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	Table of Contents	Page
I.	Introduction	2
	Precautions	3
II.	Air Requirements	3
III.	Assembling Internal Concrete Vibrator	4
	Setting the Turbo Valve for your Head	5
IV.	Operating in the Concrete	5
V.	Maintenance	6
	Disassembly & Assembly	6 - 9
VI.	Performance Data - VMP Power Unit & Interchangeable Heads	10
VII.	Power Unit Performance Data	10
VIII.	Dimensions	11
IX.	VMP Turbo with Handle Parts Explosion	12
	VMP Turbo with Handle Parts List	13
Х.	VMP Turbo with Cage Parts Explosion	14
	VMP Turbo with Cage Parts List	15
	SMART!PARTS System Guide	16

## I. Introduction

You have purchased a Viber<sup>®</sup> Pneumatic Power Unit, the center of your Smart!Parts<sup>™</sup> Internal Concrete Vibrator System. The other system components include a **Viber** vibrator head and a **Viber** reversible flexible drive.



**Power Unit+ Flexible Drive+ Head = Smart!Parts<sup>™</sup> System** 

You build the right **Smart!Parts** System for your application by choosing from the wide range of **Viber** components including many different power options, different flexible drive lengths, and steel and rubber tipped vibrator heads or heads coated completely with polyurethane. These components all use identical fittings so that **Viber** components are completely interchangeable. Any flexible drive can be used with any of the power units (electric, pneumatic, or gasoline) and any of the heads. See page 16 for recommendations to select the best **Viber** power unit, head and flex drive for your application.

When properly used, your **Smart!Parts** System will effectively compact concrete to remove entrapped air, producing high quality concrete that is dense, strong, durable, and impermeable.



# Caution

### CHECK YOUR EQUIPMENT

- 1. Inspect the vibrator system for damage. Never use a damaged vibrator.
- Have all components of the vibrator system received proper maintenance?
  VMP Pneumatic Motors: Monitor bearings. No lubrication required.

Flexible Shafts: Re-grease core after every 50 hours of use or if core rattles excessively.

Vibrator Head: Monitor bearings. **Viber** heads are permanently lubricated at the factory. No further lubrication required.

- Are all vibrator system connections tight? Apply Teflon<sup>®</sup> tape to the casing threads, before attaching the head and motor. This gives a water tight connection that will not come loose during operation.
- 4. Do you have the proper power source? Air Requirements: Use the chart on the right as a rule of thumb. Air consumption will vary based on the size of the Head and the slump of the concrete (the resistance). The 2 1/2" Head may require the VMP TURBO to demand up to 100 CFM @ 100 PSI to deliver maximum performance.
- 5. The VMP TURBO comes with the quick disconnect *motor fitting* already installed. You will need to have a quick disconnect *drive fitting* (pn 414911) for your flex drive.

### CHECK YOUR FORMS

They need to be well made to withstand the strains of vibration.

- 1. Use screws instead of nails (nails will back out with vibration).
- 2. Forms need to be well braced to prevent bulging.
- 3. Joints need to be closely fit to prevent leaking.
- 4. Monitor forms during placement of concrete. Tighten as needed.

### **II. Air Requirements**

### VMP TURBO AIR REQUIREMENTS

HEAD TYPE	HEAD SIZE	CFM						
	7/8″	35						
	1″	35						
STEEL TIP	1-1/4″	40						
	1-1/2″	40						
ROBBER III	2-1/8″	65						
	2-1/2″	85						
POLLY	1-3/4″	40						
HEADS	2″	50						
	7/8″	35						
SPECIAL	7/8″ LF	35						
	2-1/8" SP	40						
LE is our low force head. Great for IEC forms. Output is only								

LF is our low force head. Great for IFC forms. Output is only 48 force pounds at 10,000 RPM. SP is our shallow pour head. It is only 5.84" long.



#### III. Assembling Internal Concrete Vibrator

All **Viber** system components are interchangeable. All flexible drives (cores and casings) can be used to attach any head to any power unit (although certain combinations are not recommended). For optimum performance and wear consult your **Smart!Parts** System Guide on page 16 or the tables on page 10 for the best combination of components.

