KALAMAZOO INDUSTRIES, INC.

Instruction Manual

K12-14MS 14" Abrasive Metallurgical Sectioning Saw

Kalamazoo Industries, Inc.
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Kalamazoo, Michigan
1-800-592-2050
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1. Introduction

Thank you for choosing the Kalamazoo Industries K12-14MS 14-Inch Abrasive Metallurgical Sectioning Saw. This industrial-grade sectioning machine is designed to deliver efficient, clean cuts of metal samples for metallographic sample preparation and metallurgical analysis.

The K12-14MS features a powerful 5 HP motor, a semi-automatic air/oil power down feed system with adjustable feed rates of 0–12 FPM, a fully enclosed steel construction, and a heavy-duty recirculating flood coolant system with a 10-gallon capacity tank. The controlled cutting process minimizes heat damage and preserves sample integrity, making this machine ideal for material inspection, weld testing, failure analysis, and precision sectioning tasks.

Please read this manual thoroughly before operating the equipment. Proper understanding of the machine's features, safety requirements, and maintenance procedures will ensure optimal performance and longevity.

1.1 Intended Use

The K12-14MS is specifically designed for cutting ferrous metals and materials for metallurgical analysis, including:

- Low-carbon steel (bar stock, angle iron, flat stock)
- Structural steel and alloys
- Cast iron
- Rebar and reinforcing steel
- Mild steel pipe and tubing
- Hardened and heat-treated metals
- Weld samples for inspection and testing
- Ceramic materials

2. Safety Information

⚠ **WARNING:** TO REDUCE THE RISK OF FIRE OR SHOCK HAZARD, DO NOT EXPOSE THIS EQUIPMENT TO RAIN, LIQUID, OR MOISTURE BEYOND THE DESIGNED COOLANT SYSTEM.

Read all safety instructions before operating this equipment. Failure to follow safety guidelines may result in serious injury or death.

2.1 General Safety Precautions

1. Always wear appropriate personal protective equipment (PPE) including safety glasses, hearing protection, and work gloves.
2. Keep the work area clean and well-lit. Cluttered or dark areas invite accidents.
3. Do not operate the saw under the influence of drugs, alcohol, or medication that may impair judgment.
4. Keep bystanders at a safe distance from the operating machine.
5. Never leave the machine running unattended.
6. Ensure the enclosed door is properly closed during operation.
7. Disconnect power before changing wheels or performing maintenance.
8. Securely clamp all workpieces in the vises before cutting.
9. Use only water-soluble coolant with a rust inhibitor in the coolant system.
10. Ensure air/oil feed system is operating within the recommended 50–55 PSI range.

2.2 Electrical Safety

- Ensure proper grounding of the machine before operation.
- Verify voltage requirements match your facility’s electrical supply (220V single phase or 220V/440V three phase).
- Use only qualified electricians for electrical connections and repairs.
- Do not operate with damaged wiring or electrical components.

2.3 Abrasive Wheel Safety

- Use only 14” abrasive cutoff wheels rated for 2,200 RPM or higher.
- Inspect wheels for cracks, damage, or excessive wear before each use.
- Replace damaged or worn wheels immediately.
- Allow the wheel to reach full speed before beginning a cut.
- Select the appropriate wheel type for your specific material.

2.4 Coolant System Safety

- Monitor coolant level regularly during operation. Never operate without adequate coolant.
- Use only recommended water-soluble coolant with rust inhibitor.
- Clean and replace coolant regularly to prevent bacterial growth and maintain cutting performance.
- Ensure coolant nozzles are properly directed at the cutting zone before starting.

2.5 Pneumatic System Safety

- Ensure shop air supply is clean and dry. Use an inline filter/regulator.
- Operate air/oil power down feed within the recommended 50–55 PSI range.
- Inspect air hoses and fittings regularly for leaks or damage.
- Disconnect air supply before performing maintenance on the feed system.3. Technical Specifications

3.1 Motor and Performance

Specification	Value
Motor Power	5 HP
Phase Options	1 PH 220V (only) or 3 PH 220V / 440V
Spindle Speed	2,200 RPM
Spindle Arbor	1" (optional: 1.25" or 32mm)
Blade Diameter	14" abrasive cutoff wheel (not included)
Feed Mechanism	Semi-automatic air/oil power down feed
Feed Rate	Adjustable 0–12 FPM with momentary rapid override
Operating Pressure	50–55 PSI (recommended)

3.2 Cutting Capacity

Specification	Value
Solid Round/Bar (Mild Steel)	2.5 inches
Shapes (Pipe, Angle, etc.)	3 inches

3.3 Coolant System

Specification	Value
Pump Type	Heavy-duty recirculating pump, 1/4 HP
Coolant Tank	10-gallon capacity
Coolant Nozzles	Adjustable dual coolant nozzles with flood coolant
Recommended Coolant	Water-soluble coolant with rust inhibitor

3.4 Hydraulic System (Air/Oil Feed)

Specification	Value
Hydraulic Oil	DTE-24 Lightweight Hydraulic Oil
Feed Type	Air/oil power down feed with air cylinder
Operating Pressure	50–55 PSI (recommended)
Feed Rate Range	Adjustable 0–12 FPM

⚠ **WARNING:** Do not allow hydraulic oil to run out. Operating the air/oil power feed system without adequate oil will cause erratic feed operation and may damage system components. Check oil reservoir levels regularly.

