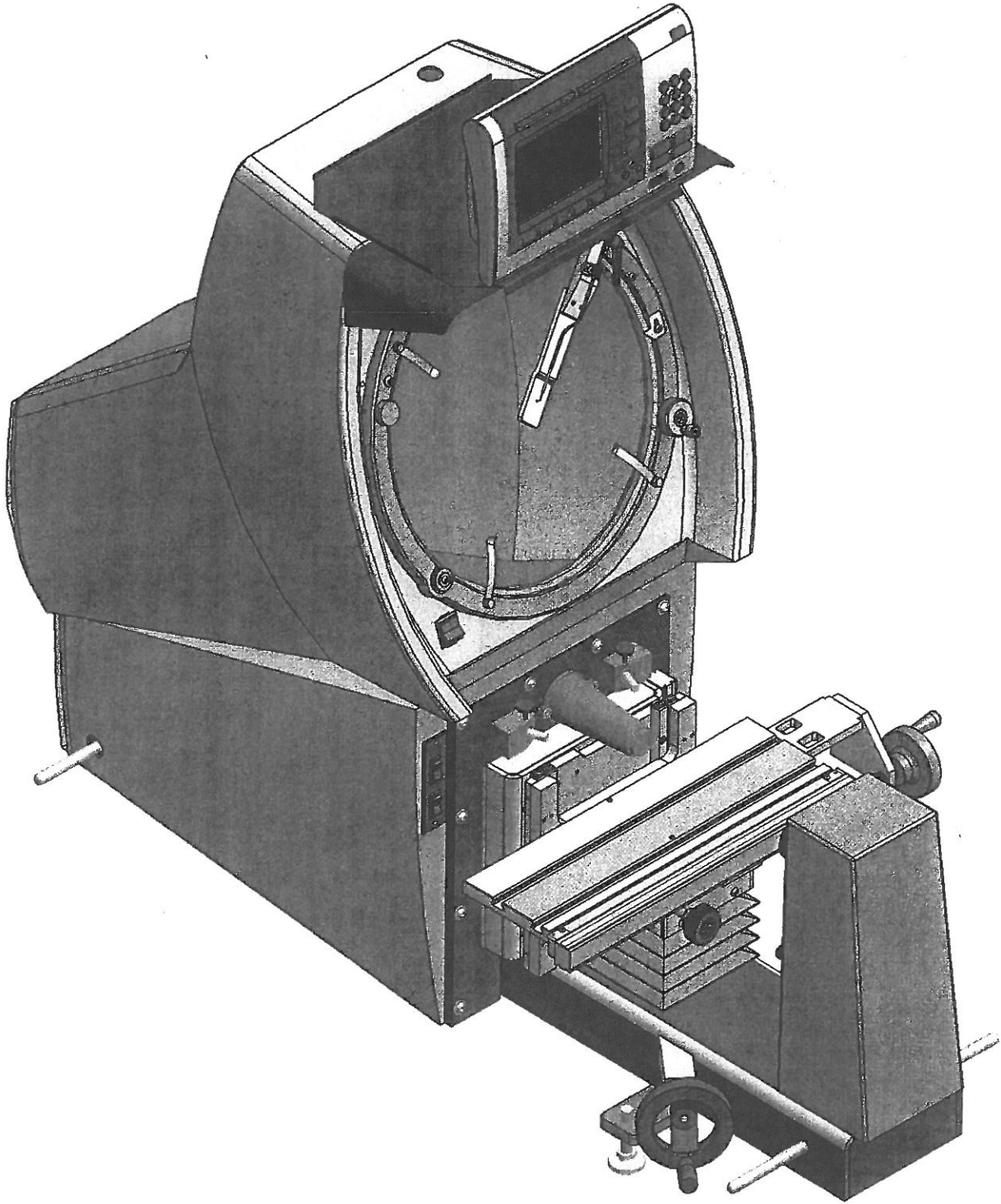


# INSTRUCTION MANUAL



14" HORIZONTAL BEAM OPTICAL COMPARATOR  
20-3500-3550 SERIES

MADE IN U.S.A.



# FEATURE IDENTIFICATION

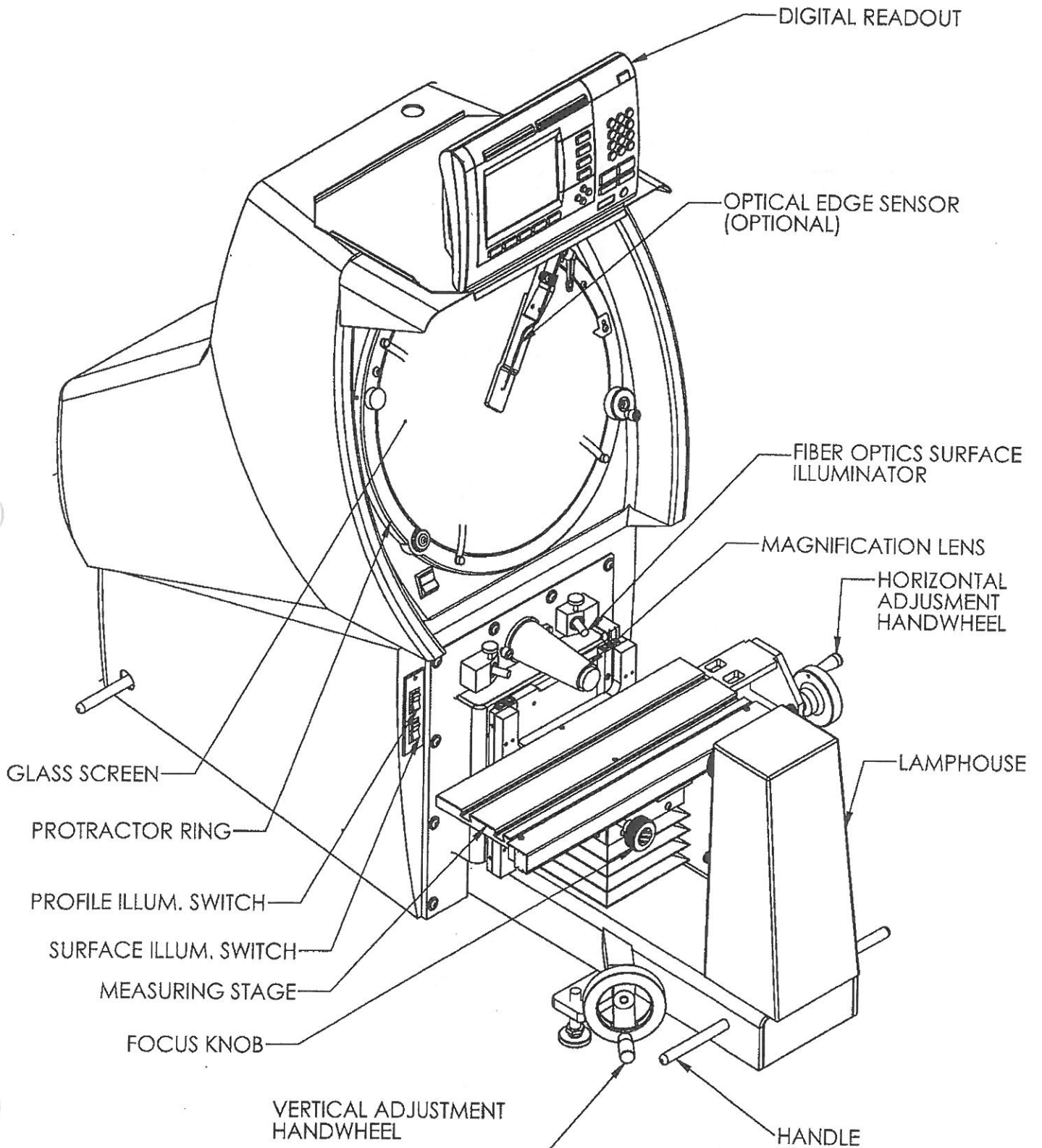
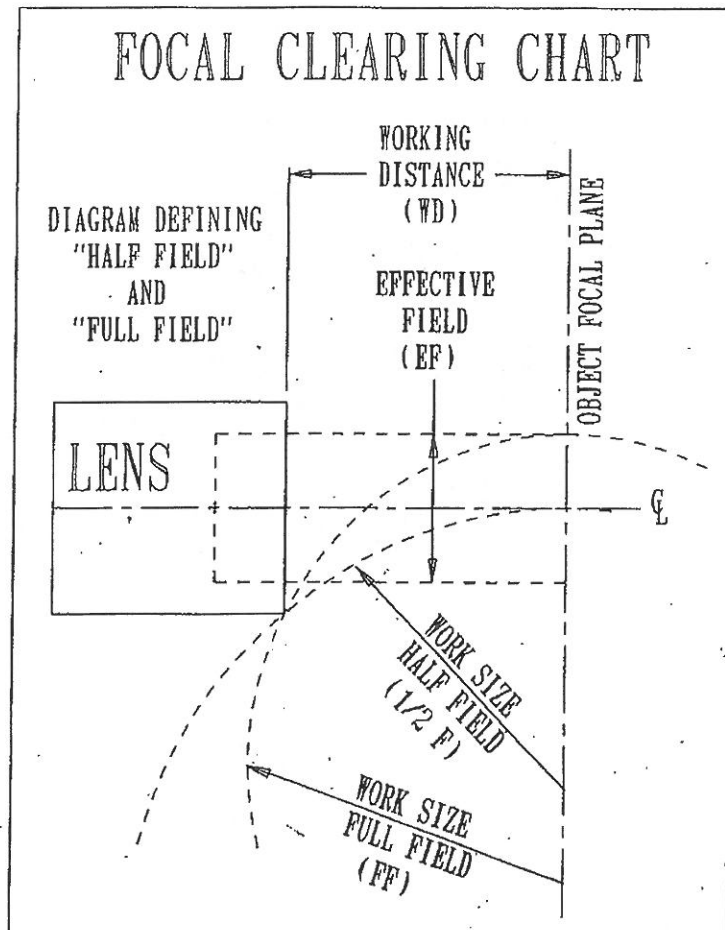


Figure 1

# Focal Clearing Chart

MAG.	WD	EF	DIA 1/2F	DIA FF
5X	1.80"(45.7mm)	2.80"(71.1mm)	3.60"(91.4mm)	3.60"(91.4mm)
10X	2.70"(68.6mm)	1.40"(35.6mm)	8.30"(210.8mm)	6.00"(152.4mm)
20X	1.25"(31.8mm)	0.70"(17.8mm)	3.20"(81.3mm)	2.60"(66.0mm)
20X*	3.13"(79.5mm)	0.70"(17.8mm)	6.79"(172.5mm)	4.84"(122.9mm)
25X	2.75"(69.9mm)	0.56"(14.2mm)	5.14"(130.6mm)	4.07"(103.4mm)
31 1/4X	2.00"(50.8mm)	0.87"(22.1mm)	2.90"(73.7mm)	2.23"(56.6mm)
50X	2.50"(63.5mm)	0.28"(7.1mm)	9.20"(233.7mm)	8.40"(213.4mm)
62 1/2X	2.90"(73.7mm)	0.22"(5.6mm)	9.20"(233.7mm)	9.20"(233.7mm)
100X	1.00"(25.4mm)	0.14"(3.6mm)	3.20"(81.3mm)	2.80"(71.1mm)
250X	0.59"(15.0mm)	0.06"(1.5mm)	1.40"(35.6mm)	1.30"(33.0mm)

\* SPECIAL 20X LENS WITH EXTRA LONG WORKING DISTANCE



## OUTLINE DIMENSIONS

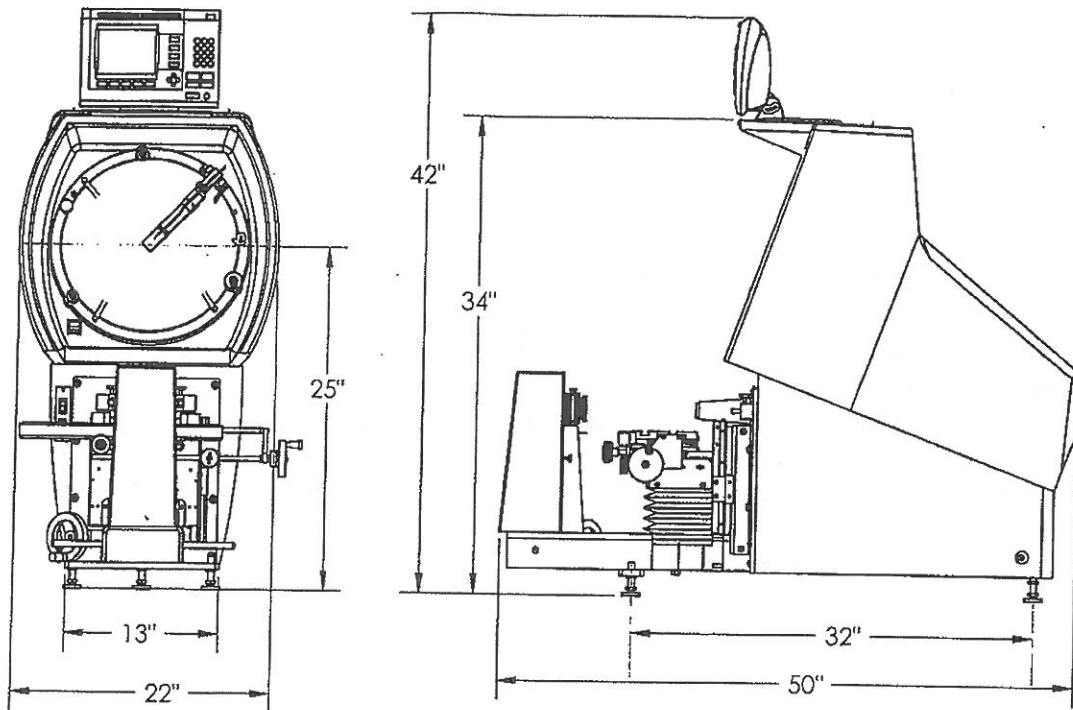


FIG. 2

## SPECIFICATIONS

### Machine Dimensions

Length..... 53" (1346 mm)  
 Width..... 21.5" (546 mm)  
 Height..... 41.8" (1061 mm)  
 Height to Screen Center..... 24.5" (622 mm)

### Work Table

Length..... 16" (406 mm)  
 Width..... 5" (125 mm)  
 Standard Clamping Slot..... 2  
 Allowable Workload..... 50 lb. (22.8 Kg)

### Measuring Capacity

X-axis..... 10" (175 mm)  
 Y-axis..... 4" (100 mm)  
 Focus..... 2.5" (63.5 mm)  
 Scale Resolution..... .00005" (.001 mm)

### Screen

Size..... 14" (355 mm)  
 Protractor resolution  
     Vernier..... 5 minute  
     Digital..... 1 minute

### Magnification Lenses

5x, 10x, 20x, 25X, 31 1/4x, 50x, 62 1/2x,  
 100x, 250x

### Electrical

Voltage..... 100-240v, 50 or 60 Hz  
 Fuse..... 3 A@(100-120v) 2 A@(220-240v)  
 Lamps (Tungsten-Halogen)  
     Profile Illumination.... 150 watt, 24 volt  
     Surface Illumination.. 100 watt, 12 volt

### Weight

Comparator..... 170 lb. (77 Kg)  
 Crated Comparator..... 330 lb. (91 Kg)

## SETUP

### UNPACKING

**IMPORTANT**...If you have any questions about unpacking or setup, contact S-T Industries or local S-T distributor.

1. Remove cardboard cover from pallet.
2. Unbolt comparator from pallet.
3. With the help of another able person, lift the comparator to its work station. **(Lift only by 4 lifting handles)** Install 3 leveling feet.
4. Wipe down the comparator with clean dust rags. **Caution:** Do not use shop air hoses to blow dirt from the comparator. Flying particles can damage mirror surfaces or optics.
5. Remove stage mount bracket and lifting handles. Insert supplied plastic plugs in holes for handles.
6. Install vertical hand crank.

**Do not connect power to the comparator until setup is complete**

### INSTALLATION

#### GLASS SCREEN INSTALLATION

The glass screen may already be installed in your optical comparator. To install or replace the glass screen, follow this procedure.

