



SCHERR-TUMICO

INSTRUCTION MANUAL

VIDEO INSPECTION SYSTEM

9700/9780 SERIES

MADE IN USA

20-9700 SERIES Video Inspection System

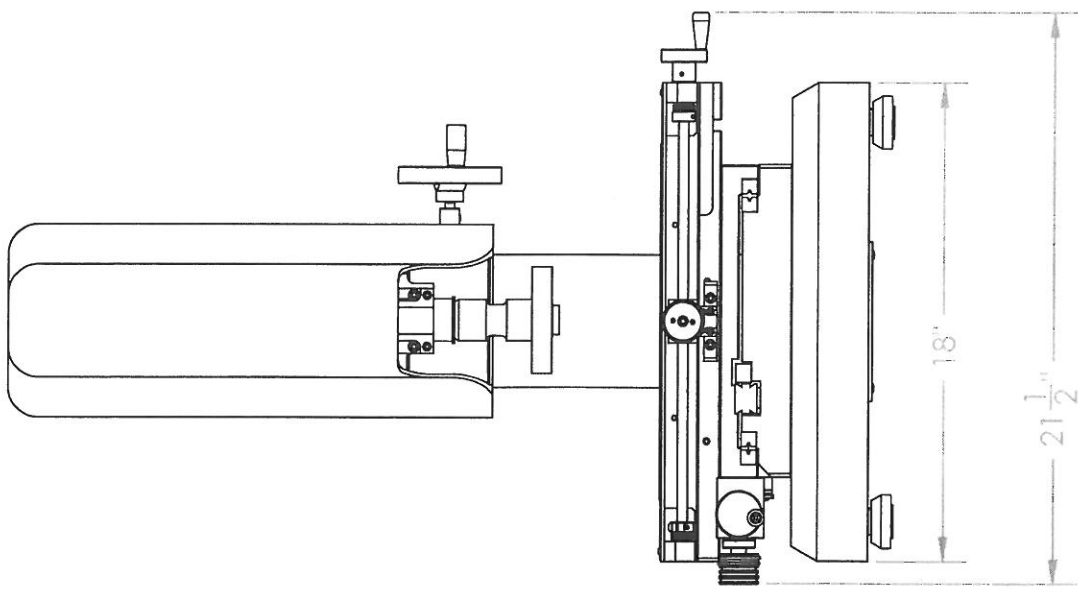
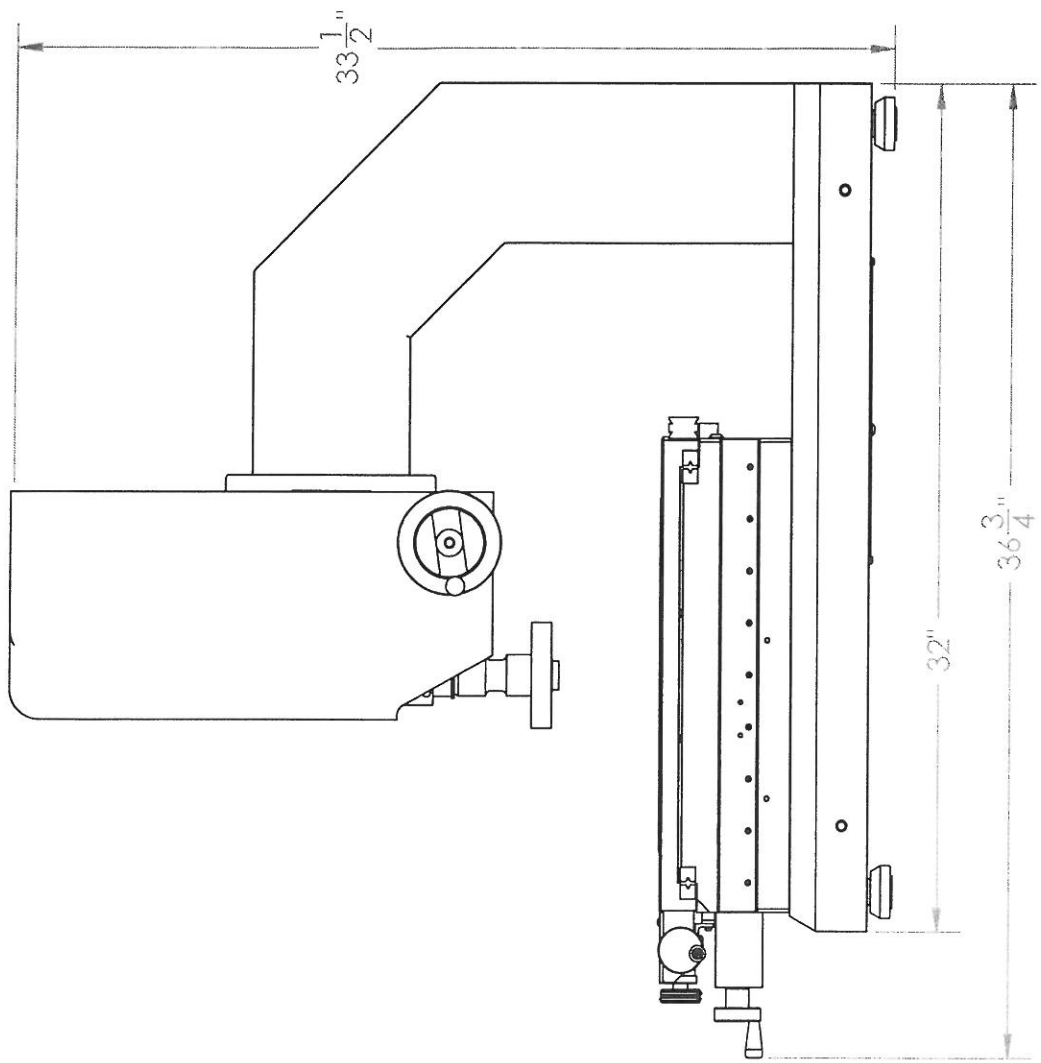
INSTRUCTION MANUAL

INTRODUCTION

This manual contains the instructions for the installation, operation and maintenance of the SCHERR-TUMICO 20-9700 Series Video Inspection System. Due to S-T Industries' policy of continued improvement of products, the right to change without notice is reserved. The information contained in this manual may vary somewhat from the machine with which it is to be used. To fully utilize the capabilities of this video inspection system, a comprehensive study of this manual is necessary. The 20-9700 Series Video Inspection System sets new standards in functional design, ease of use, rigidity and accuracy. Over 60 years of manufacturing experience combined with worldwide factory service make **S-T Video Inspection Systems your best buy.**

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Specifications

Measuring Stage: Top plate 18" x 18"; Travel 12" x 12"

Encoder Resolution .00005"/.001mm.

Focus motion (Z-axis): Travel 8";

Allowable Workload: 25 lbs. evenly distributed.

Illumination: LED ring light and LED back light; Separate controls for 0-100% intensity. (AUTO setting for programmable light control)

Optics: 1-6X zoom lens. Approximately 35X-210X magnification on 17" monitor.

Camera: Color, 1/2" CCD

Monitor: VGA flat panel, 17" diagonal

Crosshair Generator: STX-1000, VGA output, single crosshair

Electrical: 100-240 Volts, 50/60 Hz

Weight: 400 lbs. Crated 450 lbs.

Installation Procedure

IMPORTANT: Lift unit to a sturdy surface for operation using 4 screw-in lift handles. Never lift by measuring stage or by Z-axis column.

1. Adjust 4 leveling feet under base until stable. There should be no noticeable rock of the base on the operational surface.
2. Remove shipping clamps from ends of bearings (one for each axis). Replace screws after removing clamps. For Z-axis (focus), first remove plastic cover. Clamp will be at the top of bearings. Replace screws and cover. Remove any packing material from cables exiting the bottom of the Z-axis column and the back of the unit.
3. Connect camera and light cables to light control box.
4. Plug end of ring light and profile fiber optic bundles into their respective sockets in the rear panel of the light box and secure with setscrews.
5. Install stage glass by aligning radius corners with radiused corners in top plate. Adjust for level if necessary with leveling screws underneath glass. (For best results, use dial indicator on glass to check level) Lock in place by tightening 2 corner expanding plastic bushings. Note: For motorized systems, this step will be performed after the motors are activated.
6. Place video monitor, crosshair generator and digital readout in desired locations. Connect scale cables to digital readout. Plug in respective cables. Power cable from crosshair goes to light control box. Video cable from machine goes to crosshair generator; video cable from monitor goes to crosshair generator.
7. If this system has video edge detection (VED), connect the video cable from the machine to the input of QC300 or QC5000 digital readout.
8. Connect power cables of digital readout, monitor, and light control to the power strip. If this is a CNC system, connect motor cables, joystick, and CNC cables using key in Quadra-Chek manual.

You are now ready to power up!

Main Power

A power strip will serve as the main On/Off switch for the system. A universal power supply provides power to all low voltage components and accepts 100-240 volts, 50-60 Hz input power. This includes the camera, crosshair generator and LED lighting system. Digital readouts and monitors have built-in power supplies that accept 100-240 volts, 50-60 Hz input power.

