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Safety Precautions

Safety precautions are to be followed at all times when working on mechanical equipment. Air and electrical supplies are to be turned off before work is performed on conveyors, feeders or machines. Failure to do so may cause physical injury and/or property damage - all local codes are to be followed and if there is a discrepancy between this manual and local codes, consult the Lipe Automation Corp. service department at 1-800-448-7822. This manual should be read before working with the Dyna-Slide product.

While the advantage of using Dyna-Slide is that the System's design incorporates the highest degree of safety features, certain cautionary procedures should be adhered to for prevention of personal injury and system damage.

- Do not walk or step on conveyors, feeders, electrical boxes or fittings. Damage to the equipment or physical injury may result.
- Do not run machines with the guards removed.
- Completely shut down the system when working on the vibrators or when removing brush plates.
- Only qualified maintenance personnel should enter electrical panel boxes or make machine adjustments.

The adherence to the aforementioned, coupled with proper maintenance and operating procedures will insure that your Dyna-Slide unit(s) will perform satisfactorily.

Introduction to Dyna-Slide

Dyna-Slide[®]

The Dyna-Slide unit is a versatile unit with a unique working surface. Its free standing design allows it to operate independently or in combination with other conveyors, feeders and machines.

Features:

1. Brushlon surface to cushion and gently direct parts quickly and quietly.
2. Brushlon aids in removal of part residue.
3. Feed rates will vary depending on part size and configuration.
4. The brush surface will handle parts up to 180 degrees Fahrenheit.
5. Vertically adjustable legs or stands.
6. The brush surface is resistant to most common chemicals and impervious to water and oil.
7. The unit should operate under 80 dBA unloaded or loaded, depending on the type of parts being conveyed.

General Description

Dyna-Slide model “MS” electromagnetic vibratory drives are designed to provide an effective and effortless method of conveying and controlling the flow of parts from storage to feeding, orienting processing stations or between processes.

The vibratory assembly is a balanced vibrating system consisting of a brush plate and support angles with or without spring packs coupled to an electromagnetic drive by means of stacked leaf springs. The electromagnetic drive, located within the base housing, consists of a wire wound encapsulated coil mounted over a laminated iron core. The core is connected directly to the rear of the drive unit housing. An armature assembly, also included as part of the drive unit, is located opposite the core and coil and is connected directly to the conveyor. Spring assemblies are located on the drive unit housing. These spring stacks are clamped at the bottom to the drive unit housing and at the top to the support angle or brush plate. The brush plate, support angles and armature become one complete, semi-free floating assembly joined to the drive unit only through the leaf spring assemblies.

The Dyna-Slide conveyor is typically used to supply a continuous output of parts to assembly or other equipment.

Dyna-Slide®

Specifications

Electrical	120 Volts AC, 60 Hertz, Phase One 0.25 to 4.6 amps half wave
Mechanical	Variable output feed rate up to 300 inches per minute depending on parts size, configuration and tooling.
Noise	50-55 dBA (unloaded) 60-78 dBA (loaded)

Operation of Dyna-Slide Equipment

Dyna-Slide®

The following is presented to provide an understanding of how the Dyna-Slide unit operates. This knowledge may be of assistance in various maintenance or trouble shooting procedures.

The principle of Dyna-Slide operation is to produce a vibrating motion on the surface of the brush plate. The motion is obtained by pulling the brush plate sharply down and back and then allowing it to spring up and forward. This action, repeated at high speeds (approximately 3,600 times per minute at 60 hertz power supply), produces a definite vibrating movement on the brush plate surface, permitting parts to be conveyed in a smooth and easily controlled manner. In operation, power is supplied to the vibrator coil by means of a separate control. This control, in its simplest form, consists of a phase controller, fuse block and fuses, and a control potentiometer.

The phase controller is used to convert alternating current into a pulsating half-wave current. The coil is energized only by the portion of the phase controlled half wave. The half wave is altered by the phase controller. The blocked portion does not reach the coil and during this time the vibrator coil is de-energized. When the coil is energized, the core becomes magnetized and attracts the armature assembly. This magnetic attraction pulls the armature and brush plate down and back toward the core. This pull is against the leaf spring stack and the leaf springs are flexed back. Each power half cycle is followed by a half cycle of blocked current flow. During this half cycle, power is not available to the magnet coil and the coil becomes de-energized. With the coil de-energized, the magnetic pull between core and armature is released and the leaf spring system is permitted to “spring back” to its normal position. This propels the brush plate assembly up and forward. The unit is mechanically adjusted to limit the travel of the armature so it does not “strike” the face of the core. The space between the armature and core is referred to as the “air gap”. The air gap setting is critical to positive conveyor performance. (See Vibrator Adjustment and Repair: MS-1 & MS-2 page 11, MS-3 page 16, MS-7 page 19). The feed rate of material is controlled by the amount of the magnetic pull, which is varied by the control knob of the potentiometer.

Installation

The vibratory unit(s) and controller(s) should be carefully uncrated. Give a thorough visual inspection to reveal any damage that may have occurred during shipment. If any damage has occurred, please contact Automation Corp.'s Service Department immediately. Check for loose hardware, broken wiring, loose component mounting screws or plug in components not properly seated in their sockets.

Caution

Never lift the unit by the brushplate. The vibratory unit(s) has (have) been factory tuned for your specific application. Handling them by the vibratory brushplate may change the tuning, resulting in poor part feed or move the brushplate out of alignment with the base causing damage to the entire assembly.

Warning

Never make any alterations or additions to the vibratory equipment without first contacting Lipe Automation Corp.'s Service Department. Alterations, extensions or additions to the brushplates may result in serious damage to the unit and jeopardize the warranty status.

Selecting a Location

Dyna-Slide equipment must be placed on a secure surface which will not deflect under the weight of the unit or vibrate while the unit is in operation. The unit's vibratory mechanism **MUST NOT** be in contact with any rigid object, or surface, or other vibrating equipment or the unit will not function properly. The assembly, except units on wheels, **MUST** be secured to a solid rigid base.

Methods for Mounting

Dyna-Slide units are available with optional adjustable legs or stands, with or without locking wheels or table mount straps, if you require them. Units sold with locking wheels, will have performance limits slightly below that

of floor or table mounted units. Contact the Lipe-Rollway Automation Corp. Sales Department if assistance is required.

Installing the Controller

The controller assembly should be installed as close to the vibratory units as possible, preferably on a wall in a clean, dry location, free from vibration, and excessive heat. THE POWER SUPPLY MUST BE THE SAME AS THAT IS DESIGNATED ON THE EQUIPMENT NAMEPLATE. THE UNIT MUST BE PROPERLY GROUNDED! Refer to the wiring diagram supplied with the controller. Lipe Automation Corp. recommends the installation of a positive shut-off switch to be located between the power supply and the equipment controller. If at all possible, the controller should be installed at a location where it will receive good ventilation. Most electrical components experience a shortage of life when operating in an atmosphere of intense heat. Good ventilation of the control enclosure will permit internal heat to dissipate through the sides of the cabinet and into the outside atmosphere, thus prolonging component life. The controller should be installed at a location where it is easily seen and accessible to the operator.

The Controller

The line conductor and the conductor between the conveyor and controller must be appropriate to carry the current and voltage as stamped on the equipment nameplate. The distance between the controller and vibratory unit is an important factor that must be taken into consideration when determining the size of the conductor. The voltage drop through a conductor insufficient size for the distance involved which result in a definite lack of movement during operation. The further the distance, the larger the required size of the conductor.

THE POWER SUPPLY VOLTAGE AND FREQUENCY MUST MATCH THE INFORMATION STAMPED ON THE EQUIPMENT NAMEPLATE DATA.

The wiring connections between the vibrator unit, controller and power supply must be in strict accordance with the wiring diagram furnished with the controller and local electrical codes.