1. If your optical comparator is equipped with a digital protractor, remove the encoder cover (pull straight out) from the protractor ring. Remove lower left roller cover (leave bearing in place). Then, remove cardboard insert.
2. Locate screen and carefully remove from packaging. Make sure hands are very clean before handling screen. Holding from edges, insert screen under reference pointer (**frosted side out**) and into top and lower right roller. Hold encoder wheel back with finger until glass screen is in place.
3. Replace lower left roller cover. Replace encoder cover. Be sure encoder cover does not touch glass screen.

#### DRO INSTALLATION

1. Locate Digital Readout and follow mounting instructions included with DRO.
2. Unwrap cords on back of comparator and plug into digital readout. (**CAUTION** If you have edge detection option, be careful not to over-bend small fiber-optic bundles.)

## LENS INSTALLATION

1. Locate lens and remove from packaging. Remove any lens caps and make sure both ends are clean. Do not blow on lenses to remove dust; use air canister or lens cleaning cloth.
2. Remove plastic cover from lens hole. Insert lens so thumbscrews clear lens mounting flange and rotate 90°. Tighten thumbscrews evenly.

## POWER UP

1. Plug in main power cord in back of comparator and plug into outlet.
2. Turn on main power. Check fan and DRO operation.
3. Turn on profile and surface illumination. Check operation.

## PROFILE AND SURFACE ILLUMINATION

Profile and surface illumination each have their own light sources and respective ON-OFF switches.

The profile illuminator projects a light beam past a part on the stage, creating an accurately magnified image on the screen when the part is focused. This allows precise measurements of peripheral features of a part either by comparison to a chart or by positional measurement using a digital readout. The condenser lens is located in front of the profile lamp and allows adjustment of the beam size for various lens magnifications. To adjust, loosen thumbscrew and insert or extend the lens until optimum illumination on screen is observed. Tighten thumbscrew.

The surface illuminator projects light through a duplex fiber optic bundle onto the front surface of a part. The reflected image can be seen on the screen and the image can be measured. To adjust each fiber optic bundle, loosen the respective thumb screws and position the bundle to obtain desired illumination. Retighten thumbscrews to secure in place. **CAUTION** Do not over-tighten thumbscrews.

## HELIX ADJUSTMENT

This feature aligns the light from the condenser lens to the helix angle of threads so they can be viewed correctly. Move the lever under the condenser lens until the image is clear on both sides of the thread. There is a detent to return to the center position.

## **PROTRACTOR SCREEN OPERATION**

### **Absolute Zero Setting**

1. Rotate the screen so the horizontal line is approximately level.
2. Focus a pointer on the screen with its tip on the left end of the horizontal screen line.
3. Move the stage so the image of the point is on the right edge of the screen.
4. Observe the space between the tip of the pointer and the horizontal screen line.
5. Move the stage so the tip moves closer to the line by one half of the observed space.
6. Rotate the screen so the horizontal line is on the tip of the pointer.
7. Move the stage so the image of the point is on the left edge of the screen.
8. Repeat steps 4-7, alternating sides, until the tip remains on the horizontal line.
9. Loosen the reference marker on the right side of the screen and align with horizontal line.

Consult digital readout manual for establishing Zero degree set point.

**NOTE:** For systems with vernier protractor, follow steps 1-8 and for step 9, align vernier plate so the Zero mark lines up with the horizontal screen line.

### **Angular Measurements (with Digital Screen Protractor)**

Consult Digital Readout manual for information on Digital Protractor operation

#### **Differential Method**

1. Secure part to stage.
2. Focus image and position as required.
3. Align a screen reference line with an edge or feature which is a datum. Zero the incremental 'Q' or ANGLE axis display on DRO.
4. Rotate screen reference line to feature to be measured, align by moving stage if necessary and read angle on incremental 'Q' axis display.

#### **Absolute Method**

1. Focus image and position as required.
2. Align datum on part with reference line on screen. Secure part to stage.
3. Rotate screen reference line to feature to be measured, align by moving stage if necessary and read angle on absolute 'Q' axis display.



## **MEASURING TECHNIQUES**

The optical comparator has 2 basic measuring means. Direct Optical Comparison and Measured Linear Displacement.

If necessary, secure parts to stage top. Do not attempt to get accurate measurements unless parts are stable. S-T Industries offers several standard stage fixtures and builds special fixtures for unusual parts according to customer specifications. Contact S-T Industries sales department for information.

### **Direct Optical Comparison**

Precise measurements can be made by comparing accurately magnified images to scaled drawings or shapes superimposed or overlaid on the image. Irregular contours, angles, radii, tapers, etc., together with high quantity measurements get compared best by use with master charts.

Three ways of chart preparation

1. To-scale part or feature drawings. Hand or CAD produced drawings on mylar to a scale matching the lens magnification. Be sure lines are thin; .005"-.010" for best comparison accuracy.
2. Hand traced master. Focus a part or feature on the screen at the desired magnification. Use the chart clips or tape to secure a sheet of mylar or drafting film to the surface of the glass screen. Using a fine point lead pencil, trace the profile. Care must be taken not to rotate the screen or move the part while tracing. Protect pencil lines by spraying a thin coat of a clear fixative.
3. Custom and standard overlay charts. S-T Industries, Inc. can supply precision overlay charts made to order as well as a full line of standard charts.

### **Measured Linear Displacement**

The standard measuring stage allows accurate linear measurements in 2 axes, X and Y. The X axis travel is 10" (250mm), the Y axis travel is 4" (100mm). A quick-release bearing mechanism on the X axis travel allows free motion of the stage in the desired direction and fine adjustment by turning the hand wheel. Y axis motion is by hand wheel only. The stage is equipped with 0.001mm resolution glass scale encoders and one of several available digital readouts.

## **Procedure**

1. Secure the part to the stage and focus area to be measured.
2. Be sure that screen is set at 0° and align first edge to be measured with either the vertical or horizontal screen line.
3. Zero the appropriate axis on the digital readout.
4. Move the stage until the second edge to be measured aligns with the same screen line.
5. Read the linear measurement in the digital readout.

The X and Y display value or coordinate is used to directly calculate geometric features such as points, lines, circles, distances and angles. Also, fiber optic edge detection and CNC control add speed, accuracy and reliability to these measurements.

## **DIGITAL READOUT SYSTEMS**

The 20-3500 Series Optical Comparator comes with several optional digital readout systems.

20-3551-00 - 4" x 10" travel stage with QuadraChek 121 digital readout system. DRO standard features include X, Y and Q (screen angle) axes. Also includes INCH/MM, INC/ABS and PRINT functions.

20-3552-00 - 4" x 10" travel stage with QuadraChek 221 geometric digital readout system. DRO has all standard features plus geometric calculations including point, line, circle, distance, angle and skew and programmability.

20-3553-00 - 4" x 10" travel stage with QuadraChek 221E geometric digital readout system. DRO has all features of above system plus fiber optic edge detection.

20-3554-00 - 4" x 10" travel stage with QuadraChek 321E geometric digital readout system. DRO has all features of above system with color touch screen display.

20-3555-00 - 4" x 10" travel stage with QuadraChek 5215 geometric digital readout system. DRO has all features of above system and includes PC computer with WINDOWS<sup>®</sup> based QC 5000 software. Unique features are graphic representation of part features as they are measured, mouse driven commands and unlimited programmability.

## **CALIBRATION**

### **SCREEN PROTRACTOR CALIBRATION**

#### **Zeroing Protractor (Set 0°)**

1. Rotate screen until adjustable zero pointer is aligned with horizontal screen line.
2. Focus on a sharp object (e.g. a scribe) so that it is pointing at the center of the crosshair of the screen.
3. Move the image along the X axis line to the edge of the screen. If the image point is not touching the line, rotate the screen until the line touches the point.
4. Move the image along the X axis screen line to the other side of the screen. If the image point is not touching the line, repeat steps 2-4. When the image stays on the line, adjust zero pointer until it lines up with the line.

#### **Calibrate Digital Protractor**

1. Use a rule or other thin object in a vise and focus on right side of screen. Align one of the cross lines of the screen with the edge of the image.
2. Follow directions for calibrating digital protractor found in digital readout manual.
3. Test the calibration by zeroing the angular axis on the edge of the image. Rotate 90°. The tolerance is +/- 5 minutes.

## **MAGNIFICATION CALIBRATION**

The screen magnification can be calibrated by using S-T Industries' 74-0413-00 Master Ball Checker and 74-0321-10 10" magnification scale.

1. Locate appropriate ball for lens to be checked. (Scale is marked with diameters and magnifications)
  2. Focus ball in center of screen.
  3. Using magnification scale, check size of image left to right.
  4. Repeat check top to bottom.
  5. Edge of image should ideally split lines on checking scale. The tolerance is +/- .05%.
  6. Record the results and move the image to the upper right corner of the screen. Repeat the check.
  7. Move to the remaining three corners of the screen and repeat check for all.
- If the magnification is incorrect, the mirror may need adjustment.

**NOTE:** It may be determined that the mirror is correct and that a lens needs adjustment.

1. To determine if a lens needs adjustment, check another lens, if available, to determine if the lens or the mirror is the problem. Use the procedure below to check the magnification. If another lens shows correct magnification, then the lens in question probably needs to be adjusted. If only one lens is available, then if the error in magnification is equal across the screen, then the lens probably needs adjustment.

**For assistance in these procedures, contact S-T Industries, Inc.**

## MEASURING STAGE CALIBRATION

### Linear Accuracy

The measuring stage linear accuracy can be calibrated by using S-T Industries' 74-0500-00 calibration plate. Use a 50X lens, if available, for optical comparators and the highest zoom setting for video inspection systems.

1. Place the calibration plate on the stage so the longer side is parallel with the X axis and the pins are up against the forward edge of the dovetail..
2. Focus on the 6" or 150mm scale.
3. Be sure that the screen is set to 0°.
4. Move the stage back and forth to see that the scale line stays on the crosshair. Adjust the calibration plate if necessary.
5. Move the stage all the way to one end of its travel and align the end mark of the calibration scale with the vertical screen crosshair.
6. Zero the X axis display on the DRO and move the stage until the other end of the scale aligns with the crosshair.  
Note: Care must be taken to be consistent when aligning scale marks to the crosshair.
7. The X axis display should read the same as the scale length; 6.00000" or 150.000mm. If it does not, consult your DRO manual and adjust LEC (Linear Error Correction) until the reading is correct.
8. Return to the end mark of the scale, zero the X axis display, if necessary, and move to the next increment on the scale (1.0" or 10mm). Record the value and repeat for each increment. For 10" models, it will be necessary to reposition the plate to the other end of the stage and repeat the procedure to calibrate the entire length. The accuracy specification is +/- 0.0003" (0.008mm) for each axis.
9. For the Y axis, find the desired scale along the short end of the plate.
10. Move the stage up and down to see that the scale line stays on the crosshair. Adjust the calibration plate if necessary.
11. Move the stage all the way to one end of its travel and align the end mark of the calibration scale with the horizontal screen crosshair.
12. Zero the Y axis display on the DRO and move the stage until the other end of the scale aligns with the crosshair. (With this calibration plate, it is only possible to measure a 2" or 50mm range.)
13. The Y axis display should read the same as the scale length; 2.00000" or 50.000mm. If it does not, consult your DRO manual and adjust LEC (Linear Error Correction) until the reading is correct.
14. Return to the end mark of the scale, zero the Y axis display, if necessary, and move to the next increment on the scale (1.0" or 10mm). Record the value and repeat for each increment as in step 8.

## MEASURING STAGE CALIBRATION

### Stage Squareness

The measuring stage Squareness can be calibrated by using S-T Industries' 74-0500-00 calibration plate. Use a 50X lens, if available, for optical comparators and the highest zoom setting for video inspection systems.

1. Place the calibration plate on the stage so the longer side is parallel with the X axis.
2. Focus on the large crosshair in the center of the plate.
3. Be sure that the screen is set to 0°.
4. Move the stage back and forth to see that the horizontal line stays on the crosshair. Adjust the calibration plate if necessary.
5. Move the stage until the end of the vertical line of the crosshair is aligned with the screen crosshair.
6. Zero the X and Y axis displays on the DRO.
7. Move the stage in the Y direction only until you reach the end of the line or the end of stage travel. If the line has moved away from the crosshair in the X direction, move the stage until it lines up again.
8. The squareness is the deviation of the X axis divided by the length of travel along the Y axis. The squareness specification is .0001"/2.0000" or .002mm/40.00mm.

## Fuse Protection

A 3 amp fuse (2 amp for 220-240 volt) protects all electric circuits in the 20-3500 optical comparator. The fuse is located in the power input module located at the rear of the comparator. To change, remove the power cord from the power entry module and, using your finger, unsnap the fuse drawer and pull out. Change fuse and replace fuse drawer.

## Lamp Replacement

When a lamp fails, wait 5 minutes before replacing to allow fans to cool off lamp area. After this time turn off main power and disconnect main power cord.

### Profile lamp

1. Remove 2 screws holding the lamphouse cover and lift cover straight up.
2. **Be careful, the lamp may still be hot.** Swing cover up to expose lamp area.
3. When the lamp (top) is safely cool, remove it from the socket by pulling straight out.
4. Carefully, install a new lamp into the socket using a clean cloth or gloves to keep from touching the lamp. Rock slightly to seat in the socket and center the filament to the optics as close as possible.
5. Check cooling fan on base and clean if necessary.
6. Replace the cover and secure with 2 screws.
7. Replace power cord and check lamp.

### Surface Illumination Lamp

1. Remove 2 screws holding the lamphouse cover and lift cover straight up.
2. **Be careful, the lamp may still be hot.** Swing cover up to expose lamp area.
3. When the lamp (bottom) is safely cool, remove it from the socket by lifting eject lever.
4. Carefully, install a new lamp into the socket. Be sure the new lamp is seated all the way into the socket.
5. Check cooling fan on base and clean if necessary.
6. Replace the cover and secure with 2 screws.
7. Replace power cord and check lamp.

## **Lubrication**

Lubricate V-ways and ball bearings of measuring stage with light oil occasionally, to prevent corrosion and keep motion smooth.

Vertical focus screw can be lubricated by raising stage and removing cover with bellows assembly. Use "Moly-Kote" or other high-viscosity grease.

If the focus motion is not free, check for chips or other foreign material in the miter gears in the base.

## **Parts Identification**

Compare the part numbers on sub-assembly and part illustrations with their respective parts lists to identify parts.

### **Parts Ordering**

1. Furnish the comparator model and serial number
2. State the part number, description and quantity of each part required.
3. State shipping instructions.

