



WE FIND A WAY — OR MAKE ONE!

# **CAR-ROCKER® RAILCAR VIBRATORS**

**CRT  
Turbine  
Series**



## **OWNER / OPERATOR MANUAL**

**WORKMASTER** disclaims any liability for injuries, death or damages arising directly or indirectly, from the use, operation, or application of this product not in accordance with the procedures, specifications and recommendations contained in this owner's manual. The user of this product is responsible to install, maintain and operate the product and parts or components manufactured or supplied by **WORKMASTER** in such a manner as to comply with all federal, state, and local rules, ordinances, regulations, and laws, including the Williams-Steiger Occupational Safety Act, and the American National Standards Institute Safety Code.

# SYMBOLS

---

The following symbols are found throughout this Owner/Operator Manual to alert the reader to the relative danger that may result from non-observance.



This indicates a situation in which a hazard is imminent and will result in a high probability of serious injury or death.



This indicates a potentially hazardous situation, which could result in minor to moderate injury.



**CAUTION**

This indicates a potentially hazardous situation or unsafe practice which could result in product or property damaged.



**IMPORTANT**

This symbol indicates a general statement to assist the user in the operation or maintenance of the equipment.

# TABLE OF CONTENTS

---

| <b>SECTION</b> |                          | <b>PAGE</b> |
|----------------|--------------------------|-------------|
| I.             | Introduction             | 1           |
| II.            | Safety                   | 2           |
| III.           | Required Materials       | 3           |
| IV.            | Air Supply               | 4           |
| V.             | Operation                | 5           |
| Appendix A     | Air Supply Piping        | A-1         |
| Appendix B     | Vibrator Parts Breakdown | B-1         |
| Appendix C     | Bracket Parts Breakdown  | C-1         |
| Appendix D     | Hand-Held Tachometer     | D-1         |

# I. INTRODUCTION

---

Fast, safe and economical unloading of covered hopper cars continues to be a problem at most unloading sites. One of the biggest contributors to this problem is the often time-consuming and difficult job of emptying the railcar. Load compaction, weather conditions, age, abuse, or corrosive or gritty bulk materials can combine to make this task increasingly difficult.

Regardless of cause, the costs associated with the problem are significant. Delays in emptying the hopper cars means slow car turnaround, increased demurrage costs, and interrupted production schedules.

To meet our commitment of **"WE FIND A WAY – OR MAKE ONE®"**, **WORKMASTER** has developed a line of Railcar Vibrators and accessories which provide a safe, efficient, and economical solution to the problem of unloading easy, medium and hard-to-empty hopper cars.

This Operation Manual details the specifications, operation, maintenance, and safe use of the **CRT Series of Railcar Vibrators**. Experience has shown that the **CRT Series Vibrators** will help unload the most difficult railcars. However, the same experience demonstrates that total satisfaction in use depends on attention to detail in operating and maintaining the unit.



## **IMPORTANT**

All persons involved in the operation and maintenance of this equipment should be thoroughly familiar with the contents of this manual.

## II. SAFETY

---

To prevent injury to yourself or others, and/or damage to equipment, you should adhere to the following basic safety instructions.

1. Carefully read the entire Owner/Operator Manual prior to installing or operating equipment.
2. Always follow proper precautions and use proper tools and safety equipment.
3. Be sure to receive proper training.
4. Always use the equipment and all its components in applications for which they are approved.
5. Be sure to assemble all components correctly.
6. Never use worn, defective or damaged components.
7. Always Practice good housekeeping and maintain good lighting around all equipment.
8. Perform Lock-out/Tag-out procedure on all energy sources to the equipment, mounting structure, loading and discharge systems in accordance with ANSI Standards before installation or maintenance.

### III. REQUIRED MATERIALS

---

The following items are not supplied with your **WORKMASTER** Railcar Vibrator but are necessary for its proper installation and operation.

- ☑ CLEAN, DRY, and REGULATED compressed air at required PSI and CFM Volume
- ☑ High-quality air hose: 3/4" - 1" ID, preferably fitted with a Universal (Chicago type) coupling.

## IV. AIR SUPPLY

**CRT** Vibrators can be operated continuously at 80 to 90 PSI. Vibrator speed should be controlled with a pressure Regulator, and Air Valve. Clean, dry, filtered air is essential to proper operation and long Vibrator life. The ideal installation will incorporate a Filter-Regulator assembly as close to the Vibrator as is practical (no more than 25'). The Regulator should have a pressure gauge.

