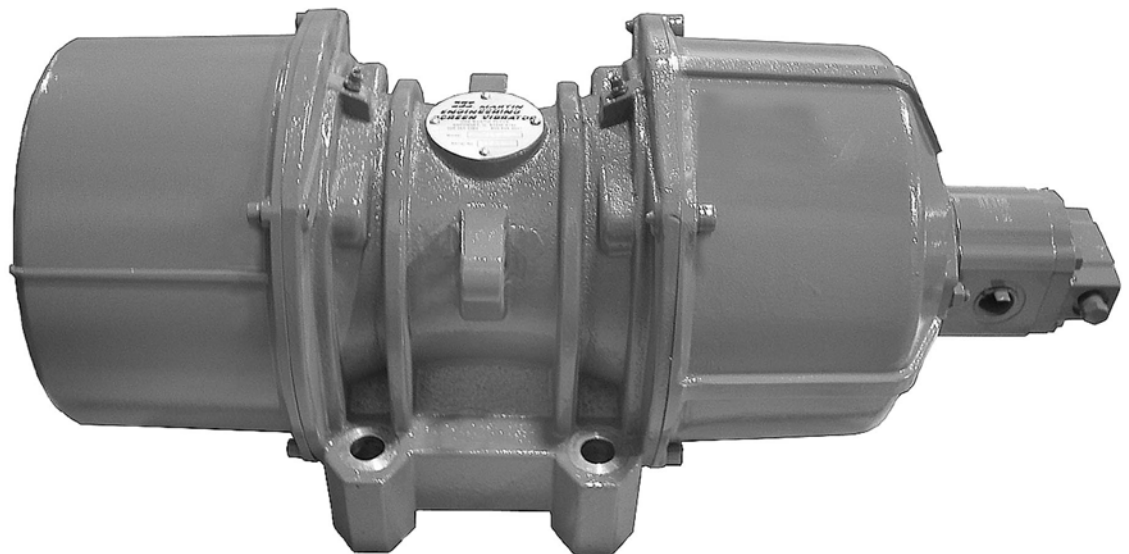


***martin***®

# ***Martin***® ***Hydraulic Screen Vibrator***

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***Operator's Manual***  
***M3758***

# Important

MARTIN ENGINEERING HEREBY DISCLAIMS ANY LIABILITY FOR: DAMAGE DUE TO CONTAMINATION OF THE MATERIAL; USER'S FAILURE TO INSPECT, MAINTAIN AND TAKE REASONABLE CARE OF THE EQUIPMENT; INJURIES OR DAMAGE RESULTING FROM USE OR APPLICATION OF THIS PRODUCT CONTRARY TO INSTRUCTIONS AND SPECIFICATIONS CONTAINED HEREIN. MARTIN ENGINEERING'S LIABILITY SHALL BE LIMITED TO REPAIR OR REPLACEMENT OF EQUIPMENT SHOWN TO BE DEFECTIVE.

Observe all safety rules given herein along with owner and Government standards and regulations. Know and understand lockout/tagout procedures as defined by American National Standards Institute (ANSI) z244.1-1982, *American National Standard for Personnel Protection - Lockout/Tagout of Energy Sources - Minimum Safety Requirements* and Occupational Safety and Health Administration (OSHA) Federal Register, Part IV, 29 CFR Part 1910, *Control of Hazardous Energy Source (Lockout/Tagout); Final Rule*.

The following symbols may be used in this manual:



**Danger:** Immediate hazards that will result in severe personal injury or death.



**Warning:** Hazards or unsafe practices that could result in personal injury.



**Caution:** Hazards or unsafe practices that could result in product or property damages.



**Important:** Instructions that must be followed to ensure proper installation/operation of equipment.



**Note:** General statements to assist the reader.

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## **General**

Martin® Hydraulic Screen Vibrators are equipped with motor-driven rotary eccentric weights that are powered by a hydraulic motor, and deliver rotary vibration through a complete range of frequencies. The motor is attached to the separate head or case assembly containing the eccentric weights, bearings, and shaft. The motor shaft is inserted in the shaft coupling and locked into place, which causes the eccentric weights to rotate with the motor shaft.

The vibrator motor has a recommended operational ambient temperature and mounting surface temperature range of -22 to 104°F (-30 to 40°C). If operating the motor in environments beyond these temperatures, call Martin Engineering, as the vibrator may require rating reduction, more frequent lubrication, or lubrication substitution.

## **Model identification**

Each model has an alphanumeric designation. Each letter and number represents a specific aspect of the vibrator.

