Operating Instructions and Parts Manual

3-In-1 Combination Shear, Brake, Roll

Model SBR-5216

Baileigh Industrial
P.O. Box 531
Manitowoc, WI 54221-0531
Ph.: 920-684-4990
Fax: 920-684-3944
Baileigh-Sales@jpwindustries.com

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1.0 Table of Contents

2.0 Safety Instructions

⚠WARNING **Failure to follow these rules may result in serious personal injury**

1. FOR YOUR OWN SAFETY, READ INSTRUCTION MANUAL BEFORE OPERATING THE MACHINE. Learn the machine's application and limitations as well as the specific hazards.
2. Only trained and qualified personnel can operate this machine.
3. Make sure guards are in place and in proper working order before operating machinery.
4. Remove any adjusting tools. Before operating the machine, make sure any adjusting tools have been removed.
5. Keep work area clean. Cluttered areas invite injuries.
6. Overloading machine. By overloading the machine, you may cause injury from flying parts. DO NOT exceed the specified machine capacities.
7. Dressing material edges. Always chamfer and deburr all sharp edges.
8. Do not force tool. Your machine will do a better and safer job if used as intended. DO NOT use inappropriate attachments in an attempt to exceed the machine's rated capacity.
9. Use the right tool for the job. DO NOT attempt to force a small tool or attachment to do the work of a large industrial tool. DO NOT use a tool for a purpose for which it was not intended.
10. Dress appropriately. DO NOT wear loose fitting clothing or jewelry as they can be caught in moving machine parts. Protective clothing and steel toe shoes are recommended when using machinery. Wear a restrictive hair covering to contain long hair.
11. Use eye protection. Always wear ISO approved protective eye wear when operating machinery. Wear a full-face shield if you are producing metal filings. Eye wear shall be impact resistant, protective safety glasses with side shields which comply with ANSI Z87.1 specification. Use of eye wear which does not comply with ANSI Z87.1 specification could result in severe injury from breakage of eye protection.
12. Do not overreach. Maintain proper footing and balance at all times. DO NOT reach over or across a running machine.
13. Stay alert. Watch what you are doing and use common sense. DO NOT operate any tool or machine when you are tired.
14. Check for damaged parts. Before using any tool or machine, carefully check any part that appears damaged. Check for alignment and binding of moving parts that may affect proper machine operation.
15. Observe work area conditions. DO NOT use machines or power tools in damp or wet locations. Do not expose to rain. Keep work area well lighted.
16. Blade adjustments and maintenance. Always keep blades sharp and properly adjusted for optimum performance.
17. Keep children away. Children must never be allowed in the work area. DO NOT let them handle machines, tools, or extension cords.
18. Keep visitors a safe distance from the work area.
19. Store idle equipment. When not in use, tools must be stored in a dry location to inhibit rust. Always lock up tools and keep them out of reach of children.
20. DO NOT operate machine if under the influence of alcohol or drugs. Read warning labels on prescriptions. If there is any doubt, DO NOT operate the machine.

Familiarize yourself with the following safety notices used in this manual:

⚠CAUTION This means that if precautions are not heeded, it may result in minor injury and/or machine damage.

⚠WARNING This means that if precautions are not heeded, it may result in serious injury or death.

⚠DANGER This means that if precautions are not heeded, it will result in serious or fatal, injury.

Save the Instructions

3.0 About This Manual

This manual is provided by Baileigh Industrial, covering the safe operation and maintenance procedures for a Baileigh Model SBR-5216 3 In 1 Combination Shear, Brake, Roll. This manual contains instructions on installation, safety precautions, general operating procedures, maintenance instructions and parts breakdown. Your machine has been designed and constructed to provide consistent, long-term operation if used in accordance with the instructions as set forth in this document.

Technical Support handles questions on setup, operation, schematics, warranty issues, and individual parts needed. Our Technical Support department can be reached at 920-684-4990.

If there are questions or comments, please contact your local supplier or Baileigh Industrial. We can also be reached at our web site: www.baileigh.com.

Retain this manual for future reference. If the machine transfers ownership, the manual should accompany it.

⚠WARNING **Read and understand the entire contents of this manual before attempting assembly or operation! Failure to comply may cause serious injury!**

Register your product online -

https://baileigh.com/product-registration

4.0 Product Identification

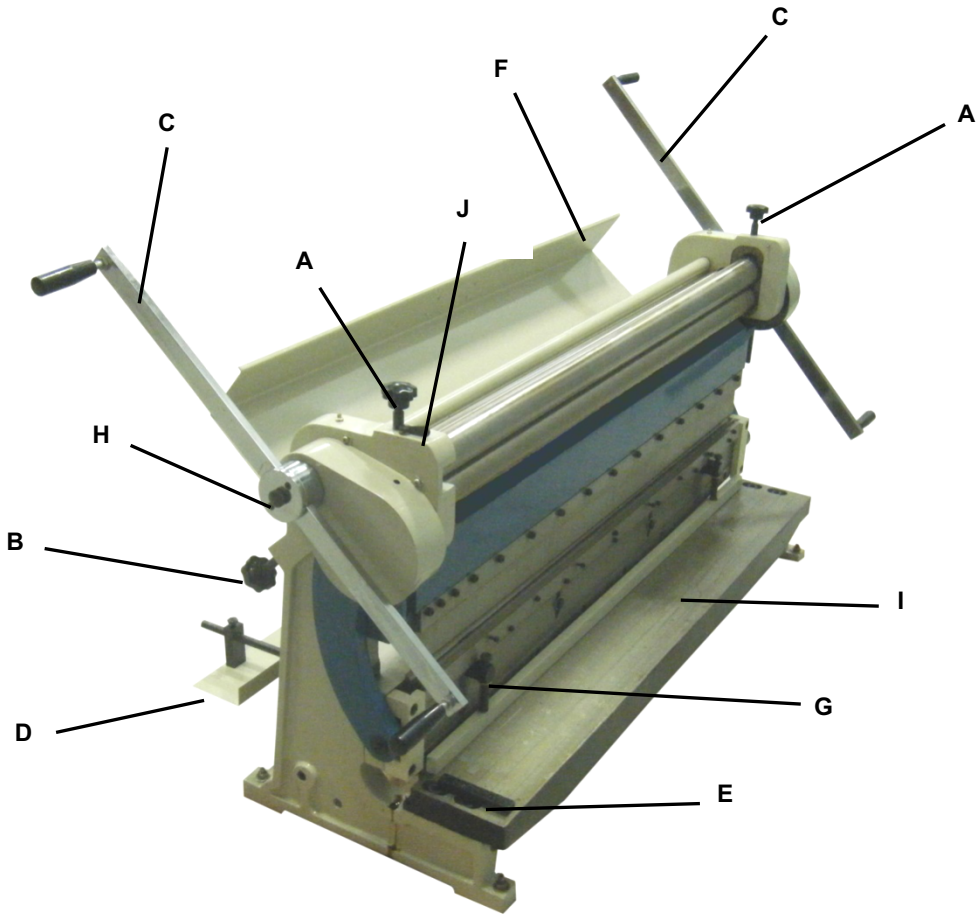
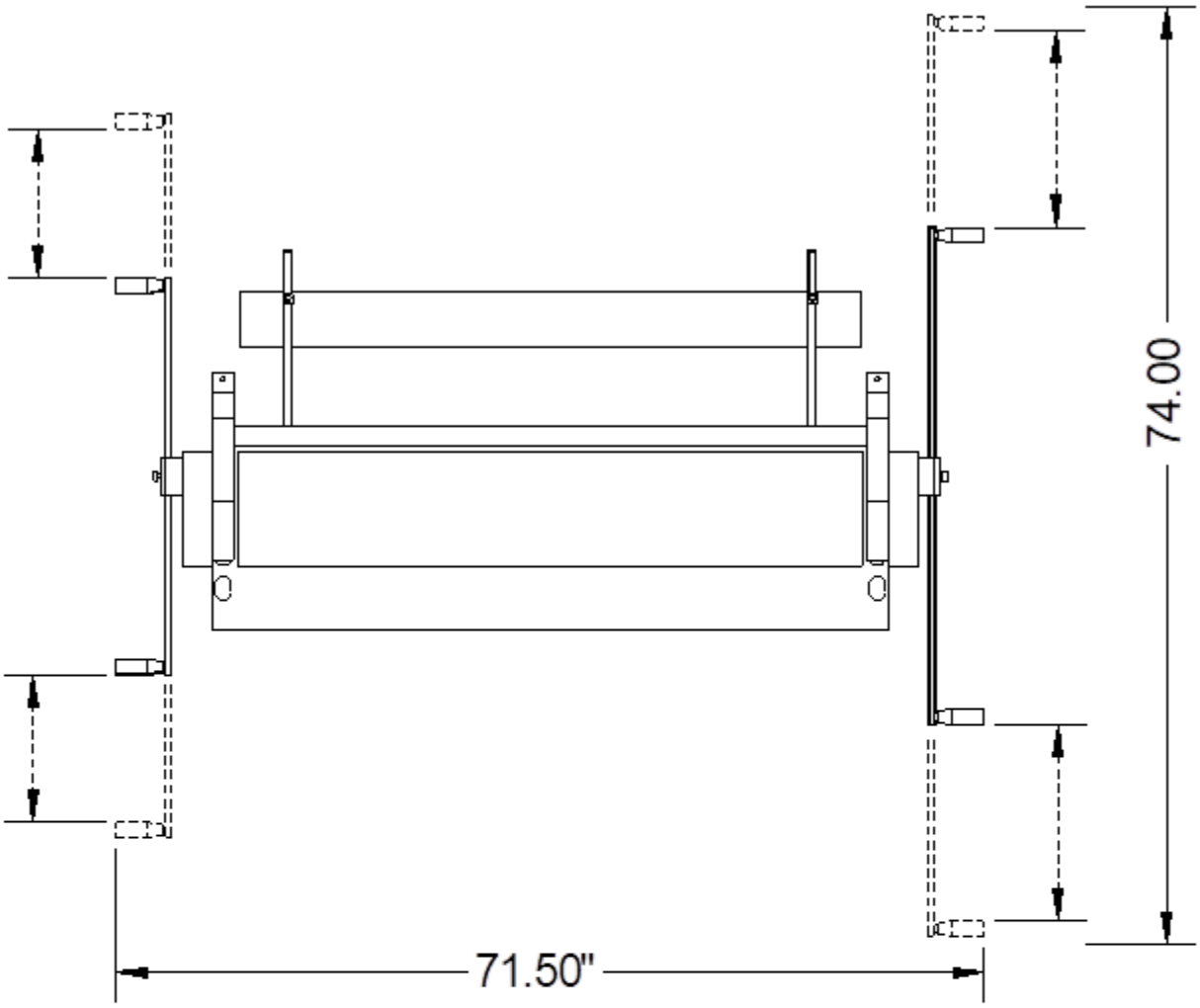