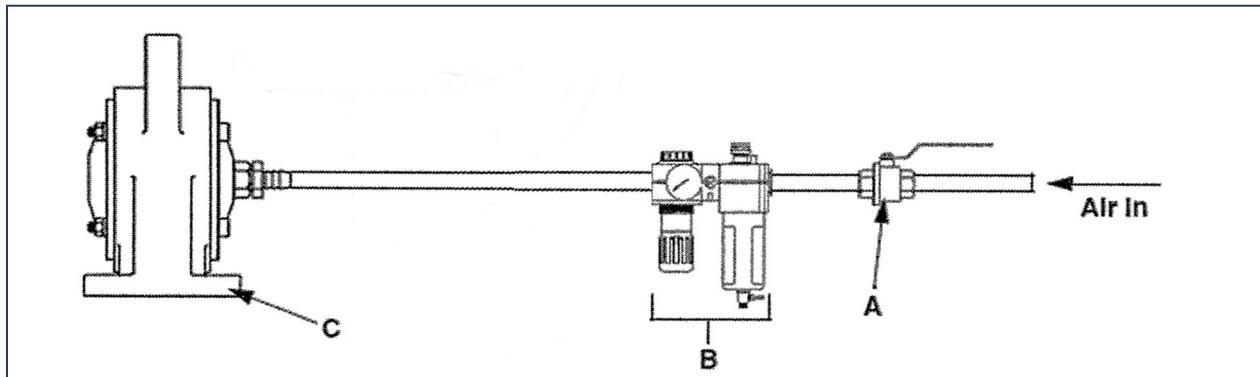
The air supply hose must be the same size as the inlet diameter of the Vibrator (3/4"). If the hose length is over 25', the next larger hose (1") should be used. Fittings that do not restrict air flow must be used. The Vibrator should always be started at a high speed (instantaneous burst of full pressure [80 – 90PSI]), and then throttled back with the air valve to the frequency that assures optimum performance. Care should be taken that an uncoupled air hose isn't dropped in the dirt and then immediately re-coupled allowing dirt to enter the hose and then the Vibrator.



### IMPORTANT

CRT Turbine Vibrators do not require lubrication. Use of lubricator can damage gearing grease and turbine wheel.

### Connecting Airline



Run suitable air supply to Vibrator (see APPENDIX A: AIR SUPPLY PIPING for recommended pipe sizes). Connect Airline to Ball Valve (A), and Filter/Regulator (B). Connect air to Vibrator (C).

## V. OPERATION

1. Verify that the Vibrator is properly seated in the cradle lug bracket and that the nut on the bracket swing bolt is tightened.



### IMPORTANT

The Vibrator must be tightened securely, started, and then re-tightened while running. Running the Vibrator assists in seating the lug bolt and nut securely, it is impossible to tighten too securely. Any unusual sound (eg, pounding), coming from the Vibrator usually means that the clamp bolt nut has loosened. It is bad practice to leave the Vibrator unattended during operation.

2. Use both the Vibrator's Top Handle and the Bracket's Side Handle to place the CRT assembly into the Railcar's female wedge bracket.
3. Vibrator is shipped without lubrication. The **CRT Series** does not require lubrication. In-line lubricators can damage bearing grease.
4. Before connecting the air supply hose to the Vibrator, make sure there is no dirt or water in the hose. Blow out each hose for 30-45 seconds prior to connecting to the Vibrator.
5. Connect the air supply hose to the Vibrator. Make sure all hose and pipe connections are secure, and re-check periodically during each operating shift.
6. Use a Coupling Safety Pin and a WHIPCHECK hose-to-hose connector to secure connection.



Always use a WHIPCHECK Safety Cable to connect air hoses across couplings to prevent a pressurized hose from uncontrolled flailing if the coupling connection separates.

7. Once the Railcar's slide gate is opened, you are ready to vibrate.



**IMPORTANT**

Never vibrate the Railcar with the slide gate closed, so as not to further compact the material in the hopper car.

8. Start the Vibrator by quickly turning the air to the vibrator on. Slowly allowing the airline to energize may not produce enough force to get the turbine wheel in motion.



**IMPORTANT**

A Vibrator is transmitting maximum force when there is little, if any, visible movement of the Vibrator and its mount. Operators must abandon the false notion that to do a good job, the Vibrator itself should show great movement while in operation.

