INSTALLATION, OPERATION AND MAINTENANCE MANUAL
MODEL W-9-1 .012
July, 2001

Machine Serial Number: ___________________________ Date Shipped: ____________

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INSTALLATION, OPERATION AND MAINTENANCE MANUAL
No. 900404.012
BAND SAW MACHINE TOOL MODEL W-9
September, 1998
BLADE SIZE: 1" x .035 x 11' 6"

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I. INTRODUCTION
Efficient performance of any machine tool is the right combination of:

A. Machine matched to the work load.
B. Tooling matched to the work piece.
C. Operator trained and conscientious.

W. F. Wells provides the machine tool. Consult a reliable blade supplier for the proper tooling, matched to the work piece. Operators must not use this machine without first reading through the manuals in this binder. The time it takes is more than made up in man hours and machine downtime saved.

This manual, together with other manuals in this binder, explains installation, operation and maintenance of your W. F. Wells Model W-9 band saw machine tool. The purpose is to thoroughly familiarize operators with proper procedures to get the best performance and dependability from the machine.

As soon as any machine arrives on the receiving dock, give it a thorough visual inspection to assure no damage occurred during transport. Normally, if the machine crating is in good condition, the machine is in good condition. If the shipping crate shows damage or signs of repair, note it on the waybill.

Uncrate and inspect the machine while the driver is still at the dock, or refuse it.

II. INSTALLATION
Carefully consider the machine installation site. The plant engineer must establish work flow to and from the machine. The machine must be level and anchored for proper, efficient, trouble free operation. Operators must have room to perform their job safely.

The work area must be uncluttered and well-lighted. Maintain temperature in the machine area at a level to provide maximum operator comfort. If it is not, machine operators will compensate in clothing or move about, creating a condition of hazard.

A. Site Preparation.
See the contents page for the machine floor plan print, and optional equipment to install with the saw. Establish machine location in relation to material handling work flow to the machine and related production functions.

Model W-9 does not require a special foundation. However, the floor under the machine must be solid and strong enough to support machine weight with intended work load. The machine must be level and shimmed so the base is resting firmly on the floor, the weight evenly distributed to the four corners of the base without twisting or straining the saw head columns or bed.

B. Machine Assembly.
Depending on accessories ordered, this machine ships as a complete unit, ready to install and run. The only assembly required is adding the coolant pump and screens in the coolant collection reservoir.

1. Loosely assemble optional accessory tables to the saw bed. Level the saw bed first, then level the accessory to the bed.

2. See the contents page for the machine elevation drawing for reference in assembling the optional work length gauge. Insert the slot end of the bar into the hole at the front of the saw bed under the guide arm. Align the slot in the end of the bar with the pin on the opposite side of the saw bed. As the bar engages the pin, place the push arm against the post under the saw head as shown on the print. Last, attach the spring to the bracket as shown in the print.

3. Assemble the coolant pump and screens in the reservoir under the blade line.

C. Pre-operation Check-out.
Do not install a blade on this machine or operate this machine before completing the pre-operation check-out.

1. Check fluid levels and filters described in maintenance section IV A, page 10.

2. See maintenance section D, 20, and connect electric service to the machine. Check motor rotation direction after hook-up.

D. Leveling and Anchoring.
This machine must be level for precision sawing. Unauthorized moving or bumping the machine alters the setup causing inaccurate sawing, making releveling necessary.

See part "A," site preparation, for proper foundation. Use leveling shims at the end of the base only.
Do not shim under sheet metal at the front or back of the machine.

1. Raise the saw head and open the vise jaws. Place an accurate machine level along the saw bed between the vise jaws. Bring the reading to level with shims under either end of the base.

2. Move the level to the stationary vise jaw and check for level front to back across the saw bed. Adjust shims front or back on both ends of the saw base for a level reading at both vise jaws. Do not shim under sheet metal front and back of the machine.

3. See the contents page for optional tables or barfeed.

4. With accessory equipment leveled to the saw bed and fasteners tightened, check all level readings. Tighten anchor bolt nuts on the saw and accessories.

5. Anchor the flange to the floor, each end of the saw base, to prevent leveling shims from shifting during sawing.

III. SAFETY and OPERATION

Few safety devices benefit the careless worker. Safety is an attitude either accepted or rejected by the operator.

A. Safety

For the operator who abides by his local shop safety practices add the following, applying to this machine.

1. Lock or tag out the electric disconnect during routine maintenance.

2. Replace guards and safety devices removed during maintenance, before returning the machine to service.

3. A qualified assistant operator need not be at the controls of this machine when the regular operator is not. Authorize other workers in the area to shut down the machine in the event of conditions of hazard.

4. Do not allow casual climbing or leaning on the machine. Slippery coolant covered surfaces are not detected until too late to prevent the slip.

5. WARNING: Blade handling can do great bodily harm. Wear heavy protective gloves when handling the blade for positive control of the blade.

Never wear gloves when operating this or any machine tool. Guard against all other body contact with the blade.

6. After installing the blade, keep hands away from the blade.

7. Always wear eye protection when operating this equipment.

C. Operator Controls

Operators must be familiar with the features of the machine in order to get the best performance and dependability from the machine. Function of the controls is self-explanatory from titles indelibly printed on the control panel at each switch, lever and dial.

Location of the controls near the work table, their function and sequence, provide for maximum operator recall and efficiency.

See page 4, Figure One, showing basic electric and hydraulic controls, numbered to correspond with numbered descriptions here of the function of each control. Actual position of controls on each machine varies according to accessories ordered with the machine.

1. Saw blade start control is press activated, starting the saw blade and will not deactivate on release.

2. Stop control is press activated, shutting down the entire system and will not deactivate on release.

3. Cutting head raise control is press activated, raising the saw head and will not deactivate on release.

4. Cutting head lower control is press activated to lower the saw head and will not deactivate on release.

5. Emergency stop is press activated, shutting down the entire system. To restart the system turn the knob clockwise and it will return to position.
Figure One, Machine Controls

- Cutting Head Lowering Valve
- Cutting Head Raise
- Cutting Head Lower
- Saw Blade Start
- Stop
6. Saw head control valve lowers the blade to the work piece. Open the valve slightly to lower the saw head slowly. Open the valve all the way for rapid saw head lowering. When sawing narrow or round work and only one or two saw teeth contact the work piece, open the valve only slightly, bringing the blade into contact with the work piece slowly. See page 4 of the Band Saw Blade Selection and Application Manual.

After the blade begins a kerf in the work, open the valve and the metering valve (see no. 8 under Other Controls) takes over for more efficient sawing. See Other Controls no. 10 for adjusting saw head raise height.

