



INTRODUCTION

The purpose of this manual is to instruct everyone involved with the proper application, usage and care of the LITTELL equipment.

WARNING

THIS MANUAL MUST BE READ AND THOROUGHLY UNDERSTOOD BEFORE APPLYING, INSTALLING, USING, AND CARING FOR THIS MACHINE. FAILURE TO COMPLY MAY CAUSE SERIOUS INJURY TO YOURSELF OR TO OTHER PERSONS.

This manual shall be used as supplementary information and combined with the owners/users training and supervisory program, (which is expected to contain safe and commonly known good work methods), for the safe and proper application, usage and care of this machine.

Only persons who thoroughly understand and comply with this manual are qualified to apply, use and care for this machine.

This manual should always be readily available to all persons involved with this machine allowing them to maintain familiarity with all warnings and instruction.

LITTELL MACHINE CO. assumes no responsibility in connection herewith, nor can it be assumed that all acceptable safety measures may not be required under particular or exceptional circumstances or conditions.

This data is confidential and is only submitted to the customer for providing information on the safe operation and servicing of LITTELL equipment.

The manual is furnished with the clear understanding that information contained herein is not to be reproduced or given in any manner to any competitive companies of the F.J. LITTELL MACHINE CO.

We thank you for selecting our product. LITTELL'S reputation is known for designing and manufacturing safe and productive machinery.

FOREWORD



To repeat the popular phrase of after-dinner toastmasters, the Punch Press is a tool that "needs no introduction." Try to imagine what modern production would be like without punch presses and you conjure up a dismal picture indeed.

One concludes with the soundest of logic that modern metal working production has reached today's, level of speed, precision and economy largely because of the punch press. And just as logically, the punch press ranks as so vital a tool in so many industries because no other tool does what a punch press does - and does it so efficiently.

A major factor, certainly, in bringing the punch press to its full efficiency is the modern Roll Feed. With the development of progressive dies and coil stock, the Roll Feed has become an essential part of the Press itself.

Littell Roll Feeds are the pioneers of their field. They have over the years become the standard feeds of industry, installed as original equipment by all leading press builders. Because of their simplicity of design, they can be installed on hand-fed presses with a minimum of down time. The increased productivity that results quickly repays the cost of the Littell Feed. Stock moves into the die at a steady pre-set-speed that makes every press stroke a productive stroke. The irregular speeds of hand feeding are replaced by sustained peak output, accuracy and operator safety as well.

LITTELL RACK AND PINION ROLL FEEDS

Littell Machine Company designs and builds Feeds for specific presses and often for specific jobs. The most commonly used Feed is the Double Rack and Pinion Roll Feed equipped with an oiler and a scrap cutter. This unit feeds pre-straightened stock for a great variety of jobs. Usually the direction of feed is from right to left across the die area. The in-going pinch rolls push the stock into the die area. Simultaneously, the out-going pinch rolls pull the scrap skeleton out of the die area and feed or push it into the scrap cutter. These Feeds are all equipped with roll lifters, which between strokes, raise the upper roll. With roll pressure removed, the stock is free to be piloted and perfectly positioned before the next ram stroke. The double Rack and Pinion Roll Feed can handle a strip stock cut to length almost as readily as it will handle coil stock. The strip stock is hand positioned into the die area. The upper roll is then released with the click or gag in position to prevent feeding less than the desired length. After the ram of the press has gone through bottom dead center, the gag is automatically released and a full feed length is advanced into the die.

Any Littell Double Rack and Pinion Roll Feed with scrap cutter can be mounted on an OBI or Gap Frame Press on bolster plates specifically designed to hold the Feed. It can also be mounted on a Straight Sided Press. Here it is attached by adjustable brackets which fit on machined ways provided by the press manufacturer.

LITTELL SINGLE ROLL FEEDS

The Single Roll Feed, mounted on either the left side or the right side of a press, is used where the operation does not produce a scrap skeleton, that is, where the die is scrapless. This type of operation, where the die is equipped with nippers, is usually for blanking, or a blank and form operation, or a straight cut-off. The Single Feed, like the Double Feed, can be mounted on either the OBI, the Gap Frame Press, or on the Straight Sided Press.

LITTELL ROLL FEED ACCESSORIES

To accommodate the variety of stamping operations, Littell furnishes many special Roll Feed features.

For example, four (4) different types of roll lifters are available, each with a specific advantage for a certain operation.

The rolls which advance the stock into the die area are specially designed and constructed for low inertia and high strength. They can be supplied with an infinite variety of finishes. The standard finish is a hardened and ground surface which will handle most stock. Chrome finished rolls are provided for stainless steel and highly polished aluminum stock. Feed rolls can be supplied with hob knurling or hob milling, or with rubber coating for certain applications.

Four (4) different types of brakes can be supplied on Littell Roll Feeds.

In addition to the standard rack, a micro running adjustment can be incorporated with the rack to change the feed length from .001" to 1/8" while the press and Feed are running.