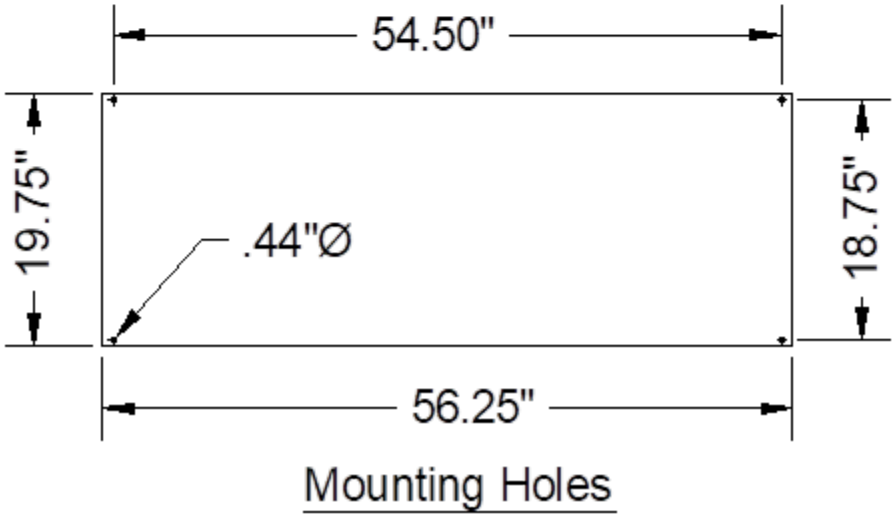
Figure 4-1

Table 4-1

Item	Description	Function
A	Upper Roller Adjustment Knob	Clockwise to lower and counterclockwise to raise
B	Rear Roller Adjustment Knob	Clockwise to raise and counterclockwise to lower
C	Handlebars	Adjustable for leverage to controls motion of the rolls, shear, and brake
D	Back Gauge	Controls material stop distance for brake and shear
E	Shear Guide	Guides edge of material when shearing
F	Slip Roll Cover	Covers rolls when not being used
G	Spring Loaded Hold Down	Controls the hold down feed gap
H	Handlebar Adjustment Knob	Loosen knob and adjust handlebar position
I	Shear Table	Place material on the table when shearing
J	Roller Pin Shaft Release	Turning the pin contains or releases roller shaft

4.2 Overall Dimensions





Mounting Holes

Figure 4-2

5.0 Specifications

Table 5-1

Model number	SBR-5216
Stock number	BA9-1006972
General Specifications	
Bed Width	52” (1321mm)
Shear Capacity	16ga. (1.90mm) mild steel*
Bending Capacity	16ga. (1.90mm) mild steel*
Rolling Capacity	16ga. (1.90mm) mild steel*
Maximum Bend Angle	90°
Slip Roll Solid Rod Sizes	.250” (6.35mm) diameter, .312” (7.92mm) diameter, .375” (9.52mm) diameter
Minimum Roll Diameter	2.38” (60.5mm)
Box Depth	4” (101.6mm)
Frame and Base	Cast Iron
Brake	Ground Steel w/Hardened Edge
Shear Table	Precision Ground Cast Iron
Shear Blades	Hardened Steel (Can be turned four times)
Shear Hold-Down Clamp	Spring-Loaded Cast Iron
Diameter of Rolls	2.38” (60.5mm)
Power Requirements	Manual
Weights and Dimensions	
Shipping Dimensions (L x W x H)	67” x 30” x 46” (1702 x 762 x 1168mm)
Shipping Weight	1200 lbs. (545 kg)
Based on a material tensile strength of *60000 PSI – mild steel	

⚠WARNING

Read and understand the entire contents of this manual before attempting assembly or operation. Failure to comply may cause serious injury.

6.0 Setup and Assembly

6.1 Unpacking and Checking Contents

Your Baileigh machine is shipped complete. Separate all parts from the packing material and check each item carefully. Make certain all items are accounted for before discarding any packing material.

⚠WARNING

SUFFOCATION HAZARD! Immediately discard any plastic bags and packing materials to eliminate choking and suffocation hazards to children and animals.

⚠WARNING

If any parts are missing, DO NOT place the machine into service until the missing parts are obtained and installed correctly.

6.2 Cleaning

⚠WARNING

DO NOT USE gasoline or other petroleum products to clean the machine. They have low flash points and can explode or cause fire.

⚠CAUTION

When using cleaning solvents work in a well-ventilated area. Many cleaning solvents are toxic if inhaled.

Your machine may be shipped with a rustproof waxy coating and/or grease on the exposed unpainted metal surfaces. Fully and completely remove this protective coating using a degreaser or solvent cleaner. Moving items will need to be moved along their travel path to allow for cleaning the entire surface. For a more thorough cleaning, some parts will occasionally have to be removed. DO NOT USE acetone or brake cleaner as they may damage painted surfaces.

Follow manufacturer's label instructions when using any type of cleaning product. After cleaning, wipe unpainted metal surfaces with a light coating of quality oil or grease for protection.

IMPORTANT: This waxy coating is NOT a lubricant and will cause the machine to stick and lose performance as the coating continues to dry.

6.3 Transporting and Lifting

NOTICE

Lifting and carrying operations should be carried out by skilled workers, such as a truck operator, crane operator, etc. If a crane is used to lift the machine, attach the lifting chain carefully, making sure the machine is well balanced.

Follow these guidelines when lifting with truck or trolley:

- The lift truck must be able to lift at least 1.5 – 2 times the machines gross weight.
- Make sure the machine is balanced. While transporting, avoid rough or jerky motion, and maintain a safe clearance zone around the transport area.
- Use a forklift with sufficient lifting capacity and forks that are long enough to reach the complete width of the machine.
- Remove the securing bolts that attach the machine to the pallet.
- Approaching the machine from the side, lift the machine on the frame taking care that there are no cables or pipes in the area of the forks.
- Move the machine to the required position and lower gently to the floor.
- Level the machine so that all the supporting feet are taking the weight of the machine and no rocking is taking place.

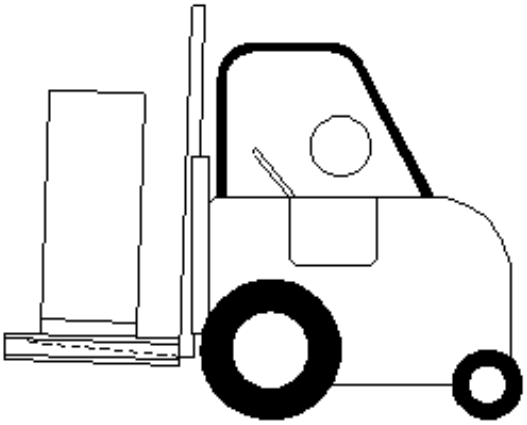


Figure 6-1

Follow these guidelines when lifting crane or hoist:

- Always lift and carry the machine with the lifting holes provided at the top of the machine.
- Use lift equipment such as straps, chains, capable of lifting 1.5 to 2 times the weight of the machine.
- Take proper precautions for handling and lifting.
- Check if the load is properly balanced by lifting it an inch or two.

- Lift the machine, avoiding sudden accelerations or quick changes of direction.
- Locate the machine where it is to be installed, then lower slowly until it touches the floor.

Figure 6-2

6.4 Installation

⚠ WARNING

It is absolutely imperative that this machine be anchored securely to the floor to prevent tipping.If this machine is installed on a work bench or stand of any type, then the mounting to the bench or stand AND the stand must be anchored in such a way as to prevent tipping. At full capacity, the leverage of both handles extending fully forward with each operator pulling downward WILL cause the machine to tip if not properly anchored.

IMPORTANT:

Consider the following when looking for a suitable location to place the machine:

- Overall weight of the machine.
- Weight of material being processed.
- Sizes of material to be processed through the machine.
- Space needed for auxiliary stands, work tables, or other machinery.
- Clearance from walls and other obstacles.
- Maintain an adequate working area around the machine for safety.
- Have the work area well illuminated with proper lighting.
- Keep the floor free of oil and make sure it is not slippery.
- Remove scrap and waste materials regularly, and make sure the work area is free from obstructing objects.
- If long lengths of material are to be fed into the machine, make sure that they will not extend into any aisles.
- **LEVELING:** The machine should be sited on a level, concrete floor. Provisions for securing it should be in position prior to placing the machine. The accuracy of any machine depends on the precise placement of it to the mounting surface.
- **FLOOR:** This tool distributes a large amount of weight over a small area. Make certain that the floor is capable of supporting the weight of the machine, work stock, and the operator. The floor should also be a level surface. If the unit wobbles or rocks once in place, be sure to eliminate by using shims.
- **WORKING CLEARANCES:** Take into consideration the size of the material to be processed. Make sure that you allow enough space for you to operate the machine freely. This shall include the full rotation of the handles at full extension.

6.4.1 Anchoring the Machine

- Once positioned, anchor the machine to the floor, as shown in the diagram. Use bolts and expansion plugs or sunken tie rods that connect through and are sized for the holes in the base of the stand.
- This machine requires a solid floor such as concrete at a minimum of 4” (102mm) thick. 6” (153mm) minimum is preferred.

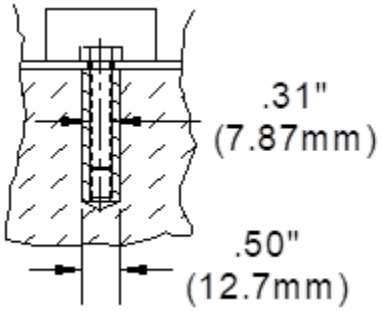


Figure 6-3

If you intend to mount the Baileigh machine on a workbench be aware of the following:

- Overall weight of the machine.
- Weight of material being processed.
- Make sure the workbench is properly reinforced to support the weight.
- The strongest mounting option is where the holes are drilled all the way through the workbench and the machine is secured with bolts, washers, and nuts.

6.5 Assembly

1. This machine comes with one long (39.5” [1003mm]) and one short (31.5” [800mm]) handlebars. It is the owners/operators choice as to which end of the machine the handlebars are installed into.

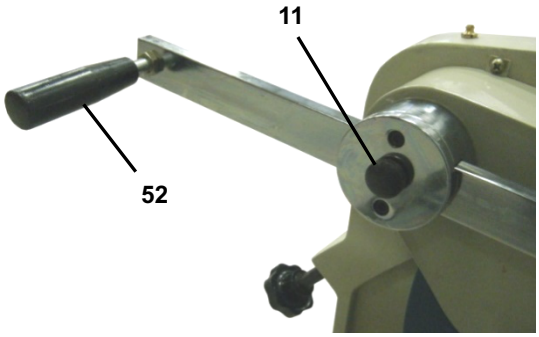


Figure 6-4

2. Remove the swivel handle (52) from the handlebar.
3. Loosen the thumb bolt, (11) enough to allow the handlebar to slide into the hub.
4. Extend the handlebar though the hub enough to allow the swivel handle to be installed.
5. Tighten the thumb bolt (11) to hold the handlebar in position.
6. Install and tighten the swivel handle (52) to prevent the handlebar from coming out of the hub and to provide the handle for pulling the machine during operation.

