

Installation, Operation & Maintenance Instructions



VIBRATORY FEEDER

MODEL 65B-HC

INTRODUCTION

This manual details the proper steps for installing, operating and maintaining an Eriez Vibratory Feeder.

Careful attention to these requirements will assure the most efficient and dependable performance of this equipment.

If there are any questions or comments about the manual, please call Eriez at +1-814-835-6000 for Vibratory Feeder assistance.

☒ Original instructions (English)

☐ Translated from the original instructions

General Product Description

Eriez electromagnetic vibratory feeders are tuned two-mass systems that convey material across a tray. The B-HC feeders operate at either 50 Hz or 60 Hz depending upon the line frequency. The feeder consists of two masses coupled by tuning springs.

Eriez B-HC feeders utilize electro-permanent magnet driving forces. When the coil is energized, the alternating current creates an AC magnetic field between the e-frame and the permanent magnet armature poles, producing a harmonic driving force between the e-frame and the poles, which drives the feeder. This motor design creates an equal and opposite driving force on both masses.

B-HC feeders are used to convey products across their tray. Product is introduced to the feeder from a hopper or another conveyor.

Business Address:

Eriez
2200 Asbury Road
Erie, Pa. 16506
Phone: +1-814-835-6000
Email: eriez@eriez.com
www.eriez.com

European Authorized Representative:

Eriez - Deutschland
Pregelstr. 20
58256 Ennepetal
Deutschland
Phone: +44-75-5780-9761
Email: info-deutschland@eriez.com
www.eriezdeutschland.de

The following information can be found on the name tag installed on the feeder:

- Company name
- Feeder model number
- Feeder assembly
- Serial number for the feeder assembly
- Feeder rated voltage and frequency
- Feeder maximum current draw at rated voltage
- Feeder tuned tray stroke

Environmental Conditions

These feeders are designed to be operated both indoors and outdoors in non-hazardous locations.

IP Rating: IP65

Minimum Ambient Temperature: -30°C (-20°F)

Maximum Ambient Temperature: 54°C (130°F)

Maximum Humidity: 90%

Maximum Elevation: 1829 m (6000 ft)

FEEDER SAFETY

	! WARNING	! ADVERTENCIA	! AVERTISSEMENT
	ELECTRIC SHOCK HAZARD This equipment is to be serviced by trained personnel only.	PELIGRO DE DESCARGA ELECTRICA Solamente el personal tecnico especializado debe dar servicio al equipo.	RISQUE D'ÉLECTROCUTION L'entretien de cet équipement doit être effectué par un technicien qualifié.

This warning label indicates that hazardous voltage can be present and the machine should only be serviced by qualified personnel who are properly trained in isolating the electrical power prior to starting any service work.

	! WARNING	! ADVERTENCIA	! AVERTISSEMENT
	Burn Hazard. Do Not touch. Allow to cool before servicing.	Peligro de quemaduras. NO TOCAR. Dejese enfriar antes de dar servicio al equipo.	Danger de brûlure. Ne PAS toucher. Laissez refroidir avant de procéder à l'entretien.

This warning label indicates that high temperatures may be present on this surface that could cause a burn.

	! WARNING	! ADVERTENCIA	! AVERTISSEMENT
	Read and understand operator's manual and all other safety instructions before using this equipment. Download the latest manual at www.eriez.com/manuals	Leer y comprender el manual del operador y todas las demás instrucciones de seguridad antes usar este equipo. Descargar el manual más reciente en www.eriez.com/manuals	Prendre le temps de lire et bien comprendre le manuel d'opération et toutes autres instructions de sécurité avant d'utiliser cet équipement. Télécharger le dernier manuel à www.eriez.com/manuals

This warning label indicates that the user must read and understand the operator's manual and all other safety instructions before using this equipment.

! CAUTION
Safety labels must be affixed to this product.
Should the safety label(s) be damaged, dislodged or removed, contact Eriez for replacement.

Feeder Safety

- Feeder drives produce strong magnetic fields.
- AC and DC magnetic fields are present during operation. These fields may cause harm to implantable medical devices.
- The armature of the feeder driver contains permanent magnets that produce a strong magnetic field that cannot be turned off. This field can attract ferrous items and pinch or entrap body parts. Only qualified personnel should service the feeder drive.
- The customer must evaluate if hearing protection is required for the operator. The study should be conducted with the actual material being conveyed by the feeder.
- The customer must evaluate any airborne dust hazards during feeder operation. Eriez can provide a tray with covers and dust boots to reduce airborne dust.
- A static charge can be produced with certain materials. It is the customer's responsibility to determine if static charges are a problem. Eriez can provide a feeder with a grounding strap to eliminate static.
- The operator must keep a safe distance from the moving parts of the feeder during operation. The feeder should not be operated with personnel sitting, laying or standing on the feeder.
- Caution must be used to clear any blockages of material. The operator must be at a safe distance not to be entrapped by uncontrolled material once blockage is removed.

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HANDLING & TRANSPORTATION

Only qualified personnel should be rigging or installing the feeder on location.

Use proper handling equipment that is rated for the weight of the feeder.

Operators of forklifts and other lifting devices should follow proper and safe operational use.

Operators of hoist equipment should always follow proper rigging procedures.

Equipment should remain in its original shipping crate or packaging while being transported.

STORAGE

Prior to storage, equipment should be carefully inspected for shipping damage. Should damage have occurred, immediately contact the freight carrier and Eriez Manufacturing.

Equipment should remain in its original shipping crate or packaging and be placed in a clean, dry area.

For electronic controllers, in addition to the above, a rust inhibitor should be placed inside the control enclosure.

Desiccant must be removed from control enclosure prior to wiring control.

Controls should not be stored in temperatures above 43°C (110°F).

INSTALLATION

General

Safety slings should be installed under feeder assembly. This safeguards against the tray and driver tipping or falling during an extreme failure of the feeder or its suspension mounts. Only qualified personnel should be rigging or installing the feeder on location.

Mounting

Refer to *Eriez Vibratory Feeders Hopper Transition and Installation Guide* for additional information regarding appropriate hopper and other transitions for vibratory feeders. Eriez heavy duty feeders may be mounted in any of the following ways:

Suspension Mounting

Suspend front and rear of feeder from cables attached to the suspension bracket eyebolts (**Parts 48 and 49 on Parts List**). Refer to **Table 1** for suspension cable size. Safety cables are also recommended for suspension mounted feeders (**See Figure 1**).

