

Manufactured For:



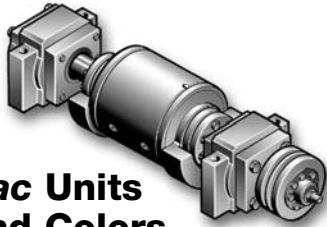
AFC SmartPac Series II (PV2-98) VIBRATOR SHAFT

# INSTALLATION MANUAL

Manufactured By:



Force Control Industries, Inc.



## SmartPac Units Sizes and Colors

- 11,000 Lb.....Yellow
- 13,000 Lb.....Green
- 15,000 Lb.....Red

## SPECIFICATIONS

### MACHINE TECHNICAL SPECIFICATIONS

**Voltage:** All available, including industrial voltages.

**Frequency:** 50/60 Hz.

**Horsepower:** Two 10 HP motors (7.5 kW)

**Shaft Amplitude:** Programmable and variable  
Fixed at 11,000 lbs. (49 kN), 13,000 lbs. (58 kN) and 15,000 lbs. (67 kN) for each shaft @ 2900 RPM.

**Shaft Speed (Frequency):** Programmable and variable 2500 to 2900 rpm. Shaft speed in excess of 2900 RPM may result in premature vibrator shaft bearing and component failure.

### CONTROL SPECIFICATIONS

**Electrical Control:** 110 VAC 50/60 Hz.

**Fluid Pressure:** 300-600 PSI (20-40 Bar)

**Air Control:** 5 cfm (.14M<sup>3</sup>/minute) at 80 PSI for 10 cycles/minute.

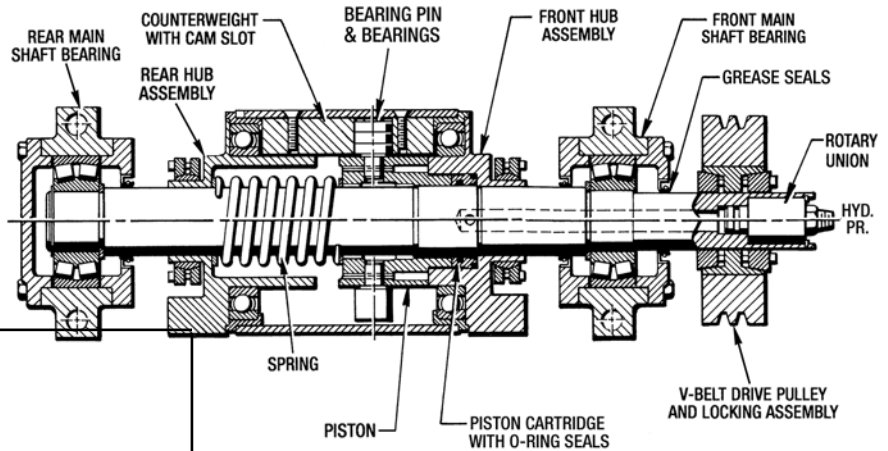
**Speed Control:** Analog controlled frequency drives.

**Method of Weight Shift:** Internally activated air over hydraulic.

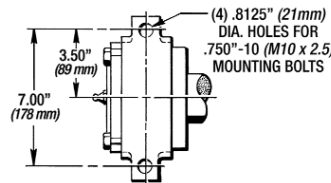
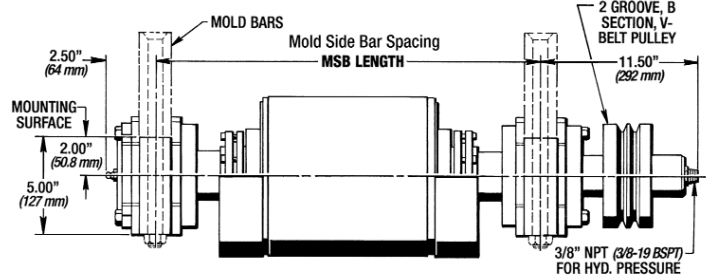
### MECHANICAL SPECIFICATIONS

Straight bore bearings, synthetic lubrication same as standard bearings. A Besser set of parts is available with all parts required to change V3-12 Vibrapac through V6-12 Superpac concrete products machines, from standard or Bescodyne vibration to the AFC SmartPac System.