Note: Do not overtighten the thumb bolt. The handlebar is typically slide from the center position to full extension as the material increases toward full capacity.

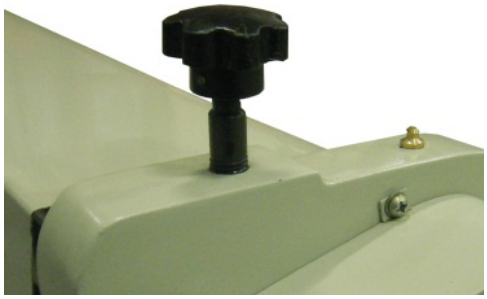


Figure 6-5

7. Repeat this procedure at the other end of the machine with the other handlebar.
8. Thread the upper roll adjusting knobs into the tapped holes on the top of each side plate as shown.
9. Tighten the knobs until just snug.

Figure 6-6

10. Thread both back stop extension rods (#28) into the lower set of holes as shown. These holes are located on the outfeed side of the casting.

Note: When the back gauge (33) is on the top of the rods, the back gauge will be aligned for use with the brake. When the back gauge is below the rods the back gauge will be aligned for use with the shear.

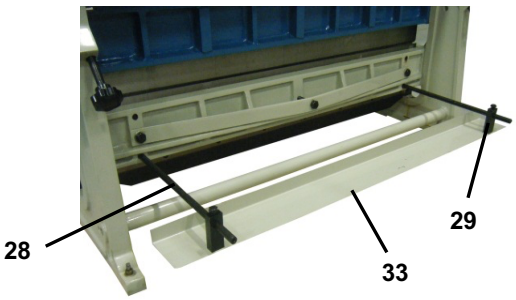


Figure 6-7

11. Fasten both mounting collars (**#29**) to the back gauge (**#33**). The stand dies can now be positioned where needed on the long rods to locate the back gauge.

7.0 Shear Overview

The shear section has blades that can be reversed to provide a sharp edge as needed and are capable of shearing up to 16 gauge (1.519mm) mild steel sheet x 52” (1321mm) wide. An adjustable upper blade assembly passes by a fixed lower blade resulting in a precise shearing action. If necessary, the back gauge can be adjusted to accommodate repeat pieces.

7.1 Shearing Tips

- Keep the blade gap to the smallest distance possible.

- When shearing, the work should be squared against a guide.
- The pressure plate should be adjusted approximately 0.125" (3.175mm) above the table when the shear blade is in the up position. As the blade is moved downward, the pressure plate should immediately rest against the workpiece and hold it in place.
- To prevent distortion when shearing, snap the handle assembly quickly to pierce the workpiece, then continue with steady even pressure to complete the cut.
- After shearing, metal parts will have a sharp edge on them. These edges may cause cuts when handled. Deburr the workpiece to remove the edge before handling.
- Have the shear blades sharpened by a professional. This will lead to accurate, quality results.
- To avoid rolling over the edge of the sheet metal and pinching it between the two blades, NEVER cut any piece narrower than eight times the thickness of the material.

8.0 Shearing Sheet Metal

⚠WARNING

Before operating the Baileigh Shear, Brake, Roll make sure it is firmly bolted to a table, bench, or the floor. If it tips over on you, it could cause severe injury or death.

⚠WARNING

The shearing blades pose an amputation hazard. Make sure no body part or clothing is near the specific hazard. Failure to follow this warning could result in severed or crushed fingers.

⚠CAUTION

Always wear proper eye protection with side shields, safety footwear, and leather gloves to protect from burrs and sharp edges.

⚠CAUTION

When handling large heavy materials make sure they are properly supported.

⚠CAUTION

Use Caution and good communication skills between the primary and secondary operator. Both operators should apply even and consistent force to the handlebars during the cut.

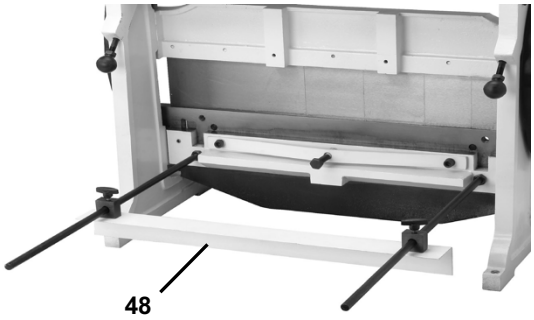


Figure 8-1

1. Adjust the rear stop (#48) to accommodate the length of the cut.
2. Adjust the handlebars within the hubs to full extension to provide as much leverage as possible to assist in the cut.
3. Using the handle assembly, raise the upper blade to the highest position.
4. Have at least one square edge of the material against the side guide or the adjustable rear stop for accurate cuts.
5. Lay the sheet metal on the work apron against the left side guide. Push the sheet under the hold down until it bumps up to the adjustable stop.

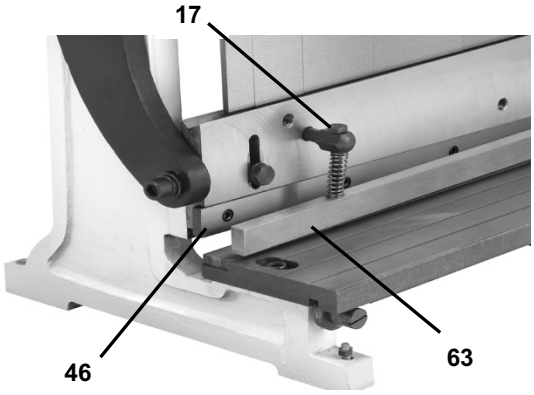


Figure 8-2

6. In a coordinated fashion, both operators should rotate the handlebar to begin the cut. The shearing action begins at the left side of the piece part and continues to the right until the cut is complete.
   a. The pressure plate (**#63**) should make contact with the sheet before the blade (**#46**) does. If it does not, adjust the two hex bolts (**#17**) on the pressure plate brackets to lower the pressure plate. When fully open the gap should not exceed 0.125" (3.175mm).
7. Carefully lift the cut piece from the rear of the machine if it does not fall to the tabletop or floor on its own.

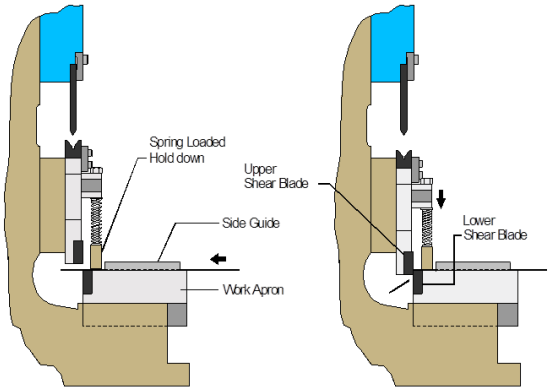


Figure 8-3

9.0 Shear Blade Adjustments

The blade was adjusted at the factory. However, after using the shear for a time, it may become necessary to re-adjust the blade.

1. Remove the material hold down by unscrewing the bolts (**#70**) from the hold down bar (**#41**).
2. Loosen the two table capscrews at each end of the table.
3. Using a flathead screwdriver tighten or loosen the table adjustment screws located under both ends of the table.

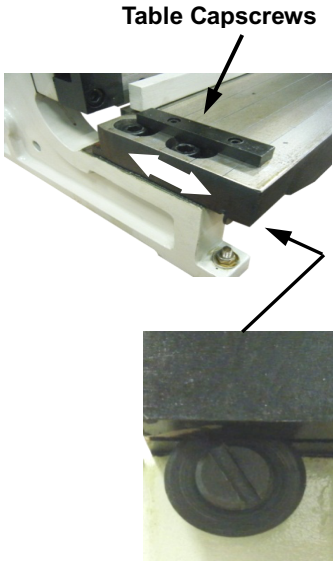


Figure 9-1

Note: These screws change the distance of the table and fixed blade to the shear blade. The idea is to obtain a snug blade fit without binding the blades.

4. Re-tighten the four table top screws.
5. While keeping fingers clear of the blades, shear a piece of paper along the full edge of the blade.

9.1 Adjustment Results

- Shear cuts properly along the full length. Reinstall the hold down and follow the adjustment procedure.
- Shear cuts clean at one end but not the other. Repeat steps 2 & 3 above.
- Shear cuts at both ends of the blade but not at the center. Turn the bow nut (A) clockwise (**cw**) until the paper cuts clean at all locations.
- Shear cuts at the center but not the blade ends. Turn the bow nut counterclockwise (**ccw**) until the paper cuts clean the full length.

Figure 9-2

Once the blade makes a clean cut the whole length, reinstall the hold down and follow the adjustment procedure.

10.0 Hold Down Adjustment

When the shearing cycle starts, the spring loaded hold down pushes on the piece part to secure it. It also helps keep the operator's fingers away from the cutting blades. When adjusted properly there should be no more than 1/4" (6.3mm) of clearance below the hold down to feed the piece part.

10.1 How to Adjust the Hold down

1. Turn the handlebar to lower the upper blade completely. Loosen or tighten as needed so there is approximately 1.125" (28.5mm) between the bottom of the bolt head and the flat of the hex stud (#44).
2. Turn the handlebar to raise the blade completely. There should be a 1/4" (6.3mm) gap between the shear table and the hold-down. If not, repeat step 1.