3.5 Construction

Specification	Value
Enclosure	Steel enclosure with hinged doors
Infeed/Outfeed Panels	Removable for long parts
Maintenance Access	Removable rear access panel
Controls	Magnetic switch with 24V low-voltage protection
Lighting	Internal LED light
Vise System	Dual moveable 4" screw vises
Oscillation	Included for enhanced cutting efficiency

3.6 Dimensions and Weight

Specification	Value
Machine Length	43 inches
Machine Width	26 inches
Machine Height	60 inches
Shipping Length	58 inches
Shipping Width	58 inches
Shipping Height	77 inches
Shipping Weight	1,000 lbs (crated)

Note: Shipping weights and dimensions are subject to change.

4. Features and Components

4.1 Key Features

The K12-14MS incorporates several features designed for industrial metallurgical performance and operator convenience:

Fully Enclosed Steel Construction

The fully enclosed design contains coolant splash and debris, maintaining a clean work environment while protecting the operator. Steel construction ensures long-lasting durability and reliability. Hinged doors provide easy access to the cutting chamber.

Semi-Automatic Air/Oil Power Down Feed

The air/oil power down feed system provides controlled, consistent cutting pressure with an adjustable feed rate of 0–12 FPM. A momentary rapid override allows quick approach to the workpiece, reducing cycle time. The recommended operating pressure is 50–55 PSI.

Heavy-Duty Recirculating Coolant System

The integrated coolant system features a heavy-duty 1/3 HP recirculating pump and a 10-gallon coolant tank for continuous flood coolant operation. Adjustable dual coolant nozzles provide precise coolant delivery to the cutting zone.

Oscillation Feature

Built-in oscillation enhances cutting efficiency by improving wheel performance and reducing heat buildup during the cut, helping to preserve sample integrity.

Magnetic Switch with Low-Voltage Protection

The magnetic switch with 24V low-voltage protection provides safe, reliable machine operation. The magnetic starter prevents automatic restart after a power interruption.

Dual Moveable Screw Vises

Two moveable 4" screw vises provide secure, adjustable clamping for a wide range of sample sizes and shapes.

Internal LED Lighting

Built-in LED lighting provides clear visibility of the cutting area through the enclosed viewing window.

Removable Infeed, Outfeed, and Maintenance Panels

Removable infeed and outfeed panels accommodate long parts that extend beyond the enclosure. A removable rear maintenance access panel simplifies service and component access.

4.2 Available Options and Accessories

- KW1 – 14-inch abrasive saw spindle wrench
- KC5 – 5’ gravity fed conveyor
- KCL – leg for KC5 conveyor
- 1.25" spindle bushing
- TS-14 T-slot table
- AV-14 Air jawed vises
- 710-050 Door safety interlocks (must be purchased with new machine)
- 051-035 – Belt tensioning tool

5. Installation and Setup

5.1 Unpacking and Inspection

1. Carefully remove all packing materials and inspect the machine for shipping damage.
2. Verify all components are present according to the packing list.
3. Report any damage or missing items to Kalamazoo Industries immediately.
4. Remove any protective coatings from machined surfaces.

5.2 Location Requirements

- Place the machine on a level, stable surface capable of supporting the machine weight (approximately 1,000 lbs).
- Ensure adequate clearance around all sides for operation, maintenance, and door opening.
- Provide adequate lighting and ventilation.
- Position the machine near a floor drain or use drip trays for coolant management.
- Provide a clean, dry compressed air supply within reach of the machine.

5.3 Electrical Connection

CAUTION: Electrical connections must be performed by a qualified electrician in accordance with local electrical codes.

1. Verify the voltage requirements match your facility’s power supply (220V single phase or 220V/440V three phase).
2. Connect to an appropriately rated circuit with proper overcurrent protection.
3. Ensure proper grounding according to electrical code requirements.
4. Check motor rotation direction before operating. The wheel should rotate down and toward the workpiece.

5.4 Pneumatic Connection

1. Connect a clean, dry compressed air supply to the air/oil power down feed system.
2. Set the regulator to the recommended operating range of 50–55 PSI.
3. Verify all air line connections are tight and free of leaks.
4. Test the power down feed operation before making a cut.

5.5 Hydraulic Oil – Refilling and Bleeding

The air/oil power down feed system is shipped pre-filled with DTE-24 Lightweight Hydraulic Oil and is ready for operation. The following instructions are for refilling the hydraulic oil reservoir when the oil level becomes low or when replacing the oil during maintenance.

⚠ **WARNING:** Do not allow the hydraulic oil to run out. Operating the air/oil power feed system without adequate oil will cause erratic feed operation and may damage system components.

1. Check the hydraulic oil reservoir level. If oil is low or has been drained for maintenance, refill with DTE-24 Lightweight Hydraulic Oil to the proper level.
2. After refilling the oil reservoir, you must bleed the air from the system. Trapped air will create air bubbles in the hydraulic lines and cause the air/oil power feed system to operate erratically.
3. To bleed the system: Disconnect the air cylinder from the saw arm. Fully extend and fully retract the cylinder shaft multiple times until all air is purged from the lines and the cylinder operates smoothly.
4. Reconnect the air cylinder to the saw arm and verify smooth, consistent feed operation before making a cut.

5.6 Coolant System Setup

1. Fill the coolant tank with water-soluble coolant mixed with rust inhibitor per the coolant manufacturer’s recommendations.
2. Prime the recirculating pump by turning on the coolant system and verifying flow.
3. Adjust the dual coolant nozzles to direct flood coolant flow to both sides of the cutting zone.
4. Verify adequate coolant volume and coverage before beginning operation.

