ANYTHING LESS IS A GAMBLE

MODEL SPECTRA MAX
SERIAL # 2004-XXYYYYY

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INSTRUCTION MANUAL

FOR ALL INQUIRIES
PLEASE CONTACT
OUR LOCAL DISTRIBUTOR

FOR NORTH AMERICA ONLY
1-800-333-6556

Thank you for choosing ORION stretch-wrapping equipment. It is a wise choice, which will benefit your company now and in the future.

ORION uses a unique combination of functional, rugged steel structure and sophisticated control systems to offer equipment high in durability and low in maintenance requirements. Our advance control systems mean that Orion equipment can be operated safely and efficiently without the need for special operator expertise.

Please read this manual carefully and keep it handy. Following these simple operating instructions will insure the safe and efficient performance of this machine while simple maintenance procedures will guarantee a long and productive life of the equipment.

Notice:

Our manual covers standard features of the machine. Certain options may not be fully covered due to their unique application.

In order to acquire more information about custom made features of your machine and to provide quicker service, the following information is required when making an inquiry:

1)Model
2)Serial Number
3)Subassembly (see PART LIST)

SAFETY:

ORION'S stretch wrappers should be operated with caution and common sense as any other industrial equipment. To prevent injury and/or electrical shocks, careful operation of the machine and awareness of its many automatic functions is required.

NOTE: All electrical power and compressed air must to be disconnected prior to all inspection, maintenance or repair work.

ORION PACKAGING INC.

SpectraMAX

Spiral Low Profile Platform Automatic Rotary Turntable System

Maximum Load Size	52”W x 52”L x 90”H
Minimum Load Size	30”W x 30”L x 10”H
Weight Capacity	5,000 Ibs. Dynamic, 20,000 Ibs. Static
Utilities	115/1/60 20 Amp Electrical Service, 3 CFM Compressed Air @ 80 PSI
Turntable & Drive:	65” Diameter x 3/8” Steel Plate 0-14 RPM variable speed with adjustable soft-start Dynamic positive alignment home positioning feature Chain & sprocket drive with automatic, self-adjusting chain tensioner In-line helical gear reducer on turntable drive train No-maintenance, quiet DuraGlide™ support bearings 3” Height floor to top of turntable
Control Features:	State-of the-Art Allen Bradley MicroLogix Programmable Logic Controller User Friendly Controls with Non-Proprietary Pushbuttons, and Switches Insta-Sense™ Film Broken /Out Sensing Logic with Indicator Light Lanyard Switch for Customer Installation to Allow Remote Cycle Start AUTOMATIC film attachment to the load and cut off RevoLogic™ Exact Wrap Counting To Eliminate Film Waste Electronic Film Tension Control Adjustment on the Panel End of Cycle Film Force Release Separate Top and Bottom Wrap Count Selectors Variable Speed & Separate Film Carriage Up/Down Controls Film Carriage Raise/Lower Switch (Manual) Turntable Jog Pushbutton Cycle Pause for Stopping the Wrap Cycle Without Resetting All Colors Compatible Photocell for Automatic Load Height Detection
Film Stretch & Delivery:	Uses standard 20” film rolls InstaThread for ultra-fast drop-in film threading 260% Standard film stretch (available from 100% to 425%) AUTOMATIC electronic non-contact film force-to-load control Dynamic dancer bar for consistent film tension around entire load Precision ground, polyurethane stretch rollers with lifetime warranty
Film Carriage Drive:	Heavy Duty Zero-maintenance industrial belt lift carriage Variable Speed Drive Motor UHMW Precision Carriage Guidance System
Structural Features:	All STEEL base frame and tower construction Base structure includes dual full-length steel channels Forklift portable from front or rear of machine Hinged tower for ease of transport (reduces machine profile) Adjustable, foldaway film roping bar to lock load to pallet
Film Tail Treatment:	Pneumatic Film Clamping Device Impulse Wire Film Cutting Pneumatic Load Seeking Film Tail Treatment System Folding Film Clamp For Short Loads Wrapping Capability
Ease of Use and Safety:	Fail-Safe film carriage drive with free-fall prevention Film carriage features obstacle detection with automatic shut-off Ergonomic side facing film replacement Protective cover over powered prestretch rollers All-enclosed chains & electronics Protective barrier for film tail treatment device No operator involvement required for film attachment to the load and cut off

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MACHINE UNLOADING
INSPECTION & INSTALLATION

UNLOADING

Machine can be easily unloaded and transported by a forklift with a minimum capacity of 2500 lbs.

1. Carefully insert the forks into the lifting tubes to the maximum possible depth. Depending on the model, a forklift access may be either at the turntable end of the machine frame, the tower end or both. In case of the mongoose machine enter the forks under the frame or insert the forks in the tube brackets welded to the top of the machine.

2. Lift the machine (or other part of system) only to the necessary height to move it with no bouncing or friction on the floor.

3. Sit the machine down assuring uniform contact with the floor, which is necessary to ensure correct and smooth operation.

INSPECTION

1. Remove all packing and supporting additions - these may include the blocks under the carriage and the restraining bar over the table.

NOTE: when removing the stretchwrap film covering the machine, care must be taken not to cut <u>any of the electrical wires and/ or polyurethane covering on the film carriage rollers.</u>

2. Perform a visual inspection of the electrical and mechanical parts for loosened joints and / or broken connections. Any suspected shipping damage must be reported immediately to the freight carrier. Any transport damage cannot be claimed to Orion Packaging Inc.

Items that are vulnerable to damage and must be inspected are as follows:

- Motors and transmissions
- Junction boxes
- Electrical conduits
- Proximity and limit switches
- Photocells

3. Check under the turntable to ensure that there is no crippling of the movable parts i.e. casters, center axle or drive assembly.

4.Verify the following:

- Turntable or rotary arm drive system to confirm that the reducer to drive the chain is snug and properly aligned.
- Verify the wires tight conduits for crushed sections or loose fittings.
- Verify the film carriage to be sure that it is correctly aligned with the tower
- Verify the tension on the lift chain.
- Verify all the dials and knobs on the control panel for smooth action.

MACHINE INSTALLATION

After the visual inspection has been completed, the electrical power and the compressed air shall be connected as specified on the diagrams supplied with the machine.
An electrical diagram is provided with each machine in the envelope attached to the panel box.

ASSEMBLY PROCEDURE

The structural frames of the machine have to be installed on a leveled floor.
Locate the main wrapper section into its final position, keeping the tower assembly* away from any traffic.
The wrapper mainframe section **must be bolted to the floor by the 1/2" concrete floor anchors** (leg & shield or expandable type).

Any wiring that has been disconnected to facilitate transport is marked with a number located on the junction box to which the wiring must be reconnected. Any wire run that appears too short or long may indicate that the position of the mechanical components is incorrect. Verify the status of all assemblies before proceeding.

* The tower deviation from vertical must not exceed 1/4" on the distance of 10 feet (angle: 0 degrees 6').

The roping bar

The roping bar is rotating around the shoulder screw (dwg M-435381 item # 7) and his height can be adjusted from 0 to 6 inches from the base. That device is squeezing a stripe from 0 to 6 inches of the film like a rope to stabilize the load itself or attach it on the pallet. To adjust the roping bar you need a ½" wrench and you have to loose up the screw #5 and #6.

Getting started

Security tip

Be careful to never walk on the turntable it could cause you an injury.

Put a pallet on the turntable and attach the end of film around the load on the same side than the control panel. Put the carriage at the bottom end of the tower to begin a cycle of wrapping. After the start don't stay to close and wait until the end of the cycle.

After the cycle, cut the film and remove the load. The carriage is returned back to the bottom of the tower and ready to wrap again.

Machine operation and security

Installation of a roll of film

The film roll can be loaded on the carriage mandrel from either end of the roll. When using tacky film, please verify that the inward tacky surface of the film is inward on the load.

1.Disconnect power (turn off power switch).

2. Swing up the top mandrel spool.

3. Put the roll of film on the bottom mandrel.

4. Install the top mandrel on top of the roll to prevent upward movement.

5. Release the lock and pull the handle to open film distributor cradle.

6. Pass the roped tail of the film through opening (as shown on the film quick threading pattern DWG. # 434460 Fig.1).

7. Close the film distributor cradle.

8. When the film distributor is completed (fig. 2) - turn the power switch on.

9. Peel off the first few winds of the film (multistrech will run due to displacement of the dancer roller) and fix the film end onto the load.

The system is now ready to begin the first wrapping cycle.

Broken film

Open the cradle, pull a few winds of film, close the cradle and the machine is ready to wrap again.

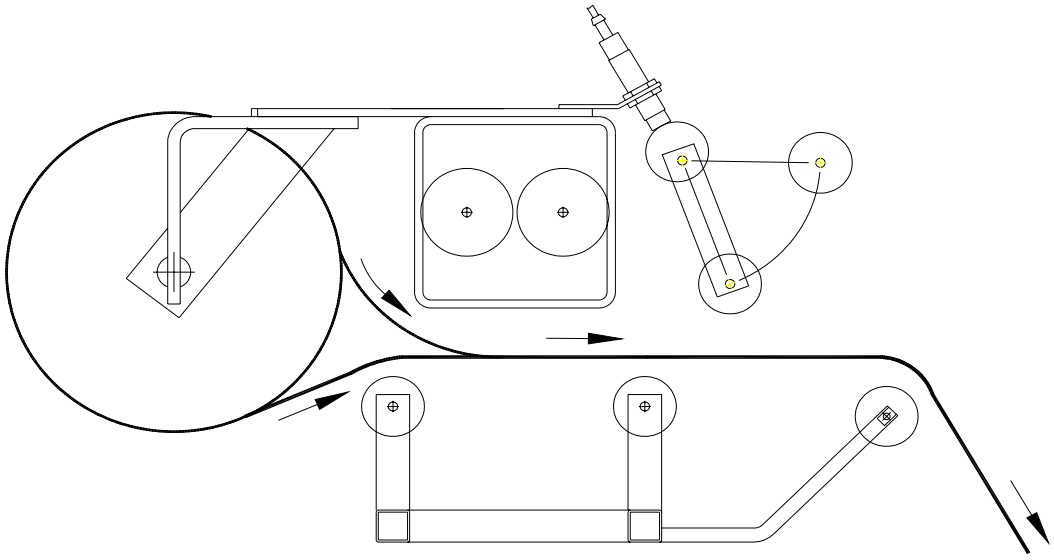


Fig. 1 OPEN CRADLE

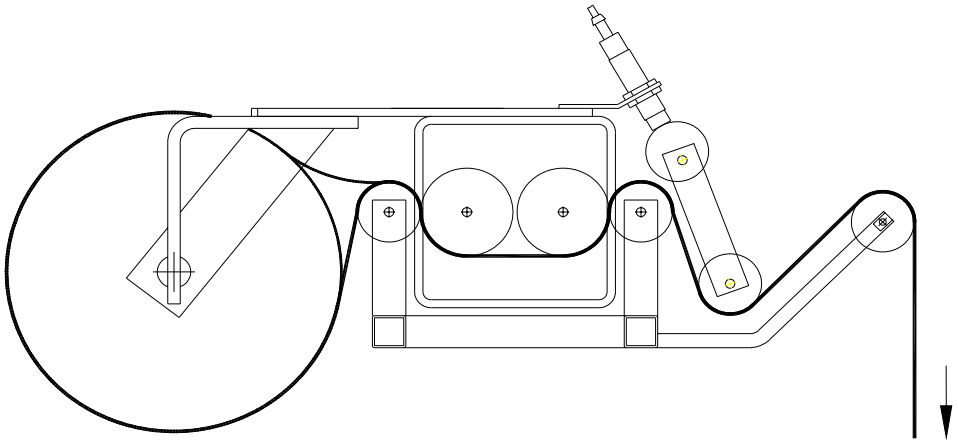
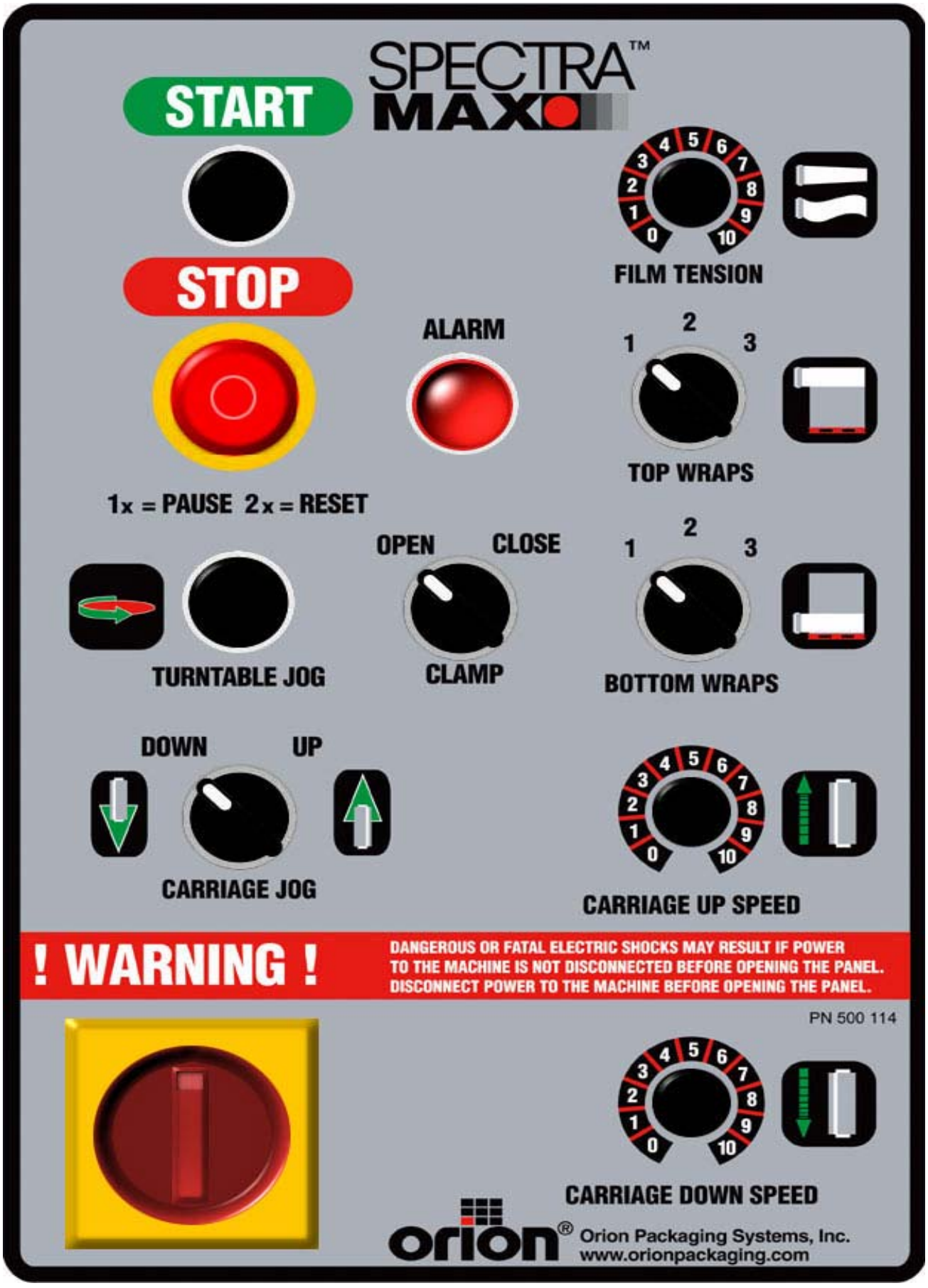


Fig. 2 CLOSED CRADLE

FILM QUICK THREADING

UPDATED APR-03-2002 **DWG # 434460**



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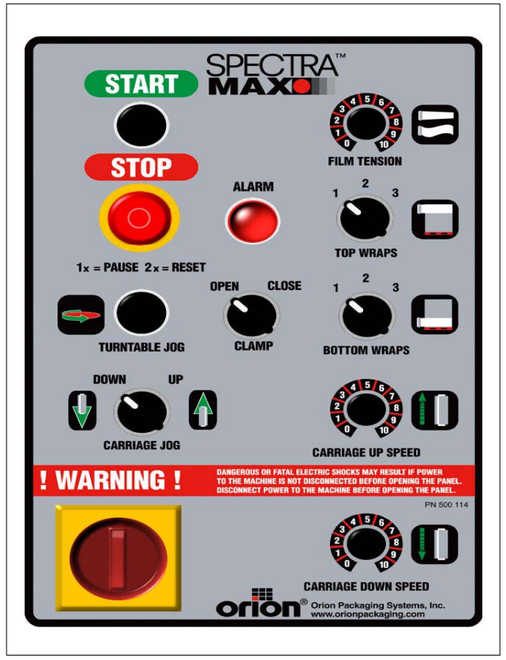

