Operator's Manual

CINCINNATI® Shears

CINCINNATI
THE CINCINNATI SHAPER COMPANY
CINCINNATI, OHIO 45211, U. S. A.

OPERATION AND MAINTENANCE MANUAL FOR CINCINNATI SHEARS

THE CINCINNATI SHAPER COMPANY

CINCINNATI, OHIO

YOUR Cincinnati Shear is an accurate tool. This manual will be helpful to you in the care and operation of this MACHINE TOOL FOR SHEARING METAL.

TABLE OF CONTENTS

SECTION I IDENTIFICATION

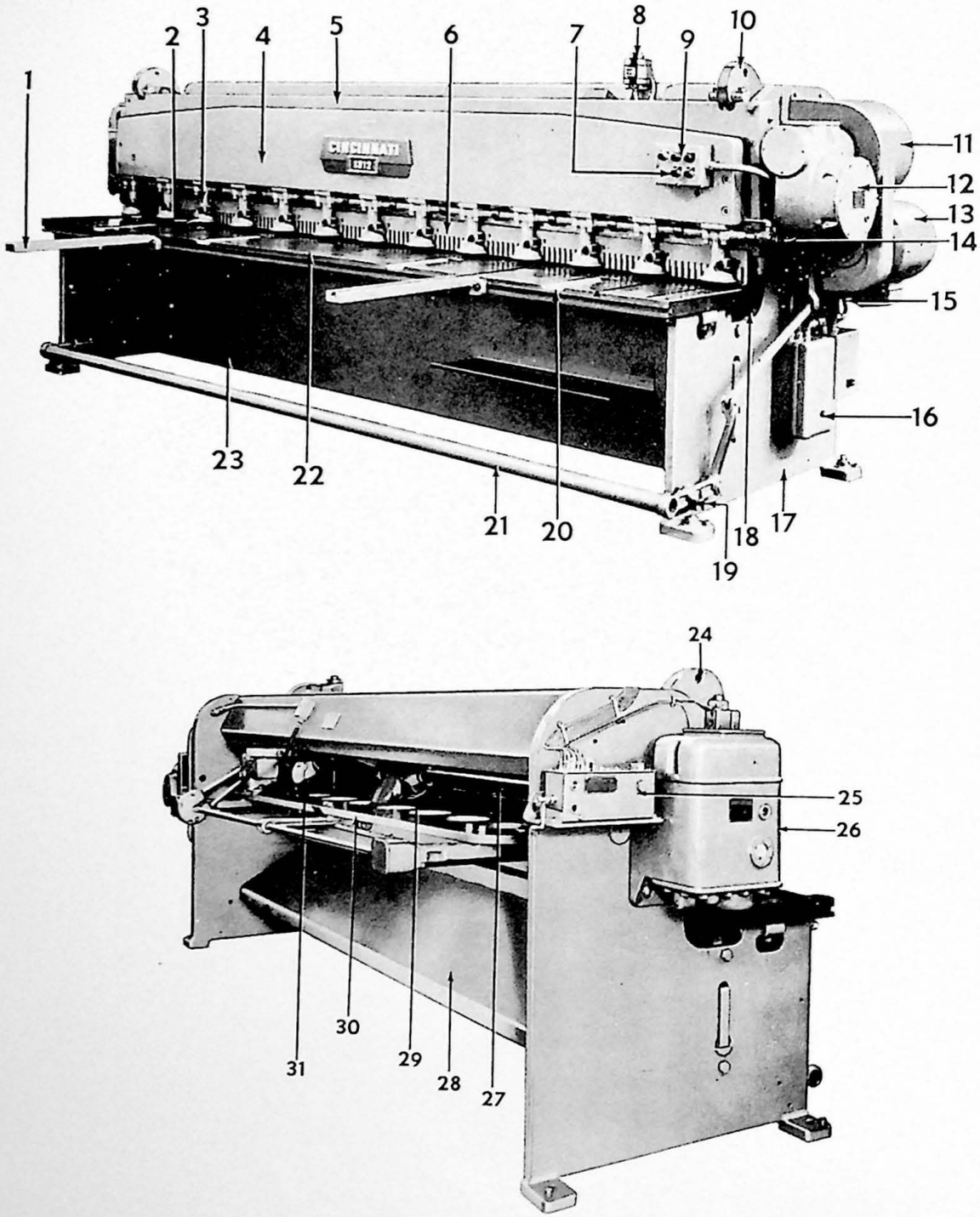


Fig. 1. Identification #10 Series Shear

1. Support Arm
2. Holddown Guard
3. Hydraulic Holddown
4. Holddown Beam
5. Ram
6. Knife Guard
7. Start-Stop Button
8. Power Back Gauge Dial
9. Power Back Gauge Control
10. Connecting Link
11. Flywheel Guard
12. Main Drive Box
13. Motor
14. Bleed Valve
15. Belt Adjustment
16. Starter
17. Housing
18. Gap
19. Treadle Lock
20. Hand Slot
21. Treadle
22. Table
23. Bed
24. Lifting Hole
25. Automatic Lubricator
26. Holddown Box
27. Eccentric Shaft
28. Scrap Chute
29. Brake
30. Ram Brace
31. Back Gauge Motor

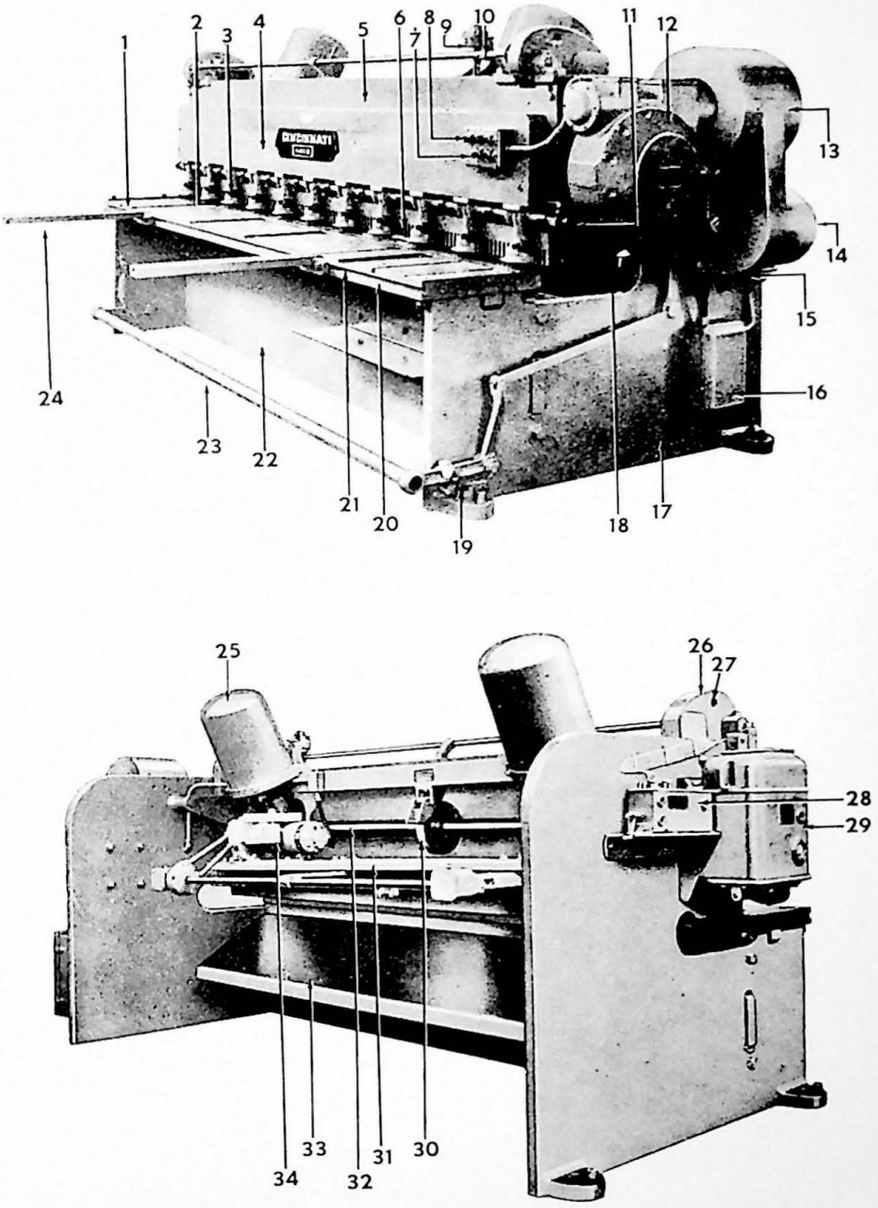


Fig. 2. Identification #14 - #18 - #25 Series Shears

1. Side Gauge
2. Holddown Guard
3. Hydraulic Holddown
4. Holddown Beam
5. Ram
6. Knife Guard
7. Start-Stop Button
8. Power Back Gauge Control
9. Power Back Gauge Dial
10. Ram Adjustment
11. Bleed Valve
12. Main Drive Box
13. Flywheel Guard
14. Motor
15. Belt Adjustment
16. Starter
17. Housing
18. Gap
19. Treadle Lock
20. Table
21. Hand Slot
22. Bed
23. Treadle
24. Support Arm
25. Counterbalance
26. Connecting Link
27. Lifting Hole
28. Automatic Lubricator
29. Holddown Box
30. Brake
31. Ram Brace
32. Eccentric Shaft
33. Scrap Chute
34. Back Gauge Motor

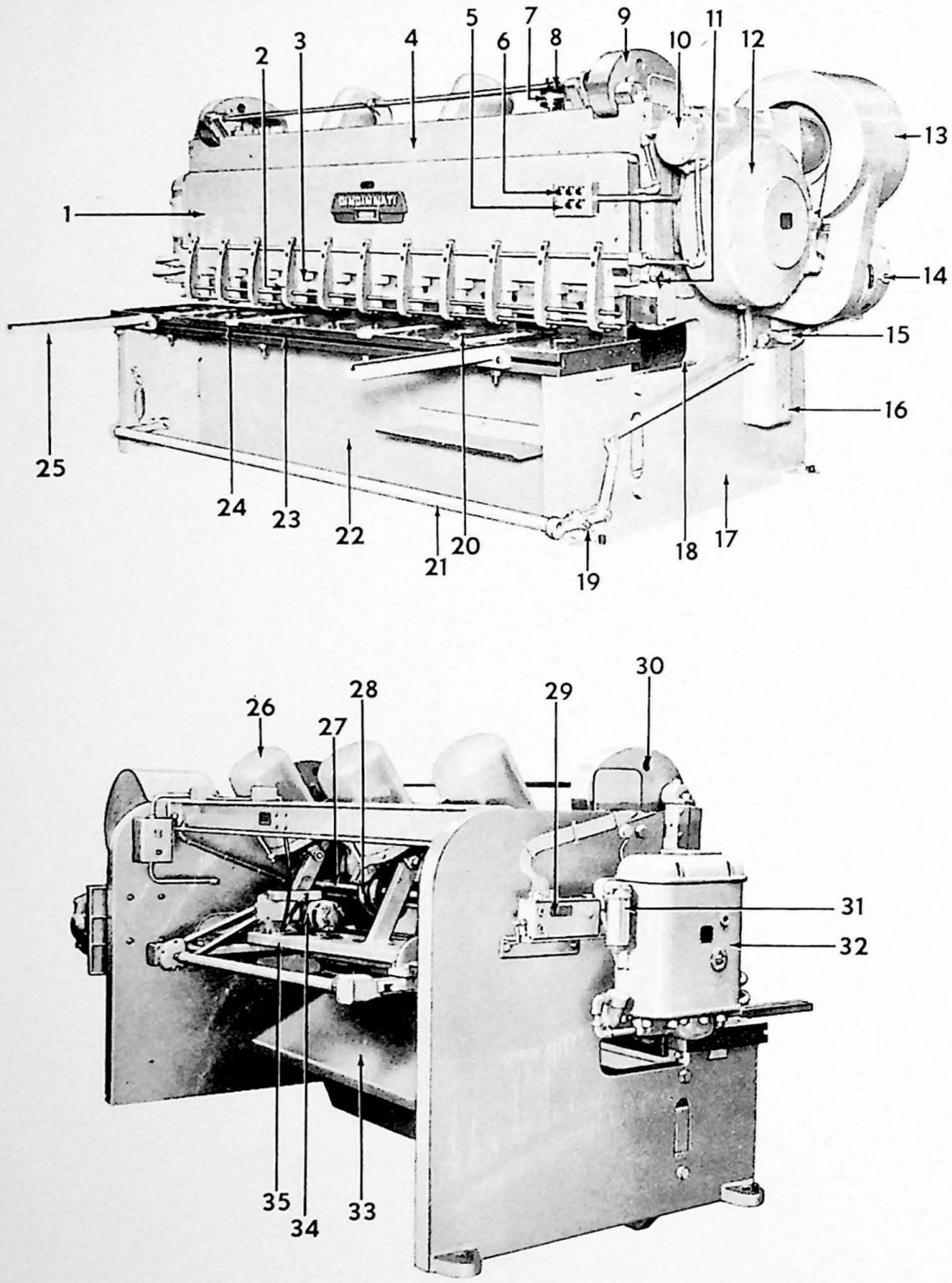


Fig. 3. Identification #43 Series Shear

1. Holddown Beam
2. Holddown Guard
3. Hydraulic Holddown
4. Ram
5. Start-Stop Button
6. Power Back Gauge Control
7. Power Back Gauge Dial
8. Ram Adjustment
9. Connecting Link
10. Vacuum Pump
11. Bleed Valve
12. Main Drive Box
13. Flywheel Guard
14. Motor
15. Belt Adjustment
16. Starter
17. Housing
18. Gap
19. Treadle Lock
20. Ball Transfer
21. Treadle
22. Bed
23. Table
24. Hand Slot
25. Support Arm
26. Counterbalance
27. Eccentric Shaft
28. Brake
29. Automatic Lubricator
30. Lifting Hole
31. Hydraulic System Filter
32. Holddown Box
33. Scrap Chute
34. Back Gauge Motor
35. Ram Brace

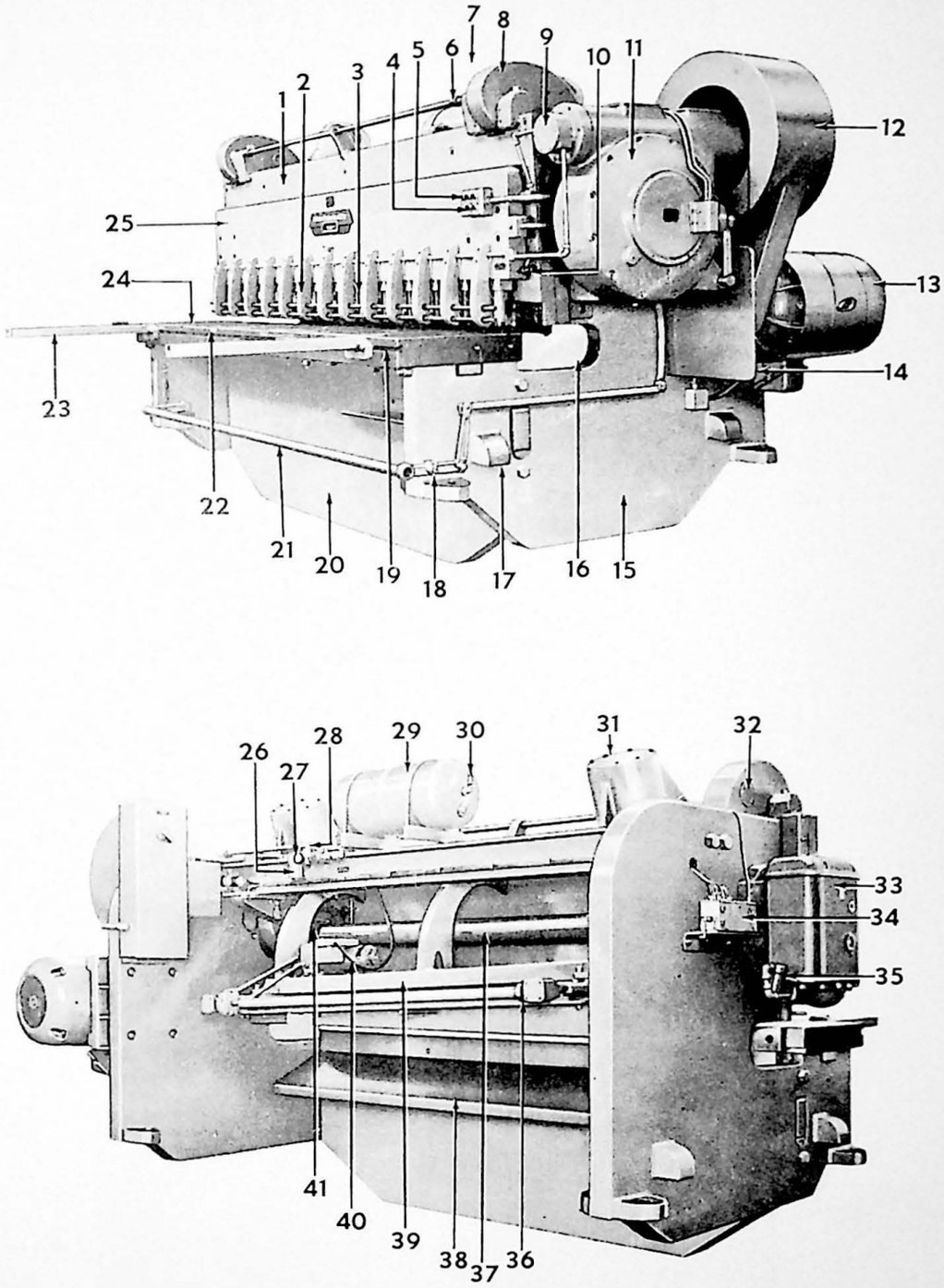


Fig. 4. Identification #62 and #100 Series Shears

1. Ram
2. Holddown Guard
3. Hydraulic Holddown
4. Start-Stop Button
5. Power Back Gauge Control
6. Ram Adjustment
7. Power Back Gauge Dial
8. Connecting Link
9. Vacuum Pump
10. Bleed Valve
11. Main Drive Box
12. Flywheel Guard
13. Motor
14. Belt Adjustment
15. Housing
16. Gap
17. Jacking Lug
18. Treadle Lock
19. Table
20. Bed
21. Treadle
22. Hand Slot
23. Support Arm
24. Ball Transfer
25. Holddown Beam
26. Counterbalance Air Filter
27. Air Gauge
28. Pressure Reg.
29. Surge Tank
30. Safety Valve
31. Counterbalance
32. Lifting Hole
33. Holddown Box
34. Automatic Lubricator
35. Hydraulic System Filter
36. Back Gauge Coupling
37. Eccentric Shaft
38. Scrap Chute
39. Ram Brace
40. Back Gauge Motor
41. Brake

SECTION II INSTALLATION

UNLOADING

Upon receipt of your Cincinnati Shear, carefully remove contents of the one or more packing boxes with the machine. All loose parts, such as wrenches, tools, front support arms, etc., will be found in these boxes. Remove all shipping paper from the wrapped parts of the shear.

Leave skids under the machine until it has been moved to the final location.

LIFTING

Cincinnati Shears are readily handled by cranes of sufficient capacity and chains and cables adjusted to proper length for even lifting. Use timber brace between top of pulldown links. A typical hitch is shown in Fig. 5.

Where crane facilities are insufficient in capacity, or not available, rig the machine into final location. Where rolling is easy, it is frequently desirable to rig the machine into final location even when crane service is available. Be careful to keep machine supported evenly. We recommend professional riggers be employed to handle the machine to insure against damage to the machine or injury to workers.

FOUNDATION

It is essential that the foundation be rigid. It must be able to support the machine without settling. Money spent on a foundation is a good investment. For details of foundation, refer to foundation plan.

REMOVING SKIDS:

Skids should be removed with the shear in position directly over the foundation bolts. Jack up the shear one end at a time and block as shown in figure #6, to remove skids. Lower each end alternately by removing blocking in steps of about 4" at a time until foundation bolts extend into the feet.

Run down the hollow hex leveling screws in the shear feet and rest the shear on these screws. See figure 7. Use steel shims under the screws. On 62 and 80 series shears, jack lugs on the housings are provided in place of jack screws.

LEVELING

Cincinnati Shears are leveled by placing flat steel shims of proper thicknesses under the Shear housings as required.

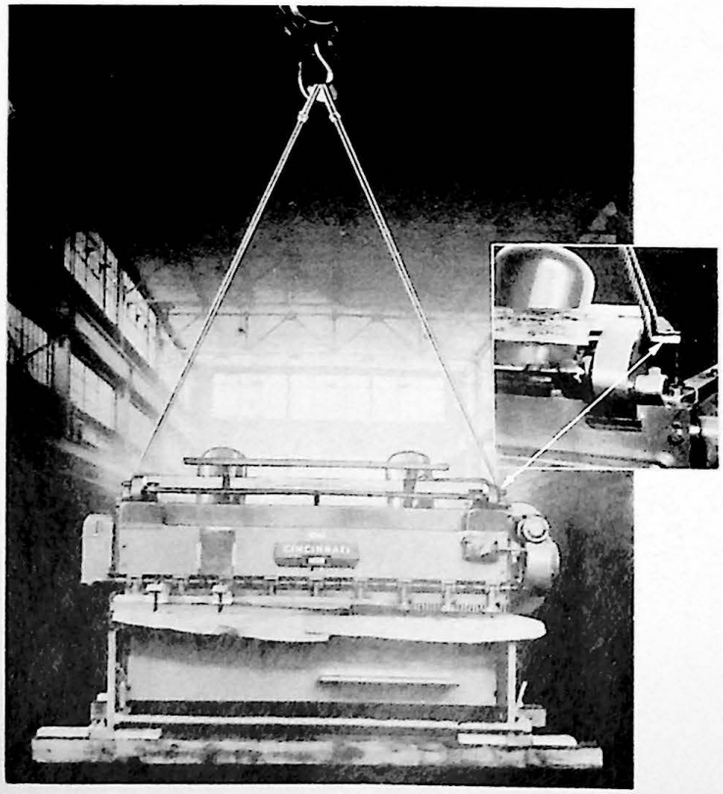


Fig. 5. Lifting

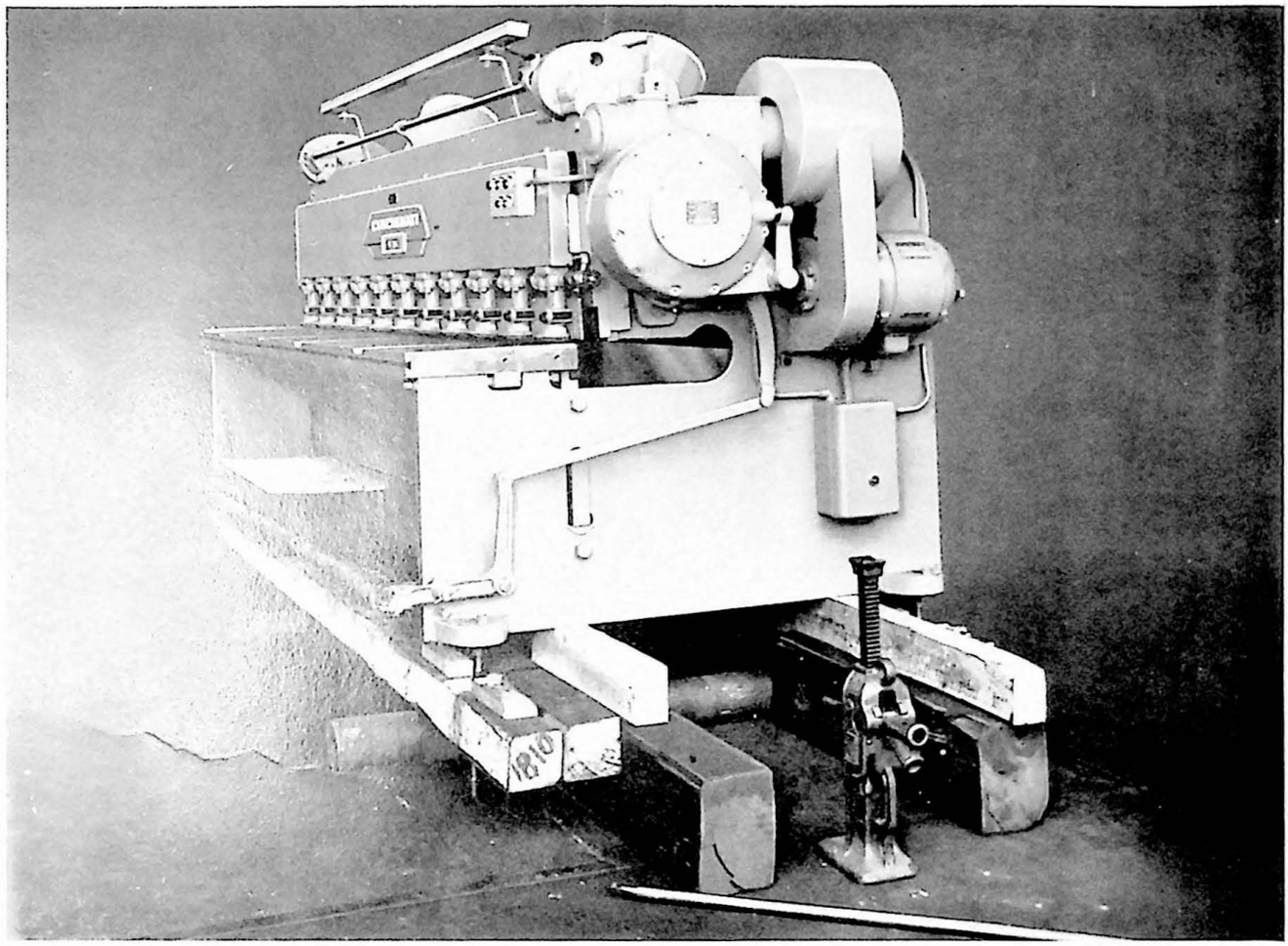


Fig. 6. Jacking Shear to Remove Skids

LEVELING (Cont'd)

Use a precision level — not a carpenter's or machinist's level. Give the bubble of precision level a full half minute to come to absolute rest. Clean protective coat of grease from the top of the table and wipe clean. Always wipe level and table surface clean before placing the level.

Raise or lower shear by means of the leveling screws in the feet. Use at least a 2′ length of pipe on the hollow hex wrench.

Start leveling by checking the setting of the shear lengthwise with the level in the center of the table and parallel to the knives. Level the shear lengthwise by placing the required metal shim under the low housing both front and back. Let the shear down and recheck level. Repeat until shear is level lengthwise.

Level the machine front to back with the level on top of the housing or crosswise on the table as shown in figure #8, first with the level at the right end of the shear then at the left end of the shear.

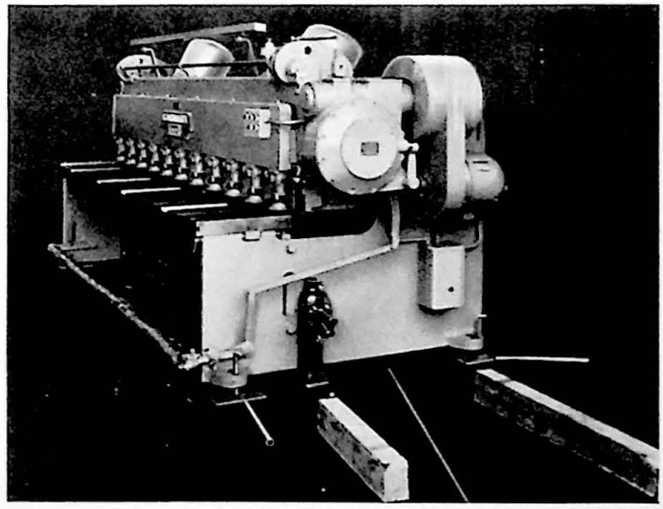


Fig. 7. Leveling Screws

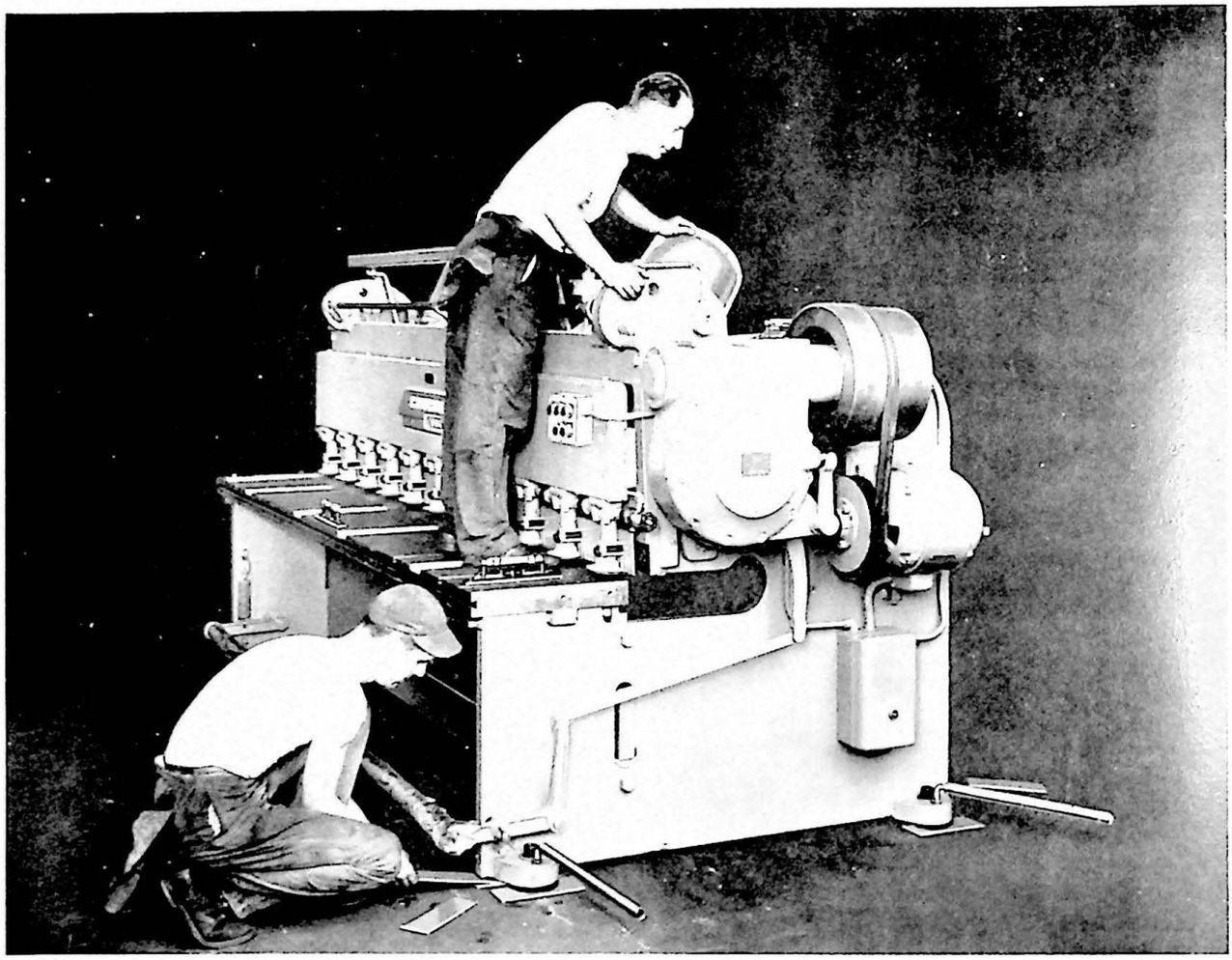


Fig. 8. Level Shear with Jack Screws and Shims

Insert or remove shims under front or back end of each housing as required, using the leveling screws for raising and lowering. LEVEL READINGS ON TOP OF BOTH HOUSINGS (OR BOTH ENDS OF TABLE ON OLD SHEARS) MUST BE ALIKE WITHIN .001". Recheck lengthwise level and repeat until level.