1. Always be sure the pneumatic power unit is disconnected from the air supply before assembling or disassembling your system.

2. Attach the quick disconnect *drive fitting* (pn# 414911) to the flexible drive casing. Apply two layers of Teflon<sup>®</sup> tape, to the 3/4'' - 16 casing threads of the flexible drive (casing with lubricated core installed) to seal the joint and prevent unscrewing. Tighten the quick disconnect *drive fitting* securely to the flex drive with small pipe wrench. File off any burrs this creates.



3. Be sure the core engages in the motor drive coupling. Turn the large hand nut **counterclockwise, from the motor side, until tight (hand nut has left hand threads to insure it will remain tight while operating the system)**. If facing the motor from the flex drive side turn hand nut clockwise.

Flex drive side



Hand Nut

**Please note:** If you do not have an assembled flexible drive, the core must be lubricated before installing it in the casing. Run the core through a handful of **Viber** Core Grease as it is inserted into the casing. Attach the end of the casing, where the core was inserted, to the motor. As the system runs the grease will migrate from the motor end to the head end of the flexible drive.

4. Before attaching the head, check the length of core extending from the head end of the flexible drive. If this length is greater than 2-3/4", twist the core while pushing it into the casing to make sure it is fully seated in the motor. If the exposed core is greater than 2-3/4" when it is fully seated in the motor it may bind and cause damage to the core, casing, or head. Do not use the system. Contact your dealer or Global Manufacturing at 1-800-551-3569.



5. Attach the head to the flexible drive. Be sure the core engages the drive coupling in the head. Apply at least two layers of Teflon<sup>®</sup> tape to the casing threads before screwing the head in a clockwise direction. Use a crescent wrench on the machined flats on the head and channel locks or a small pipe wrench on the casing fitting to make sure the connection is tight.

# Important!

Do NOT leave out the Teflon<sup>®</sup> tape! It is required to provide a watertight seal between the head and casing. If Teflon<sup>®</sup> tape or a similar sealant is not used the Head can be damaged by water that penetrates this connection and the Head may unscrew during operation and fall out into the pour.

6. Connect the power unit to the compressed air supply.

7. The VMP Pneumatic unit is equipped with a valve. The valve has vibrator Head dimension indicators based on plant air of approximately 100 PSI. Smaller heads require less power to achieve the correct rpm. Indiscriminate wide open operation will result in over speeding all heads except the 2 1/2" Head. **Do not over speed your Heads.** 

# Important!

Do not run VMP power unit without load (an attached Drive & Head). Running without load will quickly ruin the bearings.

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### Setting the Turbo Valve for your Head Do NOT run VMP fully open

Slightly loosen the socket head screw and turn the pointer indicator to the mark on the valve that corresponds to the diameter of the Vibrator Head you are using. Tighten the screw. To operate properly, open the valve unit it "stops". The pointer indicator should align with the correct diameter size.



The above Turbo Valve settings are based on 100 PSI. Adjust accordingly.

# Warning

Do not use combustible gases to drive this motor.

Wear hearing protection if sound levels exceed 85 dBA.

### **IV. Operating in the Concrete**

Follow the guidelines below when using your **Viber** Internal Concrete Vibrator for consolidating concrete:

1. Do not leave the vibrator running in air. Totally submerse the vibrator head in the concrete. This cools the bearings. Running the vibrator in air without regularly submersing it in the concrete will overheat the bearings.

2. Avoid making sharp bends in the flexible shaft.

3. Make sure you can see the concrete surface. Use lighting if necessary.

4. Place the concrete in layers no deeper than the length of the vibrator head plus 4-6". Layers should not exceed 18-20", otherwise the weight of the concrete will prevent the entrapped air from escaping.

5. Keep the vibrator head at least 3-4" from the forms. It can damage the forms causing surface defects in the concrete.

6. Do not allow the vibrator head to touch reinforcements, such as rebar. Vibration can break the bond between the reinforcement and preceding layers of stiffened concrete.

