

M-202-77

Starting with S/N K-3814

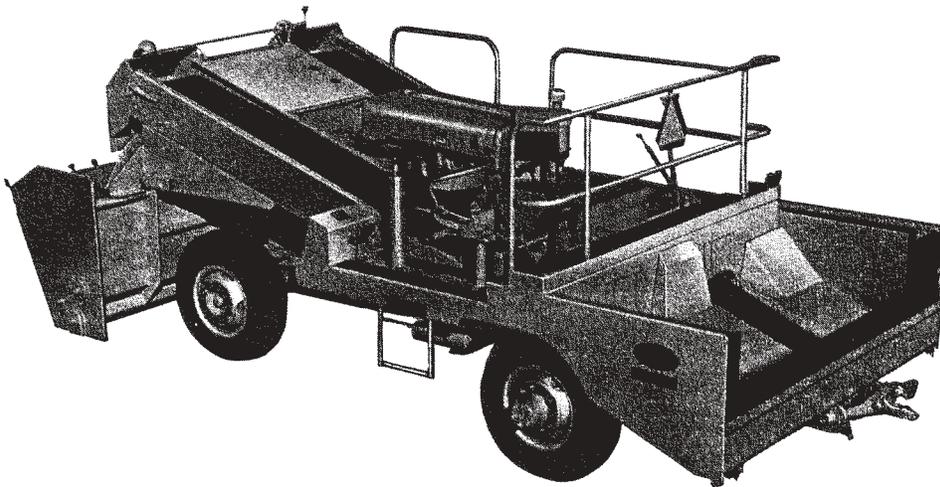


CHIPSREADER

**OPERATION, MAINTENANCE and
SAFETY MANUAL**

! WARNING

Stay off hopper when machine is in motion.
Machine movements could cause a fall
resulting in injury or death.



E. D. ETNYRE & CO., Oregon, Illinois 61061

**CHIPSPREADER
OPERATION, MAINTENANCE AND SAFETY MANUAL**

M-202-77



E. D. ETNYRE & CO., Oregon, Illinois 61061, Phone Area Code 815/732-2116, Cable Address "EDECO"

CAUTION

- ▲ 1 Make certain everyone is clear of machine before starting engine or operation.
- ▲ 2 Always use steps, platforms and handrails provided.
- ▲ 3 Remain clear of moving or rotating parts.
- ▲ 4 Always have shields, covers and guards in place when operating.
- ▲ 5 Do not stand in front of hopper to engage and disengage hopper gates.
- ▲ 6 Keep loose clothing away from conveyor area when operating conveyor clutches.
- ▲ 7 Keep drive clutch engaged when machine is being roaded down hill.

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INTRODUCTION

Your ETNYRE ChipSpreader is designed to give many years of continuous economic service. The information contained in this manual will enable you to obtain maximum performance from your ChipSpreader.

Ease of operation and application of an even uniform layer of clean dry aggregate a short distance behind a distributor are the main design criteria for the ETNYRE ChipSpreader.

IMPORTANT

1. Front hopper optional segregator screen should be up when unit is traveling between job sites.
2. Keep machine on road or relatively uniform surface at all times.
3. Place truck gear shift in neutral position as soon as truck is connected to the spreader.
4. Under most operating conditions the ChipSpreader should be allowed to tow the truck. However, certain steep up-grade conditions may require the truck to push the spreader with the spreader transmission in neutral position.
5. Never use ChipSpreader to dislodge a truck or other equipment which has become stuck in mud or soft shoulder conditions.
6. Avoid roading machine with material in front hopper.

INITIAL START-UP

Check Out

1. The following accessories are with each spreader: grease gun, allen wrench set, extra linkage rods for shortened truck hookup, cushion and seat back, agitator disconnect bolt, wheel lugnut wrench, breaker bar, and various Operator, Parts and Instruction Manuals.

2. Best performance for most operating conditions is achieved when tire pressures are set to 50 P.S.I. in front and 65 P.S.I. in rear. However, various operating speeds, road bed conditions, truck pulling arrangements, and other operating conditions may require different tire pressures.