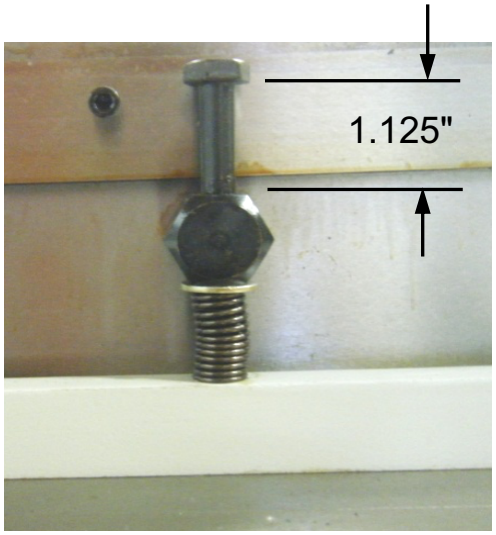


Figure 10-1

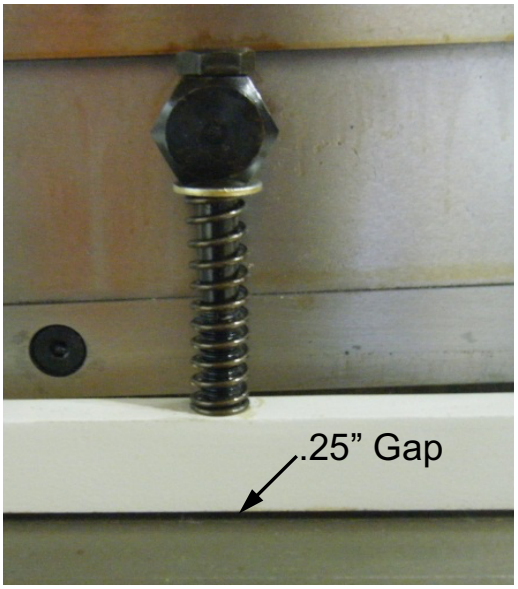


Figure 10-2

11.0 Removal of Brake Blades for Cleaning and Setup

Turn the handlebar counterclockwise (**ccw**) to raise the brake blade die until it contacts the brake blades as shown at right. Using a hex wrench, loosen all of the capscrews holding the gib. Now slide the brake blades out, one at a time. Clean the casting seat, the gib, and all of the brake blades with mineral spirits. After drying, lubricate with an anti-rust lubricant.

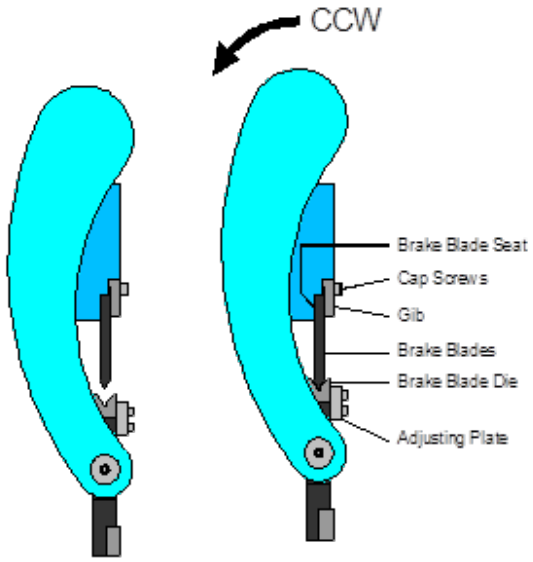


Figure 11-1

11.1 Installing the Brake Blades

Turn the handlebar clockwise (**cw**) to lower the brake blade die. Lay a strip of wood on the brake blade die the full length as shown at right. Start inserting the brake blades. Wide blades to the right and narrow blades to the left when facing the front of the machine. When the brake blades are all in place, turn the handlebar counterclockwise (**ccw**) to raise the brake blade die. When the brake blades are firmly seated in the casting, tighten all of the capscrews on the gib. Now lower the brake blade die and remove the strip of wood.

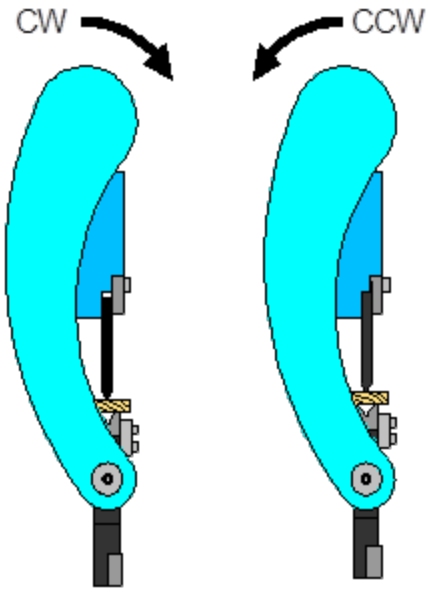


Figure 11-2

12.0 Brake Overview

The Combination SBR has adjustable and removable fingers to offer a wide variety of bending brake options. The brake section is capable of bending up to 16ga. (1.519mm) x 52” (1321mm) wide mild steel sheet.

To start a bend, the operator places a piece of sheet metal on the blade brake die. By turning the handlebar, the brake die is raised up until the tips of the brake blades line up with a line scribed on the sheet metal. If necessary the back gauge can be adjusted to accommodate repeat pieces. By continuing the upward travel of the brake die, the brake blades push the sheet metal down into the “V”-groove of the brake die. The thinner the material the further it will enter the groove for a slight overbend. This is helpful when the material experiences some springback. To remove the piece part, the operator lowers the brake die and removes the piece from the front of the machine.

12.1 Bending Allowance

In order to bend sheet metal accurately, you will need to consider the total length of each bend. This is referred to as bend allowance. Subtract the bend allowance from the sum of the outside dimensions of the piece part to obtain the actual overall length or width of the piece. Because of differences in sheet metal hardness, and whether the bend is made with the grain or against it, exact allowances must sometimes be made by trial and error. However bend allowances for general use can be obtained from metal working books or from the Internet.

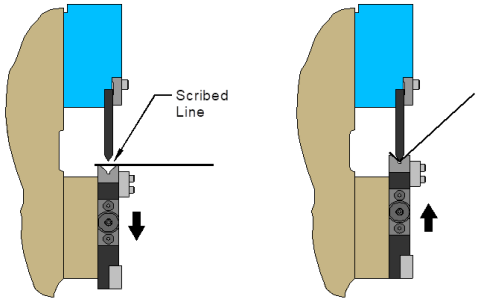


Figure 12-1

13.0 Bending Sheet Metal

When using the Combination SBR as a manual box and pan brake, the brake blades can be removed and setup to allow all four flanges of the box or pan to be bent upward.

⚠WARNING

Before operating the Baileigh Shear, Brake, Roll make sure it is firmly bolted to a table, bench, or the floor. If it tips over on you, it could cause severe injury or death.

⚠WARNING

The bending brake poses a pinching hazard. Make sure no body part or clothing is near the specific hazard. Failure to follow this warning could result in severed or crushed fingers.

⚠CAUTION

Always wear proper eye protection with side shields, safety footwear, and leather gloves to protect from burrs and sharp edges.

⚠CAUTION

When handling large heavy materials make sure they are properly supported.

⚠CAUTION

Use Caution and good communication skills between the primary and secondary operator. Both operators should apply even and consistent force to the handlebars during the cut.

13.1 Basic Bend Operation

1. Install the back gauge assembly to be on top of the rods as shown.
2. Adjust the stop to the required depth. It can also be mounted on the front of the brake. Or. Scribe a line on the sheet metal to indicate where the bend is to be made.
3. Adjust the handlebars within the hubs to full extension to provide as much leverage as possible to assist in the cut.
4. Using the handle assembly, raise the fingers on the brake until there is enough gap to fit the work piece.
5. Make sure the material is against the back stop or that the scribe mark is lined up to where the brake blade will come down.
6. While the sheet metal is being held firmly, both operators should rotate the handlebar to make the bend to the desired angle.
7. Raise the brake blade die and remove the piece part.

Figure 13-1

Note: The brake die is designed to bend material up to 90°.

13.2 Adjust the Fingers for Box and Pan Bending

1. Place a thin and flat piece of spacer material (A) over the notch of the brake die. This flat surface will help you obtain equal finger length.
2. With the handle assembly, lower the fingers so they are just touching the top of the spacer on the brake die.
3. Loosen, but do not remove, the six cap screws (#20).
4. Slide the fingers horizontally to the desired position or rearrange them to get the desired width combination for your project.
5. Using the handle assembly, lower the fingers to apply light pressure. Check to make sure each finger has continuous contact with the spacer.
6. Tighten the six cap screws.

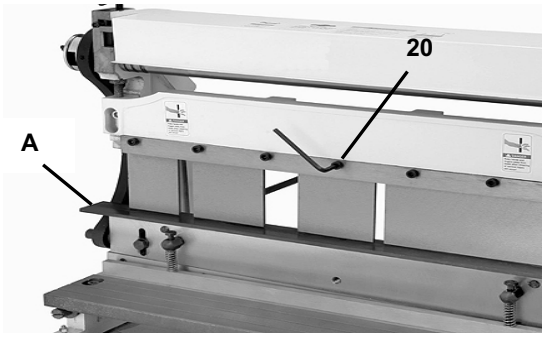


Figure 13-2

14.0 Slip Roll Overview

The slip roll section can be used to roll up to 16ga. (1.519mm) x 52” (1321mm) wide mild steel. It consists of 3 hardened rolls. The rear roll is adjustable to control the radius of the piece part as it is being formed. The closer the rear roll is brought to the front upper roll, the tighter the radius. The two front gear driven rolls pinch the material and pull it against the rear roll, forcing it up towards the front upper roll. The top front roll has two adjustment knobs, one on each end of the machine, to control the upper and lower roller spacing for different material thicknesses. When removing the formed piece part, the top front roll can be slipped out.

- When the slip roll section is not being used, the operator can cover the rolling mechanism with the formed steel pivoting cover / guard.
- The rear roll can be adjusted to a raised or tilted position on one end to roll cones or left flat to roll cylinders or arcs.
- Located on the end of the upper and lower rolls are three wire or forming grooves. These can be used for forming small diameter tubing or wire into rings or curved shapes.
- To prolong the life of the rolls, always keep them clean and well lubricated. Remove burrs from the edges of any sheet metal being processed through the rolls.
- DO NOT exceed the rated capacity on this slip roll. It has been tested at the factory to roll 16ga. (1.519mm) x 52” (1321mm) wide mild steel.
- Because material springback varies with the kind of material being formed, only by test forming several pieces can the correct adjustments be made.

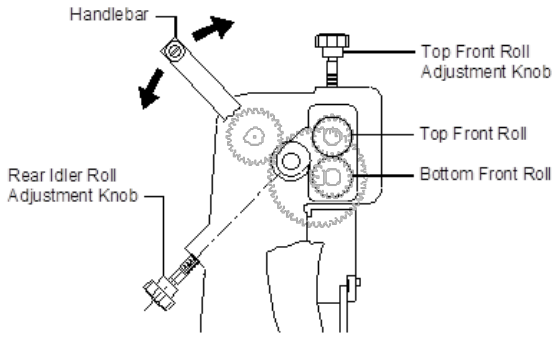


Figure 14-1

⚠CAUTION

When handling large piece parts, you may require assistance in handling the piece as it exits the rolls. Failure to adequately support the piece part may result in the piece falling and causing bodily injury.

15.0 Operating the Slip Roll

⚠WARNING

Before operating the Baileigh Shear, Brake, Roll make sure it is firmly bolted to a table, bench, or the floor. If it tips over on you, it could cause severe injury or death.

⚠WARNING

Rolling poses a pinching hazard. Make sure no body part or clothing is near the specific hazard. Failure to follow this warning could result in severed or crushed fingers.

⚠CAUTION

Always wear proper eye protection with side shields, safety footwear, and leather gloves to protect from burrs and sharp edges.