## **Options**

### **Fiber Optic Edge Detection**

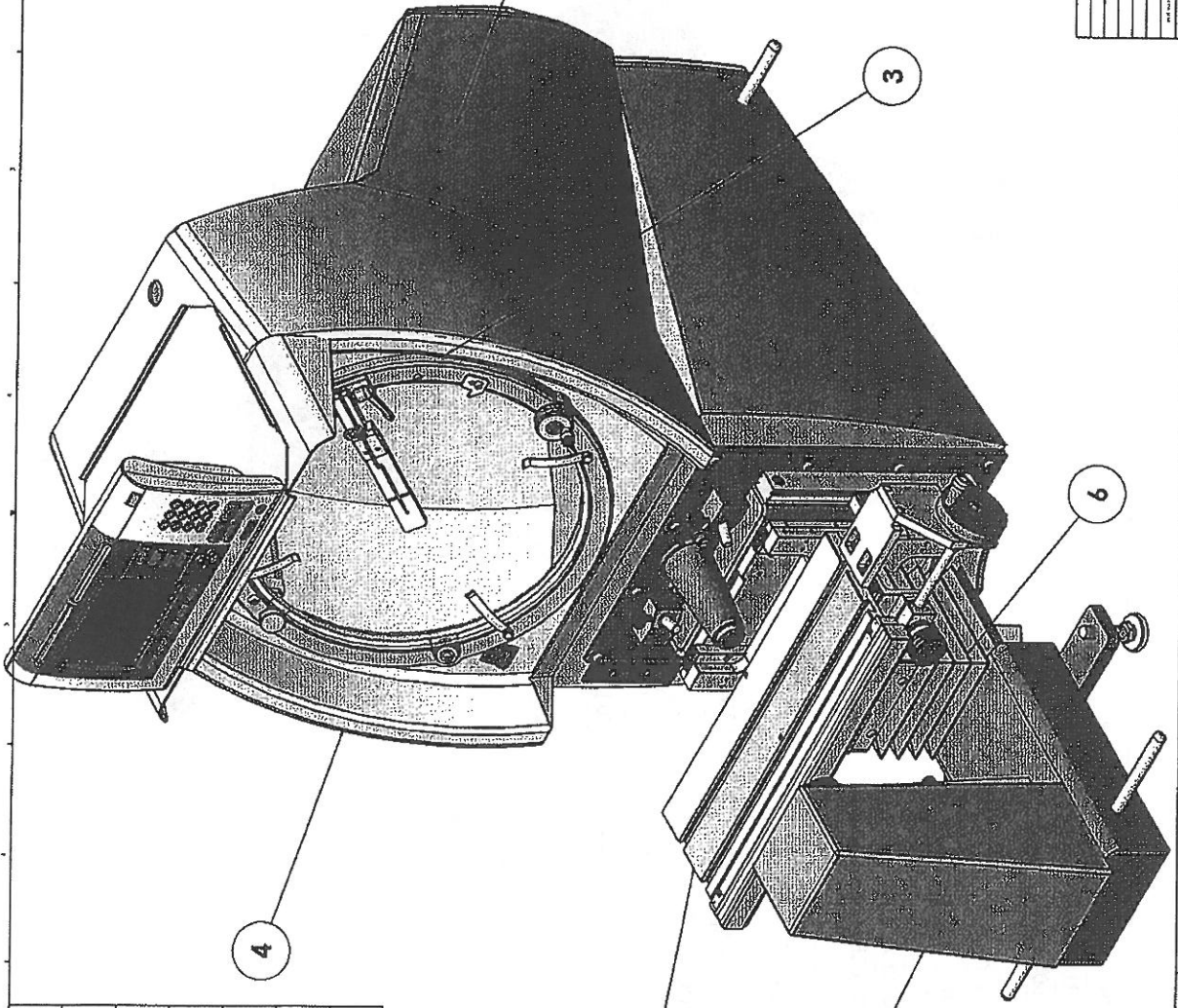
This option provides a fast, accurate means of measuring by sensing the edge of an image when it passes by a fiber optic probe on the optical comparator screen. In this way, X-Y coordinates can be automatically entered into geometric functions (points, lines, circles, etc.). A swing-away arm positions the fiber optic probe on the screen and can easily be moved out of the way when not in use.

### **Charts and Fixtures**

A complete line of screens, overlay charts and work-holding fixtures are available.



# 3500 CAT.

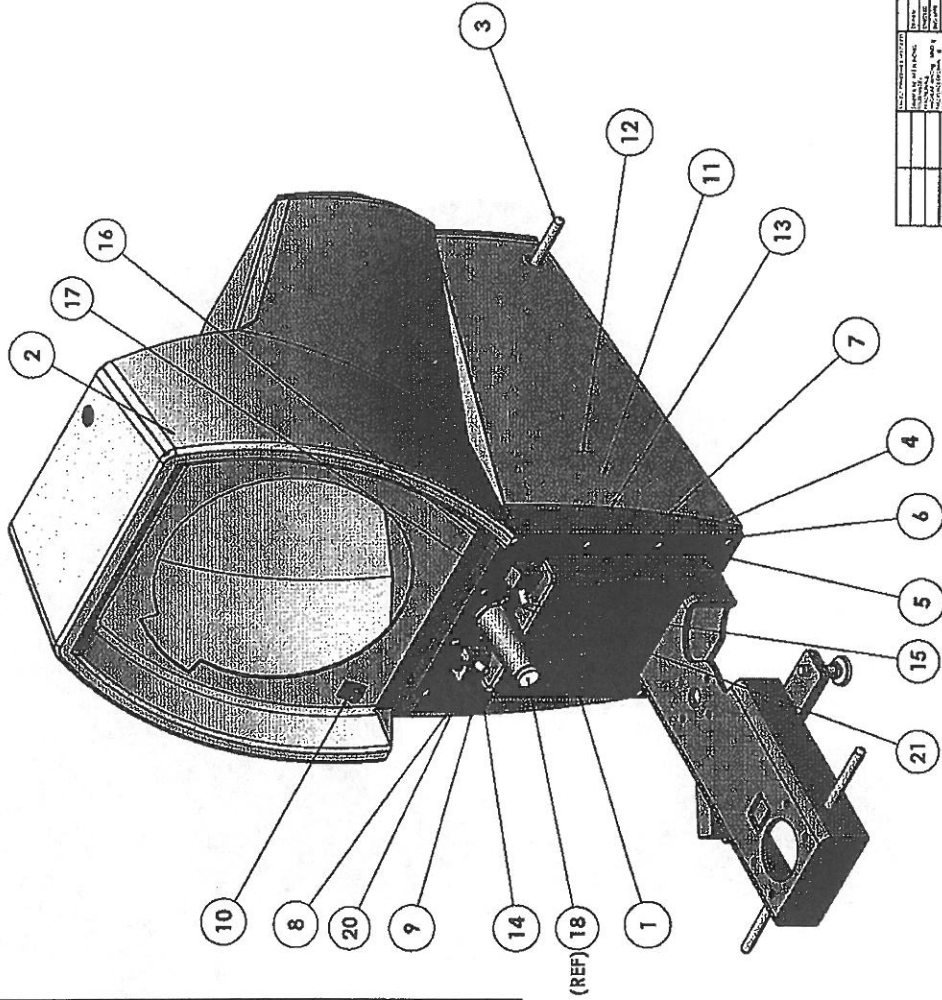


ITEM NO.	DESCRIPTION
1	STAGE ASSY (3500)
2	LAMPHOUSE ASSY. (3500)
3	SCREEN ASSY.
4	BODY ASSY.
5	MIRROR ASSY.
6	BELLOW ASSY

S-T INDUSTRIES INC.	
3500 CAT.	
REV	REV
D	D
3500 CATALOG	3500 CAT.
SCALE 1:1	SHEET 1 OF 4

D 1500 CAT.1008

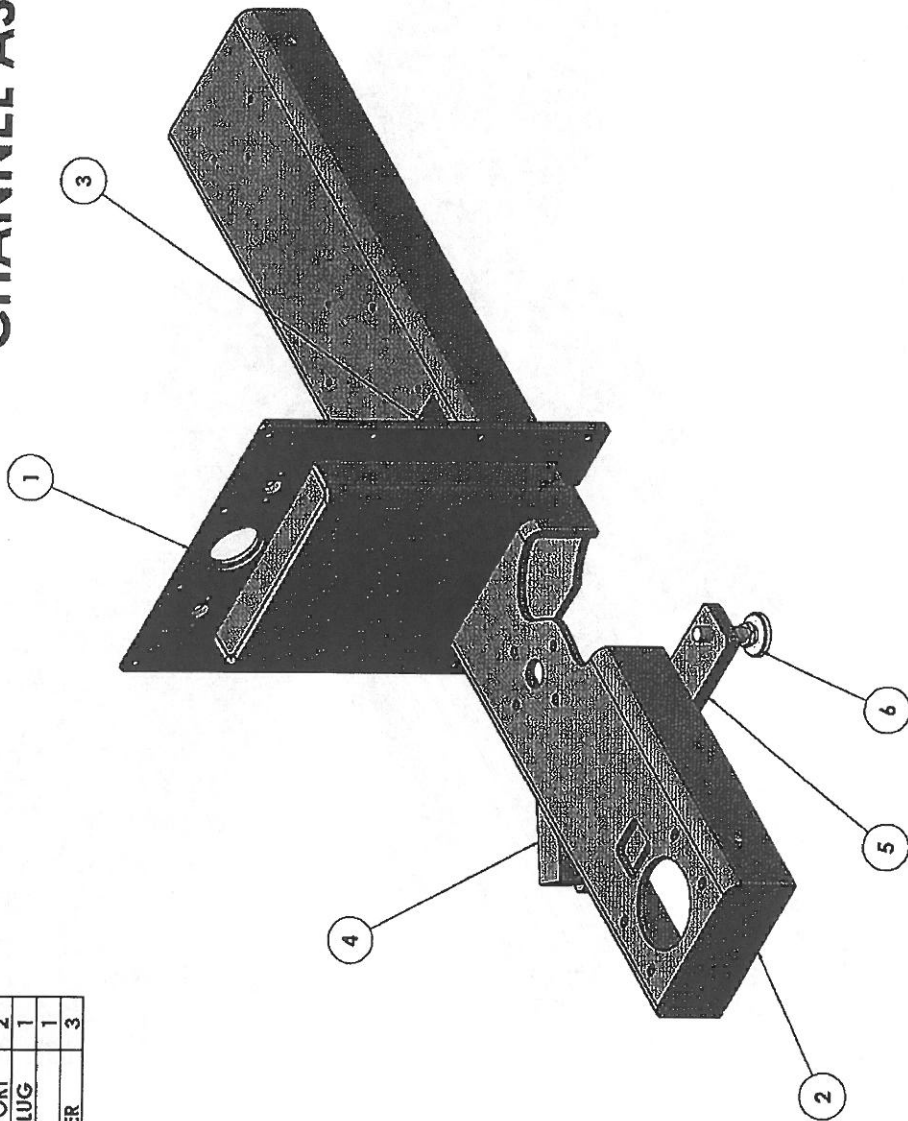
# BODY ASSY. (3500)



ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	22-3736-20	CHANNEL ASSY, WELDMENT	1
2	22-3970-01	BODY GRAY 3500	1
3	22-3843-21	HANDLE	4
4	48-5435-00	SCREW, BHCS 1/4-20 X 1 1/4	2
5	48-6033-00	1/4 WASHER	8
6	48-6069-00	1/4 WASHER	2
7	48-7399-00	SCREW, BHCS 1/4-20 X 1	8
8	22-3819-00	SWITCH PLATE, 3500 SURFACE PROFILE	1
9	48-7700-00	SWITCH	2
10	48-7443-00	SWITCH	1
11	48-7929-00	TRANSFORMER	1
12	48-5521-00	WASHER	4
13	48-5161-00	SCREW, SHCS 8-32 X 3/8	4
14	48-8030-00	SCREW, SELF TAPPING 6-32	2
15	48-7430-00	S.I. FIBER OPTICS	1
16	22-3716-15	FIBER OPTIC BUSHING	2
17	22-2107-19	THUMB SCREW	2
18	REF	LENS	1
19	48-5622-00	SCREW, BHCS 10-32 X 5/8	4
20	22-3952-03	STOP BUSHING	2
21	22-0326-00	LENS HOLD DOWN SCREW	2

S-T INDUSTRIES INC.	
DATE:	REV:
BODY ASSY. (3500)	
BY:	CHKD:
APP'D:	REV:
DATE:	REV:
S-T INDUSTRIES INC.	
BODY ASSY. (3500)	
DATE:	REV:
S-T INDUSTRIES INC.	
BODY ASSY. (3500)	
DATE:	REV:

# CHANNEL ASSY. (3500)

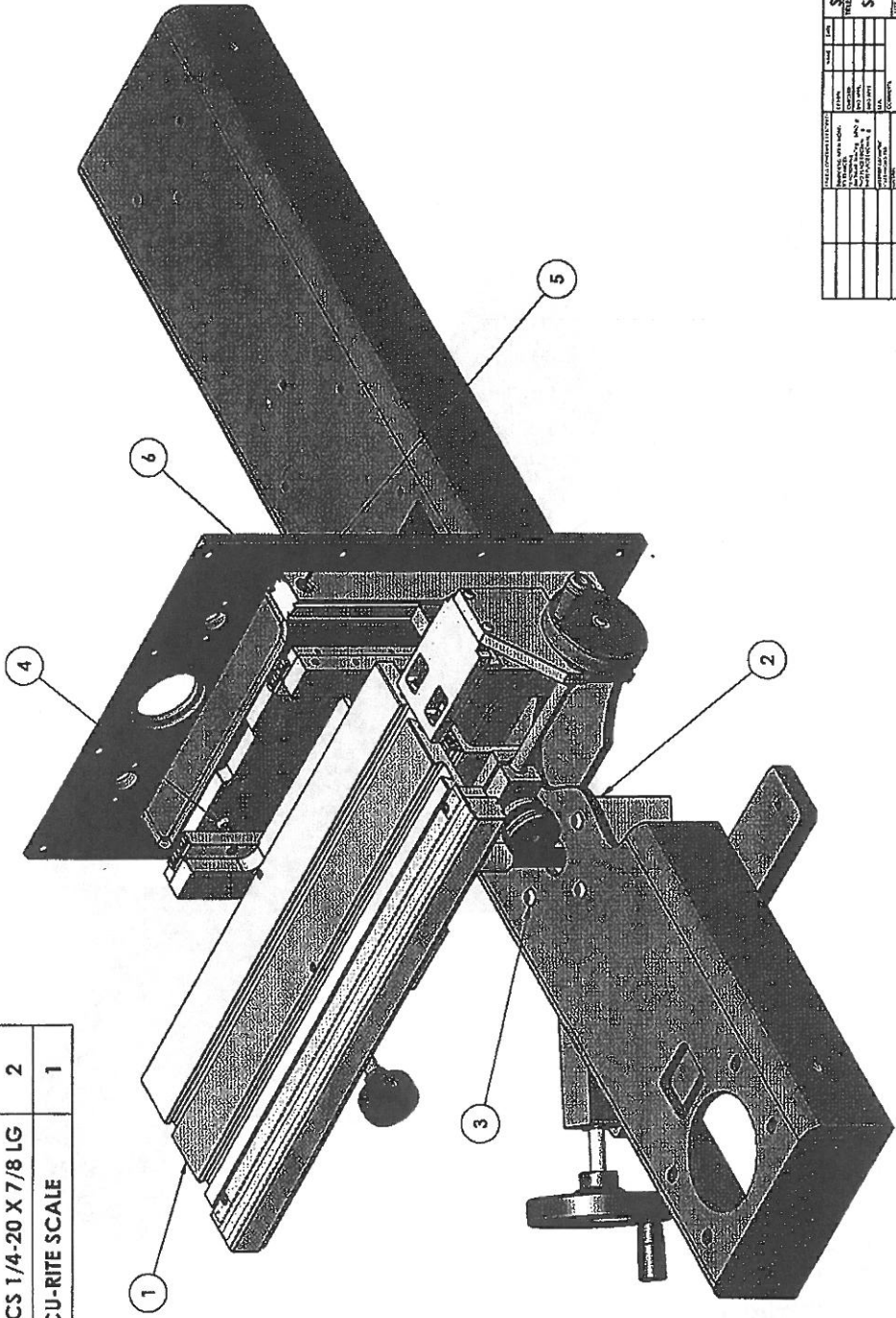


ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	22-3736-02	FRONT LENS PLATE WLDT	1
2	22-3736-11	CHANNEL WELDMENT	1
3	22-3329-00	LENS PLATE SUPPORT	2
4	22-3736-22	HAND CRANK SLUG	1
5	22-3970-04	LEG PLATE	1
6	48-7307-00	FLOOR LEVELER	3

S-T INDUSTRIES INC.	
DATE	REV
22-3736-20	D
CHANNEL ASSY. (3500)	
SHEET 1 OF 1	

# STAGE ASSY. (3500)

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	22-3732-34	STAGE ASSY.	1
2	22-3732-36	3500 VERTICAL DRIVE ASSY.	1
3	48-5284-00	SCREW, BHCS 1/4-20 X 5/8	4
4	48-7399-00	SCREW, BHCS 1/4-20 X 1	3
5	48-8152-00	SCREW SHCS 1/4-20 X 7/8 LG	2
6	48-7818-00	4" ACU-RITE SCALE	1

