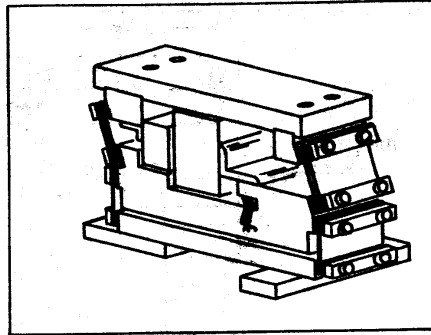


# Syntron<sup>®</sup> Linear Drive

## Models: LD-4, LD-8, LD-12



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**SAFETY INSTRUCTION: Product safety labels must remain highly visible on the equipment. Establish a regular schedule to check visibility. Should safety labels require replacement, contact Homer City Automation for an additional supply free of charge.**

### GENERAL DESCRIPTION

Syntron<sup>®</sup> Linear Drives have been designed to complement Syntron parts feeders by providing a feeding device to transport the oriented parts from the parts feeder to the next operation

### INSTALLATION

The isolator springs, which attach the base to the mounting plate, are positioned vertically. No isolation is provided to absorb the vertical motion produced by the drive. Therefore, it is important that the support structure the drive is mounted on be of sufficient mass and stiffness to resist these vertical forces.

The natural frequency of the support structure should be at least  $1\frac{1}{2}$  times the drive operating frequency. The support structures should also be leveled so that no “rocking” can occur. Small support structures should be rigidly fastened to a concrete floor.

Bolt the linear drive in its operating position. Secure the track assembly to the drive unit, if not assembled prior to installation of drive. Refer to Figures 1, 2, and 3 for outline dimensions.