⚠CAUTION

When handling large heavy materials make sure they are properly supported.

⚠ CAUTION

Use Caution and good communication skills between the primary and secondary operator. Both operators should apply even and consistent force to the handlebars during the cut.

15.1.1 Determining Length of Material

LENGTH OF MATERIAL necessary to form the desired size circle is the first consideration in circle forming. To determine the approximate length of material needed use the formula: **C = I x D**, Where **C** is the circumference, **I** is the value of π or 3.1416, and **D** is the diameter. For example, to find the length of material (C or Circumference) to form a 4" (101.6mm) diameter circle, multiply (3.1416 x 4). The result is 12.5664 or the approximate length of material needed. Cut a few pieces of material to this length for test forming. Material may have to be lengthened or shortened depending upon results of the test forming run.

15.1.2 Pre-Bending and Finish Rolling

PRE-BENDING is the operation where the ends of the material are bent to the same radius as that of the finished piece. This principle is used to get the best results in full circle bending.

Before bending, follow these steps:

- Clean the material and rolls of any dust or grease.
- Make sure the edges of the piece part are free of chips and burrs.
- Check that the material is flat.
- Have a template of the finished diameter to compare with.
- Always work in the center of the rolls.

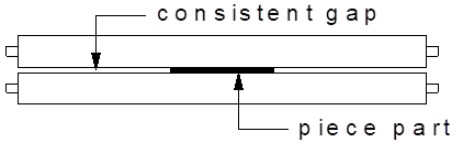


Figure 15-1

15.1.3 Rolling Operation

1. Back off the idler roll by turning the two adjustment bolts counterclockwise (ccw) as in view "A" below.
2. Unscrew the top roll adjustment bolts until there is enough gap between the top and bottom rolls to allow the piece part to fit between.
3. Rotate the handlebar to advance the piece part about 1" (25.4mm) beyond the rolls.
4. Tighten the top roll adjustment bolts to hold the piece part firmly.
5. Raise the idler roll enough to get the material started in an upward direction against the top front roll as shown in view "B.

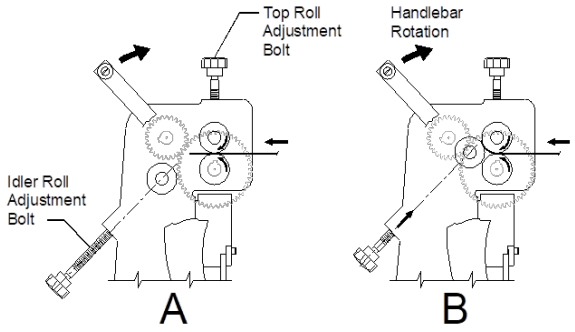


Figure 15-2

6. Rolling the initial edge slightly will give it a pre-bend.
7. Back the piece out, turn the piece part and repeat the sequence for the other end. See view "C" below.
8. Now that you have a pre-bend on both ends, it is time to roll the final diameter.
9. Back down the rear idler roll and start rolling the piece forward and reverse as shown in view "D".
10. Start raising the idler roll gradually and continue rolling the piece forward and reverse until you have reached the finished diameter.

Note: To achieve a cone configuration, adjust the idler roll on one end only.

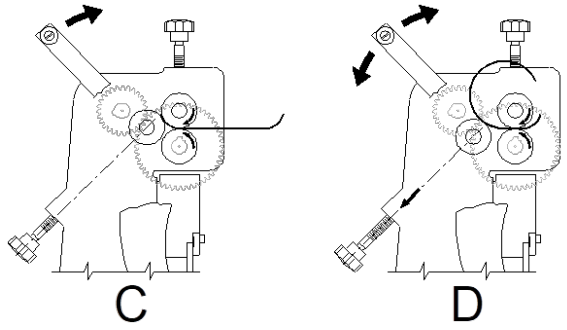


Figure 15-3

⚠ CAUTION

Have an assistant support the top roll when removing finished cylinders from the top roll. Failure to adequately support the top roll may result in the roll falling, and causing personal injury.

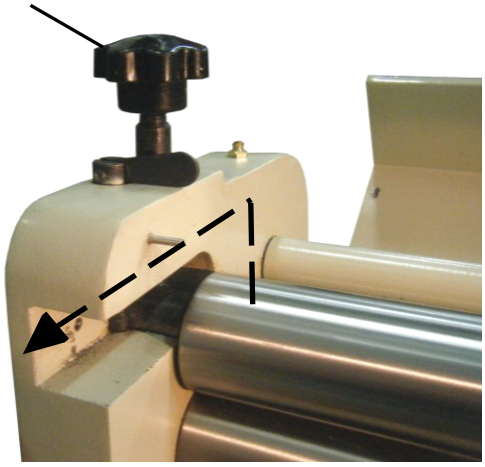


Figure 15-4

11. To remove a finished piece part from the top roll, loosen both top roll adjustment bolts (#24).
12. With the help of an assistant, lift the left end of the top roll, up and out, keeping the right end gears meshed as much as possible. The other person will slide the finished cylinder off. The roll is heavy, so DO NOT attempt this alone.

15.1.4 Rolling Round Shapes

There are three wire or forming grooves located on the right end of the upper and lower rolls. They can be used to form solid wire, rods, and small tubing.

To make rings, follow the “Determining Length of Material” procedure to calculate the actual length. Then proceed with the rolling operation.

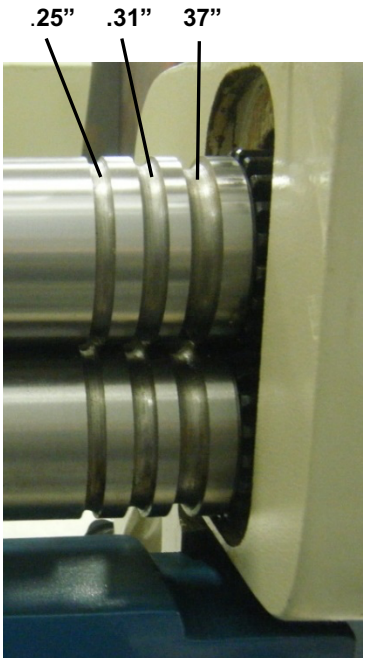


Figure 15-5

16.0 Bending Allowance

In order to bend sheet metal accurately, you will need to consider the total length of each bend. This is referred to as bend allowance. Subtract the bend allowance from the sum of the outside dimensions of the piece part to obtain the actual overall length or width of the piece. Because of differences in sheet metal hardness, and whether the bend is made with the grain or against it, exact allowances must sometimes be made by trial and error. However bend allowances for general use can be obtained from metal working books or from the Internet.

17.0 Understanding Springback

Springback, also known as elastic recovery, is the result of the metal wanting to return to its original shape after undergoing compression and stretch. After the bending leaf is removed from the metal and the load is released, the piece part relaxes, forcing the bent portion of the metal to return slightly to its original shape. The key to obtaining the correct bend angle is to over bend the metal a little and allow it to spring back to the desired angle. All metals exhibit a certain amount of spring back.

18.0 Material Selection

⚠CAUTION

It must be determined by the customer that materials being processed through the machine are NOT potentially hazardous to operator or personnel working nearby.

When selecting materials keep these instructions in mind:

- Material must be clean and dry. (without oil)
- Material should have a smooth surface so it processes easily.
- Dimensional properties of material must be consistent and not exceed the machine capacity values.
- Chemical structure of material must be consistent.
- Buy certificated steel from the same vendor when possible.

19.0 Maintenance

⚠WARNING

Maintenance should be performed on a regular basis by qualified personnel. Always follow proper safety precautions when working on or around any machinery.

Check for the following conditions and repair or replace when necessary:

- Check daily for any unsafe conditions and fix immediately.
- Check that all nuts and bolts are properly tightened.
- On a weekly basis clean the machine and the area around it.
- Lubricate gears, bushings, threaded components and sliding devices.
- Apply rust inhibitive lubricant to all non-painted surfaces.
- Loose mounting bolts.
- Chipped brake fingers.
- Dull or chipped shear blades.
- Inadequate lubrication.
- Any other condition that could hamper the safe operation of this machine.

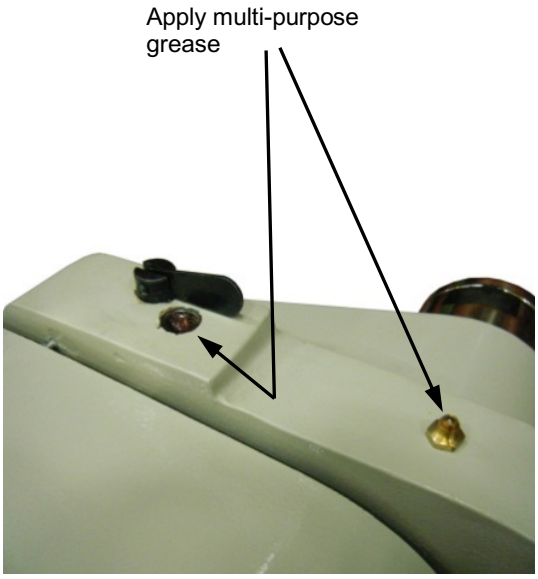


Figure 19-1

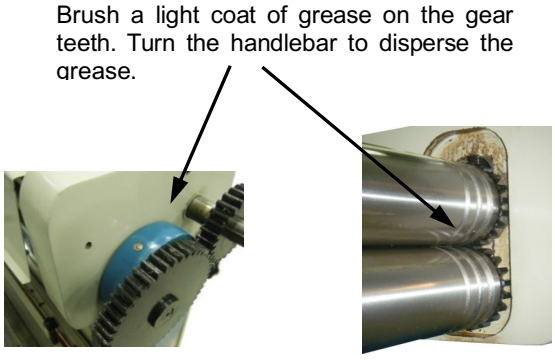


Figure 19-2

Note: Proper maintenance can increase the life expectancy of your machine.

20.0 Slip Roll Maintenance

Every (6) months remove and lubricate the roller bushings.

1. With the aid of an assistant carefully remove the top front roll. To do so, back off both top roll adjustment bolts, and rotate the roll release pin (left side of roll), 90°. Be careful not to damage the roll.
2. Remove both bushings from the ends of the roll.
3. With mineral spirits, wipe all old grease from the bushings, gears, roller end shafts, and machined pockets that the bushings rest on.
4. After the parts have dried, lubricate them sufficiently with multi-purpose grease.
5. Apply some 10W30 or equivalent oil into the bushings of the bottom front roll.
6. Lower the idler roll by turning the (2) idler adjustment bolts counterclockwise (ccw). This will give you access to apply oil to the bushings.
7. Remove the idler adjustment bolts and clean the threads. Lubricate with oil and re-install.