Remote Light Control

The remote light control allows convenient access to the light intensity adjustment.

The Profile Illumination knob controls bottom lighting. Rotate clockwise to increase light, counterclockwise to decrease.

The Surface Illumination knob controls top lighting. Rotate clockwise to increase light, counterclockwise to decrease.

Optical System

A 6X zoom lens is standard. When used in standard configuration, this provides approximately 35X to 200X magnification on screen.

Other attachments are available to modify the magnification. Consult S-T Industries for information.

Video Equipment

Standard system includes a 17" VGA monitor. (Exact size may vary slightly due to availability) Other sizes are available. Units with VED have lower on-screen magnification.

Standard system includes color camera.

Illumination

LED backlight and ringlight. Auto feature on light control allows computer to control light intensity during measuring program.

Operation

Normal operation of this video inspection system is similar to that of an optical comparator. (Make sure all components are powered up and working properly before proceeding with this section.)

a. Place part on glass plate in approximate orientation to be measured. Secure with modeling clay if necessary. (Part fixtures to hold parts square are always recommended)

b. Find feature to be measured by adjusting zoom lens to lowest setting. Adjust lighting to best illuminate part as you adjust focus.

c. When feature is located, adjust zoom lens to preferred setting, adjust lighting and refine focus if necessary.

d. To measure, move edge of feature to crosshair and zero digital readout. Move other edge of feature to crosshair and read measurement on digital readout.

This is a very simple description of the measurement process. Many enhancements are available including skewing, geometric calculations and video edge detection.

Options

1. Video Edge Detection (VED).
2. Motor control
3. CNC motor control (X, Y and Z axis) with VED, auto focus and light control

Measuring Stage Calibration

Linear Accuracy

The measuring stage linear accuracy can be calibrated by using S-T Industries' 74-0500-00 calibration plate. Use the highest zoom setting when calibrating video inspection systems.

1. Place the calibration plate on the stage so it is resting on the three rubber pads and so the longer side is parallel with the X axis.
2. Focus on the 6" or 150mm scale.
3. 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. Move the stage back and forth and see that the line remains on the center of the crosshair. Adjust the plate as necessary until it is parallel to the X stage motion.
4. Realign the end mark with the crosshair.
5. 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.
6. 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.
7. 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.
8. It will be necessary to reposition the plate to the other end of the stage and repeat the procedure to calibrate the entire length.
9. To calibrate the Y axis, rotate the calibration plate so it is aligned with the Y axis. Repeat steps 1-7 using the Y axis.

Measuring Stage Calibration

Stage Squareness

The measuring stage linear accuracy can be calibrated by using S-T Industries' 74-0500-00 calibration plate. Use the highest zoom setting when calibrating video inspection systems.

1. Place the calibration plate on the stage so it is resting on the three rubber pads and so the longer side is parallel with the X axis.
2. Focus on the large crosshair in the center of the plate.
3. Move the stage back and forth to see that the horizontal line stays on the crosshair. Adjust the calibration plate if necessary.
4. Move the stage until the end of the vertical line of the crosshair is aligned with the screen crosshair.
5. Zero the X and Y axis displays on the DRO.
6. 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.
7. The squareness is the deviation of the X axis divided by the length of travel along the Y axis.

Digital Readout Systems

The 9700 Series Video Inspection System comes with several optional digital readout systems.

20-9700-01 - 12" x 12" travel stage with standard digital readout system, QuadraChek 120 2-axis DRO. Standard features include INCH/MM, INC/ABS and PRINT.

20-9700-02 - 12" x 12" travel stage with QuadraChek 220 geometric digital readout system. DRO has all standard features plus geometric calculations including point, line, circle, distance, angle and skew and programmability.

20-9700-03 - 12" x 12" travel stage with QuadraChek 320 geometric digital readout system. DRO has all features of QC 220 plus built in monitor with Video Edge Detection (VED) and touch screen control.

20-9700-04 - 12" x 12" travel stage with QuadraChek 5200 geometric digital readout system. DRO has all features of above system and includes PC computer with WINDOWS^R based QC 5200 software. Unique features are graphic representation of part features as they are measured, mouse driven commands and unlimited programmability.

20-9788-00 - 12" x 12" travel stage with QuadraChek 323 series geometric digital readout system. Fully CNC automatic measuring system with VED, auto focus, auto lighting, joystick with trackball for X-Y-Z axis control

20-9788-01 - 12" x 12" travel stage with QuadraChek 5230 series geometric digital readout system. Fully CNC automatic measuring system with VED, auto focus, auto lighting, joystick with trackball for X-Y-Z axis control.

Maintenance

1. Lubrication

- a. Light oil should be used occasionally on ballways and bearings.
- b. Access to vertical ways is by removing main cover. Apply oil, and then move focus up and down to spread lubrication.

For more information contact:

S-T Industries, Inc.
301 Armstrong Blvd. North
St. James, MN 56081

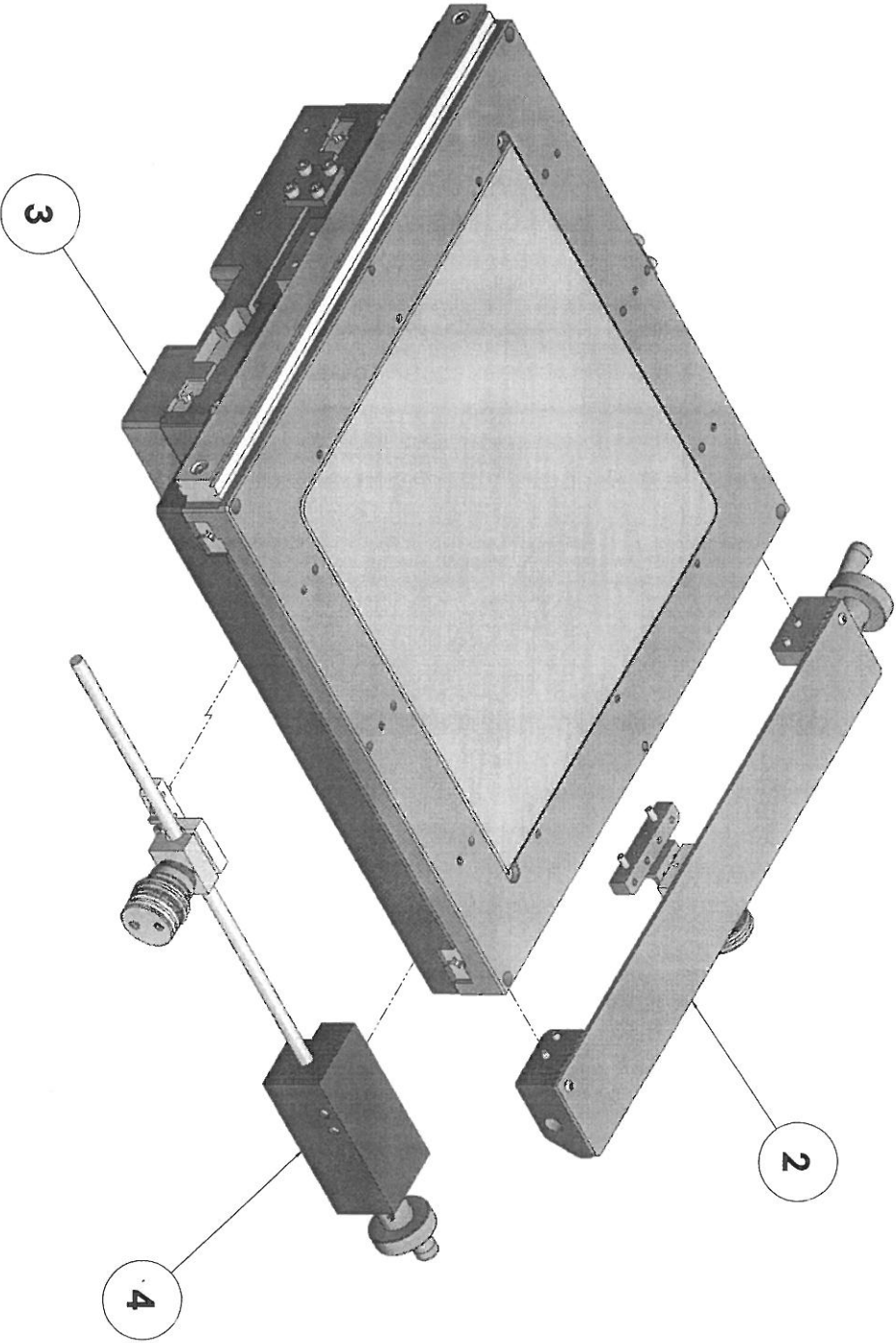
TEL 507/375-3211
FAX 507/375-4503

sales@stindustries.com

www.stindustries.com

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	48-6572-00	SCREW, SHCS 1/4-20 X 2	4
2	22-4185-14	12 INCH X-AXIS CRANK ASSY. (P)	1
3	22-4185-00	12X12 STAGE ASSY.	1
4	22-4185-12	Y-AXIS ROH-LIX ASSY. (P)	1

