Operator's Manual

FREEMAN

200 & 330 AUTOMATIC PULL-TYPE BALERS
270 & 370 BALERS

PB 102

PREFACE

This manual does not apply to pre-1986 balers. This manual is for the 200, 270, 330, 370 balers. Please note the following changes to the feed fork tines and hay knives.

The feed fork tines on these balers are shorter than the standard tines. Please use the following part numbers when ordering:

For 15" chambers:	F 7967-15
	F 7968-15
	F 7969-15
For 14" chambers:	F 7967-14
	F 7968-14
	F 7969-14

! CAUTION ! **! CAUTION !** **! CAUTION !**

Use of feed fork tines too long for the bale chamber may cause serious damage to the pickup! Please advise your customers.

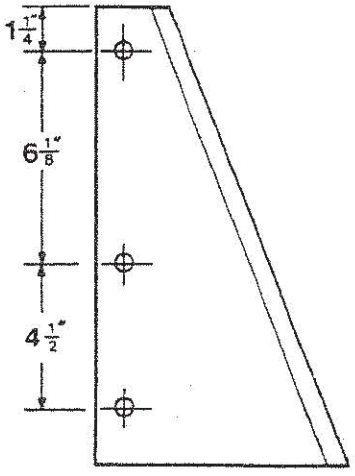
NOTE: Balers manufactured with standard 16" chambers, which have been converted using a bale chamber conversion kit are not affected.

The hay knives on these balers are shorter than the standard knives. Please use the following part numbers when ordering:

For 15" chambers:	Plunger Knife	KNF 18467
	Stationary Knife	KNF 18468
For 14" chambers:	Stationary Knife	F 7744
	Plunger Knife	F 7745 or
		F 7912
	(see below for explanation)	

NOTE: Balers manufactured with standard 16" chambers, which have been converted using a bale chamber conversion kit are not affected.

3 - Tie beginning w/serial #36147	KNF 21901
2 - Tie beginning w/serial #202404	KNF 21901



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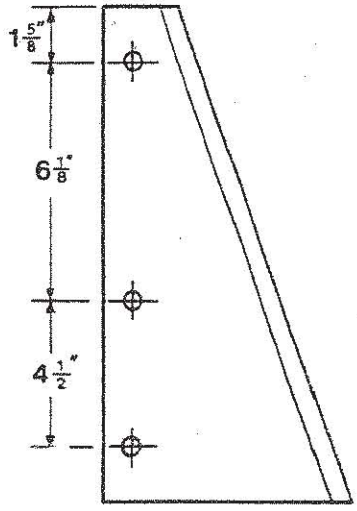

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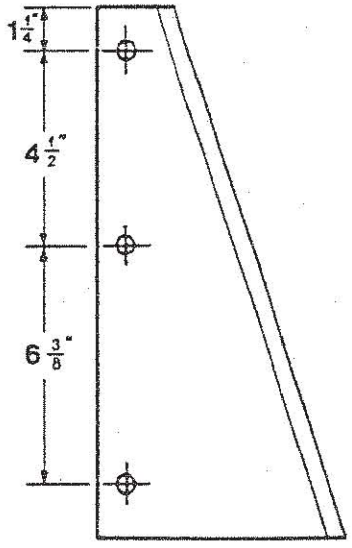

KNF 21901

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TO OUR CUSTOMERS

Your decision to buy a Freeman Baler was a wise decision. When it comes to harvesting hay, Freeman equipment is a solid investment. Dollar per dollar, ton per ton, Freeman equipment brings down costs and brings up profits. Freeman equipment has satisfied and will continue to satisfy their owners all over the world for years to come.

You will find your baler has come from the drawing boards of superior engineers who take their ideas to the field for testing and revision before you receive them. Superior engineering, coupled with professional craftsmanship, makes your Freeman Baler the leader in the industry.

At J.A. Freeman & Son, safety is not just a word, it is a rule. Safety to the operator is of great concern to Freeman engineers. Special care has been taken while designing your Freeman Baler to make it as safe as possible and an efficient baler to operate.

We recommend that you carefully read this entire manual before operating your baler. Also, time spent in becoming fully acquainted with its performance features, adjustments, and maintenance schedules will be repaid in a long and satisfactory life of the product.

BALER IDENTIFICATION

Each Freeman Baler is identified by means of a baler model number and baler serial number. As a further identification, all power units are provided with a serial number.

To ensure prompt, efficient service when ordering parts or requesting repairs from your authorized Freeman dealer, record the serial numbers in the spaces provided.

BALER SERIAL NUMBER _____

Rear, right side of baler on upper frame.

WIRE KNOTTER SERIAL NUMBER _____

Right side of twister and shuttle bar frame.

POWER UNIT SERIAL NUMBER _____

Deutz Diesel—forward side of engine on block.
Wisconsin Gasoline—right side on shroud above screen.
P.T.O. 540 and 1000—top of gearbox.
Hydraulic P.T.O.—front of motor mount and pully adjustment bracket.

NOTE: Reference to left-hand and right-hand used throughout the manual refers to the position when seated in operator's seat, facing forward.

SAFETY

Allied Systems Co. is concerned with safety. Freeman Equipment is furnished with safety features. Even with these safety features, personal injury can still occur if the operator is careless when operating or maintaining the machine. There are “CAUTION,” “DANGER,” and “BE CAREFUL” decals on the machine. Read and pay attention to the decals. Following is a list of precautions that should be taken to help prevent personal injury:

1. KEEP ALL SHIELDS IN PLACE.
2. SHUT OFF TRACTOR ENGINE BEFORE ADJUSTING, LUBRICATING, CLEANING OR SERVICING THE BALER.
3. WAIT FOR ALL MOVEMENT TO STOP BEFORE SERVICING BALER.
4. KEEP HANDS, FEET, AND CLOTHING AWAY FROM POWER DRIVEN PARTS.
5. KEEP ALL SHIELDS INSTALLED AND KEEP CLEAR OF THE P.T.O. DRIVE LINE.
6. KEEP ALL OTHERS OFF BALER.
7. USE APPROPRIATE SIGNS OR WARNING LIGHTS WHEN OPERATING ON HIGHWAYS.
8. MAKE CERTAIN EVERYONE IS CLEAR OF BALER BEFORE ENGAGING P.T.O.
9. DO NOT RIDE ON ANY PART OF THE BALER WHILE IN OPERATION.
10. KEEP HANDS AND FEET CLEAR OF PICKUP.
11. KEEP HANDS AWAY FROM KNOTTER WHEN BALER P.T.O. DRIVE IS ENGAGED.
12. PERIODICALLY CHECK ALL NUTS AND BOLTS FOR TIGHTNESS.
13. ALWAYS USE LIGHTS FOR NIGHT WORK.
14. AS A SAFETY PRECAUTION IT IS RECOMMENDED THAT AN “ABC” FIRE EXTINGUISHER BE CARRIED ON THE BALER AT ALL TIMES. IT IS ALSO RECOMMENDED TO CARRY A FOUR GALLON WATER CONTAINER WITH PUMP, OR AS REQUIRED BY LOCAL AND STATE LAW.
15. AVOID LOOSE CLOTHING WHICH CAN EASILY BE CAUGHT IN MOVING PARTS.
16. REMEMBER ‘SAFETY’ IS ONLY A WORD UNTIL IT IS PUT INTO PRACTICE.

WARNING: SOME ILLUSTRATIONS IN THIS PARTS LIST 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.

BE CAREFUL

1. KEEP ALL SHIELDS IN PLACE.
2. STOP ENGINE OR MOTOR BEFORE LEAVING OPERATORS POSITION TO ADJUST, LUBRICATE, CLEAN, OR UNCLOG MACHINE, UNLESS OTHERWISE SPECIFICALLY RECOMMENDED IN THE "OPERATOR'S MANUAL."
3. WAIT FOR ALL MOVEMENT TO STOP BEFORE SERVICING MACHINE.
4. KEEP HANDS, FEET, AND CLOTHING AWAY FROM POWER DRIVEN PARTS.
5. KEEP OFF EQUIPMENT UNLESS SEAT OR PLATFORM FOR OPERATION AND OBSERVATION IS PROVIDED.
6. KEEP ALL OTHERS OFF.
7. USE APPROPRIATE SIGNS OR WARNING LIGHTS WHEN OPERATING ON HIGHWAYS.
8. MAKE CERTAIN EVERYONE IS CLEAR OF MACHINE BEFORE STARTING ENGINE, MOTOR OR OPERATION.

DANGER

DO NOT RIDE ON FEEDER BOX

KEEP HANDS & FEET CLEAR OF FEEDER

CAUTION

SHUT MOTOR OFF WHEN
GASSING, LUBRICATING
OR ADJUSTING MACHINE

CAUTION

SHIELDS ARE FOR YOUR PROTECTION KEEP THEM IN PLACE

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SETTING UP YOUR NEW FREEMAN BALER
200 & 330 PULLTYPE

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

1. Gather All Components And Fasteners:

Fasteners are found in a wooden crate inside the bale chamber and some components are tied to the baler for transporting purposes.

2. Mount The Wheels First For Safety:

Right Hand Side:

a. Mount the 6-hole hub to the right hand wheel extension plate with five 5/8" bolts, lockwashers and nuts. The nuts fasten toward the outside.

Mount the right hand wheel extension plate onto the axle with five 5/8" bolts, lockwashers and nuts.

c. Mount wheel with tire to hub with the valve stems to the outside.

d. Optional 8-hole hub mounts to the right hand wheel extension plate with five 5/8" bolts, lockwashers and nuts. Tire and wheel mount to the hub with the valve stem to the inside.

Left Hand Side: 200 Only

a. Mount 8-hole hub onto axle with five 5/8" bolts, lockwashers and nuts.

b. Mount wheel with tire to hub. Valve stems go to the inside.

Left Hand Side: 330 Only

a. Mount the tandem wheel plate onto axle with five 5/8" bolts, lockwashers and nuts. The holes closest to the extension pipe on the tandem plate should be used. With one 5/8" bolt, lockwasher and nut, fasten top support angle of tandem plate to the hole provided in the baler frame.

b. Mount one 8-hole hub onto the main frame of the tandem plate, using the six remaining holes. Fasten with five 5/8" bolts, lockwashers and nuts.

c. Mount one 8-hole hub onto the extension of the tandem plate. Fasten with five 5/8" bolts, lockwashers and nuts.

d. Mount wheels with tires to each hub. Valve stems go to the inside.

e. Install the Tandem Axle Truss Rod onto the bottom of the tandem plate "A", *Fig. 56,* and to the axle "B". A tapered hole is provided on both the tandem plate and the axle. Tighten the tapered nut into the tapered hole when the weight of the baler is not on the wheels and tighten the jam nut against the tapered nut on both ends of the truss rod.

3. Attach The Needle Guards:

a. Remove the needle guards from inside the feeder house. Do so by removing one 5/16" bolt and nut.

b. Attach the needle guards to the needle guard mounting brackets with the two bolts and nuts provided. There is a left hand and a right hand needle guard. The forward fastening bracket on the needle guards should be fastened to the inside of the baler frame.

4. Mount Power Unit To Front Of Baler:

(I): Hydraulic P.T.O.
(II): 540 and 1000 RPM P.T.O.
(III): Wisconsin Engine
(IV): Diesel Engine

I. Hydraulic P.T.O.:

a. Install the hydraulic tank assembly to the front of the baler and bolt it on with nine, 1/2" bolts, lockwashers and nuts.

b. Install the drawbar by placing its rear end into the drawbar pivot bracket located on the left hand side of the baler. Push the 1" x 10 1/2" bolt down from the top, install the nut and cotter key.

c. Attach the pickup lift chain to the pick-up lift lever, secure with washer and cotter key.

d. Attach the baler jack to the drawbar. Align jack in the vertical position and insert the pin. Extend the jack out until the baler is resting level.

Note: For installing the hydraulic hoses complete steps e through n.

e. Connect the 3/4" x 42" high pressure hose on the hydraulic motor to the 3/4" 45 degree elbow on top of drawbar.

f. ***(330 only)*** Connect the 1" x 48" return hose on the back side of the oil filter to the male connector on the back right hand side of the drawbar.

g. ***(200 & 330)*** Connect 1 1/2" x 43" suction hose on the front bottom side of the hydraulic tank to the male connector on drawbar.

f. ***(200 only)*** Install 3/4" check valve into the right-rear side of the drawbar and connect the 1" x 42" return hose on front of oil filter to the 3/4" check valve on the right-rear side of the drawbar.

h. ***(200 & 330)*** Connect the 1" x 38" return hose on the back side of the hydraulic tank to the male connector on the bottom of the drawbar.

i. Connect the 1 1/2" x 39" suction hose to the forward facing male connector on top of the drawbar. Connect opposite end to the hydraulic pump.

j. Connect the 1/2" x 54" return hose to the 1/2" 45 degree male elbow on the forward top side of the drawbar. Connect opposite end to the hydraulic pump.

k. Connect the 3/4" x 42" high pressure hose to the 3/4" 45 degree male elbow on the top side of the drawbar. Connect opposite end into the hydraulic pump.

l. Attach the pump to the pump carrier bracket.

m. Connect the 1/2" x 22" hose to the lower left hand side of the hydraulic tank. Connect the opposite 90 degree end to the left hand side of the oil cooler.

n. ***(330 only)*** Connect the 1/2" x 22" hose to the 1/2" fitting on the right hand front of the oil filter.

n. ***(200 only)*** connect the 1/2" x 14" hose to the 1/2" fitting on top of the oil filter. Connect opposite end to the right hand side of the oil cooler.

o. ***(200 & 330)*** Install the main drive belt around the flywheel and drive pulley. Tighten the drive belt so there is a 3/4" deflection when 25 to 35 lbs. force is applied to the center of the belt.

p. Install the main drive belt shield and bracket to the baler frame using the holes provided. This requires two 1/2" x 1 1/2" bolts and self locking nuts.

q. Fill the tank with the recommended hydraulic oil.

r. Run the baler a few minutes to charge the system. After running refill the oil tank to the recommended level. Check for leaks and tighten as needed.

II. 540 and 1000 RPM P.T.O.:

a. Attach the P.T.O. mount to the front of the baler with nine 1/2" bolts, lockwashers and nuts.

b. Install the drawbar by placing the rear of the drawbar into the drawbar pivot bracket located on the left hand side of the baler. Push the 1" x 10 1/2" bolt down from the top, install the nut and cotter key.

c. Attach the baler jack to the drawbar. Attach it so that the jack is in the vertical position and insert the pin provided. Extend the jack out until the baler is resting level.

d. Place the gearbox mounting plate on the P.T.O. mounts with the two oblong holes to the right. Secure with 1/2" x (2" rear, 1 1/2" front) plow bolts down through the two countersunk holes on the left side of the plate and fasten with washers, lockwashers and nuts. Do not tighten yet. On the left side insert two 1/2" x (1 3/4" front, 2 1/2" rear) bolts, fasten with lockwashers and nuts. Do not tighten yet.

e. Install a nut onto each belt tightener bolt, then run belt tightener bolts through the eyelets underneath the engine mounts on either side. Be sure the loops of the belt tightener bolts are to the rear. Install a nut onto each belt tightener bolt on the opposite side of the eyelet.

f. Mount the gearbox onto the mounting plate.

g. Thread four 5/8" x 1 1/4" cap screws and lockwashers up through the bottom of the plate into the gearbox. Secure the bolts tightly.

h. Install the drive belt around the P.T.O. drive pulley and the flywheel. Align the drive pulley so it is parallel with the flywheel.

i. Pull the belt tight by pulling the gearbox forward with the belt tightener bolts. Do not change the alignment of the drive pulley and the flywheel. Then tighten the four bolts that fasten the base plate to the engine mounts. Tighten the main drive belt so there is a 3/4" deflection when 25 to 35 lbs. force is applied to the center of the belt.

j. Install the main drive belt shield and bracket to the baler frame using the holes provided. Fasten with two 1/2" x 1 1/2" bolts and self-locking nuts.

k. On the front of the drawbar mount the bearing pedestal. Start by placing pedestal tilt bushings in the bottom of

bearing pedestal and then insert ½" × 2" cap screws, flat washers and self-locking nuts.

l. Place the pedestal bearing over the splined shaft of the drive line. Press it on to the bearing seat shoulder.

m. Remove the cotter key, nut and lockwashers from the clutch shaft on the P.T.O. gearbox.

n. Install two clutch pins and two springs in the yoke end of the drive line.

o. Place the end of the drive line onto the P.T.O. clutch shaft and replace the lockwasher, nut and cotter key.

p. Attach the tractor end of the drive line to the pedestal bearing bracket with a swivel bushing, lockwasher and a ⅝" × 1½" bolt. The bearing pedestal bracket should be installed so that the tractor end of the drive line is horizontal as shown in *Fig. 2.*

q. Attach three shield clips to the top three bolts on the gearbox, just behind the clutch with the angle in.

r. Attach the U-joint and shield over the clutch onto the three shield clips with three ¼" cap screws,lockwashers and flat washers.

s. Mount the shield bracket over and onto the pedestal bearing housing with four 5/16" nuts and lockwashers.

t. On top of the shield bracket, mount the universal joint shield with ¼" × ¾" cap screws, lockwashers and nuts.

u. Attach the drive line on the baler. Be sure the set screw on the yoke is mated with its locating hole.

v. Be sure the gearbox is full to the check-plug level with E.P. SAE 90 gear oil. This takes two quarts.

III. Wisconsin Engine:

a. Attach the motor mount to the front of the baler with twelve 1/2" bolts, lockwashers and nuts.

b. Attach the right hand support side plate and spacer with two 1/2" x 1 1/2" button head bolts and two 1/2" x 1 1/2" hex head bolts with lock washers and nuts. Install the spacer between the side support plate and the motor mount plate using the existing bolts.

c. Attach the left hand support side plate and spacer with two 1/2" x 2" hex bolts with self locking nuts and two 1/2" x 1 1/2" hex head bolts with lock washers and nuts. Install the spacer between the side plate and the motor mount plate using the existing bolts.

d. Install the drawbar by placing the rear of the drawbar to the drawbar pivot bracket located on the left hand side of the baler. Push the 1" x 10 1/2" bolt down from the top, install the nut and cotter key.

e. Attach the Baler Jack to the drawbar. Attach it so that the Jack is in the vertical position and insert the pin provided. Extend the Jack out until the baler is resting level.

f. Attach the pickup lift connecting link to the lift lever arm on the right hand side of the baler with the 3/16" x 2" cotter key provided.

g. Attach the engine base plate to the engine mounts with engine oil access drain hole forward and the angled edge up. Be sure the two 1/2" holes are aligned with the left side engine-mount with two 1/2" x 1 1/2" bolts, flatwashers, lockwashers and nuts. Square the engine base plate with the baler frame and temporarily fasten the two front bolts.

h. Install a nut onto each belt tightener bolt, then run the belt tightener bolts through the eyelets underneath the engine mounts on either side. Be sure the loops on the belt tightener bolts are to the rear. Install a nut onto each belt tightener bolt on the opposite side of the eyelet.

i. Attach the belt tightener loops at the rear of the engine-mounts with two 1/2" x 2" bolts, flatwashers, lockwashers and nuts. Do not tighten at this time.

j. Install the engine on the engine-base plate using four 1/2" x 3" bolts, flatwashers, lockwashers and nuts. Before tightening the engine mounting bolts align the drive pulley with the flywheel.

k. Tighten the four engine mounting bolts.

l. Install the drive belt around the engine drive pulley and the flywheel. Loosen the base plate bolts and pull the belt tight with the belt tightener bolts, do not change the alignment of the drive pulley and flywheel. Tighten the base plate bolts. There should be 3/4" deflection when a 25 to 35 lb. force is given midway between the flywheel and drive pulley.

m. Fill the crankcase and air cleaner with oil recommended by the manufacturer, (the engine is shipped dry).

n. On the fuel filter, install the two short hoses with clamps. Place the fuel line from the tank in one end of the filter hose. (The arrow on the filter indicates the fuel flow direction).

o. Place the other fuel filter hose with brass adapter into the fuel strainer on the engine. Be sure to remove the red plastic plug first. The brass adapter threads into the hole.

p. Install the main drive belt shield and bracket to the baler frame using the holes provided. This requires the two 1/2" x 2" bolts and self locking nuts used in mounting the side support plate.

q. Install the battery onto the main drive belt shield bracket and fasten with the provided hold-down. Positive cable attaches to the starter solenoid, negative cable attaches to the engine clutch housing.

