P.O. Box 2176

Splendora, Texas 77372

Lone Star X-Ray Shielding

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MMARTIN201@aol.com

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www.lonestarxrayshielding.com

Linear Accelerator Sliding Doors

GENERAL

Lone Star X-Ray will furnish all materials, tools, equipment, labor and services for all LINAC room doors as required by specifications and contract documents.

1.1 ACCEPTABLE MANUFACTURERS

Sliding door shall be manufactured by, and all accessories and parts supplied by Lone Star X-Ray Shielding, Inc., or approved equal manufacturer regularly engaged in the manufacture of radiation shielding doors with at least ten (10) years experience in the production and installation of sliding radiation shielding doors.

1.2 SUBMITTALS

A. In accordance with conditions of the contract, submit six (6) copies of shop drawings for each type of sliding door unit, including typical unit elevations, sections and details of typical composite members.

B. Submit six (6) copies of door operating instruction and manufacturer's warranty. The sliding door unit shall be warranted against defects for a period of not less than one (1) year.

1.3 DESIGN

A. Design sliding door, carrying beam, and structural supports to withstand all design loads that might inhibit operation or impair radiation protection.

B. Design sliding door to have minimum overlaps to insure sufficient radiation shielding.

C. Provide lead, 5% borated polyethylene and virgin polyethylene in thickness as specified by the physicist of record. Also, furnish and install any required jamb shielding.

D. Structural engineering is excluded from the section.

E. The project engineer is to verify all connection points to the structure.

PRODUCTS

2.1 MATERIAL

A. Steel sheet and strip: commercial quality carbon steel, ASTM A568

B. Steel bars and plates: ASTM A36

C. Roll formed steel members: ASTM A36

D. Inserts, bolts and fasteners: Manufacturer's standard units, Grade #8

E. Primer: rust-inhibit paint suitable as base for specified finish paints.

F. Lead: Federal spec. QQL-201-F, ASTM B29

G. Polyethylene: 5% boron content, manufactured specifically for neutron shielding.

2.2 SLIDING DOOR AND STRUCTURAL STEEL SUPPORT SYSTEM

A. Steel: Type A36. 1" thick steel flat bar around perimeter of door or as required for the weight of the door.

B. Structural steel supports: ASTM 500 rectangular tubing based upon the length, width, thickness, and weight of the door.

C. Raceway: System consists of two raceways.

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Linear Accelerator Sliding Doors

2.3 SLIDING DOOR OPERATORS

The system will be sprocket driven with electric ball screw and linear motion sliding rails. Lone Star X-Ray electric sliding door operating system shall be motor driven. The operator has a slowdown/acceleration speed in both the opening and closing direction. The operator must be equipped with a battery backup system which will allow for the emergency opening during loss of power supply. The operator also must include two sets of buttons. A two button station (OPEN & STOP) and a three button station (OPEN, CLOSED & STOP) on the outside of the vault. A closed button is not allowed in the vault. Also, an E-Stop button must be mounted in clear view of the control area. The leading edge of the door must have a padded safety edge.

Work not included: All conduit and wiring, structural engineering.

2.4 SAFETY FEATURES

A. Standard:

Electric Safety Edges
Emergency stop
Presence sensor

2.5 FABRICATION

Fabricate rigid, neat in appearance and free from defects. Fit and assemble in shop, wherever practical. Assure proper assembly at site. Weld joints continuously, dress exposed joints smooth and flush. Clean off all mill scale and foreign materials and shop prime.

EXECUTION

3.1 PREPARATION

Examine structure, substrates, and conditions under which work is to be installed for conditions detrimental to the correct and timely completion of the project. Installation constitutes acceptance of responsibility for performance.

3.2 INSTALLATION: Lone Star X-Ray Shielding, Inc. 281-399-8281

Installation of structural frame and door by Lone Star X-Ray Shielding, Inc.

A. Touch up prime coat with compatible primer
B. Leave smooth for finish painting by others

3.3 OPERATOR

Electric door operator to be installed and maintained by trained personnel only.

3.4 TESTING

After equipment has been installed and placed in operating condition, the owner will engage a radiation health physicist to test radiation protection.

OPERATING INSTRUCTIONS

All personnel should read these instruction completely and be trained to the safe operation of this door.

4.1 OPERATION

A. The door is automatically opened by pushing an open button located both inside and outside the vault.
B. The door can only be closed from outside the vault by the close button.
C. Before operating, the door operating area should be visually inspected to be sure no person or other object is in the vicinity.
D. Sequence of Operations
1. OPEN: When this button is pushed, the door will travel to the full open position.
2. CLOSE: When this button is pushed, the door will travel to the full close position.
3. STOP: When this button is pushed, the door will stop from any current position along its path of travel.
4. PARTIAL OPEN (OPTIONAL): When this button is pushed, the door will travel to the preset partial open position and stop. This partial open switch is designed to be used only for staff to enter the vault.

→

Linear Accelerator Sliding Doors

CAUTION

5.1 No attempts should be made at adjusting door operating speed except by authorized operator technicians.

5.2 Any attempt to operate at a faster speed will cause premature wear and damage to the operator and void any warranty. Also, liability may occur to anyone operating the door faster than recommended if injuries occur as a result.

5.3 No attempt should ever be made to disengage interlock switches or any safety feature as this could present a serious health risk.

5.4 Objects should be kept clear of door operation area. No objects should ever be placed to keep door in the closed or open position restricting free movement.

STANDARD SAFETY FEATURES

6.1 Battery Back-up: In the event of a power failure the battery back-up system will be activated. The emergency battery back-up will open the door during a loss of electric power.

6.2 Padded Safety Edge: On the lead edge of the door there is one continuous safety edge. When more than 10 oz. of pressure is applied to the edge an electronic signal will be sent to the operator to stop the door.

6.3 Emergency Hand Crank: In the event of power operator failure, the hand crank will aid in manually opening the door. The hand crank is to be mounted at the ball screw motor.