Prefix letters:

- HSV = Hydraulic Screen Vibrator

Model numbers:

- First two digits = Maximum speed (x 100 rpm)
- Remaining digits = Maximum force output in lbs. at the maximum rpm
- Optional suffix letter (V) = High-pressure Viton® seals

Example: HSV12-6050

- HSV = Hydraulic Screen Vibrator
- 12 = 1200 rpm
- 6050 = 6050 lbs force

## **Safety**

All safety rules in the above documents and all owner/employer safety rules must be strictly followed when working with this unit.

## **Materials required**

Only standard hand tools are required to install and maintain this equipment.

## **Storage**

Store vibrator in an ambient temperature not less than 41°F (5°C) with a relative humidity not more than 60%. If the vibrator has been stored for 2 or more years, remove bearings, wash them, and repack them with new grease (see “Lubricating vibrator”).

## **References**

The following documents are referenced in this manual:

- *The National Electrical Code (NEC)*. National Fire Protection Association, 1 Batterymarch Park, P.O. Box 9101, Quincy MA 02269-9101.
- American National Standards Institute (ANSI) z244.1-1982, *American National Standard for Personnel Protection - Lockout/Tagout of Energy Sources - Minimum Safety Requirements*, American National Standards Institute, Inc., 1430 Broadway, New York, NY 10018.
- Federal Register, Volume 54, Number 169, Part IV, 29 CFR Part 1910, *Control of Hazardous Energy Source (Lockout/Tagout); Final Rule*, Department of Labor, Occupational Safety Health Administration (OSHA), 32nd Floor, Room 3244, 230 South Dearborn Street, Chicago, IL 60604.
- Viton® is a registered trademark of DuPont Performance Elastomers.

## Before Installing Vibrator

---

### IMPORTANT

The delivery service is responsible for damage occurring in transit. Martin Engineering CANNOT enter claims for damages. Contact your transportation agent for more information.

1. Inspect shipping container for damage. Report damage to delivery service immediately and fill out delivery service's claim form. Keep any damaged goods subject to examination.
2. Remove vibrator from shipping container.
3. If anything is missing or damaged, contact Martin Engineering or a representative.



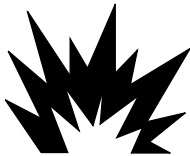
### WARNING

Turn off and lock out/tag out all energy sources to conveyor/loading systems to mounting structure.

4. Before installing vibrator, turn off and lock out/tag out all energy sources to conveyor/loading systems to mounting structure according to ANSI standards (see "References").

### WARNING

If equipment will be installed in an enclosed area, gas level or dust content must be tested before using a cutting torch or welding. Using a cutting torch or welding in an area with gas or dust may cause an explosion.



5. If using a cutting torch or welding, test atmosphere for gas level or dust content.
6. Mounting surface must be strong and flat, 0.01 in. (0.25 mm) across vibrator feet. (This will minimize internal stress to vibrator casting when tightening mount bolts. Welding in the area of the mounting surface could affect its flatness.)
7. Make sure mounting surface and vibrator are clean and free of debris.

## Mounting vibrator onto screen

### IMPORTANT

Read entire section before beginning work. This manual provides instructions for installations onto vibrating screens only. For other installations, call Martin Engineering or a representative. See Appendix for overall dimensions and mounting dimensions.

### CAUTION

If installation instructions are not followed, structure and vibrator can be damaged. Abusing or dropping vibrator will accelerate wear and cause bearing damage.

Never weld structure with vibrator mounted. Welding may cause damage to screen vibrator bearings.

Use only new bolts, lock nuts, and hardened flat washers. Old fasteners can break and cause damage to vibrator or structure.

Do not use split lock washers to install vibrator onto mount. Damage to vibrator could result.

Tighten mounting bolts in sequence shown in Figure 1. If not tightened in order, vibrator casting could be damaged.

1. Position screen vibrator mounting holes over mounting holes on screen frame. Use bolts to hold unit in place. Position screen vibrator so bolts are free in holes. (There should be no side load on bolts.) Tighten bolts in order given in Figure 1 to avoid damaging vibrator casting.