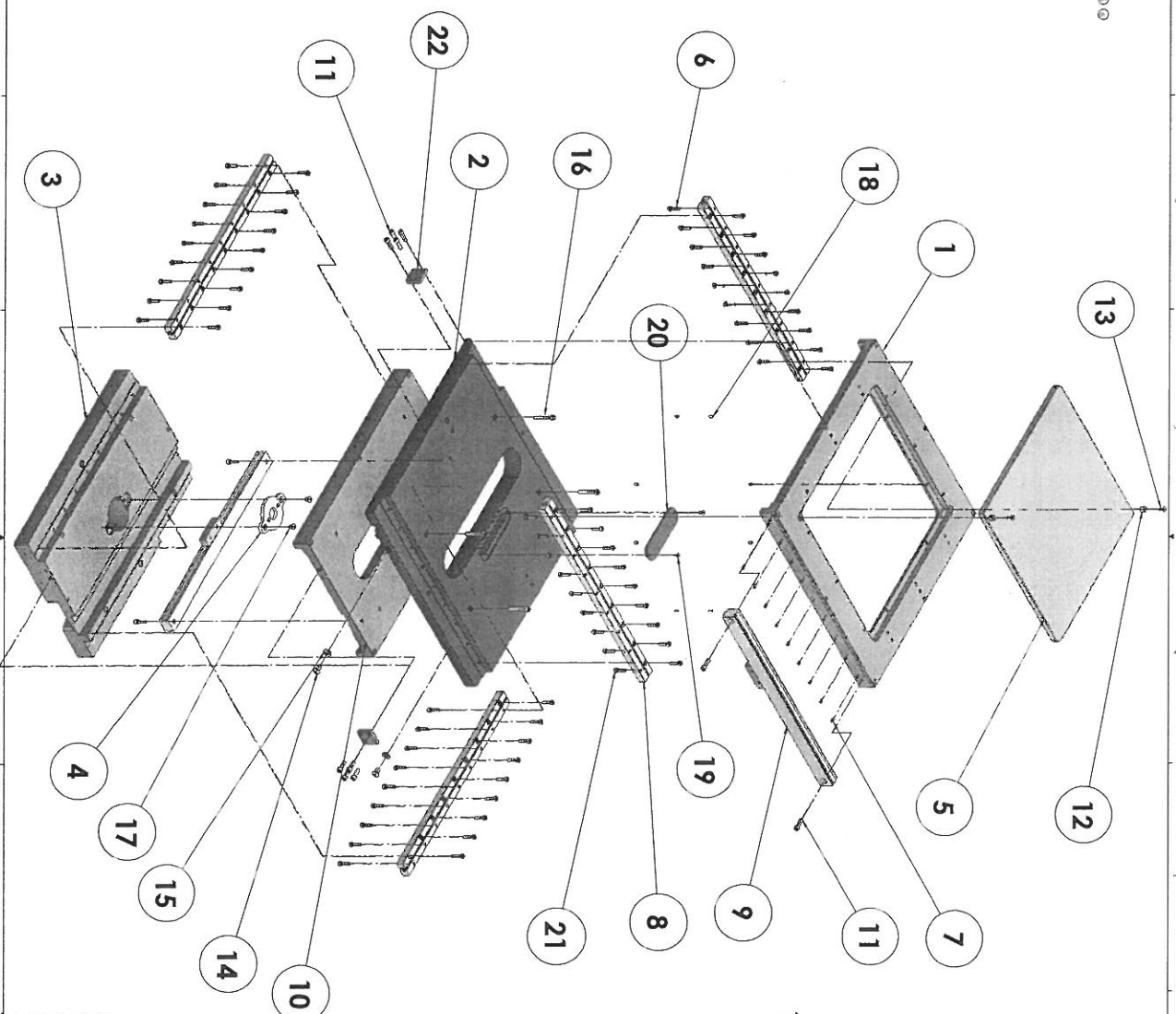
STAGE ASSY, 12X12 MANUAL 22-4185-75



REV	DATE	DESCRIPTION	BY	CHKD
1				

22-4185-00 12X12 STAGE ASSY.		22-4185-12 Y-AXIS ROH-LIX ASSY. (P)	
S-I INDUSTRIES INC. 12 X 12 MANUAL D 22-4185-75	SHEET 1 OF 1	S-I INDUSTRIES INC. 12 X 12 MANUAL D 22-4185-75	

ITEM NO.	PART NUMBER	DESCRIPTION	QTY
1	22-4185-27	TOP PLATE 12 X 12	1
2	22-4185-28	MIDDLE PLATE 12 X 12	1
3	22-4185-29	LOWER MOUNTING PLATE	1
4	22-4185-30	SCREW, 1/4-20 X 1/2	16
5	22-4185-31	SCREW, 1/4-20 X 1/2	16
6	22-4185-32	SCREW, 1/4-20 X 1/2	16
7	22-4185-33	SCREW, 1/4-20 X 1/2	16
8	22-4185-34	SCREW, 1/4-20 X 1/2	16
9	22-4185-35	SCREW, 1/4-20 X 1/2	16
10	22-4185-36	SCREW, 1/4-20 X 1/2	16
11	22-4185-37	SCREW, 1/4-20 X 1/2	16
12	22-4185-38	SCREW, 1/4-20 X 1/2	16
13	22-4185-39	SCREW, 1/4-20 X 1/2	16
14	22-4185-40	SCREW, 1/4-20 X 1/2	16
15	22-4185-41	SCREW, 1/4-20 X 1/2	16
16	22-4185-42	SCREW, 1/4-20 X 1/2	16
17	22-4185-43	SCREW, 1/4-20 X 1/2	16
18	22-4185-44	SCREW, 1/4-20 X 1/2	16
19	22-4185-45	SCREW, 1/4-20 X 1/2	16
20	22-4185-46	SCREW, 1/4-20 X 1/2	16
21	22-4185-47	SCREW, 1/4-20 X 1/2	16
22	22-4185-48	SCREW, 1/4-20 X 1/2	16



**12 X 12 STAGE PLATES ASSY.
22 4185-00**

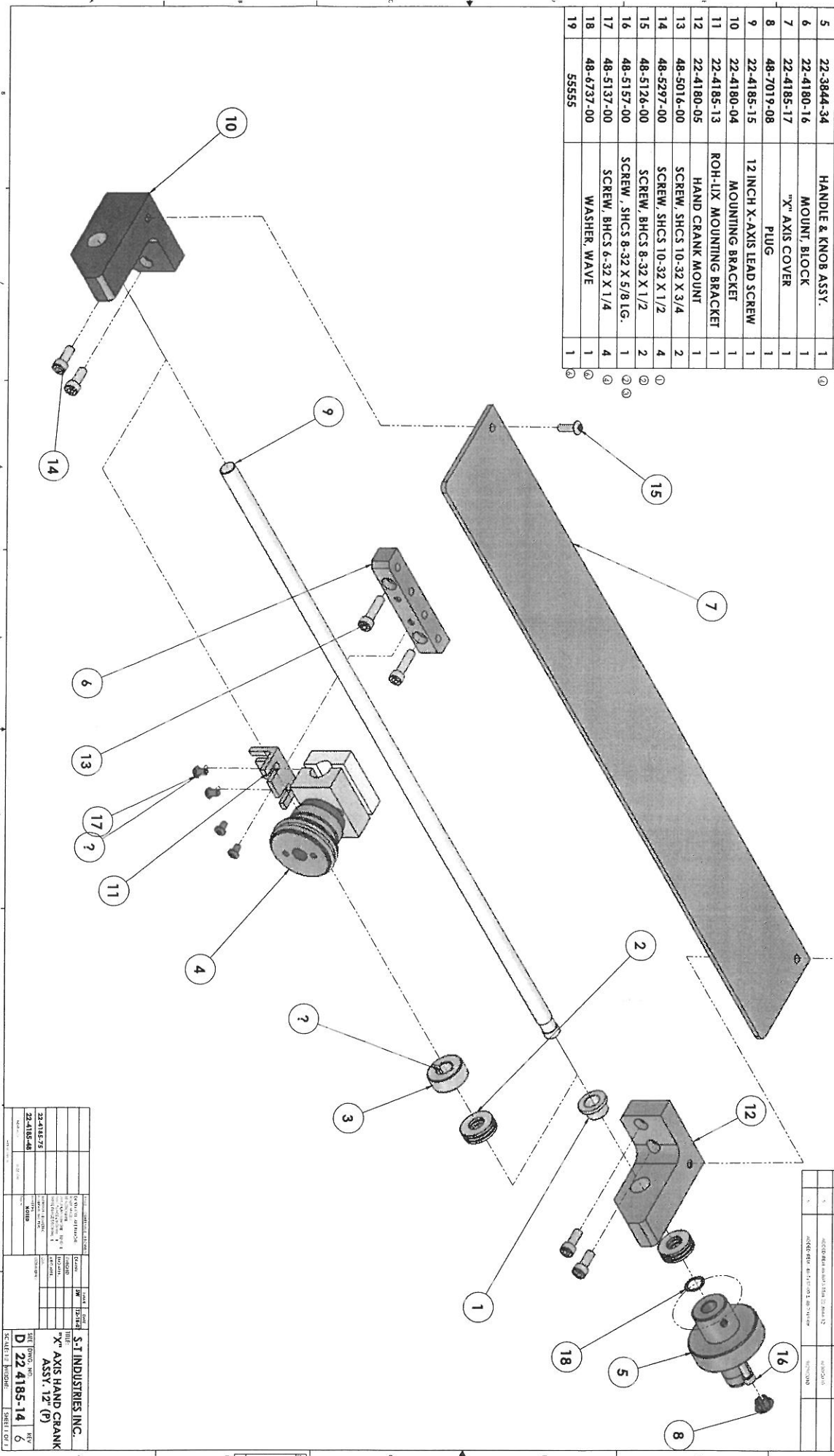
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3	LOWER MOUNTING PLATE	1	
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5	SCREW, 1/4-20 X 1/2	16	
6	SCREW, 1/4-20 X 1/2	16	
7	SCREW, 1/4-20 X 1/2	16	
8	SCREW, 1/4-20 X 1/2	16	
9	SCREW, 1/4-20 X 1/2	16	
10	SCREW, 1/4-20 X 1/2	16	
11	SCREW, 1/4-20 X 1/2	16	
12	SCREW, 1/4-20 X 1/2	16	
13	SCREW, 1/4-20 X 1/2	16	
14	SCREW, 1/4-20 X 1/2	16	
15	SCREW, 1/4-20 X 1/2	16	
16	SCREW, 1/4-20 X 1/2	16	
17	SCREW, 1/4-20 X 1/2	16	
18	SCREW, 1/4-20 X 1/2	16	
19	SCREW, 1/4-20 X 1/2	16	
20	SCREW, 1/4-20 X 1/2	16	
21	SCREW, 1/4-20 X 1/2	16	
22	SCREW, 1/4-20 X 1/2	16	