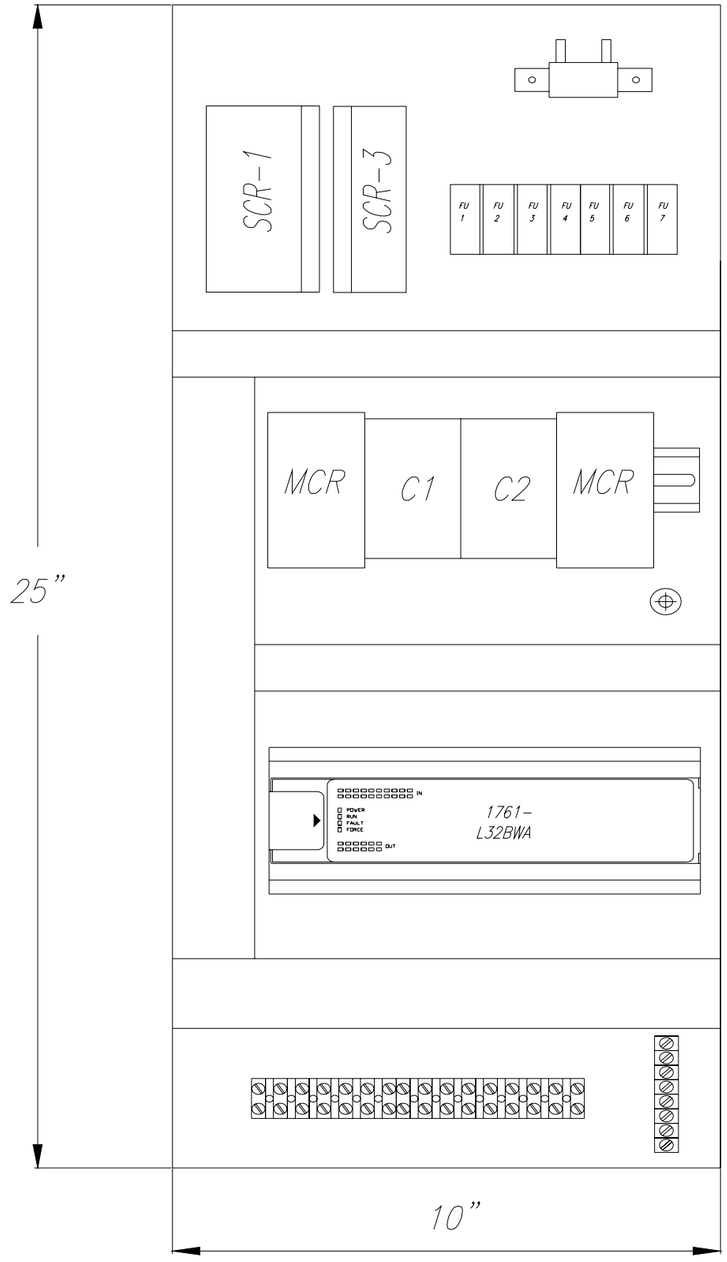

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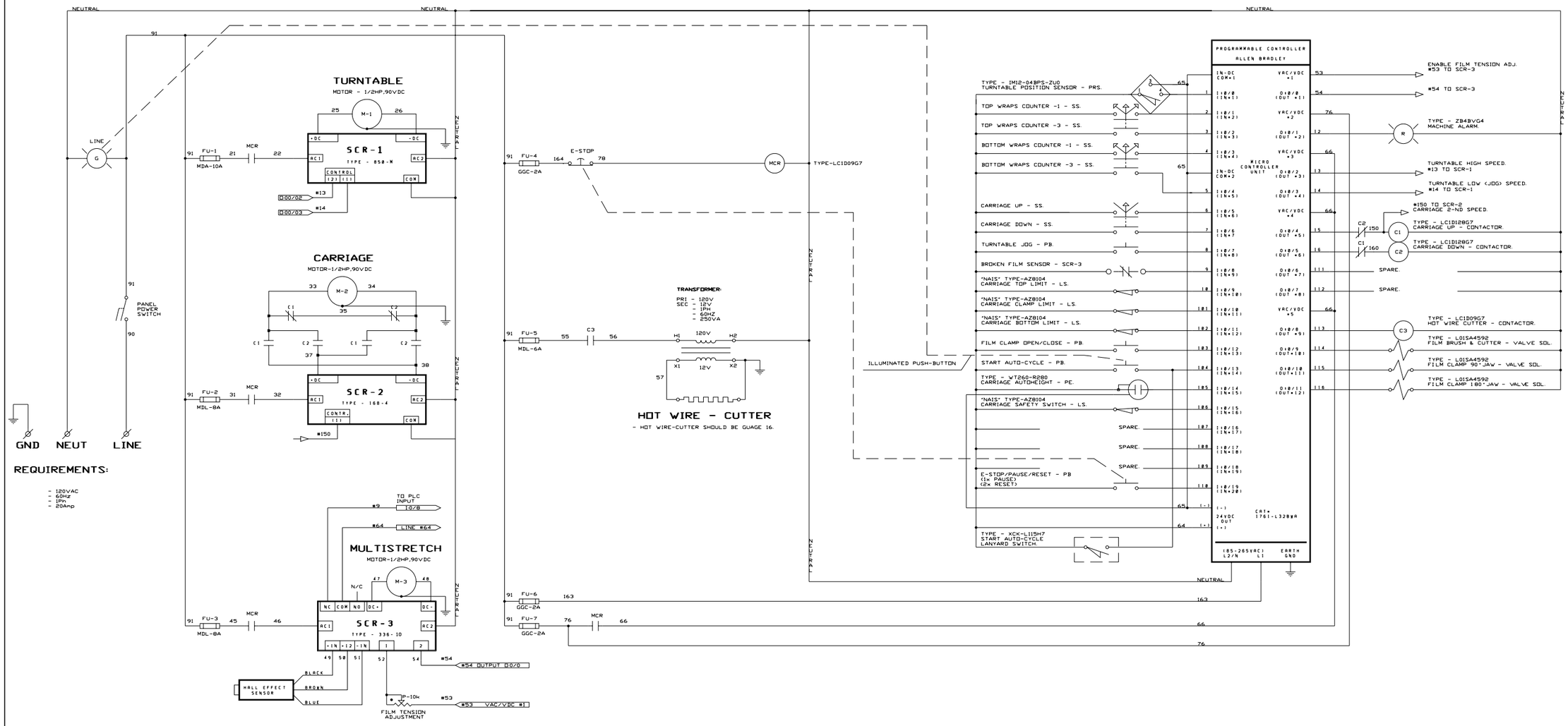
SCALE: 1:2

TITLE: LPA66-17 SPECTRA-MAX

SIZE: C | DOCUMENT NO: JOB # STD 302 719 | REV: 3

DATE: FEB-19-2004 | SHEET: 1 OF 1

FILENAME:: LPA66-17(3)L.DWG | BASE:



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SCALE: NTS

TITLE: LPA66-17 SPECTRA-Max

SIZE: D | DOCUMENT NO: JOB # STANDARD 302 719 | REV: 2

DATE: SEP-10-2003 | SHEET: 1 OF 1

FILENAME:: LPA66-17.DWG | BASE:

MACHINE MAINTENANCE

All general information about machine maintenance is based on normal machine working conditions: indoors, moderate dust and low moisture environment, and maximum rotation of 32 RPM of turntable/rotary arm.
They should be regarded as guidelines, reviewed and corrected according to requirements of actual use and conditions.

MOTOR MAINTENANCE

An occasional inspection of the brushes should be made in order to establish a wear rate. Replacement brushes should be installed before old brushes wear to 9/16" long, measured on the long side. After replacing brushes run the motor near rated speed for at least l/2 hour with no load to seat the new brushes.
Failure to properly seat the new brushes may cause commutator damage and rapid wear of the new brushes. If the commutator becomes rough, scored or out of shape, a competent motor shop should disassemble it and resurface the commutator.
With every third brush change, have a competent motor shop resurface the commutator and blow the carbon dust out of the motor.

REDUCER OIL CHANGE

All external cap screws and plugs on the reducing transmission should be checked for tightness after the first week. It is recommended to change the oil every six months or at least 1800 hours of operation, whichever comes first. When adding or changing oil, the transmission should never be filled above the oil level mark indicated, because leakage and overheating may occur. Below is the list of the type of lubricant that should be used.

List of recommended reducer oils

Manufacturer	Lubricant
American Oil Co..	American Cyl Oil no: 196-L
Cities Service Oil Co.	Citgo Cyl Oil 100-5
Gulf Oil Corp.	Gulf Senate 155
Mobil Oil Corp.	Mobil 600 W Suer-r Cyl. Oil
Philips Oil Corp.	Andes S 180
Texaco Inc.	624 + 650T Cyl.Oil
Shell Oil Co.	Velvata Oil J82
Union Oil of Cal.	Red Line Worm Gear Lube 140

RING BEARING MAINTENANCE (when applicable)

The ring bearing (located under the turntable) should be re-lubricated internally and externally.

Internally: by injecting grease into all the lubrication nipples in succession until a collar of fresh grease appears around the perimeter of the ring. The re-lubrication interval suggested for these bearings, used in Stretch Wrapping Machinery is 750 hours, with a maximum period of 6 months. The lubricant should be fresh and applied in sufficient quantities to make sure all surfaces are lubricated.

Externally: by lubricating and wiping the chain drive with oily cloth. The frequency of lubrication depends on entirely upon the usage of the machine and environment in which the machine is placed (dust, moisture etc.).
Machines working under extremely dirty conditions should be lubricated every 400 operating hours but at minimum, every 2 months. Longer lubrication intervals may occur only when machine is working under very clean and dry conditions but should be not be longer than 6 months.

List of recommended lubricants for the ring bearing lubrication

Manufacturer	Lubricant
BP	Energrease LS2
Castrol	Speeroll AP2
Esso	Beacon 2
Gulf	Crown Grease 2
Mobil	Mobilus 2
Shell	Avania Grease R2
Texaco	Glissando FT 2
Valvoline	LB-2

TOWER RACEWAYS MAINTENANCE

The film distributor (carriage) is sliding on the plastic guides attached behind its back plate. The section of the tower on which the plastic guides move (raceways) should be cleaned and re-greased approximately every 600 hours of machine operation.
NOTICE: If the machine works in a dusty and corrosive environment, the raceways should be re-greased more often (at least every 100 hours).

CHAIN MAINTENANCE

To clean the chain, wipe it with an oily cloth every month. When machine is working in a dusty and damp environment, it may be necessary to repeat the cleaning operation more often. As the chain lubricants please use the most common chain lubricants on the market.
With time, the chain will tend to stretch. A loose chain should be tightened at the chain tensioner, or by moving the reducer on its mounting plate.
NOTICE: Chain tension first adjustment must be done after the first <u>two weeks of machine usage.</u>

PNEUMATIC SYSTEM MAINTENANCE (when applicable)

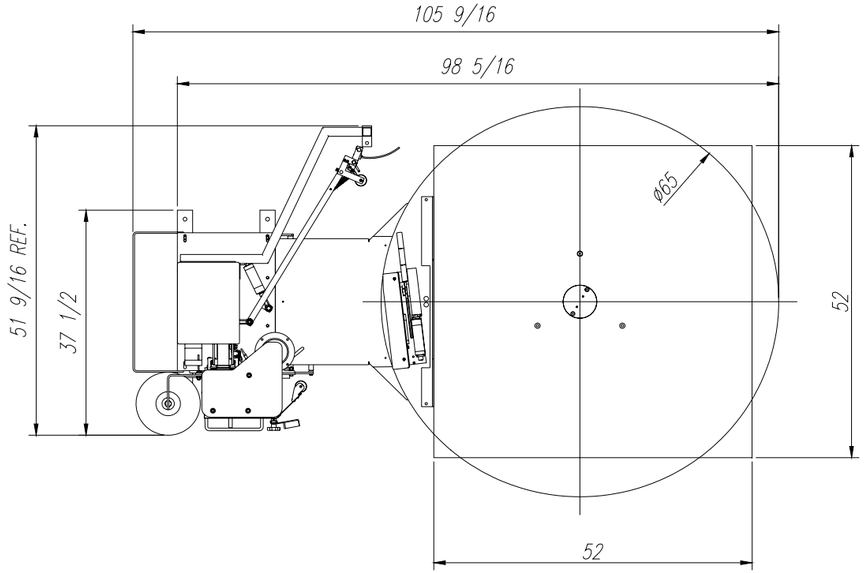
The air supply system must be checked weekly and must be free from the moisture. In cold environments, it may be necessary to drain the air supply system daily.

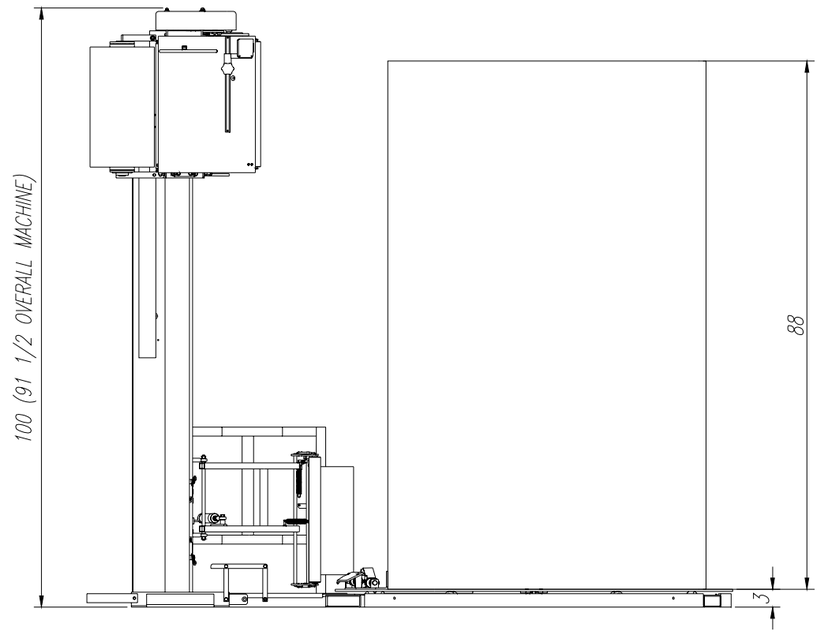
CAM FOLLOWER MAINTENANCE (when applicable)

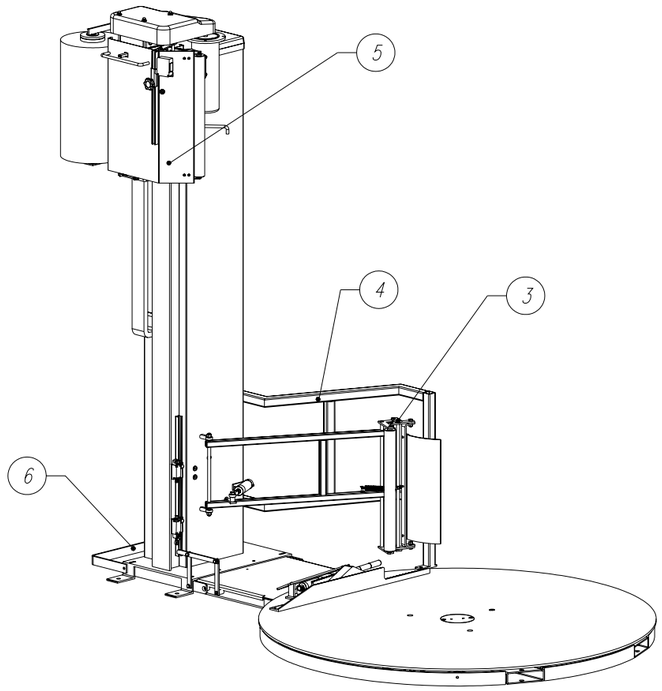
The cam followers have deep grease pockets and do not need frequent relubrication. The portion of the tower on which the cam followers run, should be cleaned and regreased every 300 hours of operation. If the machine operates in a dusty or corrosive environment the tower should be relubricated more often.

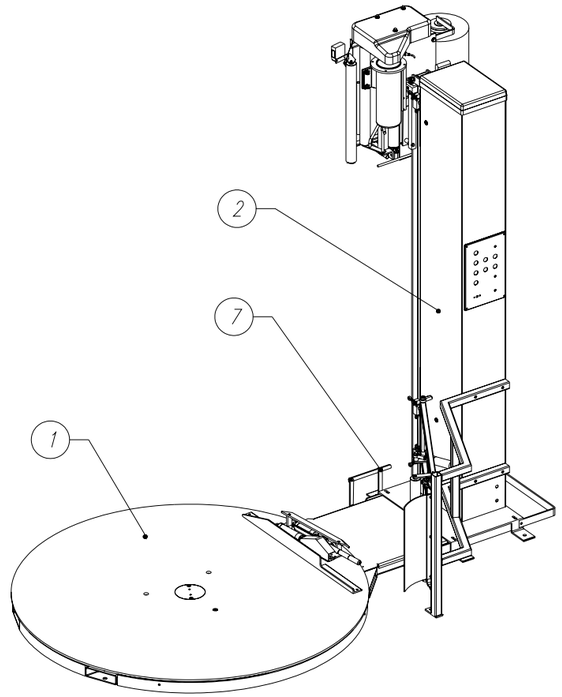
SEMI-AUTOMATIC STANDARD ASSEMBLY PART LIST

Note :
*** Quantity listed in order of part number**
** The names given to the parts are generic









ITEM	DESCRIPTION	FILE,PART NO. OR MATERIAL	Q'TY Q'TE	WEIGHT POIDS
7	ROPING BAR ASSEMBLY	436405 A	1	
6	BACK TOWER STOPPER	436790 A	1	
5	INSTA-THREAD-FRL-20-SPECTRA	435713 C	1	
4	FILM TAIL THREATMENT GUARD	LA66-13578-SF-000-00-A-A	1	
3	LPA-FILM TAIL THREATMENT	LA66-13786-FT-000-00-B-A	1	
2	LPA-TOWER ASSEMBLY	LA66-13578-TO-000-00-B-A	1	
1	LPA-BASE ASSEMBLY	LA66-13786-BA-000-00-B-A	1	

"SPECTRA-MAX" - WRAPPER | B | SCALE: ECHELLE: 1:20 | TOTAL WEIGHT-LBS: POIDS TOTAL-LBS: —

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PROJECTION

DRAWN BY: DESSINE PAR: ROGER F. | DATE: JAN-14-2004

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Q'TY: Q'TE: 1

TOL. : ± 1/4 UNLESS OTHERWISE SPECIFIED

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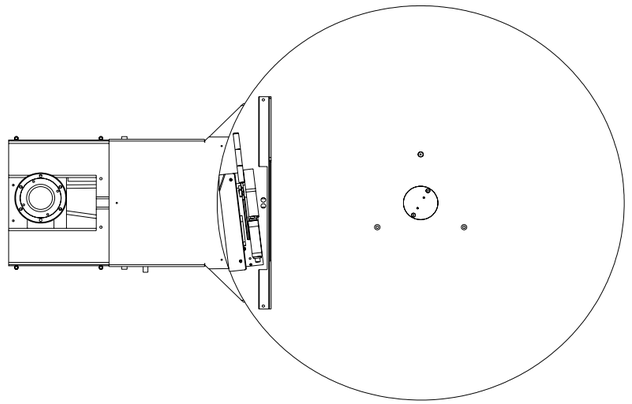

