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www.Eberbachlabtools.com

E6145.00 Orbital Shaker

Variable Speed with Timer and Tachometer

30-320 rpm, 115-230 V, 50/60 Hz

USE AND CARE FOR CATALOG NUMBER:

- E6145.00 Orbital Shaker Power Unit
Variable Speed 30-320 rpm with Timer and Tachometer
115-230V 50/60Hz

GENERAL INFORMATION

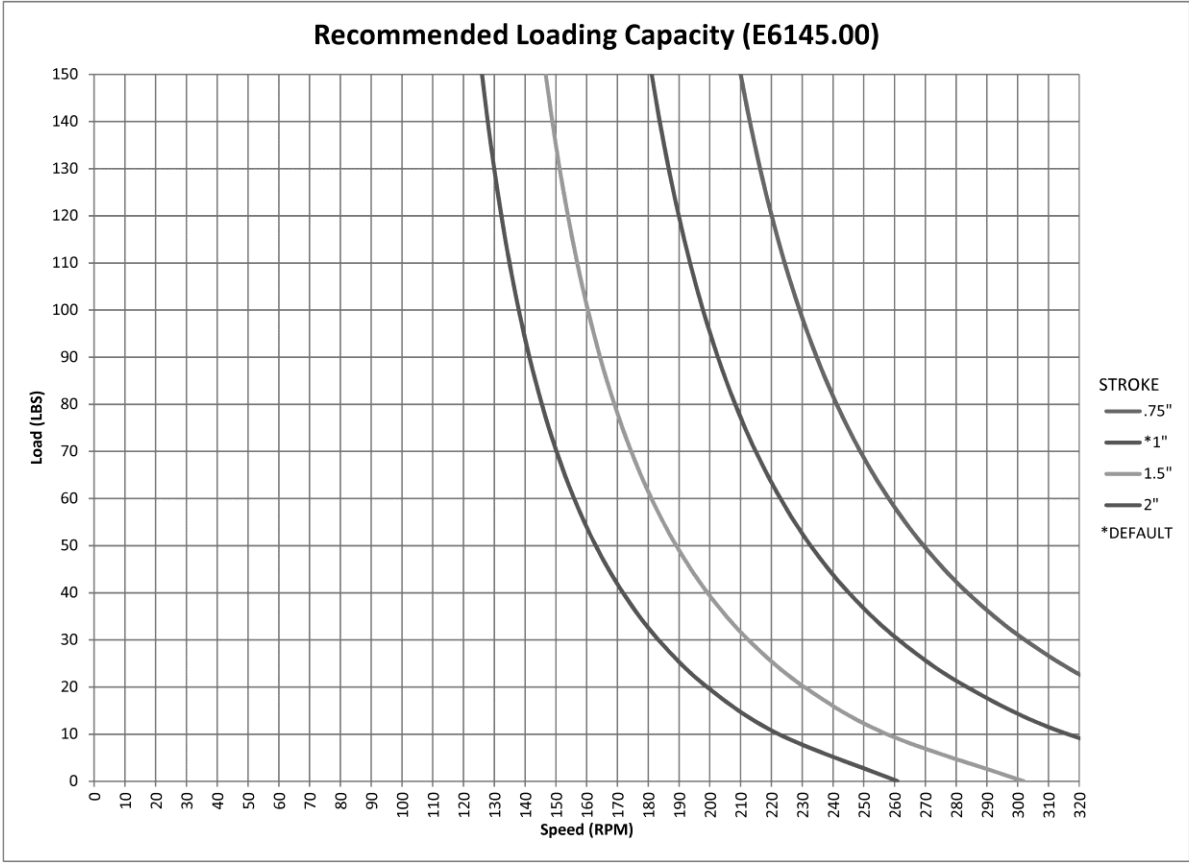
- Handle this unit with care. Unpack and check that the contents coincide with the packing-list. If any part is damaged or missing, please advise the distributor immediately.
- Do not install or use this equipment without first reading this manual.
- This manual should always be attached to the equipment and made available to all users.
- If you have any doubts or inquiries, please contact your supplier or ***Eberbach Corporation*** technical service.

OPERATION

The ***Eberbach*** orbital shaker catalog # ***E6145.00*** features:

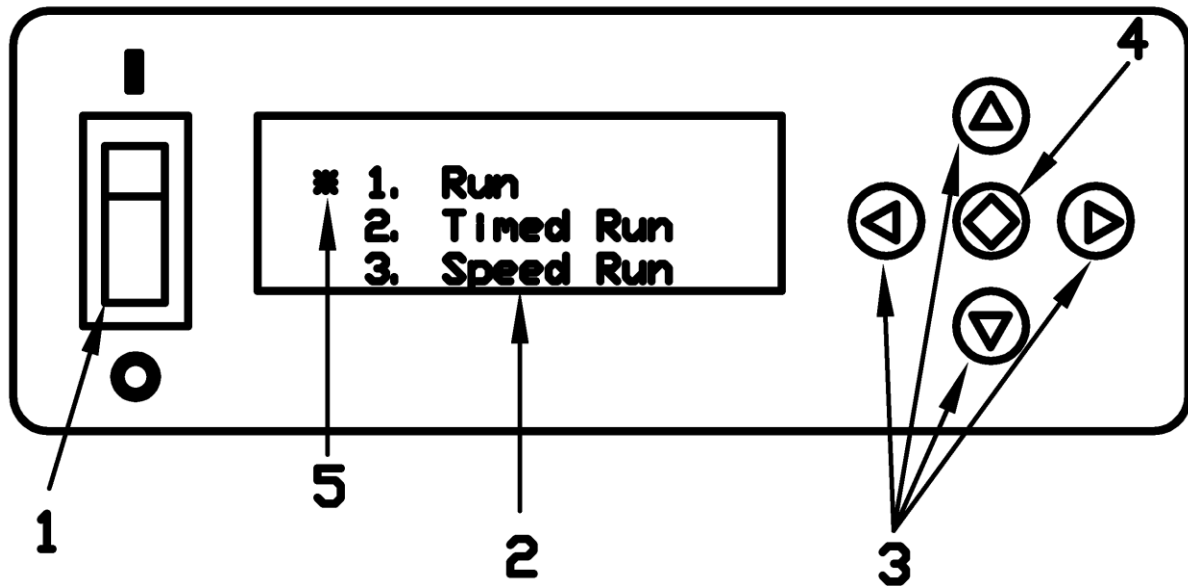
- A continuously variable speed range, adjustable between 30 and 320 rpm/min with stock orbit set to 1.0" (25.4mm).
- A digital tachometer and timer for simple and accurate use.
- See Load Graph on following page for recommended working load speeds.