Start-Up Procedure

Turn potentiometer knob in a CLOCKWISE direction until the required rate of feed is obtained. To increase the feed rate further, continue to rotate the potentiometer knob in a CLOCKWISE direction until maximum feed rate is reached.

Note that the best feed rate of a part may not occur at the maximum setting on the potentiometer.

IMPORTANT:

The vibratory unit should perform with a smooth, quiet, even stroke. IF A LOUD “STRIKING” NOISE OCCURS, IMMEDIATELY TURN OFF THE UNIT. Striking may be the result of the vibrator’s armature and core making contact during the operating stroke of the drive unit, alterations to the vibratory unit or the vibratory unit hitting a solid object. CONTINUED STRIKING CAN RESULT IN SERIOUS DAMAGE TO THE UNIT! Refer to the Vibrator Adjustment and Repair Section H for corrections to the vibrator. Check all around the vibratory unit for interference with adjacent equipment.

Note: When the equipment is in an energized, operating state, the controller door should be kept closed!

Checking vibrator with a tong meter

When checking vibrator current with a tong meter, the meter reading must always be multiplied by a value of 1.7.

A tong meter does not reveal the same current as stamped on the equipment nameplate due to the wave form characteristics of the vibrator and controller when operating.

Maintenance

Dyna-Slide requires very little maintenance. However, the following points should be given careful consideration:

1. Chips, oil and other extraneous material will fall onto the brush working surface and be deposited around the base of the fibers. Most of this residue will be “self-cleaned” by the vibrating motion, making its way to the

discharge end of the vibratory unit. It may be desirable to place a receptacle beneath the discharge end or drill a small drain hole in the brushplate. Cleaning with a vacuum is recommended. Some materials however, tend to adhere and build up on the brush bristle to a point where they dampen vibration and affect operation (examples are clay materials and sticky oil base products with metal powders suspended in them). These excessive deposits increase the dead weight of the brushplate and alter the natural frequency (tuning) of the vibratory unit and/or damage the brush. Poor tuning may cause the vibrator to strike resulting in serious damage to the unit. Solvents may be needed, but care should be taken not to use chlorinated hydrocarbons or dissolving agents which could harm the brush fibers or their adhesive base. Kerosene or industrial detergents with water and brush have been used with success (see list of solvents that follows). Please consult the Lipe Automation Corp. Service Department if questions exist, and keep temperature of any cleaner below 140 degrees F. The maximum temperature of the brush is 180 degrees F. At an ambient temperature of 200 degrees F the fibers begin to relax. Cleaning should be done on a regular basis, daily if needed, to prevent damage over the long run.

2. The vibrator units are shipped from the factory and are adjusted for the nominal voltage shown on the nameplate, with normal variation considered. Unless they have been loosened or damaged in shipment, no adjustment is required. If a problem exists, it should be remedied by (a) adjustment of the air gap or (b) adjustment or replacement of the springs.
3. All areas of the brushplate, vibrator, springs and controller should be kept reasonably clean. The use of water or other liquids is not recommended.
4. Never oil the spring assembly. This will destroy the clamping effect of the leaf spring (s) against one another.
5. The controller door should always be kept closed unless changes are being make to the equipment. The operator should keep in mind the controller is a high voltage, high current apparatus.
6. All screws should be checked once each month for tightness.

Solvent effects on polypropylene brush

Listed below are various oils, chemicals and solvents. The effects of each solvent is also listed.

Acetic Acid 20%	B	Hydrochloric Acid (20%)	B
Acetone	C	Isopropyl Alcohol	C
Benzene	C	Lacquer Solvents	C
Boric Acid	A	Lubricating Oils	B
Ethyl Acetate	A	Methyl Ethyl Ketone	C
Ethyl Alcohol	C	Nitric Acid (10%)	C
Ethylene Glycol	B	Sodium Hydroxide (20%)	B
Ferrocote 112	B	Sulfuric Acid (45%)	B
Fuel Oil	B	Toluene	C
Gasoline	B	Trichloroethylene	A
Hydraulic Oils	B	Water	A

A - Little or no effect

B - Minor to moderate effect

C - Sever to complete destruction

Model MS-1 Vibrator
Part # DA02672C00 (Ref. DR01383B)

Model MS-2 Vibrator

DynaSlide®

Part #DA0267 1C

Model MS-3 Vibrator

Part #DA03037C

Part #DA02669C00

Model MS-7 Vibrator

Part #DA01871B00

(Ref. DA03210B)

**For Typical Parts List Information:
Please Contact LAE Engineering Department**

MS-1 and MS-2 Vibrator Adjustment and Repair

Refer to the following drawings, as required:

DA02671C MS-2 Vibrator with “SO” Cord fitting - Enclosed

DA02672C MS-1 Vibrator with “SO” Cord fitting - Enclosed

DR01382C	MS-2	Vibrator Parts Breakdown	
DR01383B	MS-1	Vibrator Parts Breakdown	Contact LAE
DA01597C	MS-1	Vibrator with “Liquid Tight” fitting	Engineering
DA01598C	MS-2	Vibrator with “Liquid Tight” fitting	

General description of Vibrator (Refer to DA02672C for MS-1 vibrators, DA02671C for MS-2 vibrators).

The MS-1 and 2 Vibrators are pulsating electromagnetic powered drive units designed to promote effective and effortless controlled movement of parts on a brushed surface when used in conveyors, accumulators and feeders. Refer to : DR01383B for MS-1, DR01382C for MS-2. Located inside a cavity of the base casting (item 2) is an encapsulated wire wound coil (item 7) mounted between the backplate and backplate gasket (items 10 & 9). There are coil washers (item 6) to firmly clamp the coil between the base casting and the backplate gasket. An armature (item 1a) attached to the vibrator mounting bracket (item 15) is drawn into the coil by the core (item 8) as power is alternately turned on and off by the controller, which causes the movement. It does this through flexing of the leaf springs (item 5) which are attached to the base casting at one end and the mounting bracket at the other end. An air gap is the space between the face of the armature and face of the core. If the air gap is too small, then “striking” could occur.

“Striking” is the mechanical noise made when the armature and the core hit each other. The “striking” will cause physical damage to one or more of the following items: core, armature, leaf springs or mounting bracket.

“Striking” could be caused by one of the following: voltage above what is specified on the vibrator nameplate, damaged leaf springs, alterations to the vibratory brushplate, or movement of the core because the 1” - 14 hex nut is loose. Each of the above should be checked. (See the Air Gap and Maintenance Below).

Air Gap Adjustment and Maintenance

Once a month all vibrators and hardware should be inspected and checked for damage, tightness, wear and cleanliness as outlined in Maintenance pg. 9. If, at any time, part movement quickly slows down in a system that uses the MS-2 vibrators, the mounting bracket (item 15) should be checked for a cracked or broken weld. This is an unusual failure, but can occur when the vibrator is over driven because of high operating voltage or alterations to the brushplate.

The air gap of the MS-1 and MS-2 vibrators cannot be measured physically, but can be adjusted without disassembly of the unit to correct a “striking” condition. Proper air gap adjustment is extremely important for good operation of a vibratory unit. Improper air gap can cause premature failure of the vibrator, poor part movement, “striking”, or high operating current. If the air gap is too large, so that the armature and core are too far apart, then the operating current will be high, cause overheating and possible failure of the coil. Under normal conditions, adjustment is rarely required.

To adjust the air gap when “striking” or overheating occur, the 1” - 14 hex nut (item 11) needs to be loosened. The vibratory unit may be adjusted while running. There should be no parts on the vibratory brushplate unit surface, and the controller potentiometer should be set at the maximum setting (turned clockwise until it stops). If “striking” has occurred, use a large flat blade screw driver to turn the core in a counterclockwise direction two (2) full turns, to increase the air gap. Depress the green start button on the controller.