S-T INDUSTRIES INC.	
12 X 12 STAGE PLATES ASSY.	
22 4185-00	7
SCALE: 1:1	

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	48-8013-00	FLANGE BEARING	1
2	48-8341-00	PRECISION THRUST BEARING	2
3	22-3844-20	SPLIT COLLAR	1
4	22-4101-02	QUICK RELEASE	1
5	22-3844-34	HANDLE & KNOB ASSY.	1
6	22-4180-16	MOUNT BLOCK	1
7	22-4185-17	"X" AXIS COVER	1
8	48-7019-08	PLUG	1
9	22-4185-15	12 INCH X-AXIS LEAD SCREW	1
10	22-4180-04	MOUNTING BRACKET	1
11	22-4185-13	ROH-LIX MOUNTING BRACKET	1
12	22-4180-05	HAND CRANK MOUNT	2
13	48-5016-00	SCREW, SHCS 10-32 X 3/4	4
14	48-5297-00	SCREW, SHCS 10-32 X 1/2	4
15	48-5126-00	SCREW, BHCS 8-32 X 1/2	2
16	48-5157-00	SCREW, SHCS 8-32 X 5/8 LG.	2
17	48-5137-00	SCREW, BHCS 6-32 X 1/4	4
18	48-6737-00	WASHER, WAVE	1
19	55555		1

"X" AXIS HAND CRANK ASSY. 12"

22-4185-14



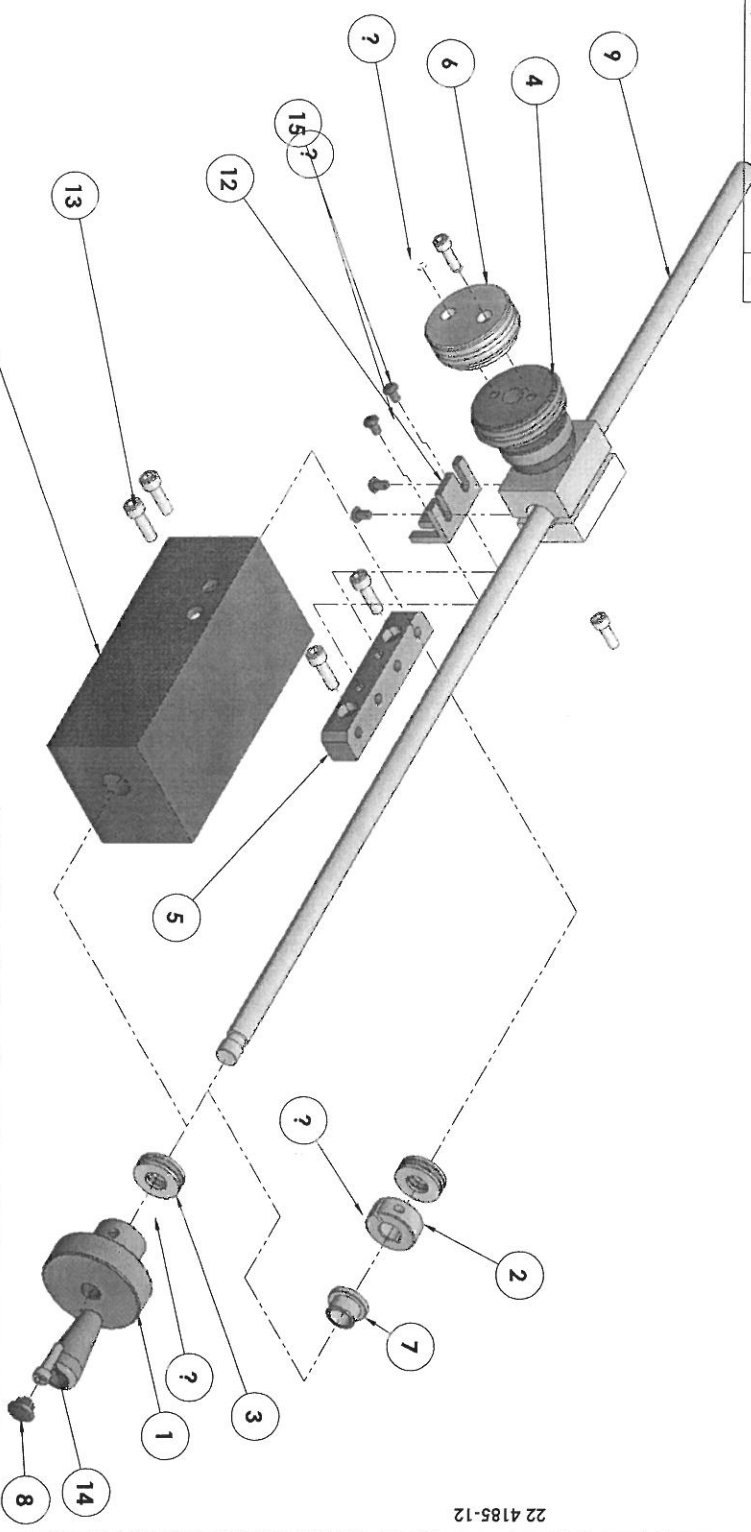
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3	ADDED DIMENSIONS FOR MANUFACTURE		
4	ADDED DIMENSIONS FOR MANUFACTURE		
5	ADDED DIMENSIONS FOR MANUFACTURE		
6	ADDED DIMENSIONS FOR MANUFACTURE		

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SCALE	AS SHOWN	SHEET	1 OF 1

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	1	ADDED ITEM 22-4185-11	6/27/2008	
	2	ADDED ITEM 48-7019-08 ETC.	5/12/2010	
	3	ADDED ITEM 48-8013 REM 22-3844-12	6/30/2010	
	4	ADDED ITEMS 48-5157-00 & 48-7019-08	9/29/2010	

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	22-3844-34	HANDLE & KNOB ASSY.	1
2	22-3844-20	SPLIT COLLAR	1 ②
3	48-8341-00	PRECISION THRUST BEARING	2
4	22-4101-02	QUICK RELEASE MOUNT, BLOCK	1 ②
5	22-4180-16	EXTENSION, ROHLIX	1 ②
6	22-4185-16	FLANGE BEARING	1 ③
7	48-8013-00	PLUG	1 ④
8	48-7019-08	Y-AXIS LEAD SCREW	1
9	22-4185-11	Y-AXIS LEAD SCREW BEARING BLOCK	1
10	22-4185-08	ROH-LIX MOUNTING BRACKET	2 ①
11	55555	SCREW, SHCS 10-32 X 5/8 LG.	1 ②
12	22-4185-13	SCREW, SHCS 8-32 X 5/8 LG.	4
13	48-6784-00	SCREW, BHCS 6-32 X 1/4	1
14	48-5157-00	SCREW, BHCS 6-32 X 1/4	4 ④