IV. Diesel Engine:

When mounting a diesel engine, Duetz or equivalent, on the Freeman Baler, steps a through d are identical to the steps found in mounting a Wisconsin engine.

e. After doing steps a through d as described in the Wisconsin section, place the engine with engine pan attached on the right hand side of the engine mounts. Align the holes on the engine pan with the sliding holes on the engine mounts.

f. Complete step f as described in the Wisconsin section.

g. Fasten the engine pan to the engine mounts loosely with two ½" × 1½" bolts, flat washers, lockwashers and nuts. On the rear use two ½" × 2" bolts, flat washers, lockwashers and nuts. Be sure the rear bolts are inserted down through the loops of the belt tightener bolts.

h. Install the drive belt around the engine drive pulley and the flywheel. Align the drive pulley and flywheel.

i. Pull the belt tight with the belt tightener bolts. Do not change the alignment of the drive pulley and flywheel. Then tighten the four bolts that fasten the engine pan to the engine mounts. There should be ¾" deflection when 25 to 35 lbs. of force is applied midway between the drive pulley and the flywheel.

j. Check the oil level in the crankcase.

k. Attach the fuel lines. Attach the 3/16" return line to the fitting on the #1 fuel injector. Then attach the 3/8" feed line to the banjo fitting on the fuel pump. Secure both lines with the clamps provided.

l. Install the main drive belt shield and bracket to the baler frame using the holes provided. This requires two ½" x 2" bolts and self-locking nuts.

m. Install the battery onto the main drive belt shield bracket and fasten with the provided hold-down. The positive cable attaches to the starter solenoid, and the negative cable attaches to the engine clutch housing.

5. Install The Pickup Drive Belt:

Note: To aid you in installing the pickup drive belt refer to *Fig. 1.*

a. The pickup drive belt is installed on the left hand side of the baler. Start by placing the pickup drive belt around the front pickup drive sheave.

b. Remove the two ⅜" × 1" bolts that fasten the bearing mount plate to the bearing mount bracket.

c. Loosen the four ½" × 1½" bolts that fasten the bearing mount bracket to the baler frame. Then slide the bearing mount bracket forward. Slotted holes are provided in the baler frame to allow for this.

d. Loosen the pickup drive belt shield to allow for enough room to get the belt installed easily.

e. Install the pickup drive belt onto the pickup driven sheave.

f. Replace the bolts that fasten the bearing mount plate to the bearing mount bracket. These bolts were taken out in step b.

g. Slide the bearing mount bracket back until the pickup drive belt is tight. Then tighten the four ½" × 1½" bolts that fasten the bearing mount bracket to the baler frame.

h. Retighten the pickup drive belt shield.

i. Place the belt tightener idler pulley on top of the pickup drive belt.

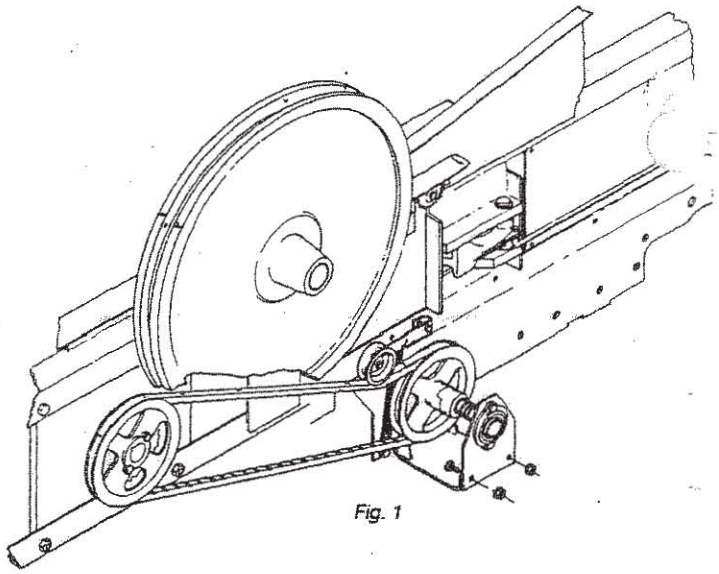


Fig. 1

6. Install The Bale Chute & Optional Bale Weight Indicator:

Note: To aid you in installing your bale chute and optional bale weight indicator, refer to *Fig. 53.* The procedures described below will install the bale chute and optional bale weight indicator so that the bales fall to the ground with the cut side up. To have the bales fall to the ground with the cut side down, reverse all the left hand procedures to right hand procedures and vice versa.

a. Start by disconnecting the bale chute chain from the upper right hand corner of the bale chamber.

b. Attach the shock absorber support, with the offset to the outside, followed by the cable bracket with the offset to the outside, to the two holes provided where the chain was removed. Fasten with two 1/2" x 2" button head bolts and self-locking nuts.

c. Attach the bale weight indicator sheave to the cable bracket with the pulley facing toward the right. Use the fasteners provided.

d. Install the weight indicator bracket, with indicator hand attached, to the two holes in the upper support frame on top of the bale chamber. The weight indicator bracket attaches to the rear of the frame. Position the spring to the left. Fasten with two 3/8" x 1 1/2" bolts and self-locking nuts.

e. Position the bale chute on the ground behind the bale chamber so that the flat side of the bale chute is toward the right hand side of the baler. Then attach the two bale skid brackets onto the rectangular tube frame found on the front of the bale chute. Fasten with two 1/2" x 5 1/2" bolts and self-locking nuts. Do not tighten yet.

f. Raise the bale chute to the bottom of the bale chamber and attach the bale chute to the holes in the frame angles on either side of the bale chamber. Attach the right hand side first. Then attach the left hand side to the center hole in the bale skid bracket. Fasten with two 1/2" x 1 1/2" button head bolts and self-locking nuts. Install the nuts to the outside. When tightening, be sure the bale chute is free to swing up and down.

g. Tighten the two 1/2" x 5 1/2" bolts that attach the bale skid brackets to the bale chute.

h. Attach one end of the bale chute chain to the bottom hole on the end of the shock absorber support. Fasten with one 1/2" x 1 1/2" button head bolt and self-locking nut. Attach the bale chute chain into the slotted hole of the bale chute chain bracket on the right hand side of the bale chute. Adjust it so that the rear of the bale chute is 2" below the bale chamber.

i. Attach the bale turner to the flat surface of the bale chute. Insert the steel peg of the bale turner into the slotted hole in the bale chute. Fasten the opposite end with one 3/8" x 1" bolt and lockwasher.

j. Attach the indicator cable to the hole in the bottom right hand side of the indicator hand. Fasten with the cable clamp provided.

Route the indicator cable through the bale weight indicator sheave. Then attach the cable to the small hole in the bale chute chain bracket. Adjust the cable so that the indicator hand is in the vertical position and fasten the cable with the provided cable clamp.

l. Install the shock absorber, with shock absorber bushings, onto the shock absorber support. Attach the opposite end onto the upper hole of the shock absorber bracket on the right hand side of the bale chute. Fasten with two 7/16" x 3" bolts, flat washers and self-locking nuts.

m. Reattach the chain on the bale chute so the bale chute is resting 4" below the level of the bale chamber. Secure the chain in the slot with one 5/16" x 1" bolt, flat washers and self-locking nut.

n. Attach one end of the bale chute spring to the bale chute chain at the first available link below the shock absorber support. Attach the other end of the spring onto the chain so that the rear of the bale chute is 1 1/2" above the level of the bale chamber when it is resting freely.

7. Install The Twine/Wire Boxes:

Twine, 9 compartment: 330

Note: to aid you in installing the 9 compartment twine box, refer to *Fig. 053.*

a. Start by mounting the right hand twine box mounting bracket to the feeder house support. Fasten with two 1/2" x 1 1/2" bolts and self locking nuts.

b. Mount the bracket end of the twine box base tube, to the right hand twine box mounting bracket. Fasten with three 3/8" x 1" bolts, lockwashers and nuts.

c. Attach the left end of the twine box base tube to the left hand twine box tube mounting bracket found on the bale chamber. Attach with the bottom support plate and fasten with two 1/2" x 5 1/2" bolts and self locking nuts.

d. Assemble the twine box. Attach the front and back sides to the left and right ends. Fasten with twelve 1/4" x 1/2" round head screws, lock washers and nuts.

e. Attach the bottom of the twine box by placing it inside of the four sides. Fasten with eight 1/4" x 1/2" round head screws, lock washers and nuts.

f. Attach the two hinges to the back side of the twine box using six 1/4" x 1/2" truss head screws, lock washers and nuts, (insert screws from outside the twine box).

g. Attach handle to twine box top using two 1/4" x 1/2" round head screws, lock washers and nuts.

h. Attach top to hinges on the back of the twine box using six 1/4" x 1/2" truss head screws, lock washers and nuts, (insert screws through the hinges first).

i. Attach the twine tension assembles to the inside of the twine guide bracket. Fasten with six 1/4" x 1/2" round head screws, lockwashers and nuts.

j. Attach twine guide bracket to the left hand side of the twine box using two 1/4" x 1/2" round head screws, lockwashers and nuts. The tension assembly faces down.

k. Install the six twine guide bushings into the three large holes on the left hand side of the twine box. Fasten with washers and snap rings on the inside of the twine box. Install the three remaining bushings onto the twine guide bracket with washers and snap rings.

m. Place the twine box onto the twine box base tube as far to the right as possible without interferring with the back of the feeder house. Mount the two twine box clamps under the base tube using two 1/2" x 5 1/2" bolts and self locking nuts.

Wire, 4 and 6 Compartment: 200 and 330

Note: To aid you in installing the 4 or 6 compartment wire box refer to *Fig. 54.*

a. Start by installing the wire box base tube to the wire box mounting bracket on the bottom right-hand side of the bale chamber. Attach with the bottom support plate. Fasten with two 1/2" x 5 1/2" bolts and self-locking nuts. Do not tighten yet.

b. *STANDARD PICKUP*
Mount the right-hand wire box mounting bracket which is attached to the wire box to the feeder house support. Fasten with two 1/2" x 1 1/2" bolts and self-locking nuts.

c. *ADVERSE CONDITION PICKUP ONLY*
For adverse condition pickups the mounting bracket goes between the pickup spring plate and support.

d. Mount the wire box bracket brace. Attach the end with the larger hole to the 5/8" bolt in the bottom rear hole of the axle plate. Take off the 5/8" nut and lockwasher to attach the wire box bracket and reinstall the nut and lockwasher to fasten. Attach the opposite end of the wire box bracket brace to the hole provided in the wire box mounting bracket. Fasten with one 1/2" x 1 1/2" bolt, flat washer and self-locking nut.

e. Tighten all the fasteners installed in steps a through c.

f. Pull the electric horn wire harness from inside the wire box base tube. Attach the wire to the wire junction on the top of the bale chamber, near the tension cylinder. Wire harness clips are provided to secure the route of the wire harness.

Twine, 6 Compartment: 200

a. Attach the left and right hand mounting brackets to the rear of the feeder house. Fasten with three 3/8" x 1" cap screws and self locking nuts.

b. Attach the front and rear sides of the twine box to the left and right hand sides. Fasten with twelve 1/4" x 1/2" cap screws, lockwashers and nuts.

c. Attach the bottom of the twine box by placing it inside the four sides. Fasten with 1/4" x 1/2" bolts, lockwashers and nuts.

d. Attach handle to the twine box lid. Fasten with two 1/4" x 1/2" bolts, lockwashers and nuts.

e. Attach the two hinges to the back side of the twine box. Fasten with three 1/4" x 1/2" truss head screws, lockwashers and nuts.

f. Attach the twine box lid to the two hinges on the twine box. Fasten with three 1/4" x 1/2" truss head screws, lockwashers and nuts.

g. Attach the twine guide bracket to the lower left hand corner of the twine box. Fasten with two 1/4" x 1/2" bolts, lockwashers and nuts that hold the end and front side of the twine box together.

h. Attach the two twine tension assemblies to the left hand end of the twine box. Be sure they are positioned toward the twine guide bracket. Fasten with two 1/4" x 1" bolts, lockwashers and nuts.

i. Install the four twine guide bushings, two into the box and two into bracket. Fasten with washers and snap rings.

j. Mount the twine box between the two mounting brackets installed on the back of the feeder house. Fasten with three 3/8" x 1" button head bolts and whiz nuts.

8. Mount The Throttle And Tension Control:

Note: To aid you in mounting the throttle and tension control box refer to *Fig. 3.*

a. Start by mounting the leg standard to drawbar. For 540 and 1000 P.T.O. balers mount the leg standard to the P.T.O. bracket before fastening it to the drawbar.

b. Attach the standard to the leg standard with two 5/8" x 1 1/2" bolts and self-locking nuts. Adjust to the desired height with the holes provided.

c. Attach the mounting base angle to the upper standard with three 3/8" x 1" bolts, lockwashers and nuts. Adjust it to the desired location with the holes provided. The mounting base angle can be attached to the tractor if desired.

d. Unwrap the throttle cable and lay it out forward of the baler. Do the same for the tension control cable.

e. Install the throttle cable bracket onto the top of the clutch housing. Fasten with the cap screw installed into the clutch housing.

f. Route the cables through the clamps provided and fasten them to the throttle cable bracket with one ¼" × 1" bolt and self-locking nut.

g. With the electrical tape provided put four wraps around both cables in 12" intervals for a distance of four feet.

h. Depending on where the control box is mounted, determine where the cables should be cut. Allow enough length for turning and allow 6¾" extra for stripping.

i. Using a knife, cut both cable coverings 6¾" from the end. Do this by stripping the outer cover from the cable housing with knife. Then using the tip of a pair of diagonal cutters, cut the cable housings 6" from the end.
Be careful not to nick the inside wire. The result will be ¾" of stripped cable housing and 6" of control wire exposed.

j. Using a pair of flat nosed pliers, pinch the pointed ends of the cable housings toward the center to allow the beach nut to spin on freely.

k. Remove the control box cover. Position the throttle control lever on the control between the ¾ and full position. Select the throttle control cable and slide the ⅜" nut and lockwasher onto the cable. Insert the throttle cable through the right-hand hole on the rear of the control box and slide the beach nut onto the cable.

l. Route the throttle wire through the swivel fastener on the throttle lever inside the control box. Thread the beach nut onto the cable housing. Then pull the throttle cable with beach nut installed into the hole and fasten with the ⅜" lockwasher and nut.

m. Using a pair of flat nosed pliers, pull the wire through the swivel fastener until the throttle control lever on the engine is full open. With a screw driver lock the wire with the provided screw in the swivel fastener.

n. Cut the excess wire so that ¾" of wire is exposed through the swivel fastener. Then wrap the ¾" length of wire back over the swivel fastener.

o. Adjust the tension control lever so that it is even with the top corner of the flange on the rear of the control box.

p. Select the tension control cable and slide the ⅜" nut and lockwasher onto the cable. Insert the tension cable through the left-hand hole on the rear of the control box, then thread the beach nut onto the cable.

q. Slide the tension control wire through the swivel fastener on the tension control indicator lever. Secure the beach nut onto the cable housing and fasten the beach nut to the control box with the ⅜" lockwasher and nut.

r. Hold the tension control indicator to the rear of the control box. Using flat nosed pliers pull the tension control wire through the swivel fastener until all of the slack is removed, then secure the wire with the hex set screw.

s. Cut the excess wire so ¾" of wire is exposed through the swivel fastener. Then wrap the ¾" length of wire back over the swivel fastener.

t. Reassemble the control box cover.

u. Insert the control box into the slot provided on the mounting base angle, insert the pin through the bottom and fasten it with a hair clip pin.

9. Install The Bale Counter:

Note: To aid you in installing your bale counter refer to *Fig. 55.*

a. Mount the bale counter, with the mounting angle, to the bale chamber at the two holes provided. Fasten with two self-tapping screws.

b. With the provided cotter key fasten the bale counter chain to the meter trip bar at the hole provided.

10. Install The Tool Box:

Install the tool box onto the tension rail on the right-hand side of the baler with two ⅜" × 1" cap screws provided.

11. Mount The Hay Saver Wheel:

Note: To aid you in installing your hay saver wheel, refer to *Fig. 52.*

a. Start by placing two ½" × 3" bolts through the holes provided in the right-hand pickup fender. The bolts insert from the inside to the outside. While inserting the bolts you have to turn the pickup in order to align the holes.

b. Place the hay saver wheel spacer and bracket, with arm attached onto the bolts. Fasten with ½" lockwashers and nuts.

c. Attach the wheel axle arm and disc assembly to the rotary clamp plate. Insert from the inside to the outside. Fasten with 1" flat washer and cotter key.

d. Adjust the hay saver wheel with the adjusting bolt found

on the bottom of the arm. Adjust so that the wheel touches the stubble when in the field. Adjust the tilt of the wheel with the U-bolts.

12. Mount The Wire Alarm Horn:

Note: For a diagram of instruction on the wiring system refer to *Fig. 50.*

a. Start by attaching the horn to the inside of the right-hand engine mount bracket. Fasten with one 3/8" x 1" bolt, lockwasher and nut.

b. Attach the red horn wire to the solenoid.

c. Note: For the hydraulic P.T.O. baler mount the wire alarm horn onto the upper front side of the crankarm shield. Fasten on the outside of the shield with the bolt provided. Use the same bolt which fastens down the bullgear luber tank.

13. Mount The Lights:

Note: For a diagram of instruction on the wiring sy refer to *Fig. 50.*

a. Remove the top 5/16" whiz nut from the right-hand corner of the feeder house where the light wire harness ends. Mount the light and ground wire. Fasten by replacing the 5/16" whiz nut.

b. Attach the light to the light bracket. Fasten with one 1/2" lockwasher and nut.

c. Attach the electrical wire to the light.

d. Attach the remaining light bracket along with ground wire to the hole provided in the right-hand motor mount plate. Fasten with one 5/16" x 1" bolt, lockwasher and nut.

e. Attach the light to the light bracket. Fasten with one 1/2" lockwasher and nut.

ATTACHING BALER TO TRACTOR

There are three types of hitches for Freeman balers. It is important that the hitches are properly adjusted to avoid equipment damage.

The three types of hitches are:

I. Engine
II. Standard 540 or 1000 RPM P.T.O.
III. Hydraulic P.T.O.

I. & II. Engine And Standard 540 Or 1000 RPM P.T.O. Balers:

Adjust the baler jack so that the bale chamber is level with the ground "A," *Fig. 3.* Place your tractor in front of the baler and adjust the baler hitch "B" to the proper height with the holes provided. The desired result is to have the baler sitting as level as possible when attached to the tractor.