Warning

If any work is going to be done on the leaf springs of the vibrator, the vibrator should be removed from the brushplate, by removing the four (4) fasteners at the mounting bracket. NEVER REMOVE BOTH SPRING

STACKS AT THE SAME TIME OR LOOSEN ALL SPRING MOUNTING HARDWARE AT THE SAME TIME. This could cause core/armature misalignment. Use care not to deflect the alignment of the vibrator mounting bracket and base casting when the leaf spring stack hardware is loose. This will cause misalignment of the coil and armature.

Look carefully at the leaf spring edges and along the leaf spring clamp bar(s) item (4) for a white looking powder, or “strings” coming out of the leaf springs. If the vibrator was running, check the warmth of the leaf spring clamp bars (item 4). If this area is hot to touch, the leaf spring(s) or clamp bar(s) have white powder on them or “strings” are present, then replacement of the leaf spring(s) is required.

LiPe Automation Corp. recommends that all leaf springs in the stack be replaced with the same size and ply leaf springs at one time, rather than “guessing” which spring(s) has (have) failed. Also, one bad leaf spring can cause premature failure of the rest of the leaf spring stack. Use care in disassembly and reassembly of the leaf spring stack. Note the locations of the leaf spring spacer(s) in the leaf spring stack assembly. If a leaf spring spacer is not used between the leaf spring, the leaf spring assembly will not flex properly.

Check vibrator base casting sides outside the coil area. Under normal operation, the casting should be warm to touch but not hot to burn (approximately 130 degrees F). If the casting is hot, it is an indicator that the coil and armature are rubbing. This rubbing is caused by misalignment.

Misalignment and Coil Replacement

Misalignment can be caused by loosening of all the leaf spring stack hardware at one time, or on both stacks, creating a sharp violent impact would cause the coil to move inside the base casting and backplate. WARNING: LOOSENING ALL SPRING MOUNTING HARDWARE AT THE SAME TIME COULD CAUSE

Dyna-Slide®

CORE/ARMATURE MISALIGNMENT. Use care not to deflect the alignment of the vibrator mounting bracket and base casting when the leaf spring stack hardware is loose.

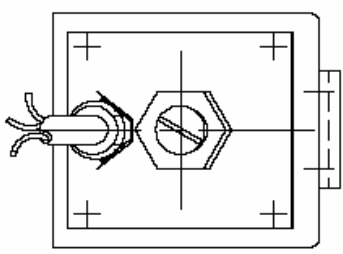
To correct the condition:

- Remove the vibrator from the brushplate at the mounting bracket.
- Clamp the vibrator by the base, casting sides in a vice, so that the backplate surface is level.
- Loosen the wire fitting. Remove the backplate mounting screws and lock washers.
- Carefully remove the backplate and backplate gasket while slipping the wire through the fitting. The core will remain attached to the backplate.
- Remove the coil from the base casting and inspect it for damage. If it is in good condition, replace it in the base casting.
- Inspect the inside diameter of the coil. If a rubbing condition existed, then wear marks will be seen on the inside diameter in line with the bore.

If the coil is bad and being replaced, cut the wire on the far side (from the coil), of the crimp connectors. Use equivalent crimp fittings to attach the new coil wires to the supply power line. Insert the coil into the base casting cavity, centered around the armature. Note that there are two (2) inside diameter sizes. The larger diameter has clearance for the armature, while a smaller diameter centers the core and backplate during reassembly. Carefully insert the core and backplate subassembly into the coil. Use caution when moving the wires, not to move the coil or squeeze the wires in the assembly. Do not move the coil, this will cause misalignment and rub.

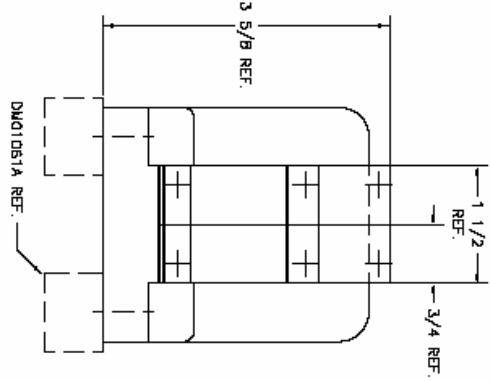
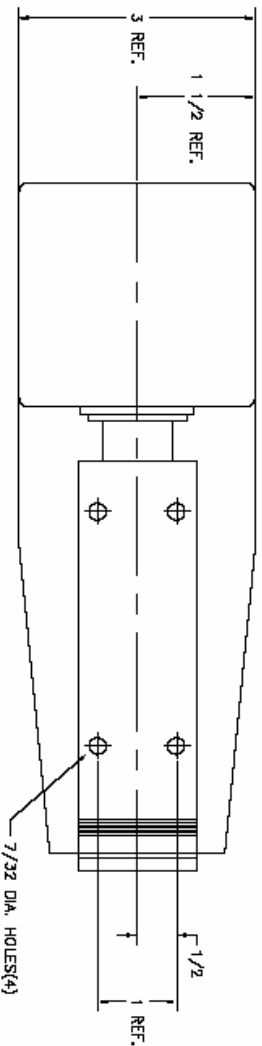
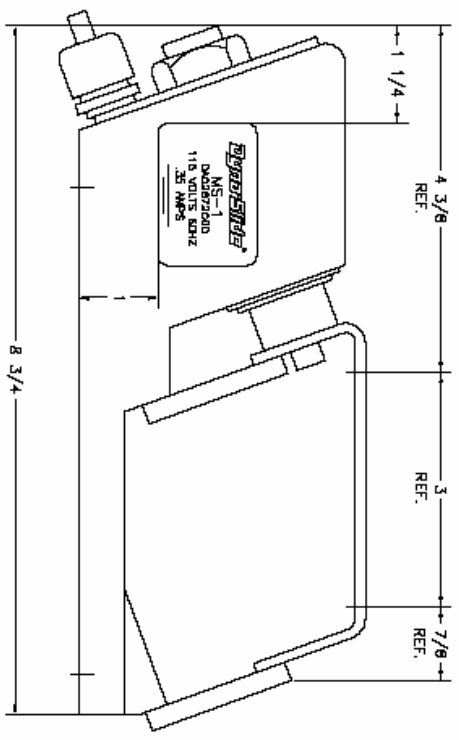
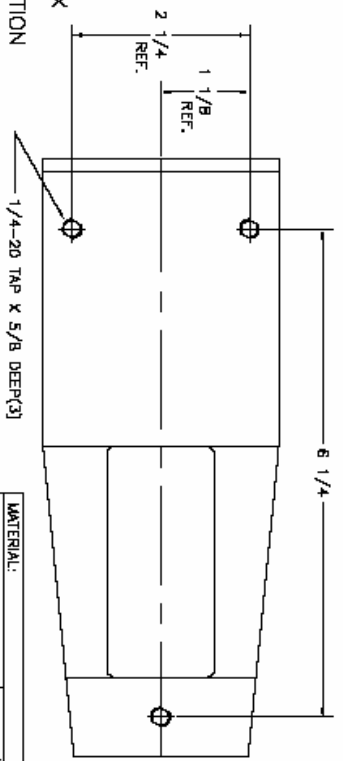
When the backplate/core subassembly with backplate gasket is in place on the coil, there should be about a .02511 clearance between the base casting housing surface and the backplate and gasket. This is the clamping force to hold the coil in place between the brushplate, brushplate gasket, coil washers and base casting when the backplate is fastened in place. Carefully insert the screws and lock washers in the backplate and tighten them down without causing the coil to move. Loosen the 1"-14 hex nut and increase the air gap setting of the vibrator. Remount the vibrator to the brushplate. Follow the air gap instructions previously outlined in this section. After all work on the

vibrator is complete and the unit has been tested, the operating current should be checked and all the hardware checked for required torque tightness. The operating current should not exceed that designated on the nameplate.