You will find on the following pages useful and informative data on the operation and maintenance of the Littell equipment installed on your press. On call at any time, on any press feeding or coil handling problem, is the experience of the Littell organization. Littell engineers and field representatives stand ready to help you select the combination of Roll Feed and Accessory Equipment best adapted to assuring maximum efficiency and accuracy in your punch press operation, at minimum cost.

SECTION I GENERAL

PART 1 - DESCRIPTION



A. GENERAL

The LITTELL No. 3 through No. 7 Rack-and-Pinion Roll Feeds are designed for use with both OBI and straight-sided presses which are fed from either left or right side.

The double roll feed incorporates two sets of rolls for use with presses which handle a variety of operations; use progressive dies, or leave a scrap skeleton.

The single roll feed, while essentially the same as the double roll feed, incorporates only one set of rolls. The single roll feed can be mounted on either side of the press and is generally for operations which leave no scrap skeleton.

Both single and double roll feeds are supplied either with brackets for mounting to straight-sided presses or with bolster plates for mounting to OBI presses.

While both single and double roll feeds can be equipped with various accessories described in Sections III through VIII of this manual, the following components are common to both types of roll feeds.

B. DRIVING DISC

The LITTELL Rack-and-Pinion Roll Feed is driven by a two-piece driving hub and disc (1 and 2, Figure 1-1). An adjustable slider block is mounted on the rotating disc hub driven by the crankshaft of the press. The two-piece construction of the disc permits easy adjustment of the timing of the roll feed with relation to the press slide. The face of the disc carries a direct-reading scale for setting the feed length.

C. DRIVE RACK

The toothed rack (3, Figure 1-1) is machined from a special steel which has been ground square. The upper end is connected to the driving disc, and the lower end carries precisely cut teeth mating with the teeth of the overrunning clutch, which drives the feed rolls.

D. OVERRUNNING CLUTCH

The overrunning clutch (5, Figure 1-1) used in LITTELL Rack-and-Pinion Roll Feeds consists of a driving outer housing, a driven inner hub, and four rollers which lock the two hubs to each other on each upstroke and unlock automatically on the downstroke. Long-life carbide inserts minimize wear of the driven inner hub.

E. SPIRAL GEAR DRIVE

The feed rolls are driven by spiral gears (6, Figure 1-1), which run in oil in a closed housing.

F. FEED ROLLS

Two hardened and ground feed rolls (7 and 9, Figure 1-1) feed stock into the press. The driven lower feed roll is geared to the upper roll. The double roll feed uses two pairs of such feed rolls.

NOTE: In addition to the standard equipment comprising the basic single and double roll feeds, the following optional equipment can be supplied to handle special press operations.*

G. BRAKES

The adjustable disc-type brake (see Section III) is mounted on the clutch end of the feed roll drive shaft (4, Figure 1-1). The brake offers a continuous resistance to rotation of the shaft, thereby suppressing the momentum of the feed rolls and stock at the end of each feeding cycle. This constant control of the feed rolls ensures consistency of length of stock fed into the press. The spring-loaded brake pressure can be adjusted precisely.

H. ROLL LIFTERS

The lifters (see Section IV) serve to lift upper feed rolls clear of the stock after each press stroke. This perfectly timed action permits the use of pilots to position stock accurately in progressive dies. Different roll lifters are available for use with different dies. Rotary, eccentric, by-pass, air-operated and slide-operated are supplied for LITTELL Rack-and-Pinion Roll Feeds.

I. RACKS

Besides the standard drive rack, which permits adjustment of feed length only when the press is shut down, a micro running adjustment rack is available (see Section V). This optional rack enables the press operator to increase or decrease the feed length by as much as 1/8 inch while the press is in operation. The desired feed length is set up at the two-piece driving disc as with the standard rack, but an exact running adjustment may be effected simply by turning a conveniently located handwheel. The micro running adjustment rack is especially valuable in operations with progressive dies requiring very accurate feed lengths.

*DETAILED INSTRUCTIONS FOR INSTALLATION AND MAINTENANCE OF OPTIONAL EQUIPMENT APPEAR IN SECTIONS III THROUGH VIII OF THIS MANUAL.