6.4 Breaker box with all limit switches

OPTIONAL SAFETY FEATURES

7.1 Interlock or kill switch: If installed by others please reference information supplied by installed or manufacturer.

7.2 Wall Mounted Safety Bumper: Mounted to the wall at the leading edge of the door.

SPECIFICATIONS

Since all door systems are custom designed per customer specifications, please refer to shop drawings for information. All shielding must be approved by the physicist of record.

SERVICE

Refer to preventive maintenance schedule. For technical information, product information and service please call 281-399-8281.

WARRANTY

All labor and materials furnished and work performed in conjunction with this project will be free from defects due to defective materials or workmanship for a period of one (1) year from the date of installation.

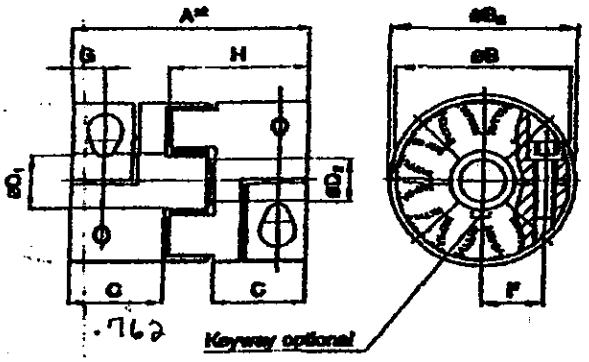
Should any defect develop during the warranty period due to improper materials or workmanship, the defect will be made good.

The Owner will give Subcontractor written notice of defective work.

Nothing in the above will be deemed to apply to work which has been abused or neglected. The guarantee does not cover defects due to the failure to exercise normal preventive maintenance, nor do we guarantee against the consequence of uses for which this product was not designed.

COUPLING

Model EK2
Zero Backlash Elastomer Insert Coupling



Features:
- Zero Backlash
- Compensates for Misalignment
- Torsionally Stiff
- Absorbs Vibrations
- Electrically Insulated

Material:
Clamping Hub: Aluminum
Elastomer Hub: Polyurethane
Type A: Shore Value SH 98 A (standard)
Type B: Shore Value SH 64 D
(Shore Value SH 80 A also available for higher vibration dampening)

Speeds:
Up to 4000 rpm standard.
Over 4000 rpm with optional balanced version.

Special Designs:
Available upon request.

Technical information:

Series	Type (elastomer)	Rated torque Nm	Peak torque Nm	Overall length of	Outer Diameter	Outer diameter screwhead	Fit length	Bore range (inch available)	Inner diameter prox. of displaced	DIN 912 fastening screw	Tightening torque of the following screw Nm	Dynamic bottom motion	Distance	Hub length	Moment of Inertia kgm²	Approx. weight in kg	static torsional stiffness, hooked	Axial (mm)	Angular (degree)	Axial (mm)
20	A	17	34	66	(42)	44.5	25	[illegible]	18	M5	8	15	8.5	39	0.04	0.15	880	0.08	1	±1.2
	B	21	42														2800	0.06	0.8	±1.2
60	A	80	120	78	66	67	30	[illegible]	27	M6	15	20	10	46	0.18	0.35	2065	0.1	1	±1.5
	B	75	150														3600	0.08	0.8	±1.5
150	A	160	320	90	86	88	35	[illegible]	36	M8	40	34	12	62.5	0.40	0.5	3440	0.12	1	±1.6
	B	200	400														6480	0.1	0.8	±1.6
300	A	325	650	114	82	85	45	[illegible]	36	M10	80	28	15	68	1.2	1.15	7800	0.14	1	±1.8
	B	405	810														15840	0.12	0.8	±1.8
450	A	450	900	128	102	105	60	[illegible]	46	M12	120	38	17.5	73	3.0	2	22360	0.16	1	±2
	B	560	1120														42360	0.14	0.8	±2

Selection Factors:

Temperature Factor - F_T

Temperature	Type A	Type B
-30°C to +30°C	1.0	1.0
+30°C to +40°C	1.2	1.1
+40°C to +60°C	1.4	1.2
+60°C to +80°C	1.7	1.5
+80°C to +100°C	2.0	1.8
+100°C to +120°C	2.6	2.4

Load Factor - F_L

Uniform	1.0
Medium Shock	1.8
Dynamic Reversing	2.5

$T_A = T_N \times F_T \times F_L \times F_C$
T_A – Adjusted torque
T_N – Nominal torque
F – Selection Factors

Cycle Factor - F_C

Cycles per hour	up to 120	120 to 240	over 240
Factor	1.0	1.3	upon request

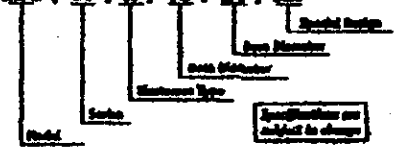
Maximum Torque Transmittable by Keyless Hub (as a function of bore size)

Series	Ø10	Ø12	Ø14	Ø20	Ø24	Ø28	Ø32	Ø35	Ø38	Ø40	Ø42	Ø45
20	28	42	42	42								
60	80	80	100	110	120	120						
150			120	150	180	200	220					
300			150	180	210	220	230	300				
450					300	340	360	410	460	520	580	

Maximum torque possible with key.