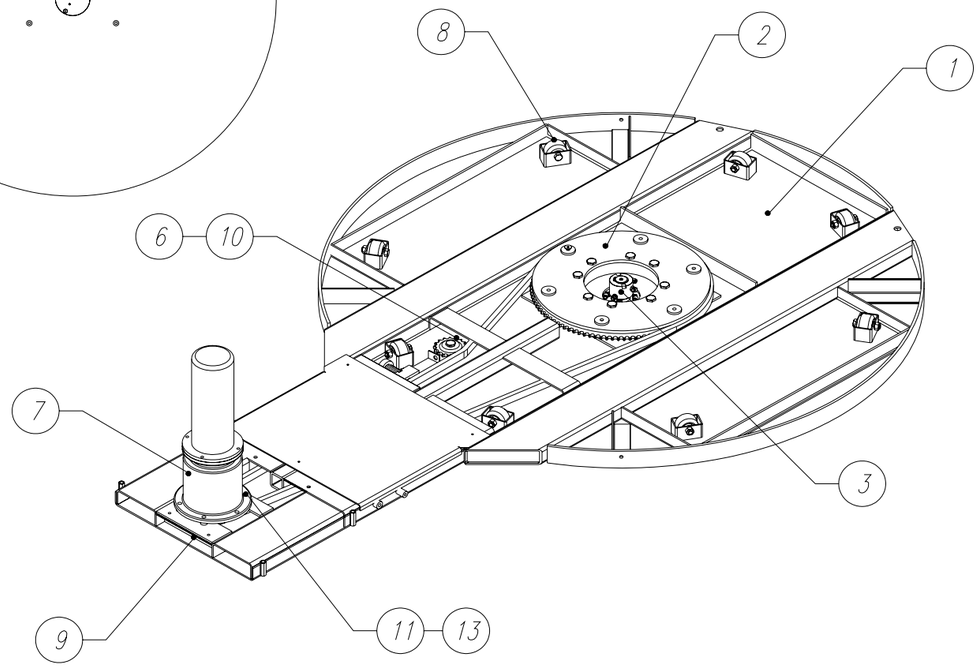

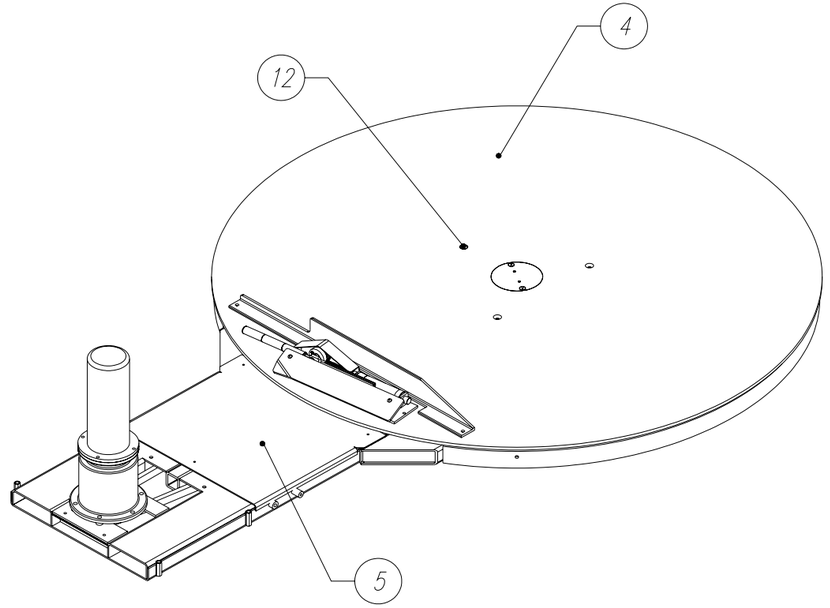

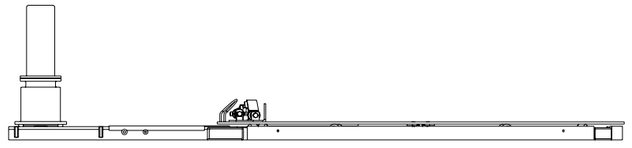

ITEM	DESCRIPTION	FILE,PART NO. OR MATERIAL	Q'TY Q'TE	WEIGHT POIDS
13	HEX SCREW	014157	4	
12	HEX SOCKET FLAT SCREW	013842	3	
11	3/8 SIZE PLAIN WASHER	010948	4	
10	SHOULDER SCREW	015122	1	
9	BASE BACK COVER	436438 A	1	
8	DURA GLIDE CASTER ASS'Y	435325 A	7	
7	TURNTABLE DRIVE ASSEMBLY	433972 A	1	
6	CHAIN TIGHTENER ASSEMBLY	430034 A	1	
5	BASE COVER	436423 A	1	
4	LPA-TURNTABLE ASSEMBLY	LA66-13786-TT-000-00-A-A	1	
3	4 PASSAGES ROTORSEAL	LA66-13578-RT-000-00-A-A	1	
2	LPA-T.T. RING-BEARING ASSEMBLY	LA66-13578-BA-200-00-A-A	1	
1	LPA-BASE WELDING	LA66-13578-BA-100-00-B-A	1	

LPA-BASE ASSEMBLY | B | SCALE: ECHELLE: 1:24 | TOTAL WEIGHT-LBS: POIDS TOTAL-LBS: —

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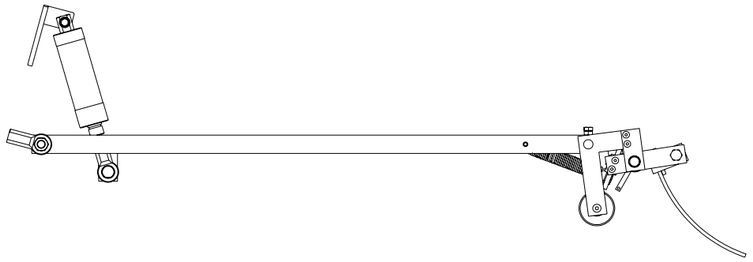

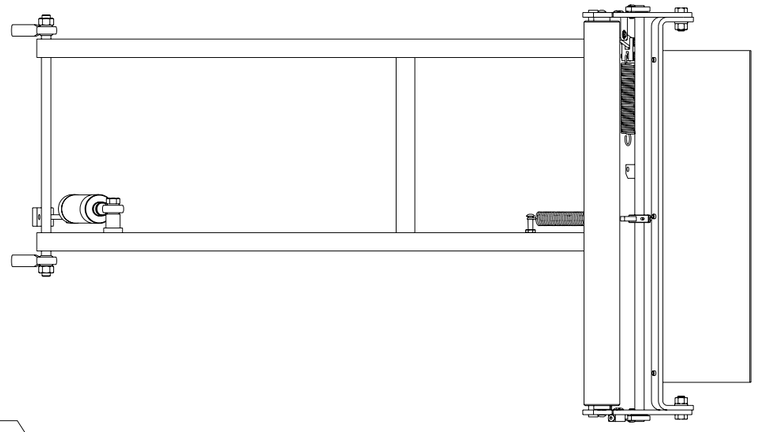

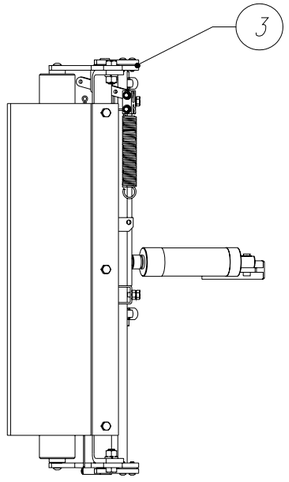

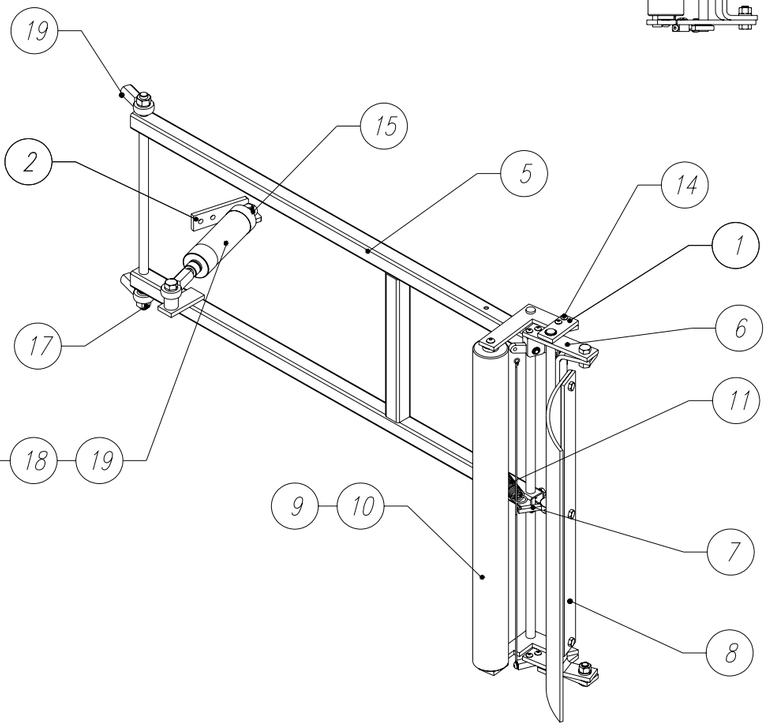

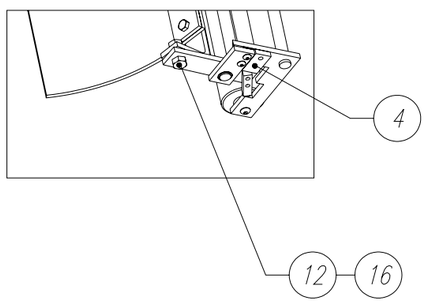

ITEM	DESCRIPTION	FILE,PART NO. OR MATERIAL	Q'TY Q'TE	WEIGHT POIDS
19	ROD END	014229	3	
18	AIR CYLINDER	016419	1	
17	HEX NUT	010262	2	
16	HEX NUT	012582	2	
15	SELF SEATING RETAINING RING	017622	1	
14	BUTTON SCREW	014313	5	
13	HEX SCREW	015120	3	
12	HEX SCREW	014157	2	
11	EXTENSION SPRING	403118 B	1	
10	ALUMINUM ROLLER	402789 A	1	
9	IDLE ROLLER SHAFT	413249 A	1	
8	FILM BRUSH ASSEMBLY	LA66-13786-FT-500-00-A-A	1	
7	SPRING ATTACHMENT	LA66-13578-FT-300-00-A-A	1	
6	FILM CUTTER ASSEMBLY	LA66-13786-FT-200-00-A-A	1	
5	FILM TAIL THREATMENT CRADLE	LA66-13578-FT-100-00-B-B	1	
4	CUTTER BUMPER	LA66-13786-FT-000-04-A-A	1	
3	DUAL HOLES SPACER	LA66-13786-FT-000-03-A-A	1	
2	AIR CYLINDER ATTACHMENT	LA66-13578-FT-000-02-A-A	1	
1	CUTTER BRACKET	LA66-13578-FT-000-01-A-A	2	

LPA-FILM TAIL THREATMENT

B

SCALE: ECHELLE: 1:8

TOTAL WEIGHT-LBS: POIDS TOTAL-LBS: —

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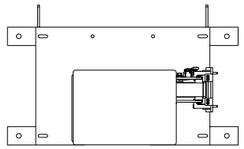
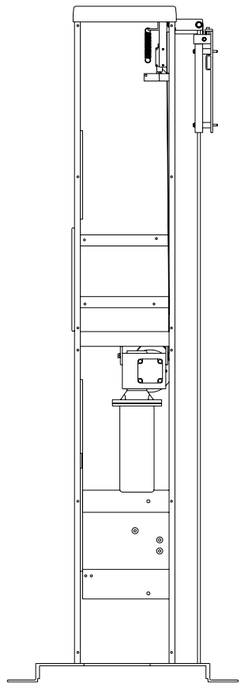
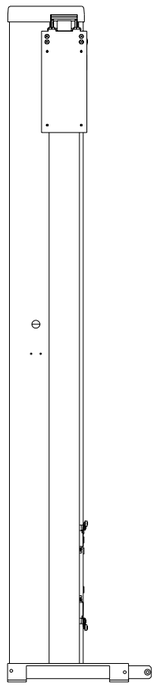
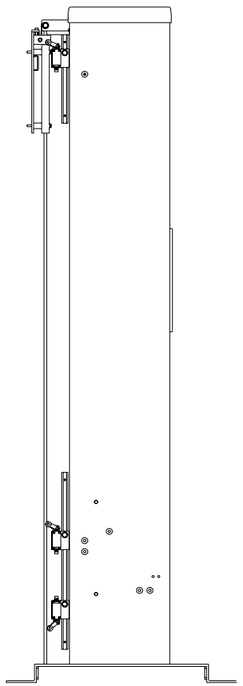
TOL. :± 1/32 OR ±.010 UNLESS OTHERWISE SPECIFIED

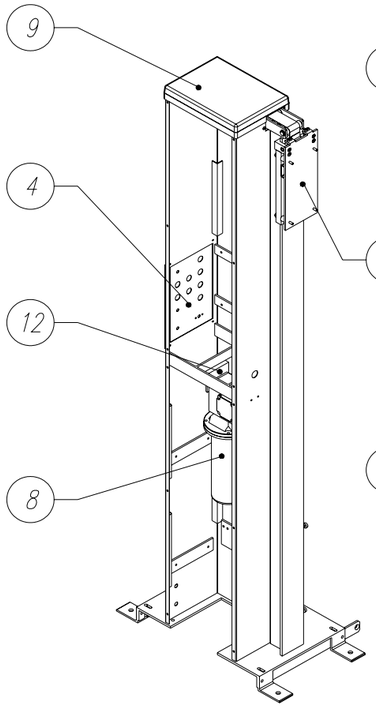
FILE: FICHIER: 13786-FT-000-00-B-AM

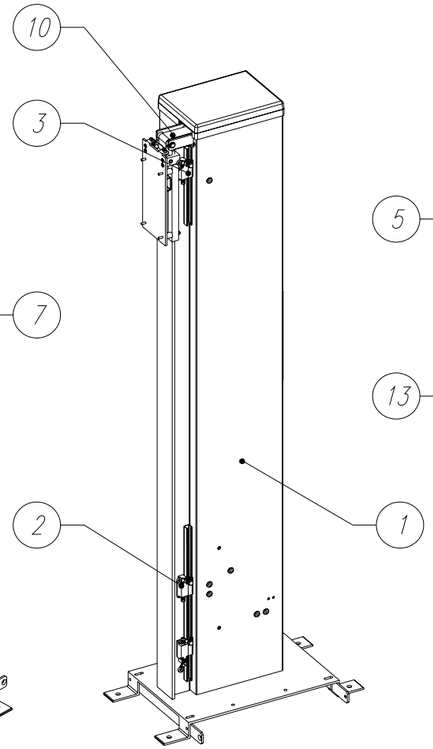


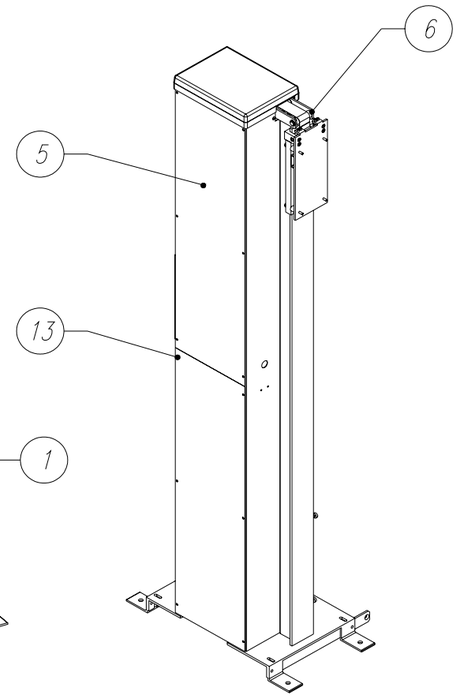












ITEM	DESCRIPTION	FILE,PART NO. OR MATERIAL	Q'TY Q'TE	WEIGHT POIDS
13	PHILLIPS PAN SCREW	013351	16	
12	HEX NUT	012582	4	
10	CARRIAGE BELT (SP-2.1)	436474 A	1	
9	TOP COVER	433976 A	1	
8	CARRIAGE BELT DRIVE	436414 A	1	
7	CARRIAGE ATTACHMENT ASSEMBLY	430020 B	1	
6	BELT IDLE ASSEMBLY	436413 A	1	
5	TOWER BACK WALL	436412 A	2	
4	ELECTRIC PANEL	LA66-13578-TO-500-00-A-A	1	
3	TOP LIMIT SWITCH ASSEMBLY	LA66-13578-TO-300-00-A-A	1	
2	BOTTOM LIMIT SWITCHES ASSEMBLY	LA66-13578-TO-200-00-A-A	1	
1	LPA - TOWER WELDING	LA66-13578-TO-100-00-B-B	1	

LPA - TOWER ASSEMBLY

B

SCALE: ECHELLE: 1:20

TOTAL WEIGHT-LBS: POIDS TOTAL-LBS: —

orion
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2270 INDUSTRIEL, LAVAL
QUEBEC, CANADA, H7S 1P9
TEL.: (450) 667-9769

PROJECTION

DRAWN BY: DESSINE PAR: ROGER F.