## DESCRIPTION



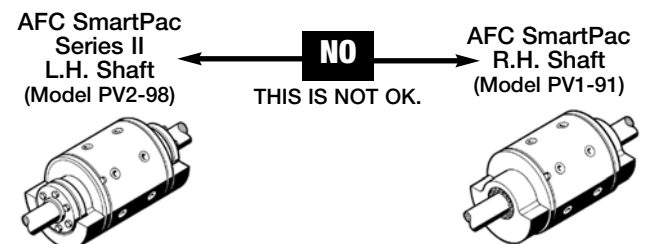
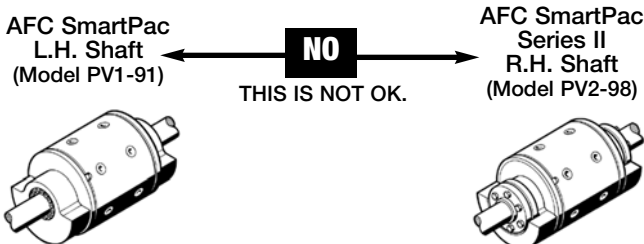
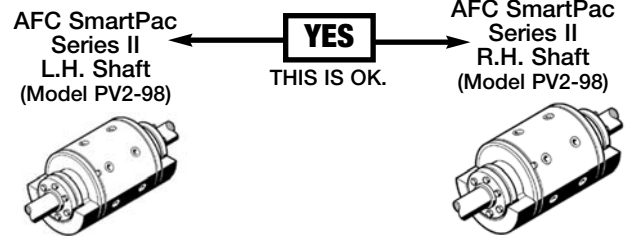
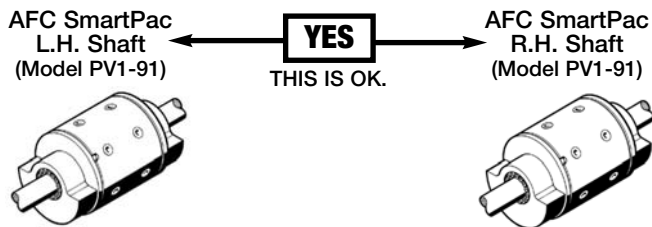
## DIMENSIONS



Available MSB Lengths	
English (Inches)	Metric (mm)
18.047	454
20.047	504
22.047	530
27.480	554

## AFC SmartPac MODEL VARIATIONS

**CAUTION - AFC SmartPac & AFC SmartPac Series II Shafts must NEVER be installed together.**



# INSTALLATION

## A. REMOVING *SmartPac* VIBRATOR SHAFTS

1. Place the Mold Box with the *SmartPac* Vibrator Shaft sets attached into the Roll-Over Fixture.
2. Roll the whole Fixture and Mold Box over to the inverted Installation Position.
3. Break loose and remove the (2) Vibrator Mounting Bolts and Hex Nuts from each Bearing Housing.
4. Insert a pry bar into each gap and pry the Front Main Bearing Housing and the Rear Main Bearing Housing loose from the Mold Bar notches as shown in *Figure 1*.

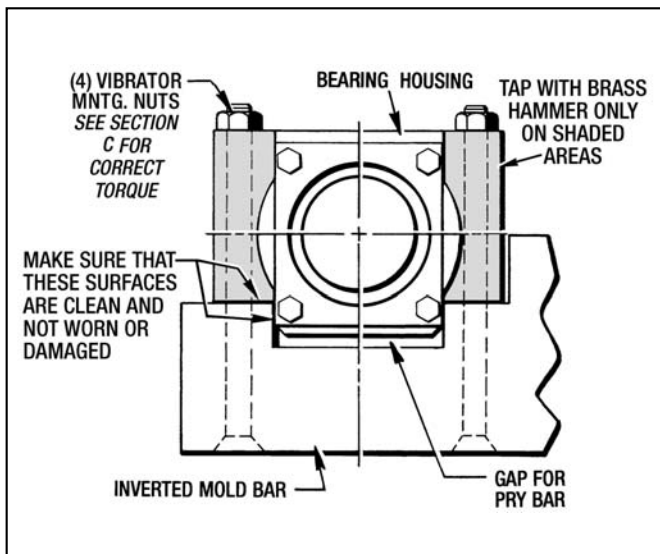


Figure 1 - Removing & Installing Vibrator Shafts

5. Lift and remove the *SmartPac* Vibrator Shaft Assembly with a soft sling and overhead hoist.

**CAUTION - Never lift the *SmartPac* Vibrator Shafts by the Bearing Housings. This could damage the Oil Seals in the Bearing Housings.**

## B. INSTALLING *SmartPac* VIBRATOR SHAFTS

**NOTE -** Inspect Mold Bar Slots for wear and/or damage. Worn Mold Bars can cause poor *SmartPac* performance and/or premature failure.