5.7 Abrasive Wheel Installation

1. Disconnect power from the machine.
2. Verify the wheel is rated for at least 2,200 RPM and is designed for the material you will be cutting.
3. Install the wheel on the 1" spindle arbor (or optional 1.25"/32mm arbor if equipped).
4. Secure with the flange and arbor nut, tightening snugly with wrench only.
5. Reconnect power and verify proper wheel rotation.

5.8 V-Belt Inspection and Tensioning

The K12-14MS uses V-belts to transfer power from the motor to the spindle. Proper belt tension and pulley alignment are critical for consistent cutting performance and belt longevity.

⚠ **WARNING:** New V-belts will stretch during initial use and must be re-checked and re-tensioned after approximately 8 hours of cutting time.

Checking Belt Tension

1. Disconnect power from the machine.
2. Access the belt area through the rear maintenance access panel.
3. Press on the top span and bottom span of the V-belt. Each span should have approximately 1/4" of squeeze (deflection) under moderate finger pressure.
4. If the belt is too loose or too tight, adjust the tension as described below.

Checking Pulley Alignment

1. The motor pulley and the spindle pulley must be parallel and aligned in the same plane.
2. Check alignment by placing a straight edge across the faces of both pulleys. The straight edge should contact both pulleys evenly without gaps.
3. If the pulleys are misaligned, loosen the motor mounting bolts and reposition the motor until the pulleys are parallel, then re-tighten.

Adjusting Belt Tension

1. Slightly loosen the motor mounting bolts – just enough to allow the motor to be moved. Do not fully remove the bolts.
2. Use the 051-035 belt tensioning tool to adjust the motor position until the correct 1/4” squeeze is achieved on both the top and bottom spans of the belt.
3. Re-check pulley alignment with a straight edge after repositioning the motor.
4. Tighten all motor mounting bolts securely.
5. Reconnect power and briefly run the machine to verify smooth, vibration-free belt operation.

CAUTION: After installing new V-belts, re-check tension after approximately 8 hours of cutting. New belts will stretch during the break-in period and may require re-tensioning.

6. Operation Instructions

6.1 Pre-Operation Checklist

- Inspect the abrasive wheel for damage, cracks, or excessive wear.
- Verify the wheel is properly secured and rated for 2,200 RPM.
- Check coolant level in the tank and top off if necessary.
- Verify coolant nozzles are properly aimed at the cutting zone.
- Verify compressed air supply is connected and set to 50–55 PSI.
- Check hydraulic oil reservoir level (DTE-24); top off if low.
- Check V-belt tension (1/4" squeeze on top and bottom spans). Re-check after approximately 8 hours if belts are new.
- Ensure the work area is clean and free of obstructions.
- Put on required personal protective equipment.

6.2 Cutting Procedure

1. Position the material in the vise, ensuring it is square to the wheel.
2. Secure the workpiece firmly in the vise.
3. Close the enclosure door.
4. Turn on the coolant system and verify flood coolant flow to the cutting area.
5. Turn on the machine using the magnetic control push button.
6. Allow the wheel to reach full operating speed (2,200 RPM).
7. Use the momentary rapid override to bring the wheel close to the workpiece surface.
8. Engage the air/oil power down feed and allow the saw to cut at the set feed rate.
9. The saw arm will automatically return to the up position upon completing the cut.
10. Turn off the machine and wait for the wheel to stop completely.
11. Turn off the coolant pump.
12. Open the enclosure door and remove the workpiece.

6.3 Cutting Tips for Best Results

- Use the adjustable feed rate to match material type and cross-section; let the wheel do the work.
- Ensure adequate flood coolant flow throughout the entire cut to minimize heat damage.
- Select the appropriate wheel type for your material.
- Support long materials adequately using the removable infeed/outfeed panels.
- Use the oscillation feature for improved wheel performance and reduced heat buildup.
- For metallographic samples, use a slower feed rate to produce cleaner cut surfaces.
- Allow the wheel to clear debris naturally; do not force cuts.
- Maintain air pressure within the 50–55 PSI recommended range for consistent feed performance.

7. Maintenance

7.1 Daily Maintenance

- Clean metal shavings, dust, and debris from the cutting chamber after each use.
- Inspect the abrasive wheel for damage or wear.
- Check vise operation and tighten if necessary.
- Verify coolant level and condition; top off as needed.
- Wipe down the enclosure interior to remove swarf and residue.

7.2 Weekly Maintenance

- Inspect V-belt for wear, cracks, or proper tension. Verify 1/4" of squeeze on both top and bottom spans. Check that motor pulley and spindle pulley are parallel using a straight edge. Adjust tension using 051-035 belt tensioning tool if needed (see Section 5.8).
- Check all fasteners for tightness.
- Clean coolant nozzles to ensure unobstructed flow.
- Inspect the coolant tank for sediment buildup.
- Inspect air/oil feed system hoses and fittings for leaks.
- Check air pressure regulator setting and filter condition.
- Check hydraulic oil reservoir level (DTE-24 Lightweight Hydraulic Oil); top off as needed. Do not allow oil to run out.

7.3 Monthly Maintenance

- Inspect bearings for noise or rough operation.
- Clean motor housing to prevent dust accumulation and overheating.
- Check wiring and electrical connections for wear or loose contacts.
- Verify motor mounting hardware is secure.
- Drain, clean, and refill the coolant tank with fresh coolant solution.
- Inspect and clean the recirculating pump and intake screen.
- Inspect the air/oil cylinder seals and lubricate as needed.
- Inspect hydraulic oil condition in the reservoir. Replace with fresh DTE-24 Lightweight Hydraulic Oil if contaminated or discolored. Bleed air from the system after refilling (see Section 5.5).
- Verify LED light operation and replace if necessary.