Ordering Example:

EK 2 / 60 / A / 10 / 24 / XX

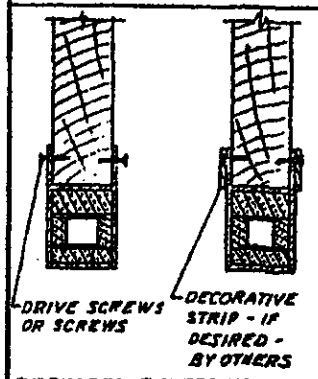


SAFETY EDGE

MOUNTING INSTRUCTIONS FOR ELECTRICALLY OPERATED REVERSING EDGE

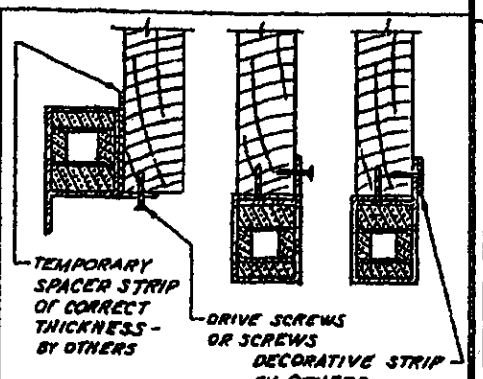
DO NOT PAINT ANY PART OF THE REVERSING EDGE

LEADING EDGE OF WOODEN DOORS - 2 METHODS :



"U" SHAPED REVERSING EDGE METHOD "A"

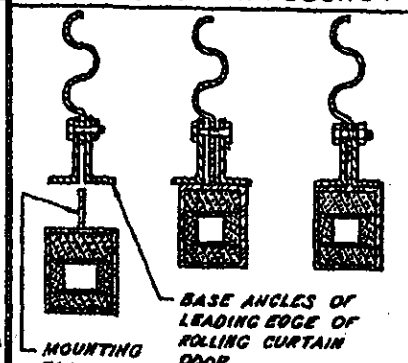
1 CENTER REVERSING EDGE ON CENTER LINE OF DOOR, WITH CONNECTIONS AT PROPER END.
2 STAPLES, OR CARPET TACKS, ARE USED TO HOLD BOTH SIDE TABS IN PLACE.
3 STARTING ON CENTER LINE, & WORKING TOWARD BOTH ENDS, ON BOTH SIDES, SPACE TACKS ABOUT 2" APART. AVOID WRINKLING OF TABS.
4 IF DECORATIVE STRIPS ARE TO BE USED, USE EXTERIOR GRADE PLYWOOD - ¾ x 1½".
5 ATTACH THESE STRIPS WITH #6 x 1" WOOD SCREWS, OR DRIVE SCREWS, SPACED ABOUT 8" APART.
6 OTHERWISE, ATTACH TABS PERMANENTLY, USING #6 x 1" WOOD, OR DRIVE, SCREWS, SPACED 8" APART, APPROXIMENTLY.



"U" SHAPED REVERSING EDGE METHOD "B"

1 TEMPORARILY ATTACH THE SPACER STRIP TO THE OUTSIDE FACE OF THE DOOR LEAF.
2 CENTER THE REVERSING EDGE ON CENTER LINE OF DOOR WITH CONNECTIONS AT THE PROPER END.
3 STAPLES, OR CARPET TACKS, ARE USED TO HOLD THE SIDE TAB IN PLACE.
4 TAKE PARTICULAR CARE TO KEEP THE EDGE OF THE TAB EXACTLY EVEN, ALONG ENTIRE LENGTH OF DOOR EDGE EXCESS TENSION ON TAB, AND UNEVEN TENSION, WILL CAUSE TAB TO WRINKLE.
5 USE #6 x 1" WOOD SCREWS, OR DRIVE SCREWS SPACING THEM ABOUT 8" APART.
6 REMOVE SPACER STRIP AND CARPET TACKS.
7 FOLD REVERSING EDGE TO BOTTOM OF DOOR LEAF.
8 STARTING AT THE CENTER LINE, TACK, OR STAPLE, INSIDE TAB IN PLACE, ON 2" CENTERS.
9 IF DECORATIVE STRIP IS TO BE USED, USE EXTERIOR GRADE PLYWOOD - ¾ x 1½".
10 ATTACH THIS STRIP WITH #6 x 1" WOOD SCREWS, OR DRIVE SCREWS, SPACED ABOUT 8" APART.
11 OTHERWISE, ATTACH TAB TO INTERIOR FACE OF DOOR LEAF WITH THESE SCREWS, 8" APART.

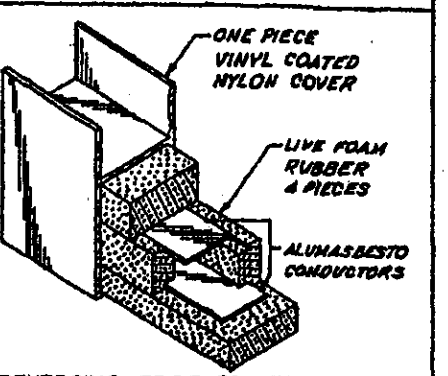
LEADING EDGE OF ROLLING CURTAIN DOORS :



"T" SHAPED REVERSING EDGE

1 LOOSEN FASTENERS OF ANGLES OF LEADING EDGE OF ROLLING CURTAIN DOOR.
2 PLACE "T" MOUNTING TAB OF REVERSING EDGE BETWEEN ANGLES
3 TAKE CARE NOT TO GET TAB TOO HIGH & PINCH THE HEAT SEALED PORTION, TO CAUSE PUNCTURE, OR PERMANENT CONTACT OF CONDUCTORS.
4 TIGHTEN ANGLES AT ELECTRICAL CONNECTIONS FIRST, THEN OPPOSITE END.
5 THEN WORK FROM CENTER, IN BOTH DIRECTIONS