12" "Y" AXIS ROH-LIX ASSY 22-4185-12

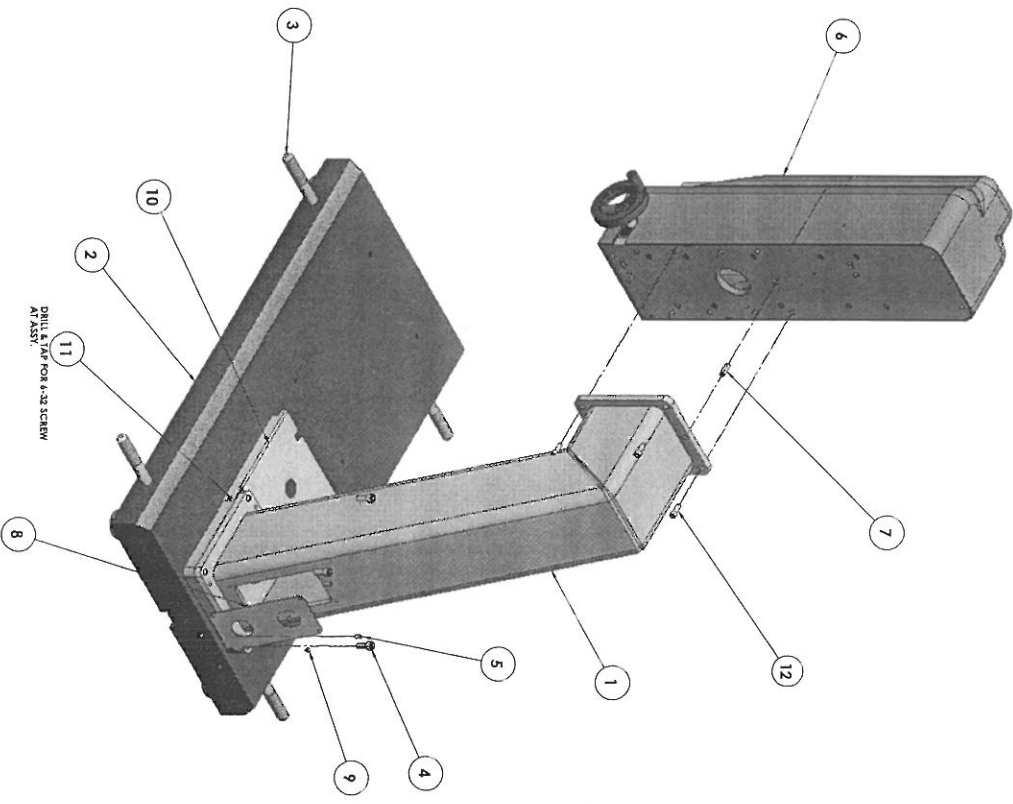


UNLESS OTHERWISE SPECIFIED:		HAZEL	DATE
DRILLING: 4.12 IN DIMS	FINISH: 16-18	SW	4-29-08
HOLE LOC: 1-12	THREADS: 1-12		
ANGLE: 45°	WELDS: 1/8" 1/16"		
ROHS COMPLIANT	100% COMPLIANT		
DATE: 10/1/09	BY: JRM		
CHECKED: 10/1/09	DATE: 10/1/09		
DESIGNED: 10/1/09	DATE: 10/1/09		
DRAWN: 10/1/09	DATE: 10/1/09		
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NO.	DATE	BY	DESCRIPTION
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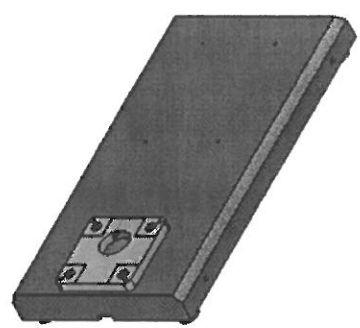
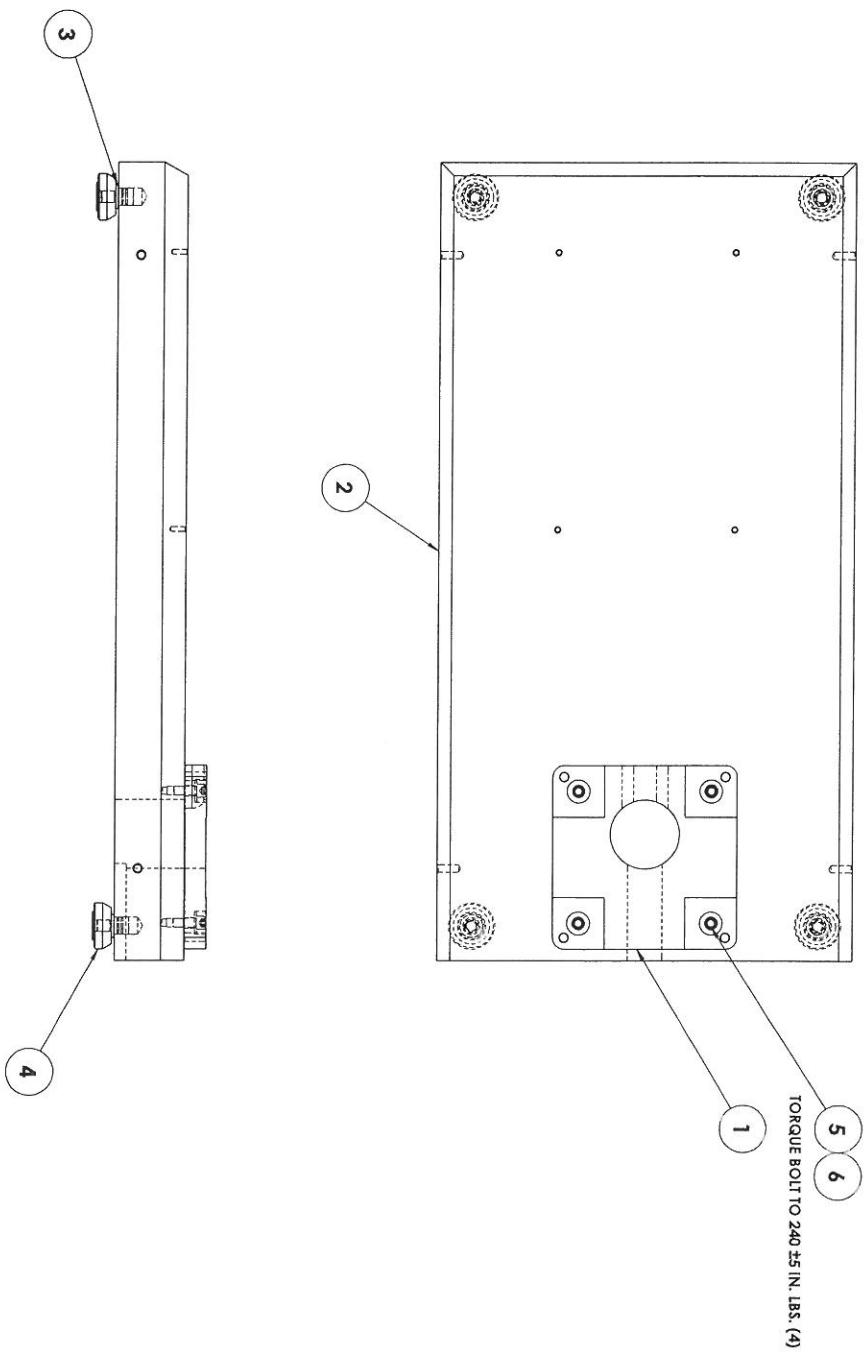
S-T INDUSTRIES INC.
12" Y" AXIS ROH-LIX ASSY
(P)
SIZE: 12" x 12" x 12"
C22-4185-12
SCALE: 1:2
WEIGHT: 1.00
SHEET 1 OF 1

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	22-4197-45	9700 EXTENDED Z COLUMN ASSY STEEL	1
2	22-4197-42	FOOT & BASE ASSY 1/2" TRAVEL Z	4
3	22-4197-99	HANDLE	4
4	46-8086-00	SCREW 4-20 X 3/4	4
5	46-8086-00	SOCKET SCREW 4-20 X 1/2	4
6	22-4197-49	Z AXIS ASSY, MANUAL EXTENDED	1
7	46-8067-00	POWER PIN 3/8 X 1	1
8	22-4081-06	COVER TOWER	1
9	46-8086-00	SCREW 4-20 X 3/4	4
10	22-4197-46	SCREW 4-20 X 3/4	4
11	46-4481-00	SCREW 4-20 X 3/4	2
12	46-8174-00	SCREW SHCS 5/16-18 X 3/4	4



REVISIONS 1. 22-4197-61 2. 22-4197-61		APPROVED FOR CONSTRUCTION DATE: 11/11/00 BY: [Signature]	
DESIGN DATE: 11/11/00 BY: [Signature]	MANUFACTURING DATE: 11/11/00 BY: [Signature]	QC DATE: 11/11/00 BY: [Signature]	FIELD DATE: 11/11/00 BY: [Signature]
3-T INDUSTRIES INC. COLUMN & BASE ASSY 1/2 TRAVEL Z AXIS D 22-4197-61 2-SCALE: 1/8"=1" SHEET OF 1		3-T INDUSTRIES INC. 1000 W. 10TH AVENUE DENVER, CO 80202 TEL: 303-733-1100 FAX: 303-733-1101 WWW: 3-T.COM	