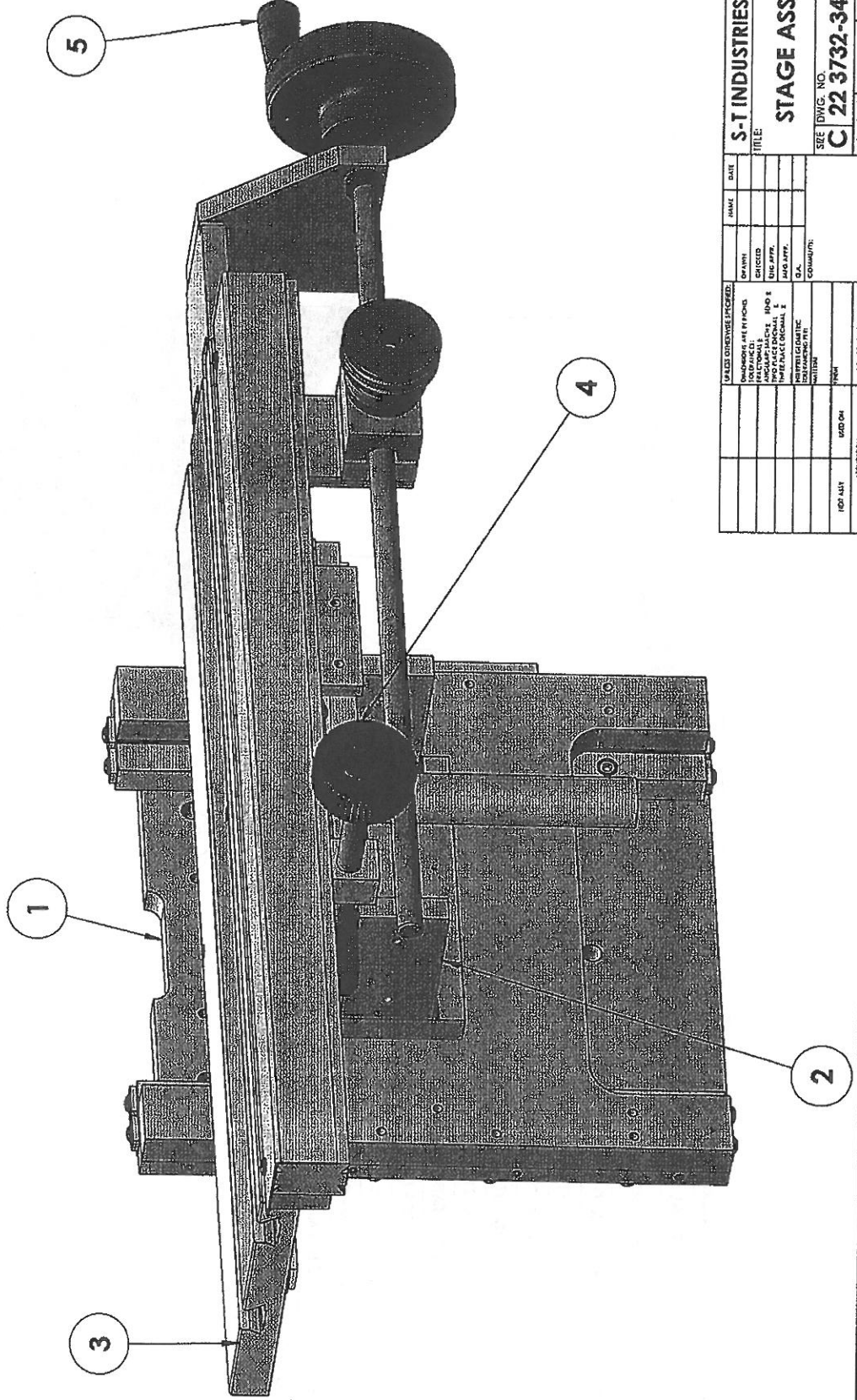


S-T INDUSTRIES INC.	
STAGE ASSY (3500)	
DATE: _____	REV: _____
DRAWN BY: _____	SCALE: 1:1
CHECKED BY: _____	SHEET 1 OF 1

STAGE ASSY (3500)

# STAGE ASSY 22-3732-34

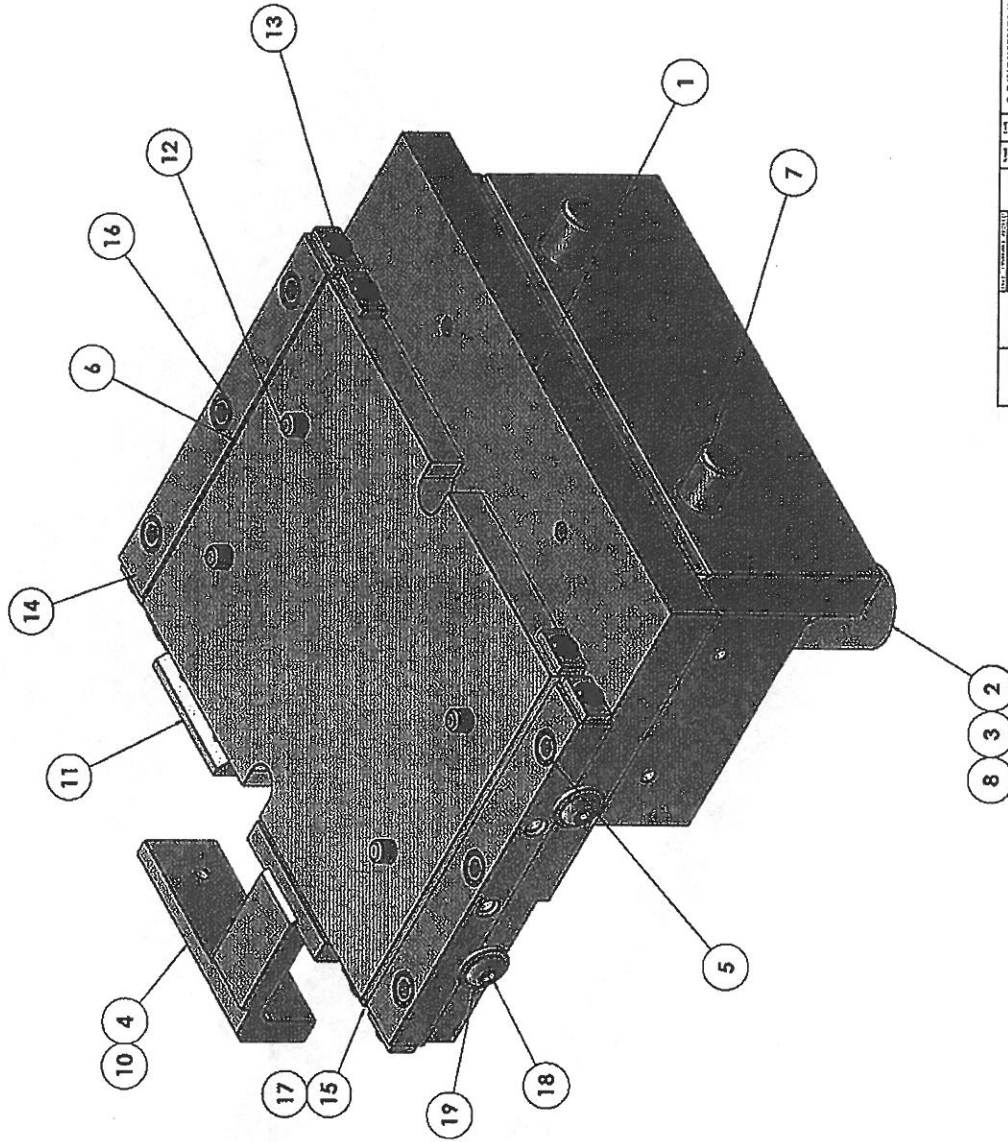
ITEM NO.	DESCRIPTION
1	VERTICAL SLIDE ASSY. (3500)
2	STAGE MOUNT ASSY. (3500)
3	TOP PLATE ASSY. (3500)
4	FOCUS ASSY. (3500)
5	MANUAL CRANK (3500)



S-T INDUSTRIES INC.		NAME	DATE
TITLE:		DESIGNED BY	
STAGE ASSY.		CHECKED BY	
SEE DWG. NO. C 22 3732-34		ENG. APP.:	
REV		MFG. APP.:	
SCALE 1/8" = 1"		DRAWN BY:	
SHEET 1 OF 1		DATE:	



# STAGE MOUNT ASSY. (3500)

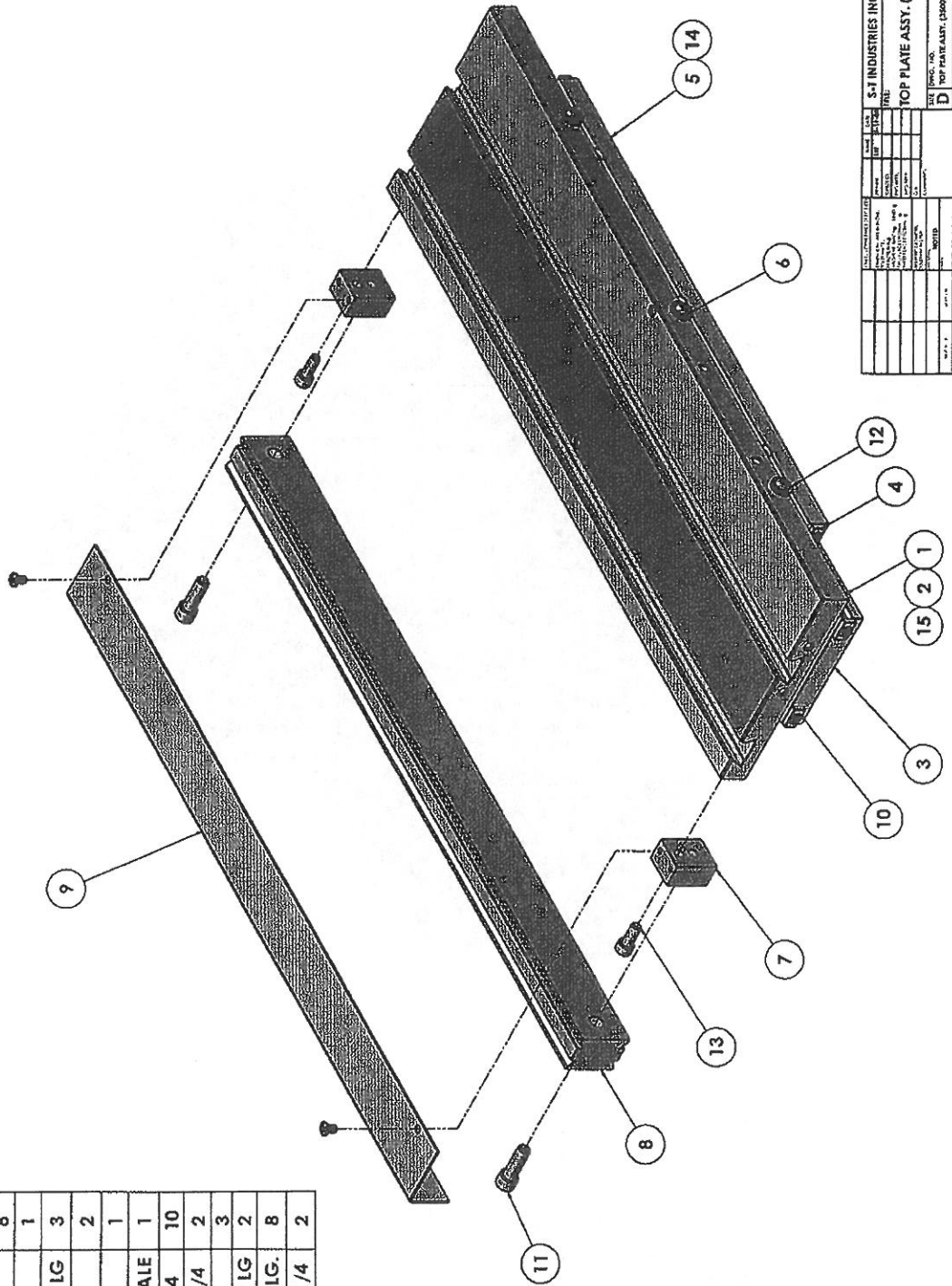


ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	22-3732-09	STAGE MOUNT BRACKET WLDI. & MACH.	1
2	22-3732-12	LIFT TUBE WLDI.	1
3	48-5032-00	WASHER	4
4	22-3366-00	ENCODER MOUNT	1
5	22-2046-00	FOCUS SLIDE GIB	2
6	22-2042-00	FOCUS SLIDE PLATE	1
7	48-5115-00	SCREW, SHCS 3/8-16 X 1	3
8	48-5126-00	SCREW, BHCS 8-32 X 1/2	4
9	48-6654-00	SPRING LOCK WASHER	4
10	48-5438-00	SCREW, BHCS 8-32 X 3/8 LG	2
11	22-2063-00	FOCUS SCREW MOUNT SPACER	1
12	48-6003-00	SCREW, BHCS 10-24 X 3/8	4
13	22-2077-00	RETAINER STOP	8
14	48-5137-00	SCREW, BHCS 6-32 X 1/4	8
15	22-2044-00	BALL GUIDE, FOCUS	2
16	48-5061-00	SCREW, SHCS 8-32x1/2 LG	6
17	48-5152-00	3/16 BALL	6
18	48-5358-00	SCREW, BHCS 8-32 X 3/8	2
19	48-6126-00	WASHER, SPRING STEEL 3/8 X .200 X .03	2

S.F. INDUSTRIES INC.	
DATE	REVISED
BY	DATE
APPROVED	DATE
DESIGNED	DATE
DRAWN	DATE
CHECKED	DATE
SCALE	1:1
STAGE MOUNT ASSY. (3500)	
REV. 1	DATE
REV. 2	DATE
REV. 3	DATE
REV. 4	DATE
REV. 5	DATE
REV. 6	DATE
REV. 7	DATE
REV. 8	DATE
REV. 9	DATE
REV. 10	DATE
REV. 11	DATE
REV. 12	DATE
REV. 13	DATE
REV. 14	DATE
REV. 15	DATE
REV. 16	DATE
REV. 17	DATE
REV. 18	DATE
REV. 19	DATE
REV. 20	DATE
REV. 21	DATE
REV. 22	DATE
REV. 23	DATE
REV. 24	DATE
REV. 25	DATE
REV. 26	DATE
REV. 27	DATE
REV. 28	DATE
REV. 29	DATE
REV. 30	DATE
REV. 31	DATE
REV. 32	DATE
REV. 33	DATE
REV. 34	DATE
REV. 35	DATE
REV. 36	DATE
REV. 37	DATE
REV. 38	DATE
REV. 39	DATE
REV. 40	DATE
REV. 41	DATE
REV. 42	DATE
REV. 43	DATE
REV. 44	DATE
REV. 45	DATE
REV. 46	DATE
REV. 47	DATE
REV. 48	DATE
REV. 49	DATE
REV. 50	DATE
REV. 51	DATE
REV. 52	DATE
REV. 53	DATE
REV. 54	DATE
REV. 55	DATE
REV. 56	DATE
REV. 57	DATE
REV. 58	DATE
REV. 59	DATE
REV. 60	DATE
REV. 61	DATE
REV. 62	DATE
REV. 63	DATE
REV. 64	DATE
REV. 65	DATE
REV. 66	DATE
REV. 67	DATE
REV. 68	DATE
REV. 69	DATE
REV. 70	DATE
REV. 71	DATE
REV. 72	DATE
REV. 73	DATE
REV. 74	DATE
REV. 75	DATE
REV. 76	DATE
REV. 77	DATE
REV. 78	DATE
REV. 79	DATE
REV. 80	DATE
REV. 81	DATE
REV. 82	DATE
REV. 83	DATE
REV. 84	DATE
REV. 85	DATE
REV. 86	DATE
REV. 87	DATE
REV. 88	DATE
REV. 89	DATE
REV. 90	DATE
REV. 91	DATE
REV. 92	DATE
REV. 93	DATE
REV. 94	DATE
REV. 95	DATE
REV. 96	DATE
REV. 97	DATE
REV. 98	DATE
REV. 99	DATE
REV. 100	DATE

