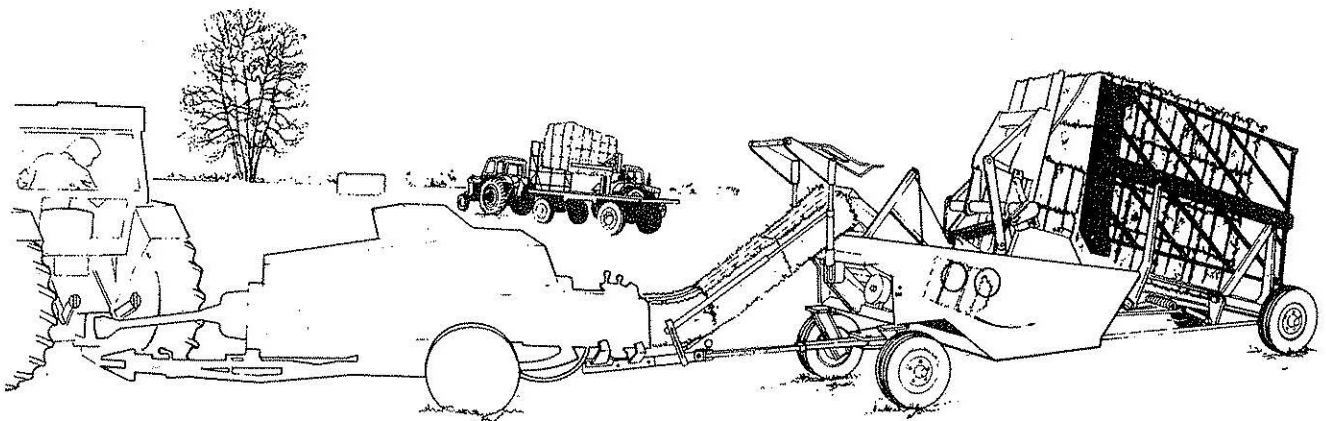


Instruction and Spare Parts Manual

BALEPACKER SYSTEM



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INTRODUCTION

Read this manual before fitting or operating the machine. Whenever any doubt exists contact your dealer or the McConnel Service Department for assistance.

Four point pusher model Balepackers were produced up to and including serial number 00BS46. For machines up to this serial no. consult Section 5 where necessary.

Both 3 point and 4 point pusher model machines are very similar in design. Basic differences between the two are that the 4 point pusher model has an added link between the pusher and the main frame on the right hand side, the needles are mounted on eccentric cams and the knotter drive operating camwheel 'B' is positioned above the knotter drive gear.

DEFINITIONS

The following definitions apply throughout this manual:

WARNING

An operating procedure, technique etc., which can result in personal injury or loss of life if not observed carefully.

CAUTION:

An operating procedure, technique etc., which can result in the damage of either machine or equipment if not observed carefully.

NOTE:

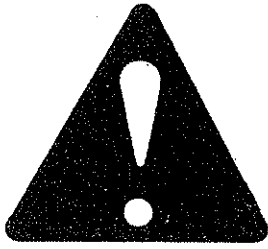
An operating procedure, technique etc., which is considered essential to emphasise.

Left and Right Hand

This term is applicable to the machine when fitted to the tractor and viewed from the rear. This also applies to tractor references.

Record the serial number of your machine on this page and always quote this number when ordering spares. Whenever information concerning the machine is requested remember to also state the type of tractor to which it is fitted.

MACHINE SERIAL NUMBER		INSTALLATION DATE
MODEL DETAILS		
DEALERS NAME		
DEALERS TELEPHONE NUMBER		



WARNING

SAFETY PRECAUTIONS

- NEVER
- ... Attempt to make any adjustments while the hydraulic supply is switched on at the machine.
 - ... Clamber over the machine or otherwise attempt to reach in to clear a machine blockage without first making the machine safe with the isolation valve and stopping the tractor engine.
 - ... Use a self seal coupling in the return line which could cause a blockage. A pressure build-up in the return line could cause the lift platform and pusher to operate even when the isolation lever is in the 'STOP' position.
- ALWAYS
- ... Keep all guards in place while working - they are for your protection.
 - ... Before starting work check the drawbar attachment bolts on the Baler for security.
 - ... Park machine on level ground before disconnecting from the baler.
 - ... Block one of the rear wheels before removing Drawbar Pins allowing the machine to slew to the transport position.
 - ... Use a tractor with sufficient power and weight when operating on sloping ground.
 - ... Operate the machine whenever possible up and down rather than across a slope.

Section 2 FITTING INSTRUCTIONS

1. Selection and preparation of tractor.

The fully laden weight of the balepacker can be well in excess of two tons; add the weight of the baler and take into account the probability of working on soft or sloping ground when deciding on the choice of tractor.

The hydraulic system of the tractor must be in good condition with a minimum relief valve setting of 2200 p.s.i. and minimum flow of 3 g.p.m. For an average operating speed of one bale every five seconds a flow of 5 g.p.m. is required.

John Deere tractors which have a 'closed centre' hydraulic system can be used satisfactorily provided that the unloader valve is screwed in completely.

WARNING

It is most important that the return line to the tractor is unobstructed. Under no circumstances should a self-seal coupling be used in the return line which could cause a blockage. A pressure build-up in the return line could cause both the lift platform and pusher to operate even when the isolation lever is down in the 'SAFE' or 'STOP' position.

Important Note

When starting-up the Balepacker at all times and especially at the beginning of the season, the engine RPM should be reduced to high idle speed when selecting tractor external service. This reduces the risk of the initial surge of oil raising the by-pass relief valve in the manifold which would allow unfiltered oil to enter the system.

The Balepacker should not be powered by tractors that utilise part of their hydraulic delivery or return flow for essential services like power steering, brakes or gearbox lubrication unless cleared for such use by their dealer or by F.W.McConnel Service Department.

Ford Dual-Power - Service Bulletin No HY/01 refers

Ford tractors equipped with Dual Power can be used provided that a return by-pass valve is installed. This valve divides the return line oil to give a constant 1½galls/minute flow at 50 psi to the transmission system for lubrication, the remainder of the oil is returned to the tractor via the gearbox filler cap at a greatly reduced pressure.

The return hose by-pass assembly (Part No 80 02 279) is 'works' calibrated and supplied complete with tractor return connection, adaptor and hoses.

Oil change

It is strongly recommended that the oil is changed in the hydraulic system of older model tractors.

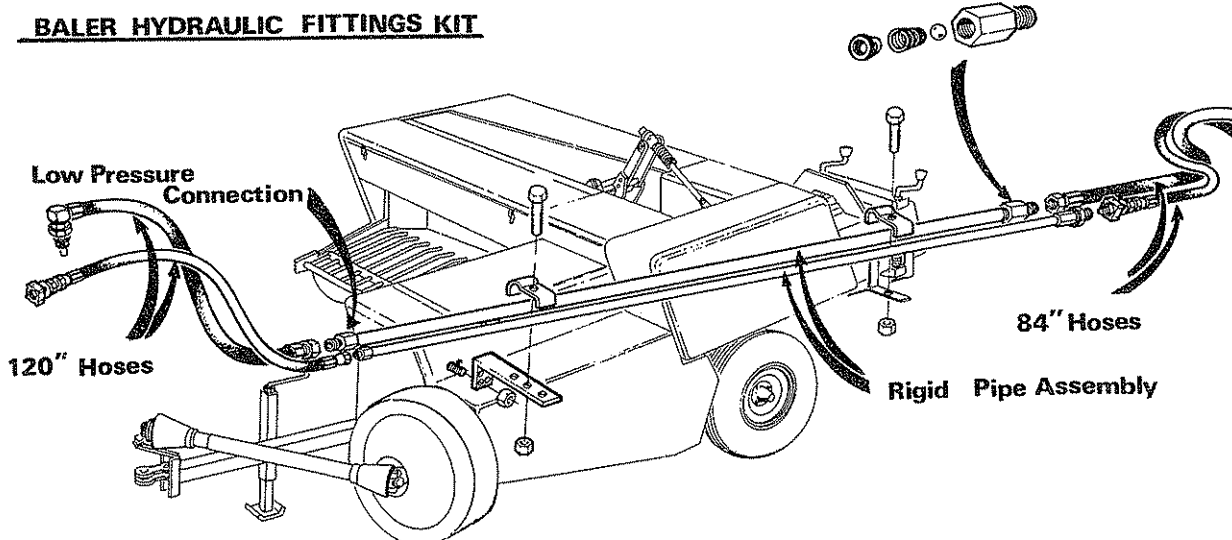
2. SELECTION AND PREPARATION OF BALER

a) It must be realised that the performance of the Balepacker is entirely dependent on the efficient functioning of the tractor's hydraulic system and the reliability and output of the baler. It is most important that the baler is in first class condition and particular attention should be paid to the setting-up of the knotter mechanism, the bale length register and trip device. Both the fixed and plunger knives should be sharp and correctly set up so that bales are completely separated.

b) Drawbar An essential requirement of the Balepacker is a reasonably straight bale. Lowering the tractor hitch point raises the rear end of the baler, allowing the bale to emerge onto the bale platform in as straight a line as possible. Added advantages to lowering the hitch point will be improved ground clearance of the towbar assembly and improved visibility of the emerging bales.

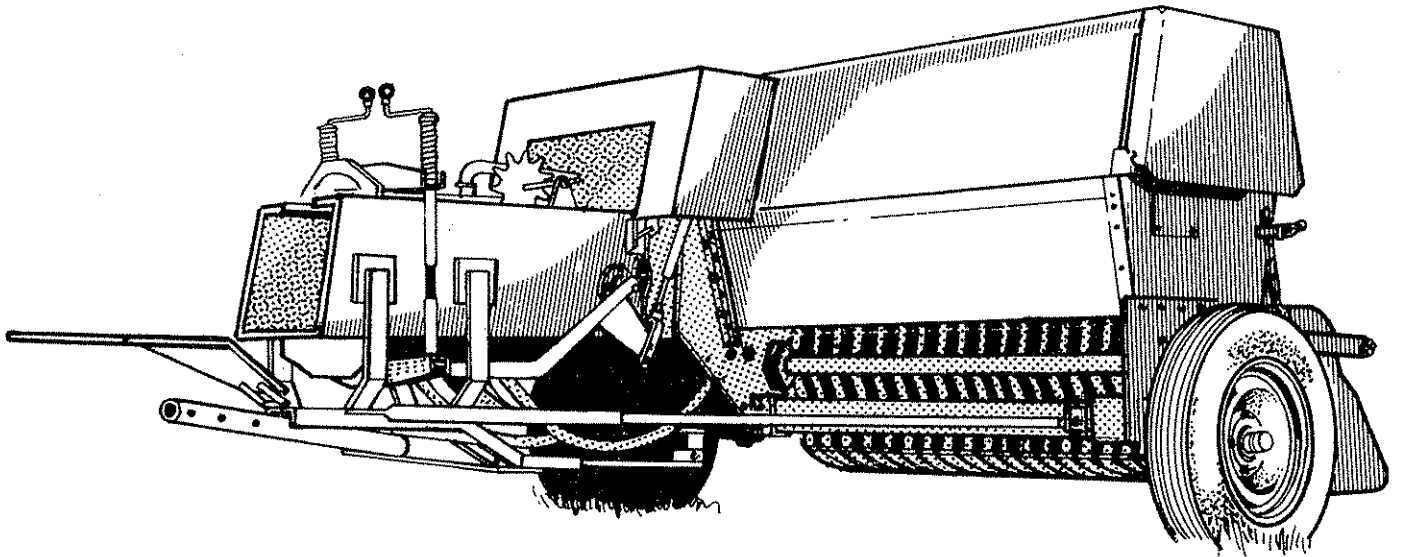
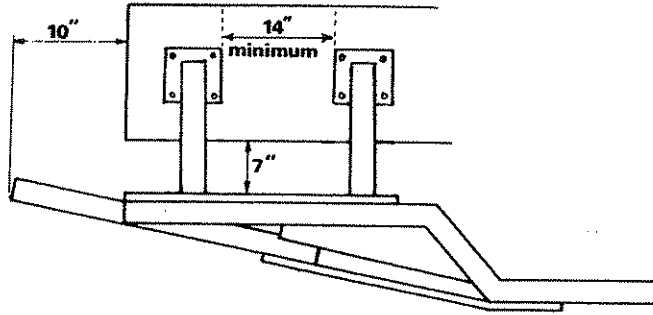
c) Bale Dimensions The Balepacker will accept bales of 18" x 14" and 18" x 16" up to a maximum length of 44". It is recommended to tie bales of 38" to 40" in length. If short bales are being produced difficulty can sometime be experienced in getting sufficient pressure on the gripper arms for lifting the pack. It is also more difficult to get sufficient side-gate pressure to tie a firm pack. Regular shaped bales of equal length and density will reduce the number of blockages that may occur in the Balepacker. Careful preparation of the crop with even, tidy windrows prior to baling can have an enormous effect on the quality of the finished bale. In the interests of economy, to reduce the amount of twine used, as well as the number of journeys involved in travelling between field and stack, the bales can be made rather longer and heavier than is usual when manual handling is involved.

d) Hydraulic Installation The illustration shows a typical hydraulic pipe installation to a baler. Note that both pipes can be bent slightly to requirements when attaching the front mounting bracket to a convenient point on the baler.

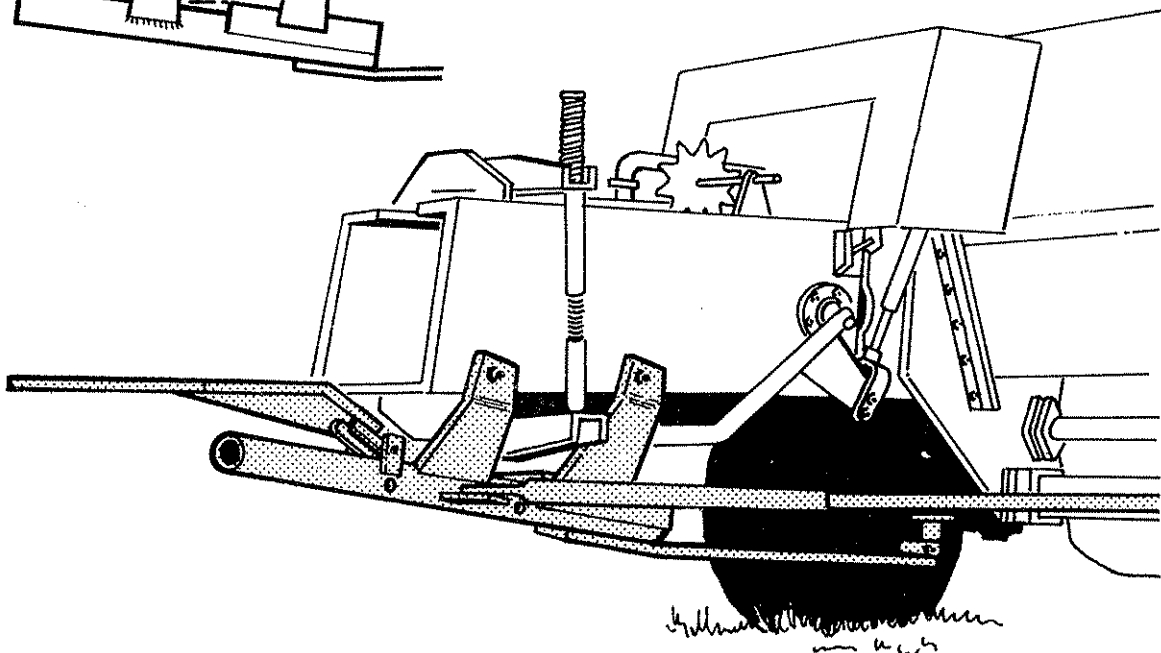
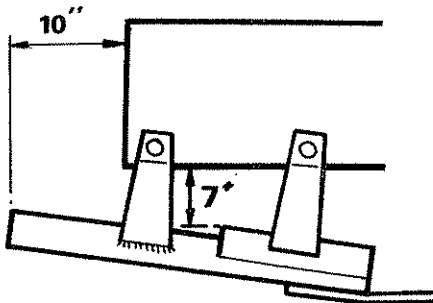


Baler towbar fittings

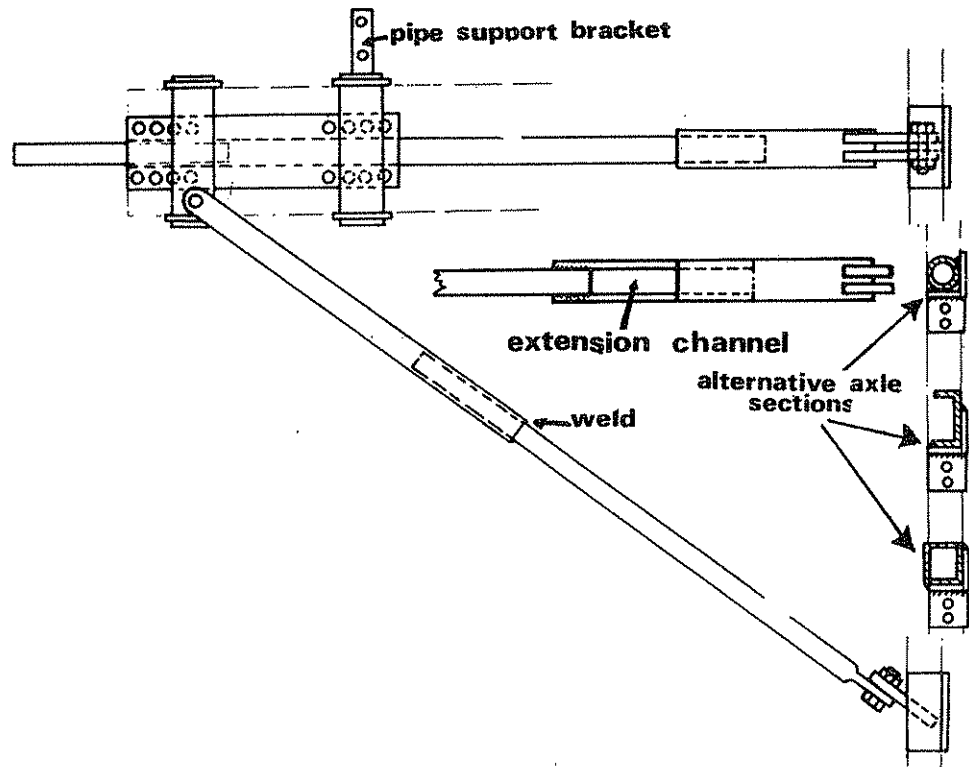
16 Bolt attachment



4 Bolt attachment



Towbar fitting details



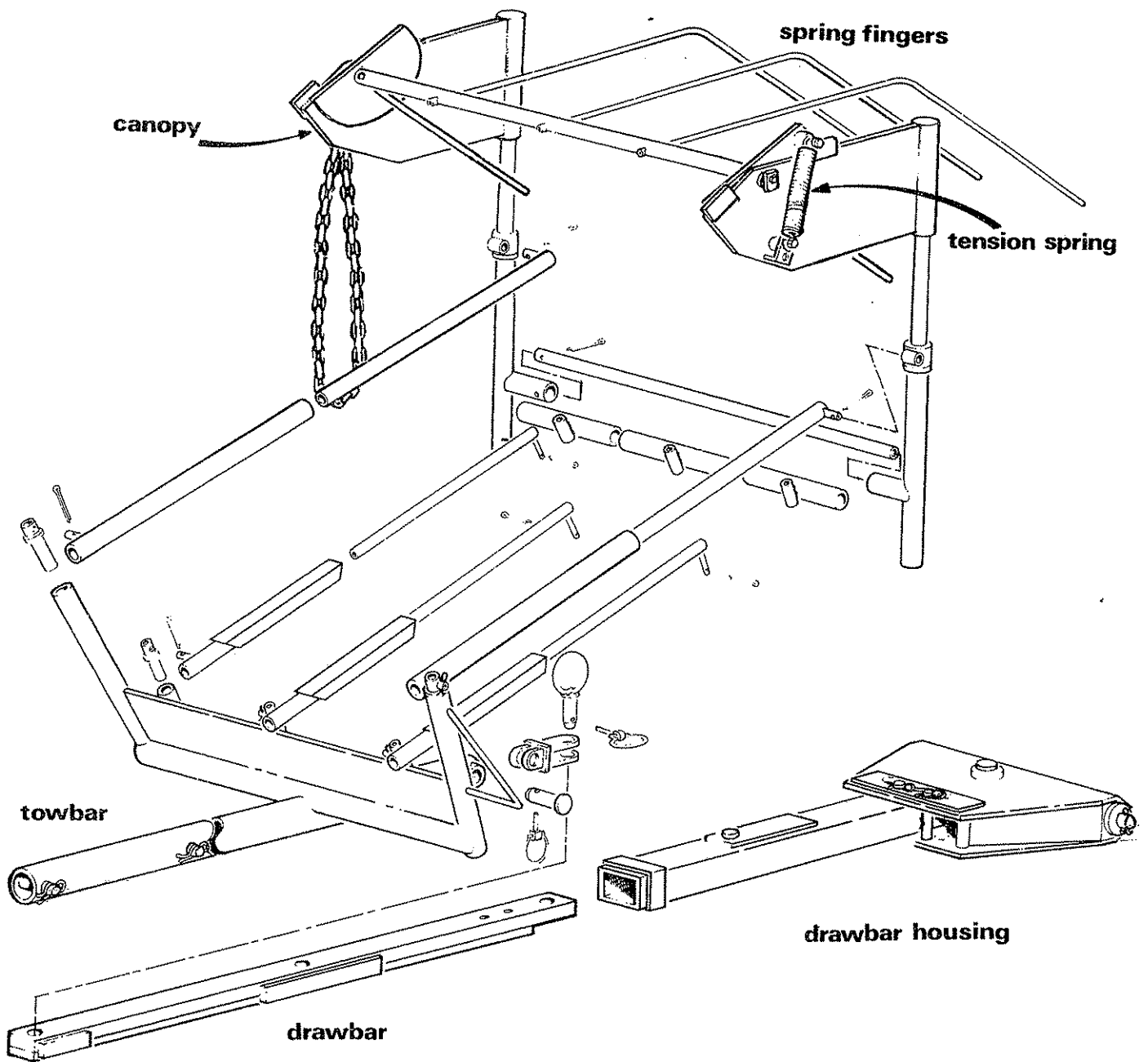
e) Fitting the Towing Attachment.

The basic kit is designed to fit most balers and comprises a tow bar housing which is rigidly bolted to the bale chamber by means of two brackets. The forward end of the towbar housing is then welded to a bracket that is pinned to an assembly welded to the main baler axle.

The order in which the fitting is carried out is as follows:-

Note: Access to an electric power point for drilling, and welding equipment is essential.

- i) The tow bar housing should be blocked up with the chamber brackets loosely bolted to the housing. Note that the dimensions shown in the diagram should be carefully maintained. The front chamber bracket is the one that has the lug to which the steel hydraulic pipes are fitted. The rear bracket should be mounted as close as possible to the end of the chamber with the strut mounting hole on the pick up side. Using the brackets as templates, mark and drill the bale chamber and bolt up the brackets to it before tightening the housing bolts.
- ii) Locate and weld the box section lug to the mounting angle which is then aligned and welded to the baler axle as shown in the diagram. Alternative methods of welding to round, square and channel section axles are also shown.
- iii) Loosely bolt the diagonal strut in position and locate the mounting lug in the widest possible position on the axle before welding. Weld the two halves of the strut firmly together where they overlap and then tighten the bolts.
- iv) Balers that have a chamber of 70" or more in length require an extension piece welded to the forward end of the tow bar housing.



Bale Chute and Canopy Installation

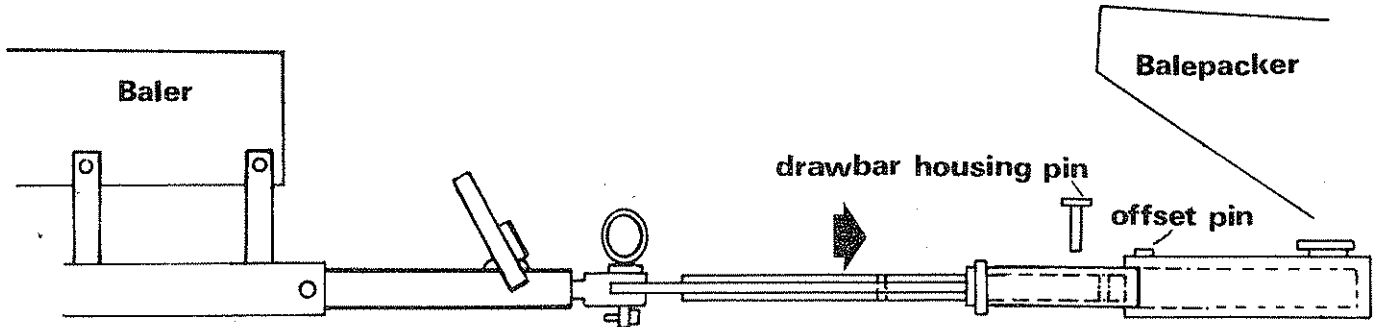
The towbar should be inserted in the towbar housing on the baler and the telescopic steel pipes which form the chute fitted as shown in illustration. For transportation, the lower ends of the pipes can be withdrawn from their sockets on the towbar, gathered up and held against the canopy by the chain provided. It is not necessary to dismantle any of the assembly.

Section 3 OPERATION

1. Hitching Balepacker to Baler.

This requires a certain amount of operator technique.

- a) Remove offset pins in the hitch-housing and the drawbar housing pin.
- b) Telescope the drawbar and swing to one side.
- c) Reverse baler to its approximate position, extend drawbar and swing it into place.
- d) Reverse the baler to telescope the drawbar and locate it into its required position.
- e) Relocate offset pins and drawbar housing pin and secure with linch pins.

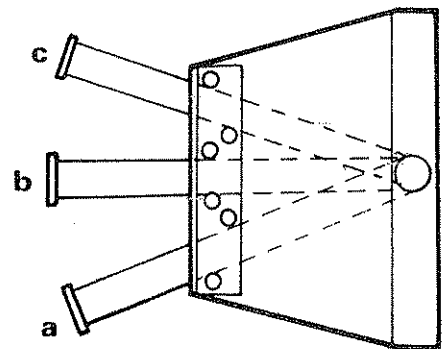


2. Travelling

Three hitch adjustments are provided.

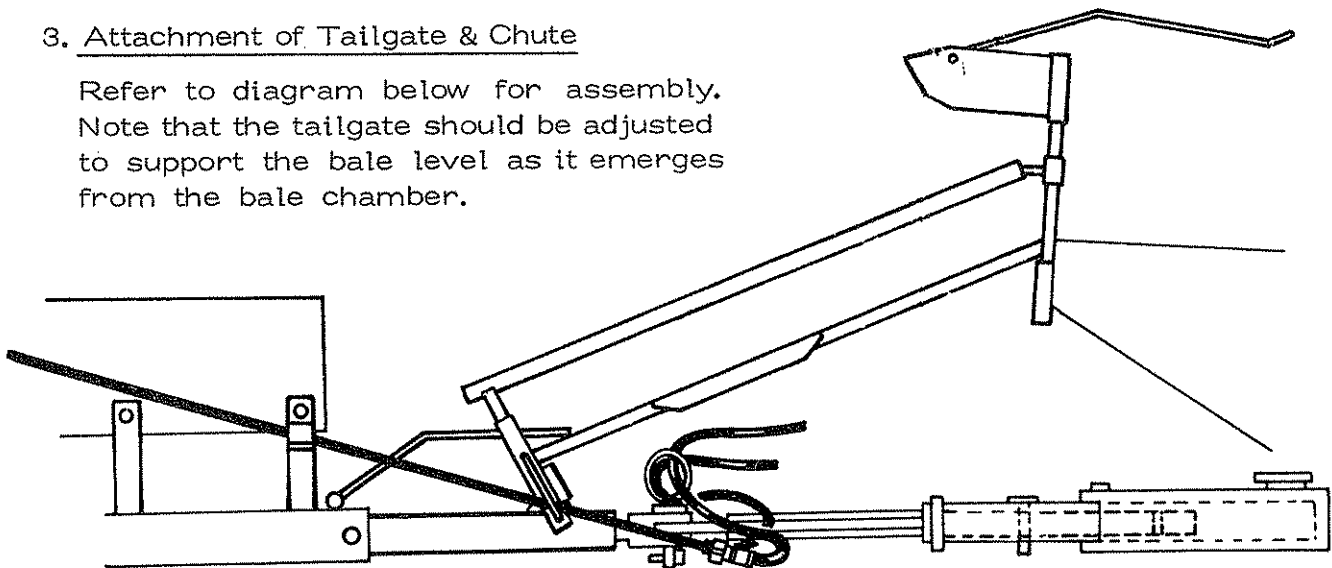
- a) On the road behind a baler.
- b) On the road behind a tractor.
- c) In the field behind baler.

Note. When towing behind tractor in position (b) use the drawbar in extended position.



3. Attachment of Tailgate & Chute

Refer to diagram below for assembly. Note that the tailgate should be adjusted to support the bale level as it emerges from the bale chamber.



4. Coupling up the hydraulic system

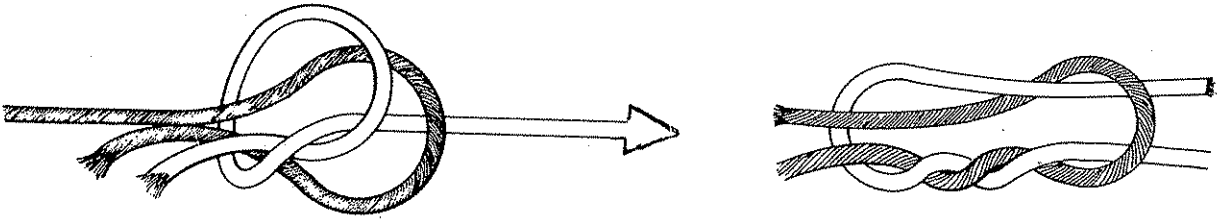
- a) Make sure the isolation lever on Balepacker is in the SAFE position.
- b) Place tractor quadrant lever in neutral.
- c) Fit the return hose to the filler plug connection on tractor.
- d) Couple the high pressure hose from the baler to the tractor self-seal coupling on its external services connection.
- e) Couple both the supply and return hoses that are fitted to the balepacker. They should be passed through the ring in the top of the drawbar pin.

NOTE Do not select constant pumping at this stage.

After initially 'running up' the Balepacker the oil level in the tractor hydraulic system should be checked.

5. "Stringing up"

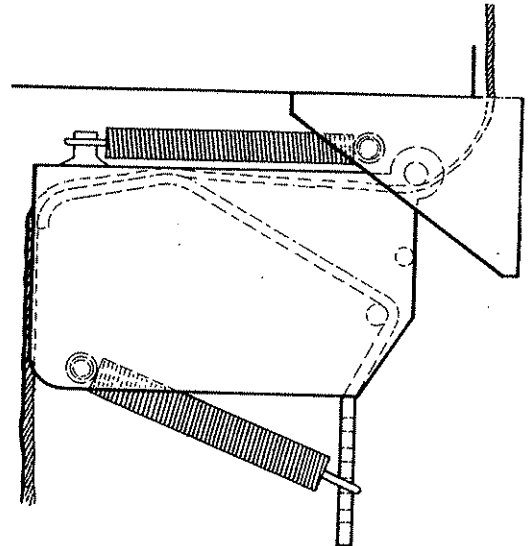
- a) Twine specification - heavy duty polypropylene.
- b) Four balls of twine can be held in the twine box. Both types of knot illustrated have been found satisfactory when joining the twine.



One twine pack i.e. 2 balls of twine will tie approx. 100 packs of 20 bales.

c) Twine tension

Controlled by two tension boxes mounted on the underside of the twine container. The spring position should be adjusted so that a pull of approx. 6 pounds is required to draw the twine out.



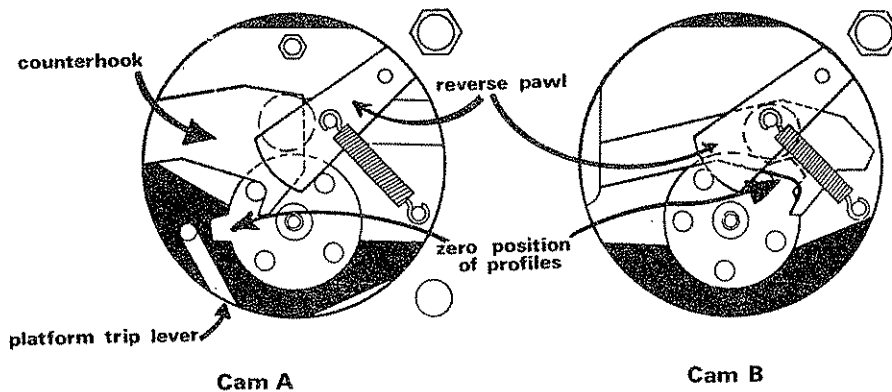
d) Threading Needles.

Twine should pass from twine tension boxes down through the funnel on the back of the needle and up through the needle eye. Tie the twine end to the needle shaft or another fixed point on the pusher.

Ensure that any slack twine at the needle end is pulled back through the twine tension boxes.

6. Selecting pack size

A pack size of either 16 or 20 bales can be made. Packs are stacked four bales high and the length is determined by fitting either the four peg or five peg counter cam to give respectively a 16 or 20 bale pack. To special order a six pegged cam with two profiles can be supplied if a pack of 3 bales high is required.



7. "Zeroing" Counter Cams

CAM A controls the pack height and regulates the platform and pusher sequence.

CAM B controls the length of balepack by activating the knotter assembly.

At the start of operations both counter cams should be set to ZERO as indicated in the diagrams. In this position the platform will rise four times before the pusher goes in on a knotting stroke.

Disconnect reverse pawl return spring, raise counter hook and rotate cam anti-clockwise. Reconnect return spring.

CAUTION. If the machine is started off when empty on a pusher stroke, the side gates could be damaged.

8. Starting the Pack

Operate quadrant lever of the tractor to charge the Balepacker hydraulic system and with the tractor engine running at baler operating speed the unloader valve will be heard to operate. This will be accompanied by a change in engine note as the tractor 'comes off load'.

An indication that the unloader valve is working correctly is that the hoses will 'kick' or flex when the valve operates.

If the tractor is unable to raise pressure, check that 'external services' has been selected on the tractor, the self seal coupling is fully engaged and the unloader valve is not sticking, see Unloader Valve adjustment page 13

Ensure the swing arm is in the parked position and the side gates are leaning inwards before moving the isolation lever ^{up} ~~down~~ to the working position. The machine is now ready to receive its first bale.

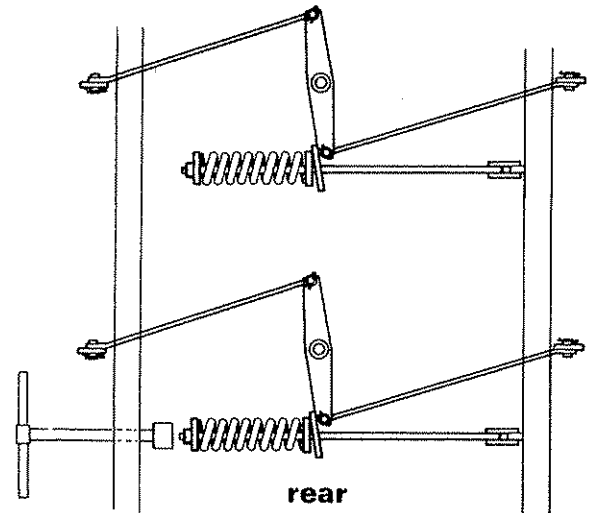
The first four bales will not be tied.

9. Platform trip lever

Raising this hand-operated lever will allow the platform to lower if a bale becomes jammed beneath the pusher assembly.

10. Side Gate Adjustment

Pressure. The tension of the balepack is regulated by spring pressure on the two side gates and can be adjusted by using the crank handle supplied with the machine. Greater tension should be applied to the rear spring. The balepack is at the correct tension when it is not possible to push a hand between the columns of bales.



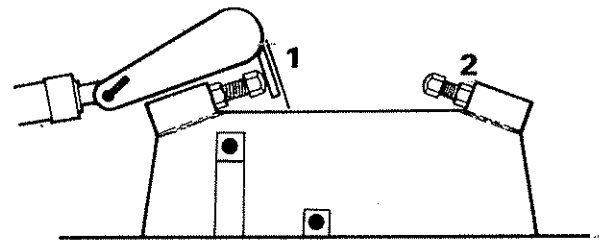
WARNING

This check should be made with the isolation lever in SAFE position.