7.4 Wheel Replacement

Replace wheels when they show signs of wear (reduced diameter), visible damage, cracks, or chips. Follow the wheel installation procedure in Section 5.7.

8. Troubleshooting

Problem	Possible Cause / Solution
Motor will not start	Check power supply and connections; verify magnetic starter is engaged; check 24V control circuit; replace switch if faulty
Excessive vibration	Check arbor nut tightness; replace damaged wheel; inspect and replace worn spindle bearings
Poor cut quality	Replace worn wheel; select appropriate wheel for material; reduce feed rate; increase coolant flow; verify oscillation is functioning
Wheel overheating	Reduce feed rate; increase coolant flow; verify nozzle aim; select wheel rated for material; check oscillation operation
Material slipping	Increase vise clamping pressure; replace worn vise jaws; verify workpiece is square to wheel
Belt slippage	Replace worn V-belt; adjust belt tension to 1/4" squeeze on top and bottom spans using 051-035 belt tensioning tool; check motor and spindle pulley alignment with a straight edge; re-check tension after approximately 8 hours on new belts (see Section 5.8)
Coolant not flowing	Check pump operation; verify tank level; clean nozzles and intake screen; check for clogged lines
Coolant leaking	Inspect door seals; check tank and hose connections; verify drain plug is secure
Feed system not operating	Check air supply pressure (50–55 PSI); inspect air lines for leaks; check air/oil cylinder and valves; verify regulator setting; check hydraulic oil reservoir level (DTE-24) – do not allow oil to run out
Feed rate inconsistent or jerky	Air may be trapped in the hydraulic lines. Bleed the system by disconnecting the air cylinder from the saw arm and fully extending/retracting the cylinder shaft multiple times (see Section 5.5). Also check for air leaks in system; verify operating pressure is within range; inspect cylinder seals; top off DTE-24 hydraulic oil
Internal LED light not working	Replace LED; check wiring connections

9. Replacement Parts

Genuine Kalamazoo Industries replacement parts are kept in stock and shipped from Kalamazoo, Michigan. Using genuine parts ensures optimal machine performance and maintains warranty coverage.

9.1 Ordering Parts

To order replacement parts, contact Kalamazoo Industries directly or visit the online parts store at www.kalamazooind.com. Have your machine model number (K12-14MS) ready when ordering.

10. Warranty Information

10.1 Warranty Coverage

Parts warranty is guaranteed for one year from the original date of purchase by the original purchaser, covering defects in material or workmanship under normal use. This warranty covers the replacement of defective parts. Some exclusions may apply.

10.2 Warranty Exclusions

This warranty does not cover:

- Normal wear items including abrasive wheels, belts, and bearings
- Damage resulting from misuse, abuse, or improper maintenance
- Damage from cutting inappropriate materials
- Modifications or alterations to the machine
- Damage from improper electrical connection
- Coolant system damage due to use of non-recommended coolant
- Damage to the air/oil feed system resulting from improper air supply or pressure

10.3 Return Authorization

Obtain written authorization before returning any merchandise by contacting Customer Service at (800) 592-2050. Unauthorized returns may not be accepted.

11. Contact Information

KALAMAZOO INDUSTRIES, INC.

Kalamazoo, Michigan

Toll-Free: **1-800-592-2050**

Local: **(269) 382-2050**

Website: www.kalamazooind.com

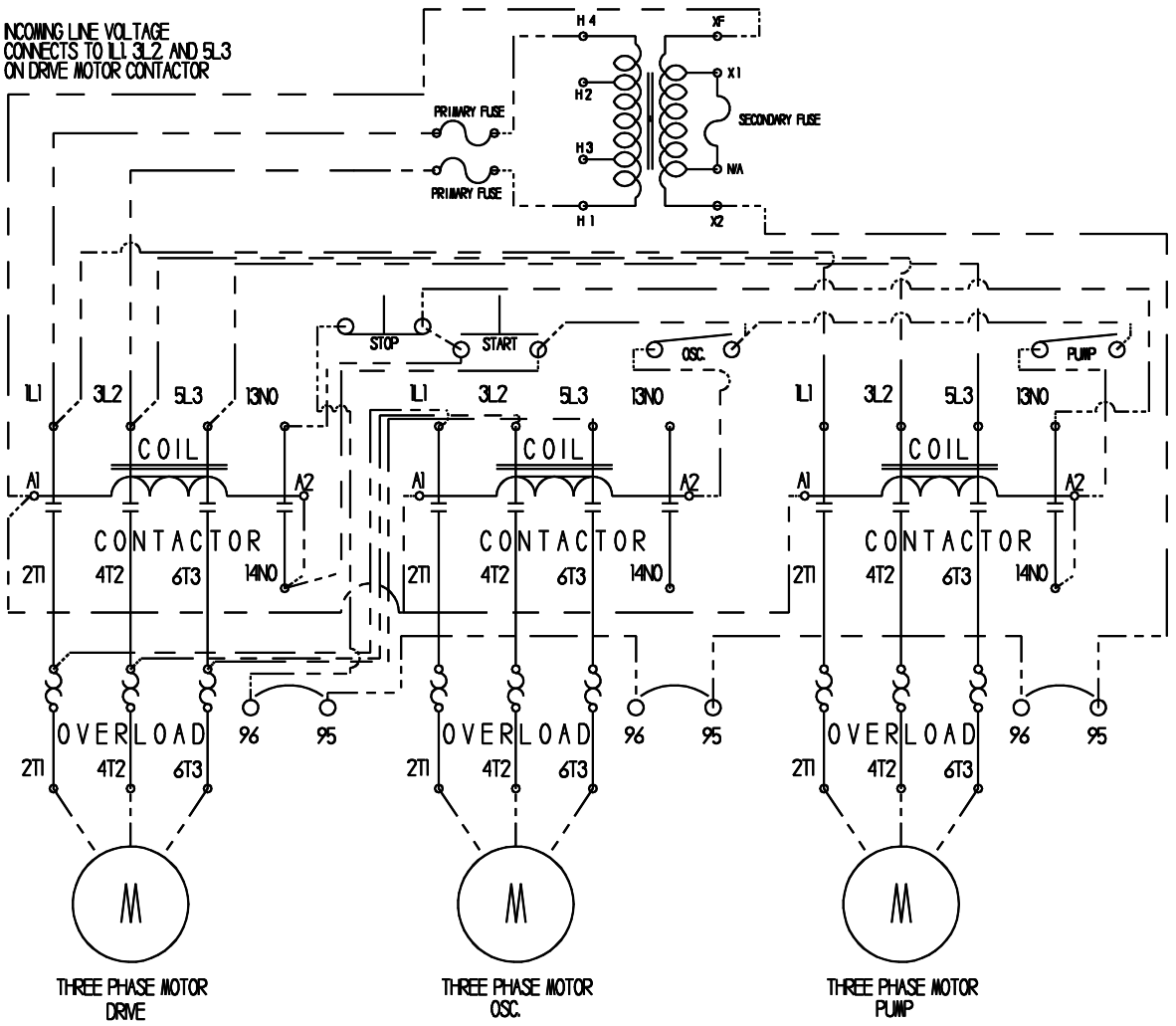
Office Hours: Monday – Friday, 8:00 AM – 4:30 PM EST