# TOP PLATE ASSY. (3500)

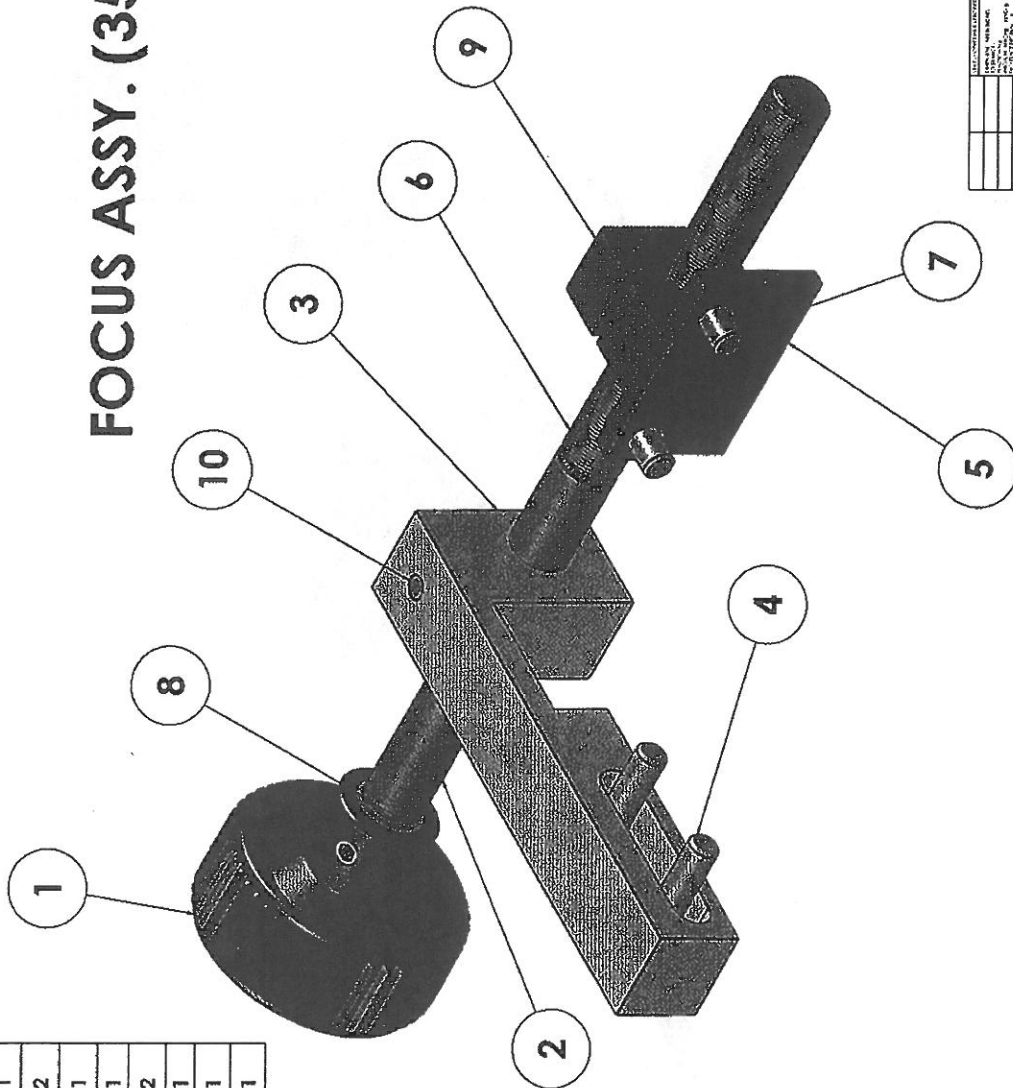
ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	22-4103-02	TOP PLATE, 10" TRAVEL 3500	1
2	22-0429-00	BALL RETAINER	2
3	22-4103-03	CROSS SLIDE PLATE	1
4	22-2077-00	RETAINER STOP	8
5	22-0257-00	GIB (PAIRED)	1
6	48-5438-00	SCREW, BHCS 8-32 X 3/8 LG	3
7	22-3339-00	HORIZ. SCALE MOUNT	2
8	48-8122-01	SCALE 10" (.00005")	1
9	22-3958-03	SCALE COVER FOR 10" SCALE	1
10	48-5137-00	SCREW, BHCS 6-32 X 1/4	10
11	48-5057-00	SCREW, SHCS 1/4-20 X 3/4	2
12	48-5032-00	WASHER	3
13	48-5297-00	SCREW, SHCS 10-32 X 1/2 LG	2
14	48-5157-00	SCREW, SHCS 8-32 X 5/8 LG.	8
15	48-6910-00	SCREW, SOC SET 8-32 X 1/4	2



DATE	22-01-1960	BY	J. S. I. INDUSTRIES INC.
DESIGNED		CHECKED	
DRAWN		APPROVED	
SCALE	1:1	DATE	
TOP PLATE ASSY. (3500)			
D TOP PLATE ASSY. (3500)			
SCALE 1:1			



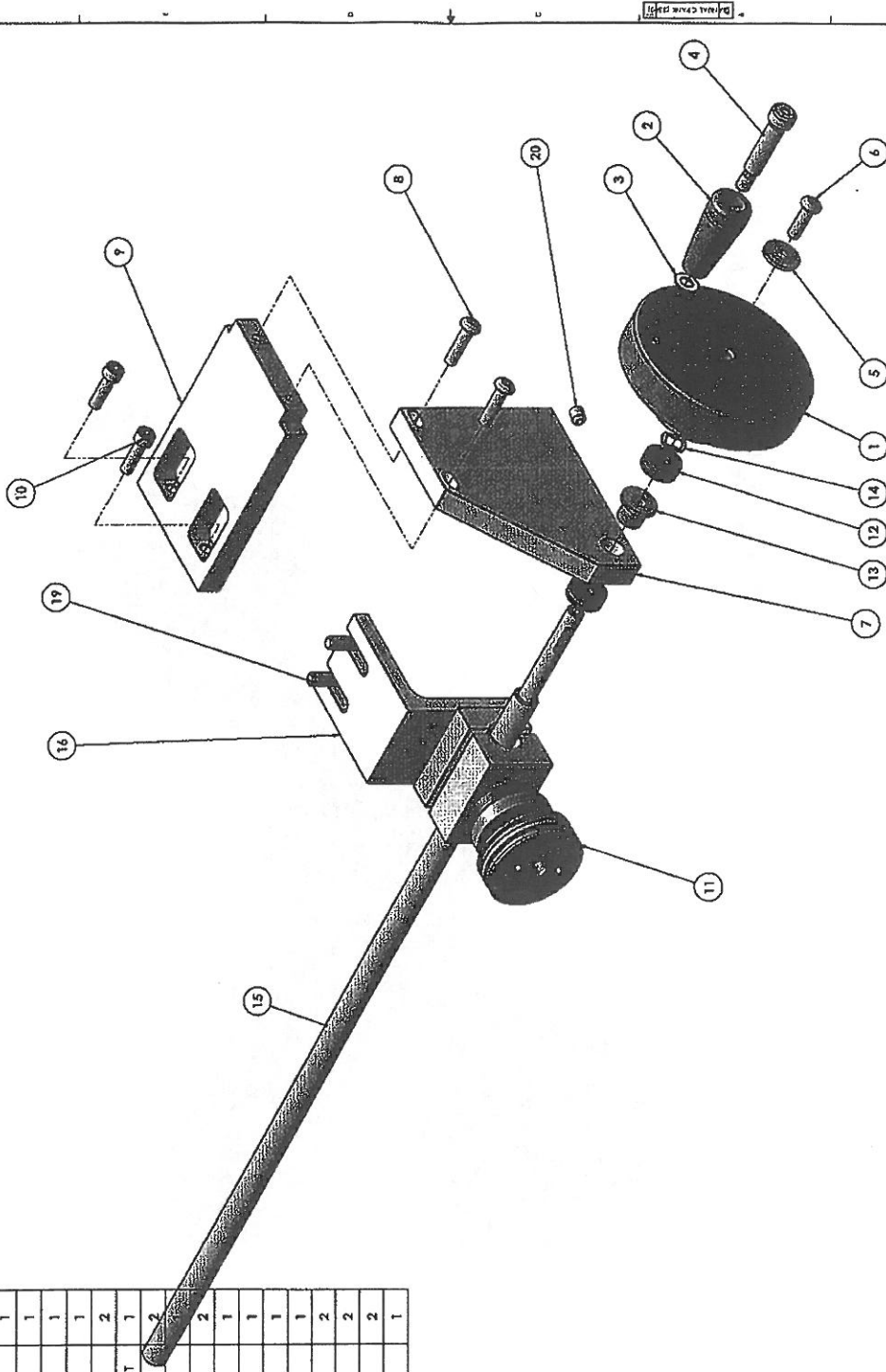
# FOCUS ASSY. (3500)



ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	48-7790-00	KNOB	1
2	22-3357-00	BRASS BUSHING	1
3	22-2062-00	FOCUS SCREW MOUNT	1
4	48-6132-00	SCREW, BHCS 10-24 X 1	2
5	22-2067-01	FOCUS BLOCK	1
6	22-3364-00	FOCUS SCREW	1
7	48-5358-00	SCREW, BHCS 8-32 X 3/8	2
8	48-6630-00	WASHER, WAVE	1
9	48-5061-00	SCREW, SHCS 8-32 X 1/2 LG	1
10	48-6146-00	SCREW, SOC SET 10-24 X 1/4	1

S-I INDUSTRIES INC.	
DATE	REV.
BY	CHKD.
APP'D.	DATE
FOCUS ASSY. (3500)	
SCALE	REV.
DATE	BY
APP'D.	DATE
SHEET NO.	
TOTAL SHEETS	

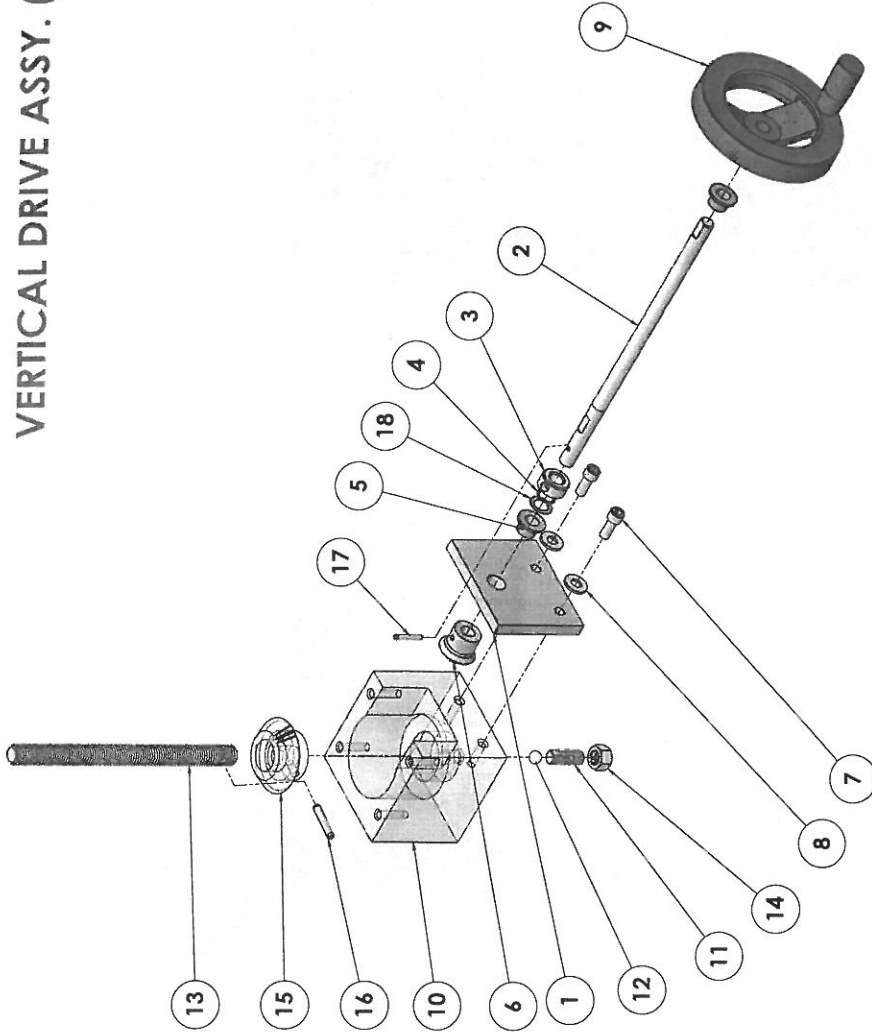
# MANUAL CRANK (3500)



ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	22-3687-00	KNOB, ADJUSTMENT	1
2	22-1007-00	HANDLE	1
3	48-6070-00	WASHER, TEFLON	1
4	48-5131-00	SHOULDER SCREW 1/4 x 1 LG	1
5	48-6083-00	WASHER #10	1
6	48-5329-00	SCREW, BHCS 8-32 X 5/8	1
7	22-3363-00	HORIZONTAL KNOB MOUNT	1
8	48-5185-00	SCREW, BHCS 8-32 X 3/4	2
9	22-4103-04	EXTENSION BLOCK FOR HORIZ. MOUNT	1
10	48-5157-00	SCREW, SHCS 8-32 X 5/8 LG.	2
11	22-4101-02	QUICK RELEASE	1
12	48-7646-00	BEARING THRUST	2
13	48-7437-00	BUSHING	1
14	48-6630-00	WASHER WAVE	1
15	22-3959-0288	LEAD SCREW 3500 10" TRAVEL	1
16	22-5844-15	ROHLIX MOUNTING BRACKET	1
17	48-5138-00	SCREW, BHCS 6-32 X 1/2	2
18	48-6888-00	WASHER, .312 X .156 X .035	2
19	48-4525-00	SCREW, BHCS 10-24 X 5/8	2
20	48-6146-00	SCREW, SOC SET 10-24 X 1/4	1

S-T INDUSTRIES INC.	
MODEL	
PART NO.	
MANUAL CRANK (3500)	
REV	
D	
MANUAL CRANK (3500)	
SHEET 1 OF 1	

# VERTICAL DRIVE ASSY. (3500)



ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	22-3736-21	GEAR DRIVE MOUNT	1
2	22-3736-17	DRIVE SHAFT	1
3	48-5125-00	SET SCREW COLLAR	1
4	48-6737-00	WASHER, WAVE	1
5	48-7973-00	FLANGE BUSHING	2
6	22-2079-00	GEAR	1
7	48-5160-00	SCREW, SHCS 1/4-20 X 5/8 LG.	2
8	48-6033-00	1/4 WASHER	2
9	22-3831-00	HANDWHEEL	1
10	22-3736-15	GEAR MOUNT BLOCK	1
11	22-3736-16	SET SCREW FOR VERT.DR.	1
12	48-5225-00	CARB. BALL	1
13	22-3731-00	LEAD SCREW	1
14	48-7927-00	HEX NUT	1
15	22-2757-00	GEAR, NYLON BEVEL	1
16	48-5121-00	SPRING PIN	1
17	48-5124-00	SPRING PIN	1

22 3732-36

S-T INDUSTRIES INC.