Spring fingers are fitted to the gates to prevent the top of the bale column from falling over particularly on sloping ground.

11. Bale Dimension Adjustment

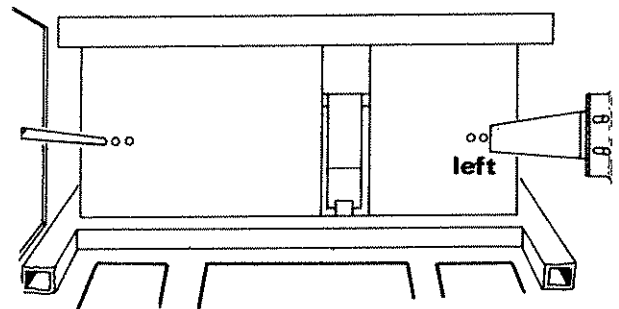
An adjusting bolt 1 is provided for altering width between the pusher and the formed column of bales. Screw the bolt in to widen the aperture. If the aperture is not wide enough the lifting bale will foul the previous bale column. If the aperture is too wide the bales will tend to fall and twist. The second adjustment bolt 2 is an abutment stop for the bale pusher. It is pre-set at the factory and should not be disturbed unless major replacements are necessary.



12. Centralizing bale on platform

It is essential that the bale is placed on the platform forks so that the pack is built up centrally in the machine and the twines spaced equally from the bale ends.

On level ground the bale will tend to be thrown to the left so the correct adjustment on this side is most important. Adjustment of the rod on the right hand side will only be necessary when working across sloping ground.



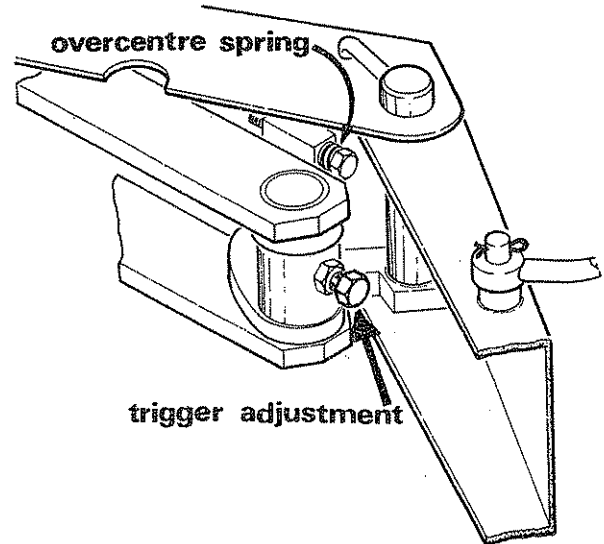
Operational adjustments

Before carrying out any operational adjustments ensure isolation lever is Down in the 'SAFE' position and stop tractor.

1. Swing Arm and Trigger Adjustment

The swing arm turns the bale through 90° and lays it across the platform forks.

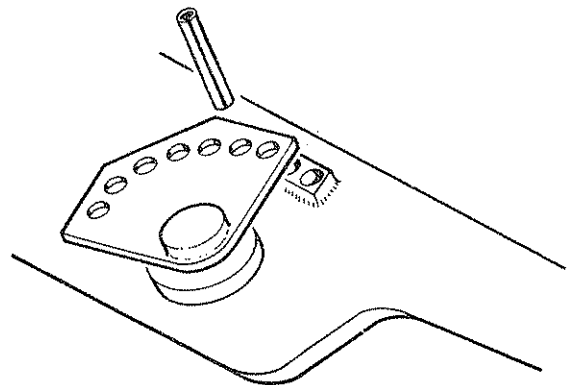
- a) Overcentre check. The swing arm must remain locked against any force that can be applied by hand at the end of the arm.
- b) Overcentre trigger spring. This is not an adjustment. It ensures that the overcentre link holds the trigger assembly in the locked position.
- c) Trigger adjustment. The trigger pressure for releasing the swing arm may need to be altered to suit the weight of bale. Adjust by screwing out the adjusting screw until a bale sliding down the platform is able to trip the mechanism. Lock the screw securely with the locknut.
- d) Swing arm alignment.



In operation, the swing arm travels through the opening in the bale deflector plate. Alignment of the swing arm is achieved by the addition of shims on the lower mounting bolt. If it is found necessary to remove the swing arm for servicing, these shims should be carefully replaced.

- e) Eccentric pin

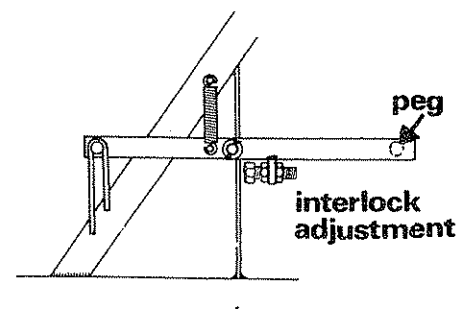
This adjustment is set at the factory and should only be altered if wear has taken place in the linkage after a long period of service. Engaging the roll pin through any one of a series of holes in the pin flange alters the position of the swing arm when in its parked position. The rubber buffer should just contact the swing arm when correctly set. When making adjustment, the roll pin should be removed by driving it right through the housing.

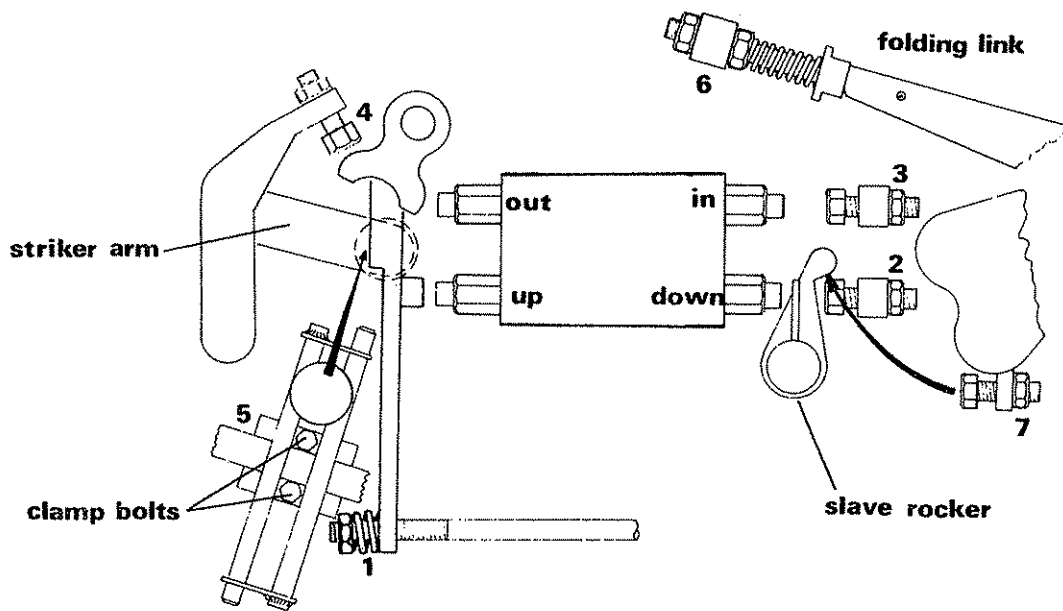


2. Bale Deflector Plate

This is a guide which directs the bale endways to the swing arm trigger mechanism. It is prevented from moving by an interlock peg.

- a) Interlock adjustment. The interlock peg is held in position by an arm which is connected to the trigger and adjustment is provided by a setscrew to centralize the arm under the peg.





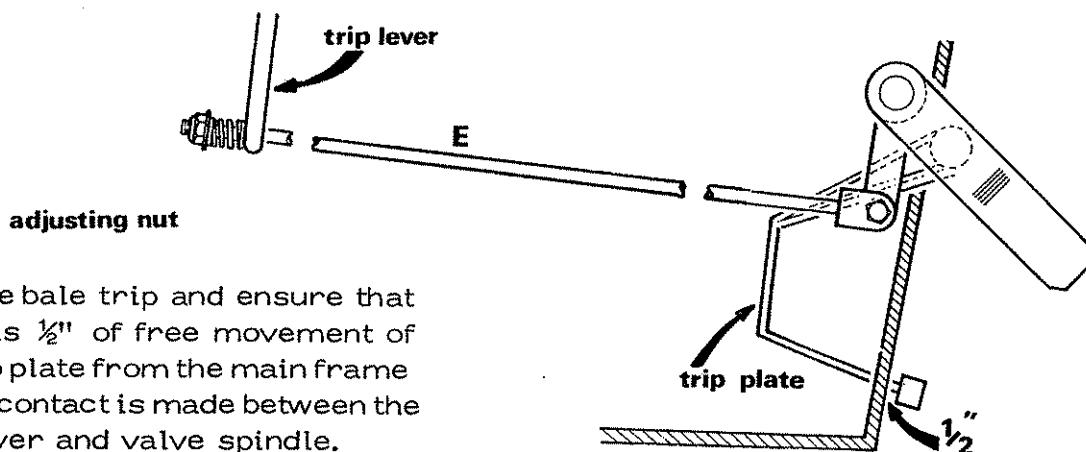
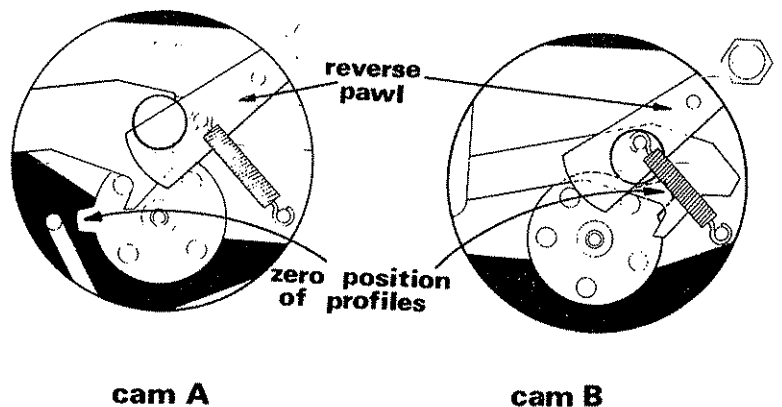
9. Sequence Valve Adjustment.

The adjustment of the sequence valve is critical. Adjusting one tappet can affect the others. The setting up of the valve should be carried out in order of the numbering shown.

Note 1. When making each adjustment ensure that all free movement is taken up in the various linkages, all return springs are in position and when provided, the adjustment is firmly secured with the locknut.

Adjustment 1 - Platform up

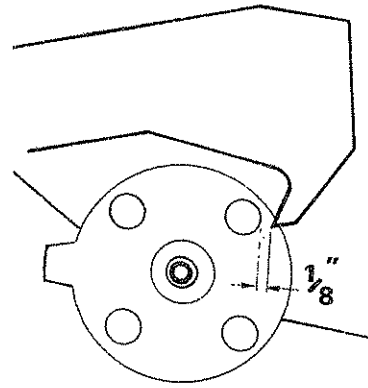
- a) Release the reverse pawl springs and zero counter cams A & B as shown - refit springs.



- b) Operate bale trip and ensure that there is $\frac{1}{2}$ " of free movement of the trip plate from the main frame before contact is made between the trip lever and valve spindle.
- c) Adjust to this clearance by the self-locking nut on the trip rod.

Adjustment 2 - Platform down

- a) Close platform tap, start tractor, raise isolation lever and operate bale trip.
- b) Open tap and allow platform to raise about halfway before reclosing ie, the roller on the striker arm mid-way between upper and lower striker plates. Lower isolation lever and stop tractor.

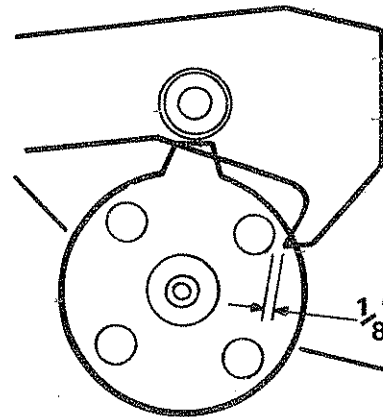


cam A

- c) Raise the striker arm to remove free play at tappet 2 and check that there is 1/8" of clearance between the counterhook tip and the peg on cam wheel 'A'.
- d) Adjust tappet 2 to give this clearance.

Adjustment 3 - Pusher IN

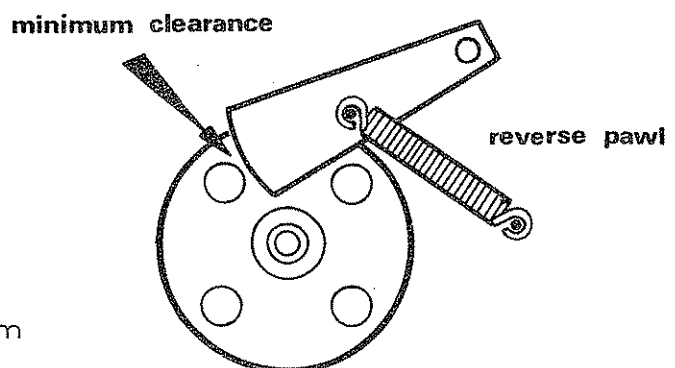
- a) Select pusher stroke by rotating camwheel 'A' until roller is lifted by profile.
- b) Raise the striker arm to remove free play at tappet 3 and check that there is 1/8" of clearance between counterhook tip and the peg.
- c) Adjust tappet 3 to give this 1/8" clearance with contact just made with valve spindle.



cam A

Adjustment 4 - Pusher OUT

- a) Press down striker arm until reverse pawl just drops down behind counter peg.
- b) Adjust tappet 4 to give this minimum clearance.
- c) Release striker arm and unscrew tappet 4 out one complete turn and lock.



Adjustment 5 – Striker rod adjustment

- a) Open tap to allow platform to drop.
- b) Set camwheel A on pusher stroke with roller on top of profile.
- c) Close pusher tap.
- d) Start tractor, raise isolation lever and operate bale trip lever. The platform will rise and remain at the top of its stroke.
- e) Close platform tap before lowering isolation lever and stopping tractor.

f) Slightly loosen the striker rod clamp bolts and hammer up the lower striker plate until there is no clearance between striker roller and plate.

g) Make a scribe mark across the lower striker rod flush with the top of the clamp block.

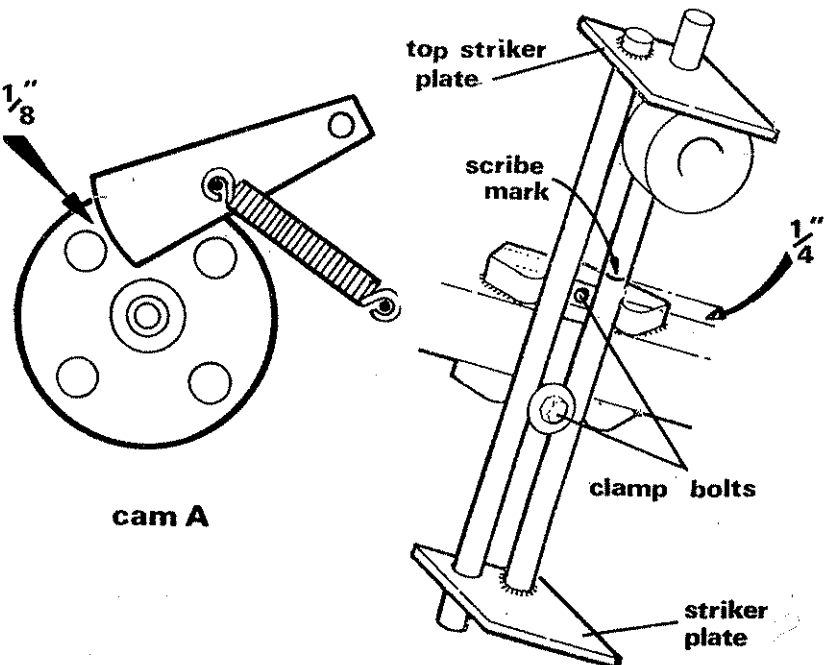
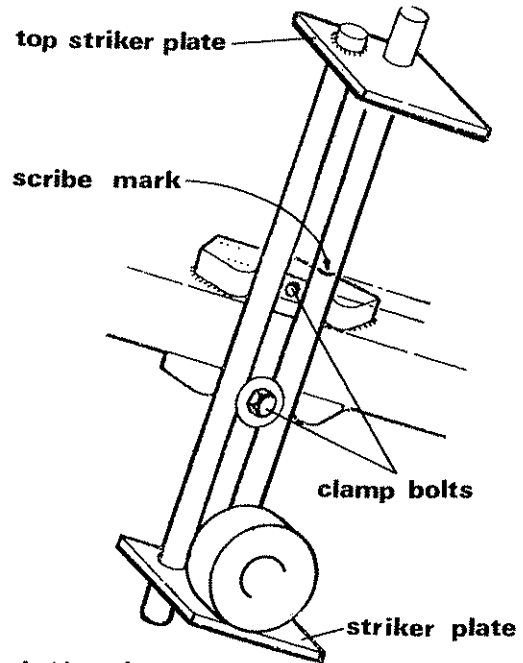
h) Open tap to allow platform to drop about halfway before reclosing tap.

i) Raise the scribe mark $\frac{1}{4}$ " by hammering up lower plate.

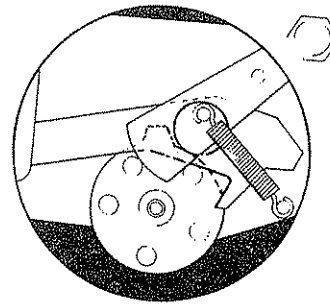
j) Open platform tap, start tractor and raise isolation lever.

k) Standing in front of machine, raise or lower top striker plate to give $\frac{1}{8}$ " clearance between reverse pawl and counterhook peg on camwheel 'A'.

l) Recheck the scribe mark on lower striker rod to ensure no movement has taken place before firmly tightening both rod clamp bolts.



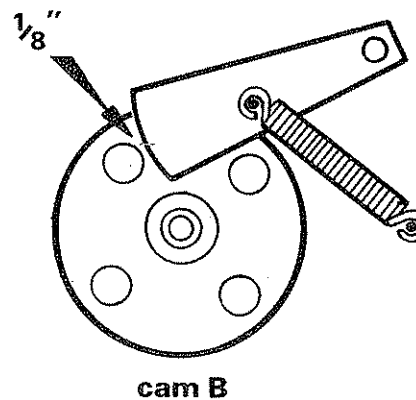
CAUTION: Before proceeding further, the knotter Cam 'B' should be rotated clockwise by raising the reverse pawl and turning the camwheel until the profile is immediately in front of the roller. This is done to prevent the operation of the knotters resulting in slack twine being entangled in them.



Adjustment 6 - Folding link adjustment

- a) Ensure link is in locked position and fully screw in tappet 7.
- b) Place cam wheel 'A' in pusher stroke ie. roller on top of profile.
- c) Close pusher tap.
- d) Start tractor, raise isolation lever and operate bale trip lever. The platform will raise, but the pusher is unable to move.
- e) Close platform tap.
- f) Open the pusher tap slowly and allow the pusher to complete its full travel, coming to rest against the abutment stop. If the pusher does not meet the abutment stop, the needle alignment must be checked before proceeding further.
- g) Isolate Balepacker and stop tractor engine.

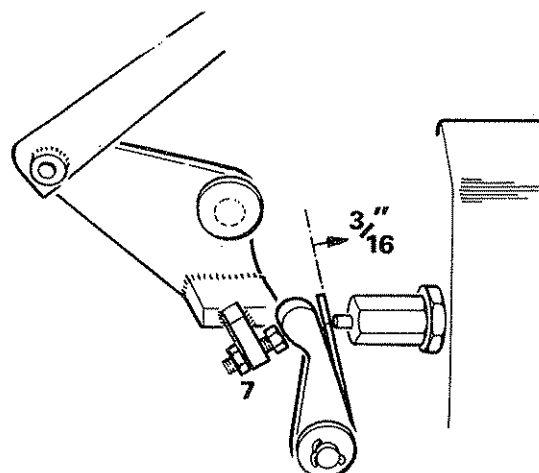
- h) The threaded rod 6 in the locked position should now be adjusted to allow the reverse pawl of the knotter cam 'B' to drop behind the counter peg with 1/8" clearance between pawl and peg.



Adjustment 7 - Pusher slave rocker

Ensure platform tap is closed

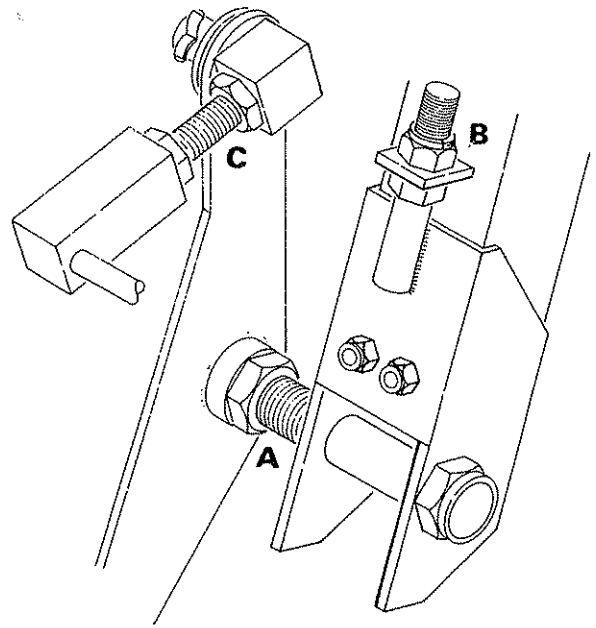
- a) Screw out tappet 7 until it contacts the slave rocker.
- b) Continue to screw out until the rocker has depressed the spindle approx. 3/16" (approx. four full revolutions of the tappet bolt).
- c) Open pusher and platform taps - start tractor raise isolation lever and the pusher should return to its parked position.



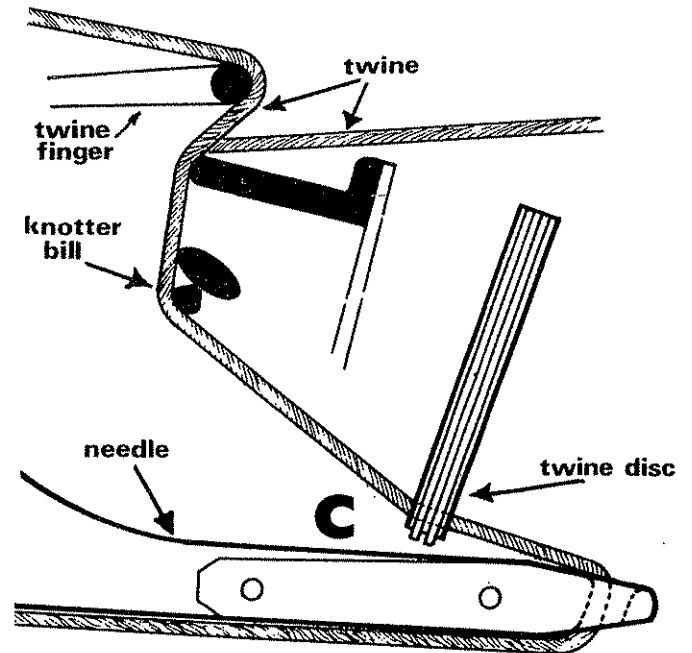
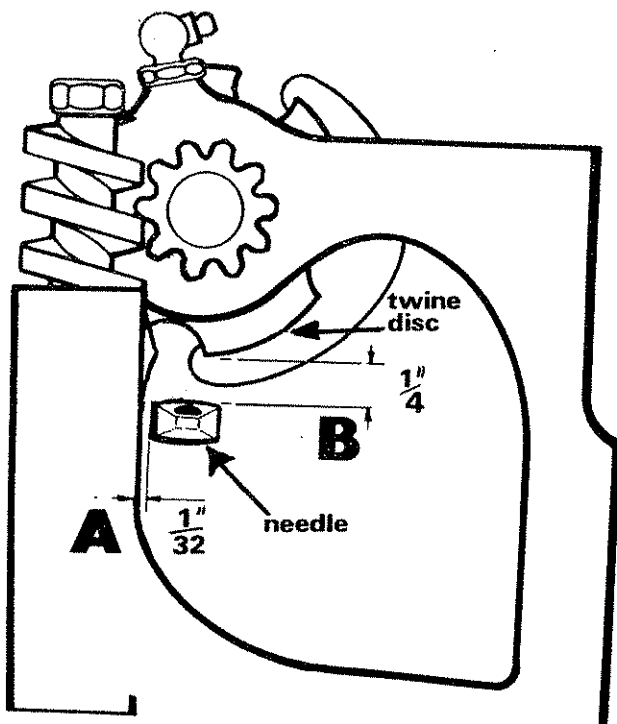
10. Needle adjustment.

The knotter cover must be in position when carrying out any adjustments. Three adjustments are provided for setting the needles.

- A. Side to side movement of the needles. A clearance of approx. $\frac{1}{32}$ " between the needle and the knotter frame must be maintained.
- B. Needle height. Approx. $\frac{1}{4}$ " clearance between the needle eye and the twine disc as the needle enters the knotter. Loosen slightly the two securing bolts before attempting to adjust.
- C. Needle arc. This adjustment should be carried out in conjunction with adjustment B. It determines the amount by which the needle eye curves round pulling the twine into the retainer disc.



Note: After completing adjustments, securely tighten all locknuts and ensure that no parts of the needles make contact with the cover or knotter frame.



Detail of needle clearances

11. Knotter adjustments.

We strongly recommend all owners and operators to examine closely the mechanism of the knotters, because familiarity of the function of the various parts will be of tremendous help in making any adjustments in a quick and easy manner.

All knotters are properly adjusted and tested before they leave our Works and they should work efficiently without immediate adjustments. If the Balepacker, when new, misses tying a few knots do not re-adjust knotter immediately, as this defect may be caused by paint on the knotter components. The Balepacker should be operated until the action of the twine smoothes out any roughness due to the paint. Also make sure that there is no grease on the bill hooks and twine discs; these parts should always be absolutely clean and smooth. If the knotter still fails to tie properly after this initial operation period, turn to the Trouble Summary Chart.

a) Twine holder.

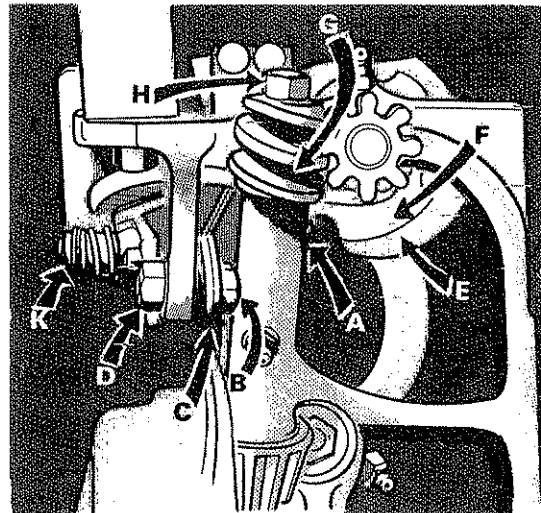
The twine holder (A) consists of a double plate which holds the twine in the disc under pressure from the two springs (C) which can be adjusted with the bolt and nut (B) & (D). Release the nut and tighten the bolt to increase the pressure on the springs.

If the pressure on the twine holder is too great, sufficient twine may not slip through the twine disc, resulting in the twine being broken at the bill hook.

Should the pressure on the twine holder be insufficient the twine may slip out of the twine disc as the pack is being formed.

If the above adjustments do not correct the problem:-

1. Reduce the tension on the pack.
2. Check that the pressure on the twine tension plates is correct.



b) Twine disc.

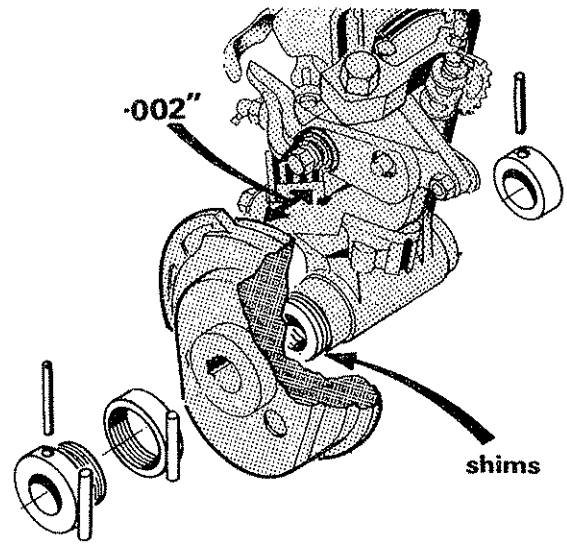
When correctly adjusted to receive the twine, the left side of the notch in the twine disc (F) should be positioned 1/16" in front of the edge of the cleaner (E) when the cleaner is moved to the left as shown. The twine disc can be adjusted to this setting by repositioning the worm gear (G) on the shaft.

To release the worm gear from the tapered shaft, unscrew the nut (H) and tap the worm gear along the shaft towards the nut. The worm gear can then be rotated as required in order to advance or retard the twine disc position. Finally, securely tighten up the lock nut (H) to lock the worm gear in the required position. Check that both knotters are timed the same.

c) Knotter Bill tension.

This is achieved by the tongue roller pressing against a spring-loaded cam and adjusted by locking nut (K). Excessive tension will cause the knots to hang on the bill hook while too little tension will result in loosely tied knots that will pull apart.

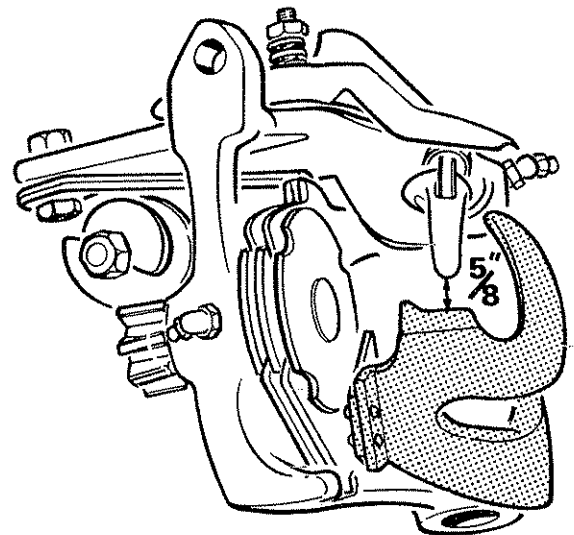
d) All free movement of the bill hook is removed and a light .002" rubbing clearance between the drive cam gear and the flat of the bill hook pinion is obtained by fitting of shims on the knotter shaft between cam gear and knotter frame. The screw type lock ring should be unwound to bear against the cam gear and the rings then bound with soft wire to prevent them becoming undone.



e) Stripper arm

As the bill hook rotates, the jaw opens and picks up twine from the twine disc. The stripper flange rides down the heel of the bill hook and strips the loop of the knot off the bill hook and over the two ends of the twine which are held by the tongue in the bill hook jaw thus completing the knot.

The stripper arm is properly adjusted when the stripper lightly rubs against the curved surface of the bill hook with sufficient pressure to cleanly strip the loop of the knot off the bill hook. Should adjustment be required, the stripper arm can be slightly bent, taking care not to overbend the arm or damage the knife.



If the stripper arm is bent down too far, it will be unable to ride back over the tip of the knotter-bill and the roller end of the stripper arm will be broken off.

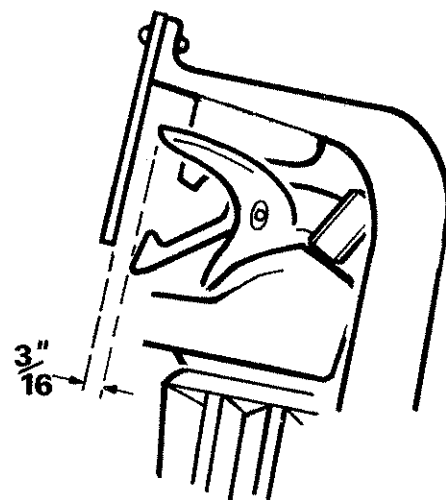
There should be a clearance of $\frac{1}{2}$ " - $\frac{5}{8}$ " between tip of the knotter bill and the stripper when arm is at maximum stroke.

f) Knife

The knife which is riveted to the stripper arm swings between the bill hook and the twine disc, cutting the twine. Because heavy duty twine is used it is most important that the knife is kept really sharp.

To sharpen the knife, remove the stripper arm completely.

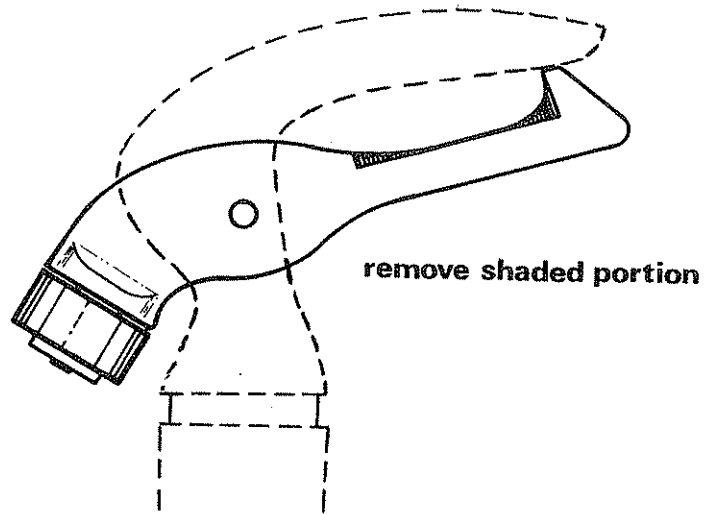
Clearance between the knotter bill and the knife should be approx. $\frac{3}{16}$ ".



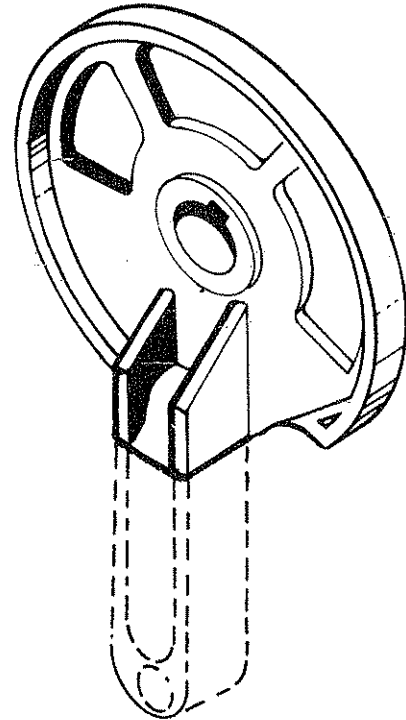
g) Knotter modifications.

The knotters used on the McConnel Balepacker are standard Bamford assemblies with two modifications made:-

- i) Bill Hook. To accommodate the larger diameter polypropylene twine the notch in the tongue must be deepened if a replacement is made. Use a fine file and polish up with emery cloth to remove any roughness.



- ii) Clutch housing. Bamford pt no. B451 H must have the crank arm cut off with a hacksaw.



1. Retiming knotter drive assembly

- i) Raise counter hook and rotate Cam A until roller is on top of profile.
- ii) Close hydraulic tap on pusher ram.
- iii) Start tractor to pressurise system and raise isolation lever.
- iv) Operate bale trip lever. The platform will rise but the pusher is unable to move.
- v) Close tap on lift ram to prevent platform dropping.
- vi) Move isolation lever to SAFE position and stop tractor engine.
- vii) Remove knotter cover completely to improve accessibility.
- viii) Place the large T spanner on the squared end of the knotter shaft and rotate knotters until the spring loaded pawl comes up hard against the clutch trip arm. Do not move the shaft further until timing is completed.
- ix) Release spring pressure on the roller lever and remove bolt, split pin, trip arm and chain idler roller.
- x) Rotate knotter drive sprocket until the cam roller is in position shown in upper drawing with 1/4" clearance.
- xi) Pull the chain tight and pass it up round the sprocket and replace the chain idler roller which will secure it against the sprocket. The timing is now unable to slip. Recheck clearance before proceeding further.
- xii) Reassemble the trip arm and the roller lever assembly. Replace bolt and spring and tighten nut sufficiently to tension the roller against the clutch housing.
- xiii) Connect up the chain as shown in upper diagram.
- xiv) Rotate knotter shaft until spring loaded pawl engages against the clutch trip arm and adjust the nut on the threaded rod until the depth of engagement of the pawl against the arm is 3/16" approx.
- xv) Open taps on both the lift and pusher rams.
- xvi) Replace the knotter cover.