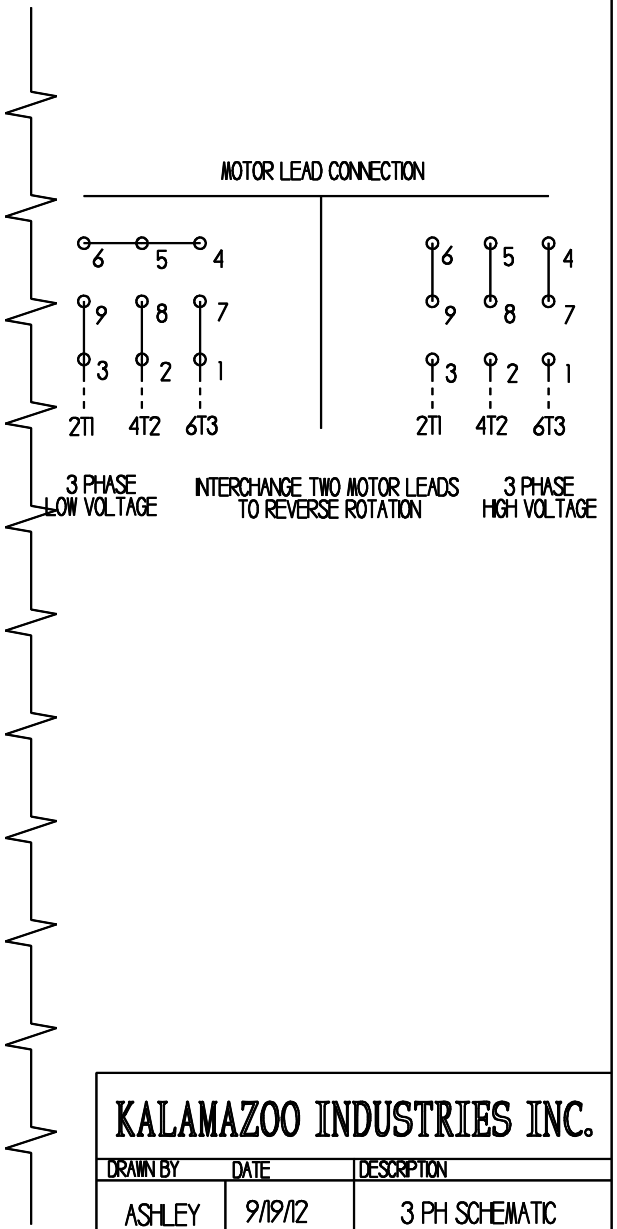
Online Resources

- Product Registration: www.kalamazooind.com/product-registration
- Parts Orders: www.kalamazooind.com/parts-by-category
- Technical Videos: www.kalamazooind.com/videos
- Contact Form: www.kalamazooind.com/contact-us

Thank you for choosing Kalamazoo Industries!