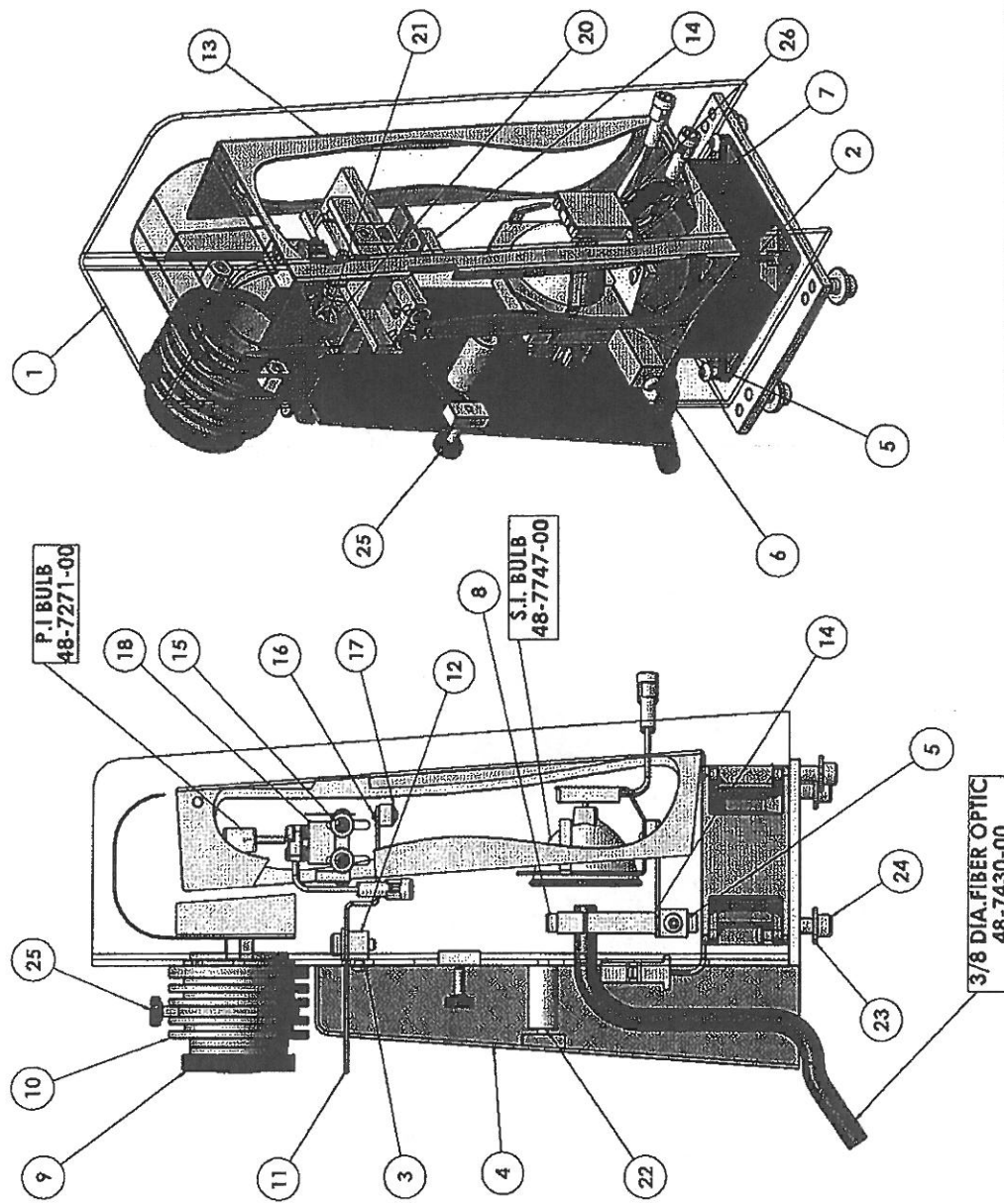
**3500 VERTICAL DRIVE ASSY.**

D 22 3732-36

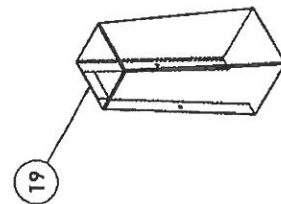
SCALE: 1:1

SHEET 1 OF 1

# LAMPHOUSE ASSY. (3500)



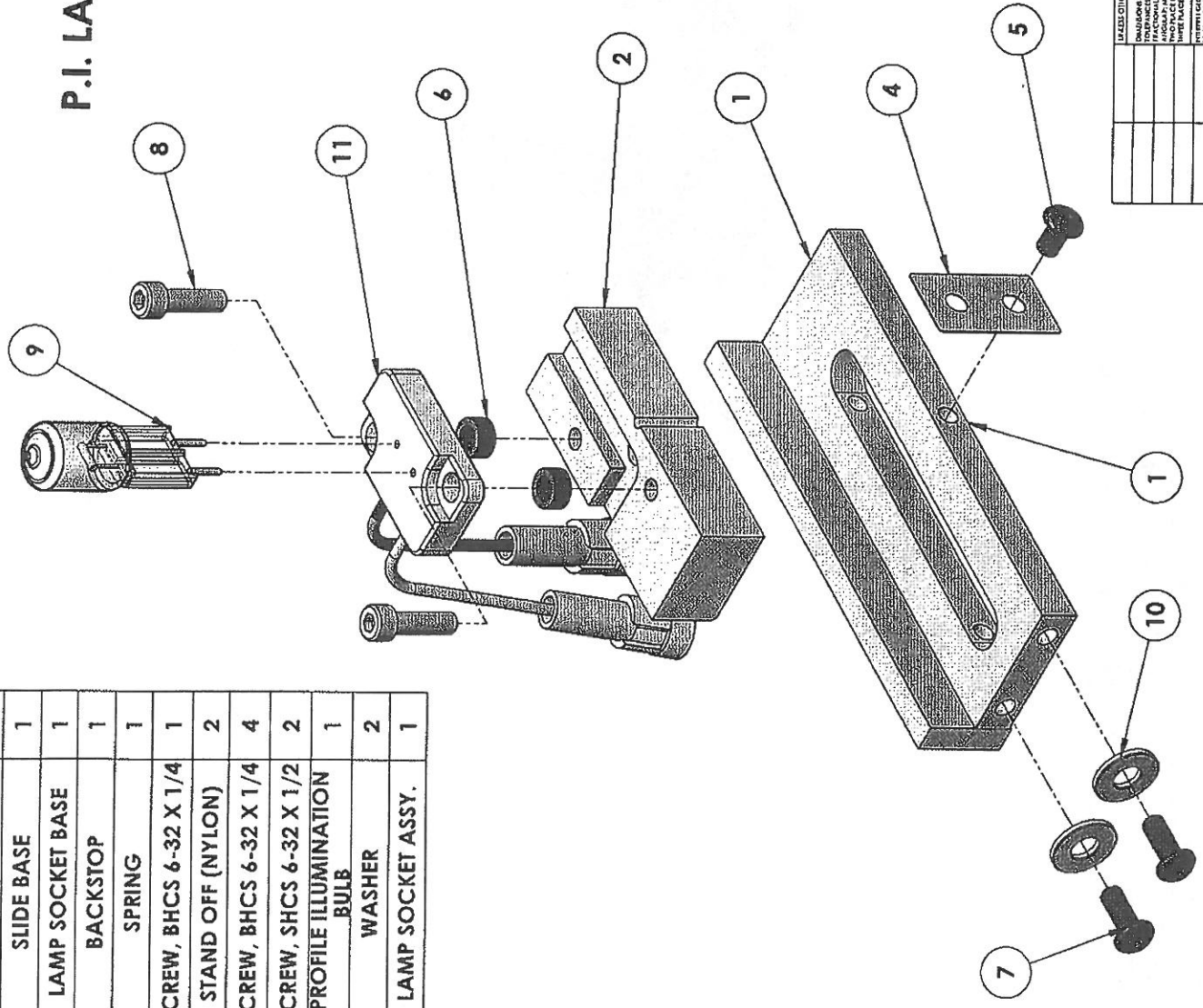
ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	22-3714-20	LAMPHOUSE FRAME W/DT.	1
2	22-3426-00	FAN ASSY. (TAPPED 8 PLACES)	1
3	48-5111-00	SCREW, BHCS 8-32 X 1/4	4
4	22-3714-26	COVER, ELECTRICAL W/DT.	1
5	22-3714-13	MOUNTING BAR-LAMP BRACKET	1
6	48-5438-00	SCREW, BHCS 8-32 X 3/8 LG	2
7	22-3714-31	SOCKET MOUNT WELDMENT	1
8	48-5016-00	SCREW, SHCS 10-32 X 3/4	3
9	22-3726-00	CONDENSER LENS ASSY	1
10	22-3714-03	LENS TUBE	1
11	22-3714-39	PIVOT LEVER	1
12	22-3714-35	PIVOT BLOCK	1
13	22-3714-58	DEFLECTOR	1
14	22-3599-00	FIBER OPTIC MOUNT	1
15	48-6421-00	SCREW, BHCS 6-32 X 1/4	1
16	48-5339-00	SCREW, BHCS 4-40 X 1/4	3
17	48-5797-00	WASHER	1
18	22-3714-41	P.I. LAMP SOCKET ASSY.	1
19	22-3714-59	WELDMENT, LAMPHOUSE COVER	1
20	48-6151-00	WASHER, TEFLON	1
21	48-7703-00	SHOULDER SCREW, 3/16	1
22	48-5126-00	SCREW, BHCS 8-32 X 1/2	1
23	48-6033-00	1/4 WASHER	4
24	48-5321-00	SCREW, SHCS 1/4-20 X 1/2	4
25	22-2107-08	THUMB SCREW	3
26	22-3714-34	S.I. LAMP SOCKET ASSY	1



S-T INDUSTRIES INC.	
LAMP HOUSE ASSY. (3500)	
REV. NO.	REV.
D	
DATE	BY
APPROVED	DESIGNED
CHECKED	TESTED
MANUFACTURED	INSPECTED
ASSEMBLED	PACKED
SHIPPED	

# P.I. LAMP SOCKET ASSY, (3500) 22-3714-41

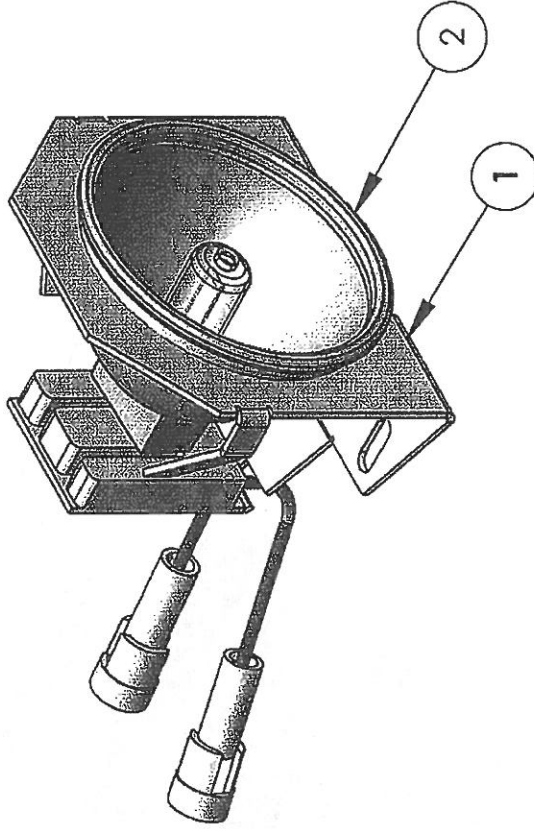
ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	22-3714-37	SLIDE BASE	1
2	22-3714-38	LAMP SOCKET BASE	1
3	22-3714-36	BACKSTOP	1
4	22-3714-42	SPRING	1
5	48-5137-00	SCREW, BHCS 6-32 X 1/4	1
6	48-7991-00	STAND OFF (NYLON)	2
7	48-6421-00	SCREW, BHCS 6-32 X 1/4	4
8	48-5319-00	SCREW, SHCS 6-32 X 1/2	2
9	48-7271-00	PROFILE ILLUMINATION BULB	1
10	48-5032-00	WASHER	2
11	22-4108-00	LAMP SOCKET ASSY.	1



S-I INDUSTRIES INC.		DATE	SCALE
TITLE: P.I. LAMP SOCKET ASSY.		DRWNG	SCALE
SHEET NO. C 22-3714-41		CHECKED	SCALE
REV		DESIGN	SCALE
SCALE 12 INCHES		APP. 1	SCALE
SHEET 1 OF 1		APP. 2	SCALE
DO NOT SCALE DRAWING		APP. 3	SCALE
NOT ASY		APP. 4	SCALE
APP. 5		APP. 6	SCALE
APP. 7		APP. 8	SCALE
APP. 9		APP. 10	SCALE
APP. 11		APP. 12	SCALE

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	22-3714-34	LAMP HOUSE SOCKET ASSY	1
2	48-7747-00	SURFACE ILLUMINATION BULB	REF

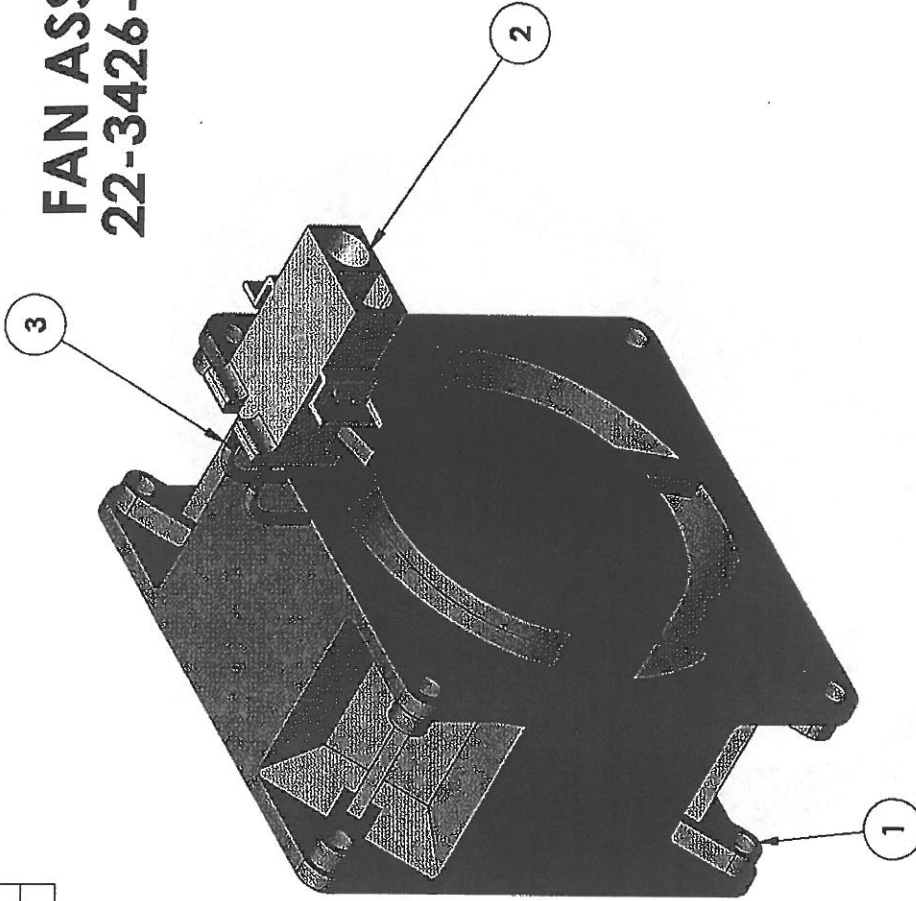
# LAMP SOCKET ASSY 22-3714-34



**S-T INDUSTRIES INC**  
**LAMP SOCKET ASSY.**  
 TITLE:  
 SIZE DWG. NO. **A 22-3714-34** REV  
 SCALE: 1:1 WEIGHT: SHEET 1 OF 1

UNLESS OTHERWISE SPECIFIED:	NAME	DATE
DIMENSIONS ARE IN INCHES	DRAWN	
TOLERANCES:	CHECKED	
FRACTIONAL ±	ENG APPR.	
ANGULAR: MACH ± BEND ±	MFG APPR.	
TWO PLACE DECIMAL ±	G.A.	
THREE PLACE DECIMAL ±	COMMENTS:	
INTERPRET GEOMETRIC TOLERANCING PER MATERIAL		
FINISH		
NEXT ASSY	USED ON	
APPLICATION		
	DO NOT SCALE DRAWING	