After machine is level, tighten nuts on foundation bolts and recheck level. BE SURE THE SHEAR IS RESTING ON THE HOUSINGS AND NOT ON THE JACK SCREWS. Do not remove shims. If grouting is used, do not grout under bed of the machine.

Leveling may not be permanent. Recheck level in two weeks, and occasionally thereafter.

CLEANING

Thoroughly clean protective grease from all parts with kerosene. Go over the grease with a rag wet with kerosene and allow to soak. Use rags instead of waste. A stiff brush will get into the coroners. Do not use an airhose — pressure will drive grit and dirt into bearing surface.

After cleaning thoroughly, wipe dry and make sure no grease or grit is left.

Periodic cleaning of the machine after installation is advisable.

SECTION III LUBRICATION

LUBRICATION

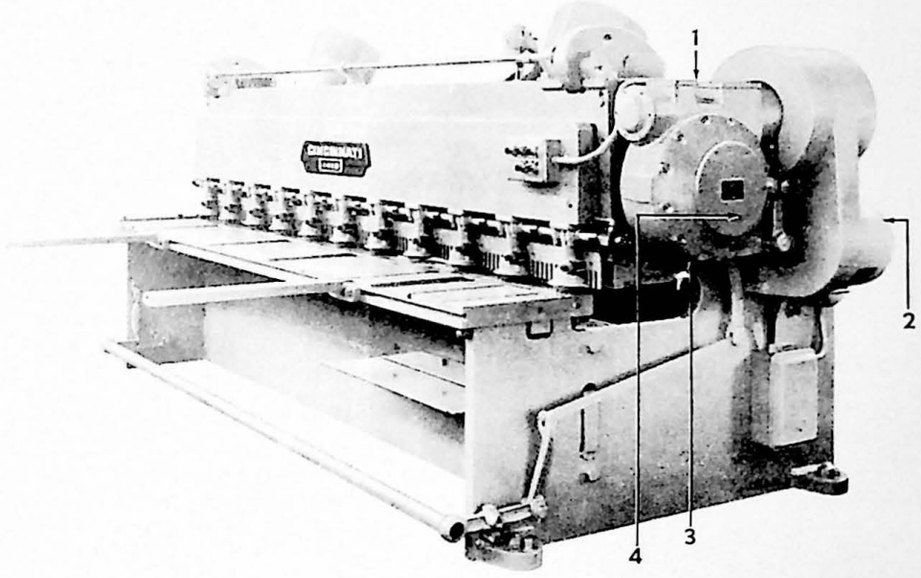
Proper lubrication is of extreme importance if any piece of equipment is to have long life and trouble free operation. Strict observance of all lubrication instructions contained herein will pay dividends in lower maintenance costs of your shear.

Cincinnati Shears are equipped with automatic sight feed lubricators that assures adequate oiling to all power driven bearings. The flywheel shaft, the drive gear, clutch, and holddown mechanism all run in a bath of oil.

Cincinnati Shears are shipped with all gear chambers filled with the proper lubricant. After thoroughly cleaning the machine, turn the hand crank on the automatic lubricator until oil appears at all bearing surfaces. Pay particular attention to the eccentrics and the R.H. Ram Guides of the machine.

NOTE:

See next page for lubrication at numbered points



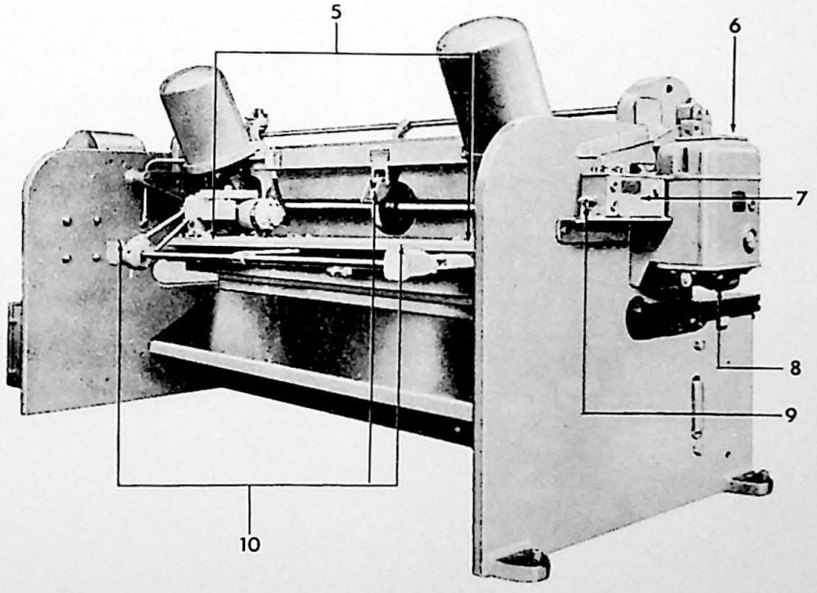


Fig. 9. Lubrication Points #10 - #14 - #18 - #25 - #43 Series Shears

LUBRICATION POINTS

The following lubrication points should be checked at regular intervals to assure proper operation: See Fig. 9 for 43 Series & smaller and Fig. 10 for large shears.

1. Drive Box

Keep drive box filled with worm gear oil (viscosity 155 seconds at 210° F.) compounded with 5 to 7% acidless tallow to the oil level plug. Check oil level with flywheel stopped. A temperature rise of 70° F. in the drive box above room temperature is normal. Drive box capacities are listed in the following chart.

Series	Cap (Gal)	Series	Cap (Gal)
10	¾	43	4 ½
14	1 ½	62	5
18	1 ½	100	5
25	2 ½		

1.A. 62 & 100 Series Ram Adjustment

Fill ram adjustment grease fitting every three months. (62 and 100 series only).

2. Drive Motor

Lubricate drive motor in accordance with motor manufacturing recommendation. Do not over-lubricate.

3. Drive Box Drain Plug

Drain clean and refill drive box six months after installation and every year thereafter.

4. Oil Level Plug

WITH FLYWHEEL STOPPED check oil level by removing plug and feeling with finger as in measuring differential gear oil level in your automobile. Fill to plug level if required.

5. Back Gauge Nuts

Run the back gauge nuts in line with holes and oil every week.

6. Hydraulic Holddowns

The hydraulic holddowns require Hydraulic or Light Turbine Oil, Viscosity 150 seconds at 100° F.

The hydraulic system should be drained and refilled with fresh oil periodically. On a shear receiving an average amount of use, this should be done approximately every twelve months. While refilling the system keep bleeder valve open to let air escape from the lines. Make sure that all air is bled out of the holddown system after it is filled by operating the shear a number of times with bleeder valve open. Close bleeder valve and recheck oil level.

If holddowns operate sluggishly, drain hydraulic system and flush with kerosene by operating the shear several times with bleeder valve open and refill with fresh oil.

Holddown system capacities are listed in the following chart:

6A. Magnetic Filter (43, 62 & 100 Series only) Disassemble and clean magnetic filter each time the oil is changed in the holddown system.

Series	Cap. (Gal.)	Series	Cap. (Gal.)
10	1½	43	4½
14	1½	62	5
18	1½	100	5
25	1½		

7. Automatic Lubricator

Automatic pressure lubricator requires a good grade of machine oil. Viscosity about 300 seconds at 100°F. Capacity one gallon.

8. Hydraulic Holddown Drain Plug

9. Automatic Lubricator Hand Crank

Each time shear is started after standing idle for several hours, turn hand crank until oil appears at the R.H. Ram Guide surfaces.

10. Back Gauge & Friction Brake

Service the grease fittings on back gauge and friction brake every three months.

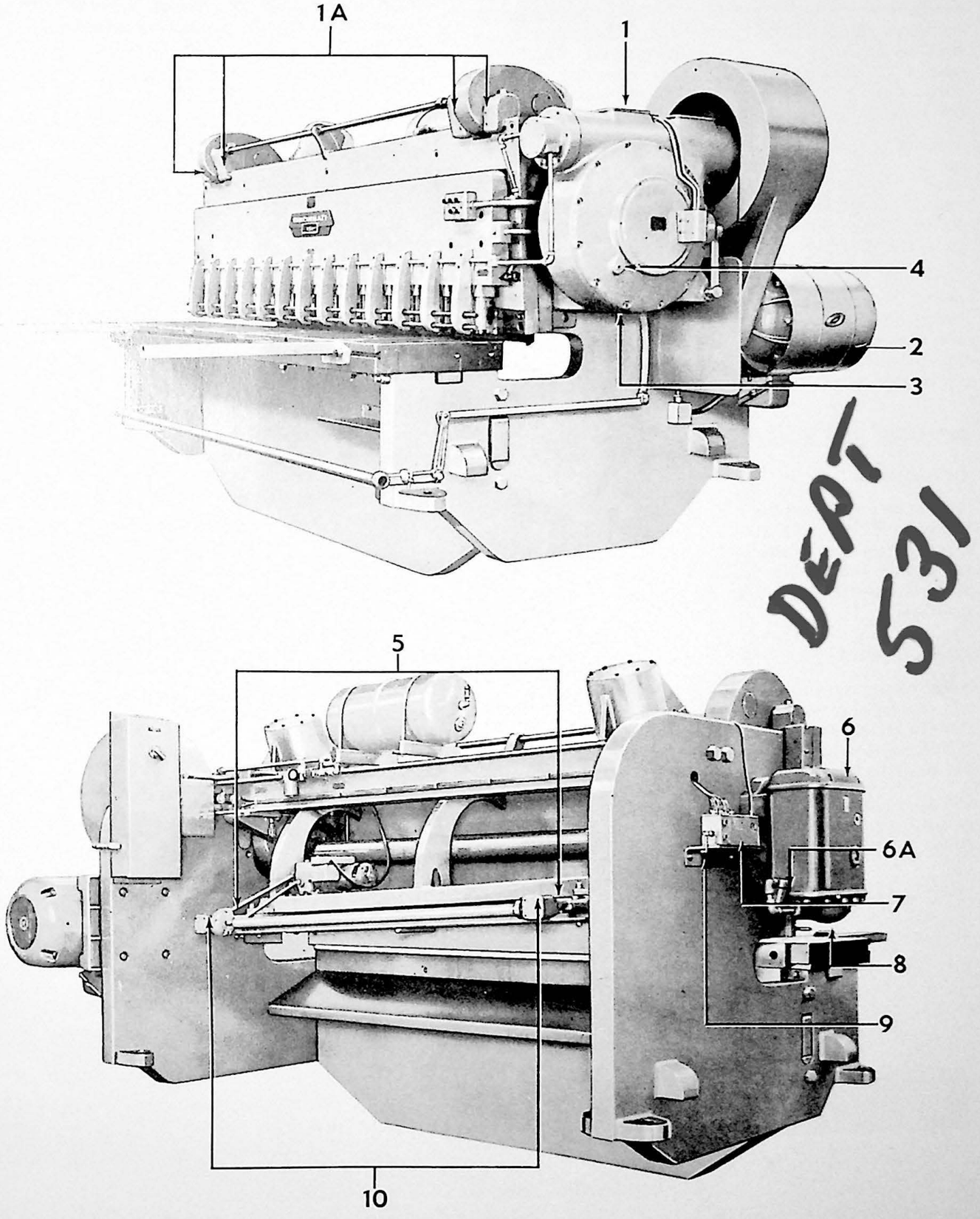


Fig. 10. Lubrication Points #62 and #100 Series Shears

SECTION IV OPERATION

STARTING MACHINE

After completing installation and lubrication procedure you are ready to start the Shear. Care should be taken the first time the shear is operated to see that all bearings are properly lubricated. To do this operate the automatic lubricator by hand until oil runs down the ram guides. Check motor bearings for lubrication.

Unlock the treadle and with flywheel stationary, step on the treadle and carefully jog the motor with the start stop button through one complete cycle. See that the machine is free and there is clearance between knives. See that direction of rotation of the flywheel is in the direction of the arrow on the guard.

Now press start button and bring flywheel up to full speed. At this time clutch will probably knock from being partially engaged due to the jogging cycle. Depress treadle immediately and knocking will disappear with first stroke. For operation of gauges etc., read the rest of this section carefully.

POWER BACK GAUGE

OPERATION

The power operated back gauge is controlled by push buttons "E" Fig. 11 at the front of the shear. The forward fast and backward fast buttons rapidly move the gauge into approximate position. The forward slow button is used to bring the gauge into exact position.

ADJUSTMENTS

After changing and regrinding knives, the dials may not correspond exactly to the size of the piece cut off, due to different knife dimensions. Correct for this difference by loosening set screw "R" and rotating the dials to the proper setting. Tighten the set screw.

Occasionally, it may be necessary to adjust the back gauge for parallelism to the knife edge. Run the back gauge forward until it touches a 1″ gauge block held at the left end between the lower knife and the face of the back gauge angle. Then try the block at the right end. Loosen the nut on tee bolt "W" and move angle forward or backward by adjusting nuts at "P". Do not loosen pivot nut "F". Adjust the angle at "P" until the block fits the same at both ends. Tighten all nuts.

On back gauges with swinging angles, an adjustable coupling on the connecting shaft is used to move one back gauge screw independently of the other. Loosen nut on the screw in the coupling and make adjustment by turning this screw. Tighten nut.

A properly adjusted back gauge angle should be dead straight or approximately .002″ hollow in the center. This insures solid contact between the edge of the sheet or plate, and gauging surface of the back angle on at least two points to give accurate gauging. Contrariwise, gauging with an angle bowed toward the operator gives a contact at only one point and allows the operator to rock the sheet or plate from side to side, and the results will not be consistent. Check the center with a 1″ gauge block. It should fit the same as at the ends, as described in the foregoing or be approximately .002″ loose. The angle is set straight or hollow by adjustment "X" Fig. 11. Loosen the nut on tee bolt "W". To throw the angle hollow, loosen the outside nut and tighten the inside nut at adjustment "X". Tighten tee bolt again to secure angle.

CHAIN DRIVE ADJUSTMENT

Remove the screws that hold the two halves of the rear sprocket guard together. Place a small pan directly under this guard to catch the oil and pry these two halves apart, being careful not to damage the gasket. Next loosen the four screws "Y". Then move the power unit by means of adjusting screw "Z" to adjust the tightness of the chain.

A friction clutch on the sprocket prevents damage to the drive mechanism if the gauge strikes an obstruction. Increase the friction by tightening the locknut holding the plate against the sprocket.

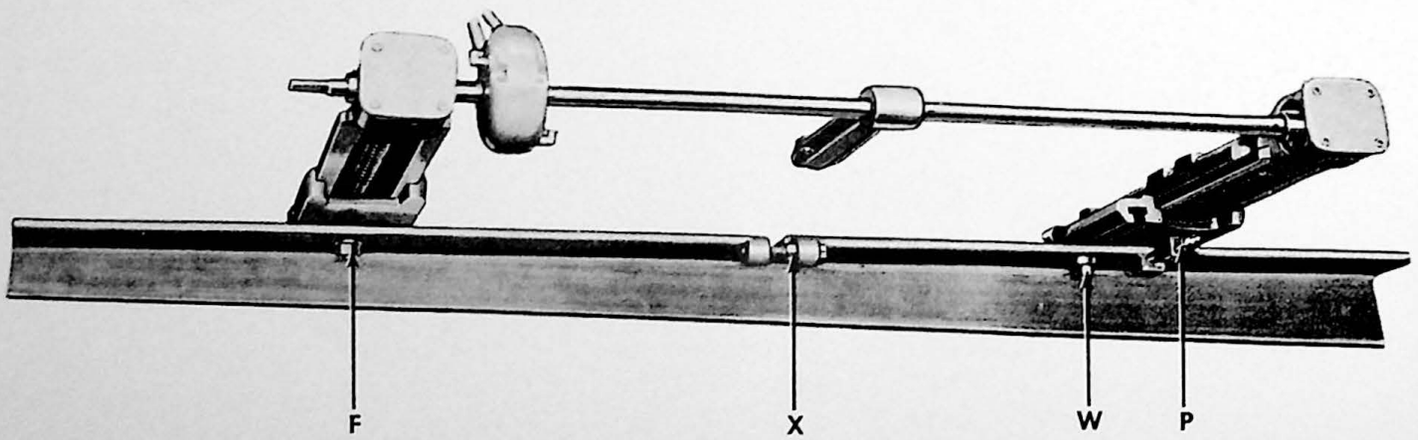


Fig. 11. Power Operated Back Gauge

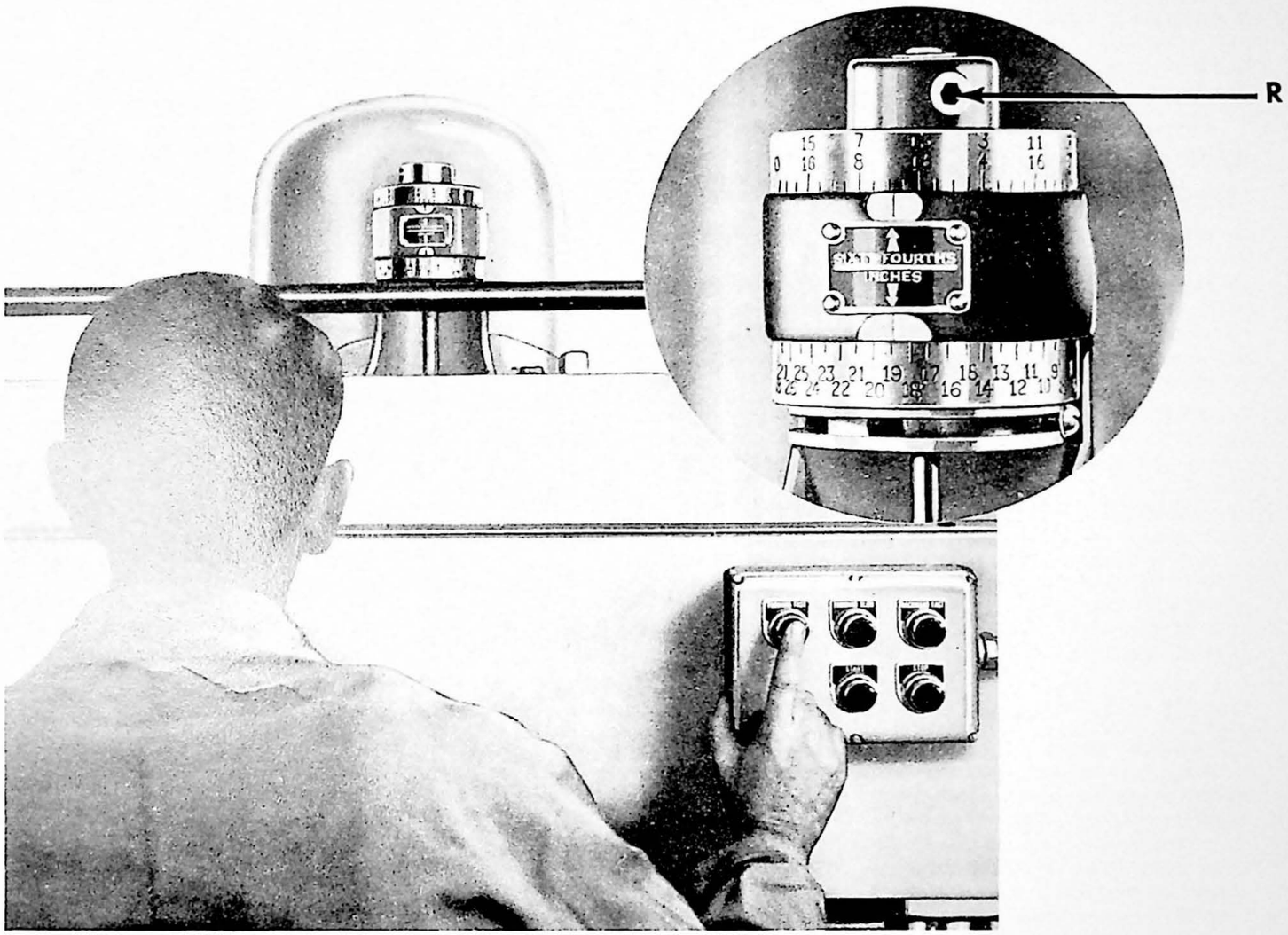


Fig. 12. Power Back Gauge Control

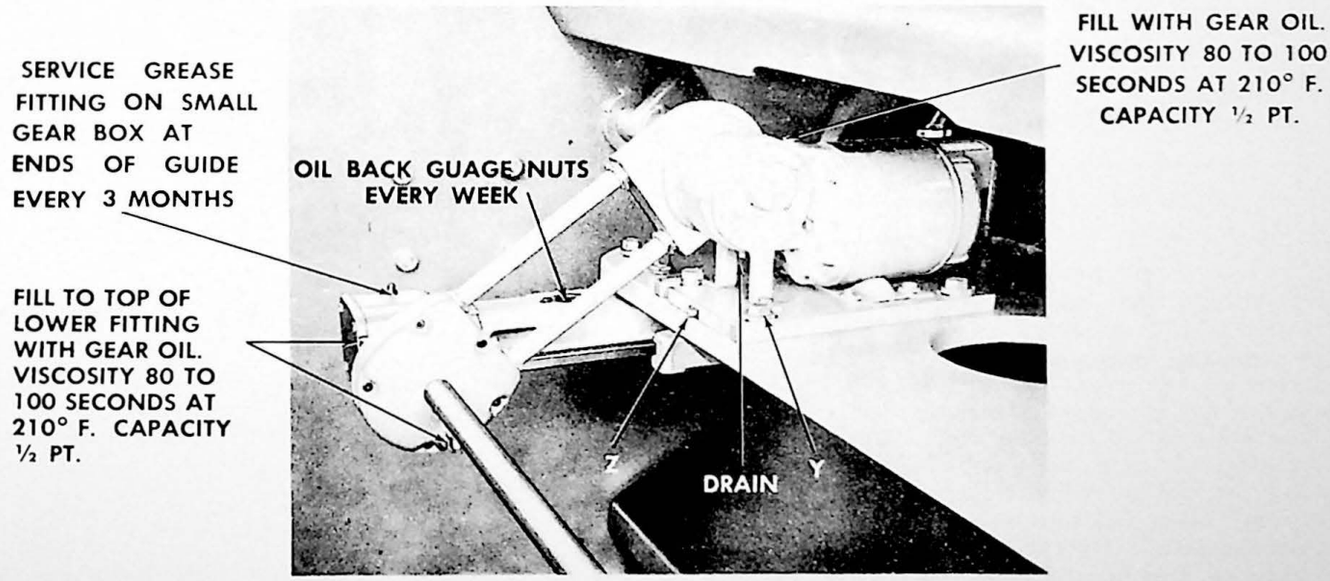


Fig. 13. Power Back Gauge Motor

BRAKE ADJUSTMENT

A brake on the motor holds the gauge when the push button control is released. If the gauge does not stop as quickly as it should, move the lever on the end of the motor clockwise to tighten brake.

RAM ADJUSTMENT

OPERATION

On all but the 10 series shears the ram or upper knife bar is equipped at the top with eccentrics for adjusting the position of the stroke. Accordingly, the position of the stroke can be changed as required for squaring, slitting, notching, or for compensating for the amount removed from the upper knife in the regrinding.

To adjust the ram, loosen nut "D", Fig. 14, at each end of the ram sufficiently to bring the teeth of the clamp block out of mesh with the teeth of the eccentric gear. Rotate the adjusting shaft "G" until the desired setting is reached, and one of the graduations is in line with the zero mark. Tighten the nut "D" at each end of the ram. DO NOT ATTEMPT TO RUN THE SHEAR WITHOUT FIRST SECURELY TIGHTENING THE NUT "D" AT EACH END OF THE RAM. Just to the outside of nut "D" each clamp has a through hole in which there is a small indicator pin. When the clamp block is properly seated the pin is flush with the top surface.

Adjustment can be made on the 10 series by changing the shims under each end of pins on top of the ram. When changing shims loosen screws at both sides but only completely remove one at a time. Be sure to shim the same amount at all four points. Do not shim more than ¼" total thickness. Securely tighten screws. Complete removal of shims will permit slitting with new knives.

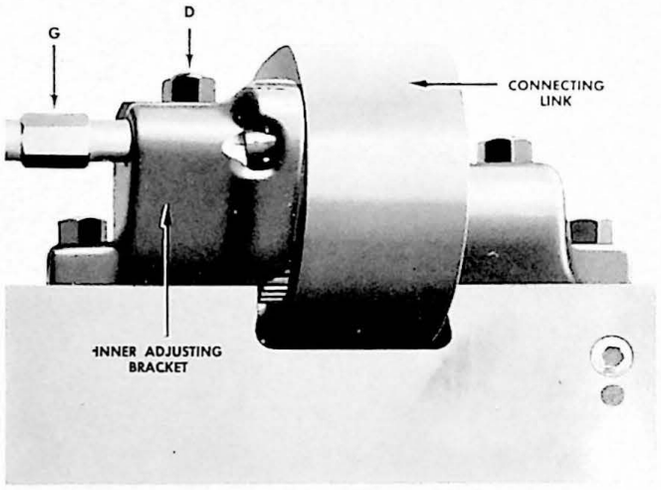


Fig. 14. Ram Adjustment

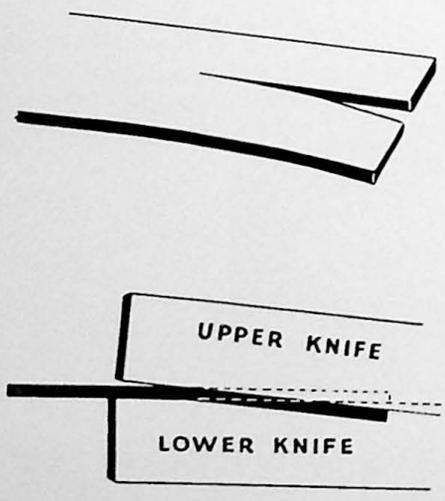
RETIMING

If the shear is operated with one clamp block lo... the pull of the connecting link will rotate the adj... ing eccentric to its lowest position. This will c... twist the shaft "G" Fig. 14 or break teeth from ... pinions. If this happens it will be necessary to re... the eccentrics as they will bind the ram and cause cutting of the ram clamps if the shear is operated in this condition. To retime the adjusting eccentrics proceed as follows:

1. Place a screw jack under each end of the ram.

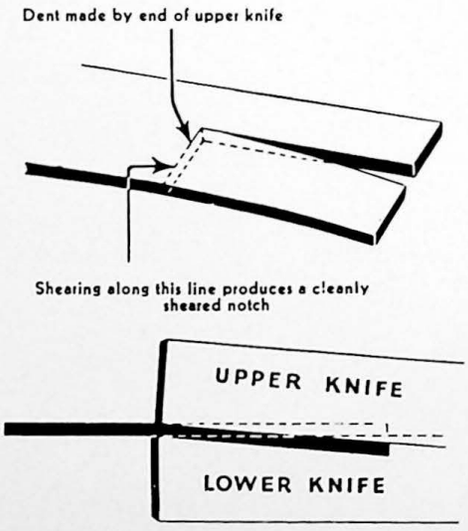
2. Remove the screws holding the inner adjusting brackets and slide them toward the center of the shear. Leave nuts "D" Fig. 14 on loosely when using a hex key to remove the studs.

3. Drive the taper pins out of the pinions.



SLITTING

For slitting, set adjustment so knives do not close at the open end. The sketch shows how ends of knives should remain open at bottom of stroke with respect to the plate thickness.



NOTCHING

For notching, set adjustment so knives do not close at open end, but opening should be less than for slitting. The sketch shows setting at bottom of stroke with respect to plate thickness, and how end of knife makes a shallow dent.

Fig. 15. Proper Adjustment for Slitting and Notching

4. Spring the adjusting shaft enough to remove it along with the pinions and brackets.

5. Weld up the four pin holes in the shaft and dress flush.

6. Either weld up the taper pin holes in the pinions and dress flush or obtain new ones.

7. Temporarily replace the inner adjusting brackets without screws, shaft, or pinions. Using a brass rod, tap against the gear teeth of the eccentrics to turn them around to where the zero lines on the inner faces of the gear portion line up with the zero lines in the bottom of slots for the clamp blocks. Adjust the screw jacks while doing this.

8. Remove the adjusting brackets and replace with the shaft and pinions. Screw them securely in place. The zero line must line up with the line at the window in the front of the bracket at each side as well as the zero lines mentioned in item 7 above.

9. Drill, ream and drive the four taper pins.

10. Remove the screw jacks and adjust the ram to the desired position as outlined above. Be sure to replace the indicator pins in the clamp blocks.

CHANGING AND SETTING KNIVES

PROCEDURE

To turn or change knives.

1. Remove the knife guard.

2. Place wooden blocks on the table to project under the upper knife and support it, Fig. 16.

3. Remove the nuts and washers from the knife bolts and push out the bolts which are not in line with holddowns.

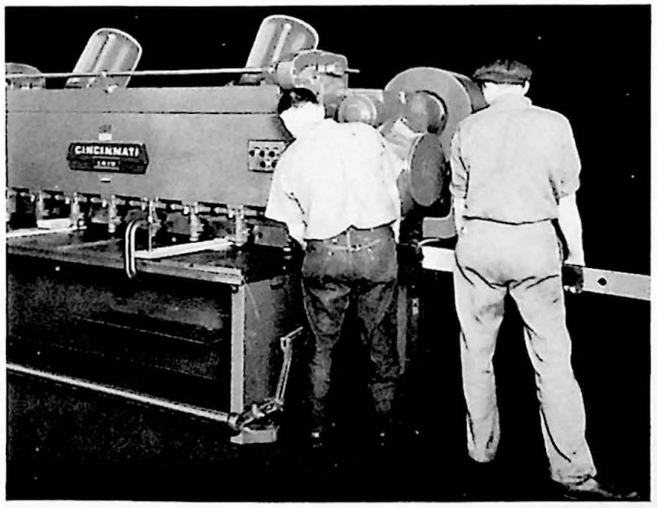


Fig. 16. Changing Knives

4. Push the upper knife to the left as far as possible and take out the remaining bolts, Fig. 17. On 43, 62 and 100 shears, push the knife to the right.