J. SCRAP CUTTERS

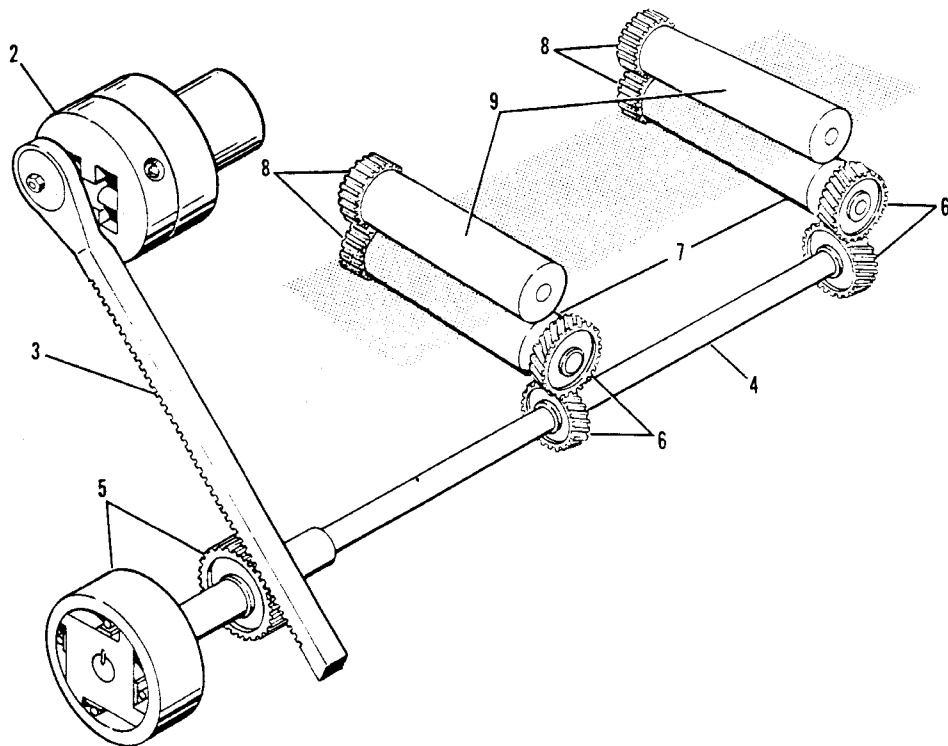
LITTELL Rack-and-Pinion Roll Feeds can be equipped with scrap cutters (see Section VI) mounted outside the outgoing feed rolls. They can be provided on an extension whether the roll feed is bolster-mounted or bracket-mounted on the press. A driving disc hub mounted on the crankshaft of the press actuates the scrap cutter to cut the scrap skeleton at each stroke of the press or in special cases after a predetermined number of strokes.

K. STOCK GUIDES

The proper tracking of stock can be maintained by use of stock guides (see Section VII). The size of the feed roll and other requirements of particular application determine the type of stock guide supplied.

L. RUN-IN UNITS

Heavy stock can be controlled precisely with a run-in unit (see Section VIII) to advance the material into the roll feed. The type of stock to be accommodated determines which of several different types of run-in units is supplied for a particular application.



1. Driving Disc Hub
2. Driving Disc
3. Rack
4. Drive Shaft
5. Overrunning Clutch
6. Spiral Gears
7. Lower Feed Roll
8. Feed Roll Gears
9. Upper Feed Roll

Figure 1-1. Double Roll Feed

PART 2 - THEORY OF OPERATION

A. GENERAL

The operation of the LITTELL Rack-and-Pinion Roll Feed is essentially the same whether a single or double roll feed is being considered. The principal difference is that the double roll feed uses two sets of feed rolls while the single roll feed uses only one set of feed rolls.

The driving hub and disc (1 and 2, Figure 1-1) is mounted on the crankshaft of the press and turns with it through a full revolution with each stroke of the press. During half of each revolution the driving disc actuates the roll feed as the rack (3) is drawn upward. The rack's upstroke works through the overrunning clutch (5) to revolve the drive shaft (4).

The drive shaft (4, Figure 1-1) drives the lower feed rolls (7) through spiral gears (6). The lower feed rolls, in turn, rotate the upper feed rolls (9) through feed roll gears (8). Spring pressure applied to the upper rolls pinches stock between upper and lower rolls. Rotation of the rolls pulls stock from a coil or reel, advances it into the die, and, in the case of double roll feeds, pulls scrap skeleton out of the press.

The rack (3, Figure 1-1) is designed to feed on the upstroke both because the rack is inherently stronger in tension than it would be under compression and because upstroke feeding eliminates bending. On the downstroke there is practically no resistance except that of the idling overrunning clutch (5).

As the rack (3, Figure 1-1) reaches the top point of its upstroke, the feeding half of the cycle is

completed. As the revolving driving disc (2) starts the rack on its downstroke, the overrunning clutch (5) disengages automatically. Consequently, the feed rolls (7 and 9) are motionless during the rack's downstroke. While the feed rolls are motionless, three actions take place: first, the stock is positioned on the die; second, the stamping is performed; third, the rack starts its return stroke, and approximately halfway up the new feeding cycle begins.

B. OVERRUNNING CLUTCH

The rack (1, Figure 1-1) is geared to the clutch outer housing (2) by meshing teeth (3). The hub turns with the rack's upward pull, causing the clutch rollers (4) to wedge themselves tightly between the faces of the carbide inserts (5) and the housing (2). This locks the driving housing to the clutch inner hub, which is keyed to the drive shaft (6). The shaft drives the rolls through the spiral gears (7), and the feed rolls advance the stock into the press.