See Graph Below For Maximum Load/Speed Recommendations Based on Orbit Diameter



Contact **Eberbach Corporation Technical Support** for other stroke setting weight limits.

FRONT PANEL DISPLAY



- 1) Power Switch
- 2) Liquid Crystal Display (LCD)
- 3) Directional Pad (D-Pad)
- 4) Enter Button
- 5) Cursor

Operation: Press the **Power Switch** down into the ON position. The **LCD** should light up and show the main menu. There are three different run modes to choose from. Select a run mode by moving the **Cursor** (using the **D-PAD**) and press the **Enter Button**.

Run Mode: The shaker will begin the run mode at its lowest speed. The speed shown in parenthesis (xxxx) is the set speed controlled by the user. The speed listed to the right is the tachometer read out or the actual speed of the shaker in real time. The speed can be increased/decreased by pressing and holding the up/down arrows on the **D-PAD**. The longer the button is held down the faster the speed will increase/decrease. Once engaged the timer will begin counting all the way up to 999 hours before the timer overflows back to zero. To pause the shaker move the **Cursor** to the PAUSE item by pressing the left arrow on the **D-PAD** and press the **Enter Button**. The clock will pause at its current time and the shaker will gradually come to a complete stop. The clock and shaker can be resumed at its current time and speed by selecting RESUME and pressing the Enter Button. To go back to the main menu move the **Cursor** to the EXIT item by pressing the right arrow on the **D-PAD** and then press the **Enter Button**.

RUN TIME	00: 00: 00
RPM	(100) 100
* PAUSE	EXIT

RUN MENU

Timed Run Mode: The timed run mode features a count down timer that automatically shuts the shaker off when the time runs out. When selected the user will be taken to the Timed Run Setup Menu and will need to input the run time in hours, minutes, seconds and select the speed for the run. The left/right arrows on the **D-PAD** can be used to move the cursor between hours, minutes or seconds and the up and down arrows can be used to set the time. The longest run time allowed is 999:59:59. Once the time is set move the **Cursor** down by pressing the right arrow on the **D-PAD** until the **Cursor** is next to the RPM line item. The speed can be set using the up and down arrows on the **D-PAD**. Now that the data is set navigate the **Cursor** to the START line item using the left/right arrows on the **D-PAD** and press the **Enter Button**.

TIMED RUN SETUP		
RUN TIME HR: MN: SC		
* RPM		100
START		EXIT

TIMED RUN SETUP MENU

After selecting START the shaker will begin at the selected speed and the timer will begin counting down. The speed can be adjusted in real time using the up/down arrows on the **D-PAD**. The speed shown in parenthesis is the target speed controlled by the user and the speed listed to the right is the actual speed as read by the tachometer. The shaker and countdown timer can be paused and resumed. Move the **Cursor** to the line item PAUSE by pressing the left arrow on the **D-PAD** and then press the **Enter Button**. Exiting the Timed Run Menu will bring the user back to the Timed Run Setup Menu.

RUN TIME	999: 59: 59
RPM	(100) 100
* PAUSE	EXIT

TIMED RUN MENU

Speed Run Mode: The speed run allows the user to program in a set run speed. Once engaged the timer will begin counting all the way up to 999 hours before the timer overflows back to zero. Select the speed run mode from the main menu and press the **Enter Button**. The user will be prompted with the speed run setup menu. Set the desired speed using the up/down arrows on the **D-PAD**. The left/right arrows can be used to move the **Cursor** between START and EXIT. EXIT will take the user back to the main menu. Keep the **Cursor** next to the START line item and press the **Enter Button**.

```
SPEED RUN SETUP

RPM                               100
* START                           EXIT
```

SPEED RUN SETUP MENU

The user will now be taken to the speed run menu. The shaker will begin at the speed selected in the setup menu. The speed run menu behaves in the same way as the run menu with one exception. Pressing EXIT will not take the user back to the main menu instead pressing EXIT will take the user back to the speed run setup menu.

```
RUN TIME 00: 00: 00
RPM      (< 100)    100
*PAUSE                                EXIT
```

SPEED RUN MENU

Error: Over Speed and No Tachometer

There are two basic Error conditions that will display during your Run. If the Tachometer value exceeds your Maximum Speed setting by over 10 RPM the main relay will be turned off. The Over Speed Error message will be flashed across the top line.