To limit saw head rate of descent, adjust the valve to the rate wanted.

OTHER CONTROLS not shown on page 4 are:

Optional vise control is three position, remaining Open, Off or Clamp and must be in Clamp when sawing to prevent the work piece moving with the blade, binding or breaking the saw blade.

This control operates one of two vise types, minimum vise travel for clamping and releasing the work piece or full stroke vise travel. To adjust minimum travel vise to the work piece, turn the switch to Open, release the thumb lock knob inside the vise handle, raise the handle and slide the vise jaw open. Place the work piece against the stationary vise jaw and slide the movable vise up next to the work piece. Return the handle to the vise slide slot and lock the barrel half-nut onto the vise screw with the thumb lever lock. Adjust the vise to the work piece with the handwheel at the end of the saw bed, close to the work piece. Turn the switch to Clamp. Full stroke procedure is holding the switch Open or Close to clamp or release the work piece. Manual procedure is clamping and releasing the work piece with the handwheel. See control no. 19.

Sawing force adjustment is at the metering valve dial on the right guide arm. The dial reads from 30 to 120 pounds sawing force. To increase sawing force turn the thimble down the dial until the top of the thimble is at the proper sawing force for the work piece. The metering valve monitors work piece resistance to the blade.

For more details on sawing force, see Blade Selection Manual 900409.

Sawing force is a very important factor and must be carefully determined. Normally a thin work section requires a light sawing force and a wide section greater force. However, as the blade guides spread wider for bigger stock, a longer distance between the guides, the blade loses some of its rigidity, or beam strength. On wide stock use a lighter sawing force and use only new blades which require less force to make a satisfactory cut. Applying heavy force to dull blades, to penetrate the work piece when sawing wide cross sections, causes blade runout, a crooked cut in the work piece. As blades dull, replace them with a sharp blade. Set dull blades aside for sawing small work pieces where the shorter span between the blade guides allows greater blade beam strength, heavier sawing force and make cuts within tolerance.

Blade speed control is as important as sawing force. Running a blade too fast for the work piece burns the blade out prematurely. Increased surface speed of any cutting tool makes the cutting edge run hot. Blade metal temperature passes critical at a given point, the cutting edge softens and the tool fails. See the cutting chart mounted on the saw with recommended blade speeds for most popular metals. Most blade suppliers furnish a slip chart with recommendations for their blade. Page 10 of the Saw Blade Selection Manual offers a guide. Change blade speed with the blade motor running. Turn the selector handwheel on the pulley shaft at the back of the saw until the witness mark is at the proper blade speed reading for the work piece.

Saw head cycle adjustment. During production sawing of small work it is not necessary for the saw head to raise the blade more than enough to clear the work piece moving under the blade for the next cut. Raise the head higher when manually feeding to allow more time a barfeed automatically allows. A limit switch on the saw head contacting a collar at the top of the left saw post controls the distance the saw head raises. Adjust the distance the head raises. Position the blade just above the work with the saw head raise and stop controls. Loosen the thumb screw on the collar. Bring the collar down into contact with the switch until the
switch clicks in.
Tighten the thumb screw.
Cycle the saw head a few times to be sure of clearance from the work piece to the blade.

**Tension the blade** with the handwheel behind the left guide arm.
Turn the handwheel tight as comfortably possible with one hand.
Use two hands for high speed steel blades.
Do not run the blade without proper tension. The blade will slip on the drive wheel, will not have beam strength between the blade guides and will not saw straight.
Too much tension causes blade metal fatigue and premature blade failure.

**Guide arm setting** is important for proper blade beam strength.

**CAUTION:** Serious damage results from lowering the saw head and guide arms onto the vise jaws, work piece or work support block.
When positioning the blade guide arm make certain the area under both guide arms is clear.
The right guide arm and vise jaw remain at the right side of the saw bed, next to the drive wheel.
The left guide arm and vise jaw adjust to stock size.
Position the left guide arm close to the left vise jaw, without touching the jaw for maximum blade support as it saws through the work piece.
Allow a half inch space for the vise jaw to open after the cut.
Position the guide arm. Turn the handwheel at the top of the guide arm to release the clamp.
Slide the arm to position and tighten the handwheel securely.

**The optional work length gauge** adjusts along a bar to the cut off length required.
Measure cut length from the blade kerf to the stop pad.
The length gauge swings up out of the way during the cut.
The cut piece falls freely away, preventing jamming between the blade and the stop pad which would stall or break the blade.

**Adjust the saw vise** to the work piece.
Place the work against the stationary vise jaw.
Unlock the movable vise jaw handle with the thumb lever under the handle.
Slide the vise jaw up against the work piece.
Reseat the handle and lock it onto the vise screw.
Final vise jaw tightening is manual with the handwheel at the end of the saw bed, or with the optional hydraulic or air vise control on the console.
For angle sawing up to 45° loosen bolts in the base of the vise jaws.
Set the stationary vise jaw to the angle required with a template or protractor. Tighten nuts in the base of the stationary jaw to hold it in place.
Slide the movable jaw up against the stationary jaw, self-adjusting it to the same angle as the stationary jaw. Tighten nuts in the base of the movable jaw and check the angle with the protractor.

**NOTE:** Use caution when occasional sawing at 45° with standard vise jaws. The grip area of standard vise jaws at 45° is much less than at 90°. Angle vise jaws with full gripping area are available as optional equipment for more efficient angle sawing.

**C. Operating Sequence.**
Do not operate this machine before studying manuals in this binder. It is the employers responsibility to ensure that the operator of this machine is familiar with it's operation. Follow the sequence closely, so it becomes automatic as you become familiar with the machine.
Blade installation procedure is in the maintenance section under mechanical adjustments.

1. Turn all controls Off.
2. Tension the saw blade.
3. Engage the electric disconnect.
4. Raise the saw head.
5. Move the blade guide far left.
6. Open the vise jaw.
7. Move the work piece against the stationary vise jaw, next to the blade, **not under the blade**.
8. Make machine adjustments to the work per part "B;" clearance for the blade, guide arm, vise, optional stop length of cut and number of pieces count.
9. Move stock under the blade for a trim cut. Clamp the vise jaws.
10. Adjust the sawing force.
11. Start the saw blade. Adjust blade speed for the work piece.
Open the saw head control valve slightly, feeding the blade into the work piece slowly.

Monitor the chips, thin and curled. Adjust the sawing force accordingly.

**D. Trouble Shooting.**
Common band sawing problems listed here give instructions for correcting the problem. Consider a problem carefully. Get at the underlying cause of a problem rather than remedy a series of side effects.