Made in the USA





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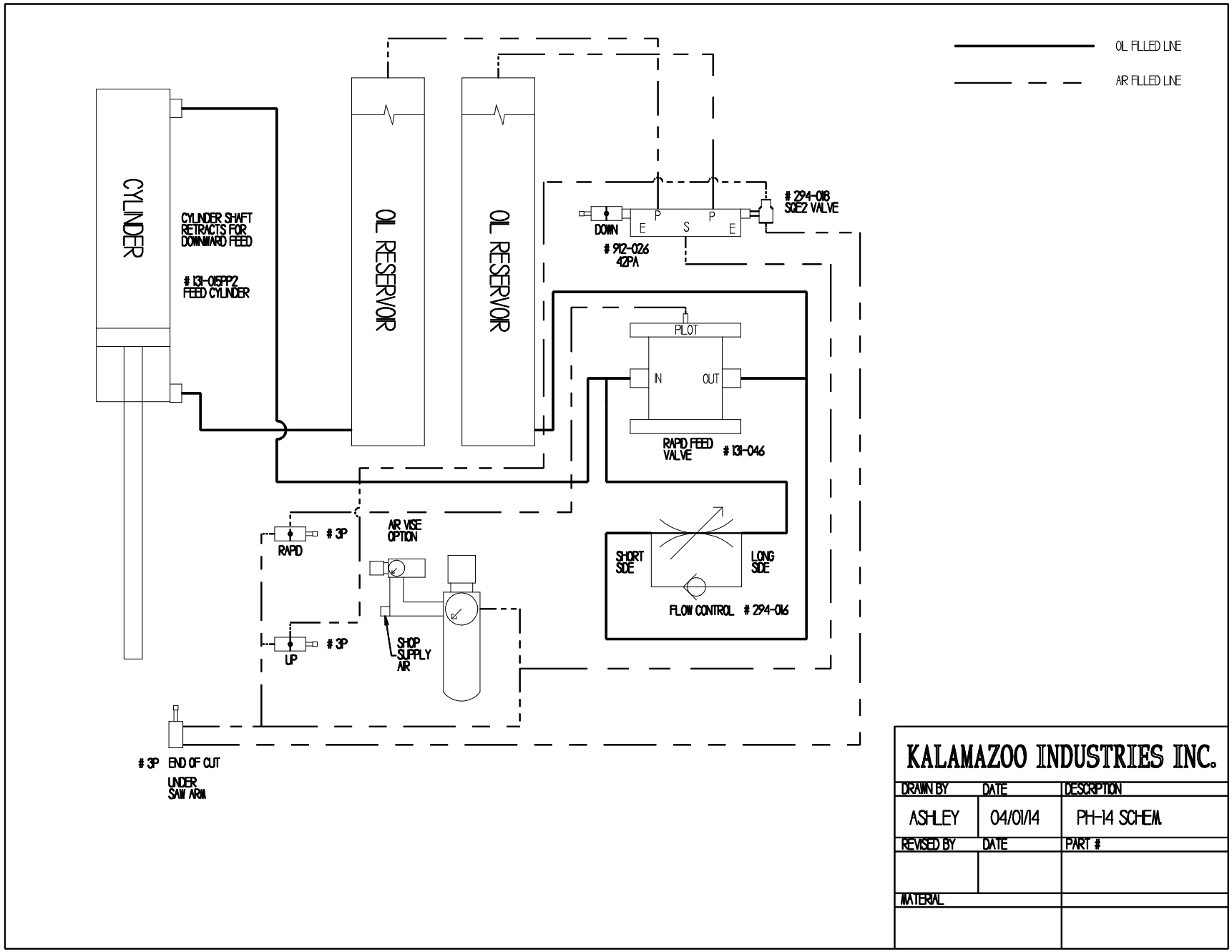
		K12-14MS
MATERIAL		
		W / OSC.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AIR FILLED LINE
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CYLINDER SHAFT RETRACTS FOR DOWNWARD FEED
131-015PP2 FEED CYLINDER
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OIL RESERVOIR
294-018 SOL2 VALVE
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912-026 42PA
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RAPID FEED VALVE # 131-046
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AIR VISE OPTION
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LONG SIDE
FLOW CONTROL # 294-016
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KALAMAZOO INDUSTRIES INC.
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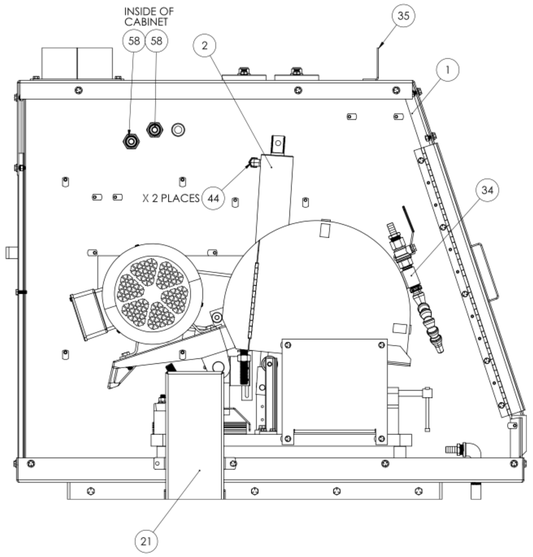
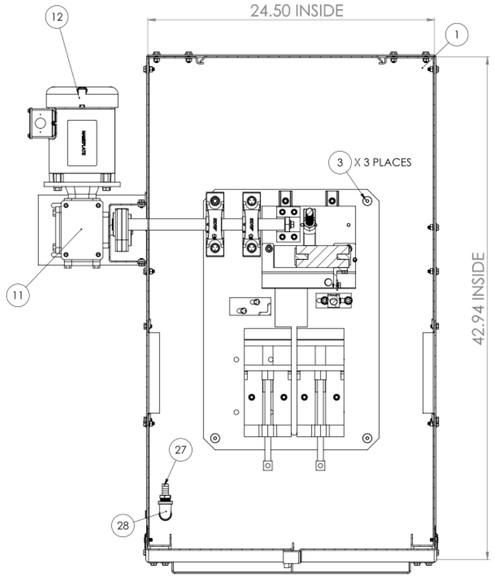
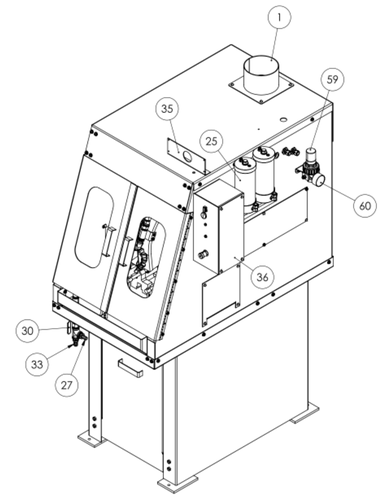
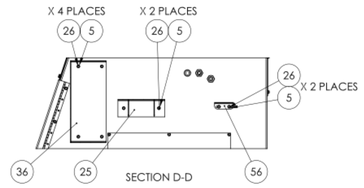