Note: To facilitate assembly of the spring loaded chain, open lift ram tap momentarily to allow the platform to drop a little. This will enable the end of the chain to be released from its anchor pin. Engage the lower end of the chain in the spring, draw it round the bottom sprocket and with a piece of string threaded through the chain two or three links from the end and passed over the ram rod pin the chain can be drawn tight to refit it to the anchor pin.

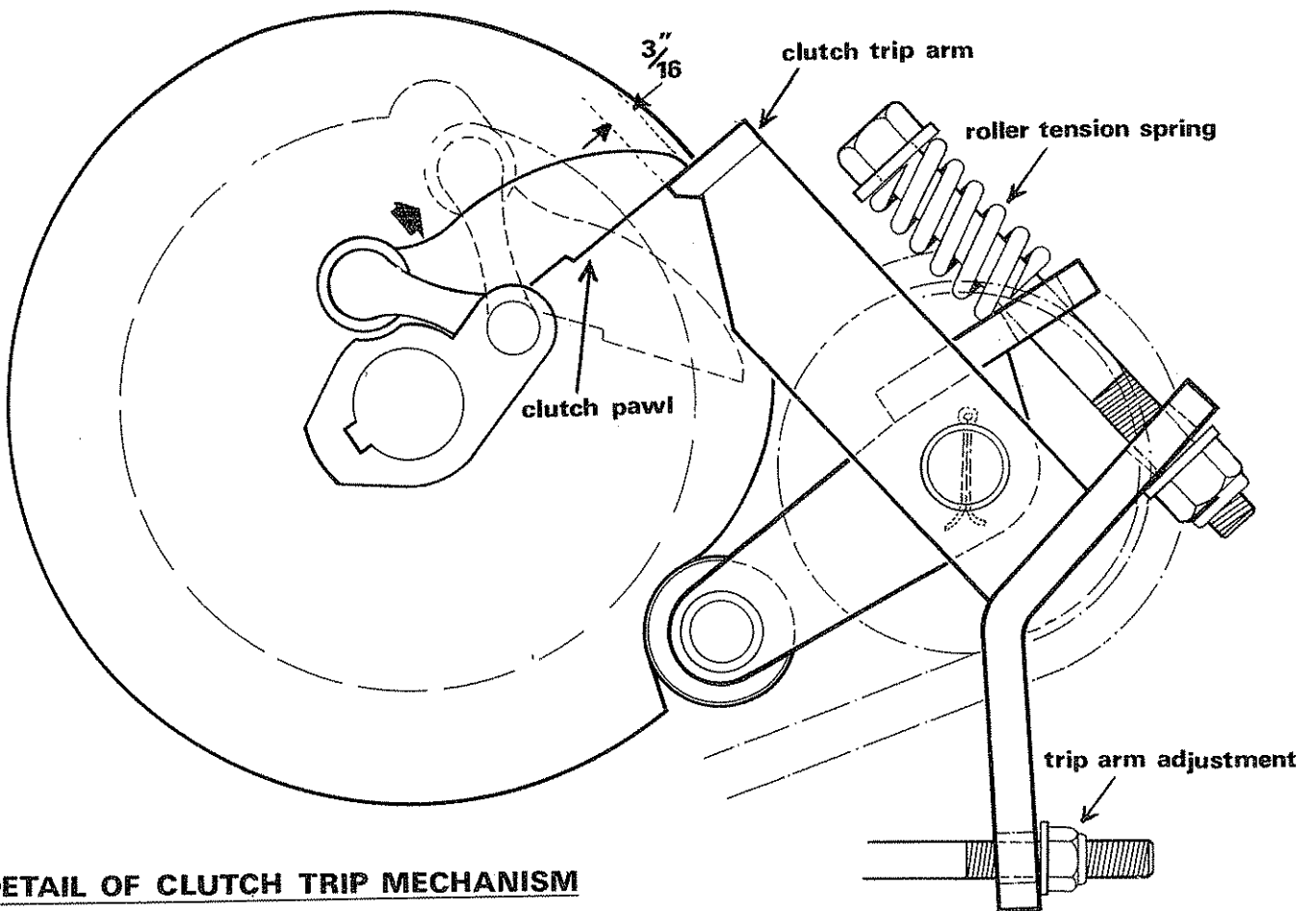
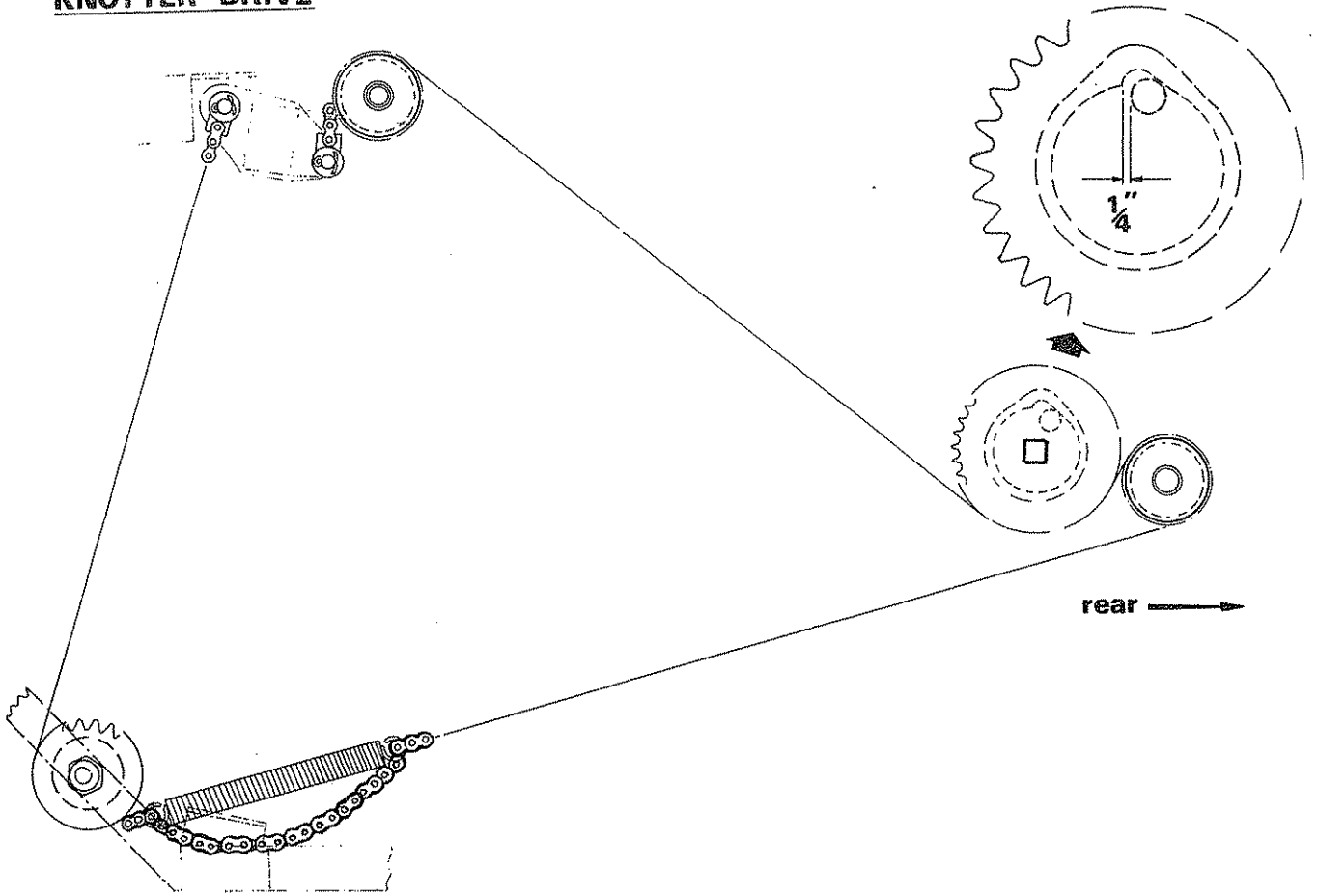
Important Note:

Unlike a baler the knotters are not synchronised. The knotter drive shaft has its keyways cut 95° out of alignment. This is done to stagger the load on the hydraulic system during the knotting cycle.

Baler knotters work at high speed and maintain momentum through the knotting cycle with the aid of the flywheel and the heavy lobe which is usually an integral part of the knotter drive gear. The knotters on the Balepacker do not have this momentum and so appear to work in an untidy jerky fashion.

If the knotting cycle appears to halt momentarily it is because the 'platform up' and 'pusher in' strokes have temporarily exhausted the accumulator. This is evidence that the tractor hydraulic system requires attention.

KNOTTER DRIVE



DETAIL OF CLUTCH TRIP MECHANISM

TROUBLE SHOOTING GUIDE

<u>Fault</u>	<u>Cause and Remedy</u>
1. Hydraulic system fails to pressurise.	a) Tractor external services selection incorrect. b) Self seal couplings not properly engaged. c) Unloader valve sticking.
2. Lack of power.	a) Check tractor hydraulic system.
3. System pressurised but no movement of swing arm when bale strikes trigger.	a) Overcentre adjustment not properly set.
4. Swing arm rotates out of sequence when the machine is pressurised.	a) Trigger mechanism set too sensitive. b) Overcentre locking springs are suspect.
5. Bale does not strike the trigger arm.	a) Interlock peg not engaging with bale deflector plate. b) Bale deflector plate out of adjustment. c) Interlock lever seized or out of adjustment.
6. Bale triggers the swing arm but fails to release interlock peg.	a) Drop arm between trigger arm and interlock pull rod requires bending. b) Interlock peg seized in platform.
7. Swing arm becomes trapped beneath bale.	a) Spring fingers of bale canopy need bending down a little.
8. Swing arm rotates but fails to return.	a) Bale trip plate lever seized. b) Sequence valve tappet not operated, check adjustment No 1. c) Deformed bale fails to strike trip plate.
9. Swing arm returns, but platform fails to raise.	a) Lift control valve needs adjustment.
10. Swing arm and platform collide.	a) Re-adjust lift control valve. b) Seized lift control valve spindle. c) Swingarm linkage to lift control valve seized.
11. Bale is flung across corner of platform.	a) Swing arm action too fast - screw out barrel-restrictor in hydraulic line to swing arm.
12. Platform keeps raising bales but pusher does not operate.	a) Counter hook fails to drop behind peg because of insufficient clearance of counterhook - adjust tappet No. 3. b) Counter cam A is pulled round too far causing the roller to drop off the profile. Caused by a very rapid 'platform down' movement. Screw in the lift control valve adjustment to slow down platform movement. c) Top striker plate incorrectly adjusted. d) Broken or missing return pawl spring.

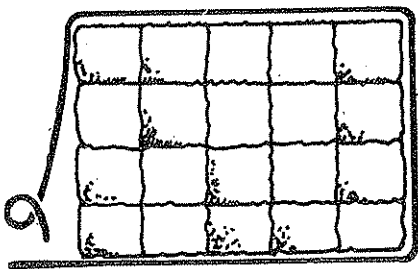
<u>Fault</u>	<u>Cause and Remedy</u>
13. Platform does not lower	a) Tappet 2 incorrect. b) Lower striker plate incorrect.
14. Apparent loss of power when platform raises bales.	a) Too little clearance between pusher and pack—adjust bale dimension stop. b) Tractor oil level low.
15. Apparent loss of power on the pusher in stroke.	a) Side gate adjustment too tight.
16. Pusher in but platform fails to lower.	a) Tappet 7 adjustment incorrect. Adjust to compress valve spindle 3/16". Make adjustment with pusher fully in and both the pusher tap closed and platform tap closed. b) Folding link not locked.
17. Platform lowers but pusher fails to return.	a) Tappet 4 adjustment incorrect. b) Striker plates incorrect. Complete sequence valve set up required.
18. Failure to tie knot.	a) Knotter fails to operate due to incorrect clutch trip arm adjustment. Adjust to give 3/16" engagement with clutch pawl. b) Incorrect adjustment of folding link. c) Knotter operates but fails to tie knot; see knotter trouble chart.
19. Platform stops during downward travel on the knotter stroke.	a) If intermittent stoppage, suspect low oil flow. Check oil level. b) Knotter drive jammed.
20. Slack twine around the pack.	a) Pusher action too rapid – adjust restrictor in pusher ram. b) Insufficient twine tension.
21. Bale keeps falling down onto the platform forks and retripping mechanism.	a) Too much clearance between pusher and pack – adjust baler dimension stop. b) Spring bale retainers not working properly – check for broken spring. c) Insufficient pressure on side gates.
22. Bale jammed beneath pusher.	a) Swing arm action too rapid – bale is bounced forward after striking trip plate. b) Anti-bounce flaps not working – broken or slipped spring; more noticeable when working downhill.
23. Pusher stops before completing its full travel and platform drops.	a) Incorrect setting of tappet No. 7. b) Incorrect folding link adjustment No. 6.
24. Unloader valve 'chatters' or vibrates when platform is lifting.	a) Faulty accumulator – this is confirmed when ram has reached end of stroke the 'chatter' should stop.

KNOTTER TROUBLE SUMMARY CHART

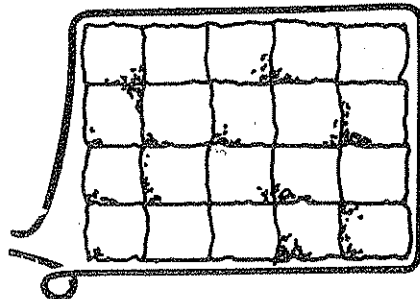
<u>Trouble</u>	<u>Cause</u>	<u>Remedy</u>
1. Knots hanging on bill hook.	1a. Stripper is not functioning properly. 1b. Insufficient travel of the stripper arm – this should be a minimum of 1/2" past the toe of the bill hook. 2. Excessive tension on bill hook. 3. Rough surface on bill hook.	1a. Bend stripper arm so that it barely touches heel of bill hook. 1b. Check for distorted stripper arm or worn cam. 2. Loosen tension. 3. Smooth surface of bill hook with emery cloth.
2. Failure to form knot.	1. Loose twine tension spring allowing twine to slip out of disc. 2. Twine tension spring too tight, not allowing sufficient twine to slip through disc to form knot. 3. Worn bill hook. 4. Rough edges on twine holder or disc. 5. Needles out of adjustment.	1. Tighten twine tension spring. 2. Loosen twine tension spring. 3. Replace bill hook. 4. Remove sharp or rough edges with emery cloth. 5. re-adjust needle clearance.
3. Twine disc timing fluctuating.	1. Worn gears. 2. Twine disc pinion pin worn or sheared. 3. Worm slipping on shaft.	1. Replace gears if badly worn. 2. Replace pin. 3. Re-time and tighten up securing nut, if loose.
4. One end of twine longer than other.	1. Insufficient tension on twine holder. 2. Excessive tension on twine holder. 3. Dull twine knife. 4. Insufficient twine tension on twine box.	1. Tighten tension on twine holder spring. 2. Decrease tension on twine holder spring. 3. Sharpen blade of twine knife. 4. Increase twine tension on twine box.

KNOTTER TROUBLE SUMMARY CHART

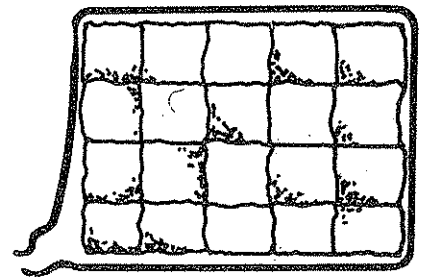
<u>Trouble</u>	<u>Cause</u>	<u>Remedy</u>
5. Twine is looped in one end of knot. (Do not adjust the knotter unless the looping is excessive).	1. Not enough bill hook tension.	1. Slightly increase bill hook tension.
6. Knot tied only in the top strand of twine.	1. Not enough tension on twine disc. 2. Excessive tension on twine disc. 3. Rough or uneven twine. 4. Excessive twine tension. 5. Knot in twine.	1. Twine disc should be adjusted for proper tension. 2. Decrease tension. 3. Remove bad portion of twine. 4. Decrease twine tension on twine can. 5. Remove knot and tie a smaller knot.
7. Knot tied in the bottom strand of the twine.	1. Placing of twine on bill hook is faulty.	1. Check needle adjustment.
8. Frayed or broken twine in knot.	1. Insufficient clearance between face of stripper arm and the back of the bill hook. 2. Excessive tension on twine holder.	1. Bend the stripper arm to eliminate binding and allow bill hook to rotate freely (be careful not to bend too far or the stripper will not strip the twine from the bill hook). 2. Decrease tension on twine holder.
9. Frayed or broken twine.	1. At about 1/2" (13mm) from the knot - rough surface on stripper arm. 2. If elsewhere look for any rough edges that could cut twine.	1. Smooth the stripper arm. 2. Smooth rough edges.



Excessive twine tension
side gate too tight



Knotter bill fails to pick up twine from needle.



Crop build up in knotter.
Knot is tied, then pulls apart.

Section 4 MAINTENANCE

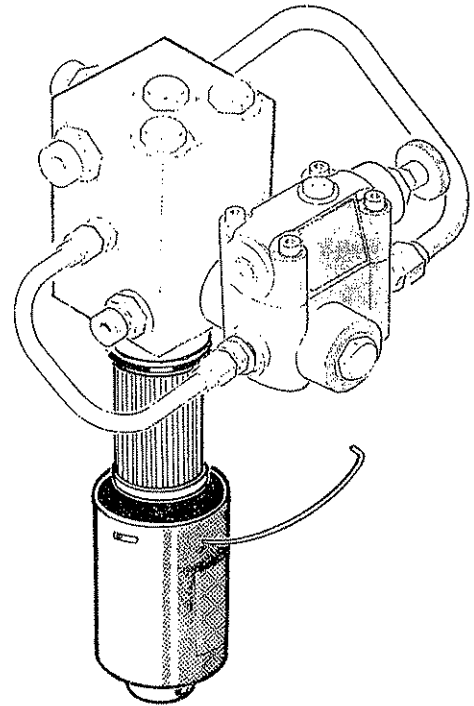
Machine maintenance has been reduced to a minimum but the following points should be followed.

Lubrication. Grease all pivot points daily and in particular remember that the knotter mechanism only operates a small number of times in relation to the baler knotters so these should be greased sparingly.

Oilite bushes are extensively used. These should receive periodic attention with an oil can.

The full flow, high pressure filter of 10 micron rating is situated at the base of the manifold valve assembly and should be changed after 25 hours and thereafter every season.

Place a shifting bar through the hole in the base of the filter bowl and rotate bowl to expose tail end of the retainer wire through the slot in the side. Counter rotate to wind wire out of groove and pull down bowl to reveal filter element which is held in place by an internal 'O' ring.



Accumulator

The accumulator stores hydraulic oil to maintain working pressure which is required by the machine. It exhausts itself automatically when the oil flow or tractor engine is stopped.

Positively no maintenance or any kind of adjustment should be attempted on the accumulator. It is precharged with pure Nitrogen to 1000 psi. Should the accumulator fail it should be returned to the factory for a replacement.

Wheels

Tyre pressures should be maintained to 44 psi on all wheels. Routine maintenance should include regular checking of all nuts and bolts for tightness - particular attention should be paid to the baler tow bar bolts and wheel nuts.

Storage

The Balepacker should be emptied of hay or straw and cleaned down. Grease and lubricate all pivot points and bushes. Apply a coating of grease to the bright surfaces of the knotters also grease or paint the bright worn surfaces of the platform and bale chamber.

Any part used packs of twine should be removed and stored in a cool dry place.

Tyres should be inflated to their correct pressure, the machine placed under cover and if possible supported on blocks to take the weight off the tyres and wheel bearings.

SECTION 5 4 POINT VARIATIONS

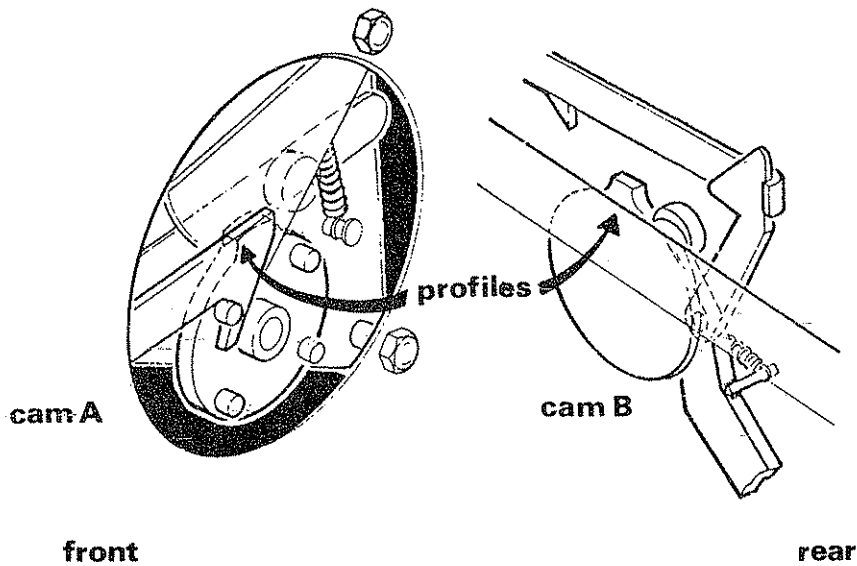
4 Point Pusher Model Balepackers

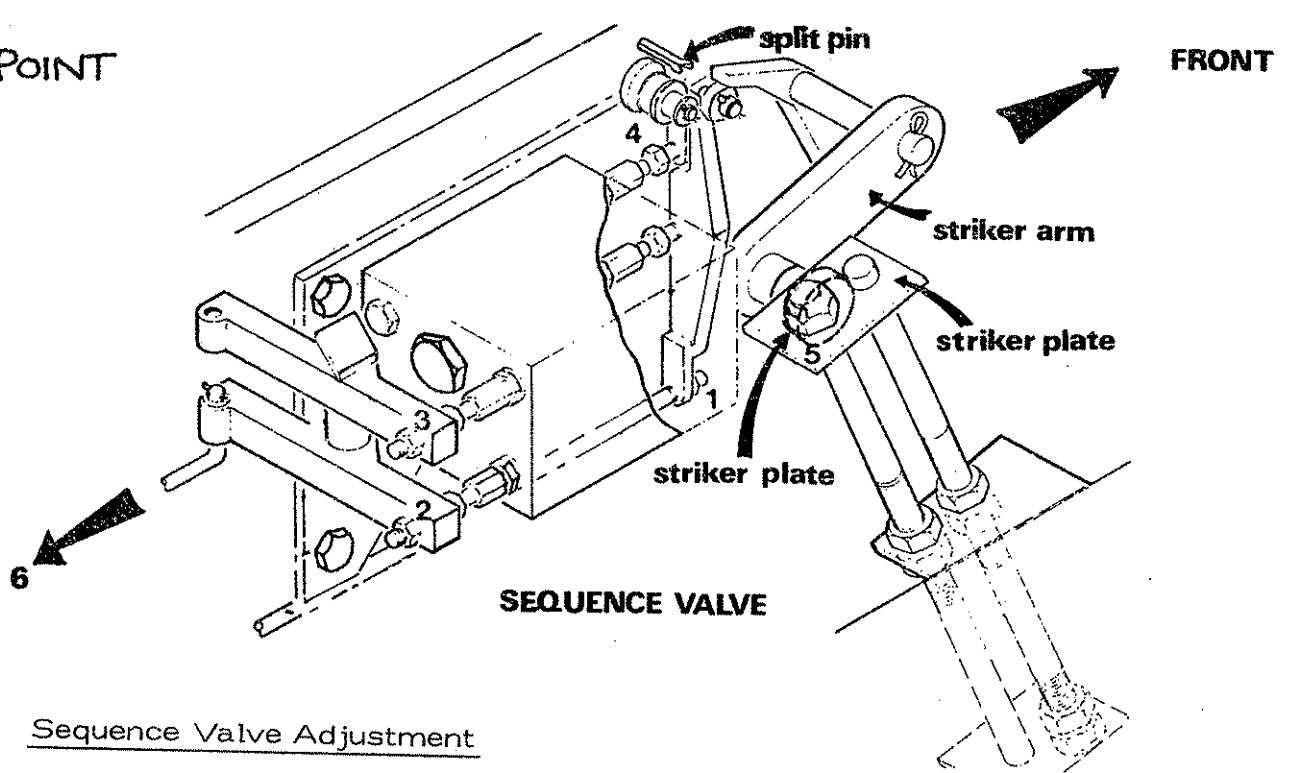
This section covers machines serial numbers 00BS21 to 00BS46 where differences occur in design or operation.

Refer to the parts list at the end of this section for spares where they differ from the 3 point pusher model.

Operation

Zero position of counter cams A and B by reference to the illustration below. In this position the first four bales entering the machine will not be tied if the twine is not already retained in the knotter.





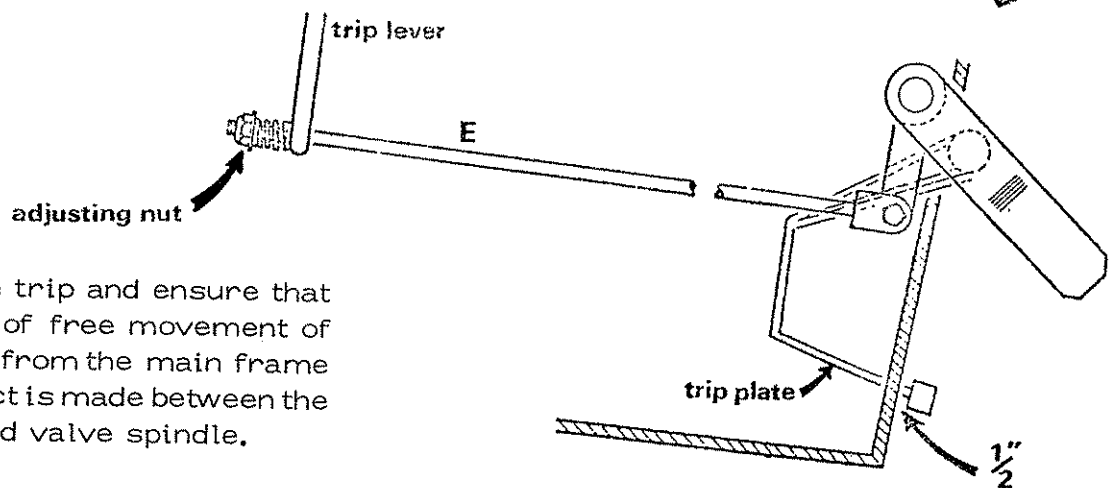
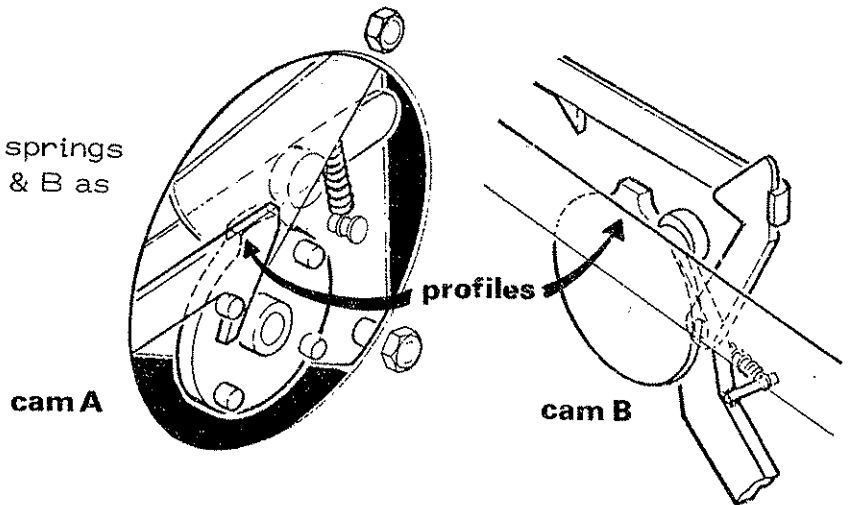
9. Sequence Valve Adjustment

The adjustment of the sequence valve is critical. Adjusting one tappet can affect the others. The setting up of the valve should be carried out in order of the numbering shown.

Note 1. When making each adjustment ensure that all free movement is taken up in the various linkages, all return springs are in position and when provided, the adjustment is firmly secured with the locknut.

Adjustment 1 - Platform up

- a) Release the reverse pawl springs and zero counter cams A & B as shown - refit springs.

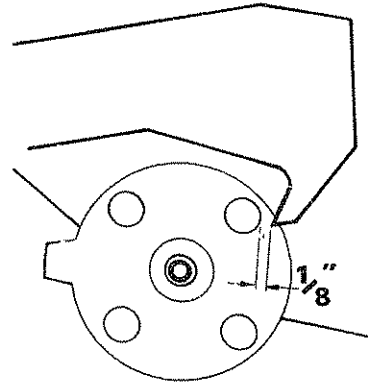


- b) Operate bale trip and ensure that there is $\frac{1}{2}$ " of free movement of the trip plate from the main frame before contact is made between the trip lever and valve spindle.

- c) Adjust to this clearance by the self-locking nut on the trip rod

Adjustment 2 - Platform down

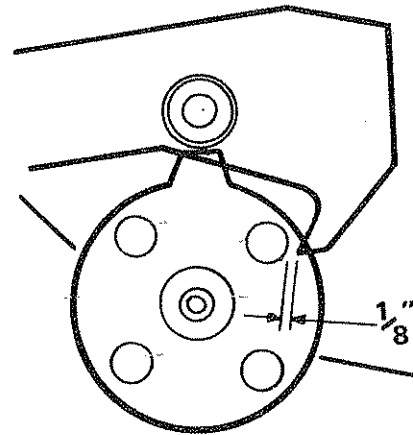
- a) Close platform tap, start tractor, raise isolation lever and operate bale trip.
- b) Open tap and allow platform to raise about halfway before reclosing i.e. the roller on the striker arm mid-way between upper and lower striker plates. Lower isolation lever and stop tractor.
- c) Raise the striker arm to remove free play at tappet 2 and check that there is 1/8" of clearance between the counterhook tip and the peg on cam wheel 'A'.
- d) Adjust tappet 2 to give this clearance.



cam A

Adjustment 3 - Pusher IN

- a) Select pusher stroke by rotating camwheel 'A' until roller is lifted by profile.
- b) Raise the striker-arm to remove free play at tappet 3 and check that there is 1/8" of clearance between counterhook tip and the peg.
- c) Adjust tappet 3 to give this 1/8" clearance with contact just made with valve spindle.

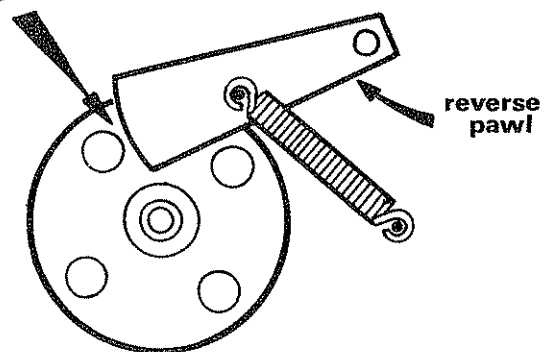


cam A

Adjustment 4 - Pusher OUT

- a) Partly withdraw the large split pin in the side of the frame to enable the slave rocker to be swung clear. This gives access to tappet bolt, No. 4.
- b) Press down striker arm until reverse pawl just drops down behind counter peg.
- c) Adjust tappet 4 to give this minimum clearance.
- d) Release striker arm and unscrew tappet 4 out one complete turn to depress the spindle and tighten locknut.

minimum clearance

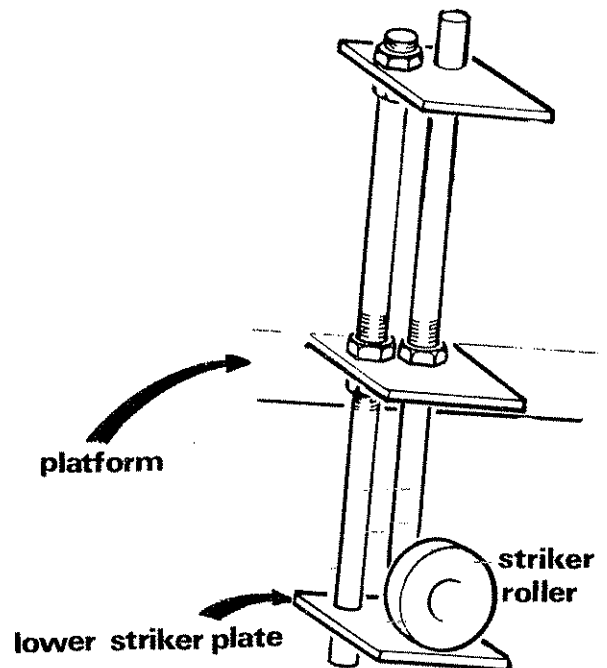


cam A

Adjustment 5 – Striker rod adjustment

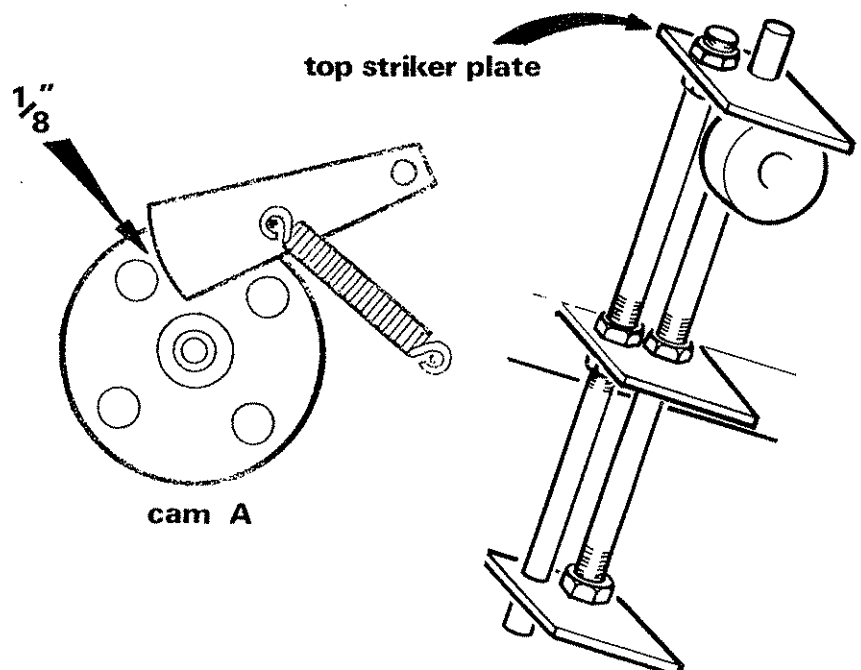
- a) Open tap to allow platform to drop.
- b) Set camwheel A on pusher stroke with roller on top of profile.
- c) Close pusher tap.
- d) Start tractor, raise isolation lever and operate bale trip lever.
The platform will rise and remain at the top of its stroke.
- e) Close platform tap before lowering isolation lever and stopping tractor.

- f) Back off both upper and lower striker plate lock nuts.
- g) Lower or raise the lower striker plate until there is no clearance between the roller and plate.
- h) Open tap to allow platform to drop about halfway before reclosing tap.
- i) Raise the lower striker plate approx. $\frac{1}{4}$ " and tighten in position with the locknut.

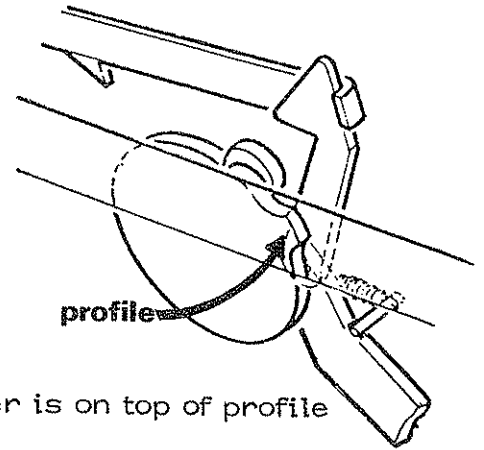


- j) Open platform tap, start tractor and raise isolation lever.

- k) Standing in front of machine, raise or lower top striker plate to give $\frac{1}{8}$ " clearance between reverse pawl and counterhook peg on camwheel 'A'. Tighten in position with locknut.