1. Make sure the mold side bar pockets are clean and free from all concrete and clean paint off bearing housing before inserting into mold side bar.
2. Set the new *SmartPac* vibrator shafts into position on the mold bars. You may have to use the pry bar in each gap to nudge the bearing housings down until they seat themselves completely into the mold bar notches. See *Figure 2*.

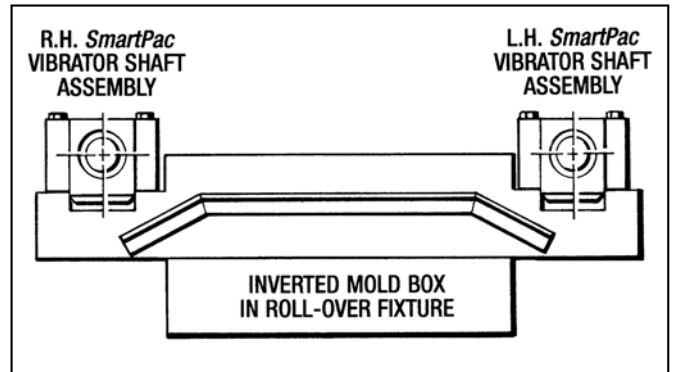


Figure 2 - Inverted Mold Box

**NOTE -** Don't forget that when the Mold Box is inverted the L.H. Shaft is on the right side and the R.H. Shaft is on the left side as shown in *Figure 2*.

3. After placing the vibrator housings in the mold side bars make sure the top of the housing does not come in contact with the mold side bar. This is critical to achieve the proper bolt torque.
4. Attach the bearing housings with the vibrator mounting bolts, washers and hex nuts to the mold side bars. Use a Hex Hd. Bolt/Flat Hd. Screw, Lock Washer and Hex Nut for Standard Mounting. Replace bolts with thread damage or thinning (necking). Do not apply lubrication to the threads of the fastener or nut. **See Section C for correct parts, Besser Part Numbers and required torque for Vibrator Mounting Bolts.**

**CAUTION - As shown on page 1, NEVER install an older *SmartPac* Vibrator Shaft (Model PV1-91) with a newer *SmartPac* Series II (Model PV-2-98) Vibrator Shaft. Always install the same models of Vibrator Shafts together.**

5. Make sure the shafts will rotate freely by hand prior to installation of the mold into the machine. Shafts not rotating freely may indicate a preload on the outer bearing race. Tap the housing with a brass hammer to relieve the preload on the bearings.

**IMPORTANT - See Section E for an installation checklist. Failure to follow these installation instructions may cause the following:**

- Broken bearing housings
- Broken mold side bars.
- Egg shaped bolt holes in bearing housing
- Premature bearing wear
- Erratic vibration
- Major damage to bearings and housings
- Broken components inside the *SmartPac*

## C. VIBRATOR SHAFT MOUNTING BOLT USAGE

This is to announce that Besser Company has a **New** high strength vibrator bolt to address vibrator bolt stretching. Our New bolt will be offered as standard for both Posapac and SmartPac vibrator shafts eliminating all previous bolt types, lockwashers and standard nuts. The combination of our **New** standard high strength bolts, hardened washers, and Flex Loc nut provides a more robust fastening system for the demands of high vibration systems. Although the **New** high strength bolt used in combination with the hardened washers and Flex Loc nut and fastening procedure is a technological advancement, it is not a fail-safe application if poor fastening procedures are used.

**Note: Vibrator Bolts, Flex Loc Nuts and Hardened Flat Washers are rated for one time use only.** Due to the special tooling and testing required to verify if a bolt has exceeded its' stretch limitations prior to re-use, the vibrator bolts cannot be relied upon past one time use.

All returns for warranty consideration for failure of any mold components, including vibrator shafts and vibrator bolts resulting from loose or broken vibrator bolts, will be contingent on return for inspection and analysis of the vibrator bolts and its' components (Flex Loc Nuts and Hardened Flat Washers), associated with those mold component failures.

Reasonable care must be taken when matching up the mating surfaces of the mold top plates, mold sidebars, bearing housings, and pallet guides. These surfaces must be kept clean prior to assembly, be free from burrs or rough edges around the holes, and they must be flat so full surface contact can be maintained. If any of the above conditions are not met, this will detract from the normal bolt stretch that keeps the fastener tight and will cause a failure in any fastening system. Careful inspection of all components must be done prior to assembly and any components showing the above conditions should be repaired or replaced. Please observe the torque requirements on the following page. These torque requirements must be achieved when tightening the fasteners as the resulting bolt stretch keeps the fastener from loosening.