1. **Scale on the work piece.**
Hot-rolled steel has a degree of mill scale. On low carbon steel the scale does not affect sawing rates, but the scale dulls the saw blade teeth. Remove scale from the sawing area.

2. **Hard surfaces.**
Torch cutting and improper grinding some steel creates a case-hardened shell a few thousandths of an inch thick. Sawing through it dulls saw blade teeth. Saw and change blades as they dull until the hardened area saws through is the only solution.

3. **Crooked sawing.**
If a new blade saws crooked, or begins to saw straight but after several cuts starts to saw crooked and results are worse with each cut, see the above paragraphs, the blade selection manual and the maintenance section on sawing force.

4. **Broken blades.**
Check to see if blades are breaking at the weld. Automatic blade welders get out of adjustment, or an inexperienced welder operator may improperly anneal the weld. If this is not the problem, see the maintenance section on sawing force and blade wheel alignment.

5. **Stripped teeth.**
Improper sawing force and blade speed is the usual cause. See the blade selection manual, and the maintenance section for a sawing force check.

6. **Poor blade life.**
Blade speed too fast for the work piece is the usual cause of poor blade life. See paragraphs 1 and 2 in this section. Another cause of poor blade life is improper blade brush adjustment. The tendency is adjusting the brush too tight to the blade.

Adjust the brush so the surface contacts teeth of the blade only lightly to do an effective job of cleaning the tooth gullet without wearing the brush or teeth excessively.

7. **Erratic saw head feed.**
Uncontrollable saw head feed into the work piece is poor maintenance.

a. Defective blade welding, defective weld grinding, blade teeth points stripped or wrong blade for the work piece.

b. Lubrication, section IV.

c. Leveling and anchoring, sec. II.

d. Blade guide clearance, blade linkage or metering valve, sec. IV.

e. After checking the above and erratic feed is still a problem look for brass frame thrust screw excessive wear. Brass marks front and back of the left post the saw head rides on, or brass dust at the base of the post means the machine is not level, or thrust screw adjustment too tight to the post.

(1) Loosen lock nuts holding the thrust screws, front and back of the left post frame. Remove the thrust screws.

(2) File the post contour from the face of the screws.

(3) Turn the rear screw in first, bringing it up to the post. Push gently on the frame to feel contact with the post.

(4) Hold the frame with the rear screw against the post. Turn the front screw to the post, lightly, then back it off one-eighth turn. One-eighth screw turn is the required .008 clearance between the post and screws.

(5) Tighten the lock nuts and check the saw head for smooth feed.

8. **Saw head stall.**
If the blade comes to the work piece and starts the cut but seems to float without sawing, check the following malfunctions.

a. Make sure the blade is sharp, and the proper blade for the work piece. Too much sawing force applied to a small tooth blade on a wide work piece fills saw tooth gullets
before the blade clears the work piece to empty the gullets.

Chips locked in the tooth gullet, still in the blade kerf, force teeth tips up away from the cut, making the blade float through the kerf.

Change the blade to one with fewer teeth and larger gullets, or use less sawing force on the small tooth blade to form smaller chips, at the risk of heating the blade to the point of hardening the work piece.

b. Monitor the sawing force.
Use only 30 to 50 pounds of sawing force and use the proper blade for the work piece.

c. Look for a hydraulic line kink from the blade guides to the control console, limiting hydraulic fluid flow from the metering valve to the control valve.

d. Look for dirt lodged in the blade guides, preventing the metering valve from functioning.
Keep the guides clean.
Dirt and chips blocking the metering valve linkage forces the metering valve closed and the saw head will not move, or come down only slowly.
See the maintenance section for a blade guide inspection.

e. Check the hydraulic fluid reservoir for a milky-white color. Water or coolant in the fluid contaminates the entire system.
See hydraulic fluid level and sawing force in the maintenance section.

If the blade jams in the cut it is the wrong blade for the work piece, too much sawing force for the blade or improper blade tension.

Correct the sawing practice.
Wait five minutes and press the motor starter reset control.
If the blade stalls with the motor running, shut the machine down.
Free the blade from the kerf and properly tension the blade.

Rotate the work piece a few degrees if possible so the blade will not hang up in the same kerf.

Also see electric maintenance section D, 20.

11. Saw head drift.
It is normal for the saw head to drift down while sitting idle for a time. Remove all work from the vise jaws, tools and other material from the work bed at the end of each shift.
Unauthorized machine use or drift down, the blade coming into contact with material left in its path, may destroy the blade and the material.

IV. MAINTENANCE

To assure smooth running machinery and save hours of downtime and repair costs follow inspection, adjustment, lubrication and maintenance outlined here.

A. Lubrication.
The lubrication chart in the back of this manual depends on shop conditions and machine use.
Some lubricants dry out or deteriorate with time.
Check the machine as shown to preserve machine finish, seals and performance.

1. Hydraulic fluid
Routinely check fluid levels. Lock or tag out the electric disconnect.
Check the fluid level with the saw head lowered and the machine turned off. Fluid standing in the hydraulic reservoir, 1” below the top of the cover is the proper level. Maintain the level with a good quality 135-165 SSU light hydraulic fluid.
See the chart on page 23. Low fluid level lets air enter the pump, causing dieseling, cavitation and a ruined pump. Dirty hydraulic fluid usually is because of a missing reservoir cap.
Dirt in the hydraulic fluid causes orifices to plug, and adjustments to improve poor sawing constantly change. If hydraulic fluid inspection reveals dirt, or is milky-white from water or coolant, the contamination is in all lines and cylinders.
Break primary connections and blow out the lines.
Drain and rinse the reservoir twice with fuel oil.
Swab out the reservoir and fill it with clean hydraulic fluid. Activate all cycles several minutes to flush out the machine.
Repeat the process five times, or until there is no dirt or discoloration in the hydraulic fluid.
Consider placing a chain and lock on the filler neck and cap.
Hydraulic fluid temperature rise over 130° is a malfunction. Check the fluid level. Check the fluid for proper viscosity. Check that all machine cycles function through completion, not partly blocked.
2. Ring and pinion.
Do not grease or oil the drive wheel ring or pinion gear. Grease and oil cause dirt and chips to cling and clog the gears. See item 9, page 19 for ring and pinion inspection and adjustment.

3. Variable speed drive.
Keep the variable speed drive belt and pulley faces free of dirt and grease for longer service life.
The motor pulley (908840) has been permanently lubricated and no additional lubrication is required. Cycling the drive through the entire speed range is not required.

