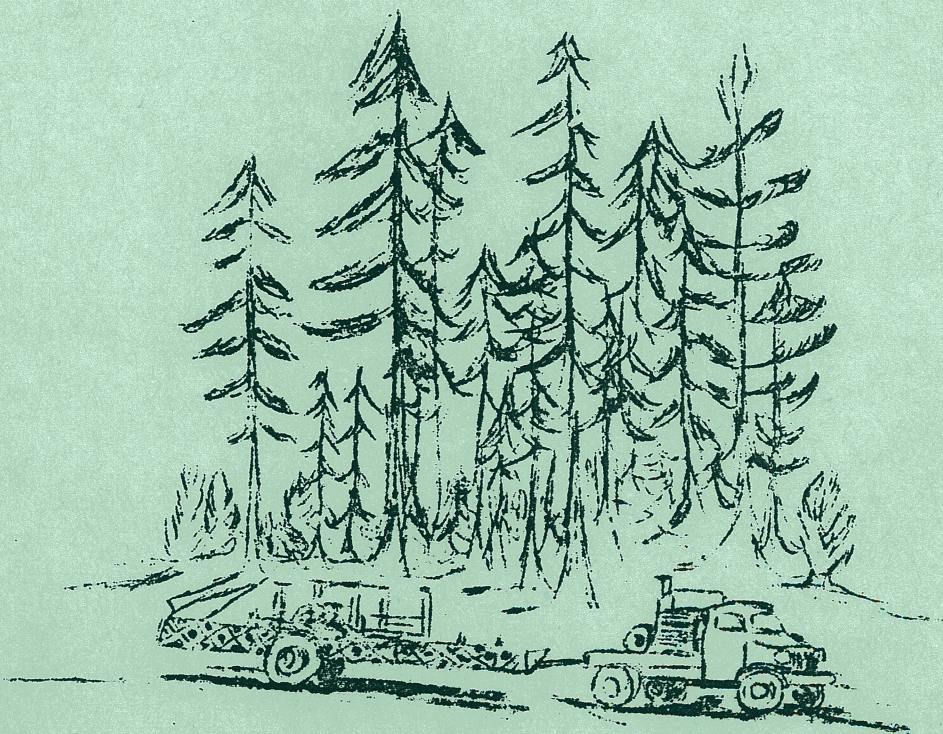


# JACKSON "LUMBER HARVESTER" OPERATOR'S MANUAL



JACKSON LUMBER HARVESTER COMPANY, INC.

Mondovi, Wisconsin  
U.S.A.

1962



# TO OUR OPERATORS\_\_\_\_\_

This manual is written to aid Jackson "Lumber Harvester" operators in obtaining the best possible results in their lumber harvesting operation. It is written frankly and sincerely, for the benefit of operators who are entering a new field of service as well as for the experienced operator, with the ultimate success of all "Lumber Harvester" operators in mind.

The Company has received relatively few inquiries from owners concerning operation, maintenance or repairs. Most of those inquiries received would have been unnecessary if the owner had carefully referred to the manual.

The Jackson "Lumber Harvester" was invented by Mr. Clinton D. Jackson, who in so doing, was the first to modernize the conventional so-called "portable sawmill," producing a new type of timber harvesting equipment, making proper utilization of second-growth timber crops practical to the individual woodlot owner and to the "Lumber Harvester" operator.

As the operator of a Jackson "Lumber Harvester," you are demonstrating to the forest products industry, to the small woodland owners, and to the profession of forestry, the practicability of harvesting timber as a crop on a sustained-yield basis.

You are making it possible for woodlot owners to harvest cash crops from their trees, not only for one season, but indefinitely. You are promoting forestry and conservation ideals which will have a beneficial effect on the economic future of your nation and its people. You are assuring yourself of a continuous and profitable business.

This manual was compiled with the generous aid of Mr. Clinton D. Jackson, who has drawn from his wide experience to give you this first-hand information. Study it, learn it, and use it.

We will be most happy to answer any questions you may have concerning your "Lumber Harvester" operations; but before writing us, read this booklet again won't you?

JACKSON LUMBER HARVESTER CO., INC.  
Mondovi, Wisconsin, U.S.A.



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Unit in position for travel.

"LUMBER HARVESTER" SPECIFICATIONS  
(Standard Model)

Horse power required . . . . .	50 to 100
Power Transmission belt speed. . . . .	Approximately 4,600' a minute
Weight of complete "Lumber Harvester". . . . .	4,000 pounds
Maximum length when folded for transport . . . . .	26'
Maximum length when set up for operation . . . . .	32'
Maximum width when set up for operation . . . . .	8'
Minimum width with bolted husk removed. . . . .	4' 10"
Maximum height when set up for operation . . . . .	6' 10"
Approximate crating dimensions . . . . .	5' 4" x 5' 7" x 26'
Maximum saw size . . . . .	50"
Minimum saw size . . . . .	48"
Total length of carriage travel. . . . .	25'
Maximum feed per saw revolution with 40-tooth saw. . . . .	4½"
Maximum gig per saw revolution with 40-tooth saw . . . . .	7 "
Maximum length of logs handled . . . . .	22'
Recommended length for top efficiency . . . . .	16'
Maximum headblock opening . . . . .	26"
Minimum headblock opening . . . . .	1"



## WHEN YOUR HARVESTER ARRIVES

Check the packing list of loose components packaged separately.

Lubricate according to instructions .

Scrape light protection coat of paint from face of feed drums and dog bar slides.

If packed for export shipping:

Replace and align knees as numbered.

Bolt axle, husk, folding end, and draw bar in place as numbered.

Used 4" x 6" x 9' timber to act as skid bar, and drill 5/8" holes for rods. (These can be made from the first log sawn.)

Use two 8' saplings and taper ends to fit 1 1/2" pipe of V-shaped bracket for outer sawdust assembly.

Use rope, cable or chain and stake to anchor.

Use 2" pipe or tapered-end 4 x 4 of proper length to fit 2 1/2" pipe and Handyman Jack for tightening transmission belt.

Use pieces of timbers as footing for leveling jacks.

## LUBRICATION

The headblocks and sliding mechanisms should be lubricated with soft oil as the need arises.

A little soft oil on the feed drums when they are new is nearly almost always necessary until the paint wears off and they become bright.

The sealed bearings, such as set shaft bearings and mandrel bearings, if they are thoroughly lubricated when the machine is started, should not require lubrication more than once a year. Therefore, only plugs are used instead of lubrication fittings since it is essential that a good grade of lubricant, completely free from dirt or foreign matter, be used in these precision bearings.



# POWER UNITS

A large percentage of sawmill troubles are due to LACK of sufficient power, or in TRANSMITTING AVAILABLE POWER TO THE SAW. The same is true in the case of the "Lumber Harvester."

In securing a powerunit, regardless of make or type, be sure to have a surplus of power rather than a shortage. Sixty to 100 horsepower is necessary on the "Lumber Harvester" for efficient production. Necessity of more or less horsepower will depend upon the type of timber primarily sawed. The effective horsepower available to most mills is far below what the operator supposes. For instance you may have an engine of 100 indicated horsepower, while the effective power for sawing may be only 75 h.p., owing to excessive friction, bad governing, leaking cylinder or valves, or ratio of transmission of power is too sharp.

With the "Harvester," it is economical and practical to have your powerunit permanently mounted on the rear of a 1-1 $\frac{1}{2}$  ton truck. This truck can also tow the "Harvester" between set-ups. Then too it provides sufficient load to give the truck traction for towing in difficult terrain. However, where "Lumber Harvesters" are used for commercial production and it is necessary to move the machine into the deep woods, it may be desirable to mount your powerunit on a trailer, moving both trailer and "Harvester" into the woods with the caterpillar tractor used in skidding logs.

Diesel industrial units have been found to be exceptionally economical to operate with the "Harvester" and are primarily recommended. Use a suitable speed reduction to obtain 500-550 r.p.m. at the saw.

## PNEUMATIC DRIVE PULLEYS

All "Lumber Harvesters" are provided with a pneumatic drive pulley, and it is essential that your powerunit also have the SAME type of drive pulley. This perhaps would not be necessary if your entire operations were permanently set up on a concrete floor, such as large mills are. But with the extremely portable "Lumber Harvester" it is necessary because it is difficult to obtain sufficient traction to transmit the horsepower to the saw, as the "Harvester" is usually set up on loose ground. Also, the inflated tire as a drive pulley cushions the shock and strain of the comparatively large horsepower expended through such a light machine. It is impossible to attain the records we have set and maintained without this system of transmitting the power from your engine to the saw.



# COMPONENTS

<u>Page</u>	<u>Part No.</u>	<u>Description</u>
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## IDENTIFICATION LISTS -- MAIN FRAME ASSEMBLIES

### MAIN FRAME

5	BRG-7	Bearing, ball, for carriage travel
6	S-1	Splitter
	LT-1	Lumber Table, hinged
	LT-2	Lumber Table, welded
	LTR-1	Lumber Table Roller (including brackets)

### LEVELING JACK ASSEMBLIES

8	J-1	End Leveling Jack - 15" (complete, including inner member, case, screw, nut, bearing)
	J-1-C	Jack, 15", Case
	J-1-IM	Jack, 15", Inner Member (including 2" pipe, guide pin, and nut)
	JS-1	Screw for Jack -- 1" x 15" cold rolled steel (threaded, including nut)
	BRG-9	Thrust Ball Bearing -- 7/8" I.D. x 1 3/4" O.D.
8	J-2	Center Leveling Jack -- 20"
	J-1-C	Jack, 20" Case
	J-2-IM	Jack, 20" Inner Member (including 2" pipe, guide pin, and nut)
	JS-2	Screw for Jack -- 1" x 15" CR Steel (threaded, including nut)
	BRG-9	Thrust Ball Bearing -- 7/8" I.D. x 1 3/4" O.D.
5	JC-1	Jack Crank



Page

Part No.