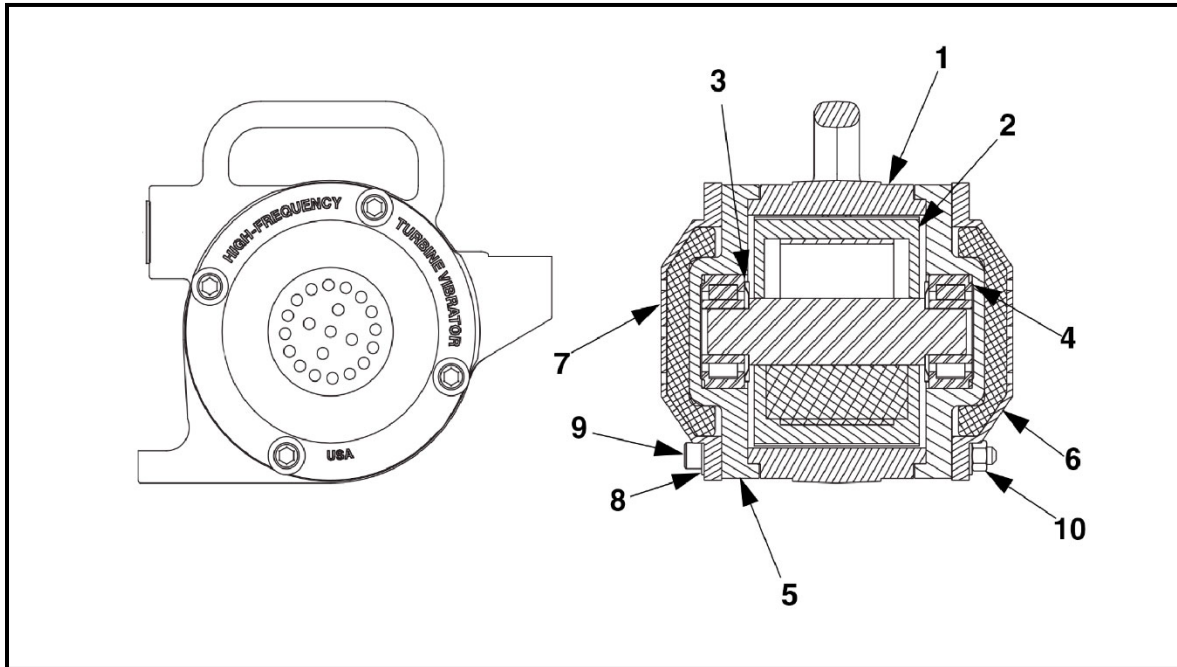
9. When finished vibrating the Railcar, shut the air OFF, disconnect the main airline from the Vibrator's Hose Whip and carefully lift the **CAR-ROCKER** out of the Pocket.
10. After prolonged use it may be difficult to remove the Vibrator from the Pocket's Female Wedge Bracket. If this occurs, turn the airline pressure down to 5-10 PSI and allow the Vibrator to "sputter" (will lessen friction) as you remove it from the Pocket.

## APPENDIX A: AIR SUPPLY PIPING

Use the Table below as a guide for sizing the airlines routed to your Vibrator. Never pipe air directly into the Vibrator. Instead, use a rubber Hose Whip (at least 2' long) to connect your airline to the Vibrator. The Hose Whip will absorb the shock generated by operating the Vibrator. This will save wear and tear on your vibrator, its fittings & couplings, and air supply piping. The appropriate Hose Whip can be purchased from your Regional **WORKMASTER** Distributor.

