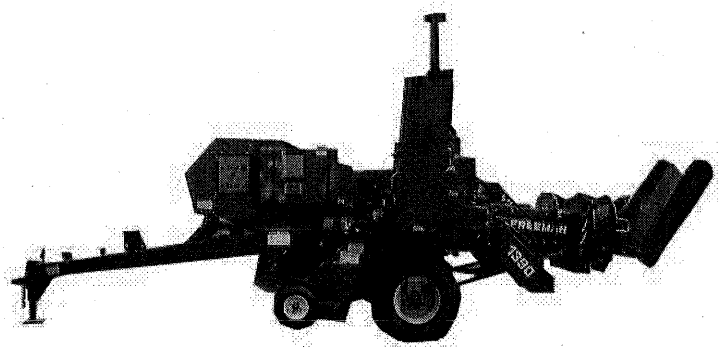
FREEMAN



MODEL 1390
AUTOMATIC HAY BALER

OPERATOR'S MANUAL

PB1390OPS2

CAUTION PRUDENCE

ACHTUNG PRUDENZA

1. Keep all shields in place.
2. Always stop engine before leaving operator's position and in any case, make sure precautions are taken.
3. Wait for all movement to stop before servicing this Machine.
4. Keep hands, feet and clothing away from power driven parts.
5. Never adjust, lubricate, clean or unclog unless engine is stopped.
6. Read operator's manual before operating machine. Illustrated parts listing is available from your dealer.
7. After servicing, make sure that tools and parts are stored and reinstall shields.
8. Make certain everyone is clear of machine before starting engine or operation.
9. Contact with moving parts or with any material which can be drawn into moving parts can result in serious injury.
10. Use flashing warning lights when operating on highways except when prohibited by law.

1. Bevor mit der Maschine gearbeitet wird, sind die Bedienungsaciaitung und die angebrachten Hinweimhilder zu lesen. Aile Sicherheits-vorschriften sind einzuhalten.

2. Vor Inbetriebnahme ist darauf zu achten, dass aile Schutzeinrichtungen angebracht sind, und dass sich keine Person im Getahrenbereich der Maschine authält.

3. Instandsetzungs, Einstellungs, Wartungs und Reinigungsarbeiten nur bei abgeschaltetem Antrieb und stillstehender Maschine vornehmen.

4. Werkzeuge oder andere lose Teile nicht in order auf der Maschine belassen.

5. Bei Fahrten auf öffentlichen Strassen sind die in Ihrem Lande geltende Vorschriften und Regelungen einzuhalten.

1. Maintenir tous les protecteurs en place.
2. Toujours arrêter le moteur avant de quitter le poste de conduite et, d'une facon générale, s'assurer que toutes les précautions sont prises.
3. Attendre l'arrdt de toutes les piéces en mouvement avant d'intervenir sur la machine.
4. Ne pas approcher mains, pieds, vétements des parties en mouvement.
5. Ne jamais régler, graisser, nettoyer ou débourrer la machine sans que le moteur soit arrêté.
6. Prendre connaissance du manuel d'utilisation avant de travailler avec la machine. Le catalogue piéces de rechanges est disponible chez votre concessionnaire.
7. Aprés intervention, veiller á ce que les outils et piéces soient rangés et remettre les carters en place.
8. S'assurer que personne n'est prés de la machine avant de démarrer le moteur ou de travailler.
9. Risque de dégats importants si quelqu'un ou quelque chose est happé par des piéces en mouvement.
10. Utiliser les feux de détresse pour la conduite sur routes, sauf si la loi l'interdit.

1. Tenere tutte le prolezioni at loro posto.
2. Spegnere sempre il motore prima di lasciare il posto di guida e, in linea di massima, assicurarsi che siano prese tutte le precauzioni.
3. Attendere l'arresto completo di tutti gli organi prima di intervenire sulla macchina.
4. Non avvicinare mani, piedi, vestiti agli organi in movimento.
5. Solo a motore spento si puó registrare, ingrassáre, pulire o eliminare gli ingolfamenti.
6. Consultare attentamente il manuale d'istruzione prima di iniziare il lavoro con la macchina. Il catalogo parti di ricambio é disponibile presso il vostro concessionario.
7. Dopo qualsiasi intervento sistemare attrezzi e pezzi e rimettere a posto le protezioni.
8. Assicurarsi che non ci sia nessuno nelle vicinanze della macchina prima di metteria il moto o iniziare il lavoro.
9. Rischi e gravi infortuni subiscono coloro che sono agganciati da parti in movimento.
10. Utilizare i fari lampeggianti durante i trasferimenti su strada.

TABLE OF CONTENTS

SAFETY

J.A. Freeman & Son is greatly concerned with safety. The Freeman 1390 Baler is furnished with safety features. Even with these safety features, personal injury or death can still occur if the operator is careless, negligent or thoughtless when maintaining, lubricating, operating, unclogging, or servicing the baler.

Your Freeman 1390 Baler has safety shields to help prevent personal injury. Do not operate the machine unless all shields are in place. There are also "CAUTION," "DANGER," and "WARNING" decals on the baler. Read and Obey decals.

Following is a list of precautions that must be taken to help prevent personal injury or death:

1. DO NOT START,OPERATE OR SERVICE THIS MACHINE WITH OUT READING AND UNDERSTANDING THIS MANUAL.

2. SHUT OFF ENGINE BEFORE ADJUSTING, LUBRICATING, CLEANING OR SERVICING THE BALER.

3. KEEP HANDS, FEET AND CLOTHING AWAY FROM ALL MOVING PARTS AND PINCH OR CRUSH POINTS.

4. USE APPROPRIATE SIGNS AND WARNING LIGHTS WHEN OPERATING ON PUBLIC ROAD WAYS.

5. MAKE CERTAIN EVERYONE IS CLEAR OF THE BALER BEFORE OPERATING ANY PART OF THE MACHINE.

6. DO NOT LEAVE THE OPERATOR'S SEAT WHILE THE EQUIPMENT IS IN OPERATION OR WHILE ANY OF THE MOVING PARTS REMAIN IN MOTION.

7. KEEP ALL SHIELDS IN PLACE AND IN SERVICEABLE CONDITION.

8. DO NOT GO NEAR ANY EQUIPMENT UNTIL ALL MOVING PARTS ARE STOPPED.

9. DO NOT GO UNDER ANY RAISED COMPONENTS UNTIL THEY ARE SAFELY BLOCKED.

10. AT ALL TIMES CARRY BOTH AN "ABC" RATED FIRE EXTINGUISHER AND WATER TYPE FIRE EXTINGUISHER ON THE MACHINE.

11. ALWAYS USE LIGHTS FOR NIGHT WORK.

12. REMEMBER "SAFETY" IS ONLY A WORD UNTIL IT IS PUT INTO PRACTICE.

 WARNING: SOME ILLUSTRATIONS IN THIS MANUAL SHOW THE BALER WITHOUT SHIELDS TO ALLOW FOR A BETTER VIEW OF THE AREA BEING ADDRESSED. THE BALER SHOULD NEVER BE OPERATED WITH ANY OF THE SAFETY SHIELDS REMOVED.

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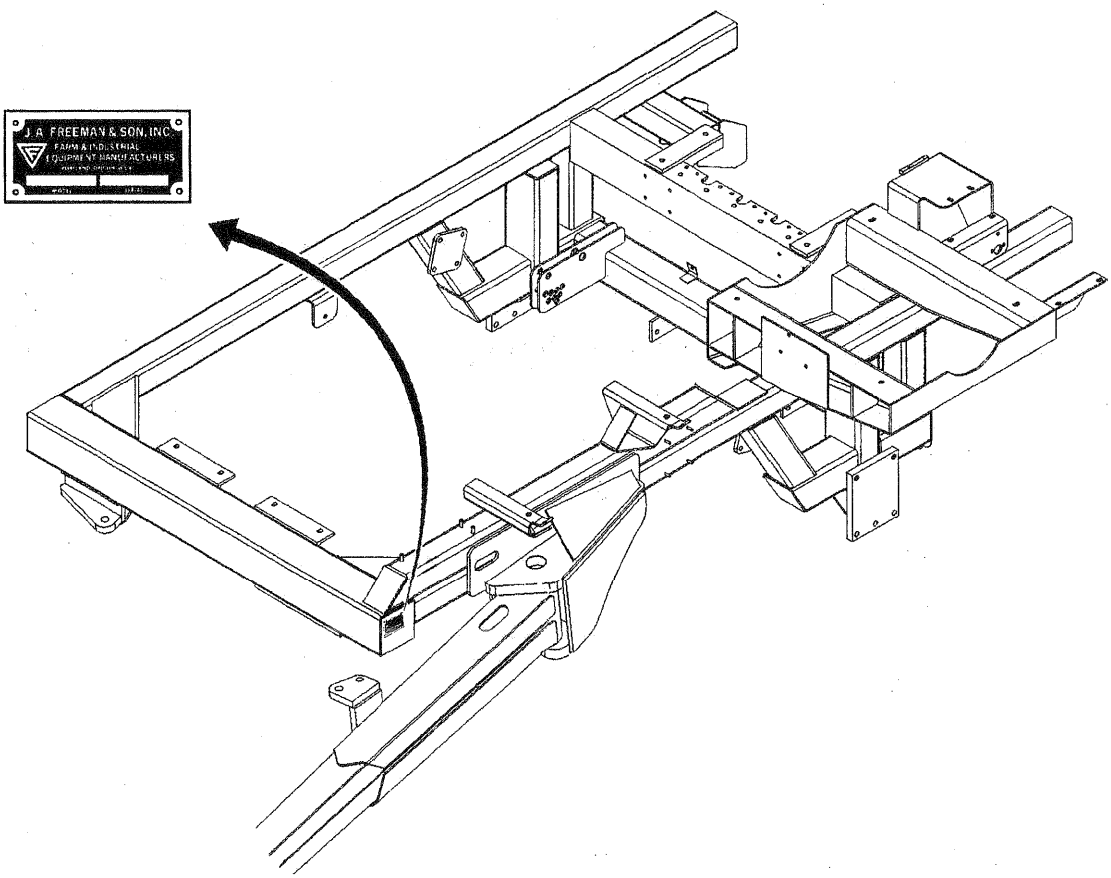
SERIAL NUMBER LOCATION

The serial number is an important piece of information about the machine and it may be necessary to know it before obtaining the correct replacement part. The serial number is located on the left front frame rail as shown.



J.A. FREEMAN & SON, INC.
2034 N.W. 27th Avenue
Portland, Oregon 97210
(503) 222-1971, FAX (503) 228-9668
www.freemanbaler.com
Since 1889

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SPECIFICATIONS:

DIMENSIONS / WEIGHT:
Length with bale chute.....310" (7874mm)
Height.....126" (1956mm)
Width.....102" (2591mm)
Weight.....11600 Lb. (5262kg)
Tongue Weight.....1280 Lb. (580kg)

ENGINE TYPE:
Deutz 4 Cyl. In line.....(230 CID) 3.77L
Horsepower.....62 H P
Fuel.....Diesel
Fuel Tank Capacity.....30 Gal. (113L)
Oil Capacity.....10 Quarts (9.46L)

TIRE SIZE:
Baler.....14 Ply Rated, 14 x 17.5"
Pickup.....4" x 8"

LIGHTS:
Working.....6 Halogen Lamps
Road.....2 Red and 2 Amber Lamps

PICKUP:
Width, Outside.....99-1/4" (2520mm)
Width, Inside.....92" (2336mm)
Width, Tine to Tine.....81-3/8" (2066mm)
Number of Tine Bars.....8
Number of Tines.....128
Tine Spacing.....2-5/8" (66mm)
Tine Bar Bearings.....Sealed Ball
Augers.....12" (305mm)
Protection.....Slip and Overrunning Clutch
Gauge Wheels.....2 Fixed Gauge
Pickup Lift.....Hydraulic Cylinder
Drive Cam.....Computer Generated Profile

BALER HITCH TYPE:
2 5/16" Diameter

FEED SYSTEM:
Charge System.....6 Tine, Dual Stage
Drive Protection.....Shear Bolt (3/8x2 1/4" NC)

BALE SIZE:
Size.14x21"(355mm x 533mm)15x22"(381mm x 559mm)16 x 22"(406mm x 559mm)
Width.....22"(559 mm).....22"(559 mm).....22"(559 mm)
Height.....14"(355mm).....14-1/2"(368 mm).....15"(381 mm)

BALE DENSITY SYSTEM:
Hydraulic Control .....4 Way Squeeze

PLUNGER:
Speed.....95 Strokes per Min
Length of Stroke.....24"

TYING MECHANISM:
Knotter.....3 Heavy Duty Knotters
Twine finger Protection.....Shear Bolt (1/4 x 1 1/4" NC)
Twine Type.....Polypropylene (Minimum 240 Knot Strength)
Twine Storage Capacity.....12 Balls of Twine
Knotter Blower.....Fan Blade Type
Drive Protection.....Shear Bolt ((2) 1/4 x 1 3/4" NC)

KNOTTER LUBRICATION:
Automatic Luber.....18 Points

MAIN DRIVE:
Gearbox..... Spur Gears (8.6:1 Ratio)
Flywheel Diameter.....28" (711 mm) Dia
Flywheel Weight.....440 Lb. (199kg)
Flywheel Protection.....Shear Bolt (3/8 x 61/2" NC)

BALE CHUTE:
Type .....Combination Flat Drop / Quarter Turn on Edge

BALER CONTROLS	TRACTOR MOUNTED CONTROLS	BALER MOUNTED CONTROLS
• Fuel Gauge	■	■
• Engine Start / Stop	■	■
• Bale Density	■	■
• Engine Speed	■	■
• Pickup Lift	■	■
• Clutch Engage	■	■
• Drawbar Swing	■	■
• Work Lights	■	■
• Baler Strokes per Minute Indicator	■	
• Strokes per Bale Indicator	■	
• Local / Remote Switch		■
• Engine Hour Meter		■
• Alternator, Oil Pressure and Temperature Warning Lights		■
• Non Resettable Bale Counter		■
• Resettable Bale Counter	■	■

ALL ABOVE SPECIFICATIONS ARE SUBJECT TO CHANGE WITHOUT NOTICE.

LUBRICATION / SERVICE SCHEDULE

Only through timely service, maintenance and making the proper adjustments can you realize the optimum performance and long life from this equipment. Follow these recommended service checks at their suggested intervals to maximize the baler's performance and service life.

CAUTION: ALWAYS STOP THE BALER ENGINE AND WAIT FOR ALL MOTION TO CEASE BEFORE SERVICING OR ADJUSTING THE MACHINE.