At the end of each upward stroke, the rack starts down, reversing the rotation of the clutch outer housing. This frees the rollers from their wedged position and permits the driving housing to rotate freely around the inner hub. The inner hub thus remains idle, the shaft (6, Figure 1-1) is not turned, and the feed rolls are consequently motionless. When the rack reaches the end of its downstroke, the cycle is complete. A new feed stroke is begun, engaging the clutch again, and the drive shaft and feed rolls turn once more in the same direction as before.

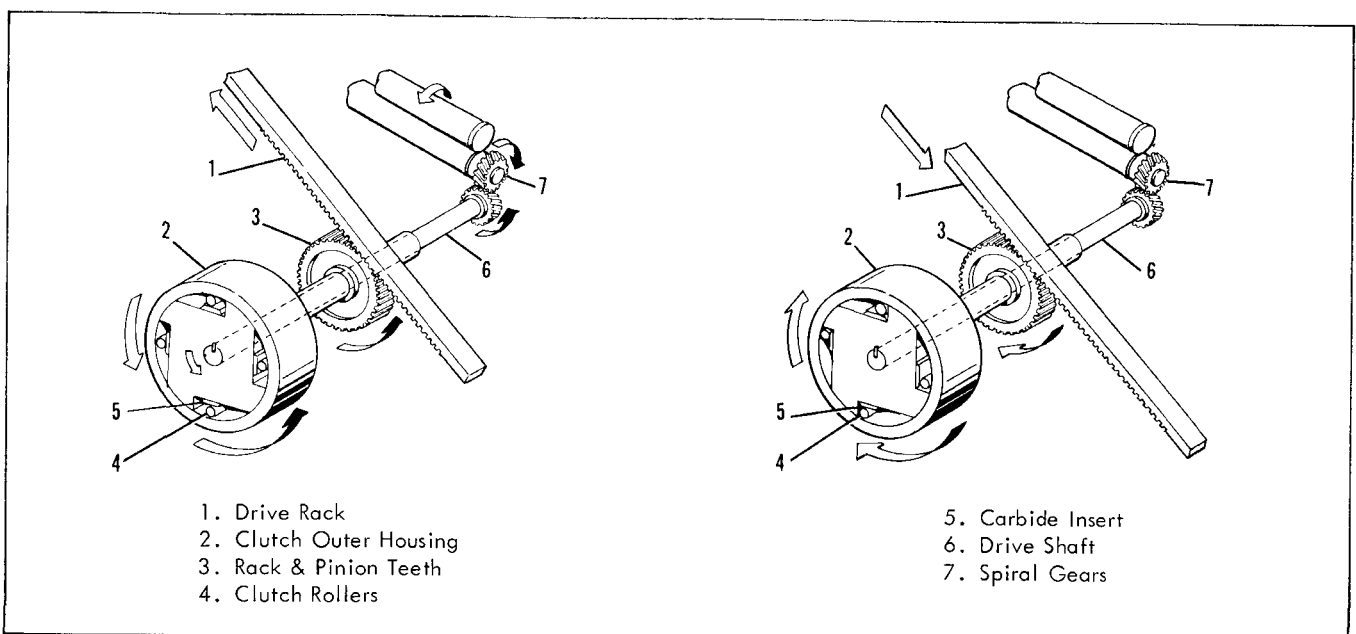


Figure 1-2. Over Running Action of Clutch

PART 3 - SETTING-UP INSTRUCTIONS

A. MOUNTING ROLL FEED ON PRESS

1. Bolster-Type Mounting

All equipment should be cleaned thoroughly. Remove all rust-preventive grease from machined or finished surfaces with a good solvent before mounting the LITTELL Rack-and-Pinion Roll Feed on the press.

Study the layout drawing furnished with your particular roll feed with care, then proceed as follows.

- a. Remove the press bolster, and position the roll feed on the press.
- b. Insert bolster mounting bolts, but do not tighten them.
- c. Clamp a pointed bar of the same diameter as the punch shank in the ram of the press, and lower slide until the point of the bar touches the top of the bolster. Shift the roll feed bolster as required until the left-and-right and front-to-back center lines intersect under the center of the bar. The centerline through the centers of the feed rolls must be absolutely parallel with the centerline of axis of the press crankshaft. This may be ascertained readily by use of a straightedge held across the gibs of the press.
- d. Tighten the bolster bolts.
- e. To align the drive rack, see the following instructions headed "Attaching Crank Disc."