TABLE 1 Suspension Cable

Rear Suspensions	Max Safe Working Loads	Front Suspension	Max Safe Working Loads
10 mm cable (3/8")	907 kg (2000 lbs)	6 mm cable (1/4")	408 kg (900 lbs)



WARNING

Suspension mounting inherently involves risk of property damage or personal injury to equipment or personnel located under or near the machine, should a mounting cable fail. Suspension component specifications given in this manual are suggestions only, and final selection of suspension method is entirely the responsibility of the user. Select and use suspension cables with rated capacities (including reduction factors for clamps, etc.) that provide adequate safety factors when the weight of the equipment and all possible loading conditions and upsets are taken into account. Consult Eriez at +1-814-835-6000 if additional Eriez equipment information is needed to make this selection. As with all suspended equipment, access to the area under the machine should be restricted.

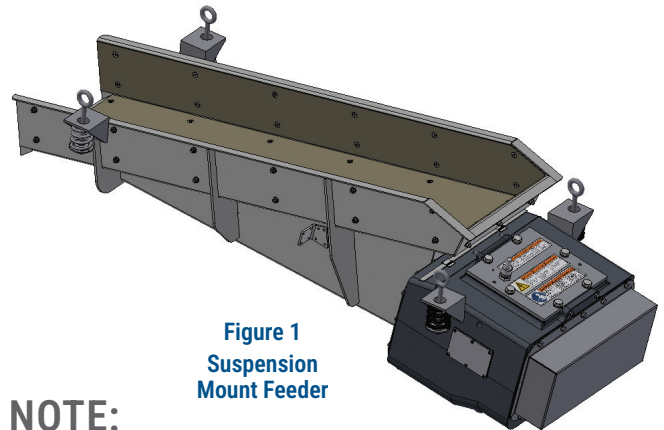


Figure 1
Suspension
Mount Feeder

NOTE:

Do not suspend from eyebolts threaded horizontally into the tray or drive housing. Eyebolts loaded at right angles to their shanks may fail unexpectedly causing damage to equipment or personal injury.

Floor Mounting

Mount front and rear of feeder on the floor mounting accessories provided as an alternate to the suspension accessories. The mounting bases (**Part 52 on Parts List**) should be bolted to the floor or other mounting surface, and the unit, with the floor mounting springs (**Parts 50 and 51**), simply placed on the bases — *no fastening necessary*. (**See Figure 2**).

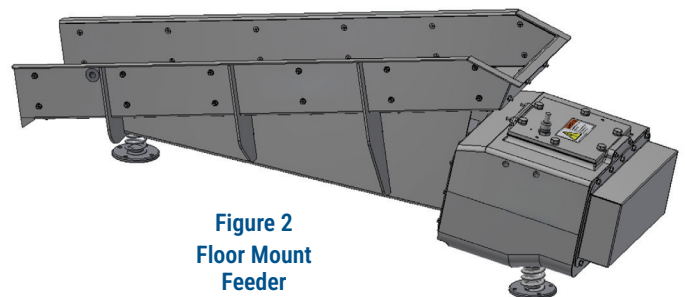


Figure 2
Floor Mount
Feeder

Combined Suspension & Floor Mounting

Any combination of suspension and floor mounting means may be utilized. The details of any such combination will, of course, be dictated by the particular application. The instructions given above should be followed.

IMPORTANT NOTE: Special Trays and Attachments

Eriez engineering services should always be consulted before undertaking the design or construction of special trays. Neither standard nor special trays as furnished by Eriez should be modified or attachments made without first consulting us. **Unauthorized alterations void Eriez' warranty.**

INSTALLATION (cont.)

Electrical Connections

The Eriez 65B-HC Vibratory Feeder is designed to be operated from an AC source. It cannot be operated from a DC source. All wiring should conform to all applicable electrical codes and should be installed by a licensed electrician.

It is the customer's responsibility for proper controller installation for safe operation, installed according to local safety codes. Only qualified personnel should install the control.



Figure 3
Eriez Feeder Control

TABLE 2 Control Data				
Voltage	No. of Phases	Frequency	Amps	Replacement Fuse When Using Eriez Control
115	1	60	25.0	30A HS Class J
230	1	60	13.0	25A HS Class J
380/460	1	50/60	7.0	15A HS Class J
575	1	60	5.0	10A HS Class J
115	1	50	22.0	30A HS Class J
230	1	50	11.0	25A HS Class J
415	1	50	6.5	15A HS Class J
400	1	60	8.0	15A HS Class J

Check the specifications of the power line to be certain that they are the same as those shown on the nameplate of the Feeder and Control.

To avoid being exposed to residual high voltages, the feeder must be hardwired to the control and the control must be hardwired to the power source.

The cable between the feeder and control must be of sufficient size for the current and voltage as indicated on the equipment name tag. A voltage drop through a cable of insufficient size for the required distance may result in reduced feeder displacement while operating.

The ground lead between the driver and control must be properly connected inside the control. The control ground must be properly connected to the main power circuit ground.

On multiple-drive feeders (two or more drives on one tray) all drives should be wired electrically in phase. The black wires from each power cord should be connected together and the white wires connected together. The black wires should be connected to the positive side of the single-phase input voltage and the white wires should be connected to the negative side.

Varying and unstable line frequency has an adverse effect on vibratory feeders because they are tuned mechanical devices, designed around either 50 or 60 cycle operating frequency. Shifts in the operating point due to changes in frequency (+or-1 cycle) cause higher than normal spring stress, striking and high line currents which can cause drive and tray failure. When operating from portable engine-driven power plants, be certain that the engine is up to speed and all other loads are started and at running speed before starting the feeder. The feeder should always be stopped first when the engine-driven power plant is shut down.