B. Coolant Fluids and Pump.
Caution: During machine set up and trial running, unplug the coolant pump at the in-line disconnect in back of the machine, or fill the coolant reservoir.
Coolant fluid is a heat sink for the pump and it must not operate unless submerged in coolant.

Routinely clean the coolant reservoir and pump screens. A blocked screen stalls the pump. A damaged screen lets chips block or enter the pump chamber, ruining the pump in minutes.

This machine has a 13 gallon coolant reservoir capacity. Consider coolant type and machine use before filling the reservoir. Some fluids deteriorate more rapidly than others.
The work piece and the blade determine coolant/lubricant type.
There are coolant fluids and there are cutting fluids.
Faster blade speeds require efficient coolant to prevent saw blade overheating.
Increased tool surface speed makes the cutting edge run hot. Without proper coolant blade metal temperature passes critical at a given point. Blade teeth soften and dull.

a. Straight cutting oil.
Slow blade speeds for hard metals and saw blades that remove a large chip require more coolant/lubricant. At these slow speeds high lubricity straight cutting oil is popular.

Do not use straight cutting oil in this machine unless factory labels clearly show machine equipment includes oversize coolant pump, lines and nozzles.

b. Water soluble oils.
Water soluble oils offer good cooling as well as good lubrication.

Use one part oil to fifteen parts water for most steels. Use one-to-one water and soluble oil for tool steel sawing. This machine uses this fluid.

c. Synthetic oils.
Synthetic oils, without chemical solution, are similar to water soluble oil capability and dependability and used in the same manner.
Use one part oil to fifteen parts water for aluminum sawing.
A drawback to some synthetic oils is animal fat in the formula which deteriorates in time, and at high temperatures, causing breakdown of the fats, creating an unpleasant odor.
This machine uses this fluid.

d. Chemical solutions.
Some cooling/cutting fluid used in high speed aluminum machining and free-machining alloys contain chemical wetting agents.
The application is useful but side effects are harmful to the work piece and the machine.

Do not use chemical coolant in this machine unless factory labels clearly show machine equipment includes corrosion resistant pump, hoses, seals and paint.

C. Mechanical.

1. Blade installation.
Do not install a blade on this machine before completing the pre-operation check-out.
See the Saw Blade Selection and Application manual to select the proper blade for the work piece.
For maximum feed, speed and blade life, request a reliable blade supplier conduct test sawing with his recommended blades on the machine and the work piece.

WARNING: Blade handling can do great bodily harm.
Wear heavy protective gloves for positive control of the blade.

Never wear gloves while operating a metal cutting band saw! Guard against all other body contact with the blade.

Follow blade manufacturer instructions for safe, proper unpackaging a new blade for installation.
Do not recoil a used blade. Cut it apart for disposal.

Follow blade manufacturer instructions for breaking in a new blade.
a. Raise the saw head so the guide arms clear the vise jaws.

b. Lock or tag out the electric disconnect switch.

c. Release blade tension.

d. Open the blade wheel guard doors. Blade wheels rotate counterclockwise, drawing blade teeth through the work piece from left to right against the stationary vise. Hold the blade in front of the wheels with teeth pointing toward the wheels. Teeth on the lower blade loop must angle right, toward the stationary vise jaw and drive wheel. If teeth on the lower loop point to the back of the machine but angle left, toward the tension wheel, the band is inside out. Reverse it. Following applies to grit edge blades as well, doubling blade life when the grit edge dulls sawing in one direction, reverse it. For safety, clear personnel from the area. Loop the band over a handy guard post or trash barrel. Twist the band, as far around the circumference as necessary, until the band snaps over. This dulls toothed blades. Tell blade suppliers the proper blade welding configuration for the machine.

e. Again, hold the blade in front of the wheels with teeth pointing toward the wheels and teeth on the lower loop angling right, toward the drive wheel.

f. Place the top of the loop over the frame posts, into the blade guard channel and onto the wheels.

g. Place the bottom of the loop into the blade guards and around the bottom of the wheels. Pull the back of the band up next to the wheel flanges.

h. Tension blade just enough to take up slack in the band.

i. One guide at a time, take the blade firmly each side of the guide, twist the teeth down and bring the back edge of the blade up between the guide rollers.

j. Check that the back of the blade is against the wheel flanges. Close the blade wheel guard doors.

k. Fully tension the blade.

l. Start the machine. Start the blade and run it 30 seconds.

m. Shut down the machine. Check that the back of the blade is close to, but not scrubbing on the wheel flanges. .010" to .030" clearance from the back of the blade to the wheel flange is ideal. Check blade tension before each saw cut.

2. Blade wheel alignment.
Wheel alignment is not part of a routine machine setup.
Factory-aligned, inspected and tested wheels, blade and guides require no maintenance. Experimenting or bumping the wheels or guides with the work piece or material handling equipment is the usual cause of misalignment. Routinely check the wheel flanges for wear and be alert to audible and visual changes in machine operation. A high-pitched metal-to-metal scrubbing sound coming from the wheel guard doors is the back of the blade scrubbing on the wheel flange, wearing the flange from the wheel before the blade breaks. .010" to .030" clearance is ideal. When checking wheel alignment use only a new blade, known to be straight. A used blade may have a camber, making alignment results useless. To adjust either wheel release blade tension and lock or tag out the electric disconnect.

a. To adjust the tension wheel, see the contents page for the tension wheel assembly print and Figure 2, below.

(1) Open the tension wheel guard door. The tension wheel mounts on a sliding plate. Locate and loosen two lock nuts, under the wheel
spokes, top and bottom of the outside edge of the slide plate.
A set screw beside each lock nut is a spacer for the plate.

(2) See "A" Figure 2.
The blade is running too far away from the wheel flange, the wheel rim too close to the frame plate on the outside.

Turn both set screws clockwise, equally, ¼ turn each, pushing the outside rim of the wheel up away from the frame plate.

**NOTE: Do not overcompensate.** Turn the screws equally ¼ turn only.

(3) Tighten the lock nuts. Close the wheel guard doors. Tension the blade and run it 30 seconds.

(4) Shut down the machine. Check that the blade is not still running too far away from, or scrubbing on the wheel flange. .010" to .030" clearance is ideal.

(5) See "B" Figure 2. The blade is running too close to the wheel flange, scrubbing, the wheel rim too far from the frame plate on the outside.
Turn both set screws counterclockwise, equally, ¼ turn each, resting the outside rim of the wheel closer to the frame plate.