CUT-AWAY VIEW OF REVERSING EDGE



REVERSING EDGE CONSTRUCTION
"U" SHAPED CONFIGURATION SHOWN

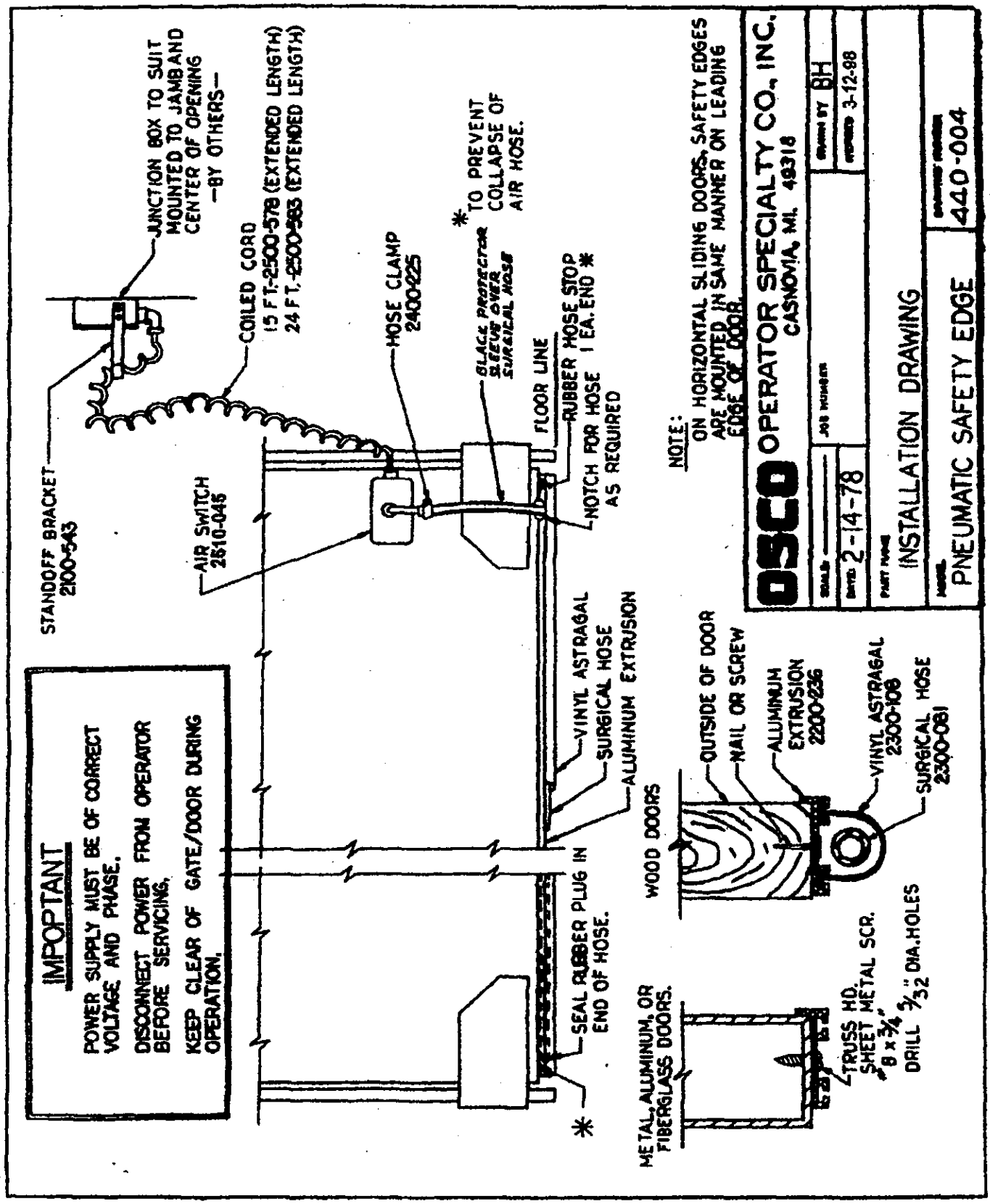
CONTACT STRIPS ARE ON OPPOSITE FACES OF THE CENTER CHANNEL.

AN EVEN, LATERAL PRESSURE ON THE REVERSING EDGE MAKES AN ABSOLUTE CONTACT FOR A STOP AND REVERSING ACTION

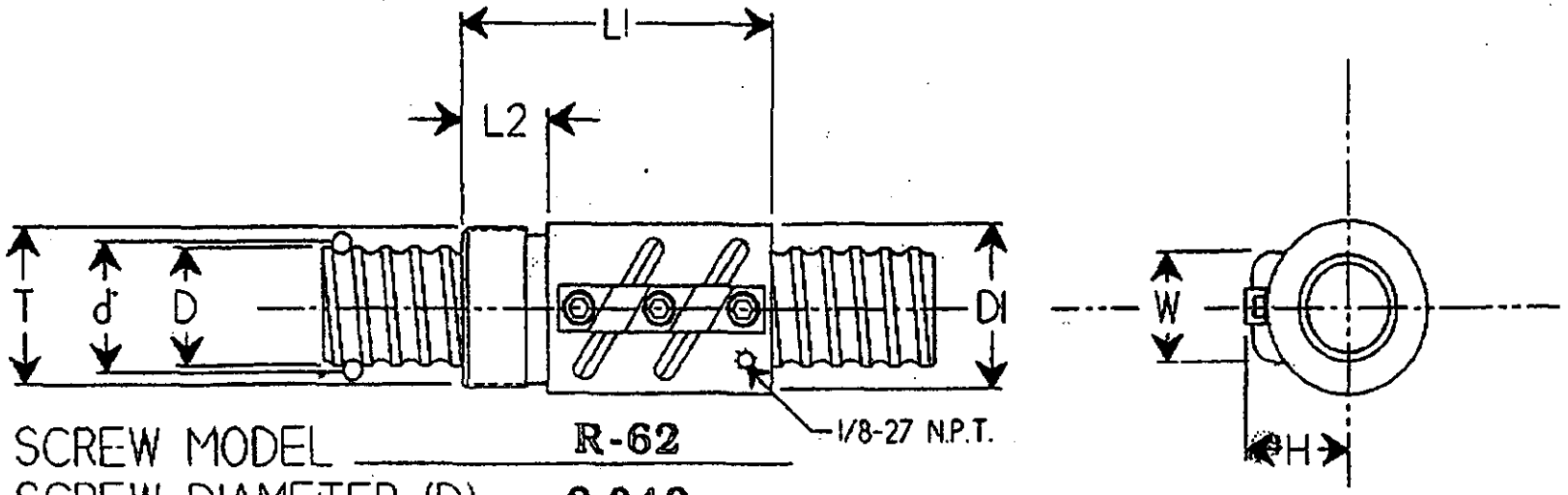
OPERATOR SPECIALTY CO., INC.
CASNOVIA, MI., 49318

SCALE NONE		SCALE 11-1-8
DATE 1-21-80		
MOUNTING INSTRUCTIONS FOR ELECTRICALLY OPERATED REVERSING EDGE		
ELECTRIC REVERSING EDGE		154-002