3. Grease and check oil levels in accordance with the ChipSpreader lubrication chart prior to operation.

4. Check engine water and oil level prior to operation. Refer to Engine Operators Maintenance Manual for complete engine service requirements.

5. Hopper gate adjustment and spread roll straightness are established at the factory. However, to be sure adjustments or straightness were not altered during shipment and storage the following gate and spread roll adjustment checks should be performed prior to operation:

A. With the hopper removed from the spreader, or the reach rod disconnected, each gate adjusting screw should be set so as to maintain 1/16 inch clearance between the gate and spread roll. At the same time, the gate control lever linkage should be adjusted so the gate control lever just touches the actuator bar stop.

B. With the hopper attached to the spreader, disengage a 6 inch gate at each end and a 12 inch gate at the hopper center. Engage hopper. Spread roll rotation should not cause disengaged gate levers to move. However, if any gate levers do move, indicating that spread roll is out of round or bent, contact factory for spread roll straightening instructions.

Attaching Hopper to Unit

1. By hooking a lifting device into the rear lifting eye, the hopper can be tilted forward while

being raised, allowing the hopper carrying shafts to engage hopper carrying arms on the spreader. (Figure 1 and 2). Lower hopper slowly until lifting device can be disconnected.

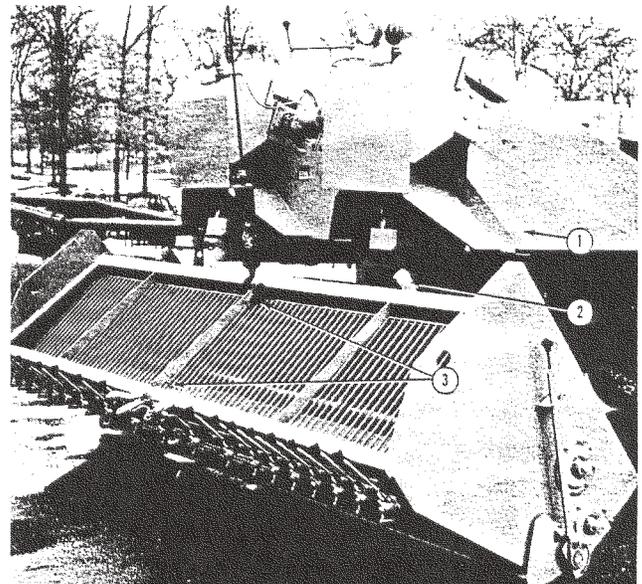


Figure 1

1. Latch
2. Catch Arm

3. Lifting Eye

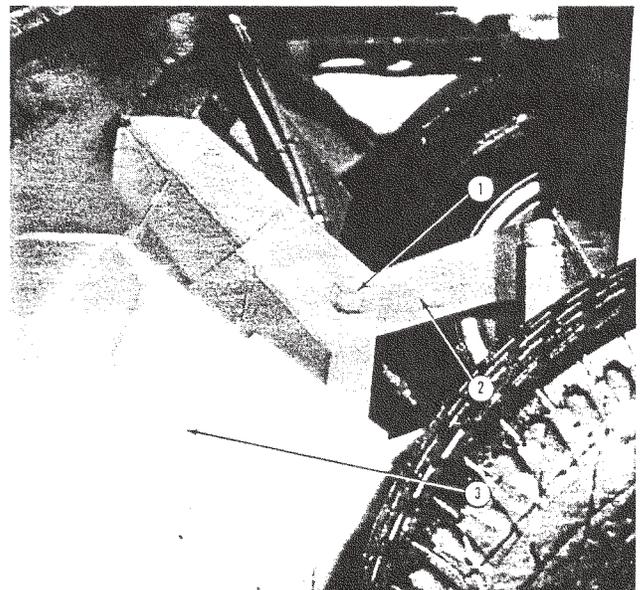


Figure 2

1. Carry Shafts (2)
2. Carry Arms (2)

3. Hopper

2. Check to insure hopper catch arm latches on each side of the spreader are in float position.

3. Attach lifting device to front lifting attachment and raise hopper to vertical position.

4. After hopper catch arms have engaged latches, rotate each latch pawl to locking position.

5. Connect hopper drive motor hoses.

6. Attach reach rod.

7. After proper setting of gate adjusting screws and control lever linkages has been established, only then, if necessary, should the reach rod be adjusted to maintain 1/16 inch clearance between gate and spread roll.