Description

AXLE ASSEMBLY

AX-1	Axle -- $5\frac{1}{2}$ ton capacity -- $4\frac{1}{2}$ " heavy duty tubing, $48\frac{1}{2}$ " track, with 5-bolt hubs for Ford Wheels, not including spring seats, brakes or flanges (for standard unit)
AX-2	Special Axle with 62" track, less springs, 4" OD x $\frac{1}{2}$ " wall tube, 3/4 ton spindle size, complete with hydraulic brakes and 3/4 ton hubs, drums and bearings
WT-1	Wheel, Transportation -- 20 x 5.00 (for standard unit)
T-1	Tire - 8 ply, 7.00 x 20 (for standard unit)
TUB-1	Tube - 7.00 x 20 (for standard unit)

SAWDUST REMOVAL ASSEMBLY

	SSC-1	Screw, Sawdust Conveyor -- 6" x 30"
	BB-1	Babbitt Bearing - 1 5/16" I.C.
6	SPK-1-(3)	Sprocket -- 11 tooth for No. 45 Sawdust Chain, 1 3/8" bore
6	SPK-1-(5)	Sprocket -- 11 tooth for No. 45 Sawdust Chain, 1 5/16" bore
6	BRG-6	Pillow Blocks - Self aligning Ball Bearing -- 1 3/8" I.D.
	SHV-12	Sheave -- 6", 2-groove, B Section -- 1 3/8" bore, 3/8" x 3/16" keyway
	SHV-3	Sheave - 5", 2-groove, B Section -- 1 3/8" bore
6	BLT-7	V-Belt, 42", B-Section (Matched)
6	GBA	Gear Box Assembly

Page	Part No.	Description
SAWDUST REMOVAL ASSEMBLY (continued)		
	BCR-1-1	Bevel Gears (Set) 11-tooth pinion; 19 tooth bevel gear - sets required (Used in Gear Box Assembly)
	BCR-1-2	Bevel Gears (Set) 18 and 36-tooth, steel
	SPK-2	Sprocket 19-tooth for No. 45 Sawdust Chain, including V-bracket
	CH-1	Chain -- No. 45 with Sawdust Paddles, 30'
	CH-2	Chain Link - No. 45, with Sawdust Paddles
FFED WORKS ASSEMBLY		
	CH-3	Roller Chain No. 50 - 13 feet required
	CH-4	Connecting Link, for No. 50 roller chain
	CH-5	Offset Link (half-link) for No. 50 roller chain
	FS-1	Feed Shaft -- 53" x 1 7/16" cold rolled shafting with 1/4" and 3/8" keyway ( <u>For Reverse Drum</u> )
	SPK-5	Sprocket -- 72 tooth for No. 50 roller chain, 1 7/16" bore
15	RD-3	Drum, Reverse -- 5 1/4" x 10" diameter - 1 7/16" bore
	SPK-8	Mandrel Sprocket -- 20 tooth for No. 50 roller chain, 1 7/16" bore
	FS-2	Feed Shaft -- 27" x 1 7/16" cold rolled shafting 1/2" x 3/8" keyways ( <u>For Feed Drum</u> )
	SPK-3	Sprocket -- 54-tooth for No. 50 roller chain, 1 7/16" bore



<u>Page</u>	<u>Part No.</u>	<u>Description</u>
FEED WORKS ASSEMBLY (continued)		
15	RD-4	Drum, Feed -- 5 1/2" x 15" diameter -- 1 7/16" bore
	BRG-5	Pillow Block Bearings -- 1 7/16" ID
8	ROP-1	Rope, Sisal -- 1/2" -- 130' required
6, 15	SHV-10-(1)	Sheave -- 7", cable pulley, oil-filled bronze bushing, with bracket

#### MANDREL ASSEMBLY

8	SAA-1	Saw Arbor Assembly (Including 2 7/16" G & P, SAE 1030, one loose collar, one fixed collar, left-hand nut -- machined)
	SMA-1	Saw Mandrel Assembly (Including SAA-1, two BGR-1, one SPK-4, one P-3, with keystock - machined)
	SMP-1	Saw Mandrel Pin -- 9/16" x 1 3/4"
	NSM-1	Nut, Saw Mandrel
	SW-1	Saw Mandrel Nut Wrench
	BRG-1-(1)	Pillow Block, double row, self-aligning, 2 7/16"
	BRG-1-(2)	Pillow Block, double row, self-aligning, 2 1/4"
	BRG-2-(1)	Replacement Bearing for above housing, 2 7/16"
	BRG-2-(2)	Replacement Bearing for above housing, 2 1/4"
	SPK-4-(1)	Sprocket -- 20 tooth for No. 50 roller chain, 2 7/16" bore
	SPK-4-(2)	Sprocket -- 20 tooth for No. 50 roller chain, 2 1/4" bore
	P-3	Pneumatic Pulley, driven, 20" (less tire & tube)
	T-3	Tire, 6.00 x 20, 6-ply
	TUB-3	Tube, 6.00 x 20

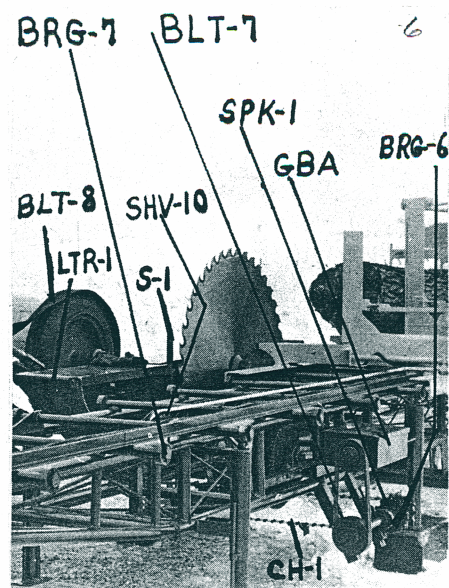
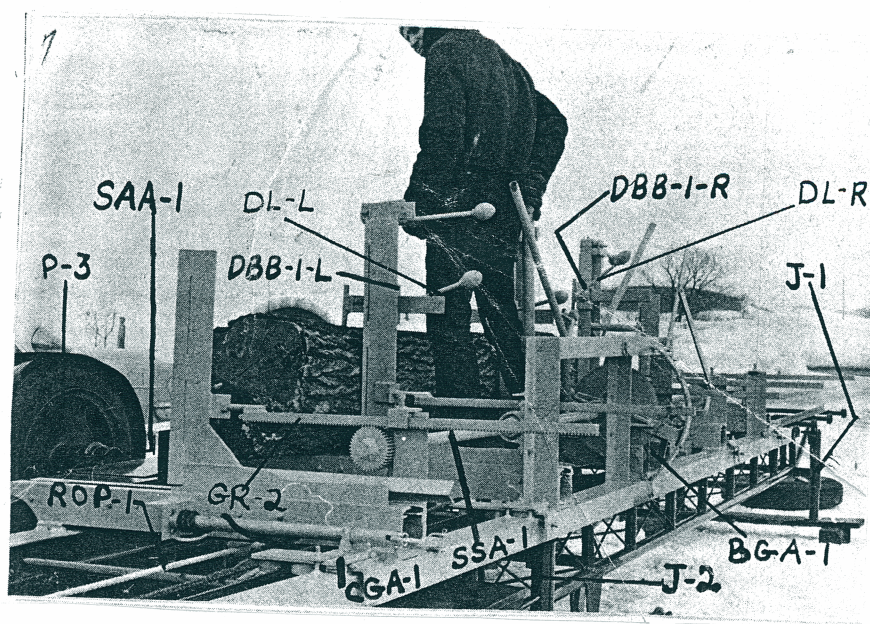
#### DOG BOARD LEVER ASSEMBLY

DBL	Dog Board Lever Assembly
BRG-7	Bearing, Ball

<u>Page</u>	<u>Part No.</u>	<u>Description</u>
	SAW ASSEMBLY	
	SAW-1	Saw -- 50", 5/16" kerf, 7-8 gauge, 500-550 rpm, left hand
	SAW-2	Saw -- 1/8", 1/4" kerf, 9-10 gauge, hoe style No. 2 1/2, 500 rpm, left hand, PHS 2-5/8-3
	ST-1	Saw Teeth -- Style B & F, 5/16" kerf, 8 gauge
	ST-2	Saw Teeth -- Style B & F, or ABC, 9/32" or 17/64" kerf
	ST-3	Saw Teeth -- hoe style No. 2 1/2, 10-gauge, 1/4" kerf
	STH-1	Saw Teeth Holders (Shanks) Style B & F
	STH-2	Saw Teeth Holders (Shanks) Style ABC
	STH-3	Saw Teeth Holders, (Shanks), Hoe Style No. 2 1/2

#### SAW GUIDE ASSEMBLY

SGA-1	Saw Guide Assembly (including pins and nuts)
SGP-1	Saw Guide Pin
SGN-1	Saw Guide Assembly Locknut
SGW-1	Saw Guide Assembly Wrench





Page	Part No.	Description
<u>IDENTIFICATION LISTS -- CARRIAGE ASSEMBLIES</u>		

CARRIAGE ASSEMBLY

	YST-1	Wood Sawyer's Rule
	ASR-1	Aluminum Sawyer's Rule
10	CBA-1	Carriage Brake Assembly, complete
	DS-1	Dog Slide for Second and Third Knees -- 30" cold rolled flat 5/8" x 2", drilled & milled
	DS-2	Dog Slide for Fourth Knee -- 30" cold rolled flat, 5/8" x 2", drilled and milled