7. Let the vibrator head penetrate to the bottom of the layer as quickly as possible under its own weight. Do not **force** the Head into the pour.

8. Keep the vibrator head vertical to minimize voids and enhance the release of entrapped air. For shallow flat slabs, lay the vibrator head horizontally and drag it through the concrete or use our Shallow Pour Head - VH34-SP.

9. Withdraw the vibrator head slowly. Be sure concrete fills in behind leaving no hole. Do not attempt to "stir" the concrete.

10. Use repeated placements of the vibrator in a systematic pattern to be sure the entire surface has been vibrated. The area of action can be observed by noting how far from the vibrator head bubbles appear on the surface. Placements of the head should insure overlapping of the areas of action.

11. When compacting concrete placed on a previously compacted layer, push the vibrator 4-6" into the lower layer. Move the vibrator up & down for 5-15 seconds to "knit" the two layers together.

12. Avoid placing the concrete in "heaps". If it is necessary to flatten a heap, insert the vibrator head around the perimeter of the heap using as many placements as necessary.

13. Consolidation is complete when no new bubbles come to the top, a glistening layer of mortar covers the concrete surface, and the "whine" of the motor indicates that the vibrator speed has leveled off.

14. Clean all vibrator parts immediately following each use.



## V. Maintenance

Routine monthly maintenance inspection is recommended unless the power unit is used for multiple shifts per day or in harsh environments (heavy dust, snow, sand, etc.).

Bearings are permanently lubricated with special high-speed lubrication and require no additional lubrication. Replace bearings when shaft rotation appears restricted or if bearings become noisy.

**Disassembly & Assembly** should only be performed by a Factory-Authorized Repair Facility or a trained mechanic.



Disconnect air supply and vent all airlines before maintenance.

## **Tools Required:**

- 1/4" Hex Key
- Propane Torch
- 3/4" Open End Wrench
- 3/32" Hex Key
- 3/16" Hex Key
- Medium Non-marring Mallet
- Outside Retaining Ring Pliers
- Medium Common Screw Driver
- 1 1/2" Diameter Bearing Press Rod 4" Long



1. Take off the handle using  $\frac{1}{4}$ " hex key. Illustration shows VMP with Handle (pn 911212). The VMP with Cage (pn 911211) attachment is similar.



2. Use a propane torch to heat the quick disconnect BEHIND the hand nut for 1 -2 minutes to soften the thread adhesive.



Quick Disconnect Nut

3. Working quickly, slide a  $\frac{3}{4}$ " open-end wrench behind the hand nut and unscrew the quick disconnect from the nose. Do NOT stop unscrewing until the quick disconnect is free of the nose cap.



4. Use a 3/32'' hex key to remove the 6 flat head screws (8 -  $32 \times 34''$ ) from the nose cap.

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Bearings installed

11. **Opposite** of the nose end side use a screw driver to push front bearing out of its tolerance ring.



13. Use a  $1 \frac{1}{2}$  diameter bearing press rod (a piece of wood, pipe, etc.) to drive the bearings into the grip of the tolerance rings from the front and rear side of the housing. Seat the bearings against the shoulder in the housing.

NOTE: An Arbor Press is preferable to a mallet if available.



12. Remove the tolerance rings and clean the inside of the bearing housing with any type of solvent. Replace the tolerance rings making certain they seat against their shoulder in the bearing bore. 14. Place seal into seal bore with spring side facing the turbine wheel and press flush with the housing. Place a small amount of general purpose grease on seal contact area of shaft and on seal lips.

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15. While turning the turbine wheel, gently push the shaft/wheel assembly into the bearings until the ring (the 'ring' in the illustration above cannot be seen because it is near the wheel end) on the shaft passes through the seal and seats on inner bearing.



16. Set the unit down on the wheel so that the shaft is vertical. Replace the spring washer and retaining ring. You will need to compress the spring washer to do this, so note the gap in the ring before reinstalling it on the shaft. When the retaining ring is fully seated in the groove, the gap should be nearly equal to the un-installed ring.