5. Slide the upper knife from the machine.

6. Clean the knife and the knife seat in the ram.

7. Turn the knife and bring a sharp edge to the cutting position and slide it back into the shear over the blocks on the table.

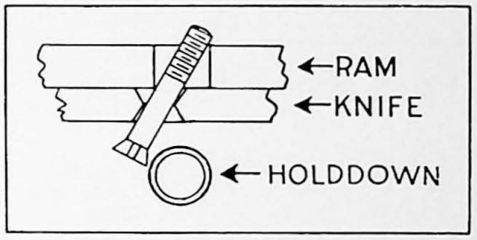


Fig. 17. Removing Knife Bolts at Holddowns

8. Replace the bolts which were taken out at an angle. Slide the knife into its normal position and insert the remaining knife bolts. Be sure that the tongues on the bolt heads go into the keyways in the knife.

9. Hold the upper knife tight against its seat, by prying up with a long wooden lever at the center of the shear, and tighten the center bolt. Repeat this prying operation as you tighten each bolt. Work from the center to the right and then from the center to the left until all the bolts are tight.

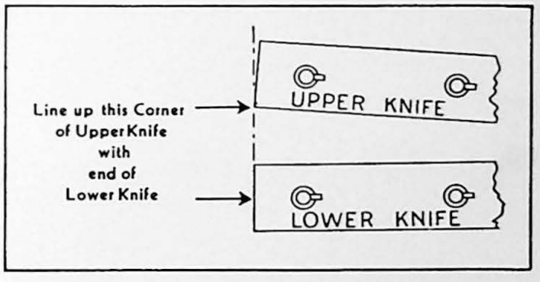


Fig. 18. Lining Up Knives

10. Remove the lower knife, turn it over and replace it in the shear with a sharp edge in the cutting position. NOTE-After knives are reground, adjust laminated shim under lower knife (See figure 19) and set cutting edge level with or slightly above the table top. Laminated shim packs are furnished with the shears and are also available from the factory. Use a straight edge or steel scale resting on the table surface to check this setting. The knife has a slight tilt and the edge against the table will be lower than the cutting edge. The ideal setting is where the straight edge hits the center of the knife. This means that the rear half is slightly above the table level. See instruction sheet for shimming lower knife in the rear section in this manual for additional information.

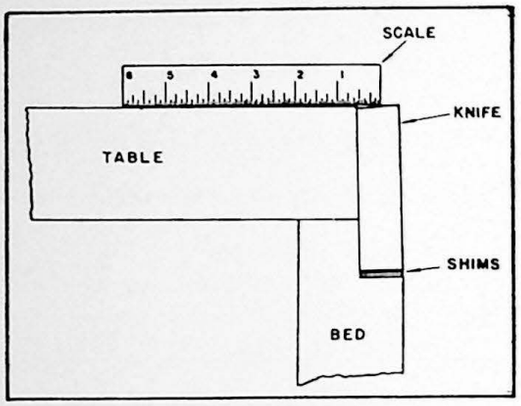


Fig. 19. Shimming Lower Knife

To set knives:

1. Loosen the nuts which hold the table to the bed and housings. The nut at each end of the table should be kept moderately tight during adjustment. Move the table backwards with the adjusting screws, to be sure that the upper knife will clear the lower knife as it comes down.

2. Stop the flywheel, remove the flywheel guard and open the holddown bleed valve. Engage the clutch and move the ram down by rotating the flywheel by hand until the knives cross behind the first holddown.

3. Move the table forward until a .010″ feeler will just go between the knives where they cross at the first holddown. Then slowly run the ram down until the knives cross at the last holddown and adjust to .010″ clearance at that point.

4. Tighten the nuts which hold the table to the bed and housings.

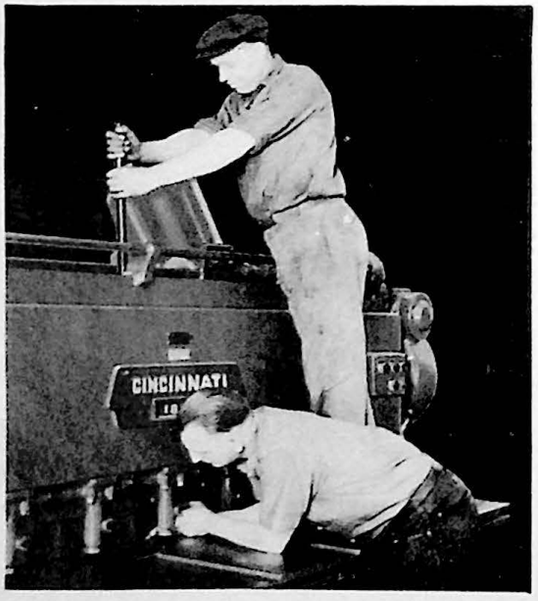


Fig. 20. Setting Knives

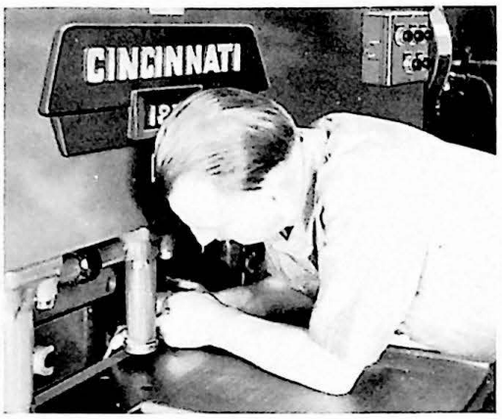


Fig. 21. Close-up of Knife Setting with Feelers

5. Lower the ram again; then check the clearance at each holddown. The clearance should diminish as you approach the center where it should be about .008″. If the clearance varies too much, realign the ram by means of the adjusting nuts. "C", Fig. 22.

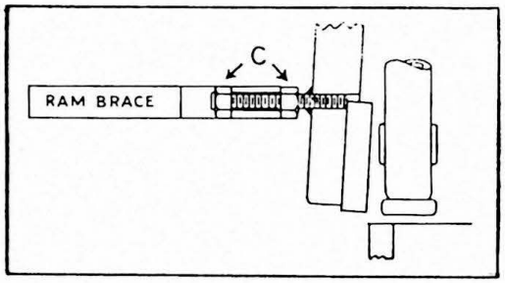


Fig. 22. Ram Brace Adjustment

6. The stiff ram brace controls the alignment of the ram by means of studs and nuts. By loosening one nut, "C" Fig. 22, and tightening the other you can move the ram the desired amount. One man should check the clearance while the other stands on the table and uses the long handled wrench to adjust the nuts, Fig. 20. Use a long wrench to adjust the nuts. Use a short wrench when necessary. Do not stand on the ram brace. After making each adjustment be sure that both nuts are tight.

7. Now that you have the knives set with .010″ clearance at each end, you can get another clearance say, .004″, by moving the table .006″ forward. Check the clearance again with feelers at each end.

The foregoing also applies to installation and setting of knives after they have been reground. Reground knives also require adjustment of:

1. Back gauge dials.
2. Scales in the table.
3. Ram or upper knife bar.
4. Shim on the lower knife.

KNIFE CLEARANCE

It is not necessary to change knife clearance for successful shearing on a Cincinnati. SET THE KNIFE

CLEARANCE FOR THE THINNEST MATERIAL AND SHEAR ALL THICKNESSES UP TO CAPACITY. Clearance should be approximately 7 per cent of the thickness of the lightest material to be cut. Set the knives approximately .002″ closer at the center than at the end on clearances greater than .004″. Recommended knife clearances for general purpose work are given in clearance chart, Fig. 23.

When cutting a range of thicknesses that extend into the very light gauges, set the upper knife straight and use a full length knife clearance of .0015″ to .002″. Very light guage materials require sharp knives.

Series Shear	Left end	Center	Right end
10, 14, 18 and 25	.005″	.003″	.005″
43	.010″	.008″	.010″
62	.020″	.018″	.020″
100	.020″	.018″	.020″

Fig. 23. Knife Clearance for General Purpose Work

REGRINDING

Knives must be ground carefully to give you good results. We recommend you send your knives to shear knife manufacturers for regrinding because they are experienced in the care of your knives and have the equipment to give you an accurate grind. When returning knives to be reground, specify the grinding limits given below.

GRINDING LIMITS

Width—parallel within .005″ from end to end.
Thickness—parallel within .003″ from end to end.
No variation greater than .001″ within any 12″ of length.

KNIFE LIFE

Some of the factors governing knife life are:

1. Grade of knife that was purchased with the Shear. There are at least 3 grades of knives. The best grade will give approximately 4 to 6 times the knife life that you will obtain with a standard grade. We recommend High Carbon Chrome knives on ¼″ mild steel and lighter and Electric Induction Steel knives on ⅜″ mild steel and heavier.

2. The number of cuts that you make in 24 hours (not the tonnage).

3. The kind of material that you are cutting. Alloy steels, such as stainless, must have High Carbon, High Chrome or Electric Induction Steel knives.

4. The care with which adjustments are made.

5. Whether you distribute the cutting of short pieces at different points throughout the length of the Shear.

NOTE: Extensive tests on squaring shears show that knife clearances have no measurable effect on the knife life.

ADVANTAGES OF CINCINNATI CONSTRUCTION

The inclined upper knife bar on Cincinnati Shears is an important feature offering five distinct advantages. This design makes it possible to shear the edge of the table piece perpendicular to the surface with clearance between the knives. It partially offsets the thrust due to the shearing action; it presents the corner of the knife to the work, thus getting the effect of a slightly beveled blade; the back gauge traveling at this angle moves down and away as the stroke progresses, so that work will not normally pack between the gauge and the lower knife; it permits the use of knives with straight sides.

Knives with straight sides gives you the advantage of extra strength due to better section. Also, the overall ground surface of straight sided knives eliminates the possibility of cracks. Straight sided knives also give a solid fit in the knife seat with no chance for the holding bolts to spring the knives. The straight sided knives are ground easier. There is less tendency for narrow strips to be caught because the straight sided knife is free of the undercut or recess found in the usual knife.

The foregoing advantages are illustrated in the sketch, Fig. 24.

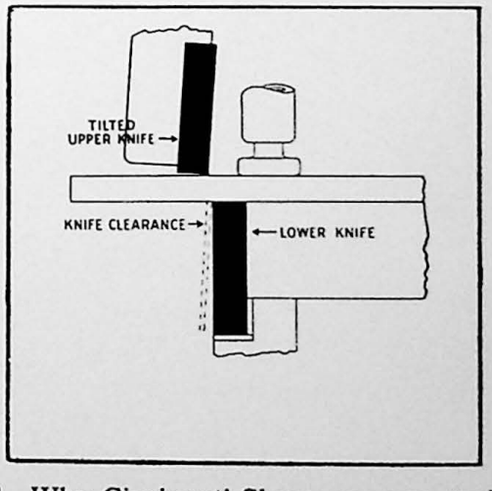


Fig. 24. Why Cincinnati Shears can use straight sided knives and also cut a square edge with full clearance between Knives

FRONT GAUGING

Cincinnati Shears are equipped as standard equipment with two front support arms and two disappearing stops (See Figure 26) for front gauging sheets that cannot be handled with the standard back gauge. With additional stops arranged as shown in Figure 25 they can be used for shearing light gauge sheets that sag too much to be accurately gauged with the back gauge without a sheet support. Stops are made with a two step gauge to provide for trimming both sides of a sheet.

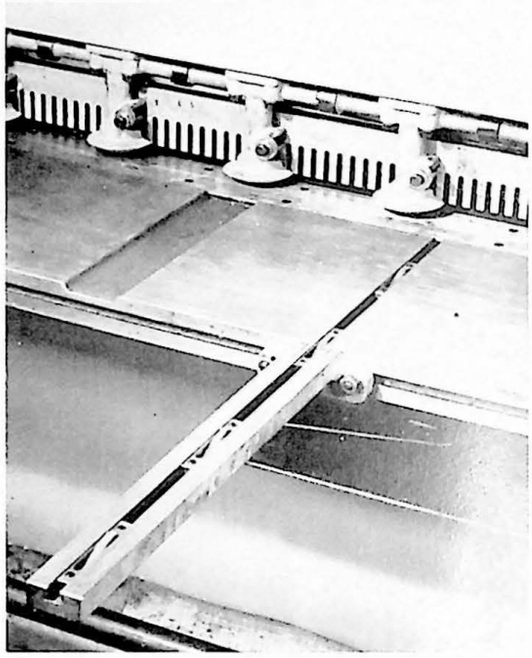


Fig. 25. Disappearing Stops

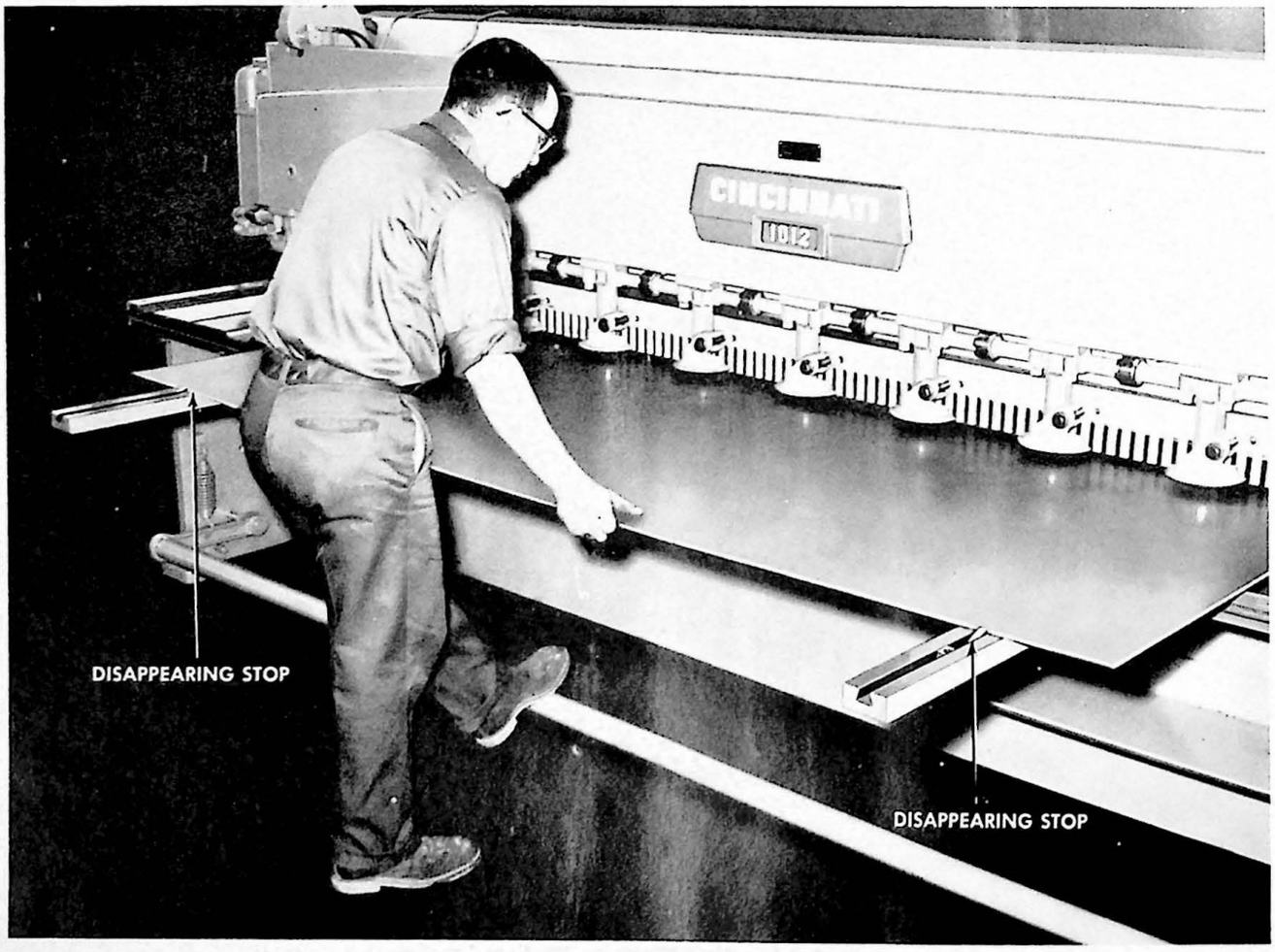


Fig. 26. Front Gauging with Support Arms and Disappearing Stops

SECTION V MAINTENANCE

ACCURATE PERFORMANCE

So that you obtain the exceptionally accurate performance which your Cincinnati Shear can give, the following points should be remembered:

1. The shear must be level. Check front to back at each end of table with precision level or check on top of the housings where they are finished. See leveling instructions.

2. The knives must be sharp and set with the proper clearance.

3. Use the holddowns on all pieces. Work must be held securely to be cut accurately.

4. The valve at the right hand end should be closed, and the holddowns should maintain their pressure throughout the cutting or downstroke. See holddown system, check list, page 27.

5. Operator must hold work solidly against gauge. Gauge edge of sheet must be straight.

6. For maximum accuracy when shearing capacity thickness, butt work against the side gauge at the open or high end of the knife.

7. The table adjusting screws and the nuts holding the table to the bed and housings should be tight. See knife setting, page 18.

8. The ram should stop very near the top dead center.

Attention to these points will be repaid by accurate results. Lack of attention to these points will cause inaccurate work and possible injury to the shear. For example, an attempt to split a thin narrow strip that is not held by holddowns may result in the strip being tipped up and forced between the knives if the clearance is excessive and knives are dull. This will jam and strain the shear.

After years of operation check these points to re-establish accurate performance.

1. All knife bolts must be tight as must be the nuts on the ram adjustment studs between the ram and ram brace. The end studs may have become loose — if so chip away the weld, tighten the nuts and reweld.

The back gauge assembly should be in good condition with very little play. The back gauge angle itself should be smooth on its face and have a slight hollow of .002″ to .003″ (clearance) in the center when the ends are properly set with a gauge block. See adjustments under BACK GUAGE, page 14.

3. The lower knife should be shimmed properly. See item 10, CHANGING KNIVES, page 17.

4. The four socket head screws holding the holddown beam to the housings must be tight.

5. The ram gibs should be set with .003″ clearance. In some cases it is necessary to engage clutch and turn flywheel by hand to bring gib over guide for proper adjustment.

GRADE OF MATERIAL

In addition to sharp knives and proper adjustments, accurate shearing requires good material. Material that is full of strains, buckled sheets, second stock, etc., will not give results as accurate as first grade stock. Twist, camber, and bow, will also be more pronounced.

RAPID CUTTING

Cutting on each stroke with the treadle down usually requires larger motors than standard.

DRIVE

OPERATION

The drive is vee belt from motor to flywheel, then through a silent worm and wheel reduction unit and jaw clutch to the main shaft. The flywheel is carried by the worm shaft and drives it through a friction mounting on all shears except the 10 series. Slippage of the flywheel on this mounting should only occur in the case of an overload. If the shear will not make a full length capacity cut, remove the flywheel guard and check for slippage by making chalk marks opposite each other on the flywheel and mounting. Tighten nuts over springs only the amount needed to prevent slippage. The worm wheel is mounted on the spider and turns constantly when the drive motor is on. The spider has multiple jaws on its face for driving the clutch.

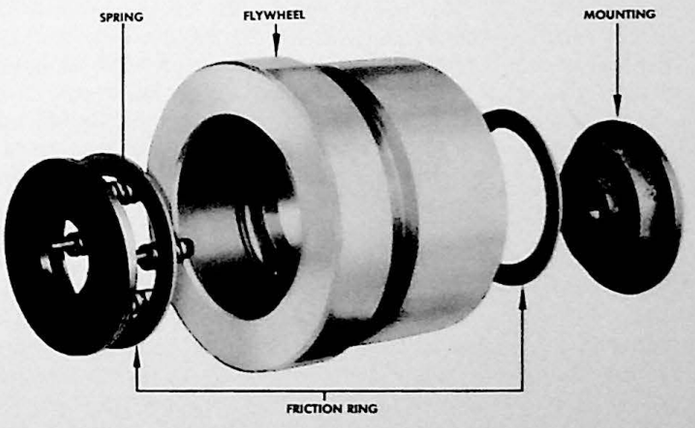


Fig. 27. Flywheel Friction Mounting

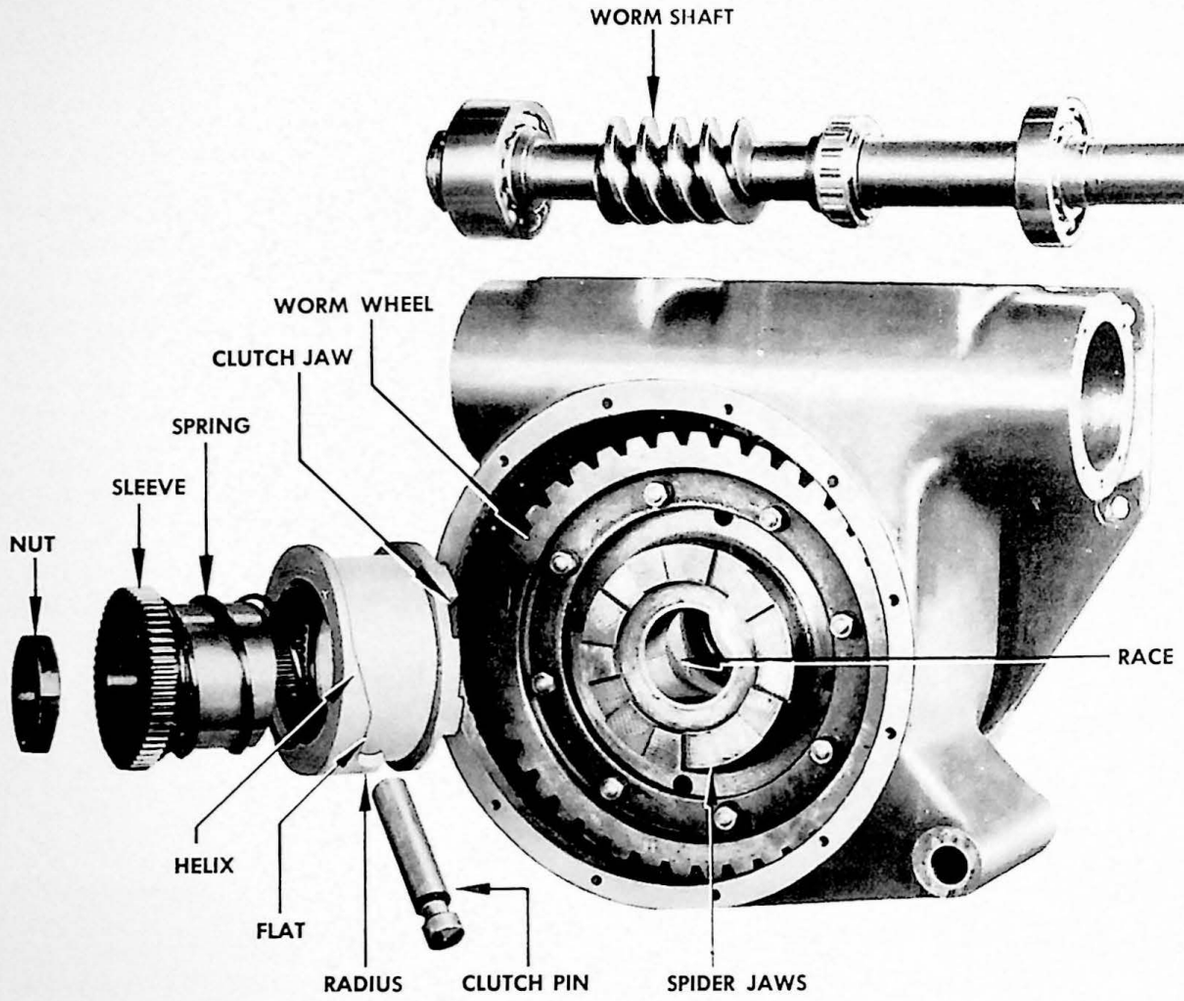


Fig. 28. Multiple Jaw Clutch

CLUTCH

OPERATION

The clutch, Fig. 28 which has multiple jaws on its inside face, slides on the sleeve and is splined to it. The sleeve is keyed and forced on the tapered end of the drive shaft and is retained by a nut. The clutch is constantly pushed toward the spider by a spring between it and the sleeve. In the idle position the clutch is held away from the spider by the clutch pin. When the clutch pin is withdrawn, by depressing the foot treadle, the spring forces the clutch jaws into mesh with the revolving jaws on the spider and causes the drive shaft to turn. As long as the treadle is held down, the drive shaft will continue to turn and the shear ram will make continuous up and down strokes. When the treadle is released, the clutch pin moves in, and at the proper time, engages a helix on the clutch, pulling it out of engagement with the spider.

The clutch is only driven by the spider as long as its jaws are in mesh with the spider jaws. However, in order to get complete disengagement of the jaws, the clutch must continue to turn slightly beyond the point of disengagement. Normally the momentum of the drive shaft and other moving parts, together with the help of the spring counterbalances for the ram, will continue rotating the clutch until the full length of the helix has moved past the clutch pin.

At the end of the helix there is a flat portion and then a semicircular pocket or a radius forming a positive stop. When the clutch is properly disengaged, this flat portion should rest on the clutch pin. No adjustment or change in timing should be necessary for the life of the clutch.

CLUTCH KNOCKING

Continuous knocking should be corrected immediately as this will round the jaws much more sooner than normal use. Continuous knocking of the clutch with the ram in the up position indicates incomplete disengagement. Before attempting to correct this condition by changing the clutch timing, check the following items:

1. The clutch may have disengaged with the shear operating at reduced speed, which may happen as when rapidly shearing strips with too small a motor. Bring the flywheel up to full speed and trip the treadle again.

2. The treadle may have been tripped with the flywheel stopped. Hold the treadle down, bring the flywheel up to speed and release the treadle.

3. The friction brake may be too tight. If necessary loosen completely to stop knocking. See section on FRICTION BRAKE, page 25.

4. As mentioned above, the shear must operate freely to get proper clutch disengagement. Binding

will prevent the drive shaft from coasting around beyond the point where the clutch teeth separate and continuous knocking will result. Run shear continuously and check for hot bearings. The best way to check the freeness of a shear is to remove the flywheel guard; then with the drive motor stopped, operate the shear through a complete stroke by turning the flywheel by hand. One man should be able to do this easily on a small shear and two on a large shear. If the shear is properly counterbalanced it should move up more easily than down at midstroke. Be sure bleed valve on holddown is open. See Item 5 on counterbalance springs, page 28. Binding may be caused by any one of the following:

A. Shear not level. See section on LEVELING, page 10.

B. Ram gibs too tight. Adjust to .003" clearance.

C. Guides and eccentrics not properly oiled. Check automatic lubrication.

D. Oil in worm box may be too stiff, especially when cold. Run shear continuously to warm oil. Specifications of lighter oil for cold locations will be furnished on request. Electric strip heaters applied to drive box are a good solution.

E. Knives rubbing. Check clearance.

F. Lower bearing of connecting links may be out of round due to overloading, and binding the eccentrics. Check bearing clearance with feeler gage.

G. Ram guides cut.

H. Burr on clutch pin, or helix of clutch.

I. Drive shaft may be twisted due to overload. Check "DC" (dead center) marks at bottom of eccentrics and connecting links at each side. (See Figure 29.)

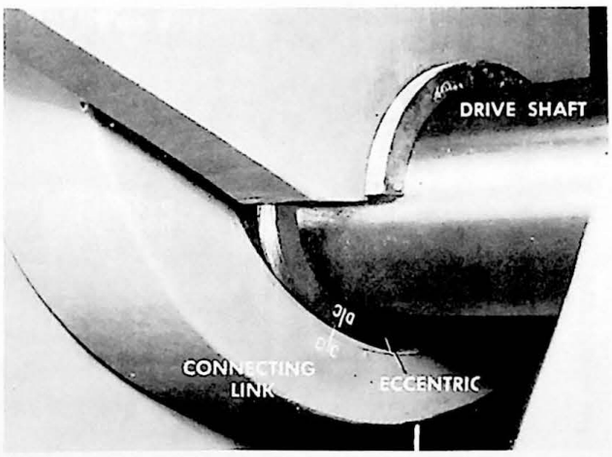


Fig. 29. When "DC" Marks are in Line Ram is on Top Dead Center

J. Spring counterbalance barrels may be binding due to broken springs, worn pull rods or bushings.

K. Drive shaft may have insufficient end play. Adjust to .020". See section on HOLDDOWNS, page 26.

L. Ram adjustment may be out of time. See section on RAM ADJUSTMENT, page 16.

5. The counterbalance springs may be weak or broken. If the ram feels underbalanced at midstroke when turning the flywheel by hand, dissassemble the spring barrels and check for broken springs. See section on COUNTERBALANCE, page 28.

6. The clutch or spider jaws may be rounded causing the clutch to jump out too soon. To check the jaws remove the large cover that carries the clutch pin and pry the clutch out. If the clutch or spider jaws are quite rounded, and the shear checks correctly on all points as outlined above, they have served their normal life and should be replaced.

7. The clutch pin may be worn to a point where it does not pull the clutch out of engagement with the spider.

CLUTCH PULLING

When the clutch becomes worn and needs replacement, it should be removed as follows:

1. Drain the oil from the drive box.

2. Remove the small end cover.

3. Wipe the faces of the clutch and sleeve clean so that the markings can be read.

4. Make note of the number on the clutch opposite the arrow on the sleeve. Older clutches have a tooth out and a tooth space filled on the sleeve.

5. Remove the set screw holding the sleeve retaining nut.

6. Remove the nut.

7. Using a combination square, measure the distance from the end of the drive shaft to the face of the sleeve. Leave the square set at this figure. (Fig. 30)

8. Insert a ⅜" x 1" pin at the point indicated on the face of the clutch. See Fig. 30. This is to prevent the clutch sleeve from being pushed out rapidly by the clutch spring when it is pulled loose from its taper on the drive shaft. On older shears where this hole is not provided the retaining nut should be left part way on until the sleeve is pulled loose.