DATE: NOV-20-2003

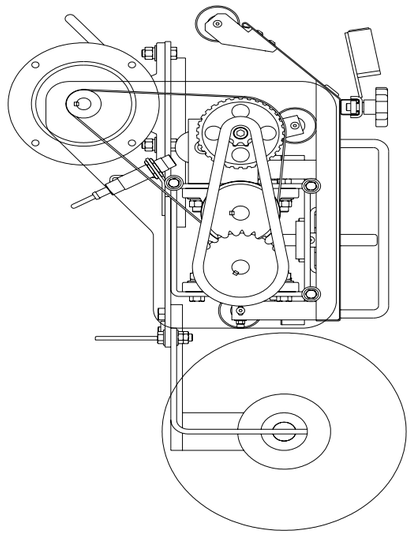
Q'TY: Q'TE: 1

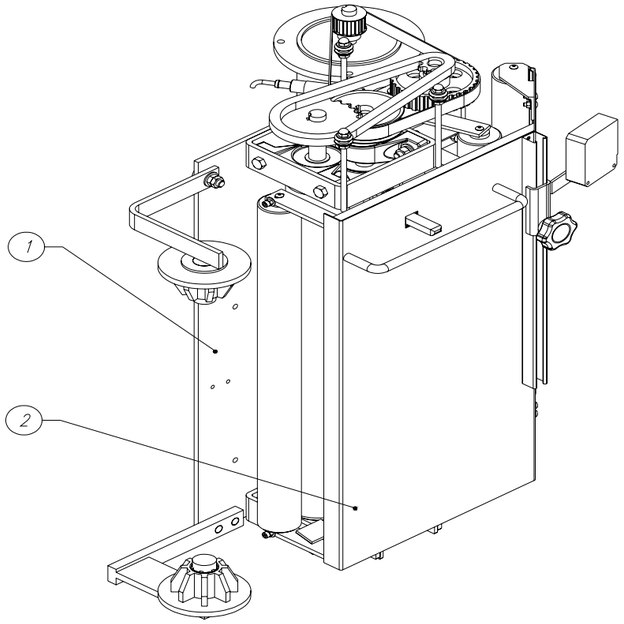
CHECKED BY: VERIFIE PAR: –

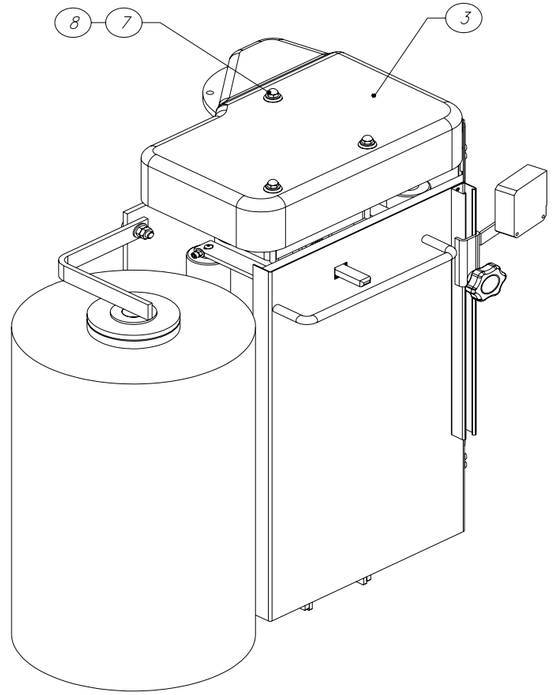
DATE: –

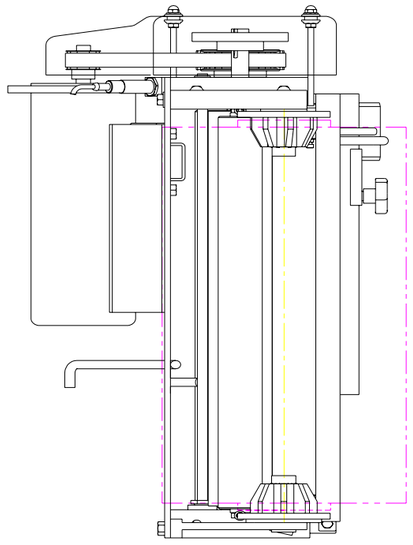
TOL. :± 1/32 OR ±.010 UNLESS OTHERWISE SPECIFIED

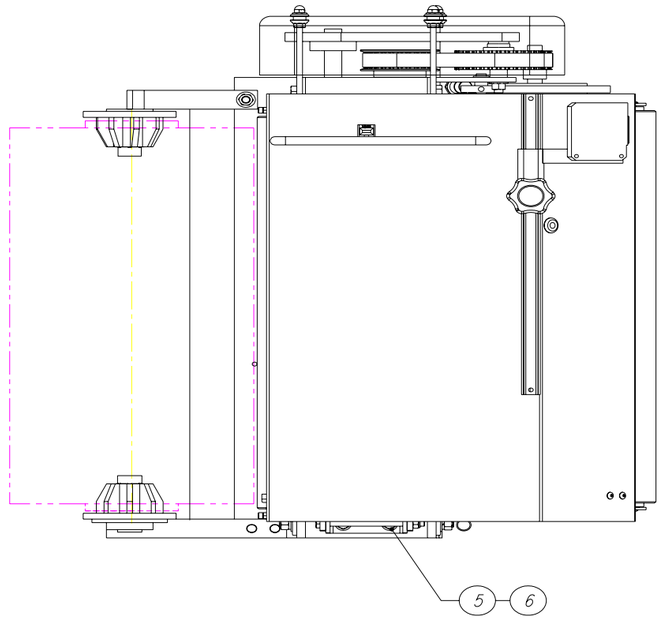
FILE: FICHIER: 13578-TO-000-00-B-AM











No.	DESCRIPTION	DWG. SIZE	PART No.	Q'ty	WEIGHT
8	HEX NUT		012689	3	
7	FLAT WASHER		012221	3	
6	FLAT WASHER		012725	2	
5	HEX HEAD SCREW		017400	2	
3	INSTA-THREAD FIBERGLASS COVER-FLR		414854	1	
2	CRADLE ROLLER ASSEMBLY-FLR-20-SPECTRA		434007	1	
1	INSTA-THREAD-FLR-20-SPECTRA BACK PL. ASS'Y		435714	1	

REMARKS:

REMARKS:

INSTA-THREAD -FLR-20-SPECTRA CARRIAGE

orion
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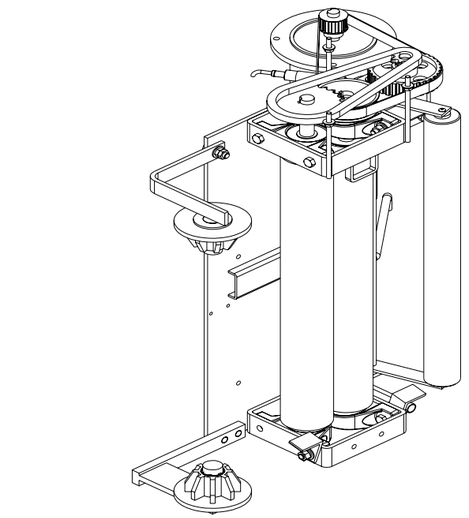
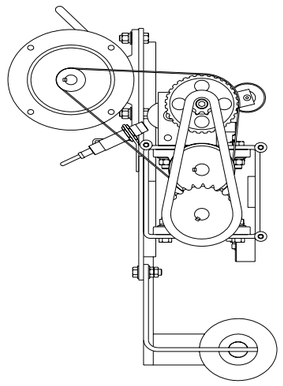
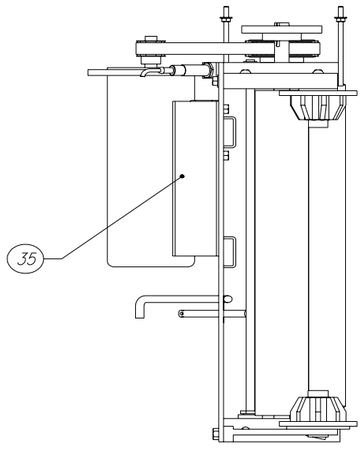
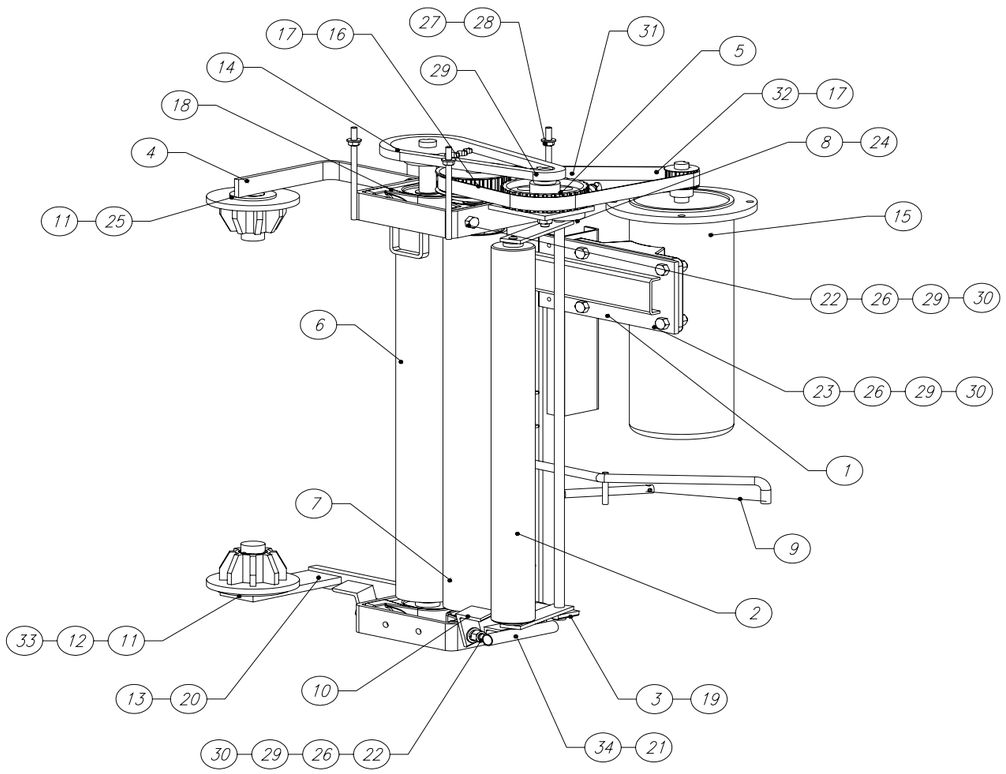
QUEBEC, CANADA, H7S 1P9
TEL.: (450) 667-9769

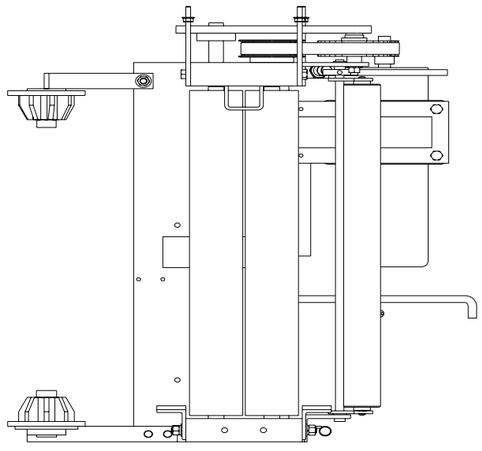
ASSEMBLY DWG.: 435681	JOB No.: —	DRAWING No.: 435713M
	DRAWN BY: ROGER F.	MACHINE TYPE: SP-2
	CHECKED BY:	DRAWING SIZE: C
	DATE: AUG-02-2002	SCALE: 1 : 5











No.	DESCRIPTION	DWG. SIZE	PART No.	Q'ty	WEIGHT
35	LIMIT SWITCH BRACKET		434410	1	
34	CABLE SUPPORT BRACKET		434409	1	
33	SELF SEATING RETAINING RING		013860	2	
32	GEARBELT PULLEY		011283	1	
31	GEARBELT		011151	1	
30	SPRING LOCK WASHER		011390	12	
29	HEX. NUT		011128	12	
28	HEX. NUT		012689	3	
27	FLAT WASHER		012221	3	
26	FLAT WASHER		010948	12	
25	FLAT WASHER		012323	1	
24	SOCKET CAP SCREW		010326	1	
23	HEX. HEAD CAP SCREW		012406	4	
22	HEX. HEAD CAP SCREW		012476	4	
21	PAN PHIL SCREW		012481	2	
20	FLAT HEAD		013363	2	
19	FL. BRONZE BUSHING		014247	2	
18	PILLOW BLOCK		011192	4	
17	SQ. KEY		010227	3	
16	GEARBELT PULLEY		431672	1	
15	ELECTRIC MOTOR		015240	1	
14	SPROCKET (260 %)		435715	1	
13	BOTTOM MANDREL-FLR		431737	1	
12	BOTTOM SPOOL		432323	2	
11	BOTTOM SPOOL WASHER		432322	2	
10	CRADLE ROLLER OPENING LOCK		409469	2	
9	TENSION SCREW ASSEMBLY		435261	1	
8	PROXIMITY SENSOR CAM		413744	1	
7	RUBBER ROLLER - 2 (20" FILM)		420917	1	
6	RUBBER ROLLER - 1 (20" FILM)		420916	1	
5	SPROCKET		434017	1	
4	TOP MANDREL FLR		434077	1	
3	DANCER ROLLER BRACKET FLR		414852	1	
2	DANCER ROLLER ASSEMBLY - 20 MIRROR		435540	1	
1	CARR. BACK PL. WELDING-FLR-20-SPECTRA-SP-2		435721	1	

REMARKS:

REMARKS:

INSTA THREAD-FLR-20-SPECTRA BACK PL. ASS'Y

orion
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2270 INDUSTRIEL, LAVAL
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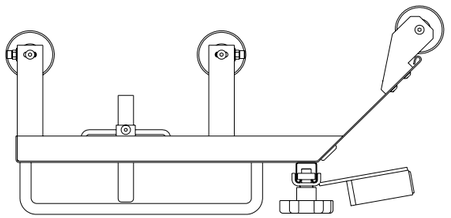
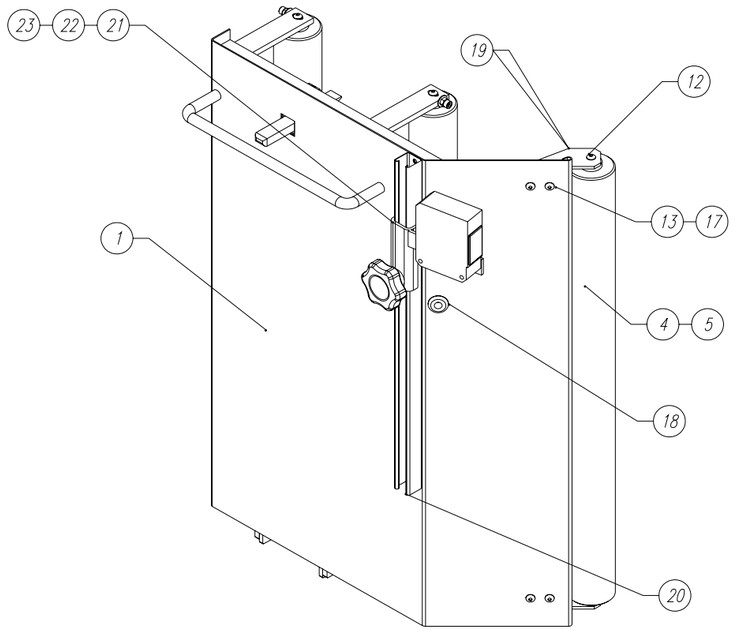
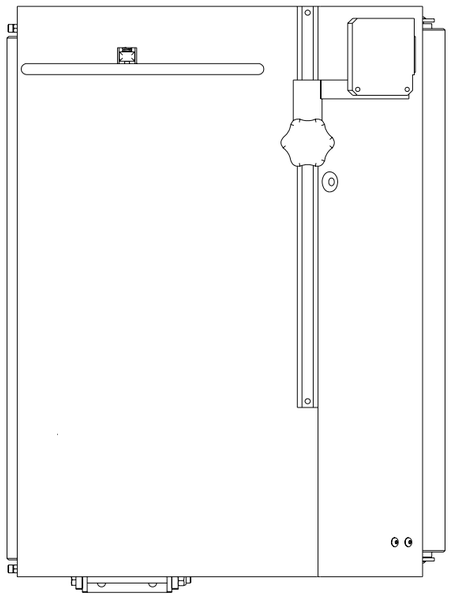
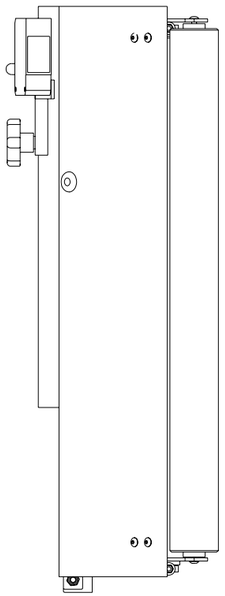
TEL.: (450) 667-9769

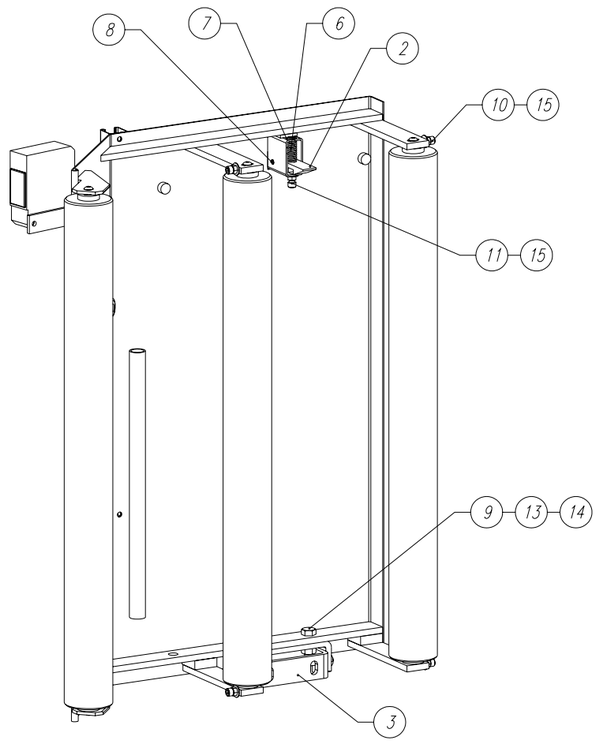
	DATE: NOV-25-2002	SCALE: 1 : 1
	DRAWN BY: ROGER F.	MACHINE TYPE: SP-2
	CHECKED BY:	DRAWING SIZE: C
ASSEMBLY DWG.: 435713	JOB No.: -	DRAWING No.: 435714M