If the Tachometer should fail your machine will shut down for safety reasons. This can also be caused by a stalled motor or unplugged Tachometer cable. The No Tachometer Error message will be flashed across the top line. It is possible to run the machine without a Tachometer although the accuracy of the speed may vary. When prompted with the error select "Yes" to run the Machine in Open Loop mode. Although this is not recommended for Safety Reasons.

Note: All run menus will have two speeds listed. The leftmost speed will be displayed inside parenthesis. This is the target speed controlled by the user. The shaker will attempt to match this speed and should do so within ten seconds after making an adjustment. The rightmost speed is the tachometer reading, which shows the user what the shaker is actually running at. The tachometer reading will not necessarily match the target speed at all times, but is guaranteed to be within +/- 1% RPM.

Note: Reciprocating shakers will display OSC (oscillations) instead of RPM (revolutions per minute).

Note: Use slowest speed necessary to produce required shaking action.

If you have any doubts or inquiries concerning operation contact your supplier or Eberbach Corporation technical service.

LOADING:

It is impossible to outline the exact limitations for loading a shaker, as resulting shaking action is dependent upon several factors. Principal among these is the size and shape of the containers, speed, orbit radius, and the amount and type of material being shaken.

Basic considerations should be:

- Use lowest speed consistent with the required shaking action.
- At higher speed use less weight on platform.
- When using a tiered platform (one platform above the other), place equal load on each or, if possible, place heavier mass on lower platform and lighter on the top. If shaking action imparts a “whip” to the upper platform, then either the speed is too high or the load is too heavy on that platform.
- If shaker has tendency to “walk” on floor, then rubber feet should be secured to the floor using rubber or contact cement.

Good judgment in the selection of the factors will contribute to proper use of the shaker.

BELT INSPECTION:

Remove top plate and inspect belt annually and replace if actually broken or if the cords are exposed and frayed. In the case of a high duty cycle inspect every 6 months. Small outer fabric breaks are not harmful.

BELT REPLACEMENT AND ADJUSTMENT:

To replace belt, loosen motor mount screws and drop belt below both pulleys. Install new belt (Stock #4312) and tighten the motor screws but do not tighten belt to the point where the bearings will be overloaded. When belt is tight, the operator should be able to press lightly on the middle of the belt and cause it to bow in an amount equal to the width of the belt.

REPLACEMENT PARTS LIST FOR E6145.00

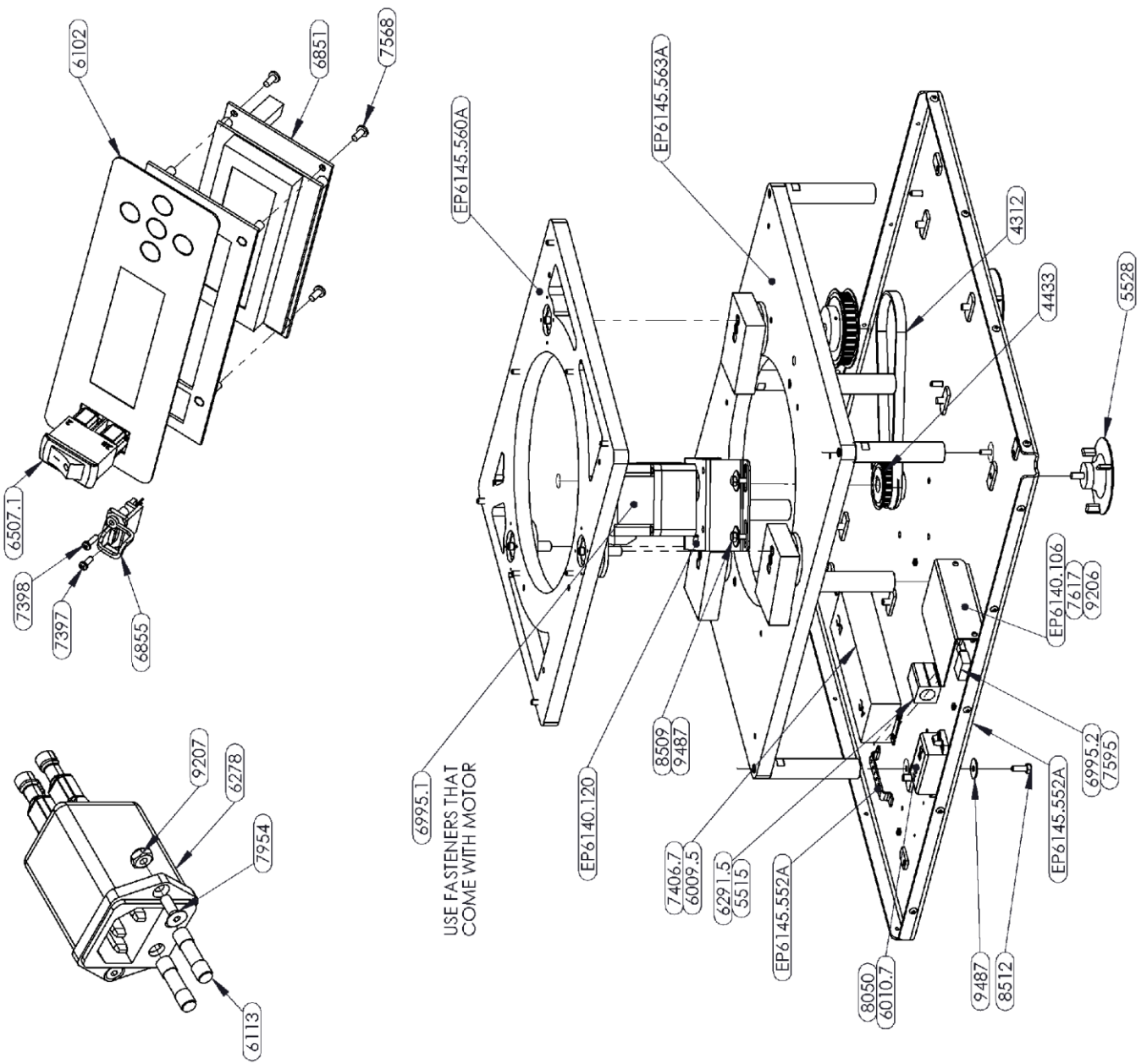
PartNo	DESCRIPTION	QTY.
4312	TIMING BELT	1
4433	L-PULLEY 18 TEETH X 18MM BORE	1
5515	3/4" W X 50 FT VELCRO STRIPS	2
5528	3.75" SUCTION CUP W/ 5/16-18 THREADED POST	8
6009.5	POWER SUPPLY, 24V 185W	1
6010.7	30W POWER SUPPLY	1
6063.1	CABLE TIE MOUNT, HOLE DIA (.025 - .125")	6
6063.2	CABLE TIE	8
6102	OVERLAY	1
6113	FUSE, TIME DELAY 3A	2
6278	AC INLET	1
6291.5	CLAMP ON SHIELD BEAD ASSEMBLY	1
6507.1	ROCKER SWITCH	1
6649	115V POWER CORD, TYPE B PLUG	1
6730	7 TERMINAL GROUNDING BLOCK	1
6851	DISPLAY BOARD	1
6855	USB BOARD	1
6995.1	MOTOR	1
6995.2	100W MOTOR CONTROLER (REPLACEMENT ONLY)	1
7397	#2-56 X 1/4" S/S PAN HD. MACHINE SCREW	1
7398	#2-56 X 5/16" S/S PAN HD. MACHINE SCREW	1
7406.7	#6-32 X 3/16" S/S PAN HD. MACHINE SCREW	4
7568	#4-40 X 1/4" S/S PAN HD. MACHINE SCREW	4
7595	#6-32 X 1/4" S/S ROUND HD. MACHINE SCREW	2
7954	#5-40 X 3/8" S/S FLAT HD. SOCKET SCREW	2
8050	#4-40 x 3/8" S/S PAN HD. MACHINE SCREW	4
8285	#8-32 X 1/4" S/S TRUST HD. SCREW	40
8509	1/4"-20 X 5/8" HEX HEAD SCREW	4