**NOTE: Do not overcompensate.** Turn the screws equally ¼ turn only.

(6) Tighten the lock nuts. Close the wheel guard doors. Tension the blade. Start the blade and run it 30 seconds. Check the clearance as in step (4).

b. **To adjust the drive wheel,** see the contents page for the drive assembly print and see Figure 3, below.
(1) Open the drive wheel guard door.
The drive wheel mounts on a plate.
Locate and loosen two hex head screws, under the wheel spokes, top and bottom of the outside edge of the drive wheel mount plate.
A set screw beside each hex head screw is as a spacer for the plate.

(2) See "A" Figure 3.
The blade is running too far away from the wheel flange, the wheel rim too close to the frame plate on the outside. Turn both set screws clockwise, equally, ¼ turn each, pushing the outside rim of the wheel up away from the frame plate.

**NOTE: Do not overcompensate.** Turn the screws equally ¼ turn only.

(3) Tighten the hex screws. Close the wheel guard doors. Tension the blade and run it 30 seconds.

(4) Shut down the machine. Check that the blade is not still running too far away from, or scrubbing on the wheel flange. .010" to .030" clearance is ideal.

(5) See "B" Figure 3. The blade is running too close to the wheel flange, scrubbing, the wheel rim too far from the frame plate on the outside.
Turn both set screws counterclockwise, equally, ¼ turn each, resting the outside rim of the wheel closer to the frame plate.

**NOTE: Do not overcompensate.** Turn the screws equally ¼ turn only.

(6) Tighten the hex screws.

Close the wheel guard doors.
Tension the blade and run it 30 seconds. Shut down the machine and check that the blade is not still scrubbing, or running too far away from the wheel flange. .010" to .030" clearance is ideal.

3. **Blade brush adjustment.**
Blade brush alignment to the saw blade is important to brush and saw teeth life. Adjust the brush properly against the blade. See the drive assembly print for proper brush to blade alignment.
The tendency is adjusting the brush too tight to the blade, quickly making the brush misshaped and useless. Adjust the brush 30° to the surface of the blade, so the brush contacts the blade teeth only lightly to do an effective job of cleaning teeth gullets without abrading saw teeth or wearing the brush excessively.

4. Blade tension adjustment.
Blade tension on this model is manual, screw type with a handwheel behind the left blade guide. Turn the handwheel as tight as comfortably possible with one hand when using carbon steel blades. Use two hands for high speed steel blades.

Check blade tension before machine start up. Optional blade tension indicator witness mark is factory set for size and type blades used in general purpose sawing. For maximum feed, speed and blade life request a reliable blade supplier make test cuts on the machine and the work piece with his recommended blade. Tension the blade to manufacturer specifications with a precision tension gauge mounted on the blade.

a. With the recommended blade installed, before taking up tension, the supplier will mount his gauge on the blade.

b. Tension the blade. When the blade supplier indicates proper tension for his blade, mark the location for sawing reference. Scribe a new witness mark on the optional tension indicator. On the standard machine, mark the tension wheel slide plate location. If blade types change for sawing other work, tension the new blades to manufacturer specifications.

5. Sawing force check.
The hydraulic sawing force system measures work piece resistance to the blade while sawing, applying uniformly controlled force to the blade for accurate sawing regardless of configuration, size or type work piece. Sawing force range for this machine is 30 to 120 pounds, dialed at the metering valve on the guide arm. Too much or too little sawing force results in uneven sawing or broken blades. With each blade change, inspect the blade guides for chips and sludge build up as they can prevent the blade guides and metering valve linkage from working properly, producing other than the sawing force dialed at the metering valve. Sludge in the coolant or hydraulic fluid, a malfunctioning metering valve or linkage from the blade to the metering valve alters the actual force the blade applies to the work piece. Use preventive maintenance.

Sawing force is adjusted by setting the length the linkage from the metering valve to the carbide backup slipper travels. This travel should be between .030" - .040" as shown in enclosed drawing 415460.

Routinely, or when changing blades, check that the blade guide rollers and carbides are free from dirt and sludge and adjusted for proper blade clearance. See the contents page for the blade guide print. Normally, blade guide rollers require adjustment only after years of wearing in. Do not allow stock to bump, break and misalign the guides. Following are three steps for preventive maintenance blade guide inspection:

a. Clean and inspect the guides for blade to roller clearance.

(1) Guide rollers are factory set .001" wider than blade thickness for proper blade clearance. Blade thickness .035" requires .036" roller clearance. See the contents page for the blade guide print.

CAUTION: Rollers adjusted too tight to the blade prevent the metering valve from controlling the sawing force. The blade will snake through the rollers; inaccurate sawing and blade breaking results. Keep the rollers clean and free wheeling.

(2) Check roller clearance with feeler gauges. Or assemble a new blade on the machine, tension it, run it 30 seconds to track in. Turn the blade off and raise the saw head. Use a new blade to check the roller clearance. A used blade may have a camber, making adjustment results worthless.

(3) Force the tensioned blade down out of the guide to check for tight or loose fit between the rollers. Twist the blade, between the wheel and guide, to check for blade movement between the guide arms.

(4) If feeler gauges fit snugly between the
rollers, or if the tensioned blade only partly returns when pushed down out of the rollers and there is no blade movement between the guides when twisted from outside the guides, problems with sawing force are not with guide roller clearance. Go to item 7 for a metering valve linkage inspection.

(5) If step (4) failed, proceed with guide roller clearance adjustment. Raise the saw head for convenience and remove the blade.

(6) One roller on each guide arm is not adjustable. The companion roller adjusts on a cam shoulder bolt. Loosen the hex lock nut, top of the casting, to unlock the cam bolt.

(7) Under the roller, rotate the hex head cam bolt to increase or decrease clearance between the rollers. Go back to step (2) and repeat the clearance check.

(8) After the rollers have been adjusted, position the carbides so they are snug but not binding on the blade.

b. Horizontal guide adjustment.
(1) Use a combination square with the head centered. Place the 90° side of the head into the vise slide in the saw bed. Bring the face of the stationary vise jaw to square with the combination blade. Make the same check on the movable vise jaw.

(2) With vise jaws aligned square to the saw bed, move the 90° side of the square head to the end of the combination blade. Place the head against the stationary vise jaw and bring the square blade up against the saw blade to check for square. If the saw blade is parallel to the machine bed, square to both vise jaws, go to step c.

(3) If the saw blade is not parallel to the machine bed and 90° to both vise jaws, discover which guide arm (or both) is out of alignment. See "C" pages 13 and 14. Mount a new blade on the machine and tension it. On top of the guide beam, loosen one guide arm clamp at a time. If the tensioned blade pulls either guide assembly in or out at the blade line with the arm loosened, the guide is out of alignment.