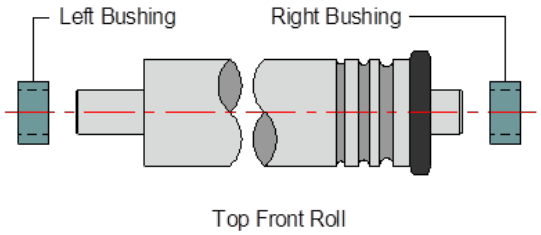


Figure 20-1

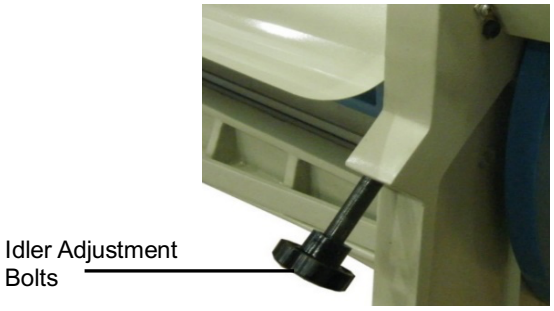


Figure 20-2

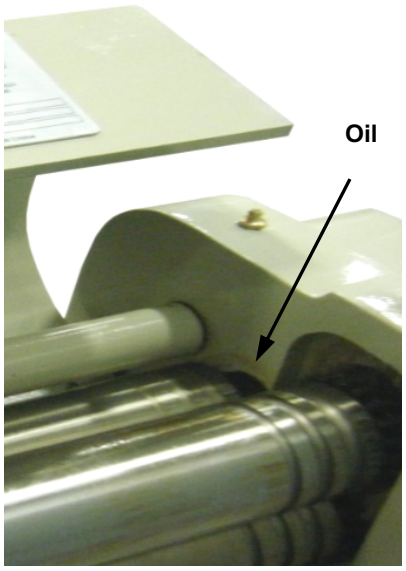


Figure 20-3

21.0 Brake Alignment

⚠WARNING

The bending brake poses a pinching hazard. Make sure no body part or clothing is near the specific hazard. Failure to follow this warning could result in severed or crushed fingers.

On occasion, it may become necessary to realign the brake blades and the brake die. Follow the procedure below:

1. The first thing to do is clean and then deburr the brake blades and the V-groove of the brake die.
2. Make sure all brake blades are tight and seated properly.
3. Place a straight piece of .5” to .75” (12.7 to 19mm) diameter tubing (approx.) 42” (1067mm) long in the brake die “V”- groove.
4. Raise the blade die until the side of the pipe lightly contacts the brake blades.
5. From one end to the other, visually check for consistent contact between the pipe and the blades.
6. If you notice a gap at one end of the brake, loosen the (2) carriage lock capscrews at that end, and adjust the jack bolt until the brake blades just touch the pipe.
7. Tighten both capscrews and remove the pipe.
8. After cycling the brake a few times, recheck the alignment.

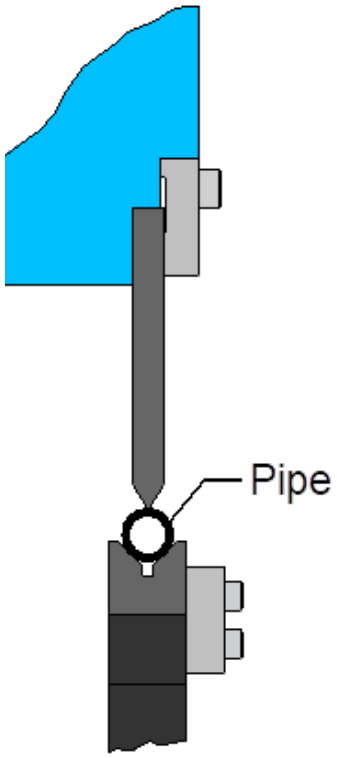


Figure 21-1

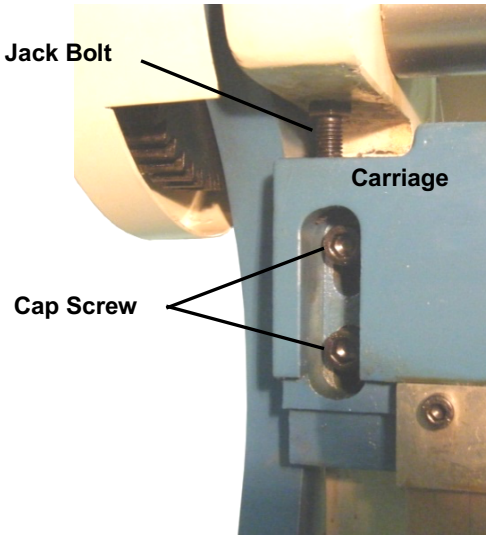


Figure 21-2

22.0 Replacing the Shear Blade

⚠WARNING

The shear blade poses an amputation hazard. Make sure no body part or clothing is near the specific hazard. Failure to follow this warning could result in severed or crushed fingers.

When the blade edge has been ground to the point that the blade gap can no longer be set correctly, replace the blades as a set. Contact Baileigh Industrial for replacement blades.

22.1 Replace Blades

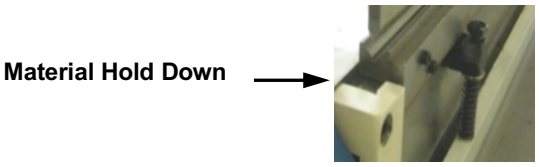


Figure 22-1

1. Remove the material hold down by unscrewing the bolts (#70) from the hold down bar (#41).
2. Raise the shearing blade assembly to the top of its stroke and secure either by blocking the frame or tying off the handlebar. MAKE SURE it is secure to avoid accidental shearing.
3. Remove the eight flathead screws holding on the upper blade (#40) and remove it from the movable blade (#39). When handling the blade always wear leather gloves to protect your hands.
4. Grind or replace the blade. Replace the flat head screws and tighten securely.
5. To replace the lower blade you must work from the other side (rear) of the machine.
6. Remove the eight flathead screws holding on the lower blade (#40) and remove it from the shear table (#2). When handling the blade always wear leather gloves to protect your hands.
7. Grind or replace the blade. Replace the flat head screws and tighten securely.
8. While keeping fingers clear of the blades, shear a piece of paper all along the full length of the blades.

22.1.1 Shear Results

- Shear cuts properly along the full length. Reinstall the hold down and follow the adjustment procedure.
- Shear cuts poorly at the blade ends. Follow the blade adjustment procedure.
- Shear cuts all but one or two locations in the center. Loosen the flat head screw at the location where the cut is poor. Apply a piece of shim material between the blade and the backup and then retighten the screw. Check cut again.

23.0 Troubleshooting

23.1 Shear Operation

Table 23-1

Fault	Probable Cause	Remedy
Can't shear material	Improper blade gap distance, exceeding machine capacities	Widen gap for thicker material
Cuts are not square	Blade gap unequal across length, Too much bow in blade, Inadequate hold down pressure	Adjust blade gap to be equal across length, Adjust blade bow, Adjust hold down gap
Poor quality of cuts, ripping./ or tearing	Dull blades, Poor blade gap set-up, Loose blade	Replace or sharpen blades, Adjust blade gap, Remove blade, clean mounting

23.2 Brake Operation

Table 23-2

Fault	Probable Cause	Remedy
Heavy resistance during bends	Exceeding machine capacities	Use materials within machine capabilities
Bend radius is not consistent	Brake blades and die are not aligned	Adjust brake alignment
Brake blade points are chipping	Brake blades and die are not aligned	Adjust brake alignment
Piece part shows scoring marks after bend	Brake blades or die has scratches	Polish out scratches