The new Magne finish, which is silver in color complies with new EPA restrictions and meets the same requirements as our previous gold colored cadmium coating found on vibrator bolts used for Ultrapac applications. Initially, during the transition period to the **New** high strength bolt, some bolts will have a black finish but will meet the same specifications.

A 1/4 "thick hardened washer (#115333) will be placed above the nut of all fasteners and under the head of the hex-head fas-

teners for a more rigid assembly. Non-hardened washers can adversely affect bolt stretch. The hardened washer also helps dissipate the load forces by offering a larger surface area. Note the orientation of the washers on the attached drawings.

A 3/4" Flex Loc Nut (#087871) is used with the fasteners. A Flex Loc Nut distributes the load evenly across the bolt threads, eliminating use of a lock washer.

PART NO.	DESCRIPTION
#648371	.....Complete Set of Parts for one Ultrapac mold
#488059	.....Hex Head Bolt 13.0" long
#488060	.....Flat Head Bolt 13.25" long
#087871	.....Flex Loc Nut
#115333	.....Hardened Flat Washer
#490711	.....Flat Head Assembly & Instruction Drawing
#490710	.....Hex Head Assembly & Instruction Drawing

**NOTE:** SOP 648371 is designed for Ultrapac molds

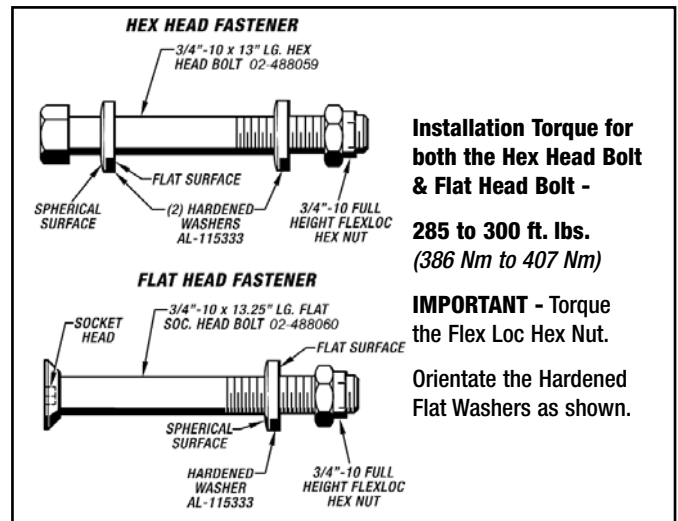


Figure 3 - Ultrapac Fastening System

but the Flex Loc Nut and hardened washers can be used on any bolt length and will be an improvement over lock washers and standard nuts.

**WARNING: SERIOUS DAMAGE CAN OCCUR TO THE *SmartPac* VIBRATING SHAFT ASSEMBLY OR THE MOLD SIDE BARS IF THE VIBRATOR MOUNTING BOLTS ARE NOT TORQUED PROPERLY.**

## D. LUBRICATION & CLEANING

### • VIBRATOR BEARING HOUSINGS & CAM FOLLOWER BEARINGS

Vibrator Bearing Housings and CAM follower bearings should be lubricated every eight hours with one fluid ounce of **NLGI Rated Synthetic Grade 2 Extreme Pressure Grease**. (Besser Part Number 114135). (See Figure 4.)

### • CONTROL UNIT

1. The hydraulic supply tank should be maintained at no less than 3/4 full.
2. The hydraulic lines from the pump to the vibrator shaft must be of equal length and size to assure smooth and equal shifting of the right hand and left hand vibrator units.
3. The air silencer will require periodic cleaning depending on plant environment conditions.

4. The air filter on the supply tank needs periodic cleaning depending upon plant environment conditions

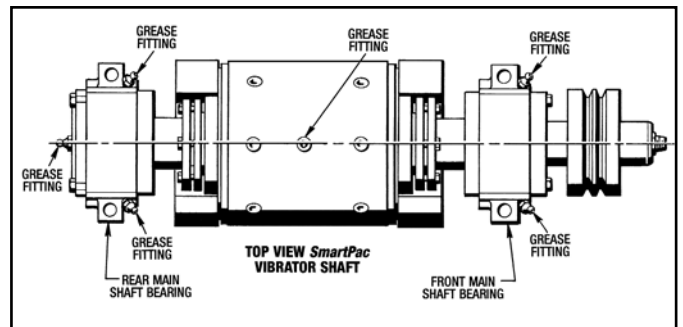


Figure 4 - Main Shaft Bearing Lubrication

## E. INSTALLATION CHECK LIST

The Table below summarizes operational checks and adjustments for the *SmartPac* System. For complete information, refer to your machine's operation and maintenance manual.