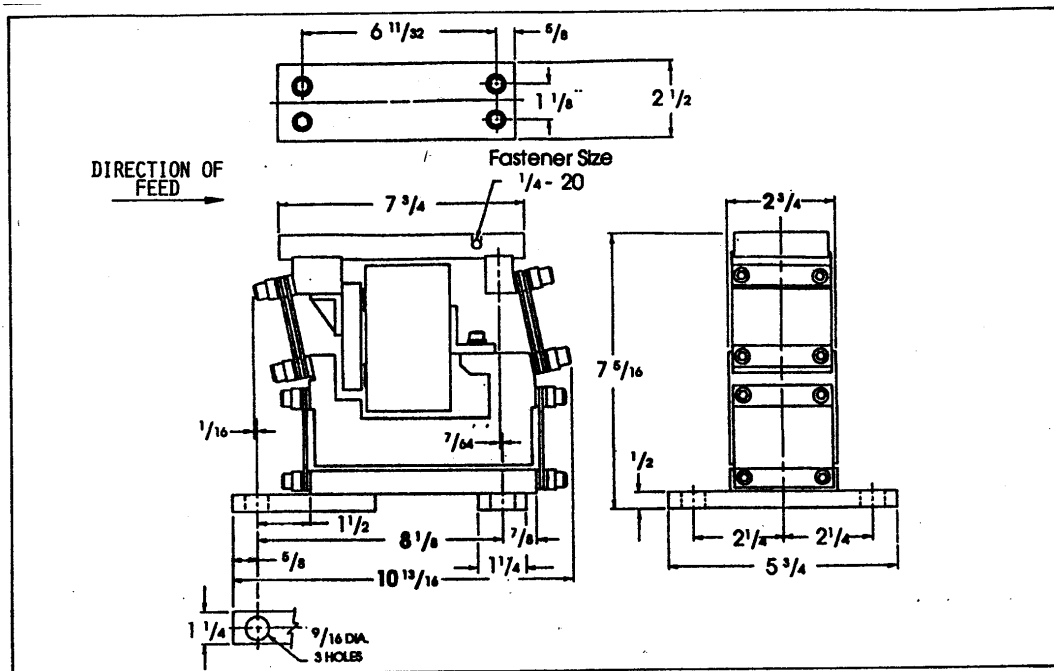


FIGURE 1 - LD-4 OUTLINE DIMENSIONS

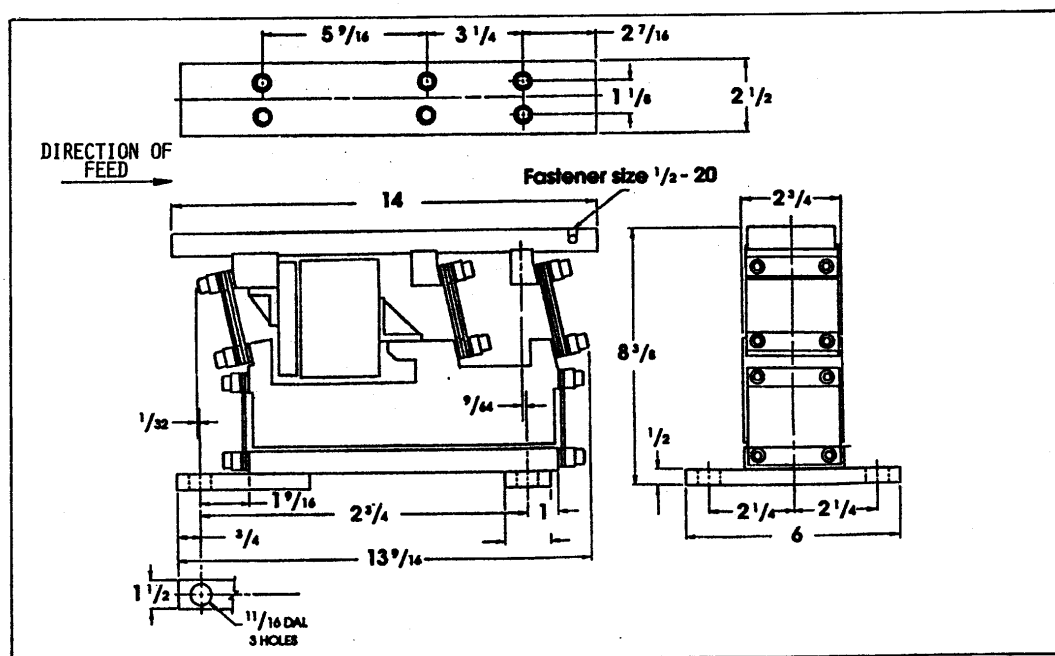


FIGURE 2 - LD-8 OUTLINE DIMENSIONS

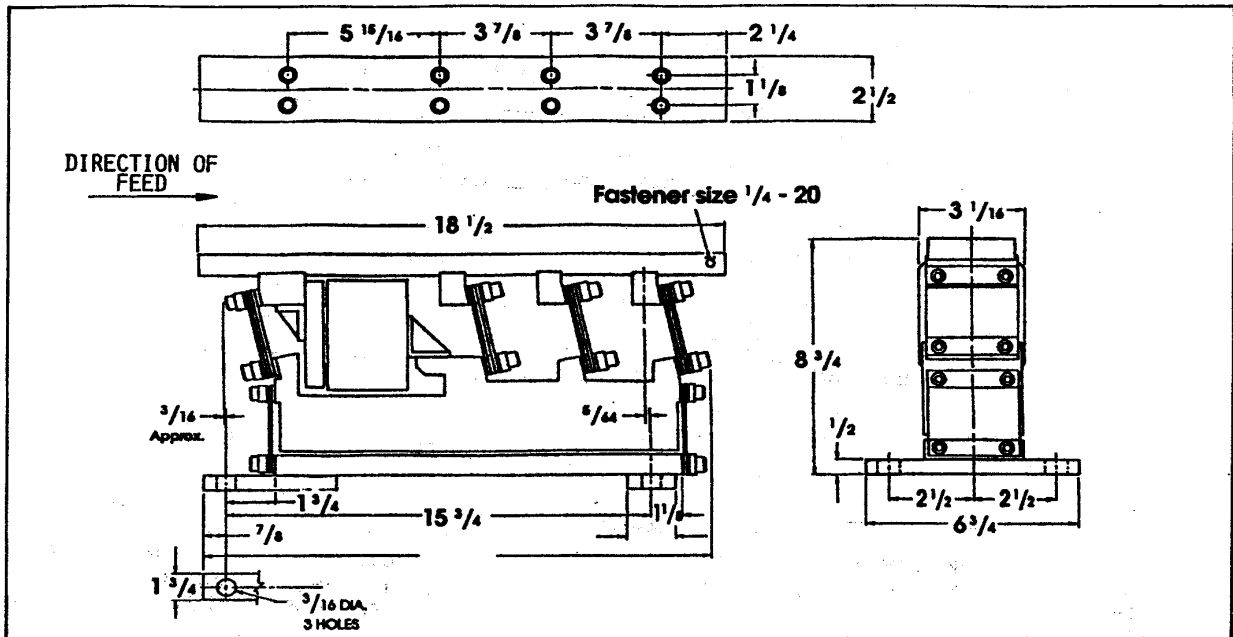


FIGURE 3 - LD-12 OUTLINE DIMENSIONS

The linear drive has two red shipping brackets attached to the bottom spring stacks, one at each end of the drive. Remove these brackets; replace the bolt, and torque to 47 ft-lbs (Dry) or 35 ft-lbs (Lube).



**WARNING:** The electrical power supply connection to the Homer City Automation-supplied controller must be made through a customer-supplied safety disconnect switch, which must be mounted next to the control.

If used, the separate controller must be mounted in a location free of vibration and excessive heat. In addition, it should be within sight of the operator and easily accessible.

The linear drive may be wired to a master control when used with a parts handling system. Refer to the wiring diagram supplied for your particular installation.



**WARNING:** The power supply voltage and frequency must correspond to the nameplate ratings, and the unit must be properly grounded.

## TRACK DESIGN

If no track is supplied with the drive, the recommendations shown in Table 1 should be followed for designing and mounting the track. The track support must be drilled and tapped for mounting the track. Minimum mounting hole size recommended is 1/4-20. The position of track along the length of track support is not critical, but it is advisable that overhanging ends be kept stiff enough to limit vertical track deflection. (Refer to Table 2). Keep track mounting screws as close to ends of track support as practical.

Long overhangs may require the use of heavier isolator springs to obtain uniform track motion.

Stroke w/ Optimum Track Wt.		Stroke w/ Maximum Track Wt.	Drive Weight (Lbs.)	Track Weight Optimum	Track Weight Maximum