OPERATION

Standard Unit (2 Man)

1. To start engine open throttle about 1/4 to 1/3, add choke if necessary, and engage starter switch.

2. Operate spreader with engine at full governed speed.

3. Engage the proper number of hopper gate control levers to obtain the desired spread width. (Figure 3).

4. Select gear ratio from speed chart to obtain desired forward speed. For operators new to the machine it is suggested to start in first gear high range. It should be noted that second gear high-range and third gear low-range offer the two most convenient operating speeds. NOTE: Shift two speed differential (Hi-Lo Range) only while unit is stationary.

5. Set mechanical hopper gate opener to achieve desired application rate using the following steps. (Figure 5).

A. Place gate opener stop at approximate position that will give desired application rate.

B. Upon beginning operation pull gate opener lever to stop and make final adjust-

ment by moving stop forward and back as required.

C. Should a piece of foreign material become lodged in the gates, quickly pull gate

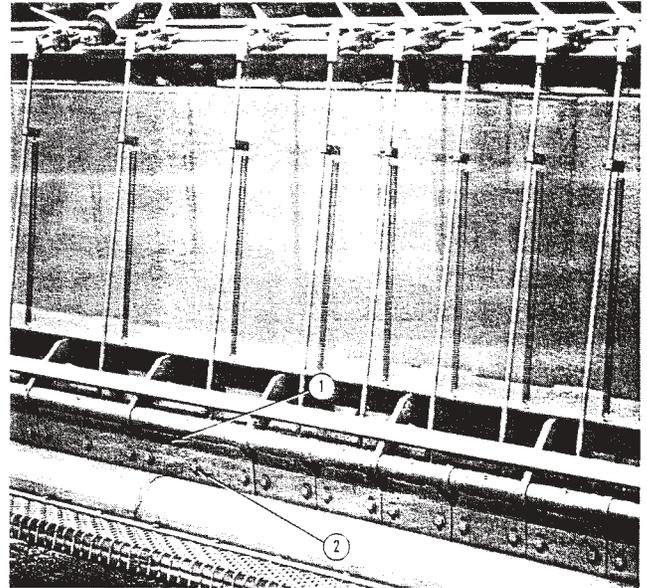


Figure 4
HOPPER

1. Gate Wear Plate

2. Adjusting Bolt

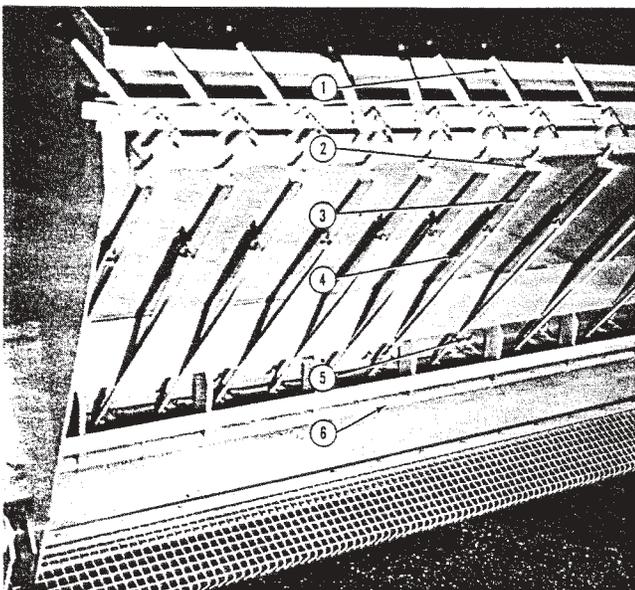


Figure 3

- | | |
|------------------------|-------------------------|
| 1. Gate Control Levers | 4. Return Spring |
| 2. Ball Joint | 5. Gate Adjusting Screw |
| 3. Gate Linkage | 6. Lub Fitting |