6-18-02


IMPORTANT
POWER SUPPLY MUST BE OF CORRECT VOLTAGE AND PHASE.
DISCONNECT POWER FROM OPERATOR BEFORE SERVICING.
KEEP CLEAR OF GATE/DOOR DURING OPERATION.
STANDOFF BRACKET 2100-543
JUNCTION BOX TO SUIT MOUNTED TO JAMB AND CENTER OF OPENING —BY OTHERS—
COILED CORD 15 FT.-2500-578 (EXTENDED LENGTH) 24 FT.-2500-583 (EXTENDED LENGTH)
AIR SWITCH 2510-045
HOSE CLAMP 2400-025
BLACK PROTECTIVE SLEEVE OVER SURGICAL HOSE
* TO PREVENT COLLAPSE OF AIR HOSE.
FLOOR LINE
RUBBER HOSE STOP
NOTCH FOR HOSE 1 EA. END * AS REQUIRED
VINYL ASTRAGAL
SURGICAL HOSE
ALUMINUM EXTRUSION
SEAL RUBBER PLUG IN END OF HOSE.
*
METAL, ALUMINUM, OR FIBERGLASS DOORS.
WOOD DOORS
OUTSIDE OF DOOR
NAIL OR SCREW
ALUMINUM EXTRUSION 2200-236
VINYL ASTRAGAL 2300-108
SURGICAL HOSE 2300-061
TRUSS HD. SHEET METAL SCR. #8 x 3/4"
DRILL 3/32" DIA. HOLES
NOTE:
ON HORIZONTAL SLIDING DOORS, SAFETY EDGES ARE MOUNTED IN SAME MANNER ON LEADING EDGE OF DOOR.
OSCO OPERATOR SPECIALTY CO., INC.
CASNOVIA, MI. 49318
DRAWN BY BH
DATE 2-14-78
REVISED 3-12-88
INSTALLATION DRAWING
PNEUMATIC SAFETY EDGE
440-004

BALL SCREW



SCREW MODEL	R-62
SCREW DIAMETER (D)	2.040
SCREW LEAD (PITCH)	.500
BALL CIRCLE DIA. (d')	2.106
DIRECTION OF TURNS	R.H.
# OF BALL CIRCUITS	TWO
NUT LENGTH (L1)	6.375
THREAD LENGTH (L2)	1.500
THREAD SIZE (T)	3.000-12
NUT DIAMETER (D1)	3.250
TUBE WIDTH (W)	2.545
TUBE HEIGHT (H)	2.250
BALL SIZE	.375
QTY. PER NUT	152 (AVG.)
OPERATING LOAD	18,000 LBS.
FOR 1 X 10^6 INCHES LIFE.	
MAX. STATIC LOAD	130,000 LBS.

MOUNTING FLANGE

DIAMETER	5.375
THICKNESS	1.531
NUMBER OF HOLES	8
HOLE DIA.	.656
BOLT CIRCLE DIA.:	4.250

WIPER KIT INFO.:

DIAMETER	2.690
THICKNESS	.160
MATRL.	NYLON BRUSH

PART NUMBERS

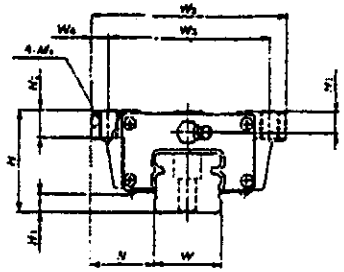
SCREW:	R-62-1
BALLNUT:	R-62-2
FLANGE:	R-62-3
WIPER KIT:	R-62-4

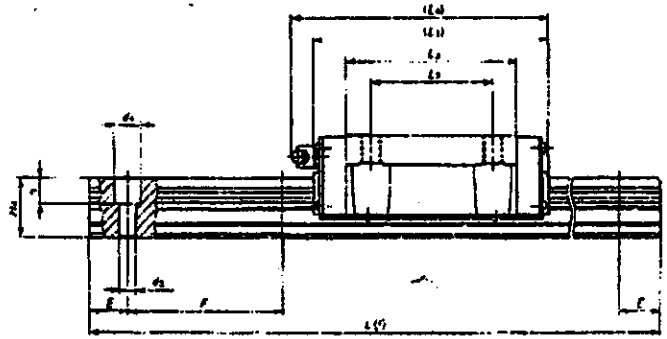
R-62 BALL SCREW

[redacted]

TOLERANCES	DRAWN BY APO	SCALE NONE	DATE 8/3/93
XX +/-.020			
XXX .010			
FRAC. 1/32			
ANG 1 DEG			
FINISH BLACK		MATERIAL ALLOY STL.	
REV	DRW. NO. R-62		

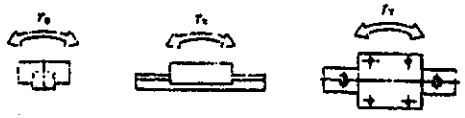
LINEAR WAY H LWHT···B, LWHTG





Model number	Weight: Slide unit kg	Weight: Track rail kg/m	Dimensions of assembly mm: H	H_1	N	W_2	W_3	W_4	Dimensions of slide unit mm: L_1	L_2	L_3	L_4	M_1	H_2	H_3	W
LWHT 15···B	0.22	1.47	24	4.5	16	47	38	4.5	66	30	44.6	69	M 5	7	4.5	15
LWHT 20···B	0.49	2.56	30	5	21.5	63	53	5	83	40	57.2	90	M 6	10	5.5	20
LWHTG 20	0.71								112		68	124				
LWHT 25···B	0.70	3.50	36	6.5	23.5	70	57	6.5	95	45	64.7	106	M 8	10	6.5	23
LWHTG 25	0.93								118		87.4	129				
LWHT 30···B	1.28	4.82	42	7	31	90	72	9	113	52	80.6	124	M10	10	8	28
LWHTG 30	1.69								139		106.6	150				
LWHT 35···B	1.79	6.65	48	8	33	100	82	9	123	62	86.2	135	M10	13	10	34
LWHTG 35	2.35								161		114	163				
LWHT 45···B	3.17	10.7	60	10	37.5	120	100	10	147	80	103.4	158	M12	16	13	45
LWHTG 45	4.34								190		146.6	201				
LWHT 55···B	5.30	15.6	70	13	43.5	140	116	12	183	95	132	194	M14	17	14	53
LWHTG 55	7.40								235		183.6	248				
LWHT 65···B	12.3	22.2	90	14	53.5	170	142	14	229	110	164	239	M16	23	20	63
LWHTG 65	17.6								303		238.6	313				

Note (1) : Length of track rail L_0 is shown in Table 16 on page 29.
(2) : Shown values of the static moments T_0, T_X and T_Y are static moments as shown below illustration.
In case of T_X and T_Y, the figure in upper column shows for one slide unit and it in lower column shows for two slide units in close contact.