8512	1/4"-20 X 3/4" HEX HEAD SCREW	8
9207	#5-40 NYLON-INSERT HEX LOCKNUT	2
9235	#8-32 S/S MACHINE SCREW NUT	2
9487	1/4" OVERSIVE WASHER	12
EP6140.120	MOTOR MOUNT	1
EP6145.130	TOP PANEL ASSEMBLY	8
EP6145.432	LEFT SIDE PANEL	1
EP6145.433	RIGHT SIDE PANEL	1
EP6145.434	TOP PANEL	1
EP6145.552A	BASE ASSEMBLY	1
EP6145.553A	BACK PANEL ASSEMBLY	1
EP6145.554A	FRONT PANEL ASSEMBLY	1
EP6145.560A	UPPER BEARING LADDER ASSEMBLY	1
EP6145.563A	LOWER BEARING LADDER ASSEMBLY	1
EP6145.652A	WIRING HARNESS ASSEMBLY	1

PartNo	DESCRIPTION	QTY.
4312	TIMING BELT	1
4433	L-PULLEY 18 TEETH X 18MM BORE	1
5515	3/4" W X 50 FT VELCRO STRIPS	2
5528	3.75" SUCTION CUP W/ 5/16-18 THREADED POST	8
6009.5	POWER SUPPLY, 24V 185W	1
6010.7	POWER SUPPLY, 5V 30W	1
6063.1	CABLE TIE MOUNT	6
6063.2	CABLE TIE	8
6102	OVERLAY	1
6113	FUSE, TIME DELAY 3A	2
6278	AC INLET	1
6291.5	CLAMP ON SHIELD BEAD ASSEMBLY	1
6507.1	ROCKER SWITCH	1
6649	CORD AND PLUG	1
6851	DISPLAY BOARD	1
6855	USB BOARD	1
6995.1	MOTOR	1
6995.2	100W MOTOR CONTROLLER (REPLACEMENT ONLY)	1
7397	#2-56 X 1/4" S/S PAN HD. MACHINE SCREW	1
7398	#2-56 X 5/16" S/S PAN HD. MACHINE SCREW	1
7406.7	#6-32 X 3/16" S/S PAN HD. MACHINE SCREW	4
7568	#4-40 X 1/4" S/S PAN HD. MACHINE SCREW	4
7595	#6-32 X 1/4" S/S ROUND HD. MACHINE SCREW	2
7617	#6-32 X 1/2" S/S ROUND HD. MACHINE SCREW	2
7954	#5-40 X 3/8" S/S FLAT HD. SOCKET SCREW	2
8050	#4-40 X 3/8" S/S PAN HD. MACHINE SCREW	4
8285	#8-32 X 1/4" S/S TRUST HD. SCREW	40
8509	1/4"-20 X 5/8" HEX HEAD SCREW	4
8512	1/4"-20 X 3/4" HEX HEAD SCREW	8
9206	#6-32 S/S NYLON LOCK NUT	2
9207	#5-40 NYLON-INSERT HEX LOCKNUT	2
9235	#8-32 S/S MACHINE SCREW NUT	2
9487	1/4" OVERSIZE WASHER	12
EP6140.106	SPLASH GUARD MOTOR CONTROLLER	1
EP6140.120	MOTOR MOUNT	1
EP6145.130	TOP PANEL SEAL	8
EP6145.432	LEFT SIDE PANEL	1
EP6145.433	RIGHT SIDE PANEL	1
EP6145.434	TOP PANEL	1
EP6145.552A	BASE ASSEMBLY	1
EP6145.553A	BACK PANEL ASSEMBLY	1
EP6145.554A	FRONT PANEL ASSEMBLY	1
EP6145.560A	UPPER BEARING LADDER ASSEMBLY	1
EP6145.563A	LOWER BEARING LADDER ASSEMBLY	1
EP6145.652A	WIRING HARNESS ASSEMBLY	1