COIL DESIGNATION				
X	PART NO.	V	Hz	A
0	DE04098L	115	50/60	4
2	DE04098L	230	50/60	2

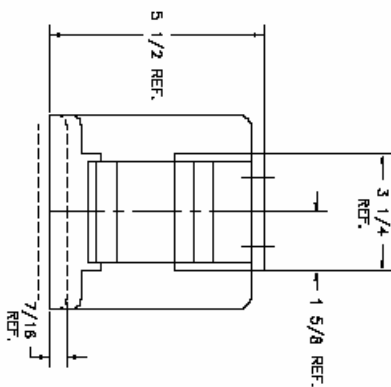
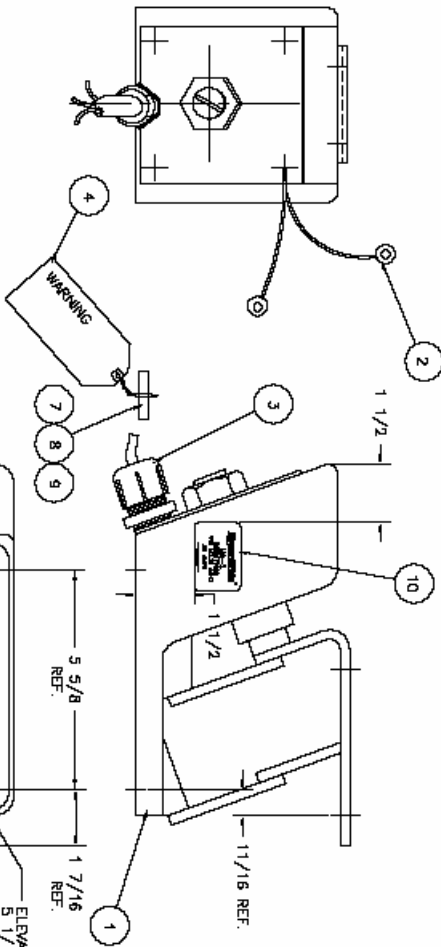
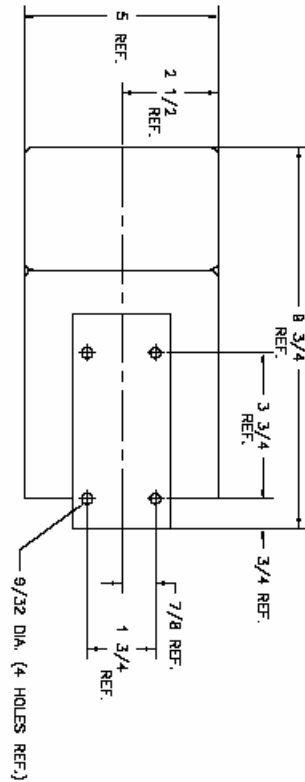
SEE DRAWING DR01383BOX
FOR ITEM 1 PARTS
DESIGNATION & IDENTIFICATION



NOTES:

1. TORQUE REQUIREMENT FOR REASSEMBLING SPRINGS IS 30 INCH POUNDS. GRADE 5 OR BETTER HARDWARE.
2. CHECK ALIGNMENT OF MAGNET & CORE BEFORE REASSEMBLY.
3. TUNE VIBRATOR AT ASSEMBLY TO FIT APPLICATION BY ADDING OR SUBTRACTING SPRINGS AND/OR PILES.

MATERIAL:		DRW: D(2)	DATE: 3-17-81	LUBE ROLLWAY CORP. AUTOMATION EQUIPMENT LIVERPOOL, N.Y. 13090	
SCALE: FULL		MS-1 VIBRATOR STRAIGHT SO CORD FITTING			
DA02672C	GENERAL	ORDER NO.	SHEET 1 OF 1	CAD DISK NO.	DWG. NO.: DA02672C0X
NEXT ASSY					



COIL DESIGNATION				
X	PART NO.	V	HZ	A
0	DE0402BL	115	50/60	1
2	DE04030L	230	50/60	.5

SEE DRAWING DR01832C0X
FOR ITEM 1 PARTS
DESIGNATION & IDENTIFICATION

REDRAWN BY JOSH EAMES 5-1-95

NOTES:

1. TORQUE REQUIREMENT FOR REASSEMBLING SPRINGS IS 350 INCH POUNDS. GRADE 5 OR BETTER HARDWARE.
2. CHECK ALIGNMENT OF MAGNET & CORE BEFORE REASSEMBLY.
3. TUNE VIBRATOR AT ASSEMBLY TO FIT APPLICATION BY ADDING OR SUBTRACTING SPRINGS AND/OR PILES.

MATERIAL:

SCALE 1/2

DRN: JG HIGGINS

DATE: 6-17-82

LIPE ROLLWAY CORP.

GENERAL

MS-2 VIBRATOR

STRAIGHT 50° CONE FITTING

Automation Equipment
LIVERPOOL, N.Y. 13090

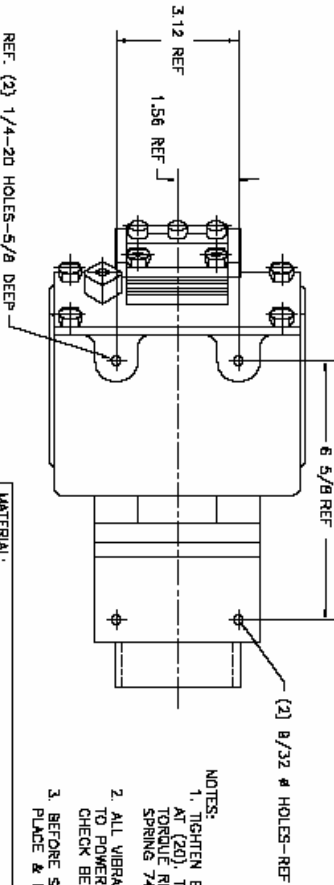
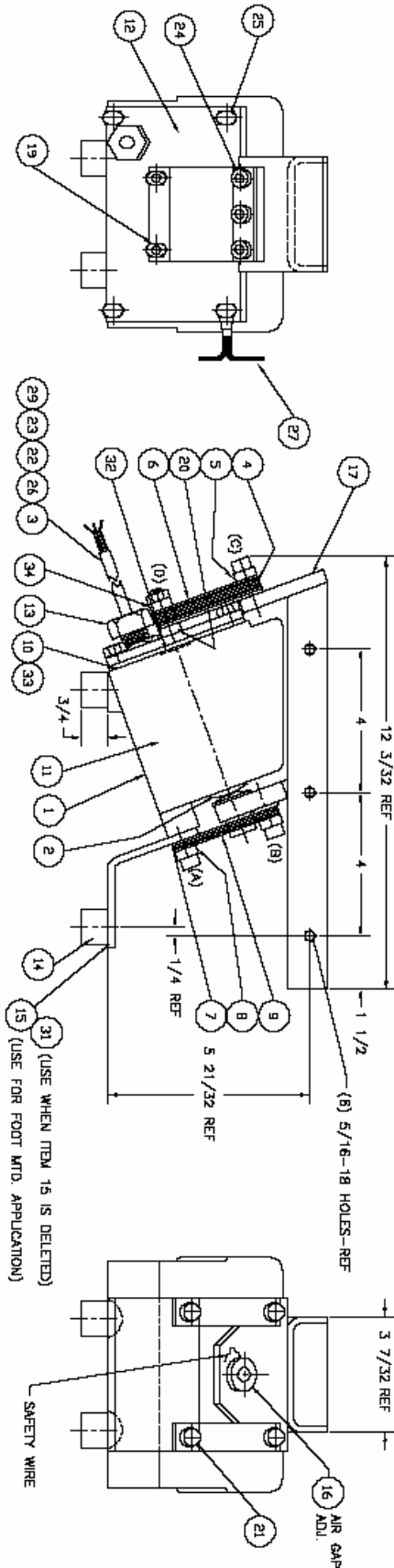
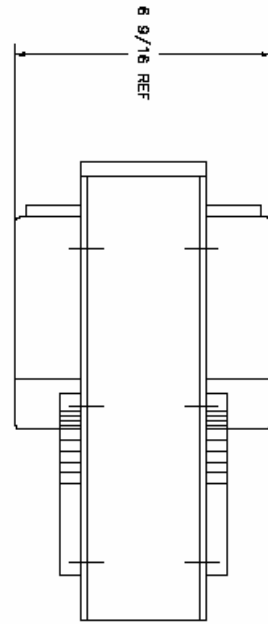
NEXT ASSY

ORDER NO.