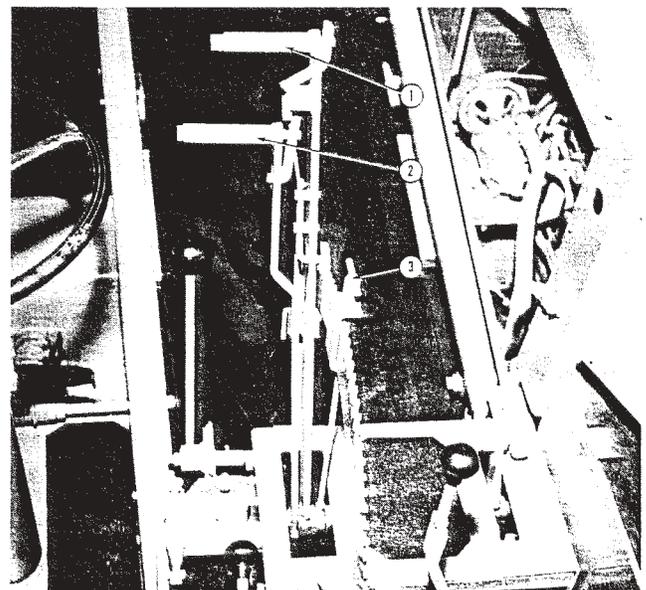


Figure 5
MECHANICAL HOPPER GATE OPENER

- | |
|-------------------|
| 1. Opener Lever |
| 2. Override Lever |

3. Stop

override lever to full open position and allow piece to pass through gates. Once this has been accomplished return gate override lever to gate opener lever. This operation should be performed as quickly as possible so as to maintain a uniform application.

NOTE: Aggregate size, moisture content and spreader speed will determine the proper gate opening.

6. Adjust spreader hitch height if necessary to accommodate individual trucks.

7. Operate conveyor belt control switches so as to maintain an even distribution of aggregate in front hopper.

8. Conveyor flow deflectors may be used to achieve a desired aggregate distribution in the front hopper.

9. Rear conveyor gates may be adjusted so material is supplied to the front hopper at a rate approximately equal to the rate at which material is being spread. (Figure 6).

10. The operator may wish to disengage the front hopper agitator while spreading clean dry aggregate. This operation is performed by removing the agitator sprocket drive bolt. (Figure 7).

11. Should an electrical system failure occur, the conveyors may be operated by using conveyor control valve emergency override palm buttons until system failure can be located and corrected. (Figure 18).

FORWARD SPEED CHART

GEAR	RANGE	
	HIGH	LOW
1st	2.4 M.P.H. = 210 FPM	1.7 M.P.H. = 150 FPM
2nd	4.1 M.P.H. = 360 FPM	3.0 M.P.H. = 260 FPM
3rd	7.5 M.P.H. = 660 FPM	5.3 M.P.H. = 470 FPM
4th	11.4 M.P.H. = 1000 FPM	8.2 M.P.H. = 720 FPM
5th	16.7 M.P.H. = 1470 FPM	12.0 M.P.H. = 1060 FPM

This chart is based on: 2000 R.P.M. engine speed and 10:00 - 20 tires.