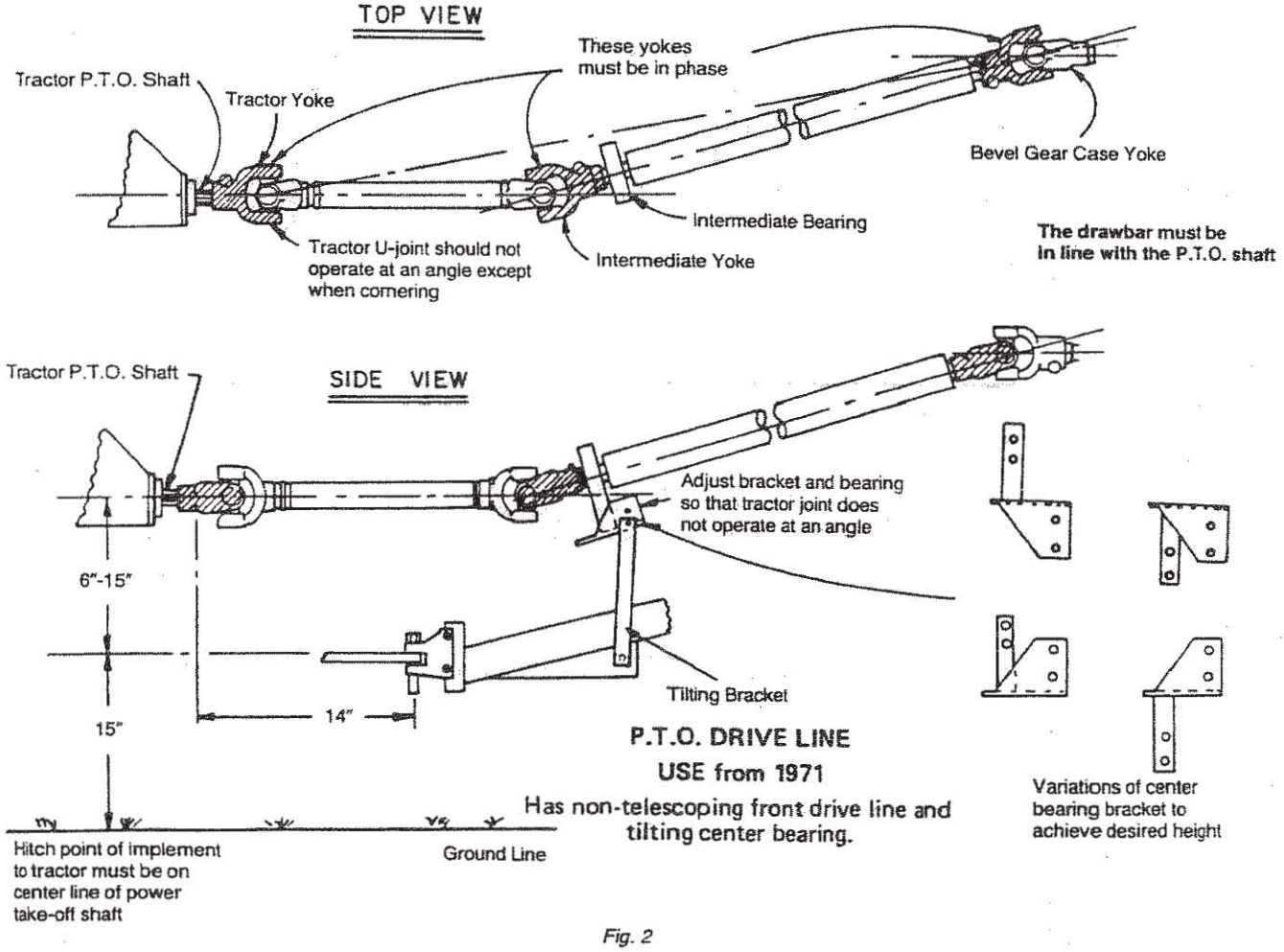


Fig. 2

For the 540 and 1000 RPM P.T.O. balers follow the adjustment specifications in *Fig. 2.* Failure to follow these specifications can result in serious equipment damage.

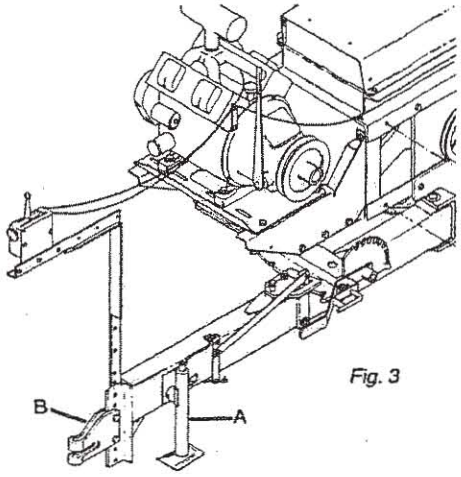


Fig. 3

III. Hydraulic P.T.O. Baler:

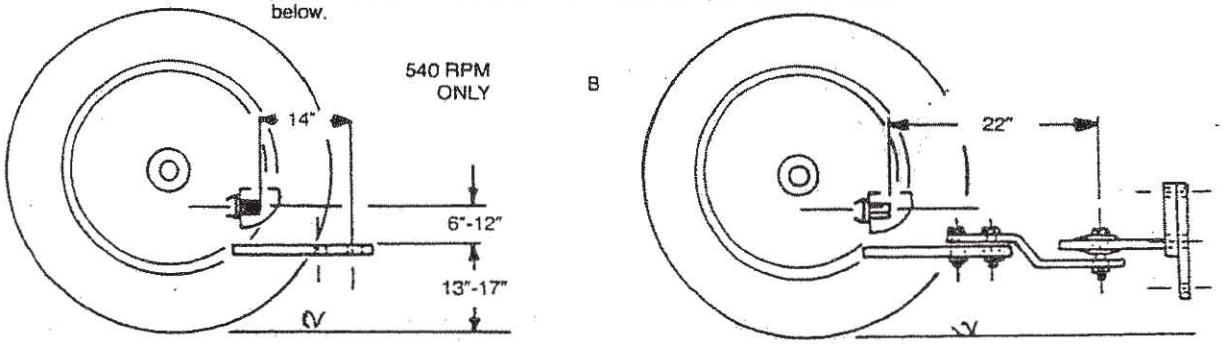
When attaching tractor to a hydraulic P.T.O. baler, sta... installing the drawbar extension to tractor drawbar "A," *Fig. 4.* The drawbar extension mounts on top of your tractor drawbar. The front fasteners are one 1"×3½" bolt, flat washers, castle nut and cotter key. The rear fasteners are one ¾"×3½" bolt, flat washers, ¾"×1"×1" inner race, castle nut and cotter key.

Then adjust the ball joint hitch on the baler drawbar to one of the three different positions so that it corresponds to the tractor drawbar height "A," *Fig. 4.*

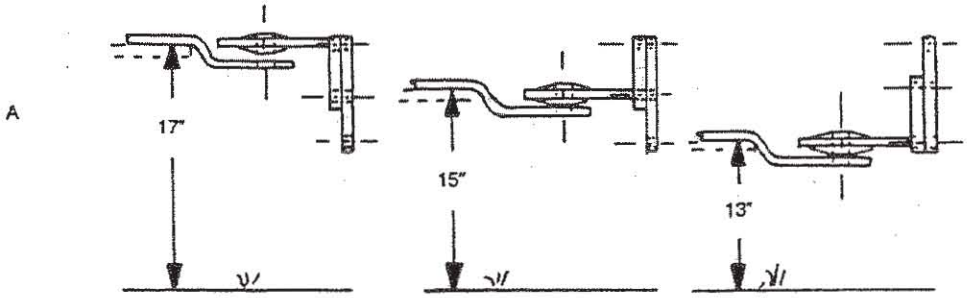
For the most satisfactory operation, the tractor drawbar should be adjusted to conform with ASAE standard drawbar specifications as shown in *Fig. "B."*

After all the hitches are adjusted and fastened into place, hook the baler drawbar to the tractor drawbar. Fasten with one 1⅜"×4½" bolt, castle nut and cotter key.

For the most satisfactory operation, the tractor drawbar should be adjusted to conform with ASAE standard drawbar specifications as shown below.



The baler ball joint hitch may be attached to the baler drawbar in 3 different positions as shown below. Select the one that corresponds to your tractor drawbar height. This should put the baler in a level operating position.



Tractor ground drive P.T.O. must be disengaged while operating machine to prevent damage to pump & motor.

Fig. 4

Mount the hydraulic P.T.O. pump assembly to the tractor drive shaft by lining up the splines on the drive shaft with the pump assembly and slide onto the drive shaft. The forward pressure from the hydraulic hoses will keep the pump assembly on the drive shaft.

Be certain the pump torque arm is hanging down on the right side of the drawbar. Adjust the pump torque arm so that one clevis on the end of the chain is fastened into the connecting hole in the pump torque arm. Then wrap the chain around the drawbar and fasten the other clevis into the other connecting hole in the pump torque arm, *Fig. 5.*

Note: Do not operate hydraulic P.T.O. unit until the hydraulic P.T.O. unit is full of the recommended hydraulic oil, or major damage will occur. Read the section on the hydraulic P.T.O. in this manual before operating the baler.

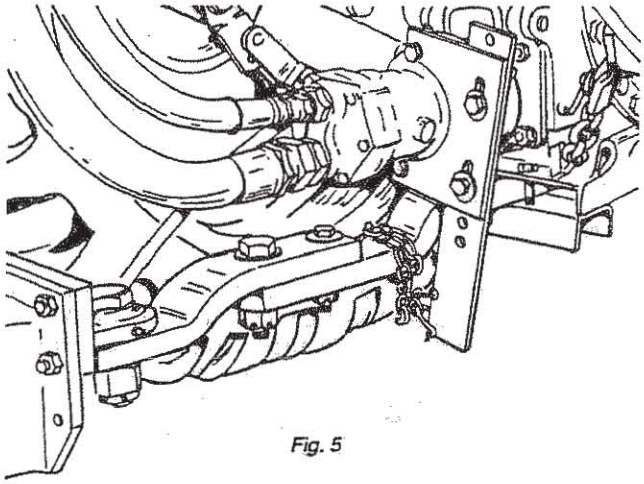


Fig. 5

FIELD START-UP PROCEDURE

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:

I. Drawbar Adjustment
II. Pickup Adjustment
III. Tension Adjustment

I. Drawbar Adjustment:

The baler drawbar is adjustable in two positions. Transport position "A," *Fig. 6,* and the baling position "B." The tongue latch plate "C" should be locked into the transport position when transporting the baler on public roads, highways or areas of narrow access. Once the baler is in the hay field, change the tongue latch plate to the baling position. Any time the baler is operating, be sure the drawbar is in the baling position.

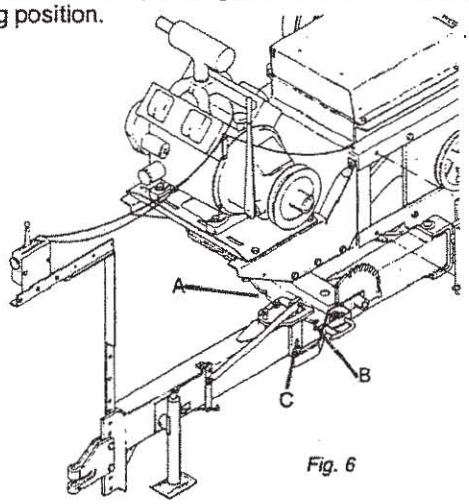


Fig. 6

II. Pickup Adjustment:

The pickup lift lever should be in the raised position when transporting the baler "A," *Fig. 7.* Once the baler is in the hay field change the pickup lift lever to the baling position "B." If it should become necessary to bale with the pickup in a higher position, this can be done by locking the pickup raising lever into the desired slot on the raising lever quadrant "C."

When the pickup is in the baling position, be sure the pickup fingers clear the ground by at least 1". Do not rotivate the ground with the pickup fingers. Adjust the balance springs at the end of the pickup on the right-hand side of the baler so that the pickup may be lifted with one hand or approximately a 35 lb. lift. If a hay saver wheel is used, readjust the balance springs to arrive at the adjustment described above.

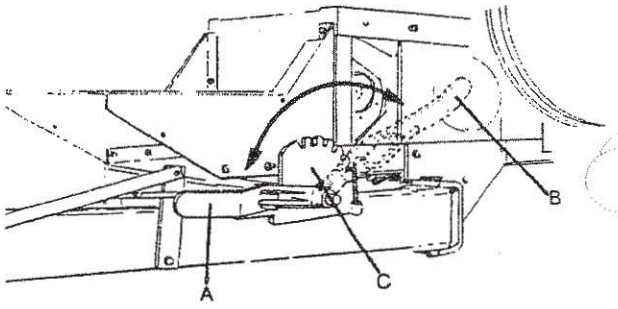


Fig. 7

III. Tension Adjustment:

When baling is started adjust tension to maximum relaxed position. As the first few bales are made increase the tension with the automatic tension control until the desired amount of tension is reached. The proper bale tension can be determined by the weight and shape of the bale. As major hay condition changes occur, tension control adjustments are required to maintain bale density.

Note: Before loading the baler with hay, thread the knotters. See twine threading on page 24 or wire threading on page 26.

BALER OPERATING SPEEDS

The Wisconsin and Deutz engines have the governor set according to their manufacturers' specifications when you receive the baler. For further information on the operating speeds of the Wisconsin and Deutz engines, see the individual manufacturer's manual.

The baler is designed for operation at or near maximum capacity. This requires the feeder house to be full at all times. To arrive at this advance ground speed and reduce baler speed when the hay volume is low. Reduce ground speed and advance baler speed when hay volume is high.

The baler should be operated so that the plunger speed is 74 to 84 strokes per minute. Adjust the baler engine speed, for engine balers, or the tractor speed, for P.T.O. balers, so that you are operating at the recommended plunger strokes.

The ground travel speed should be regulated according to the volume and condition of the hay. To check this, count the number of plunger strokes in each bale. There should be 12 to 16 plunger strokes in each bale under normal conditions. The plunger strokes are counted between each time the knotter ties a bale. The baler should not be run at high speeds when it is empty.

A quality bale can be produced by adhering to the above instructions. Consistent bale length is of great importance when using any automatic stacking system. Consistent bale length will occur as a result of following the above instructions. For easy, efficient stacking and hauling set and maintain the bale length at 46 inches.

For the hydraulic P.T.O. balers, the oil temperature should be observed frequently to insure it remains below 225 degrees F (107 degrees C). The baler speed should be reduced if the oil gets too hot.

Caution: Always shut off baler and tractor when inspecting, adjusting, lubricating, or servicing baler.

KNOTTER ADJUSTMENT: Twine and Wire

All Models:

Needle Timing:

Note: Before timing the needles, be sure the needles are in adjustment. For adjusting the needles on a twine baler refer to page 21, for a wire baler refer to page 24.

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 counterclockwise until the tips of the needles are even with the bottom of the bale chamber, *Fig. 8.*

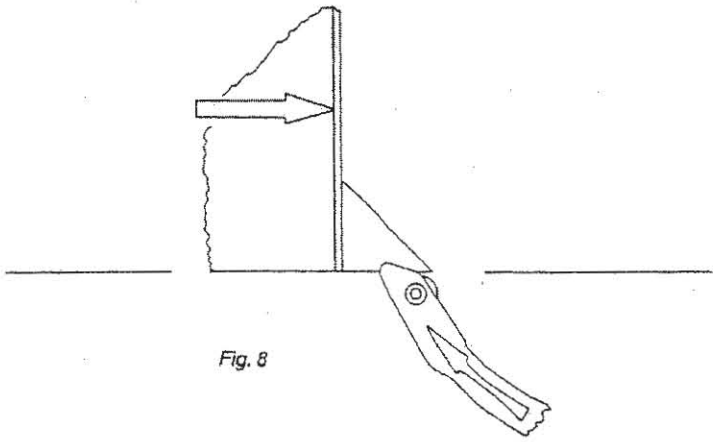


Fig. 8

b. The leading edge of the gussets on the plunger must be ¼" to 3" past the tips of the needles when the plunger is on the compression stroke. The needles are late if the leading edge of the plunger gussets are more than 3" past the tips of the needles and the needles are early if they are less than ¼" past the leading edge of the plunger gussets. Consult the decal on the left-hand side of the baler.

Needle Timing Adjustment:

c. If the needles are late, retard the knotter drive chain on the knotter sprocket one link. If the needles are early advance the chain one link.

d. Replace the chain on the sprocket and connect it. Be sure that the clutch pawl roller is seated in the notch in the clutch, *Fig. 9,* and that the chain is connected on the idle side and on top of the idler sprockets, *Fig. 10.*

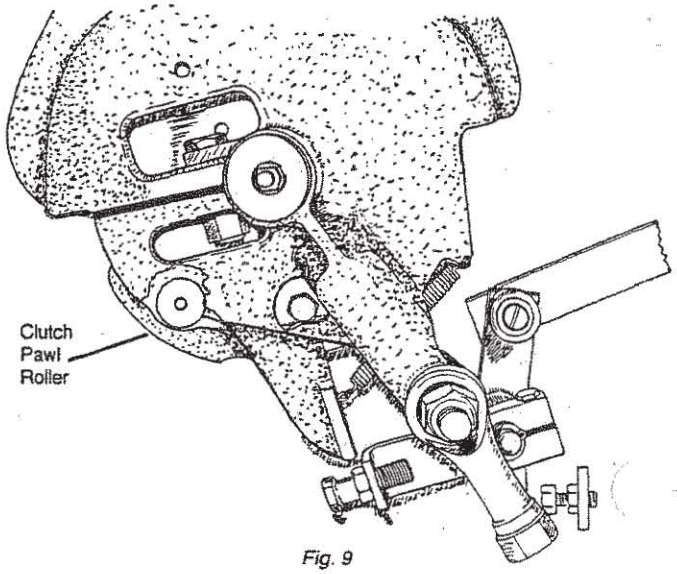


Fig. 9

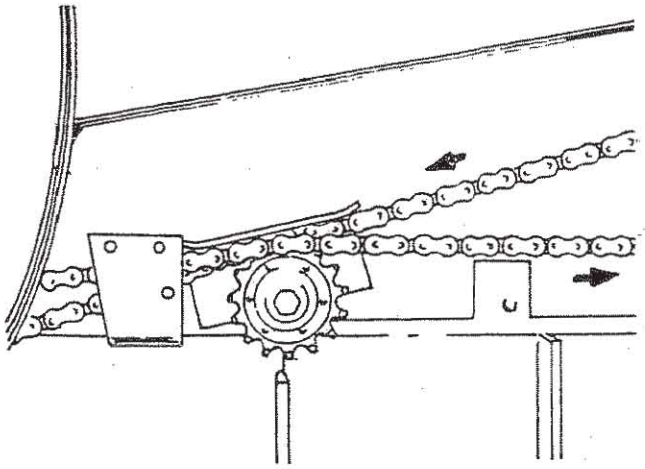


Fig. 10

e. Trip the knotter clutch and turn the flywheel counterclockwise and recheck the timing. Repeat the above procedures until adjustment is correct.

Note: Always shut off baler and tractor when inspecting, adjusting, lubricating, or servicing baler.

Meter Trip Bar Adjustment:

Note: Before adjusting the knotter clutch, be sure the needles are in adjustment. For needle adjustment on twine balers refer to page 21, for wire balers refer to page 24.

Trip the knotter clutch by raising the trip bar until the notch is positioned over the knurl, then turn the flywheel counterclockwise until the needles are near top dead center. The meter trip bar should have ⅛" clearance from the knurl, "A," *Fig. 11,* 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.