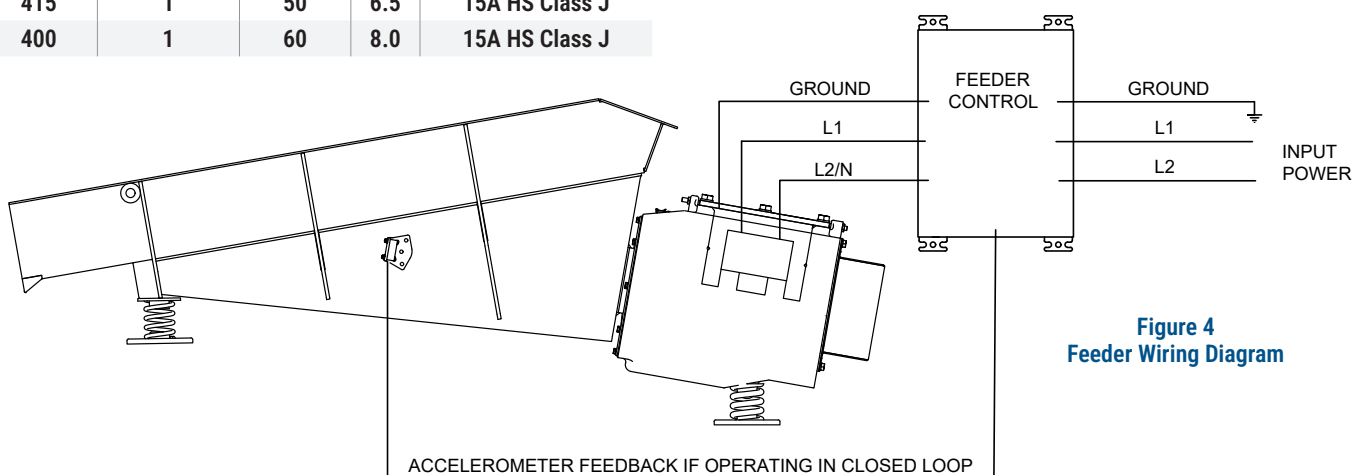


Figure 4
Feeder Wiring Diagram

INSTALLATION (cont.)

Feeder Control

To take full advantage of the feeder capacity, it is recommended to utilize an Eriez controller with a feedback accelerometer in closed loop control.

Customer bears responsibility for proper controller selection and installation for safe operation. It is the responsibility of the customer to use safety devices/relays to ensure that the feeder does not create a hazard by automatically restarting after a power failure.

The control being used to operate the feeder must utilize a soft start feature to start the feeder. Starting the feeder without a soft start will result in motor striking and motor damage.

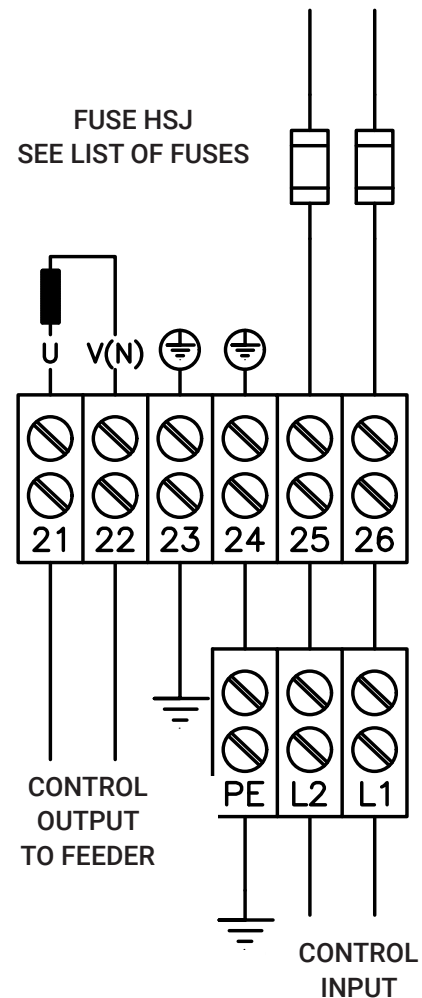


Figure 5
Eriez Supplied Control
Wiring Diagram

OPERATION

To start the vibratory feeder after all connections have been made, turn the switch on the control to the "ON" position and adjust the feed rate by rotating the control knob. With the tray empty and the control knob set to maximum, start and stop the feeder several times. No motor striking should occur. If striking occurs, increase the soft-start ramp up time in the control until the feeder no longer strikes at start up. **Do not operate the unit with any associated equipment touching any part of the feeder.**

No routine maintenance or lubrication is required, except that any accumulation of foreign matter should be periodically removed from the tray and between the tray and the body to prevent restriction of movement of the vibratory elements.

Adjustment (Tuning)

Eriez feeders, when shipped from the factory with a tray, are tuned and require no further adjustment. However, if the tray is to be attached in the field or replacement liners installed, etc. final tuning may be required. In this instance, the instructions outlined below should be followed: This unit is adjusted by changing the stiffness of the springing system. Spring stiffness adjustment consists of varying the number of springs (**Parts 14, 15, and 16 on Parts List**) at the back of the unit or the thickness of individual springs. Access to the rear springs is gained by removing the cover (**Part 3**) at the back of the unit (**See Figure 6**). In tuning, the front springs need never be disturbed. In NORMAL OPERATION at full voltage with the unit fully warmed up, the displacement of the tray, measured at the back of the tray or the tray mounting brace is 2.16 – 2.29 mm (0.85" – 0.90") for a 65B-HC. Excessive displacement will result in noisy operation of the unit and may, if continued, cause damage to components.



CAUTION

(Please Read Carefully): Only those feeder trays approved by Eriez are acceptable under the limits of our warranty. Any modifications, alterations, or changes of any degree must be approved by the Eriez Manufacturing Co. This is a tuned device and the correct tray must be applied to the motor drive for which it is tuned.
NEVER OPERATE THE UNIT IN A STRIKING CONDITION!