SHEET 1 OF 1

CAD DISK NO. 115

DWG. NO.: DA02671C0X



- NOTES:
1. TIGHTEN BOLTS (A) (B) & (C) FIRST. CHECK FOR PROPER SPACING AT (20). THEN TIGHTEN HEX NUT (D) CHECK TORQUE REQ. TORQUE REQUIREMENTS FOR REASSEMBLING SPRING 740 IN LBS.
 2. ALL VIBRATORS MUST BE CONNECTED TO POWER SOURCE FOR PERFORMANCE. CHECK BEFORE PLACING IN STOCK.
 3. BEFORE SHIPMENT SAFETY WIRE AT ITEM 16 SHOULD BE IN PLACE & REMAIN FOR PROPER OPERATION OF VIBRATOR.

MATERIAL:

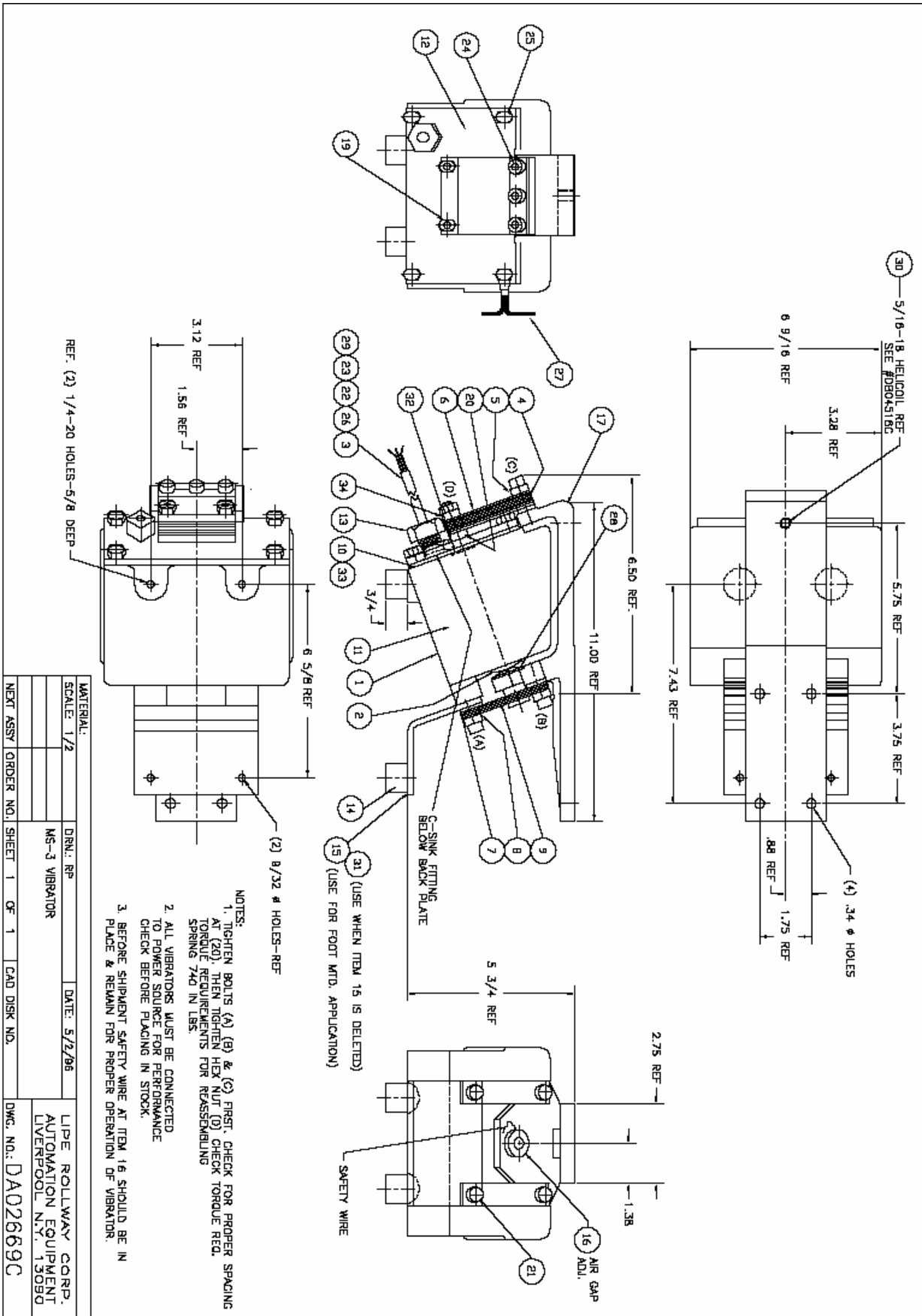
SCALE: 1/2

DRN: RICK PRINZIP DATE: 4/23/86

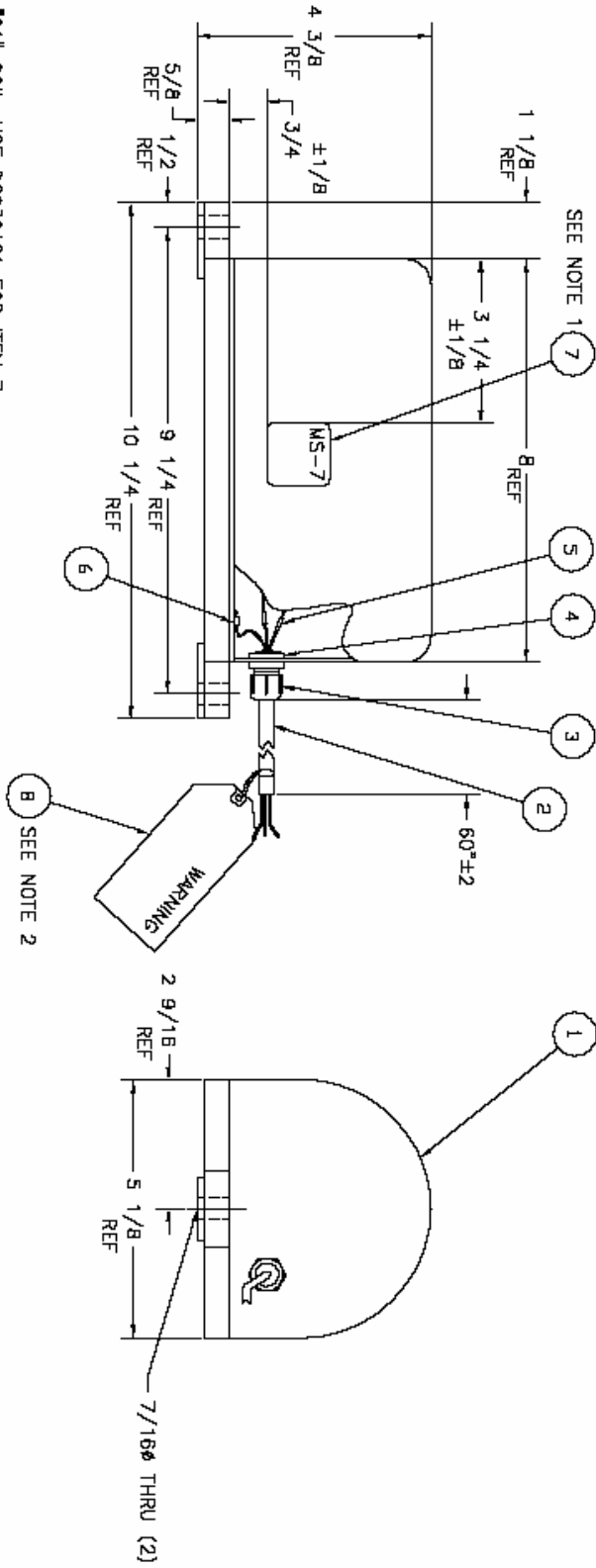
MS-3 VIBRATOR

NEXT ASSY ORDER NO. SHEET 1 OF 1 CAD DISK NO.