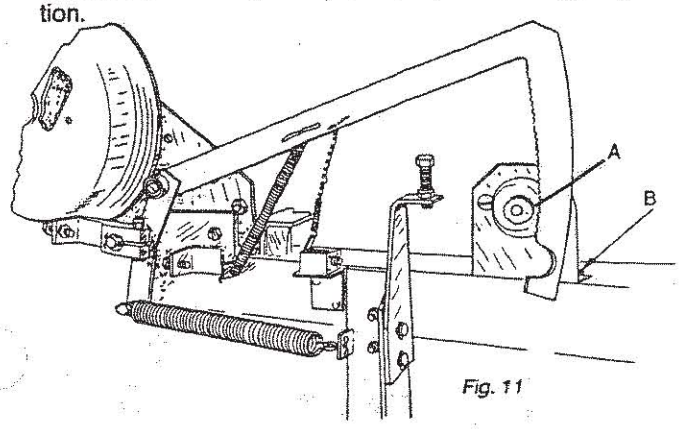


Fig. 11

Knotter Clutch Adjustment:

Note: Before adjusting the knotter clutch, be sure the needles are in adjustment. For needle adjustment on twine balers refer to page 21, for wire balers refer to page 24. Also be sure the meter trip bar is properly adjusted, refer to page 20.

a. With needles in the home position, set the needle yoke drive bolt "A," *Fig. 12,* ¼" to ½" past center between "B" and "C." To obtain this setting, adjust saddle roller "A," *Fig. 13,* on the opposite side of the knotter.

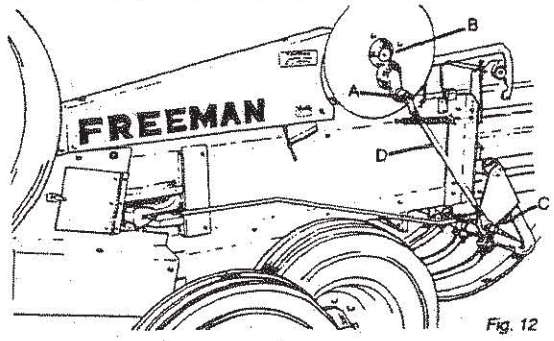


Fig. 12

b. Loosen clamp bolt "A," *Fig. 15* to position stop bolt "B," *Fig. 14* square to the face of clutch pawl "A," *Fig. 14.*

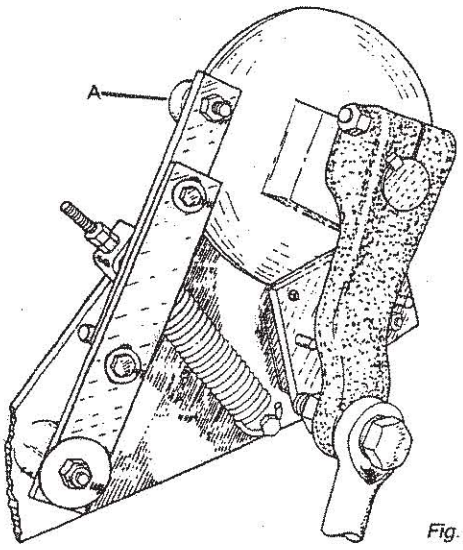


Fig. 13

c. The clutch pawl must have approximately ½" clearance at "C," *Fig. 14,* when depressed. The clutch pawl roller should have ⅛" clearance at "D" when the notch in the clutch disc is **not** near the clutch pawl roller. Adjust with bolt "B" *Fig. 14.*

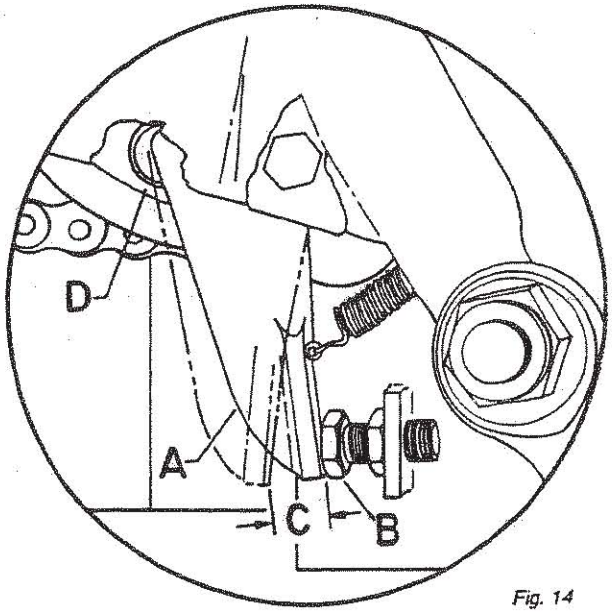


Fig. 14

d. Trip the knotter clutch and rotate the clutch. The clutch pawl must have ⅛" clearance from the stop lever at "B," *Fig. 15.* Adjust with stop bolt "G."

Knotter Brake Adjustment:

a. Adjust the brake shoe tension springs so that the springs are fully depressed, "A," *Fig. 16.*

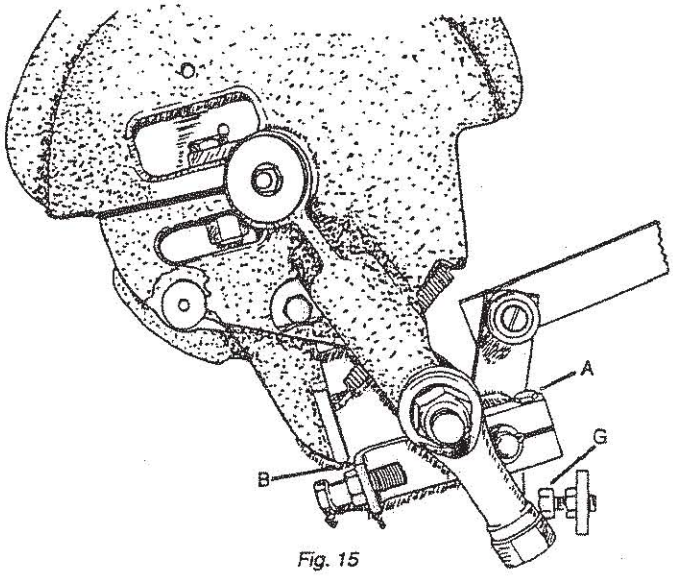


Fig. 15

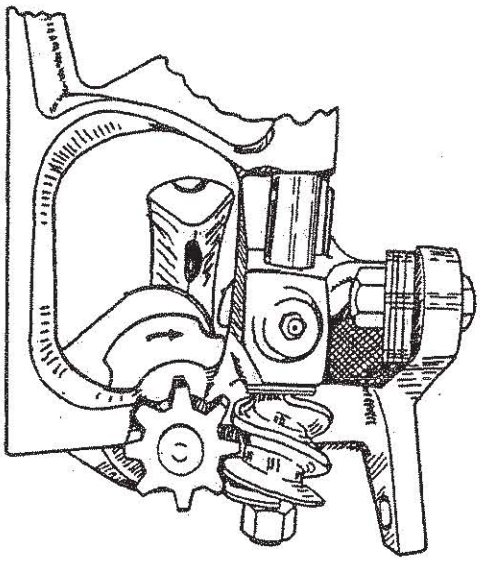


Fig. 17

b. The needles should clear the twine disc cleaner ⅛". 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.

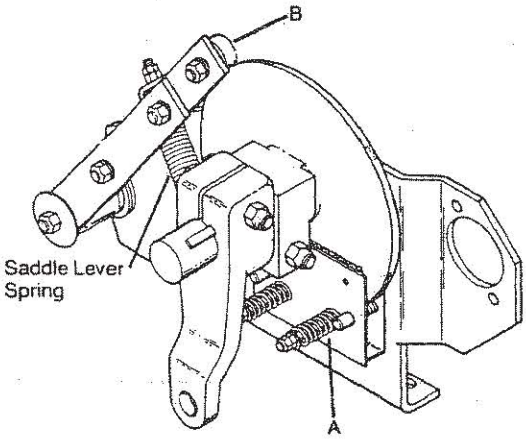


Fig. 16

b. The saddle spring is adjusted properly when roller "B" is in the notch and there is ½" of adjusted tension on the saddle lever spring.

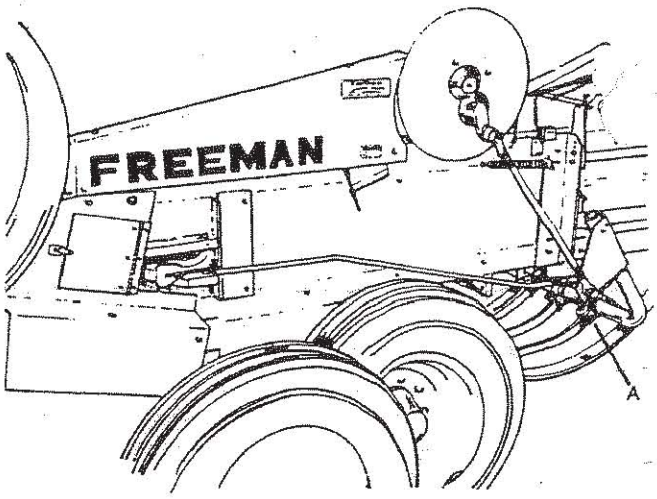


Fig. 18

Twine Balers:

Twine Needle Adjustment:

a. Trip the knotter clutch and swing the needles up through the bale chamber by turning the flywheel counterclockwise by hand. The needles should be adjusted left or right so that there is 0 to 1/32" clearance between the needle and the knotter hook pinion, *Fig. 17.* Adjust by sliding the needle left or right on the needle yoke.

c. Trip the knotter and turn the flywheel counterclockwise, 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 4½", *Fig. 19.*

d. Adjust needle height by loosening the lock nuts on the needle yoke drive rod "D," *Fig. 12.* Turn the rod to the right or left for desired setting. All of the 330 balers and 200 wire balers have a needle yoke drive rod on each side. Be sure both are adjusted for equal load on each rod at top dead center.

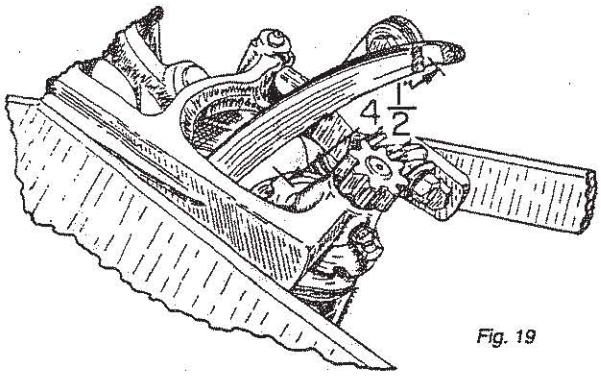


Fig. 19

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

Twine Finger Adjustment:

a. Trip the knotter and turn the flywheel counterclockwise until the point of the twine finger is just passing the inside edge of the needle. The point of the twine finger should clear the needle by ⅛", *Fig. 20.*

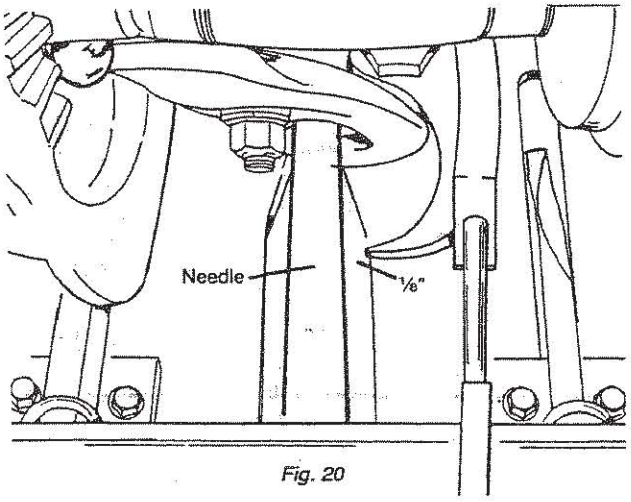


Fig. 20

This adjustment is made by loosening the twine finger anchor bolts and sliding them to the front or back in the slotted holes in the bale chamber top "A," *Fig. 21.*

b. Continue to turn the flywheel counterclockwise until the twine fingers reach the far point of their travel. Measure the distance from the tip of the twine fingers back to the knotter support angle "C," *Fig. 21.* This measurement should be 6½" on the model 200 and 5½" on the model 330. This adjustment is made by lengthening or shortening the twine finger drive rods "B," *Fig. 21.*

After adjusting the twine fingers, turn the flywheel counterclockwise until the twine fingers are in the returned position. Check to see that there is ⅛" from the tips of the twine fingers to the edge of the needle slots "A," *Fig. 22.*

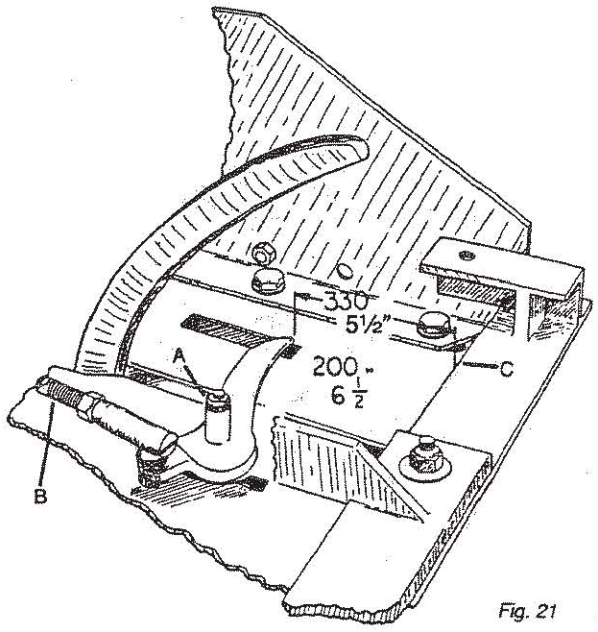


Fig. 21

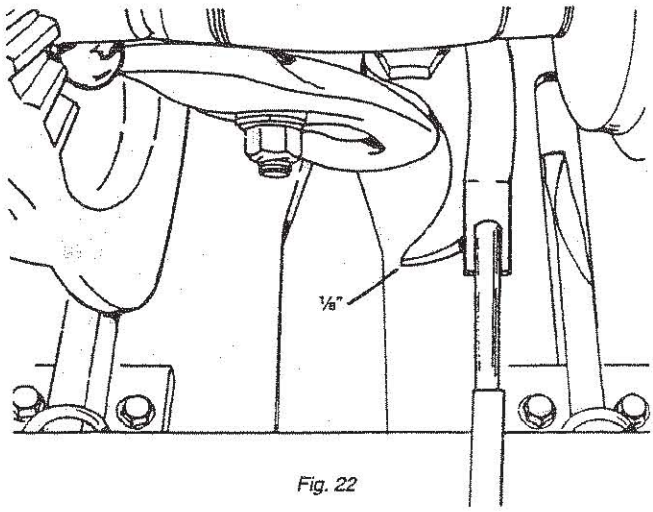


Fig. 22

Adjust the position of the twine fingers at the needle slots with the stop bolt, *Fig. 23.*

Caution: Always shut off baler and tractor when inspecting, adjusting, lubricating, or servicing baler.

Twine 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. 24.*

Adjust the twine holder only as tight as necessary to prevent the twine from pulling from the disc and/or producing

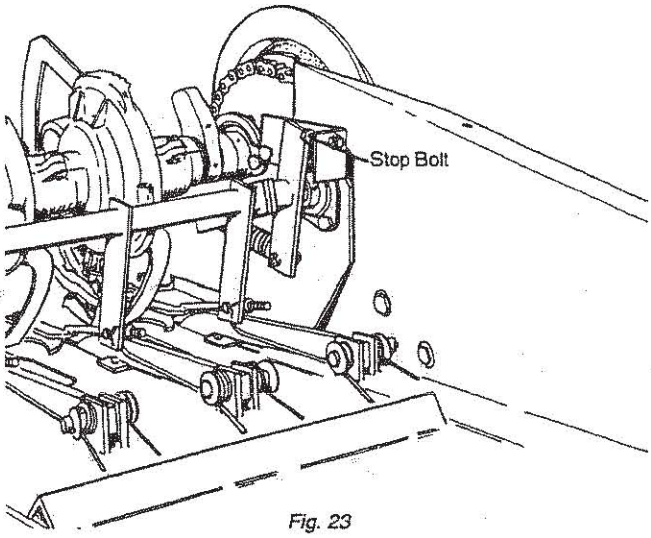


Fig. 23

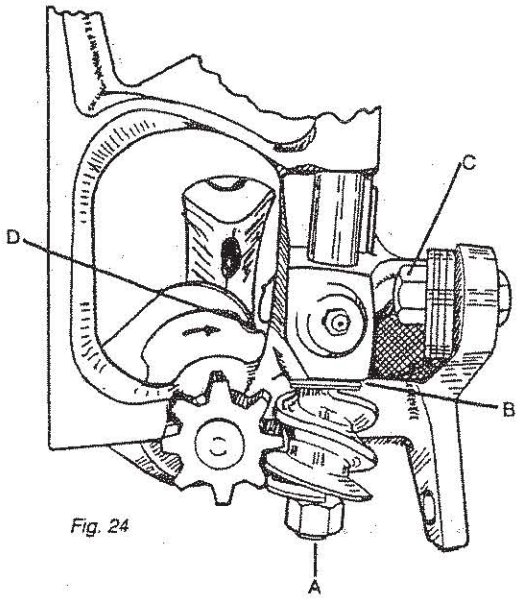


Fig. 24

bow knots. Make adjustments on bolt "C" in ⅛ 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. 24.* 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. 24,* and tighten the nut. After the knotter has completed one cycle check the notch setting again.

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 on the knife arm should just touch the bill hook without pressure as the stripper flange adv the knot past the end of the bill hook, *Fig. 25.*

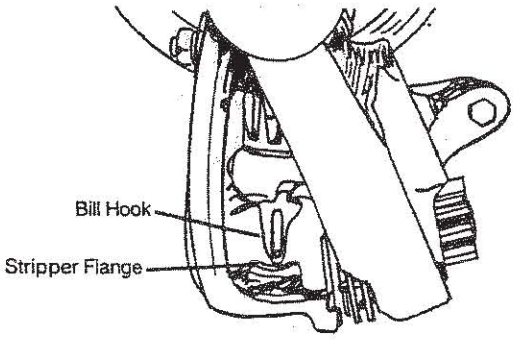


Fig. 25

The knife arm should be ¼" to ⅜" past the end of the bill hook when the knife arm is in the most extreme position, *Fig. 26.* Correct the adjustment of the knife arm by replacing it.

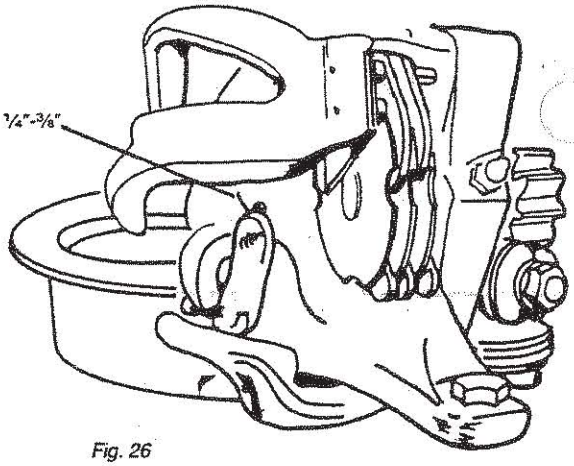


Fig. 26

d. Cam Gear Adjustment:

Both flat surfaces of the knotter hook and worm gear pinions must be held flat with 0 to .005 interference on the smooth face of the cam gears, *Fig. 27.*

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 "A," *Fig. 28.*

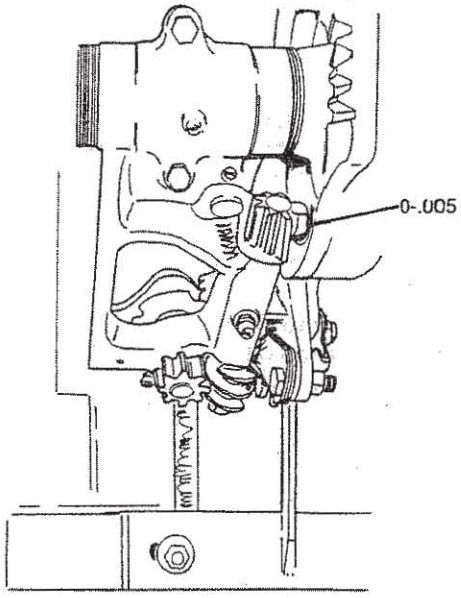


Fig. 27

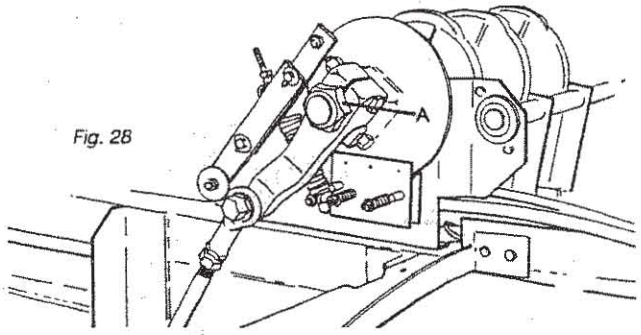


Fig. 28

Threading The Twine Knotter:

a. Put twine in the twine box. Route the twine through the twine guides on the top of the twine box.

b. Thread the twine from the left side of the twine box through the top hole of the twine guide on the side of the bale chamber.

c. Thread the same twine through the twine guide on the rear anchor bolt of the right needle.

d. Route the twine on the underside of the needle and thread the twine through the two dahls and then through the needle eye.

e. Fasten the twine to the reinforcing brace on the bottom side of the bale chamber behind the needles.

f. Follow steps a through e for the remaining needles.