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PART NO. E6145.00		PRODUCTION		REV. C-01	
DATE 10-20-16		DRAWING STAMP		3D/CAD NO.	
ENG. 140LB		DATE		PART NO.	
APPR.		SCALE 1:1		MATERIAL	
1:8		3RD ANGLE PROJ		FUNCTION	
3RD ANGLE PROJ		3RD ANGLE PROJ		FUNCTION	
3RD ANGLE PROJ		3RD ANGLE PROJ		FUNCTION	

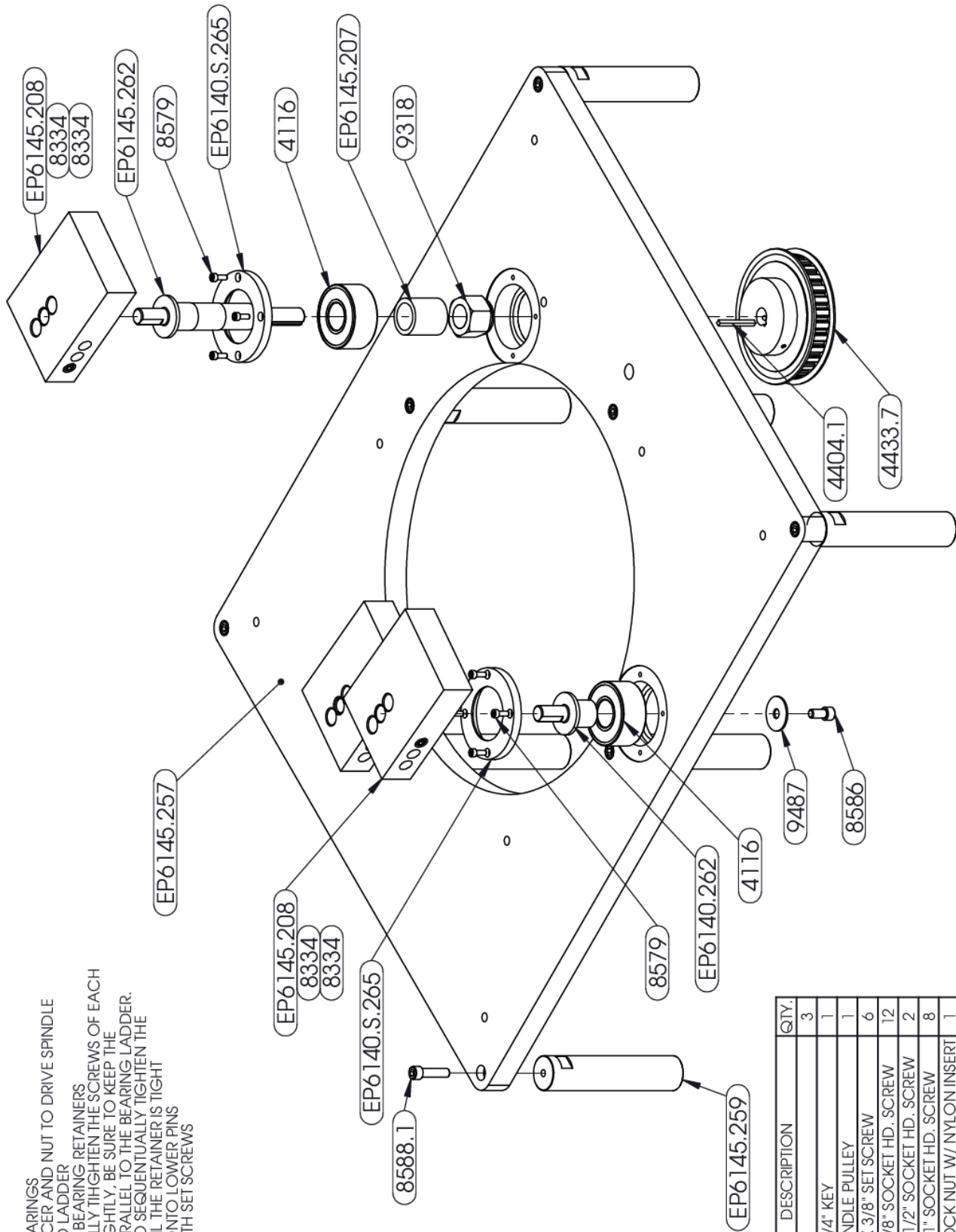


USE FASTENERS THAT COME WITH MOTOR

- LADDER ASSEMBLY PROCESS**
- ATTACH LOWER BEARING LADDER ASSEMBLY TO BASE
 - ALIGN ECCENTRICS
 - SLIP UPPER PINS INTO ECCENTRICS
 - FIX ECCENTRICS WITH SET SCREWS