LIPE ROLLWAY CORP.
AUTOMATION EQUIPMENT
LIVERPOOL, N.Y. 13090
DWG. NO.: DA03037C



COIL DESIGNATION	
"DX"	SPECIFICATIONS
01	115 VAC 50/60 HZ 2 AMP
02	230 VAC 50/60 HZ 1 AMP
04	460 VAC 50/60 HZ .5 AMP

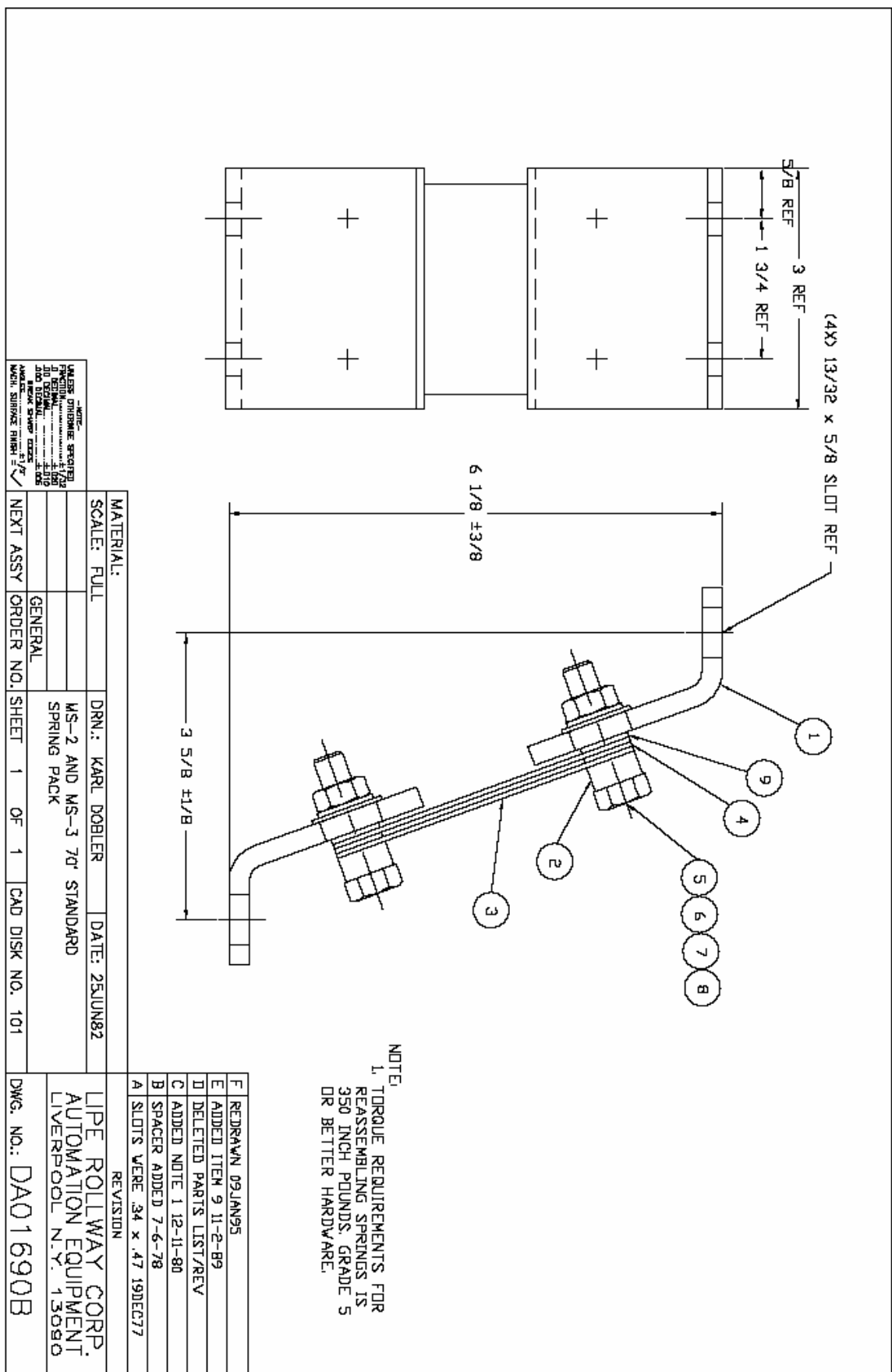


- NOTES:
1. FOR "01" COIL, USE DG03012A FOR ITEM 7.
 2. FOR "02" & "04" COILS, TYPE NECESSARY INFORMATION ON DG0301D15A FOR ITEM 7.
 3. WIND ITEM 2 INTO A 6"-9" COIL & USE ITEM 8 TO KEEP IT WOUND.

The design, concept, and features depicted or described herein are the exclusive property of Dyna-Slide, Inc. and are identified by the Dyna-Slide logo. All rights are reserved. No part of this drawing may be reproduced without the prior written permission of Dyna-Slide, Inc.

DATE: 1/12/98
DRAWN BY: FJK
CHECKED BY: JLD
APPROVED BY: JLD
MATERIAL: AS NOTED
FINISH: DYNASLIDE BLUE

MATERIAL: AS NOTED		DATE: 1/12/98	
SCALE: 1:2	DRN.: FJK	MS-7 VIBRATOR WITH "SO" CORD	
GENERAL		FINISH: DYNASLIDE BLUE	
NEXT ASSY		ORDER NO.	
DWG. NO.: DA01871BOX			



Air Gap Adjustment for MS-3 Vibrator:

The Air Gap of a MS-3 is the spacing that exists between the face of the armature and the face of the core assembly. Proper adjustment of this space is extremely important for good feeder operation.

If the Air Gap is adjusted so the armature and core are too close, the faces of items will make contact during feeder operation. This is called “striking”. A striking condition will cause severe mechanical damage (broken spring cracked trough or base, cracked armature or core). If the Air Gap is adjusted so the armature and core are too far apart, the feeder current may climb to a dangerous level. A high current condition will result in coil burn-out, failure of control components or reduced material feed.

The Air Gap is properly set at the factory, therefore readjustment should rarely be required. However, if high voltage is applied to the feeder or if the air gap has been removed due to the improper handling during shipment or installation, an adjustment may be in order.

Adjustment Procedure for MS-3 Vibrator:

1. The conveyor must be running empty and the control knob set at maximum feed.
2. Locate Air Gap adjusting cap screw (item #16) at the front of the feeder base.
3. Adjust cap screw as follows:

If armature and core are “striking”, rotate cap screw in a CLOCKWISE direction to INCREASE the Air Gap spacing. If feeder lacks power at 100% control setting, or draws excessive current, rotate cap screw in a counterclockwise direction to DECREASE the Air Gap spacing. The limit of movements being slashed just before an armature and core “strike” under full load condition.

NOTE: The air gap adjustment is a very delicate procedure and may require a little time to properly obtain the desired setting. The correct air gap spacing will be obtained when the armature and core faces are as close as possible without “striking” the feeder magnet.

Caution

If the air gap adjusting cap screw is rotated to an extreme position, the tension disc will spring. A jingling sound may occur caused by disc springs vibrating against one another. Adjusting cap screws should never be rotated to this extreme.