CAUTION: Before proceeding further, the knotter cam 'B' should be rotated by raising the reverse pawl and turning the cam until the profile is immediately behind the roller. This is done to prevent operation of the knotters resulting in slack twine being entangled in them.

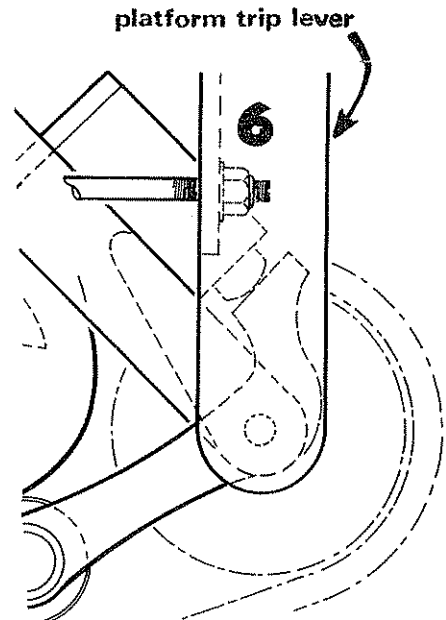


Adjustment 6 - Platform Trip

- a) Raise counterhook and rotate cam 'A' until roller is on top of profile on a pushing stroke.
- b) Unscrew adjusting nut No. 6.
- c) Close pusher tap.
- d) Start tractor and raise isolation lever.
- e) Operate bale trip lever, the platform will rise but the pusher is unable to move.
- f) Close platform tap
- g) Open the pusher tap sufficiently to allow the pusher to complete its full travel coming to rest against the abutment stop.

Note: If the pusher does not meet the abutment stop, the needle alignment should be checked before proceeding further.

- h) Screw up adjusting nut number 6 until the valve spindle at tappet 2 is depressed approximately 3/16".
- i) Open pusher and platform tap, start tractor and raise isolation lever, and the pusher should complete its stroke, returning to its parked position.



8. Retiming knotter drive assembly

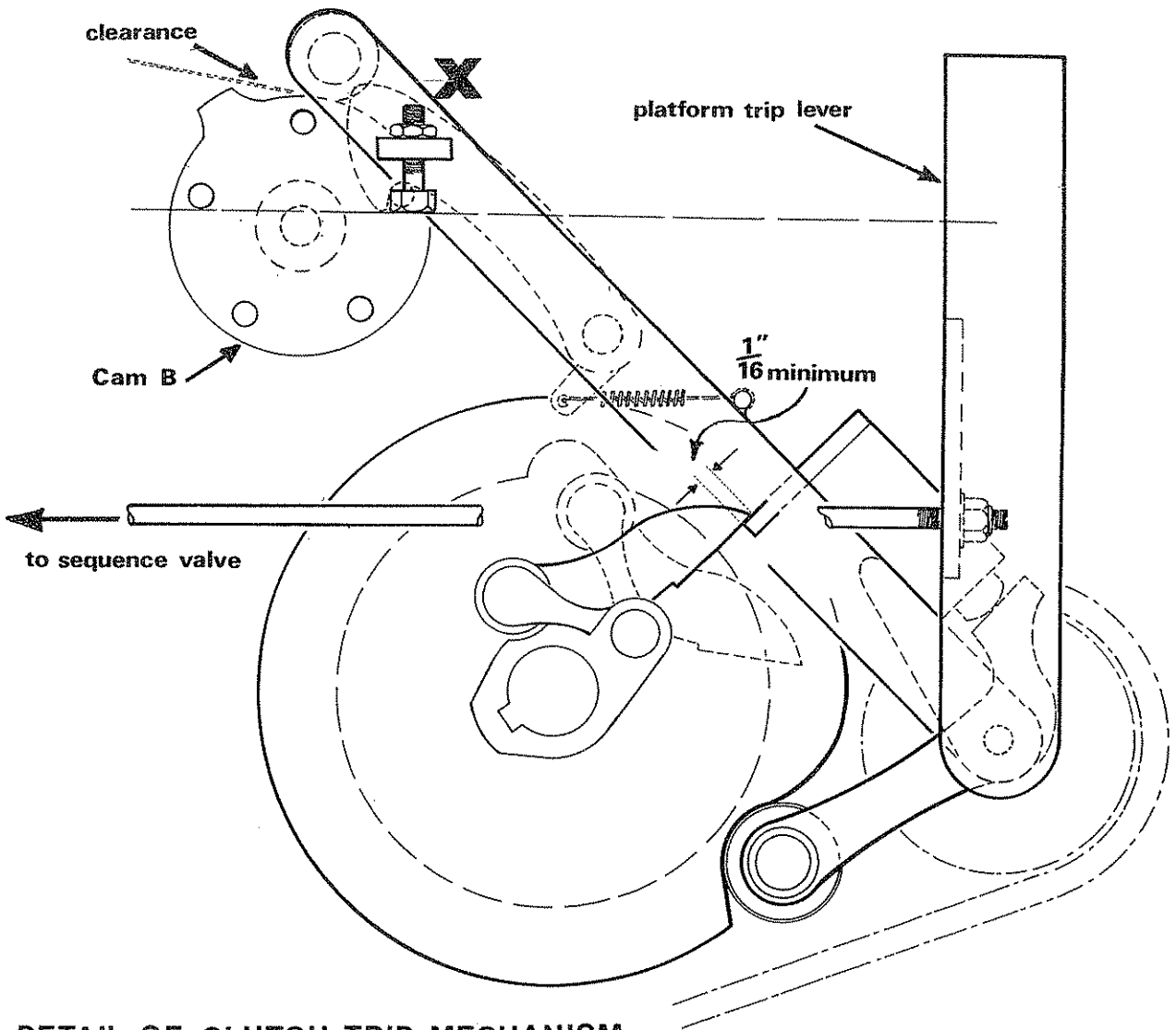
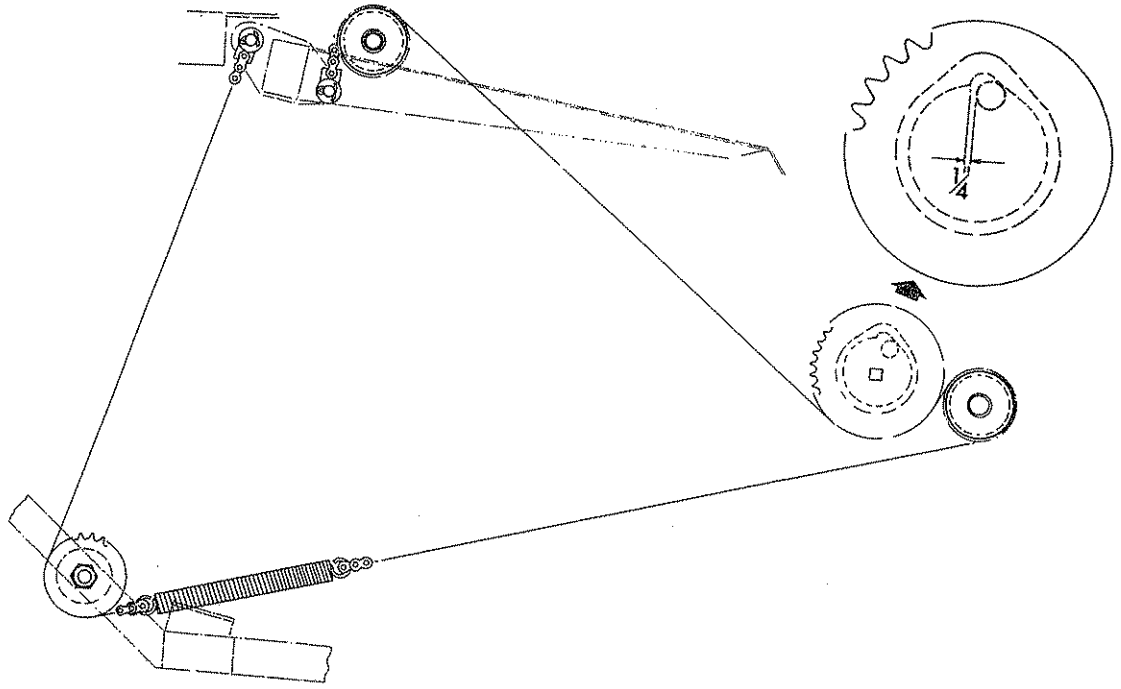
- i) Raise counter hook and rotate Cam A until roller is on top of profile.
- ii) Close hydraulic tap on pusher ram.
- iii) Start tractor to pressurise system and raise isolation lever.
- iv) Operate bale trip lever. The platform will rise but the pusher is unable to move.
- v) Close tap on lift ram to prevent platform dropping.
- vi) Move isolation lever to SAFE position and stop tractor engine.
- vii) Remove knotter cover completely to improve accessibility.
- viii) Place the large T spanner on the squared end of the knotter shaft and rotate knotters until the spring loaded pawl comes up hard against the clutch trip arm. Do not move the shaft further until timing is completed.
- ix) Release some of the spring pressure on the trip arm by removing the counter cam B and screwing in the adjusting bolt marked (X). Remove idler roller spindle complete with trip arm and reverse pawl roller.
- x) Rotate knotter drive sprocket until the cam roller is in position shown in upper drawing with $\frac{1}{4}$ " clearance.
- xi) Pull the chain tight and pass it up round the sprocket and replace the chain idler roller which will secure it against the sprocket. The timing is now unable to slip. Recheck clearance before proceeding further.
- xii) Reassemble the trip arm and roller lever assembly. Replace counter cam and screw out adjuster bolt (X) to just give a clearance between the roller and the crown of the cam wheel. At the same time ensure the knotter pawl has sufficient depth of engagement with the clutch trip arm.
- xiii) Connect up the chain as shown in upper diagram.
- xiv) Rotate knotter shaft until spring loaded pawl engages against the clutch trip arm.
- xv) Open taps on both the lift and pusher rams.
- xvi) Replace the knotter cover.

Note: To facilitate assembly of the spring loaded chain, open lift ram tap momentarily to allow the platform to drop a little. This will enable the end of the chain to be released from its anchor pin. Engage the lower end of the chain in the spring, draw it round the bottom sprocket and with a piece of string threaded through the chain two or three links from the end and passed over the ram rod pin the chain can be drawn tight to refit it to the anchor pin.

Important Note:

Unlike a baler the knotters are not synchronised. The knotter drive shaft has its keyways cut 95° out of alignment. This is done to stagger the load on the hydraulic system during the knotting cycle.

KNOTTER DRIVE



DETAIL OF CLUTCH TRIP MECHANISM

7. Needle Adjustment.

Three adjustments are provided for setting up the needles. After completing adjustments securely tighten all locknuts and ensure that no part of the needle makes contact with the knotter frame or cover.

A. Side to Side movement of the needles.

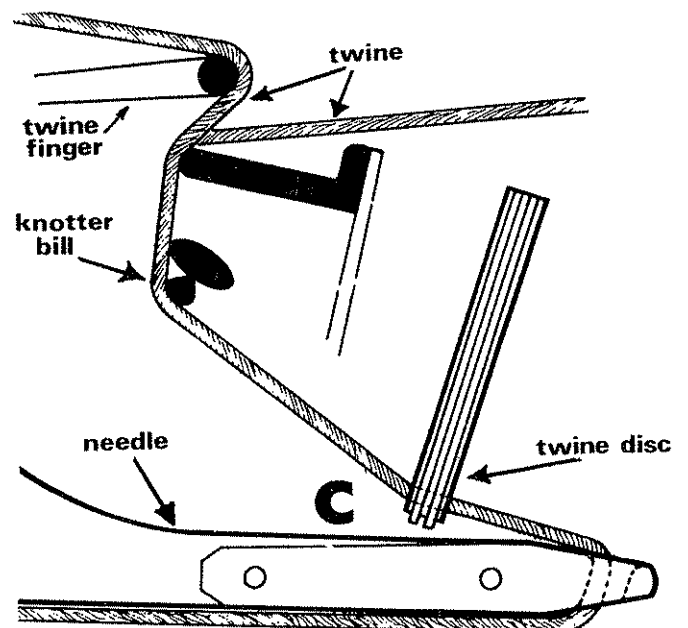
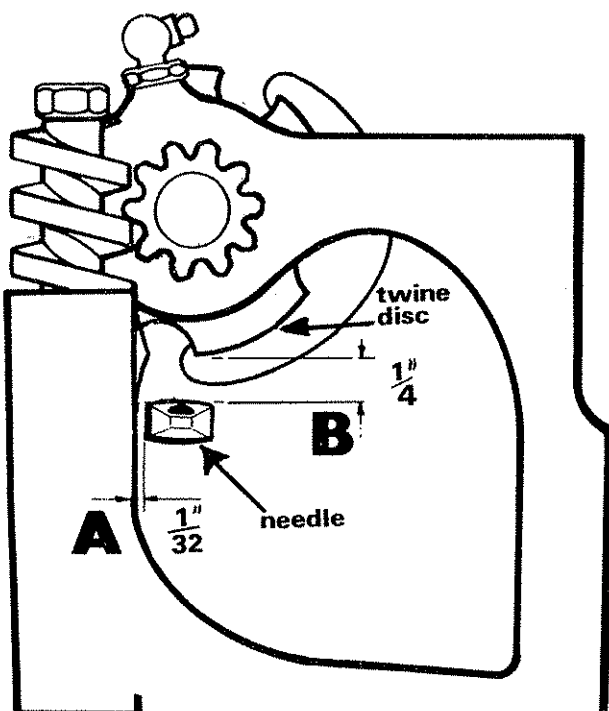
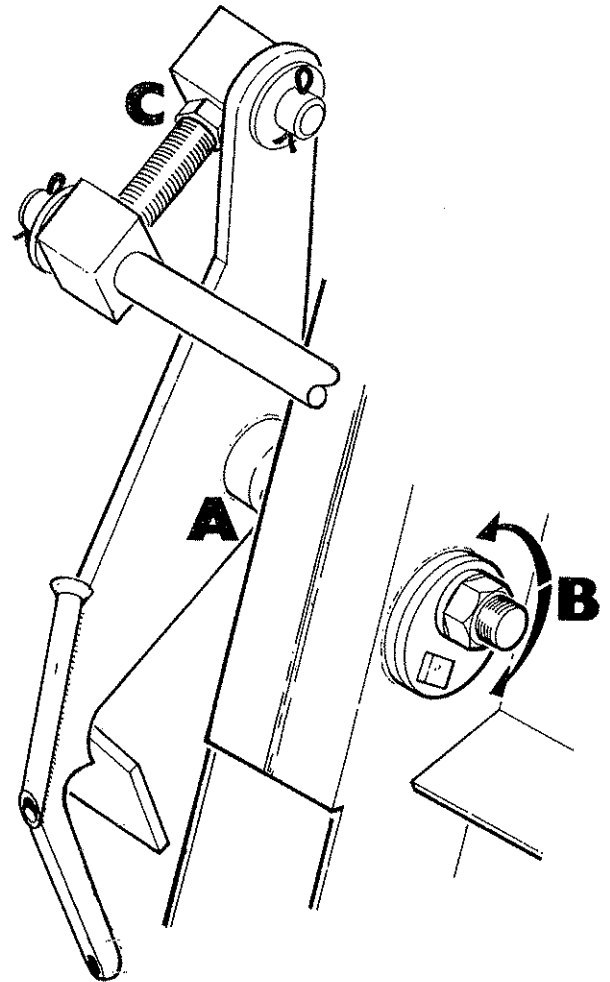
A clearance of $1/32''$ approx. should be maintained between the needle and knotter frame. Shims are provided on the needle pivot for adjustment.

B. Needle Height.

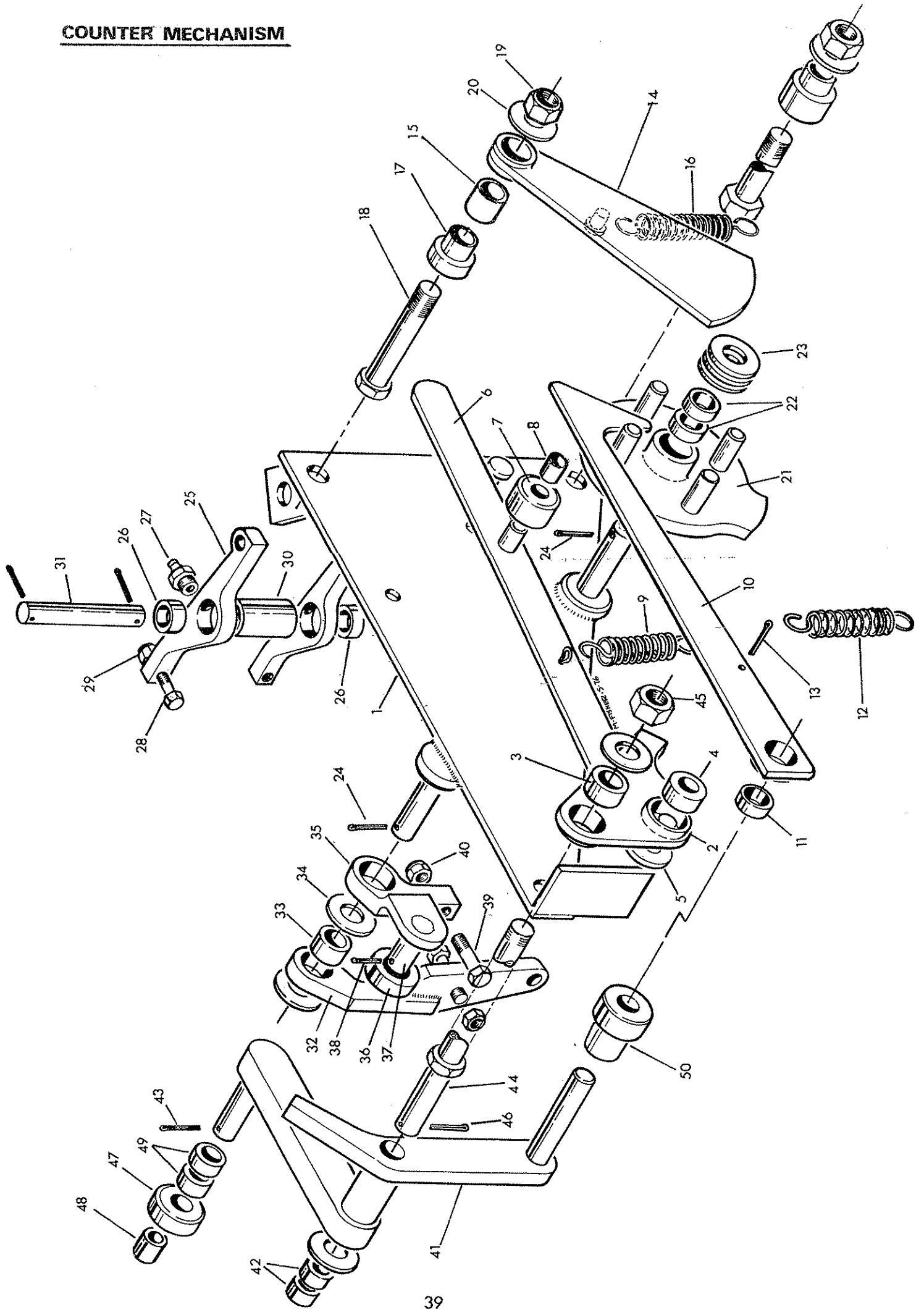
Approx. $1/4''$ clearance between the needle eye and the twine disc is required as the needle enters the knotter. Loosen locknut and place a spanner on the raised lug of the eccentric to raise or lower the needle.

C. Needle Arc.

This adjustment should be carried out in conjunction with adjustment B. It determines the amount by which the needle eye curves round pulling the twine into the retainer disc.

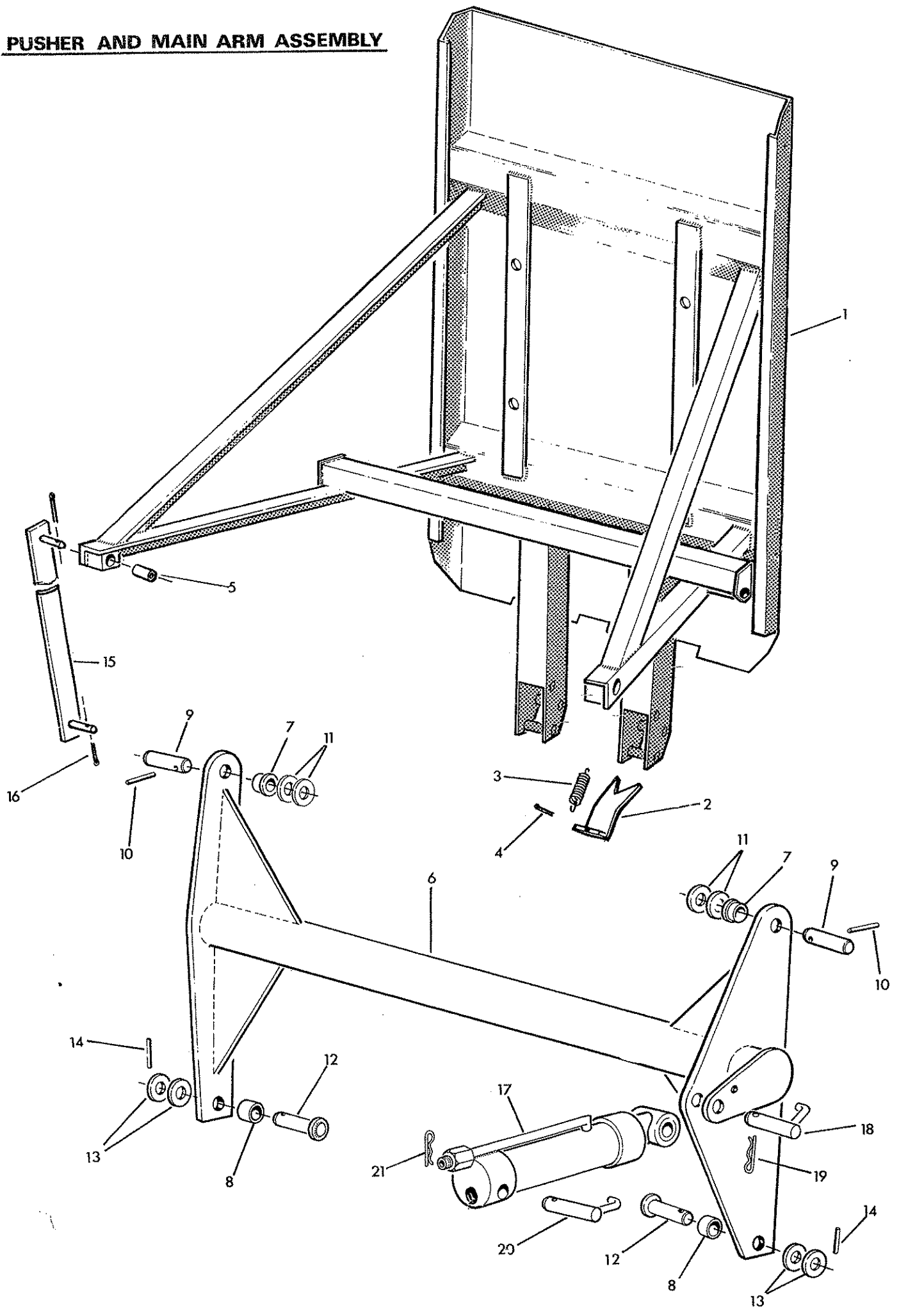


COUNTER MECHANISM



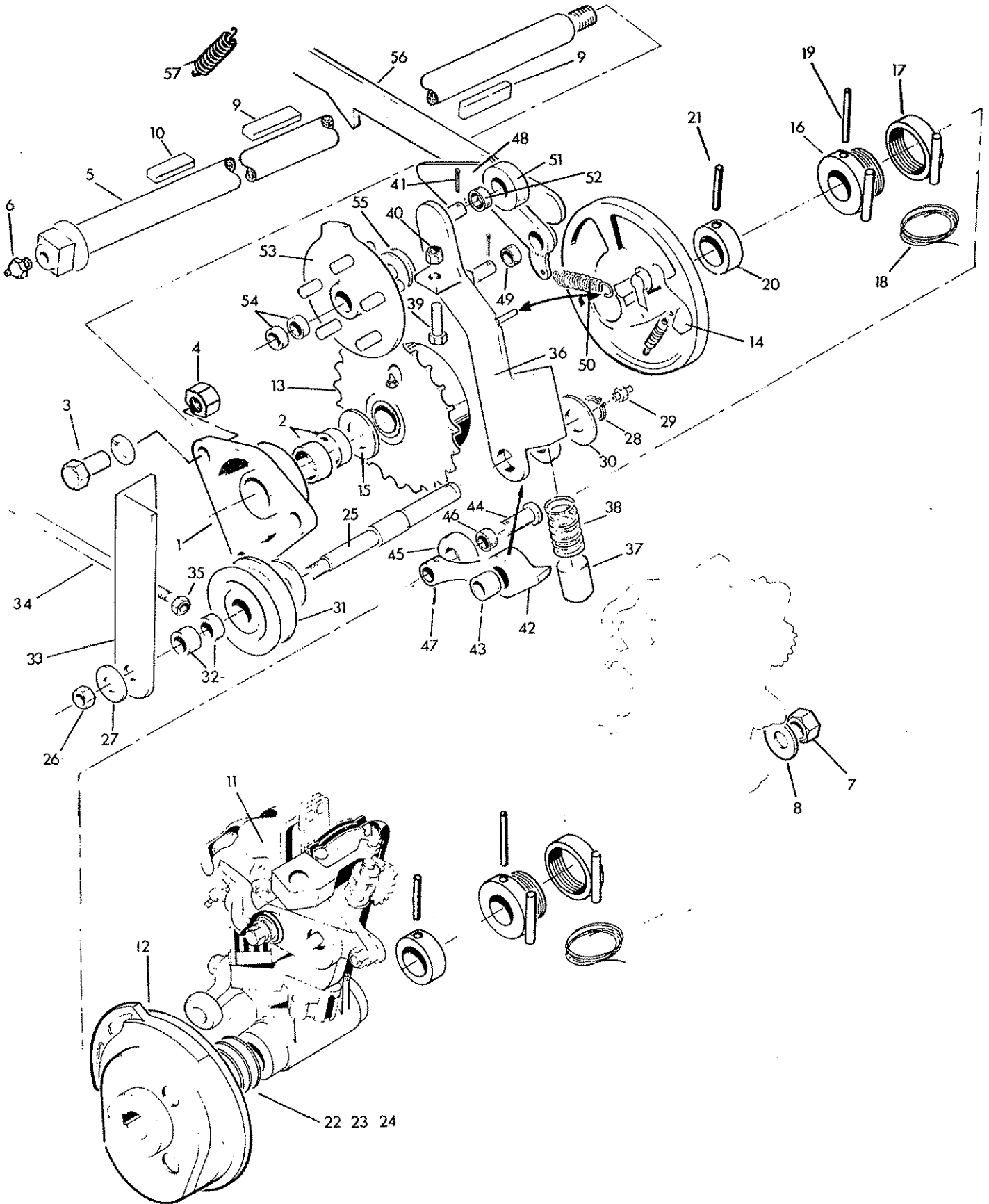
Ref	Part No	Qty	Description
	13 34 251	1	COUNTER MECHANISM
1	13 34 117	1	.Mounting Plate
2	13 34 112	1	.Toggle plate assembly
3	70 14 028	1	..Bush 7/8" i/d
4	13 34 022	1	.Spacer
5	01 00 606	1	.Plain washer 5/8" dia.
6	13 34 015	1	.Selector arm assembly c/w roller & spring
7	13 35 175	1	..Roller c/w bush
8	71 01 036	1	...Bush
9	60 04 017	1	..Spring
10	13 34 014	1	.Hook c/w spring
11	71 01 036	1	..Bush
12	60 04 017	1	..Spring
13	05 03 104	1	..Split pin 5/32" dia. x 1¼"
14	13 34 016	1	.Reverse pawl c/w bush and spring
15	70 14 028	1	..Bush 7/8" i/d
16	60 01 064	1	..Spring
17	13 34 022	2	.Spacer
18	02 11 266	2	.Bolt 5/8" dia. x 3¼"
19	01 41 006	2	.Aeronut 5/8" UNF
20	01 00 106	2	.Washer 5/8" dia.
21	13 34 010	1	.4 peg counter c/w bushes
22	71 01 036	2	..Bush 5/8" i/d
23	01 00 106	2	.Plain washer 5/8" dia.
24	05 03 104	2	.Split pin 5/32" dia. x 1¼"
25	13 34 018	2	.Valve rocker c/w bush and greaser
26	71 01 036	1	..Bush 5/8" i/d
27	09 01 121	1	..Greaser
28	03 11 103	1	..Screw 3/8" UNF x 1¼"
29	01 11 003	1	..Nut 3/8" UNF
30	13 35 186	1	.Rocker spacer
31	13 35 187	1	.Rocker pivot pin c/w split pin 05 03 014
32	13 34 019	1	.Bale trip lever c/w bush
33	71 01 036	1	..Bush
34	01 00 106	2	.Washer 5/8" dia.
35	13 34 013	1	.Bell crank c/w bush and screw
36	13 35 175	1	..Roller c/w bush
37	71 01 036	1	...Bush
38	05 03 104	1	..Split pin 5/32" x 1¼" long
39	03 11 103	1	..Screw 3/8" UNF x 1¼"
40	01 00 003	1	..Nut 3/8" UNF
41	13 34 011	1	.Lever arm assembly
42	71 01 036	2	..Bush
43	05 03 104	1	..Split pin
44	13 34 021	1	.Locking pin c/w nut and split pin
45	01 41 006	1	..Aeronut 5/8" UNF
46	05 03 104	1	..Split pin 5/32" x 1¼" long
47	13 35 175	1	.Roller c/w bush
48	71 01 036	1	..Bush
49	13 34 020	2	.Spacer
50	13 34 022	1	.Spacer

PUSHER AND MAIN ARM ASSEMBLY



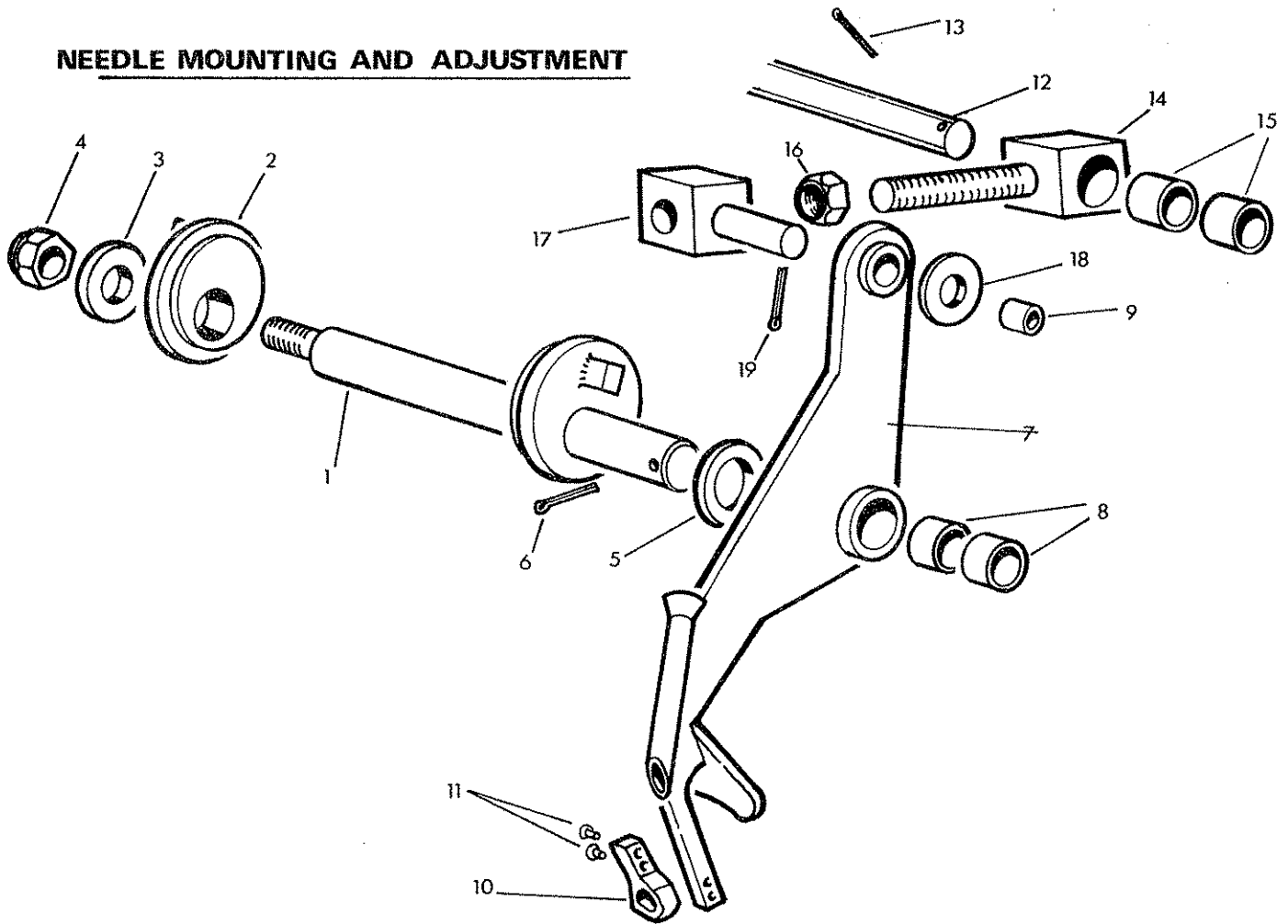
Ref	Part No	Qty	Description
			PUSHER & MAIN ARM ASSEMBLY
1	13 34 103	1	.Pusher assembly
2	13 34 101	2	.Pusher flap
3	60 01 064	1	..Spring
4	05 03 105	1	..Split pin 3/16" x 1¼"
5	71 01 083	2	..Bush 1" i/d
6	13 34 102	1	.Main arm
7	71 02 173	2	..Headed bush 1" diameter
8	71 01 083	2	..Bush 1" diameter
9	13 34 017	2	.Pin -main arm to pusher c/w dowel
10	04 22 624	1	..Spring dowel 3/8" dia. x 1½" long
11	01 00 109	1	..Packing washer
12	13 34 016	2	.Headed pin c/w washers and dowel
13	01 00 109	2	..Packing bushes
14	04 22 624	1	..Spring dowel 3/8" dia. x 1½" long
15	13 34 011	2	.Link arm
16	05 03 125	2	..Split pin 3/16" dia. x 1½" long
17	13 35 433	1	.Pusher ram
18	13 35 061	1	.Pin - rod end
19	04 31 105	1	..Spring cotter
20	13 35 041	1	.Pin - Base end
21	04 31 105	1	..Spring cotter

KNOTTER CLUTCH ASSEMBLY



Ref	Part No	Qty	Description
1	13 34 023	1	.Fixed clutch housing c/w bushes
2	13 35 230	2	..Bush 1.1/8" dia.
3	03 12 103	3	..Bolt 3/8" UNF x 1 1/4" long
4	01 41 003	3	..Aeronut 3/8" UNF
5	13 34 022	1	.Knotter shaft c/w keys and nut
6	09 01 121	1	..Greaser
7	01 41 006	1	..Aeronut 5/8" UNF
8	01 00 106	1	..Washer 5/8" dia.
9	15 76 214	2	..Key 3/8" x 5/16" x 2 1/4" long
10	13 35 151	1	..Key 3/8" x 5/16" x 1 1/2" long
11	13 35 968	2	.Knotter
12	13 35 971	2	.Cam gear
13	13 35 972	1	.Driving sprocket
14	13 35 969	1	.Rotating clutch housing
15	13 35 146	1	.Special washer
	13 37 029	2	.Knotter adjuster assembly comprising
16	13 37 026	1	..Male adjuster
17	13 37 027	1	..Female adjuster
18	13 37 028	1	..Locking wire - 16 SWG
19	04 41 632	1	..Scroll pin 3/16" x 2" long
20	13 37 136	2	.Spacer
21	04 41 632	1	..Scroll pin 3/16" x 2" long
22	13 37 020	As req'd	.Shim .010" thick
23	13 37 021	" "	.Shim 21 SWG
24	13 37 022	" "	.Shim 16 SWG
25	13 34 043	1	.Pulley & trip shaft assembly
26	01 41 006	1	..Aeronut 5/8" UNF
27	01 00 106	1	..Plain washer 5/8"
28	04 06 116	1	..Spring clip
29	09 01 121	1	..Greaser
30	01 00 108	1	..Plain washer 7/8"
31	13 34 021	1	.Chain pulley c/w bushes
32	13 35 230	2	..Bush 1.1/8" dia.
33	13 34 057	1	.Pusher trip lever
34	13 34 062	1	.Pusher trip rod assembly
35	01 41 005	1	..Aeronut 1/2" UNF
36	13 34 066	1	.Clutch trip lever assembly
37	13 34 070	1	..Plunger
38	73 15 075	1	..Spring
39	03 11 105	1	..Setscrew 1/2" UNF x 1 1/4" long
40	01 11 005	1	..Plain nut 1/2" UNF
41	05 03 104	2	..Split pin 5/32" x 1 1/4" long
42	13 34 067	1	.Roller lever c/w bushes and roller
43	70 14 028	1	..Bush 7/8" i/d
44	13 35 196	1	..Headed pin
45	13 35 197	1	..Roller c/w bush
46	71 01 036	1	...Bush 5/8" i/d
47	04 21 616	1	..Spring dowel 3/16" dia. x 1" long
48	13 34 065	1	.Reverse pawl
49	71 01 036	1	..Bush 5/8" i/d
50	60 01 064	1	..Spring
51	13 35 197	1	.Roller c/w bush
52	71 01 036	1	..Bush 5/8" i/d
53	13 34 104	1	.4/5 Peg counter c/w bushes
54	71 01 036	2	..Bush 5/8" i/d
55	01 00 106	2	.Washer 5/8" dia
56	13 34 055	1	.Pusher trip lever c/w spring
57	60 04 017	1	..Spring