17. To reassemble reverse the disassembly steps. Check rotation after assembly. The wheel should turn freely with only drag caused by the shaft seal.



## VI. Performance Data

PERFORMANCE DATA FOR VIBER <sup>®</sup> PNEUMATIC POWER UNIT & INTERCHANGEABLE HEADS												
	VMP Т	URBO										
Part #	Model #	Size Dia.	Head Length	Weight	Unbalance	Amplitude Peak to Peak	Radius of Action	Speed	Force			
		IN	IN	LBS	LB-IN	IN	IN	RPM	LBS			
STANDARD HEADS - STEEL TIP OR RUBBER TIP												
950014	VH14	7/8	11.95	1.3	.030	.046	4.6	12,000	119			
950016	VH16	1	12.13	2.0	.030	.030	5.0	12,000	115			
950020	VH20	1-1/4	12.18	2.9	.094	.065	7.5	12,000	376			
950024	VH24	1-1/2	12.03	4.1	.170	.083	9.5	12,000	663			
950028	VH28	1-3/4	12.04	5.6	.210	.075	11.0	12,000	818			
950034	VH34	2-1/8	12.29	8.8	.396	.090	14.0	12,000	1,452			
950040	VH40	2-1/2	13.52	13.9	.600	.086	18.0	12,000	2,335			
POLLY	HEADS								Λ			
950328	VH28-PH	1-3/4	13.25	4.7	.170	.07	10.0	12,000	663			
950332	VH32-PH	2	13.40	6.4	.210	.06	12.0	12,000	818			
SPECIA	L PURPOS	SE HEA	DS									
950014	VH14-ST	7/8	11.95	1.3	.030	.046	4.6	12,000	119			
951014	VH14-LF	7/8	9.95	1.1	.017	.031	5.6	12,000	70			
952034	VH34-SP	2-1/8	5.88	3.3	.147	.089	14.0	12,000	687			
The speed provided is an approximation of the head speed in constant for the specified mater head combination. The actual												

The speed provided is an approximation of the head speed in concrete for the specified motor-head combination. The actual speed will vary depending on temperature, consistency of the concrete, the power unit's condition, the hours on the bearings, etc...

# VII. Power Unit Performance Data

VIBER <sup>®</sup> PNEUMATIC POWER UNIT											
PART #	MODEL #	MAX AIR FLOW	HORSEPOWER	MAX HEAD SIZE	NET WT LBS						
911211	VMP TURBO with Cage	100 CFM	2.2 HP	2-1/2″	17.6						
911212 VMP TURBO with Handle 100 CFM 2.2 HP 2-1/2" 14.7											
Quick Disconnect fitting is built into the design. To other but a flow Drive to the VMD newer unit, and as a Flow Drive with a											

Quick Disconnect fitting is built into the design. To attach the Flex Drive to the VMP power unit, order a Flex Drive with a 'Drive Fitting' or order the Drive Fitting separately.

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### **VIII.** Dimensions

Dimension are in inches





# IX. VMP Turbo with Handle (pn 911212) Parts Explosion





VMP Turbo Power Unit with Handle * Part Number 911212									
Item no.	Part Number	Description	Qty.						
1	337010	Screw scs 5/16-18 unc x 1"	1						
2	490630	Handle	1						
3	414912	Fitting	1						
4	385216	O-ring Buna N 568-216	1						
5	414913	Quick disconnect nut	1						
6	470023	Insert	1						
7	334802	Screw fsh #8-32 unc x 3/4"	6						
8	402042	Сар	1						
9	490643	Grip	1						
10	270012	Muffler	2						
11	490649	Plug	1						
12	349186	Retaining ring 5160-66	1						
13	338558	Wave washer 5806-150-2	1						
14	382232	Bearing	2						
15	389911	Tolerance ring	2						
16	249015	Housing	1						
17	249355	Shaft	1						
18	386696	Seal	1						
19	336920	Screw hhc 1/4-28 unf 2-1/4"	6						
20	110200	Exhaust plate	1						
21	334910	Screw fsh 1/4-20 unc x 1"	6						
22	199940	Turbine wheel	1						
23	385020	O-ring cord	1						
24	249023	Jet plate	1						
25	385022	O-ring cord	1						
26	3349041	Screw fsh 1/4-28 unf 5/8"	4						
27	249053	Manifold plate	1						
28	385015	O-ring cord	1						
29	249033	Inlet plate	1						
30	294602	Nipple	1						
31	290110	Valve	1						
32	269510	Universal twist claw coupling with screen	1						
33	269608	Air screen	1						
34	269710	Rubber washer modified	1						