Warning

Item 15 on drawing #DA03037C (MS-3 Vibrator Assembly) has a safety wire to prevent vibrations from backing the screw out and causing misalignment of air gap. Any alterations to the MS-3 vibrator that requires removal of safety wire must be reestablished to protect your warranty and prevent accidental striking and damage to the vibrator.

Specifications

The following tabulations contains air gap setting, current ratings and operating amplitude ranges for the MS-3 Vibrator.

Operating feeder typical static maximum current ratings amplitude model air gap setting 115v, 230v, 460v range.

<u>Vibrator Model</u>	<u>Typical Static Air Gap Setting</u>	<u>Maximum Current</u>	<u>Supply Voltage</u>	<u>Operating Amp. Range</u>
M-S 3	.140”	2A 1A	115 VAC 230 VAC	.055-.060 inches

Vibrator Adjustments for MS-7

Refer to the following drawings, as required:

DA01871BOX	MS-7 Vibrator with “SO” Cord fitting - Enclosed
DA03168BOX	MS-7 Vibrator with “Liquid Tight” fitting
DA03192BXX	MS-7 Vibrator with “SO” Card fitting for F0610 System
DA03210BOX	MS-7 Vibrator parts breakdown

00	115VAC	50/60HZ	2 Amp
02	230VAC	50/60HZ	1 Amp
04	460VAC	50/60HZ	.5 Amp

Description of MS-7 Vibrator

The MS-7 Model Vibrator is a pulsating electromagnetic powered drive unit designed to promote an effective and effortless controlled movement of parts on a brushed pattern as used in accumulate small feeders, for slow speed conveyors with thin parts to prevent shingling, or to break apart congestion in hoppers.

Refer to DA03210BOX MS-7 Vibrator:

Located under the housing cover (item 10) is an encapsulated wire wound core (item 2) mounted directly to the housing base (item 8). A laminated armature assembly (item 1) causes the pulsating movement of the brushplate as power is alternately turned on and off by the controller. It does so through flexing of the leaf springs (item 4) which are attached to the housing base at each end through spacers (item 3) and leaf spring spacers (item 5), while the armature is attached at the center of each leaf spring. A rubber striking block (item 7) is adjusted to limit the stroke of the armature and set the “air gap”.

Air Gap Adjustment and Maintenance for the MS-7 Vibrator:

Dyna-Slide®

Once a month each vibrator and its hardware should be inspected and checked for damage, tightness, wear and cleanliness as outlined in Maintenance (page 9).

Warning

Before doing any internal work on the vibrator, turn off all supply power and lock out the supply. When air gap, springs or strike gap, always check both ends of vibrator. When checking vibrator current with a tong meter, the meter reading must always be multiplied by a value of 1.7. A tong meter does not reveal the same current as stamped on the equipment nameplate, due to the waveform characteristics of the vibrator and controller when operating.

Carefully remove housing cover by removing the two (2) mounting screws, loosen wire fitting at wire and gently pull the housing cover off. Use care not to damage cover gasket (item 9) or wire connections. In an at rest condition, without damaged leaf springs, there should be .08511 to .0951 air gap between the armature and the base assembly, as shown in DA03210BOX. If “striking” occurs at this setting, check the supply voltage and current against the information on the vibrator nameplate. If line supply power and supply requirements are the same, the leaf springs should be checked for damage.

Look carefully at the leaf spring edges for a white looking powder or “strings” coming out of the leaf spring. If the vibrator was running just before the housing cover was removed, check the warmth of the leaf springs at the end clamp blocks or the armature. If the springs are hot to touch, have white powder on them or “strings” at the edges, replace all the leaf springs and both ends with same size and ply of leaf spring. Use caution to reassemble the vibrator. Check location of leaf spring spacers and clamp blocks at the ends and armature. If there is more than one leaf spring at each end, there MUST be a leaf spring spacer between each leaf spring (item 4) at each bait, as shown in the detail views on DA03210BOX. If the leaf spring spacer is not used at location, the leaf springs will not flex properly. All leaf springs, leaf spring spacers and clamp blocks should be square and in line for best performance. If a leaf spring needs replacement Lipe Automation Corp. recommends that all springs be replaced at the same time. After replacing the leaf springs, if required, recheck the air gap. The air gap can be

adjusted by adding or subtracting leaf spring spacers at the armature. Next, adjust striking block by loosening the jam nut below the striking block. Rotate the striking block clockwise to increase the strike gap or counterclockwise to decrease the strike gap, until a gap of 0.040" to 0.04" at 60 hertz operation or 0.047" to 0.052" at 50 hertz operation is obtained. Lock the jam nut down and recheck the strike gap. Check all screws and bolts of the vibrator assembly for tightness per DA03210BOX.

Place the housing cover in position over the vibrator and gently pull the wires into their proper position. Check for cover gasket to be in its proper location. Tighten all screws and fittings and mount vibrator in its working position. Turn potentiometer counterclockwise until it stops. Depress the green start button and slowly turn the potentiometer to full. If "striking" reoccurs, depress the red stop button at once, remove the housing cover and readjust the strike gap by turning the strike block ¼ turn counterclockwise, at each end of the vibrator and recheck the operation by following the actions at the beginning of this paragraph. Repeat as required, until "striking" stops. Consult the Lipe Automation Corp. Service Department if the strike gap becomes less than 0.025". Under no circumstances should the striking block and the armature touch at rest.

GENERAL DESCRIPTION OF SPRING PACK

Refer to DA01690B (MS-2 70 degrees Standard Spring Pack)

The spring pack is an assembly of a stack of leaf springs (item 3) leaf spring spacers (item 4), and leaf spring clamp bars (item 2), clamped firmly to spring supports (item 1). The assembly is adjustable to some extent, but the mounting surfaces of the spring supports must be parallel to one another for optimum performance.

Anything less than parallel will cause the vibratory brushplate to transport the parts slower and possibly not in the required direction. At rest there should be no distortion or deflection in the leaf springs of a spring pack assembly.

These conditions could also damage the unit or the leaf springs and cause erratic operation. Adjustments can be made where the spring pack assembly is attached to the base channel or plate and the spring pack mount under the brushplate. If needed, the hardware (items 5,6,7 & 8) clamping the leaf spring stack can be loosened to the assembly. Tighten all hardware to the required as shown on the reference drawing. Replace any broken or damaged hardware with grade 5 or better.

There may be one (1) or more spring pack assemblies used on a brushplate application. All spring packs should be set at the same height.

Spring Pack Adjustment and Repair

DA01690B	MS-2 & 3	70 degrees Standard Spring Pack - Enclosed
DA01416A	MS-1	70 degrees Standard Spring Pack Assembly
DA01765A	MS-1	70 degrees Reverse Feeder Spring Pack Assembly
DA02201B	MS-4	70 degrees (Spring Pack Assembly)
DA03122A	MS-1	Vertical Spring Pack
DA03122A	MS-1	Horizontal Spring Pack Assembly
DA03463B	MS-2 & 3	70 degrees Half Spring Pack Assembly
DA03446B	MS-2 & 3	Vertical Spring Pack

SPRING PACK MAINTENANCE

Once a month each spring pack and its hardware should be inspected and checked for damage, tightness, wear and cleanliness as outlined in Maintenance on page 9. If a leaf spring needs replacement, Lipe Automation Corp.

recommends that all leaf springs in the assembly be replaced. Check the appropriate Spring Pack from Machine Assembly Drawing & Bills of Material (See Specifications for the appropriate spring pack listed on page 21). Carefully reassemble the spring pack with the same size and ply of leaf spring(s) making sure that the leaf spring spacers are in their proper locations.

LUBRICATION

Under no circumstances should any part of the spring packs, brushplates, or vibrators be lubricated.