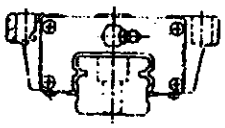
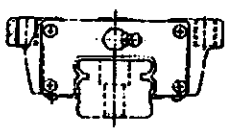
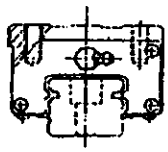
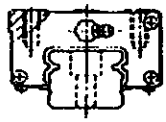
Dimensions of steel rail mm: H_4	d_3	d_4	h	E	F	Mounting bolt for track rail: mm Bolt size × weight	Basic dynamic load rating: C kgf	Basic static load rating: C_0 kgf	T_0 kgf·m	Static permissible moment (2): T_X kgf·m	T_Y kgf·m	Model number
15	4.5	8	6	30	60	M 4×16	950	1 420	11.9	10.1 98.8	10.1 98.8	LWHT 15···B
18	8	9.5	8.5	30	60	M 5×18	1 480	2 230	24.8	20.8 115	20.8 115	LWHT 20···B
							1 940	3 350	36.8	44.5 226	44.5 226	LWHTG 20
22	7	11	9	30	60	M 6×22	2 060	3 040	38.3	32.7 179	32.7 179	LWHT 25···B
							2 480	4 060	51.1	58.4 290	58.4 290	LWHTG 25
25	9	14	12	40	80	M 8×28	2 980	4 300	65.8	58.7 298	58.7 298	LWHT 30···B
							3 420	5 630	86.1	94.6 472	94.6 472	LWHTG 30
28	9	14	12	40	80	M 8×28	3 780	5 680	88.5	66.8 368	61.3 338	LWHT 35···B
							4 580	7 570	118	115 589	106 541	LWHTG 35
34	14	20	17	52.5	105	M12×35	5 770	8 480	176	122 885	112 802	LWHT 45···B
							7 270	12 000	248	237 1 170	217 1 070	LWHTG 45
41	16	23	20	60	120	M14×45	8 640	12 900	311	234 1 220	215 1 120	LWHT 55···B
							10 700	17 900	431	436 2 140	398 1 960	LWHTG 55
48	18	26	22	75	150	M16×50	13 400	19 400	562	436 2 330	400 2 140	LWHT 65···B
							17 700	28 400	821	902 4 350	846 4 030	LWHTG 65

1 kgf = 9.807N = 2.205 lbs.
1 mm = 0.039 inch

●Type

Four respective different types slide unit are available. On each type, normal and longer slide unit length are suppliable.

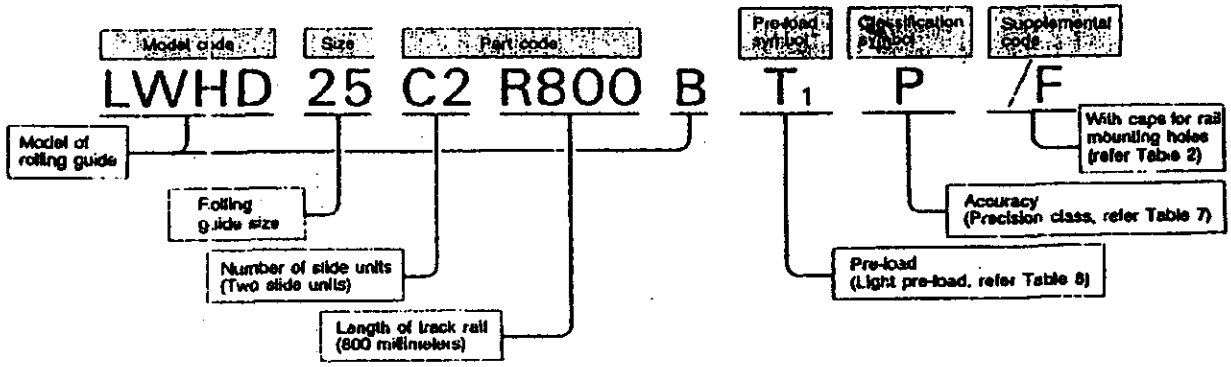
Table 1 Type and characteristics of LINEAR WAY H Series

Item \ Type	LWH□-B	LWHG	LWHT□-B	LWHTG	LWHD□-B	LWHDG	LWHS□-B	LWHSG
From								
Length of slide unit	Normal	Long	Normal	Long	Normal	Long	Normal	Long
Flange	With flange				Without flange			
Mounting method of slide unit	only from bottom		only from upper		only from upper			
Height	Normal				High		Normal	
Width	Normal				Narrow			
Load rating	Large	Very large	Large	Very large	Large	Very large	Large	Very large
Moment load	Good	Excellent	Good	Excellent	Good	Excellent	Good	Excellent