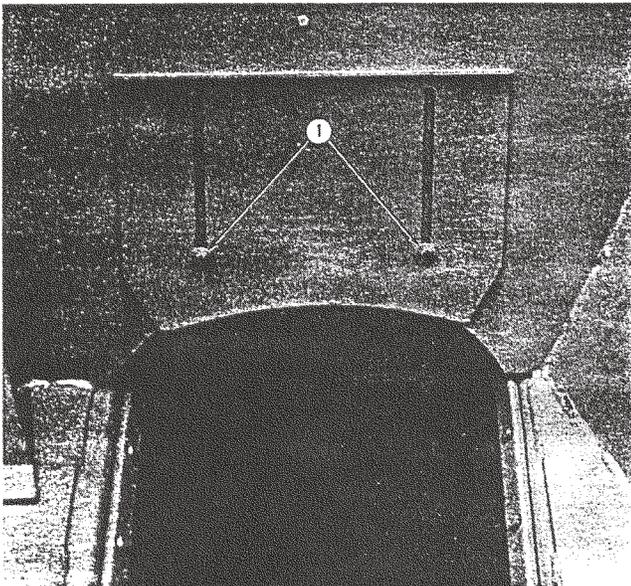


Figure 6
REAR CONVEYOR GATE

1. Adjustment Bolt

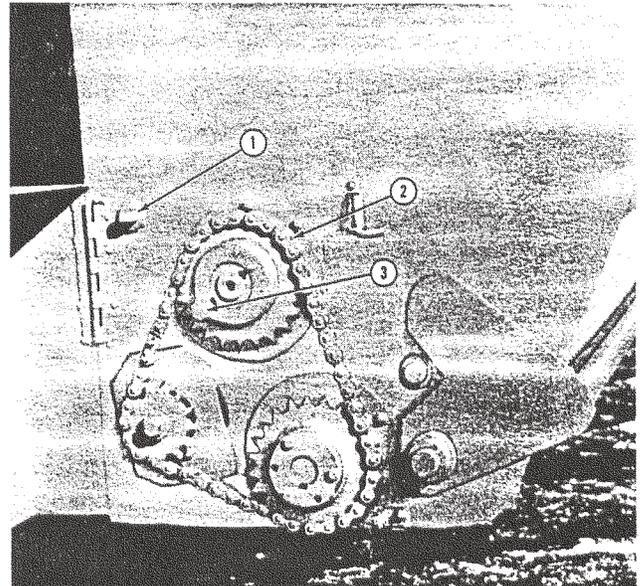


Figure 7
HOPPER CHAIN DRIVE

1. Drive Bolt Holder
2. Agitator Drive Sprocket 3. Sprocket Drive Bolt

OPTIONAL EQUIPMENT OPERATION

Automatic Conveyor Control

On units equipped with automatic conveyor control each belt has a master control switch located in the control panel. The conveyors may be controlled individually by placing the left or right hand conveyor switch in the "automatic," "front," or "drive" position. (Figure 8).

A. By placing the conveyor master control switches in "automatic" position both belts will be automatically started and stopped as necessary to maintain a uniform distribution of material in the front hopper provided conveyor hoods are adjusted properly.

B. With both master switches in "front" position the conveyor control switches located on the front of the right hand conveyor may be used to control each conveyor.

C. The "driver" position allows driver operation of each conveyor from the control panel.

C. When ready to start operation throw over gate opener lock so gate opener lever is free to move to stop position.

D. Upon beginning operation pull gate

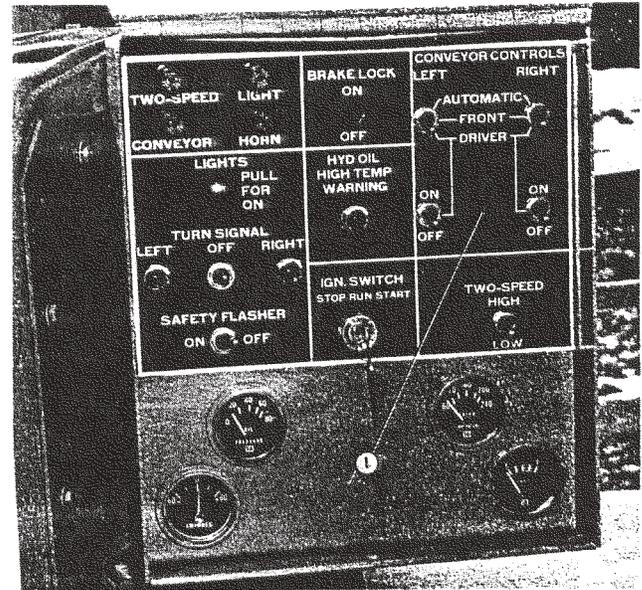


Figure 8

1. Automatic Conveyor Control
(4 Switches)

Belt Speed Control

This option allows the operator located on the right front catwalk to vary conveyor belt speed so as to provide a uniform distribution of material to the front hopper. Valves for this operation are located on the left side of the right hand conveyor and are adjusted by turning the appropriate valve control knob, i.e., clockwise for slow and counter-clockwise for fast. (Figure 9). This option is particularly helpful when doing shoulder work and operations using less than full hopper width.