**WARNING - Do not operate the system if the vibrators or control unit is not functioning correctly.**

<b>SMARTPAC INSTALLATION CHECKLIST</b>	
<b>SmartPac to Mold</b>	
<input type="checkbox"/>	Assure the left and right hand units are the same model.
<input type="checkbox"/>	Verify that the left and right sides of the bearing housings are snug up to the mold side bar. <i>Damage to the mold side bar or bearing housings may prevent this from occurring. If this is the case, replace the worn components.</i>
<input type="checkbox"/>	Check for a gap of 1/16 inch between the top of the bearing housing and the mold side bar. <i>If the top of the housing is in contact with the mold side bar severe damage can occur to the transmission of vibration into the mold side bar.</i>
<input type="checkbox"/>	<i>SmartPac</i> bearing housing nuts and bolts are torqued 250 ft. lbs.
<input type="checkbox"/>	Assure that the shafts can be turned freely by hand when the <i>SmartPac</i> units are bolted to the mold. <i>If the shafts are not turning freely, it is an indication of preloading the bearing. This situation does not allow the bearing to rotate properly and can result in the overheating and failure of the bearings.</i>
<input type="checkbox"/>	Assure <i>SmartPac</i> units are on the proper side of the mold.
<b>Mold Assembly with SmartPacs in the Machine</b>	
<input type="checkbox"/>	Verify that lower hoses at the "V" fitting on the dump valve assemblies are filled with ATF fluid. <i>This prevents air from entering your lines and possibly causing erratic shifting of the unit.</i>
<input type="checkbox"/>	Verify that control unit tank is 3/4 filled with ATF fluid.
<input type="checkbox"/>	Verify that air pressure for the cylinder rod end is set to 60 psi (413.7 kPa).
<input type="checkbox"/>	Verify that air pressure for cylinder cap end is set to 30 psi (206.9 kPa).
<input type="checkbox"/>	Thoroughly clean both ends of the quick disconnects and attach hoses to dump valve assemblies.
<input type="checkbox"/>	Operate air valve to extend air cylinder rod.
<input type="checkbox"/>	Retract air cylinder. Wait two seconds and then extend air cylinder rod again while watching both vibrators shift 90 degrees. If vibrators do not shift fully when rod is retracted, stop operation and refill reservoir tank.
<input type="checkbox"/>	Assure that when air cylinder rod is extended, both vibrators return to balanced position.
<input type="checkbox"/>	Assure the shafts are rotating inward.
<input type="checkbox"/>	Adjust one motor to match the RPM of the other motor (+/- 2 RPM)

## F. FACTORY REBUILD AND RAPID EXCHANGE SERVICE

A **Rapid Exchange Service** is offered by **Force Control** exclusively through the **Besser Company**.

Before returning any units to **Force Control**, contact the **Besser Company Central Order Department** for shipping instructions and order processing. The Besser Company will arrange proper authorization with **Force Control** for **Same Day Shipment** of a Reconditioned Core directly to you and the return of your old Core.

These Reconditioned Cores are shipped in a **Returnable Shipping Container** for you to ship your old failed core directly to **Force Control** for a "**Core Credit**".

Neither **Force Control** or the **Besser Company** can be responsible for any units returned without following the procedures outlined.

If you are not using one of the Returnable Shipping Containers extra care must be given to the packaging of returned units. Firmly attach

the shaft assembly to a suitable skid. Shipment damaged units always delay repairs. It is usually impossible to recover damage costs from the carrier. Whenever possible describe the problems you are having with the failed unit on your shipping papers.

Contact: **Besser Central Order Department** for complete return address. • **Phone: (989) 354-4111** • **Fax: (989) 354-3120**

Return to: **Force Control Industries, Inc.**

For more detailed information a complete **Service Manual** can be downloaded and printed off our web site.  
Go to: <http://www.besser.com>

All of our Catalogs and Service Manuals on the website are in PDF format and will require **Adobe Acrobat Reader 5.0** or later. This **Adobe Acrobat Reader 5.0** can be downloaded from our web site if you do not have it installed on your computer.