LD-4	RC .060" AC .030"	RC .040"* AC .020"	26	4	8
LD-8	RC .060"	RC .045"*	44	8	16
LD-12	RC .060"	RC .045*	64	12	24

\*Refer to "Stroke" instructions on page 6.

**TABLE 1 – TRACK RECOMMENDATIONS**

Track weights which approach 1½ times the optimum weights shown, or higher, will result in lower feed rates, when drive is tuned for safe and stable operation.

Model	Track Length - Inches	Max. Allowable Deflection of Overhanging Ends
LD-4	7 ¾" – 18"	RC .0008" AC .0003"
LD-8	14" – 30"	RC .0008"
LD-12	18 ½" – 36"	RC .0008"

**TABLE 2 – TRACK OVERHANG**

The use of the CC-1 or CC-2 Control, with its current limiting and soft start features is recommended, especially when track weights are approximately 1½ times the optimum weights shown, or higher. These features allow for fine-tuning stroke and feeder current to avoid striking, drive spring breakage, and coil failures.

## OPERATION

During operation with its controller, the unit is put into operation by turning the rheostat knob to a low setting and switching on the control switch. To increase the feed rate, turn the rheostat knob in a clockwise direction until the required feed rate is obtained. Counterclockwise rotation of the rheostat knob will decrease the feed rate.

## MAINTENANCE



**WARNING:** Before performing any maintenance work, the electrical power supply must be disconnected at the safety disconnect switch.

**Spring Replacement:** If it is determined the springs need replacing, disconnect the unit from its power supply. Work on one spring assembly at a time. Make a note of the location and arrangement of each spring, spacer, and clamp. Remove the bolts which secure the leaf springs to the base, then remove the bolts which secure the springs to the track brackets. Check springs for defects or signs of wear.