(4) Adjust the guide, aligning the saw blade parallel to the bed, square to the vise jaws. Clamp the arm at the guide beam and see the contents page for the blade guide print.

(5) Loosen the hex screw midway on the arm at the top of the plate holding the guide assembly to the arm. Loosen the hex nut immediately under it, unlocking the assembly plate and cam bolt.

(6) Locate the hex head cam bolt on the opposite side of the plate from the hex lock nut. Turn it to rotate the plate and blade into alignment with the blade wheels, parallel to the machine bed, square to the vise jaws. Go back to step (3). Repeat the tensioned blade/guide movement check.

c. Vertical blade/guide adjustment. Adjustment to align the blade parallel to the bed requires another adjustment to pivot the blade perpendicular square to the bed.

(1) Place a dial indicator on the machine bed near the guide with the indicator point contacting the blade directly above the tooth gullet. Set the indicator to "0."

(2) Open the saw head control valve slightly to bring the blade slowly down across the dial indicator contact point. If the indicator dial reads "0" bottom to top of the blade at both guides, go to item 7.

(3) If step (2) failed, correct the dial indicator reading to "0" bottom to top of the blade. Locate the adjusting screw just above the guide rollers, as seen in the Blade Alignment Bulletin and the blade guide print.

(4) Turn the adjusting screw to pivot the guide roller assembly and blade perpendicular square to the machine bed. Before turning the adjusting screw, loosen the two 10-32 flat head screws that hold the carbide block to the guide arm. Failure to do so will result in damage to the adjusting screw and/or the guide itself. See drawing 415460. Visually check the alignment with the combination square during the adjustment. Make a positive check with the dial indicator for a "0" reading bottom to top of the blade as it passes over the indicator tip.

7. Metering valve linkage check. See the blade guide print 415460. Linkage travel from the back of the blade to the metering valve on the guide arm is .030" to
.040" travel, the linkage too short, will not control the metering valve and could allow saw teeth to enter between the rollers, ruining the blade and rollers.
Less than .030" travel, the linkage too long, holds the metering valve closed, the saw head raised, or come down only slowly. If the sawing force check, item 5, page 15, failed, check the linkage travel. See the blade guide print. Make a quick visual check.

Metering Valve

Spring A
Thimble B
Self-lock Nut C
Lock Nut D
Threaded Nut E

Figure 4.

a. Raise the saw head.

DO NOT start the blade.
.030" to .040" is about 1/32 inch.
Start the saw head coming down slowly. Use a screw driver to pry the linkage assembly up from the blade guide casting, forcing the metering valve closed as if the blade was forcing the linkage to stop the saw head from coming down.

b. If prying up on the linkage more than 1/32 stops the saw head, inspect the blade backup roller.
Replace a roller with a track worn more than .030". See spare parts.

c. If no wear shows on the backup roller, or after replacing it and the sawing force check still fails but forcing the linkage up stops the saw head from coming down, the linkage is out of adjustment.

d. Make a positive check. Fasten a dial indicator to the guide arm.
Place the contact point on the back edge of the saw blade. Set the dial to "0." Place a block of wood under the blade next to the guide arm.
Use a piece of round stock in the tooth gullet on the block of wood.
Bring the saw head down.
Read the saw head indicator when the saw head stops.

e. Linkage travel more than .040" it is too short to close the metering valve. See Figure 4, below.
Lengthen the stem .025". Loosen hex nut "D" on top of the barrel stem.
Turn self-lock nut "C" on the threaded stud counterclockwise, up out of the barrel stem, not more than one-half turn. Check the travel.

NOTE: Loosen lock nut "D" or spring tension on the valve changes.

f. If linkage traveled less than .030" it is too long to let the metering valve control the sawing force. Shorten the linkage.
Reverse step e. Turn the threaded stud down into the barrel stem.
Repeat the linkage travel check, step d.
If the sawing force test still fails with linkage clearance from the blade to the metering valve properly adjusted, go to item 8.

8. Metering valve inspection.
If guide rollers and linkage are not the cause of a sawing force failure, check the left guide arm.

a. See the guide arm print and adjustable spring on the left guide.
Too much tension on the spring with the guides close together while sawing small stock may place too much tension on the spring. The spring tension may be holding the blade down. Decrease tension on the spring, acting the same as decreasing sawing force at the metering valve on the opposite arm.

b. Also check that the spring in the metering valve spool is not binding in the housing or adjusted with too much tension.
With sawing force dialed to minimum setting, the stem must be loose fitting. See Figure 4. Relieve tension on the metering valve spring by loosening self-lock nut "C" until the nut only touches the spring without placing pressure on it. After the above two checks if the sawing force check with the bathroom scale fails, clean the metering valve, next step.

c. Particles flaking from hydraulic line walls, or contaminated hydraulic fluid (and filter with optional barfeed) lets sludge accumulate in the metering valve. See the contents page for the metering valve print. Remove the round head
screw holding the stem/connecting rod linkage to the blade backup roller. The connecting rod stem and spring drops out of the metering valve. Remove the 1 3/8 inch nut at the top of the stem holding the stem to the valve body.

d. Wash all parts in mineral spirits. Inspect the diaphragm and Teflon needle valve for wear and embedded dirt. Replace from spare parts as necessary.

e. Hold a cup under the valve body. Open and quickly close the saw head valve, flushing out the valve body with the system hydraulic fluid.

f. Cleaning the metering valve and blade guides, replacing worn parts from the metering valve down to the blade backup roller and adjusting the connecting rod linkage from the blade to the metering valve is complete overhaul. Properly accomplished, the overhaul brings about proper results with the sawing force check, item 5, page 15.

9. Ring and pinion adjustment.
Maintain drive wheel ring and pinion gear clearance at .010". Excessive noise and wear is improper adjustment. Check the clearance. Tension the saw blade. Grasp the drive wheel spokes and turn it back and forth looking and feeling for too much clearance. Adjust the clearance. Loosen the two hex head bolts each side of the pinion.

CAUTION: Do not rotate the drive belt cam bushing under the hex head at the right of the pinion. Tap the lower shoulder of the pinion up or down to close or open the clearance.