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	22-4088-04	MOUNT PLATE, POWER	1
2	22-4088-0688	GRANITE BASE	1
3	22-4192-05	STUD FOOT	4
4	22-4192-07	FOOT ASSY	4
5	48-5115-00	SCREW, SHCS 3/8-16 X 1	4
6	48-7933-00	FLAT WASHER 3/8	4



22 4197-62

REVISION	DATE	BY	APP'D	DESCRIPTION
1	11-15-77	SW		ISSUED

UNLESS OTHERWISE SPECIFIED:	FINISH	STAINLESS STEEL
DIMENSIONS ARE IN INCHES	TOLERANCES	FRACTIONS
ANGLES ARE IN DEGREES	FRACTIONS	DECIMALS
FINISHES ARE AS SHOWN	FRACTIONS	DECIMALS
UNLESS OTHERWISE SPECIFIED:	FINISH	STAINLESS STEEL
DIMENSIONS ARE IN INCHES	TOLERANCES	FRACTIONS
ANGLES ARE IN DEGREES	FRACTIONS	DECIMALS
FINISHES ARE AS SHOWN	FRACTIONS	DECIMALS

PROPERTY AND COMMENTS	22 4197-62
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SCALE: 1/4" = 1"	WEIGHT:	SHEET 1 OF 1
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S-I INDUSTRIES INC.

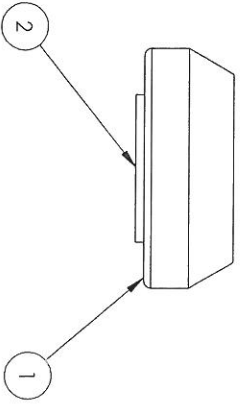
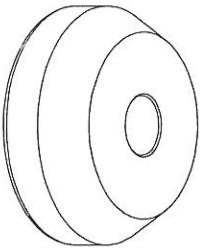
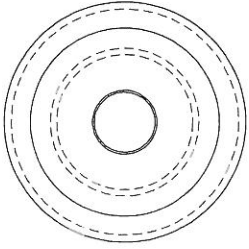
GRANITE BASE ASSY.
12" TRAVEL Z AXIS

S-I DRAWING NO. C22-4197-62

22 4192-07

REVISIONS

REV.	DESCRIPTION	DATE	APPROVED
1	REMOVED ITEM 22 4192-05	8/5/2008	
2	ADDED ITEM 48 8360-00	1/29/2009	



ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	22-4192-04	FOOT	1
2	48-8360-00	RUBBER PAD	1

PROPRIETARY AND CONFIDENTIAL
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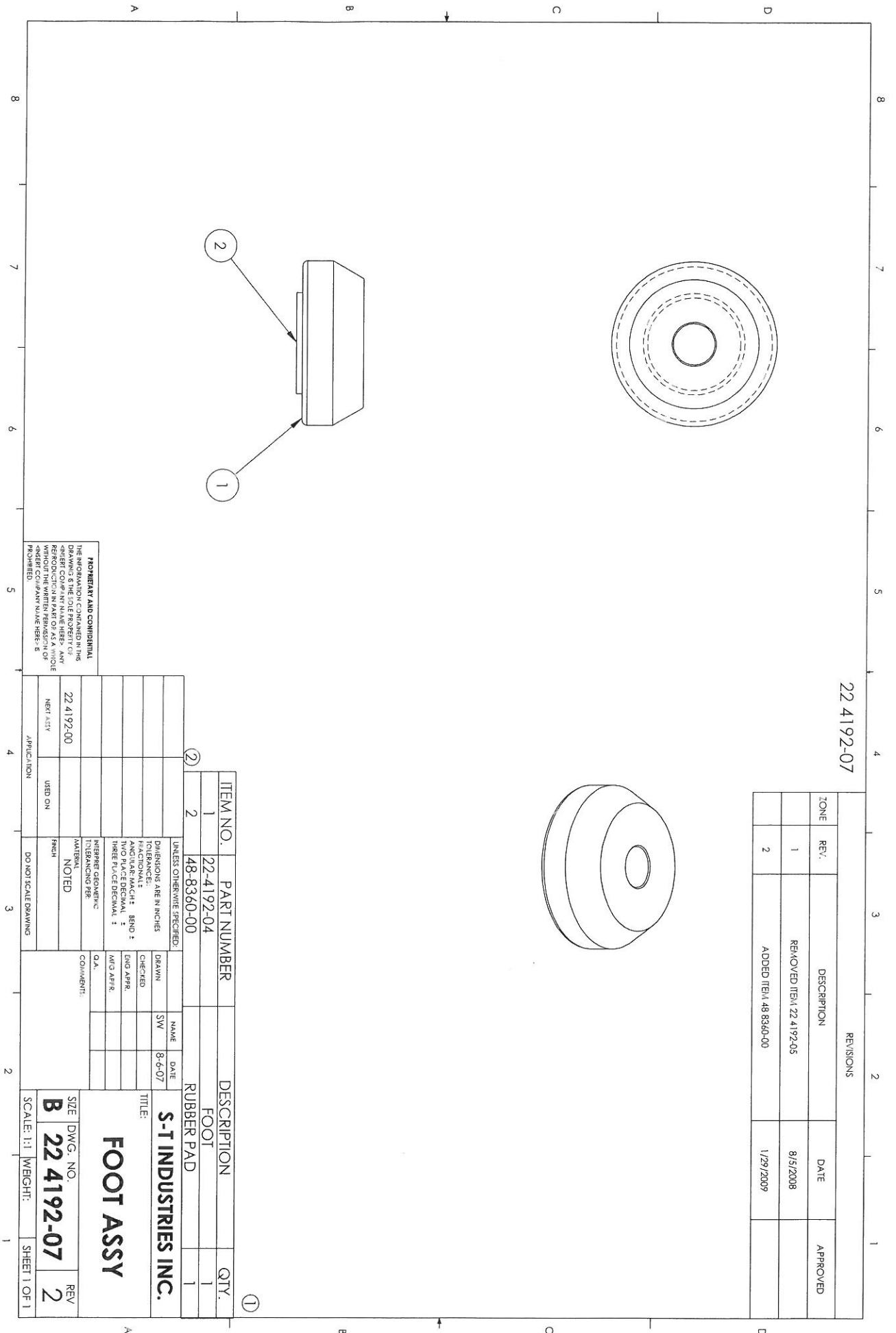
UNLESS OTHERWISE SPECIFIED:	DRAWN	NAME	DATE
TOLERANCES ARE IN INCHES	CHECKED	DATE	8-6-07
ANGULAR MATCH: BEND :	ENG APPR.		
TWO PLACE DECIMAL :	MFG APPR.		
THREE PLACE DECIMAL :	Q.A.		
MATERIAL	COMMENTS:		
NOTED			
INTERFERING GEOMETRIC TOLERANCING PER			
FRONT			
DO NOT SCALE DRAWINGS			
USED ON			
22 4192-00			
NEXT ASY			
APPLICATION			