DOGGING ASSEMBLY

	JD-1	Dog, Jackson, Chisel and Bar
8	DBB-1-L	Dog Bar Box, left hand
6	DL-L	Drop Lever, left hand
8	DL-R	Drop Lever, right hand
8	DBB-1-R	Dog Bar Box, right hand

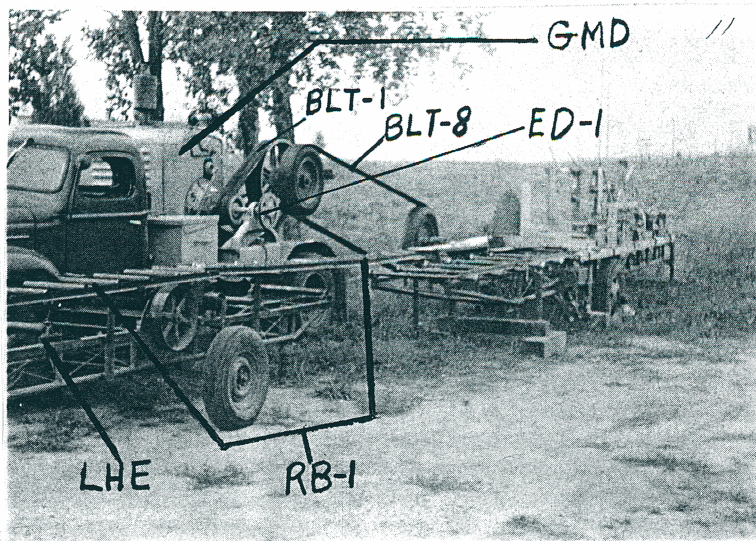
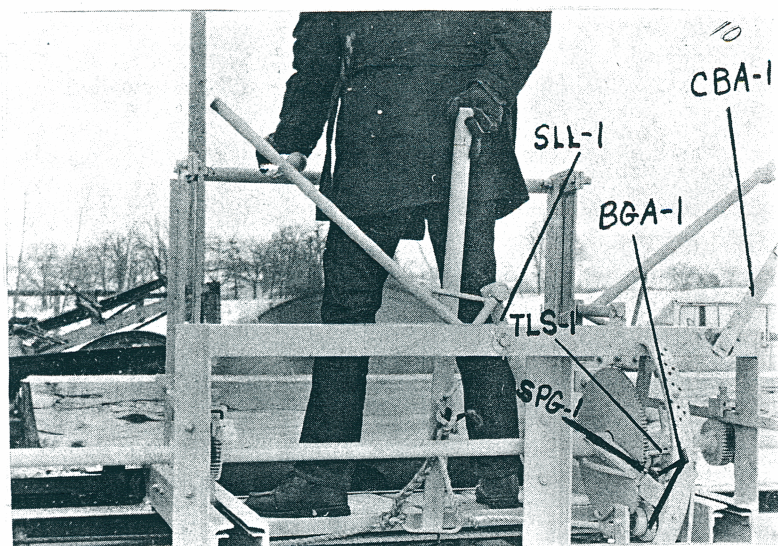
SET SHAFT ASSEMBLY

8	SSA-1	Set Shaft Assembly, complete Shafting - 1 3/8" cold rolled round, 13' 4"
	GR-3	Gear -- 40 tooth, 1 3/8" bore, 1 1/4" face, 10 DP (welded to shaft)
6	BRG-6	Pillow Block Bearing -- 1 3/8" I.D.
10	GR-1	Gear -- 132 tooth, 10 DP, 1 3/8" bore, 1/2" face, 2 1/2" hub
	SLL-1	Set Lever Linkage
	RLL-1	Receding Lever Linkage
		Bendix Frame, Bendix U Frame, braces

SET WORKS ASSEMBLY

8	BGA-1-(U)	Bendix Gear Assembly, Upper Gear -- 33 tooth Bendix Drive and gear pin - No. 93C
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<u>Page</u>	<u>Part No.</u>	<u>Description</u>
8	BGA-1-(L)	Bendix Gear Assembly, Lower Gear - 33 tooth Bendix Drive and gear pin - No. 93C
8	GR-2	Gear Rack -- 1" x 1" x 10DP, 3' long (including adjusting bolt)
10	TLS-1	Trip Latches - set of three - sets
10	SPG-1	Coil Spring for trip latches
10	TL-1	Trip Latch
	SS-1	Safety Stop
	SLA-1	Set Lever Assembly (including set lever linkage)
	RLA-1	Receding Lever Assembly (including receding lever linkage)
10	CBA-1	Carriage Brake Assembly
CARRIAGE GUIDE ASSEMBLY		
8	CGA-1	Carriage Guide Assembly, complete
6	BFG-7	Bearings



#### IDENTIFICATION LISTS -- POWER UNIT ASSEMBLY

##### Specifications for Diesel Engine for Power Unit

11	GMD	General Motors Detroit Diesel Engine, Model 3029C 3 cylinder, or Model 4029C, 4 cylinder, 70 mm. injectors, variable speed hydraulic governor, 12-volt battery charging generator and regulator, 600W (standard)
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<u>Page</u>	<u>Part No.</u>	<u>Description</u>
SPEED REDUCTION ASSEMBLY		
	SHV-13	Sheave -- 10", 7-groove, C-Section, 2 $\frac{1}{4}$ " bore
	SHV-14	Sheave -- 30", 7-groove, C-Section, 2 3/16" bore
11	BLT-1	V-Belts 128" C-Section (Matched)
	BRG-3-1	Pillow Block Bearings - 2 3/16" I.D.
	BRG-3-2	Pillow Block Bearings - 2 7/16" I.D.
	P-4	Pneumatic Drive Pulley -- 15 x 4.50 rim with plate and hub welded (less tire and tube)
	T-4	Tire -- 6.00 x 15 4-ply
	TUB-4	Tube -- 6.00 x 15
	J-3	Handyman Jack, with pipe for tightening drivebelt
STARTING ASSEMBLY		
		6 or 12-volt Battery
		Battery fittings and belt assembly cables
6, 11	BLT-8	Belt -- power transmission -- 30' compass cord, 6" flat, for left-hand engine, (straight belt)
	BLT-9	Belt -- power transmission -- 50' compass cord, 6" flat, for right-hand engine, (crossed belt)
		EDGER ASSEMBLY
11	LHE	"Lumber Harvester" Edger
11	RB-1	Roller Bed, Style M, 2 $\frac{1}{4}$ " roller, 16-gauge, 15" roller on 17" centers, 10' sections
11	ED-1	Edger Drive Sheave

# SKIDWAY

Line up your sawing sites in advance of actual sawing, to determine EXACT LOCATION of logs, ACCESSIBILITY by truck, and to CHECK SKIDWAYS. Skidways should be made in convenient locations in woodlots or near farm buildings. Often it is advisable to have several in one woodlot. If possible they should be made on a gentle slope, leaving sufficient space to pile lumber, slabs, and sawdust. Lumber and slabs can then be carried downgrade, tremendously lessening the labor involved. It is also advantageous to have the logs piled on one roll-way as the limit of the "Harvester" carriage does not permit the taking-on of logs from two roll-ways. Logs should be received on the carriage with butt-end toward the saw.

A 20-inch log (diameter) placed longitudinally 6 to 8 feet from the main frame of the "Lumber Harvester," on which rests two full length medium size logs placed 7 to 8 feet apart, makes a desirable arrangement when short skids are used between the log resting on the ground and the "Harvester" support, forming a "deck" from which the cant turners work. If the "Harvester" set in this position becomes too high for convenience of the cant turners, a low stand can readily be made up from the first lumber sawed. Also it may be necessary to saw out more skids if they are needed after setting up.

Sometimes a tractor with a finger lift can be used to great advantage with a "Lumber Harvester." It can load and even turn large logs at the skidway, and load lumber on trucks. In large commercial operations or where the timber stands are thick and the logs large, "Lumber Harvesters" can be used in pairs. A tractor with finger lift can be kept busy at the skidways, at the slab piles, and loading lumber at the trucks. As many as six men can be eliminated by this method.





# SETTING UP THE LUMBER HARVESTER

It is found practical in most cases to set up once a day and it is seldom advantageous to remain over two days at one set-up. It is preferable to move the Lumber Harvester away from material accumulated rather than move the lumber, slabs, and sawdust. On large set-ups, the Harvester simply moves ahead progressively to other skidways and away from the accumulated material.

Ten to 20 thousand board feet is the average cut per setting. After considerable practice, you should be able to set up the Harvester in 30 minutes. REMEMBER, TIME LOST IN SETTING UP MEANS DOLLARS LOST.

To set up the Harvester, place it within three feet of its desired position longitudinally. Dig a hole in front of each wheel, about 6 inches deep on level ground, so that when the Harvester is leveled up FIFTY PER CENT OF ITS WEIGHT WILL BE REMOVED FROM THE TIRES. If this is not done, the Harvester will not sit rigidly enough. Pull the Harvester ahead to fit in the holes. BE CAREFUL NOT TO HAVE THE HOLES SO DEEP THAT THE SAWDUST CONVEYOR RESTS ON THE GROUND WHEN THE HARVESTER IS PULLED AHEAD INTO THE HOLES. Unhitch the truck or power unit from the Harvester and place it in a relative position to the Harvester. At this time ascertain that no difficulties will prevent proper alignment for the drive belt from the power unit to the Harvester.