10. Variable speed belt.
The primary variable speed belt requires no other adjustment than turning the crank to change speeds. The drive motor must be running to change speeds. Do not use sharp tools, screw driver or pry bar, to separate the pulley faces when replacing the variable speed belt. Use a block of wood. Scratches or burrs on the pulley face will ruin a new belt. Do not adjust the final timing drive belt too tight. Adjust the belt with a half inch flex at mid-span, easily sliding side to side on the pinion shaft. A belt adjusted too tight, singing, wears the belt prematurely. Adjust the tension. Loosen the hex head bolt, right of the pinion gear under the drive wheel spokes. Loosen the belt. Rotate the cam bushing under the bolt head with the high side of the cam either side of top or bottom. After adjusting belt tension, before tightening the hex head bolt, check clearance between the ring and pinion gears, item 9, page 19.

C. Electrical Maintenance.

WARNING: COMPLETE THE PRE-OPERATION CHECK-OUT BEFORE STARTING THIS MACHINE.

A qualified electrician must make electric hook up and adjustments to this equipment. See machine voltage, labeled on the electric cabinet door. See the contents page for the electric print.

1. Caution: During machine installation and trial running, unplug the coolant pump at the in-line disconnect at the back of the machine, or fill the coolant reservoir. Coolant is a heat sink for the pump and it must not operate unless submerged in coolant. See maintenance section B, 11 on coolant fluids.

2. At installation or any electric service alteration to the machine, check the drive motor rotation. Open the drive wheel guard door and start the saw blade. The drive wheel must rotate counter-clockwise. If it does not, press the Emergency Stop control. Lock or tag out the electric disconnect. Reverse service into the machine electric cabinet, reversing drive motor and wheel rotation to counterclockwise, the direction necessary for sawing. DO NOT reverse wiring at the drive motor. This leaves the hydraulic pump reversed, ruining the pump.

3. Manual machine functions may operate when automatic function sequences do not. If the machine will not function in the manual mode, begin checking at the electric source. Trace through fuses and switches to motor overload starter switches.

4. Routinely check limit switch mountings for dirt and loose fasteners which could cause a malfunction later.

5. Optional production piece counter must show at least "1" on the dial to close circuits to
6. Optional blade break switch shuts down the drive motor if the blade breaks or loses tension for any reason.
The tension wheel moves over to the switch, breaking the electric circuit. Manually pull the tension wheel away from the switch to close the circuit. Check that blade length is not too long for the machine.

7. A blown fuse in the 115 volt line is probably caused by dirt or chips inside the coolant pump. Check that coolant pump screens are clean and in place. If screens are not in place check for a burned out pump or locked up pump rotor. Unplug the coolant pump at the in-line disconnect. Replace the fuse and run the machine. If the fuse holds without the pump, clean all screens and the pump rotor to determine if the pump can be salvaged.

8. Optional blade break switch shuts down the drive motor if the blade breaks or loses tension for any reason.
See the contents page for the optional equipment drawing.
The tension wheel slides over, triggering the switch, breaking the electric circuit to the drive motor. Pull the wheel away from the switch. Make sure the blade is not too long for the machine.

D. Parts and Service.

Most-used replacement parts are available from factory stock with same-day shipment. Service is available by telephone conference.

1. Parts.

For 95% insurance against downtime, the lists show most commonly used parts. Program them into inventory on a replace-as-used basis. 2,000 hours equals one eight hour shift working for one year. Account for spare parts. Enter them into inventory with a zero stock level reordering system to assure availability when the need arises.
Write additional part numbers assigned for plant systems compatibility on the lists for reference. Shelf life for parts listed is indefinite, only so long as packaging is intact. Look for packaging opened for inspection, authorized or otherwise.

Repackage and identify parts in suitable containers to preserve usefulness when the need arises.
Except fluids and filters, expect machine life of those parts planned for replacement to exceed the hours shown by as much as three times. Variables are machine operator and original equipment manufacturer workmanship reliability. If a needed part is not identified, provide our parts department with a detailed description of the part, where it is on the machine and what it does in operation. This is enough information for our parts department to identify and supply the part or provide information for what to purchase locally.

2. Service.

Preventive maintenance is the only requirement for many years, with expendable belts, bulbs, filters and blade brushes replaced by maintenance personnel. It is vital to machine life and sawing efficiency that machine operators and maintenance personnel read and have access to the contents of this binder. If a sawing or machine malfunction occurs, get at the cause of the problem rather than remedy a series of side effects. The index in this manual is topical, offering a solution to common problems. If a machine problem is not resolved by in-plant personnel, do not hesitate to call our service department. A factory-trained and qualified person will resolve the malfunction on the telephone.

For Parts or Service
Telephone: 269-279-5123
Fax: 269-279-6337
Home Page: www.wfwells.com
E-Mail: wfwells@net-link.net

For faster service, furnish the machine model and serial number from the identification plate on the machine bed.
RECOMMENDED SPARE PARTS FOR 95% INSURANCE AGAINST DOWNTIME
On A Replace-As-Used Basis

<table>
<thead>
<tr>
<th>Group</th>
<th>Hours</th>
<th>Qty</th>
<th>Part #</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Group I,</td>
<td>2,000</td>
<td>1</td>
<td>900083</td>
<td>Blade brush.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>7</td>
<td>901200</td>
<td>(1) Blade brush bearing.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>(4) Blade guide rollers.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>(2) Blade guide backup rollers.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>4</td>
<td>901241</td>
<td>Blade guide rollers.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1</td>
<td>292500</td>
<td>Carbide guide insert.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1</td>
<td>292505</td>
<td>Carbide guide insert.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1</td>
<td>909060</td>
<td>V-belt.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1</td>
<td>908550</td>
<td>Timing belt.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1</td>
<td>410210</td>
<td>Vise screw, barrel half-nut.</td>
</tr>
<tr>
<td>Group II,</td>
<td>5,000</td>
<td>1</td>
<td>900085</td>
<td>Lift cylinder leather, 1 ¼&quot;.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1</td>
<td>900086</td>
<td>Lift cylinder leather, 1 ¾&quot;.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1</td>
<td>410470</td>
<td>Drive wheel ring gear.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1</td>
<td>410490</td>
<td>Drive wheel pinion gear.</td>
</tr>
<tr>
<td>Group III,</td>
<td>10,000</td>
<td>1</td>
<td>415193</td>
<td>Drive and Tension wheel and bearings, 1&quot; blade.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1</td>
<td>415192</td>
<td>Drive wheel and bearings and ring gear, 1&quot; blade.</td>
</tr>
</tbody>
</table>
The following recommendations are for nominal-clean operations. Consider shop conditions and machine use when wiping oil on exposed areas.

Saw blade and guide lubrication depends on a properly functioning coolant distribution system. Check the coolant pump screens often to be sure they are clean and in place. Clean the coolant reservoir and change or filter the coolant fluid often, depending on coolant type and machine use.