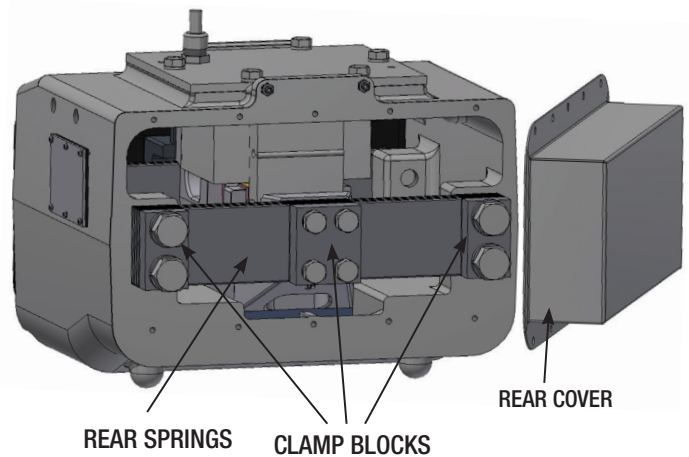


Figure 6
Rear Tuning Springs

Adjustment (Tuning) Guide

The following general rules should be kept in mind when making adjustments:

1. To **increase** the tray displacement, **decrease** the stiffness of the spring system.
2. To **decrease** the tray displacement, **increase** the stiffness of the spring system.

The above rules are true where the unit is operating on the normal side of its tuning curve. If increasing or decreasing the spring stiffness has an effect opposite to that noted in (1) or (2) above, it means that the mass of the tray and/or load has been great enough to throw the operating point to the reverse side of the curve, which is undesirable. In this event, the stiffness should be increased (or the tray-load mass reduced) until the behavior is in accordance with rules (1) and (2) above. The unit can then be properly tuned.

Normally, spring thicknesses of 6, 5, and 3 mm (1/4", 3/16", and 1/8") are used. To serve as a guide in tuning, the following spring stiffness figures should be used: a 5 mm (3/16") thick spring is approximately 44% as stiff as a 6 mm (1/4") thick spring; and a 3 mm (1/8") thick spring is approximately 30% as stiff as a 5 mm (3/16") thick spring.

Example: to slightly increase the deflection of a unit, a 6 mm (1/4") thick spring could be removed and replaced with two 5 mm (3/16") thick springs. Or, to slightly decrease the deflection of a unit, two 3 mm (1/8") thick springs could be removed and replaced with one 5 mm (3/16") thick spring. These combinations must be determined by the existing springs on the rear spring stack.

OPERATION (cont.)

How To Measure Displacement

With the unit operating, observe where the fine gray lines on the displacement sticker meet. This point will be higher or lower as the displacement changes. Opposite the point where they meet, read amount of displacement.

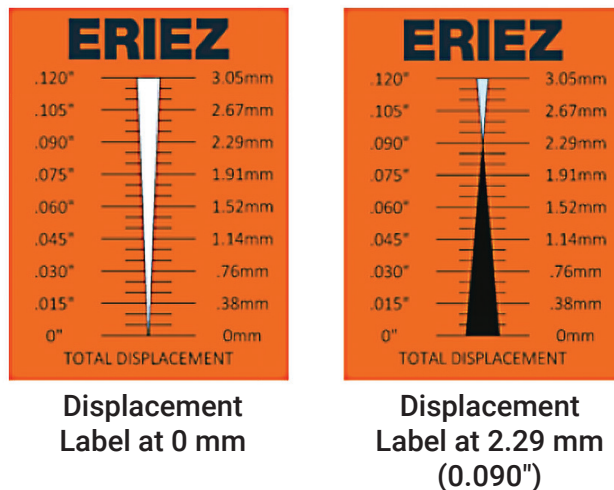


Figure 7
Displacement Sticker

Tuning with New Tray

In the adjustment of the unit, the following steps should be followed:

1. Attach the tray (**Part 55 on Parts List**) and draw all bolts tight. Make sure the inner tray clamp (**Part 5**) and tray surfaces in contact with the inner tray clamp are clean and free of dirt, oil, rust etc. prior to mounting tray. Torque 16 mm nuts (**Part 21**) per Table 3. Check motor air gap (**See Steps 8 and 9 under Coil Replacement**).
2. Energize the unit at the voltage and frequency shown on nameplate.

3. If a control box is used, turn potentiometer from 0% to 100% slowly and observe the unit in operation.
 - a) If a hammering noise is observed, the tray displacement is excessive. To produce normal quiet operation, increase the stiffness of the rear spring stack by substituting a spring of greater thickness for one or more of the rear springs, or by adding additional springs until the displacement is approximately 2.16 – 2.29 mm (0.085" – 0.090"). Additional springs may be purchased from Eriez (**See Parts List Items 14-16**).
 - b) If the displacement measured is considerably less than 2.16 – 2.29 mm (0.085" – 0.090"), decrease the spring stiffness by substituting springs of lesser thickness.

In changing tuning springs, put the clamp blocks (**Parts 10 and 11 on Parts List**) back on the same way they came off to ensure smooth clamping surfaces against the springs. All clamping bolts (**Parts 24-28 and 30-34**) should have a thread engagement of not less than one and one-half times the bolt diameter and should be drawn very tight (**See Bolt Torque Information below on Table 3**).

If "bottoming" of bolts should occur, washers of sufficient thickness to prevent "bottoming" should be used under the bolt heads.

TABLE 3 Bolt Torques by Item Number			
Item Number	Description	Torque	
		N-M	Ft-lbs
21	Nut Hex M16-2 Plated	200	150
23	Bolt Hex HD M16-2 x 45 mm Plated Class 8.8	200	150
24-28	Bolt Hex HD M16-2 Plated Class 8.8	200	150
30-34	Bolt Hex HD M24-3 Plated Class 8.8	600	445
40	Bolt Hex Head M14-2 x 40 mm Plated Class 8.8	125	92

REPAIRS



CAUTION

The 65B-HC armature assembly should only be removed by an Eriez on site technician or sent back to Eriez for repair due to the strong magnetic force produced from the RE Magnets. Failure to follow this procedure can result in serious bodily injury or armature assembly failure.



CAUTION - STRONG MAGNET

This equipment includes one or more extremely powerful magnetic circuits. The magnetic field may be much stronger than the Earth's background field at a distance several times the largest dimension of the equipment.

- If you use a heart pacemaker or similar device you must never approach the equipment because your device may malfunction in the magnetic field, with consequences up to and including death.
- To avoid serious pinch-type injuries caused by objects attracted to the magnet, keep all steel and iron objects well away from the equipment. Do not allow hands, fingers, or other body parts to be caught between the equipment and nearby steel or iron objects.
- Keep credit cards, computer disks, and other magnetic storage devices away from the equipment because magnetically stored information may be corrupted by the magnetic field.
- Keep electronic devices, such as computers or monitors, away from the equipment because exposure to the magnetic field may result in malfunction or permanent damage to such devices.