SIZE DWG. NO. **B 22 4192-07** REV **2**
 SCALE: 1:1 WEIGHT: SHEET 1 OF 1

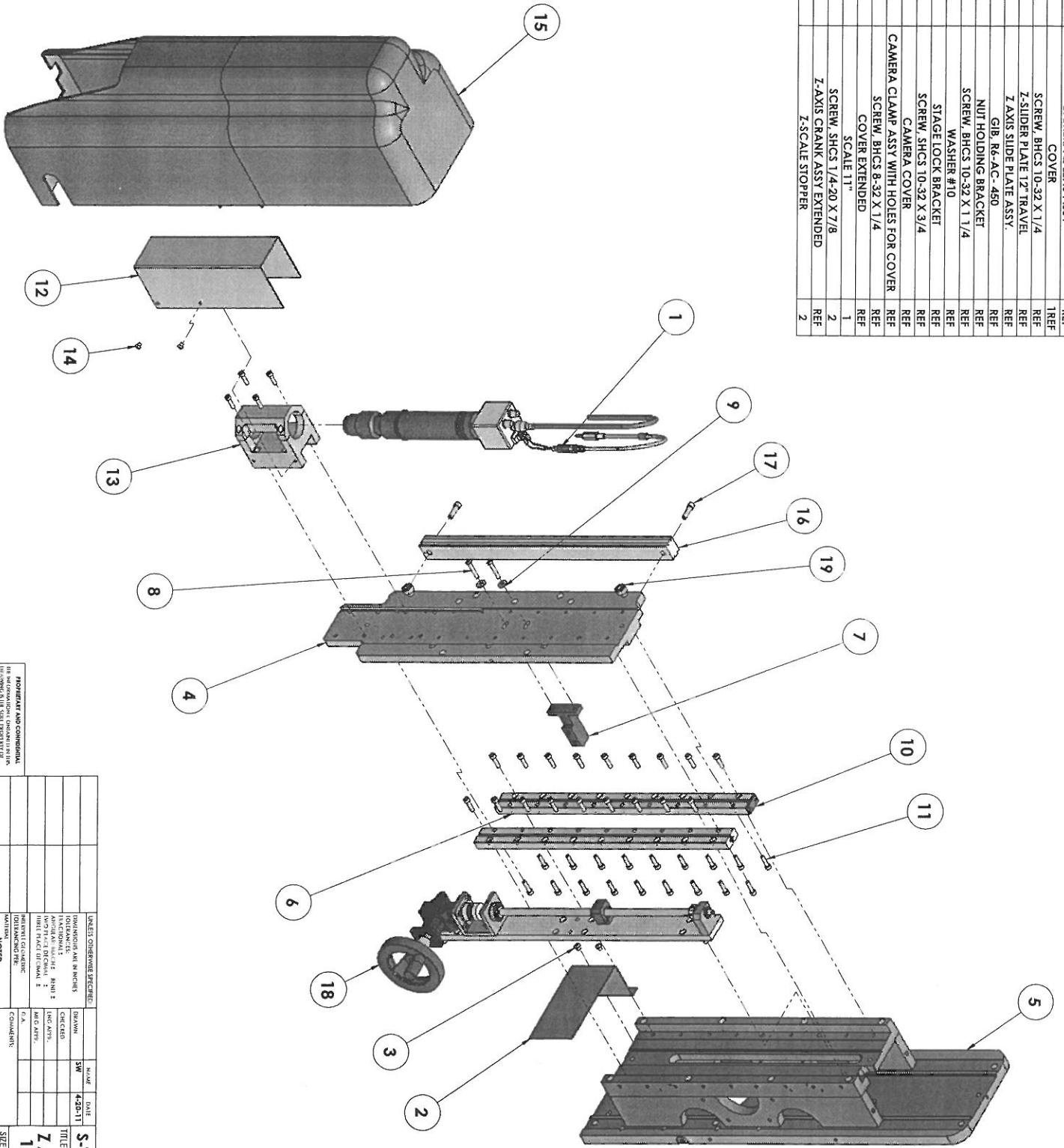
FOOT ASSY

S-T INDUSTRIES INC.

TITLE: RUBBER PAD



ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	22-4189-11	CAMERA & LENS ASSY	REF
2	22-4189-12	COVER	REF
3	48-5106-00	SCREW, BHCS 10-32 X 1/4	REF
4	22-4189-59	Z-SLIDER PLATE 12" TRAVEL	REF
5	22-4189-61	Z-AXIS SLIDE PLATE ASSY	REF
6	48-8371-00	GIB, R6-AC-450	REF
7	22-4189-10	NUT HOLDING BRACKET	REF
8	48-7851-00	SCREW, BHCS 10-32 X 1 1/4	REF
9	48-6083-00	WASHER #10	REF
10	22-4189-13	STAGE LOCK BRACKET	REF
11	48-5016-00	SCREW, SHCS 10-32 X 3/4	REF
12	22-4189-66	CAMERA COVER	REF
13	22-4189-67	CAMERA CLAMP ASSY WITH HOLES FOR COVER	REF
14	48-5111-00	SCREW, BHCS 8-32 X 1/4	REF
15	22-4189-65	COVER EXTENDED	REF
16	48-8370-00	SCREW, SHCS 1/4-20 X 7/8	1
17	48-8152-00	SCALE 11"	REF
18	22-4189-54	Z-AXIS CRANK ASSY EXTENDED	2
19	22-4189-02	Z-SCALE STOPPER	REF



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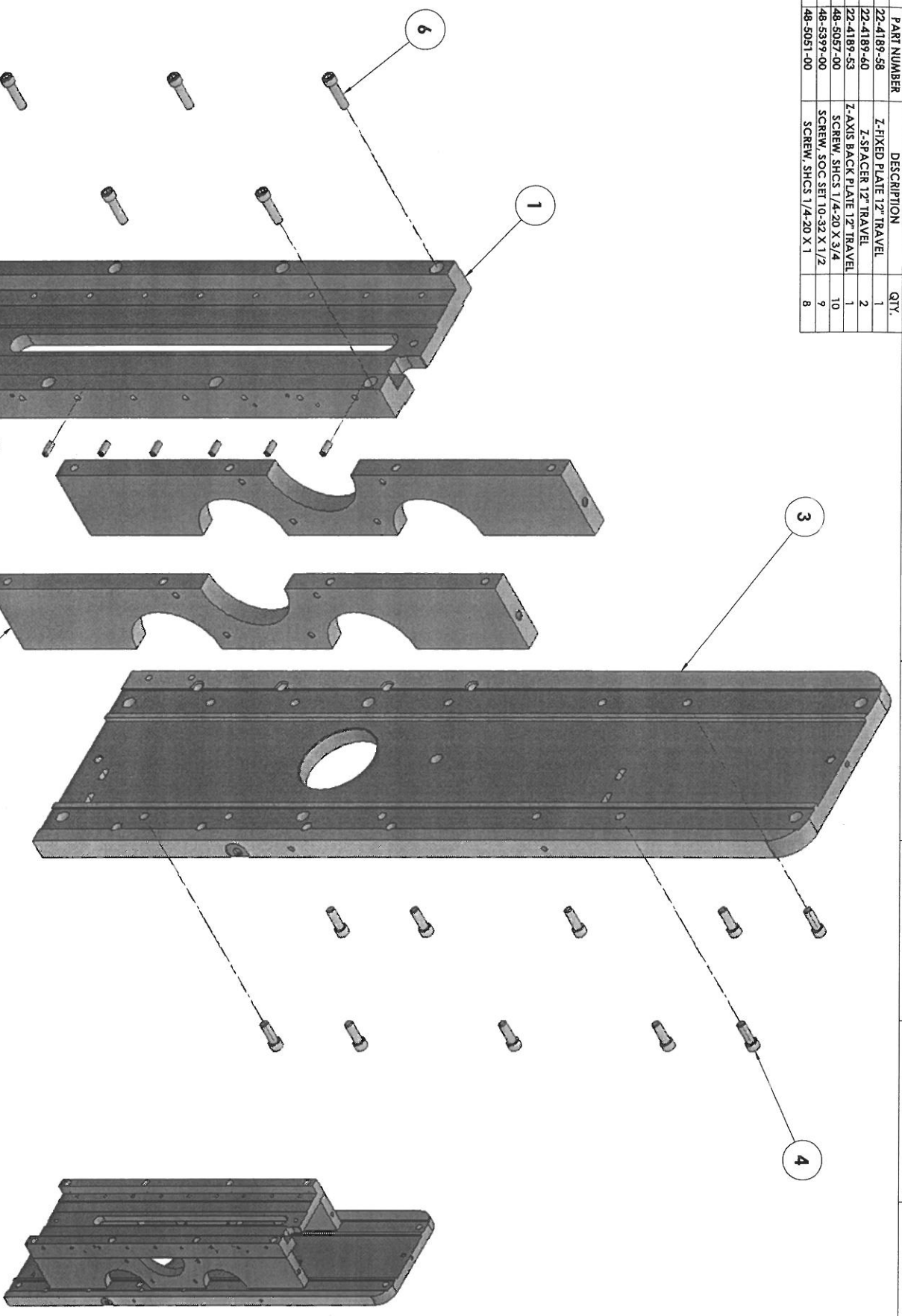
REV	DATE	BY	CHKD	APP'D	DESCRIPTION

UNLESS OTHERWISE SPECIFIED:	UNIT	SCALE
FINISHES	INCHES	AS SHOWN
THREADS	UNF	
PLATING		
WELDING		
OTHER		

TITLE:	S-I INDUSTRIES INC.
PROJECT:	Z-AXIS ASSY. MANUAL
DWG. NO.:	C22-4189-49
SCALE:	1/4" = 1"
WEIGHT:	
SHEET:	1 OF 1

REFER TO 22-4189-00

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	22-4189-58	Z-FIXED PLATE 12" TRAVEL	1
2	22-4189-60	Z-SPACER 12" TRAVEL	2
3	22-4189-53	Z-AXIS BACK PLATE 12" TRAVEL	1
4	48-5057-00	SCREW, SHCS 1/4-20 X 3/4	10
5	48-5397-00	SCREW, SOC SET 10-32 X 1/2	9
6	48-5051-00	SCREW, SHCS 1/4-20 X 1	8