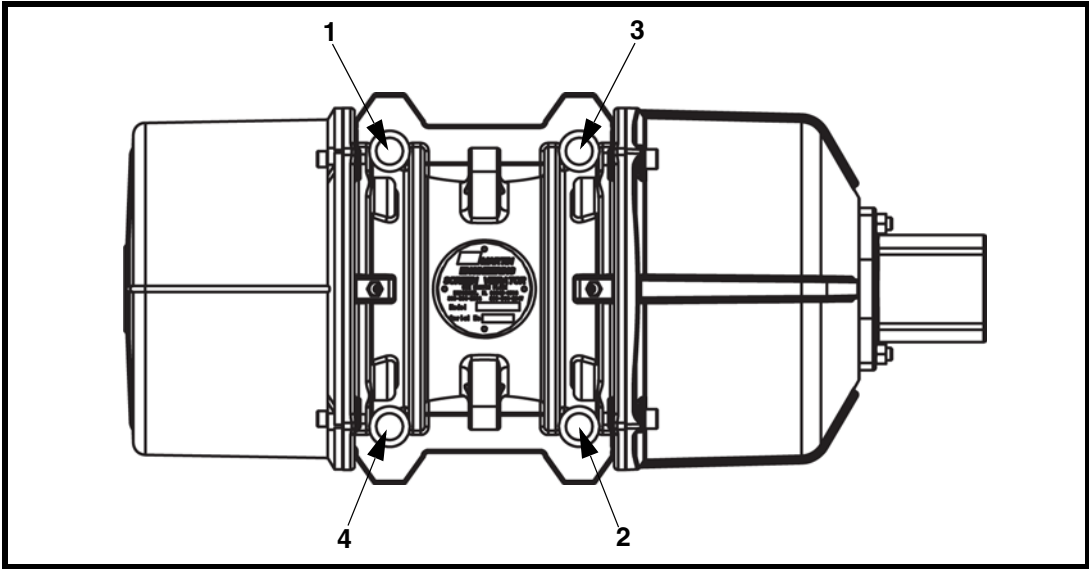


Figure 1. Mounting Bolt Tightening Sequence

2. Tighten nuts to specified torque.

**Table I. Mounting Bolts and Torque Requirements\***

| English          |                    | Metric    |                  |
|------------------|--------------------|-----------|------------------|
| Bolt Size (Gr 5) | Dry Torque (ft-lb) | Bolt Size | Dry Torque (kgm) |
| 3/4 in. -10NC    | 288                | M20       | 38               |
| 7/8 in. -9NC     | 430                | M22       | 56               |

\*Torque specifications are for reference only. Contact fastener manufacturer for specific information regarding bolt torque.



**Before checking bolt torque on vibrator, lock out and tag out energy source.**

3. After the vibrator has been operated for 10 to 20 minutes, de-energize vibrator, lock out/tag out energy source, and check bolt torque. Tighten if necessary.

***Nut and cap screw torque***

After removing any nuts or cap screws from vibrator assembly, re-install to the torque values specified in Table II.

**Table II. Vibrator Nut and Cap Screw Torque Requirements**

| Cap Screws | ft/lb (kgm) | Terminal Block Nuts | ft/lb (kgm) |
|------------|-------------|---------------------|-------------|
| M6         | 7 (1)       | M4                  | 0.87 (0.12) |
| M8         | 16.5 (2.3)  | M5                  | 1.45 (0.20) |
| M10        | 28 (3.9)    | M6                  | 2.17 (0.30) |
| M12        | 58 (8)      | M8                  | 4.70 (0.65) |
| M14        | 94 (13)     | M10                 | 9.80 (1.35) |
| M16        | 137 (19)    |                     |             |
| M18        | 195 (27)    |                     |             |
| M20        | 275 (38)    |                     |             |



# After Installing Vibrator

---

## *Hydraulic Vibrator Pressure Settings*

### **IMPORTANT**

Maximum supply line pressure is 2500 psi (172 bar). Hydraulic motor is bi-directional. Minimum pressure differential between hydraulic oil supply and return line is 363 psi (25 bar).

### **IMPORTANT**

The factory-set pressure relief valves are adjusted to 2500 psi (172 bar) and are intended to relieve pressure from shut down and reversals. Do not adjust pressure relief valves.

## *Case Drain*

### **IMPORTANT**

The case drain should not communicate with the return line. It should be directed to the reservoir without pipe reductions, filters, or other restrictions. The case drain pressure should not exceed 43.5 psi (3 bar).

### **IMPORTANT**

The shaft seal in the hydraulic motor is lubricated internally with oil that communicates with the case drain. The shaft seal is subject to case drain pressure. It is best practice to establish and maintain case drain pressure as low as possible (never to exceed 43.5 psi (3 bar)).

## *Starting vibrator*

### **⚠ WARNING**

Hydraulic oil under pressure can penetrate skin and result in injection poisoning. Special medical treatment is required for fluid injection injuries. If oil penetrates skin, see a doctor trained in fluid injection medicine immediately.