# FAN ASSY 22-3426-00

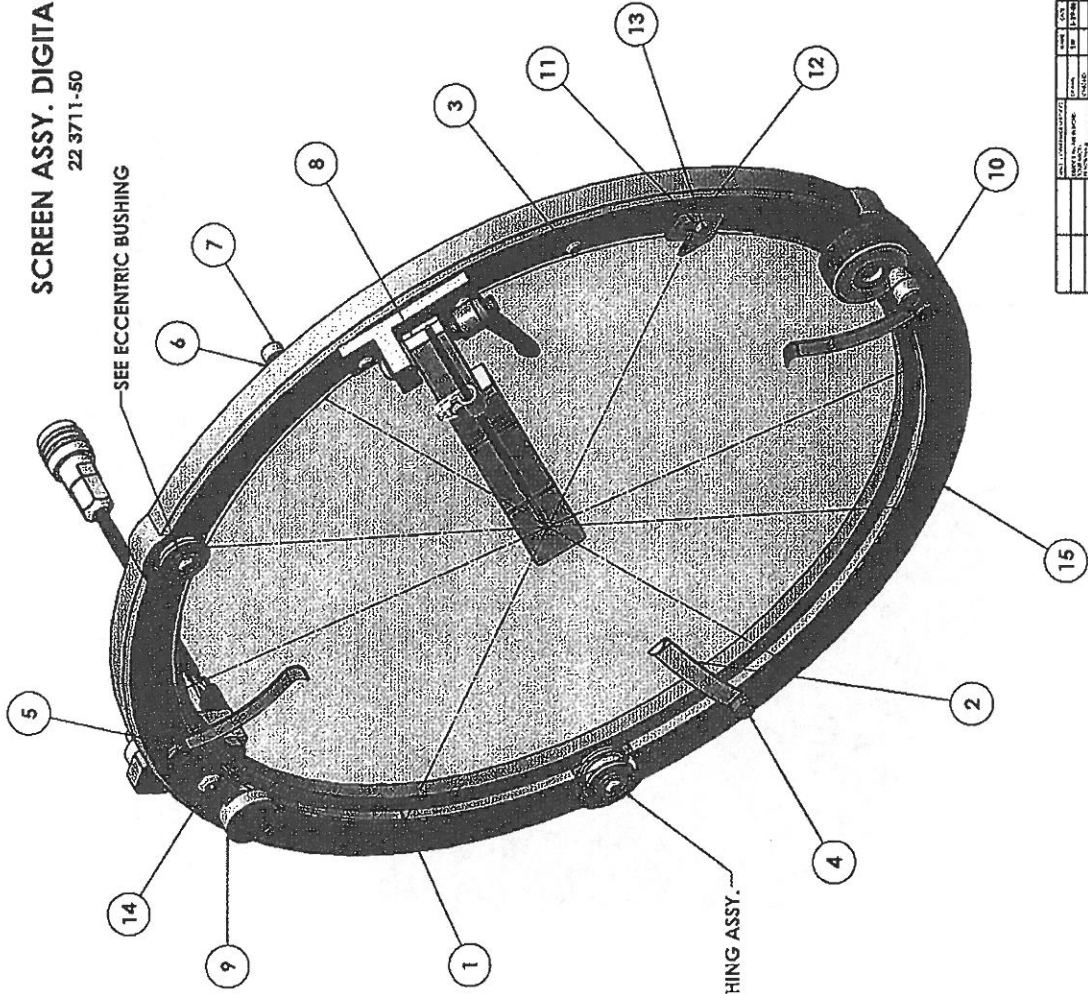


ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	48-6289-00	FAN	1
2	48-6706-00	PLUG, 2 CIRCUIT	1
3	48-6189-00	PIN TERMINAL	2

S-T INDUSTRIES INC		DATE	1	2	3	4	5
TITLE:		NAME					
FAN ASSY, (TAPPED 8 PLACES)		DRAWN					
SIZE DWG. NO.		CHECKED					
A 22 3426-00		ENG APPR.					
REV		MFG APPR.					
SCALE: 1:2		G.A.					
WEIGHT:		COMMENTS:					
SHEET 1 OF 1		INTERPRET GEOMETRIC TOLERANCING PER:					
		MATERIAL:					
		FINISH:					
		NEXT ASSY	USED ON				
		APPLICATION					
		DO NOT SCALE DRAWING					

# SCREEN ASSY. DIGITAL (3500)

22 3711-50



SEE ECCENTRIC BUSHING

SEE STRAIGHT BUSHING ASSY.

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	74-0423-1425	CENTERLINE GLASS SCREEN	1
2	22-0334-00	SCREEN CLIP	3
3	48-5111-00	SCREW, BHCS 8-32 X 1/4	2
4	22-0087-00	LOCK SCREW	3
5	48-6070-00	WASHER, TEFLON	3
6	48-6033-00	1/4 WASHER	6
7	48-5057-00	SCREW, SHCS 1/4-20 X 3/4	3
8	22-3747-10	OPTIC ARM ASSY.	1
9	48-7692-00	ENCODER	1
10	22-3711-11	DRIVE KNOB & ROLLER ASSY	1
11	48-6988-00	WASHER, FEED SCREW LOCK	1
12	22-3711-25	POINTER	1
13	48-5438-00	SCREW, BHCS 8-32 X 3/8 LG	2
14	48-8017-00	SCREW, BHCS 1/4-20 X 5/8	1
15	22-3711-34	PROTRACTOR RING	1

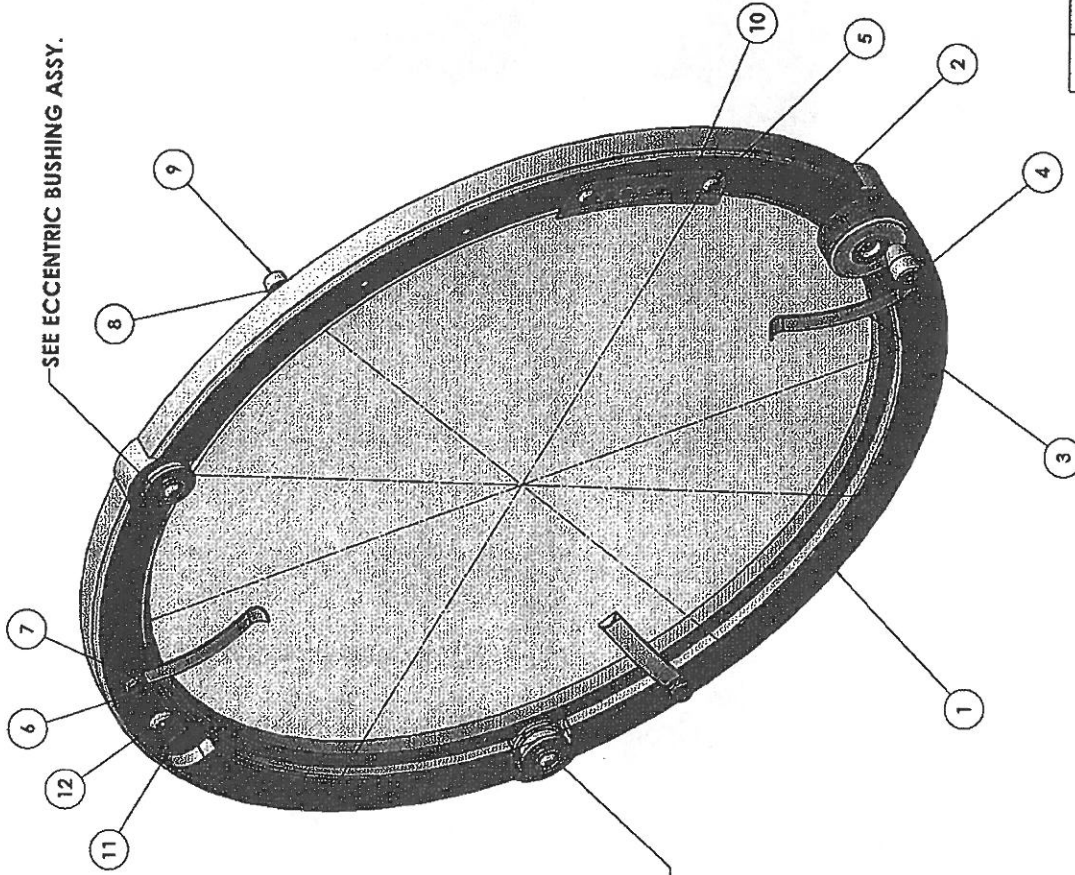
REV. 1	REV. 2	REV. 3	REV. 4	REV. 5	REV. 6	REV. 7	REV. 8	REV. 9	REV. 10	REV. 11	REV. 12	REV. 13	REV. 14	REV. 15
DATE	DATE	DATE	DATE	DATE	DATE	DATE	DATE	DATE	DATE	DATE	DATE	DATE	DATE	DATE
BY	BY	BY	BY	BY	BY	BY	BY	BY	BY	BY	BY	BY	BY	BY
S-T INDUSTRIES INC.														
SCREEN ASSY. (3500)														
SCALE IS FINISH														



ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	22-3711-34	PROTRACTOR RING	1
2	74-0423-1425	CENTERLINE GLASS SCREEN	1
3	22-0334-00	SCREEN CLIP	3
4	22-3711-11	DRIVE KNOB & ROLLER ASSY	1
5	48-5111-00	SCREW, BHCS 8-32 X 1/4	2
6	22-0087-00	LOCK SCREW	3
7	48-6070-00	WASHER, TEFLON	3
8	48-6033-00	1/4 WASHER	6
9	48-5057-00	SCREW, SHCS 1/4-20 X 3/4	3
10	22-5314-00	VERNIER PLATE	1
11	48-7019-06	HOLE PLUG	1
12	48-8017-00	SCREW, BHCS 1/4-20 X 5/8	1

**SCREEN ASSY (VERNIER)  
3500**

SEE ECCENTRIC BUSHING ASSY.

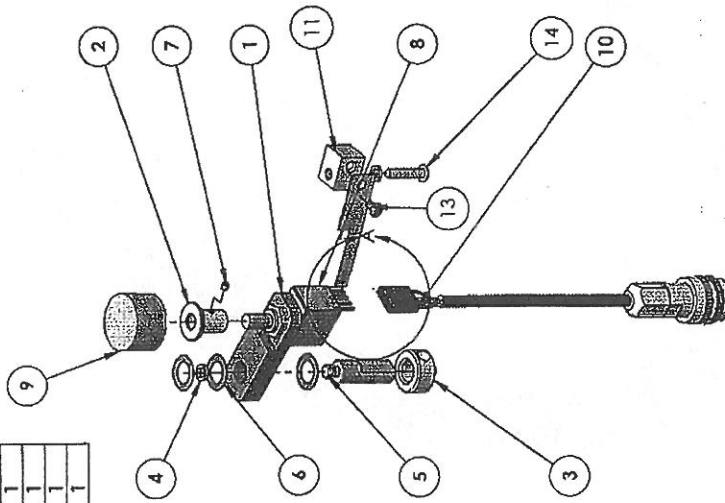


SEE STRAIGHT BUSHING ASSY.

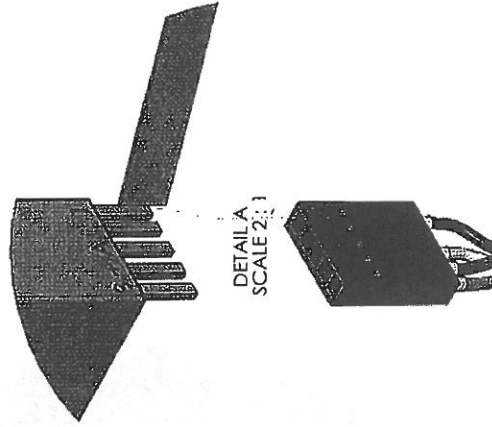
22 3711-49

S-I INDUSTRIES INC	
PROTRACTOR RING ASSY. (VERNIER)	22 3711-49
SCALE 1/2" = 1"	SHEET 1 OF 1

# ENCODER ASSY. (3500)



DETAIL A  
SCALE 2:1



ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	22-3711-02	PIVOT ARM	1
2	22-3711-26	ENCODER WHEEL	1
3	48-5125-00	SET SCREW COLLAR	1
4	48-6654-00	SPRING LOCK WASHER	2
5	22-3711-06	PIVOT SHAFT	1
6	48-6070-00	NYLON WASHER	3
7	48-5813-00	SET SCREW 4-40 X 1/8	1
8	48-7692-00	ENCODER	1
9	22-3711-19	ENCODER COVER	1
10	22-3723-03	CABLE ASSY. ENCODER	1
11	22-3711-07	TENSION BLOCK	1
12	22-3711-08	TENSION SPRING	1
13	48-5137-00	SCREW, BHCS 6-32 X 1/4	1
14	48-5185-00	SCREW, BHCS 8-32 X 3/4	1

**S-T INDUSTRIES INC.**  
TITLE: **ENCODER**  
SIZE: DWG. NO. **B** ENCODER ASSY (3500) REV  
SCALE: 1:5 WEIGHT: SHEET 1 OF 1

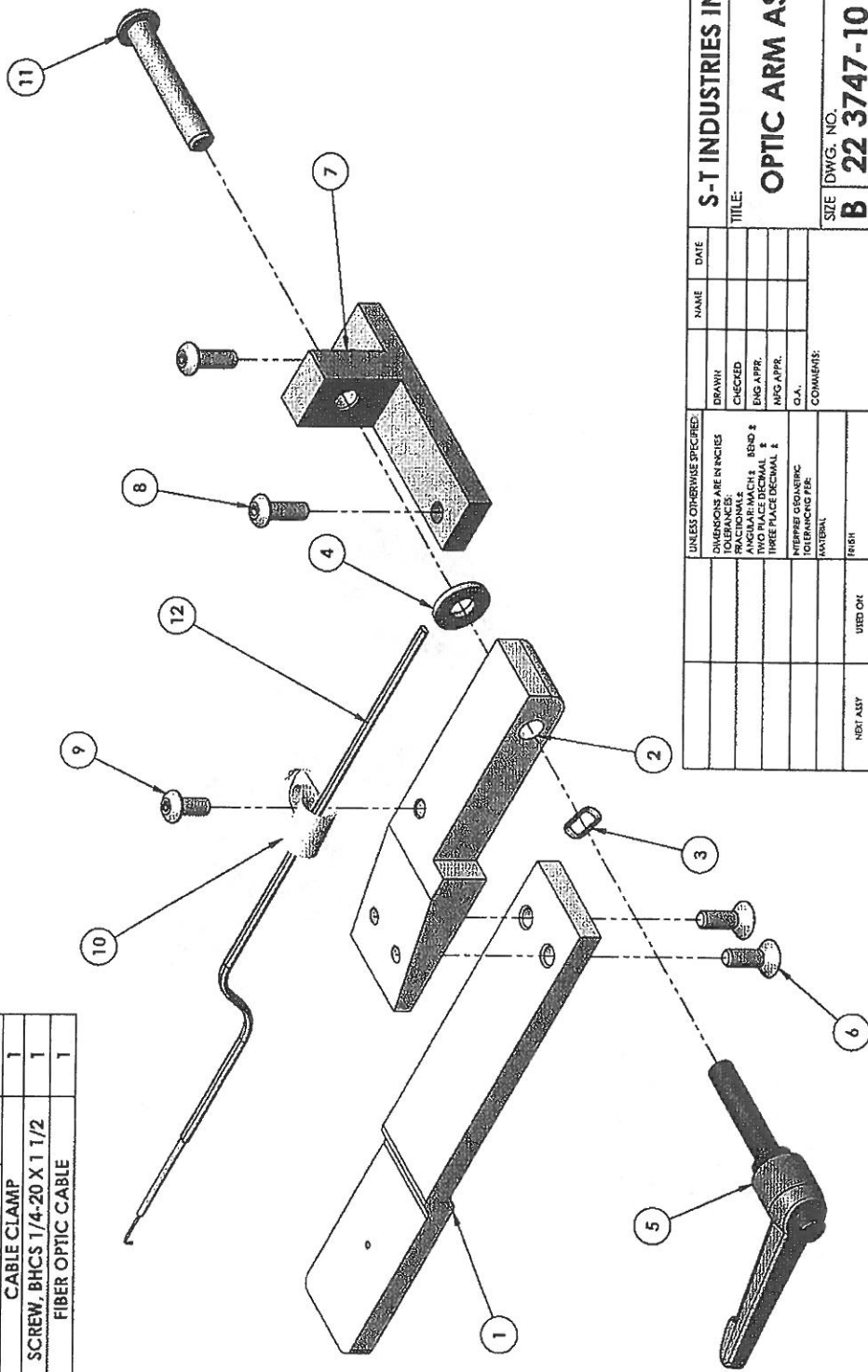
UNLESS OTHERWISE SPECIFIED:  
DIMENSIONS ARE IN INCHES  
TOLERANCES  
FRACTIONAL ±  
ANGULAR: MACH. ±  
TWO PLACE DECIMAL ±  
THREE PLACE DECIMAL ±  
INTERPRET GEOMETRIC  
TOLERANCING PER:  
MATERIAL:  
FINISH:  
DO NOT SCALE DRAWING

NAME: \_\_\_\_\_ DATE: \_\_\_\_\_  
DRAWN: \_\_\_\_\_ CHECKED: \_\_\_\_\_  
DESIGNED: \_\_\_\_\_ ENG. APPR.: \_\_\_\_\_  
MFG. APPR.: \_\_\_\_\_  
Q.A.: \_\_\_\_\_  
COMMENTS: \_\_\_\_\_