Power Gate Opener Standard on Dual Station Control Units

This option replaces the standard mechanical gate opener and substantially reduces driver effort to open hopper gates. (Figure 10).

A. To set, first loosen gate opener stop lock by turning knob counter-clockwise.

B. Then slide stop to approximate position that will give desired hopper gate opening.

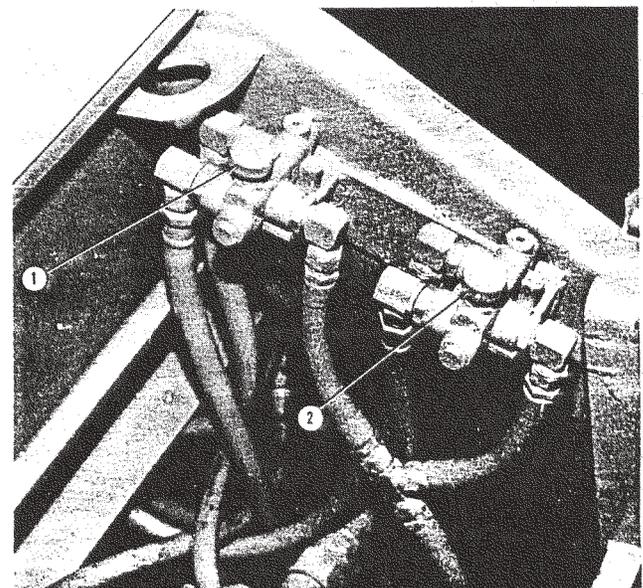


Figure 9
BELT SPEED CONTROL (OPTION)

1. Control Knob (Right Conveyor) 2. Control Knob (Left Conveyor)

opener lever to stop and make final gate adjustment by moving final adjustment lever forward and back as required.

E. Should a piece of foreign material become lodged in the gates, quickly override opener stop by pulling gate opener lever to full open position and allowing piece to pass through gates. Once this has been accomplished return gate opener lever

to operational position. This step should be performed as quickly as possible so as to maintain a uniform application rate.

F. When transporting spreader between job sites, lock gate opener in forward position so as to prevent gates from opening accidentally.

Dual Station Control

Dual station control allows for complete control of the ChipSpreader from either the left or right hand side. When one station is being used, steering control of the opposite station is inoperative. When the driver is changing from one side of the unit to the other, the following steps should be taken. (Figure 11).

A. Engage hydraulic brake lock by holding lock switch in "ON" position and depressing brake pedal, then release switch.

B. Place gate opener stop in rear most position on the control opposite the drivers side.

C. Swing control panel to drivers side and lock into position.

D. Locate gate opener stop at desired position on drivers side.

E. Pull power steering control knob on steering column to upper most position on drivers side.

F. Disengage hydraulic brake lock by depressing brake pedal.

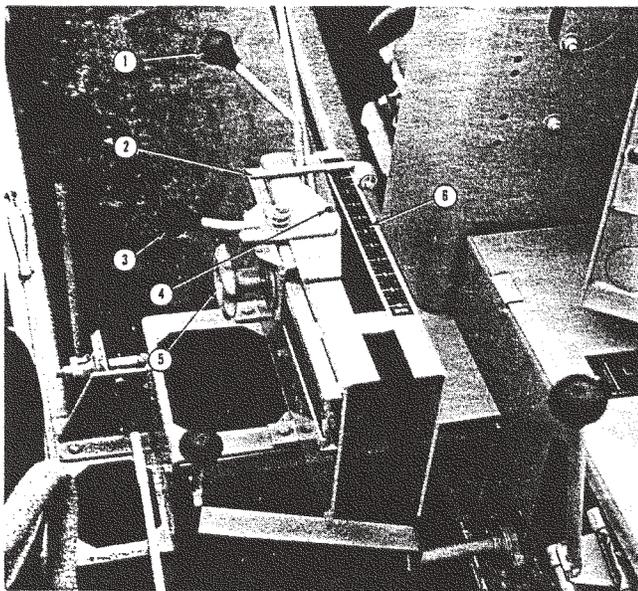


Figure 10
POWER HOPPER GATE OPENER CONTROL (OPTION)