Caution: Always shut off baler and tractor when threading the knotter.

Wire Balers:

Wire Needle Adjustment:

Trip the knotter clutch and swing the needles up through the bale chamber. When the heads of the needles are directly above the wire dividers the needle roller should clear the wire divider on top of the tongue by ⅛", "D," *Fig. 29.* The needle roller should center directly over the pivot bolt "C."

To increase the distance between the needle roller and the wire divider, loosen the front and tighten the rear needle anchor bolts "A," *Fig. 18.* To decrease the distance reverse the procedure.

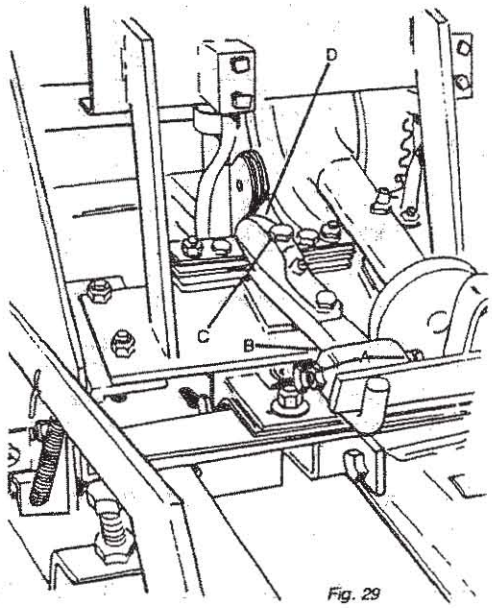


Fig. 29

Continue to run needles up to top dead center. The distance from the bottom of the tongue to the center of the needle roller screw should be 4½" for 15" and 16" bale chambers and 4" for the 17" bale chamber, "A," *Fig. 30.* For adjustment to be accurate both needle yoke drive rods must be adjusted for equal load on each rod at top dead center.

To adjust the needle height, loosen the nuts on the needle yoke drive rod and turn rod "D," *Fig. 12,* right or left for the desired setting.

Any time needles are adjusted, check the alignment of the wire guides on the bottom of the bale chamber. This adjustment must be checked when the needles are on the forward stroke. Run the needles up until the needle rollers are even with the rollers in the wire guides on the bottom side of the bale chamber. The guide rollers should be as close as possible and centered on the needle roller trough. Line the guides to the needles, not the needles to the guides.

Note: When an adjustment is made to the needles, recheck each adjustment in the sequence presented.

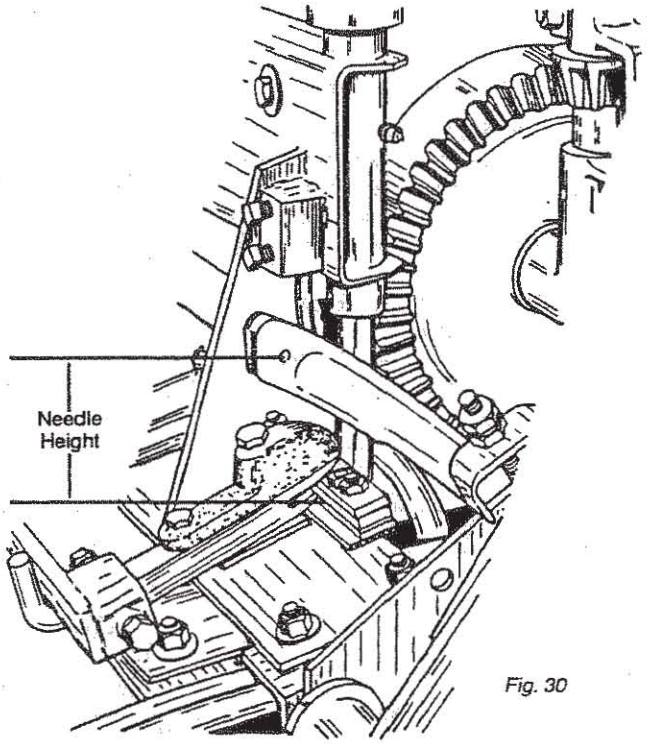


Fig. 30

When installing a new needle, be sure to scrape the paint off of the area where it attaches to the needle yoke.
NOTE: Always shut off baler and tractor when inspecting, adjusting, lubricating, or servicing baler.

Twister Hook And Wire Holder Rod Adjustment:

Set the twister hook 3¾" above the bale chamber. This measurement is from the tip of the hook to the top of the bale chamber, *Fig. 31.*
The wire holder rod should clear the top of the hook ¼" and just touch the twister shaft without any pressure, *Fig. 31.*

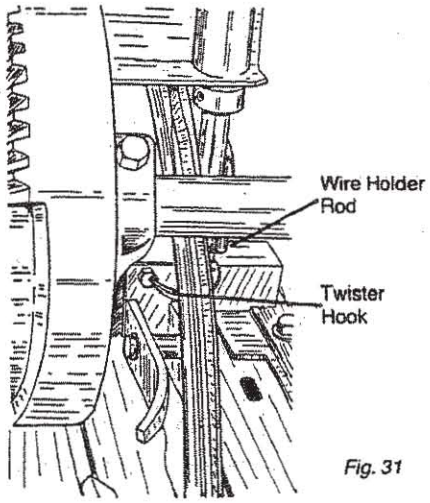


Fig. 31

Gripper Adjustment:

Adjust grippers with the bolts on each side of the tongue "A," *Fig. 29.* Insert .115" gauge between tongue and bolt "B," *Fig. 29.* Adjust the tongue so that it just comes in contact with the gripper block. Adjust both sides of each knotter the same way.

Wire Cut Timing:

With the needles top dead center, place a length of wire between the gripper tongue and the wire knife, "C," *Fig. 32.* Rotate the knotter until the wire is cut. The point of the twister hook should be from 2:00 to 3:00 o'clock when the wire is cut, *Fig. 33.*

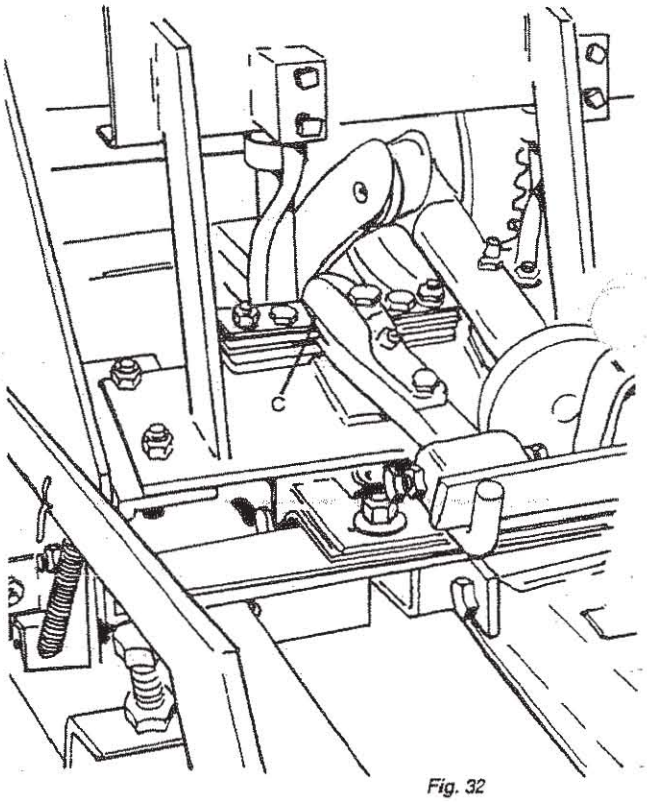


Fig. 32

The adjustment is made by loosening the twister chain and advancing or retarding the twister sprocket. When the twister hooks are in the desired location retighten the twister chain. After the cut timing is adjusted, the twister hook should be between 5:00 and 7:00 o'clock when in the resting position.

Caution: Always shut off baler and tractor whe
specting, adjusting, lubricating, or servicing.

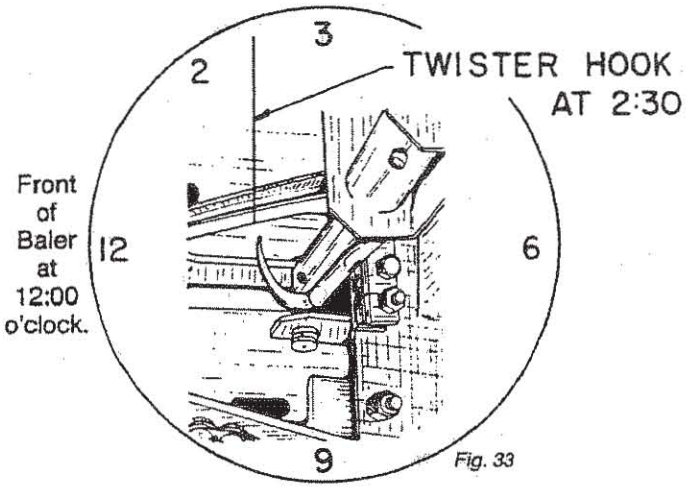


Fig. 33

Threading The Wire Knotter:

Thread the wire from the left spool in the wire box through the left wire guide, "A," *Fig. 34,* in a straight line through the feeder house support, "B," to the right front wire guide, "C," then back between the rollers of the right rear wire guide, "D," and fasten to the reinforcing brace, "E."

Thread the right spool of wire in the same manner to be picked up by the left needle. Do not thread the needles.

Trip the knotter clutch and rotate the knotters slowly, making sure the needles have picked up the wires. Then complete the cycle and remove the wires from the reinforcing brace, "E," *Fig. 34.* The baler will now be ready for operation.

When threading the wire, check for wear to be sure all the rollers are free. Check the wire guides and upper wire guide wearing pin for wear.

Caution: Always shut off baler and tractor when inspecting, adjusting, lubricating, or servicing baler.

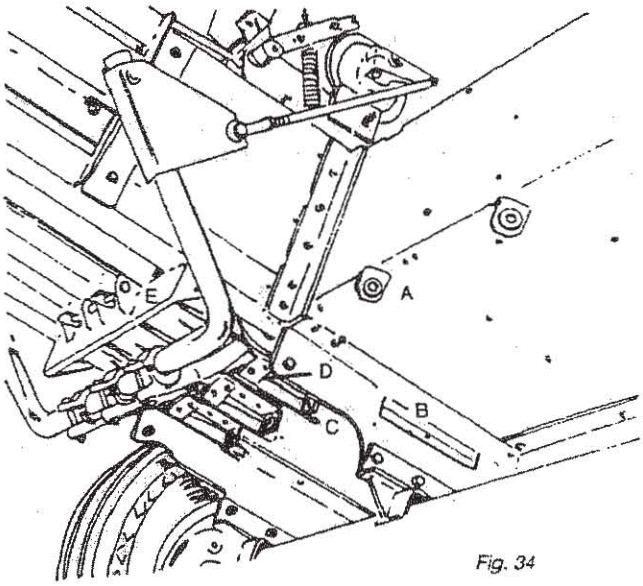


Fig. 34

FEED SYSTEM ADJUSTMENT

The location of the feed tines on the feed fork as well as the feed arm adjustment can effect the shape of the bales. Quality bales are of high density and are uniform. A quality bale can be produced by adhering to the following instructions.

Feed Fork Adjustment:

The two forward tines on the feed fork are adjustable. The tines can be fastened to the feed fork in position "A," "B" or "C," *Fig. 35*. The normal position is "B."

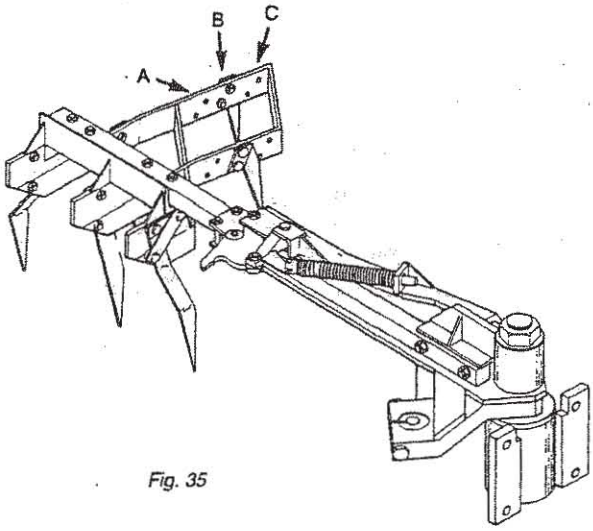


Fig. 35

If the bales are not uniform and more hay is needed on the left-hand side of the bale chamber, move both tines to position "B." If more hay is needed on the right-hand side of the bale chamber, move both tines to position "A." Some experimenting may be required to properly adjust the tines.

After adjusting the feed fork tines, run the feed arm through one complete cycle by turning the flywheel counterclockwise to insure it does not interfere with any other parts.

Additional adjustment can be done with the feed arm.

Feed Arm Adjustment:

The normal position of the arm is parallel to the bale chamber when fully extended. The travel of the feed fork into the bale chamber can be adjusted so that the distance is retarded or advanced. The adjustment of the feed arm can effect the shape of the bales. By retarding the feed arm you put more hay to the right-hand side of the bale chamber. By advancing the feed arm you put more hay to the left-hand side of the bale chamber.

To Adjust The Feed Arm: 330

Loosen bolt "A," *Fig. 36*, and rotate rod "B" to give desired position of the feed fork. There should be no endplay in rod at "C." *(see next paragraph)*

The feed arm connecting rod swivel adjustment is done by loosening jam nut "C", *Fig. 36*. Rotate the swivel nut clockwise until tight. Then loosen the swivel nut in a counterclockwise rotation ½ of a turn. To secure, hold the swivel nut in position and retighten the 2" jam nut.

To Adjust The Feed Arm: 200

Loosen bolt "A," *Fig. 36a*, and rotate rod "B" to give the desired position of the feed fork arm. There should be no endplay in rod at "C." *(see next paragraph)*

The feed arm connecting rod swivel adjustment should be .002—.007 clearance at "C," *Fig. 36a*. To adjust remove or insert shims in combination of .005 and .007 behind adjusting nut "D". The .002—.007 clearance is checked when nut "D" is securely tightened.

Under extreme conditions when more hay is needed on the left-hand side of the bale chamber, replace the feed tines on the end of the feed fork with longer str tines, F1189.

After adjusting the feed arm, run it through by hand one complete cycle to insure it does not interfere with any other parts.

Caution: Always shut off baler and tractor when inspecting, adjusting, lubricating, or servicing baler.

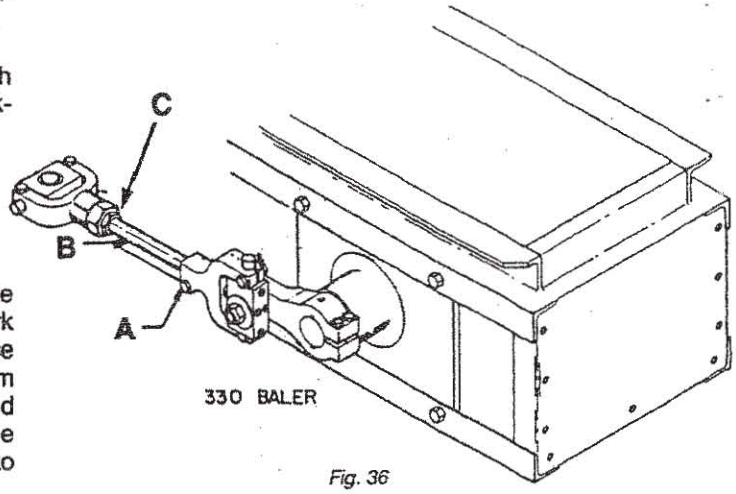


Fig. 36

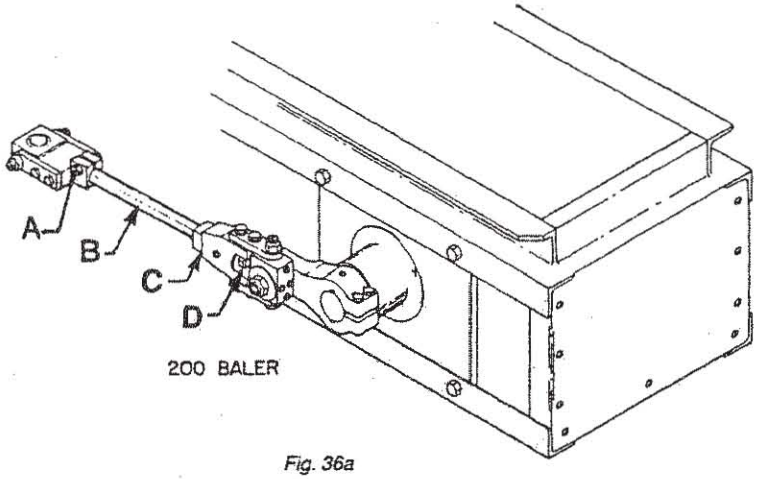


Fig. 36a

FEED ARM SAFETY LATCH

Your Freeman Baler is designed so that under extreme conditions of overfeeding the pickup, the feed fork will automatically release from the feed arm. When this happens the feed fork locks into the feed fork catch, "A," *Fig. 37.*

After removing any excess hay or foreign material from the feeder house, unlatch the feed fork from the feed fork catch, and attach it back to the latch on the feed arm "B," *Fig. 37.*

The feed arm latch should be adjusted to break away at 120 lbs.-ft. torque. This adjustment should be measured with a torque wrench applied to the end of the latch, "B," *Fig. 37.* The torque is raised by increasing the amount of washers on the trip spring rod "C" and is lowered by decreasing the amount of washers.

Caution: Always shut off baler and tractor when inspecting, adjusting, lubricating, or servicing baler.