### **⚠ CAUTION**

**DO NOT** run vibrator with eccentric weights removed. Running vibrator with eccentric weights removed will damage bearings.

### **NOTE**

Make sure hydraulic system has a filtration system.

1. Make sure hydraulic hoses are secured to hydraulic pump.
2. Apply plastic sealing compound to all fittings.

**⚠ CAUTION**

**Avoid dropping disconnected hydraulic pump hoses where dirt or material can get in fittings.**

**Do not overtighten hydraulic hose fittings. If original position of fittings must be changed, end plate assembly, case, and motor assembly drive plate must be clamped together as a unit to prevent misalignment of plates. Misalignment of plates will cause motor damage. Contact Martin Engineering for further instructions.**

**Make sure supply hose is same size as inlet motor fitting, and return hose is one size larger than outlet motor fitting and larger than supply hose.**

3. Install hydraulic hose fittings on back of vibrator motor. Install supply hose fitting on inlet vibrator motor fitting, and return hose fitting on outlet vibrator motor fitting. Tighten fittings.

**IMPORTANT**

**Do not place flow-control valve on return line from motor. Return line must be free of restrictions or vibrator will not run correctly.**

4. To control vibrator speed, place a flow-control valve on pressure side of motor.
5. Make sure hydraulic oil temperature does not exceed 150°F (65°C). (If oil temperature is above 150°F [65°C], a larger reservoir or heat exchanger on hydraulic pump may be required to allow better cooling. Consult Martin Engineering for instructions.)
6. Start vibrator and operate.

**⚠ CAUTION**

**Do not let supply line pressure exceed 2500 psi (172 bar). Seals will fail above 2500 psi (172 bar).**

**Differential pressure between supply and return lines shall be a minimum of 363 psi (25 bar).**

**Remove pressure gauge after use. If pressure gauge is left on unit, gauge will be damaged.**

7. Use a pressure gauge to check both supply and return line pressure at vibrator. If supply line pressure exceeds 2500 psi (172 bar) or if differential pressure is less than 363 psi (25 bar), check for restrictive fittings or increase hose size.
8. The case drain should not communicate with the return line. It should be directed to the reservoir without pipe reductions, filters, or other restrictions. The case drain pressure should not exceed 43.5 psi (3 bar).

*Adjusting eccentric weights*

**NOTE**

The percentage increments on the weight are percentages of the total force pounds listed on the nameplate.

**IMPORTANT**

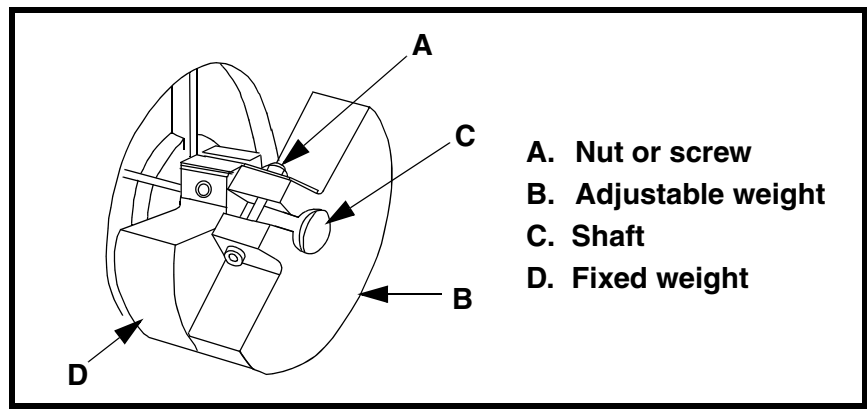
For the most efficient operation, vibrator eccentric weights should be adjusted to the lowest force setting required to move the material. This will increase vibrator life and reduce energy costs.

**WARNING**

Before adjusting eccentric weights, turn off and lock out/tag out energy source to vibrator.



1. Turn off and lock out/tag out energy source to vibrator according to ANSI standards (see “References”).
2. Remove weight cover.
3. Loosen nut or screw (A, Figure 2) so adjustable weight (B) will rotate around shaft (C).