No.	DESCRIPTION	DWG. SIZE	PART No.	Q'ty	WEIGHT
23	BLACK KNOB		010092	1	
22	CHANNEL GUIDE		427690	1	
21	PHOTOCELL HIGH HOLDER		434412	2	
20	PHOTOCELL HIGH CHANNEL		434411	1	
19	EXIT ROLLER BRACKET		434319	2	
18	GROMMET		014502	1	
17	FLANGE HEX NUT		017401	4	
16	HEX NUT		013407	2	
15	HEX NUT		013451	5	
14	FLAT WASHER		012725	2	
13	BUTTON HEAD SCREW		014665	4	
12	BUTTON HEAD SCREW		012725	6	
11	HEX SOCKET CAP NUT		014209	1	
10	HEX SOCKET CAP NUT		015020	4	
9	HEX HEAD SCREW		017400	2	
8	SPRING PIN		014458	1	
7	POP RIVET		015534	1	
6	SPRING		013995	1	
5	IDLE ROLLER SHAFT		413249	3	
4	ALUMINIUM ROLLER		402789	3	
3	ROLLER CRADLE HINGE		430054	1	
2	LATCH		430053	1	
1	CRADLE ROLLER WELDING-FLR-20-SPECTRA		434011	1	

REMARKS:

REMARKS:

CRADLE ROLLER ASSEMBLY CE-FLR-20

orion
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2270 INDUSTRIEL, LAVAL
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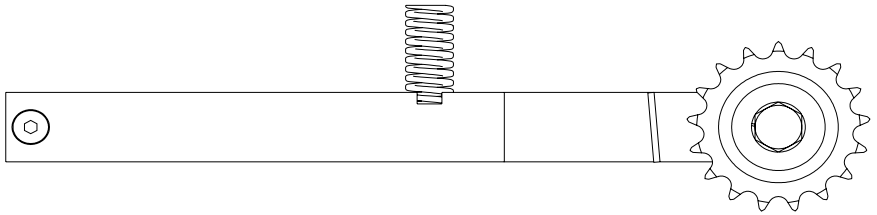
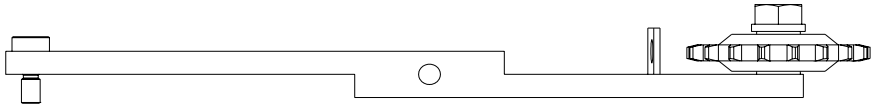
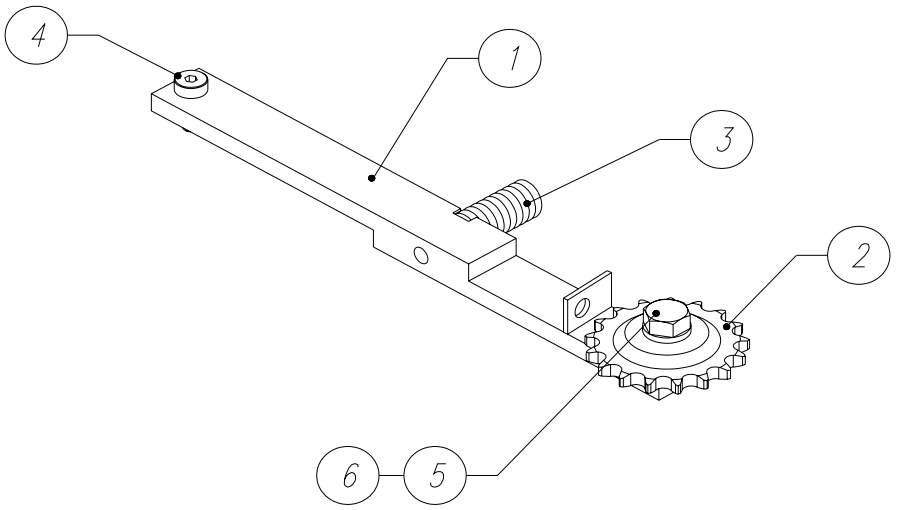
TEL.: (450) 667-9769

	DATE: APR-02-2000	SCALE: 1 : 6
	DRAWN BY: ROGER F.	MACHINE TYPE: SPECTRA
	CHECKED BY:	DRAWING SIZE: B
ASSEMBLY DWG.: 434005	JOB No.: 12237	DRAWING No.: 434007M







No.	DESCRIPTION	DWG. SIZE	PART No.	Q'ty	WEIGHT
6	LOCK WASHER		012721	1	
5	SCREW		010329	1	
4	SHOULDER SCREW		015122	1	
3	SPRING		016581	1	
2	IDLE SPROCKET		010008	1	
1	CHAIN TIGHTENER ARM		430035	1	

REMARKS:

REMARKS:

CHAIN TIGHTENER ASSEMBLY

orion
PACKAGING INC.
2270 INDUSTRIEL, LAVAL
QUEBEC, CANADA, H7S 1P9
TEL.: (450) 667-9769

DATE: MAR-25-2002

SCALE: 1 : 4

DRAWN BY: ROGER F.

MACHINE TYPE: SPECTRA

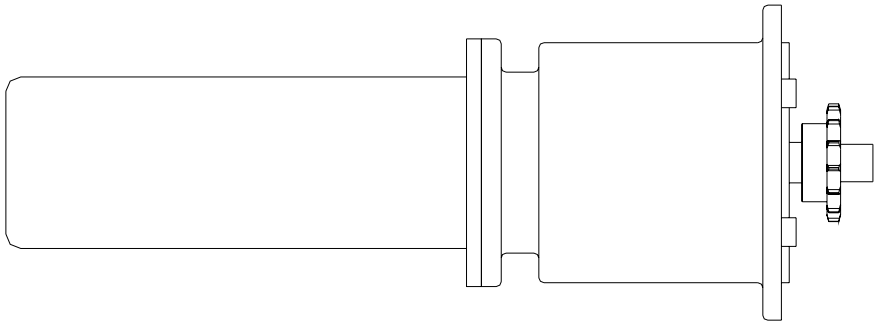
CHECKED BY:

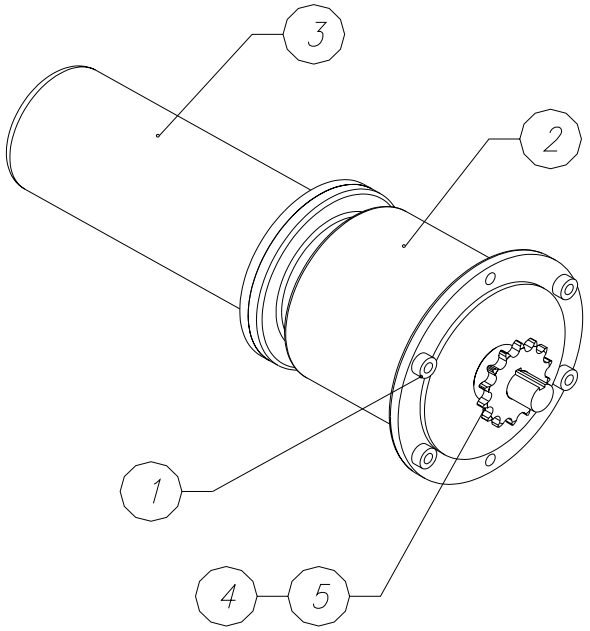
DRAWING SIZE: A

ASSEMBLY DWG.: 430002

JOB No.: 11295

DRAWING No.: 430034M





No.	DESCRIPTION	DWG. SIZE	PART No.	Q'ty	WEIGHT
5	KEY		010295	1	
4	SPROCKET		013997	1	
3	ELECTRIC MOTOR		010036	1	
2	VERTICAL REDUCER		016580	1	
1	SPACER		434081	4	

REMARKS:

REMARKS:

TURNTABLE DRIVE ASSEMBLY

orion
PACKAGING INC.
2270 INDUSTRIEL, LAVAL
QUEBEC, CANADA, H7S 1P9
TEL.: (450) 667-9769

DATE: JAN-23-2003

SCALE: 1 : 1

DRAWN BY: ROGER F.

MACHINE TYPE: SPECTRA

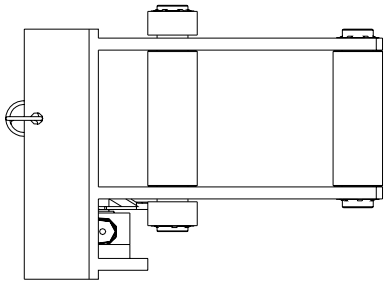
CHECKED BY:

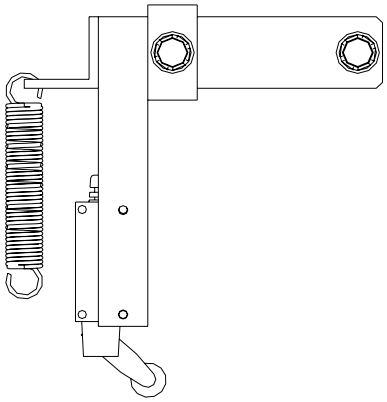
DRAWING SIZE: A

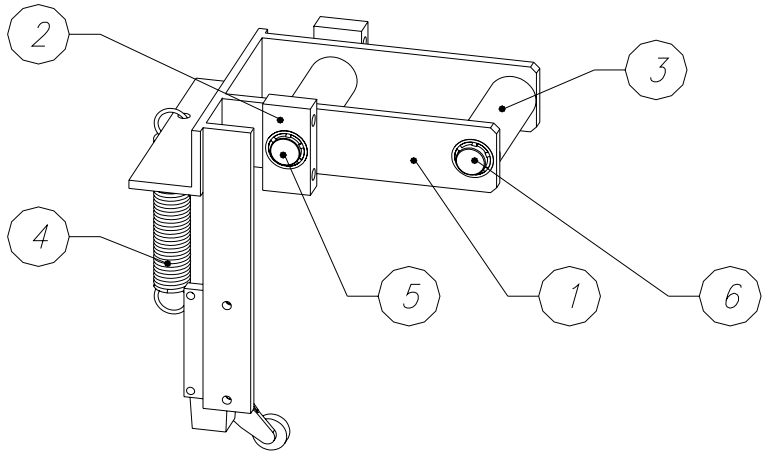
ASSEMBLY DWG.: 433771

JOB No.: 12237

DRAWING No.: 433972M







No.	DESCRIPTION	DWG. SIZE	PART No.	Q'ty	WEIGHT
7	SELF SEATING EXTERNAL RETAINING RING		017603	4	
6	CRS SHAFT		–	1	
5	CRS SHAFT		–	1	
4	EXTENSION SPRING		403118	1	
3	BELT ROLLER		436421	2	
2	BEARING PLATE		430022	2	
1	BELT IDLER ROLLER BRACKET		436420	1	

REMARKS:

REMARKS:

BELT IDLER ROLLER ASSEMBLY

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2270 INDUSTRIEL, LAVAL
QUEBEC, CANADA, H7S 1P9
TEL.: (450) 667-9769

DATE: NOV-19-2002

SCALE: 1 : 4

DRAWN BY: ROGER F.

MACHINE TYPE: SP-2.1

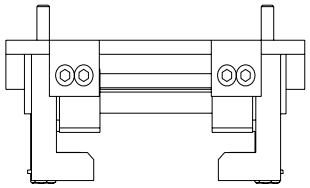
CHECKED BY:

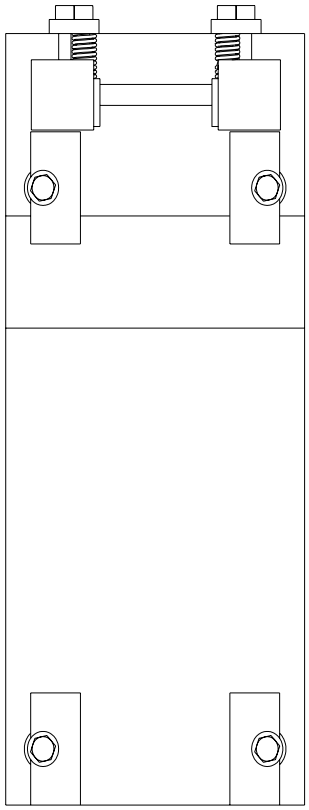
DRAWING SIZE: A

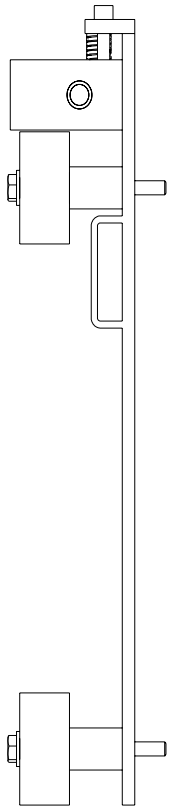
ASSEMBLY DWG.: 436404

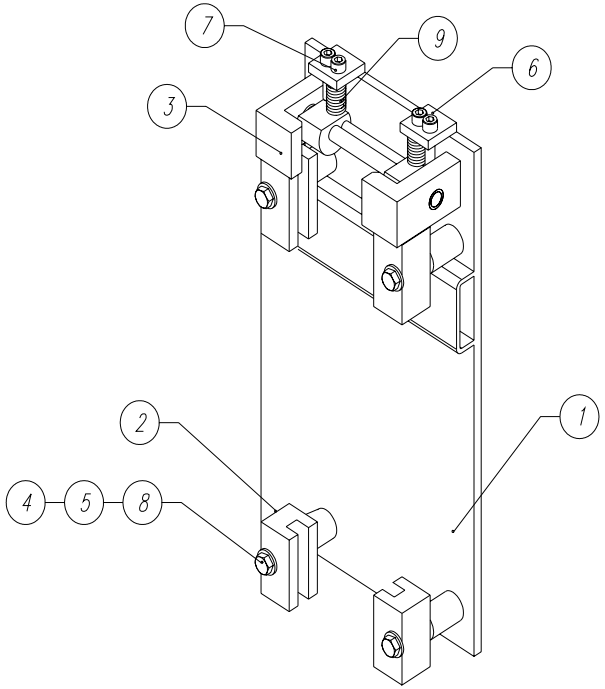
JOB No.: 12812

DRAWING No.: 436413M









No.	DESCRIPTION	DWG. SIZE	PART No.	Q'ty	WEIGHT
9	SPRING		013995	2	
8	FLAT WASHER		012221	4	
7	SOCKET CAP SCREW		017398	2	
6	SOCKET CAP SCREW		014254	2	
5	HEX CAP SREW		018276	4	
4	SPACER		434102	4	
3	SAFETY LOCK		430031	1	
2	SLIDE BEARING		439161	4	
1	CARRIAGE ATTACHMENT BACK PLATE		430028	1	

REMARKS:

REMARKS:

CARRIAGE ATTACHMENT ASSEMBLY

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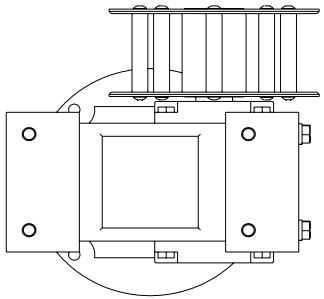
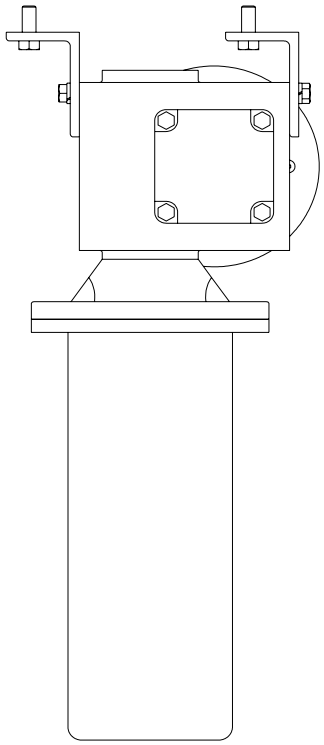
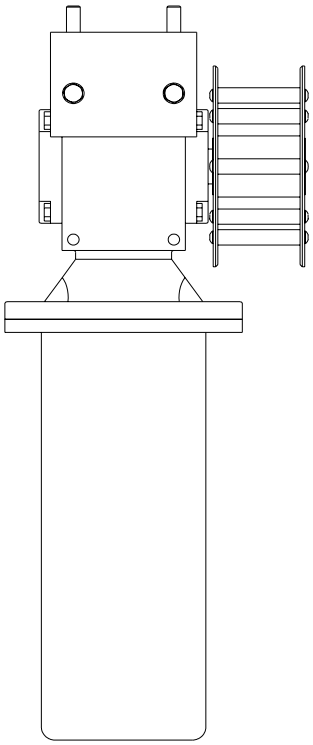
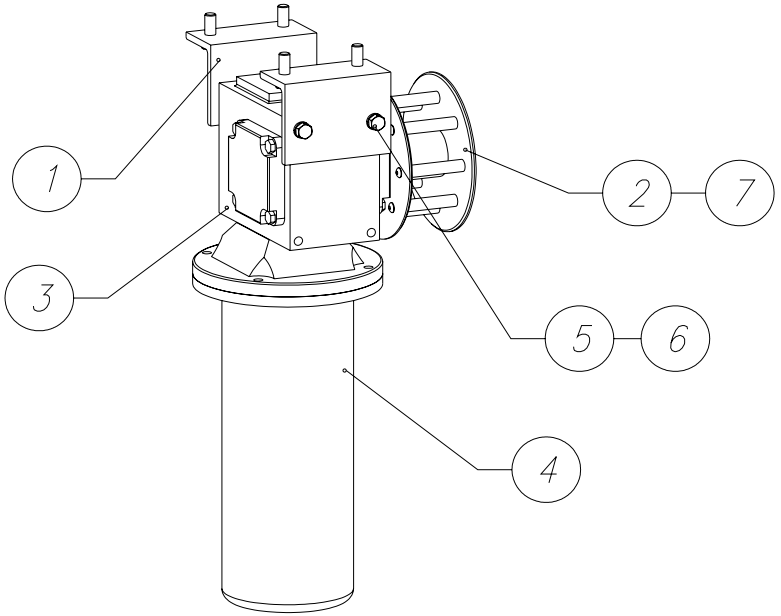
PACKAGING INC.
2270 INDUSTRIEL, LAVAL
QUEBEC, CANADA, H7S 1P9
TEL.: (450) 667-9769

DATE: MAR-25-2002		SCALE: 1 : 2.5
DRAWN BY: ROGER F.		MACHINE TYPE: SPECTRA
CHECKED BY:		DRAWING SIZE: B
ASSEMBLY DWG.: 4300011	JOB No.: 11295	DRAWING No.: 430020M









No.	DESCRIPTION	DWG. SIZE	PART No.	Q'ty	WEIGHT
7	KEY		012295	1	
6	LOCK WASHER		012724	4	
5	HEX SCREW		010316	4	
4	EL. MOTOR		010036	1	
3	REDUCER		010986	1	
2	BELT WHEEL		430024	1	
1	REDUCER BRACKET		436439	2	

REMARKS:

REMARKS:

CARRIAGE BELT DRIVE

orion
PACKAGING INC.
2270 INDUSTRIEL, LAVAL
QUEBEC, CANADA, H7S 1P9
TEL.: (450) 667-9769

DATE: DEC-18-2002

SCALE: 1 : 6

DRAWN BY: ROGER F.