●Model Number

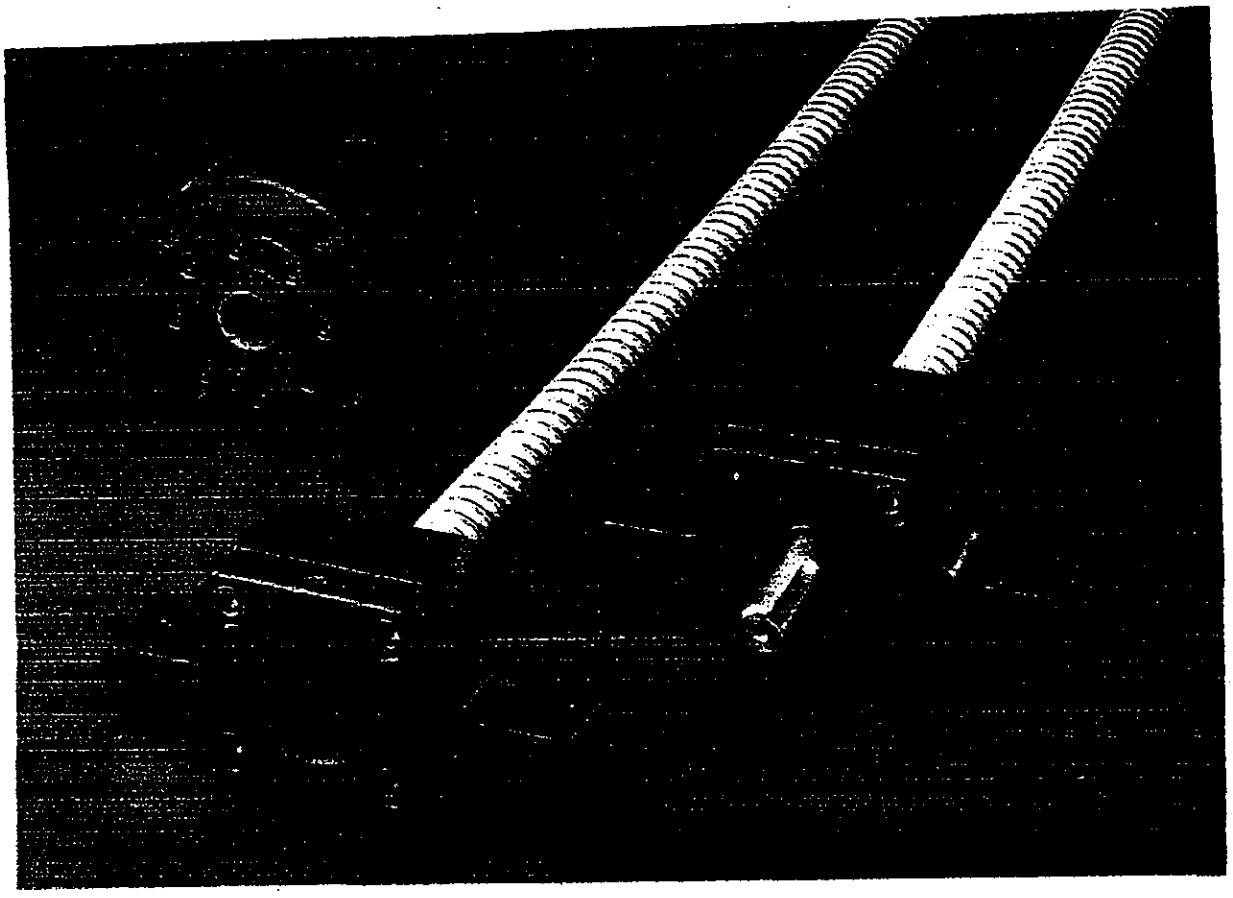
Model number of LINEAR WAY H Series consists of model code, size, part code, pre-load symbol, classification symbol and supplemental code.
When several special specifications are required, arrange the supplemental code alphabetically.

Example of model number



END MOUNTING SUPPORTS

Bearing Block Installation Sheet



Warner Electric now has a line of pre-engineered ball screw support bearings for use with our ball bearing screws. Bearing supports are available as a base mount (for mounting to a surface) or flange mount (for mounting through the surface). Be sure to follow these directions carefully during installation to avoid damaging or reducing the life of the bearings.

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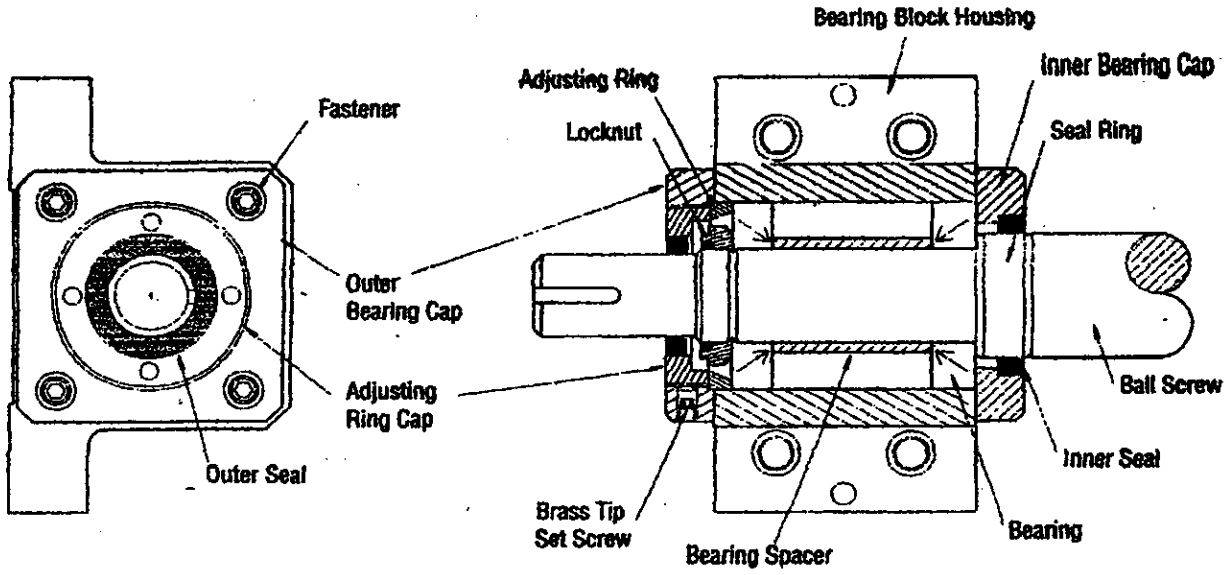


Specifications

1. Remove the seal ring from inner bearing cap of the bearing block assembly. (The type "E" simple bearing blocks have a sealed radial bearing and do not require a seal ring.)
2. Remove the mounting fasteners from the outer bearing cap. Remove the bearing cap and adjusting ring.
3. Install the seal ring on ball screw journal by using an arbor to drive the seal ring against the ball screw shoulder.
4. Lubricate outside diameter of seal ring.
5. Install the bearing block assembly on the ball screw using an arbor to drive the inner part of the bearing/bearings only until the bearings are seated against the seal ring shoulder. Care should be taken not to damage locknut threads while installing bearings and that the bearings are not reversed. Do not change the orientation of the bearing faces during installation.
6. Install the locking nut and torque to the required specifications.