## LEVELING:

Proceed with leveling of the Harvester to remove weight from wheels as above stated. Place the two CENTER legs down first and level the Harvester CROSSWISE at this point. Place the two legs on the log-end next and level at that point, letting the two legs on the lumber-end down last, with just enough tension to give adequate support. (See page 27 "Leveling.") It may be necessary to slide the carriage forward in order to use the crank to adjust the legs. Thus it is necessary to have a relatively level position to the frame before releasing the carriage so it can be moved for the final adjustment of the legs as previously stated. BE SURE THAT SOME MATERIAL, SUCH AS A PLANK OR TIMBER, IS PLACED ON THE GROUND UNDERNEATH EACH LEG TO PREVENT THEM FROM SETTLING INTO THE SOIL AS OPERATIONS PROCEED.

## BRACING:

Now secure a brace against the frame of the Harvester and to the ground or power unit, to compensate for drive belt tension. If this brace is connected between the Harvester and the power unit, you should have some means of increasing its length; a Handyman Jack will provide proper belt tension. Where longer drive belts are used and the brace extends from the Harvester to a stake driven in the ground, this tightening adjustment should be provided BETWEEN THE POWER UNIT AND THE STAKE driven in to secure it, as the power unit is the more movable.

## SAWDUST CONVEYOR:

Set up sawdust chain and anchor it. Secure one-half of truck axle or similar bar and sharpen end, to use as anchor.

### THREADING FEED ROPE:

You are now ready to thread the feed rope. One end of the rope is first secured by passing the end through the loop at the bottom of the feed lever (which is the free lever in the center of the carriage), and hook the end of the rope securely on one of the hooks provided for it on the side of the lever. (Several hooks are provided for convenience in tightening the rope.)

Next, pass the free end of the feed rope TOWARD the log-end of the frame UNDER the carriage but ABOVE the cross-shafts, passing it down through the pulley on the extreme log-end, and BACK toward the center THROUGH the idler loop and OVER the top of the large feed drum, then making TWO COMPLETE COILS AROUND THE FEED DRUM, leading off on the side of the drum TOWARD the saw. This will bring it in alignment with the pulley near where the frame hinges. Pass ropes UP THROUGH this pulley, then BACK toward the log-end of the frame again. Being sure that the feed rope is now above the cross-shafts and UNDER the carriage to the extreme log-end of the carriage, pass it UP THROUGH the loop provided and secure through the hook-bolt in the pipe winch. By tightening this winch, the rope can be adjusted to proper length.

### THREADING REVERSE ROPE:

To thread the reverse rope, proceed as with the feed rope, except that you go in the OPPOSITE direction and use TWO coils around the drum. THE REVERSE ROPE IS FED ONTO THE DRUM FROM THE BOTTOM whereas the feed rope is fed onto the drum from the top.

When both feed rope and reverse rope are threaded, tighten the winch on each end of the carriage UNTIL THE FEED LEVER IS IN A VERTICAL POSITION, WITH SLACK ENOUGH TO LEAVE AT LEAST ONE FOOT OF MOVEMENT (not over two and one-half feet) TO THE LEVER WHEN A REASONABLE PRESSURE IS APPLIED. If leaving the ropes in overnight, BE SURE TO SLACKEN THEM AT EACH END.

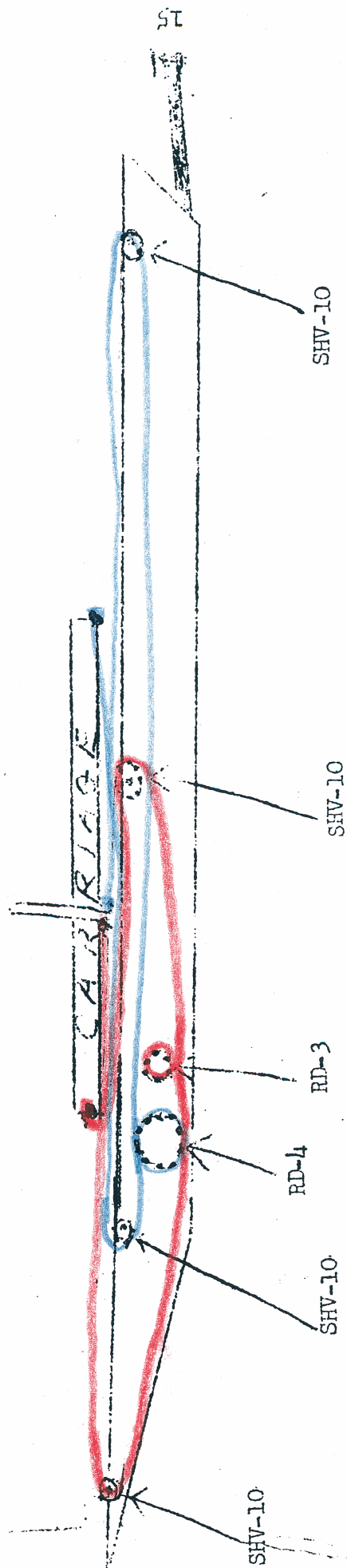
The feed rope is usually 64 feet long and the reverse rope 56 feet. In this way, the feed rope, after worn in the middle, can be spliced into a 56' length and used as a reverse rope, thereby obtaining maximum life from a set of ropes. One set of ropes should last through 40 M b.f. of sawing or one week's sawing, after drums are worn in smooth. Use ONE-HALF INCH SISAL HEMP ROPE for replacement.

After threading the ropes into the Harvester and checking the tension and BEFORE putting the power unit and Harvester in operation, BE SURE THAT THE LOCK PIN WHICH PREVENTS THE CARRIAGE FROM TRAVELING IS IN A LOCKED POSITION, and set the hand brake; release pin only AFTER you are in position on the carriage with feed lever in your right hand and have tested the slack in your feed lever and have noticed a slight forward or backward movement of the carriage as you move the set lever. With a little experience you will soon know the proper tension to have in the ropes before releasing the lock pin.

Make several short travels of the carriage, increasing the length of travel until you have made several FULL LENGTH travels of the carriage BEFORE attempting to take on the first log. THIS SHOULD BE PRACTICED AFTER EVERY SHUT-DOWN OF THE LUMBER HARVESTER, to assure yourself that the carriage is in the clear, that the ropes are properly threaded, with the proper tension.



# SKETCH OF ROPE FEED



FEED ROPE --- Blue  
 REVERSE ROPE- Red

# PROPER PROCEDURE OF BREAKING DOWN LOG ON LUMBER HARVESTER

Before you, as an operator, attempt to break down a log on the Lumber Harvester, it would be well to read the following paragraphs CAREFULLY, and fix in your mind a mental picture of just what takes place as each operation is performed.

## OPERATORS POSITION:

First, you must acquaint yourself with the operator's or sawyer's position and stance on the carriage, so that you have the "feel" of the moving carriage, and that you may make the movements most natural to you.

Stand on the operator's platform facing the skidway with feet far enough apart so that a sudden movement of the carriage will not unbalance you. Put on your "sea legs," so to speak! Bring your right hand to the back of the body, slightly across the right hip, and grasp the feed lever lightly. This permits your left hand to operate the set lever (which is on your left) with a straight pull that can soon become very accurate.

To recede the headblocks, change the feed lever from the right hand to the left, behind the back, after the "dog board" is dropped and AS THE CARRIAGE IS RETURNING TO ITS ORIGINAL POSITION parallel with the skidway. This permits you to catch the receding lever with your right hand.

GO THROUGH THESE VARIOUS MOVEMENTS A NUMBER OF TIMES BEFORE ATTEMPTING TO PLACE THE FIRST LOG ON THE CARRIAGE.



## CARRIAGE POSITION:

You must now acquaint yourself with the relative dimensions of the carriage, as to length and distance between head blocks (or bunks), so that you can properly position the carriage, by means of the feed lever, to receive the log that is approaching on the skidway. THIS CANNOT BE OVEREMPHASIZED. Due to the fact that all logs are different, no set rule can be given, but you should ALWAYS strive to work from the CENTER of the log and carriage.

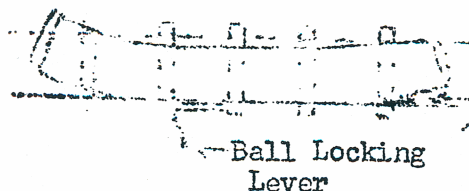
Mentally number the head blocks from 1 to 5, beginning nearest the saw.



A 4 to 6 foot log should be placed on Head Blocks No. 2 and 3. An 8 to 10 foot log on Nos. 2-3-4. A 12 foot log on Nos. 1-2-3-4. A 14 to 18 foot on Nos. 1-2-3-4-5, and EXTENDING THE SAME DISTANCE OVER EACH END. A 22 foot log should extend slightly more TOWARD the saw. Twenty-two foot logs are maximum length you should attempt to cut on the Lumber Harvester.

You must consider, as the log is being brought up in readiness to be placed on the carriage, the presence of extending knots or other obstructions that could prevent the log from laying FIRMLY on the carriage or OBSTRUCT ITS PASSAGE OVER THE ARBOR as the carriage is brought forward. In some cases it is best to have the obstruction rest on the head blocks, especially is this true in the case of a "swell" or "churn butt." (Encountered frequently in cypress logs and the like.)

Also, you must consider the crook and sweep of the log. The tendency for a new operator is to place the bow or "belly" of the log UP OR DOWN. In fact, many old sawyers want the bow up and slightly out. WE HAVE FOUND BY CAREFUL CHECK AS TO THE QUALITY OF LUMBER PRODUCED, THAT THIS PROCEDURE IS DEFINITELY WRONG. Perhaps more so on a Lumber Harvester, because it is built so the log CAN BE PLACED CORRECTLY. The right position is: with the bow of the log on a horizontal plane TOWARD THE KNEES, and resting on ALL the head blocks over which it extends.



In this position, it can easily be brought out on either end by use of a wedge or pryed out with a cant hook, SO THAT THE LINE OF CUT WILL BE EQUAL ON EACH END.