NEE ASSTY USED ON APPLICATION

# OPTIC ARM ASSY. 3500 22-3747-10

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	22-3747-05	OPTIC MOUNT	1
2	22-3747-02	SWIVEL ARM	1
3	48-6630-00	WASHER, WAVE	1
4	48-6151-00	WASHER, TEFLON	1
5	48-8299-00	ADJUSTABLE HANDLE	1
6	48-5974-00	SCREW, FHCS 8-32 X 1/2	2
7	22-3747-11	EDGE SENSOR ARM MOUNT	1
8	48-5126-00	SCREW, BHCS 8-32 X 1/2	2
9	48-5438-00	SCREW, BHCS 8-32 X 3/8 LG	1
10	48-7352-00	CABLE CLAMP	1
11	48-8147-00	SCREW, BHCS 1/4-20 X 1 1/2	1
12	48-7785-00	FIBER OPTIC CABLE	1



DRAWN		NAME	DATE
CHECKED			
ENG APPR.			
MFG APPR.			
D.A.			
INTERPRETER		COMMENTS:	
TOLERANCING PER			
MATERIAL			
FINISH			
USED OR			
NOT ASY			
APPLICATION			
DO NOT SCALE DRAWING			

UNLESS OTHERWISE SPECIFIED:  
 DIMENSIONS ARE IN INCHES  
 TOLERANCES:  
 ANGULAR DIMS: BOND  
 TWO PLACE DECIMAL  
 THREE PLACE DECIMAL  
 INTERPRETER TOLERANCING PER MATERIAL

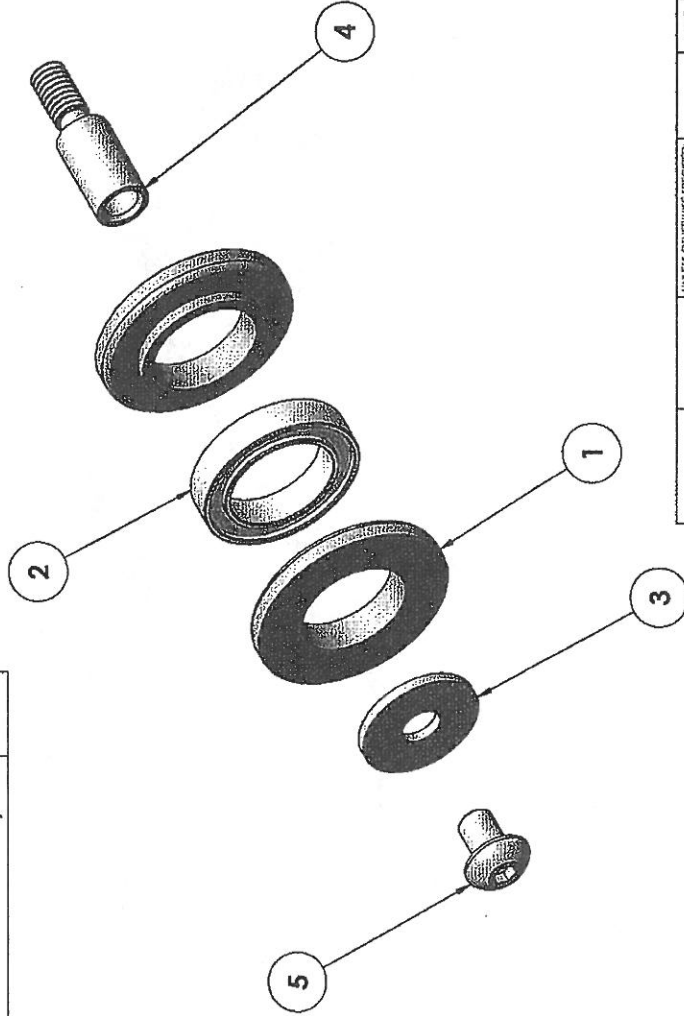
S-T INDUSTRIES INC.  
 TITLE:  
**OPTIC ARM ASSY.**

SIZE DWG. NO. REV  
**B 22 3747-10**

SCALE: 1:5 WEIGHT: SHEET 1 OF 1

# STRAIGHT BUSHING ASSY. (3500)

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	22-3711-30	CAP	2
2	48-8003-00	BEARING	1
3	48-6083-00	WASHER #10	1
4	22-3711-29	THREAD PIVOT STUD	1
5	48-5111-00	SCREW, BHCS 8-32 X 1/4	1



UNLESS OTHERWISE SPECIFIED:		NAME	DATE
DRAWN	CHECKED		
DESIGNER	ENG APPR.		
FRACTIONAL	MFG APPR.		
ANGULAR/MACH. BEND ±	D.A.		
WELDING SYMBOLS	COMMENTS:		
THREE PLACE DECIMAL ±			
TEMPER GEOMETRIC			
TO DIMENSIONING PER			
MATERIAL			
FRESH			
NEED LAST	WELD ON		
APPLICATION			
DO NOT SCALE DRAWING			

S-T INDUSTRIES INC.

TITLE:

STRAIGHT BUSHING ASSY. (3500)

SIZE DWG. NO.

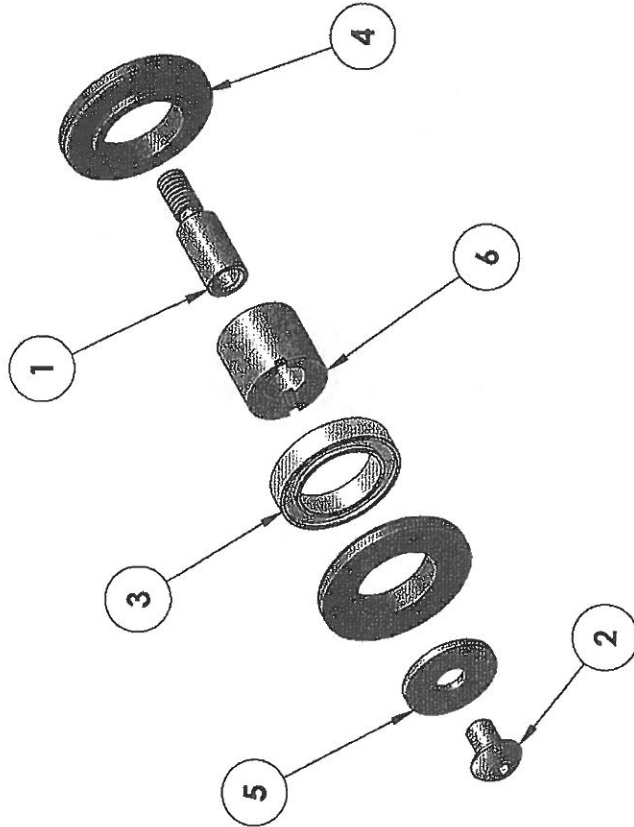
B STRAIGHT BUSHING

SCALE: 1:1 WEIGHT: SHEET 1 OF 1

REV

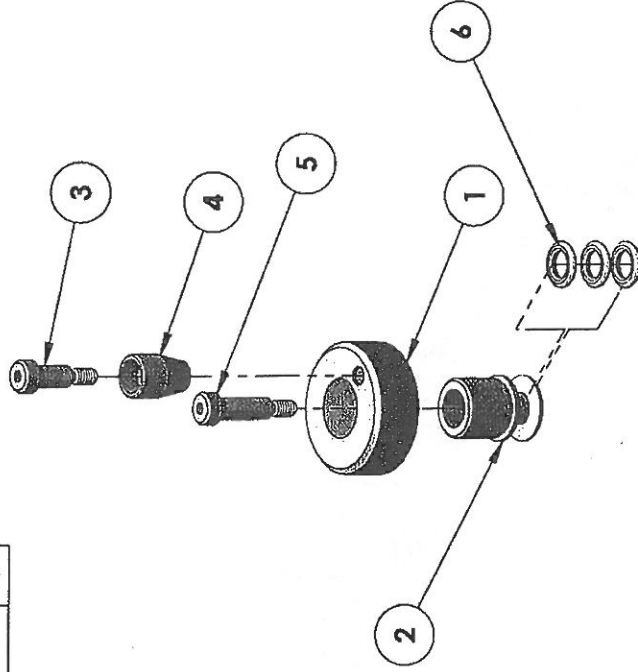
# ECCENTRIC BUSHING ASSY. (3500)

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	22-3711-29	THREAD PIVOT STUD	1
2	48-5111-00	SCREW, BHCS 8-32 X 1/4	1
3	48-8003-00	BEARING	1
4	22-3711-30	CAP	2
5	48-6083-00	WASHER #10	1
6	22-3711-31	BUSHING, ECCENTRIC	1



<b>S-T INDUSTRIES INC.</b>		DATE
TITLE: <b>ECCENTRIC BUSHING (3500) ASSY.</b>		DRAWN
SIZE DWG. NO. <b>A</b>		CHECKED
ECCENTRIC BUSHING		ENG APPR.
SCALE: 1:2		MFG APPR.
REV		Q.A.
SHEET 1 OF 1		COMMENTS:
WEIGHT:		UNLESS OTHERWISE SPECIFIED:
1		DIMENSIONS ARE IN INCHES
2		TOLERANCES:
3		FRACTIONAL ±
4		ANGULAR: MACH ± BEND ±
5		THREE PLACE DECIMAL ±
6		INTERPRET GEOMETRIC TOLERANCING PER:
NEXT ASSY		MATERIAL
USED ON		FINISH
APPLICATION:		DO NOT SCALE DRAWING
1		2
2		3
3		4
4		5
5		6

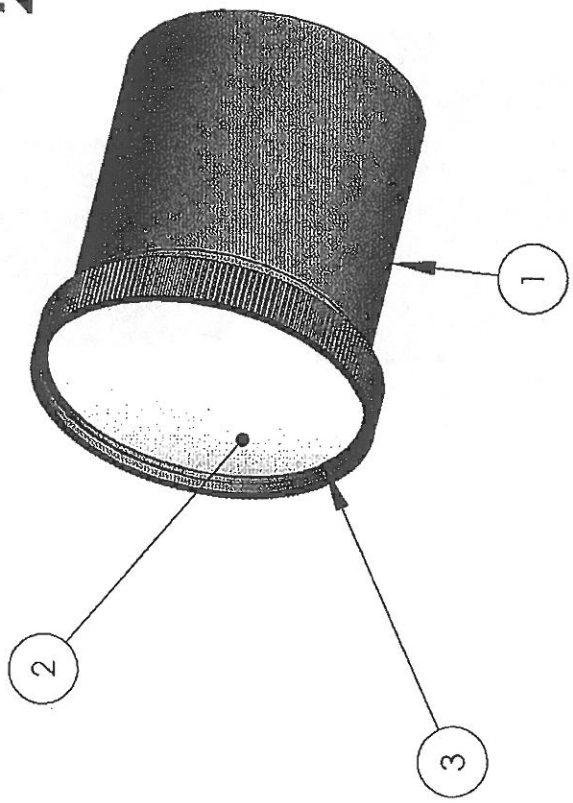
# 3500 DRIVE KNOB & ROLLER ASSY. 22-3711-11



ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	22-3711-12	DRIVE KNOB	1
2	22-3711-13	DRIVE ROLLER	1
3	48-6131-00	SHOULDER SCREW 1/4 X 1/2 LONG	1
4	22-3711-32	SPINNER	1
5	48-5988-00	SHOULDER SCREW	1
6	48-7010-00	O RING	3

<b>S-T INDUSTRIES INC.</b>		NAME	DATE
TITLE: <b>DRIVE KNOB &amp; ROLLER ASSY</b>		DRAWN	
SIZE DWG. NO. <b>A 22 3711-11</b>		CHECKED	
SCALE: 1:2 WEIGHT: SHEET 1 OF 1		ENG APPR.	
REV		MFG APPR.	
COMMENTS:		G.A.	
DO NOT SCALE DRAWING			
APPLICATION			
NEXT ASSY		USED ON	

# CONDENSER LENS ASSY, 22-3726-00

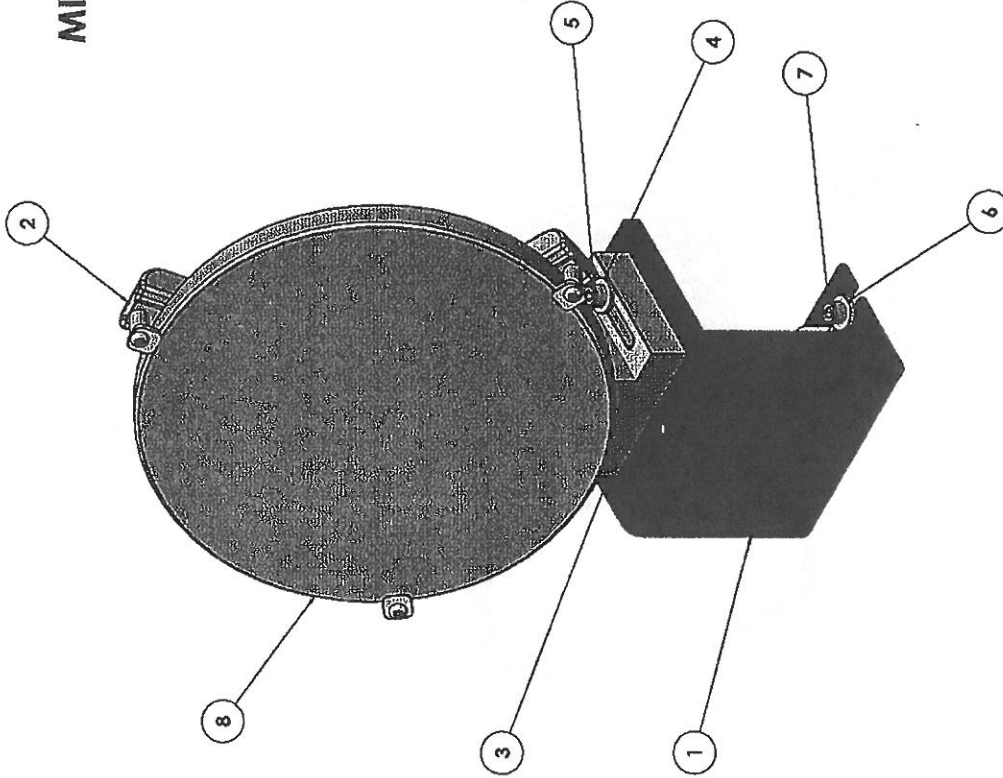


ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	22-3726-01	LENS MOUNT TUBE	1
2	22-0099-0088	CONDENSER LENS	1
3	22-0098-0088	RETAINING RING FOR CONDENSER LENS	1

S-T INDUSTRIES INC,		DATE	1	2	1	1
TITLE:		NAME				
CONDENSER LENS ASSY		DRAWN				
SIZE DWG. NO.		CHECKED				
A 22 3726-00		ENG APPR.				
SCALE: 1:2		MFG APPR.				
WEIGHT:		Q.A.				
SHEET 1 OF 1		COMMENTS:				
REV						
UNLESS OTHERWISE SPECIFIED:						
DIMENSIONS ARE IN INCHES						
TOLERANCES:						
FRACTIONAL ±						
ANGULAR: MACH: BEND ±						
TWO PLACE DECIMAL ±						
THREE PLACE DECIMAL ±						
INTERPRET GEOMETRIC TOLERANCING PER:						
MATERIAL						
FINISH						
NEXT ASSY		USED ON				
APPLICATION		DO NOT SCALE DRAWING				
5	4	3	2	1	1	1

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	22-3720-00	BRACKET MIRROR, MOUNTING	1
2	22-3384-01	MIRROR MOUNT ASSY. W LONGER POST	1
3	22-3340-00	MIRROR MOUNT BASE	1
4	48-6069-00	1/4 WASHER	2
5	48-5262-00	SCREW, SHCS 1/4-20 X 1 1/4	2
6	48-6033-00	1/4 WASHER	4
7	48-5321-00	SCREW, SHCS 1/4-20 X 1/2	3
8	22-0124-00	FRONT FACE ROUND MIRROR	1

# MIRROR ASSY. (3500)



DATE	BY	CHKD	APP'D	REV
S-T INDUSTRIES INC.				SCALE 1:1
MIRROR ASSY.				REV
D MIRROR ASSY (3500)				REV