HYDRAULIC OIL:
Chevron AW-46 or equivalent
Capacity: 5 Gallon's / 19 L

GREASE:
Multi-purpose grease

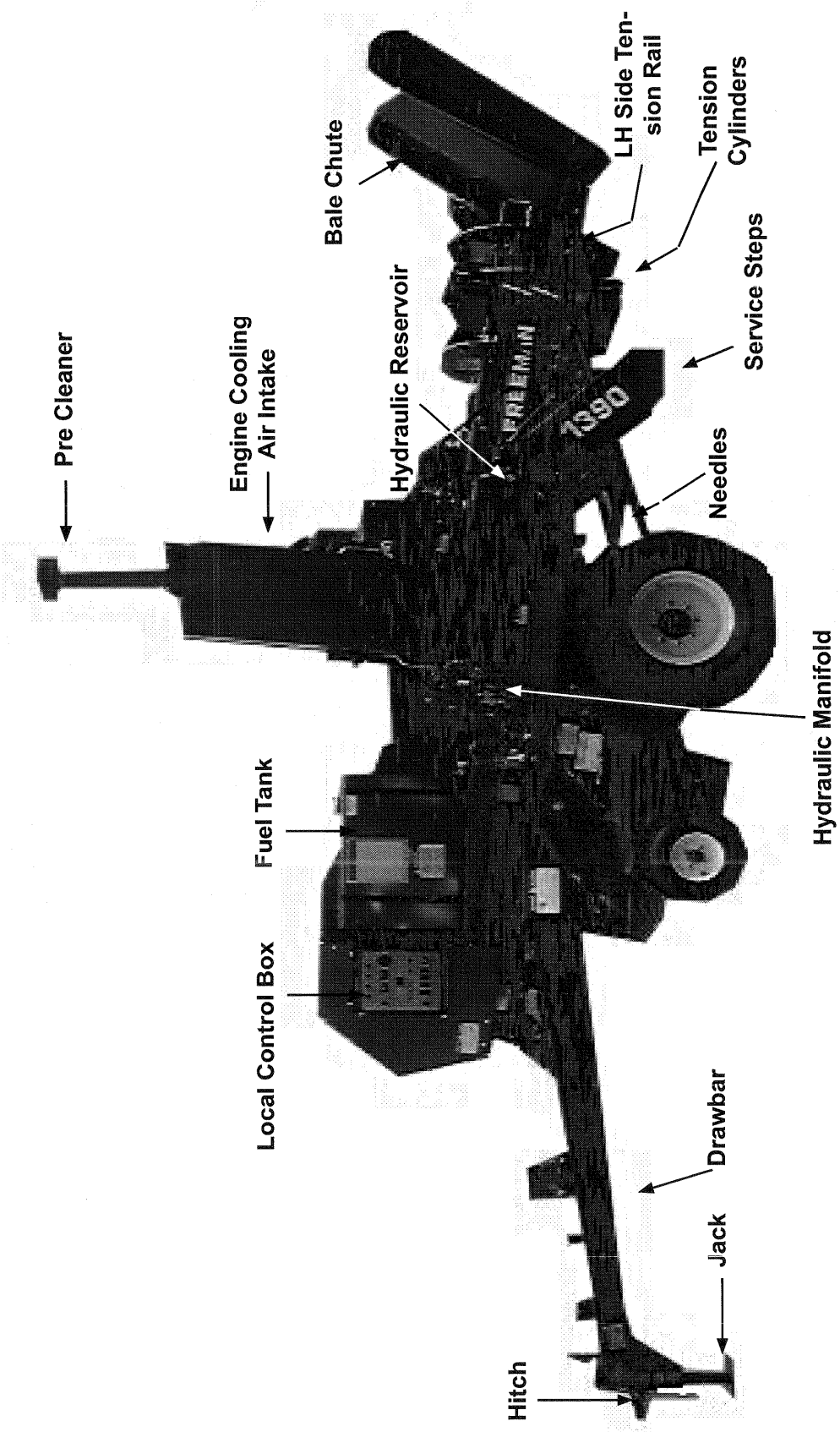
AUTOMATIC KNOTTER LUBER:
SAE 30 WT. motor oil
Capacity: 1 Gallon / 3.7 L

ENGINE LUBRICATION:
See engine manufacturer's owner's manual

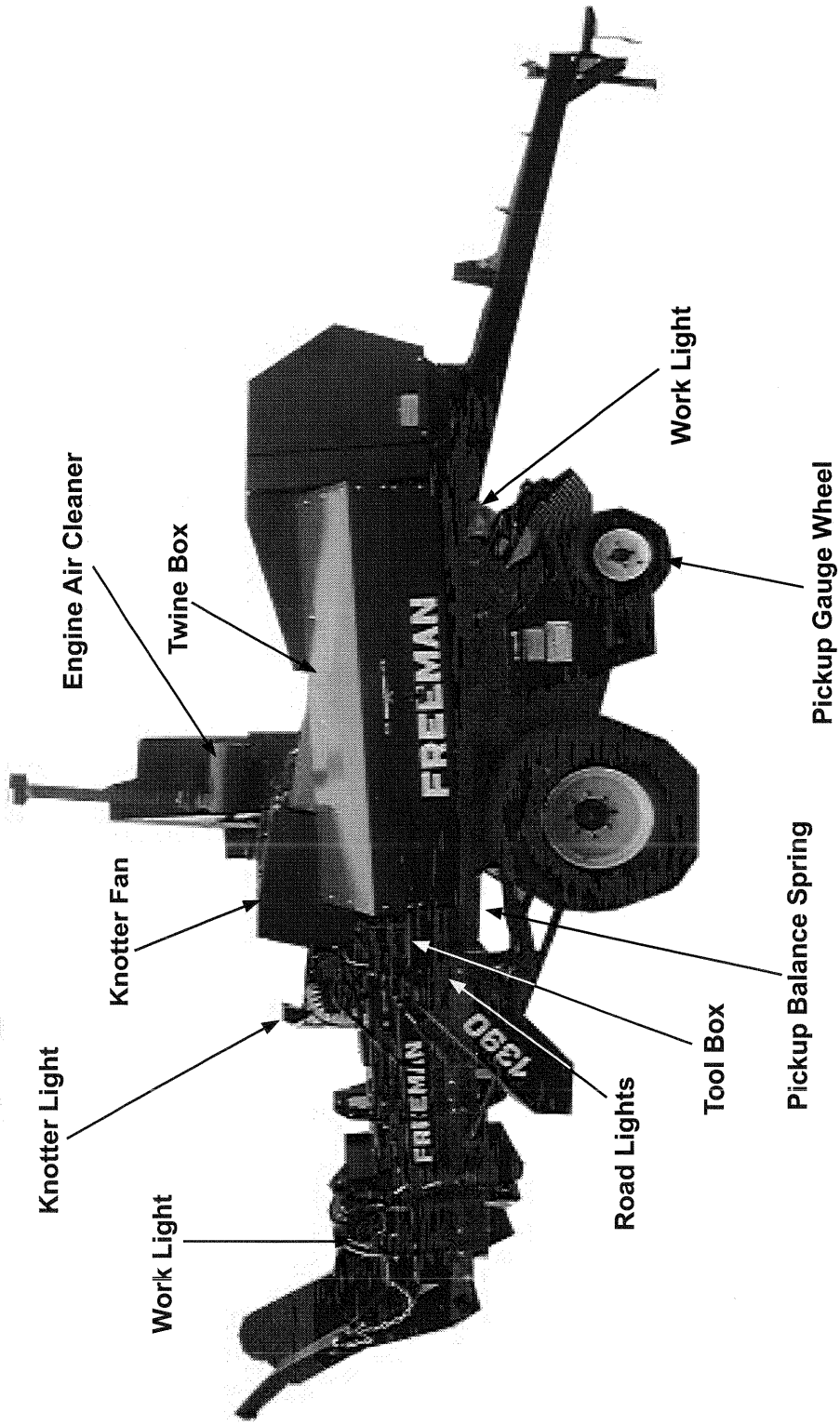
GEARBOX:
SAE 90-140 gear oil
Capacity: 1.5 Gallons / 5.6 L

CHECK/SERVICE EVERY:	Start Of Season	Daily	4 Hours	80 Hours	250 Hours	500 Hours	End Of Season
Engine Oil Level	■	■					■
Change Engine Oil (See engine manufacturer's owner's manual)							
Oil Level In Knotter Luber Tank	■	■					
System Hydraulic Oil Level	■	■					
Gear Box Oil Level	■	■					
Change Gear Box Oil (Change after first 50 hours then every 250 hours)					■		■
Change Hydraulic Oil & Filters							■
Change Knotter Luber Filter							■
Engine Air Cleaner	■		■				
Blow Machine Clean (do not steam clean)			■				■
Repack Wheel Bearings	■						
Needle Timing	■						
Drive/Engine Belts, Tension & Condition	■			■			
Tire Inflation	■	■					
Wheel Fasteners for Proper Torque	■			■			
Knotter Brake Adjustment	■			■			
Clean Battery Terminals	■					■	
Grease Ball Hitch	■	■					
GreaseFeeder Crank Journal (Lube until grease is visable at breather)	■						
Grease Gearbox Crank Arm Bearing's	■					■	
Grease Pickup Clutch	■	■					
Grease Saddle Lever	■	■					
Grease Needle Yoke Rod	■	■					
Grease Feeder Crank Shaft Bearing's (2)	■					■	

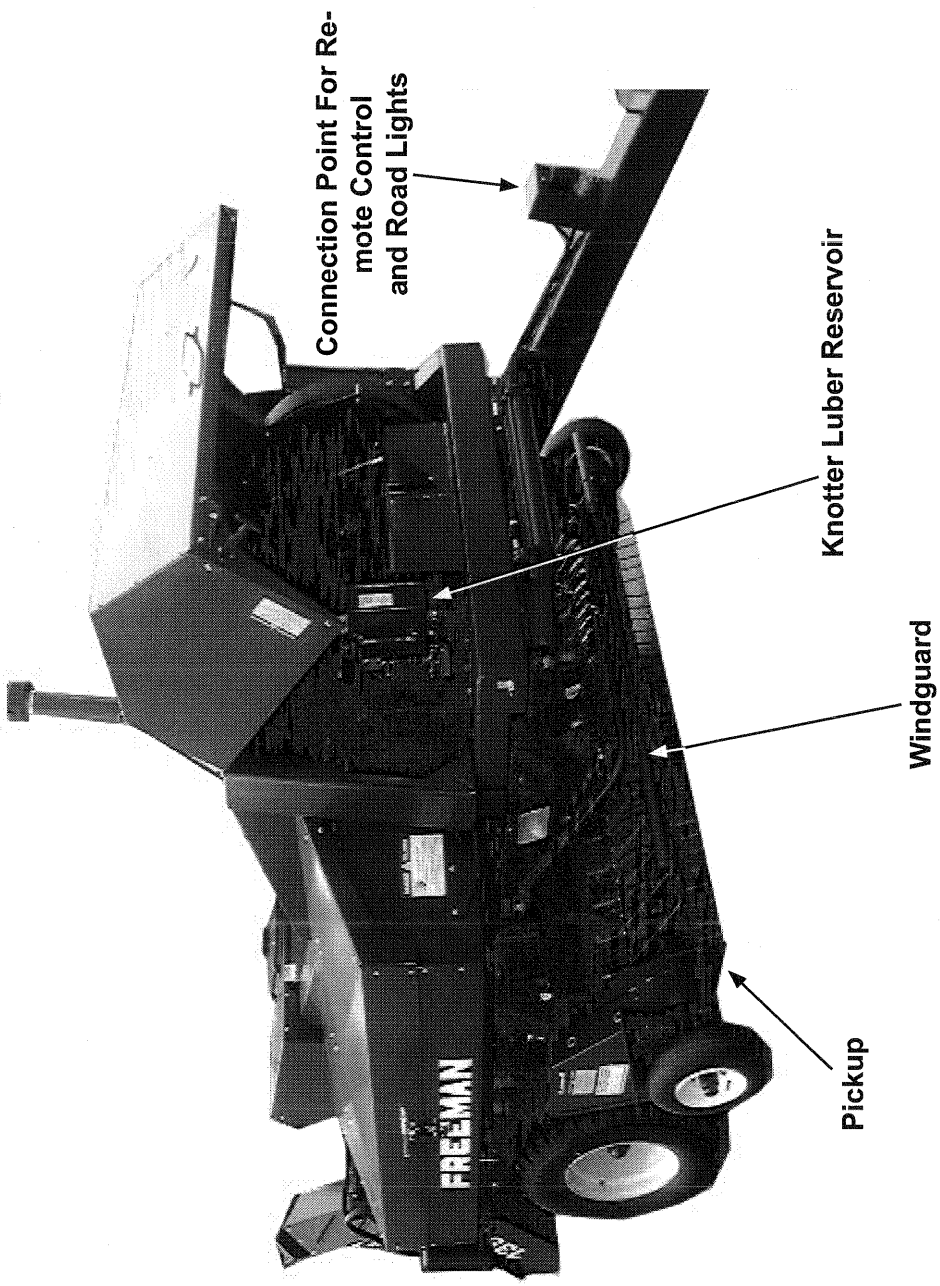
BALER OVER VIEW



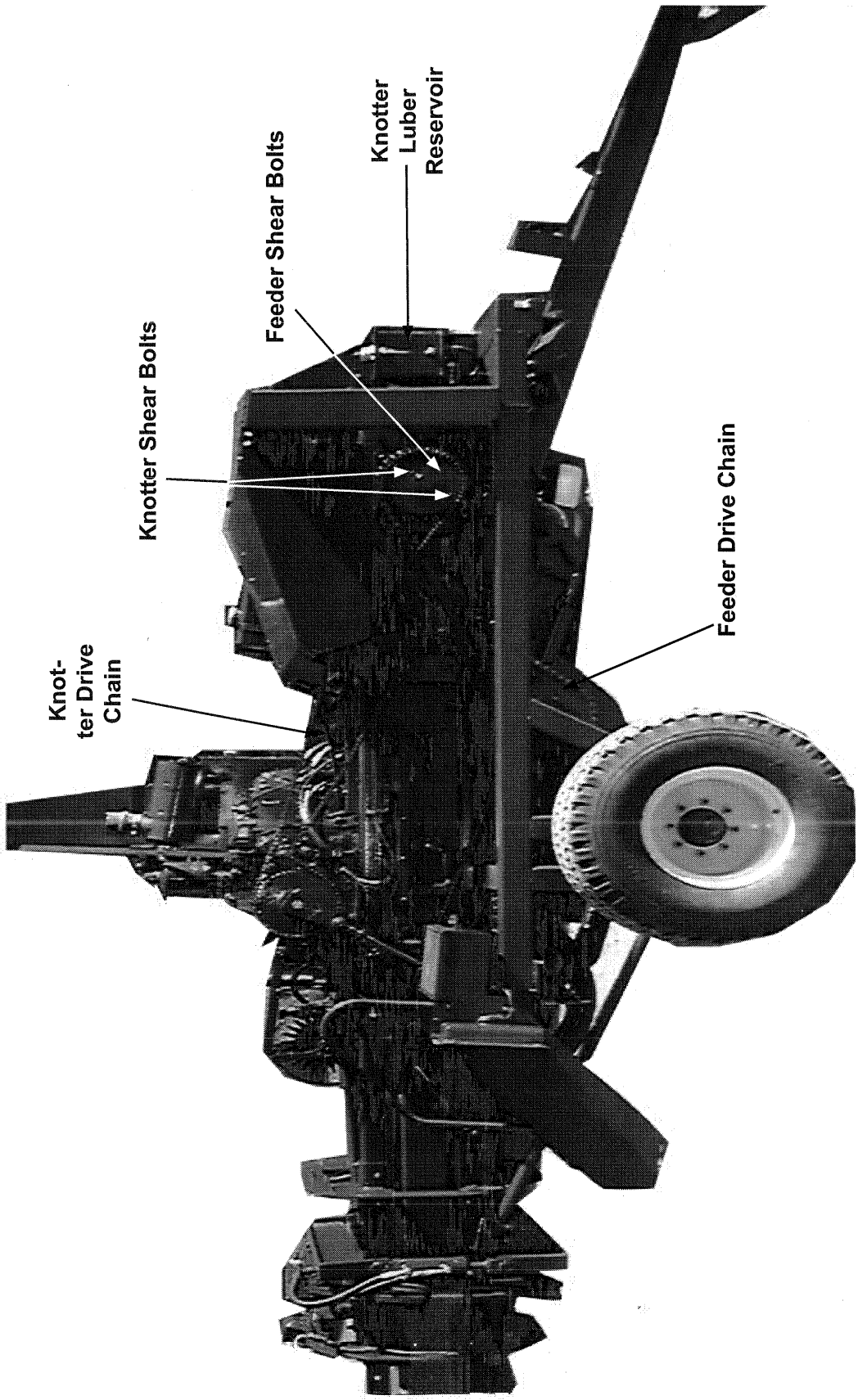
BALER OVER VIEW



BALER OVER VIEW



BALER OVER VIEW



BALER OVER VIEW

All new Freeman Balers are adjusted and tested before leaving the factory, although certain adjustments must be completed during the field start-up procedure. Special attention must be given to the following areas:

Pivoting Drawbar:

The baler's drawbar has two positions. Transport position (as shown) *Fig.1,* and the baling position. **When transporting the baler on public roads, highways or areas of narrow access the drawbar should be in the transport position, with the drawbar latch pin "A" *Fig.1,* installed in the transport position "B" *Fig.1.*** Once the baler is in the hay field, the drawbar latch pin should be removed and installed in the storage position "**C**" *Fig.1.* The drawbar is then movable to the baling position using the DRAWBAR switch "**I**" *Fig.5,* located on either the remote or baler mounted control boxes. See **Baler Controls.** page 15.