MACHINE TYPE: SP-2.1

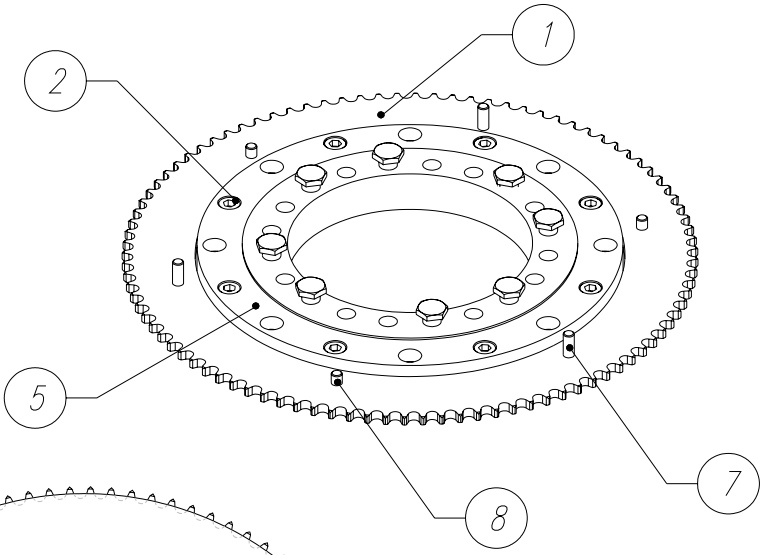
CHECKED BY:

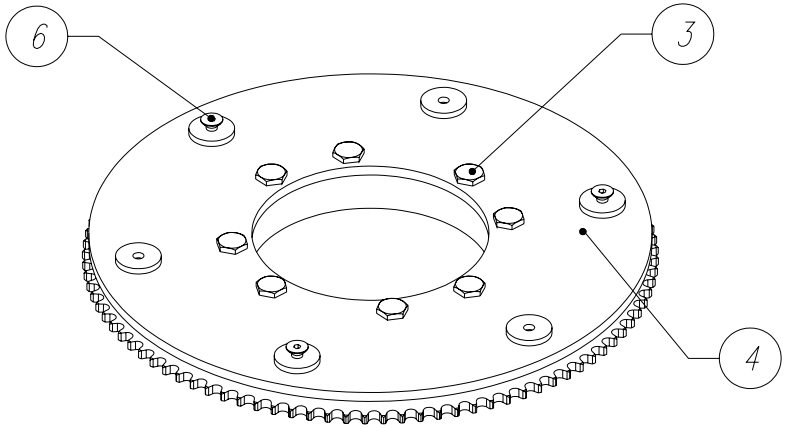
DRAWING SIZE: A

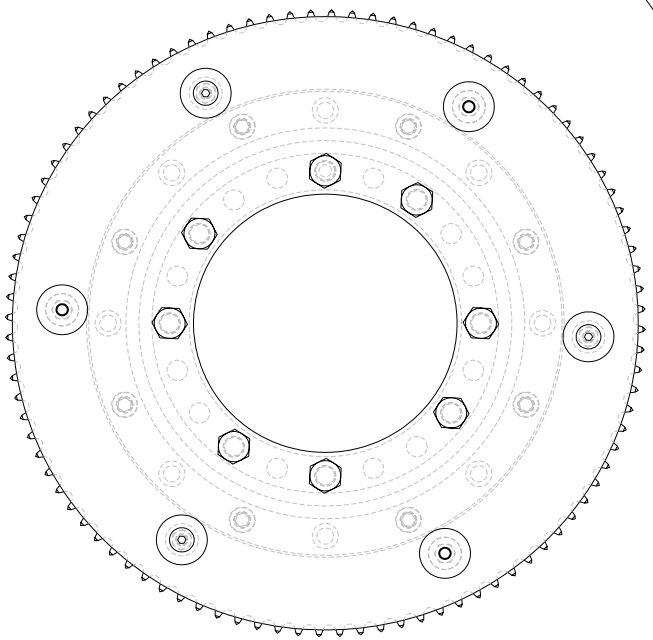
ASSEMBLY DWG.: 436404

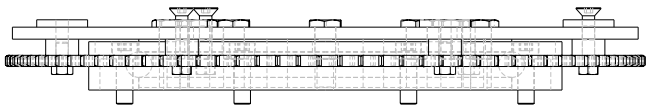
JOB No.: 12812

DRAWING No.: 436414M









ITEM	DESCRIPTION	FILE,PART NO. OR MATERIAL	Q'TY Q'TE	WEIGHT POIDS
8	HEX HEAD SCREW	016112	3	
7	HEX HEAD SCREW	014668	3	
6	FLAT HEAD SCREW	014157	3	
5	RING-BEARING	017801	1	
4	LPA-TT SUPPORTING DISK	LA66-13578-BA-210-00-A-A	1	
3	SPECIAL HEX HEAD SCREW	LA66-13578-BA-200-04-A-A	8	
2	SPECIAL SOCKET CAP SCREW	LA66-13578-BA-200-03-A-A	8	
1	LPA-SPROCKET	LA66-13578-BA-200-01-A-A	1	

LPA-T.T. RING-BEARING ASSEMBLY | A | SCALE: ECHELLE: 1:6 | TOTAL WEIGHT-LBS: POIDS TOTAL-LBS: 76

orion
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QUEBEC, CANADA, H7S 1P9
TEL.: (450) 667-9769

PROJECTION

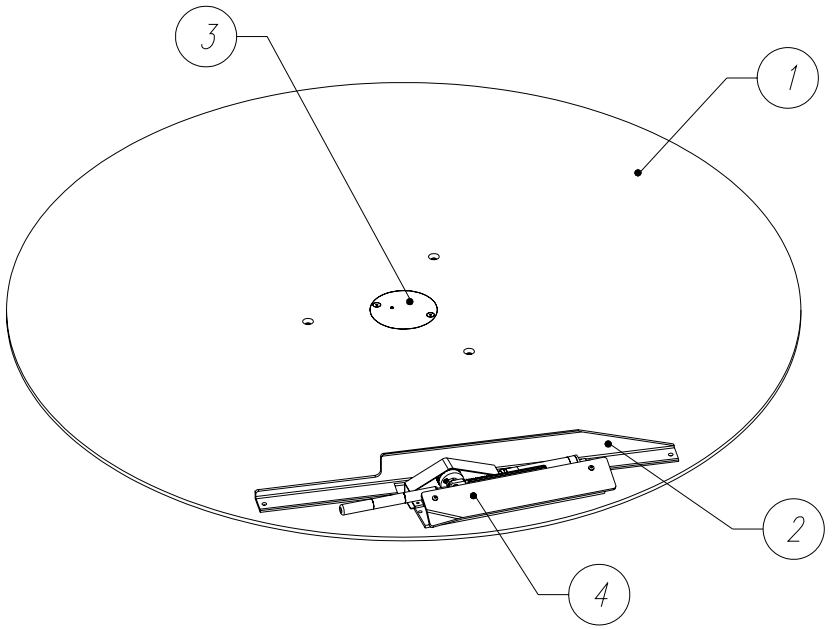
DRAWN BY: DESSINE PAR: ROGER F. | DATE: OCT-22-2003

CHECKED BY: VERIFIE PAR: - | DATE: -

Q'TY: Q'TE: 1

TOL. :± 1/32 OR ±.010 UNLESS OTHERWISE SPECIFIED

FILE: FICHIER: 13578-BA-200-00-A-AM



ITEM	DESCRIPTION	FILE,PART NO. OR MATERIAL	Q'TY Q'TE	WEIGHT POIDS
4	CLAMP ASSEMBLY	LA66-13786-FT-400-00-A-A	1	–
3	TURNTABLE PLUG ASSEMBLY	LA66-13578-TT-100-00-A-A	1	–
2	PALLET POSITIONER	LA66-13786-TT-000-02-A-A	1	–
1	SPECTRA-MAX TURNTABLE DISK	LA66-13786-TT-100-00-A-A	1	–

LPA-TURNTABLE ASSEMBLY | A | SCALE: ECHELLE: 1:16 | TOTAL WEIGHT-LBS: POIDS TOTAL-LBS: —

orion
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2270 INDUSTRIEL, LAVAL
QUEBEC, CANADA, H7S 1P9
TEL.: (450) 667-9769

PROJECTION

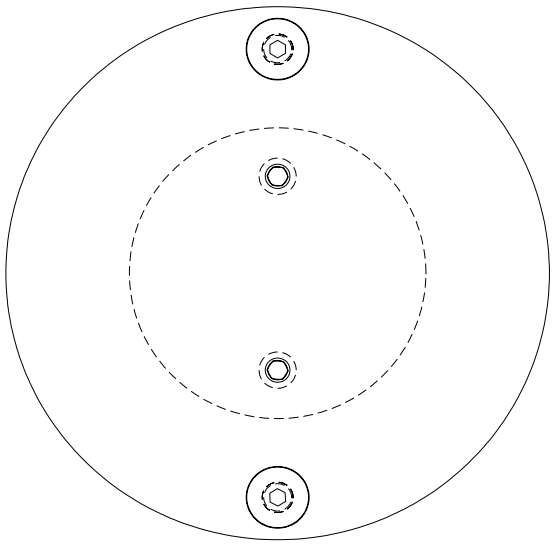
DRAWN BY: DESSINE PAR: ROGER F. | DATE: MAR-06-2004

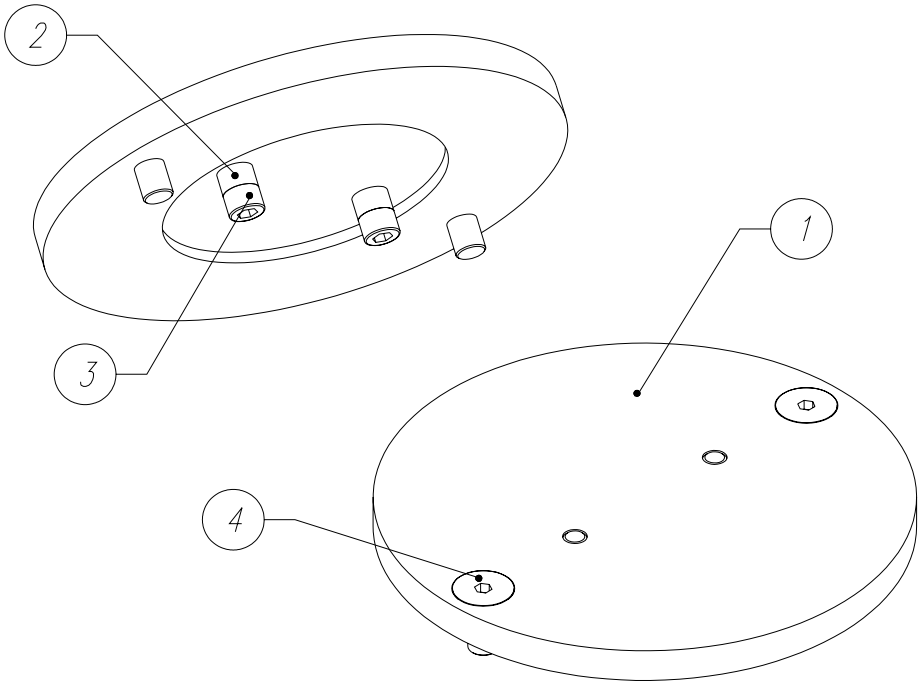
CHECKED BY: VERIFIE PAR: – | DATE: –

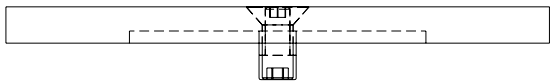
Q'TY: Q'TE: 1

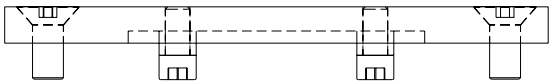
TOL. : ± 1/32 OR ± .010 UNLESS OTHERWISE SPECIFIED

FILE: FICHIER: 13786-TT-000-00-A-A









ITEM	DESCRIPTION	FILE,PART NO. OR MATERIAL	Q'TY Q'TE	WEIGHT POIDS
4	SOCK. HD FLAT SCREW	012693	2	
3	SOCK. HEAD CAP SCREW	016264	2	
2	SPACER	LA66-13578-TT-100-02-A-A	1	
1	HRS DISK	LA66-13578-TT-100-01-A-A	1	2.2

TURNTABLE PLUG ASSEMBLY | A | SCALE: ECHELLE: 1:2 | TOTAL WEIGHT-LBS: POIDS TOTAL-LBS: 2.2

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TEL.: (450) 667-9769

PROJECTION

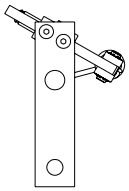
DRAWN BY: DESSINE PAR: ROGER F. | DATE: NOV-12-2003

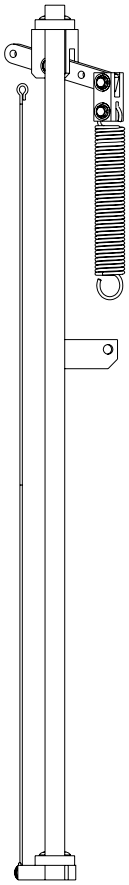
CHECKED BY: VERIFIE PAR: - | DATE: -

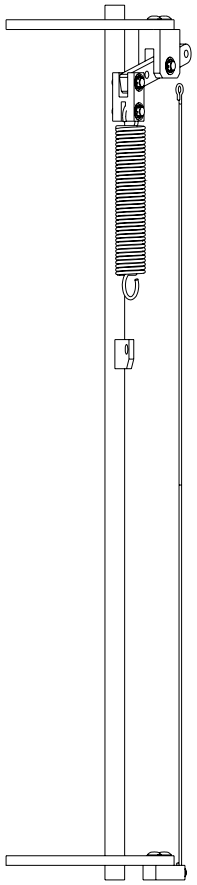
Q'TY: Q'TE: 1

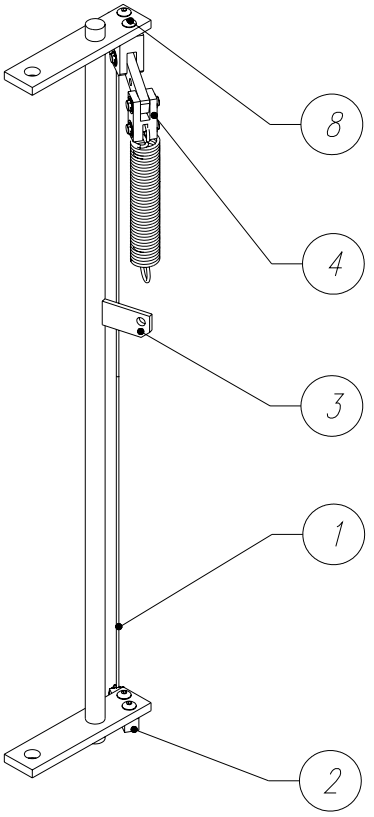
TOL. :± 1/32 OR ±.010 UNLESS OTHERWISE SPECIFIED

FILE: FICHIER: 13578-TT-100-00-A-AM









ITEM	DESCRIPTION	FILE,PART NO. OR MATERIAL	Q'TY Q'TE	WEIGHT POIDS
5	BUTTON HEAD SCREW	014313	6	
4	CUTTING WIRE ATTACHMENT	LA66-13578-FT-220-00-A-A	1	
3	CUTTER BRACKET	LA66-13786-FT-210-00-A-A	1	
2	WIRE ATTACHMENT	LA66-13578-FT-200-02-A-B	1	
1	CUTTING WIRE	LA66-13578-FT-200-01-A-A	1	

FILM CUTTER ASSEMBLY | A | SCALE: ECHELLE: 1:5 | TOTAL WEIGHT-LBS: POIDS TOTAL-LBS: —

orion
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TEL.: (450) 667-9769

PROJECTION

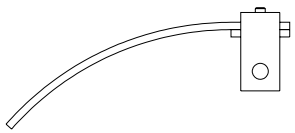
DRAWN BY: DESSINE PAR: ROGER F. | DATE: JAN-13-2004

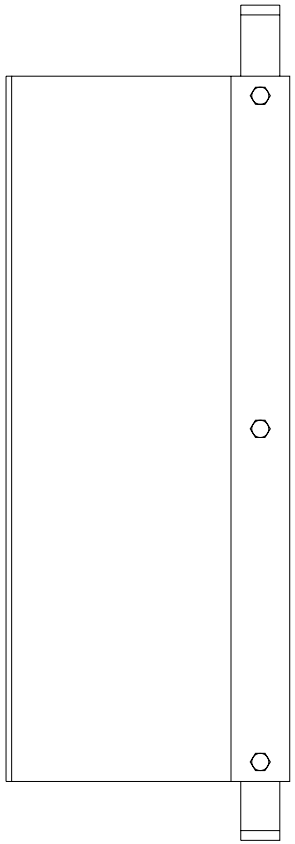
CHECKED BY: VERIFIE PAR: – | DATE: –

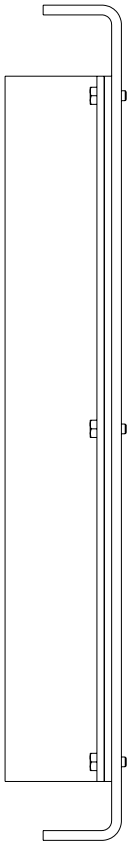
Q'TY: Q'TE: 1

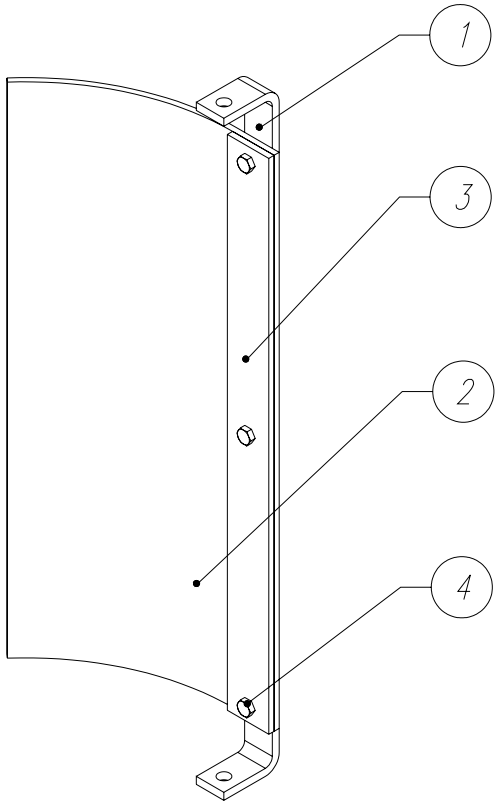
TOL. : ± 1/32 OR ± .010 UNLESS OTHERWISE SPECIFIED