LOGS SHOULD BE RECEIVED ON THE CARRIAGE WITH BUTT-ENDS TOWARD THE SAW, ESPECIALLY IN LONG LOGS, as the heavy butt on the overhanging end will have a tendency to tip up the carriage. Also, the saw is less apt to run "out" following the grain of the wood.

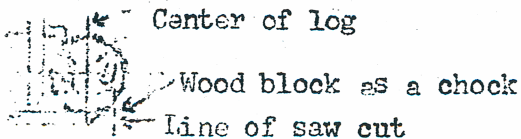
## DOGGING THE LOG:

"Dogging" is the term given to the act of securing the log on the carriage, and is VERY IMPORTANT because of the fact that improperly dogged logs (or cants) may result in accidents, and usually result in damage to your saw, which in turn means loss of time and money.

In setting the dogs, hold the ball lever vertically, with dog projecting the desired amount. Then send the slide ball and dog assembly down into the log with a BRISK MOVEMENT, letting loose of the ball levers as the dog "bits" penetrate the wood. The weight of the ball levers is sufficient to lock the dog and hold it while the ball locking lever on the top bar between Head Blocks 2 and 3 is brought into LOCKED position, forcing dog "bits" still further into the wood. IT IS NOT NECESSARY TO PRESS DOWN ON THE BALL LEVERS AND THIS PRACTICE SHOULD BE AVOIDED.

Before sawing very large logs, use a small wood block to chock the log on at least one head block. This will prevent the possibility of the log rolling as the saw pulls down in making the first cut.

Before starting to saw the first log, dogs must be set SECURELY about midway between the head block and the center of the log, on the average log. Just where to set your dogs will, of course, vary with the curve or amount and size of knots in the log, as you will want to take a narrower or thicker slab board from the first cut. Learn to judge where your saw-cut is going to come in comparison with where your dogs are set into the log.



BE SURE THAT THE DOGS ARE SET BACK FAR ENOUGH SO THAT THE SAW WILL NOT HIT THEM, at the same time far enough in towards the center of the log to hold the log TIGHTLY. Also, be certain that the hook on the dog PENETRATES WELL INTO THE LOG, ESPECIALLY WHEN THE LOG IS COMPLETELY ROUND AND RESTING ON ITS CURVED SURFACE, as the dogs will not sink in as readily as in the sawed surface of the log, resulting after one cut is made. When dogging the log on the sawed surface, you must also use careful judgment, so as to dog it securely and still have a reasonable margin for the saw-cut. However, it is not necessary to use as much force in driving the dogs into the SAWED surface as is necessary when dogging the log when completely round and with the bark on.

In hardwoods, when the ball locking lever is locked, it may cause undue pressure on the head block where the knees slide, MAKING IT DIFFICULT TO MOVE THE SET LEVER and bring the knees out. When this occurs, grasp the ball locking lever in the right hand and set lever in the left hand, and release the pressure so exerted by an upward movement of the ball locking lever, UNTIL THE SET IS MADE. The left hand can then return the ball locking lever to its former position, AS the right hand grasps the feed lever.

As a rule, it is not necessary to use No. 4 dog on No. 4 head block on logs shorter than 12 feet. However, this practice can be determined by the sawyer.

## SETTING THE HEAD BLOCKS:

After the dogs are set on Head Blocks 2-3-4, the log is brought out by use of the set lever, until the head block that shows the most just passes out of view. (Usually No. 3 head block on the first cut, and No. 4 or 5 after the log has been turned 180 degrees.) Then one or two pulls of the set lever will bring the log into the proper position for the first slab-cut. The amount of set



given after the last block. Slabs from now will depend on the height of the operator and the natural position he takes on the operator's platform. This judgment must be gained from experience but is not difficult to acquire. Sometimes it is necessary at this point to consider the position of the pointer on the rule in order to divide the dimension of the log between the two slabs to secure the required size of cant when certain specific material is requested. You are now ready to make the first cut.

#### SAWING LUMBER:

Assuming you are in proper position on the carriage (see page 16 "Operator's Position") while your left hand grasps the ball locking lever, for support your right hand should press the feed lever away from the saw, causing the carriage to move forward. (The natural weight of your body will be thrust in the opposite direction of the movement of the carriage.)

When the first cut is NEARLY completed, thrust your right hand (which is on the feed lever) gently in the OPPOSITE DIRECTION, so that by THE TIME THE CUT IS COMPLETED, THE CARRIAGE WILL COME TO A STOP, and IMMEDIATELY start the reverse travel. BEFORE THE LOG HAS CLEARED THE SAW, your right hand is again brought AWAY from the saw with a certain full movement of the body (which will be acquired naturally), and which permits your left hand to grasp the set lever, giving a pull . . . up and back . . . which is also a natural movement, and brings the log or cant out for the next cut. THIS MOVEMENT COMES AT THE SAME TIME THE RIGHT HAND PRESSES THE FEED LEVER AWAY FROM THE SAW TO END THE REVERSE TRAVEL OF THE CARRIAGE, and starts the logs again toward the saw. THIS SHOULD NOT BE DONE UNTIL THE LOG HAS CLEARED THE CUTTING EDGE OF THE SAW HOWEVER.

The sequence of these movements is the same for all sawing and will not be repeated. You should strive to make these movements with an easy natural swing of the body and arms, and THE BETTER COORDINATION YOU CAN ACQUIRE IN THIS CONNECTION, WILL INCREASE YOUR PRODUCTION ACCORDINGLY.

You have now cut off your first slab-board. When it is released from the log IT SHOULD BE TIPPED WITH THE SIDE NEXT TO THE SAW UP. THIS ALLOWS YOU TO VIEW AND JUDGE THE FACE OF THE LOG FROM THE APPEARANCE OF THE SLAB-BOARD.

When you have again set the dogs PROPERLY (See page 18 "Dogging the Log") your pointer (on the rule) now shows you the dimension in inches of the logs that you have left to work with. You must now determine what FINAL thickness the cant shall be. From this point, you must count INCHES for each slab-board you expect to cut off, ADDING ONE QUARTER INCH ( $\frac{1}{4}$ " ) FOR EACH CUT to allow for saw kerf. The point at which you start to saw must be the THICKNESS OF THE SLAB LESS THE DIMENSION OF YOUR LOG INCHES. Set your pointer at a number which will allow the desired number of boards to be taken from the cant. Proceed to saw in the manner before outlined.

When the desired "cant thickness" is reached, and you have the carriage again back to the log-end of the frame, a slight pull on the receding lever will permit the cant turner to easily tip the cant backward to a flat position. (With the cant in this position, experienced operators will dog the small end of the cant out in such a manner as to divide the taper of the cant.)

With the cant in the above position, it is usually well to cut to a point NEARING THE HEART OF THE LOG, OR TO A POINT WHERE THE TIMBER STRAIN CAUSES EXCESSIVE BOWING OF THE CANT. Now rest the carriage at the log-end while the cant turners again turn the cant 180 degrees.

At this time, the FINAL YIELD of the cant must be calculated in your mind before the proper setting can be made, in order to provide the saw kerf and complete the breaking down procedure so that the final "dog board" is left in a STANDARD DIMENSION PIECE. With this procedure, the final "dog board" will be the heart of the log and the heart will grade higher as dimension lumber. Therefore, it is recommended that you leave at least a TWO INCH cant as a "dog board." This lessens the danger of sawing into the dogs, and relieves the necessity of slowing down to make the last cut, which in turn increases your production.

#### DOG BOARD RELEASE:

After the last cut is completed and the "dog board" IS TO BE released on the lumber end of the Harvester, DO NOT RELEASE THE "DOG BOARD" TO OFF-BEARERS UNTIL ALL BOARDS FORMERLY CUT ARE BACK OF THE SPLITTER. This is very important as a safety precaution, in preventing the saw from catching boards and throwing them. "Dog boards" that are too long to clear the splitter should not be released until the head blocks are receded, which will permit the "dog board" to lie flat on the head blocks and be dropped end-wise without lifting it over rotating saw. This is a definite advantage for you as the operator of a Lumber Harvester because YOU ARE IN A POSITION TO CONTROL THE RELEASE OF THE "DOG BOARD" IN A SAFE, SATISFACTORY MANNER.

#### UNUSUAL LOGS:

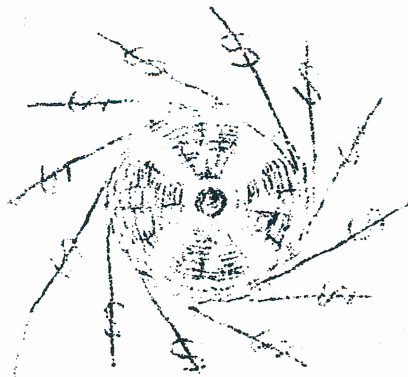
Logs that are too large to be turned UP 180 degrees as indicated previously, must be turned DOWN to permit the saw to cut THROUGH . The following procedure should be used.

After the operator recedes the head blocks, the cant turners push the log back in a manner so that it follows the head blocks back without turning. Then turn the log down, and when it is at a balance, push back at the bottom. When sufficient slab boards are removed to secure the proper face, this procedure is repeated, receding the head blocks each time to allow the outside corner of the log to be brought back onto the head blocks, so that in turning the log it will not have a tendency to slide back onto the skids. After the second such turn is made, the dimension of the log must be computed the same as it was in the former paragraph after the 180 degree turn. In this manner, boards are continuously taken off AROUND THE LOG until it is small enough for the saw to reach through, when it can be further broken down in the desired manner.

It is often advisable in sawing extremely large logs when the saw does not cut through, to release the slab and turn the log up about one-sixteenth of a turn, continuing to take DIAGONAL slices or slabs until the saw will cut through sufficiently to remove the slab. This is called "beavering" the log and should be practiced only in EXTREME cases and on extremely large logs that cannot be cut any other way. It is a much better practice to refuse to saw logs of this size.