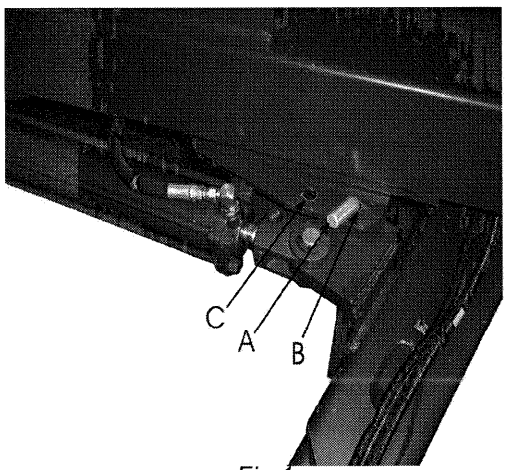


Fig.1

Pickup Operation:

The pickup tines are among the fastest moving, highest stressed parts on the entire hay baler. In order to maximize the life of these parts it is important to keep the pickup height adjusted properly. Ideally, the pickup tines should never touch the ground during operation, however irregularities in field surface make this impossible. To minimize damage to pickup components, the pickup tines should always operate at the maximum height above the ground which still permits clean crop pickup. DO NOT operate the machine with the pickup tines constantly hitting the ground! Doing so will not only damage the pickup tines, but also may cause rocks and clumps of dirt to be fed into the machine causing damage or premature wear of other parts. Crops with heavy windrows or long stemmed material will not require as low a pickup setting as light or short stemmed crops. Typically, an appropriate setting on firm level ground would have the pickup tines missing the ground by 2" to 2 1/2" (50 mm to 63 mm).

Note: For cleanest crop pickup, it is common practice to pickup the windrow in the same direction it was cut or raked.

Most of the weight of the pickup is carried by the flotation springs, these are set at the factory such that the apparent weight of the pickup is about 100 lbs(45 kg) when lifted by one of the gauge wheels. During operation, transport or storage, the remaining weight is carried by the pickup stop pin. DO NOT allow the pickup to be carried by the gauge wheels during field operation! Occasional ground contact by the gauge wheels to help the pickup float over bumps or obstructions is normal. The preferred pickup tine clearance of 2 1/2" (63 mm) should leave the gauge wheels about 1/2" (13 mm) above the ground.

The pickup height must be adjusted for the current condition of each field. For example, loose soil may allow the baler to sink, thereby bringing the pickup lower to the ground where the gauge wheels could make contact. In such a case, the operator should move the pickup stop pin to a hole that would support the pickup with the tips of the tines 2 ½" (63 mm) above the ground.

To adjust the operating height of the pickup, raise the pickup to release the weight off the stop pin. With the baler engine off and the pickup blocked in the raised position, remove the stop pin and reinstall it in the desired hole. The holes are spaced such that there is a ½ " (13 mm) difference in pickup height from one to the next, and are numbered in order from lowest to highest.

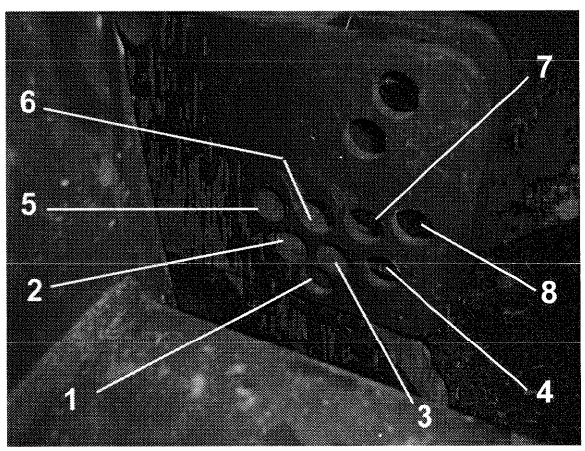


Fig.2

BALER OVER VIEW

Occasionally, the operator may encounter an obstacle such as a large rock or mound of dirt in the baler's path which the gauge wheels will not be able to guide the pickup over safely. Since pickup parts are easily damaged by collision with immovable objects, the operator should protect the pickup from damage by using the switch on the control box to raise the pickup when passing over obstacles or extremely rough sections of field.

When transporting or storing the baler, move the stop pin to the transport position so that the hydraulic cylinder will not have to support the weight of the pickup in the fully raised position.

Pickup Operating Position

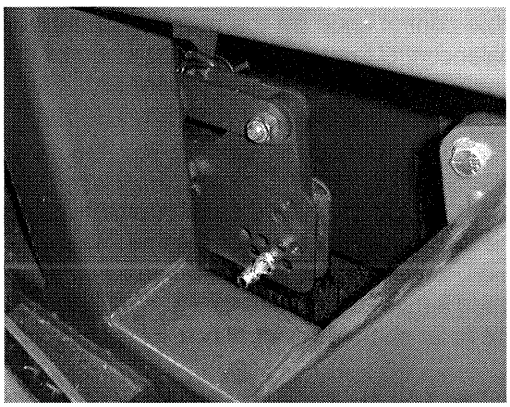


Fig.3

Pickup Transport Position

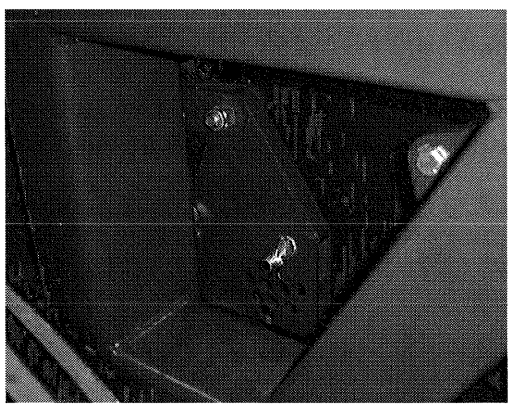


Fig.4

Bale Density:

Bale density is proportional to bale weight, and is regulated by applying pressure to the top, bottom and sides of the forming bale. Three hydraulic cylinders exert force on the tension rails. These hydraulic cylinders are pressurized by a engine mounted pump on the left side of the baler. This pump maintains a constant but adjustable pressure to the cylinders as the bale is being formed. An increase or decrease in the bale density is accomplished by regulating the pressure through a valve electronically operated by the bale density circuitry. An adjustable control knob "**K**" *Fig5 page15* on the baler control box and/or the tractor remote control box allows the operator to make convenient changes in the bale density. It is recommended to start baling with the bale density control set at a lower setting and then adjust higher as needed. See **Bale Density Adjustment.** page 16.

Baler Operating Speed:

The baler is designed for operating at or near maximum capacity. This requires that the feed chamber be full at all times. The baler is typically operated at 95 plunger strokes per minute and the baler ground speed is varied so the feeder mechanism is feeding full charges of hay into the baling chamber. This can be monitored by observing that the inlet to the feed chamber is filled at all times but yet not overfilled with " overflowing" hay. Proper feed rate is also monitored by checking the " strokes per bale" readout on the remote controller digital display. Optimum feed rate is obtained with approximately 16 to 18 plunger strokes per bale.

When operating in very light crop and/or rough field conditions, it will be impossible to maintain sufficient ground speed to either keep the feed chamber full or maintain clean pickup of the windrow.

Consistent bale length is very important when using any automatic stacking system and following the above instructions will give the best result. For best stacking and hauling, set and maintain bale length between 44" and 46". (1115 mm and 1170 mm)

BALER CONTROLS

Although the baler is normally controlled by the tractor remote control box, the baler mounted control box provides full backup and is the central location for housing relays, switches, resistors and other electrical components that control the various functions of the baler.

Note: Left and right of the machine are understood to mean from a position facing in the direction of travel.

CAUTION: ALWAYS STOP THE BALER ENGINE AND WAIT FOR ALL MOTION TO CEASE BEFORE SERVICING OR ADJUSTING THE MACHINE.

Control Boxes: (See *Fig.5 page 15)*

1. The REMOTE CONTROL/LOCAL CONTROL switch "**A**," is a rocker switch which allows the baler to controlled from either the tractor remote or baler mounted control boxes, and needs to be set for the desired control box before start-up of the baler. To switch control from one control box to the other while the baler is running, the key switch on the desired control box must be switched to "RUN," and the REMOTE CONTROL/LOCAL CONTROL switch "**A**" switched to that control box, at which time all control of the baler is switched to that box. If the key switch is not in the run position at the desired control box during a control box switch, the engine will shut down.

2. Baler running information such as strokes per bale, baler speed-strokes/min, bale count and fuel level are displayed automatically in the display window "**E**." To reset the bale count on the remote control box only, press and hold both the FUNCTION SELECT and BALE COUNT RESET buttons "**F**."

3. The CLUTCH engage/disengage switch "**G**" is a momentary press and release rocker switch. Pressing the top "ENGAGE" side of the switch, tightens the flywheel drive belt starting baler operation. Pressing the bottom "DISENGAGE" side of the switch, disengages the flywheel belt and stops baler operation.

4. The PICKUP switch "**H**," is a press and momentary hold rocker switch. Press and hold the top "UP" side of the switch to raise the pickup to any desired height or to it's full up position. Press and hold the bottom "DOWN" side of the switch to lower to any desired position.

5. The DRAWBAR switch "**I**," is a press and momentary hold rocker switch. To move the baler to the right, press and hold the top "RIGHT" side of the switch until the correct baler position is attained. To move the baler to the left, press and hold the bottom "LEFT" side of the switch.

6. The WORK LIGHTS switch "**J**," is a on or off rocker switch which controls all working lights on the baler.

7. The BALE DENSITY control knob "**K**" is an adjustable control knob on the remote control box and the baler control box which allows the operator to make convenient changes in the bale density. See **Bale Density** and **Bale Density Adjustment.** page 13 & 16.

8. The key switch "**L**," is different from the key switch on the remote control box, only in that it has a "TEST" position, which is used to test the alternator, oil pressure and temperature indicator lights "**M**," located only on the baler mounted control box.

9. Fuse 1 "**N**," is a AGC 30 amp fuse protecting the work lights.

10. Fuse 2 "**O**," is a AGC 20 amp fuse protecting the engine starter solenoid, engine hour meter, broken fan belt switch and the fuel shutoff solenoid.

11. Fuse 3 "**P**," is a AGC 20 amp fuse protecting the main hydraulic valve solenoids, fuel gauge, knotter fan and throttle control.

12. Fuse 4 "**Q**," is a AGC 20 amp fuse protecting the remote control / local control switch and baler mounted key switch.

REMOTE CONTROL BOX

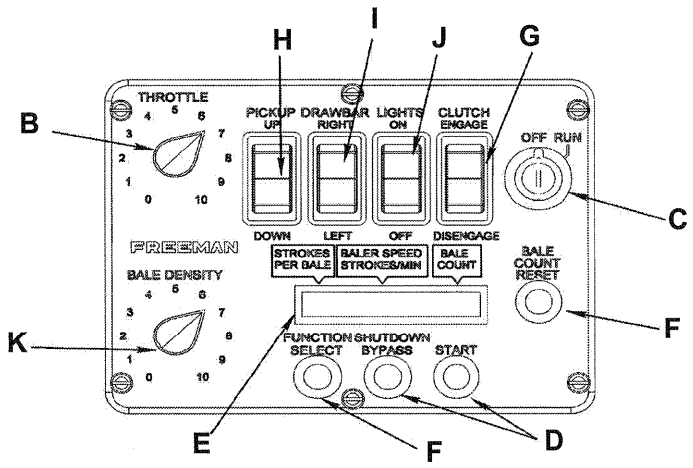
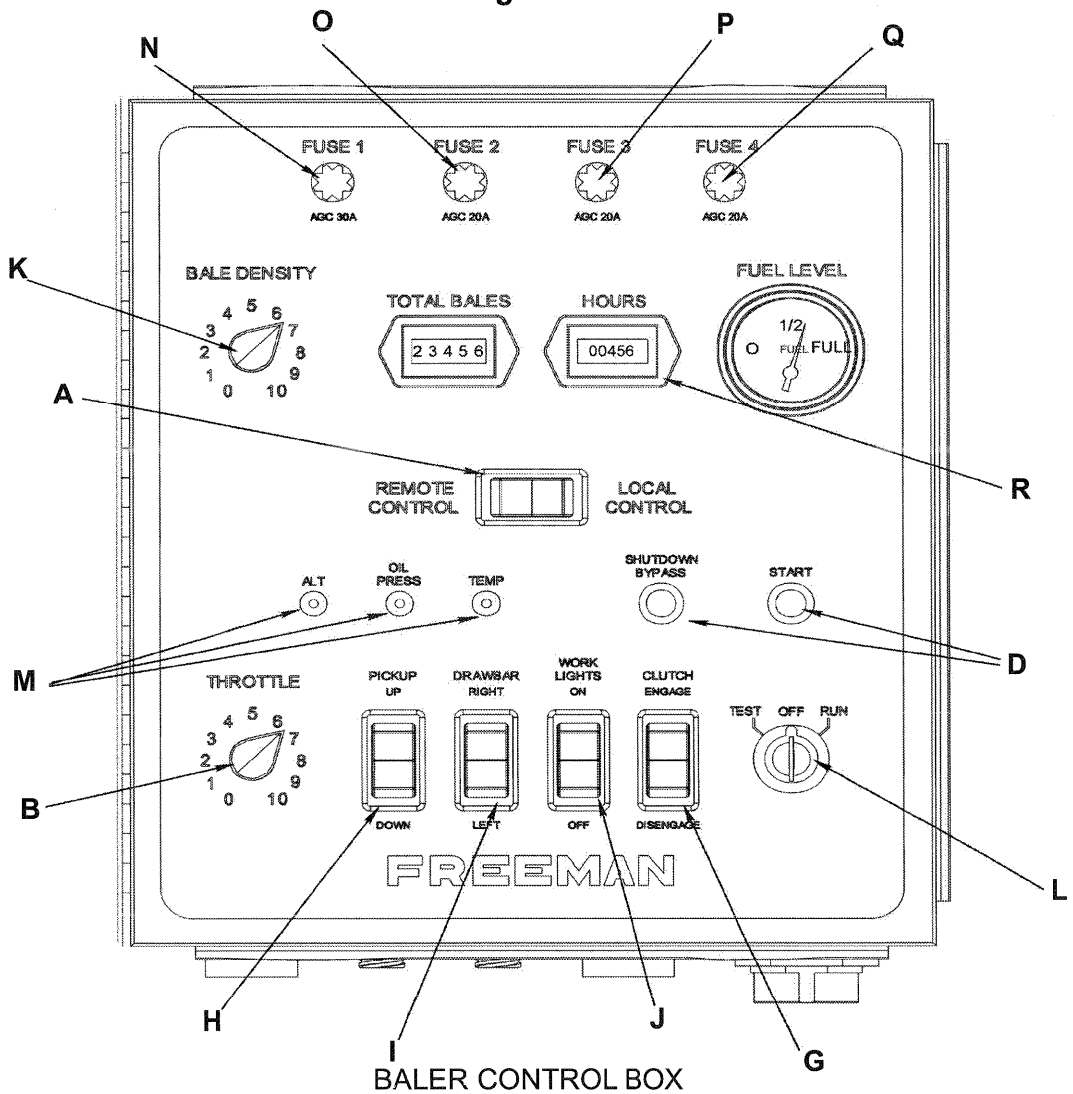


Fig.5



BALER CONTROL BOX

BALER OPERATION

Engine Start-up:

1. Proper starting procedure of the baler engine requires the REMOTE CONTROL/LOCAL CONTROL switch "**A**" *Fig.5,* located on the baler mounted control box only, to be set for either remote control or local control as required.