Replacement springs must be of the same size and thickness. Homer City Automation recommends replacing all springs rather than just one.

Reassemble springs, spacers and clamps in the reverse order of removal, and tighten the bolts to torque specifications on pages 8, 9 and 10. When properly assembled, there should be no distortion or tension placed on the springs. After changing springs, check the operating current of the unit. It must not exceed that designated on the equipment nameplate. (If a clamp-on meter is used, multiply the reading by 1.7 when checking current of RC units.)

Check air gap and adjust to original recorded setting. If original setting is not known, then refer to Air Gap Adjustment.

### TROUBLESHOOTING

PROBLEM	CAUSE	CORRECTION
Drive operates too slow	Line voltage below designated voltage rating	Increase line voltage to that designated on nameplate
	Air gap too wide	Adjust to closer gap
	Unit in contact with rigid object or surface	Isolate unit
	Unit natural frequency too low	Add springs
	Spring action may be hampered	Remove and clean spring assemblies (see separate instructions)
Drive operates too fast	Defective leaf springs	*Replace
	Air gap too close	Adjust to wider gap
	Line voltage above designated voltage rating. High voltage will cause a "striking" condition.	Reduce line voltage to that as designated on nameplate
Unit hums, will not vibrate	Unit natural frequency too high	Remove springs
	Defective controller (Refer to controller instructions)	*Replace
Unit fails to operate	No power to controller	Check for broken or grounded lines
	Defective switch or fuse	*Replace
	Defective controller (Refer to controller instructions)	*Replace
	Feeder magnet may be burned-out or grounded	*Replace
	Short circuit in wiring	Repair

\* Replace parts only with those supplied, or recommended, by Homer City Automation.

## AIR GAP ADJUSTMENT

The air gap is the space between the faces of the armature and core assemblies. This space is critical for efficient operation. Too wide of an air gap will cause an excessive current draw; too narrow of an air gap will cause the faces of the magnet and armature to strike. Either condition must not exist at 100% rheostat setting. It is recommended that the air gap be checked for striking by turning the unit on and off several times in rapid succession.

If an air gap adjustment is required, loosen the cap screws which secure the magnet to the base. Moving the magnet in the direction which the parts flow will increase the air gap; moving the magnet in the opposite direction will decrease the air gap.

	Approximate Air Gaps	
	AC	RC
LD-4	.050	.080"
LD-8	----	.080" - .090"
LD-12	----	.090" - .100"

**TABLE 3 – AIR GAP**

The faces of the magnet and armature assemblies must be parallel. When the proper air gap is obtained, tighten the cap screws to secure the magnet to the base assembly.

## CURRENT RATINGS

The current ratings for the linear drives are listed in Table 4. Exceeding these limits will result in coil burnout or control failure.

Model	Voltage	Current (Amps)
LD-4	115/60 Cy RC	1.25
	115/60 Cy AC	1.25
	230/60 Cy RC	.63
LD-8	115/60 Cy RC	2.5
	230/60 Cy RC	1.35
	115/50 Cy RC	1.4
	230/50 Cy RC	.7
LD-12	115/60 Cy RC	4
	230/60 Cy RC	2
	115/50 Cy RC	2.7
	230/50 Cy RC	1.35

- If a clamp-on meter is used to measure the current draw, multiply the reading by 1.7, when checking RC units.

**TABLE 4 – CURRENT RATINGS**

## STROKE

Stroke is the distance the track travels in one complete cycle of vibration. This is measured from the forward upward limit of the vibrating stroke to the downward backward limit of the vibrating stroke.

Operating the linear drive at an excessive stroke may cause the springs to break or striking of the armature and coil faces, which may severely damage the magnet and armature assembly.