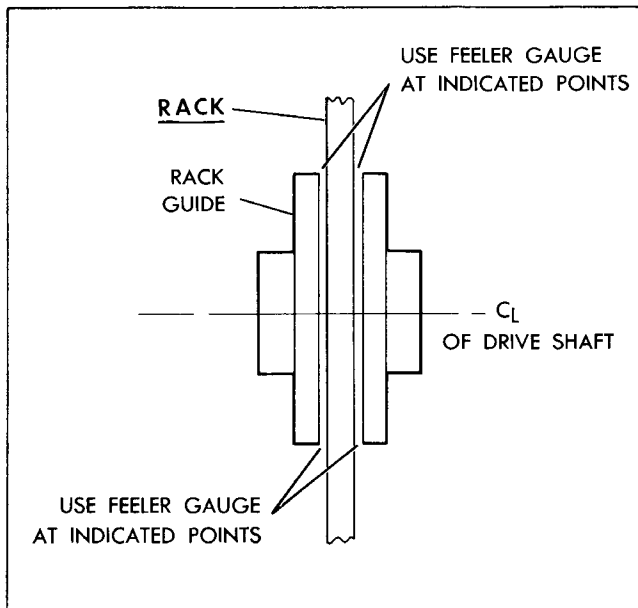


Figure 1-3. Checking Rack Alignment in Rack Guide

2. Bracket-Type Mounting

Clean both the press and the roll feed with a good grade of solvent to remove all rust-preventive grease from machined or finished surfaces.

Study the layout drawing furnished with your particular roll feed with care, then proceed as follows.

- a. Mount the roll feed support brackets to the press, and secure them to bolt studs as shown on the layout drawing.
- b. Secure the jackscrew bracket to the finished pad on the press. (The jackscrew assembly raises or lowers the roll feed mounting bracket when turned with a wrench. This feature permits adjusting of the feed line height to within the recommended 1/4 inch of the die pass line. The top of the lower feed roll determines the feed line.)
- c. The feed line must be adjusted to accommodate dies of different heights, permitting the stock to move in a straight line through the feed rolls and over the die. When adjusting the feed line height, be certain the scrap cutter connecting rod (A)* is adjusted to the appropriate length. If eccentric-type roll lifters, which are operated by a connecting rod from the press crankshaft, are supplied with the roll feed, their connecting rod must be adjusted to the required length also.

B. ATTACHING DRIVE DISC TO CRANKSHAFT

- a. Remove disc face from disc hub. Put a small quantity of thinned white lead into the bore of the hub and on the end of the press crankshaft, and paint the mating surfaces.
- b. Drive the disc hub onto the crankshaft until it touches the shoulder on the shaft, taking care to align the keyways. Insert the drive key.
- c. Secure the hub to the shaft with the parts supplied. These are usually a retainer plate and cap screws. Some roll feeds are supplied with setscrews, which must be spotted into the crankshaft and tightened securely.

- d. Replace the drive disc face on the disc hub, assemble the rack to the slider block (B), and check the alignment of the rack in the rack guide as shown in Figure 1-3. Use a feeler gauge at each end of each side of the rack to align the rack with equal clearance on top and bottom. In setting up roll feeds whose drive discs are secured by retainer plates, it may be necessary to shift the bolster plate slightly to obtain correct alignment of the drive rack. If this is done, pin the bolster plate to the bed of the press with dowels to maintain the alignment.

PART 4 - PRE-OPERATING INSTRUCTIONS



A. ADJUSTING FEED LENGTH

To adjust the length of stock fed into the press with each feed cycle, adjust the slider block until the pointer on the block indicates the desired length on the scale on the face of the drive disc. **THEN MAKE SURE THE SLIDER BLOCK NUT IS RETIGHTENED SECURELY.** The scale is graduated to permit setting the feed length within $\pm 1/32$ inch of desired length.

To determine the length of stock fed into the press with great accuracy, proceed as follows.

a. Operate the press for two or three single strokes, and measure the length fed. If the effective feed length is more than $1/32$ inch too short or too long, readjust the slider block and recheck the actual length fed on single strokes.

b. Operate the press line in for a continuous run of ten to fifteen strokes. Discard the first three and the last three cuts, and measure the average length fed at intervening strokes. A final adjustment may be desired before putting the press into production.

B. TIMING ROLL FEED

In normal operation, stock is fed into the press during the top 180 degrees of the press stroke (while the punch travels from the mid point of its upstroke to the top of its stroke and halfway down). To time the LITTELL Rack-and-Pinion Roll Feed, turn the press slowly until its slide is halfway through its upstroke. (Operation timing sequence of feed, see page 1-7). Loosen the cap screws on the front of the drive disc, and rotate the disc face until the disc slider block is in its lowest position (with the feed length scale parallel with the rack). Retighten the cap screws. This adjustment synchronizes the start of the feed cycle with the beginning of the top half of the press cycle.

C. TIMING ROLL LIFTERS

1. General

The primary purpose of the roll lifters (C) is to release the grip of the rolls on the stock to permit die pilots to position the stock precisely. This prevents cumulative errors in stock fed through progressive dies.

The upper feed rolls should not be lifted more than $1/16$ inch above the stock, and the rolls must be lifted only during the idle half of the feed cycle, when the feed rolls are not in motion. Accordingly, the

roll lifters must be timed as follows to lift the feed rolls off the stock just as the pilots begin to enter the material, permitting the pilots to position the stock precisely on the die. Refer to Figure 1-4.