2. Set the THROTTLE control "**B**"*Fig.5* to the lowest setting (idle). Turn the key switch "**C**" OR "**L**" to the "RUN" position, press and hold both the START and SHUTDOWN BYPASS buttons "**D**" until the engine starts.

Bale Length Adjustment:

> **CAUTION: ALWAYS STOP THE BALER ENGINE AND WAIT FOR ALL MOTION TO CEASE BEFORE SERVICING OR ADJUSTING THE MACHINE.**

The operating speed of the baler has a direct effect on the bale length, see **Baler Operating Speed**. page 13.

Bale length is controlled by the meter trip bar assembly "A," *Fig.6* and is adjusted by the meter trip/stop bar, which is raised or lowered by loosening the two mounting bolts and adjusting the trip/stop adjusting bolt "B," Raising the bar decreases bale length and lowering increases bale length.

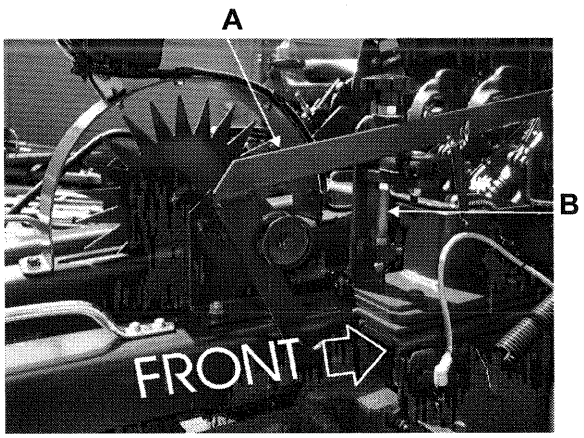


Fig.6

Bale Density Adjustment:

The bale density control knob "K" *Fig.5 page15,* is numbered for reference from 0 to 10. Turning the knob to a higher number increases bale density. It is recommended to start baling with the bale density control set at a lower setting and then adjust higher as needed. The main pressure gauge "A" *Fig.8* located on the right front of the baler, indicates pressure to the restriction rails' hydraulic cylinders and will rise or fall relative to the adjustment of the bale density.

Tension Rail Selector:

The tension rail hydraulic system includes a selector valve mounted on the left rear side of the baler chamber, which allows the tension rails to be opened for the removal of bales during cleaning or maintenance. The valve operating handle "A" *Fig.7* pushed forward for normal baling operation. With the engine at an idle, the valve handle may be pulled to the rear to reverse the pressure on the tension rail cylinders causing the tension rails to open.

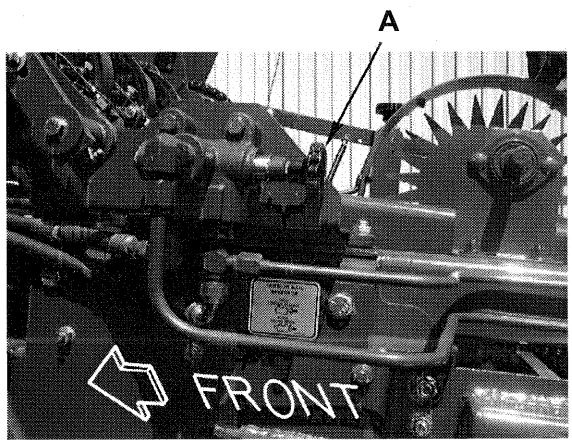


Fig.7

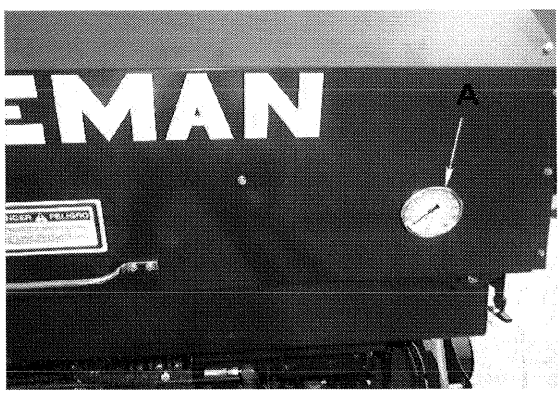


Fig.8

BALER OPERATION

CAUTION: ALWAYS STOP THE BALER ENGINE AND WAIT FOR ALL MOTION TO CEASE BEFORE SERVICING OR ADJUSTING THE MACHINE.

Setting Windguard:

The windguard shown "F" *fig.11* is to help the baler manage the windrow crop into the pickup. It can be adjusted for different size windrows.

The windguard is adjustable in 3 different places. We recommend the chain in "A" *fig.9* be no more than 14 links between the windguard and the baler frame. Adding more length to the chain may cause the windguard to interfere with the pickup and cause damage. This chain will lower or raise the windguard by lengthening or shortening the chain.

You can adjust the windguard stop "C" *fig.10* by loosening the bolt "B" *fig.10.* Once you have the windguard stop to the desired position, torque the bolt to 75 LB-FT

The third wind guard adjustment "D" *fig.11* has 3 holes for spring "E" tension.

Remove all tools when you are done with all your adjustments.

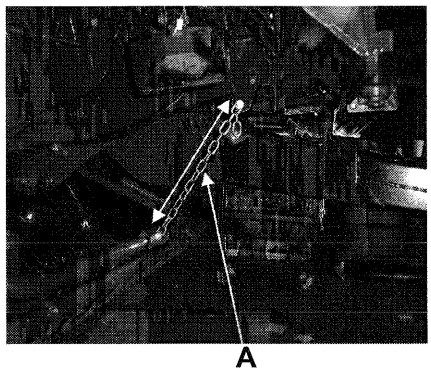


Fig.9

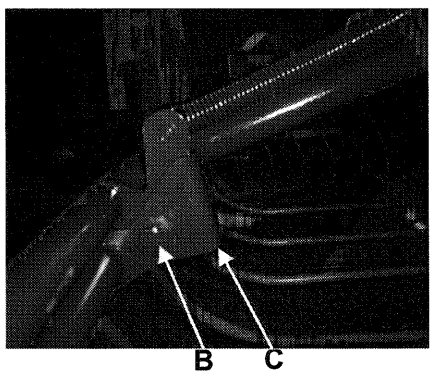


Fig.10

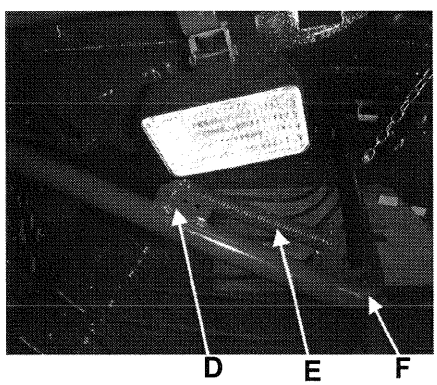


Fig.11

BALER OPERATION

CAUTION: ALWAYS STOP THE BALER ENGINE AND WAIT FOR ALL MOTION TO CEASE BEFORE SERVICING OR ADJUSTING THE MACHINE.

Setting Drawbar Hitch Height:

The drawbar hitch is adjustable by loosening 4 bolts as shown in "A" *fig.12.* Loosen and remove bolts and raise or lower hitch to the desired height. Tighten bolts and torque to 75 LB-FT.

An ideal baling position would be for the part of the frame as shown in *fig.13* to be parallel to the ground.

Fig.12

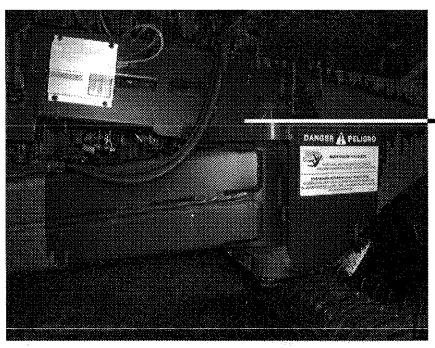


Fig.13

Setting Bale Chute Height:

The level of the bale chute is adjustable by unlatching the chain as shown in "A" *fig.14.* To adjust bale chute height, raise the back end of the bale chute and unlatch the chain. Once you have the desired height of the bale chute, latch the chain again in its anchor position.

Adjust the bale chute level with the bottom of the bale chamber for best performance as shown in *fig15.*

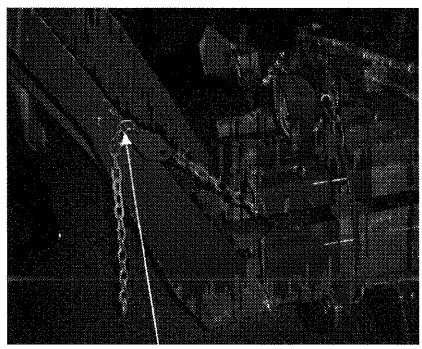


Fig.14

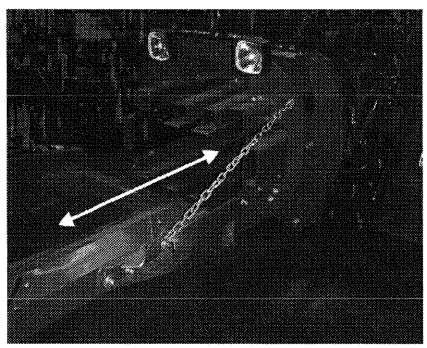


Fig.15

KNOTTER ADJUSTMENT

The following procedures in the sequence they are presented will provide for the systematic set up of the Freeman baler. For best results read the instructions completely before beginning.

CAUTION: ALWAYS STOP THE BALER ENGINE AND WAIT FOR ALL MOTION TO CEASE BEFORE SERVICING OR ADJUSTING THE MACHINE.

Note: Left and right of the machine are understood to mean from a position facing in the direction of travel. Reference to turning the Flywheel are understood to mean from a position facing the Flywheel, from the left side of the machine.

Needle Adjustment:

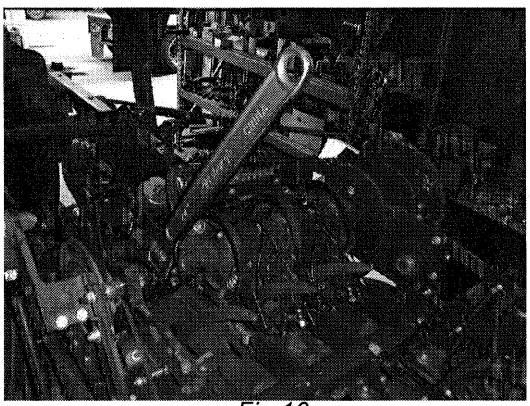


Fig.16

1. Trip the knotter clutch and swing the needles up through the bale chamber by turning the flywheel clockwise by hand or using a large wrench as shown in *Fig.16.* The needles "A" *Fig.17* should be adjusted left or right so that there is 0 to 1/32" (.8 mm) clearance between the needle and the knotter hook pinion "B," *Fig. 17.* Adjust by sliding the needle left or right on the needle yoke.

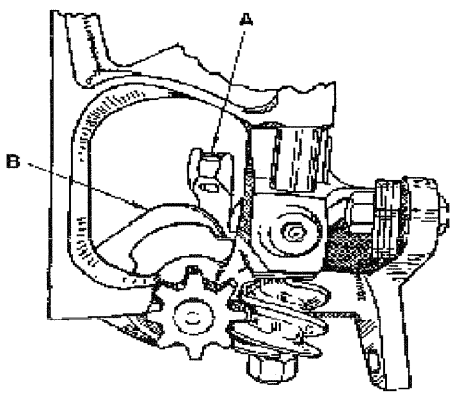


Fig.17

2. The needles should clear the twine disc cleaner by 1/8" (3 mm). To increase the distance between the needle and the twine disc cleaner, loosen the front and tighten the rear needle anchor bolts "A," *Fig.18.* To decrease the clearance reverse the procedure.

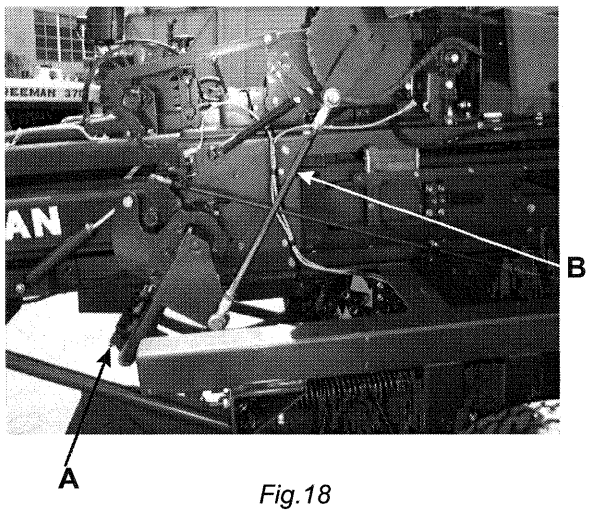


Fig.18

3. Trip the knotter and turn the flywheel clockwise by hand, until the needles are in the uppermost position. The distance from the bottom of the needle eye to the twine disc should be 4-1/2" (114 mm), *Fig.19.*

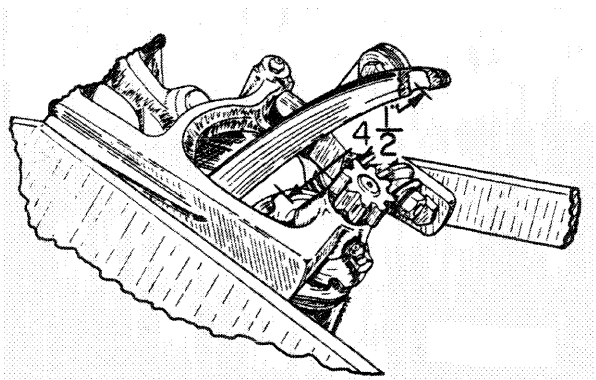


Fig.19

4. Adjust needle height by loosening the lock nuts on the needle yoke drive rods "B," *Fig.18.* Turn the rod to the right or left for desired setting. Be sure both needle yoke rods are adjusted for equal load at top dead center.

5. Always check the twine finger adjustment after adjusting the needles.

Twine Finger Adjustment:

A. Trip the knotter and turn the flywheel clockwise until the point of the twine finger "A"is just passing the inside edge of the needle "B". The point of the twine finger should clear the needle by 1/8" (3 mm), *Fig.20*

This adjustment is made by loosening the twine finger anchor bolts "C," and sliding them to the front or back in the slotted holes in the Top Chamber Plate Assembly.