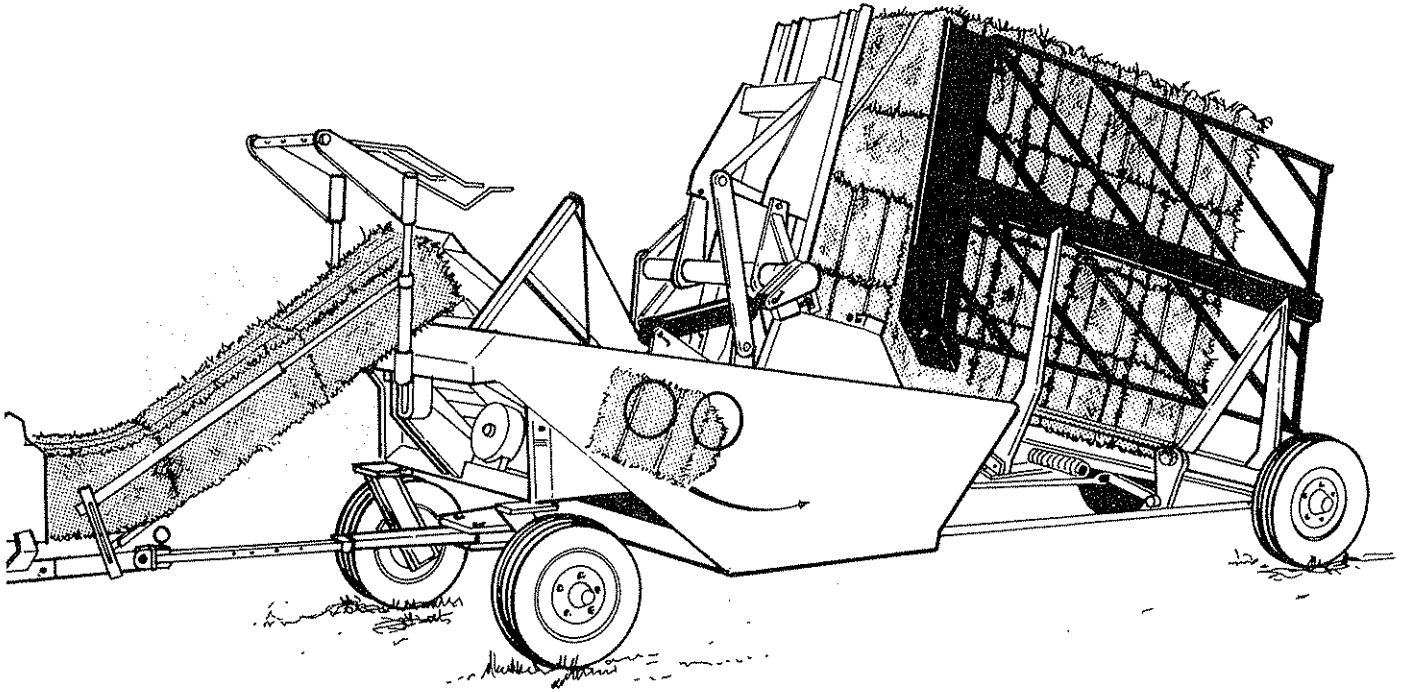
NEEDLE MOUNTING AND ADJUSTMENT



Ref	Part No	Qty	Description
* NEEDLE MOUNTING & ADJUSTMENT			
1	13 34 012	2	.Needle mounting shaft
2	13 34 013	1	..Eccentric boss
3	01 00 106	1	..Plain washer 5/8"
4	01 41 006	1	..Aeronut 5/8"
5	01 00 109	1	..Washer 1" dia.
6	05 03 125	1	..Split pin 3/16" x 1 1/2" long
7	13 34 250	2	.Needle assembly c/w bushes and eye
8	71 03 083	2	..Bush 1" dia.
9	71 01 036	1	..Bush 5/8" dia.
10	13 35 243	1	..Needle eye
11	13 35 134	2	..Rivet 1/4"
12	13 34 033	1	.Needle adjuster pin
13	05 03 104	2	..Split pin 5/32" x 1 1/4"
14	13 34 031	2	.Needle adjuster block
15	71 01 036	2	..Bush 5/8" i/d
16	01 12 007	1	..Nut 3/4" UNC
17	13 34 032	2	.Needle pivot block
18	01 00 106	1	..Plain washer 5/8" dia.
19	05 03 104	1	..Split pin 5/32" x 1 1/4"

Spare Parts Manual

BALEPACKER



FOR BEST PERFORMANCE....

USE ONLY McCONNEL SPARE PARTS

To be assured of the latest design improvements purchase your genuine replacements from the original equipment manufacturer F.W. McConnel Ltd. through your local dealer or stockist.

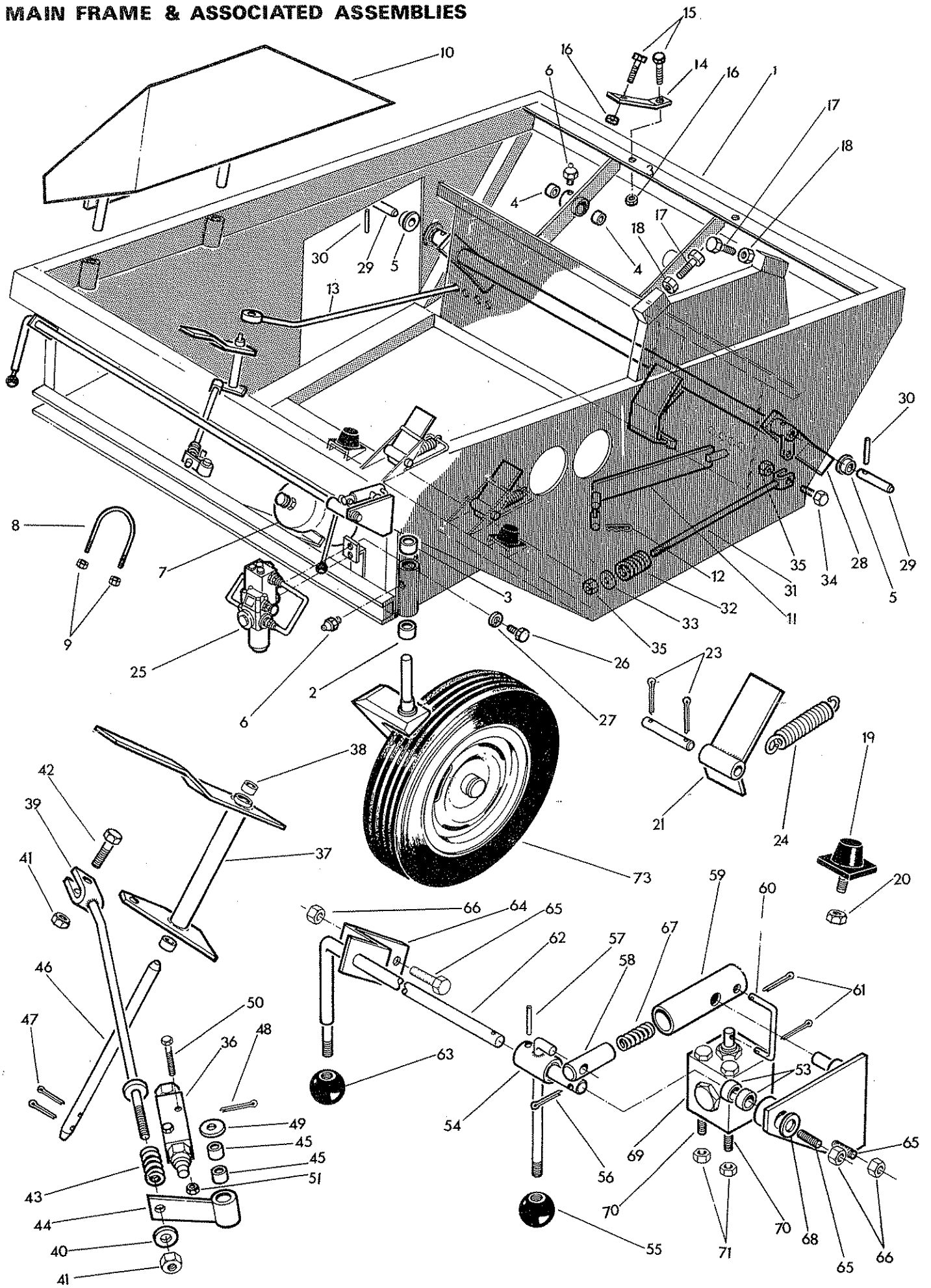
Always quote machine type and serial number as well as the part number.

Design improvement may have altered some of the parts listed in this manual - The latest part will always be supplied when it is interchangeable with an earlier one.

THE DOT SYSTEM

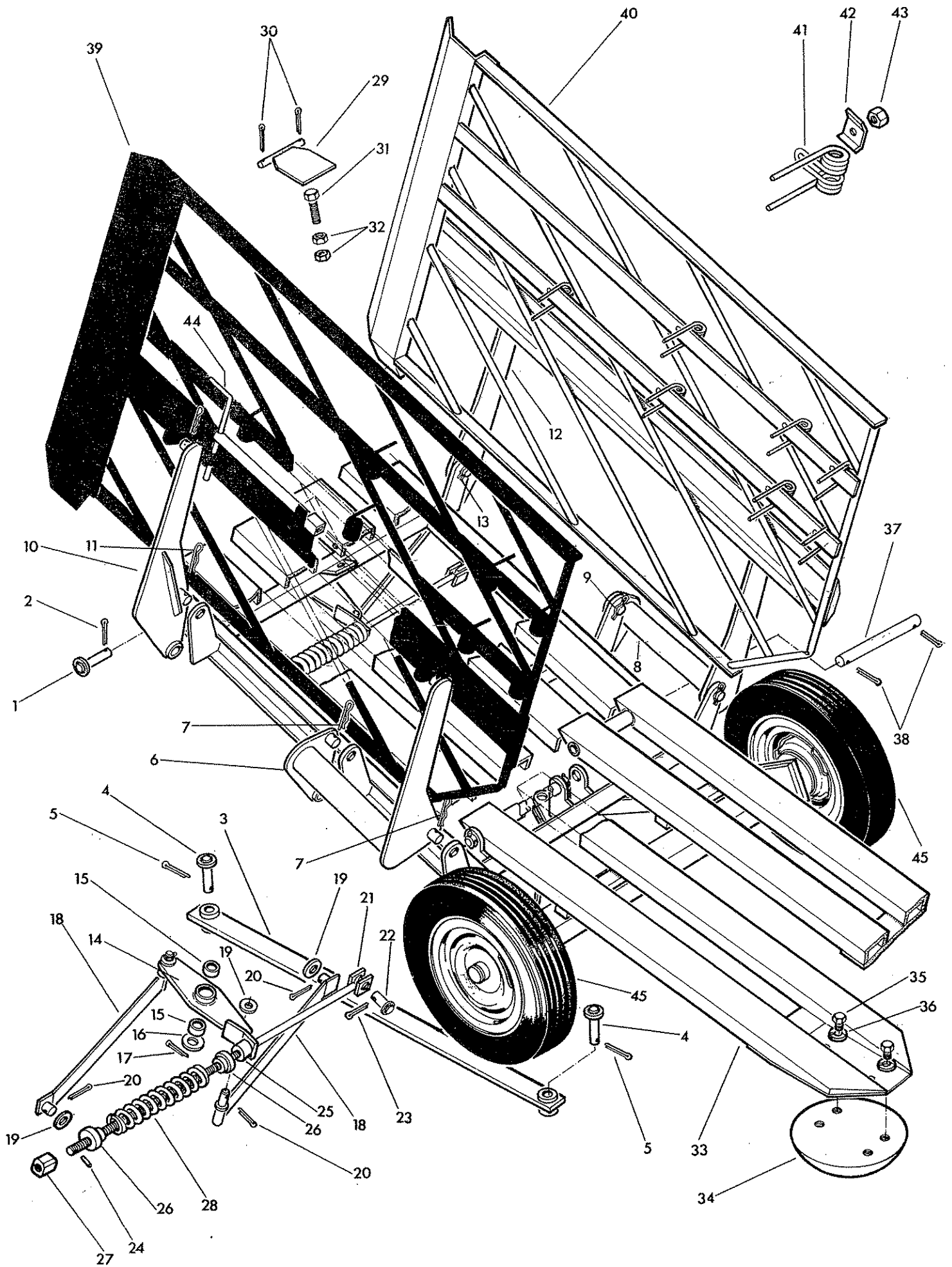
Many spares are supplied as Assemblies or as Sub assemblies and to help the customer determine the composition of an Assembly the Dot System is used. The Main Assembly will not show a dot preceding its description and is printed in BLOCK CAPITALS. Subsequent listed parts are preceded by one or more dots until the next major assembly is reached. An increase in the number of preceding dots indicates that the item is an associated part of the preceding item. Whenever the number of dots are decreased by one this indicates the termination of an assembly.

MAIN FRAME & ASSOCIATED ASSEMBLIES



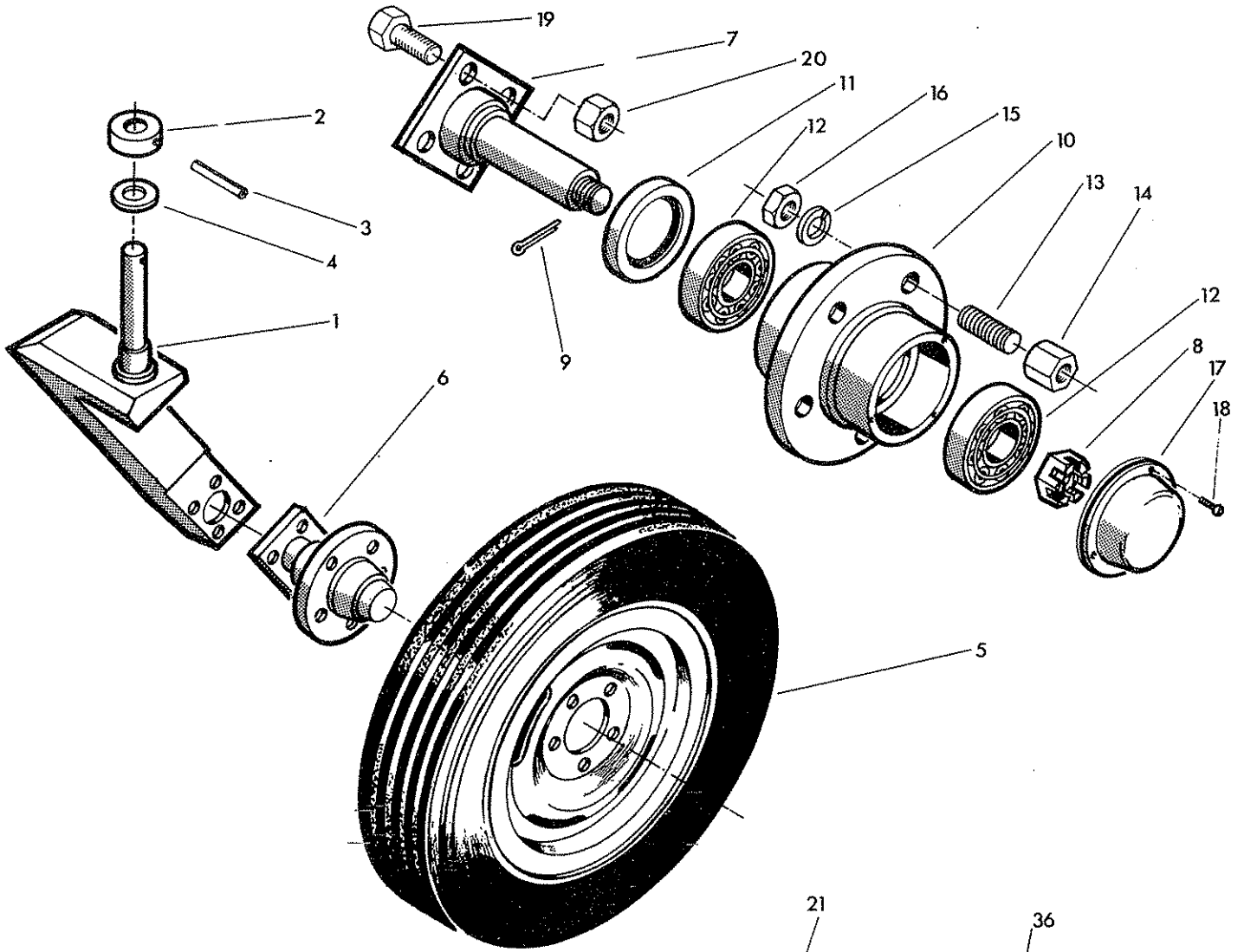
Ref	Part No	Qty	Description
			MAINFRAME & ASSOCIATED ASSEMBLIES
	13 35 377	1	MAIN FRAME ASSEMBLY comprising:-
1	13 35 264	1	.Main frame welded assembly
2	13 37 042	2	..Bush 2" inside diameter
3	71 05 011	2	..Bush 1½" inside diameter
4	13 35 230	4	..Bush 1.1/8" inside diameter
5	60 02 150	2	..Headed bush ¾" inside diameter
6	09 01 121	4	..Greaser - straight
7	13 35 961	1	..Accumulator
8	13 35 158	1	..Accumulator strap c/w nut
9	01 41 003	2	..Aeronut 3/8" UNF
10	13 35 366	1	..Deflector plate
11	13 35 299	1	..Bale guide - left hand
12	04 31 105	1	..Spring cotter
13	13 35 298	1	..Bale guide
14	13 37 019	1	..Knotter stay c/w bolts and nuts
15	02 11 123	2	..Bolt 3/8" UNF x 1½" long
16	01 41 003	2	..Aeronut 3/8" UNF
17	13 35 155	2	..Pusher adjuster bolt
18	01 16 009	1	..Plain nut 1" UNC
19	13 37 114	2	..Rubber buffer c/w aeronut
20	01 41 003	1	..Aeronut 3/8" UNF
21	13 35 263	2	..Anti-bounce flap c/w pin and spring
22	13 35 159	1	..Pivot pin c/w split pin
23	05 03 083	2	...Split pin 1/8" diameter x 1" long
24	60 10 032	1	..Spring
25	81 27 500	1	..Manifold valve assembly c/w bolts
26	03 11 083	2	..Setscrew 3/8" UNF x 1" long
27	01 00 203	2	..Spring washer 3/8"
28	13 35 292	1	..Trip arm assembly
29	13 35 052	2	..Pivot pin c/w spring dowel
30	04 22 524	1	..Spring dowel 5/16" diameter
31	13 35 205	1	..Bale trip pull rod assembly
32	60 00 110	1	..Spring
33	01 00 103	1	..Plain washer 3/8"
34	02 11 123	1	..Bolt 3/8" UNF x 1½" long
35	01 41 003	2	..Aeronut 3/8" UNF
	13 35 382	1	..LIFT CONTROL VALVE GEAR c/w VALVE
36	81 27 352	1	..Lift control valve (see page 83)
37	13 35 381	1	..Control lever
38	71 01 036	2	...Bush 5/8" inside diameter
39	13 37 121	1	..Pull rod welded assembly
40	01 00 103	1	...Plain washer 3/8"
41	01 41 003	2	..Aeronut 3/8" UNF
42	02 11 123	1	...Bolt 3/8" UNF x 1½" long
43	60 01 207	1	...Spring
44	13 37 117	1	..Operating lever c/w bushes
45	71 01 036	2	...Bush 5/8" inside diameter
46	13 37 119	1	..Pivot pin c/w split pin
47	05 03 126	1	...Split pin ¼" x 1½" long
48	05 03 095	1	..Split pin 3/16" x 1.1/8" long
49	01 00 106	1	..Plain washer 5/8"
50	02 11 181	2	..Bolt ¼" UNF x 2¼" long
51	01 41 001	2	..Aeronut ½" UNF
	13 35 383	1	..ISOLATION VALVE MOUNTING ASSEMBLY
52	13 35 330	1	..Mounting bracket
53	71 01 036	2	..Bush 5/8" inside diameter
54	13 35 331	1	..Shut-off lever
55	09 03 112	1	...Knob - Red
56	05 03 083	1	...Split pin 1/8" diameter x 1" long
57	04 21 616	1	...Spring dowel 3/16" diameter x 1" long
58	13 35 214	1	..Push rod
59	13 35 215	1	..Lever
60	13 35 216	1	..Operating rod
61	05 03 082	2	...Split pin 3/32" diameter x 1" long
62	13 35 217	1	..Cross-shaft c/w knob
63	09 03 112	1	...Knob - Red
64	13 35 218	1	..Support bracket
65	03 11 105	4	..Bolt ½" UNF x 1¼" long
66	01 41 005	4	..Aeronut ½" UNF
67	60 00 110	1	..Spring
68	01 00 106	1	..Plain washer 5/8" diameter
69	81 27 400	1	..Isolating valve (see page 83)
70	02 11 322	2	..Bolt 5/16" UNF x 3¾" long
71	01 41 002	2	..Aeronut 5/16" UNF
72	13 35 396	1	..FRONT CASTOR & WHEEL ASSEMBLY right hand (not illustrated)
73	13 35 397	1	..FRONT CASTOR & WHEEL ASSEMBLY left hand.

see
page 51

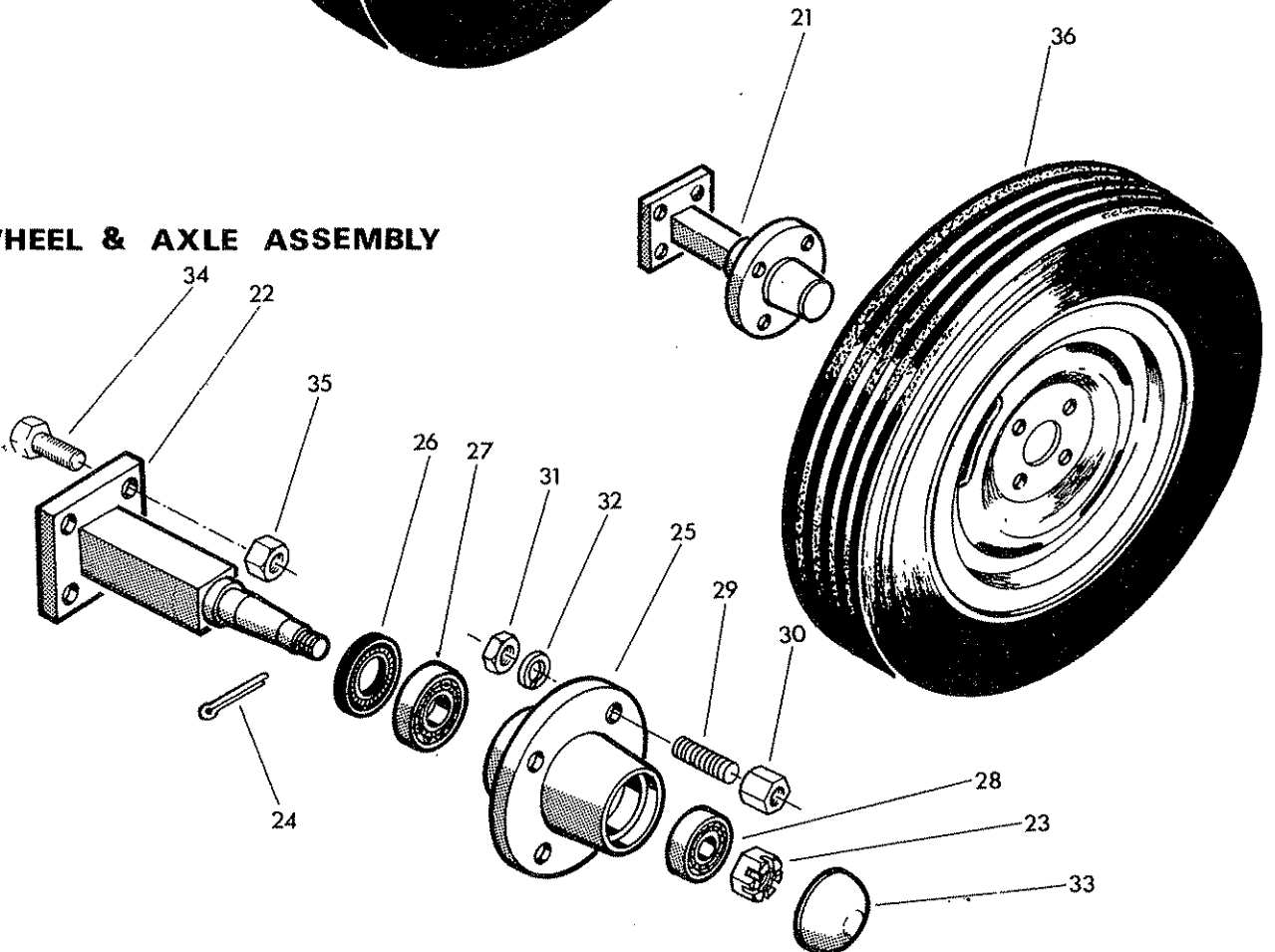


Ref	Part No	Qty	Description
	13 35 350		ASSEMBLY REAR FRAME & SIDE GATES
	13 35 253	1	.Rear frame welded assembly
1	13 35 012	2	.Pin - top rear frame
2	05 03 145	1	..Split pin 3/16" x 1 1/4" long
3	13 37 079	1	.Tie bar c/w pins
4	13 35 011	2	..Tie bar pin c/w split pin
5	05 03 145	1	... Split pin 3/16" x 1 1/4" long
6	13 35 354	1	.Rear retainer arm - left hand c/w spring cotter
7	04 31 105	3	..Spring cotter
8	13 35 355	1	.Rear retainer arm - right hand c/w spring cotter
9	04 31 105	3	..Spring cotter
10	13 35 356	1	.Front retainer arm - left hand c/w spring cotter
11	04 31 105	2	..Spring cotter
12	13 35 357	1	.Front retainer arm - right hand c/w spring cotter
13	04 31 105	2	..Spring cotter
14	13 35 255	2	.Swivel plate c/w bushes and pins
15	71 01 083	2	..Oilite bush
16	01 00 109	1	.. Plain washer 1"
17	05 03 125	1	.. Split pin 3/16" x 1 1/2" long
18	13 35 256	4	.Connecting link c/w split pin etc.
19	01 00 107	2	.. Plain washer 3/4"
20	05 03 125	2	..Split pin 3/16" x 1 1/2" long
21	13 35 257	2	.Push rod c/w pins
22	13 35 014	1	.. Headed pin c/w split pin
23	05 03 104	1	... Split pin 5/32" x 1 1/4" long
24	04 21 612	1	.. Roll pin 3/16" x 3/4" long
25	13 37 131	2	.Spacer
26	13 35 013	4	.Spring guide
27	13 35 015	2	.Adjuster block
28	73 14 075	2	.Spring
29	13 37 085	2	.Brake flap c/w split pin
30	05 03 104	2	.. Split pin 5/32" x 1 1/4" long
31	03 12 365	2	.Adjuster screw
32	01 12 005	4	.Plain nut
33	13 35 375	2	.Rear slide c/w dome
34	13 35 373	1	..Dome c/w setscrew and spring washer
35	93 13 050	4	...Setscrew M10 x 25 mm long
36	01 00 203	4	... Spring washer 3/8"
37	13 37 086	1	.. Rear slide pin c/w split pin
38	05 03 125	2	... Split pin 3/16" x 1 1/2" long
39	13 35 278	1	.Rear side gate assembly - left hand
40	13 35 279	1	.Rear side gate assembly - right hand
41	13 35 966	7	..Spring tine
42	13 35 017	7	..Clamp
43	91 15 005	7	.. Nut M10
44	13 35 315	1	.Handle
45	13 35 384	2	.Rear wheels & hub assembly (see page 51)

FRONT WHEEL & CASTOR ASSEMBLY

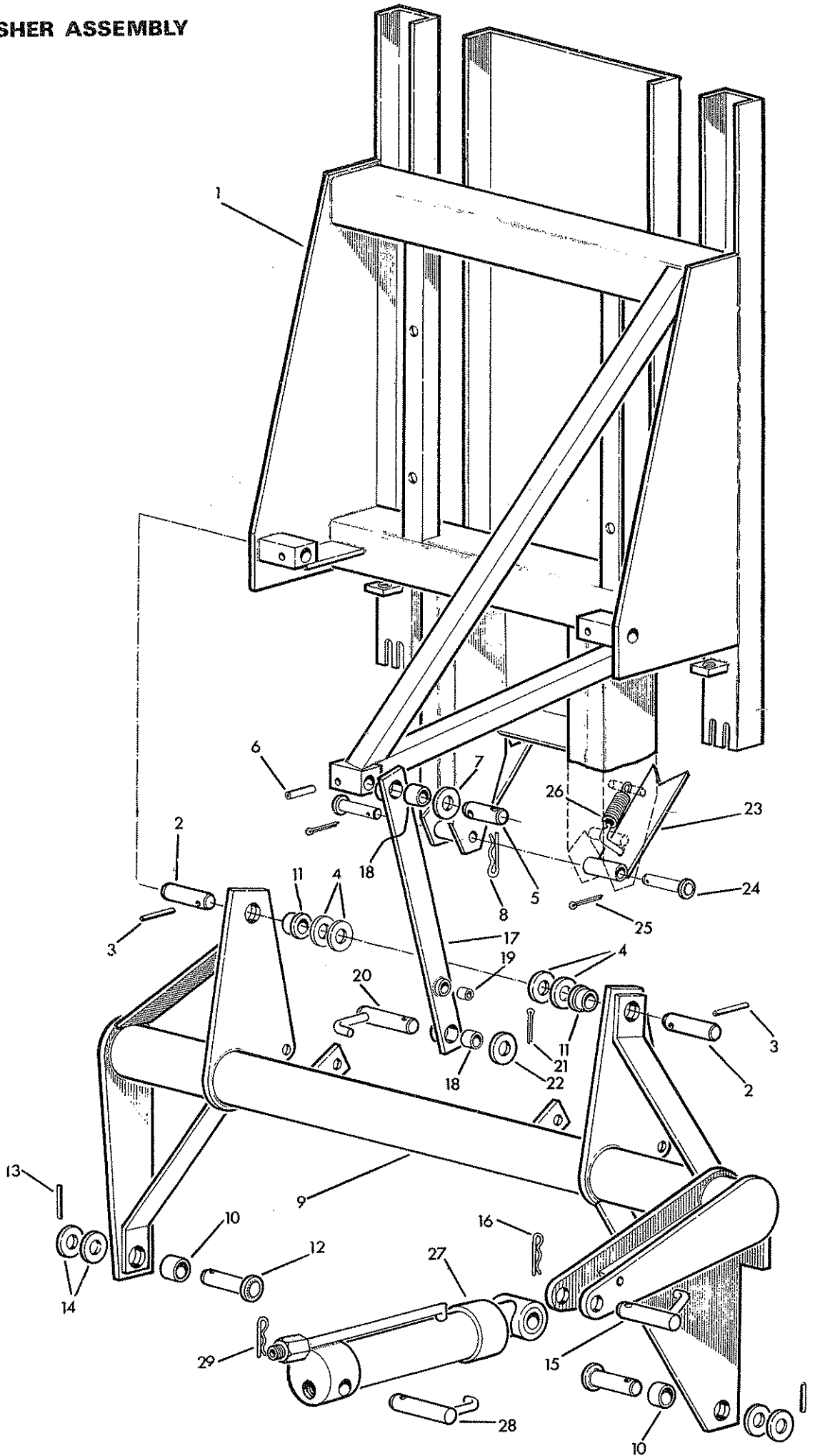


REAR WHEEL & AXLE ASSEMBLY



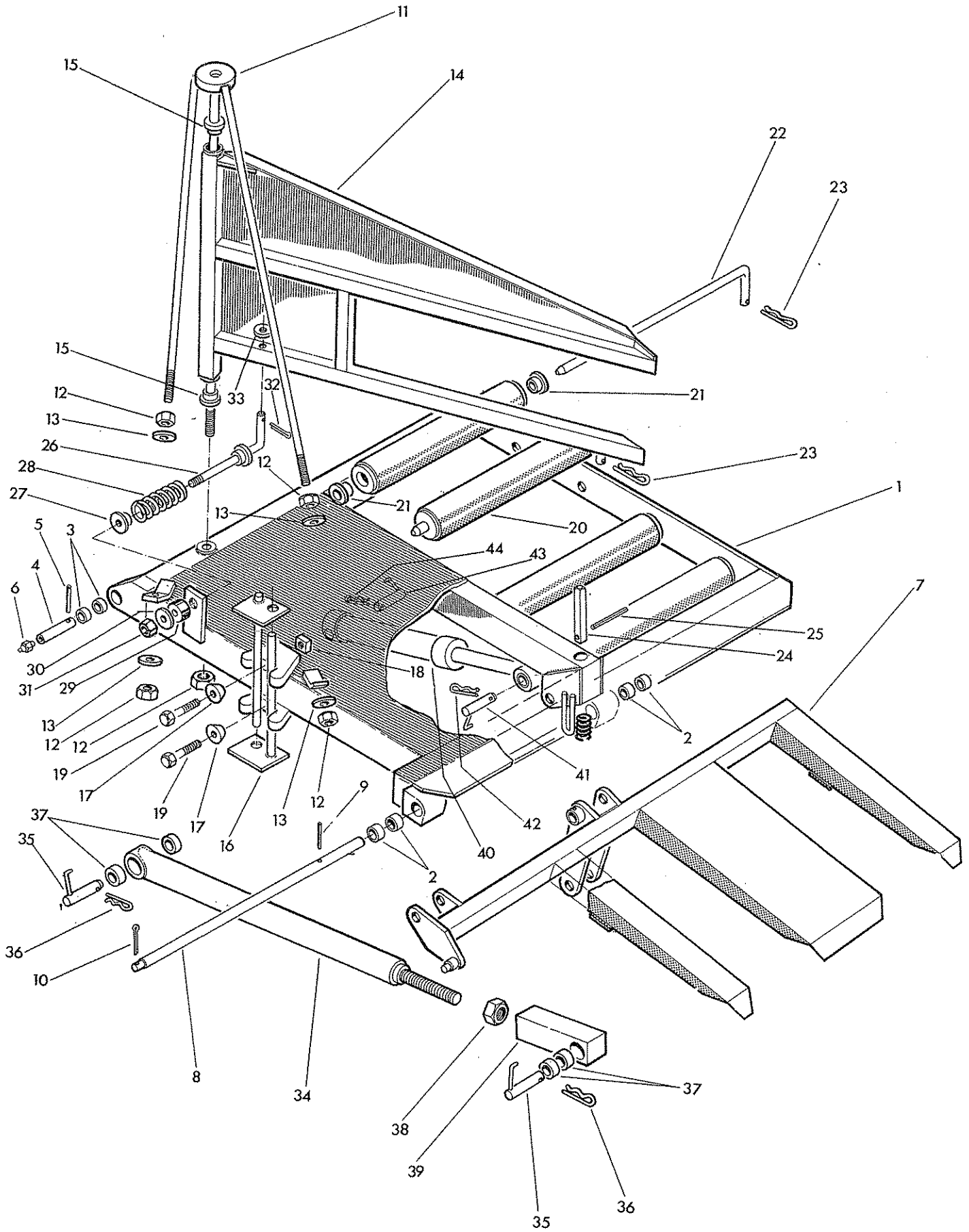
Ref	Part No	Qty	Description	
	13 35 428	1	WHEEL & CASTOR ASSEMBLY right hand	} Not illustrated
	13 35 364	1	.Castor RH c/w Collar & Washer	
	71 06 025	1	..Collar c/w Spring Dowel	
	04 22 740	1	...Spring dowel 7/16" dia. x 2½" long	
	13 37 043	1	..Thrust washer	
	13 35 429	1	WHEEL & CASTOR ASSEMBLY left hand	
1	13 35 363	1	.Castor LH c/w Collar & Washer	
2	71 06 025	1	..Collar c/w Spring Dowel	
3	04 22 740	1	...Spring Dowel 7/16" dia. x 2½" long	
4	13 37 043	1	..Thrust Washer	
	The following items 5-20 (inclusive) are common to both wheel and castor assemblies:-			
5	13 35 365	1	.Wheel & tyre assembly comprising:-	
	13 35 359	1	..Wheel	
	13 35 360	1	..Tyre 5-50 x 16 x 6 ply	
	13 35 361	1	..Inner tube	
6	13 35 358	2	.5 Stud Stub Axle Assembly comprising:-	
7	13 37 137	1	..Stub Axle Shaft	
8	13 37 138	1	..Axle Nut 1.3/8" BSF slotted	
9	05 03 166	1	..Cotter pin	
10	13 37 140	1	..Hub shell	
11	13 37 141	1	..Oil seal	
12	13 37 142	2	..Taper roller bearings	
13	13 37 143	5	..Wheel stud	
14	13 37 144	5	..Wheel nut	
15	01 00 206	5	..Spring washer	
16	01 33 006	5	..Locknut	
17	13 37 147	1	..Hub cap and gasket	
18	13 37 148	1	..Hub cap screws 2BA x 3/8" long	
19	02 11 166	4	..Bolt 5/8" UNF x 2" long	
20	01 41 006	4	..Aeronut 5/8" UNF	
	13 35 384	2	WHEEL AND STUB AXLE ASSEMBLY	
21	13 35 965	1	.4 Stud stub axle	
22	13 37 150	1	..Stub axle shaft	
23	01 73 007	1	..Axle nut ¾" BSF slotted	
24	05 03 105	1	..Split pin 3/16" dia. x 1¼" long	
25	13 37 151	1	..Hub shell	
26	13 37 152	1	..Oil seal	
27	13 37 153	1	..Inner bearing	
28	13 37 154	1	..Outer bearing	
29	13 35 237	4	..Wheel stud	
30	13 35 239	4	..Wheel nut	
31	01 31 005	4	..Locknut ½" UNF	
32	01 00 205	4	..Spring washer	
33	13 37 155	1	..Hub cap	
34	02 11 166	4	..Bolt 5/8" UNF x 2" long	
35	01 41 006	4	..Aeronut 5/8" UNF	
36	13 35 389	2	.Wheel & tyre assembly comprising:-	
	13 35 963	1	..Wheel - 4 stud	
	13 35 964	1	..Tyre 6.40 x 15	
	13 35 975	1	..Inner tube	