NOTE: Do not add grease or oil to the drive ring or pinion gear. This causes dirt and shavings to cling that would otherwise fall away.

The motor pulley (908840) has been permanently lubricated and no additional lubrication is required. Cycling the drive through the entire speed range is not required.

200 HOURS

GREASE with NLGI No. 2
Blade tension wheel slide and screw, under wheel.

Variable speed assembly at grease fitting on the speed dial.

OIL with 300 SSU at 100°
WIPE CLEAN FIRST, THEN WIPE ON OIL

Frame columns. Door hinges and latches.

Guide arm beam. Vise slides and screw, add a few drops to bearing on end of the screw.

10,000 HOURS
(See the maintenance section)

Hydraulic reservoir, complete change.
Three quarts required.
Use Mobil DTE-24 light hydraulic oil.

25,000 HOURS

Electric motor bearings, grease at fittings on motor.
Material Safety Data Sheets

W. F. Wells Incorporated supplies the following Material Safety Data Sheets, furnished us by the original manufacturer of the product, as a material used in our equipment of manufacture.

Responsibility for accuracy of information therein rests with the manufacturer of the product.
It is our intent to seek out, use and pass along to our customers the safest products available, necessary to the operation of our equipment.

1st Ayd Gel Lube The product is rust-inhibitive fluid, used on all of our band saw machine tools.
The product is applied to unpainted surfaces before shipping the equipment.

602623 MOBIL DTE 24 The product is hydraulic fluid, used in all of our band saw machine tools.
The product is in hydraulic fluid reservoirs, motors and cylinders activated with hydraulic fluid.
Air Vise Option Operation

If your machine is equipped with an Air Vise the following applies.

The Master Start lighted pushbutton control must be pressed before any other controls can be activated.

The Saw Vise control must be in the “Close” position before the blade can be started.
MACHINE WEIGHT:
- Saw: 650 lbs. (300 kN)
- Barfeed: 400 lbs. (185 kN)
- Total: 1050 lbs. (485 kN)

W. F. WELLS
W-9 WITH BF-20-1 FLOOR PLAN
DRAWING NUMBER 411340
BLADE, WITH CARBIDES

415460

VIEW A A

1. Loosen before adjusting 411070.
   - If less than .040, adjust rod down.
   - If more than .050, adjust rod up.

GUI DE ASSEMBLY
1" BLADE, W TH CARBIDES
POST ALIGNMENT:
TO ALIGN POST PARALLEL AND PERPENDICULAR TO THE BED TOP WITHIN .005 IN.
USE JACK SCREW TO DEFLECT BED SIDE WALL.
NOTE:
TO PROPERLY ALIGN BLADE TO WHEEL:
1) LOOSEN LOCK NUTS.
2) TURN SET SCREWS COUNTERCLOCKWISE TO BRING BLADE TOWARD WHEEL FLANGE.
(MAINTAIN .010 TO .030 CLEARANCE)
3) TIGHTEN LOCK NUTS.

NOTE:
MAINTAIN .010 TO .030 CLEARANCE BETWEEN BLADE AND WHEEL FLANGE.

W. F. WELLS
W-9 TENSION ASSEMBLY
#415185
NOTE: DRIVE BOTH KEYS TIGHT INTO THE BOTTOM OF KEYWAY.

USE LOCTITE #609 TO SECURE GEAR 410530 AND FLANGE 410510 TO BEARING 410500

HOLD 5/16-18 X 3/4 HHS

PRESS BEARING (410500) SO THIS END IS FLUSH WITH PINION (410490)

900322 1/8 X 1/8 X 1/2 KEY

A 410500 BEARING

A 410520

908550 BELT

900248 5/16-18 X 3/4 HHS

900323 KEY

A 410490 PINION

904042 O-RING

W. F. WELLS

ASSEMBLY

BEARING FLANGE

A 415150

REV. 03-03-03

SCALE NONE

DRAWING NUMBER A

W. F. WELLS

DRAWN BY

TITLE

MATERIAL

D  ADD LOCTITE NOTE 10-04-99
E  900248 WAS 5/16 CUT WASHER 3-00
F  410590 WAS 410695 4-00
G  ADD "HOLD FLUSH" NOTE 02-27-03
H  5/8 WAS 1/16 03-05-03

C  1 3/4 WAS 1 15/16 8-11-95
B  REVISE 410500 1 15/16 WAS 1 3/4 12-18-92
A  ADD 904042 2-12-91

NOTE: DRIVE BOTH KEYS TIGHT INTO THE BOTTOM OF KEYWAY.
To remove pulley:
1. Loosen draw bolt until it protrudes from the pulley shaft about 1/4".
2. Using a hammer, firmly tap the head of the draw bolt. Repeat if necessary until the pulley becomes obviously loose on the shaft.
3. Slide the pulley off the shaft.
4. Before reinstalling the drive, inspect the IC collet and draw bolt for any signs of burrs or other damage.

Tighten the draw bolt to 175 inch pounds.
Frame Lift Cylinders

1 4

1 4

415010
1 1/4" B.
18" S.

911940
Frame Lower

911531
Rate of Descent

015030
Cutting Force

3/8

P

A

3/8

3/8

Fill Reservoir to proper level

1 (3 quarts) with Hydraulic Mineral Oil, 135-165 SSU at 100° F.

Mobil DTE 24 or equivalent.

1/3 HP
1725 RPM

415020
1 3/4" B.
18" S.

415089
1/3 HP, C Face, 1750 RPM
Set Pump Pressure at 450 PSI.

Motor, Pump and Reservoir. Alter shaft.

912710
Screen

W. F. WELLS
Three Rivers, MI  www.wfwells.com

Hydraulic Schematic

Title
W-9-1

A ADD 912710 SCREEN  JN 5/31/5

SYM. REVISION INITIAL DATE

SCALE SIZE DRAWING NUMBER REV.

W-9-1

019517 A
A411610

A411605

900638
TORQUE WRENCH
F-16-1
SET TO
25 FT/LBS
B/M 411600
1¼" BLADE MACHINES

900637
TORQUE WRENCH
W-9-1 W-10-1
SET TO
16 FT/LBS
B/M 411601
1" BLADE MACHINES

C 16 FT. LB WAS 192 IN. LB. JN 8-31-4
B WRENCHES WERE PRE SET JN 10-30-03
A 16 FT. LB WAS 20 FT LB JN 12-01-02

W. F. WELLS INC.
MANUAL BLADE TENSION INDICATOR

CHANGES

411600 C
W. F. WELLS
W-9 ANGLE VISE
411280