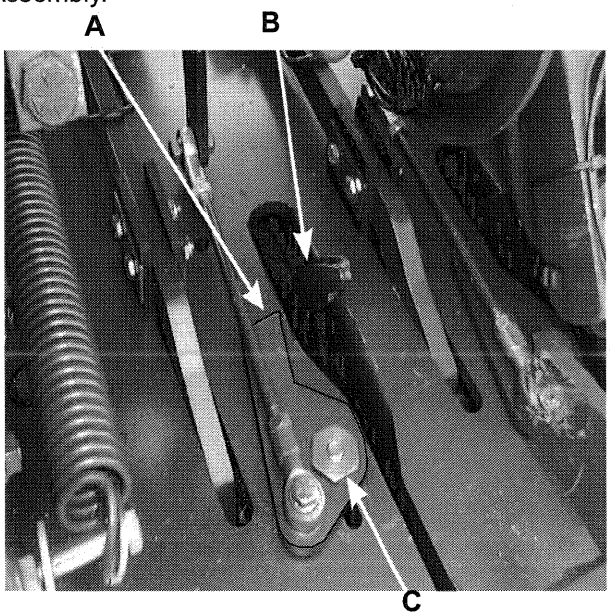


Fig.20

B. Continue to turn the flywheel clockwise until the twine fingers reach the far point of their travel. Measure from the tip of the twine finger to the front edge of the tubular cross member. This adjustment is made by lengthening or shortening the twine finger drive rods "A," *Fig.21.*

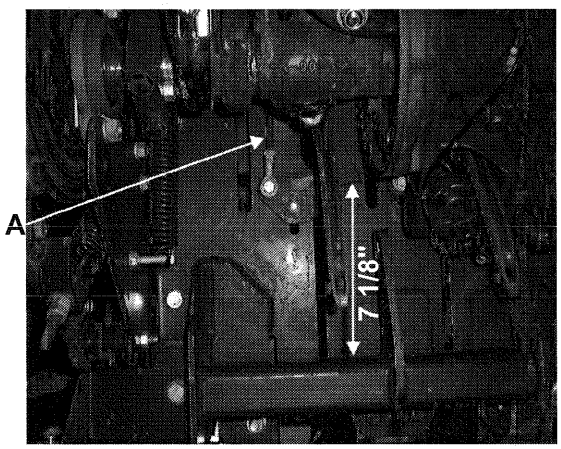


Fig.21

C. After adjusting the twine fingers, turn the flywheel clockwise until the twine fingers are in the returned position. Check to see that there is 1/8" (3 mm) from the tips of the twine fingers to the edge of the needle slots "A," *Fig.20*

Adjust the position of the twine fingers at the needle slots with the stop bolt "A," *Fig.22*

Fig.22

Needle Timing:

Note: Before timing the needles, be sure the needles are in adjustment. See **Needle Adjustment**. page 19

To Check Needle Timing:

A. Trip the knotter clutch by raising the trip bar until the notch is positioned over the knurl, and turn the flywheel clockwise until the tips of the needles are even with the bottom of the bale chamber, *Fig. 23.*

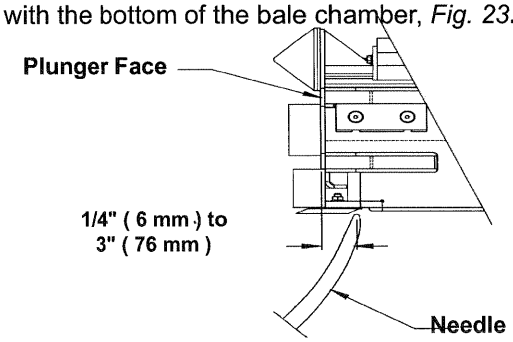


Fig.23

B. The plunger face must be 1/4" (6 mm) to 3" (76 mm) past the tips of the needles *Fig.23,* as they are entering the chamber area and the plunger is on the compression stroke, *Fig.24.* The needles are late if the plunger face is more than 3" (76 mm) past the tips of the needles and the needles are early if they are less than 1/4" (6 mm) past the plunger face.

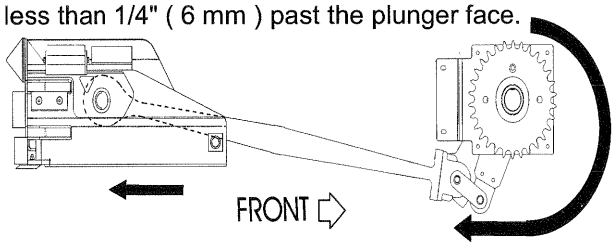


Fig.24

Needle Timing Adjustment

C. If the needles are late, loosen the knotter drive chain and move the chain counterclockwise one link on the knotter sprocket . If the needles are early, move the chain clockwise one link on the knotter sprocket.

D. Trip the knotter clutch and ensure that the clutch pawl roller "A," is in contact with the clutch drive hub and in front of the knotter clutch stop cleat "B," *Fig.25.* Remove slack in the chain by rotating the knotter sprocket and tighten. Ensure that the chain is connected as shown in *Fig.26.*

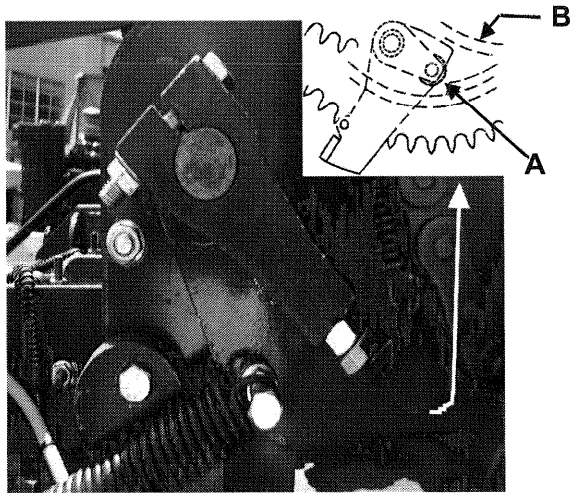


Fig.25

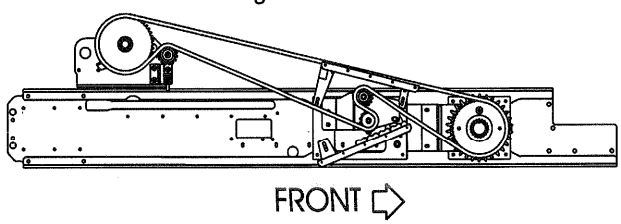


Fig.26

E. Turn the flywheel clockwise and recheck the timing. Repeat the above procedures until adjustment is correct.

Meter Trip Bar Adjustment:

Trip the knotter clutch by raising the trip bar until the notch is positioned over the knurl, then turn the flywheel clockwise until the needles are near top dead center. The meter trip bar should have 1/8" (3 mm) clearance from the knurl, "A," *Fig.27,* when it is in the resting position. Adjustment is made by loosening the bolts on the bearing support, "B" and moving fore or aft as needed. The trip bar should not bind on guide washers when in the tripped position.

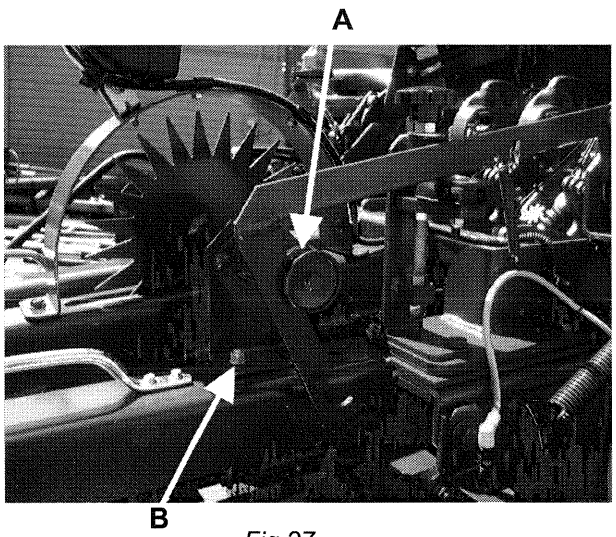


Fig.27

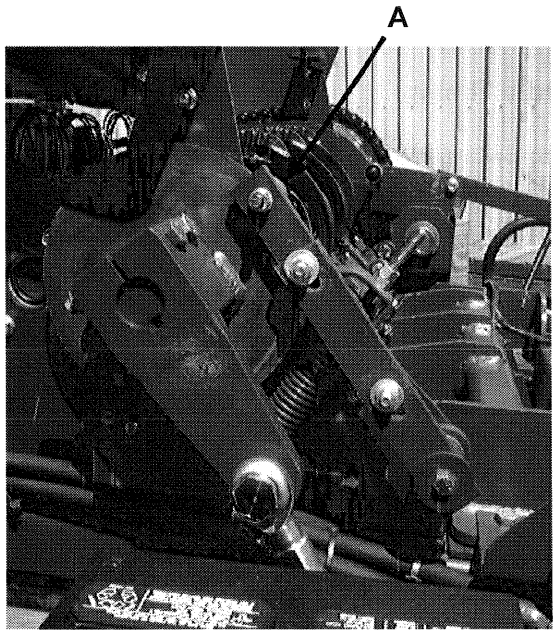


Fig.29

Knotter Clutch Adjustment:

Note: Before adjusting the knotter clutch, be sure the needles are in adjustment. See **Twine Needle Adjustment**. page 19. Also be sure the meter trip bar is properly adjusted. See **Meter Trip Bar Adjustment**. page 21.

A. With needles in the home position, set the needle yoke drive bolt "A," *Fig.28*, 1/4"(6mm) to 1/2" (13 mm)past center between "B" and "C." To obtain this setting, adjust saddle roller "A," *Fig.29*, on the opposite side of the knotter.

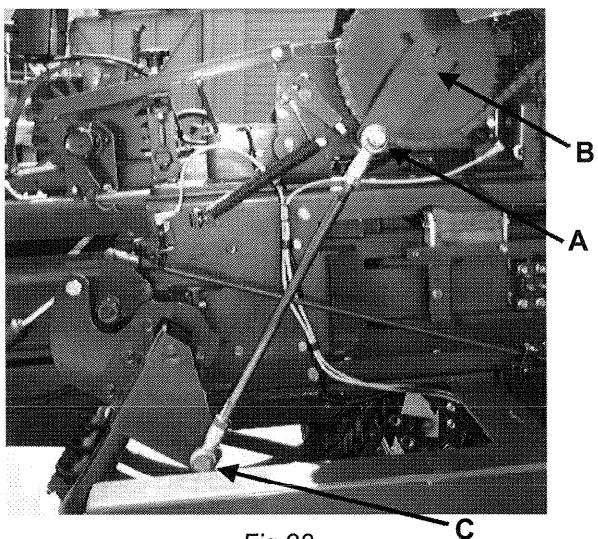


Fig.28

B. Loosen clamp bolt "A," to position stop bolt "B," square to the face of clutch pawl "C," *Fig.30*.

C. The clutch pawl should have approximately 1/2" (13 mm) clearance at "D," when depressed. The clutch pawl roller and the knotter clutch stop cleat should have 1/8" (3 mm) clearance at "E." Adjust with bolt "B" *Fig.30*.

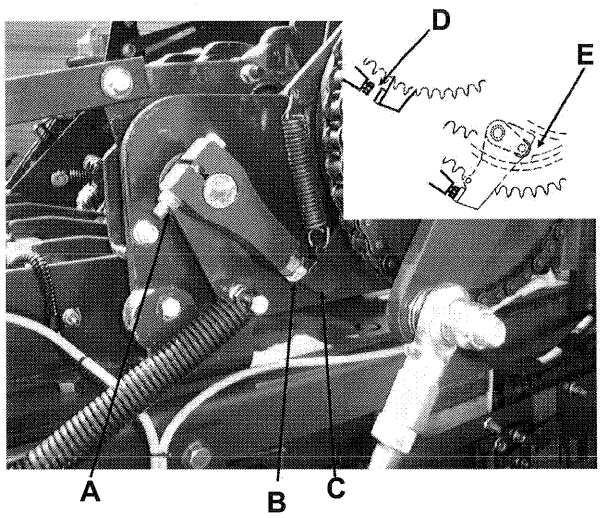


Fig.30

D. Trip the knotter clutch and rotate the clutch. The clutch pawl must have1/8" (3 mm) clearance from the stop lever at "A," *Fig.31*. Adjust by loosening the Cam Stop mounting bolt and rotating the Cam Stop "B."

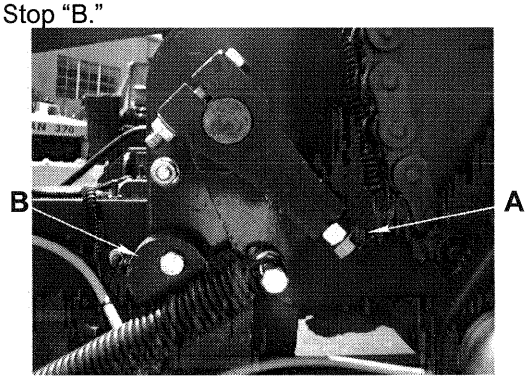


Fig.31

Knotter Brake Adjustment:

A. Adjust the brake shoe tension springs so that the springs are fully compressed, "A," *Fig.32*

B. The saddle spring is adjusted properly when roller "B" *Fig.32,* is in the notch and there is 1/2"(13 mm) of adjusted tension on the saddle lever spring.

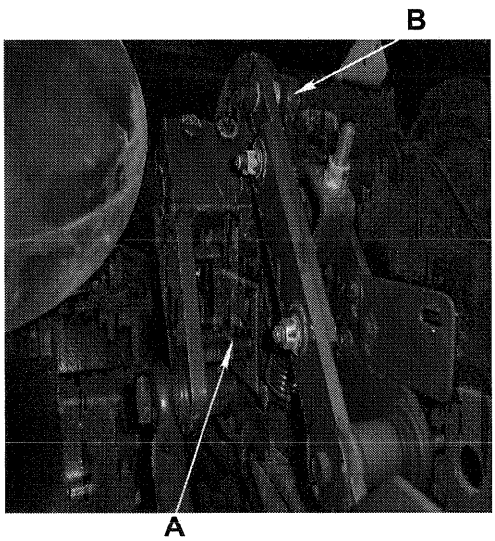


Fig.32

CAUTION: ALWAYS STOP THE BALER ENGINE AND WAIT FOR ALL MOTION TO CEASE BEFORE SERVICING OR ADJUSTING THE MACHINE.

Knotter Adjustment:

A. Twine Holder:

The twine holder holds the twine in the twine disc while the bale is being made and tied. The pressure is regulated by bolt "C," *Fig.33.*

Adjust the twine holder only as tight as necessary to prevent the twine from pulling from the disc and/or producing bow knots. Make adjustments on bolt "C" in 1/6 of one turn increments. Proper adjustment is achieved when the knotter is producing a clean and smooth knot.

B. Twine Disc:

Be certain the twine disc cleaner is free. Adjust the twine disc notch so the left-hand side of the notch is even with the cleaner "D," *Fig.33*. Do this by loosening nut "A" several turns. Tap the nut end of the shaft to loosen the worm. After the disc is set turn the worm against the spacer washers "B," *Fig.33*, and tighten the nut. After the knotter has completed one cycle check the notch setting again.