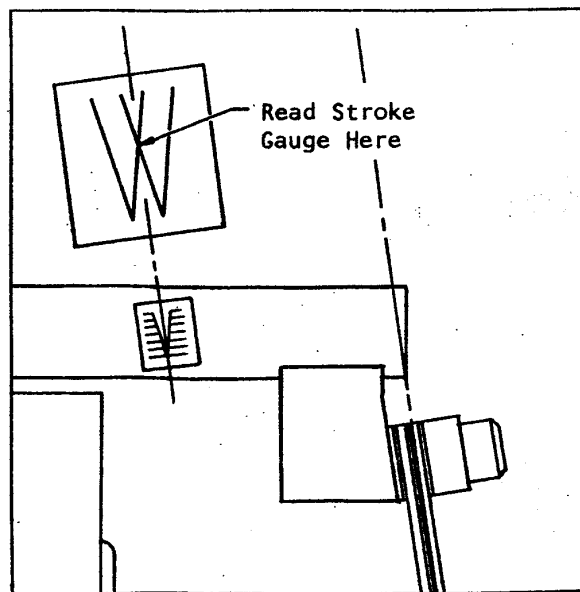
The total stroke is determined by the sum of the stroke at the base and the track. The total stroke must not exceed the following:

Spring	Total Stroke
7 ply (.070" thick)	.100"
9 ply (.090" thick)	.080"
5 ply (.050" thick)	.140"

**TABLE 5 – MAXIMUM STROKE**

Track stroke can be read by applying a stroke gauge (Part No A-186886) to the track as illustrated in Figure 4. For most accurate results, the stroke gauge should be applied to the track so that the graduated lines are parallel to the motion line of the tracks, approximately 90° to the spring banks.

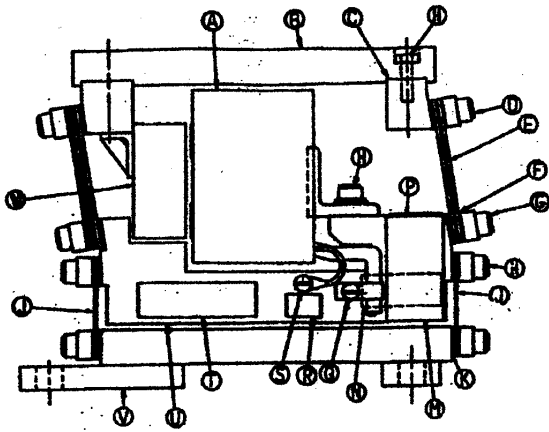
Under vibration, the two black lines of the gauge “V” widen. As the stroke of the track increased, the lines widen until at some stroke the black lines appear as 4 lines, separated by a shaded area. The two black lines at the inner edge form an inner “V” and, as stroke is increased, appear as an “X”. Stroke is read in the black line an estimated .010” below the white apex of the inner, upper “V”. When the inner lines appear as an “X”, stroke should be read at the intersection of the “X”. Variations in position and quality of the individual stroke gauge will cause errors as much as .010”, but this is generally an acceptable reading.



**FIGURE 4 – STROKE GAUGE**

If lines do not remain sharp during running and appear “fuzzy”, the stroke gauge is improperly positioned. When the gauge is properly positioned, the image width and the apex of the inner lines will be at the maximum conditions observed if various positions have been tried.

Stroke gauge results are interpreted differently by different viewers, and it is important that they are being interpreted properly in critical feed rate applications or when maximum safe strokes are approached. For extremely critical stroke applications, Homer City Automation recommends the use of an electronic stroke measuring device for accurately measuring stroke.



**TORQUE SPECIFICATIONS**  
Ft./Lbs.

Item	Dry	Lubricated
D & H	47	35

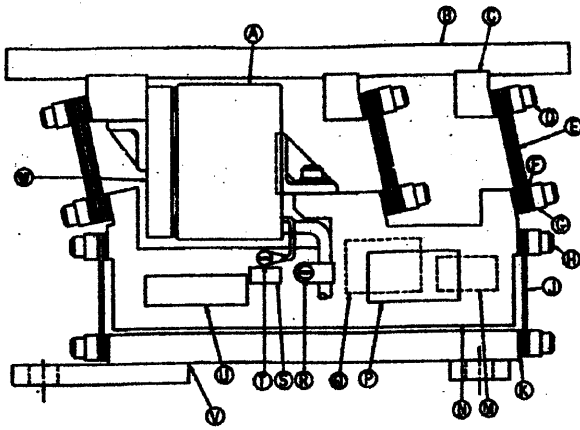
**PARTS LIST – LINEAR FEEDER MODEL: LD-4**