# X. VMP Turbo with Cage (pn 911211)

# **Parts Explosion**





VMP Turbo with Cage * Part Number 911211								
Item no.	Part number	Description	Qty.					
1	414912	Fitting	1					
2	385216	O-ring Buna N 568-216	1					
3	414913	Quick disconnect nut	1					
4	470023	Insert	1					
5	334802	Screw fsh #8-32 unc x 3/4"	6					
6	402042	Сар	1					
7	270012	Muffler	2					
8	349186	Retaining ring 5160-66	1					
9	338558	Wave washer 5806-150-2	1					
10	382232	Bearing	2					
11	389911	Tolerance ring	2					
12	249015	Housing	1					
13	249355	Shaft	1					
14	386696	Seal	1					
15	336920	Screw hhc 1/4-28 unf 2-1/4"	6					
16	337010	Screw scs 5/16-18 unc x 1"	1					
17	490632	Cage handle	1					
18	110200	Exhaust plate	1					
19	334910	Screw fsh 1/4-20 unc x 1"	6					
20	199940	Turbine wheel	1					
21	385020	O-ring cord	1					
22	249023	Jet plate	1					
23	385022	O-ring cord	1					
24	3349041	Screw fsh 1/4-28 unf 5/8"	4					
25	249053	Manifold plate	1					
26	385015	O-ring cord	1					
27	249033	Inlet plate	1					
28	294602	Nipple	1					
29	290110	Valve	1					
30	269510	Universal twist claw coupling with screen	1					
31	269608	Air screen	1					
32	269710	Rubber washer modified	1					