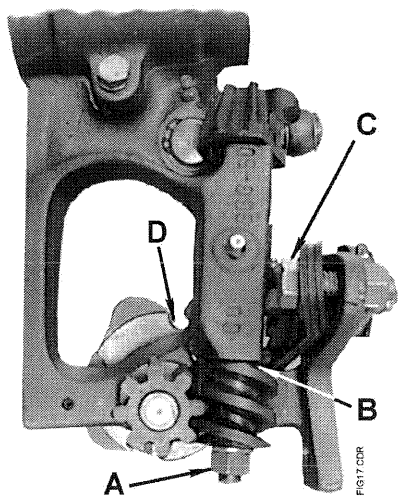


Fig.33

C. Knife Arm:

The knife arm cuts the twine and strips it off of the bill hook during the tying process of the knotter. The stripper flange "A" on the knife arm should just touch the bill hook "B" without pressure as the stripper flange advances the knot past the end of the bill hook, *Fig.34.*

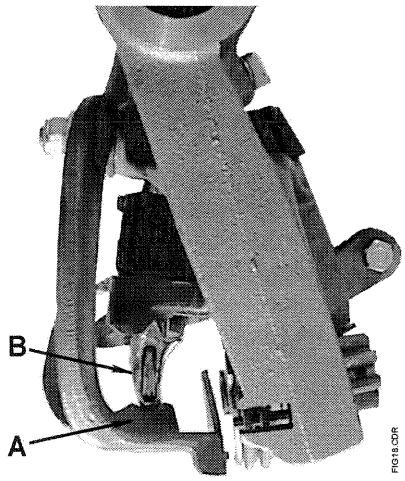


Fig.34

The knife arm "A" should be 1/4"(6 mm) to 3/8" (10 mm) "B" past the end of the bill hook "C" when the knife arm is in the most extreme position, *Fig.35.* Correct the adjustment of the knife arm by replacing it.

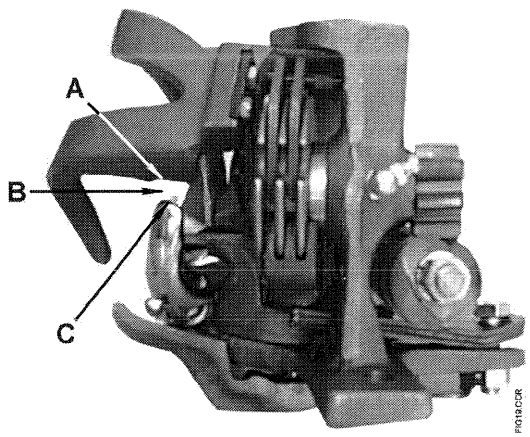


Fig.35

D. Cam Gear Adjustment:

Both flat surfaces of the knotter hook and worm gear pinions must be held flat with 0 to .005 (.127 mm) interference "A" on the smooth face of the cam gears, *Fig.36.*

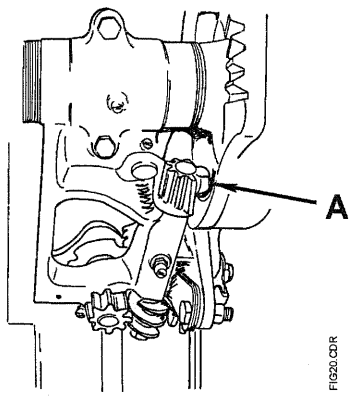


Fig.36

This adjustment is made with shims between the cam gears and knotter frames. Shimming must be done between the cam gears and the knotter frames any time a knotter is assembled. Excess space between the cam gears and the knotter frames, is taken out by adjusting the (2) square head set screws on the left hand Knotter Shaft Clamp "A," against the Twine Finger Cam "B," *Fig.37.*

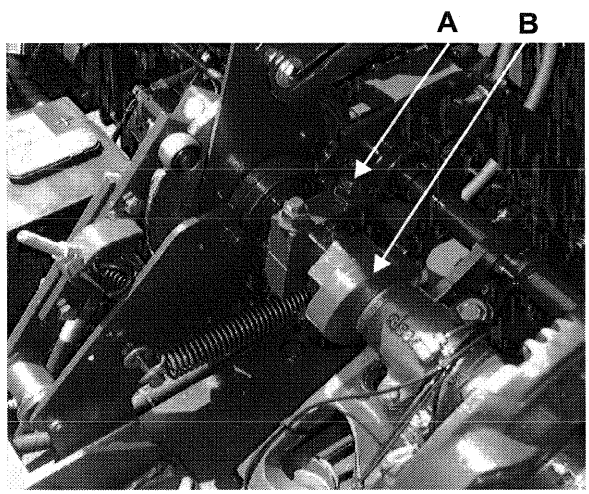


Fig.37

TWINE BOX

Threading The Twine:

CAUTION: ALWAYS STOP THE BALER ENGINE AND WAIT FOR ALL MOTION TO CEASE BEFORE SERVICING OR ADJUSTING THE MACHINE.

Fig.38 shows the correct routing of the twine from the twine box to the needles, with no crossing or tangling after the twine box lid is shut.

A. Put twine in the twine box. Route the twine through the twine guides and twine tension assemblies on the inside of the lid "A" *Fig.38*, then through the twine guides on the rear of the twine box.

B. Thread the twine from the rear of the twine box through the twine guides mounted on the inside of the right hand step assembly "B."

C. Thread the twine through the rear twine guides mounted on the frame of the baler.

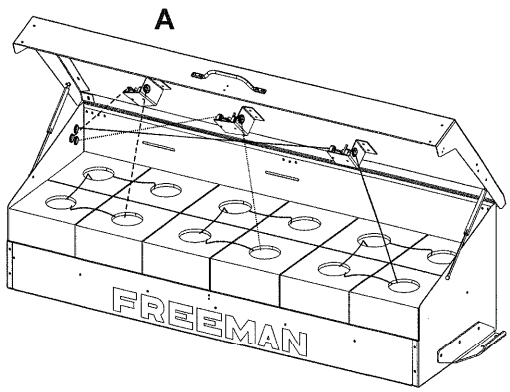
D. Route twine to 3 guides located under the chamber directly in front of the needles.

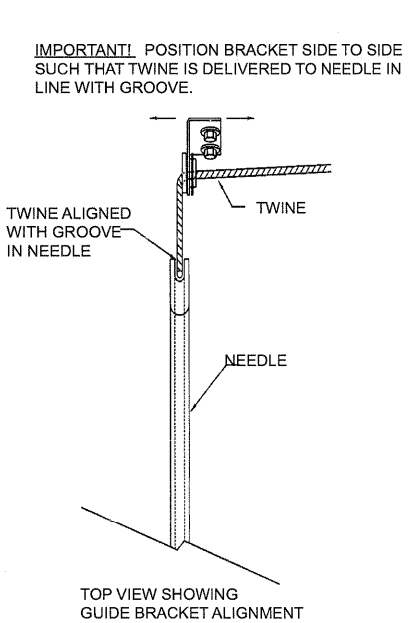
E. Route the twine through the needle eyes.

F. Fasten the twine to the needle yoke or to the left and right rear chamber braces on the bottom side of the bale chamber behind the needles.

It is important that the three twine tension assemblies "A," are adjusted so that there is a slight amount of drag on the twine.

If the twine is too loose it may lash out or the twine fingers may not be able to grasp the twine or both. If the twine is too tight it may break or come out of the knotter's twine disc or both. Keep the twine guides in good condition for easy travel of the twine.





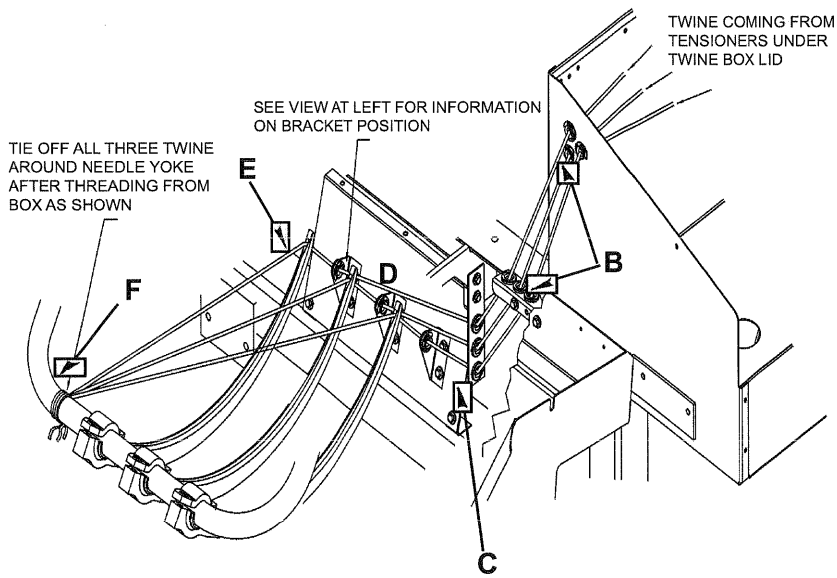


Fig.38

FEEDER TIMING

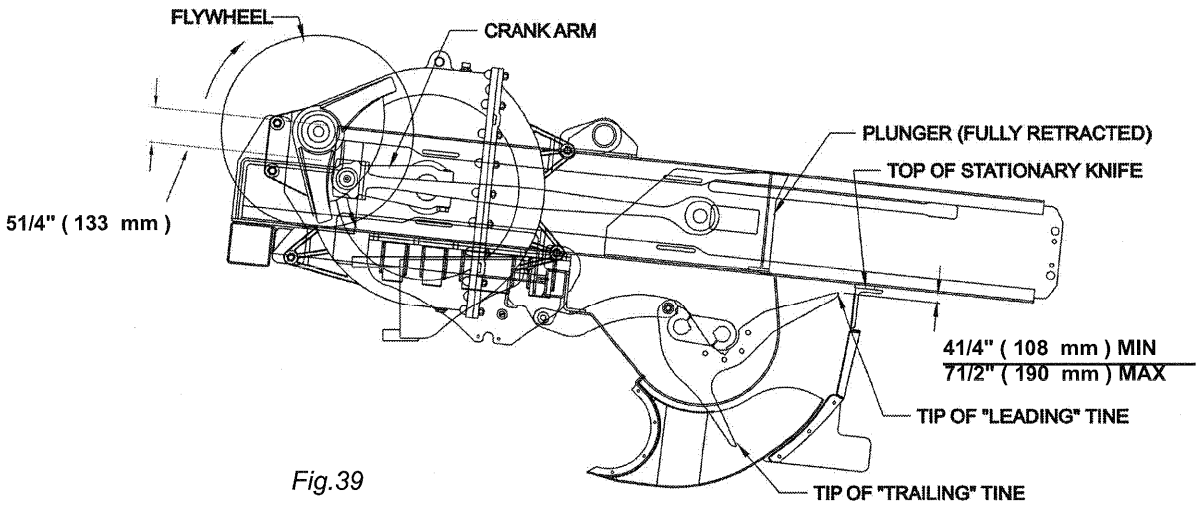


Fig.39

LEFT HAND SIDE VIEW

CAUTION: ALWAYS STOP THE BALER ENGINE AND WAIT FOR ALL MOTION TO CEASE BEFORE SERVICING OR ADJUSTING THE MACHINE.

The following procedures in the sequence they are presented will provide for the systematic set up of the Freeman baler. For best results read the instructions completely before beginning.

Note: Left and right of the machine are understood to mean from a position facing in the direction of travel. Reference to turning the Flywheel are understood to mean from a position facing the Flywheel, from the left side of the machine.

Timing Procedure

A. Turn the flywheel clockwise until the plunger is fully retracted. Confirm this by measuring 5 1/4" (133 mm) from the top edge of the crank arm to the top surface of the baling chamber.

B. Measure the vertical distance from the tip of the leading feeder tine to the top of the stationary plunger knife. The acceptable range is 4 1/4" (108 mm) to 7 1/2" (190 mm)

C. If it is necessary to adjust the timing, turn the flywheel to position the tines as shown in *Fig.40.* With the feeder in this position there should be no tension on the drive chain, making it possible to safely loosen the feeder chain. Never attempt to adjust the feeder timing unless the feeder is in the position shown in *Fig.40* Serious injury or death may result from failing to follow this procedure. adjustments on the preceding page.

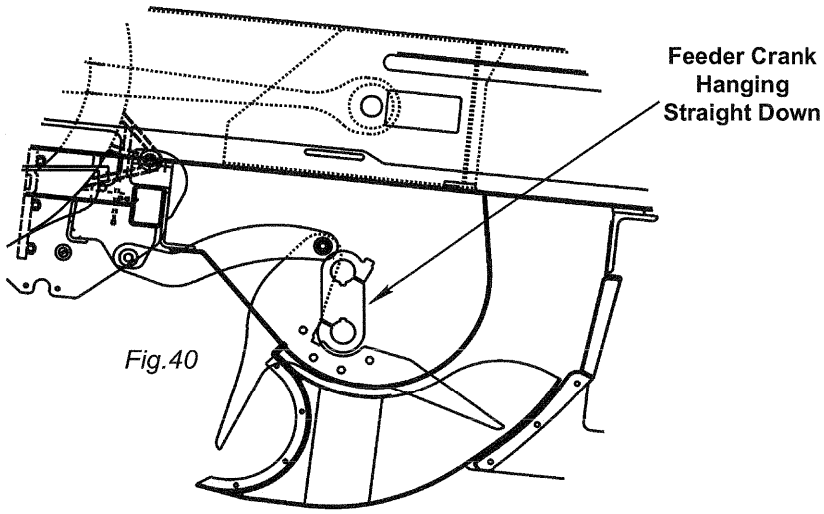


Fig.40

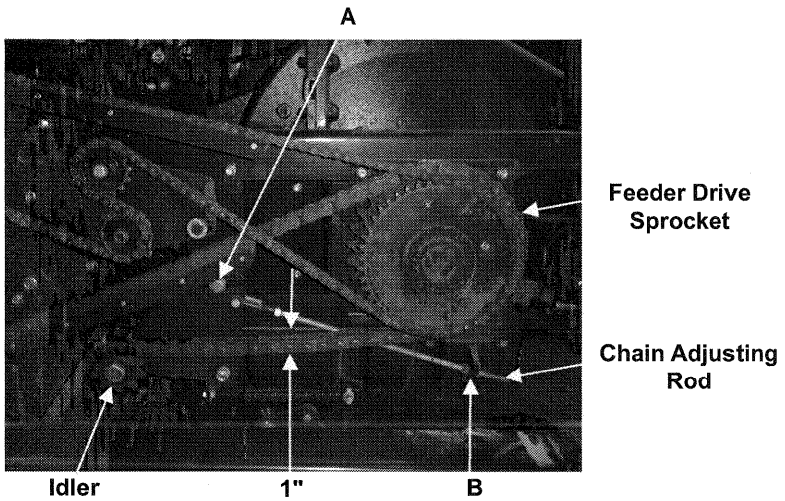


Fig.41

D. To adjust the timing first loosen the chain idler mount bolts (A) about 2 turns and then loosen the nut (B) on the chain tension adjusting rod in *Fig.41.* Once the chain is slack, move it one pitch on the drive sprocket in a counterclockwise direction to retard the feeder timing or clockwise to advance it. Recheck the feeder timing by repeating steps A and B.

E. Once the feeder timing is correct. Re-Tension the feeder drive chain by tightening the nut (B) on the chain tension adjusting rod. See *Fig.41.* With the feeder in the position shown in *Fig 39.* Tighten the tensioner until there is about 1" of free chain movement at the center of the span between the drive sprocket and idler. After tensioning the feeder chain, tighten the chain idler mount bolts (A).

PLUNGER STOP ADJUSTMENT

Plunger Stop Mechanism:

Note: Left and right of the machine are understood to mean from a position facing in the direction of travel. References to turning the Flywheel are understood to mean from a position facing the Flywheel, from the left side of the machine.

The plunger stop mechanism "A" *Fig.42,* helps protect the needles against breakage, caused by improper needle timing. If for any reason the needles lose proper timing while baling, the plunger stop dogs will stop the plunger and the flywheel shear bolt "B" will break.