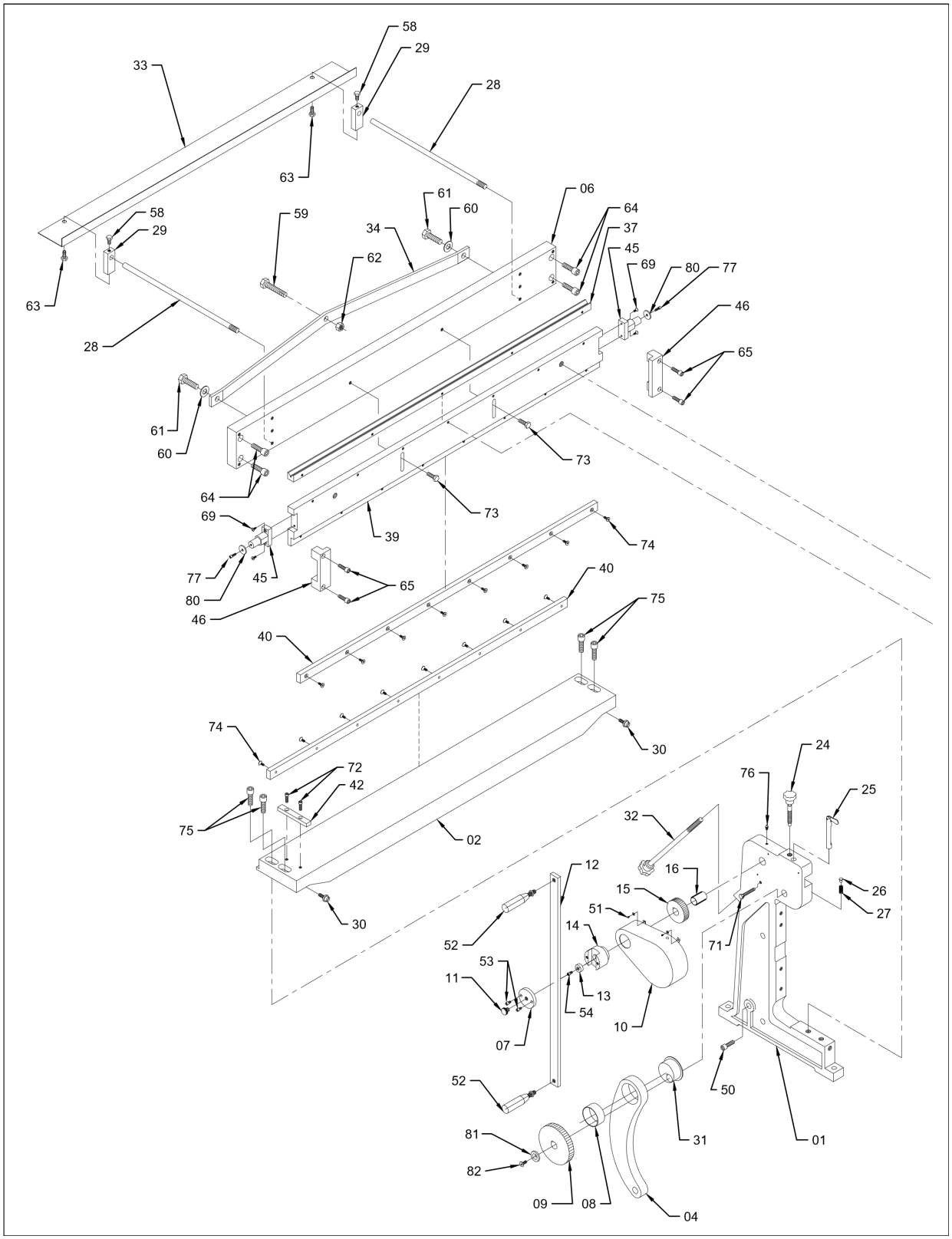
23.3 Slip Roll Operation

Table 23-3

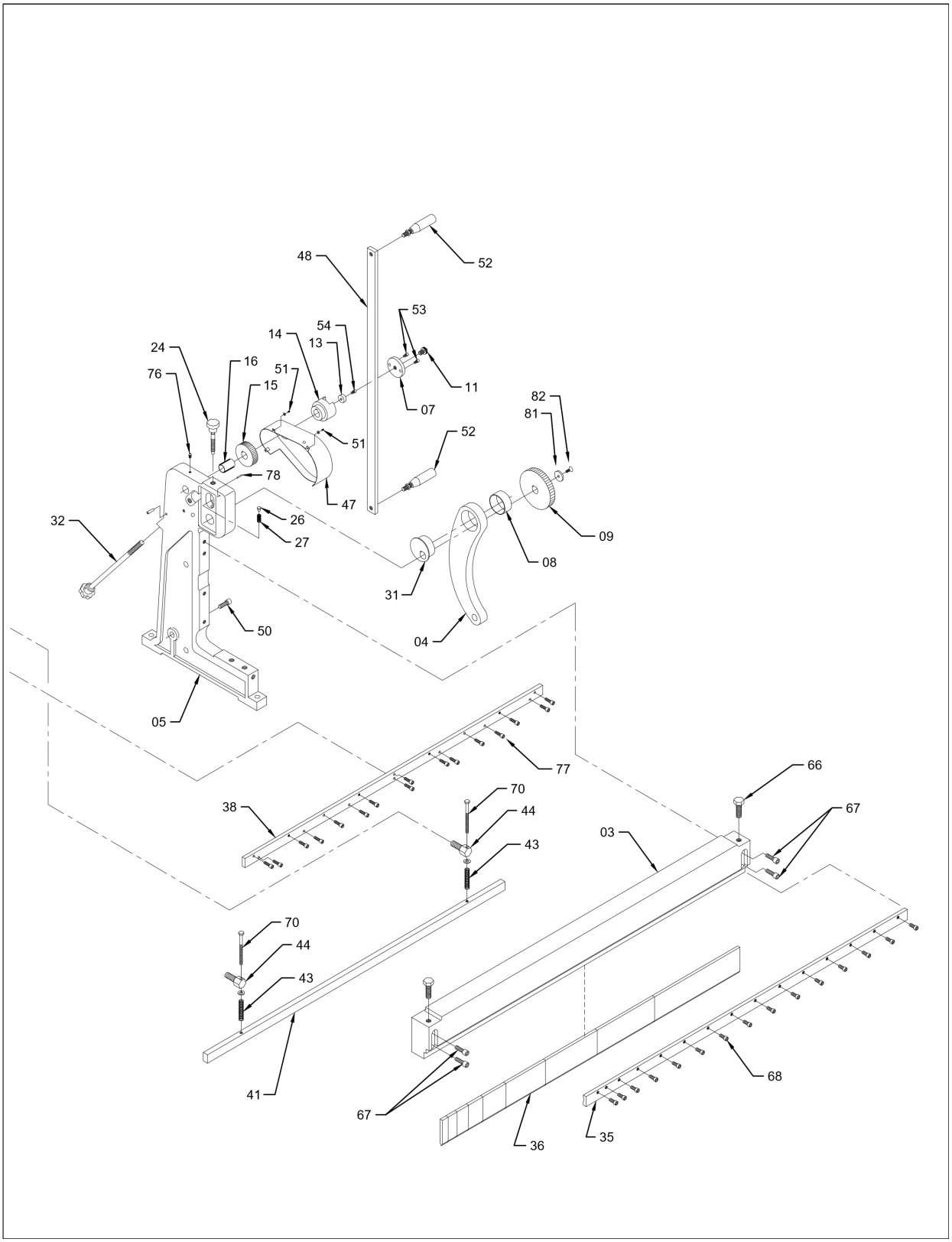
Fault	Probable Cause	Remedy
Slip Roll creates cones instead of cylinders.	Rolls are not parallel to each other.	Adjust the rear roll to be parallel to the top roll.
A noticeable crease forms in the piece part.	Excessive pressure applied to one spot.	Reduce the radius and make the bend in several passes.
Piece part is pitted.	Material sheet is dirty or roll is damaged.	Clean material, polish nicks in roller.

24.0 Replacement Parts

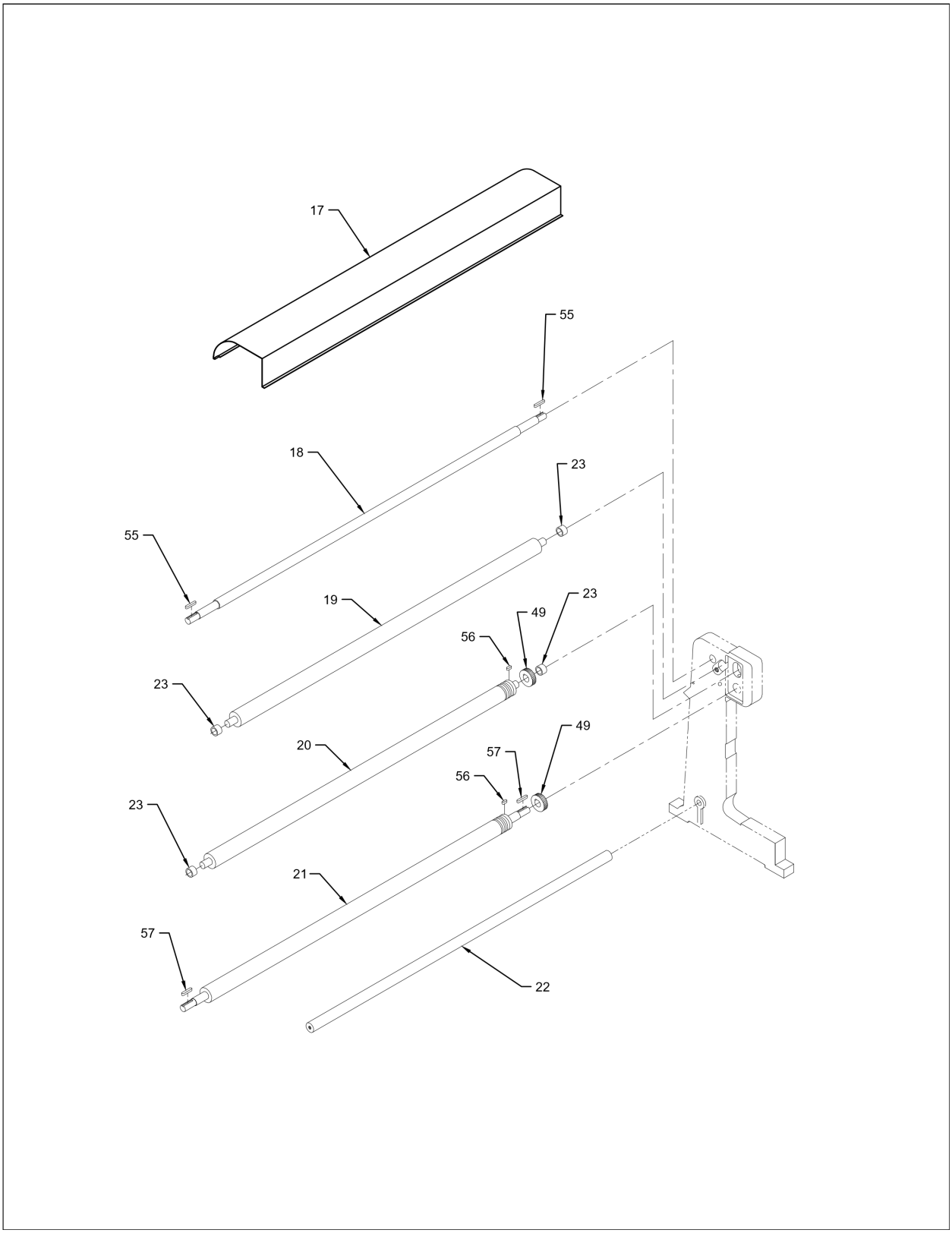
24.1.1 3-In-1 Combination Shear, Brake, Roll Assembly – Exploded View A



24.1.2 3-In-1 Combination Shear, Brake, Roll Assembly – Exploded View B



24.1.3 3-In-1 Combination Shear, Brake, Roll Assembly – Exploded View C



24.1.4 3-In-1 Combination Shear, Brake, Roll Assembly – Part List

Index No	Part No	Description	Size	Qty
01	BA9-1013546	Left Side Member		1
02	BA9-1018404	Shear Table		1
03	BA9-1018405	Crossbeam		1
04	BA9-1006974	Crank Arm		2
05	BA9-1013547	Right Side Member		1
06	BA9-1006992	Connector		1
07	BA9-1006994	Cover		2
08	BA9-1006975	Bushing		2
09	BA9-1014044	Large Gear		2
10	BA9-1018406	Left Gear Cover		1
11	BA9-1006976	Threaded Knob		2
12	BA9-1006977	Short Handlebar		1
13	BA9-1018407	Pressing Cover		2
14	BA9-1010383	Handle Seat		2
15	BA9-1006978	Small Gear		2
16	BA9-1006979	Bushing		2
17	BA9-1018408	Roll Cover		1
18	BA9-1006980	Transmission Shaft		1
19	BA9-1018409	Rear Shaft		1
20	BA9-1015483	Front Upper Shaft		1
21	BA9-1018410	Front Lower Shaft		1
22	BA9-1018411	Connect Pipe		1
23	BA9-1015800	Bushing		4
24	BA9-1018412	Top Roll Adjustment Bolt		2
25	**	Knob		1
26	BA9-1008448	Pin		2
27	BA9-1008444	Spring		2
28	BA9-1010382	Long Screw		2
29	BA9-1010381	Stand Die		2
30	BA9-1018414	Table Adjustment Screw		2
31	BA9-1012688	Eccentric Plate		2
32	BA9-1021848	Rear Adjustment Knob		2
33	BA9-1006995	Back Gauge		1
34	BA9-1018416	Bending Bar		1
35	**	Presser plate		1
36	BA1-9687	Brake Blade (Assorted Sizes)		1
37	BA9-1017852	Brake Blade Die		1
38	BA9-1017853	Adjusting Plate		1
39	BA9-1006984	Movable Blade Mount		1
40	BA9-1006996	Blade-Upper		2
41	BA9-1018418	Hold Down		1
42	BA9-1018419	Side Guide		1
43	BA9-1012918	Hold Down Spring		2
44	BA9-1018420	Hex Stud		2
45	BA9-1014300	Pin Seat		2
46	BA9-1006985	Left and Right Press Block		2
47	BA9-1018421	Right Gear Cover		1
48	BA9-1006986	Long Handlebar		1
49	BA9-1006987	Small Roll Gear		2
50	BA9-1018422	Socket Head Cap Screw	M12X55	2
51	BA9-1018423	MACH Screw, Pan HD,PHILLIPS	M6X10	6
52	BA9-1006988	Handle	M12X100	4
53	BA9-1006989	Socket Head Cap Screw	M6X12	4
54	BA9-1018425	Socket Head Cap Screw	M6X14	2
55	BA9-1018426	Flat Key	8X7X45	2
56	BA9-1006990	Flat Key	6X14	2
57	BA9-1006991	Flat Key	8X7X55	2
58	**	Hex Cap Screw	M12X25	2
59	BA9-1018427	Hex Cap Screw	M16X80	1