**Figure 2. Adjusting Eccentric Weights**

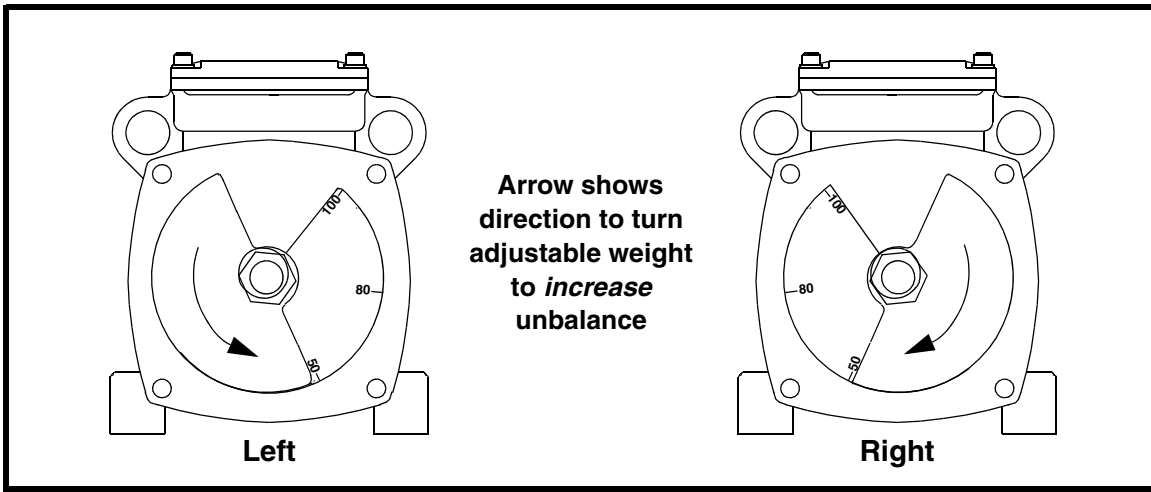


Figure 3. Adjustable Weights Set at 50%

**NOTE**

The fixed weight is attached to the shaft. The adjustable weight rotates around the shaft.

4. See Figure 3. Rotate adjustable eccentric weight to proper setting. To produce more force, move weight to higher setting (i.e., higher number). When set, tighten cap screw or nut according to Table II.
5. Check o-rings for damage. Replace if damaged.

**CAUTION**

Do not operate vibrator with weight covers removed. Dust accumulating around vibrator shaft could cause unit to fail.

6. Replace weight covers.

**CAUTION**

Adjust both sets of eccentric weights to same setting number (mirror images), or force output will be uneven and damage vibrator.

7. Repeat steps 2 through 5 for second set of weights. Set both sets of weights to same setting number so they are mirror images, as shown in Figure 4.

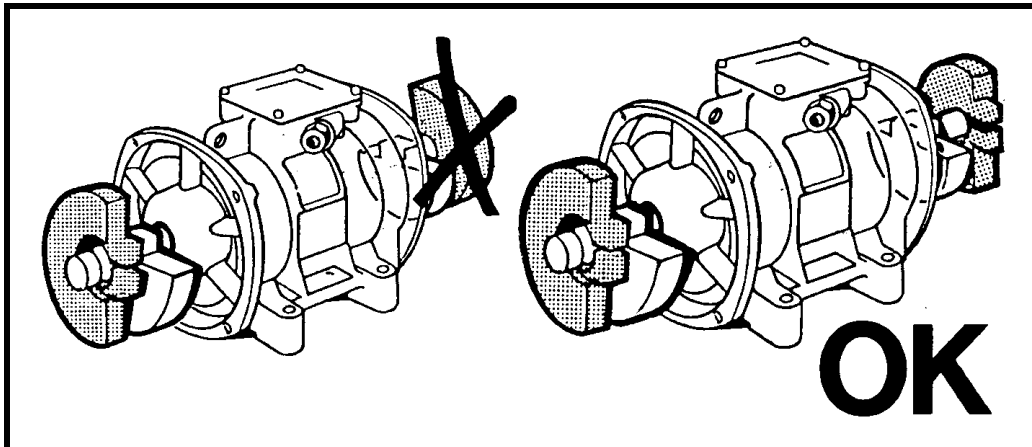


Figure 4. Setting Sets of Eccentric Weights to Mirror Images

## *Initial start up*

1. If vibrator makes unusual or excessive noise, make sure mounting bolts are tight and mount welds are not damaged.



**Vibrator may produce loud noise during operation when mounted on structure. See OSHA 1910.95 for guidelines. If required, wear ear protection to avoid impairment or loss of hearing.**

2. Check decibel level of vibrator noise during operation. See OSHA 1910.95 to determine whether noise exceeds safe limits. If required, wear ear protection to avoid impairment or loss of hearing.
3. After first 8 hours of use and periodically thereafter, check mounting bolts and tighten if necessary.