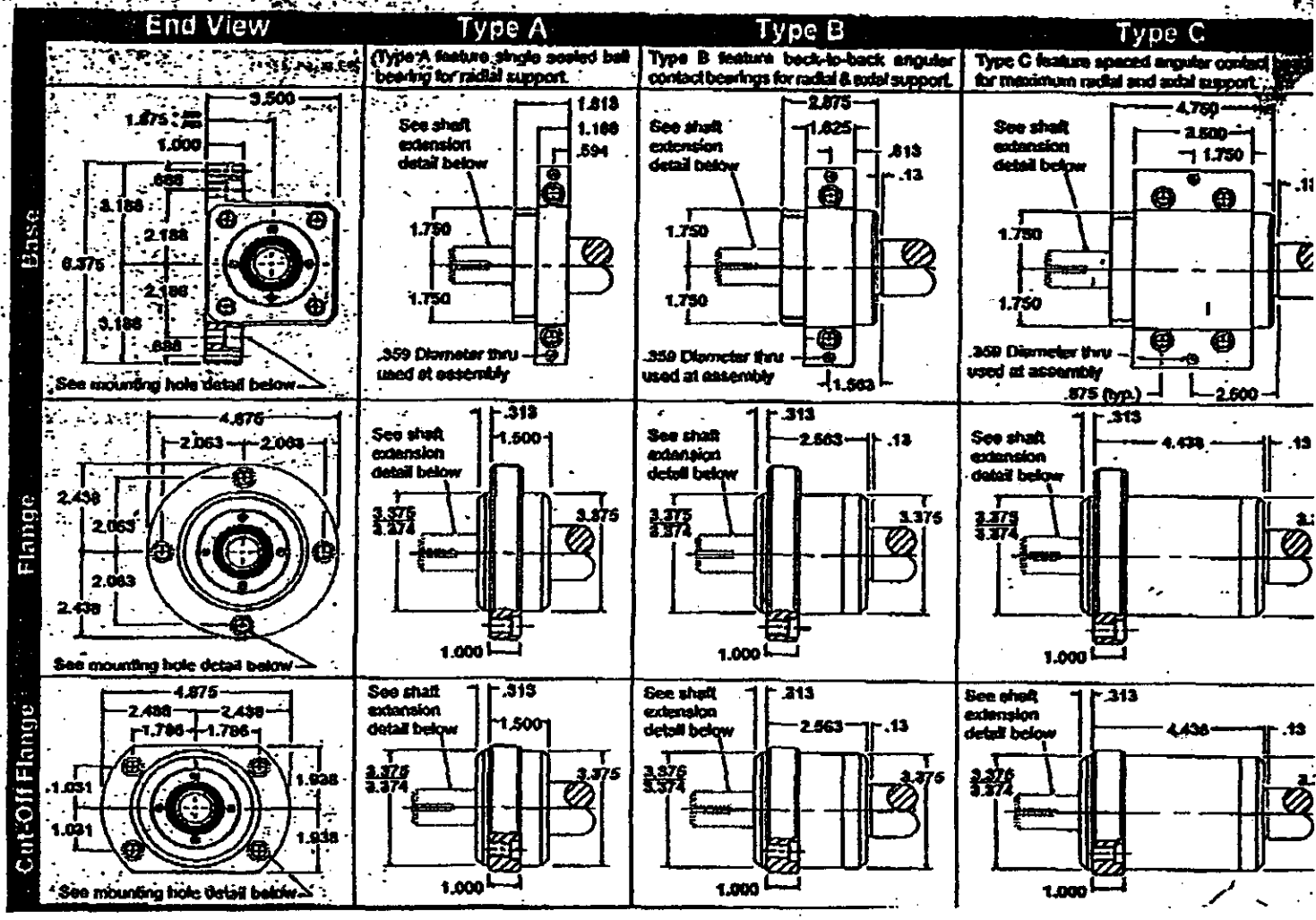
Ball Screw Dia.	Torque (lb.ft.)
.625	10 - 20
.750	10 - 20
1.00	12-35
1.125	23-50
1.500	32-60
2.000	50-80
2.250	64-90
2.500	82-125
3.000	99-150

7. Install adjusting ring with the thin face toward the bearing race.
8. Loosen the inner bearing cap fasteners and align the inner seal on the seal ring and tighten in place.
9. Back off the two brass tip set screws in the outer bearing cap that are 90 degrees apart from each other. Rotate the adjusting ring cap counter clockwise two turns in order to ensure that the bearings will not be over tightened accidentally. Install the outer bearing cap and tighten both the inner and outer bearing cap fasteners securely.
10. Rotate the adjusting cap clockwise until it contacts the bearing. Adjust according to the following types of bearing blocks.

    Type "E" & "F" bearing blocks: tighten the adjusting ring securely locking the bearing/bearings in place.

    Type "H" bearing blocks: tighten the adjusting ring until there is no axial or radial play in the bearing housing, there will be a slight increase in drag on the bearings. **Note: Do not over tighten the bearings, this will increase the drag torque and shorten the bearing life of the assembly.**
11. Snug the two brass tip set screws that are in the outer bearing cap 90 degrees apart from each other.

[redacted] 1.500" End Suppor



TYPE C

GEAR MOTOR DRIVE