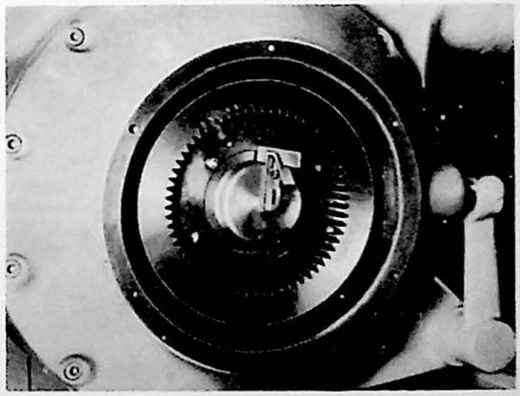


Fig. 30. Measuring Sleeve Setting

Fig. 31. Clutch Pulling

9. Screw a high pressure grease gun fitting into the ⅛" pipe tapped hole, as marked on the face of the sleeve.

10. Arrange heat treated alloy steel pulling studs, a steel block slightly smaller than the end of the shaft, and a heavy cross bar as shown in Fig. 31.

11. Apply pressure to the fitting with a good high pressure grease gun.

12. Tighten the nuts on the pulling studs while applying grease pressure. If the sleeve does not pull loose, strike the center of the cross bar with a heavy sledge.

On older shears where the hole for a pressure fitting is not provided it will always be necessary to strike with a sledge. This should be done while there is maximum tension on the pulling studs.

If ever the spider needs replacing proceed as follows:

1. Remove the large cover that carries the clutch pin.

2. Pull the race on which the spider turns. On 43 series shears this is part of the clutch sleeve.

3. Remove the wormwheel and spider assembly.

4. Remove the cap screws and press out the old spider.

5. Heat the wormwheel in boiling water and insert the new spider so that the screw holes line up.

6. Ream the holes in the new spider to a drive fit for the cap screws.

7. Install screws, nuts and cotter pins.

8. Reverse the above procedure to assemble.

INSTALL THE NEW CLUTCH AS FOLLOWS:

1. Assemble the clutch, spring and sleeve on the shear table. Press the sleeve into the clutch until the ⅜" pin can be inserted to hold it there.

2. Check the timing. Set the arrow on the sleeve opposite the same number as it was on the old clutch. In general this should be 3. If the sleeve has no arrow set number 3 directly in line with the center of the keyway. On some series of shears, the keyway is on top and others on the bottom. Determine whether 3

should be on the same or opposite side as the keyway by observing the keyway in the drive shaft. Where a shear has an electric or air clutch control the clutch is rotated 90 degrees counterclockwise relative to the sleeve. SEE SECTION ON CLUTCH BRAKE TIMING, below.

3. Install the sleeve, spring and clutch assembly on the drive shaft and insert the key until it is flush with the face of the sleeve.

4. Drive the sleeve on to the taper with a brass bar and sledge. Drive evenly around the face until the combination square dimension is reached.

5. Replace the retiming nut and tighten slightly until first notch is in line for set screw.

6. Replace set screw.

7. Replace small cover.

8. Remove one of the small covers over the worm shaft and fill the gear box with fresh oil to plug level with flywheel stopped.

9. Check drive shaft end play as explained in section on HOLDDOWNS, page 26.

CLUTCH REPEATING

When the shear fails to stop at the top of the stroke and repeats a stroke, it may be caused by:

1. Holding the foot treadle down too long before releasing it.

2. A treadle that bounces when released. This may be caused by hitting the treadle with the foot and letting it snap back suddenly.

3. A weak spring for returning the treadle. The hook can be fastened to the housing at a higher point to increase the tension on the spring.

4. Looseness in the linkage. The clutch pin should be pushed all the way in when the treadle is up. If looseness prevents this, it should be corrected. The connecting link can be lengthened or one of the levers heated and bent if necessary.

5. Any of the levers becoming bent. With the treadle locked in the up position, heat the lever and bend it to make the clutch pin go in as far as it will go.

6. The helix on the clutch and the end of the clutch pin may be rounded causing the clutch pin to jump out. See Figure 28.

FRICTION BRAKE

The purpose of the friction brake on the drive shaft is to help bring the drive shaft and other moving parts to a stop at the top of the stroke. If the brake is allowed to become loose the radius of the clutch will strike the clutch pin. When this is happening a single heavy thump will be heard in the drive box

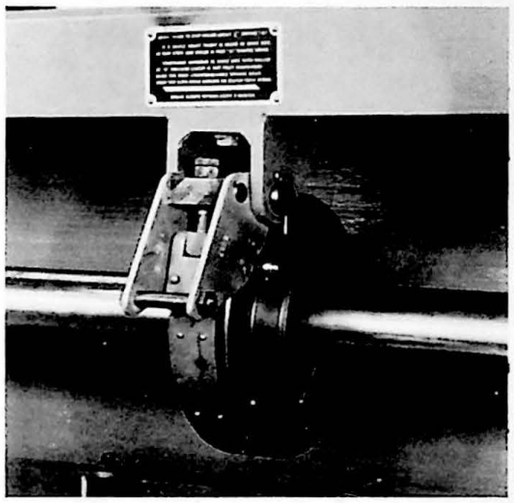


Fig. 32. Friction Brake

just as the drive shaft stops at the completion of each stroke. On all shears except 62 and 100 series, tighten the brake until the roller stops about ¼" before "A" Further tightening throws unnecessary load on the brake and causes the ram to stop before the top of the stroke.

This may cause inaccuracy in shearing. It also may cause the clutch to knock. If the clutch knocks continuously as it disengages the brake should be gradually loosened. If this does not help even with the band completely loose check over the shear as outlined under CLUTCH KNOCKING, page 22.

The friction brake on 62 and 100 series shears is operated by an air chamber controlled by a valve mounted on the large cover of the worm drive box. See drawing in the back of this manual for details. No adjustments are necessary on this brake for normal use of the shear. In some cases, when used infrequently, the shear will tend to become sluggish. The brake lining will tend to wear to closer conformity to the segment and provide greater braking friction. It may then be necessary to retard application of the brake to allow the ram to come up to top dead center. This can be done by shortening the pin which actuates the control valve as described on the drawing in the back of this manual.

If the ram stops beyond the top of the stroke as indicated by the arrow on the segment, check the air pressure on the gage attached to the regulator. The pressure must be maintained at the figure on the instruction plate to maintain the balance between the action of the air counterbalances and the action of the air brake, since both of these functions operate from the same air supply.

CLUTCH AND BRAKE TIMING

The clutch, friction brake, and holddown cam all turn together in fixed relation on the drive shaft. The ideal relation of these parts is as shown in Fig. 33. With the ram on top dead center as shown by the "DC" marks at the bottom of the links and eccentrics, Fig. 29, or as determined by the use of a dial indicator, the position of these parts should be as follows:

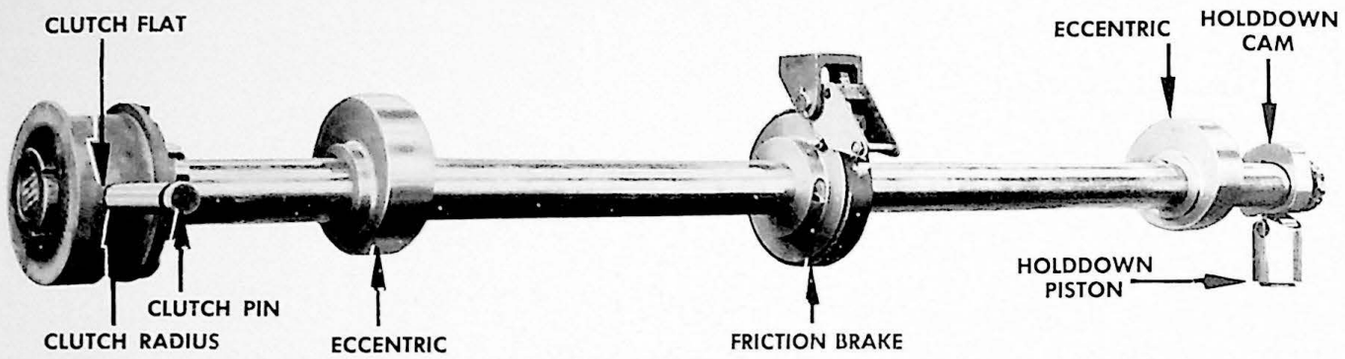


Fig. 33. Clutch and Brake Timing

1. The flat of the clutch should be resting on the clutch pin and there should be from ⅛" to ½" between the side of the pin and the radius or pocket that forms a solid stop.

To make this check, remove the small outer cover from the gear box. Some oil will drain out. Engage the clutch and turn the flywheel by hand until the ram is on top dead center. Using a hook on either side, pull the clutch out until the clutch pin moves back in. The distance between the clutch pin and radius can now be observed.

2. The brake roller, or arrow on 62 and 100 series shears, should be between "A" and "B", ¼" before A. See Fig. 32.

3. The rise on the holddown cam should be just ready to engage the piston roller. See HOLDDOWN SECTION that follows.

If necessary the clutch can be retimed by pulling the sleeve and reassembling with the clutch shifted in either direction the desired number of teeth.

The brake drum on all but 62 and 100 series shears can be shifted by loosening the two set screws and four screws that clamp the halves together. Spot the shaft for the set screws when final position is determined. The timing of the holddown cam cannot be changed.

If a dial indicator is used to determine top dead center of the ram, it will be found that the flywheel can be turned a full turn or more without moving the indicator as the ram passes over top dead center. The midpoint of this flywheel movement is true top dead center.

Where old shears do not have "DC" marks and no dial indicator is available, the timing can be checked as follows:

1. Bring the clutch to a position where the radius is against the clutch pin using the method outlined above.

2. The brake roller, or arrow on 62 and 100 shears, should be slightly past A.

3. The rise on the holddown cam should be engaging the piston roller. If the holddown bleed valve is closed when the clutch is brought to this position, some of the holddown plungers may move down slightly. This will be corrected when the brake is properly adjusted. If the relation of the clutch, friction brake, and holddown cam check by either of the two methods outlined above, no change should be made. If there is continuous knocking of the clutch look under CLUTCH KNOCKING, page 22.

HOLDDOWNS

HOLDDOWN SYSTEM — OPERATION

The hydraulic holddown system consists of the holddown pump box mounted on the left hand housing and a series of independent cylinders mounted along the holddown beam with plungers that clamp the work to the shear table. The 43, 62, and 100 series shears also have a vacuum pump mounted at the front end of the worm shaft. These units operate as follows: The holddown pump box, Fig. 34 is made up of the box, the top cover, and the bottom or cylinder head as shown. The cylinder head contains a cylinder in which there is a piston fitted with a roller. The main drive shaft extends into the holddown pump box and carries a cam on its end against which this roller rides. Behind the cylinder is the ball check valve and then the relief valve cylinder and plunger.

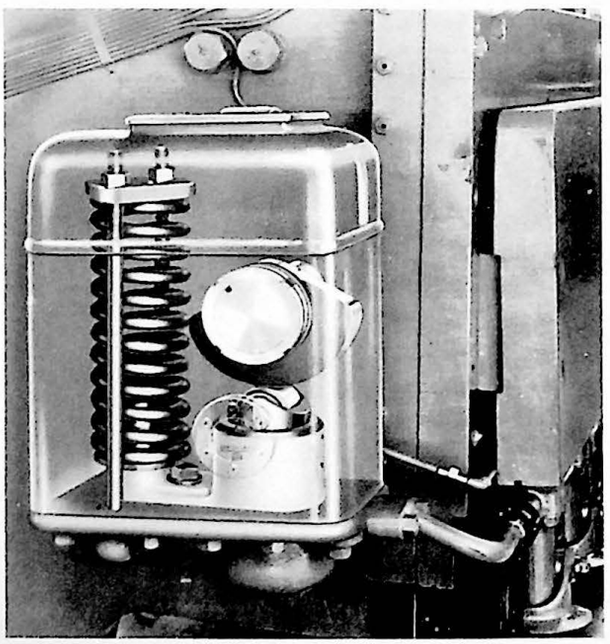


Fig. 34. Phantom View of Holddown Pump Box

When the shear is idle with the ram at the top of its stroke, the piston roller rests against the small diameter of the cam. When the treadle is tripped the cam turns with the drive shaft and pushes the piston down. The oil displaced by the piston goes through the bent pipe to the individual holddown cylinders pushing the plungers down. The piston always displaces a little more oil than is necessary to push the plungers down. After the plungers are down on either the work or the shear table they can go no further and pressure is built up. When the proper pressure is reached, the relief valve under the large spring raises up and the excess oil is expelled through relief ports. Since the relief valve plunger raises up 1" before reaching the first port, it acts as an accumulator to make up for the slight leakage of oil past the piston thus maintaining pressure through the shearing stroke. The pressure can be easily changed by adjusting the two nuts over the pressure plate on top of the spring. See the chart in this manual for the desired pressure. As the ram passes the bottom of its stroke the cam starts to reduce to a smaller diameter and the spring under the piston pushes it up drawing oil back from the holddowns. Also oil is drawn in through the ball check valve to make up for the oil expelled through the relief valve. The cam then turns on around to where its small diameter is again against the roller as the shear stops at the top of its stroke.

The relief valve plunger seats with a "thump" after the down stroke. When this thump can be heard just as the ram passes the bottom of its stroke, you can be certain that the holddown pressure was maintained throughout the shearing stroke. This test can be made very accurately by allowing the flywheel to slow down and then tripping the treadle.

Shears of 3/8" capacity and smaller have what is known as the "bracket type" holddowns. Refer to drawing in back of this manual for detailed drawing. These are individual cylinders with integral connecting arm. Each cylinder carries a plunger with three special cup type packings, a return spring, and an enlarged flat foot for clamping the work.

Shears of 1/2" capacity and larger have what is known as "piston ring type" holddowns. See drawing at rear of this manual for details of holddown. These are individual cylinders, flange mounted to the holddown beam. The oil passage is drilled through the solid beam. Each cylinder carries a plunger with two special metal piston rings, a return spring, and a clamping foot. These cylinders also have a sleeve pressed in the bottom surrounding the plunger stem. This forms a reservoir for the slight amount of oil that leaks past the piston rings. The leakage oil is drawn off from this reservoir through a small copper tube and through piping to the vacuum pump.

The vacuum pump is mounted at the front end of the worm shaft. It is a simple vane type pump. The rotor is carried by a stub shaft projecting from the worm shaft. The pump operates whenever the drive motor is on, drawing the leakage oil from each holddown and discharging it back into the holddown pump box. This leakage oil lubricates the pump.

HOLDDOWN SYSTEM — CHECK LIST

1. OIL

Chang oil every six to twelve months. If oil is quite dirty fill box with kerosene and run shear several minutes with bleed valve open.

Drain and refill with light hydraulic or turbine oil having a viscosity of 150 seconds at 100°F. See Lubrication Points, Item 6, page 12.

2. CAM AND ROLLER

When changing oil remove top cover from holddown box and inspect cam surface while shear is turned through a complete stroke by hand. Inspect the piston roller by "feel". If the surface of either is rough or broken out they should be replaced. If a new cam is installed, allow about .020" between its inside face and the bearing against which it normally rides. Pry the shaft toward the cam end when making this check.

3. MARKING OF SHEETS

If a very slight marking of soft sheets is objectionable, slip over rubber pads should be used on the holddown feet. When pads are used the knife should be shimmed so that the edge against the table is flush with its top surface. When pads are not used, the edge against the table should be about .010" below its top surface. Use a heavy Kraft paper on the table and secure it with masking tape.

4. PLUNGERS HANGING DOWN

The holddown plungers can hang down for anyone of the following reasons:

A. If the friction brake is too loose, the drive shaft may be turning far enough past top dead center to cause the cam to engage the piston roller and push it part way down. This in turn will push the holddowns part way down.

SOLUTION: Tighten the friction brake. If the shear is stopping on top dead center or slightly before, this is not the cause. Further tightening of the friction brake will not help. The relation of the cam and roller can be checked by "feel" with the holddown box cover removed and the drive motor stopped. See CLUTCH AND BRAKE TIMING, page 25.

B. Gummy oil may cause the holddown plungers to hang down.

SOLUTION: Flush and refill as outlined above.

C. If the piston in the holddown box does not return completely to its up position, some holddowns will hang down. A sticking piston is usually caused by dirty or gummy oil.

SOLUTION: Flush and refill as outlined above. Also push the piston down several times with a wood stick to check freeness.

D. If the clutch has been replaced it may be incorrectly timed. See section on CLUTCH AND BRAKE TIMING, page 25.

E. If insufficient oil is displaced by the piston, some holddowns will hang down. If this is only slight, the holddowns will usually all return when a plate is placed under several of them. This lack of oil can be caused by a cam with too small of a throw, addition of extra holddowns, or increased holddown stroke.

F. A broken return spring will cause a holddown to hang down. However, this seldom happens. If none of these suggestions help this certain holddown, then the return spring is probably broken and the unit should be replaced.

5. If after a number of years the holddowns start to leak, they should be rebuilt or replaced at the same time. We strongly recommend you take advantage of our exchange arrangements on holddowns. Please write our Parts Department. If a piston ring type of holddown should develop a leak, first check the vacuum lines and pump. Check the small copper tube leading to the bottom of the holddown cylinder. Check the vacuum by removing the plug in the block at the right end of the vacuum manifold. There should be a strong pull on thumb when placed over the hole. With these holddowns we suggest you replace only the one that shows leakage.

6. Automatic lubricators on the machine are set high at the factory. See instruction plate.

7. To do accurate shearing the holddowns must maintain full pressure throughout the shearing stroke. This can be checked either by listening for the thump of the relief valve plunger as described above, or by connecting a pressure gauge at the right end of the holddown beam where a plug is provided. We suggest and can furnish a rugged plunger type gauge.

If the pressure is not holding up, check as follows:

A. The bleed valve may be leaking. Check by opening the union where the return line goes into the holddown box. Hold a finger over the line going into the box. With the valve closed no oil should flow from the line from the beam when the shear is tripped. With the valve opened slightly oil should flow freely.

B. The ball check valve in the cylinder head may be leaking. Remove the plug below it and clean the seat. The seat can be inspected by removing the plug above the ball.

C. If the shear is quite old, the piston in the cylinder head may be too loose. If the clearance is over .005" the cylinder head assembly should be replaced.

COUNTERBALANCE

OPERATION

All Cincinnati Shears are provided with units set at an angle that counterbalance the weight of the moving ram assembly and hold the ram back against the guides. On the 10, 14, 18, 25, and 43 series shears these are spring units and on the 62 and 100 series shears they are air cylinders. When the balancing force is right, the ram assembly should be slightly overbalanced with the ram on top dead center. This balance is necessary to obtain proper disengagement of the clutch.

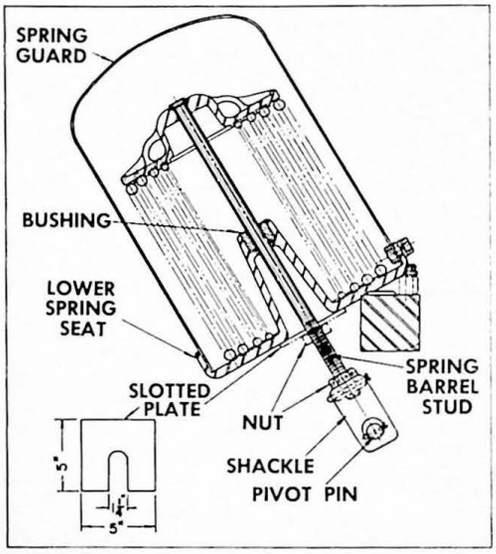


Fig. 35. Counterbalance Assembly
#10 - #14 - #18 - #25 - #43 Series Shears

INSTALLING NEW SPRINGS 10, 14, 18, 25 & 43, Series

After a number of years some of the springs in the spring barrels may break. When this happens the clutch will not fully disengage and will knock continuously when the ram stops. Replace the springs as follows:

1. Place a slotted plate around the spring barrel stud.

2. Remove cotter pin from shackle at lower end of spring barrel stud and back nut against the slotted plate until nut controls tension of springs.

3. Remove the pivot pin where spring barrel stud attaches to ram assembly.

4. For 10 series shears only, engage the clutch and turn the flywheel by hand to bring the ram to bottom of its stroke. The spring barrel assembly can now be unhooked and removed from the machine.

5. For 14, 18, 25, and 43 series shears, remove the screws holding the lower spring seat and lift the spring barrel assembly from the machine.

6. Compress the springs under an arbor press or drill press and remove the nut from the spring barrel stud. A maximum of 16 inches of travel is required.

7. Slowly release the spring tension and disassemble the barrel.

8. Apply heavy oil to the new springs before reassembly.

It may be necessary to install new bushings.

It is good practice on all but 10 series shears to block under the ram so it will not fall while working on the counterbalance units. If any new weight has been added to the ram assembly such as a deeper back gauge it may be necessary to install additional counterbalance springs.

Replace the packings in 62 and 100 series air cylinder as follows. See assembly drawing in this manual.

1. Shut off the air supply and bleed all of the air out of the surge tank using the pet cock at the bottom.

2. Drive out the pivot pin where the connecting link attaches to the ram assembly.

3. Remove the top cover from the cylinder.

4. Remove the piston assembly.

5. Replace the piston cup packing and felt.

6. Remove the flange packing and retainer.

7. Replace piston making sure cup starts in cylinder properly. Hold the new flange packing and the retainer with new felt in place as the connecting rod passes through the bottom of the cylinder. Work the flange over the piston tube and replace the retainer. Use plenty of oil.

8. Replace the pivot pin and top cover.

ORDERING REPAIR PARTS

When ordering repair parts, be sure to give this information:

1. Serial number of Shear. (located at right end of upper knife seat.)

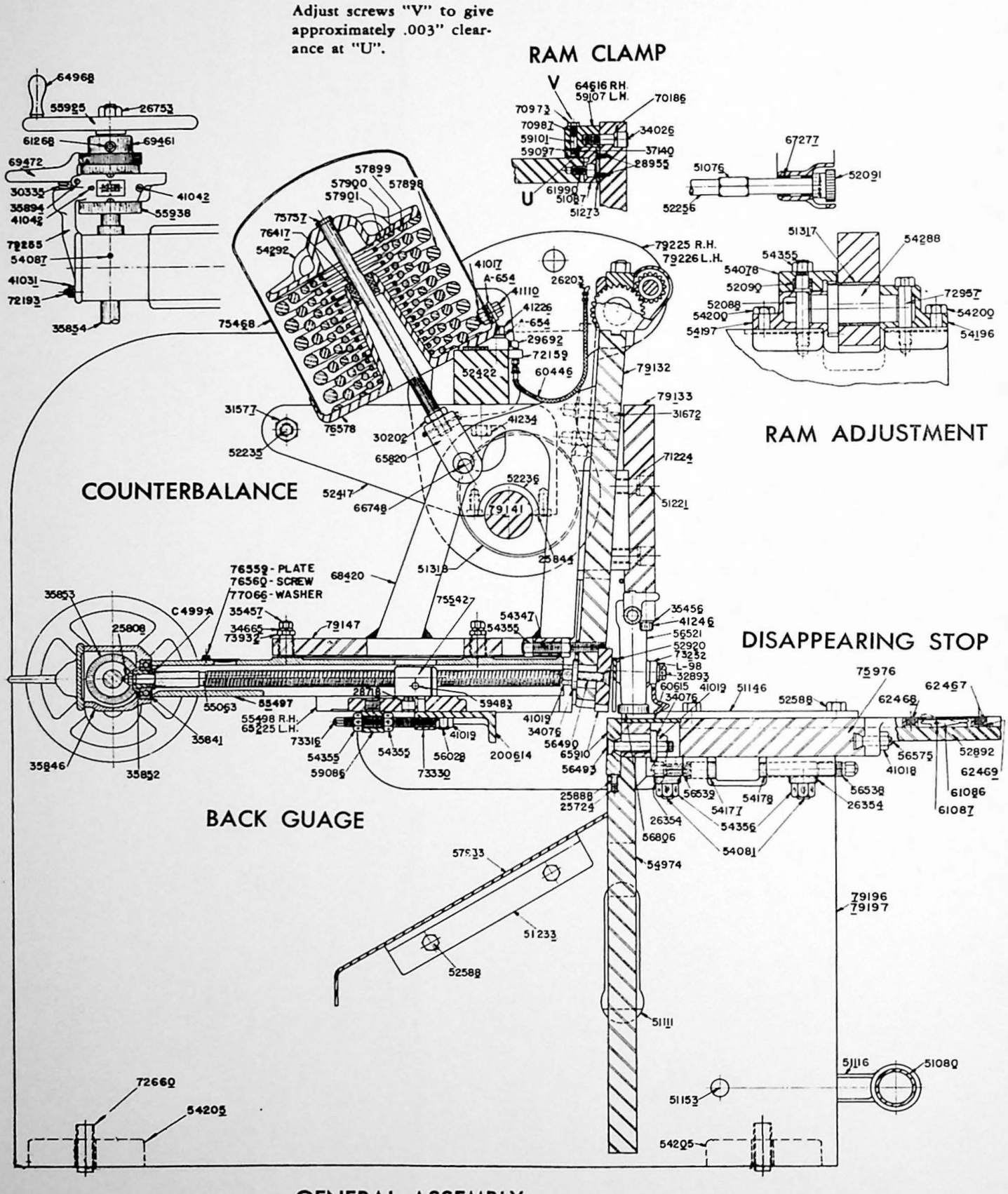
2. The part number and name from assembly drawings included in this book.

3. As complete a description of the part as possible.

4. Delivery required.

NOTES

ASSEMBLY—14-18 SERIES CINCINNATI SHEARS



GENERAL ASSEMBLY

GENERAL AS

Piece No.	Amt.	Name of Piece
L-98-A	11	5/8" Washer
25724-A	11	Knife Shim Spring
25844-A	4	5/8" x 1-1/4" Spec. Hd. Scr.
25888-A	13	3/8" x 3/4" Pin
26203-A	2	1/8" Street Ell
26354-A	4	Spec. 1" Washer
29692-A	4	Elbow Fitting
31577-A	2	1" N. C. Nut
31672-A	4	1" x 2-1/2" Soc. Hd. Scr.
32893-A	11	5/8" x 3-1/2" Hex Hd. Scr.
34076-A	16	Spec. 3/4" Washer
35456-A	22	5/8" Washer
41018-A	2	5/8" N. C. Nut
41019-A	32	3/4" N. C. Nut
41234-A	2	3/4" x 2-1/2" Hex Hd. Scr.
41246-A	22	5/8" x 3" Hex Hd. Scr.
51080-A	1	Treadle Pipe
51111-B	2	Bed Shoe
51116-C	1	Lever
51146-B	1	Side Gage
51153-A	1	1-1/4" x 5" Pin
51221-A	4	1" x 2-3/4" Soc. Hd. Scr.
51233-A	2	Angle

Piece No.	Amt.	Name o
51318-B	2	Conn. I
52235-A	2	Support
52236-A	2	Bush
52417-C	1	R. H. S
52422-C	1	Housing
52588-A	4	3/4" x
52892-C	1	Front G
52920-B	1	Knife G
54081-A	5	Stud for
54177-A	2	1-1/8"
54178-A	2	1-1/8"
54205-B	4	Housing
54347-A	9	Stud for
54355-A	18	7/8" N.
54356-A	5	1" N. F
54974-D	1	Bed
56490-A	16	Plow B
56493-A	16	Plow B
56521-D	11	Holddov
56538-A	2	Table A
56539-A	2	Table A
56575-A	4	5/8" x
56806-B	1	Plunger

RAM CLA

Piece No.	Amt.	Name of Piece
28955-A	18	3/8" Screw
34026-A	6	3/4" x 2" Soc. Hd. Scr.
37140-A	4	Gib Retaining Pin
51087-B	1	R. H. Upper Guide

Piece No.	Amt.	Name o
51273-B	2	Ram Sh
59087-B	4	Gib
59101-A	12	Bevel P
59107-C	1	L. H.