Item	Description	Quantity	Part No.
A	Magnet Assembly (115V / 60 Hz RC) } Magnet Assembly (115V / 50 Hz AC) } Magnet Assembly (230V / 50 Hz RC) }	1 Only	C-212869-B C-212869-C C-212869-D
B	Track Support	1	B-212868-1
C	Track Mounting Block	1	A-212879-1
D	Cap Screw, Hex Soc Hd (3/8" – 16 x 1-1/4") } Cap Screw, Hex Soc Hd (3/8" – 16 x 1") }	As Req'd	H0421900 H0421600
E	Leaf Spring (.140" Thk) } Leaf Spring (.050" Thk) } Leaf Spring (.070" Thk) } Leaf Spring (.090" Thk) }	As Req'd	A-212837-2 A-96252-A A-96252-B A-96252-C
F	Spacer	As Req'd	A-63773
G	Clamp Bar	8	A-59177
H	Cap Screw, Hex Soc Hd (3/8" – 16 x 1") } Plain Washer (3/8") } Lockwasher (3/8") }	6 2 6	H0421600 H0117010 H0113209
J	Leaf Spring, Isolator (.032" Thk) (for RC Units) } Leaf Spring, Isolator (.050" Thk) (for AC Units) }	4 2	A-212860-2 A-212860-3
K	Spring Seat	8	A-59176
M	■ Nameplate (N.S.) } Drive Screw (#2 x 1/4") }	1 2	A-62245 H0430600
N	■ Homer City Automation (F.S.)	1	A-189525-A
P	■ Instruction Label	1	A-195774
Q	Cable Clamp } Mach Screw, Rd Hd SI (#10 – 32 x 1/2") } Lockwasher, Ext Tooth (#10) }	1 1 1	0198X037 H0203401 H0112404
R	■ Gnd. Label	1	B-107437-H
S	Mach Screw, Rd Hd Br (#10 – 32 x 1/2")	1	H0203402
T	■ Warning Label	1	A-202600
U	Base	1	D-212870-1
V	Mounting Plate Assembly	1	B-212866-A
W	Armature Assembly	1	B-212867-A

When ordering these parts, please provide all information from equipment nameplate.

■ Do not remove or paint over safety labels. Should safety labels require replacement, contact Homer City Automation for an additional supply free of charge.





**TORQUE SPECIFICATIONS**  
Ft./Lbs.

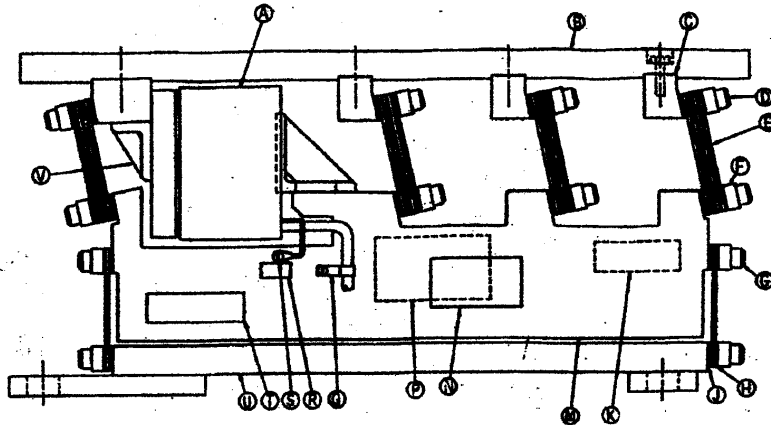
Item	Ft./Lbs.	
	Dry	Lubricated
D & H	47	35