PUSHER ASSEMBLY



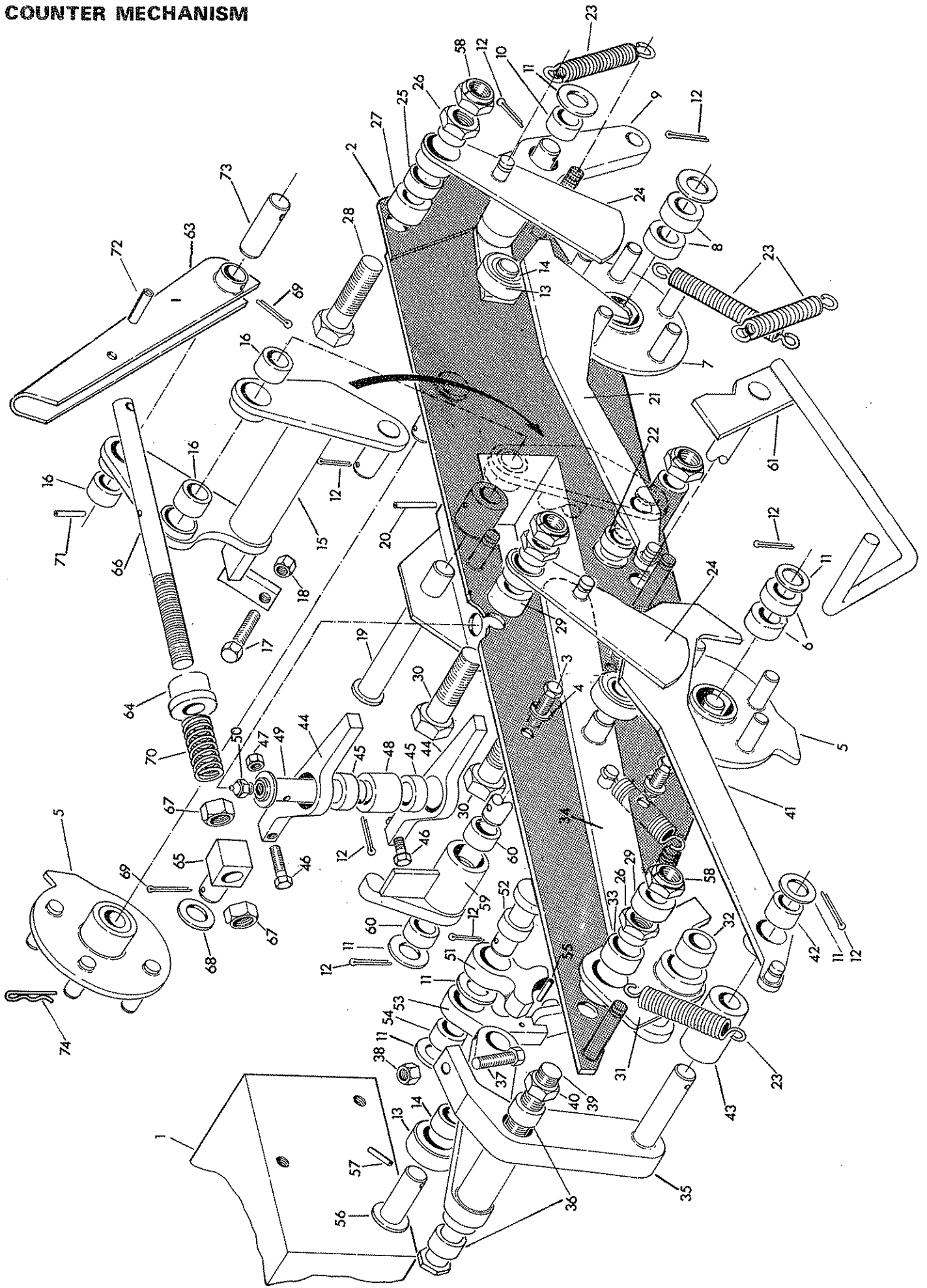
Ref	Part No	Qty	Description
	13 35 344	1	PUSHER ASSEMBLY comprising:-
1	13 35 300	1	..Pusher plate welded assembly c/w pins
2	13 35 101	2	..Pin, main arm to pusher c/w spring dowel
3	04 22 624	1	...Spring dowel 3/8" x 1½"
4	01 00 109	4	...Packing washer 1" diameter
5	13 35 100	1	.. Pin, link arm to pusher c/w spring dowel
6	04 22 624	1	...Spring dowel 3/8" x 1½"
7	01 00 109	1	...Packing washer 1" diameter
8	04 31 105	1	...Spring cotter
9	13 35 304	1	..Main arm c/w bushes and pins
10	71 01 083	2	..Bush 1" diameter
11	71 02 173	2	..Headed bush 1" diameter
12	13 35 039	2	..Main arm pivot pin c/w dowel
13	04 22 624	1	...Spring dowel 3/8" x 1½"
14	01 00 109	4	..Packing washer 1" diameter
15	13 35 061	1	..Pin, ram rod c/w spring cotter
16	04 31 105	1	...Spring cotter
17	13 35 301	1	..Pusher link arm c/w bushes
18	71 01 083	2	..Bush 1" diameter
19	71 01 036	1	..Bush 5/8" diameter
20	13 35 042	1	..Pin, pusher link to main frame
21	05 03 125	1	...Split pin 3/16" x 1½"
22	01 00 109	1	...Packing washer 1" diameter
23	13 35 303	2	..Pusher flap c/w pin
24	13 35 109	1	..Pin, flap
25	05 03 083	1	...Split pin 1/8" x 1"
26	60 01 064	1	...Spring
27	13 35 433	1	..Pusher ram (see page 85)
28	13 35 041	1	..Pin, ram base c/w spring cotter
29	04 31 105	1	..Spring cotter

LIFT & ROLLER PLATFORM ASSEMBLY



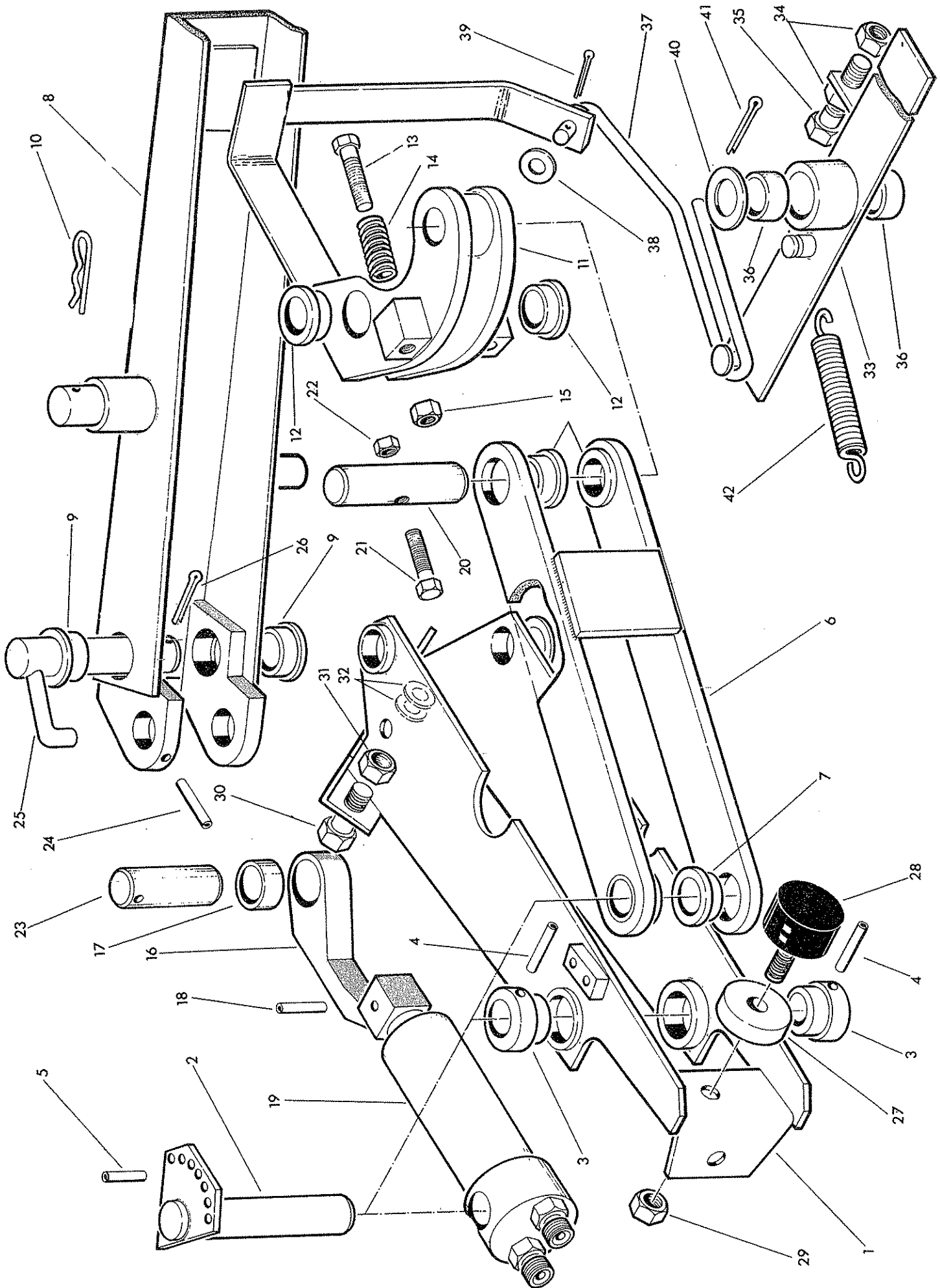
Ref	Part No	Qty	Description
	13 35 340	1	LIFT & ROLLER PLATFORM ASSEMBLY
1	13 35 284	1	.Lift platform welded assembly
2	70 01 083	4	..Bush 1" inside diameter x 1" long
3	70 12 037	4	..Steel bush 1" inside diameter x ½" long
4	13 35 101	2	.Lift platform pin c/w spring dowel & greaser
5	04 22 624	1	..Spring dowel 3/8" x 1½" long
6	09 01 121	1	..Greaser
7	13 35 280	1	.Fork platform
8	13 35 059	1	.Lift platform pin c/w spring dowel
9	04 22 624	1	..Spring dowel 3/8" x 1½" long
10	05 03 083	1	..Split pin 1/8" diameter
11	13 35 288	1	.Tripod c/w nuts etc.
12	01 11 006	5	..Nut 5/8" UNF
13	01 00 206	5	..Spring washer 5/8" UNF
14	13 35 289	1	.Assembly deflector plate c/w bushes
15	60 02 150	2	..Headed bush ¾" inside diameter x ¾" long
	13 35 326	1	.Assembly actuator plates c/w clamp
16	13 35 167	2	..Striker plate
17	13 35 168	2	..Clamping washer
18	13 35 169	2	..Special locknut
19	02 11 203	2	..Bolt 3/8" UNF x 2½" long
20	13 35 287	4	.Roller c/w bushes
21	13 35 231	2	..Headed bush
22	13 35 071	4	.Roller pin c/w spring cotter
23	04 31 105	1	..Spring cotter
24	13 35 073	1	.Interlock peg c/w spring dowel
25	04 22 648	1	..Spring dowel 3/8" diameter x 3" long
	13 35 291	1	.Assembly of deflector plate return
26	13 35 081	1	..Spring bar
27	13 35 082	1	..Spring holder
28	13 35 229	1	..Spring
29	13 35 235	1	..Rubber stop
30	13 35 083	1	..Special washer
31	01 41 006	1	..Aeronut 5/8" UNF
32	05 03 105	1	..Split pin 3/16" diameter x 1¼" long
33	01 00 106	1	..Washer 5/8" diameter
34	13 35 060	1	.Parallel motion link c/w bushes
35	13 35 061	2	..Pivot pin c/w spring cotter
36	04 31 105	1	...Spring cotter
37	71 01 083	4	..Bush 1" inside diameter x 1" long
38	01 16 009	1	..1" UNC plain nut
39	13 37 014	1	..Screwed block
40	13 35 435	1	.Assembly of lift ram - see separate page
41	13 35 061	1	.Pivot pin c/w spring cotter
42	04 31 105	1	..Spring cotter
43	13 35 041	1	.Pivot pin c/w spring cotter
44	04 31 105	1	..Spring cotter

COUNTER MECHANISM



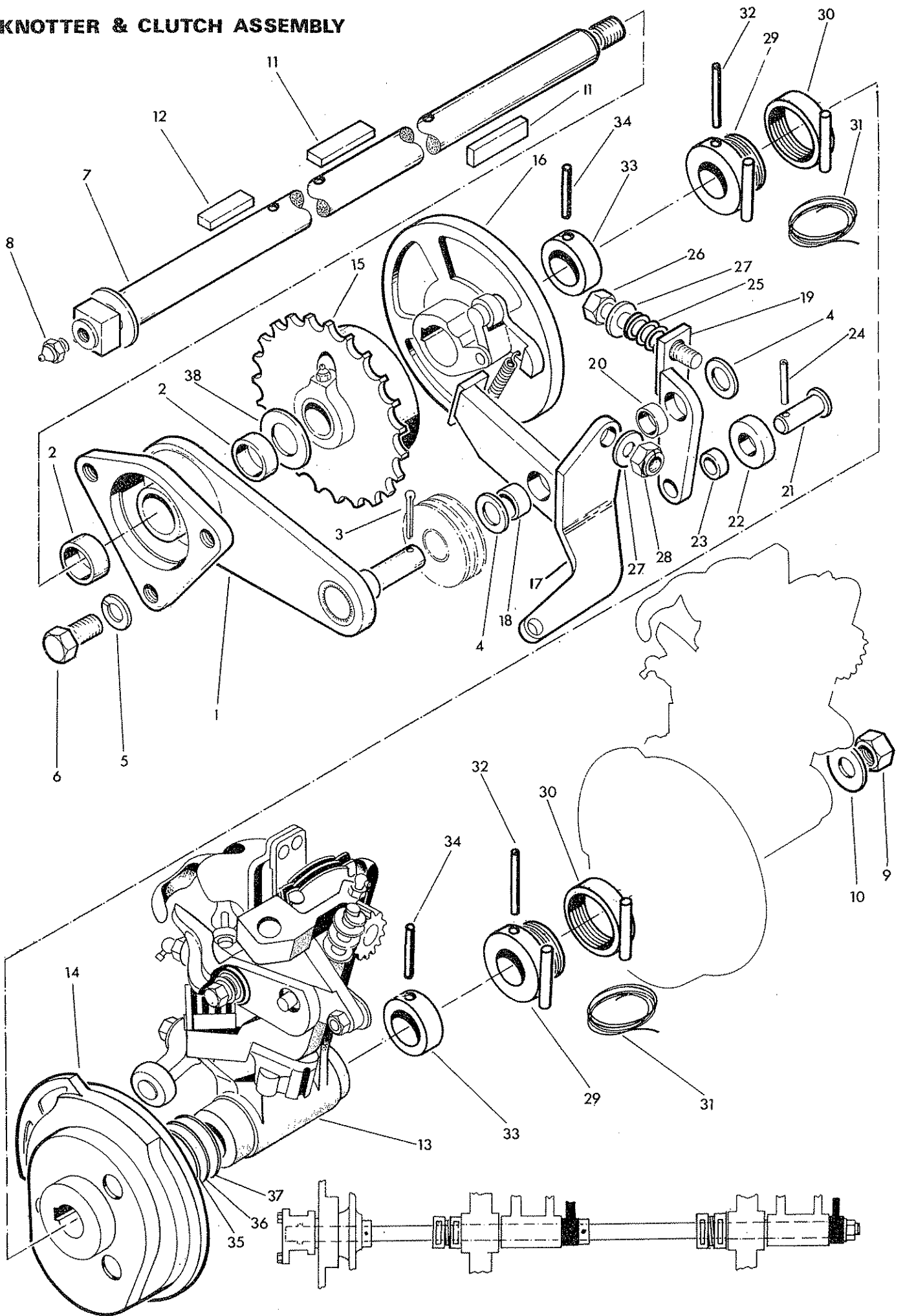
Ref	Part No	Qty	Description
	13 35 400	1	COUNTER MECHANISM c/w SEQUENCE VALVE
1	81 27 250	1	.Sequence valve
	13 35 399	1	.Counter mechanism
2	13 35 401	1	..Counter mounting plate
3	03 12 063	3	..Setscrew 3/8" UNC x 3/4" long
4	01 00 203	3	..Spring washer 3/8" dia.
5	13 35 404	2	..Counter cam - 4 pin c/w bush
6	71 01 036	2	...Bush 5/8" inside diameter
7	13 35 405	1	..Counter cam - 5 pin c/w bush
8	71 01 036	2	...Bush - 5/8" inside diameter
9	13 35 175	1	..Cam follower c/w bush
10	71 01 036	1	...Bush 5/8" inside diameter
11	01 00 606	8	..Thin washer 5/8" diameter
12	05 03 103	8	..Split pin 1/8" diameter x 1 1/4" long
13	13 35 197	3	..Cam roller c/w bush
14	71 01 036	3	...Bush 5/8" inside diameter
15	13 35 407	1	..Trip arm c/w bush
16	71 01 036	3	...Bush 5/8" inside diameter
17	03 11 103	1	...Setscrew 3/8" UNF x 1 1/4" long
18	01 00 003	1	...Nut 3/8" UNF
19	13 35 177	1	..Trip arm pivot pin c/w spring dowel
20	04 21 516	1	... Spring dowel 5/32" diameter x 1" long
21	13 35 408	1	..Push counter hook c/w bush
22	71 01 036	1	...Bush 5/8" inside diameter
23	60 01 064	5	..Tension spring
24	13 35 178	2	..Counter pawl c/w bush
25	70 14 028	1	...Bush 7/8" inside diameter
26	13 35 179	3	..Spacer nut
27	13 35 180	1	..Spacer - short
28	02 11 246	1	..Bolt 5/8" UNF x 3" long
29	13 35 181	2	..Spacer -long
30	02 11 246	2	..Bolt 5/8" UNF x 3" long
31	13 35 182	1	..Trip plate c/w bushes
32	70 14 028	1	...Bush 7/8" inside diameter
33	71 01 036	1	...Bush 5/8" inside diameter
34	13 35 409	1	..Push rod
35	13 35 410	1	..Striker arm
36	71 01 036	2	...Bush 5/8" inside diameter
37	03 11 103	1	... Screw 3/8" UNF x 1 1/4" long
38	01 11 003	1	...Nut 3/8" UNF
39	13 35 183	1	..Platform trip pivot
40	01 11 006	1	..Nut 5/8" UNF
41	13 35 411	1	..Lift counter hook c/w bush
42	71 01 036	1	...Bush 5/8" inside diameter
43	13 35 184	1	..Trip roller
44	13 35 185	2	..Valve rocker c/w bush and screw
45	71 01 036	1	...Bush 5/8" inside diameter
46	03 11 103	1	...Screw 3/8" UNF x 1 1/4" long
47	01 11 003	1	...Nut 3/8" UNF
48	13 35 186	1	..Rocker spacer
49	13 35 187	1	..Rocker pivot pin c/w greaser
50	09 01 121	1	...Greaser 1/8" BSP
51	13 35 188	1	..Bell crank c/w bush
52	71 01 036	1	..Bush 5/8" inside diameter
53	13 35 412	1	..Trip lever c/w bush, and spring dowel
54	71 01 036	1	...Bush 5/8" inside diameter
55	04 20 820	1	...Spring dowel 1/8" diameter x 1 1/4" long
56	13 35 189	1	..Roller pivot c/w spring dowel
57	04 20 820	1	...Spring dowel 1/8" diameter x 1 1/4" long
58	01 51 006	4	..Thin aeronut 5/8" UNF
59	13 35 207	1	..Slave rocker c/w bush
60	71 01 036	2	...Bush 5/8" inside diameter
61	13 35 413	1	..Hand trip lever
	13 35 335	1	..Folding link
63	13 35 219	1	...Folded link
64	13 35 220	1	...Collar
65	13 35 221	1	...Swivel block
66	13 35 222	1	...Screwed rod
67	01 11 006	2	...Nut 5/8" UNF
68	01 00 106	1	...Washer 5/8" diameter
69	05 03 104	2	...Split pin 5/32" diameter x 1 1/4" long
70	12 57 027	1	...Spring
71	04 20 816	1	...Spring dowel 1/8" diameter x 1" long
72	04 42 520	1	...Spirol dowel 5/16" diameter x 1 1/4" long
73	13 35 223	1	..Pin
74	04 31 105	1	..Spring cotter

SWING ARM ASSEMBLY



Ref	Part No	Qty	Description
	13 35 341	1	SWING ARM c/w RAM
1	13 35 317	1	.Swing arm housing
	13 35 087	1	.Swing ram base end pin c/w collars
2	13 35 088	1	..Base end pin
3	13 35 089	2	..Eccentric collar c/w spring dowel
4	04 22 632	1	...Spring dowel 3/8" diameter x 2" long
5	04 22 620	1	..Spring dowel 3/8" diameter x 1 1/4" long
6	13 35 318	1	.Main link c/w bushes
7	13 35 233	4	..Headed bush 1" inside diameter x 5/8" long
8	13 35 321	1	.Swing arm c/w bushes
9	71 02 173	2	..Headed bush 1" inside diameter x 1" long
10	04 31 105	1	..Spring cotter
11	13 35 320	1	.Trigger link c/w bushes
12	13 35 233	2	..Headed bush 1" inside diameter
13	02 11 223	2	..Bolt 3/8" UNF x 2 1/2" long
14	60 01 207	2	..Spring
15	01 41 003	2	..Aeronut 3/8" UNF
16	13 35 319	1	.Rod end c/w bush
17	71 01 083	1	..Bush 1" inside diameter
18	04 42 824	1	..Spirol pin 1/2" diameter x 1 1/2" long
19	13 35 430	1	.Swing ram assembly (see separate page)
20	13 35 093	1	.Locking pin c/w screw & nut
21	03 11 203	1	..Setscrew 3/8" UNF x 2 1/2" long
22	01 41 003	1	..Aeronut 3/8" UNF
23	13 35 094	1	.Arm pivot pin c/w spring dowel
24	04 22 628	1	..Spring dowel 3/8" diameter x 1 3/4" long
25	13 35 042	1	.Swing pin c/w split pin
26	05 03 125	1	..Split pin 3/16" diameter x 1 1/2" long
27	13 35 095	1	.Stop boss
28	71 03 046	1	.Rubber buffer
29	91 43 005	1	.Aeronut M10
30	02 11 166	2	.Bolt 5/8" UNF x 2" long
31	01 41 006	2	.Aeronut 5/8" UNF
32	01 00 106	As req'd	.Packing washer 5/8" diameter
	13 35 342	1	INTERLOCK ASSEMBLY comprising:-
33	13 35 305	1	.Interlock lever c/w bushes
34	01 31 006	2	..Thin nut 5/8" UNF
35	03 11 146	1	..Setscrew 5/8" UNF x 1 3/4" long
36	71 01 083	2	..Bush 1" inside diameter x 1" long
37	13 35 294	1	.Pull rod
38	01 00 105	1	..Thin washer
39	05 03 104	1	..Split pin 5/32" x 1 1/4" long
40	01 00 109	1	.Washer 1" diameter
41	05 03 125	1	.Split pin 3/16" diameter x 1 1/2" long
42	60 10 032	1	.Spring

KNOTTER & CLUTCH ASSEMBLY

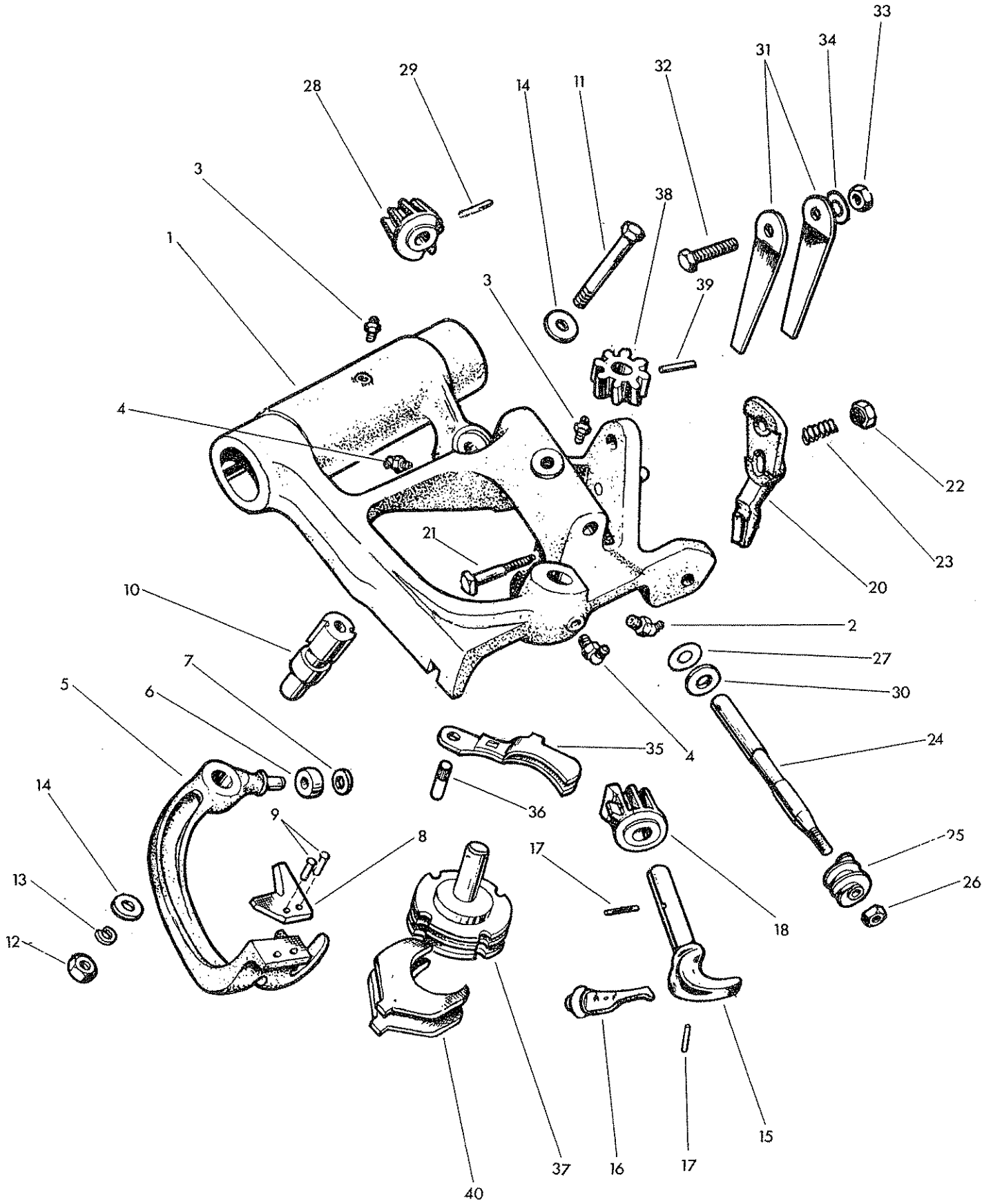


Ref	Part No	Qty	Description
	13 35 343	1	KNOTTER AND CLUTCH ASSEMBLY
1	13 35 325	1	.Fixed clutch housing c/w bushes
2	13 35 230	2	..Bush 1.1/8" i/d x 3/8" long
3	05 03 105	1	..Split pin 3/16" dia. x 1¼" long
4	01 00 108	2	..Washer 7/8" dia.
5	01 00 206	3	..Spring washer 5/8" dia.
6	03 11 086	3	..Setscrew 5/8" UNF x 1" long
7	13 35 324	1	.Knotter shaft c/w greaser and keys
8	09 01 121	1	.. Greaser 1/8" BSP
9	01 41 006	1	.. Aeronut 5/8" UNF
10	01 00 106	1	..Washer 5/8" dia.
11	15 76 214	2	..Key 3/8" x 5/16" x 2¼" long
12	13 35 151	1	..Key 3/8" x 5/16" x 1¾" long
* 13	13 35 968	2	.Knotter
* 14	13 35 971	2	.Cam gear
* 15	13 35 972	1	.Driving sprocket
* 16	13 35 969	1	.Rotating clutch housing
17	13 35 327	1	.Trip lever c/w bush
18	70 14 028	1	..Bush ¾" i/d x ¾" long
19	13 35 195	1	.Roller lever c/w bush
20	70 14 028	1	..Bush ¾" i/d x ¾" long
21	13 35 196	1	..Headed pin
22	13 35 197	1	..Roller c/w bush
23	71 01 036	1	...Bush 5/8" i/d
24	04 21 616	1	..Spring dowel 3/16" dia. x 1" long
25	73 15 075	1	.Spring
26	02 11 405	1	.Belt ½" UNF x 5" long
27	01 00 105	2	.Washer ½" dia.
28	01 41 005	1	.Aeronut ½" UNF
	13 37 029	2	.Knotter adjust assembly comprising:-
29	13 37 026	1	..Male adjuster
30	13 37 027	1	..Female adjuster
31	13 37 028	1	..Locking wire - 16 standard wire gauge
32	04 41 632	1	.. Scroll pin 3/16" x 2" long
33	13 37 136	2	.Spacer
34	04 41 632	1	..Scroll pin 3/16" x 2" long
35	13 37 020	As req'd	. Shim .010" thick
36	13 37 021	" "	. Shim 21 standard wire gauge
37	13 37 022	" "	. Shim 16 " " "
38	13 35 146	1	. Special washer

* The following items are standard components which have Bamford Part No. These should be quoted when ordering spares from your local stockist:-

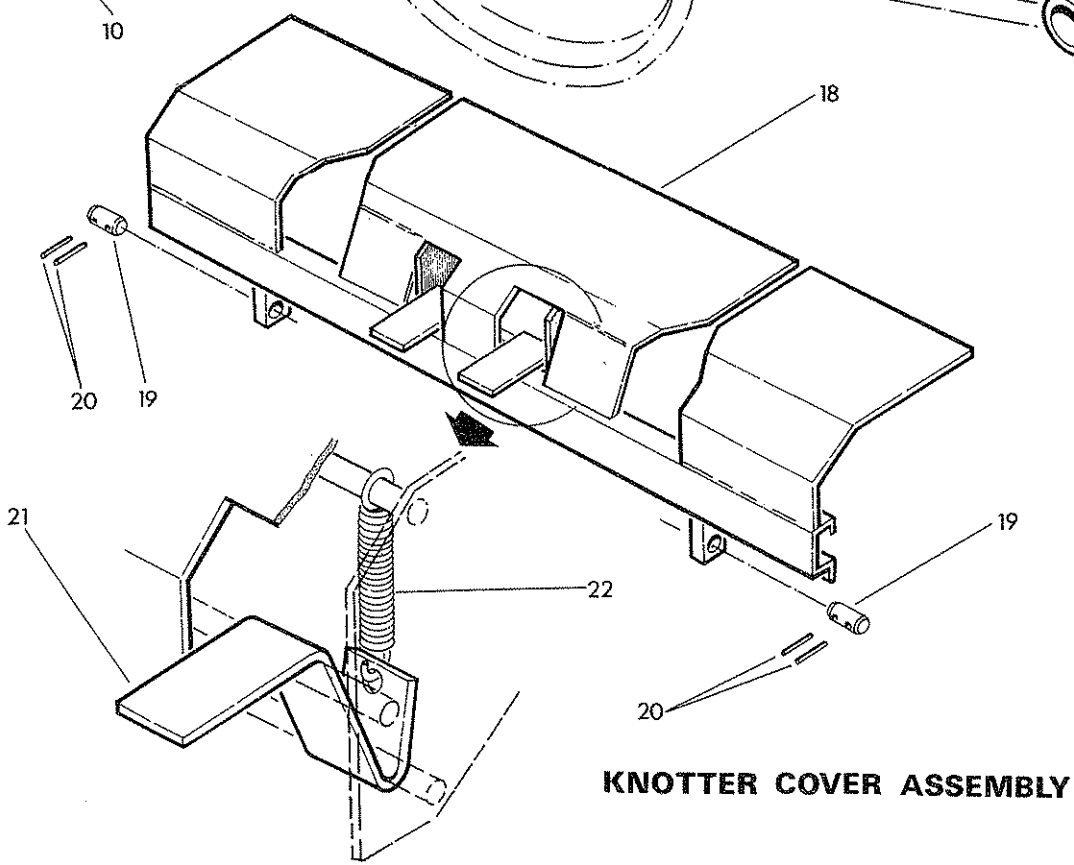
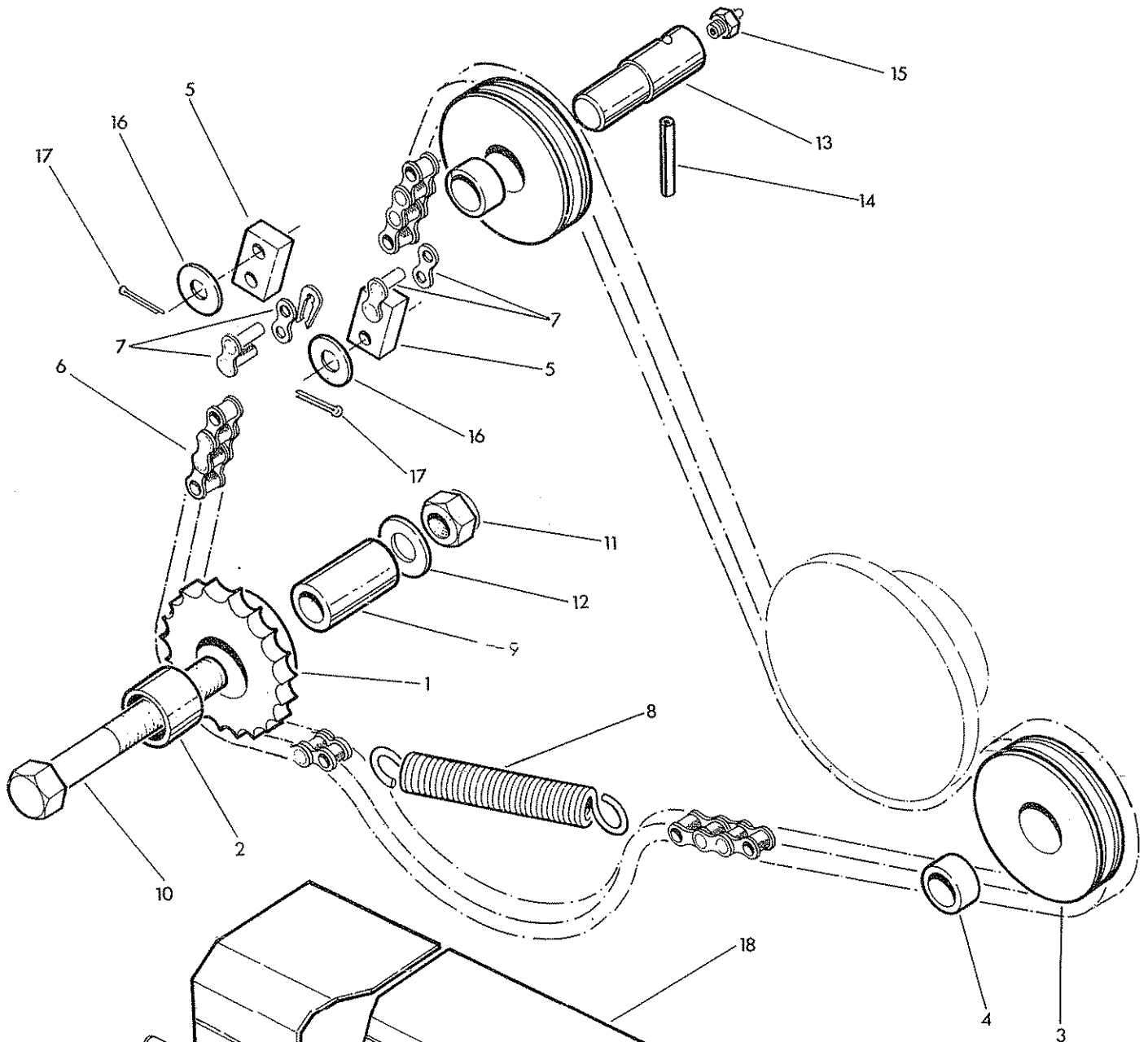
13	46527 B9	Knotter complete
14	B 234	Knotter Gear Cam
15	45067 B9	Knotter Drive Sprocket
16	B 451 C	Clutch Housing complete