ASSEMBLY PROCESS

- PRESS PINS INTO BEARINGS
- ADD BEARING SPACER AND NUT TO DRIVE SPINDLE
- SLIP BEARINGS INTO LADDER
- FIX BEARINGS WITH BEARING RETAINERS
- SEQUENTIALLY TIGHTEN THE SCREWS OF EACH RETAINER SLIGHTLY, BE SURE TO KEEP THE RETAINER PARALLEL TO THE BEARING LADDER. CONTINUE TO SEQUENTIALLY TIGHTEN THE SCREWS UNTIL THE RETAINER IS TIGHT
- SLIP ECCENTRICS ONTO LOWER PINS
- FIX ECCENTRICS WITH SET SCREWS

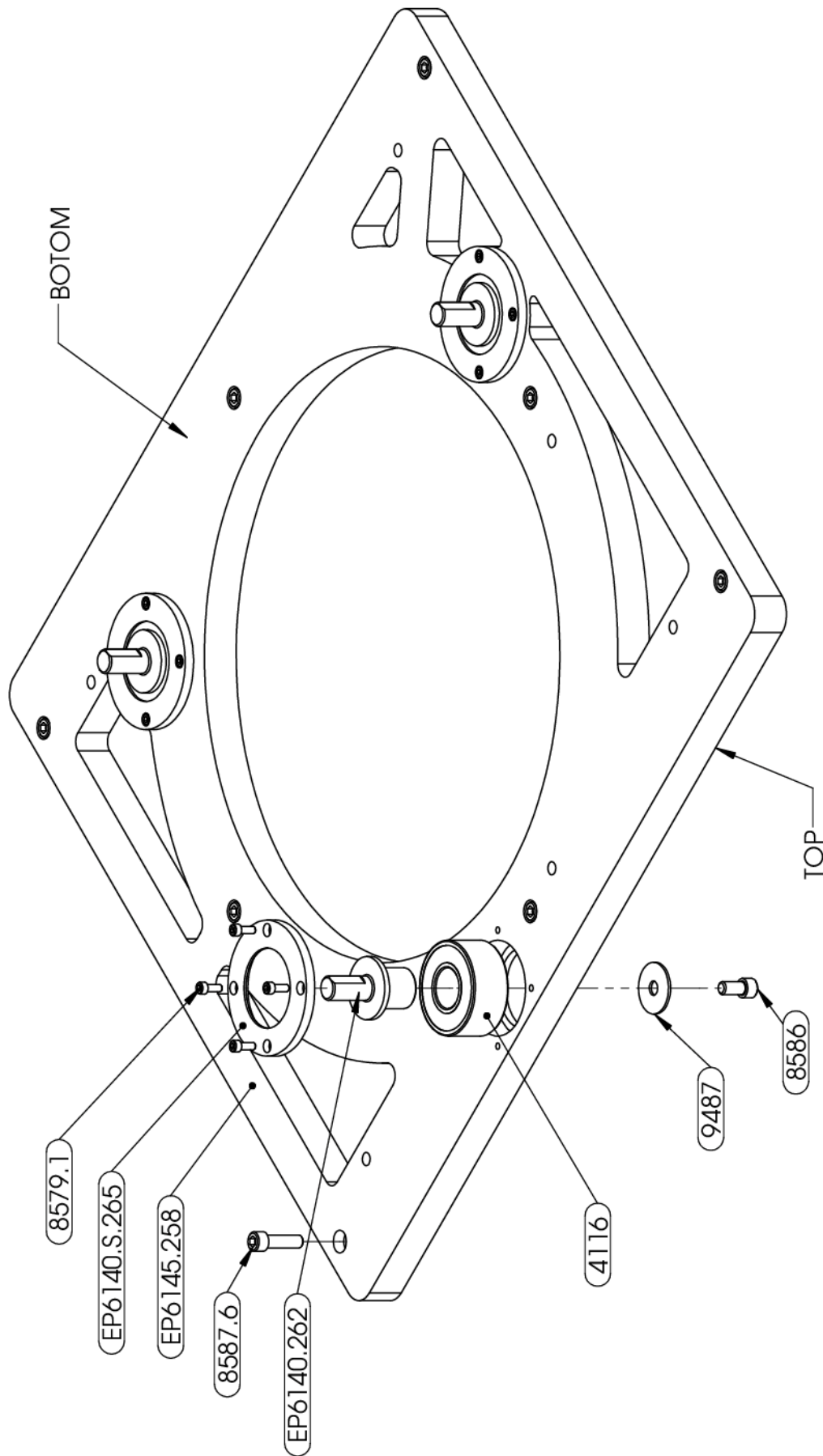


PartNo	DESCRIPTION	QTY.
4116	BEARING	3
4404.1	1/8" X 1-1/4" KEY	1
4433.7	DRIVE SPINDLE PULLEY	1
8334	5/16"-18 X 3/8" SET SCREW	6
8579	# 6-32 X 3/8" SOCKET HD. SCREW	12
8586	1/4"-20 X 1/2" SOCKET HD. SCREW	2
8588.1	1/4"-20 X 1" SOCKET HD. SCREW	8
9318	3/4"-16 LOCK NUT W/ NYLON INSERT	1
9487	1/4" OVERSIVE WASHER	2
EP6140.262	ECCENTRIC PIN	2
EP6140.S.265	BEARING RETAINER	3
EP6145.207	BEARING SPACER	1
EP6145.208	ECCENTRIC BLOCK	3
EP6145.257	LOWER BEARING LADDER	1
EP6145.259	LOWER LADDER SUPPORT	8
EP6145.262	SPINDLE	1

EBERBACH CORPORATION U.S.A.