BACK GAU

Piece No.	Amt.	Name of Piece
C-499-A	3	3/4" Washer
25808-A	1	5/8" N. F. Nut
26753-A	1	3/4" N. C. Nut
28718-A	2	5/8" x 1-1/4" Hol. Hex Scr.
30335-A	1	Spring
34665-A	8	5/8" Lock Washer
35457-A	8	5/8" x 3" Hex Hd. Scr.
35841-A	2	Ball Bearing
35846-C	2	Bevel Gear Box
35852-B	2	Bevel Pinion
35853-B	2	Bevel Gear
35854-B	1	Conn. Shaft
35894-A	1	3/8 x 3-1/8" Pin
41019-A	2	3/4" N. C. Nut

Piece No.	Amt.	Name o
41031-A	2	3/8" H
41042-A	2	Oiler
54087-A	1	Alemit
54355-A	2	7/8" N.
55063-B	2	Back G
55497-D	2	Back G
55498-C	1	R. H.
55925-B	1	Handwh
55938-C	1	Gradua
56028-A	1	Stud
59086-A	1	Stop
59483-A	2	Pipe P
61268-A	2	5/8" x
64968-A	1	Handle

COUNTERBA

Piece No.	Amt.	Name of Piece
A-654-A	4	7/8" Washer
30202-A	2	1" N. C. Nut
41017-A	6	5/8" Hex Nut
41110-A	6	5/8" x 1-1/4" Hex Hd. Scr.
41226-A	4	7/8" x 2-1/4" Hex Hd. Scr.
54292-C	2	Spring Seat (Upper)

Piece No.	Amt.	Name o
57898-B	2	Spring
57899-B	2	Spring
57900-B	2	Spring
57901-B	2	Spring
65820-C	2	Shackl
66748-A	2	1" x 5-

RAM ADJUS

Piece No.	Amt.	Name of Piece
51076-A	1	Sleeve
51317-B	2	Conn. Link Bush
52088-A	2	Clamp Stud
52090-A	2	Spring
52091-B	1	R. H. Pinion

Piece No.	Amt.	Name
52256-B	1	Ram A
54078-B	2	Clamp
54196-C	1	R. H.
54197-D	1	R. H.
54200-A	4	7/8" x

GENERAL ASSEMBLY

Piece No.	Amt.	Name of Piece
L-98-A	11	5/8" Washer
25724-A	11	Knife Shim Spring
25844-A	4	5/8" x 1-1/4" Spec. Hd. Scr.
25888-A	13	3/8" x 3/4" Pin
26203-A	2	1/8" Street Ell
26354-A	4	Spec. 1" Washer
29692-A	4	Elbow Fitting
31577-A	2	1" N. C. Nut
31672-A	4	1" x 2-1/2" Soc. Hd. Scr.
32893-A	11	5/8" x 3-1/2" Hex Hd. Scr.
34076-A	16	Spec. 3/4" Washer
35456-A	22	5/8" Washer
41018-A	2	5/8" N. C. Nut
41019-A	32	3/4" N. C. Nut
41234-A	2	3/4" x 2-1/2" Hex Hd. Scr.
41246-A	22	5/8" x 3" Hex Hd. Scr.
51080-A	1	Treadle Pipe
51111-B	2	Bed Shoe
51116-C	1	Lever
51146-B	1	Side Gage
51153-A	1	1-1/4" x 5" Pin
51221-A	4	1" x 2-3/4" Soc. Hd. Scr.
51233-A	2	Angle
51318-B	2	Conn. Link Bush
52235-A	2	Support Stud
52236-A	2	Bush
52417-C	1	R. H. Support Plate
52422-C	1	Housing Brace
52588-A	4	3/4" x 1-1/4" Hex Hd. Scr.
52892-C	1	Front Gage Support
52920-B	1	Knife Guard
54081-A	5	Stud for Table
54177-A	2	1-1/8" x 1-3/4" Pin
54178-A	2	1-1/8" x 7-1/4" Pin
54205-B	4	Housing Foot
54347-A	9	Stud for Ram Brace
54355-A	18	7/8" N. C. Nut
54356-A	5	1" N. F. Nut
54974-D	1	Bed
56490-A	16	Plow Bolt
56493-A	16	Plow Bolt
56521-D	11	Holddown Bracket
56538-A	2	Table Adj. Scr.
56539-A	2	Table Adj. Scr.
56575-A	4	5/8" x 2-5/16" Dovetail
56806-B	1	Plunger

RAM CLAMP

Piece No.	Amt.	Name of Piece
28955-A	18	3/8" Screw
34026-A	6	3/4" x 2" Soc. Hd. Scr.
37140-A	4	Gib Retaining Pin
51087-B	1	R. H. Upper Guide
51273-B	2	Ram Shoe
59087-B	4	Gib
59101-A	12	Bevel Pin
59107-C	1	L. H. Clamp

BACK GAUGE

Piece No.	Amt.	Name of Piece
C-499-A	3	3/4" Washer
25808-A	1	5/8" N. F. Nut
26753-A	1	3/4" N. C. Nut
28718-A	2	5/8" x 1-1/4" Hol. Hex Scr.
30335-A	1	Spring
34665-A	8	5/8" Lock Washer
35457-A	8	5/8" x 3" Hex Hd. Scr.
35841-A	2	Ball Bearing
35846-C	2	Bevel Gear Box
35852-B	2	Bevel Pinion
35853-B	2	Bevel Gear
35854-B	1	Conn. Shaft
35894-A	1	3/8 x 3-1/8" Pin
41019-A	2	3/4" N. C. Nut
41031-A	2	3/8" Hex Nut
41042-A	2	Oiler
54087-A	1	Alemite Fitting
54355-A	2	7/8" N. F. Nut
55063-B	2	Back Gage Scr.
55497-D	2	Back Gage Guide
55498-C	1	R. H. Back Gage Slide
55925-B	1	Handwheel
55938-C	1	Graduated Gear
56028-A	1	Stud
59086-A	1	Stop
59483-A	2	Pipe Plug
61268-A	2	5/8" x 1/2" Set Scr.
64968-A	1	Handle

COUNTERBALANCE

Piece No.	Amt.	Name of Piece
A-654-A	4	7/8" Washer
30202-A	2	1" N. C. Nut
41017-A	6	5/8" Hex Nut
41110-A	6	5/8" x 1-1/4" Hex Hd. Scr.
41226-A	4	7/8" x 2-1/4" Hex Hd. Scr.
54292-C	2	Spring Seat (Upper)
57898-B	2	Spring
57899-B	2	Spring
57900-B	2	Spring
57901-B	2	Spring
65820-C	2	Shackle
66748-A	2	1" x 5-1/4" Pin

RAM ADJUSTMENT

Piece No.	Amt.	Name of Piece
51076-A	1	Sleeve
51317-B	2	Conn. Link Bush
52088-A	2	Clamp Stud
52090-A	2	Spring
52091-B	1	R. H. Pinion
52256-B	1	Ram Adj. Shaft
54078-B	2	Clamp
54196-C	1	R. H. Outer Adj. Brk't
54197-D	1	R. H. Inner Adj. Brk't
54200-A	4	7/8" x 2-1/4" Hex Hd. Scr

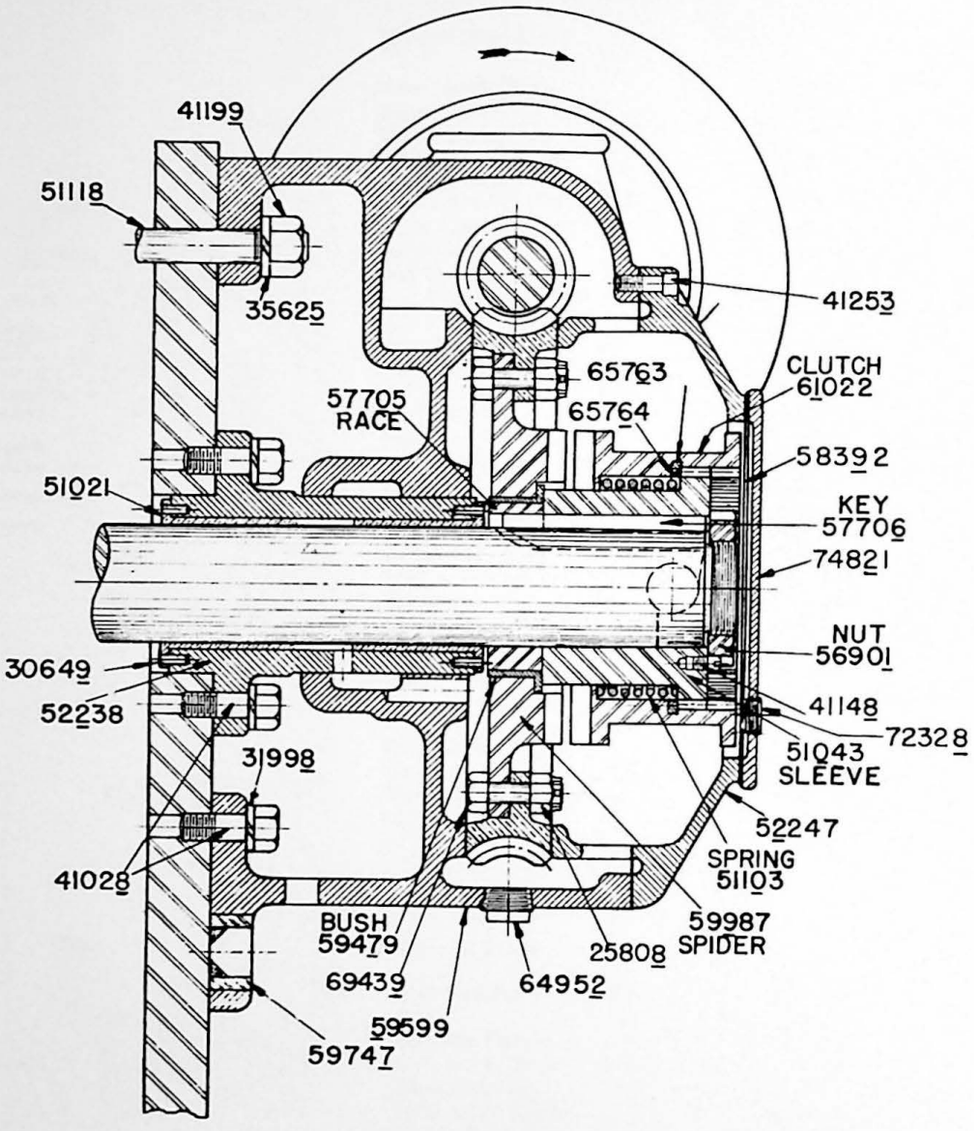
Piece No.	Amt.	Name of Piece
57933-B	1	Scrap Chute
60446-A	4	Flexible Hose
60615-C	1	Cover for Table
61086-B	2	Finger
61087-A	2	Pin
62467-B	2	Block
62468-A	2	1/2" Spec. N. C. Set Scr.
62469-A	2	Disc for Scr.
65910-C	2	Shear Knife
71224-A	4	1" Lock Washer
72159-A	2	Tapped Block
72660-A	4	Leveling Screws
73252-C	11	Holddown Guards
75976-D	1	Table
79132-D	1	Ram
79133-C	1	Holddown Beam
79141-C	1	Drive Shaft
79147-D	1	Ram Brace
79196-E	1	L. H. Housing
79197-E	1	R. H. Housing
79225-D	1	R. H. Conn. Link
79226-D	1	L. H. Conn. Link

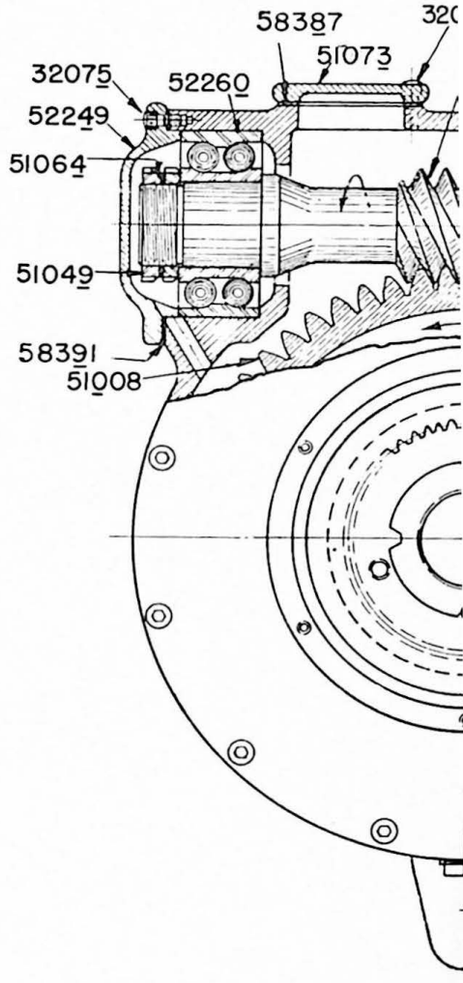
Piece No.	Amt.	Name of Piece
61990-A	12	5/8" x 1" Soc. Hd. Scr.
64616-C	1	R. H. Clamp
70186-A	8	3/4" Lock Washer
70973-A	12	1/2" x 20" N. F. Nut
70987-A	12	1/2" x 1-1/8" Set Scr.

Piece No.	Amt.	Name of Piece
65225-A	1	L. H. Back Gage Slide
69461-C	1	Graduated Collar
69472-C	1	Latch Lever
72193-A	2	Dowel Pin
73316-A	1	Stop Screw
73330-C	1	Block
73932-A	8	Leveling Bushing
75542-C	2	Compensating Nut Ass'y
76559-A	2	Cover Plate
76560-A	2	1/4" x 13/32" Hex Hd. Scr.
77066-A	2	5/16" Spring Washer
79255-D	1	Gear Box Bracket
200614-C	1	Back Gage Angle

Piece No.	Amt.	Name of Piece
68420-C	2	Ram Brace Brk't
75468-B	2	Spring Guard
75757-A	2	Spring Barrel Stud
76417-A	2	Bearing Collar
76578-D	2	Spring Seat (Lower)

Piece No.	Amt.	Name of Piece
54355-A	4	7/8" N. C. Nut
54888-C	2	Eccentric Pin
67277-A	1	Oilite Bushing
72957-A	2	7/8" x 4-1/4" Cap Scr.



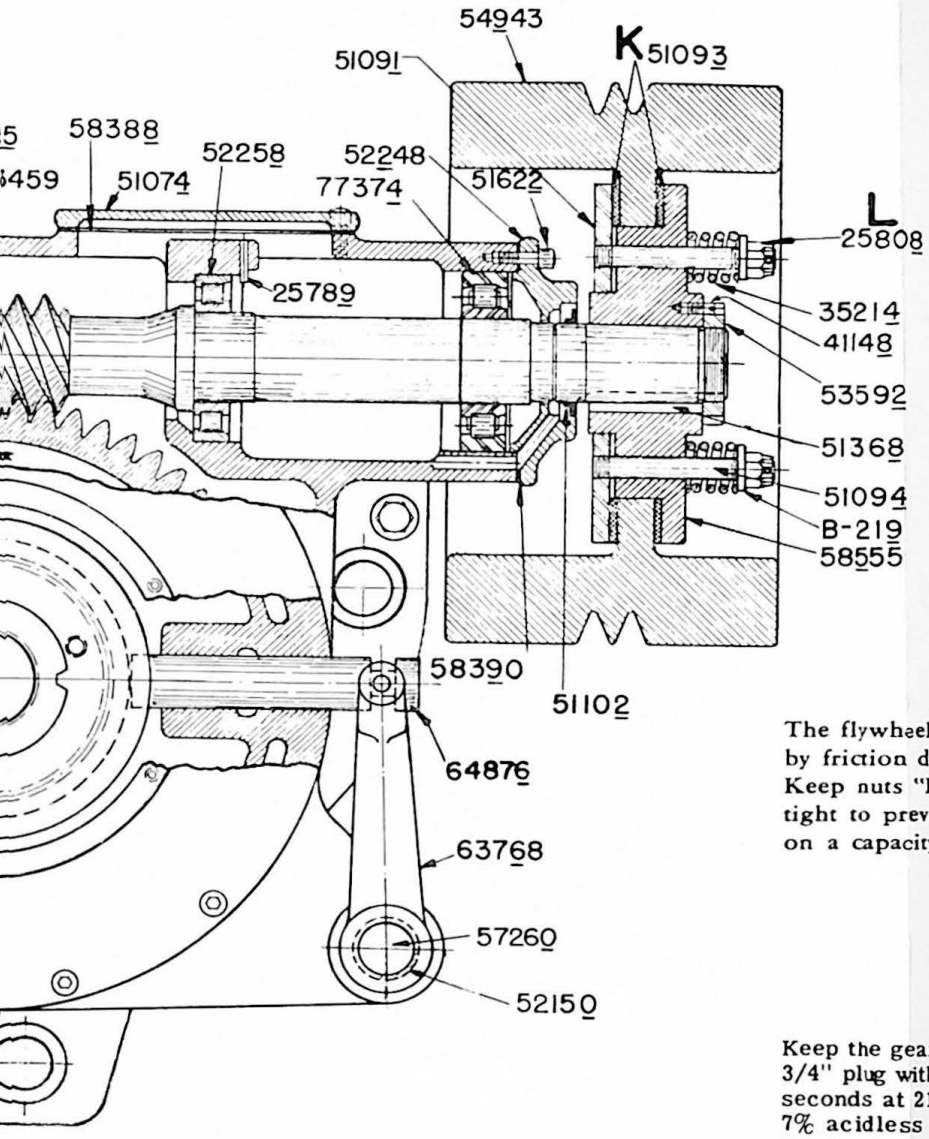


OP-6211

WORM DRIVE AND CLUTCH

Piece No.	Amt.	Name of Piece	Piece No.	Amt.	Name of Piece	Piece No.	A
B-219-A	4	5/8" Washer	51064-A	1	Lock Washer	52249-B	
25789-A	1	1/4" x 1-1/8" Pin	51073-A	1	Cover	52258-A	
25808-A	10	5/8" N. F. Nut	51074-A	1	Cover	52260-A	
30649-A	6	3/8" Pin	51091-A	1	Friction Plate	53459-E	
31998-A	4	3/4" Lock Washer	51093-A	2	Facing	53592-A	
32075-A	16	3/8" x 3/4" Soc. Hd. Scr.	51094-A	4	Stud 5/8"	54943-C	
35214-A	4	Spring	51102-A	1	Oil Seal	56901-A	
35625-A	4	1" Lock Washer	51103-B	1	Spring	57260-A	
41028-A	4	3/4" x 2" Hex Hd. Scr.	51118-A	1	Hous. Brace Stud	57705-B	
41148-A	2	3/8" x 1-1/8" Set Scr.	51368-A	1	Key	57706-A	
41199-A	1	1" N. C. Nut	51622-A	3	3/8" x 1" Soc. Hd. Scr.	58387-B	
41253-A	12	1/2" x 1-1/2" Soc. Hd. Scr.	52150-A	2	Oilite Bushing	58388-B	
51008-C	1	Worm Wheel	52238-C	1	R. H. Bearing	58390-B	
51021-C	2	R. H. Brg. Bush	52247-D	1	Cover	58391-B	
51043-C	1	Sleeve	52248-C	1	Cap	58392-B	
51049-A	2	Lock Nut					

WORM DRIVE AND
14-18 SERIE
CINCINNATI SH

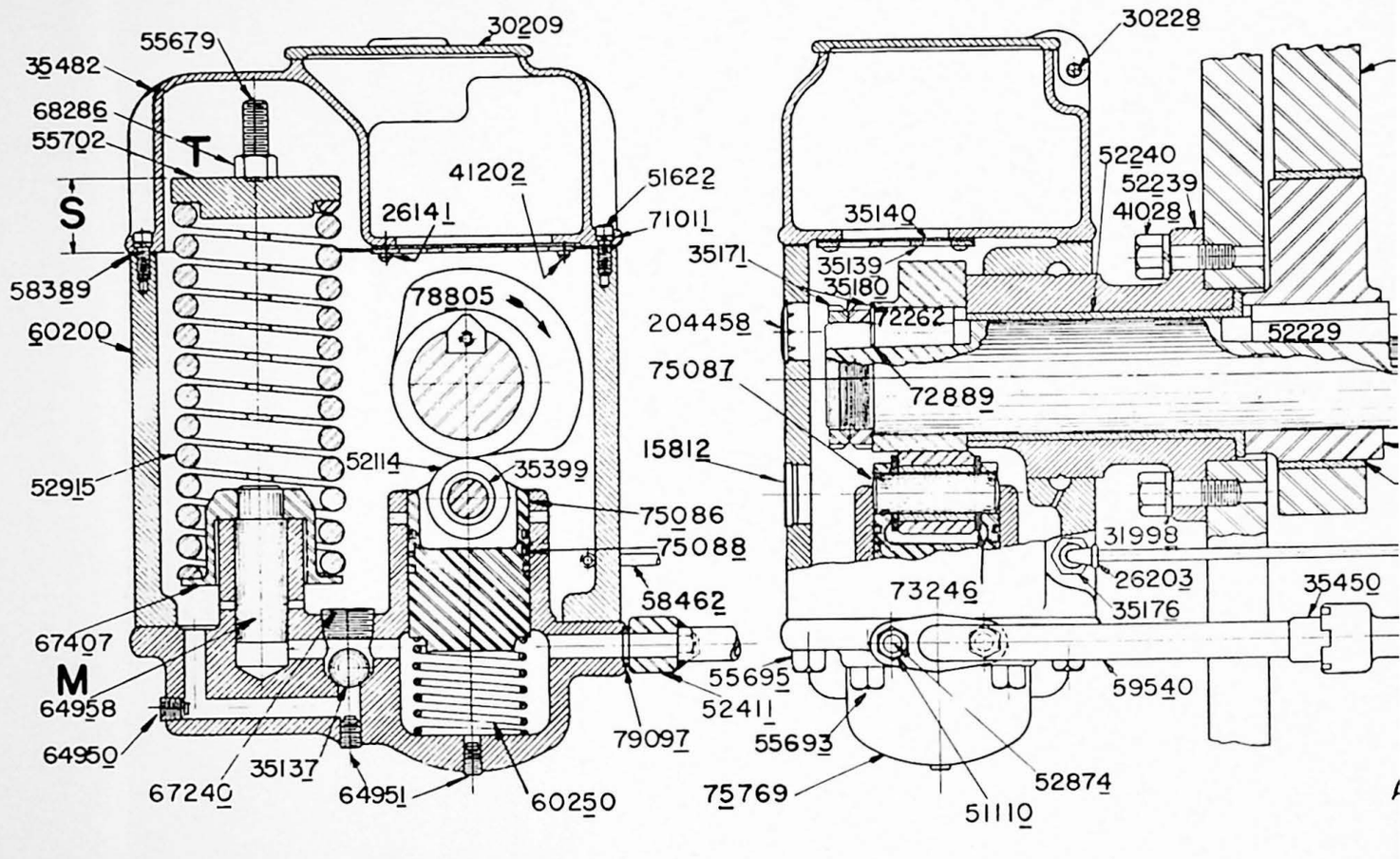


The flywheel rim is held by friction discs "K". Keep nuts "L" sufficiently tight to prevent slippage on a capacity cut

Keep the gear box filled to the level of the 3/4" plug with worm gear oil, (viscosity 155 seconds at 210° F.) compounded with 5 to 7% acidless tallow. Check oil level with flywheel stopped. Capacity 1½ gallon. A rise of 70° F. above room temperature is normal.

.	Name of Piece	Piece No.	Amt.	Name of Piece
	Bearing Retainer	58555-C	1	Flywheel Mounting
	Roller Bearing	59479-B	1	Bush
	Ball Bearing	59599-E	1	Gear Box
	Worm Shaft	59747-A	1	Hollow Dowel
	Lock Nut	59987-C	1	Spider
	Flywheel	61022-D	1	Clutch
	2-3/4" N. S. Nut	63768-B	1	Lever
	Lever Shaft	64876-A	1	Clutch Pin
	Race	64952-A	1	1-1/4" Pipe Plug
	Key	65763-B	1	Outer Snap Ring
	Gasket	65764-B	1	Inner Snap Ring
	Gasket	69439-A	6	5/8" x 2" Hex Hd. Scr.
	Gasket	72328-A	1	3/4" Plug
	Gasket	74821-B	1	Cover
	Gasket	77374-A	1	Cyl. Roller Brg.

HOLDDOWN BOX



SETTING "S"	OIL PRESSURE LBS. PER SQ. IN.	FORCE ON EACH HOLDDOWN
3- 3/8	300	525
2-15/16	400	710
2- 1/2	500	885
2- 1/16	600	1060
1- 5/8	•700	1240
1- 3/16	••800	1410
3/4	900	1590

•Normal for No. 14
••Normal for No. 18

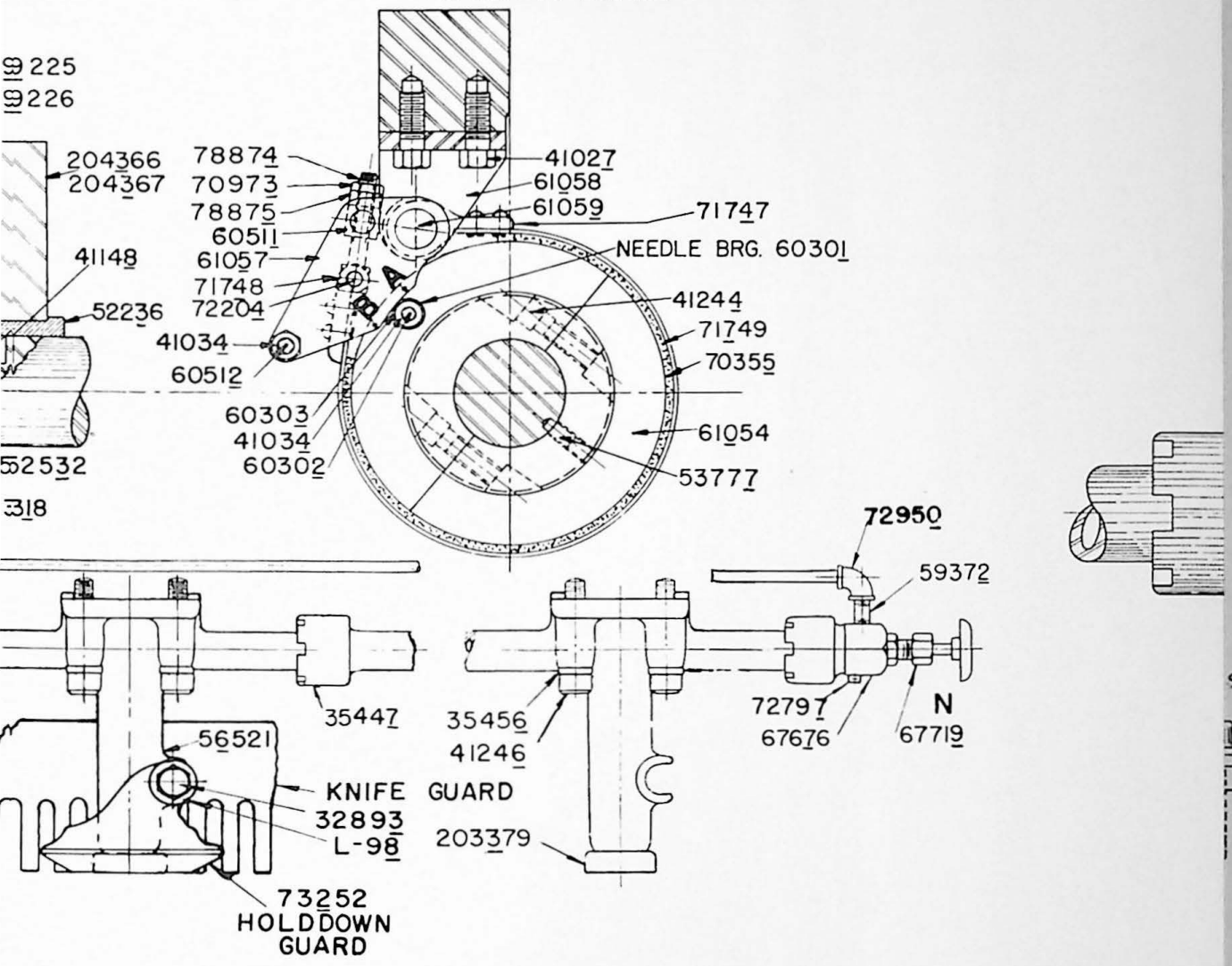
At each stroke of the shear, the oil pressure is built up to a point determined by the relief valve "M". The pressure may be changed by adjusting nuts "T".

Keep the oil in the holddown box at the oil level shown on the window, capacity 1½ gallons. Use hydraulic or light turbine oil, viscosity 150 seconds at 100°F.

When filling the system with oil, open valve "N" to allow air to escape. Run the shear a few minutes before closing the valve.

Piece No.	Amt.	Name of Piece
L-98-A	11	5/8" Washer
15812-A	1	Oil Window Unit
26141-A	4	1/4" Lock Washer
26203-A	1	1/8" Street Ell
30209-C	1	Oil Pot Lid
30228-A	1	3/8" x 4-1/4" Pin
31998-A	4	3/4" Lock Washer
32893-A	11	5/8" x 3-1/2" Hex Hd.
35137-A	1	Ball
35139-A	1	Oil Strainer Plate
35140-A	1	Oil Strainer Screen
35171-A	2	Lock Nut
35176-A	1	1/8" Union
35180-A	1	Lock Washer
35399-A	1	Roller Bush
35447-A	12	Coupling Nut
35450-A	1	L. H. Coupling
35456-A	22	5/8" Washer
35482-D	1	Cover
41028-A	4	3/4" x 2" Hex Hd.
41148-A	2	3/8" x 1-1/8" Cone Pt.
41202-A	4	1/4" x 1/2" But. Hd.
41246-A	22	5/8" x 3" Soc. Hd.
51110-A	2	5/8" N. F. Nut

FRICTION BRAKE



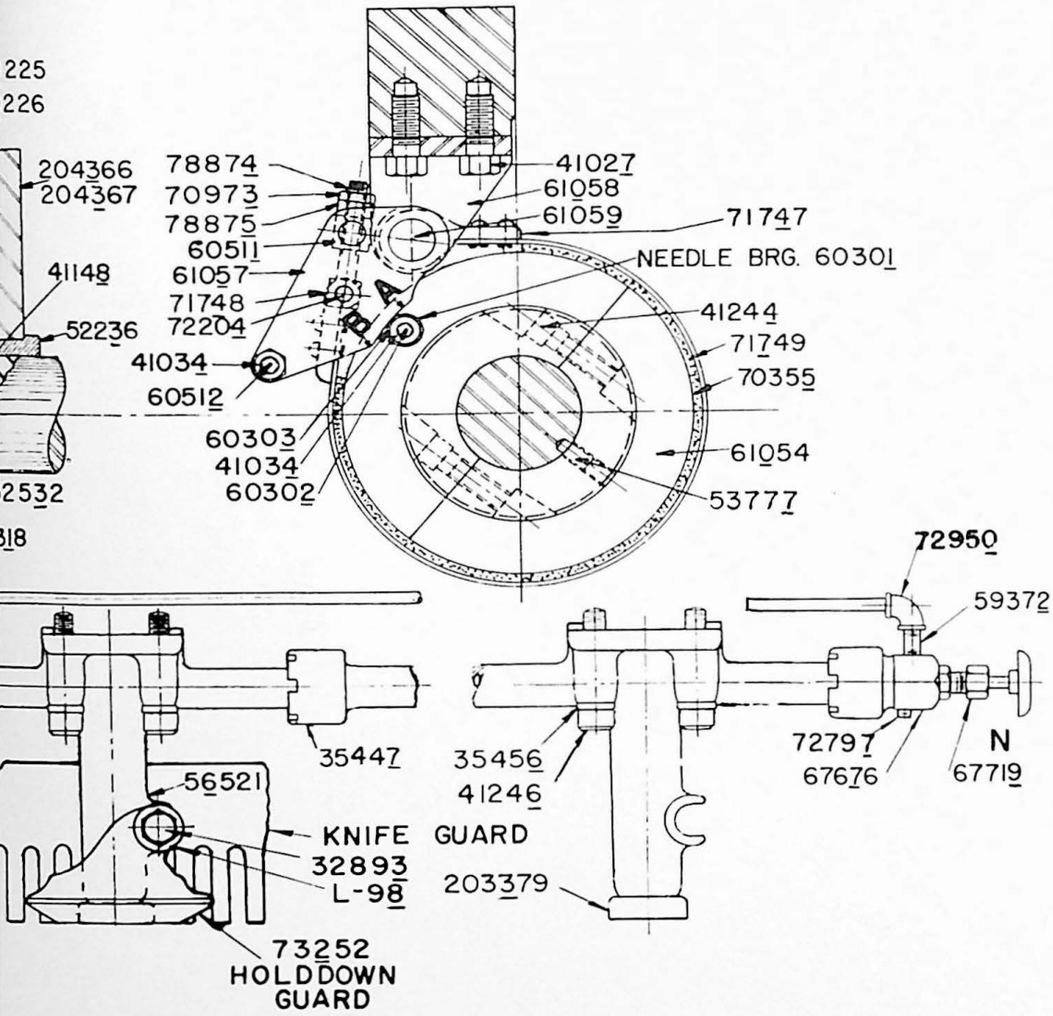
HOLDDOWN BOX

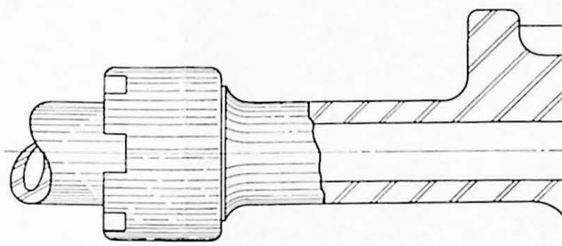
Piece No.	Amt.	Name of Piece
51318-B	2	Bush for Conn. Link
51622-A	2	3/8" Soc. Hd.
52114-A	1	Roller
52229-A	2	Key for Eccentric
52236-B	2	Bush
52239-C	1	L. H. Bearing
52240-C	1	L. H. Bush
52411-A	1	Flange
52532-B	2	Eccentric
52874-A	2	5/8" Stud
52915-B	1	Spring
55679-B	2	Spring Stud
55693-A	2	3/4" x 2-3/8" Hex Hd.
55695-A	10	3/4" x 1-3/4" Hex Hd.
55702-B	1	Pressure Plate
56521-D	1	Holddown Bracket
58389-B	1	Gasket
58462-A	1	1/8" Pipe
59372-A	1	1/4" x 1/2" Nipple
59540-B	1	Bent Pipe
60200-E	1	Holddown Box
60250-B	1	Spring
64950-A	1	3/8" Plug
64951-A	2	1/2" Plug