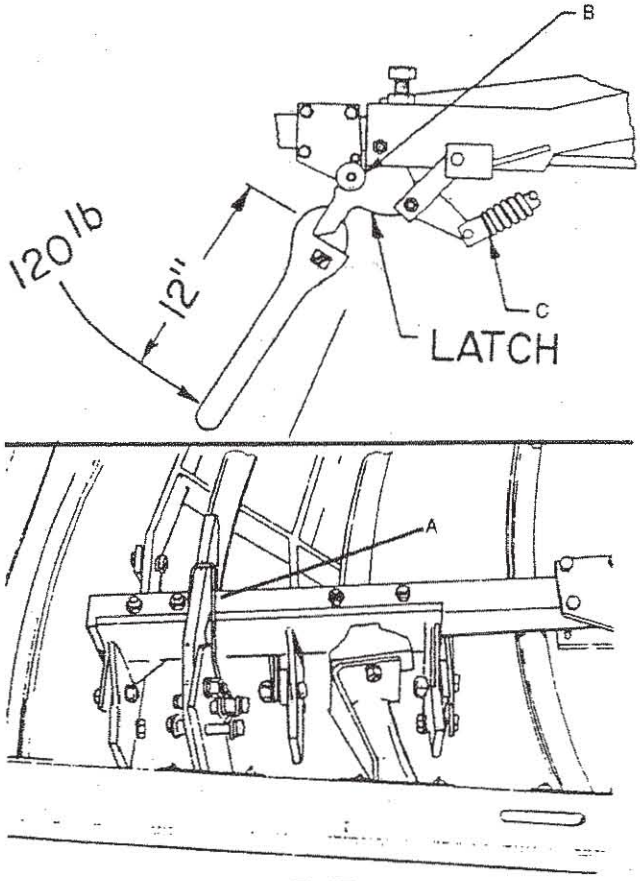


Fig. 37

BALE CHAMBER

There are different bale chamber sizes available on a Freeman Baler. The measurement of the tension bolt "A," *Fig. 38,* varies according to bale chamber size. The measurement is taken between "B." The correct measurement can be found in the chart, *Fig. 39.*

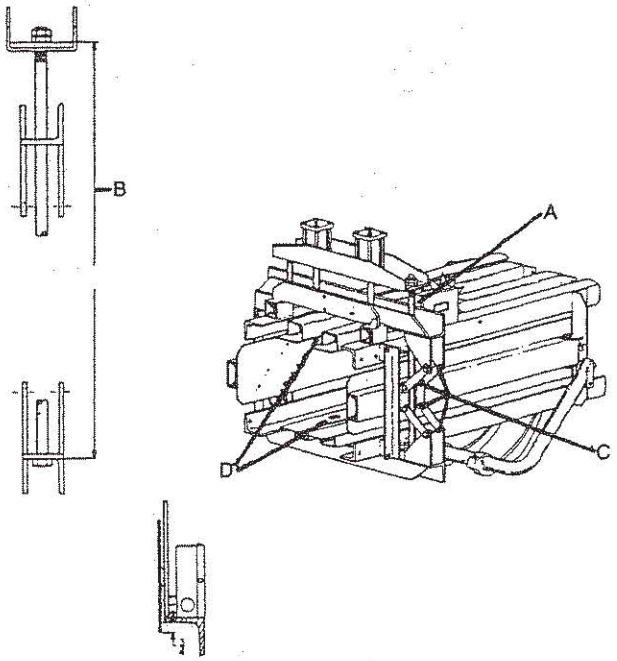


Fig. 38

The tension bolt should never be changed from the measurement given in the chart, *Fig. 39.* Adjusting the tension bolts has NO effect on the shape of the bale. **DO NOT ADJUST TENSION BOLTS.**

The bolts in "C," *Fig. 38,* must remain loose to allow free movement of lever action on the side rails. The bolts in "D" must be free to allow floating action of the bottom and top rails.

Chamber Size	Tension Bolt Measurement
17" × 22"	26 inches
16" × 22"	25¼ inches
16" × 18"	25¼ inches
15" × 22"	24¼ inches
14" × 18"	23¼ inches
16" × 22" with 15" × 22" conversion	25¼ inches

Fig. 39

PLUNGER ADJUSTMENT

The plunger can be adjusted to remove both side play and up/down play. It is important to keep the plunger in adjustment to avoid unnecessary wear.

To adjust the up/down play, be sure the top plunger roller is up to the top rail angle. Adjust the roller by loosening nut "A," *Fig. 40.* Move the roller and shaft up or down as needed. Lock it with nut "A."

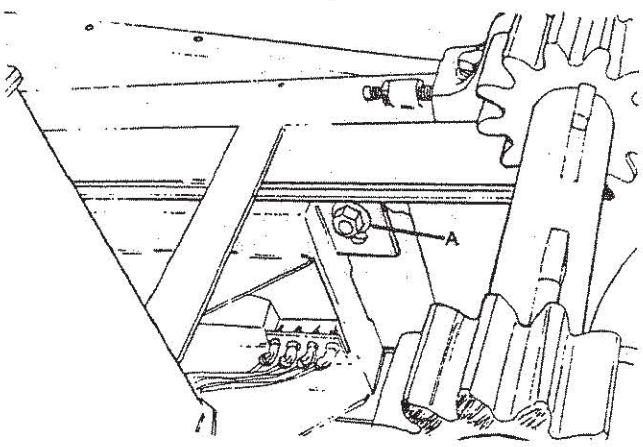


Fig. 40

Plunger side play may be removed by adjusting the top and bottom hard slide mounting angles on the left-hand side of the plunger. Complete the following steps:

a. Loosen the eight hold-down bolts "A," *Fig. 41.*

b. Slide the plunger over to the right-hand side of the bale chamber. Use a leverage bar to do this.

c. Adjust the four set screws, "B," *Fig. 41* (two top and two bottom), until there is 1/32" (the width of a thin knife shim) between the hard slides and the slide rails, "C."

d. Tighten the eight hold-down bolts.

e. Remember the plunger must travel free. Run the plunger back and forth by hand to insure it is not binding.

Caution: Always shut off baler and tractor when inspecting, adjusting, lubricating, or servicing baler.

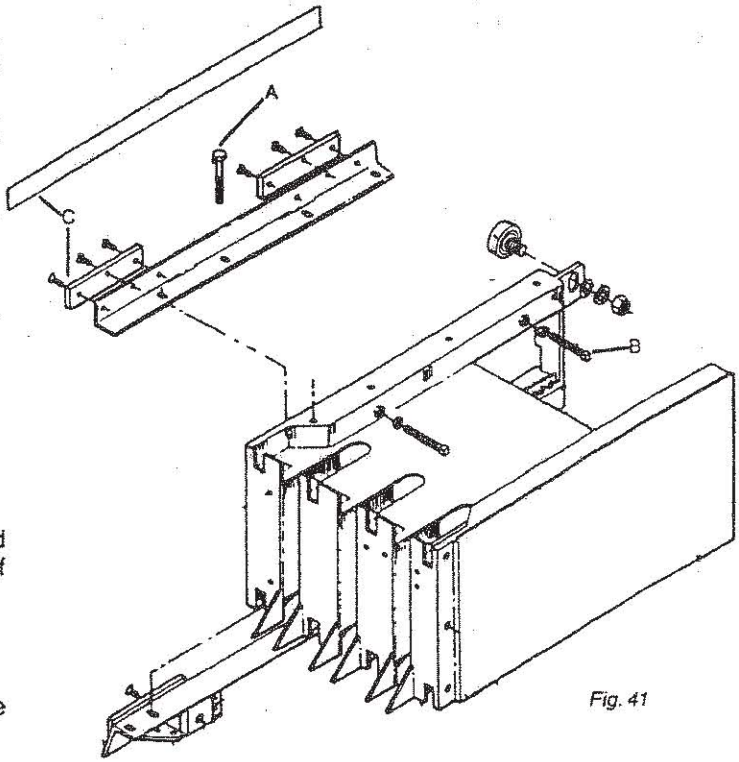


Fig. 41

PLUNGER SAFETY LATCH

Caution: Always check the needle timing with the plunger before adjusting the safety latch.

If the needles are obstructed by foreign material in the needle slots, foreign material in the chamber, or if the needles prematurely enter the chamber because of early timing, needle breakage can occur.

The plunger safety latch "A," *Fig. 42,* helps protect the needles against breakage. If for any reason the needles remain in the bale chamber while baling, the plunger is stopped by the plunger stop dog and the flywheel shear bolt is sheared.

Before replacing the flywheel shear bolt, always pull the stop dog out of the bale chamber. Do this by pulling the needle yoke back to the home position. The safety latch is adjusted by lengthening or shortening the latch rod at "B," *Fig. 42.* As the needles are leaving the bale chamber and the tips of the needles are even with the bottom of the bale chamber, adjust the length of the latch rod so that the plunger stop dog "A" is just leaving the chamber and is flush with the inside of the dog plate.

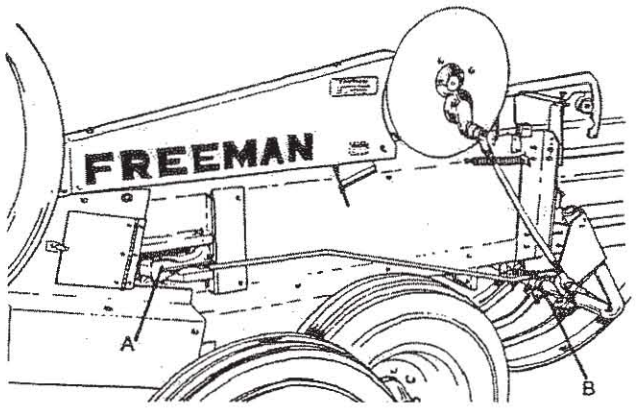


Fig. 42

KNIFE ADJUSTMENT

The baler should have sharp knives at all times. When replacing the knives with new or resharpened knives, be certain the adjustments of the knives are as described below to avoid serious equipment damage.

Before adjusting the knife, adjust the plunger as described in the Plunger Adjustment section on page 30 of this manual.

After adjusting the plunger, shim the stationary knive, "D," *Fig. 43,* so that the two knives clear by 1/16" at the top, "E." Do not attempt to shim the plunger knife.

Rotate the flywheel until the knives are even. Then with the use of a leverage bar slide the plunger over to the right side. Adjust the bottom of the knives so that they have 1/32" clearance at "A." Do this by loosening bolt "B," *Fig. 43,* and adjusting set screw "C," which is under the stationary knife bolts, and set screw "F," which is about six inches forward under the feeder house.

If adjustment cannot be achieved with bolts "C" and "F," remove or install shims behind the stationary knife. It is important to feather shim.

After adjusting the bottom of the knives, adjust the top until there is 1/16" clearance between the two knives. The top of the knives can only be adjusted with shims.

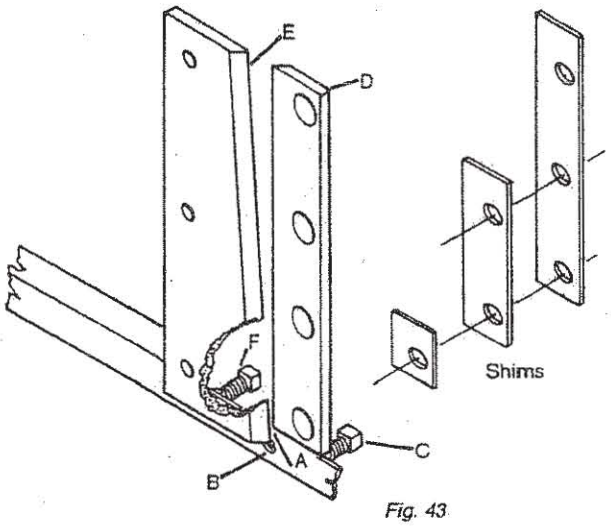


Fig. 43

Check these adjustments closely and run the plunger back and forth by hand to insure the knives are properly adjusted. Using a bar force the plunger to the right side of the chamber with great pressure to insure the knives do not lock up.

Caution: Always shut off baler and tractor when inspecting, adjusting, lubricating, or servicing baler.

PINION AND BULLGEAR ADJUSTMENT

The flywheel should be parallel to the frame plus or minus ⅛", with pinions meshing evenly with the bullgear teeth, "A," *Fig. 44.*

The lash of the pinion gears should have between ⅛" and ⅜" of free play on the rim of the flywheel at "B." Measure this when the connecting rod is fully extended and blocked to prevent bullgear movement.

To correct excessive free play adjust set screws "C." Be certain both sides are adjusted evenly to avoid serious equipment damage.

Caution: Always shut off tractor and baler when inspecting, adjusting, lubricating, or servicing baler.

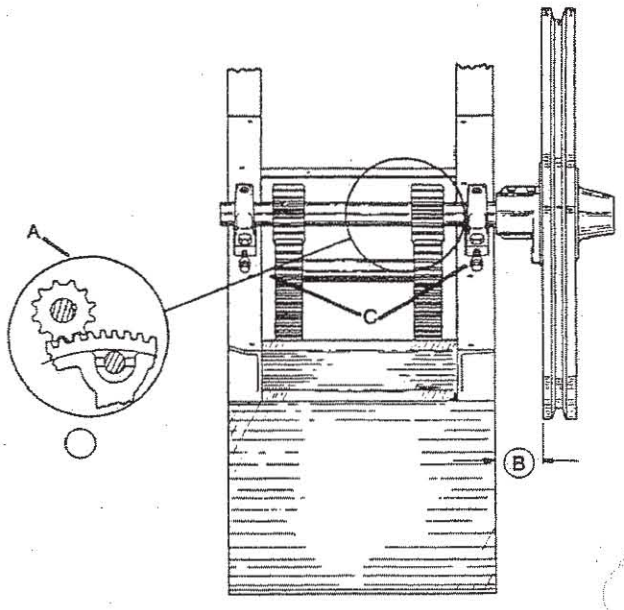


Fig. 44

TENSION CONTROL

Tension Control Adjustment:

Penetration Wheel Adjustment:

The penetration wheel automatically makes minor pressure adjustments to accommodate minor moisture variations in the hay. Adjust bolt "A," *Fig. 45*, so the penetration wheel points "B" extend ¾" below the inside frame angle "C" when the lever "D" is full forward.

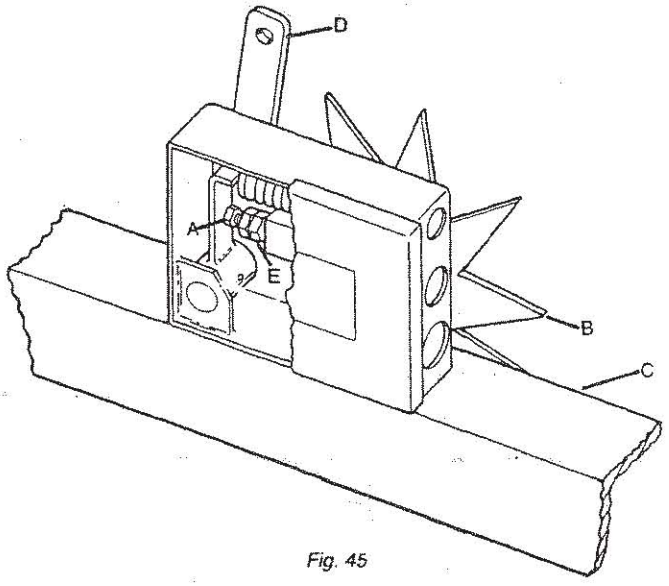


Fig. 45

System Pressure Adjustment:

The pressure is to be set at 800 lbs. when lever "D" is full forward. To achieve this pressure adjust nuts "E." Do not adjust the pressure without the proper gauge, and be certain that lever "D" is full forward when the pressure is read.

Tension Control Pump Drive:

To tighten the tension control chain "A," *Fig. 46*, loosen the two bolts "B" that hold the tank to the mounting plate. Move the tank back until the chain has about ¾" of slack up and down at the center of the chain. Retighten the bolts when the chain is at the desired tension.

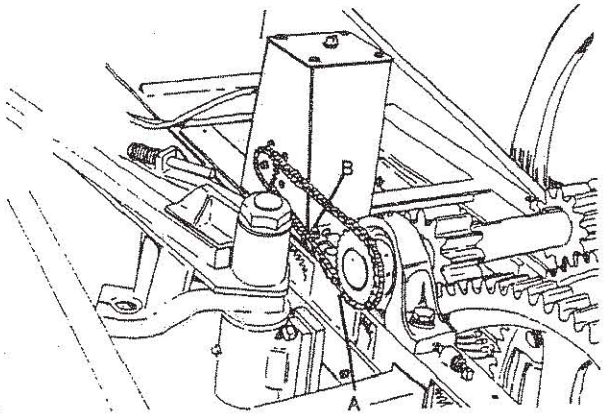


Fig. 46

Automatic Tension Release: (option for twine balers)

The tension release attachment releases the tension on the bale while the knotter is in the tying cycle. This in turn decreases the tension in the knotter, allowing tighter bales to be tied.

Use *Fig. 47* when adjusting the automatic tension release.

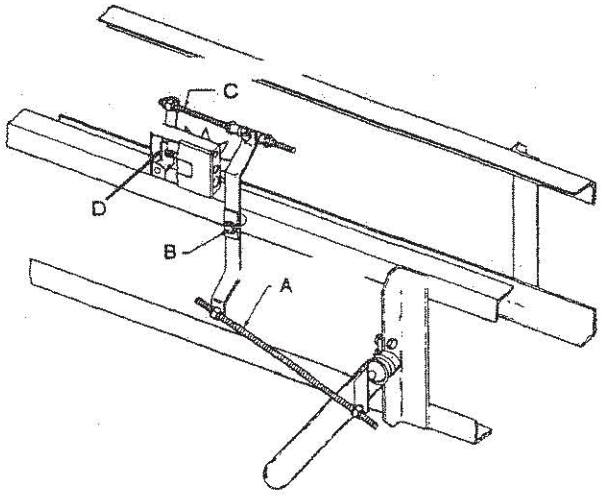


Fig. 47

a. With needles resting in the home position, adjust operating rod "A" so that tension release lever "B" is vertical to the bale chamber.

b. Next, with the needles at top dead center, adjust tension release rod "C" so that bypass lever "D" is ⅛" from the back inside wall of the bypass box.

Caution: Always shut off baler and tractor when inspecting, adjusting, lubricating, or servicing baler.

BALE LENGTH ADJUSTMENT

The operating speed of the baler has a direct effect on the bale length. To help maintain a consistent bale length adhere to **BALER OPERATING SPEEDS**, on page 18.

Bale length is adjusted by changing the height of the trip bar stop bolt "A," *Fig. 48*. Raising the bolt decreases bale length and lowering the bolt increases bale length.

If no more adjustment is available with the trip bar stop bolt, change the height of the meter trip bar stop "B." Use the holes provided to adjust the meter trip bar. If the meter trip bar is moved, the meter trip bar bolt will need adjustment.

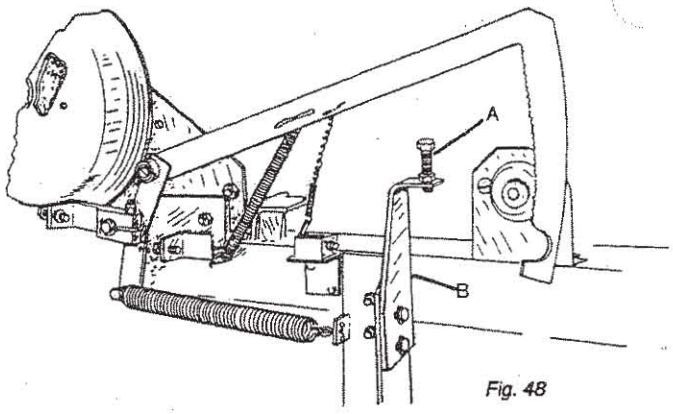


Fig. 48

BULLGEAR LUBER

The bullgear luber, *Fig. 49,* distributes bullgear grease onto the bullgears through a manifold under the bullgear hood.