DIMENSIONS ARE IN INCHES TOLERANCE UNLESS OTHERWISE SPECIFIED	
FRACTION	DECIMAL
1/16	X + 1
1/32	.XX + 01
1/64	.XXX + 005
ANGLE	+ .5°
3RD ANGLE PROJ.	

MATERIAL	STOCKING
ASSEMBLY	FINAL
SCALE	1:4
APPR	C.J.
DRW.	A
DATE	10/12/2018
WGT	39.31b
PART NAME	LOWER BEARING LADDER ASSEMBLY
PART NO.	EP6145.563A
REV.	A-01



PartNo	DESCRIPTION	QTY.
4116	BEARING	3
8579.1	#6-32 X 3/8" S/S SOCKET HD. SCREW	12
8586	1/4"-20 X 1/2" SOCKET HD. SCREW	3
8587.6	1/4"-20 X 7/8" SOCKET HD. SCREW	8
9487	1/4" OVERSIVE WASHER	3
EP6140.S.265	ECCENTRIC PIN	3
EP6140.S.265	BEARING RETAINER	3
EP6145.258	UPPER BEARING LADDER	1

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STOCKING

MATERIAL

FINAL

UPPER BEARING LADDER ASSEMBLY

PART NAME

PART NO.

PART NO.

DATE

15/19/2016

WGT

15.11b

APPR

C.J.

DPT.

DRW.

SCALE

1:3

3RD ANGLE PROJ.