SECTION A-A

INTERNAL VIEW
SCALE 1 : 5

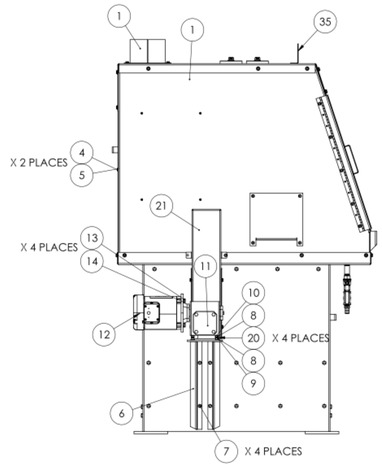


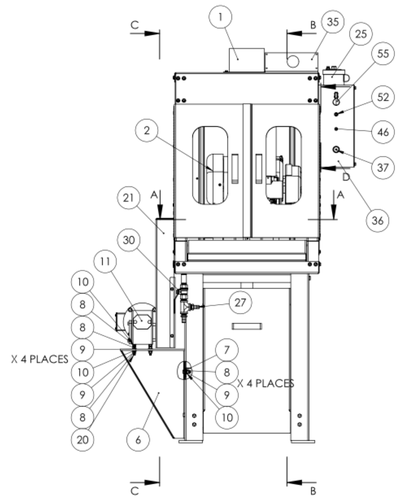


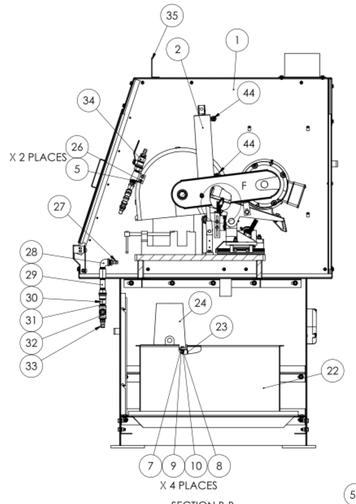
SECTION D-D

ATTACHING PHV CONTROLS BOX, RESERVOIR BRACKET, AND REGULATOR VALVE DETAILS

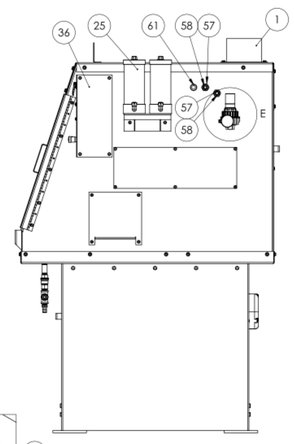
ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	124-011	COMPLETE CABINET FOR K12-14MS INCLUDING BASE AND HOOD ASSEMBLIES	1
2	K12-14MS-UPRHD-VBELT-W-PALMGREN	K12-14MS UPPER HEAD ASSEMBLY WITH V-BELT DRIVE AND PALMGREN VISES	1
3	FSCA037020	3/8-16 X 1-1/4 FSHCS	3
4	HHC5025012	1/4-20 X 3/4 HHCS GR5 Z	2
5	SLWZ025	1/4 SPLIT L/W Z	12
6	556-143	OSCILLATION GEARBOX MOUNT FOR K12-14MS W LINEAR OSC	1
7	HHC5031016	5/16-18 X 1 HHCS GR5 Z	8
8	FHN5031	5/16-18 FHN GR5 ZINC	20
9	UFWZ031	5/16 USS F/W Z	16
10	SLWZ031	5/16 SPLIT L/W Z	16
11	486-033-R	GEAR REDUCER	1
12	486-033-M	1/2HP OSCILLATION MOTOR	1
13	HHC5037016	3/8-16 X 1 HHCS GR5 Z	4
14	SLWZ037	3/8 SPLIT L/W Z	4
15	049-080	JAX1 BUSHING	1
16	560-052	MOTOR PULLEY SHEAVE FOR S6MW, S612 AND S460W	1
17	049-068	SHX7/8 BUSHING	1
18	560-051	SPINDLE PULLEY SHEAVE FOR S6MW, S612 & S460W	1
19	051-010	3V X 450 FOR S10D, S10W, AND K12-14MS OSCILLATION DRIVE	2
20	RND-0.312-18X2.5THRDROD	2-1/2 INCHES OF 5/16-18 THREADED ROD	4
21	342-123	K12-14MS OSCILLATION BELT DRIVE GUARD (NEW STYLE)	1
22	716-011	COOLANT TANK ASSEMBLY FOR S460W, S6MW, S660MW, K12-14MS, K12-14W	1
23	041-114	1/4 TO 1/2 H.P. COOLANT PUMP MOUNTING BRACKET FOR WET SANDERS	1
24	577-002	1/4HP COOLANT PUMP AND MOTOR	1
25	641-010	OIL RESERVOIR ASSEMBLY FOR PH-14 AND HSM14	1
26	HHC5025008	1/4-20 X 1/2 HHCS GR5 Z	10
27	BN44	HOSE BARB 1/2H X 1/2MNTP	2
28	05015BLTS90	1/2" BLACK STREET ELBOW	1
29	05030040BLN	1/2" X 3 BLACK PIPE NIPPLE	1
30	912-030	JOM 100-703 BRONZE BALL VALVE FULL PORT-1/2	1
31	050CL40BLN	1/2" BLACK CLOSE NIPPLE	1
32	05015BLTTI	1/2" BLACK PIPE TEE	1
33	BN54	HOSE BARB 5/8H X 1/2MNPT	1
34	389-013	COOLANT HOSE MOUNTING BRACKET ASSEMBLY W FLEXIBLE HOSE & FITTINGS FOR K12-14MS, K12-14W, AND OTHER MACHINES	1