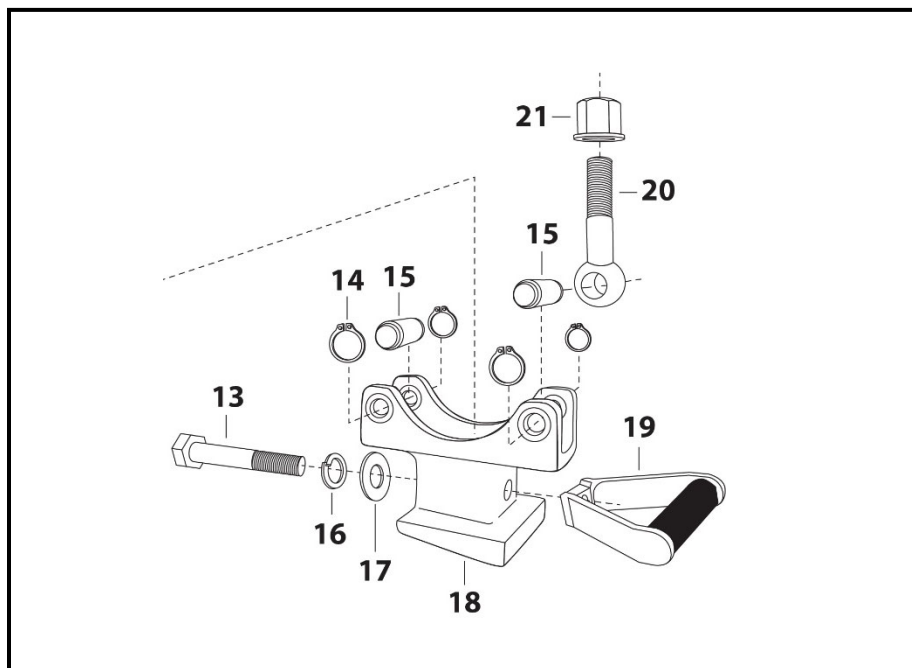
| Recommended Pipe Size for Compressed Air Flow to 125 PSI |                                    |        |        |        |        |        |        |        |        |
|----------------------------------------------------------|------------------------------------|--------|--------|--------|--------|--------|--------|--------|--------|
| Air Volume                                               | Pipe Length – feet (')             |        |        |        |        |        |        |        |        |
|                                                          | Nominal Pipe Diameter – inches (") |        |        |        |        |        |        |        |        |
| CFM                                                      | 25'                                | 50'    | 75'    | 100'   | 150'   | 200'   | 300'   | 500'   | 1000'  |
| 6                                                        | 1/2"                               | 1/2"   | 1/2"   | 1/2"   | 1/2"   | 1/2"   | 1/2"   | 3/4"   | 3/4"   |
| 18                                                       | 1/2"                               | 1/2"   | 1/2"   | 3/4"   | 3/4"   | 3/4"   | 3/4"   | 1"     | 1"     |
| 30                                                       | 3/4"                               | 3/4"   | 3/4"   | 3/4"   | 1"     | 1"     | 1"     | 1-1/4" | 1-1/4" |
| 45                                                       | 3/4"                               | 3/4"   | 1"     | 1"     | 1"     | 1"     | 1-1/4" | 1-1/4" | 1-1/4" |
| 60                                                       | 3/4"                               | 1"     | 1"     | 1"     | 1-1/4" | 1-1/4" | 1-1/4" | 1-1/2" | 1-1/2" |
| 90                                                       | 1"                                 | 1"     | 1-1/4" | 1-1/4" | 1-1/4" | 1-1/4" | 1-1/2" | 1-1/2" | 2"     |
| 120                                                      | 1"                                 | 1-1/4" | 1-1/4" | 1-1/4" | 1-1/2" | 1-1/2" | 1-1/2" | 2"     | 2"     |
| 150                                                      | 1-1/4"                             | 1-1/4" | 1-1/4" | 1-1/2" | 1-1/2" | 2"     | 2"     | 2"     | 2-1/2" |
| 180                                                      | 1-1/4"                             | 1-1/2" | 1-1/2" | 1-1/2" | 2"     | 2"     | 2"     | 2-1/2" | 2-1/2" |
| 240                                                      | 1-1/4"                             | 1-1/2" | 1-1/2" | 2"     | 2"     | 2"     | 2-1/2" | 2-1/2" | 3"     |
| 300                                                      | 1-1/2"                             | 2"     | 2"     | 2"     | 2"     | 2-1/2" | 2-1/2" | 3"     | 3"     |
| 360                                                      | 1-1/2"                             | 2"     | 2"     | 2"     | 2-1/2" | 2-1/2" | 2-1/2" | 3"     | 3"     |

## APPENDIX B: VIBRATOR PARTS BREAKDOWN



| Item #    | Part #   | Description                         | Req. |
|-----------|----------|-------------------------------------|------|
| <b>1</b>  | 12-5A001 | Turbine Vibrator Case               | 1    |
| <b>2</b>  | 12-5A002 | Rotor Assembly for Turbine Vibrator | 1    |
| <b>3</b>  | 12-5A003 | Metallic Bearing Seal (nilos ring)  | 2    |
| <b>4</b>  | 12-5A004 | Bearing Cyl Roller 2.44 OD x .98 ID | 2    |
| <b>5</b>  | 12-5A005 | End Cap (machined)                  | 2    |
| <b>6</b>  | 12-5A006 | Foam Filter 3/4" x 4-1/2" Sq.       | 2    |
| <b>7</b>  | 12-5A007 | Cap Cover                           | 2    |
| <b>8</b>  | 75-70300 | Washer Compression 3/8              | 8    |
| <b>9</b>  | 12-5A009 | Screw SHC 3/8 - 16NC x 6-1/2        | 4    |
| <b>10</b> | 75-30300 | Nut Hex 3/8 - 16NC ZP               | 4    |