DIMENSIONS ARE IN INCHES TOLERANCE UNLESS OTHERWISE SPECIFIED

FRACTION DECIMAL

1/16 .0625

1/8 .125

3/16 .1875

1/4 .25

5/16 .3125

3/8 .375

1/2 .5

5/8 .625

3/4 .75

7/8 .875

1 1.0

1 1/8 1.125

1 1/4 1.25

1 3/8 1.375

1 1/2 1.5

1 5/8 1.625

1 3/4 1.75

1 7/8 1.875

2 2.0

2 1/8 2.125

2 1/4 2.25

2 3/8 2.375

2 1/2 2.5

2 5/8 2.625

2 3/4 2.75

2 7/8 2.875

3 3.0

3 1/8 3.125

3 1/4 3.25

3 3/8 3.375

3 1/2 3.5

3 5/8 3.625

3 3/4 3.75

3 7/8 3.875

4 4.0

4 1/8 4.125

4 1/4 4.25

4 3/8 4.375

4 1/2 4.5

4 5/8 4.625

4 3/4 4.75

4 7/8 4.875

5 5.0

5 1/8 5.125

5 1/4 5.25

5 3/8 5.375

5 1/2 5.5

5 5/8 5.625

5 3/4 5.75

5 7/8 5.875

6 6.0

6 1/8 6.125

6 1/4 6.25

6 3/8 6.375

6 1/2 6.5

6 5/8 6.625

6 3/4 6.75

6 7/8 6.875

7 7.0

7 1/8 7.125

7 1/4 7.25

7 3/8 7.375

7 1/2 7.5

7 5/8 7.625

7 3/4 7.75

7 7/8 7.875

8 8.0

8 1/8 8.125

8 1/4 8.25

8 3/8 8.375

8 1/2 8.5

8 5/8 8.625

8 3/4 8.75

8 7/8 8.875

9 9.0

9 1/8 9.125

9 1/4 9.25

9 3/8 9.375

9 1/2 9.5

9 5/8 9.625

9 3/4 9.75

9 7/8 9.875

10 10.0

10 1/8 10.125

10 1/4 10.25

10 3/8 10.375

10 1/2 10.5

10 5/8 10.625

10 3/4 10.75

10 7/8 10.875

11 11.0

11 1/8 11.125

11 1/4 11.25

11 3/8 11.375

11 1/2 11.5

11 5/8 11.625

11 3/4 11.75

11 7/8 11.875

12 12.0

12 1/8 12.125

12 1/4 12.25

12 3/8 12.375

12 1/2 12.5

12 5/8 12.625

12 3/4 12.75

12 7/8 12.875

13 13.0

13 1/8 13.125

13 1/4 13.25

13 3/8 13.375

13 1/2 13.5

13 5/8 13.625

13 3/4 13.75

13 7/8 13.875

14 14.0

14 1/8 14.125

14 1/4 14.25

14 3/8 14.375

14 1/2 14.5

14 5/8 14.625

14 3/4 14.75

14 7/8 14.875

15 15.0

15 1/8 15.125

15 1/4 15.25

15 3/8 15.375

15 1/2 15.5

15 5/8 15.625

15 3/4 15.75

15 7/8 15.875

16 16.0

16 1/8 16.125

16 1/4 16.25

16 3/8 16.375

16 1/2 16.5

16 5/8 16.625

16 3/4 16.75

16 7/8 16.875

17 17.0

17 1/8 17.125

17 1/4 17.25

17 3/8 17.375

17 1/2 17.5

17 5/8 17.625

17 3/4 17.75

17 7/8 17.875

18 18.0

18 1/8 18.125

18 1/4 18.25

18 3/8 18.375

18 1/2 18.5

18 5/8 18.625

18 3/4 18.75

18 7/8 18.875

19 19.0

19 1/8 19.125

19 1/4 19.25

19 3/8 19.375

19 1/2 19.5

19 5/8 19.625

19 3/4 19.75

19 7/8 19.875

20 20.0

20 1/8 20.125

20 1/4 20.25

20 3/8 20.375

20 1/2 20.5

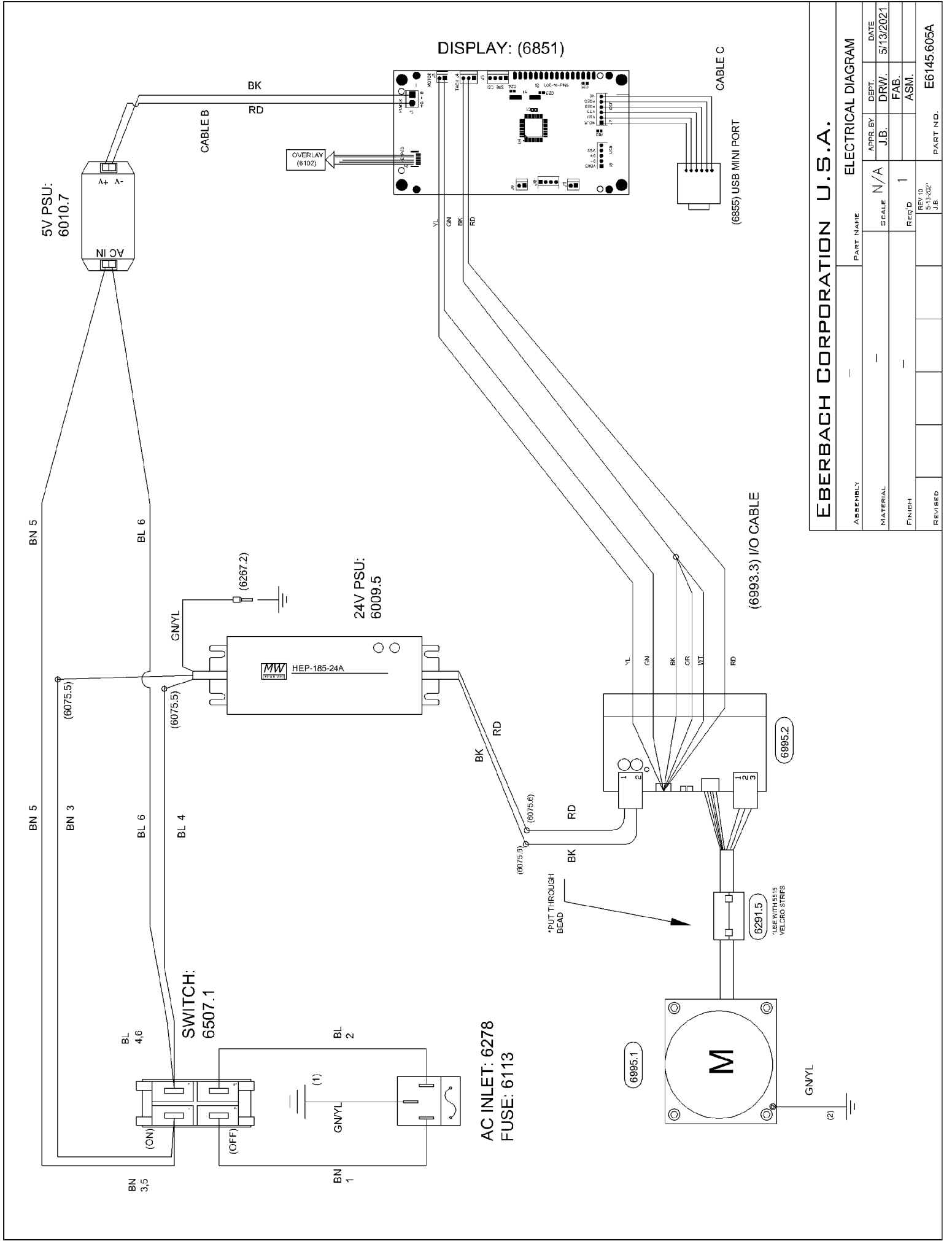
20 5/8 20.625

20 3/4 20.75

20 7/8 20.875

ASSEMBLY PROCESS

- PRESS PINS INTO BEARINGS
- SLIP BEARINGS INTO LADDER
- SEQUENTIALLY TIGHTEN THE SCREWS OF EACH RETAINER SLIGHTLY. BE SURE TO KEEP THE RETAINER PARALLEL TO THE BEARING LADDER. CONTINUE TO SEQUENTIALLY TIGHTEN THE SCREWS UNTIL THE RETAINER IS TIGHT



EBERBACH CORPORATION U.S.A.

ASSEMBLY		PART NAME		ELECTRICAL DIAGRAM	
SCALE	N/A	APPR. BY	J.B.	DEPT.	DATE
MATERIAL		DRW	5/13/2021	FAB.	
FINISH		REQ'D	1	ASM.	
REVISED		REV. 1.0	5-13-2021	J.B.	
					E6145.605A