FILE: FICHIER: 13786-FT-200-00-A-AM









ITEM	DESCRIPTION	FILE,PART NO. OR MATERIAL	Q'TY Q'TE	WEIGHT POIDS
4	HEX SCREW	015009	2	
3	20" FLAT BAR	417541 A	1	
2	FILM WIPER	LA66-13786-FT-500-02-A-A	1	
1	FILM BRUSH BRACKET	LA66-13786-FT-500-01-A-A	1	

FILM BRUSH ASSEMBLY | A | SCALE: ECHELLE: 1:5 | TOTAL WEIGHT-LBS: POIDS TOTAL-LBS: —

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TEL.: (450) 667-9769

PROJECTION

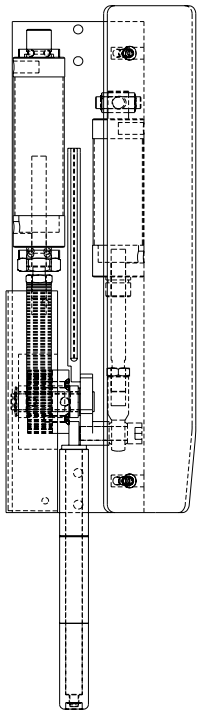
TOL. :± 1/32 OR ±.010 UNLESS OTHERWISE SPECIFIED

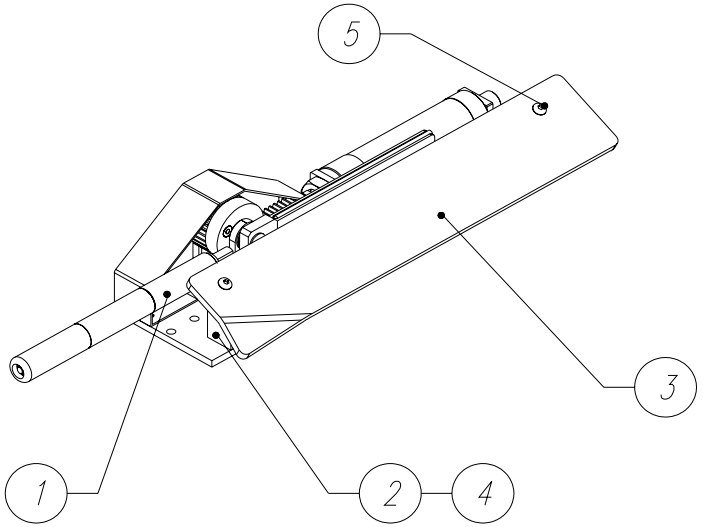
DRAWN BY: DESSINE PAR: ROGER F. | DATE: JAN-13-2004

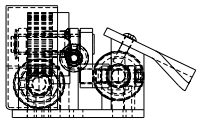
CHECKED BY: VERIFIE PAR: – | DATE: –

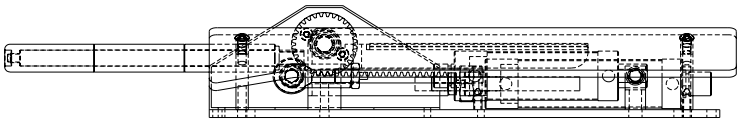
Q'TY: Q'TE: 1

FILE: FICHIER: 13786-FT-500-00-A-AM









ITEM	DESCRIPTION	FILE,PART NO. OR MATERIAL	Q'TY Q'TE	WEIGHT POIDS
5	BUTTON HEAD SCREW	017305	2	
4	FLAT HEAD SCREW	017399	2	
3	CLAMP GUARD	LA66-13786-FT-400-02-A-A	1	
2	CLAMP GUARD POST	LA66-13786-FT-400-01-A-A	2	
1	CLAMP ASSEMBLY 90-180	MA33-12330-FT-100-00-B-C	1	

FILM CALMP ASSEMBLY

A

SCALE: ECHELLE: 1:8

TOTAL WEIGHT-LBS: POIDS TOTAL-LBS: —

Q'TY: Q'TE: 1

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QUEBEC, CANADA, H7S 1P9
TEL.: (450) 667-9769

PROJECTION

DRAWN BY: DESSINE PAR: ROGER F.

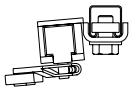
DATE: JAN-19-2004

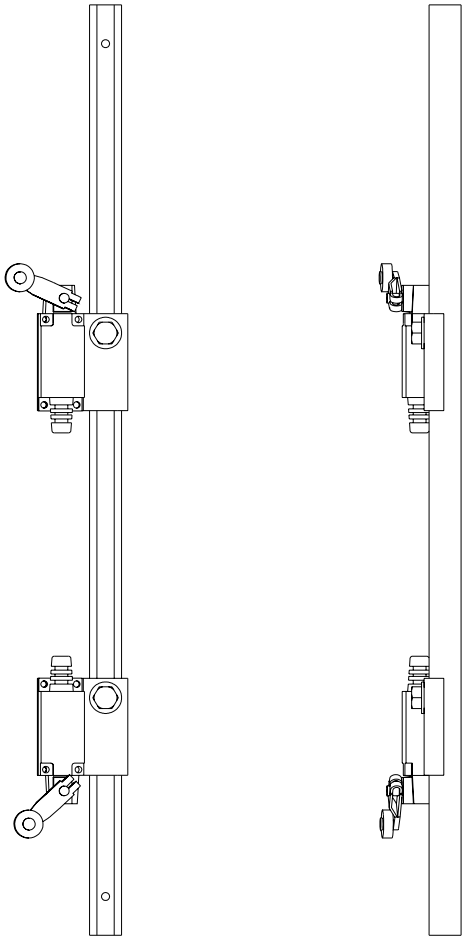
CHECKED BY: VERIFIE PAR: –

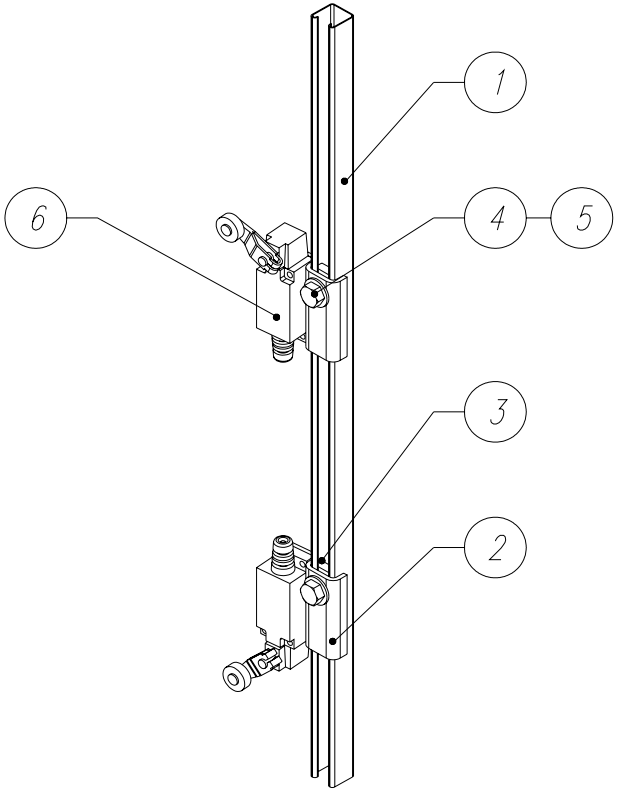
DATE: –

TOL. : ± 1/32 OR ± .010 UNLESS OTHERWISE SPECIFIED

FILE: FICHIER: 13786-FT-400-00-A-AM







ITEM	DESCRIPTION	FILE,PART NO. OR MATERIAL	Q'TY Q'TE	WEIGHT POIDS
6	VL LIMIT SWITCH	–	2	
5	LOCK WASHER	011390	2	
4	HEX SCREW	012474	2	
3	CHANNEL GUIDE	427690 A	2	
2	LIMIT SWITCH BRACKET	LA66-13578-TO-200-02-A-A	2	
1	CHANNEL	LA66-13578-TO-200-01-A-A	1	

BOTTOM LIMITS SWITCHES ASSEMBLY | A | SCALE: ECHELLE: 1:5 | TOTAL WEIGHT-LBS: POIDS TOTAL-LBS: –

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2270 INDUSTRIEL, LAVAL
QUEBEC, CANADA, H7S 1P9
TEL.: (450) 667-9769

PROJECTION

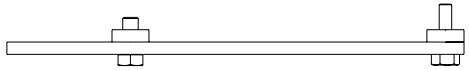
DRAWN BY: DESSINE PAR: ROGER F. | DATE: NOV-20-2003

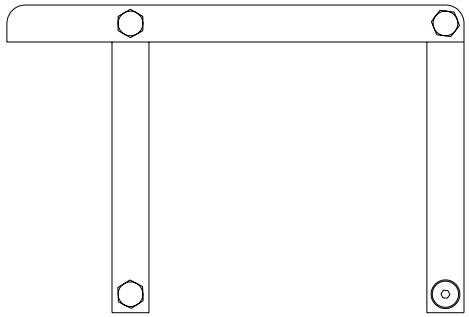
CHECKED BY: VERIFIE PAR: – | DATE: –

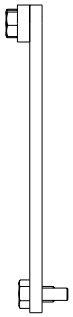
Q'TY: Q'TE: 1

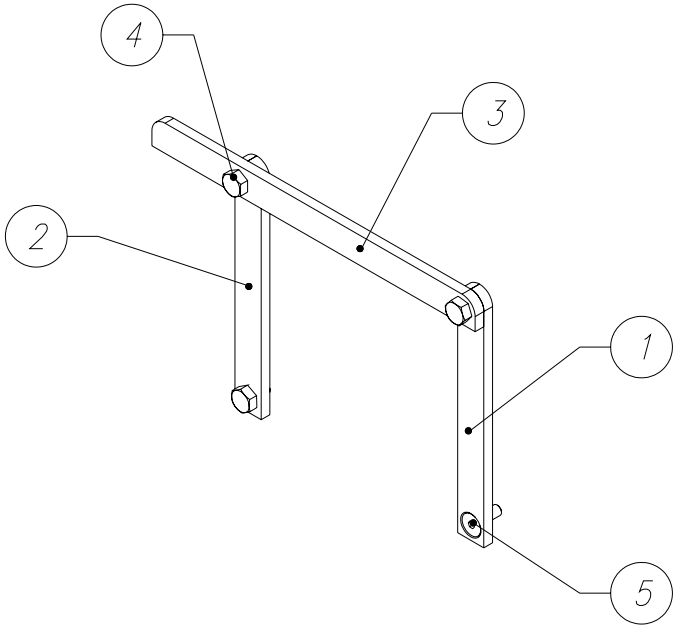
TOL. : ± 1/32 OR ± .010 UNLESS OTHERWISE SPECIFIED

FILE: FICHIER: 13578-TO-200-00-A-AM









No.	DESCRIPTION	DWG. SIZE	PART No.	Q'ty	WEIGHT
5	SOCKET FLAT HEAD SCREW		010260	1	
4	SCREW		013471	3	
3	ROPING BAR		436441	1	
2	ROPING BAR SUPPORT – 2		436443	1	
1	ROPING BAR SUPPORT – 1		436442	1	

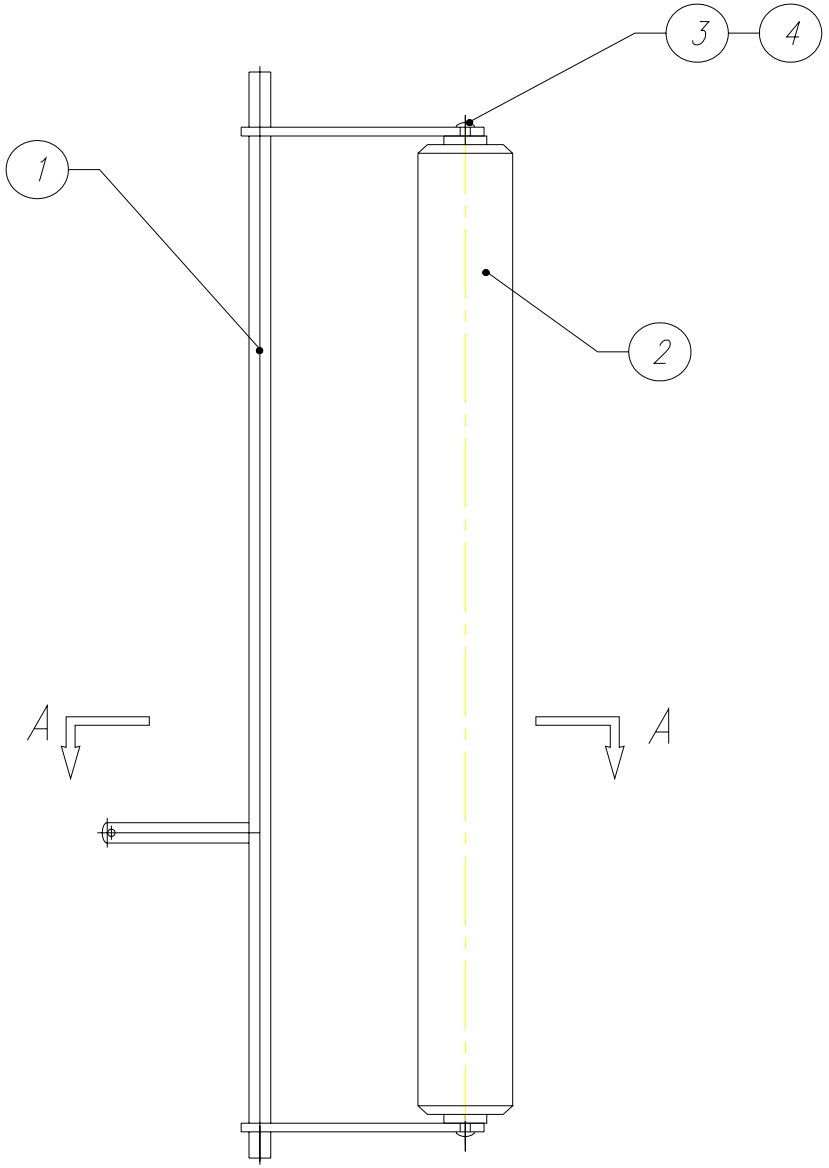
REMARKS:

REMARKS:

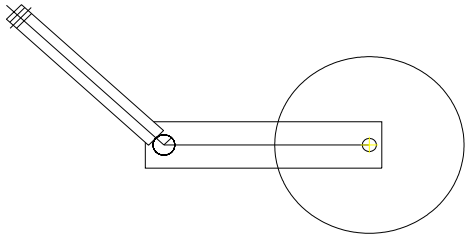
ROPING BAR ASSEMBLY

orion
PACKAGING INC.
2270 INDUSTRIEL, LAVAL
QUEBEC, CANADA, H7S 1P9
TEL.: (450) 667-9769

	DATE: OCT-27-2002	SCALE: 1 : 4
	DRAWN BY: ROGER F.	MACHINE TYPE: SP-2.1
	CHECKED BY:	DRAWING SIZE: A
ASSEMBLY DWG.: 436402	JOB No.: STD	DRAWING No.: 436405M



A – A



No.	DESCRIPTION	DWG. SIZE	PART No.	Q'ty	WEIGHT
4	BUTTON HEAD SCREW		014665	2	
3	FLANGE NUT		014164	1	
2	ALUMINIUM ROLLER		402789	1	
1	DANCER ROLLER CRADLE – 20 (FLR)		435541	1	

REMARKS:

REMARKS:

DANCER ROLLER ASSEMBLY – 20 (FLR)

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QUEBEC, CANADA, H7S 1P9
TEL.: (514) 667-9769

DATE: JAN-13-2003

SCALE: 1 : 4

DRAWN BY: ROGER F.