KNOTTER ASSEMBLY



Ref No	McConnel Part No.	Bamford Part No.	Qty	Description
	13 35 968	46527B9	2	Knotter assembly complete each comp:-
1	13 35 953	46528B5	1	Knotter frame with locating pins
2	09 01 114	96004	1	Greaser 1/4" BSF angular
3	09 01 111	96003	2	Greaser 1/4" BSF straight
4	09 01 113	96005	2	Greaser 1/4" BSF angular
	13 35 954	BL 1090	1	Pin in knotter frame for cam
5	13 35 957	B 401H	1	Stripper arm c/w twine knife & roller
	13 35 958	93456	as req.	Shim .015" thick
6	13 35 959	BL 1078	1	Roller for stripper arm
7	13 35 960	93420	1	Plain washer
8	13 35 976	BL 1030	1	Twine knife for stripper arm
9	13 35 977	94111	2	Rivet for twine knife
10	13 35 978	BL 1039	1	Pivot shaft for stripper arm
11	02 12 243	90257	1	Bolt 3/8" x 3" stripper arm mounting
12	01 12 003	92202	1	Nut
13	01 00 203	93122	1	Spring washer
14	01 00 103	93413	2	Plain washer
15	13 35 979	BL 1040H	1	Bill hook complete
16	13 35 980	BL 1041H	1	Tongue and roller
17	13 35 981	BL 1042	1	Pin - tongue fixing
18	13 35 982	B 736	1	Bevel pinion for bill hook
19	04 21 614	94382	1	Pin
20	13 35 984	B 665	1	Cam for bill hook
21	13 35 985	44599B1	1	Cam adjusting bolt
22	01 12 002	BL 1083	1	Nut
23	13 35 986	BL 1071	1	Spring for cam
24	13 35 987	BL 1081	1	Worm shaft
25	13 35 988	BL 1069	1	Worm
26	01 11 003	92206	1	Nut 3/8" UNF for worm shaft
27	13 35 958	93456	as req.	Shim .015" thick
28	13 35 989	B 404	1	Bevel pinion for worm shaft
29	04 21 614	94382	1	Pin for bevel pinion
30	13 35 991	93454	as req.	Shim 1/16" for worm shaft
	13 35 992	93455	as req.	Shim 1/32" for worm shaft
31	13 35 993	BL 1073	2	Leaf spring for twine holder
32	03 12 083	90310	1	Setscrew 3/8" x 1"
33	01 12 003	92202	1	Nut
34	01 00 103	93421	1	Plain washer
35	13 35 994	BL 1031H	1	Twine holder complete
36	13 35 995	BL 2303	1	Locating pin
37	13 35 996	35147B2	1	Twine disc complete
38	13 35 997	36076B1	1	Pinion for Twine disc
39	04 21 614	94382	1	Pin for pinion
40	13 35 999	BL 1034	2	Cleaner for twine disc

CHAIN INSTALLATION

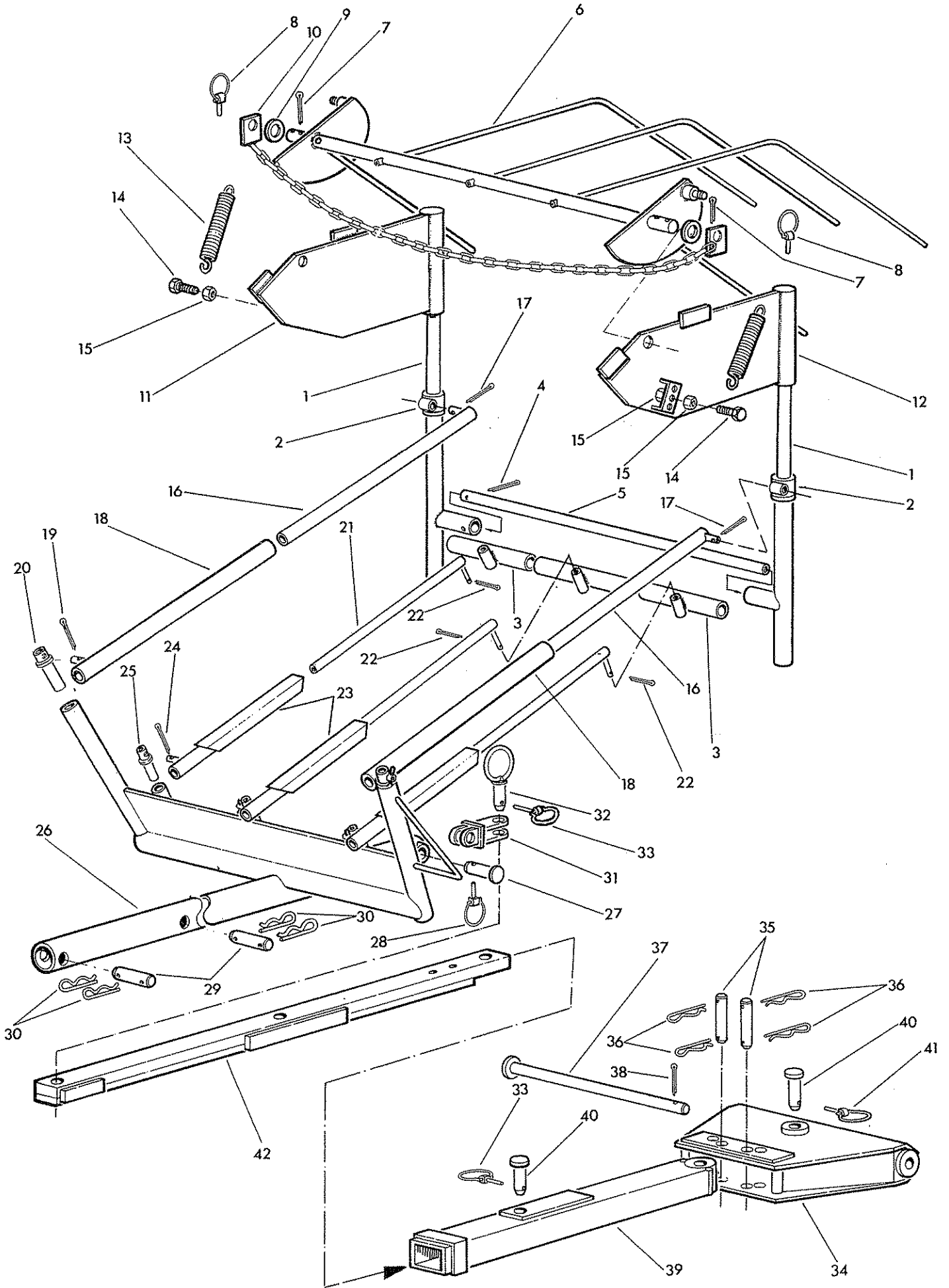


KNOTTER COVER ASSEMBLY

Ref	Part No	Qty	Description
	13 35 339		CHAIN INSTALLATION comprising:-
1	13 35 018	1	.Guide sprocket c/w bush
2	71 01 083	1	..Bush 1" dia. x 1" long
3	13 35 084	2	.Guide pulley c/w bush
4	71 01 083	1	..Bush 1" dia. c/w bush
5	13 35 157	2	. Chain block
6	13 37 040	1	. Chain 5/8" x 233 pitches c/w connectors
7	13 35 062	2	..Connecting link
8	60 10 032	1	. Spring
9	13 35 047	1	. Sprocket sleeve
10	02 11 486	1	. Bolt 5/8" UNF x 6" long
11	01 41 006	1	. Aeronut 5/8" UNF
12	01 00 106	1	..Washer 5/8" dia.
13	13 35 031	1	. Pivot pin c/w spring dowel and greaser
14	04 22 632	1	.. Spring dowel
15	09 01 121	1	.. Greaser 1/8" BSP
16	01 00 105	2	. Washer 1/2"
17	05 03 083	2	. Split pin 1/8" x 1"

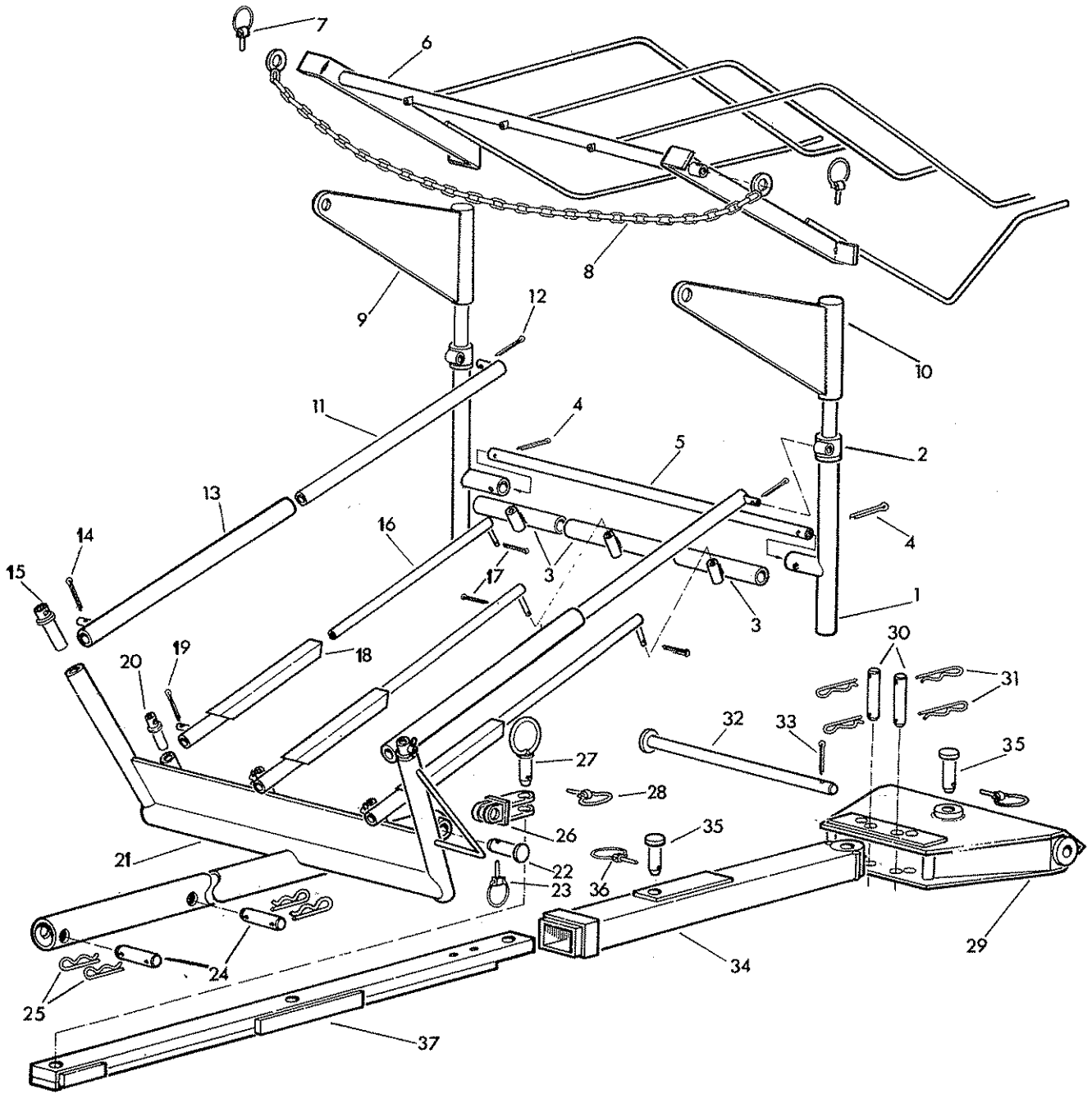
	13 35 351		KNOTTER COVER ASSEMBLY comprising:-
18	13 35 306	1	. Knotter cover c/w pivot pins
19	13 35 122	2	.. Pivot pin c/w split pin
20	05 03 083	4	... Split pin 1/8.x 1" long
21	13 35 307	2	. Flap
22	60 04 017	1	.. Spring

CHUTE; CANOPY AND TOWBAR ASSEMBLY (Sprung loaded)



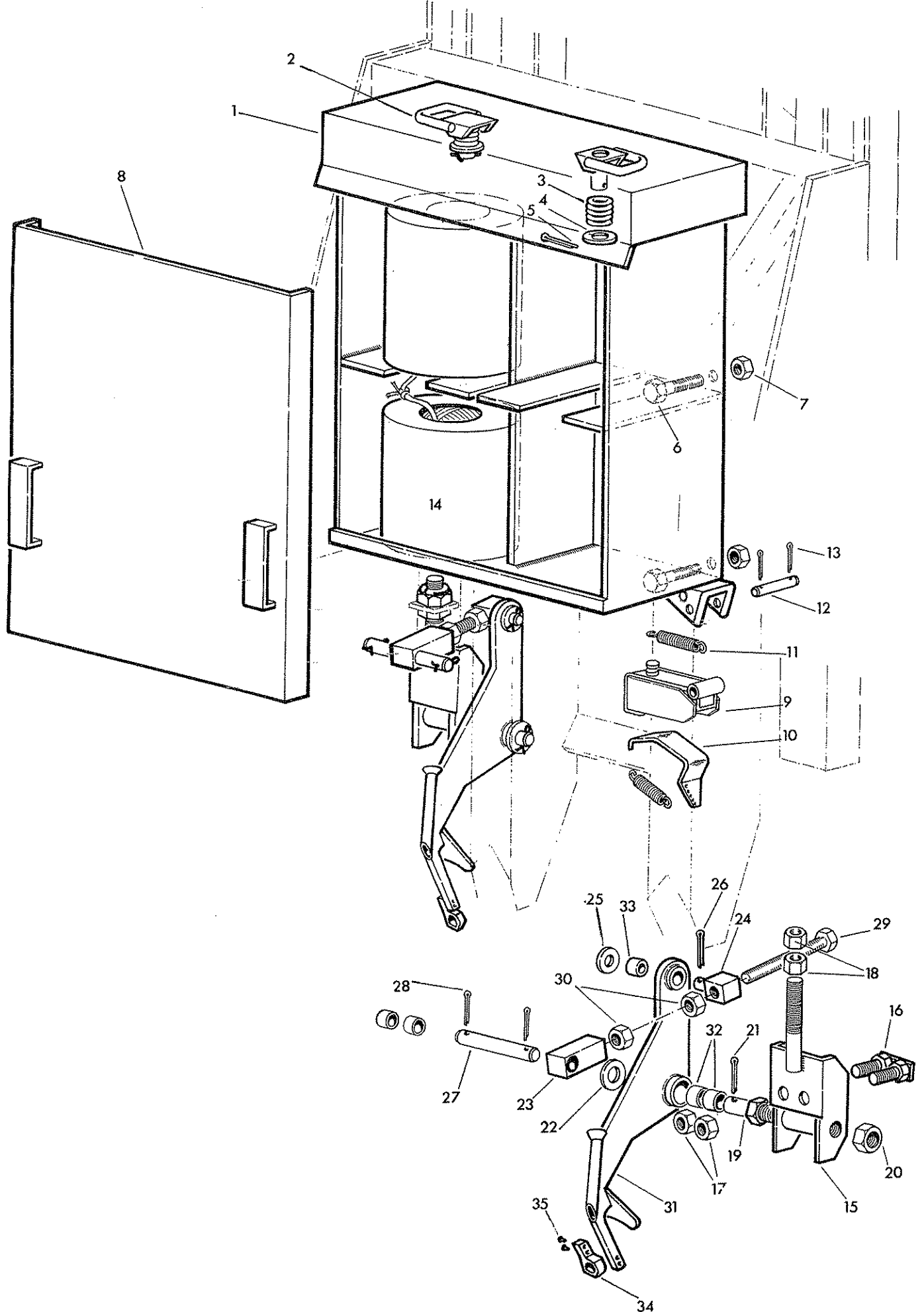
Ref	Part No	Qty	Description
	13 36 286	1	BALE CHUTE & CANOPY INSTALLATION
	13 36 254	1	.Canopy carrier assembly
1	13 36 282	2	..Vertical post
2	13 36 009	2	..Side rail pivot
3	13 36 011	3	..Runner pivot
4	05 03 205	2	..Split pin 3/16" x 2½" long
5	13 36 010	1	..Cross tube
6	13 36 283	1	.Canopy welded assembly
7	05 03 126	2	..Split pin 2" x 1½" long
8	04 31 217	2	..Linch pin
9	01 00 109	2	..Plain washer 1" diameter
10	13 36 263	1	.Chute chain
11	13 36 284	1	.Canopy mounting bracket - RH - each c/w spring etc.
12	13 36 285	1	.Canopy mounting bracket - LH - each c/w spring etc.
13	60 10 032	1	..Spring
14	02 11 123	1	..Bolt 3/8" UNF x 1½" long
15	01 11 003	2	..Nut 3/8" UNF
16	13 36 256	2	.Side rail
17	05 03 095	1	..Split pin 3/16" x 1.1/8"
18	13 36 258	2	.Side rail housing
19	05 03 095	1	..Split pin 3/16" x 1.1/8"
20	13 36 012	2	.Carrier post
21	13 36 257	3	.Runner
22	05 03 095	1	..Split pin 3/16" x 1.1/8"
23	13 36 253	3	.Chute runner housing
24	05 03 095	1	..Split pin 3/16" x 1.1/8"
25	13 36 008	3	.Universal post
26	13 36 252	1	.Baler tow bar welded assembly c/w pins etc.
27	13 35 144	1	..Pin c/w linch pin
28	04 31 217	1	...Linch pin
29	13 36 005	2	..Tow bar pin c/w spring cotter
30	04 31 105	2	..Spring cotter
31	13 36 007	1	.Knuckle c/w ringed towbar pin
32	13 36 006	1	..Ringed towbar pin c/w linch pin
33	04 31 217	1	...Linch pin
	13 35 349	1	Drawbar assembly
34	13 35 334	1	.Hitch housing c/w pin and spring cotter etc.
35	13 35 210	2	..Offset pin c/w spring cotter
36	04 31 105	2	...Spring cotter
37	13 35 206	1	..Pivot pin c/w split pin
38	05 03 165	1	...Split pin 3/16" x 2" long
39	13 35 332	1	.Drawbar housing
40	13 35 144	2	..Drawbar pin c/w linch pin
41	04 31 217	2	...Linch pin
42	13 35 333	1	.Packer drawbar

BALE CHUTE DRAWBAR and CANOPY (Standard)



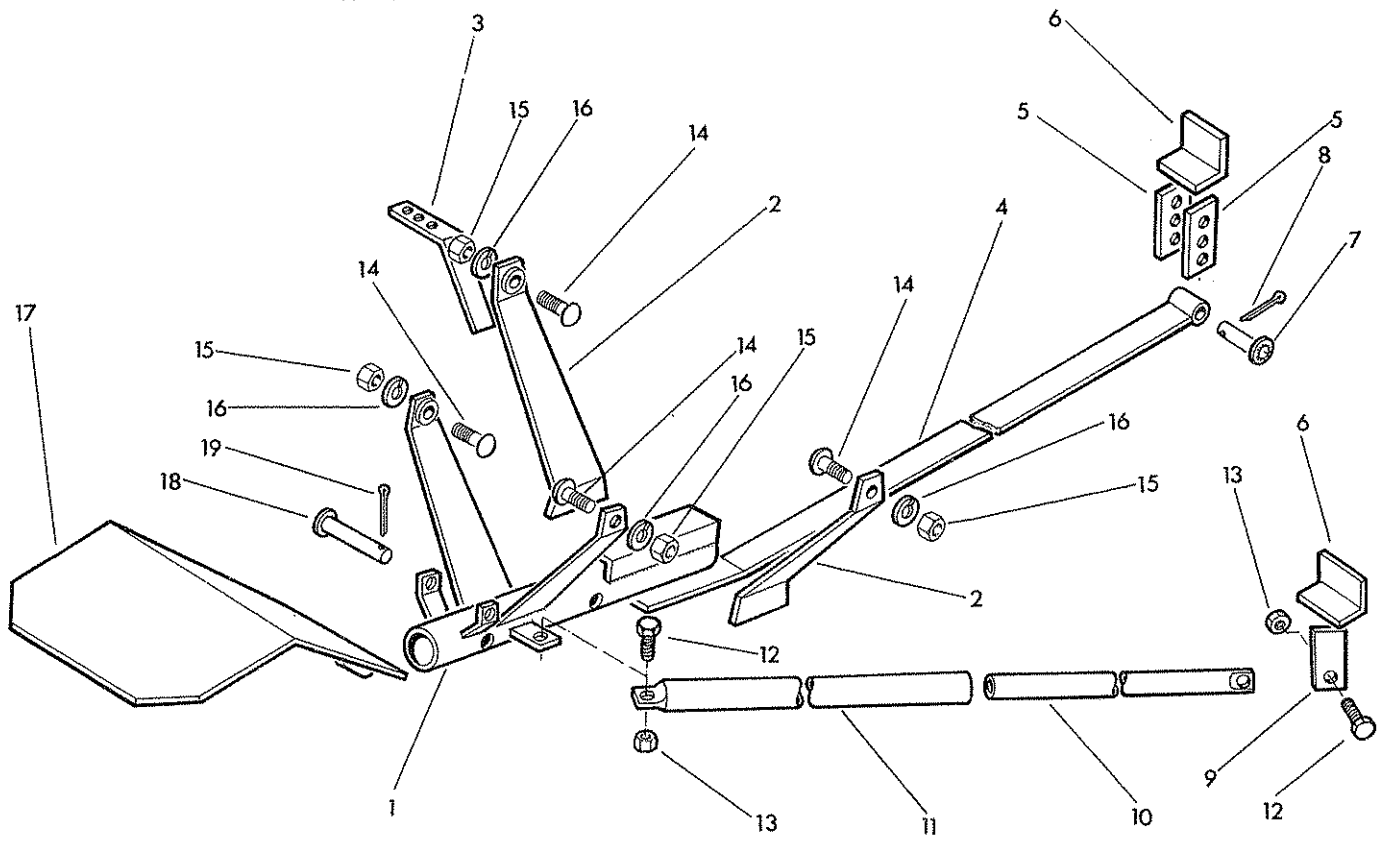
Ref	Part No	Qty	Description
	13 36 251		BALE CHUTE AND CANOPY INSTALLATION.
	13 36 254	1	. Canopy Carrier
1	13 36 255	2	.. Vertical Post
2	13 36 009	2	.. Side Rail Pivot
3	13 36 011	3	.. Runner pivot
4	05 03 205	2	.. Split pin 3/16" x 2.1/2"
5	13 36 010	1	.. Cross Tube
6	13 36 264	1	. Canopy, Welded Assembly
7	04 31 217	2	.. Linch Pin
8	13 36 263	1	.. Chain Assembly
9	13 36 020	1	. Canopy Bracket Right Hand
10	13 36 021	1	. Canopy Bracket Left Hand
11	13 36 256	2	. Side Rail
12	05 03 093	1	.. Split pin 1/8" x 1.1/8"
13	13 36 258	2	. Side Rail Housing
14	05 03 093	1	.. Split Pin 1/8" x 1.1/8"
15	13 36 012	2	. Carrier Post
16	13 36 257	3	. Runner
17	05 03 093	1	.. Split Pin 1/8" x 1.1/8"
18	13 36 253	3	. Chute Runner Housing
19	05 03 093	1	.. Split Pin 1/8" x 1.1/8"
20	13 36 008	3	. Universal Post
21	13 36 252	1	. Baler Towbar, welded assembly
22	13 35 144	1	.. Pin c/w linch pin
23	04 31 217	1	... Linch Pin
24	13 36 005	2	.. Towbar Pin c/w Spring Cotters
25	04 31 105	2	... Spring Cotter
26	13 36 007	1	. Knuckle c/w Ringed Towbar Pin
27	13 36 006	1	.. Ringed Towbar Pin c/w Linch Pin
28	04 31 217	1	... Linch Pin
	13 35 349	1	DRAWBAR ASSEMBLY
29	13 35 334	1	. Hitch Housing
30	13 35 210	2	.. Offset Pin
31	04 31 105	2	... Spring Cotter
32	13 35 206	1	.. Pivot Pin
33	05 03 165	1	... Split Pin 3/16" x 2"
34	13 35 332	1	. Drawbar Housing
35	13 35 144	2	.. Drawbar Pin
36	04 31 217	2	... Linch Pin
37	13 35 333	1	. Packer Drawbar

TWINE BOX and NEEDLE ASSEMBLY

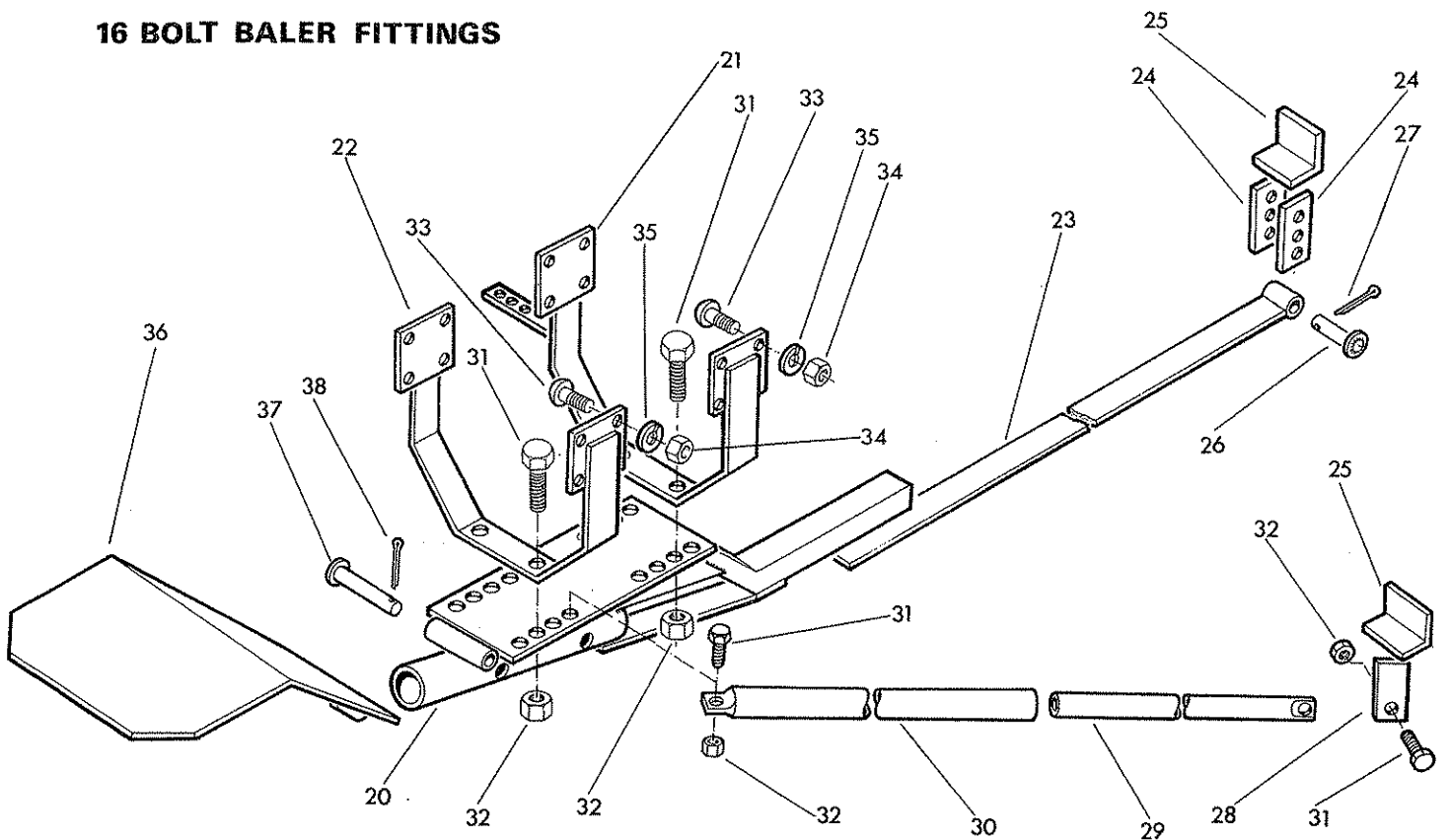


Ref	Part No	Qty	Description
	13 35 346	1	TWINE BOX & TENSIONER ASSEMBLY
1	13 35 311	1	.Twine box
2	13 35 141	2	..String staple c/w washer, spring and pin
3	81 14 024	1	...Spring
4	01 00 603	1	...Washer 3/8" diameter
5	05 03 063	1	...Split pin 1/8" x 3/4"
6	03 11 083	4	..Setscrew 3/8" UNF x 1"
7	01 41 003	4	..Aeronut 3/8" UNF
8	13 35 312	1	.Twine box door
	13 35 347	2	.Tensioner assembly
9	13 35 308	1	..Tensioner body
10	13 35 123	1	..Moving plate
11	60 01 064	2	..Spring
12	13 35 128	1	..Tensioner pivot pin c/w split pin
13	05 03 063	2	...Split pin 1/8" x 3/4"
14	13 35 316	1	TWINE PACK: 2 balls Heavy duty polypropylene (sufficient for about 100 packs of 20 bales).
	13 35 309	2	NEEDLE MOUNTING & ADJUSTER ASSEMBLY, each comprising:-
15	13 35 302	1	.Needle mounting shoe with bolt assembly
16	13 35 104	1	..Welded bolt assembly c/w nuts
17	01 41 006	2	...Aeronut 5/8" UNF
18	01 31 006	2	..Locknut 5/8" UNF
19	13 35 105	2	.Needle adjuster pin c/w nut
20	01 51 009	1	..Thin aeronut 1" UNF
21	05 03 125	1	..Split pin 3/16" x 1 1/2"
22	01 00 109	1	..Washer 1"
	13 35 345	2	ADJUSTABLE NEEDLE LINK ASSEMBLY each comprising:-
23	13 35 106	1	.Needle adjustable block, c/w bushes 2 off 71 01 C
24	13 35 107	1	.Needle adjusting trunnion
25	01 00 106	1	..Washer 5/8"
26	05 03 104	1	..Split pin 5/32" x 1 1/4"
27	13 35 209	1	.Needle adjusting pin c/w split pin
28	05 03 104	2	..Split pin 5/32" x 1 1/4"
29	03 16 367	1	.Screw 3/4" UNC x 4 1/2"
30	01 12 007	2	.Plain nut 3/4" UNC
31	13 35 310	1	.Needle assembly c/w bushes and eye
32	71 03 083	2	..Bush 1"
33	71 01 036	1	..Bush 5/8"
34	13 35 243	1	..Needle eye
35	13 35 134	2	..Rivet 1/4"