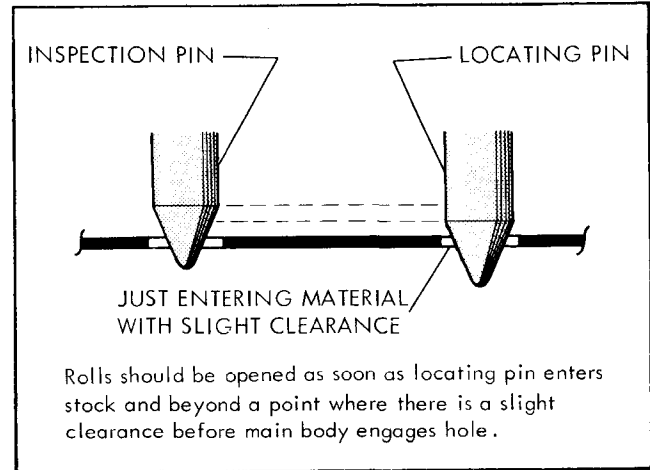


Figure 1-4. Inspection and Locating Pins

The type of roll lifter supplied with your LITTELL Rack-and-Pinion Roll Feed has been selected as most suitable for your particular application.

Remember that when straight blanking or cutting is required, roll lifters should not be used unless camber in the stock makes them necessary.

D. ADJUSTING SCRAP CUTTER

To adjust the scrap cutter slide, the length of the connecting rod (A) should be adjusted so that the upper knife will not overlap the lower knife any farther than necessary. The overlap should be about $1/16$ inch when the operating eccentric is in its lowest position.

The stripper plate (D) must extend below the cutting edge of the blade to prevent scrap from catching on the upper knife.

Scrap cutters are usually timed to cut the stock about 30 degrees later than the press slide. That is, the eccentric reaches its lowest position when the press crankshaft has turned about 30 degrees past the beginning of the press upstroke. This prevents the stripper plate from gripping the stock and so interfering with piloting of stock on the die.

The entire scrap cutter is adjustable to permit the knives to be positioned to cut through the scrap at its weakest section.

NOTE: PARENTHETICAL LETTERS AND NUMBERS REFER TO POINTS ILLUSTRATED ON THE LAYOUT DRAWING FURNISHED WITH EACH LITTELL RACK-AND-PINION ROLL FEED.



E. ADJUSTING BRAKE

Brake springs (E) are adjustable to provide the drag required to suppress the momentum of the feed rolls at the end of each feed cycle. Use the minimum spring pressure that will control the feed length accurately. For drum-type brakes this pressure will be exerted when the springs are compressed to approximately 50 per cent of their free length.

Disc-type brakes are designed for high-speed operation during which they will generate a lot of heat. The recommended maximum operating temperature is about 100 degrees Centigrade (212 degrees Fahrenheit). Although the disc-type brakes will operate satisfactorily at temperatures as high as 140 degrees Centigrade, but the brake life will be reduced considerably. The longest brake wear life will be obtained if brake spring pressure and press speed are adjusted to keep the brake temperature at or below 100 degrees Centigrade.