# YOUR PRECIOUS SAW



It is impossible to place enough emphasis on the CARE OF YOUR SAW. It can truthfully be said that it is the most important part of any type of machine which converts logs into lumber, whether it be the conventional portable sawmill or a Jackson "Lumber Harvester." If not properly taken care of, it can slash your production, ruin accuracy of your lumber, empty your pocketbook, and leave YOU in the depths of despair.

It is obvious that there is nothing on the Lumber Harvester that takes as much abuse as your saw, inasmuch as it is expected to dissipate upwards of 100 horsepower through one edge of it in the process of its operation. For instance, should a log come loose from the dogs while this tremendous strain is on the saw, it will very likely "kink" it, bringing a halt to operations and resulting in the loss of time and money. All saws vary considerably, and like people, have certain personalities and require different methods of handling. This is partly due to the hardness or mildness of the steel from which they are made. Therefore, the following treatise will deal with all saws in a general way. (Occasionally one will possibly find a saw where certain explanations given here will not apply.) Inasmuch as it is impossible to carry a "filing room" around with a Lumber Harvester, we recommend only the use of inserted tooth saws, and will deal only with this type.

## TEETH:

A new saw, or a new set of teeth, will always run well for the first five thousand feet of cutting. They may make a rather rough cut, but will always run approximately this long if the saw is tensioned for the proper speed and the natural lead is properly set. This fact assures you, that if the teeth can be kept properly sharpened (like a new tooth), the saw will continue to run and cut in a true line. Thus, when you find that it does not, it usually indicates that something is lacking in the man who is sharpening the teeth and his methods. A very good way to check this is to put in a new set of teeth and check the results. (Cases have been cited by Mr. Jackson, where attempts to run the saw when improperly sharpened, have continued so long that the saw lost the proper tension, and has sometimes been carried to a point where blisters develop.) If such a case develops, it will be necessary to have a COMPETENT saw expert retension the saw by hammering it. Hammering a saw is an ART and SHOULD UNDER NO CIRCUMSTANCES BE ATTEMPTED BY ANYONE WITH LIMITED EXPERIENCE. When your saw ceases to cut properly, STOP YOUR OPERATIONS AND SHARPEN IT.

It might be well to know just how a chisel tooth saw works. (All inserted tooth saws used to cut wood lengthwise of the grain are swedge-set chisel tooth saws. Saws used to cut crosswise of the grain are spring-set pointed tooth saws.) A spring set cut-off saw cuts the SIDES free and TEARS OUT THE PORTION BETWEEN THE TWO EDGES that are cut free by the sharp points. Thus, as soon as the points become dull and do not cut the edges free, further sawing is difficult and the saw is said to be dull. Sharpening the points will again

correct this and work can be resumed. Inasmuch as the center is torn out, any slight increase in the kerf will increase the amount to be thus torn, and will increase the power accordingly.

A chisel tooth rip saw cuts ACROSS the center and TEARS OUT THE TWO CORNERS. For this reason, the width of kerf does not materially affect the power required. The two edges have to be torn free regardless of how narrow the kerf is, and that is what consumes your power. The center being cut, the amount of material cut varies power consumption very slightly. The corners being the part of the tooth that do the tearing, it naturally follows that the things which would lessen the tearing-effect of the corners, will effect the power consumption immediately, and cause a corresponding increase in the power dissipated through each tooth; and can cause plenty of trouble in so doing. The chisel tooth saw is the type used on a Lumber Harvester. The condition of the corners of the teeth is, therefore, of great importance.

Still further, if one corner of the tooth becomes duller than the other, it naturally follows that the one causing the greater resistance will have a tendency to force the saw the opposite way, which will cause the side of the saw to rub on the side of the log. This rubbing will do one of two things: (1) If the log is moving end-ways slowly, and the saw is rotating as it rubs the slowly moving log, it will generate heat in the saw causing the metal to expand. The saw will thus lose the stiffness required to run straight. THE FURTHER THIS CONDITION IS ALLOWED TO DEVELOP, THE HARDER IT BECOMES TO REMEDY. (2) On the other hand, if the log is passing the saw at a higher rate of speed, the log being cool in the inside will have a tendency to cool the saw as it rubs against it, causing the metal to shrink and stiffen, which is necessary to off-set the rubbing caused by one corner of the tooth being duller than the other.

From the above we conclude, that, it is first necessary, as far as possible, to KEEP THE CORNERS OF THE TEETH OUT FULL AND SHARP. Secondly, if the corners are becoming dull, it is better to increase the speed of the feed, if the power will permit, in order to keep cool lumber passing the saw. Also, your saw may appear sharp, but if the corners are not KEEN and are not PROJECTING BEYOND THE EDGE OF THE TOOTH (like new teeth), it is STILL A DULL SAW.

Another factor, which will cause your saw to run "in" or "out" as the case may be, is an IMPROPER ANGLE TO THE FRONT OF THE TOOTH. The cutting edge should be STRAIGHT ACROSS. (Some sawyers prefer having the log-side of the tooth slightly longer. The idea is, that this will counteract the tendency of the logside corner wearing faster because it cuts more lumber due to the curve of the log. If this is practiced, it should be very slightly.)

The "hook" or bevel of the underside of the tooth is very important. New teeth usually have a maximum of "hook." A good rule to follow is to set the main frame of the Harvester slightly higher on the lumber-end. In fact, as much higher as you can and still have the carriage remain at rest with the saw running and the feed lever unattended. Then give the teeth all the "hook" they will take without picking up the feed, due to their extensive draft. (See page 24 "Filing.") If a mechanical filer is used, it can be set in this position and will maintain this proper "hook" for half the life of the tooth. However, after the tooth is half worn out, it will be found necessary to round out the throat of the tooth to keep a sharp "groove" from forming as the metal is filed away. This is important because a "groove" at this point will cause an "eddy current" in the flow of chips as they come from the keen point, obstructing in turn the flow of sawdust from the kerf, which causes the saw to dodge "in" and "out." Plenty of "HOOK" WILL PULL THE FRONT EDGE OF THE SAW INTO THE WOOD, WHILE A LACK OF "HOOK" WILL CAUSE THE SAW TO DODGE SIDWAYS INSTEAD OF CUTTING FORWARD DOWN A STRAIGHT LINE.



#### NUMBER OF TEETH AND GAUGE:

The majority of saws on the Jackson "Lumber Harvesters" are 50" diameter with 36 to 46 inserted teeth, 7 gauge at center and 8 gauge at rim, 5/16" or 9/32" kerf, speed of 500-550 r.p.m. and lefthand. (A mill on which the log passes the saw on the lefthand side as it is being cut, is a "lefthand mill," and thus carries a lefthand saw.)

It may be well to remember that a saw with insufficient teeth is wasteful on a Lumber Harvester with a good power unit, because it is unable to take full advantage of the power. On the other hand, light power is over-burdened by a saw with too many teeth. Also, fast feed, backed up by ample power, requires a fine-toothed saw, especially in small logs where large gullet capacity is not required. A fast feed requires ENOUGH TEETH TO DO THE CUTTING. A slow feed does not require as many teeth. (Too many teeth at a slow feed do not get a large enough "bite" and cut too fine sawdust and waste power grinding the wood.)

We do not recommend thin saws. A 7-8 gauge is naturally able to stand more crowding and abuse, as well as being a longer wearing saw, than a 8-9 gauge. A 7-8 GAUGE SAW SHOULD BE USED ESPECIALLY IN FROZEN TIMBER AND ON MACHINES WHERE THE POWER IS OVER 80 H.P. DIESEL. The standard kerf for 8 gauge saw is 9/32" while the standard kerf for 9 gauge is 17/64", only 1/64" difference. When for instance, only 6 to 10 cuts are made in a log, there is little saving in kerf, considering that any saving made would not be enough for a full one inch board and therefore would go into slab.

#### SPEED:

The speed of the saw on a Jackson "Lumber Harvester" should be the greatest which can be maintained BOTH IN AND OUT OF THE CUT. A usual mistake of operators is to try to operate their saw at too great a speed. A REGULAR UNIFORM SPEED BOTH IN AND OUT OF THE CUT INSURES MORE LUMBER AND MORE ACCURATE LUMBER. Speed should be governed by the available horsepower, of course, and must be increased as the power to drive the saw is increased. The 50" inserted tooth saw most commonly used on the Harvester should run at 500 r.p.m. When ordering new saws, be sure and advise the speed at which your saw is operated both in and out of the cut. Do not guess at this, but take it with a speed indicator.

#### KERF:

Nothing is gained by attempting to use inserted teeth too narrow on the cutting edge. New teeth which are too narrow become entirely too narrow to clear the saw properly after one or two filings, resulting in the heating and buckling of the saw, and a "SNAKING" SAW WILL WASTE MORE LUMBER THAN A WIDE KERF. However, when cutting frozen timber, it is possible to use a trifle narrower tooth.

#### FROZEN TIMBER:

As stated above, the kerf may be slightly narrower in cutting frozen timber because frozen timber cuts very clean. Short points generally do better than points of the full length; and for this reason, teeth which have been discarded in the summer can be used in the winter, but be sure to select teeth in sets of ONE LENGTH. Also BE CERTAIN THAT YOUR TEETH ARE PROPERLY FILED AND THAT THE CORNERS ARE SHARP AT ALL TIMES so that the saw will not dodge in the first cut. Be sure that you have good holders to chamber the fine frozen sawdust which will otherwise frequently cake on the side of the log, forcing the saw out of true line of cut.