# Troubleshooting

---

| Symptom  | Corrective action   |
|--|---|
| Gallons-per-minute flow to vibrator is less than required. | Return hose is too small. Make sure return hose is one size larger than outlet motor fitting.   |
| Vibrator will not start.                                   | Restriction in line or in vibrator.<br>Incorrect flow control settings.   |
| Unusual or excessive noise.                                | Vibrator loose to mount. Check mounting bolts for proper torque.<br>Structure loose. Check structure for cracks.<br>Bearings are worn out or damaged. Inspect bearings. |

## IMPORTANT

Read entire section before beginning work. Allow vibrator to cool to ambient temperature before working on it.

## NOTE

All vibrators are lubricated at the factory.

## CAUTION

Use only prescribed grease in vibrator. If a different grease is used, vibrator can be damaged and warranty will be void.

Use only prescribed amount of grease to lubricate vibrator. Too much grease will cause bearings to overheat and result in premature bearing failure.

### Lubricating vibrator

1. Lubricate the vibrator after each 2000 hours of operation.
2. If motor housing temperatures exceed 194°F (90°C), cut lubrication time and amount in half for every 18°F (10°C) increment that meets or exceeds 194°F (90°C). For example, if motor housing temperature is 204°F (96°C), use 9 grams of grease per bearing every 1000 hours. (Maximum bearing temperature allowed is 248°F [120°C].) For motor housing temperatures above 212°F (100°C), consult Martin Engineering or a representative.

## NOTE

Kluber grease may be purchased from Martin Engineering by calling 800-544-2947 or from Kluber Lubrication by calling 800-447-2238.

3. For HSV9, HSV12, and HSV18 model vibrators, lubricate vibrators with Kluber Staburags NBU 8EP grease only. Lubricate as follows:
  - a. Clean vibrator case around grease fitting with clean shop towel.
  - b. Insert grease gun into grease fitting. Add grease.

Table III. Lubrication Schedule for Each Bearing\*

| Model      | Lube g |
|------------|--------|
| HSV12-6050 | 18     |
| HSV18-5900 | 18     |

\*Unless otherwise noted, lubricate every 2000 hours.

***Inspecting vibrator***

**⚠ WARNING**

Hydraulic oil under pressure can penetrate skin and result in injection poisoning. Special medical treatment is required for fluid injection injuries. If oil penetrates skin, see a doctor trained in fluid injection medicine immediately.

1. Use cardboard to inspect hoses and fittings for leaks.
2. Inspect oil. If dark or thick, replace.

**⚠ CAUTION**

**Do not overtighten hydraulic hose fittings. Damage to fittings and motor will result.**

3. Make sure all fasteners are tight.
4. Inspect structure for cracks or fatigue. If found, repair before operating vibrator again.

**⚠ CAUTION**

***Repairing motor and replacing bearings***

**Do not attempt to repair vibrator motor or replace bearings yourself. If you attempt to do so during the warranty period, the warranty may be void.**

If vibrator motor needs repair or if bearings need to be replaced, call Martin Engineering at **800-544-2947** for instructions.



# Part Numbers

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This section provides part numbers for the Martin® Hydraulic Screen Vibrators and related equipment. Please reference part numbers when ordering parts.

**Table IV. Martin® Hydraulic Screen Vibrator  
Model Numbers and Part Numbers**

| Model      | Part No. |
|------------|----------|
| HSV12-6050 | 38020    |
| HSV18-5900 | 38020-60 |