**PARTS LIST – LINEAR DRIVE MODEL: LD-8**

Item	Description	Quantity	Part No.
A	Magnet Assembly (115V / 60 Hz RC) } Magnet Assembly (230V / 50 Hz RC) } Magnet Assembly (115V / 50 Hz RC) } Magnet Assembly (230V / 60 Hz RC) }	1 Only	C-214120-B C-214120-C C-214120-D C-214120-E
B	Track Support	1	B-214426-1
C	Track Mounting Blocks	2	A-214023-1
D	Cap Screw, Hex Soc Hd (3/8" – 16 x 1-1/4") } Cap Screw, Hex Soc Hd (3/8" – 16 x 1") }	As Req'd	H0421900 H0421600
E	Leaf Spring (.050" Thk) } Leaf Spring (.070" Thk) } Leaf Spring (.090" Thk) }	As Req'd	A-96252-A A-96252-B A-96252-C
F	Spacer	As Req'd	A-63773
G	Clamp Bar	10	A-59177
H	Cap Screw, Hex Soc Hd (3/8" – 16 x 1") Plain Washer (3/8") Lockwasher (3/8")	16 2 8	H0421600 H0117010 H0113209
J	Leaf Spring, Isolator (.070" Thk)	2	A-96252-B
K	Spring Seat	10	A-59176
M	■ Homer City Automation Label (F.S.)	1	A-189525-A
N	Base	1	D-214126-1
P	■ Nameplate (N.S.) Drive Screw (#2 x 1/4")	1 2	A-62245 H0430600
Q	■ Instruction Label (F.S.)	1	A-195774
R	Cable Clamp Mach Screw, Rd Hd SI (#10 – 32 x 1/2") Lockwasher, Ext Tooth (#10)	1 1 1	0198X037 H0203401 H0112404
S	■ Gnd. Label	1	B-107437-H
T	Mach Screw, Rd Hd Br (#10 – 32 x 1/2") Lockwasher, Ext Tooth (#10)	1 1	H0203402 H0112404
U	■ Warning Label	1	A-202600
V	Mounting Plate Assembly	1	B-214456-A
W	Armature Assembly	1	B-214110-A

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**TORQUE SPECIFICATIONS**  
Ft./Lbs.

Item	Dry	Lubricated
D & H	47	35

**PARTS LIST – LINEAR DRIVE MODEL: LD-12**

Item	Description	Quantity	Part No.
A	Magnet Assembly (115V / 60 Hz RC) } Magnet Assembly (230V / 50 Hz RC) } Magnet Assembly (115V / 50 Hz RC) } Magnet Assembly (230V / 60 Hz RC) }	1 Only	C-214171-B C-214171-C C-214171-D C-214171-E
B	Track Support	1	B-212896-1
C	Track Mounting Blocks	3	A-214023-1
D	Cap Screw, Hex Soc Hd (3/8" – 16 x 1-1/4")	16	H0421900
E	Leaf Spring (.050" Thk) } Leaf Spring (.070" Thk) } Leaf Spring (.090" Thk) }	As Req'd	A-96252-A A-96252-B A-96252-C
F	Clamp Bar	12	A-59177
G	Cap Screw, Hex Soc Hd (3/8" – 16 x 1") Plain Washer (3/8") Lockwasher (3/8")	10 2 10	H0421600 H0117010 H0113209
H	Spacer	As Req'd	A-63773
J	Spring Seat	12	A-59176
K	■ Homer City Automation label (F.S.)	1	A-189525-B
M	Base Assembly	1	D-214421-1
N	■ Nameplate (N.S.) Drive Screw (#2 x 1/4")	1 2	A-62245 H0430600
P	■ Instruction Label (F.S.)	1	A-195774
Q	Cable Clamp Mach Screw, Rd Hd SI (#10 – 32 x 1/2") Lockwasher, Ext Tooth (#10)	1 1 1	0198X037 H0203401 H0112404
R	■ Gnd. Label	1	B-107437-H
S	Mach Screw, Rd Hd Br (#10 – 32 x 1/2") Lockwasher, Ext Tooth (#10)	1 1	H0203402 H0112404
T	■ Warning Label (N.S.)	1	A-202600
U	Mounting Plate Assembly	1	B-212936-A
V	Armature Assembly	1	B-214169-A
W	Leaf Spring, Isolator (.070" Thk)	2	A-96252-B

When ordering these parts, please provide all information from equipment nameplate.

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