Before replacing the flywheel shear bolt, always move the stop dogs out of contact with the plunger cranks "B," *Fig.43.* Do this by turning the knotter shaft until the needle yoke "C" *Fig.42,* returns to the home position, (position the needles are normally in when the knotter is at rest).

CAUTION: ALWAYS STOP THE BALER ENGINE AND WAIT FOR ALL MOTION TO CEASE BEFORE SERVICING OR ADJUSTING THE MACHINE.

Plunger Stop Adjustment:

Note: Always check the needle timing with the plunger before adjusting the plunger stop. See **Needle Adjustment**. page 19.

A. Trip the knotter clutch and swing the needles up into the bale chamber by turning the knotter shaft. With the stop dogs resting against the stop bumpers "E," turn the flywheel counterclockwise until the plunger cranks "B" make contact with the tips of the stop dogs "A," with a minimum interference of 3/4" (19 mm) "C," *Fig.43,* which is adjusted by the plunger stop dog adjusting springs "D," which is adjusted by the plunger latch springs "F," ensure the plunger latch spring is stretched at least 10" (250 mm).

B. With the stop dogs resting against the stop bumpers "E," ensure there is a 1/8" (3 mm) maximum clearance between the roller on the plunger stop cam lever "H" and the plunger stop cam "J," *Fig.43.*
Adjustments to the plunger stop rod length should be made equally between the spring end and the cam end clevises. Do not adjust either end clevis to less than 3/4" (19 mm) thread engagement.
The spring "K " inside the spring housing assembly should be compressed 3/4" (19 mm) to a length of approximately 7-1/4" (184 mm) by removing the snap ring retainer, removing the spring and rod assembly, loosening the jam nut and turning the adjusting nut, then retightening the jam nut. Never adjust or attempt to replace the spring while still installed in the spring housing assembly.

C. Turn the flywheel clockwise far enough for the crank to disengage the stop dogs and reset, by turning the knotter shaft until the needles are in the home position.

Plunger Stop Adjustment:

A. *Fig.44* shows the correct operating clearance of approximately 1/2" (13 mm), between the plunger cranks and the stop dogs, after the needles are returned to the home position.

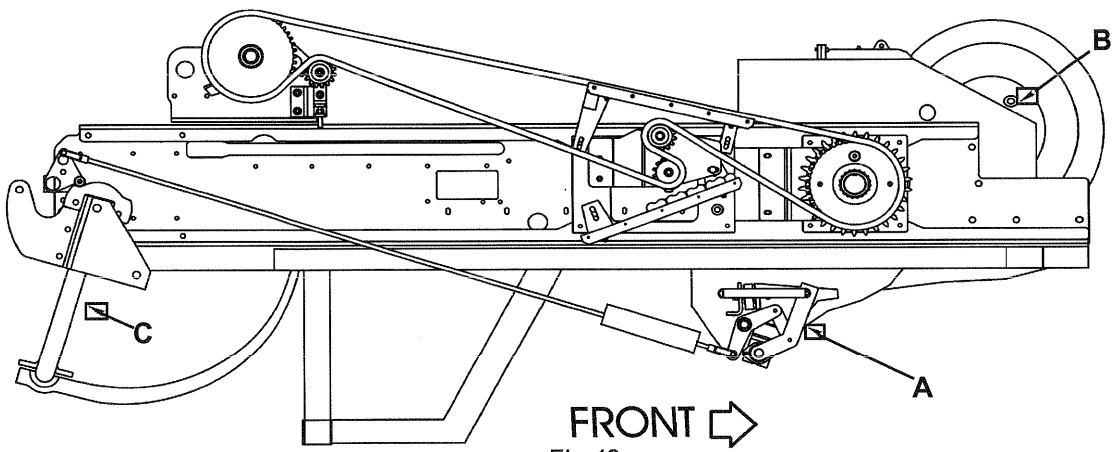


Fig.42

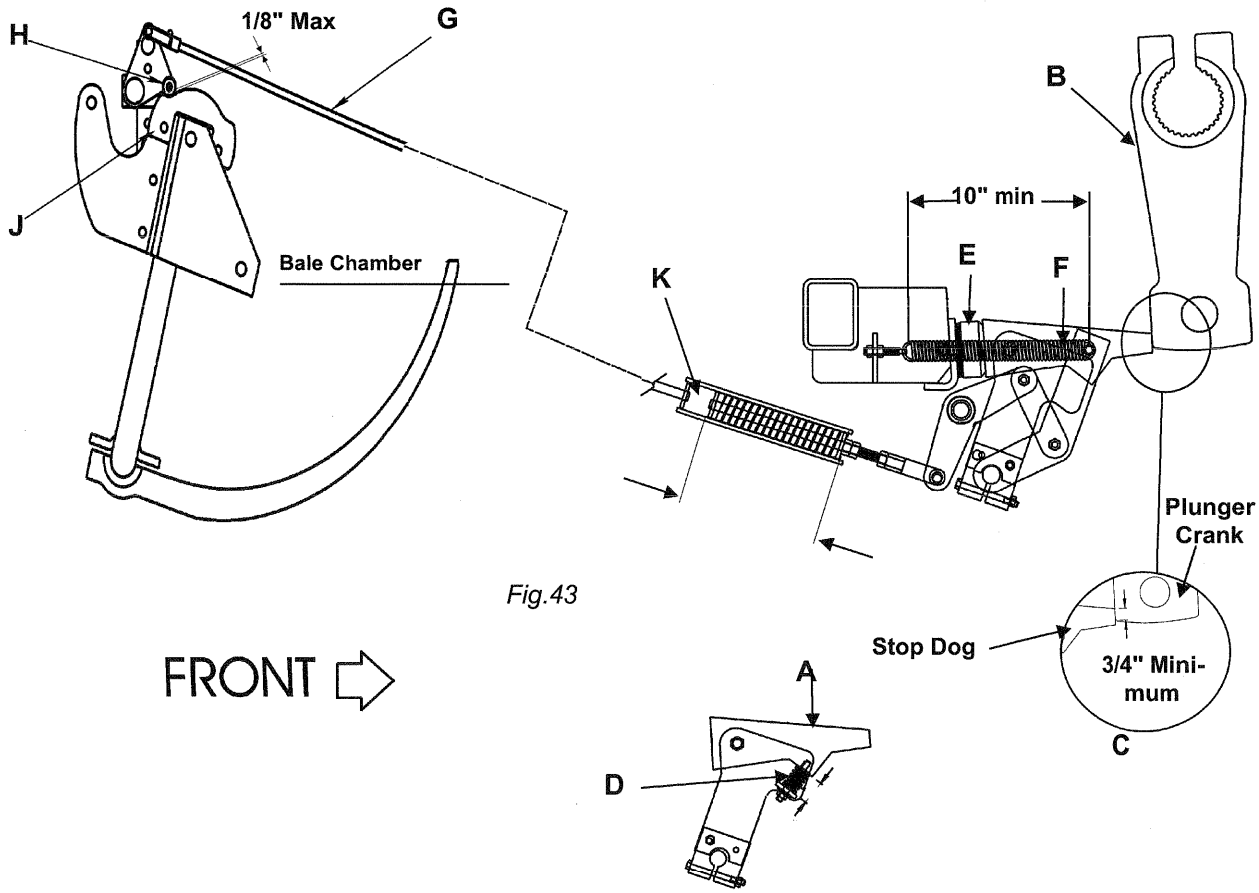

H
1/8" Max
G
J
Bale Chamber
B
10" min
E
F
K
Plunger
Crank
Stop Dog
3/4" Mini-
mum
C
A
D
FRONT

Fig.43

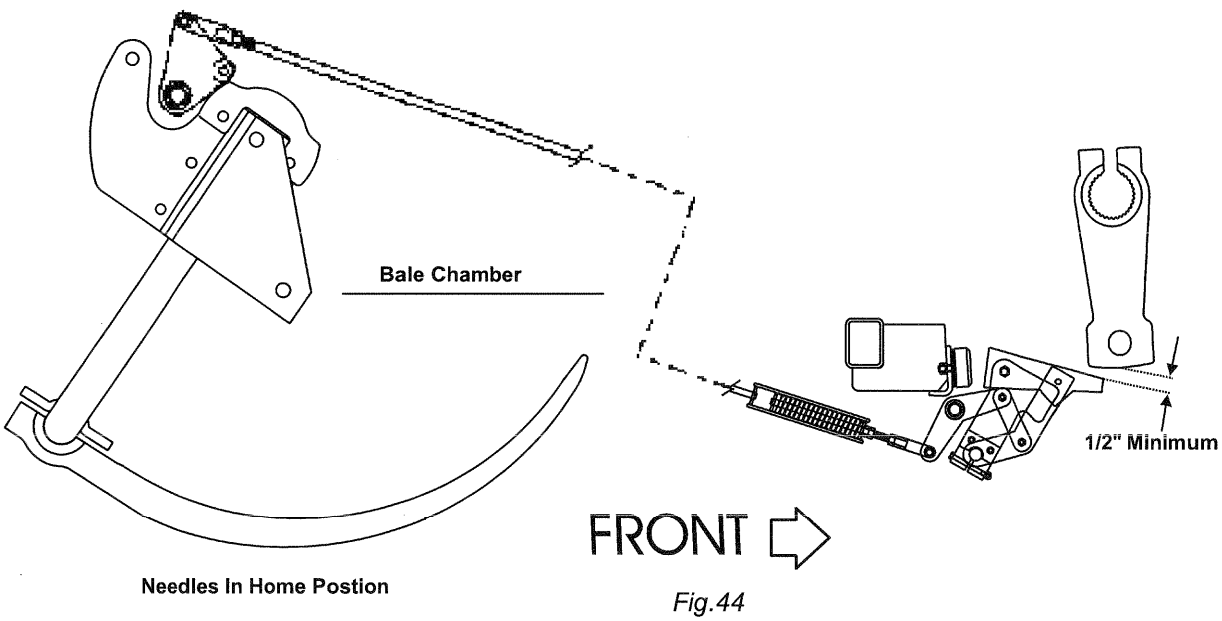

Bale Chamber
1/2" Minimum
FRONT
Needles In Home Postion

Fig.44

REPLACING SHEARBOLTS

Shearbolts are used on the baler for protection against damage caused by overload conditions. They are used on the Flywheel,Feeder,Knotter and Twine Finger. The shearbolts are designed to fail whenever the particular component is overloaded. Overload conditions may be caused by foreign objects, components being out of adjustment, or exceeding the baler's feed capacity. The following steps will describe proper shearbolt replacement procedure.

CAUTION: ALWAYS STOP THE BALER ENGINE AND WAIT FOR ALL MOTION TO CEASE BEFORE SERVICING OR ADJUSTING THE MACHINE.

FLYWHEEL SHEARBOLT

(3/8 x 6 1/2 NC, GR5)

Start working on the baler after shutting down all equipment and waiting for all moving parts to completely stop.

Lift the front shield up and out of the way. Locate where the shearbolt is and remove the broken shearbolt pieces. Use the long part of the broken shearbolt and wedge between the bushing on the hub and the frame. see *fig.45* This will help keep the hub in place while lining up the 2 holes. Insert the new shearbolt into the flywheel. Turn the flywheel slowly while applying pressure to the shearbolt. When the holes line up, the shearbolt should slip through the shear hub. Tighten a new 3/8" ESNA nut on the shearbolt to 30 LB-FT. Remove all tools and close the shield.

Fig.45

FEEDER SHEARBOLT

(3/8 x 2 1/4 NC, GR5)

Start working on the baler after shutting down all equipment and waiting for all moving parts to completely stop.

Check for and remove any obstructions in the feed chute

Lift the front shield up and out of the way. Locate and remove the broken shearbolt as shown in "A" *fig.46.* Insert new shearbolt into the shear hub through hole in knotter drive sprocket. Turn the flywheel slowly while applying pressure to the shearbolt. When the holes line up, the shearbolt should slip through the sprocket. Tighten a new 3/8" ESNA nut to 30 LB-FT. Remove all tools and close the shields.

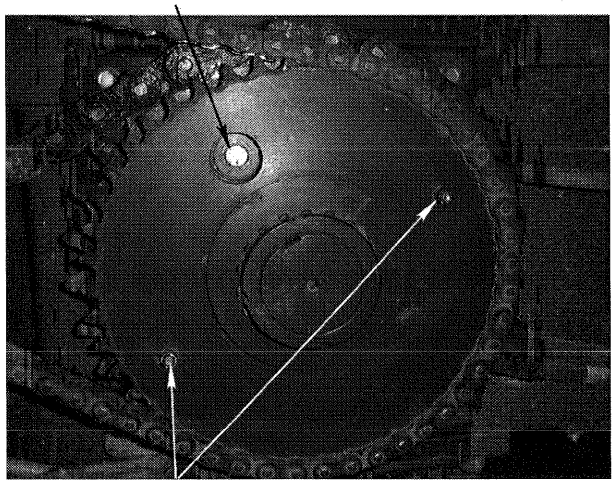


Fig.46

NOTE: USE EXACT SHEARBOLT AS SPECIFIED

REPLACING SHEARBOLTS

CAUTION: ALWAYS STOP THE BALER ENGINE AND WAIT FOR ALL MOTION TO CEASE BEFORE SERVICING OR ADJUSTING THE MACHINE.

KNOTTER SHEARBOLTS

(1/4 x 1 3/4 NF, GR5 (2))

Start working on the baler after shutting down all equipment and waiting for all moving parts to completely stop.

When knotter shearbolts fail, the needles are typically left partially in the chamber. Before replacing the shearbolts, return the needles to the home position using a large wrench as shown in *Fig.16* page 19. Always turn the knotter in the normal operating direction. This should allow the knots to tie successfully and prevent damage to knotter components. Normal knotter shaft rotation is clockwise when viewed from the right side of the machine.

Lift the front shield up and out of the way. With the needles in the home position locate and remove the broken shearbolts as shown in "B" *fig.46* Turn the flywheel until the feeder shearbolt is visible through the hole in the knotter drive sprocket. (If the feeder shearbolt is not visible, then the knotter drive is out of time and the baler will not tie.) Insert a shearbolt through the feeder sprocket and shear hub, continue to rotate the flywheel slowly in both directions until the shearbolt can be pushed through the hole in the knotter sprocket. Insert the second shearbolt. Tighten new 1/4" ESNA nuts to 10 LB-FT. Remove all tools and close the shields.

TWINE FINGER SHEARBOLT

(1/4 x 1 1/4 NC, GR5)

Start working on the baler after shutting down all equipment and waiting for all moving parts to completely stop.

First lift the knotter fan shield up and out of the way. Locate where the shearbolt is and remove the broken shearbolt pieces "A" *fig.47.* Line up the twine finger cam follower hole with the hole on the follower lever mount. Insert new shearbolt and tighten a new 1/4" ESNA nut to 8 LB-FT. Also, adjacent to the shearbolt is a 3/8" x 1 1/4" NC bolt which the twine finger cam follower pivots on. Make sure the 3/8" ESNA nut is torqued to 15 LB-FT. Remove all tools and close knotter fan shield.