## APPENDIX C: BRACKET PARTS BREAKDOWN



| Item # | Part #   | Description   | Req |
|--------|----------|---------------|-----|
| 13     | 75-12924 | Bolt          | 1   |
| 14     | 32-17873 | Ret Ring      | 4   |
| 15     | 32-17874 | Pin           | 2   |
| 16     | 75-90900 | Lock Washer   | 1   |
| 17     | 75-80900 | Washer        | 1   |
| 18     | 32-17871 | Base          | 1   |
| 19     | 32-17801 | Side Handle   | 1   |
| 20     | 32-17321 | Tie Rod       | 1   |
| 21     | 32-17875 | Nut w/ Washer | 1   |

## APPENDIX D: TROUBLESHOOTING

Use the Table below as a guide to help solve possible operational problems. If you experience any Symptoms not covered in the Table, or the Cause(s) is determined not to be the reason(s), call **WORKMASTER** or your Regional **WORKMASTER** Distributor for assistance.

| PROBLEM                    | POSSIBLE CAUSES                                                                                                                                                                                                           |                                                                                                                                                                                                                                        |
|----------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Lack of Power              | <ul style="list-style-type: none"> <li>- Air Supply Too Small</li> <li>- Hose Too Small</li> <li>- Fitting(s) Too Small</li> <li>- Dirty Air</li> <li>- Air Pressure Too Low</li> <li>- Airline Filter Clogged</li> </ul> | <ul style="list-style-type: none"> <li>- Using Lubricant</li> <li>- Exhaust Plugged</li> <li>- Gaskets Incorrectly Installed</li> <li>- Worn End Plates</li> <li>- Inlet Clogged; Restricted; Closed</li> <li>- Air Leakage</li> </ul> |
| Speed Too Low              | <ul style="list-style-type: none"> <li>- Air Supply Too Small</li> <li>- Hose Too Small</li> <li>- Fitting(s) Too Small</li> <li>- Dirty Air</li> <li>- Air Pressure Too Low</li> </ul>                                   | <ul style="list-style-type: none"> <li>- Airline Filter Clogged</li> <li>- Worn End Plates</li> <li>- Weak Mount</li> <li>- Mount Breakage</li> <li>- Using Lubricant</li> </ul>                                                       |
| Speed Too High             | - Air Pressure Too High                                                                                                                                                                                                   |                                                                                                                                                                                                                                        |
| Air "Blow-By"(Won't Run)   | <ul style="list-style-type: none"> <li>- Dirty Air</li> <li>- Water in Air</li> </ul>                                                                                                                                     | - Inlet Clogged; Restricted; Closed                                                                                                                                                                                                    |
| Exhaust Freezes            | - Water in Air                                                                                                                                                                                                            |                                                                                                                                                                                                                                        |
| Parts Rusting              | - Water in Air                                                                                                                                                                                                            |                                                                                                                                                                                                                                        |
| Can't Adjust Speed         | <ul style="list-style-type: none"> <li>- Air Supply Too Small</li> <li>- Hose Too Small</li> <li>- Fitting(s) Too Small</li> </ul>                                                                                        | <ul style="list-style-type: none"> <li>- Air Pressure Too Low</li> <li>- Filter Clogged</li> </ul>                                                                                                                                     |
| Breakage of Internal Parts | <ul style="list-style-type: none"> <li>- Dirty Air</li> <li>- Water in Air</li> </ul>                                                                                                                                     | - Air Pressure Too High                                                                                                                                                                                                                |
| "Hunting" (Varying) Speed  | - Dirty Air                                                                                                                                                                                                               | - Air Pressure Too Low                                                                                                                                                                                                                 |
| High Air Consumption       | <ul style="list-style-type: none"> <li>- Air Pressure Too High</li> <li>- Worn Cover Plate</li> </ul>                                                                                                                     | <ul style="list-style-type: none"> <li>- Operation at Too High Speed</li> <li>- Air Leakage</li> </ul>                                                                                                                                 |
| "Erratic" Start-Up         | <ul style="list-style-type: none"> <li>- Air Supply Too Small</li> <li>- Hose Too Small</li> </ul>                                                                                                                        | <ul style="list-style-type: none"> <li>- Fitting(s) Too Small</li> <li>- Air Pressure Too Low</li> </ul>                                                                                                                               |
| Stalling                   | <ul style="list-style-type: none"> <li>- Dirty Air</li> <li>- Air Pressure Too Low</li> </ul>                                                                                                                             | <ul style="list-style-type: none"> <li>- Airline Filter Clogged</li> <li>- Inlet Clogged; Restricted; Closed</li> </ul>                                                                                                                |
| Excessive Noise            | <ul style="list-style-type: none"> <li>- Fitting(s) Too Small</li> <li>- Dirty Air</li> <li>- Water in Air</li> <li>- Air Pressure Too High</li> <li>- Air Pressure Too Low</li> <li>- Airline Filter Clogged</li> </ul>  | <ul style="list-style-type: none"> <li>- Insufficient Lubrication</li> <li>- Operation at Too High Speed</li> <li>- Air Leakage</li> <li>- Weak Mount</li> <li>- Mount Breakage</li> </ul>                                             |