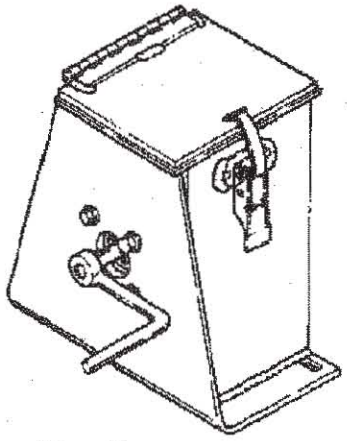


Fig. 49

Prior to initial baler operation the bullgears require a complete coating of lubricant (Freeman bullgear grease, F000007626, only) Allow 4 hours before first using the baler, after completely covering the bullgears with grease. During the next 48 hours of bailing grease bullgears every 30 minutes, and again at the end of the shift. Greasing at the end of the shift gives the bullgear grease an opportunity to set up and adhere to the bullgears. Once you have established a good coverage of grease on the bullgears, greasing every four hours thereafter is usually adequate; and always grease at the end of the shift.

While turning the flywheel, operate the lube pump handle to apply a coating of bullgear grease to the gears. This typically will require about 5 revolutions of the bullgears to get a full film of lube covering the working surfaces of the gear teeth. This process should only be done by turning the flywheel by hand and not by running the baler with the engine or tractor.

Subsequent lubrication should be done at the end of the baling shift to allow the lube time to set up and minimize the "flinging" off of the product.

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

DANGER: SHIELDS ARE FOR YOUR PROTECTION. ALWAYS HAVE SHIELDS IN PLACE BEFORE STARTING OR OPERATING THE BALER.

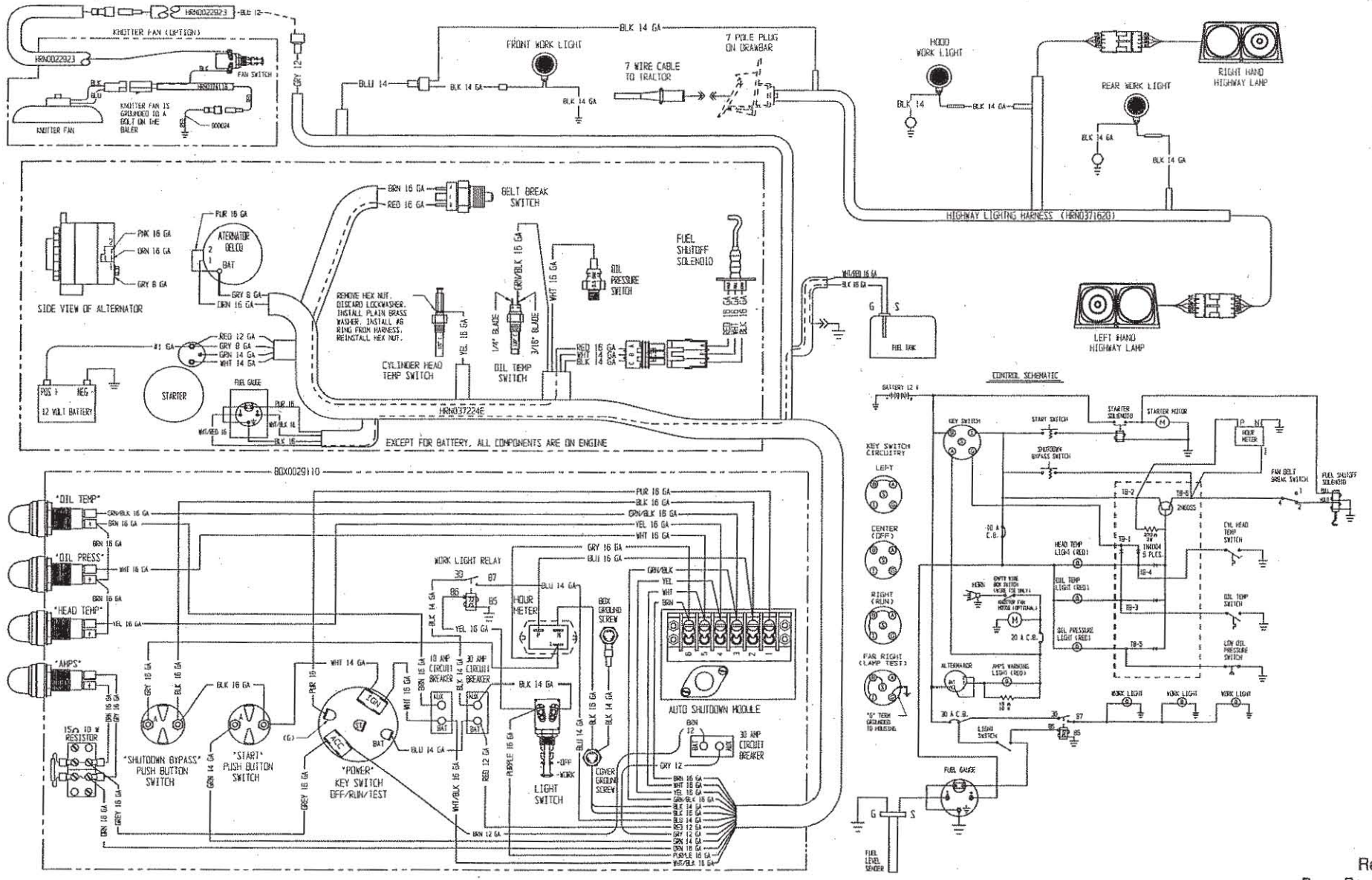
BALER LIGHTS

Lights are standard on the 280,330,370,380,385 balers. There are three lights on the baler. One light is on the rear of the bale chamber, one is on the rear corner of the feeder house, and one is on the front right hand side attached to the side plate.

Procedures for mounting the lights are on page 13 of this manual. A diagram for instruction on the wring system is in the fold out page. *Fig 50*

FREEMAN
A Division of Allied Systems Company

330/370 Wire diagram for Deutz Engine



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BALE CHUTE
With Optional Bale Weight Indicator

The bale chute can be mounted to turn the bales onto the ground with the cut side of the bales facing up or down. Simply turn the bale chute over 180 degrees to reverse how the bale rests on the ground.

If the bale chute is turned over, the bale weight indicator components will have to be installed in reverse order of the way they are presently installed.

In order to set the indicator to the exact position, produce a bale that is of the desired weight. Then set the bale onto the bale chute and adjust the indicator spring into the proper links so that the indicator hand is in the vertical position.

Procedures for installing and adjusting the bale chute and/or optional bale weight indicator are on page 9 of this manual.

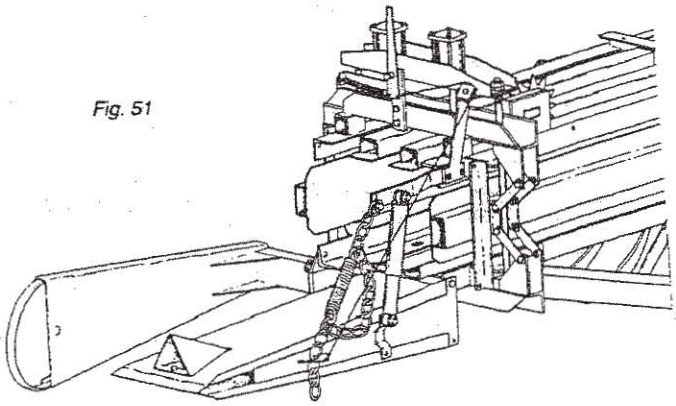


Fig. 51

HAY SAVER WHEEL (Option)

For mounting and adjusting procedures of the hay saver wheel, *Fig. 52*, refer to page 12 of this manual.

When a hay saver wheel is installed onto a baler for the first time, it is necessary to adjust the pickup balance springs as described on page 17 of this manual.

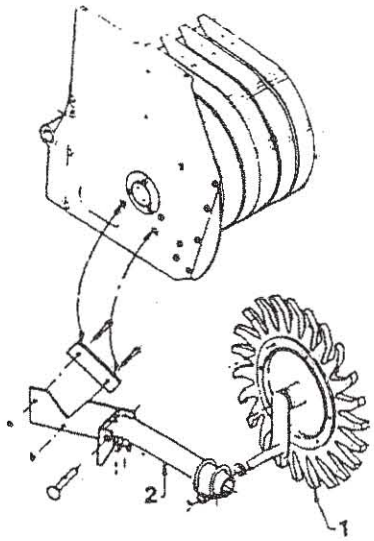


Fig. 52

TWINE BOX

330 Twine Balers:

The standard twine box for a 330 baler is a nine compartment, *Fig. 53.* 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 the twine lashes out or the twine fingers are not able to grasp the twine or both. If the twine is too tight it may break or come out of the twine disk or both.

Keep the twine guides in good condition for easy travel of the twine. Procedures for installing the nine compartment twine box are on page 10 of this manual.

200 Twine Balers:

The standard twine box for a 200 baler is a four compartment. The same rules apply to the four compartment twine box as the nine compartment described above. Procedures for installing the four compartment twine box are on page 11 of this manual.

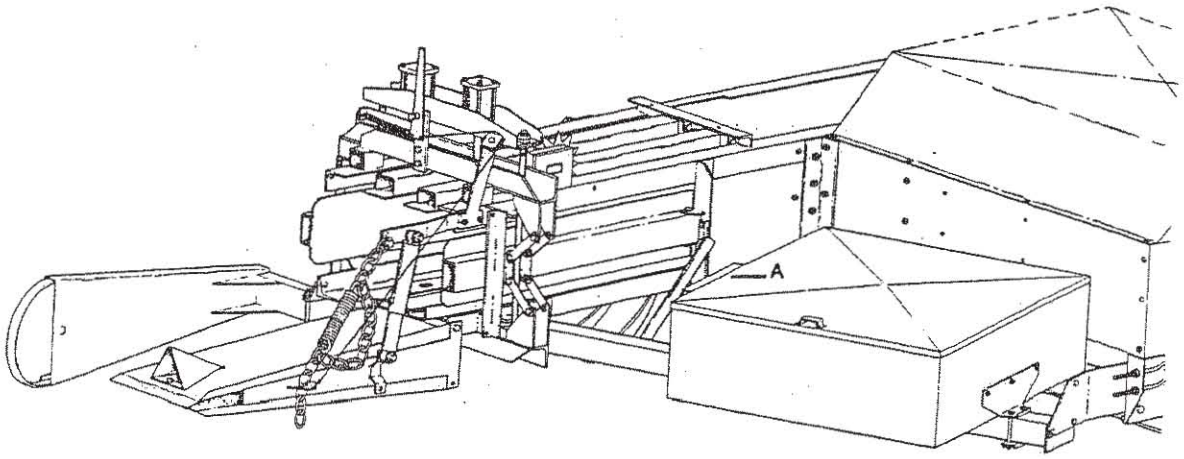


Fig. 53

WIRE BOX

330 Wire Balers:

All 330 wire balers have a six compartment wire box, *Fig. 54*. It is important that the wire guides and wire rollers are kept in good condition for easy travel of the wire. Procedures for installing the six compartment wire box are on page 11 of this manual.

200 Wire Balers:

All 200 wire balers have a four compartment wire box. It is installed, maintained and used in the same way the six compartment wire box is for the 330 wire baler, *Fig. 54.*

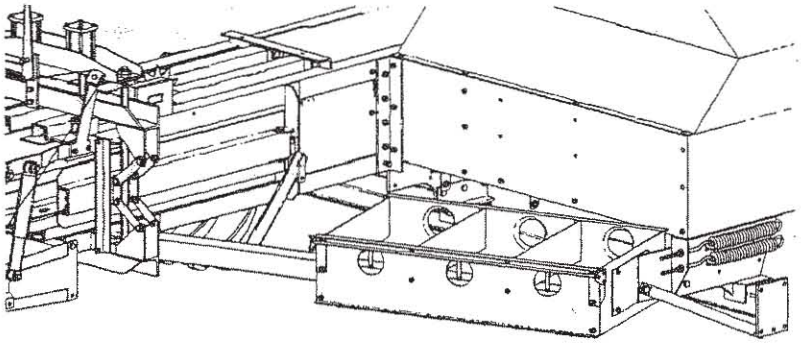


Fig. 54

BALE COUNTER

Each time the knotter ties a bale, the bale counter records it. This provides you with an easy way to keep track of your production. There is a reset button on the right-hand side of the bale counter so that at any time you can reset the bale counter to zero, "A" *Fig. 55*. There are procedures for installing the bale counter on page 12 of this manual.

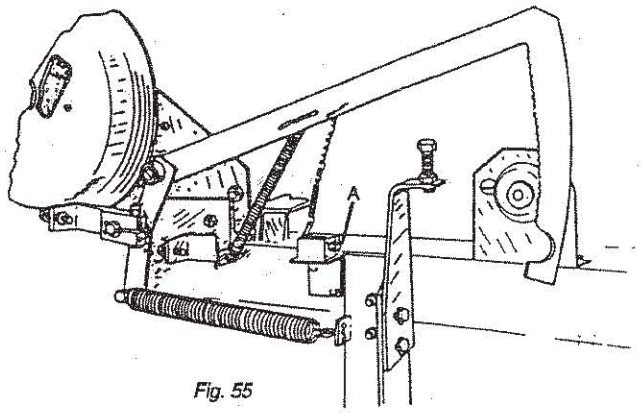


Fig. 55

WHEELS, TIRES, HUBS AND TANDEMS

Fig. 56 shows the different components in the order they are mounted on the baler. It is important that all the fasteners are kept tight. The recommended air pressure for the standard tires is 50 lbs. for 8 ply tires and 32 lbs. for 4 ply tires. For all flotation tires the recommended air pressure is 32 lbs. Mounting procedures for wheels, tires, hubs and tandems is on page 6 of this manual.

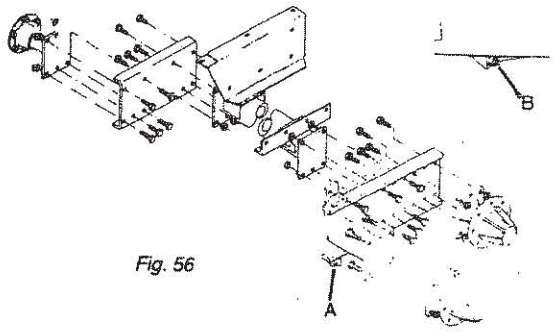


Fig. 56

POWER UNITS

Standard 540 and 1000 RPM P.T.O. Baler:

a. Check oil level in right angle P.T.O. gearbox on new balers before starting and each day of operation there after. Fill to plug level with E.P. SAE 90-140 gear oil. This takes two quarts of oil.

b. Operate P.T.O. drive only with the drawbar swung to the left (away from pickup).

c. Disconnect the P.T.O. shaft when transporting baler with hitch swung to the right (toward pickup).

d. Do not exceed a 70 degree turn when P.T.O. is operating.

e. Be certain the tractor being used complies with the instructions on page 14, "Attaching Baler To The Tractor."

f. The square shaft and the tube of the telescope shaft should be well-lubricated so that the P.T.O. shaft can telescope freely.

g. Before operating baler read "Attaching Baler To The Tractor" on page 14. Also read "Operating Speeds" on page 18.

Hydraulic P.T.O. Baler:

a. Check the oil level on the sight gauge daily. If oil is below sight glass range, check for oil leaks and fill with hydraulic Oil. Use the oil recommended on the decal on the tank.

Change hydraulic oil and oil filter annually under normal operating conditions. If operation is under more severe conditions and oil temperature is continually maintained at or near 225 degrees F (107 degrees C), oil and filter should be changed two times in a season.

b. The oil temperature should be observed frequently to insure that it remains below 225 degrees F (107 degrees C). An optional oil cooler is available from your Freeman dealer to help prevent severe heating problems.

c. Before operating baler read "Attaching Baler To The Tractor" on page 14. Also read "Operating Speeds" on page 18.

V465D Wisconsin And 173 CID Deutz Engines:

a. For information on these engines refer to their respective manufacturer's owner's manual.

b. Before operating baler read "Attaching Baler To The Tractor" on page 14. Also read "Operating Speeds" on page 18.

PERIODIC MAINTENANCE OR LUBRICATION

See *Lubrication & Maintenance Schedule, Freeman Side Feed Balers* (form 92-002) and/or your respective engine manufacturers owners manual for maintenance intervals.

STORING THE BALER

At the close of the baling season, remove all material from the bale chamber and thoroughly clean the complete baler.

Coat the bale chamber lightly with grease to prevent from rusting.

Lubricate the machine: all grease zerks, chains and bullgears.

Provide adequate protection from the weather.

To increase the life of the tires, place the baler on blocks to remove the load from the wheels while stored.

For engine balers, fill the fuel tank to the top.

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

SPECIFICATIONS

Overall Length: 18 ft. 4 in.

Overall Width: 200 model, 101"

Overall Width: 330 model, 106"

Overall Height: Top of flywheel 66"

Weight, 200 Model: 5840 lbs. with Deutz Engine
5590 lbs. with V465D Wisconsin Engine
5590 lbs. with Hydraulic P.T.O.
5220 lbs. with Standard P.T.O.

Weight, 330 Model: 6750 lbs. with Deutz Engine
6500 lbs. with V465D Wisconsin Engine
6500 lbs. with Hydraulic P.T.O.
6130 lbs. with Standard P.T.O.

Pickup Width: 66" including flare

Tires: Left side 7:50 × 16 8-ply, right side 7:50 × 16 4-ply

Wheels: Drop center

Fuel Tank: 15 gallons

Plunger Speed: 74 to 84 strokes per minute

Bale Chamber: Replaceable liners. Sizes are 14" × 18", 15" × 22", 16" × 18", 16" × 22", 17" × 22"

Bale Chute: Reversible left or right turn

Hitch: Swinging hitch with spring release from tractor seat

Meter Wheel: Quick adjustment for bale length

Feed System: Adjustable feed arm, swings on tapered bearings in sealed tube

Bullgears: On tapered roller bearings

Plunger Drive: Heavy duty bull gears

TROUBLE SHOOTING
ALL MODEL BALERS

PROBLEM	POSSIBLE CAUSE	REMEDY
Excessive shearing of shear bolts.	a. Plunger safety latch engaging.	a. Retime needles. See needle timing, page 19. Check plunger latch return spring. See plunger latch, page 28.
	b. Worn, broken or cracked steel bushings in flywheel or flange.	b. Replace bushings.
	c. Worn brass bushing in the flywheel.	c. Replace bushings.
	d. Plunger and shear knives dull.	d. Sharpen knives.
	e. Excessive pinion lash when plunger is fully extended.	e. Follow pinion and bullgear adjustment, page 33.
	f. Connecting rod bearings and/or bushings worn.	f. Replace bearings and/or bushings.
	g. Plunger slide rails and chamber slide rails worn.	g. Replace slide rails and adjust knife clearance, sharpen knives if necessary.
Pickup teeth breaking.	a. Pickup too low.	a. Adjust cable so pickup teeth clear the ground about 1".
	b. Wheels dropping in ditches or corrugation.	b. Raise pickup. In severe cases, tandem wheels are recommended.
	c. Not enough tension on pickup balance spring.	c. Adjust springs so that pickup floats.
	d. Allowing pickup to excessively build with hay.	d. Adhere to feed system rules on page 27.
	e. Teeth running through uncut material.	e. Raise the height of the pickup teeth.
	f. Hay is too wet.	f. Allow hay to dry.
Uneven length of bales.	a. Meter wheel not adjusted properly.	a. See meter trip bar adjustment, page 20.
	b. Uneven feeding.	b. See operating speeds, page 18.
	c. Stop bolt not properly adjusted.	c. See bale length adjustment, page 35.
	d. Not enough clearance between clutch & stop.	d. See clutch adjustment, page 20.
	e. Worn out knurl or teeth on meter trip bar.	e. Replace knurl F1687 or meter trip bar F1686.
Needle breakage.	a. Obstruction in plunger slots, such as sticks, stones, etc.	a. Clean out needle slots in plunger.
	b. Bent tines or frame on feed fork.	b. Repair feed fork.
	c. Needles timed too early.	c. Check needle timing. See needle timing, page 19.
Erratic action of tension control.	a. Bent or dull points on star wheel.	a. Straighten and sharpen points of star wheel.
	b. Restriction in oil return base.	b. Take off hose and clean out.
	c. Building up of uncured hay on rails and angles of bale chamber. This can also be caused by excessive aphid in the hay.	c. Clean off rails and angles.
	d. Tension control bypass valve not working properly caused by dirt or other foreign material.	d. Use clean oil. Replace filter.

	e. Wrong grade and weight of oil.	e. Use Standard Oil Co. AW46 or equivalent. Be sure tank is filled up to 1" from the top of the tank, when the ram or rams are depressed.
	f. Oil level too low.	f. Fill tension control oil level to ¾" from the top when tension control cylinders are retracted.
	g. Water in oil tank.	g. Check for water and replace with fresh oil as needed
Bales of uneven density (crooked bales)	a. Feed fork and/or feedarm not adjusted properly.	a. See feed system adjustment, page 27.
	b. Pickup teeth not working properly.	b. Check condition of pickup tooth bar bearing, pin, and cam. Replace as needed.
	c. Bushing and clips on feed tines worn causing feed tines to drag.	c. Check condition of feed tine bushings and clips. Replace as needed.
	d. Pickup belt slipping.	d. Tighten pickup belt.
	e. Feedfork is tilted down towards deck.	e. Check torque shaft bearing.