#### HARDWOOD:

In sawing hardwood extensively, the kerf may be a trifle narrower than for soft or fibrous timber. Red elm sometimes presents difficulty when trying to cut a thin slab because of a tough inner bark. Either cut a thick slab or file the saw, as only a very keen edge can cut through this tough bark when it comes in contact with the saw at a sharp angle.

#### FILING:

As previously stated (see page 21 "Teeth"), more hook can be used on the saw teeth on a Jackson "Lumber Harvester" than is commonly recommended by sawyers of the conventional portable sawmill, because it is possible to readily adjust the frame of the Lumber Harvester longitudinally, whereas the conventional mill rests solidly on mud sills and is not readily adjustable. PLACE THE MAXIMUM HOOK ON THE TEETH THAT CAN BE USED WITHOUT THE SAW "GRABBING" or seemingly picking the feed away from the operator. The position of the machine will make a difference. Lower the log-end of the carriage to a point above which the carriage ceases to stand at rest when the feed lever is released. The lowering of the log end of the Harvester causes the carriage to run up hill toward the saw, facilitating the return movement of the carriage and lessening the possibility of the saw "grabbing" or picking up the feed when encountering knots or cross-grain sections in the log, as would be the case when extreme is hook is used. DO NOT FILE "LEAD" IN THE SAW. It will have a tendency to cause the saw to run IN when sharp and OUT as the teeth become dull. DO NOT FILE THE BACKS OF TEETH as this will reduce back clearance and make the saw run hard, if it will run at all. (See page..25 "Dull Teeth.")



# DON'T EVER SAW WITH A HOT SAW



If the saw runs hot, check and DOUBLE-CHECK the following CAREFULLY, starting with the first item and continuing down the list until the difficulty is ascertained.

1. HOT MANDREL BEARING. Be sure the saw is not absorbing heat from the mandrel. Bearings should not be much above blood temperature which can be judged by contact with the hand.
2. DULL TEETH. NEVER SAW WITH DULL TEETH. You will save time and money by stopping and sharpening the teeth. If logs are dirty and difficult to cut, it will be necessary to sharpen teeth 4-5 times a day. Take special notice of the points, corners, and sides of NEW teeth, and endeavor to KEEP them in that condition. Do not remove teeth to sharpen.

A 50" saw can be filed in 20-30 minutes on the Harvester and the greatest value will be secured from the teeth. When filing, BE SURE THAT YOU FILE THE TIPS OF THE TEETH SQUARE. If tips are longer on one edge it will cause the saw to run in and out (see page 21 "Teeth"), further causing the saw to rub against one of the guide pins and heat in the rim even though the saw has the proper lead. (See page 27 "Lead.") Squareness of points can be determined by placing a short straight edge, like a 12" rule, against the tip of the tooth and sighting across the arbor to see that it is straight with the arbor.



3. NEW TEETH. If filing does not remedy heating of the saw, put in a new set of teeth. In many cases, new teeth will make a new saw. Also, you can determine here and now if the actual heating is caused from the teeth or the saw itself. Take special notice of type and style of teeth in saw and secure same kind if possible. When securing new teeth, do not get teeth which are too narrow, as they become entirely too narrow after one or two filings, causing saw to heat. (It is possible to swedge narrow teeth, but we do not recommend this practice as it is apt to cause holders to loosen and teeth will not be held securely.)

Before inserting new teeth, the V in the plate and holder (or shank) should be WIPED PERFECTLY CLEAN and WELL OILED. After dipping the tooth in oil, hold it in your left hand in position with the holder, keeping it EVEN with the side of the holder. While holding the tooth evenly with side of the blade, press the wrench downward until the stops meet. DO NOT USE UNDUE FORCE. Let the stops meet lightly and when the tooth is in place, no further pressure is necessary. If teeth incline to one side of the holder or shank, use the WRENCH as an anvil on one side and a hammer on the other, to line up the tooth and force it to its proper position. TEETH AND HOLDERS MUST BE IN LINE AND MUST BE KEPT IN LINE TO INSURE BETTER AND SMOOTHER LUMBER. The saw will also run better. When inserting teeth, do not permit holder to ride up out of the bottom of the socket or ridge on the head of the holder. If held properly, and if wrench is pulled down as well as turned with the socket, the tooth should move in

easily. If a tooth rides, raise the wrench and so bring the head of the holder up until it again assumes its proper place in the recess of the tooth. It will then turn readily.

In removing teeth which are tight and are immovable with the wrench, NEVER HAMMER THE WRENCH OR THE TEETH. Place a blunt cold chisel on the heel of the holder, BEING CAREFUL NOT TO TOUCH THE SAW and tap LIGHTLY with a hammer. This will start the tooth and holder and enable you to remove it easily with the wrench.

4. **HOLDERS.** Keep holders or shanks tight by all means, as they should maintain practically the same pressure on the teeth at all times, and constant changing of teeth will set or crimp the holders. AT ALL TIMES KEEP THEM AS TIGHT AS WHEN THEY WERE NEW. Tightness can be determined by the feel of the wrench when teeth are changed. Peen the loose holders with a hammer on inside edge of gullet, but BE CAREFUL NOT TO HAMMER MORE ON ONE SIDE THAN THE OTHER AND DO NOT BEND THE HOLDER IN DOING THIS. This will retain the tension in your saw the same as when new and in some cases will save a hammering job. When putting in half sets of holders be sure to put in every other one.
5. **RUBBING.** Do not allow saw to rub the log while backing up. The log corner will soon become rounded and it will be hard to hold the saw in the log. Do not allow chips to rub your saw. KEEP APRON CLEAN OF CHIPS CONSTANTLY. KEEP SAW CLEAN FROM PITCH.
6. **GUIDES.** Check for guides being set wrong. DO NOT ATTEMPT TO SET GUIDES WHILE SAW IS HOT. Cool saw down by applying water WHILE SAW IS RUNNING until it is thoroughly cooled. Then ascertain if the saw has proper natural lead (see page 26 "Natural Lead and Arbor Alignment"). If lead is correct, set guides equally, leaving a clearance the thickness of a post card on the side of the saw.
7. **MANDREL.** Saw mandrel may be running untrue on Harvesters after seeing considerable hard use. To determine this, remove nut and loose collar and check the face of the stationary collar for a wobble or uneven surface. If so, remove entire mandrel or arbor and have it remedied by a COMPETENT machinist. When aligning the collar, be sure to support the mandrel in the bearing on the collar end -- not at the center of the shaft.
8. **NATURAL LEAD AND ARBOR ALIGNMENT.** To check your lead and alignment of the arbor, run carriage to extreme log-end and back out guide pins from contact with the saw. Then place a mark on the saw, near the rim and just above the saw guide. Measure the distance from the mark to the guide rail. Rotate the saw 180 degrees (or one-half turn) and measure to the guide rail again. It should be  $1/32''$  more in the second measurement. BE SURE THAT THE SAW GUIDES ARE BACKED AWAY SO THAT THEY DO NOT TOUCH THE SAW AT ALL WHEN DOING THIS. Also BE SURE THAT BOTH MEASUREMENTS ARE MADE IN LEVEL POSITION OR ON THE SAME PLANE. When this adjustment has been made, bring the guide pins up from each side EQUALLY, leaving a clearance of the thickness of a post card. If the saw is properly tensioned and has the proper hook to the teeth, it should run cool.

If above rule is carefully followed and a gauge provided for this use, you can easily check arbor alignment and natural lead any time you have saw trouble and know that the lead and arbor alignment are correct before proceeding further to correct saw difficulties.



9. PROPER LEAD. Another way to test proper lead is to slacken both guide pins in manner outlined above (see page 26 "Natural Lead and Arbor Alignment"), and with the saw running full speed, hold a small stick on the block. Move the carriage ahead letting the saw cut the stick in two. When at the BACK of the saw, the stick should clear by about 1/16-inch. Proper lead can also be checked with the saw still, by marking a tooth and measuring exactly the distance from the marked tooth to the end of the block. Then move carriage ahead and rotate the saw backwards until the marked tooth is in exactly the same position to the end of the block. The measurement this time should be 1/32" more. You may run less lead than this in hardwood and a trifle more in softwood. WHEN YOUR SAW WEARS BRIGHT NEAR THE COLLAR ON THE LOG-SIDE, IT INDICATES TOO LITTLE LEAD providing the saw is correct otherwise. This friction will cause the saw to heat. A saw with too much lead is apt to become "dished" into the log if run in such a condition for very long. DON'T CROWD OR FORCE A NEW OR REPAIRED SAW UNTIL THE LEAD IS CORRECT. A SAW WHICH HEATS AT THE CENTER REQUIRES MORE LEAD. HEAT AT THE RIM INDICATES THERE IS TOO MUCH LEAD.

Some operators prefer to use enough lead so that it is necessary to hold the saw slightly out of the log when the teeth are sharp and as the teeth continue to lose their keenness, adjusting the guide toward the log by means of the set screws, until a reasonable pressure ceases to keep the saw running straight. When the saw is again sharpened, the guides are again adjusted to hold the saw slightly out of the log, and the process is repeated.

10. TOO SLOW. It is a known fact, if an operator saws too slowly, or if the log moves into the saw too slowly because of lack of horsepower, inefficient drive, ineffective governor, or lack of aggressiveness on the part of the operator, the saw rubbing on the logs or boards will cause the saw to heat and to run in and out. More horsepower or better drive to secure faster feed, thereby dissipating the heat by the cool lumber as it passes the saw, will correct this. In other words, TOO SLOW SAWING WILL CAUSE A SAW TO HEAT, WHILE FAST SAWING WILL COOL DOWN A HOT SAW. This is especially true in hot weather.
11. LEVELING. Check the Harvester to determine that it is level CROSSWISE and LENGTHWISE, by placing the level on the arbor for the check crosswise and on the carriage main frame AT THE CENTER for the check lengthwise. Be sure and check BOTH ends of the main frame to make sure that the level registers the SAME ON EACH END. This is done by placing the level on the cross-shafts that support the ball-bearings on which the carriage travels. This also checks for square lumber, preventing it from being thin on the top edge. If your last board or cant is thin on the top edge put a shim under the arbor box next to the saw. This will cause the knees on the log-end to appear high when level is placed on the head block and on the arbor. Remember, that a SAW THAT RUNS "IN" AT THE FRONT WILL MAKE THE LAST PIECE OF LUMBER CUT, (the "dog board"), THIN AT THE TOP. A SAW THAT RUNS "OUT" AT THE FRONT WILL MAKE THE "DOG BOARD" THICK AT THE TOP.