Contact Eriez if you have a question regarding these precautions.

REPAIRS (cont.)

Coil Replacement

The electrical assembly in a vibratory feeder may require replacement due to operation at over-voltage, or normal aging of the unit. Re-assembly will require checking and possible re-centering of the air gap between the e-frame and the permanent magnet elements. The air gap is directly accessible from the outside of the unit as described below. The following procedure should be followed in removing and replacing the electrical assembly (**See Figure 8 and 9**).

1. Remove the bolts securing the electrical assembly plate to the body casing.
2. Back off the adjusting screws that position the electrical assembly plate.
3. Pry and lift the electrical assembly from the body casing, using a sling or some other safe method of lifting. (**See Figure 9**).
4. Replace defective electrical assembly **with Part 19 on Parts List**.
5. In replacing the electrical assembly, insert it into its original position in the body casing. **DO NOT FORCE THE ASSEMBLY INTO PLACE**. When properly aligned, the assembly will go in easily, although there will be a distinct pull exerted by the permanent magnets in the armature. To overcome this pull, it may be necessary to guide the plate with a pry bar, meanwhile applying pressure to the top of the plate.
6. Start the electrical assembly plate bolts into the body casing, tighten bolts and back off 1/4 – 1/2 turn.
7. Tighten the adjusting screws that position the electrical assembly plate.
8. Remove the nameplate from the side of the body casing to gain access to air gap (**See Figure 10**).
9. Working through the opening in the side of the body casing (**Figure 10**) and using a non-magnetic feeler gauge furnished with each unit (**Part 53**), approximately 2.54 mm (0.100") thick, check the air gaps between the e-Frame legs and the armature pole pieces (**See Figure 11**). These gaps should be uniform in width and parallel and as nearly alike as possible. If they are not, they should be adjusted by shifting the electrical assembly plate with the front or rear adjustment screws. In checking the gaps, the internal parts will be easier to see if the rear cover is removed.
10. Tighten the electrical assembly plate bolts according to **Table 3** and replace the nameplate, and rear cover.

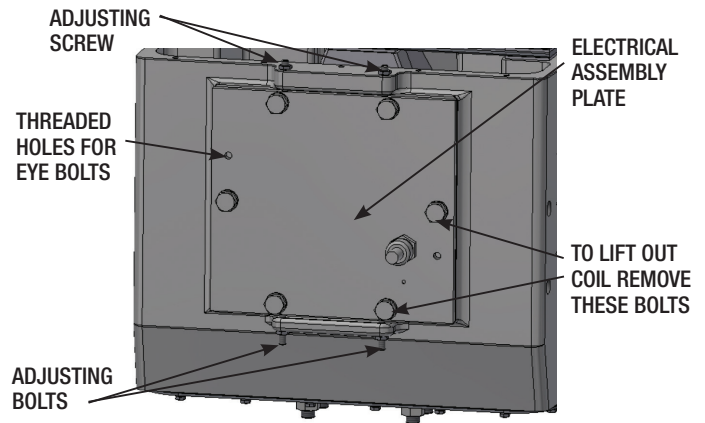


Figure 8 - Electrical Assembly Bolts

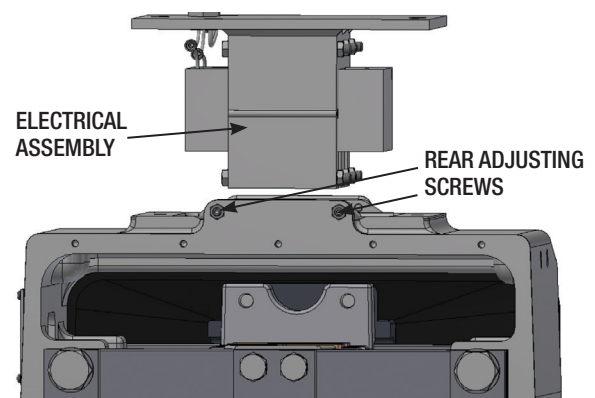


Figure 9 - Electrical Assembly Removal

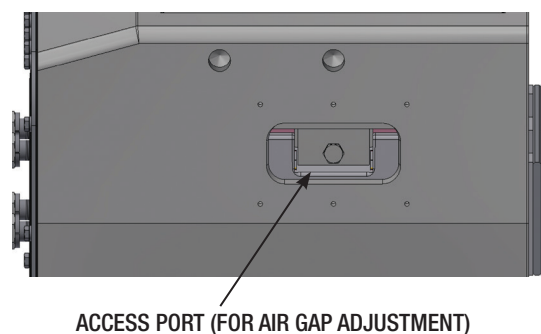


Figure 10 - Access Port

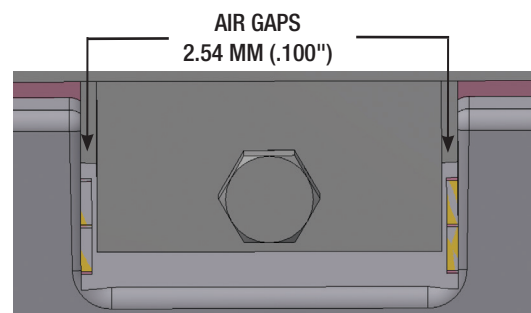


Figure 11 - Motor Gap

REPAIRS (cont.)

Spring Change or Replacement

Although the metallic leaf springs have outstanding life characteristics, failure may eventually occur, especially if the displacement is greater than normal. The symptoms of such failure are:

1. Erratic behavior of the unit
2. Greatly reduced displacement
3. Greatly increased and perhaps uncontrollable displacement

If spring failure is suspected, the front and rear spring stacks should be removed, checked, and replaced one stack at a time. Replace broken or cracked springs with springs of equal thickness.

NOTE: *Fractures in springs are not always visible. Tapping springs to obtain a distinctive ring ensures no fractures present. If sound is dull, replace spring, as it has fractures.*

Replacement of Front Springs

1. Remove diaphragm clamp and rubber diaphragm from front of unit—**Parts 7 and 8 in Parts List (See Figure 12).**
2. Remove inner tray clamp attached to armature (**Part 5**).