4 BOLT BALER FITTINGS

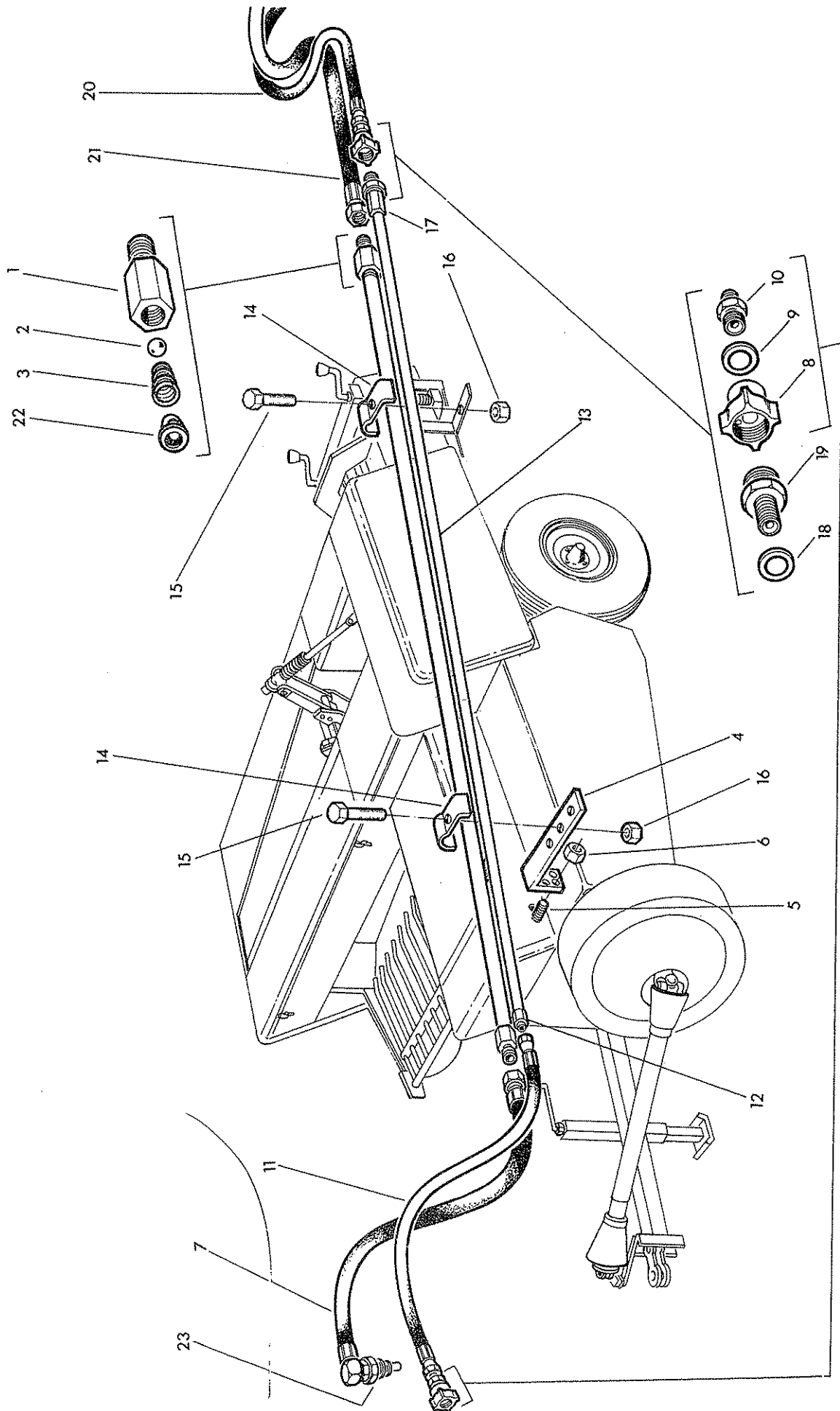


16 BOLT BALER FITTINGS



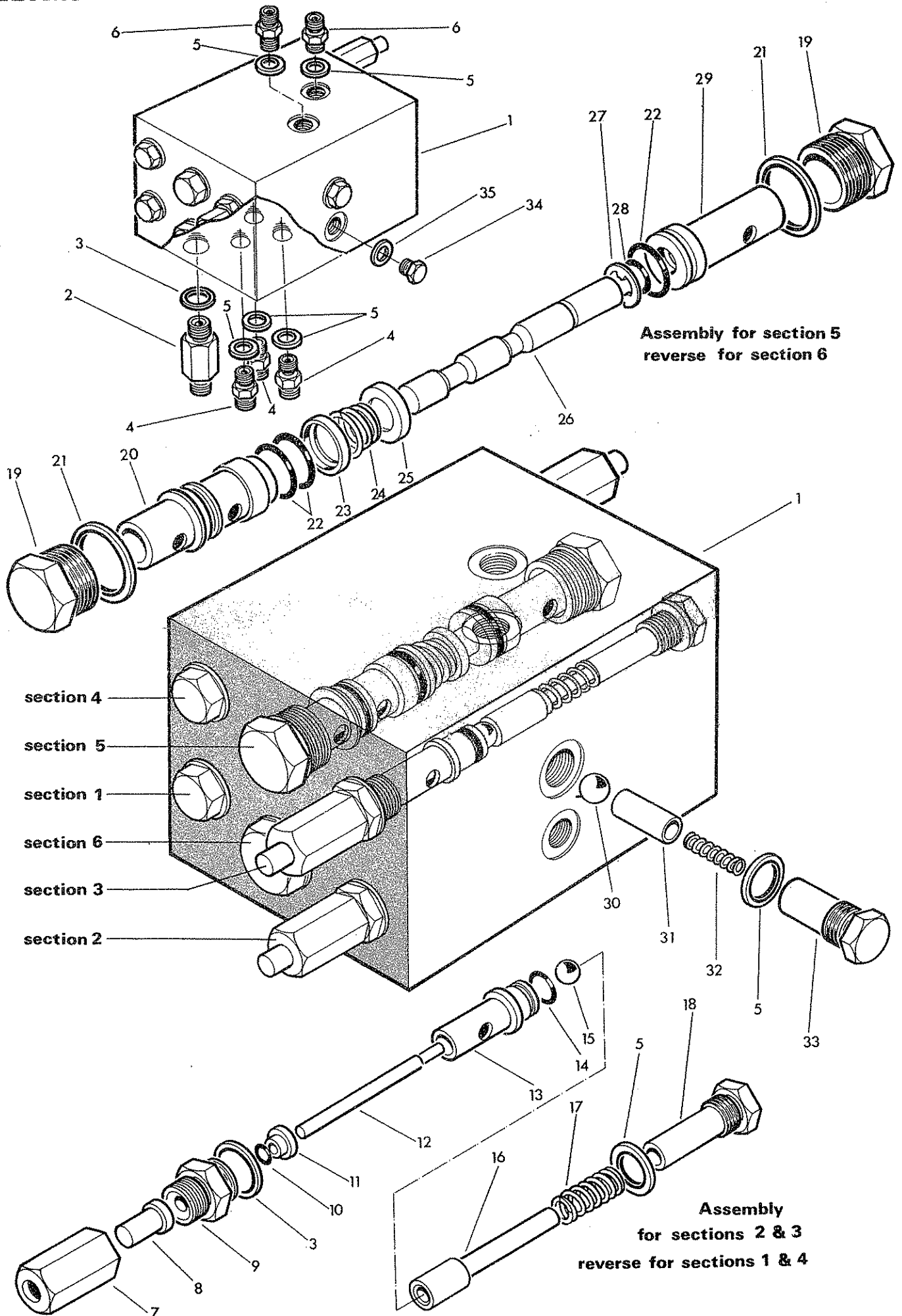
Ref	Part No	Qty	Description
	13 36 273	1	4 BOLT BALER FITTING ASSEMBLY
1	13 36 269	1	.Baler tow bar housing
2	13 36 032	2	.Mounting bracket
3	13 36 033	1	.Pipe support stay
4	13 36 037	1	.Axle pull bar
5	13 36 035	2	.Axle lug
6	13 36 026	2	.Axle mounting angle
7	13 36 036	1	.Headed pin
8	05 03 105	1	..Split pin 3/16" dia. x 1¼"
9	13 36 029	1	.Strut lug
10	13 36 027	1	.Inner strut
11	13 36 028	1	.Outer strut
12	03 11 146	2	.5/8" UNF setscrew x 1¼" long
13	01 41 006	2	.5/8" UNF aeronut
14	93 00 102	4	.M10 domed setscrew x 32 mm long
15	91 13 005	4	.M10 plain nut
16	01 00 203	4	.3/8" spring washer
17	13 36 262	1	.Bale platform
18	13 36 018	1	..Pin c/w split pin
19	05 03 105	1	...3/16" split pin x 1¼" long
	13 36 272	1	16 BOLT BALER FITTING ASSEMBLY
20	13 36 259	1	.Baler tow bar housing
21	13 36 260	1	.Chamber bracket with lug
22	13 36 261	1	.Chamber bracket
23	13 36 034	1	.Axle pull bar
24	13 36 035	1	.Axle lug
25	13 36 026	2	.Axle mounting angle
26	13 36 036	1	.Headed pin
27	05 03 105	1	..Split pin 3/16" dia. x 1¼"
28	13 36 029	1	.Strut lug
29	13 36 027	1	.Inner strut
30	13 36 028	1	.Outer strut
31	03 11 146	6	.5/8" UNF setscrew x 1¼" long
32	01 41 006	6	.5/8" UNF aeronut
33	93 00 102	16	.M10 domed setscrew x 32 mm long
34	91 13 005	16	.M10 plain nut
35	01 00 203	16	.3/8" spring washer
36	13 36 262	1	.Bale platform
37	13 36 018	1	..Pin c/w split pin
38	05 03 105	1	...3/16" split pin x 1¼" long

BALER HYDRAULIC FITTINGS KIT



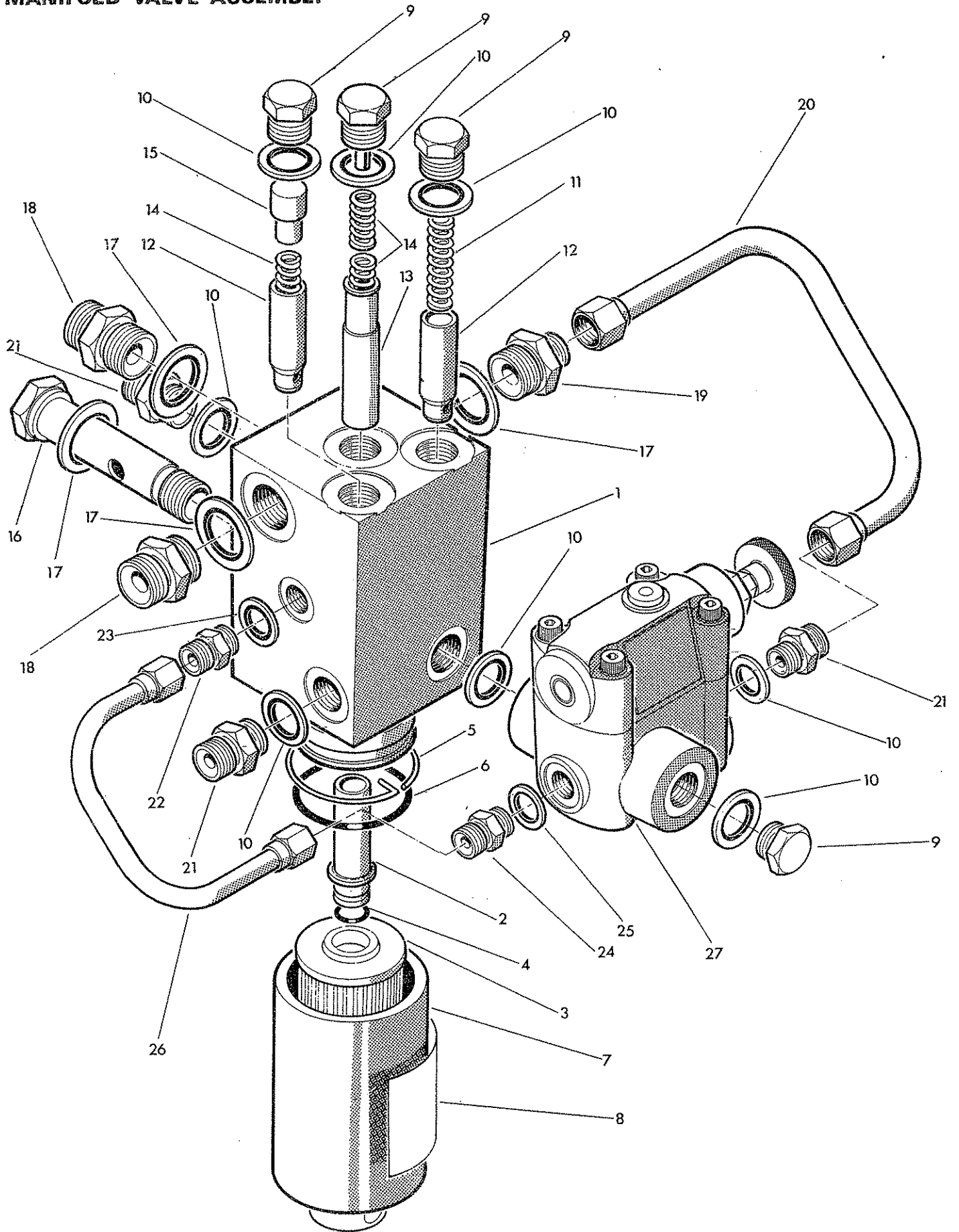
Ref	Part No	Qty	Description
	80 16 251		BALER PIPING INSTALLATION
1	85 81 140	1	.Non return valve housing
2	09 05 124	1	.Steel ball $\frac{3}{4}$ " diameter
3	80 16 001	1	.Conical spring
4	13 36 022	1	.Pipe stay c/w bolts and nuts
5	03 11 105	2	.. Setscrew $\frac{1}{2}$ " UNF x $1\frac{1}{4}$ " long
6	01 41 005	2	.. Aeronut $\frac{1}{2}$ " UNF
7	85 01 069	1	.Hose $\frac{3}{4}$ " BSP x 120" long
8	85 90 023	2	.Female self-sealing coupling
9	86 50 103	2	.Bonded seal $\frac{3}{8}$ " BSP
10	60 00 112	2	.Union $\frac{3}{8}$ " BSP x $\frac{1}{2}$ " BSP
11	85 13 024	1	.Hose $\frac{1}{2}$ " BSP x 120" long
12	85 81 142	1	.Adaptor $\frac{1}{2}$ " BSP x $\frac{3}{8}$ " BSP
13	13 36 265	1	.Return & pressure pipe welded assembly
14	13 36 013	2	.Pipe clip c/w nut and bolt
15	02 11 165	1	.. Bolt $\frac{1}{2}$ " UNF x 2" long
16	01 41 005	1	.. Aeronut $\frac{1}{2}$ " UNF
17	80 02 056	1	.Adaptor
18	86 50 104	1	.Bonded seal $\frac{1}{2}$ " BSP
19	85 90 013	1	.Male self sealing coupling
20	85 13 014	1	.Hose $\frac{1}{2}$ " BSP x 84" long
21	85 01 070	1	.Hose $\frac{3}{4}$ " BSP x 84" long
22	80 16 002	1	.Ball stop
23		1	.Tractor return connector - to suit tractor

SEQUENCE VALVE ASSEMBLY



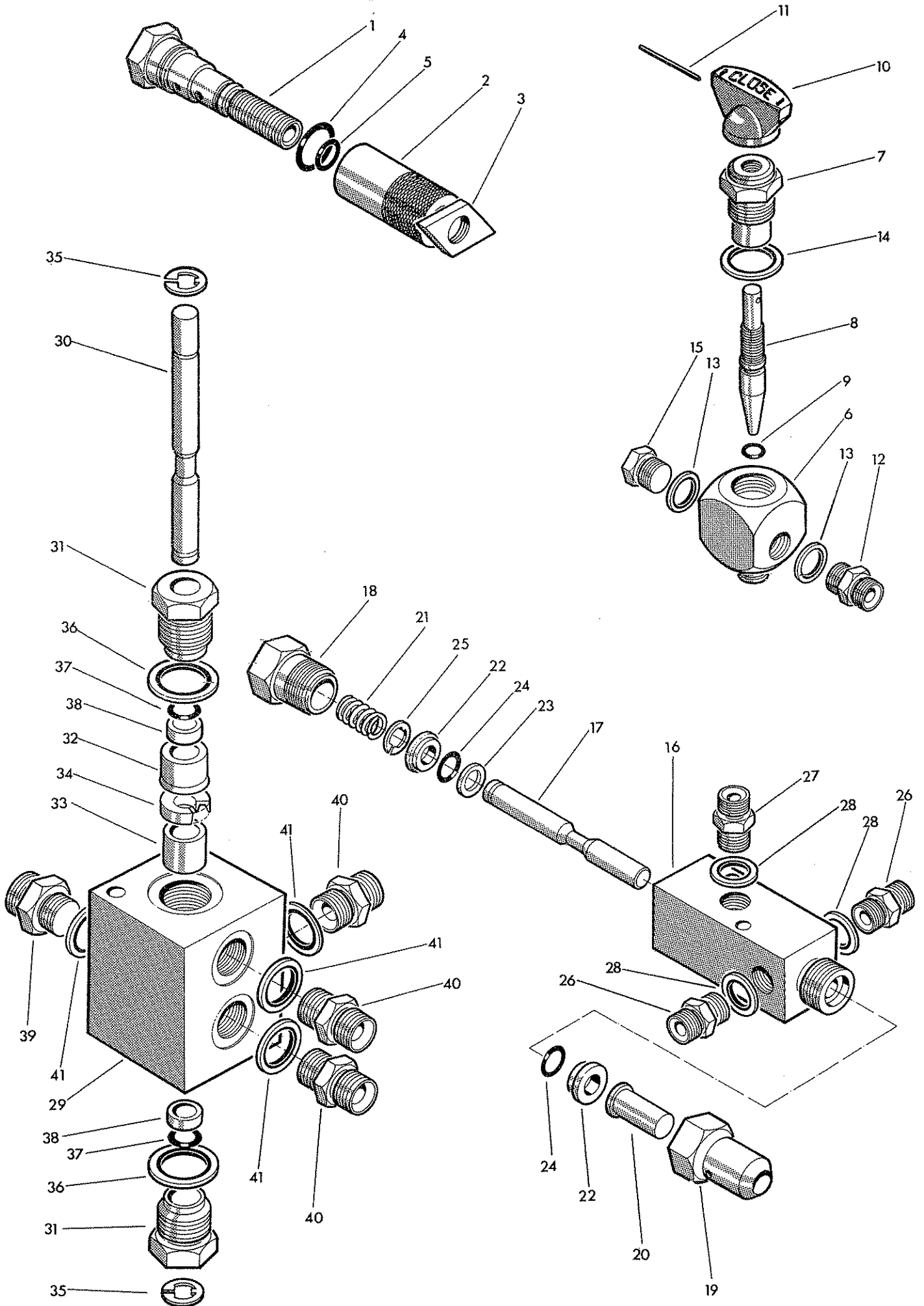
Ref	Part No	Qty	Description
	81 27 250		SEQUENCE VALVE ASSEMBLY
1	81 27 252	1	.Main body
2	85 81 132	1	.Extension union 1/2" BSP - 3/4" BSP
3	86 50 104	5	.Bonded seal 1/2" BSP
4	60 00 112	3	.Union 3/8" BSP - 1/2" BSP
5	86 50 103	10	.Bonded seal 3/8" BSP
6	60 00 113	2	.Union 3/8" BSP - 3/8" BSP
7	81 27 006	4	.Plunger guide
8	81 27 010	4	.Plunger pilot plug
9	81 27 004	4	.Push rod guide
10	86 00 103	4	.O' ring
11	81 27 013	4	.Push rod guide ring
12	81 27 009	4	.Push rod
13	81 27 007	4	.Ball seat
14	86 00 109	4	.O' ring
15	09 05 112	4	.Ball 3/8" diameter
16	81 27 008	4	.Spring seat
17	81 11 009	4	.Spring
18	81 27 005	4	.Retainer plug
19	81 27 067	4	.End plug
20	81 27 068	2	.Valve sleeve
21	86 50 218	4	.Bonded seal 1.1/8" UNF
22	86 00 401	6	.O' ring
23	81 27 070	2	.Seal plate
24	81 14 003	2	.Spring
25	81 27 071	2	.Spring plate
26	81 27 066	2	.Valve spool
27	81 14 058	2	.Circlip
28	86 00 110	2	.O' ring
29	81 27 069	2	.Seal spacer
30	09 05 116	1	.Ball 1/2" diameter
31	81 27 084	1	.Spring guide
32	81 27 019	1	.Spring
33	81 27 072	1	.Spring retainer
34	85 81 113	1	.Plug
35	86 50 102	1	.Bonded seal 1/4" BSP
	86 99 151		Seal kit

MANIFOLD VALVE ASSEMBLY



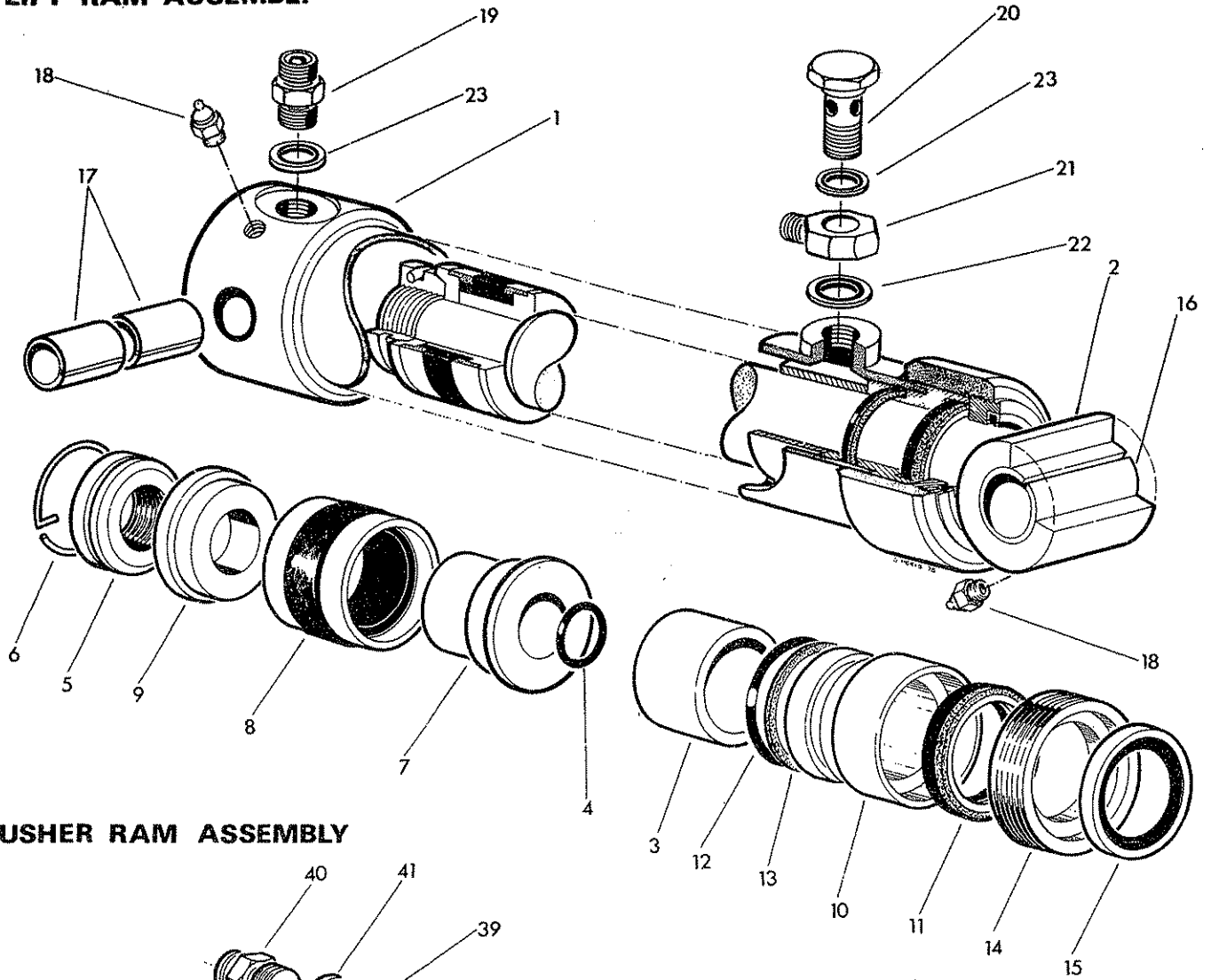
Ref	Part No	Qty	Description
	81 27 500		MANIFOLD VALVE ASSEMBLY
1	81 27 501	1	.Main body
2	81 27 076	1	.Filter adaptor
3	84 01 006	1	.Filter element c/w 'O' ring
4	87 00 641	1	.. 'O' ring
5	81 27 083	1	.Locking wire
6	86 00 306	1	. 'O' ring
7	81 27 075	1	.Filter case
8	84 01 007	1	.Instruction label
9	81 03 001	4	.Plug ½" BSP
10	86 50 104	8	.Bonded seal ½" BSP
11	81 04 018	1	.Spring
12	81 27 078	2	.Piston
13	81 27 077	1	.Safety piston
14	81 11 009	3	.Spring
15	81 27 079	1	.Spring spacer
16	81 27 080	1	.Banjo bolt
17	86 50 106	4	.Bonded seal ¾" BSP
18	85 81 136	2	.Union ¾" BSP - ¾" BSP
19	85 81 130	1	.Union ¾" BSP - ½" BSP
20	81 27 081	1	.Pipe assembly ½" BSP
21	85 81 110	3	.Union ½" BSP - ½" BSP
22	60 00 113	1	.Union 3/8" BSP - 3/8" BSP
23	86 50 103	1	.Bonded seal 3/8" BSP
24	85 81 115	1	.Union 3/8" BSP - ¼" BSP
25	86 50 102	1	.Bonded seal ¼" BSP
26	81 27 082	1	.Pipe assembly 3/8" BSP
27	81 11 260	1	.Unloader valve assembly

AUXILIARY HYDRAULIC ASSEMBLIES

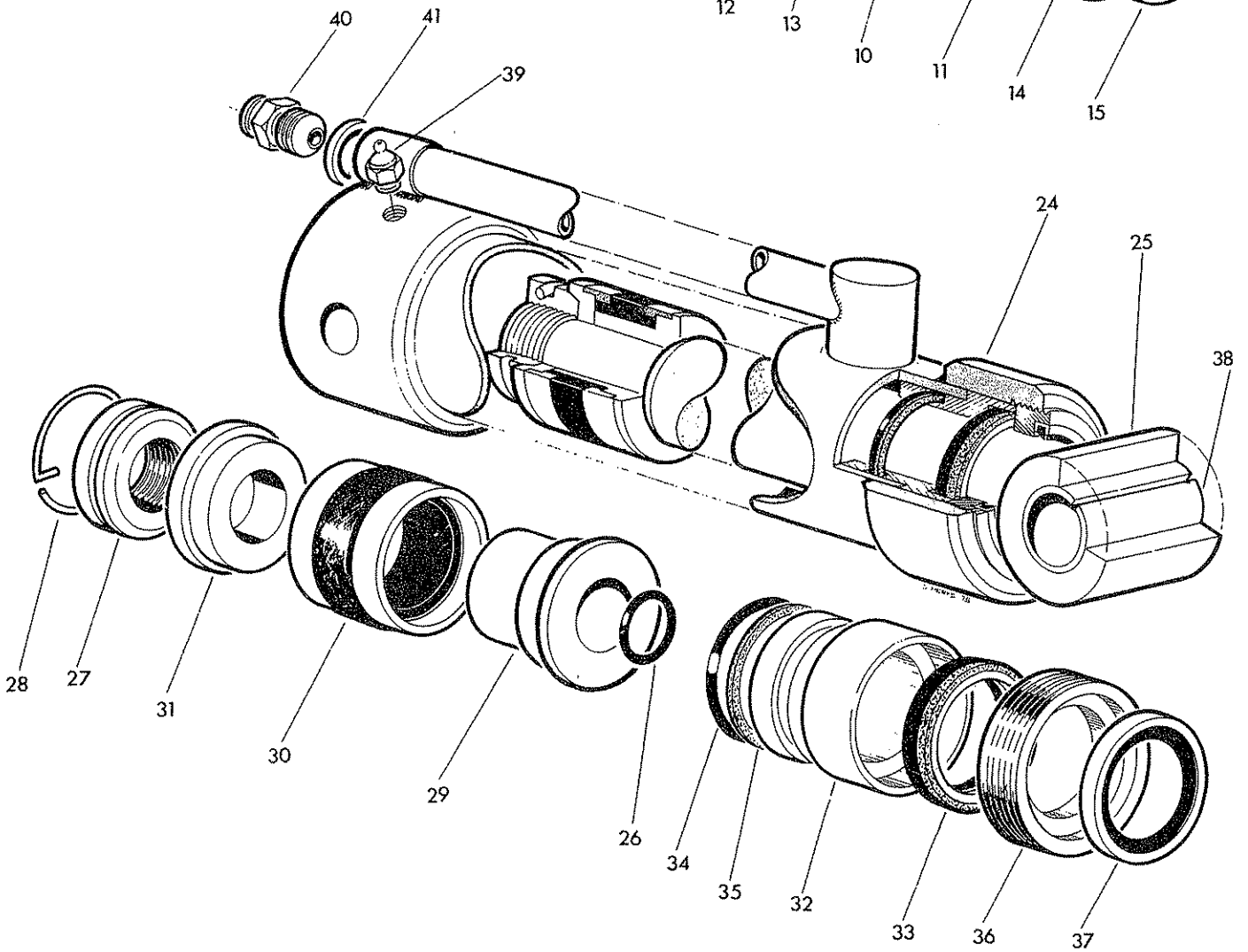


Ref	Part No	Qty	Description
	81 27 450	1	LOCK/RESTRICTOR ASSEMBLY
1	81 27 451	1	.Main body
2	81 27 116	1	.Sleeve
3	81 27 117	1	.Lock nut
4	87 00 646	1	.'O' ring
5	87 00 640	1	.'O' ring
	13 37 134	2	HYDRAULIC TAP ASSEMBLY
6	13 37 133	1	.Tap body
7	81 06 043	1	.Gland nut
8	81 06 044	1	.Spindle c/w 'O' ring
9	81 06 045	1	..'O' ring
10	81 08 006	1	.Knob
11	04 20 820	1	.Spring dowel 1/8" diameter
12	60 00 113	1	.Union 3/8" BSP
13	86 50 103	2	.Bonded seal 3/8" BSP
14	86 50 104	1	.Bonded seal 1/2" BSP
15	80 03 001	1	.Plug
	81 27 354	1	LIFT CONTROL VALVE ASSEMBLY c/w UNIONS
	81 27 352	1	.Lift control valve
16	81 27 353	1	..Main body
17	81 27 110	1	..Spindle
18	81 27 111	1	..Spring cap
19	81 27 112	1	..Push rod cap
20	81 27 113	1	..Tappet
21	81 08 008	1	..Spring
22	81 27 114	2	..Seal plate
23	81 27 115	1	..Spacer
24	86 00 110	2	..'O' ring
25	81 14 058	1	..Circlip
26	60 00 112	2	.Union 1/2" - 3/8" BSP
27	60 00 113	1	.Union 3/8" BSP
28	86 50 103	3	.Bonded seal 3/8" BSP
	81 27 402	1	ISOLATION VALVE ASSEMBLY c/w UNIONS
	81 27 400	1	.Isolation valve
29	81 27 401	1	..Body
30	81 27 064	1	..Shut-off spindle
31	81 27 065	2	..End plug
32	81 08 011	1	..Spacer
33	81 08 014	1	..Spacer
34	81 06 022	1	..Seal
35	81 14 058	2	..Circlip
36	86 50 218	2	..Dowty seal 1.1/8" UNF
37	86 00 110	2	..'O' ring
38	81 27 053	2	..Bush
39	85 81 143	1	.Blanking union
40	85 81 110	3	.Union 1/2" - 1/2" BSP
41	86 50 104	4	.Bonded seal 1/2" BSP
	86 99 152		Seal kit

LIFT RAM ASSEMBLY



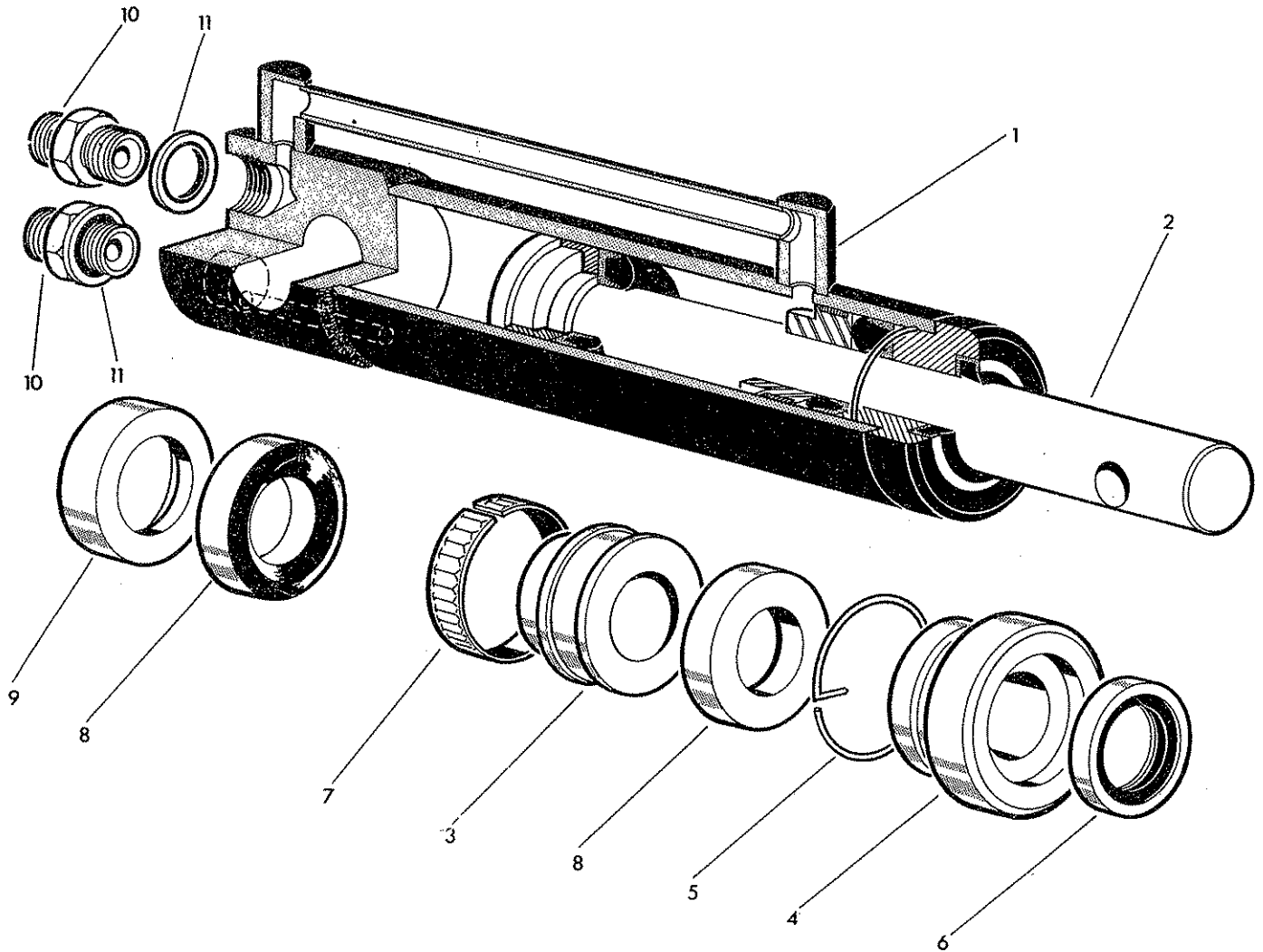
PUSHER RAM ASSEMBLY



Ref	Part No	Qty	Description
	13 35 435	1	PLATFORM LIFT RAM ASSEMBLY c/w BUSHES etc.
	13 35 952	1	Ram - 2¼" bore x 12" Stroke comprising
1	13 35 379	1	..Ram cylinder
2	72 12 004	1	..Piston rod '0' ring and nut
3	71 06 196	1	..Ram spacer
4	86 00 119	1	... '0' ring for piston rod
5	71 01 096	1	..Piston nut
6	71 01 152	1	..Locking ring
7	71 01 097	1	..Piston inner assembly c/w sea'
8	86 35 131	1	... Seal
9	71 01 098	1	..Piston - outer
10	71 01 099	1	..Gland housing assembly
11	86 22 127	1	... Gland seal
12	86 00 304	1	... '0' ring
13	86 09 304	1	... Anti-extrusion ring
14	71 01 100	1	..Gland nut assembly
15	86 40 328	1	... Wiper seal
16	71 05 050	1	.Bush - rod end
17	71 01 158	2	.Sleeve
18	09 01 121	2	.Greaser
19	60 00 113	1	.Union 3/8" BSP
20	85 81 138	1	.Banjo bolt
21	85 81 137	1	.Banjo
22	86 50 104	1	.Bonded seal ½" BSP
23	86 50 103	2	.Bonded seal 3/8" BSP-
	86 99 102		SEAL KIT

			PUSHER RAM ASSEMBLY c/w BUSHES etc.
	13 35 434	1	.Ram - 2¼" bore x 13,7/8" stroke comprising:-
24	72 12 272	1	..Ram cylinder
25	13 37 010	1	..Piston rod
26	86 00 119	1	... '0' ring for piston rod
27	71 01 096	1	..Piston nut
28	71 01 152	1	..Locking ring
29	71 01 097	1	..Piston inner assembly c/w seal
30	86 35 131	1	... Seal
31	71 01 098	1	..Piston - outer
32	13 37 009	1	..Gland housing assembly
33	86 29 129	1	... Seal
34	86 00 304	1	... '0' ring
35	86 09 304	1	... Anti-extrusion ring
36	13 37 011	1	..Gland nut assembly
37	86 29 117	1	... Wiper
38	60 12 022	1	.Bush - rod end
39	09 01 121	1	.Greaser
40	81 07 010	1	.Restrictor assembly
41	86 50 103	1	.Bonded seal 3/8" BSP
	86 99 153		SEAL KIT

SWING RAM ASSEMBLY



Ref	Part No	Qty	Description
	13 35 430	1	SWING RAM ASSEMBLY c/w UNIONS
	13 35 431	1	.Basic ram
1	13 35 432	1	..Ram barrel welded assembly
2	13 37 004	1	..Piston rod
3	13 37 005	1	..Retaining ring
4	13 37 006	1	..Gland bush
5	13 37 007	1	..Locking wire
6	86 40 319	1	..Wiper seal
7	86 55 127	1	..Tolerance ring
8	86 14 119	2	..Single acting seal
9	13 37 008	1	..Wear ring
10	60 00 113	2	..Union 3/8" BSP
11	86 50 103	2	..Bonded seal 3/8" BSP
	86 99 155		Seal kit

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