## *Miscellaneous*

**Seal Kit for Hydraulic Motor:** P/N 38542.

**Viton® Seal Kit for Hydraulic Motor:** P/N 38542-V

**Vibrator Bearing Grease:** P/N 30559-05

# Part Numbers

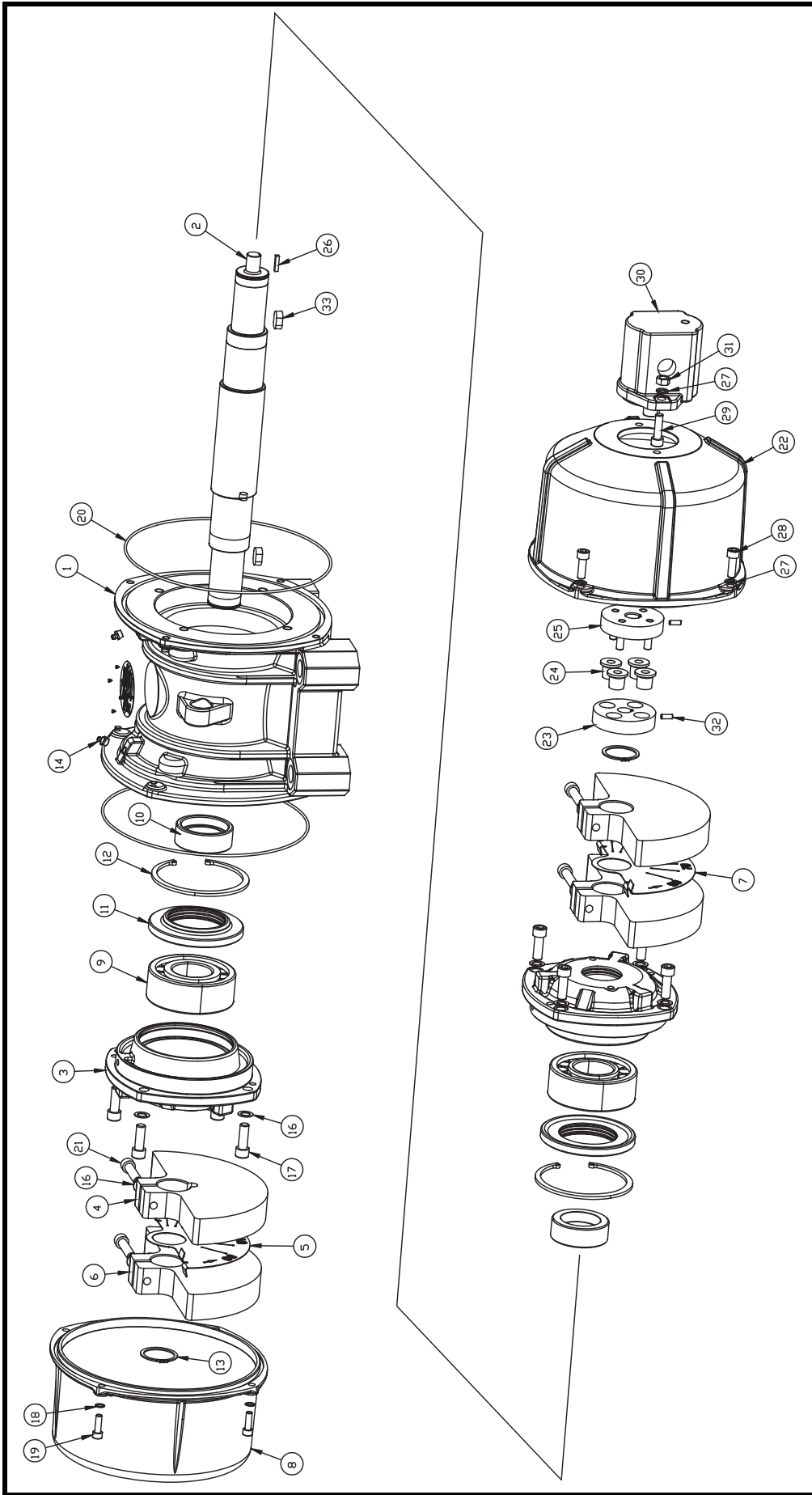


Figure 5. Hydraulic Screen Vibrator Part Numbers (page 1 of 2)