CAUTION

Tray mounting pads (**Part 18 on Parts List**) are special flat washers and must be reassembled at same stud locations as disassembled.

3. Remove spring bolts, spring clamps, spacers, and springs.
4. Replace springs and reassemble unit by reversing above procedure.
5. Torque all spring bolts per **Table 3**.
6. Torque inner tray clamp bolts per **Table 3**.

Replacement of Rear Springs

1. Remove rear sheet metal cover.
2. Remove rear spring bolts, spring clamps, spacers and springs (**See Figure 13**).
3. Replace springs and reassemble entire unit by reversing above procedure.
4. Torque all spring bolts per **Table 3**.

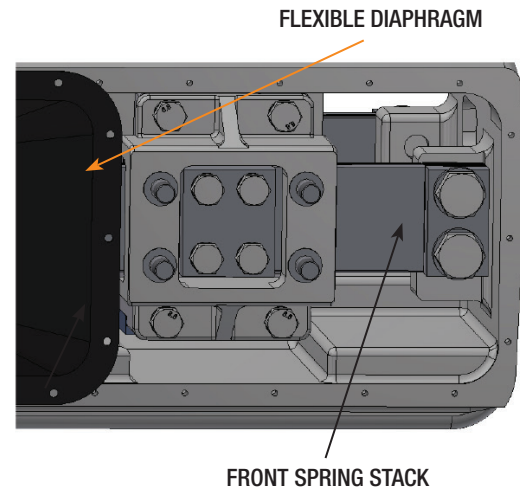


Figure 12
Front Diaphragm and Springs

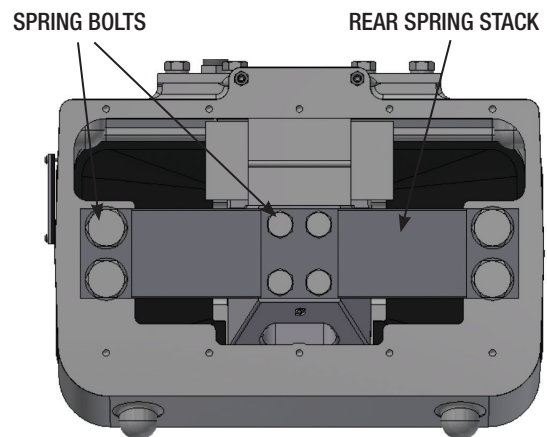


Figure 13
Rear Tuning Springs

DRIVE SEALING PROCEDURE

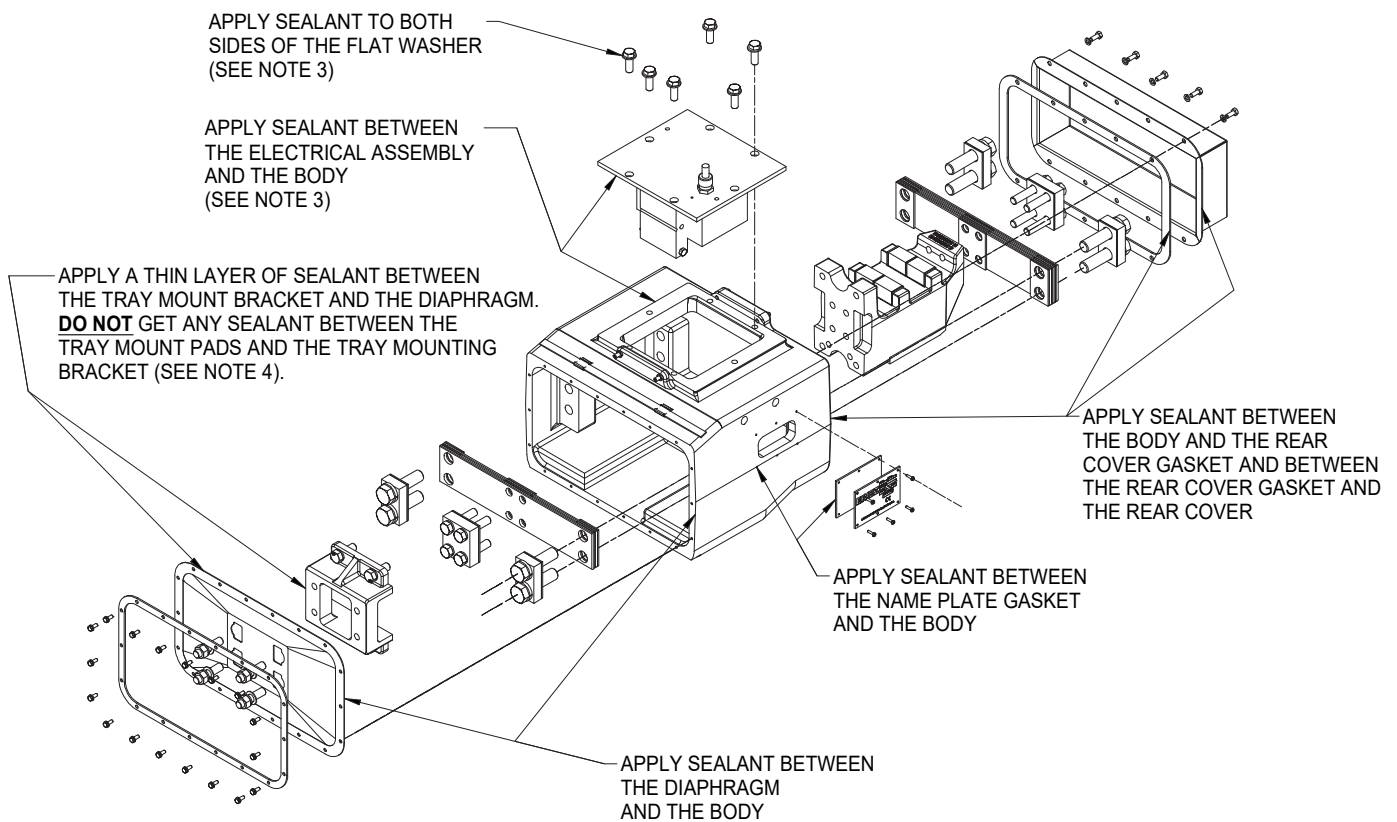


Figure 14
Drive Sealing

The drive must be sealed to maintain an IP65 rating.
Dow 732 sealant is recommended.