Piece No.	Amt.	Name of Piece
64958-B	1	Plunger
67240-A	1	1-1/4" Pipe Plug
67407-B	1	Spring Seat
67676-B	1	R. H. Coupling
67719-A	1	Valve Trimmings
68286-A	2	3/4" Special Nut
71011-A	2	3/8" Lock Washer
72262-A	1	Holddown Cam Key
72797-A	1	3/8" Pipe Plug
72889-A	1	Shim
72950-A	1	1/4" x 1/8" Elbow
73246-A	2	Thrust Washer
73252-C	11	Holddown Guard
75086-C	1	Piston
75087-A	1	Roller Pin
75088-A	2	Rings
75769-D	1	Cylinder Head
78805-C	1	Cam
79225-D	1	R. H. Conn. Link
79226-D	1	L. H. Conn. Link
203379-C	11	Holddown Plunger
204366-C	1	L. H. Support Plate
204367-C	1	R. H. Support Plate
204458-A	1	Plug Button

Piece No.
41027-A
41034-A
41244-A
53777-A
60301-A
60302-A
60303-A
60511-A
60512-A
61054-C
61057-B
61058-C
61059-A
70355-A
70973-A
71748-B
71748-B
71749-C
72204-A
78874-A
78875-A

FRICTION BRAKE





HOLDDOWN BOX

Piece No.	Amt.	Name of Piece
51318-B	2	Bush for Conn. Link
51622-A	2	3/8" Soc. Hd.
52114-A	1	Roller
52229-A	2	Key for Eccentric
52236-B	2	Bush
52239-C	1	L. H. Bearing
52240-C	1	L. H. Bush
52411-A	1	Flange
52532-B	2	Eccentric
52874-A	2	5/8" Stud
52915-B	1	Spring
55679-B	2	Spring Stud
55693-A	2	3/4" x 2-3/8" Hex Hd.
55695-A	10	3/4" x 1-3/4" Hex Hd.
55702-B	1	Pressure Plate
56521-D	1	Holddown Bracket
58389-B	1	Gasket
58462-A	1	1/8" Pipe
59372-A	1	1/4" x 1/2" Nipple
59540-B	1	Bent Pipe
60200-E	1	Holddown Box
60250-B	1	Spring
64950-A	1	3/8" Plug
64951-A	2	1/2" Plug

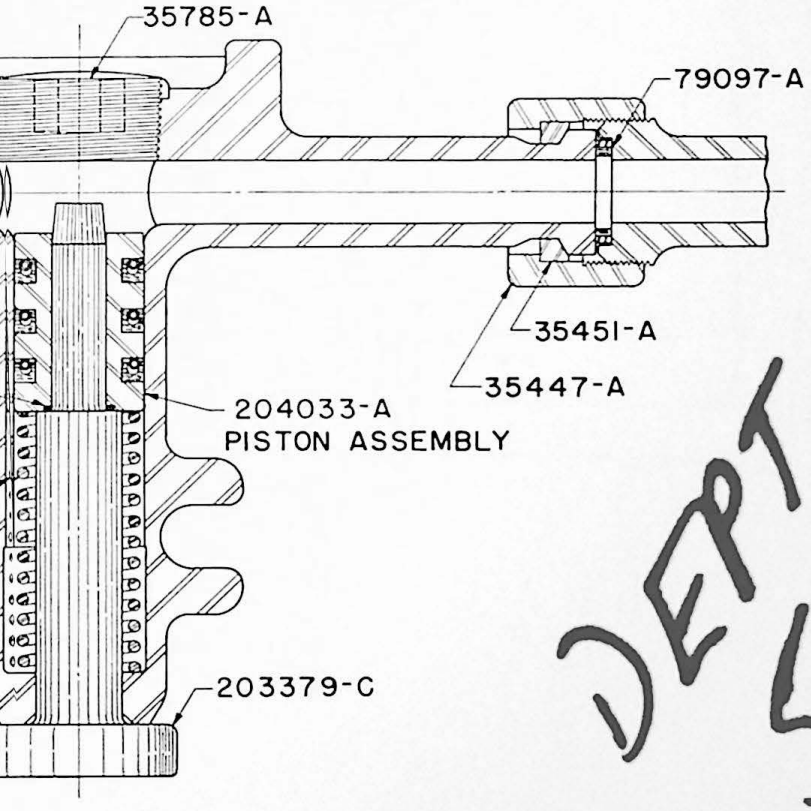
Piece No.	Amt.	Name of Piece
64958-B	1	Plunger
67240-A	1	1-1/4" Pipe Plug
67407-B	1	Spring Seat
67676-B	1	R. H. Coupling
67719-A	1	Valve Trimmings
68286-A	2	3/4" Special Nut
71011-A	2	3/8" Lock Washer
72262-A	1	Holddown Cam Key
72797-A	1	3/8" Pipe Plug
72889-A	1	Shim
72950-A	1	1/4" x 1/8" Elbow
73246-A	2	Thrust Washer
73252-C	11	Holddown Guard
75086-C	1	Piston
75087-A	1	Roller Pin
75088-A	2	Rings
75769-D	1	Cylinder Head
78805-C	1	Cam
79225-D	1	R. H. Conn. Link
79226-D	1	L. H. Conn. Link
203379-C	11	Holddown Plunger
204366-C	1	L. H. Support Plate
204367-C	1	R. H. Support Plate
204458-A	1	Plug Button

FRICTION BRAKE

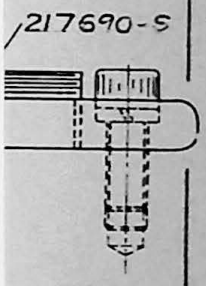
Piece No.	Amt.	Name of Piece
41027-A	2	3/4" x 1-3/4" Hex Hd.
41034-A	3	1/2" N. C. Nut
41244-A	4	5/8" x 1-3/4" Soc. Hd.
53777-A	2	1/2" x 1-1/2" Set Scr.
60301-A	2	Needle Bearing
60302-A	1	Roller Pin
60303-A	1	Roller
60511-A	1	Pivot
60512-A	1	5/8" Stud
61054-C	1	Brake Drum
61057-B	2	Cam
61058-C	1	Supporting Bracket
61059-A	1	Pin for Bracket
70355-A	1	Brake Lining
70973-A	1	1/2" Jam Nut
71748-B	1	Anchor Lug
71748-B	1	Adjusting Lug
71749-C	1	Brake Band
72204-A	1	Pin
78874-A	1	Eye Bolt
78875-A	1	1/2" N. F. Nut

DRAULIC HOLDDOWNS
ND FRICTION BRAKE
ERIES CINCINNATI SHEARS

DDOWN UNIT



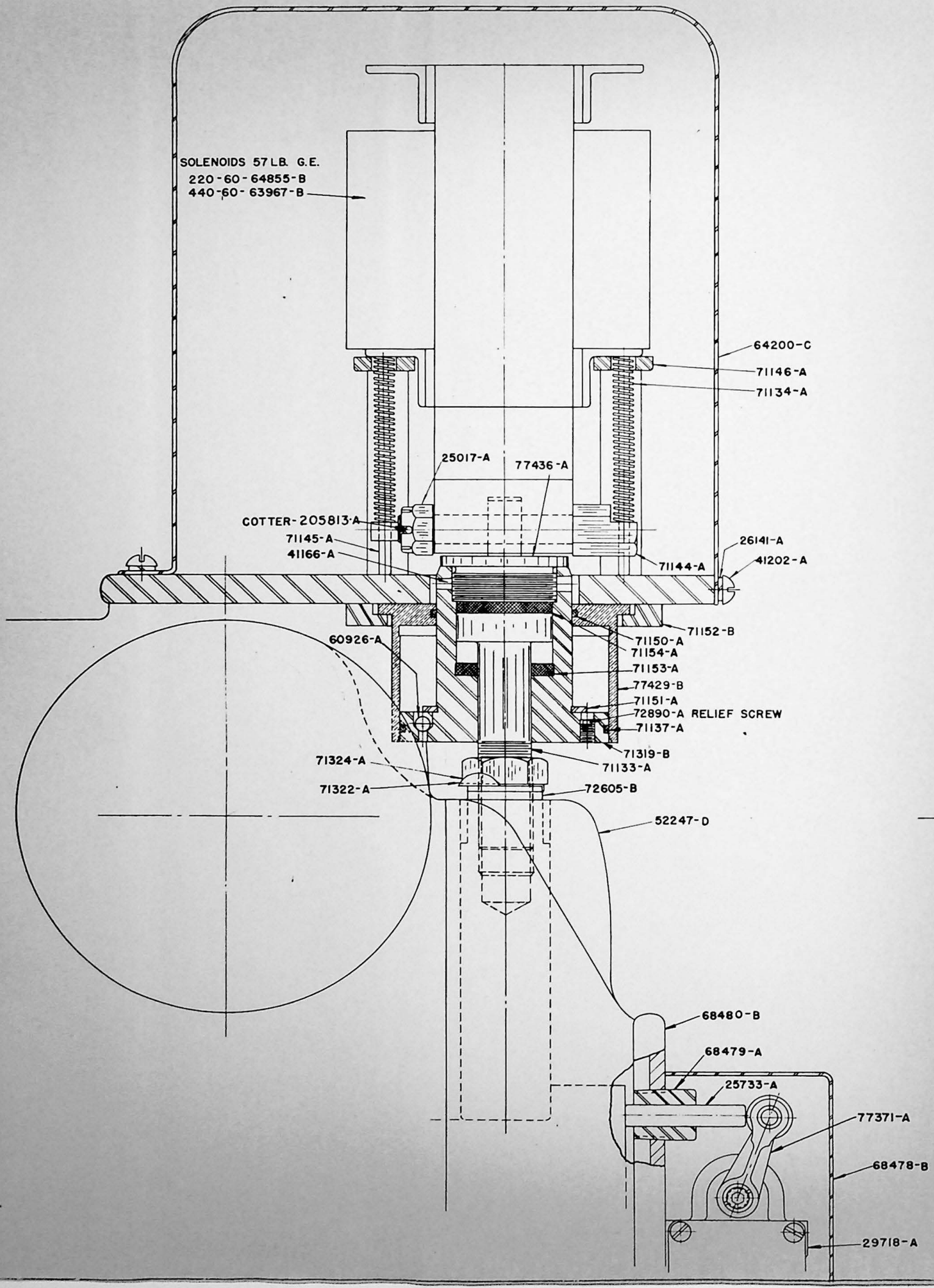
DEPT 531

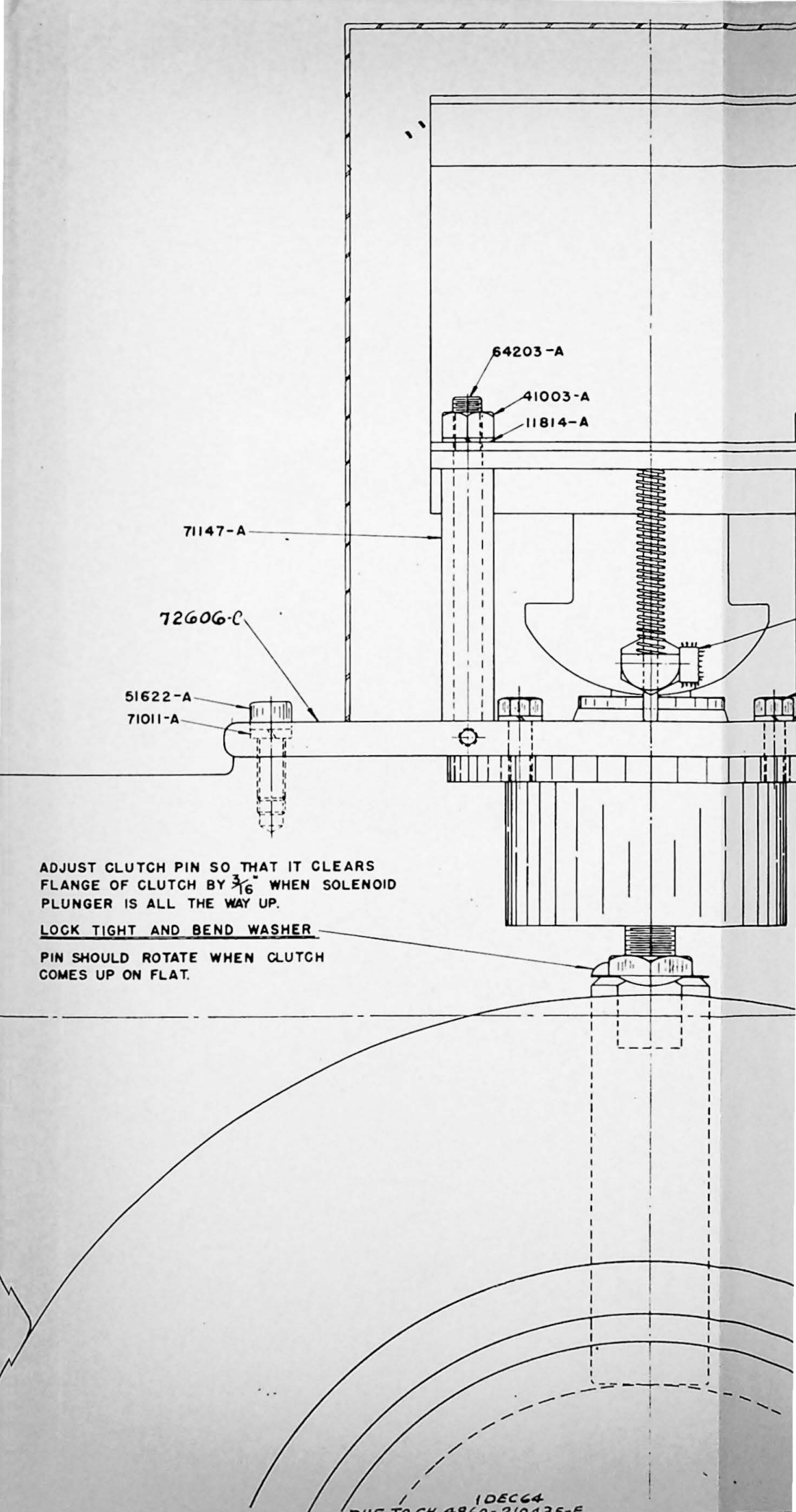


HOLDDOWN UNIT

Piece No.	Amt.	Name of Piece
29454-A	11	"O" Ring
35447-A	12	Coupling Nut
35451-A	12	Ring
35785-A	11	1-1/2" Pipe Plug
56020-A	11	Spring
56521-D	11	Holddown Bracket
79097-A	11	Sealing Spacer
203379-C	11	Plunger
204033-A	11	Piston Ass'y.

2696-C


SOLENOIDS 57 LB. G.E.
220-60-64855-B
440-60-63967-B
64200-C
71146-A
71134-A
25017-A
77436-A
COTTER-205813-A
71145-A
41166-A
26141-A
41202-A
71144-A
71152-B
60926-A
71150-A
71154-A
71153-A
77429-B
71151-A
72890-A RELIEF SCREW
71137-A
71319-B
71324-A
71133-A
71322-A
72605-B
52247-D
68480-B
68479-A
25733-A
77371-A
68478-B
29718-A



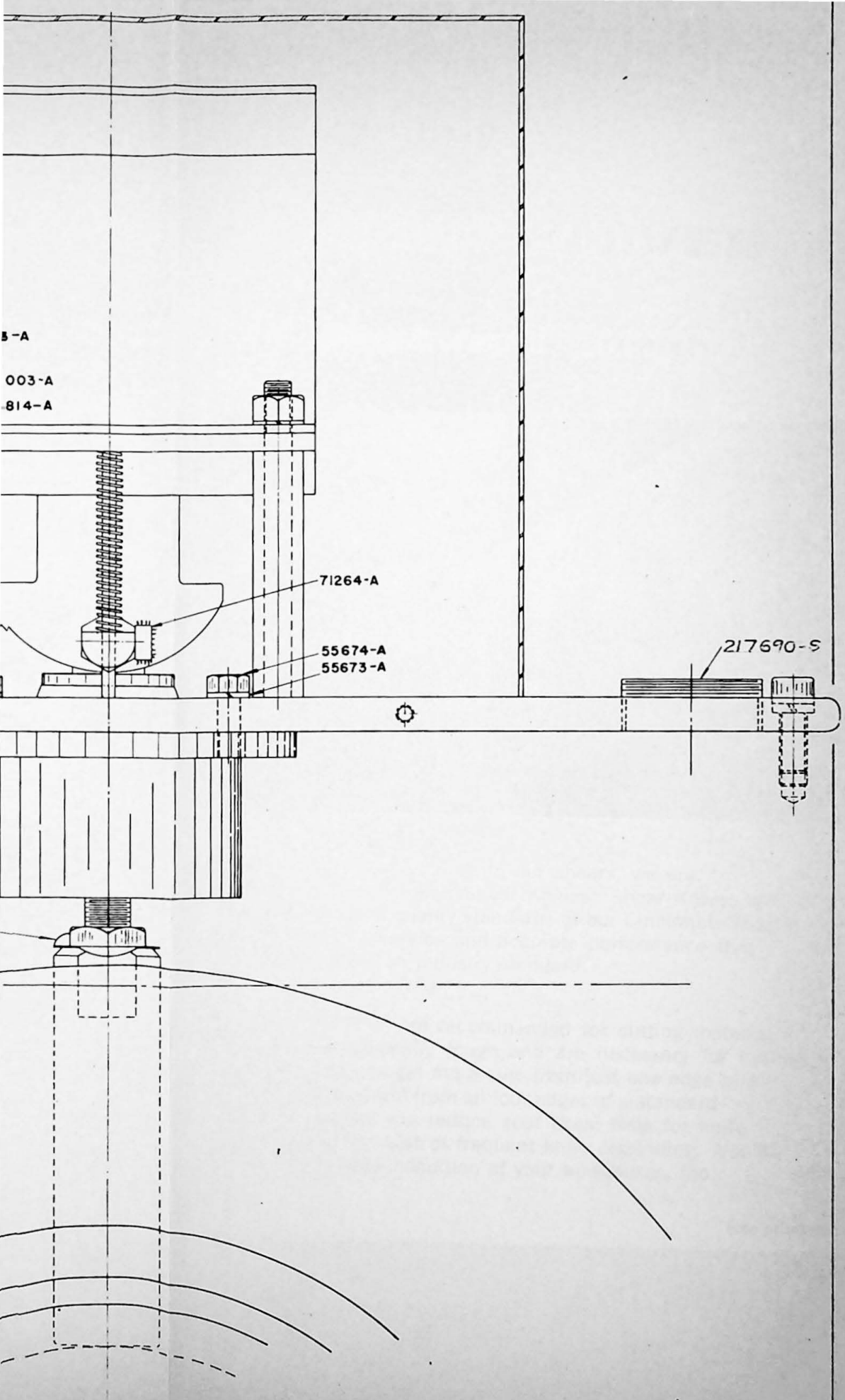
ADJUST CLUTCH PIN SO THAT IT CLEARS FLANGE OF CLUTCH BY 3/16" WHEN SOLENOID PLUNGER IS ALL THE WAY UP.

LOCK TIGHT AND BEND WASHER

PIN SHOULD ROTATE WHEN CLUTCH COMES UP ON FLAT.

1 DEC 64
DUE TO CH. 4860-210435-E
SUPERSEDES NO. 71130-E
SUPERSEDED BY NO. 210435-E

USED IN *14-18 SHEARS



SOLENOID OPERATED CLUTCH
#14-18 SHEARS

-355-E
E
5-BE
USED ON #14-18 SHEARS

CHANGES

THE CINCINNATI SHAPER CO.
CINCINNATI, OHIO, U.S.A.

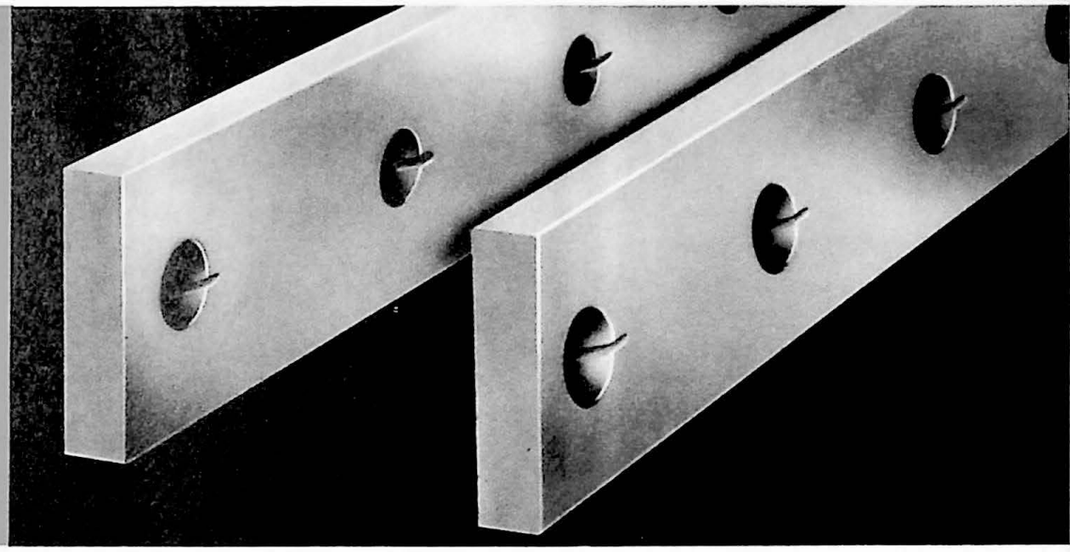
PIECE NO. 72696-C

DRAWN 7-30-48 BY LK
CHECKED ____ BY ____

now you can buy

CINCINNATI® KNIVES

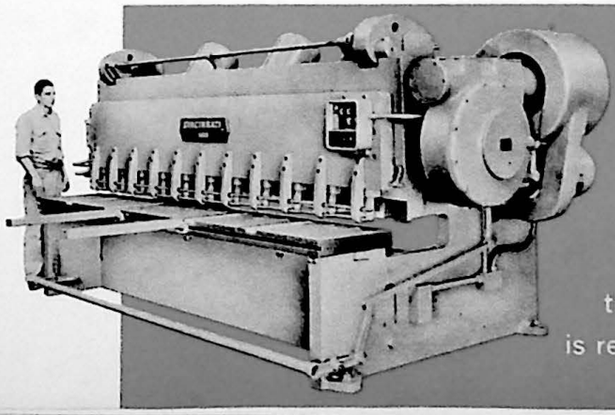
for your Cincinnati® Shear



Striving to maintain the accuracy built into our shears, we are introducing our own line of Cincinnati Shear Knives. Shear Knives are manufactured to the same strict quality standards of our Cincinnati Shears. You get the same dependable service and accurate performance that has made the Cincinnati Shear an industry standard.

Cincinnati "HC" Knives are recommended for cutting material through ¼". They are exceptionally tough and are necessary for cutting the newer metal alloys. You will get more cuts from just one edge of a Cincinnati "HC" Knife than you will from all four edges of a standard grade knife. With "HC" knives you reduce your down time for knife changing by 75% and save the cost of frequent knife regrinding. You'll notice the difference in the edge condition of your workpieces, too.

(see other side)

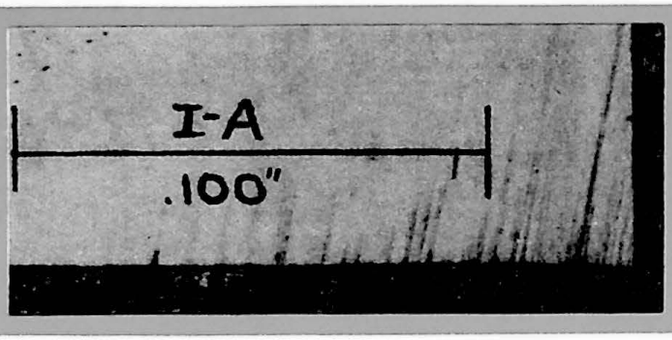


this 43 Series Shear
is representative of Cincinnati Shears

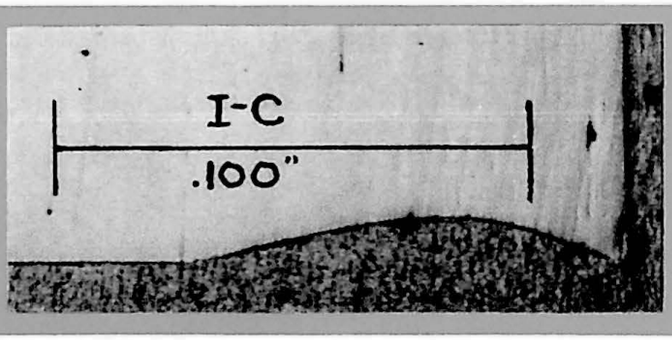
Tests prove superiority of "HC" Shear Knives

Here are actual photographs (enlarged 23 times) comparing the amount of wear between Cincinnati "HC" Knives and standard grade shear knives after an accelerated test on 10 gauge mild steel. They show why you'll get more cuts from one edge of a CINCINNATI "HC" KNIFE than you will from all four edges of a standard grade knife when you're cutting material through ¼" thickness.

CINCINNATI "HC" KNIFE



STANDARD GRADE KNIFE



Cincinnati "SR" Knives are available for cutting ¼" through 1½" material. "SR" knives are manufactured from a special alloy tool steel. Cincinnati tests show that when cutting materials from ¼" to ½" thick you can expect 2 to 3 times more life from "SR" knives than from standard grade knives. For heavier plate cutting "SR" knives offer the greatest spall resistance while providing the longest expected life.

Cincinnati "HC" and "SR" Knives mean economy for you

When you total up (1) the money saved in less shear down time, (2) the better edge condition of your workpieces, (3) money saved by elimination of frequent knife regrinding, and (4) the greater number of cuts you get, Cincinnati "HC" and "SR" Knives are the most economical you can buy.

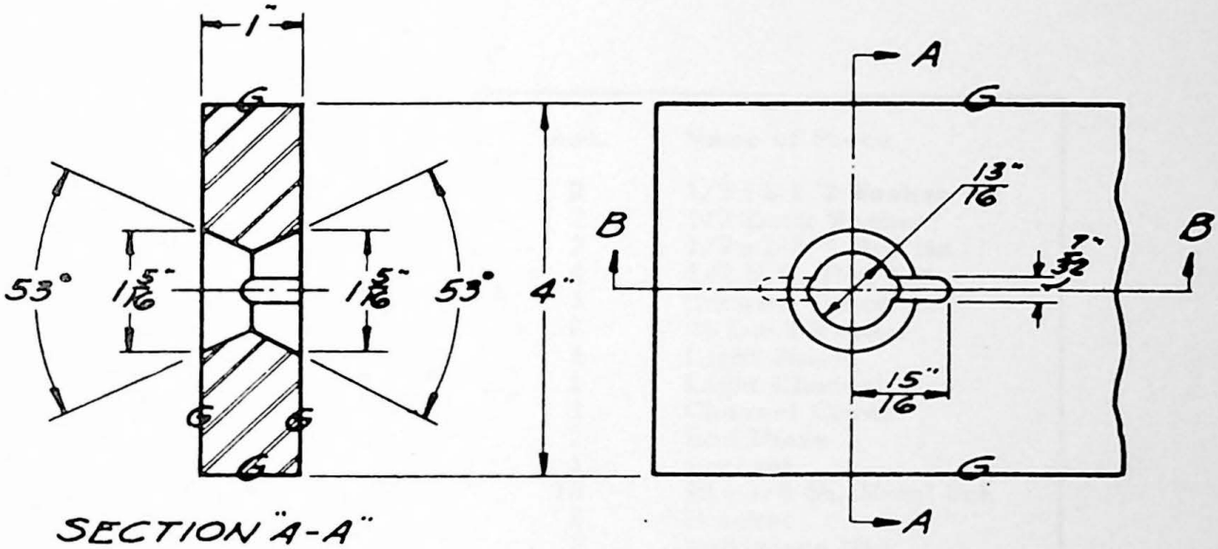
Cincinnati "S" Knives are our line of standard grade knives. They are manufactured from a select high carbon tool steel. They are produced with the same high quality production standards as our "HC" and "SR" knives. All machining and heat treating operations are carefully controlled and each knife is inspected to insure meeting our high production standards. Cincinnati "S" Knives can be used to cut mild steel and softer materials from 10 gauge to 1½" thick.

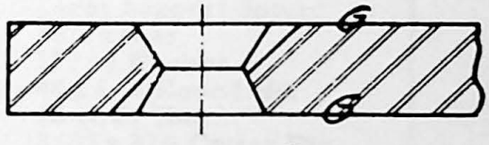
CINCINNATI
THE CINCINNATI SHAPER CO.
CINCINNATI 11, OHIO U.S.A.
IN THE UNITED KINGDOM: THE CINCINNATI SHAPER CO., LTD.
PEEL PARK PLACE, EAST KILBRIDE, GLASGOW, SCOTLAND

KNIVES FOR CINCINNATI 14, 18, AND 25 SERIES SHEARS

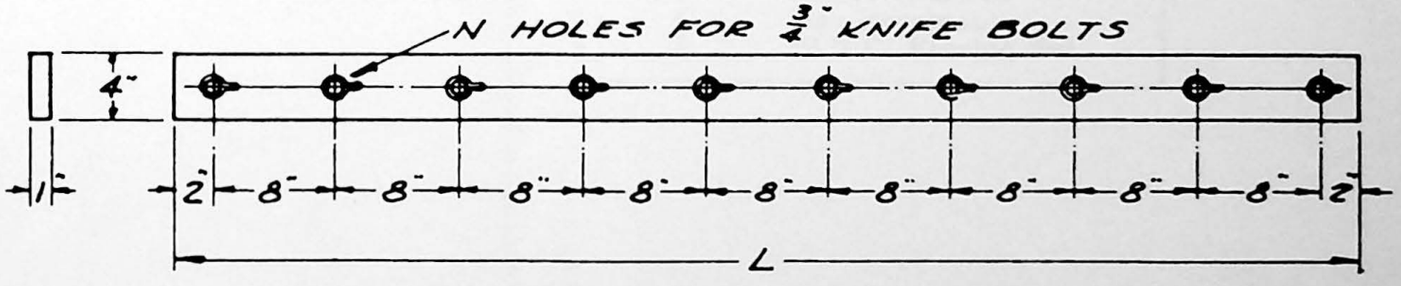
GRINDING LIMITS

WIDTH – PARALLEL WITHIN .005 FROM END TO END
THICKNESS – PARALLEL WITHIN .003 FROM END TO END
NO VARIATION GREATER THAN .001 WITHIN ANY 12" OF LENGTH.