MACHINE TYPE: SPECTRA

CHECKED BY:

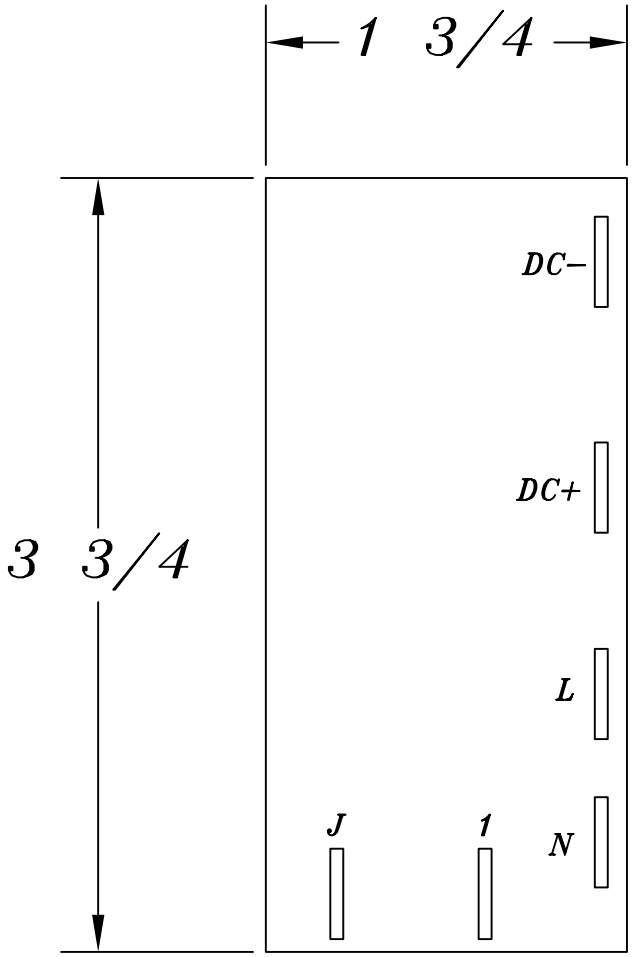
DRAWING SIZE: A

ASSEMBLY DWG.: 434006

JOB No.: 12237

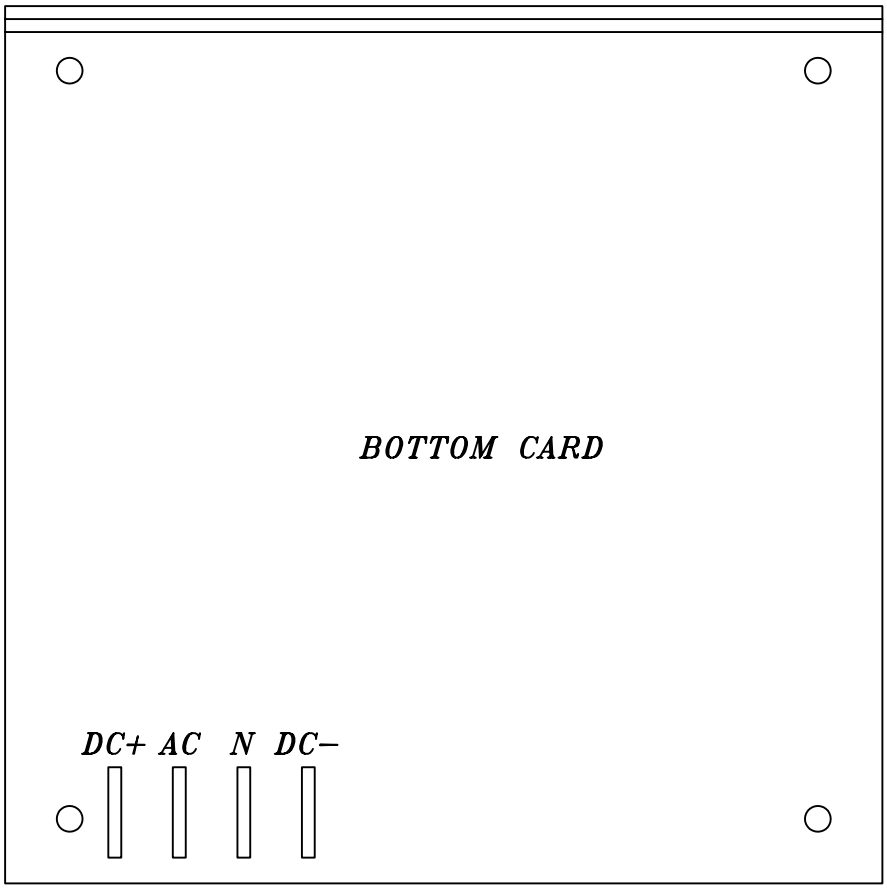
DRAWING No.: 435540M

APPENDIX



DC–: ARMATURE CONTROL.
DC+: ARMATURE CONTROL.
L: AC INPUT – LINE.
N: AC INPUT – NEUTRAL.
1: CONTROL – LINE.
J: CONTROL – COMMON.
(REQUIRES A JUMPER TO "N")

NEW STYLE
168–4 TWO SPEED 120VAC/90VDC
MOTOR CONTROL BOARD

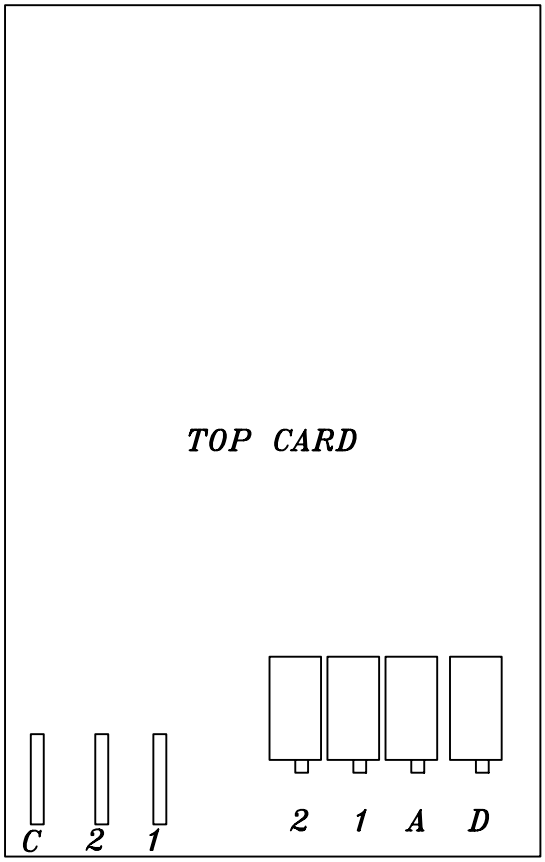


DC+: ARMATURE CONTROL.

AC: AC INPUT – LINE.

N: AC INPUT – NEUTRAL.

DC–: ARMATURE CONTROL.



1: CONTROL – LINE. LOW SPEED

1: LOW SPEED ADJ.

2: CONTROL – LINE. HIGH SPEED

2: HIGH SPEED ADJ.

C: CONTROL – COMMON.
(REQUIRES A JUMPER TO "N")

850M TWO SPEED 120VAC/90VDC MOTOR CONTROL BOARD

TURNTABLE & TOWER MOTOR CONTROL BOARD ADJUSTMENTS

66 & 55 SERIES EQUIPMENT (850M & 850DM Board)

INTRODUCTION

The 850M and 850 DM Motor Control Boards are DC/SCR drives that are used in 66 & 55 series Orion stretch wrapping equipment. The following calibration instructions apply to all 66 & 55 series turntable and rotary tower type machinery, but it will be important to note specific reference to your particular Orion model for best calibration results.

The 850M and 850DM boards feature two selectable pre-set speeds (1 & 2), and four potentiometers (marked 1,2,A and D).

The instructions are in the suggested order of adjustment, and intended to be made after installation of the board in the control enclosure. Please refer to the attached sketch of the board for identification of the adjustment points.

INSTALLATION

This unit is equipped with an aluminum chassis, which serves as a heatsink. This should be oriented with the printed circuit board in a vertical plane for optimum convection cooling.

Connectors are to .250" quick-disconnect terminals. Standard units require 120 VAC supply. AC line attaches to terminals **AC1**, **AC2**. Motor Armature attaches to terminals **DC+**, **DC-**. The standard unit is suitable for permanent magnet shunt style DC motors with 90 V armature rating.

ADJUSTMENTS

Acceleration: (RV3) The pot marked **A** is the control for the acceleration or electronic soft start feature.

For an initial setting, turn the **A** pot fully counter-clockwise (CCW) until a faint "clicking" sound is heard, then approximately 2 turns (or revolutions) clockwise (CW). CW adjustment of this potentiometer softens the start and lengthens the time required for the turntable/tower to reach its preset speed.

Speed Control: (RV1) The pot marked **1** controls the turntable/tower jog speed*1*.

Simply activate the turntable/tower jog function, adjusting the jog speed (pot 1) as The turntable/tower rotates. This should be set for approximately 2 to 3 RPM. Please note that this setting should be made with a load on the turntable (turntable type models only). A CW turn increases the jog speed, while CCW decreases jog speed.

Speed Control: (RV2) The pot marked **2** is the control for the high speed*2* for the turntable/tower during the wrap cycle once acceleration is complete.

This speed can be as high as 12 RPM. However, you should note that if it is set too high, you may see chopping of the current to the turntable/tower drive motor which will cause pulsating, half-speed operation of the turntable/tower drive itself. If this is seen, please decrease the setting of pot **2**, until it is no longer in effect.

For best calibration results, it is recommended that you make this adjustment while the machine is in cycle. After starting a wrap cycle, set the film carriage speed control to the "0" (minimum) position. This will prevent the film carriage from rising and completing its cycle. Then simply adjust the high speed (pot **2**) as the turntable/tower rotates. A CW turn increases speed, a CCW turn decreases speed.

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1 Speed Control 1 = Turntable/Tower Jog Speed
Selected by a 120 VAC signal applied from terminal (1) to (C)

2 Speed Control 2 = Turntable/Tower High Speed
Selected by a 120 VAC signal applied from terminal (2) to (C)

Deceleration: (RV4) The pot marked **D** is the deceleration control. Functionally, it is the opposite of acceleration, except that it is a more critical setting**,** in that our machine logic requires that we decelerate from speed 2 to speed 1 during the course of the final revolution of the turntable/tower before shutoff.

For an initial setting, start with the **D** pot set fully CCW. Then, cycling the machine; observe the transition to jog speed at the end of the cycle, prior to the stop of the turntable/tower at the home position. Gradually increase the **D** pot setting (CW) until the turntable/tower only jogs approximately 1/8 to 1/4 revolution before reaching home position. CW adjustment of this potentiometer quickens the stop and shortens the deceleration time required for the turntable/tower to settle to its preset jog speed. CCW softens the stop and lengthens the time required for the turntable/tower to settle to its preset jog speed.

Thus, the deceleration control is important in that if the deceleration time is too short, we will prematurely reach jog speed and jog an excessive amount of time to the home position before shutoff.

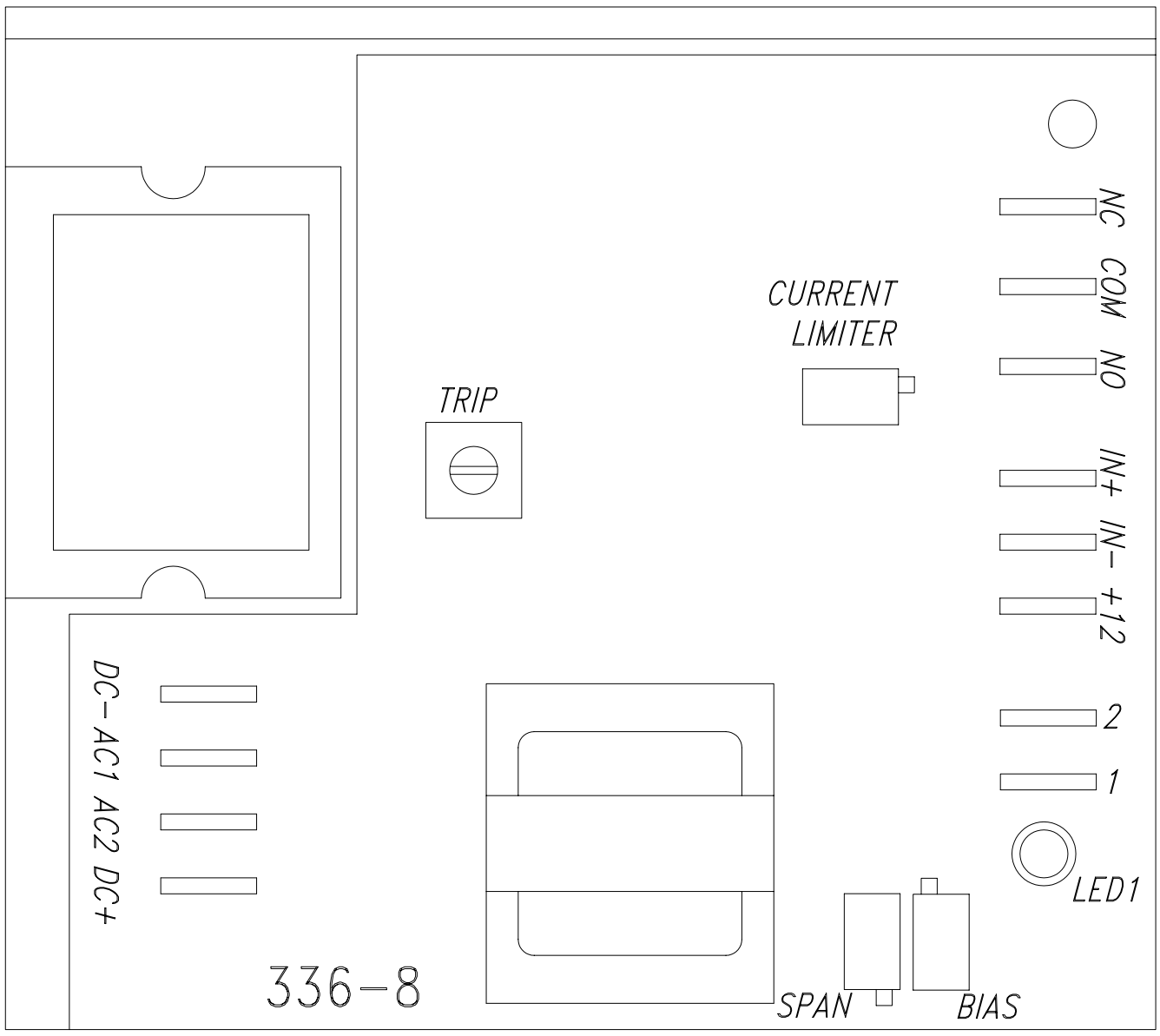
Conversely, if the deceleration time is set too long, the turntable/tower will not settle to the jog speed and thus will be going too fast to align properly and the momentum will take the turntable/tower beyond the start position. As you can imagine, any time the wrap speed is changed, you will need to make a corresponding change in the setting of the pot marked **D** (for deceleration).

Note: The 850DM requires a jumper from the **W** pin to the **CW** pin for speed 2 to operate.

TROUBLE SHOOTING & REPAIR

In most cases, repair will require parts replacement. If user intends to, and is equipped to perform repairs, spare parts are available from Orion Parts & Service.

Damage is usually visually evident on the 850M board. Replacing the obviously damaged board frequently restores operation. However, if damage is not evidently visible, swapping boards will determine if the board is at fault.



DC+: ARMATURE CONTROL

AC1: AC INPUT

AC2: AC INPUT

DC−: ARMATURE CONTROL

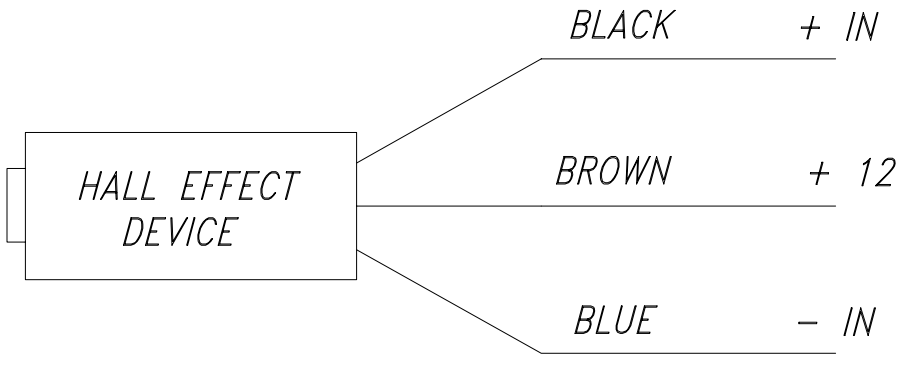
POTENTIOMETER

SPAN: HALL EFFECT SENSITIVITY CONTROL

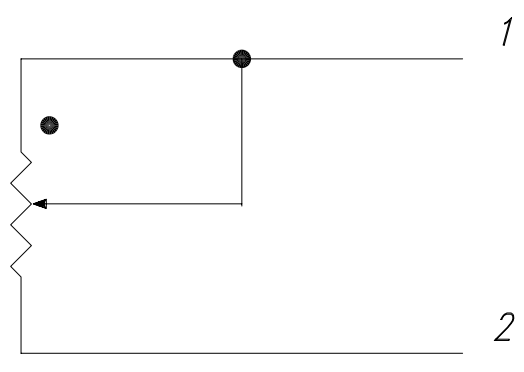
BIAS: SYSTEM BIAS (FACTORY SET)

TRIP: END OR BROKEN FILM SENSING CIRCUITRY. TRIP LEVEL (FACTORY SET)

CURRENT LIMITER: (FACTORY SET)



FILM TENSION ADJUSTMENT
REMOTE POTENTIOMETER



336−8
MULTISTRETCH BOARD

MULTISTRETCH MOTOR CONTROL BOARD CALIBRATION INSTRUCTIONS FOR 336-8/10 BOARD

Adjustments

Bias: (RV3) The **RV3** pot controls the system bias.

This control injects an offset voltage that adds or subtracts from the voltage reference defined by the External Tension Adjustment (Film Tension Potentiometer). This will allow extremes of adjustment to be set to levels consistent with proper operation. Typically, the bias will be used to center the operating range in linear portion of its characteristics.

Note: This adjustment is normally made at the factory and should not require field adjustment. For reference, the factory test procedure calls for a voltage setting of 1.3 volts DC at the cathode of Z1 (Zener Diode) achieved by adjusting the **RV3** pot.

Span: (RV1) The **RV1** pot controls the system loop gain.

The system loop gain may be adjusted if the motor continues to be energized when the dancer arm is unloaded and at rest. With the machine stopped, the pot should be adjusted to ensure that the motor is de-energized in this condition, and so that a light pull on the free end of the film causes the film to feed freely. CCW adjustment of this pot will increase the response time, in effect softening the motor tension response plus decreasing the maximum motor speed attainable. CW adjustment will decrease the response time, in effect sharpening the motor response time plus increasing the maximum motor speed attainable.

Current Limit: (RV4) The **RV4** pot controls the torque (amperage) that the 336 board will allow to the motor.

To protect the unit against damage should the motor stall, jam, or current demands exceed its rating, a current limiting circuit is included which keeps motor current at

a safe level regardless of motor load or input from the tension-arm. This pot is factory pre-set to suit ½ hp motors. Should changes be required in the field, proceed as follows: Monitor the motor current. Advance the pot slowly until the desired current is achieved. This should not exceed 125% of the motor nameplate rating. Do not stall the motor for more than a few seconds, or damage may occur.

Trip: The output relay located on SCR Board (Outputs: Com, NO, NC) is energized when the current flowing between **DC "+"** and **DC "-"** overshoots the level selected on the pot marked **"Trip."** It de-energizes when the current falls below the normal current by approximately 5% or when power to the board breaks.