1. Apply a 6 mm (1/4") bead of sealant to all identified surfaces unless noted otherwise.
2. The sealant should be applied just prior to assembly.
Do not let the sealant cure before completing assembly.
3. The electrical assembly and armature must be gapped, fasteners torqued per **Table 3** prior to the sealant curing.
4. **Do not** get any sealant on any contact surfaces of the tray mounting pads. Any sealant on these surfaces will affect the torque of the tray mounting studs and lead to stud failure.
- 5) Torque all fasteners per the specified torque.
- 6) Wipe off any excess of sealant once parts are assembled

TROUBLESHOOTING

1. Feeder Not Operating

- a. Check fuses.
- b. Check input voltage.
- c. Check output voltage and current (amps).
- d. If voltage is going to feeder coil, check coil for open or ground.

2. Slow Output of Feeder

- a. Check current on feeder at 100% voltage with the tray empty. If current is higher than nameplate reading, check for broken tuning springs.
- b. Check for broken tray mounting bolts.
- c. Check for cracked welds and cracks in the tray.
- d. Check for worn tray or liner.
- e. If tray is enclosed, the booting to the inlet and outlet must be flexible, as not to restrict tray movement.
- f. Check air gap.

3. Feeder Is Noisy (metal-to-metal striking sound)

- a. Check for broken isolation coil springs (suspended or floor mount).
- b. Check if the tray is rubbing on a hopper, chute work or anything else in the area.
- c. Check air gap per manual.
- d. Check current on feeder at 100% voltage with the tray. If the current is higher than the nameplate reading, then check for broken tuning springs.

PREVENTATIVE MAINTENANCE

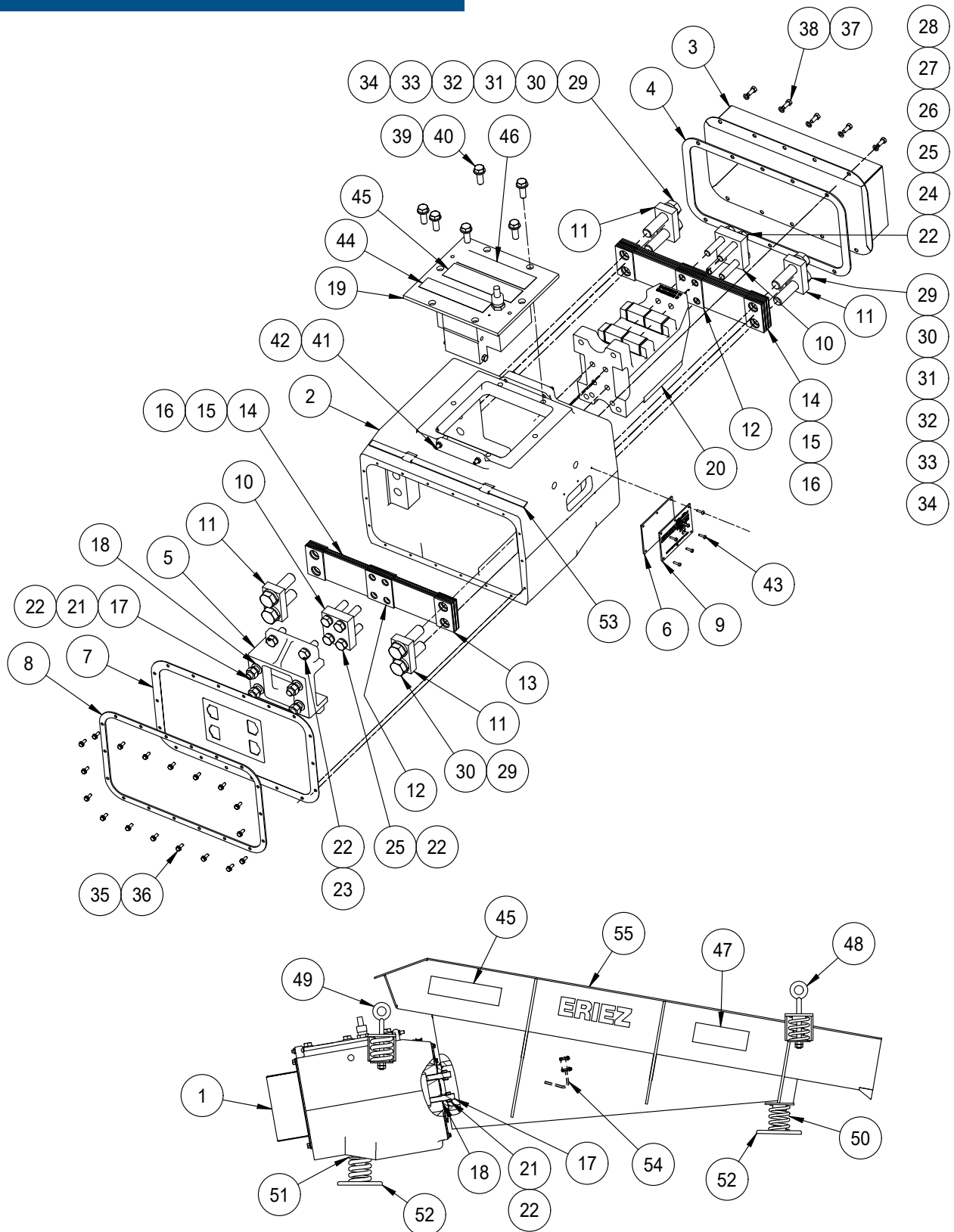
1. Check suspension, and keep feeder clear of hopper and all other objects.
2. Check for build-up of product in the tray. Remove any build up.
3. Check deflection.
4. Check current on feeder (should be within nameplate rating).
5. Check liners in tray for wear and loose bolts. If liner is to be replaced, use same thickness material.
6. Inspect power cord. Do not operate feeder if power cord is damaged.

PARTS LIST

NOTE: 1) Refer to sticker on tray for model and serial number, consult Eriez.