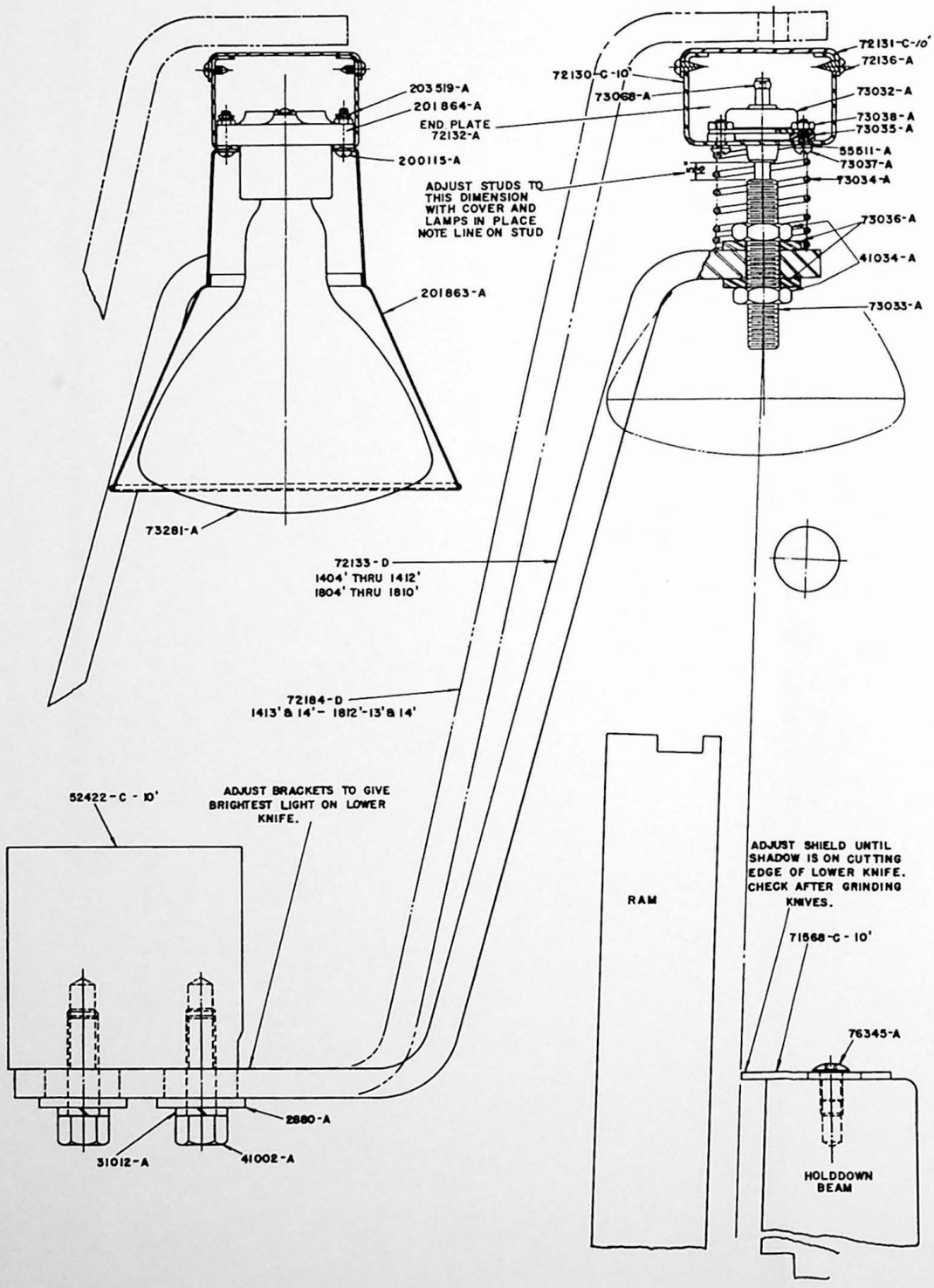
WG-6711



SIZE SHEARS	L	N
1404, 1804, 2504	4' – 4"	7
1406, 1806, 2506	6' – 4"	10
1408, 1808, 2508	8' – 4"	13
1410, 1810, 2510	10' – 4"	16
1412, 1812, 2512	12' – 4"	19
1414, 1814, 2514	14' – 4"	22
2516	16' – 4"	25

THE SPACING OF HOLES IS 8" FOR ALL THE KNIVES LISTED. FOR KNIVES 13'-4" LONG AND 15'-4" LONG THE SPACING IS 7-13/16".

WHEN ORDERING KNIVES, SPECIFY THE THICKNESS AND HARDNESS OF THE MATERIAL TO BE SHEARED.


203519-A
201864-A
END PLATE
72132-A
200115-A
ADJUST STUDS TO
THIS DIMENSION
WITH COVER AND
LAMPS IN PLACE
NOTE LINE ON STUD
201863-A
73281-A
72133-D
1404' THRU 1412'
1804' THRU 1810'
72184-D
1413' & 14' - 1812'-13' & 14'
52422-C-10'
ADJUST BRACKETS TO GIVE
BRIGHTEST LIGHT ON LOWER
KNIFE.
2880-A
31012-A
41002-A
72131-C-10'
72136-A
72130-C-10'
73068-A
73032-A
73038-A
73035-A
55511-A
73037-A
73034-A
73036-A
41034-A
73033-A
RAM
ADJUST SHIELD UNTIL
SHADOW IS ON CUTTING
EDGE OF LOWER KNIFE.
CHECK AFTER GRINDING
KNIVES.
71568-C-10'
76345-A
HOLDDOWN
BEAM

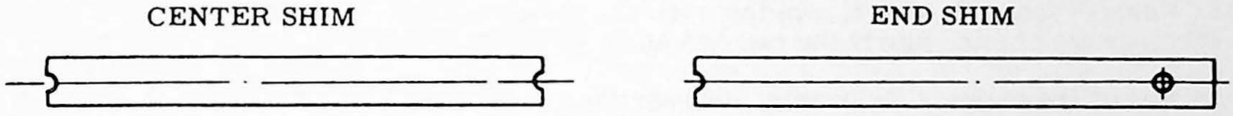
LIGHT BEAM SHEARING GAGE

10-14-18-25-43 CINCINNATI SHEARS

Piece No.	Amt.	Name of Piece
2880-A	2	1/2 x 1-1/2 Washer
31012	2	1/2 Lock Washer
41002	2	1/2 x 1-3/4 Hex Hd.
41034	4	1/2 N.C. Hex Nut
52422-C	1	Housing Brace
55511	8	#8 Lock Washer
71568-C	1	Light Shield
72130-C	1	Light Channel
72131-C	1	Channel Cover
72132-A	2	End Plate
72133-D	1	Bracket
72136-A	18	#8 x 3/8 Sh. Metal Scr.
72184-D	1	Bracket
73032-A	2	Multiplane Mtg.
73033-A	2	Light Support Stud
73034-A	2	Light Support Spring
73035-A	8	#8 Washer
73036-A	4	17/32 Washer
73037-A	8	#8 x 1/2 Round Hd.
73038-A	8	#8 N.C. Nut
73068-A	2	3/32 x 3/4 Cotter Pin
73281-A	4	Reflector Spot Lamp
76345	6	3/8 x 1/2 Butt. Hd. Scr.
200115-A	8	#8-32 x 1'' But. Hd.
201863-A	4	Reflector Shade
201864-A	4	Sign Receptacle
203519-A	8	#8 N.C. Flexloc Nut

INSTRUCTIONS FOR SHIMMING LOWER KNIFE ON CINCINNATI SHEARS

After the knives have been ground, or when new knives are installed, it is necessary to change the shims under the lower knife to bring the cutting edge to the proper level with respect to the table surface. For this purpose, we recommend our standard shim packs as shown.



Each pack consists of eight shims: .005", .007", .010", .015", .025", .050", .050", and .093" in thickness.

Proceed as follows:

1. Thoroughly clean the knife seat and table cover recess if shear has table cover. Replace springs and pins.
2. Place the correct shim packs in a line along the table adjacent to the knife bolt pockets.
3. Clean and oil the knife.
4. Set the knife on the seat without shims or bolts.
5. Run the back gage angle forward to hold the knife against the table.
6. If the shear has a table cover, lay the table cover in place without screws.

RB—6711

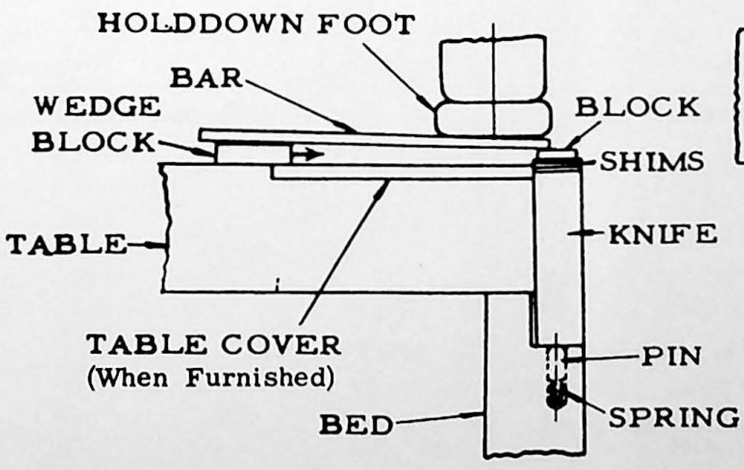


FIG. 1

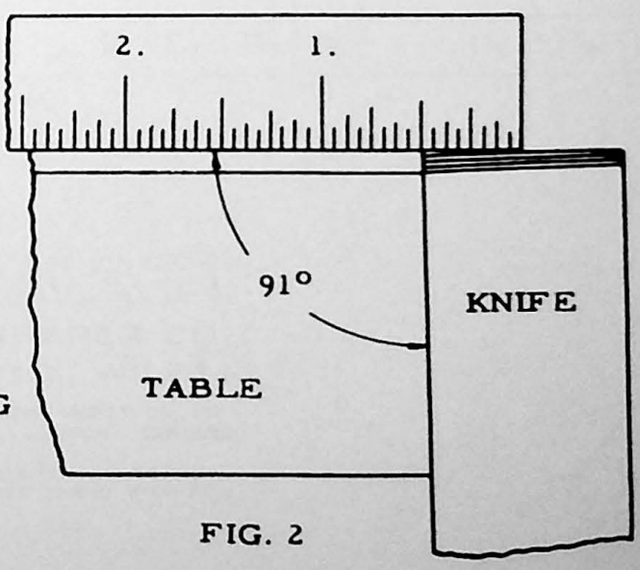


FIG. 2

(Over)

7. Select enough shims from one end pack so that when placed on top of the knife they will come about flush with the top of the table or top of the table cover. It may be necessary to use two packs.

8. Compress the shims as shown in Fig. 1 by moving wedge block toward knife and check with a scale as shown in Fig. 2. The scale should hit at about the center of the knife.

9. Repeat the above using the holddown at the center of each shim pack. There should not be a difference in thickness of more than .003 between adjacent stacks of shims.

10. Place all unused shims in their proper envelopes.

11. Remove the table cover, run the back gage angle back, raise the knife high enough to clear the shims, insert the two end and one center bolt and tighten.

12. Install the shims. To do this, depress the spring-loaded pins in the knife seat of bed, install the selected shims, then release the pins seeing that they enter the hole or slot in shims. It is best to have the thin shims inserted between heavy shims.

13. Lower the knife, insert all knife bolts and tighten. It may be necessary to pry the knife down with a soft bar.

14. Install the table cover if the shear is so equipped.

15. Make a final check as shown in Fig. 2. Shims can be changed without removing the knife by loosening the bolts and raising the knife as outlined above.

When changing shear knives the complete procedure outlined in the operator's manual should be followed.

SHEARING CAPACITIES FOR VARIOUS METALS COMPARED TO MILD STEEL

CINCINNATI SHEAR SALES DATA SHEET NO. 140

	MILD STEEL	16 GA.	14 GA.	12 GA.	10 GA.	3/16"	1/4"	5/16"	3/8"	7/16"	1/2"	5/8"	3/4"	7/8"	1"	1 1/4"	1 1/2"
NON-FERROUS METALS	ALUMINUM & ALLOYS* 1100-O | 2024-O 1100-H16 | A51S	11 GA.	1/8	5/32	7/32	5/16	3/8	1/2	5/8	11/16	3/4	1	1 3/16	1 3/8	1 9/16	1 15/16	2 5/16
	2024-T3 | 6061-T6 2024-T4 | 7075-T4	1/8	5/32	3/16	1/4	3/8	1/2	5/8	3/4	7/8	1	1 1/4	1 1/2	1 11/16	1 15/16	2 7/16	2 15/16
	COPPER & ALLOYS* BRONZE, AMPCO GILDING METAL BRASS, 70—30 (SOFT)	14 GA.	12 GA.	10 GA.	1/8	3/16	1/4	5/16	3/8	7/16	1/2	11/16	13/16	15/16	1 1/16	1 5/16	1 5/8
	BRONZE, COMMERCIAL COPPER, ELECTROLYTIC	14 GA.	12 GA.	10 GA.	1/8	3/16	1/4	5/16	3/8	7/16	1/2	5/8	3/4	1/8	1	1 1/4	1 1/2
	BRASS, 70—30 (EXTRA HARD)	11 GA.	1/8	5/32	7/32	5/16	3/8	1/2	5/8	11/16	3/4	1	1 3/16	1 3/8	1 9/16	1 15/16	2 5/16
	CUPRO-NICKEL, CU-70, NI-30	16 GA.	14 GA.	11 GA.	10 GA.	5/32	7/32	9/32	5/16	3/8	7/16	9/16	11/16	3/4	7/8	1 1/16	1 5/16
	NICKEL & ALLOYS (ANNEALED:) INCOLOY 301 "T" | INCONEL 600 MONEL K405 | INCONEL 625 NICKEL 200 "A" | INCONEL 718 NIMONIC 90 | INCONEL x 750	19 GA.	18 GA.	14 GA.	12 GA.	10 GA.	3/16	1/4	9/32	5/16	3/8	1/2	5/8	11/16	3/4	1	1 3/16
	INCONEL 600 (AS ROLLED) MONEL 400 (AS ROLLED) NICKEL ELECTROLYTIC NI-O-NEL 825 (ANNEALED) RENE 41	18 GA.	16 GA.	14 GA.	12 GA.	10 GA.	3/16	1/4	9/32	5/16	3/8	1/2	5/8	3/4	13/16	1	1 1/4
	(AS ROLLED:) HASTELLOY "A" | INCOLOY 901 INCONEL 702 | MONEL K500 NICKEL 200 "A" | NIMONIC 75	18 GA.	16 GA.	13 GA.	12 GA.	8 GA.	7/32	9/32	5/16	3/8	7/16	9/16	11/16	3/4	7/8	1 1/16	1 5/16
	(AGE HARD:) INCOLOY 901 | MONEL K500 INCONEL x 750 | NIMONEL 90	18 GA.	16 GA.	13 GA.	11 GA.	8 GA.	1/4	9/32	5/16	3/8	7/16	9/16	11/16	13/16	15/16	1 3/16	1 3/8
	MAGNESIUM & ALLOYS* DOWMETAL	11 GA.	9 GA.	7 GA.	1/4	3/8	1/2	5/8	3/4	7/8	1	1 1/4	1 1/2	1 11/16	1 15/16	2 7/16	2 15/16
	MOLYBDENUM PURE (AS ROLLED)	18 GA.	16 GA.	14 GA.	12 GA.	8 GA.	3/16	1/4	9/32	5/16	3/8	1/2	5/8	3/4	13/16	1	1 1/4
	TITANIUM & ALLOYS TITANIUM (PURE AS ROLLED) TITANIUM, GAL-4V	16 GA.	14 GA.	12 GA.	10 GA.	3/16	1/4	5/16	3/8	7/16	1/2	5/8	3/4	7/8	1	1 1/4	1 1/2
	TITANIUM, PURE (ANNEALED)	18 GA.	16 GA.	14 GA.	12 GA.	8 GA.	3/16	1/4	9/32	5/16	3/8	1/2	5/8	3/4	13/16	1	1 1/4
	URANIUM	16 GA.	14 GA.	12 GA.	10 GA.	3/16	1/4	5/16	3/8	7/16	1/2	5/8	3/4	7/8	1	1 1/4	1 1/2
	ZINC* (AS ROLLED)	16 GA.	14 GA.	11 GA.	9 GA.	7/32	9/32	3/8	7/16	1/2	9/16	11/16	7/8	1	1 1/8	1 3/8	1 11/16

MAY REQUIRE MORE CLEARANCE UNDER HOLDDOWNS AND AT LOW END OF UPPER KNIFE.

CINCINNATI

THE CINCINNATI SHAPER CO.
CINCINNATI, OHIO, 45211

IN THE UNITED KINGDOM: THE CINCINNATI SHAPER CO., LTD.
PEEL PARK PLACE, EAST KILBRIDE, GLASGOW, SCOTLAND

PRESS BRAKES, SHEARS, COMPACTING PRESSES,
HIGH-ENERGY-RATE FORMING MACHINES, SHAPERS

Form S6607A

(Continued Other Side)

(Continued From Other Side)

SHEARING CAPACITIES FOR VARIOUS METALS COMPARED TO MILD STEEL

CINCINNATI SHEAR SALES DATA SHEET NO. 140

FERROUS METALS

MILD STEEL	16 GA.	14 GA.	11 GA.	10 GA.	3/16"	1/4"	5/16"	3/8"	7/16"	1/2"	5/8"	3/4"	7/8"	1"	1 1/4"	1 1/2"
IRON INGOT IRON (DEAD SOFT)	16 GA.	14 GA.	12 GA.	11 GA.	3/16	1/4	9/32	5/16	3/8	7/16	9/16	11/16	13/16	15/16	1 3/16	1 3/8
STEEL—AISI 4340 (ANNEALED) 1025 (HARD ROLLED) 1045 (HOT ROLLED) 8620 (HOT ROLLED)	16 GA.	14 GA.	12 GA.	11 GA.	3/16	1/4	9/32	5/16	3/8	7/16	9/16	11/16	13/16	15/16	1 3/16	1 3/8
52100 (ANNEALED) (AS ROLLED:) 1020 | 4340 1040	16 GA.	14 GA.	12 GA.	10 GA.	3/16	1/4	5/16	3/8	7/16	1/2	5/8	3/4	7/8	1	1 1/4	1 1/2
STEEL—ASTM (AS ROLLED) A-440 A-441	18 GA.	16 GA.	14 GA.	12 GA.	8 GA.	3/16	1/4	9/32	5/16	3/8	1/2	5/8	3/4	13/16	1	1 1/4
A-242 | A-374 A-375	16 GA.	14 GA.	12 GA.	11 GA.	3/16	1/4	9/32	5/16	3/8	7/16	9/16	11/16	13/16	15/16	1 3/16	1 7/16
A-36 | A-212	16 GA.	14 GA.	12 GA.	10 GA.	3/16	1/4	5/16	3/8	7/16	1/2	5/8	3/4	7/8	1	1 1/4	1 1/2
STEEL—STAINLESS (ANNEALED:) 302 | 309 304 | 410	19 GA.	18 GA.	14 GA.	12 GA.	10 GA.	3/16	1/4	9/32	5/16	3/8	1/2	5/8	11/16	3/4	1	1 3/16
STEEL—TOOL (ANNEALED:) 0-1 | M-2	16 GA.	14 GA.	12 GA.	11 GA.	3/16	1/4	9/32	5/16	3/8	7/16	9/16	11/16	13/16	15/16	1 3/16	1 3/8
STEEL HIGH STRENGTH & SPECIAL MARAGING HY-80 MANGANESE STS, NAVY FLOOR PLATE TRI-TEN MANTEN SSS-100 (HEAT TREATED) VANADIUM STEEL (ANNEALED)	18 GA.	16 GA.	14 GA.	12 GA.	5/32	3/16	1/4	9/32	5/16	3/8	1/2	5/8	11/16	3/4	1	1 3/16
ABRASION RESISTANT ABRASION FLOOR PLATE JALLOY #3 (HEAT TREATED) (AS ROLLED:) T-1 and T-1 (321) HTS, NAVY NA-XTRA-100 STELCOLOY	16 GA.	14 GA.	12 GA.	11 GA.	3/16	1/4	9/32	5/16	3/8	7/16	9/16	11/16	13/16	15/16	1 3/16	1 3/8

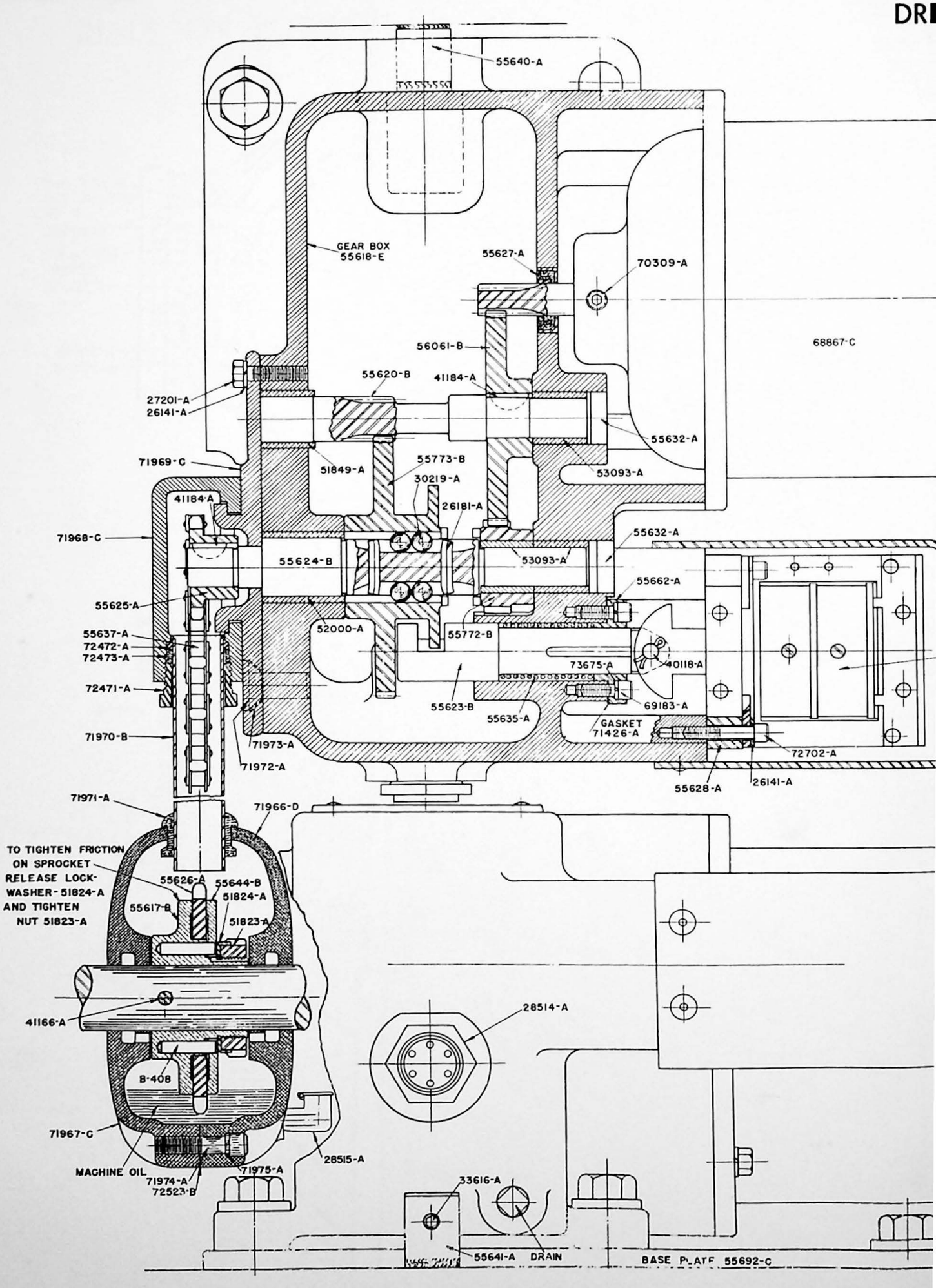
The Material Gauge Numbers used on the preceding charts are those commonly used in industry. For Decimal Thickness, refer to the following Gauge Conversion Chart:

GAUGE NUMBER	MANUFACTURER'S STANDARD	STAINLESS & NICKEL (U. S. STD.)	NON-FERROUS ALUMINUM, BRASS, COPPER (B. & S.)
7	.1793	.1875	.1443
8	.1644	.1719	.1285
9	.1495	.1562	.1144
10	.1345	.1406	.1019
11	.1196	.1250	.0907
12	.1046	.1094	.0808
13	.0897	.0937	.0720
14	.0747	.0781	.0641
16	.0598	.0625	.0508
18	.0478	.0500	.0403
20	.0359	.0375	.0320
22	.0299	.0312	.0253

NOTE: Materials of a hardness of 30 Rc or above or those with abrasives included present severe knife problems.

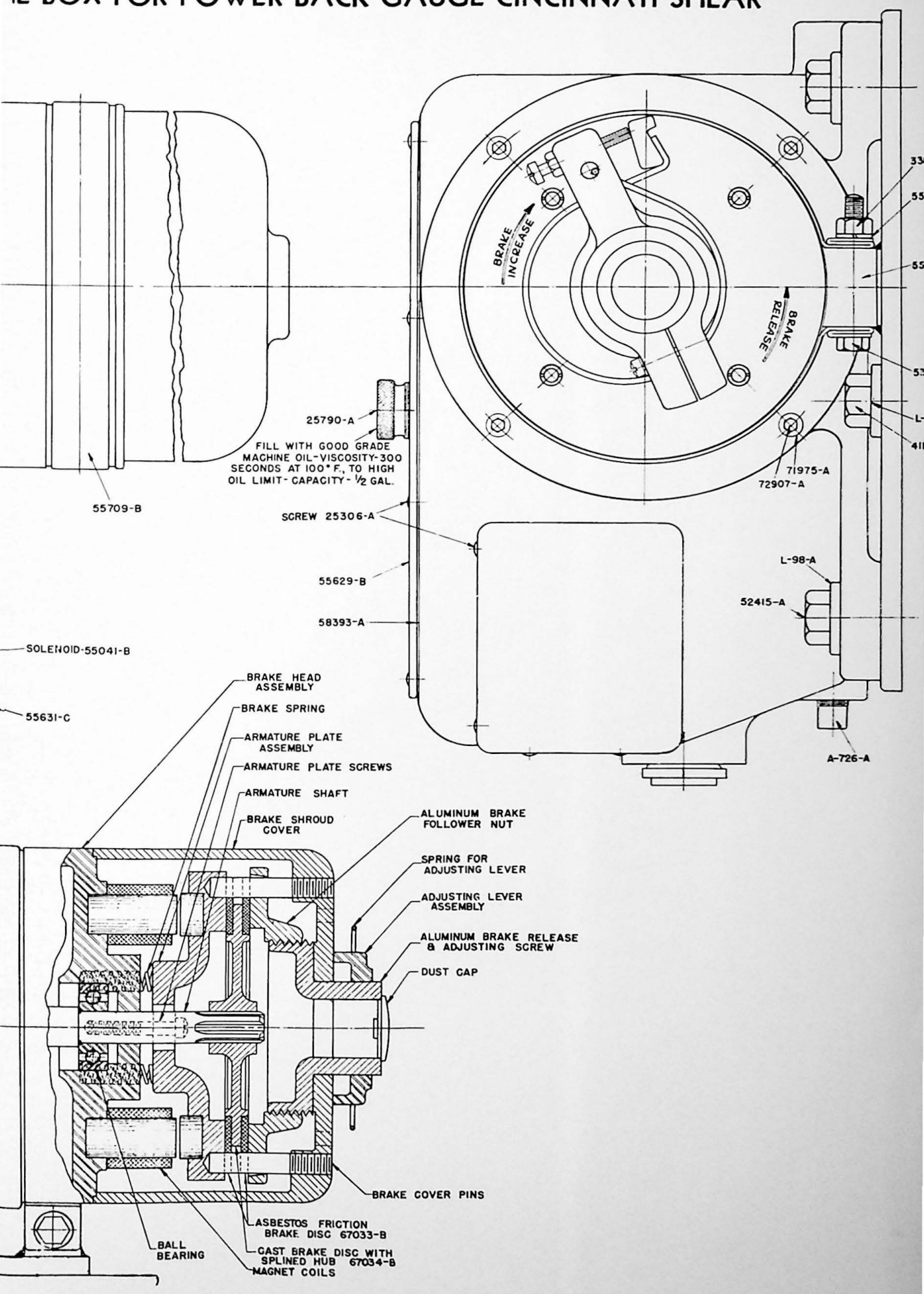
RECOMMENDED LUBRICANTS FOR ALL MACHINES MANUFACTURED BY THE C.S.CO.