TROUBLE SHOOTING
TWINE KNOTTERS ONLY

PROBLEM	POSSIBLE CAUSE	REMEDY
Knots hanging on bill hook.	a. Dull twine knife.	a. Sharpen twine knife.
	b. Loose tension on twine holder.	b. Tighten springs on twine holder.
	c. Foreign material in twine holder.	c. Clean twine holder.
	d. Worn twine disc.	d. Replace twine disc and holder.
	e. Twine too light or inferior grade of twine.	e. Use heavier knot strength twine or better grade of twine
Knot on top twine only.	a. Improper needle adjustment.	a. See needle adjustment, page 21.
	b. Improper twine finger adjustment.	b. See twine finger adjustment, page 22.
	c. Top hay dog not working.	c. Replace hay dog spring if broken.
	d. Hay dogs worn so they do not hold the hay properly.	d. Replace worn hay dogs.
	e. Not enough tension on the twine.	e. Adjust tension on the twine so that twine will not cast out (about 3 lbs. pull).
Knot on bottom twine only.	a. Bale tension too tight or hay too damp.	a. Release tension on tension control.
	b. Uneven twine.	b. Use a good grade of twine.
	c. Not enough tension on twine holder spring.	c. See twine holder, page 22.
No knot on either end.	a. Ends of knot too short and twine knot pulls out.	a. Loosen twine holder.
	b. Twine breaks between twine disc and bill hook.	b. Twine holder too tight. See twine holder, page 22.

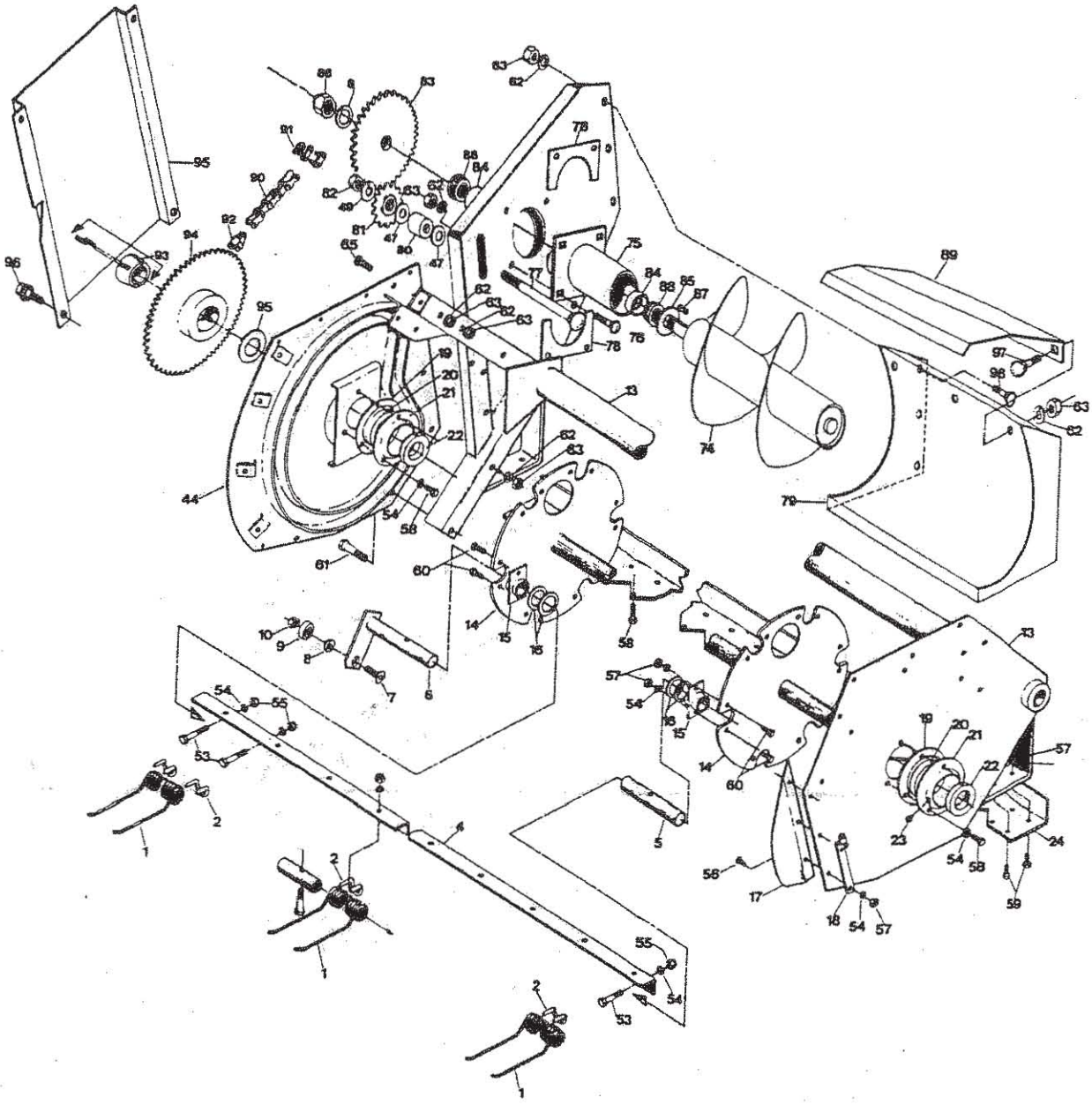
TROUBLE SHOOTING
WIRE KNOTTERS ONLY

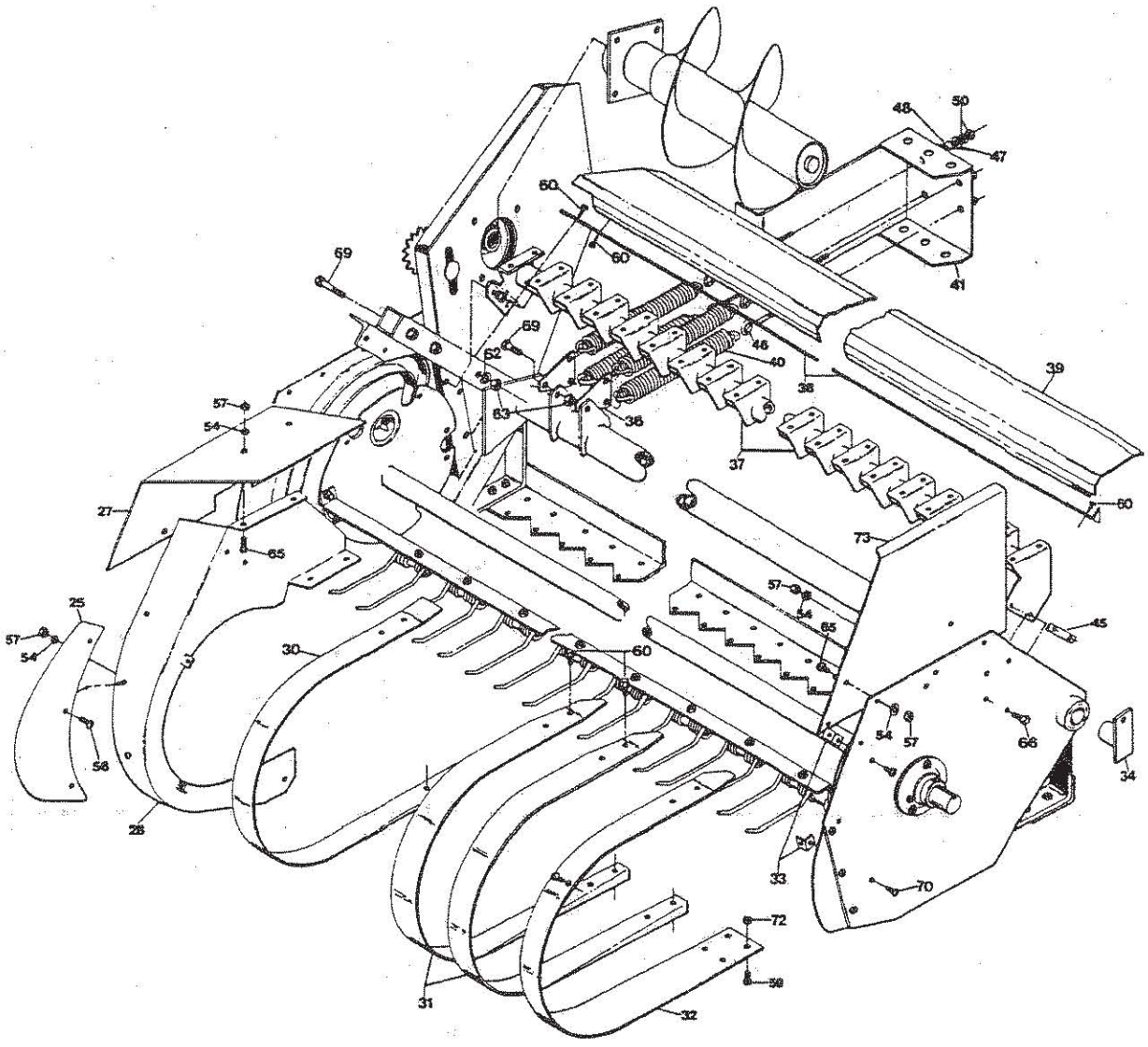
PROBLEM	POSSIBLE CAUSE	REMEDY
Needle doesn't carry wire to gripper.	a. Wire tangled in can.	a. Check wire in can.
	b. Wire tangles through guides and needle heads.	b. Check wire through guides and needles, making sure it runs freely.
	c. Wire guides on bottom of bale chamber not aligned with needle rollers.	c. See wire needle adjustment, page 24.
	d. Worn guide rollers.	d. Replace worn guides.
Wire wraps and breaks off on twister shaft.	a. Needles are out of alignment with knotter.	a. See wire needle adjustment, page 24.
Short length of wire breaks off and wraps on twister shaft.	a. Hooks are advanced too far.	a. Adjust hook to cut at 2 to 3 o'clock.
	b. Wire pulls too hard through bale.	b. Check bale density. Feed fork adjustment may be necessary, see page 27.
No twist on bottom wire.	a. Twister hooks too low.	a. Adjust twister hooks. See page 25.
	b. Needles out of alignment.	b. See wire needle adjustment, page 24.
No twist on top wire.	a. Grippers need adjustment.	a. Check gripper adjustment, page 25.
	b. Tension control not working properly.	b. See tension control, page 34.
	c. Needle out of line.	c. See wire needle adjustment, page 24.
Wire breaks at bottom of the twist.	a. Twister hooks too low.	a. See hook adjustment, page 25.
	b. Too much tension between wire holder rod and twister shaft.	b. See twister hook and wire holder adjustment, page 25.
	c. Too much tension on hay.	c. Reduce tension control pressure.

370/270
ADVERSE CONDITION PICKUP

REF. NO.	PART NO.	DESCRIPTION
1	F0001226	Pickup Finger (66 used)
2	F0000100	Pickup Finger Guide (78 used)
3	F0000101	Pickup Finger Guide Short (48 used)
4	BAR0018482	Tooth Bar (6 used)
5	SHF0018483	Pin Shaft (6 used)
6	BAR0011323	Tooth Bar Lever (6 used)
7	SCO0000504	½" x 1 ½" NC Flat Head Cap Screw (6 used)
8	BSH0006231	Bushing Tooth Bar (6 used)
9	BRG0002029	Cam Follower Bearing (6 used)
10	NCH0000500	½" NC Hex Nut (6 used)
11	CAM0002029	Cam Lever Complete (6 used)
12	F0008102	Bearing Pickup Shaft (2 used)
13	PFR0020706	Pickup Frame
14	SHF0018480	Pickup Real Assembly
15	BRG0006219	Tooth Bar Bearing (12 used)
16	WAS0011459	Washer Tooth Bearing Bar (24 used)
17	F0007151	Fender Flare L.H. Inside
18	F0007194	Pickup Lift Bracket
19	F0008383	Flangette (2 used)
20	F0008380	Bearing Only (2 used)
21	F0008382	Flangette W/Zerk (2 used)
22	F0008381	Locking Collar (2 used)
23	ZZ0000109	3/16" Zerk Fitting (2 used)
24	BAR0018479	Bottom Stripper Bar
25	SHD0006253	R.H. Fender Flare
26	SHD0013975	Access Cover
27	SHD0020832	R.H. Deflector
28	PCY0020861	R.H. Fender Assembly
29	SHD0011344	Short Fender Extension
30	STR0006253	Outside Stripper
31	STR0006209	Center Stripper (21 used)
32	STR0018478	Inside Stripper
33	MNT0011313	Stripper Mount Angle (2 used)
34	F0007176	Bearing L.H. Pickup Mounting
35	F0007382	Bearing R.H. Pickup Mounting
36	PLT0011331	Spring Plate
37	MNT0018475	Top Stripper Mount
38	MNT0018911	Extension Sheet Mount
39	SHD0020829	Extension Sheet
40	F0007154	Spring (4 used)
41	MNT0020470	Pickup Spring Anchor
42	F0007156	Spring Plate
43	MNT0011311	Inside Fender Mount
44	PCY0020483	Pickup R.H. End Plate
45	SHM0017697	Pickup Mounting Stripper
46	F0000096	Eyebolt for Lift Spring (4 used)
47	WCT0000500	½" Cutwasher
48	F0006410	Bushing (4 used)
49	WLK0000500	½" Lockwasher
50	NCH0000500	½" NC Cap Screw
51	SCC0000503	½" x 1 ¼" NC Cap Screw
52	NCE0000500	½" NC Esna Nut
53	SFC0000207	5/16" x 2 ¼" NF Cap Screw (60 used)
54	WLK0003125	5/16" Lockwasher
55	NFE0003125	5/16" NF Esna Nut
56	SMT0000202	5/16" x 1" NC Thruss Head Machine Screw
57	NCH0003125	5/16" NC Hex Nut
58	SCC0000202	5/16" x 1" NC Cap Screw

REF. NO.	PART NO.	DESCRIPTION
59	SCC0000203	5/16" x 1 ¼" NC Cap Screw (4 used)
60	SCC0000201	5/16" x ¾" NC Cap Screw (24 used)
61	SCC0000309	⅜" x 2 ¾" NC Cap Screw (2 used)
62	WLK0000375	⅜" Lockwasher (6 used)
63	NCH0000375	⅜" NC Hex Nut (6 used)
64	SCC0000302	⅜" x 1" NC Cap Screw (2 used)
65	SMT0000201	5/16" x ¾" Thruss Head Machine Screw (4 used)
66	SCC0000205	5/16" x 1 ¾" NC Cap Screw (4 used)
67	SMS0000177	5/16" x 1" NC Whiz Lock Bolt (2 used)
68	SCC0000504	½" x 1 ½" NC Cap Screw (2 used)
69	SCC0000305	⅜" x 1 ¾" NC Cap Screw (2 used)
70	SMT0000100	¼" x ½" NC Thruss Head Machine Screw (2 used)
71	WLK0000250	¼" Lockwasher (2 used)
72	NCG0003125	5/16" NC Gripco Nut (42 used)
73	SHD0011309	L.H. Deflector
74	AUG0018799	Auger
75	HSN0017659	Auger Bearing Housing
76	CRB3750200	⅜" x 2 NC Carriage Bolt
77	CRB5004000	½" x 4 NC Carriage Bolt
78	SHM0020501	Auger Drive Shim
79	AUG0018777	Auger Trough
80	SPC0017669	Idler Sprocket Spacer
81	SPK0002318	Idler Sprocket
82	NCH0005000	½" NC Hex Nut
83	SPK00040030	Sprocket 40B30/1 1/4" Bore
84	BRC0067010	Bearing Cup (2 used)
85	WAS0015783	10 ga Washer (2 used)
86	F0008080	1 ¼" NF Esna Jam Nut
87	ZZ0000450	¼" x ¼" x 1 ⅛" Key Stock (2 used)
88	BRG0067000	Bearing
89	AUG0020830	Auger Scraper
90	CHN0040125	40 Chain 125 P 125P
91	F0004074	Connecting Link RC 40
92	F0004073	Offset Link RC 40
93	BSH0001610	1 ⅜" Bushing
94	SPK0040045	Sprocket
95	SHD0021013	Auger Drive Chain Shield
96	SMS0000198	5/16" x ½" Whiz Bolts (4) (4 used)

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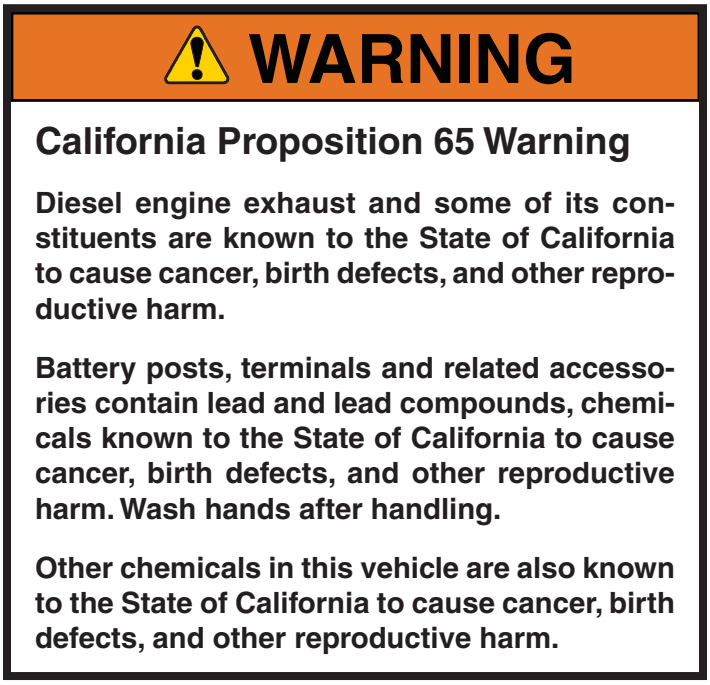
WARNING
California Proposition 65 Warning
Diesel engine exhaust and some of its constituents are known to the State of California to cause cancer, birth defects, and other reproductive harm.
Battery posts, terminals and related accessories contain lead and lead compounds, chemicals known to the State of California to cause cancer, birth defects, and other reproductive harm. Wash hands after handling.
Other chemicals in this vehicle are also known to the State of California to cause cancer, birth defects, and other reproductive harm.