## APPENDIX E: COMPRESSED AIR SYSTEM

---

View the plant's air supply as a power transmission utility system. Correctly designed, installed, and maintained, no other utility is as powerful, economical, and unique as your Compressed Air System. The top performance of any air-driven device only occurs when the required operating PSI (air pressure) and CFM (air volume) are supplied, maintained, and controlled. Be sure to:

1. Eliminate or compensate for air leaks in pipes, couplings, valves and fittings.
2. Check that the ID of the couplings & supply hose are at least the size of the Opener's NPT tapped inlet port (eg, 1" NPT inlet = ID Hose > 1").

Use a **Filter** (< 40µm) to make sure the air supply is kept as clean and dry as possible. An air tool operated with excess moisture or contaminants in the system will suffer poor performance, premature wear, increased maintenance and downtime, and higher noise levels. The filter must be drained regularly, and its filtration element regularly cleaned or replaced. A **Regulator w/ gauge** is required so that the air tool's force, frequency, energy (air) consumption and noise can be adjusted and controlled. A **Lubricator** will extend the air tool's life. The Lubricator must be correctly sized, pressurized, oil-flow adjusted, and installed as close to the air tool as practical.

The lubrication rate must be tailored to specific needs. Precise control is difficult to achieve – it's affected by airflow (CFM), air pressure (PSI), oil level, temperature, and viscosity. **Do not over-lubricate.** Most devices need only a small amount of oil. Oil flooding causes: (1) sluggish operation; (2) oil laden exhaust air which causes: (a) back-pressure due to clogged mufflers; (b) product or atmosphere contamination. Regularly check Lubricator's oil level. Use only **WORKMASTER** recommended oil (eg, **WORKMASTER's TOOL-LUBE Air Tool Oil PN: 36-21010**), or a high-grade air motor oil.

## APPENDIX F: HAND-HELD TACHOMETER

The Hand-Held Tachometer is used to measure the frequency (vibrations per minute – VPM) of a running Vibrator. We recommend the **WORKMASTER VIBRA-TAK™** Slide Rule Tachometer which is the simplest and easiest to carry and use tachometer on the market.

**VIBRA-TAK Tachometer; Std Speed; 2,000 to 20,000 VPM**



**Part #: 31-10000**

### HOW TO USE:

1. Press the bullet nose against the airline feeding the Vibrator, about 6 -12" away from the Vibrator's inlet.
2. Move tuning slide up/down scale until reed reaches maximum throw.
3. Multiply reading by 1000 vibrations per min.
4. The "throw" of the reed is in direct proportion to speed and amplitude. Each 1/2" of "throw" equals .001" amplitude.

**NOTES:**

[illegible]

**NOTES:**

This image shows a single sheet of white paper with horizontal ruling lines. The lines are evenly spaced and run across the width of the page. There are no margins, text, or other markings on the paper.

**NOTES:**

[illegible]

# Ask about other Railcar Products

Such as . . .

Our RAILCAR GATE  
OPENERS



**WORKMASTER** has the Railcar Gate Opener you need to eliminate the safety and productivity problems with the dangerous, dirty, and slow job of unloading railcars. We offer the industry's most complete line of Openers for hopper bottom railcars. Based on factors such as number of cars loaded, unloading site conditions including available utilities (compressed air pressure and volume, 3-phase power, etc), site security, and budget, a Customer can choose between a number of wheeled-cart, beam-mount, and portable Gate Openers available in pneumatic, electric, Battery, or manual power.

**WORKMASTER®**  
PH: 267.350.2809

PN: 10-00103  
03-2024