TROUBLESHOOTING

Dyna-Slide model “MS” Vibrators and related equipment are designed for rugged operation. When used properly, this equipment will provide many years of efficient, trouble-free service. The following list of items (#1-7) is provided to supply you with methods of “curing” a variety of faulty operating conditions. You will note that some of the listed suggestions apply directly to the vibratory unit or controller, while others deal with the bounding environment.

1. Vibratory unit operates too slow

- a. Low operating line voltage - the operating voltage is very important and must be kept close to the designated voltage as stamped on the nameplate. Low voltage definitely decreases vibratory output.
- b. The vibratory unit must be installed in a location that no part of the unit (other than the mounting points)

is touching a rigid object or adjacent component part of the system or machines.

- c. After a period of time, the spring assemblies may become packed with dust or powdered material resulting in an increased spring stiffness. These springs should be removed and replaced. (See Spring Pack Adjustment and Repair or Vibrator Adjustment and Repair, pages 9 and 11).
- d. The unit may have cracked or broken leaf springs. Defective leaf springs or loose spring packs have a tendency to generate heat. This is evident by feeling the spring ends for warmth. Before searching for defective springs, check spring clamping bolts for tightness (See Spring Pack Adjustment and Repair on page 9 and refer to #DA01960B for recommended spring clamping torque). In order to insure maximum efficiency of operation (feed rate vs. power input), each brushplate must be tuned for resonance at the operating frequency. If too few or too many leaf springs are employed, power requirements to produce a given feed rate will change.
- e. The brushplate may be damaged due to rough handling or due to alterations or additions that were not part of the original design.

2. Vibratory unit operates too fast

High operating voltage - the operating voltage must be kept within the limits of the rating stamped on the equipment nameplate. High voltage, in most instances, will cause the magnet and armature faces to strike.

“Striking” can be corrected by widening the air gap (See Vibrator Adjustment and Repair). The correct cure for an installation where the operating voltage is consistently high, is to replace the coils with a specially wound coil suited for the particular operating voltage or use of step down power line transformer to supply power at the equipment rating.

3. Effect on worn brush

Worn out brushplates or brushplates packed with dirt will affect the movement of parts. The vibratory unit is tuned for the original mass weight and any change of weight will have a definite bearing on the part movement action.

Clean dirty brushplates when possible. Replacement of brushplate must be with identical part number (see Bill of Materials and Assembly Drawing, page 27). Design changes in part weight, size or shape may have drastic effects on operation.

4. Misalignment

Misalignment of the brushplate can occur if the spring pack mounting bolts become loose or the brushplate has been jolted. Should the brushplate misalignment be severe enough, a slow feed rate will occur.

5. Coil failures and the causes

- a. High operating voltage resulting in excessive heat.
- b. Air gap, between magnet and armature, that is too wide may cause current to increase over coil limitations.
- c. Short in the electrical wiring.
- d. Grounded phases will generally cause fuse failure, but if the unit is fused too high the coil may burn out.
- e. High current resulting from defective springs.

6. Unit will not vibrate

In most cases this condition is the result of phase controller failure in the controller. It is recommended to replace the phase controller.

7. Unit fails to operate

A variety of reasons could result in the unit failing to operate when energized. Included among these reasons are:

- a. Lack of power supply to the controller
- b. Blown fuse or faulty switchgear
- c. Voltage or frequency of power supply does not match the rating as stamped on the nameplate
- d. Line from the controller to the conveyor (or to power supply) could be broken, grounded or shorted.
- e. Wiring of the components in the controller may be loose or broken

- f. Vibrator coil may be burned out or grounded
- g. Short circuit in the electrical wiring
- h. Potentiometer may have an open winding. Check with meter. Replace as needed. Make certain potentiometer controls feed rate.
- i. Relays center time delay or other control components may not be functioning properly.

IMPORTANT:

Vibrator coils, under normal operating conditions run warm but never too hot to touch.

If the problems experienced are not solved by any of the above information or other sections of this manual, consult with the Lipe Automation Corp. Service Department at:

1-800-448-7822

Specification Sheets

Bill of Materials / Assembly Drawings

Electric Controller & Schematic

Recommended Spare Parts

DG75013 10-6 Glue Down

DG75017 12-8 Glue Down

DG75067 12-5 Glue Down

DG75068 16-4 Glue Down

DG75075 05-2 Glue Down

DG75076 12-5 Velcro

DG75077 12-8 Velcro

DG75078 10-6 Velcro

DG75079 16-4 Velcro

DG75081 05-2 Velcro

DG75092 05-2 Velcro

DG75086 Felt Back Hook Tape

DG05006 Psa Hook Tape Remains

DG75088 4" Wide Psa Hook Tape

DG75087 10-4 Velcro Hollow Flag

DG75091 12-8 Velcro Anti Static

LIMITED WARRANTIES:

Mechanical, Electrical and Electronic Equipment & Systems are provided by Seller including a Limited Warranty Any and all warranties are limited as follows:

10.1 Provided that the equipment is properly operated, maintained and managed by Buyer, all new equipment manufactured by Seller is warranted against defective workmanship and material and for operation as provided in written specifications for a period of one year of one shift operation or 2000 hours, from system acceptance or from shipment if installed by Buyer This warranty covers all parts and one-way transportation charges. If usage by Buyer exceeds one shift operation, the warranty period shall be reduced on a Pro Rated basis.

10.2 Warranty service on these products is provided on a return basis. Malfunctioning units shall be returned with insurance and shipping charges prepaid by Buyer The repaired/ replaced unit will be returned via DHL (surface). If requested, units will be returned by air freight or air express, the charge for which shall be borne by Buyer. Seller shall not be held liable for customs duties or other unusual expenses involved in obtaining warranted replacement parts.

10.3 This warranty shall be void if the system or equipment has either not been paid for to the full satisfaction of Seller; or, in the reasonable judgment of Seller., been misused or in any way altered or modified by the Buyer, including but not be limited to, the removal of any factory supplied warnings or safety devices affixed to the subject equipment.

10.4 Seller shall not be held liable for charges or repairs in the field unless such repair has been previously authorized Seller.

Seller does not provide warranty repair labor unless specifically specified within service agreement.

10.5 No equipment or component may be returned to Seller without having prior return authorization. Without such authorization, the company reserves the right to refuse and return shipments. Units returned to Seller "shipping" collect" will not be accepted. Buyer shall contact Seller's Customer Service Office to acquire a return authorization number prior to return of any equipment or component and shall mark the return authorization number conspicuously on the returned item(s) packaging.

10.6 This warranty does not cover preventive maintenance or inspection; these services may be provided on a flat-rate charge basis by Seller.

10.7 All components, equipment or devices not manufactured by Seller shall be defined as third party equipment for the purpose of this agreement. Buyer will look to the manufacturer of said equipment for warranty remedy. Seller may act as Buyer's agent to assist in warranty claim at it's option.

10.8 Sellers motor control, process control and data collection software is warranted to perform according to the specifications which are expressly made part of this Agreement. No additional warranties are extended for software after system acceptance as defined by Seller's sales proposal. After system acceptance all software warranty service provided hereunder is by back up software disk transfer only. Seller may support system by remote modem if this options is available and purchased by Buyer.

10.9 No representation or warranty expressed or implied, made by any sales representative or other agent or representative of Seller which is not specifically set forth herein shall be binding upon Seller

10.10 Seller warrants that neither the equipment nor the Seller systems will infringe any third party's rights under any copyright, trade secret or currently issued United States Patent.

10.11 THE FOREGOING WARRANTY IS IN LIEU OF AND EXCLUDES ALL OTHER WARRANTIES NOT EXPRESSLY SET FORTH HEREIN, WHETHER EXPRESSED OR IMPLIED BY OPERATION OF LAW OR OTHERWISE, INCLUDING BUT NOT LIMITED TO ANY IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE.

800- 448-7822

www.lipeautomation.com