	VIBE	R SMA	RT!PA	RTS <sup>™</sup>	SYSTEM	I SE	LEC	TIO	N G	UID	E						
1		2	3		4					5			1				
Application	Slump	Snace	Head	Radius	Power Units		Flex			xible Drive Length-Feet							
Аррисаціон	Siump	Space	Diameter	of Action	Fower onits	1′	3′	5′	7′	10′	14′	21′	28′	35′			
Block Walls & Small Diameter Fills:					VME-1500	x	x	X	х	x	х	x	x	х			
Plastic and flowing	> 3″	2.5″ x	7/8″	4.6″	VMP Turbo	x	х	x	х	x	х	x	x	х			
members & walls &		2.5″	VH 14		VMG-1750	7' or lon	7' or longer recommended		х	x	х	x	x	х			
confined places.					VMG-2500BP	7' or lon	iger recor	mmended	Х	х	х	х	х	х			
Thinnest Prestressed Sections:					VME-1500	x	x	х	х	x	х	х	х	х			
Plastic and flowing	>3″	3″ × 3″	1″	5.0″	VMP Turbo	x	х	х	х	x	x	x	х	х			
members & walls &	- 3		VH 16	5.0	VMG-1750	7' or lon	iger recor	nmended	х	x	x	x	х	х			
confined places.					VMG-2500BP	7' or lon	iger recor	nmended	х	х	х	х	x	х			
Thin Prestressed					VME-1500	x	х	х	х	х	х	х	х	х			
Plastic concrete in thin					VME-2500	х	х	х	х	х	х	х	х	х			
walls, columns, beams, precast piles, thin slabs,	3 - 5″	3.25″ x 3.25″	1-1/4″ VH	7.0″	VMP Turbo	x	x	х	х	х	х	х	x	х			
and along construction					VMG-1750	7' or lon	iger recor	nmended	х	х	х	х	х	х			
joints.					VMG-2500BP	7' or lon	iger recor	mmended	х	x	х	х	х	х			
Thin Wall Sections &			1 1/7″		VME-1500	x	х	x	х	х	х	х	Not Reco	mmended			
Plastic concrete in thin			VH 24	9.5″	VME-2500	x	х	х	х	х	х	х	х	х			
walls, columns, beams, precast piles, thin slabs.	3 - 5″	3.5″ x 3.5″			VMP Turbo	x	x	x	х	x	x	х	x	х			
and along construction		5.5	1-3/4" VH 28-PH Polly Head	10″	VMG-1750	7' or lon	7' or longer recommended			х	х	х	Not Reco	ommended			
joints.				10	VMG-2500BP	7' or lon	iger recor	nmended	х	х	х	х	x	х			
General Use:			1-3/4″ VH 28	11″	VME-1500	x	x	x	х	х	х	х	Not Reco	ommended			
Plastic & stiff plastic concrete in general					VME-2500	x	x	x	х	x	х	x	x	х			
construction such as walls columns beams		3.75″ x			VME-3000	x	x	x	х	x	х	x	x	х			
pre-stressed piles, and	2 - 4″	3.75″	~"		VMP Turbo	x	х	x	х	x	x	х	х	х			
heavy slabs.			2″ VH 32-PH	12″	VMG-1750	7' or lon	7' or longer recommended		х	x	х	х	Not Recommended				
			Polly Head		VMG-2500BP	7' or lon	7' or longer recommended		х	x	х	x	х	х			
Stiff Low-Slump					VME-2500	x	x	x	х	x	x	x	Not Reco	ommended			
Concrete: Stiff plastic concrete	1 - 3″	4" x 4"	2-1/8″ VH 34	14″	VME-3000	x	x	x	х	x	x	x	x	х			
in general construction					VMP Turbo	x	x	x	х	x	x	x	x	x			
beams, pre-stressed						7/ 07 107		l	v	v	v	v	v	v			
piles, and heavy slabs.					VMG-2300BP	7 01 101	7' or longer recommended		^	^	^	^	^	^			
Stiffest Low-Slump Concrete:					VME-2500	x	x	X	Х	x	x	х	Not Reco	ommended			
Mass and structural	< 2″	5″ x 5″	2-1/2″	18″	VME-3000	x	x	X	Х	x	x	х	x	Х			
relatively open forms.			VH 40		VMP Turbo	x	х	X	Х	x	x	x	x	Х			
		ļ			VMG-2500BP	7' or lon	iger recor	nmended	х	×	х	х	x	Х			
Shallow Pours: Plastic & stiff plastic					VME-1500	x	x	x	х	x	х	x	Not Reco	ommended			
concrete in slabs and			2-1/8″		VME-2500	x	x	x	х	x	х	x	x	х			
than 12" thick.	2-4″	4″ x 4″	Shallow	14″	VMP Turbo	x	х	x	Х	x	x	х	х	х			
			Pour		VMG-1750	7' or lon	7' or longer recommended		х	x	x	x	Not Reco	ommended			
					VMG-2500BP	7' or lon	iger recor	mmended	х	×	x	х	x	х			
ICF Applications: Plastic and flowing					VME-1500	x	х	x	х	x	x	x	х	х			
concrete for very thin		2.5″ x 2.5″	7/8" VH 14-LF Low Force		VMP Turbo	x	х	х	х	x	х	х	х	х			
members & walls & confined places where	> 4″			5.6″	VMG-1750	7' or lon	iger recor	mmended	х	x	х	х	х	х			
insulated concrete forms are used.					VMG-2500BP	7' or lon	iger recor	nmended	x	x	x	x	x	х			

Find description in column 1 that matches the desired application.
Use column 2 to adjust for any size restrictions due to reinforcements, such as rebar, or other limiting structures.
Column 3 gives the diameter of the vibrator head needed.
Select the power unit desired from column 4.
Find the core and casing length desired in section 5.