Index No	Part No	Description	Size	Qty
60	BA9-1018428	Flat Washer	M16	2
61	BA9-1018429	Hex Cap Screw	M16X30	2
62	BA9-1018430	Hex Nut 16mm	M16	1
63	BA9-1010380	Hex Cap Screw	M12X20	2
64	BA9-1018431	Socket Head Cap Screw	M16X45	4
65	BA9-1018432	Socket Head Cap Screw	M12X55	4
66	BA9-1018433	Hex Cap Screw	M12X35	2
67	BA9-1018434	Socket Head Cap Screw	M12X65	4
68	BA9-1018435	Socket Head Cap Screw	M8X25	15
69	BA9-1006993	Socket Head Cap Screw	M8X16	4
70	BA9-1012917	Hex Cap Screw	M12X120	2
71	BA9-1018436	Hex Cap Screw	M8X70	2
72	BA9-1018437	Socket Head Cap Screw	M6X12	2
73	BA9-1018438	Hex Cap Screw	M12X45	2
74	BA9-1013908	Socket HD Flat Screw	M8X25	16
75	BA9-1018439	Socket Head Cap Screw	M16X45	4
76	BA9-1018440	Straight Grease Fittings	M10X1	2
77	BA9-1018441	Socket Head Cap Screw	M6X20	2
78	BA9-1018442	Taper pins	3X18	2
79	BA9-1018443	Taper pins with internal thread	8X30	2
80	BA9-1018444	Washer	φ6	2
81	**	Washer	φ6	2
82	TS-1515031	Socket HD Flat Screw	M8X25	2

** These parts are shown for reference only and are not available for order individually. Non-proprietary parts, such as fasteners, can usually be found at local hardware stores.

25.0 Warranty and Service

Thank you for your purchase of a machine from Baileigh Industrial. We hope that you find it productive and useful to you for a long time to come.

Inspection & Acceptance. Buyer shall inspect all Goods within ten (10) days after receipt thereof. Buyer's payment shall constitute final acceptance of the Goods and shall act as a waiver of the Buyer's rights to inspect or reject the Goods unless otherwise agreed. If Buyer rejects any merchandise, Buyer must first obtain a Returned Goods Authorization ("RGA") number before returning any Goods to Seller. Goods returned without an RGA will be refused. Seller will not be responsible for any freight costs, damages to Goods, or any other costs or liabilities pertaining to Goods returned without an RGA. Seller shall have the right to substitute a conforming tender. Buyer will be responsible for all freight costs to and from Buyer and repackaging costs, if any, if Buyer refuses to accept shipment. If Goods are returned in unsalable condition, Buyer shall be responsible for full value of the Goods. Buyer may not return any special-order Goods. Any Goods returned hereunder shall be subject to a restocking fee equal to 30% of the invoice price.

Specifications. Seller may, at its option, make changes in the designs, **specifications**, or components of the Goods to improve the safety of such Goods, or if in Seller's judgment, such changes will be beneficial to their operation or use. Buyer may not make any changes in the specifications for the Goods unless Seller approves of such changes in writing, in which event Seller may impose additional charges to implement such changes.

Limited Warranty. Seller warrants to the original end-user that the Goods manufactured or provided by Seller under this Agreement shall be free of defects in material or workmanship for a period of twelve (12) months from the date of purchase, provided that the Goods are installed, used, and maintained in accordance with any instruction manual or technical guidelines provided by the Seller or supplied with the Goods, if applicable. The original end-user must give written notice to Seller of any suspected defect in the Goods prior to the expiration of the warranty period. The original end-user must also obtain an RGA from Seller prior to returning any Goods to Seller for warranty service under this paragraph. Seller will not accept any responsibility for Goods returned without an RGA. The original end-user shall be responsible for all costs and expenses associated with returning the Goods to Seller for warranty service. In the event of a defect, Seller, at its sole option, shall repair or replace the defective Goods or refund to the original end-user the purchase price for such defective Goods. Goods are not eligible for replacement or return after a period of 10 days from date of receipt. The foregoing warranty is Seller's sole obligation, and the original end-user's exclusive remedy, with regard to any defective Goods. This limited warranty does not apply to: (a) die sets, tooling, and saw blades; (b) periodic or routine maintenance and setup, (c) repair or replacement of the Goods due to normal wear and tear, (d) defects or damage to the Goods resulting from misuse, abuse, neglect, or accidents, (f) defects or damage to the Goods resulting from improper or unauthorized alterations, modifications, or changes; and (f) any Goods that has not been installed and/or maintained in accordance with the instruction manual or technical guidelines provided by Seller.

EXCLUSION OF OTHER WARRANTIES. THE FOREGOING LIMITED WARRANTY IS IN LIEU OF ALL OTHER WARRANTIES, EXPRESS OR IMPLIED. ANY AND ALL OTHER EXPRESS, STATUTORY, OR IMPLIED WARRANTIES, INCLUDING BUT NOT LIMITED TO, ANY WARRANTY OF MERCHANTABILITY OR FITNESS FOR ANY PARTICULAR PURPOSE ARE EXPRESSLY DISCLAIMED. NO WARRANTY IS MADE WHICH EXTENDS BEYOND THAT WHICH IS EXPRESSLY CONTAINED HEREIN.

Limitation of Liability. IN NO EVENT SHALL SELLER BE LIABLE TO BUYER OR ANY OTHER PARTY FOR ANY INCIDENTIAL, CONSEQUENTIAL OR SPECIAL DAMAGES (INCLUDING, WITHOUT LIMITATION, LOST PROFITS OR DOWN TIME) ARISING FROM OR IN MANNER CONNECTED WITH THE GOODS, ANY BREACH BY SELLER OR ITS AGENTS OF THIS AGREEMENT, OR ANY OTHER CAUSE WHATSOEVER, WHETHER BASED ON CONTRACT, TORT OR ANY OTHER THEORY OF LIABILITY. BUYER'S REMEDY WITH RESPECT TO ANY CLAIM ARISING UNDER THIS AGREEMENT IS STRICTLY LIMITED TO NO MORE THAN THE AMOUNT PAID BY THE BUYER FOR THE GOODS.

Force Majeure. Seller shall not be responsible for any delay in the delivery of, or failure to deliver, Goods due to causes beyond Seller's reasonable control including, without limitation, acts of God, acts of war or terrorism, enemy actions, hostilities, strikes, labor difficulties, embargoes, non-delivery or late delivery of materials, parts and equipment or transportation delays not caused by the fault of Seller, delays caused by civil authorities, governmental regulations or orders, fire, lightning, natural disasters or any other cause beyond Seller's reasonable control. In the event of any such delay, performance will be postponed by such length of time as may be reasonably necessary to compensate for the delay.

Installation. If Buyer purchases any Goods that require installation, Buyer shall, at its expense, make all arrangements and connections necessary to install and operate the Goods. Buyer shall install the Goods in accordance with any Seller instructions and shall indemnify Seller against any and all damages, demands, suits, causes of action, claims and expenses (including actual attorneys' fees and costs) arising directly or indirectly out of Buyer's failure to properly install the Goods.

Work By Others; Safety Devices. Unless agreed to in writing by Seller, Seller has no responsibility for labor or work performed by Buyer or others, of any nature, relating to design, manufacture, fabrication, use, installation, or provision of Goods. Buyer is solely responsible for furnishing and requiring its employees and customers to use all safety devices, guards and safe operating procedures required by law and/or as set forth in manuals and instruction sheets furnished by Seller. Buyer is responsible for consulting all operator manuals, ANSI or comparable safety standards, OSHA regulations and other sources of safety standards and regulations applicable to the use and operation of the Goods.

Remedies. Each of the rights and remedies of Seller under this Agreement is cumulative and in addition to any other or further remedies provided under this Agreement or at law or equity.
Attorney's Fees. In the event legal action is necessary to recover monies due from Buyer or to enforce any provision of this Agreement, Buyer shall be liable to Seller for all costs and expenses associated therewith, including Seller's actual attorney fees and costs.

Governing Law/Venue. This Agreement shall be construed and governed under the laws of the State of Wisconsin, without application of conflict of law principles. Each party agrees that all actions or proceedings arising out of or in connection with this Agreement shall be commenced, tried, and litigated only in the state courts sitting in Manitowoc County, Wisconsin or the U.S. Federal Court for the Eastern District of Wisconsin. Each party waives any right it may have to assert the doctrine of "forum non conveniens" or to object to venue to the extent that any proceeding is brought in accordance with this section. Each party consents to and waives any objection to the exercise of personal jurisdiction over it by courts described in this section. Each party waives to the fullest extent permitted by applicable law the right to a trial by jury.

Summary of Return Policy:
• 10 Day acceptance period from date of delivery. Damage claims and order discrepancies will not be accepted after this time.
• You must obtain a Baileigh Industrial issued RGA number PRIOR to returning any materials.
• Returned materials must be received at Baileigh Industrial in new condition and in original packaging.
• Altered items are not eligible for return.
• Buyer is responsible for all shipping charges.
• A 30% re-stocking fee applies to all returns.
Baileigh Industrial makes every effort to ensure that our posted specifications, images, pricing, and product availability are as correct and timely as possible. We apologize for any discrepancies that may occur. Baileigh Industrial reserves the right to make any and all changes deemed necessary in the course of business including but not limited to pricing, product specifications, quantities, and product availability.

For Customer Service & Technical Support:
Please contact one of our knowledgeable Sales and Service team members at:
(920) 684-4990 or e-mail us at Baileigh-Service@jpwindustries.com

26.0 Notes

BAILEIGH INDUSTRIAL
1625 DUFEK DRIVE MANITOWOC, WI 54220
PHONE: 920.684.4990 FAX: 920.684.3944
www.baileigh.com