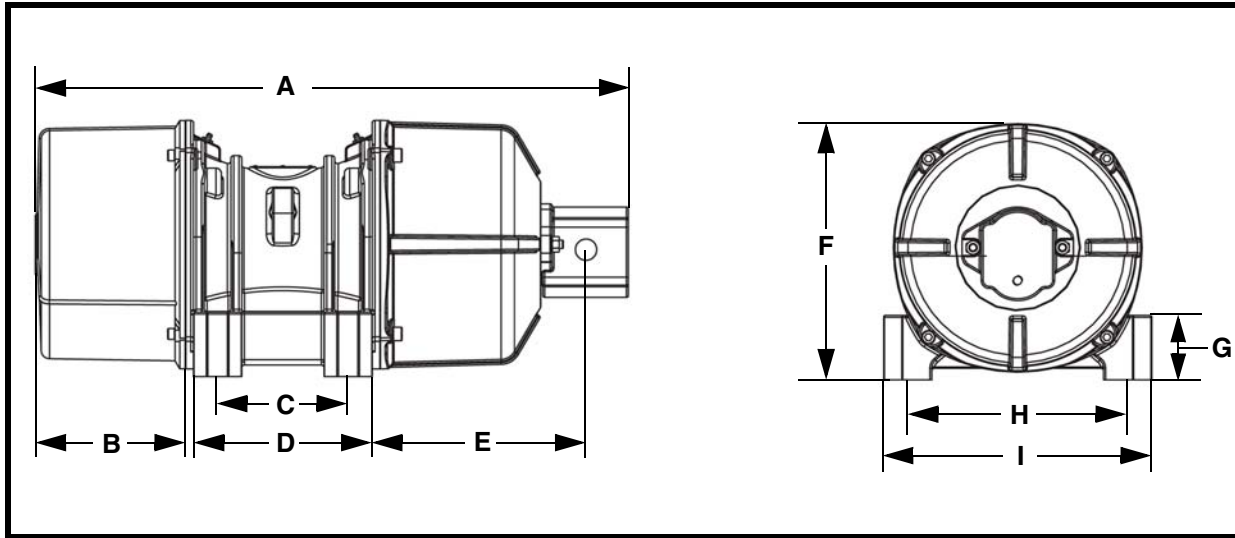
| Description             | Item | 38020*      | 38020-60*   |
|-------------------------|------|-------------|-------------|
| Case                    | 1    | 37883-AL    | 37833-AL-60 |
| Shaft                   | 2    | 38018       | 38018       |
| Flange Bearing          | 3    | 802010      | 802010      |
| Weight Fixed            | 4    | 807009-605F | 38192       |
| Weight Adj. Disk        | 5    | 808001-A    | —           |
| Weight Adj. 50Hz        | 6    | 807009-605A | —           |
| Weight Adj. Disk        | 7    | 808001-B    | —           |
| Weight Cover            | 8    | 805003      | 805003      |
| Bearing                 | 9    | 506536      | 506536      |
| Shaft Bushing           | 10   | 508051-MF   | 508051-MF   |
| Bearing Cover           | 11   | 804007-P    | 804007-P    |
| Snap Ring               | 12   | 500008      | 500008      |
| Retaining Ring          | 13   | 500063      | 500063      |
| Grease Fitting          | 14   | 11814       | 11814       |
| Lub Cap                 | 15   | 12533       | 12533       |
| Washer Schnorr D12      | 16   | 513006      | 513006      |
| Screw SHC               | 17   | 515558      | 515558      |
| Washer Schnorr D8       | 18   | 513004      | 513004      |
| Screw SHC               | 19   | 515508      | 515508      |
| O-Ring #276             | 20   | 508629      | 508629      |
| Screw SHC               | 21   | 515588      | 515588      |
| Motor Bell              | 22   | 38019       | 38019       |
| Shaft Coupling          | 23   | 36644       | 36644       |
| Bushing Coupling        | 24   | 36647       | 36647       |
| Motor Coupling Assembly | 25   | 36645-AS    | 36645-AS    |
| Key                     | 26   | 36353-02    | 36353-02    |
| Washer Schnorr D10      | 27   | 513005      | 513005      |
| Screw SHC               | 28   | 515538      | 515538      |
| Screw SHC               | 29   | 515514      | 515514      |
| Hydraulic Motor         | 30   | 38607       | 38607       |
| Hex Nut                 | 31   | 14139       | 14139       |
| Set Screw               | 32   | 36650       | 36650       |
| Key                     | 33   | 809001      | 809001      |

**Figure 5. Hydraulic Screen Vibrator Part Numbers (page 2 of 2)**

\* Models with suffix (V) use hydraulic motor P/N 38607 (Item 30)

## Appendix

### Martin® Hydraulic Screen Vibrator Technical Data



### Martin® Hydraulic Screen Vibrator Dimensions

| Model      | A           | B          | C          | D          | E           | F           | G         | H           | I           |
|------------|-------------|------------|------------|------------|-------------|-------------|-----------|-------------|-------------|
| HSV12-6050 | 27.73 (704) | 7.01 (178) | 6.10 (155) | 8.35 (212) | 11.13 (283) | 12.00 (305) | 3.03 (77) | 10.04 (255) | 12.54 (319) |
| HSV18-5900 | 27.73 (704) | 7.01 (178) | 6.10 (155) | 8.35 (212) | 11.13 (283) | 12.00 (305) | 3.03 (77) | 8.86 (225)  | 12.54 (319) |

### Martin® Hydraulic Screen Vibrator Specifications\*

| Model      | Weight Setting | Unbalance in-lb | gpm | Force lb | rpm  |
|------------|----------------|-----------------|-----|----------|------|
| HSV12-6050 | 100%           | 148             | 5.0 | 6050     | 1200 |
| HSV18-5900 | 100%           | 64              | 7.5 | 5900     | 1800 |

\*All values given are the maximum for the vibrator.

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