35	041-056	SWITCH BRACKET FOR K12-14MS	1
36	PH-14-CONTROLSBOX	PH-14 CONTROLS BOX	1
37	294-016	F600B 3/8" BRASS FLOW CONTROL VALVE FOR PH-14 AND PH-20	1
38	3600X6	3600X6 BRASS MALE BRANCH TEE	2
39	169CA-8-6	169CA-8-6 PH 90 DEG BRASS ELBOW (69X8)	3
40	3400X6	3400X6 BRASS STREET ELBOW-90 DEG- 3/8M X 3/8F	1
41	5500-06-04-4	MALE ELBOW 3/8MP X 1/4MP	1
42	131-046	1/4" DUMP VALVE	1
43	3162-04	3162-04 OB BRASS HEX SOCKET PLUG 1/4	1
44	169CA-8-4	169CA-8-4 PH 90 DEG BRASS ELBOW (69X4)	3
45	W169PLP-4-2	W169PLP-4-2 BULK PRESTOLOK 1/4" X 1/8" NPT ELBOW	1
46	912-026	1/4" 4W TAC VALVE	1
47	3325X4X2	3325X4X2 HEX BRASS BUSHING-1/4" X 1/8"	1
48	294-018	QEV SQE2 1/4" EXHAUST VALVE/ DUMP VALVE	1
49	W169PLP-4-4	PRESTOLOK 1/4"OD X 1/4" MALE NPT ELBOW	4
50	BM-28	BM-28 1/4 AIR SILENCER	2
51	W68PLP-4-4	PRESTOLOK 1/4" OD X 1/4" MALE NPT STRAIGHT	2
52	3P	3P 10-32 3W NC VALVE	3
53	32-1	32-1 10/32 ST EL	2
54	SBF-170	SBF-170 1/8" X 10-32 BARB (STRAIGHT THREAD)	5
55	34T	FINGERTIP OPERATOR FOR TAC VALVES	1
56	PS707P	PARKER MOUNTING BRACKET W PANEL NUT	1
57	W17709	AIRBRAKE BULKHEAD COUPLING	2
58	68CA-8-6	68CA-8-6 PH BRASS COMPRESSION FITTING	4
59	06R113AC	1/4 AIR REGULATOR	1
60	102D-204F	2" 1/4 BACK AIR PRESSURE GAUGE	1
61	839-0435	HEYCO G1215 GROMMET	1
62	3220X4X2	3220X4X2 BRASS PIPE BUSHING	1
63	BF1	HU BARB, 1/4 O.D. HOSE	1

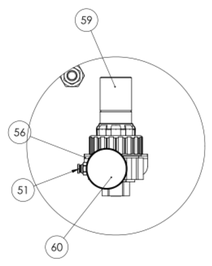






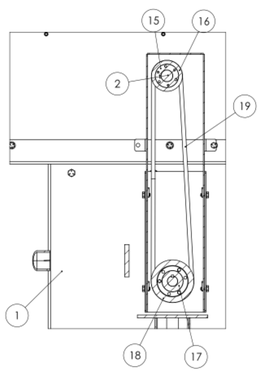
SECTION B-B





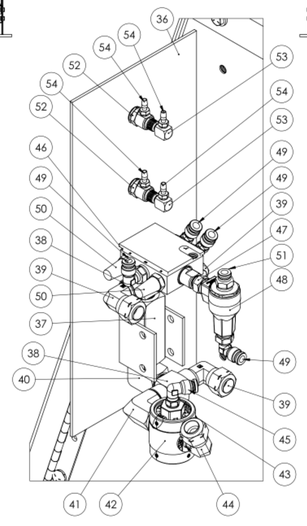
DETAIL E
SCALE 1 : 3

AIR REGULATOR DETAILS



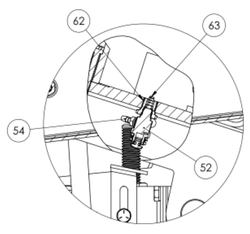
SECTION C-C
SCALE 1 : 5

OSCILLATION DRIVE PULLEYS DETAIL



SCALE 1 : 2

PHV CONTROLS BOX DETAILS



DETAIL F
SCALE 1 : 2

PHV DOWN STOP RETURN VALVE DETAILS

PLEASE CONSULT DRAWING "K12-14MS-VBELT-W-PALMGREN" DRAWING FOR ADDITIONAL INTERNAL DETAILS.

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

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

KALAMAZOO MANUFACTURING, INC.

TITLE: K12-14MS-VBELT-W-PALMGREN VISES

SIZE E | DWG. NO. K12-14MS-VBELT-W-PALMGREN | REV

SCALE: 1:10 | WEIGHT: | SHEET 1 OF 1