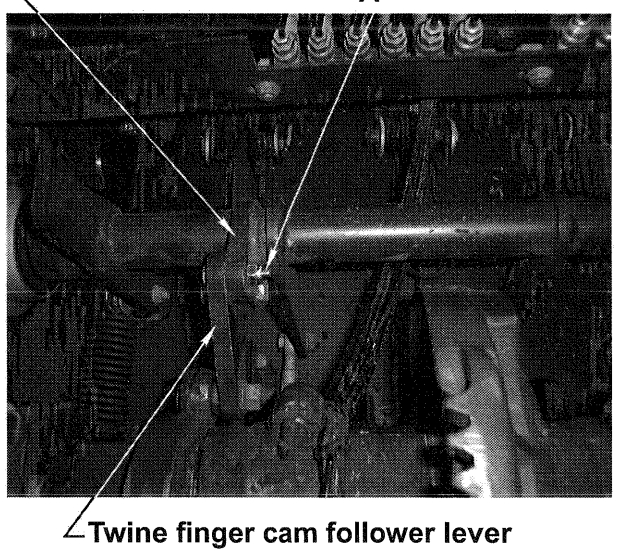


Fig.47

NOTE: USE EXACT SHEARBOLT AS SPECIFIED

Checking and Adjusting Drive Belt Tension

CAUTION: ALWAYS STOP THE BALER ENGINE AND WAIT FOR ALL MOTION TO CEASE BEFORE SERVICING OR ADJUSTING THE MACHINE.

It is recommended to check or service your drive belt tension at the start of the season and every 80 hours.

CHECKING BELT TENSION

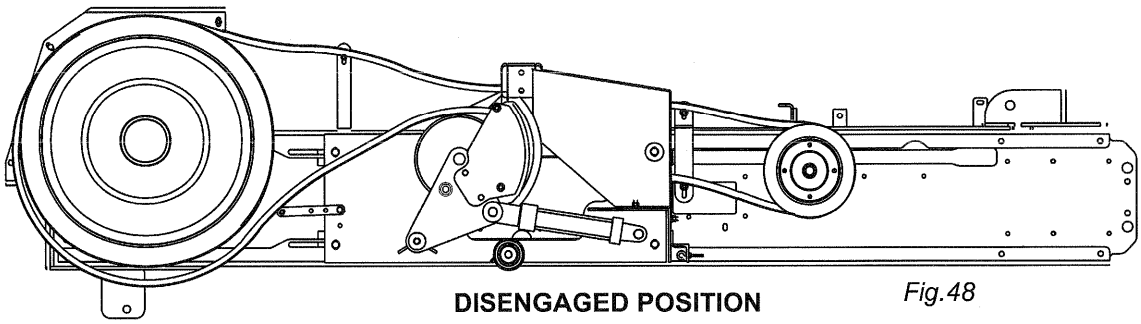
Remove the upper belt guide pin "D" *fig49* on page 33. Place your preferred tool on the adjusting nut located on the belt idler bell crank "A" as shown in *fig.49* Pull the bell crank forward until the tension cylinder is fully extended. In the center of the belt as shown in *fig.50,* using a spring scale, pull the belt upwards one inch (25mm). If the belt has had more than 5 hours of use, the scale should read 25-30lb. (110-135N). A belt with less than 5 hours of use will be stiffer and should read 30-35lbs (135-155N). If the belt tension is outside this range, it is recommended to adjust your drive belt to the correct tightness. (see ADJUSTING BELT TENSION).

ADJUSTING BELT TENSION

To adjust the belt tension, Loosen all 4 bolts "B" *fig.49.* Move the belt idler mount assembly "C" towards the front of the baler to tighten the belt or toward the rear to loosen it. Snug one of the bolts "B". Check belt tension again. Repeat until the belt has been adjusted to the correct tension as described in the previous paragraph and on the following page. When the belt tension is correct, replace pin "D", all shields and tighten all bolts.

Tighten bolts before replacing shields.

Checking and Adjusting Drive Belt Tension



DISENGAGED POSITION *Fig.48*

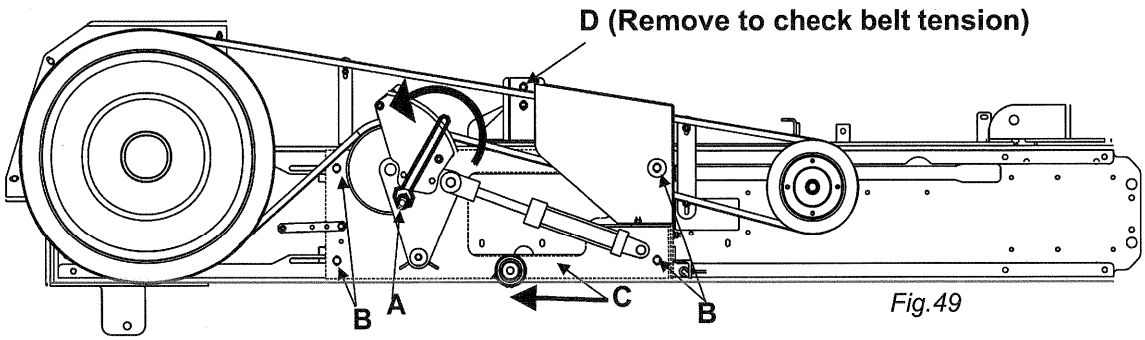


Fig.49

Correct idler pulley position for checking belt tension

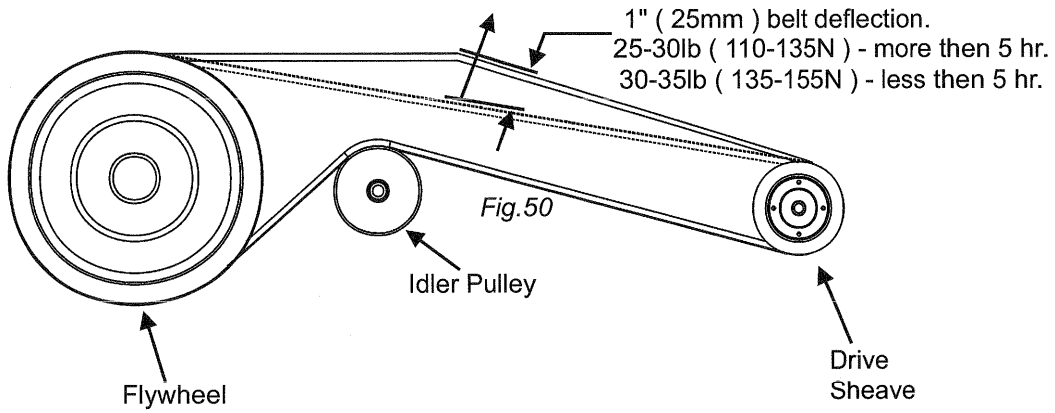


Fig.50

KNOTTER TROUBLE SHOOTING

When having a twine knotter problem or missing a knot on one twine or another it is impor tant to determine which twine is not tying properly. The TOP twine is the twine that is being held in the knotter while the bale is being formed. The BOTTOM twine is the twine that the needle delivers to the knotter to tie the bale.

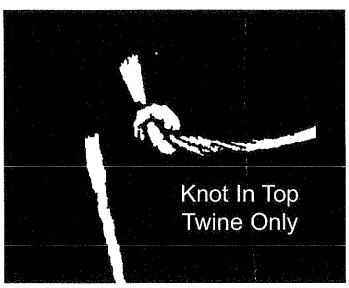
When a miss tie occurs you must locate the problem twine and determine:

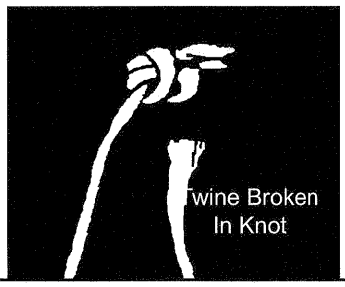
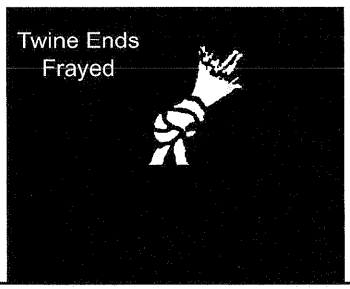
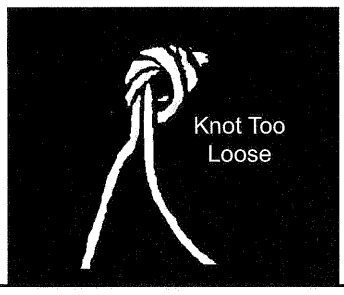
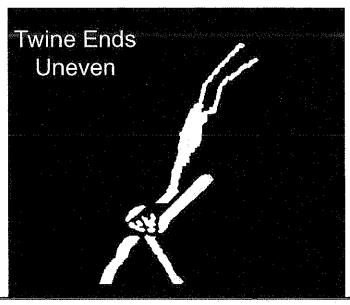
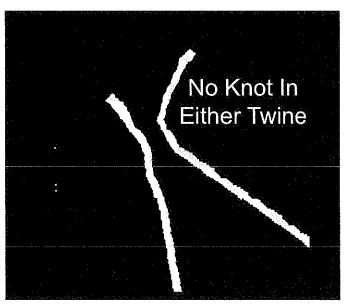
1. Is the knot missing in the TOP or BOTTOM twine?
2. Is the end of the untied twine frayed, or squared cut?
3. Is there any damage to the twine? Frayed along the length, frayed beyond the knot?
4. Is the twine long enough to wrap around the bale?
5. Are there any scraps longer than one inch in or around the knotter?
6. Is there twine tangled in the knotter?

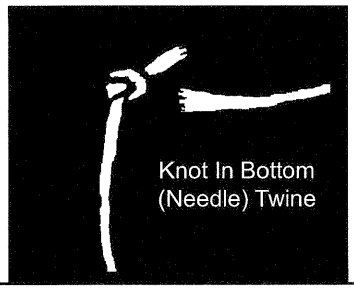
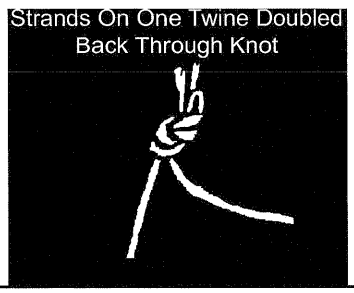
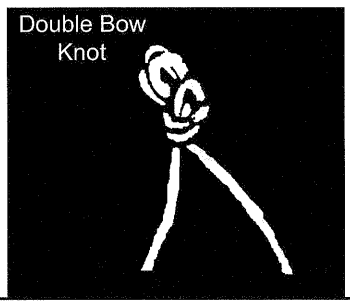
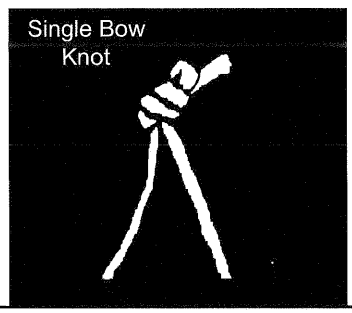
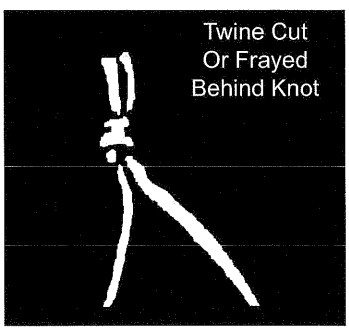
Not all times, but a majority of the time, the miss tie is caused external of the knotter frame. Some things to always check before condemning the knotter are:

1. Check twine delivery from the twine box. Twine boxes are correctly tied together so not obstructing free feeding.
2. Twine is properly routed to the needle.
3. Twine guides and or needles have no sharp worn edges.
4. Twine tensioners are properly adjusted so that twine has approximately 4 pounds of pull, while the knotter is tying.
5. Check hay dogs for proper operation, and or broke or missing springs. Hay dogs will wear and are very important. If unable to correct a twine finger miss tie, it is possible that the hay dogs have worn and are not properly holding the end of the bale.
6. Check bale weight/density. Too light of a bale may cause the knot to hang on the billhook, and to heavy of bale can cause several different miss ties (see chart).
7. Are all the necessary components in proper adjustments? Remember any time you replace or adjust a needle the twine finger must be checked and probably adjusted at the same time.
8. Next to the hay dogs, the twine fingers are important to keep in good operating condition. They cannot have excessive play in the pivot, and they must be free of any nicks or burrs that may damage the twine.

Following are a few examples of failed knots with possible causes for, and possible remedies.

Problem	Possible Cause	Possible Remedy
	Twine fingers did not pickup needle twine. Alternatively, did not fully load the billhook. Hay dogs not properly holding end of bale	Adjust twine fingers closer to the needle, adjust full travel, adjust needle to twine disc clearance. Check twine tension. Check hay dog springs and free operation. Hay dogs worn replace.

Problem	Possible Cause	Possible Remedy
	Extreme tension on twine around billhook during tying cycle causes twine to shear or pull apart.	Loosen twine disc holder spring. Smooth off all rough edges on billhook.
	Dull twine knife.	Replace twine knife or sharpen cutting edge.
	Worn or damaged billhook tongue. Bale density to low. Excessive twine holder preasure. Improper adjustment of twine disc.	Replace billhook. Increase bale density tension. Loosen twine holder spring. Adjust, time twine disc.
	Insufficient tension on twine holder. Dull or chipped knife.	Tighten twine holder spring. Replace twine knife, or sharpen cutting edge.
	Twine sheared in twine disc. Billhook not rotating. Billhook tongue fails to open. can also be a result of a bow knot that has come apart.	Loosen twine holder or remove all sharp edges and burrs on twine holder and twine disc. Check for sheared roll pin in billhook pinion. Check for lost trigger roller, or cam face worn. Check twine finger travel.

Problem	Possible Cause	Possible Remedy
	Top twine over bale pulled out or sheared out of the twine holder. This twine will be too short to wrap around the bale. If the top twine is squared cut, it pulled out of twine holder. If it is ragged and drastically frayed, it sheared out of the twine disc or over billhook.	Tighten twine holder spring pressure. Decrease bale density tension. Decrease twine holder spring pressure. Decrease bale density tension.
	Billhook is closing on top of twine.	Model knife arm so grove in knife arm will hold twine over billhook tongue farther to the right. Adjust twine disc timing.
	Insufficient travel of knife arm past billhook. Billhook roller cam pressure too loose. Twine finger full travel not going far enough, knot is being formed to far to the left on the billhook.	Model knife arm to obtain more travel past billhook. Check for wear on cam lobe. Tighten billhook roller cam springs. Check twine finger full travel adjusment.
	Insufficient travel of knife arm past billhook. Billhook roller cam pressure too loose.	Model knife arm to obtain more travel past billhook. Check for wear on cam lobe. Tighten billhook roller cam springs.
	As billhook rotates, twine is pinched between billhook and knife arm and twine is damaged below knot. Rough knife arm cuts twine. Extreme high top twine tension.	Bend knife arm so billhook turns freely. Make certain wiper ledge on knife arm contacts back side of billhook. Smooth rough edge in twine notch on knife arm, or replace knife arm. Reduse bale density tension, or check twine tensioners.

STORING THE BALER

At the end of the season, remove all material from the bale chamber and clean with compressed air. Pressure washing or steam cleaning is not advised. Moisture can create problems with electrical components by promoting corrosion. Any hay, chaff or dust on the baler will collect moisture during the winter and cause unnecessary rusting.

Check the baler for any worn or damaged parts. Replace and order parts from the dealer as needed.

Coat the bale chamber lightly with grease to prevent rusting.
Fill the fuel tank to the top.
Provide adequate protection from the weather.

To increase tire life during storage, place the baler on blocks to remove the load from the wheels.

Disconnect the battery.

It is good practice to have the baler inspected at the end of the season and the entire machine placed in top condition.

JA FREEMAN & SON would like to encourage you to go to thier web site and register on our new message board called The Hay Den. This is a great way for hay handlers to post their ideas on how to make Freeman hay equipment even better or help other hay handlers around the world with advice on how to make the best hay crops.

You can reach JA FREEMAN web site at
www.freemanbaler.com
It is FREE to register so enjoy and have fun!