Item Number	Item Name	Quantity	Drawing Number	Group Number	Part Number
1	65B-HC DRIVE ASSEMBLY 115/60 VAC	1	4N-202203515	1	202203515G1
	65B-HC DRIVE ASSEMBLY 230/60 VAC			2	202203515G2
	65B-HC DRIVE ASSEMBLY 460/60 VAC			3	202203515G3
	65B-HC DRIVE ASSEMBLY 575/60 VAC			4	202203515G4
	65B-HC DRIVE ASSEMBLY 115/50 VAC			5	202203515G5
	65B-HC DRIVE ASSEMBLY 230/50 VAC			6	202203515G6
	65B-HC DRIVE ASSEMBLY 415/50 VAC			7	202203515G7
	65B-HC DRIVE ASSEMBLY 400/60 VAC			8	202203515G8
	65B-HC DRIVE ASSEMBLY 380/50 VAC			9	202203515G9
2	BODY MACHINING	1	4N-202203516		481008
3	REAR COVER	1	3N-202203517		202203517G1
4	REAR COVER GASKET	1	2N-202203518		481013
5	INNER TRAY CLAMP MACHINING	1	4N-202203519		202203519G1
6	NAME PLATE GASKET	1	2N-202203520		481016
7	FRONT SEAL DIAPHRAGM	1	3N-202203521		481017
8	FRONT SEAL CLAMP	1	2N-202203522		202203522G1
9	IDENTIFICATION NAMEPLATE	1	2N-202203523		481020
10	INNER SPRING CLAMP BAR	2	2N-202203524		481018
11	OUTER SPRING CLAMP BAR	4	2N-202203525		481019
12	INNER SPRING SPACER	AS REQ'D	2N-202203526		202203526G1
13	OUTER SPRING SPACER	AS REQ'D	2N-202203527		202203527G1
14	STEEL SPRING 3 mm (1/8")	AS REQ'D	2N-202203528	1	480971
15	STEEL SPRING 5 mm (3/16")	AS REQ'D	2N-202203528	2	480972
16	STEEL SPRING 6 mm (1/4")	AS REQ'D	2N-202203528	3	480973
17	MOUNTING STUD	4	1N-202203531		480976
18	TRAY CLAMP PAD	4	1N-202203532		480977
19	ELECTRICAL ASSEMBLY 115/60 VAC	1	3N-202203533	1	202203533G1
	ELECTRICAL ASSEMBLY 230/60 VAC			2	202203533G2
	ELECTRICAL ASSEMBLY 380/50, 460/60 VAC			3	202203533G3
	ELECTRICAL ASSEMBLY 575/60 VAC			4	202203533G4
	ELECTRICAL ASSEMBLY 115/50 VAC			5	202203533G5
	ELECTRICAL ASSEMBLY 230/50 VAC			6	202203533G6
	ELECTRICAL ASSEMBLY 415/50 VAC			7	202203533G7
	ELECTRICAL ASSEMBLY 400/60 VAC			8	202203533G8
20	ARMATURE AND MAGNET ASSEMBLY	1	4N-202203547		202203547G1
21	NUT HEX M16-2 PLATED	4	N/A		421006
22	WASHER LOCK M16 PLATED	16	N/A		432171
23	BOLT HEX HEAD M16-2 X 45 mm PLATED CLASS 8.8	4	N/A		468920
24	BOLT HEX HEAD M16-2 X 75 mm PLATED CLASS 8.8	A/R	N/A		428906
25	BOLT HEX HEAD M16-2 X 80 mm PLATED CLASS 8.8	A/R	N/A		433179
26	BOLT HEX HEAD M16-2 X 90 mm PLATED CLASS 8.8	A/R	N/A		232730
27	BOLT HEX HEAD M16-2 X100 mm PLATED CLASS 8.8	A/R	N/A		232341
28	BOLT HEX HEAD M16-2 X 110 mm PLATED CLASS 8.8	A/R	N/A		225200
29	WASHER LOCK M24	8	N/A		436555
30	BOLT HEX HEAD M24-3 X 90 mm PLATED CLASS 8.8	A/R	N/A		232731
31	BOLT HEX HEAD M24-3 X 100 mm PLATED CLASS 8.8	A/R	N/A		232732
32	BOLT HEX HEAD M24-3 X 110 mm PLATED CLASS 8.8	A/R	N/A		232759
33	BOLT HEX HEAD M24-3 X 120 mm PLATED CLASS 8.8	A/R	N/A		232777
34	BOLT HEX HEAD M14-2 X 130 mm PLATED CLASS 8.8	A/R	N/A		232778
35	WASHER LOCK M6 PLATED	18	N/A		431553
36	BOLT HEX HEAD M6-1 X 16 mm PLATED CLASS 8.8	18	N/A		431552
37	WASHER LOCK M8 PLATED	10	N/A		431550
38	BOLT HEX HEAD M8-1.25 X 20 mm PLATED CLASS 8.8	10	N/A		468825
39	WASHER FLAT M14 PLATED	6	N/A		226127
40	BOLT HEX HEAD M14-2 X 40 mm PLATED CLASS 8.8	6	N/A		226125
41	SCREW SOCKET SET M8-1.25 X 35MM FLAT POINT	4	N/A		232729
42	NUT JAM HEX M8-1.25 PLATED	4	N/A		225272
43	SCREW SELF TAP M4-0.7 X 16 mm PAN HEAD PLATED	6	N/A		232735
44	DECAL WARNING SHOCK HAZARD	1	201005042		456970
45	DECAL READ INSTRUCTION MANUAL	3	201004007		456858
46	DECAL WARNING BURN HAZARD	1	201004486		456916
47	DECAL TRAY MODIFICATION WARNING	1	202402390		483101
48	SUSPENSION MOUNTING ASSEMBLY, TRAY	2	2N-62702	4	110384
49	SUSPENSION MOUNTING ASSEMBLY, DRIVE	2	2N-62702	3	102401
50	FLOOR MOUNTING SPRING, TRAY	1	1N-61703	1	143014
51	FLOOR MOUNTING SPRING, DRIVE	2	1N-611149	1	143015
52	FLOOR MOUNTING SPRING, BASE	3	1N-59628		385120
53	GAP GAUGE	1	202302508		202302508G1
54	ACCELEROMETER	1	N/A		476355
55	TRAY	1	SEE NOTE 1		

PARTS LIST (cont.)





HEADQUARTERS

2200 Asbury Road • Erie, PA 16506-1402 U.S.A. • +1-814-835-6000 • eriez@eriez.com • www.eriez.com