F. ADJUSTING FEED ROLL SPRINGS

The springs (F) on the incoming and outgoing

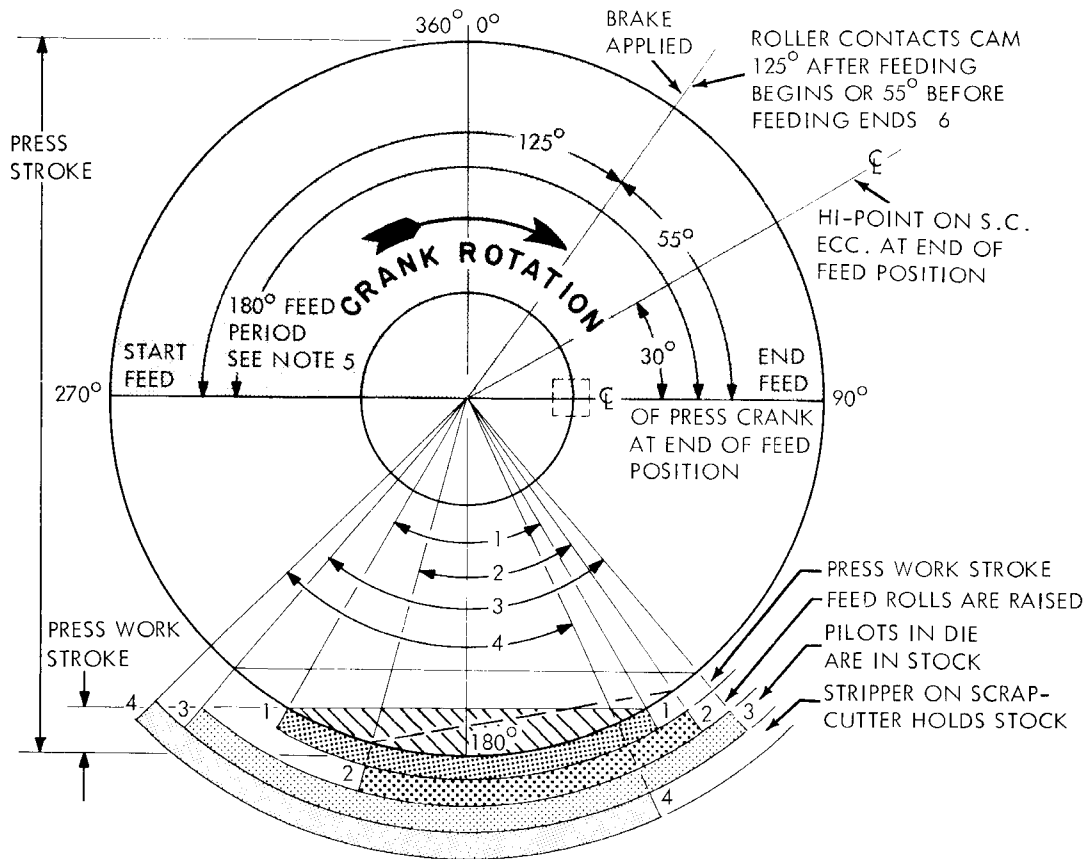
feed rolls should be adjusted to equal heights with sufficient pressure to prevent any slippage of the rolls on the material. Adjust spring height by tightening or loosening the hexagon nuts above the springs. NEVER COMPRESS THE SPRINGS FULLY. THIS WOULD RESULT IN SERIOUS DAMAGE- ESPECIALLY WHEN ROLL LIFTERS ARE USED.

G. ADJUSTING STOCK GUIDES

Position entering guides (G) on the roll feed to line up the entering stock with the die in use. ALLOW 1/32 INCH CLEARANCE OVER WIDTH OF STOCK TO ENSURE FREE PASSAGE.

H. LUBRICATION CHECK

Before putting the roll feed into operation, be sure all working parts are well lubricated. Follow the "General Lubrication Instructions" (Part 6 of this manual), and keep all working parts well lubricated at all times.



1. Stock is locked in the dies during press working stroke.
2. On slide-operated lifters, the rolls are set down on the "up" stroke of the press at the same time they are lifted on the "down" stroke. With Ecc. or air operated lifters the rolls can be adjusted to set down anytime after the stock is locked in the dies.
3. Pilots begin to enter the stock (unless anti-back-up rolls are used) before the feed rolls are lifted.
4. Scrap-cutter cuts off the scrap 30° after press bottoms. Stripper plate must not clamp the stock until after the pilots are fully entered.
5. Normal "feed cycle" is 180° of press stroke. With "Shaper Motion" drive the feed usually occurs in 130° Press stroke. Timing of both are adjustable with relation to press stroke.
6. Air Brake:
Cam for air brake should be made with an adjustable dwell of 45 to 90 degrees. Set Cam for full 90 degree dwell with cam coming on at 55 degrees before end of feed. Regulator pressure should be set between 30 and 40 pounds.

Figure 1-5. Operation Timing Sequence



PART 5 - OPERATING INSTRUCTIONS

A. GENERAL

After all the preoperating procedures described in Part 4 and 6 have been performed, the LITTELL Rack-and-Pinion Roll Feed is ready to be put into operation.

Set the press for its minimum speed, start it, and check the accuracy of the feed length control before going into full-speed production.

Refer to "Troubleshooting," Part 7 of this manual, if any difficulties are encountered when the roll feed is put into operation.

B. MICRO RUNNING ADJUSTMENT

If your LITTELL Rack-and-Pinion Roll Feed is equipped with a micro running adjustment, check the feed length setting at full production speed as follows.

a. Set the press speed at its normal production rate, and check the effective feed length through six or eight strokes. The feed length should be within 1/16 inch of the desired length. If the setting is off by more than 1/16 inch, stop the press and correct the setting at the drive disc slider block (B).

b. When the effective feed length has been brought within 1/16 inch of the desired setting, the exact length can be obtained by use of the micro running adjustment handwheel (H) while the press is operating at its normal production speed.

c. Micro running adjustments must be made while the press is operating at its normal speed. At slower speeds and at higher speeds the effective feed length will differ slightly, and at high speed it may be necessary to increase the brake spring pressure to eliminate overfeeding.

C. RACK AND DRIVE HOUSING

Where a majority of the feed lengths are only a fraction of an inch up to as much as 2" or 3", the Bell Crank type of drive would be superior to the rack-and-pinion roll feed. However, if a large number of short feed lengths are being run on the rack-and-pinion roll feed, usually only one or two gears of the rack and one or two gears of the pinion of the drive housing are being used. About every month or so, the rack can be removed from the rack housing and the drive housing turned 1/4 of a turn. This will prevent excessive wear on one or two teeth of the housing.