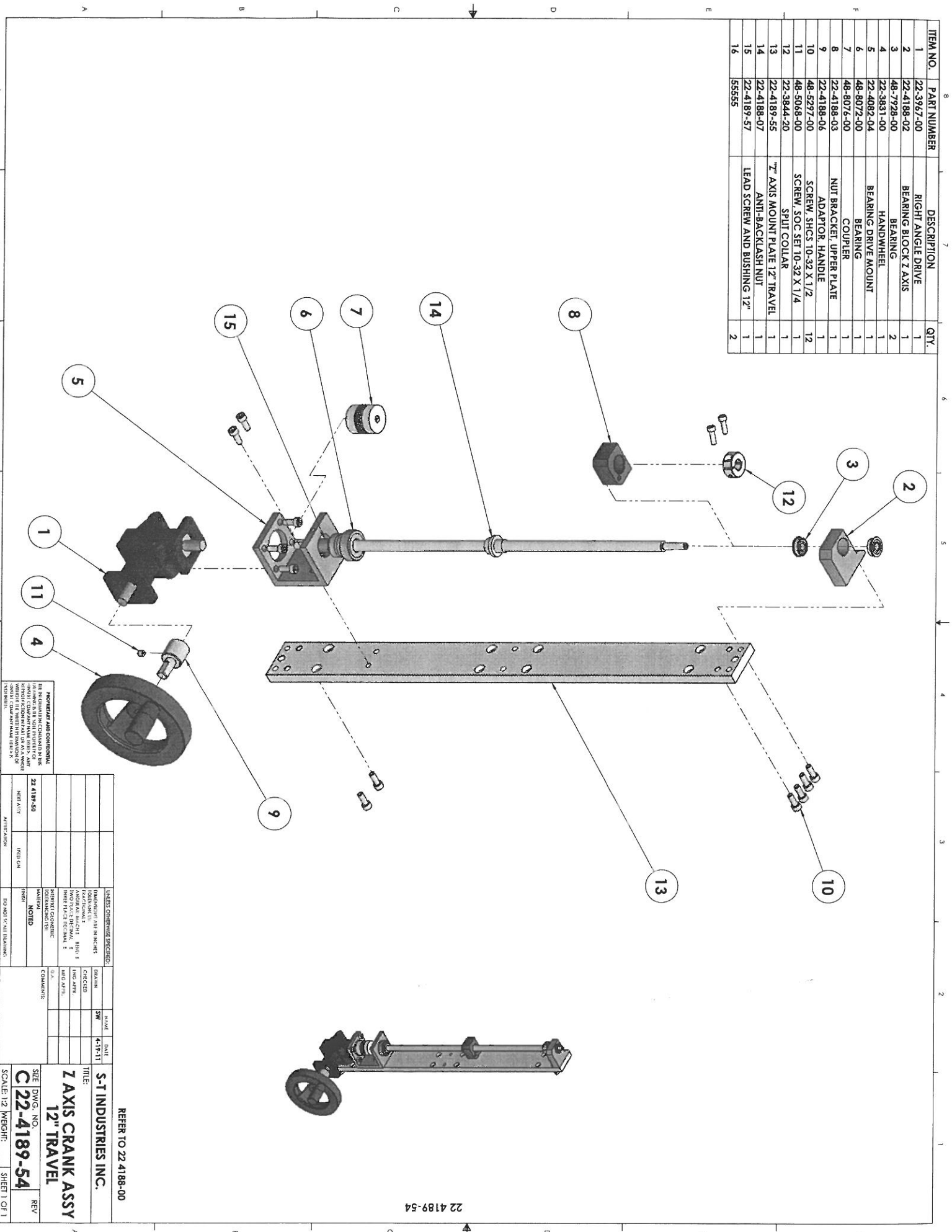
REFER TO 22 4189-16

22 4189-61

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UNLESS OTHERWISE SPECIFIED:	UNITS:	INCHES
FRONT VIEW:	FRONT VIEW:	FRONT VIEW:
RIGHT SIDE:	RIGHT SIDE:	RIGHT SIDE:
TOP VIEW:	TOP VIEW:	TOP VIEW:
ISOMETRIC:	ISOMETRIC:	ISOMETRIC:
OTHER:	OTHER:	OTHER:
DATE:	DATE:	DATE:
BY:	BY:	BY:
CHECKED:	CHECKED:	CHECKED:
DATE:	DATE:	DATE:
SCALE:	SCALE:	SCALE:
REV:	REV:	REV:
TITLE:	S-I INDUSTRIES INC.	
SIZE:	C 22-4189-61	
NO.	2	
REV:	1	
	SHEET 1 OF 1	

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	22-3967-00	RIGHT ANGLE DRIVE	1
2	22-4188-02	BEARING BLOCK Z AXIS	1
3	48-7928-00	BEARING	2
4	22-3831-00	HANDWHEEL	1
5	22-4082-04	BEARING DRIVE MOUNT	1
6	48-8072-00	BEARING	1
7	48-8076-00	COUPLER	1
8	22-4188-03	NUT BRACKET, UPPER PLATE	1
9	22-4188-06	ADAPTOR, HANDLE	1
10	48-5297-00	SCREW, SHCS 10-32 X 1/2	12
11	48-5066-00	SCREW, SOC SET 10-32 X 1/4	1
12	22-3844-20	SPLIT COLLAR	1
13	22-4189-55	"Z" AXIS MOUNT PLATE 12" TRAVEL	1
14	22-4188-07	ANTI-BACKLASH NUT	1
15	22-4189-57	LEAD SCREW AND RUSHING 12"	1
16	55555		2



22 4189-54

REFER TO 22 4188-00

UNLESS OTHERWISE SPECIFIED:		FINISH	SCALE	DATE
DIMENSIONS	IN MILLIMETERS	AS SHOWN	1:1	4-15-11
STOCK	AS SHOWN	AS SHOWN		
THREADS	AS SHOWN	AS SHOWN		
WELDING	AS SHOWN	AS SHOWN		
FINISH	AS SHOWN	AS SHOWN		
PLATING	AS SHOWN	AS SHOWN		
COATING	AS SHOWN	AS SHOWN		
OTHER	AS SHOWN	AS SHOWN		

SEE DWG. NO. **C22-4189-54** REV

SCALE: 1/2" = 1" SHEET 1 OF 1

REVISIONS AND COMMENTS	
22-4189-50	NEW ASSY

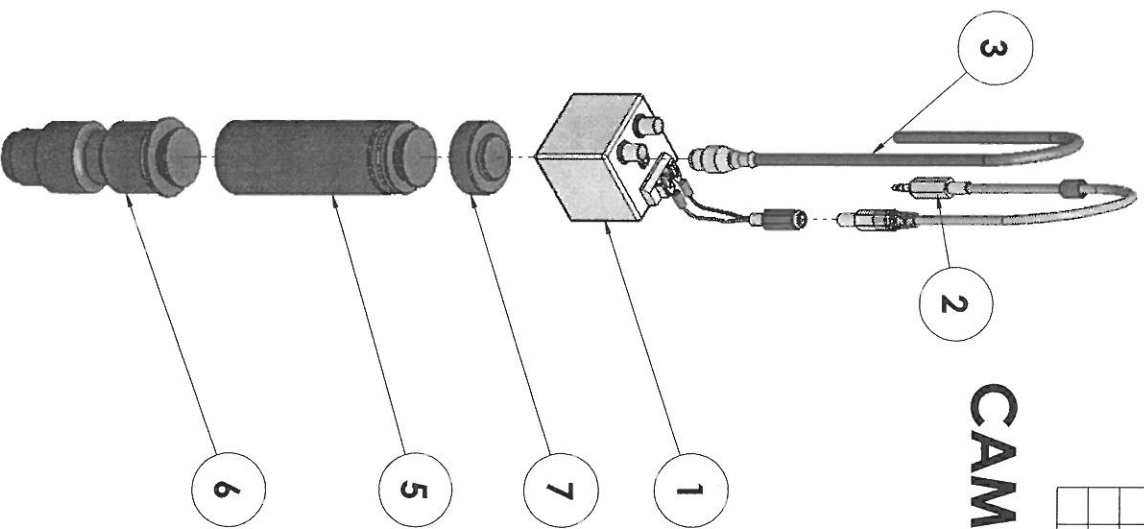
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S-T INDUSTRIES INC.

Z AXIS CRANK ASSY

12" TRAVEL

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	22-4090-18	COLOR, S-VIDEO CAMERA & PIGTAIL CABLE	REF
2	48-8412-00	CAMERA CABLE	REF
3	48 8018-00	S VIDEO CABLE	REF
4	48-7867-01	ZOOM LENS W/DETFENTS	REF
5	48-7868-00	ADAPTOR, LENS	REF
6	48-7867-00	ZOOM LENS	REF
7	48-7880-00	C-MOUNT ADAPTOR	REF



CAMERA & LENS ASSY. 22-4189-11

ZONE	REV.	DESCRIPTION	DATE	APPRO. CD
1		ADDED ITEM 22 4090-18 & 48 8018-00	8/12/2008	
2		ADDED ITEM 48 8412 REVISION 22 4090-13	4/16/2009	
3		48 8412 REVISION WAS QTY. 1	4/29/2009	
4		ADDED ITEM 48 7867-01	8/20/2009	
5		22 4090-18 QTY REF WAS 1 ETC.	6/16/2011	

DRAWING TITLE: S-T INDUSTRIES INC. CAMERA & LENS ASSY	
DATE: 4-10-07	SCALE: 1:4
DESIGNER: SW	SCALE: 1:4
CHECKED: _____	SCALE: 1:4
INSTRUMENT: _____	SCALE: 1:4
PROJECT: 22 4189-00	SCALE: 1:4
REVISION: _____	SCALE: 1:4

22 4189-11