# EFFICIENCY

INITIAL OPERATIONS: Always put the Lumber Harvester through its operations in some secluded place. Too often, because the machine is something "new and different" in the community, crowds gather around to "see" . . . making comments pro and con . . . checking production, accuracy of cut, etc., irritating the new operator to a point where he is not in a position to do his best . . . or give the Lumber Harvester a chance. On the other hand, if the Harvester is placed in the hands of careful workmen in a secluded spot, letting the new operator become "acquainted" with the Harvester, with just enough help to "get along" . . . in a few days he will come through with much better satisfaction for all.

PATIENCE: Operator must have patience until acquainted with the Harvester and has the "feel" of the machine. Remember, this machine is not a sawmill, but is a "Lumber Harvester," and is designed somewhat differently than a sawmill. Therefore, if the new operator is an "old hand" with sawmills, it will require additional patience on his part to master this machine. But once he is thoroughly acquainted with the Lumber Harvester, we doubt that he will go back to operating a sawmill. It has been our experience to have the Lumber Harvester thoroughly condemned, when all that was necessary was a COMPETENT operator, to change the condemnation to the highest praise.

FIGURING: As the operator, familiarize yourself with log scales, scaling of logs, lumber grade, and figuring cuts and volume quickly and accurately BEFORE starting sawing operations.

PEAK PRODUCTION: For continuous efficiency and peak production, and after considerable experience, some owners use two TRAINED operators, who change off sawing every hour. It has been proven that after an hour's sawing, an operator's production gradually decreases. While the one operator is sawing, the other should check on the machine's operation as a millwright, checking production and lubrication on parts of the Harvester as well as the power unit. Never simply stand around.

For added protection, and especially for public demonstrational purposes, one should have a trained cant turner cooperating with the sawyer.

SIZE OF LOGS: Do not be afraid to establish a precedent on size of logs sawn in custom sawing, and the sooner, the better.

We do not recommend using a saw larger than 48 or 50 inches on the Harvester. Also, second-growth timber, if properly harvested, should come within the scope of a 50" saw. Further, logs that are larger than a 50" saw will take, are too large to be handled manually, as is definitely necessary in the extremely portable operations of the Lumber Harvester.

It is generally considered, in the operations of the Lumber Harvester, that LOGS FROM 16 TO 24 INCHES (DIAMETER) ARE HANDLED MOST EFFICIENTLY AND MOST PROFITABLY. FROM 24 TO 30 INCHES, ONE IS MAKING LESS PROFIT AS THE DIAMETER OF THE LOG INCREASES.

PEELING LOGS: When accepting jobs where the majority of the logs have been hauled through gravel, mud and sand, and are heavily coated, you should use a grit gouger. This saves your precious saw and produces better lumber.



ACCURACY AND SPEED: You, as the operator or sawyer, are responsible for the production and accuracy of the lumber produced. A good operator will size up a log at one glance and cut it to produce the highest grade lumber in the shortest possible time with least waste. From your position on the carriage, you can direct operations, while also having at your convenience the feed lever, set lever, headblocks, dogs, and ball locking lever.

Remember that you are the one who "sets the pace" of the entire operation, and if the Harvester is set up properly with plenty of power available, but production is lagging, it is your fault. You should require that the cant turner have the next log rolled into position, ready to roll onto the carriage when you are making the last cut in the preceding log. Also, as you return the carriage to the log-end and tip the ball locking lever into release position, the cant turner should be ready to make the required turn of the log AS SOON AS YOU REACH THE LOG-END. Also require that the off-bearers take lumber away as fast as it comes off the carriage. Do not slow down to accommodate the cant turner or off-bearers except in unusual conditions. If cant turners and off-bearers are unable to work at your speed, insist that more help be added, and if necessary, STOP OPERATIONS until such is had and you are able to proceed EFFICIENTLY AND PROFITABLY. Further, when you slow down a great amount for any length of time, you are very apt to have a "hot saw" on your hands (see page 25 "Don't Ever Saw with a 'Hot Saw,' 'Too Slow.'")

## MAJOR DISMANTLING POINTS

1. Dig sawdust out from under sawdust auger before retracting legs to eliminate the possibility of bending the screw-conveyor on the sawdust mechanism.
2. Take out the removable section of the guide rail before attempting to fold up end of the frame.
3. Remove the sawdust and soil from in front of the wheels to facilitate forward movement of the Harvester.
4. Be sure that carriage is SECURELY LOCKED BEFORE ATTEMPTING TO MOVE OUT OF THE SET-UP.
5. Be sure that headblocks are well advanced to a position which will eliminate projection of the gear racks and provide proper clearance for road travel.

# SUMMARY OF IMPORTANT DO'S AND DON'TS

## GREASING:

1. Use soft, light pressure gun grease.
2. Use ONLY PRESSURE GUN GREASE IN GREASE GUN.
3. Lubricate the kneeslides and gear rack slides, and other moving parts FREQUENTLY with LIGHT MACHINE OIL. Some operators make a practice of lubricating the surface of the knees on which the log rests, when taking on an unusually large log, as it facilitates turning. (Some operators use powdered graphite on the headblock slides instead of oil.)
4. Ball bearings on which carriage slides should be removed, washed out with gasoline, and repacked with pressure gun grease ONCE A YEAR.

## SAW:

1. DON'T EVER SAW WITH A "HOT SAW." See page 25 on saw heating.
2. NEVER SAW WITH DULL TEETH, IT DOESN'T PAY. If difficulty continues after sharpening, put in a new set of teeth to determine whether trouble is in teeth or in saw. If trouble is in the saw, start checking on YOUR METHOD OF SHARPENING SAW. Learn PROPER filing of saw teeth. A Jackson Saw Grinder is on the market now which is very portable and is therefore well adapted for use with the Harvester, and has been highly recommended by many Harvester operators in various states, working with various species of timber. The Jackson Saw Grinder is attached permanently to the Lumber Harvester and becomes an integral part of the unit. It can be powered from the power unit battery or standard 110-volt AC house current. The main factor to remember when using any portable filer is TO MAKE CERTAIN YOU ARE FILING THE TIPS OF THE TEETH SQUARE. (See page 21 "Teeth.")
3. Do not allow chips to rub saw. ALWAYS KEEP APRON CLEAN OF CHIPS.
4. Keep saw clean of pitch. Pitch sticks only to a hot saw.
5. ALWAYS CARRY EXTRA SAW TEETH and be sure to dip them in oil before putting them in saw. (See page 25 "New Teeth.")

## CARRIAGE:

1. BE SURE CARRIAGE IS LEVEL CROSSWISE. Start leveling main frame from center legs to front end. Tighten legs on lumber-end JUST ENOUGH TO TAKE UP SLACK. Center legs should carry at least 50% of the weight on the tires. (See pages 13 and 27 "Leveling.")
2. SET HARVESTER SLIGHTLY LOW ON LOG-END. Govern lowness by ability of carriage to remain at rest when feed lever is in neutral position.
3. ALWAYS CHECK CARRIAGE BEFORE STARTING TO SAW by running up and down track 2-3 times to determine that ropes are in order and saw is in the clear.



4. Always check DOGS WHEN NOT SAWING, especially on the "return" after the last board is cut from the log, keeping them WELL BACK FROM THE SAW.

5. ALWAYS KEEP SAW GUIDE PROPERLY ADJUSTED, with just enough space for saw to run free. (See page 26 "Guides.")

6. ALWAYS LOCK CARRIAGE WHEN DAYS WORK IS FINISHED OR WHENEVER MACHINE IS NOT IN OPERATION, AND NEVER RELEASE LOCK UNTIL OPERATOR IS ON CARRIAGE WITH FEED LEVER IN HAND AND HAS PROPER TENSION OBTAINED ON ROPES.

7. ALWAYS PUT IN CARRIAGE BOLT AND LOCK PIN WHEN MOVING, AND SET THE HAND BRAKE.

#### ROPES:

1. Always take ropes out, or cover them, when rain comes up or at night when leaving machine outside. If ropes can be covered but left in position on machine, they may last longer than if taken out too often. If ropes are left over night BE SURE AND SLACKEN THEM AT EACH END.

2. Always carry extra set of ropes.

3. NEVER ATTEMPT TO OPERATE WITH WET ROPES.

4. Give rope drums squirt of oil MORNING and NOON when machine is new or until drums are worn smooth.

5. When feed rope is worn in center, splice good ends together and use for reverse rope.

6. Change ropes as soon as broken strand warns operator by slight jerk on feed lever.

7. KEEP SAWDUST CLEAR OF ROPES UNDERNEATH CARRIAGE, as pitch and moisture from sawdust accumulated on ropes will cause them to run jumpy. This is especially true when sawing frozen timber.

8. Rope drums are more or less coated with paint and dust on new machines and should be oiled with THIN oil quite liberally for first few hours of operation, or when ropes seem damp. After drums are worn in, they work best when kept free from oil, moisture, and pitch.

#### SAWDUST CONVEYOR:

1. Secure one-half of truck axle, or similar bar, and sharpen end to use as anchor for sawdust chain.