PART 6 - LUBRICATION INSTRUCTIONS



A. GENERAL

LITTELL Rack-and-Pinion Roll Feeds are generally provided with Alemite grease fittings. Before EACH SHIFT the press operator should apply grease through each lubrication fitting.

Centralized block lubrication with a manual pump is provided on some roll feeds. Before EACH SHIFT the operator should pump the handle through the same number of strokes, the number to be determined by experience as being sufficient to deliver new grease to all moving parts.

Automatic centralized block lubrication is provided on still other roll feeds. Before EACH SHIFT the press operator should be certain that the pump is in operating condition and is doing its job.

Some LITTELL Rack-and-Pinion Roll Feeds are provided with motorized continuous lubrication. On these installations a motor-driven pump circulates oil from a reservoir to moving parts of the rack and pinion, feed roll drive shaft, and eccentrics. Before

EACH SHIFT the operator should make sure that the oil filter in the sump of the reservoir is clean and that the reservoir is filled to the FULL mark on the sight gauge with Mobil Vacetra oil, extra-heavy (SAE 30) or equivalent.

The drive housings are provided with oil holes and drain holes. ONCE A MONTH the operator should flush the drive hub with kerosene to remove any stickiness or sludge accumulation, then add a generous quantity of a good grade of light oil. This will minimize wear of the drive housing and roller drive hub and will keep the plungers and springs free. After a prolonged shutdown, the above should be done.

B. LUBRICATION CHART

The lubricants listed in the RECOMMENDATIONS column of the lubrication chart are widely distributed typical lubricants recommended for use in your LITTELL Rack-and-Pinion Roll Feed. Comparable products of other manufacturers may be used.

LUBRICATION CHART

PARTS TO BE LUBRICATED	INTERVAL	RECOMMENDATIONS
Feed roll bearings: Oiled	Twice per shift	Mobil Vacetra oil, extra-heavy (SAE 30) Mobil Sovarex grease L1
Greased	Daily	
Spiral drive gear case	Weekly - change annually	Mobilube #46 (SAE 90)
Chains and open gears	Daily	Mobil Vacetra oil, extra-heavy (SAE 30)
Rack and pinion teeth	Daily	Sinclair Jetlube #8
Drive housings: Large and small holes . .	Daily	Mobil DTE oil, light SAE 10W Kerosene or other solvent, followed by Mobil DTE oil, light SAE 10W
Small hole only	Monthly	
Eccentric strap: Oiled	Per shift	Mobil Vacetra oil, extra-heavy (SAE 30) Mobil Sovarex grease L1
Greased	Daily	
Lever operating arm and sliding posts: Oiled	Per shift	Mobil Vacetra oil, extra-heavy (SAE 30) Mobil Sovarex grease L1
Greased	Per shift	
Miscellaneous grease fittings .	Weekly	Mobil Sovarex grease L1
Miscellaneous oiling points . .	Daily	Mobil Vacetra oil, extra-heavy (SAE 30)
Open gears	Weekly	Sinclair Jetlube #8



PART 7 - TROUBLE SHOOTING

The following chart lists troubles that may be experienced with LITTELL Rack-and-Pinion Roll Feeds, their probable causes, and their remedies. Inquiries about any troubles not listed below should be directed to the factory.

TROUBLESHOOTING CHECKLIST

TROUBLE	CAUSE	REMEDY
Feed length too long	<ol style="list-style-type: none"> 1. Improper feed length setting 2. Insufficient braking 3. Worn brakes 	<ol style="list-style-type: none"> 1. Adjust at drive disc slider block (B). 2. Increase brake spring pressure. 3. Replace brake linings.
Feed length too short	<ol style="list-style-type: none"> 1. Improper feed length setting 2. Feed rolls slipping on stock 3. Incorrect roll lifter timing lifts feed rolls before end of feeding cycle 4. Stock interference 	<ol style="list-style-type: none"> 1. Adjust at drive disc slider block (B). 2. Increase roll spring pressure. 3. Adjust roll lifter timing as instructed in Part 4, paragraph C. 4. Check clearance of stock width in dies and in stock guides. Provide free loop of stock entering roll feed. Adjust feed line to height of die.
Brakes overheating	<ol style="list-style-type: none"> 1. Excessive braking 	<ol style="list-style-type: none"> 1. Reset brake spring pressure to minimum for controlling overfeeding.
Improper tracking of stock through dies	<ol style="list-style-type: none"> 1. Uneven spring pressure on feed rolls 	<ol style="list-style-type: none"> 1. Equalize spring pressures.

HOW TO ORDER REPAIR PARTS

When ordering repair parts, please specify the following:

1. Serial number of the roll feed unit.
2. Index number and part name from illustration and parts list.
3. Page number of the repair parts list.

EXAMPLE:

Illustration Index No.	Part Name	Roll Feed Serial Number	Repair Parts List Page Number
1	Seal - oil	70000-62	2-1