CSCO	A	B	C	D	E	F	G	W	X	Y
SPECIFICATION	LIGHT HYD OIL 150 SECONDS AT 100° F TURBINE GRADE, WITH ANTI-RUST, OXIDATION, AND ANTI-WEAR ADDITIVES.	MEDIUM HYD. OIL 200 TO 250 SEC AT 100°F ANTI-OXIDATION & ANTI-RUST ADDITIVES	MEDIUM HYD. OIL-FIRE RESISTANT 230 SECONDS AT 100° F PHOSPHATE - ESTER BASE	MED.-HEAVY HYD. OIL 300 SECONDS AT 100° F ANTI-OXIDATION & ANTI-RUST ADDITIVES	HEAVY EXTREME PRESSURE GEAR OIL 80 TO 100 SEC AT 210° F LEAD NAPTHENATE	WORM GEAR OIL 155 SECONDS AT 210° F 5% ACIDLESS TALLOW	HEAVY EXTREME PRESSURE GEAR OIL 700 TO 1000 SEC. AT 100° F SULPHUR-PHOSPHORUS	#2 GREASE-LITHIUM SOAP BASE WATERPROOF	#2 E.P GREASE LITHIUM SOAP BASE WATERPROOF	HEAVY OPEN GEAR GREASE ADHERING FIBER
SUPPLIER	PRODUCT NAME									
AMERICAN (STD. OIL)	RYKON INDUST. OIL #15	AMERICAN INDUST. OIL #21		AMERICAN INDUST. OIL #31	AMOGEAR COMPOUND #3	AMERICAN WORM GEAR OIL	MULTI-PURPOSE GEAR OIL #80	AMOLITH GREASE NO.2	AMOLITH GREASE MP	AMOVIS #8X
ASHLAND		ETC OIL (R&O) #20		ETC OIL (R&O) #30	E. P. GEAR COMPOUND #150	DARK CYLINDER OIL	ENARCO MULTI-PURPOSE GEAR LUBRICANT "D"	FLOTEX GREASE #2	FLOTEX GREASE EP#2	VISTEX COMP. #2 OR VISTEX COMPOUND (FLUID) SUMMER
CELANESE			CELLULUBE 220							
CITGO	PACEMAKER XD-15	PACEMAKER T-20		PACEMAKER T-30	CITGO COMPOUND L-20	CITGO COMPOUND OIL 145-5	STANDARD GEAR OIL (MP) 90	CITGO H-2		CITGO OPEN GEAR COMPOUND #2
FISKE (LUBRI-PLATE)	LUBRIPLATE HYD. OIL HO-0	LUBRIPLATE HYD. OIL NO.1 (SAE 10)		LUBRIPLATE HYD. OIL NO. 2 (SAE 20)			LUBRICATE APG 90	LUBRIPLATE 630-2	LUBRIPLATE 630-2	GEAR SHIELD HEAVY
GULF	HARMONY 43 AW	HARMONY 47		HARMONY 53	E.P. LUBE #95	SENATE 155	MULTI-PURPOSE GEAR LUBRICANT 90	GULFCROWN GREASE 2	GULFCROWN GREASE E.P. #2	FLUID LUBCOTE # 3
HOUGHTON	HYDRODRIVE HP-150		HOUGHTOSAFE #1120	HYDRODRIVE MIH 20	HOUGHTOGEAR #90	ME WORM GEAR OIL	MP GEAR OIL 90	COSMOLUBE #2	COSMOLUBE #2 EP	STA-PUT 591
HUMBLE (ESSO)	NUTO H 44	TERESSTIC 47 OR NUTO 48		TERESSTIC 52 OR NUTO 53	PEN-O-LED EP 3	CANTONA LK-150	SPARTAN EP 3	NEBULA EP 1 (CALCIUM-COMPLEX TYPE)	NEBULA EP 1 (CALCIUM-COMPLEX TYPE)	SURETT N-850
MOBILE	D.T.E. 24	D.T.E. 25		D.T.E. 26	COMPOUND DD	MOBIL 600 W	MOBILUBE EP 90	MOBILUX GREASE #2	MOBILUX GREASE EP 2	MOBILTAC GREASE #150
PENNZOIL	PENNBELL #1	PENNBELL #2		PENNBELL #3	MAXOL EP #3	ST. CYL. #2	MAXOL EP #3	MP #303	HDW 705	PENN AMERICAN SUPER GEAR-SHIELD FLUID 3000
PURE	PUROPALE RX 150	PUROPALE RX MED.		PUROPALE RX HEAVY MEDIUM	POCO PB # 8	DARK CLIPPER	POCO PURELUBE EE	H.T. GREASE #2	H.T. GREASE EP #2	POCO GEARSHIELD A
SHELL	TELLUS 927	TELLUS 29		TELLUS 33	MACOMA # 72	NASSA K-79	SPIRAX EP 90	ALVANIA # 2	ALVANIA EP #2	CARDIUM COMPOUND "D"
SINCLAIR	DURO AW 16	DURO 250		DURO 300	PENNANT EP #3	MODOC CYL. LIGHT	EXTRA DUTY GEAR LUBRICANT 90	LITHOLENE INDUST. #2	LITHOLENE INDUST. EP#2	JET NO.8
STANDARD (CALIF.)	CHEVRON EP HYDRAULIC OIL #9	CHEVRON OC TURBINE OIL #11		CHEVRON OC TURBINE OIL #15	CHEVRON GEAR COMPOUND 90	CHEVRON CYL OIL 155 PX		CHEVRON DURA-LITH GREASE EP #2	CHEVRON DURA-LITH GREASE EP #2	CHEVRON PINION GREASE #2
STANDARD (OHIO)	INDUSTRON FF 44	SOHIVIS 47		SOHIVIS 52	FACTOLUBE 3	SOHICYL C-150	GEAREP 90	SOHITRAN #2	SOHITRAN EP 2	SOHITAC # 1
SUN	SUNVIS 816	SUNVIS 921		SUNVIS 931	SUNEP 90	OCCIDENT CYL OIL	SUNEP 1070	PRESTIGE #42	PRESTIGE 742 EP	PRESTIGE 741 EP
TEXACO	RANDO HDA (729)	REGAL B (R&O)		REGAL PC (R&O)	MEROPA #3	MEROPA #6	MULTI-GEAR LUBRICANT EP 90	MULTIFAK #2	MULTIFAK EP #2	CRATER #1
PHILLIPS	MAGNUS A 150	MAGNUS 215		MAGNUS 315		HECTOR 2000 S	ALL PURPOSE GEAR OIL SAE 90	PHILUBE L2	PHILUBE EP 2	PHILSTICK 2 OR D3
CONOCO	SUPER HYDRAULIC 15	DECTOL 21 R & O		DECTOL 33 R & O	MILGEAR L84	INCA OIL		SUPER LUBE	EP CONOLITH NO. 2	COGLUBE NO. 7


55640-A
GEAR BOX
55618-E
55627-A
70309-A
68867-C
56061-B
55620-B
41184-A
27201-A
26141-A
55632-A
71969-C
51849-A
55773-B
30219-A
53093-A
41184-A
26181-A
71968-C
55632-A
55624-B
53093-A
55662-A
55625-A
52000-A
55772-B
55637-A
72472-A
72473-A
73675-A
40118-A
72471-A
55623-B
55635-A
69183-A
GASKET
71426-A
71970-B
71973-A
71972-A
72702-A
55628-A
26141-A
71971-A
71966-D
TO TIGHTEN FRICTION
ON SPROCKET
RELEASE LOCK-
WASHER-51824-A
AND TIGHTEN
NUT 51823-A
55626-A
55644-B
51824-A
55617-B
51823-A
41166-A
28514-A
B-408
71967-C
MACHINE OIL
71974-A
72523-B
71975-A
28515-A
33616-A
55641-A
DRAIN
BASE PLATE 55692-C

OP-6211

VIE BOX FOR POWER BACK GAUGE CINCINNATI SHEAR

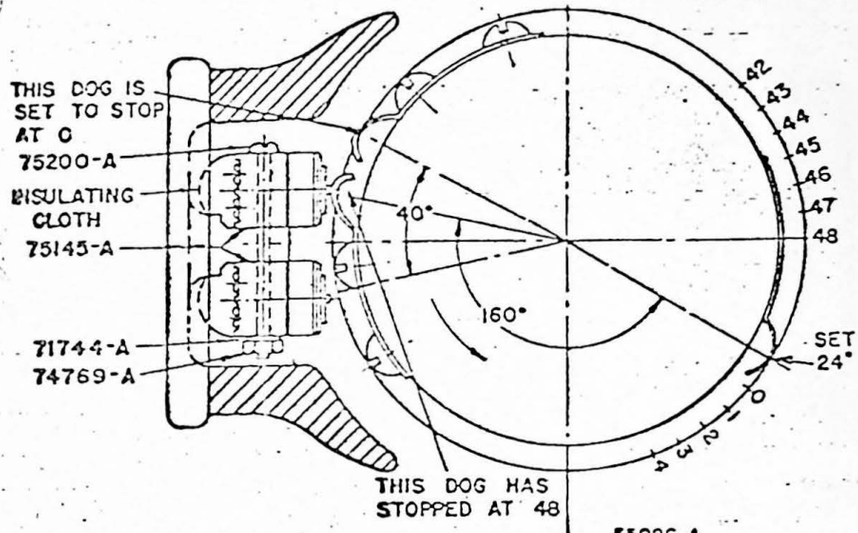


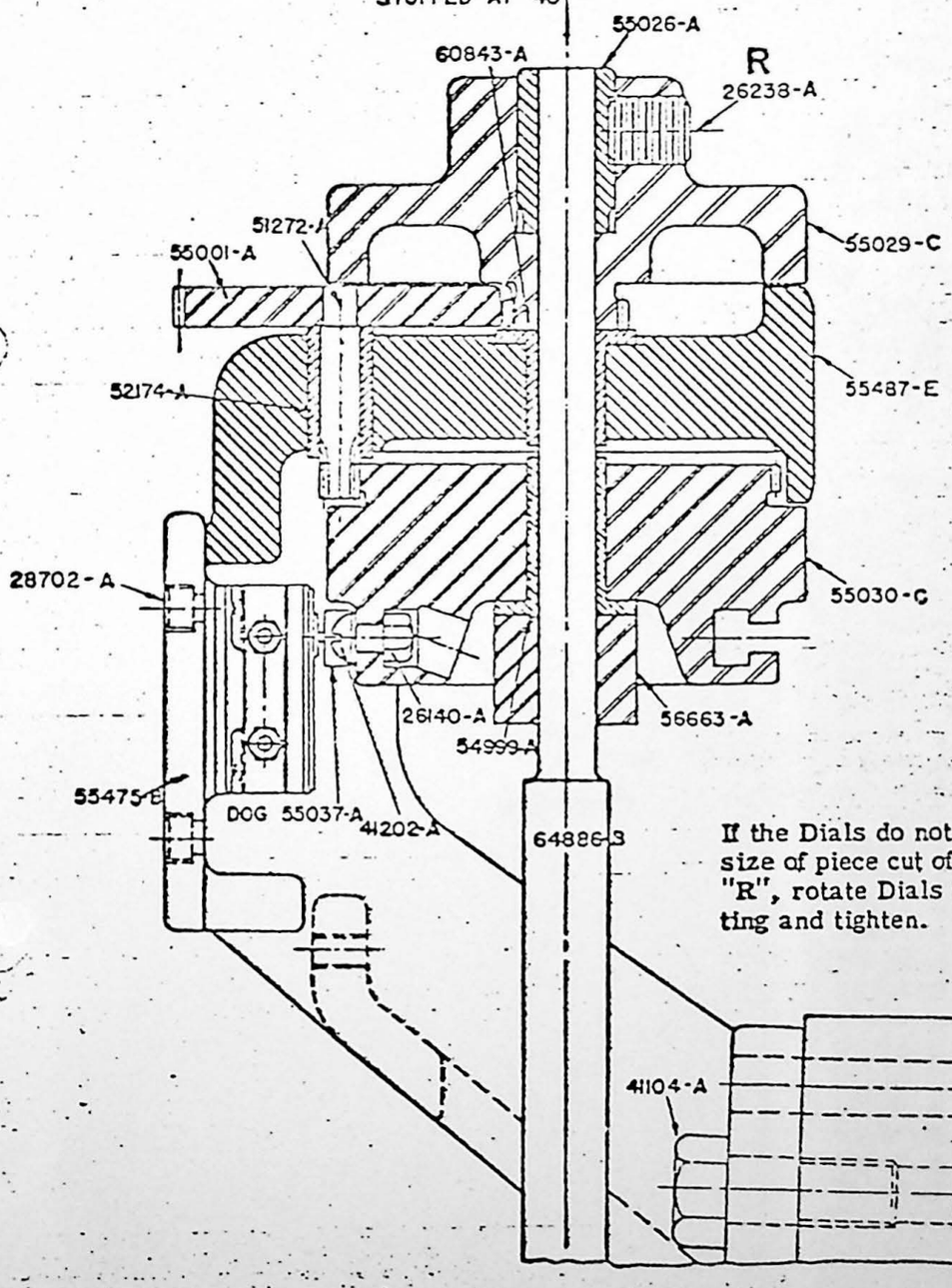
DRIVE BOX FOR POWER BACK GAUGE

Piece No.	Amt.	Name of Piece
L-98-A	5	5/8 Washer
B-408-A	2	1/4 x 1 Pin
A-726-A	1	3/ 8 Pipe Plug
25306-A	12	1/4 x 1/2 Oval Hd.
25790-A	1	Oil Plug
26141-A	4	Lockwashers
26181-A	2	3/16 x 1-1/6 Pin
27201-A	3	1/4 x 3/4 Hex. Hd.
28514-A	1	Oil Gauge
28515-A	2	Oiler
30219-A	4	Ball
33616-A	1	3/8 x 1-3/4 Set Scr.
33851-A	1	5/16 N.C. Nut
40118-A	1	5/16 x 1-1/2 Pin
41106-A	1	5/8 x 1-3/4 Hex. Hd.
41166-A	1	#5 Taper Pin
41184-A	2	3/16 Woodruff Key
51823-A	1	Locknut
51824-A	1	Lockwasher
51849-A	1	Oilite Bushing
52000-A	1	Oilite Bushing
52415-A	4	5/8 x 2-1/2 Hex. Hd.
53093-A	3	Oilite Bushing
53517-A	1	5/16 x 2-3/4 Hex. Hd.
55041-A	1	Solenoid
55617-B	1	Friction Driver
55618-E	1	Gear Box
55620-B	1	Pinion 10-T 16-P
55623-B	1	Shifter
55624-B	1	Shaft
55625-A	1	Sprocket Small
55626-A	1	Sprocket Large
55627-A	1	Oil Seal
55628-A	4	Solenoid Collar
55629-B	1	Cover
55631-C	1	Solenoid Guard
55632-A	2	Plug

Piece No.	Amt.	Name of Piece
55635-A	1	Spring
55637-A	1	Roller Chain
55640-A	1	Key
55641-A	1	Key
55644-B	1	Friction Plate
55662-A	1	Flanged Bushing
55673-A	1	5/16 Lockwasher
55692-C	1	Base Plate
55708-A	1	Tie Strap Block
55709-B	1	Tie Strap
55772-B	1	Clutch Gear 25T, 16P
55773-B	1	Sliding Gear Clutch
56061-B	1	Gear 64-T, 16P
58393-A	1	Gasket
67033-B	1	Brake Disc
67034-B	1	Friction Plate
68867-C	2	Motor
69183-A	2	1/4 x 3/4 Allen Hd. Scr.
70309-A	1	1/8" Pipe Plug
71426-A	1	Gasket
71966-D	1	L.H. Sprocket Cover
71967-C	1	R.H. Sprocket Cover
71968-C	1	Upper Sprocket Cover
71969-C	1	Gear Box Cover
71970-B	2	Chain Tube
71971-A	2	Grommet
71972-A	2	1/2 x 1-1/4 Flat Hd. Scr.
71973-A	5	1/2 Lockwasher
71974-A	5	5/16 x 1-1/4 Soc. Hd. Scr.
71975-A	9	5/16 Lockwasher
72471-A	2	Coupling Nut
72472-A	2	Spacer
72473-A	2	Sleeve
72523-B	1	Gasket
72702-A	4	1/4 x 1-1/4 Allen Hd. Scr.
72907-A	4	5/16 x 1 Soc. Hd. Scr.
73675-A	2	1/4" Washer

DIALS ON POWER BACK GAUGE FOR CINCINNATI SHEAR



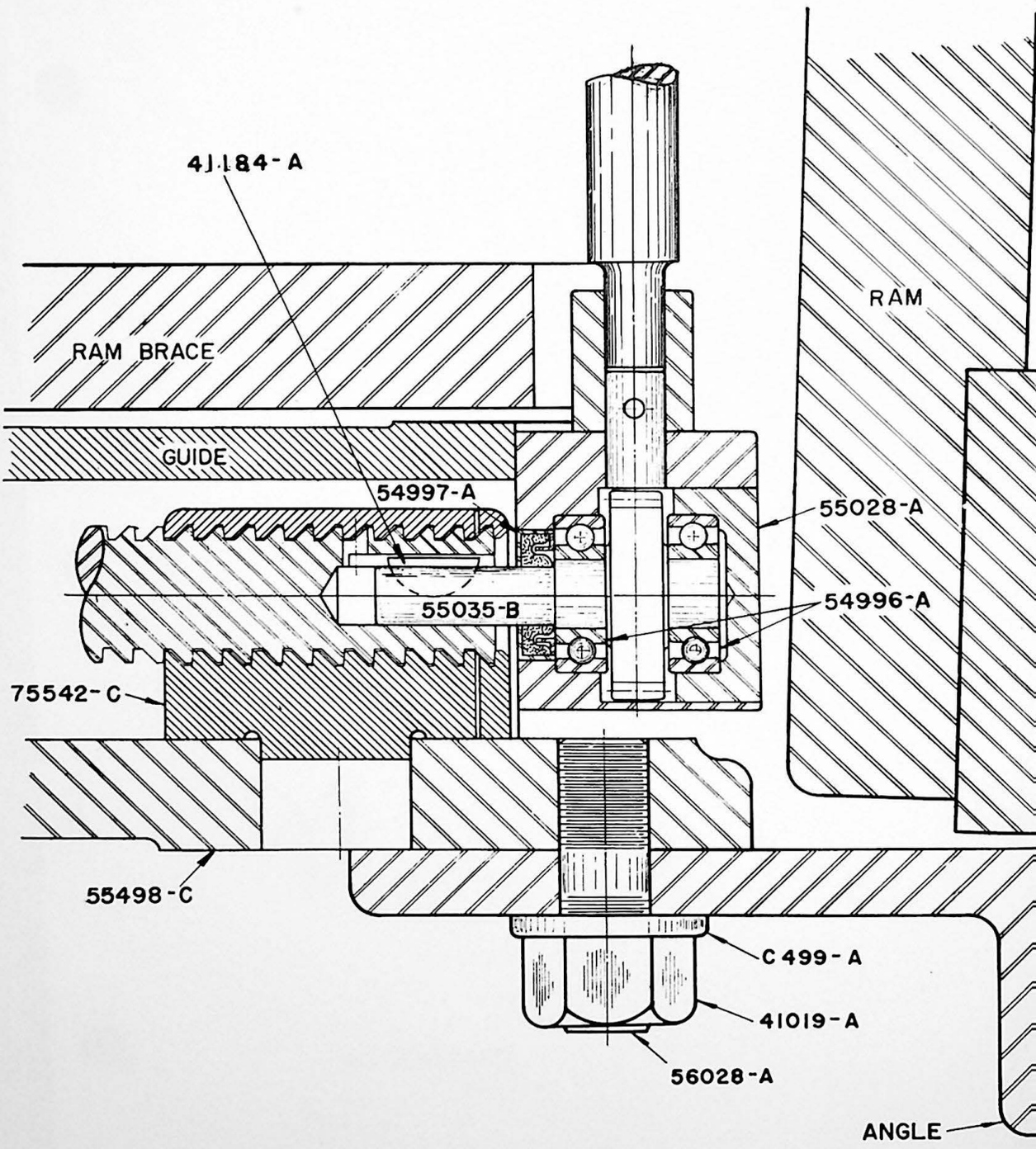


DIALS ON POWER BACK GAUGE

Piece No.	Amt.	Name of Piece
26140-A	4	1/4" N. C. Nut
26238-A	1	5/8" x 3/4" Set Scr.
28702-A	4	1/4" x 5/8" Soc. Hd. Scr.
41104-A	2	5/8" x 1-1/2" Hex Hd. Scr.
41202-A	1	1/4" x 1/2" But. Hd. Scr.
51272-A	1	Pinion
52174-A	1	Oilite Bushing
54999-A	1	Oilite Bushing
55001-A	1	Gear
55026-A	1	Clamp Bushing
55029-C	1	Graduated Collar
55030-C	1	Graduated Gear
55037-A	2	Limit Switch Dog
55475-B	1	Limit Switch Holder
55487-E	1	Dial Bracket
56663-A	1	Collar
60843-A	1	Flanged Bushing
64886-A	1	Vertical Shaft
71744-A	2	#6 Lock Washer
74769-A	2	#6-32 Hex Nut
75145-A	2	R. H. Limit Switch
75200-A	4	#6 x 2" Rd. Hd. Scr.

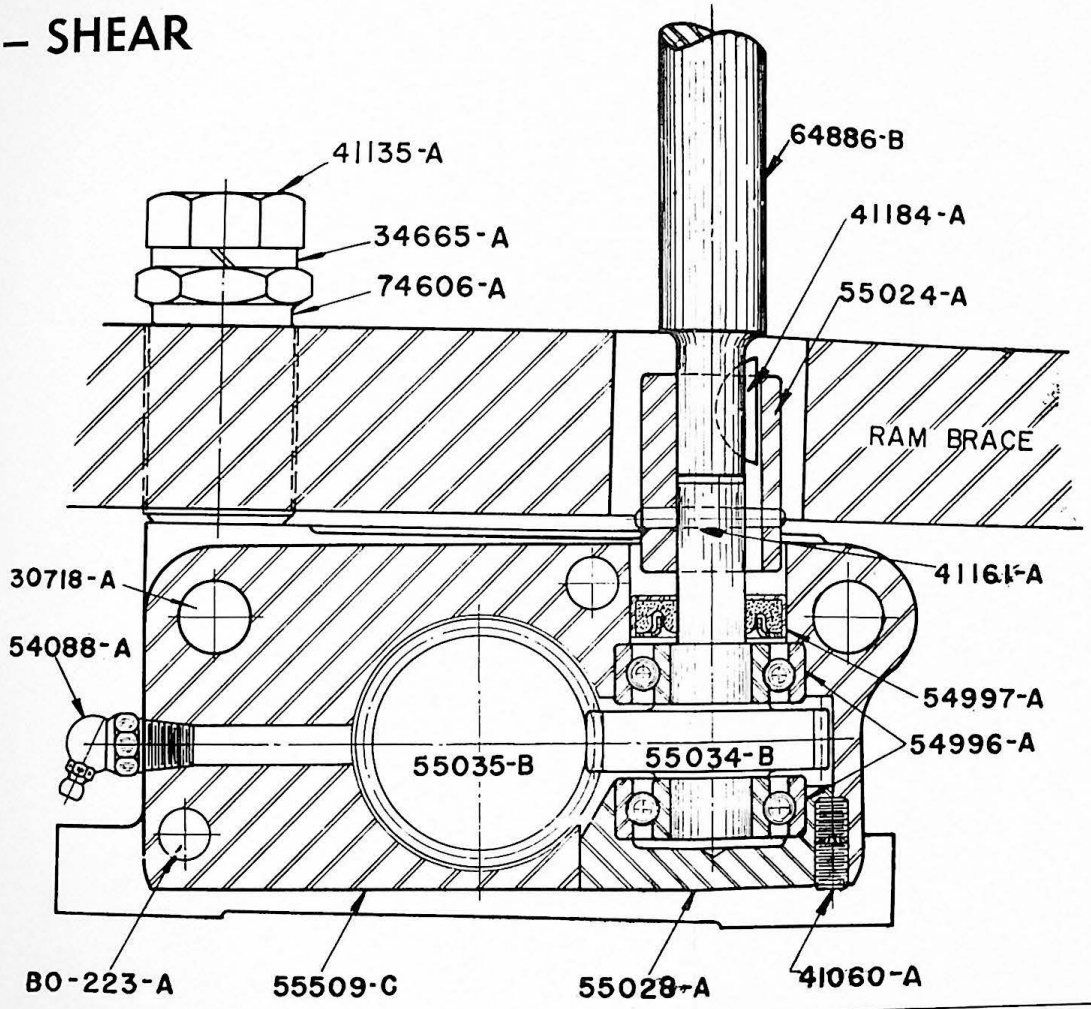
If the Dials do not correspond to the size of piece cut off, loosen Set Screw "R", rotate Dials to the proper Setting and tighten.

HELICAL GEAR
POWER BACK



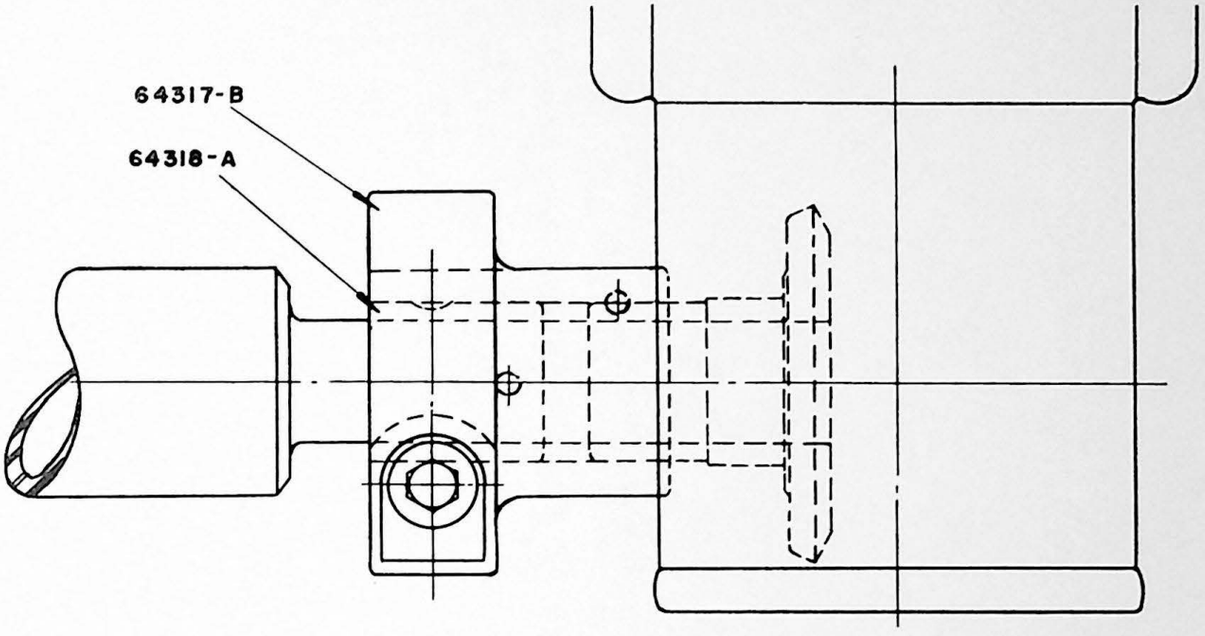
OP-6211

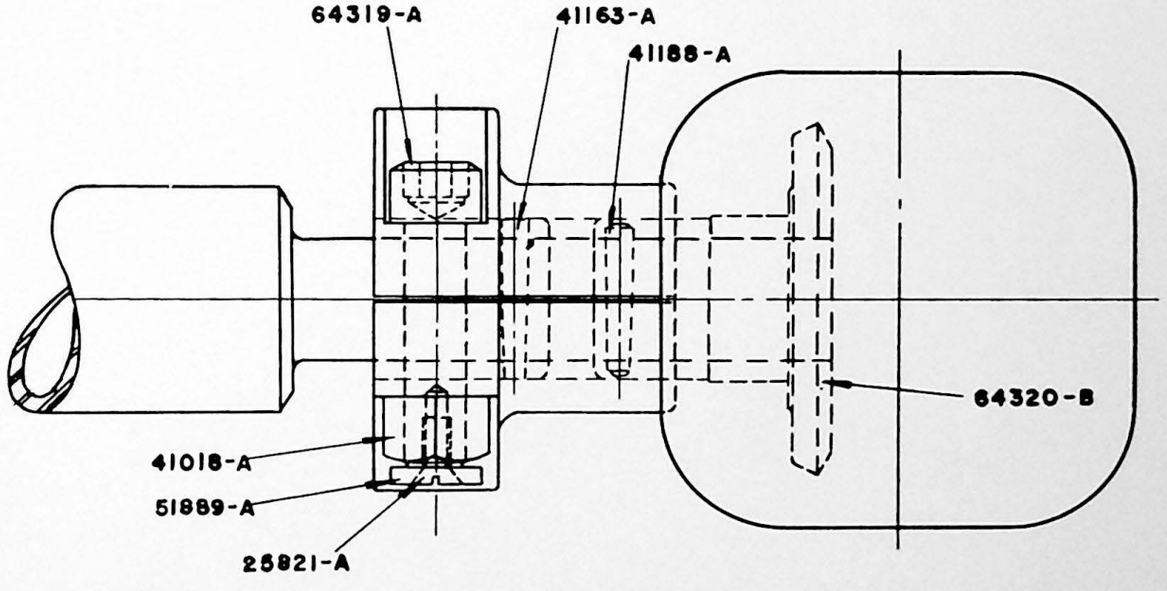
CASE ASSEMBLY
GAGE – SHEAR



Piece No.	Amt.	Name of Piece
BO-223-A	2	3/8"x2-7/16" Pin
C-499-A	1	3/4" Washer
30718-A	1	1/2"x2-1/2" Soc. Hd. Scr.
34665-A	1	5/8" Lock Washer
41019-A	1	3/4" N. C. Nut
41060-A	4	1/4"x3/8" Set Scr.
41135-A	8	5/8"x2-3/4" Hex Hd.
41161-A	2	#2x1-1/4" Taper Pin
41184-A	3	3/16" Woodruff Key
54088-A	1	Alemite Fitting
54996-A	4	Ball Bearing
54997-A	2	Oil Seal
55024-A	1	Coupling
55028-A	2	Bearing Retainer
55034-B	1	Helical Gear 24 T.
55035-B	1	Helical Gear 12 T.
55498-C	1	R. H. Slide
55509-C	1	Gear Case
56028-A	1	Stud
64886-B	8	Vertical Shaft
74606-A	1	Leveling Bush
75542-C		Compen. Nut Ass'y

BACK GAGE ADJUSTMENT FOR CINCINNATI SHEARS WITH HINGED BACK GAGE





BACK GAUGE ADJUSTMENT

Piece No.	Amt.	Name of Piece
25821-A	1	1/4 x 1/2 Flat Hd.
41018-A	1	5/8 N. C. Nut
41163-A	1	#5 x 1-3/4" Taper Pin
41188-A	1	#5 x 1-1/2" Taper Pin
51889-A	1	Clamp Washer
64317-B	1	Coupling
64318-A	1	Worm Wheel Sleeve
64319-A	1	5/8 x 2-1/2 Soc. Hd.
64320-B	1	Bevel Gear

LOOSEN NUT AND TURN SCREW TO ADJUST BACK GAGE ANGLE PARALLEL TO KNIFE.
TURNING HEAD OF SCREW CLOCKWISE MOVES BACK GAGE ANGLE TOWARD KNIFE.
TIGHTEN NUT.

RB-621