- | | |
|---------------------------|----------------|
| 1. Opener Lever | 4. Opener Stop |
| 2. Opener Lock | 5. Stop Lock |
| 3. Final Adjustment Lever | 6. Scale |

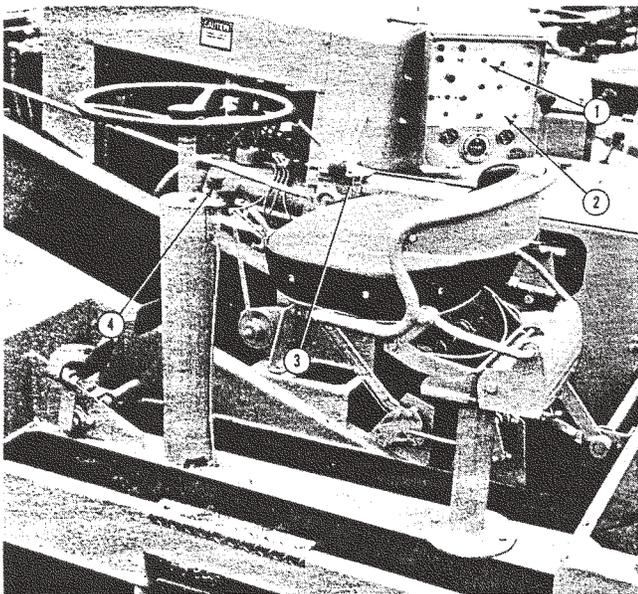


Figure 11

- | | |
|----------------------|--------------------------------|
| 1. Brake Lock Switch | 3. Hopper Gate Opener |
| 2. Instrument Panel | 4. Power Steering Control Knob |

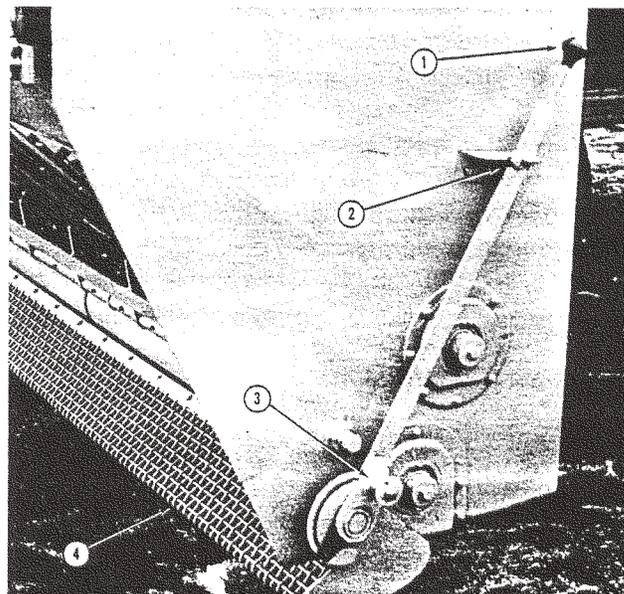


Figure 12
SEGREGATOR SCREEN

- | | |
|-----------|----------------------|
| 1. Handle | 3. Latch |
| 2. Lock | 4. Segregator Screen |

Segregator Screen

When the aggregate is not of uniform size the optional front hopper segregator screen may be used to place larger chips on the asphalt ahead of smaller chips and fines. This helps prevent the smaller chips and fines from blotting out the larger material. (Figure 12).

Electric Horn

Optional horn may be used to signal the truck

driver of various operations, i.e. disengage truck, starting of a shot, or raise truck dump box.

Extra Agitator

When sand or other small aggregate is being spread, an optional second agitator may be placed in the spread hopper so as to eliminate the possibility of bridging. This agitator should be disengaged when normal sized aggregate are being spread.

ADJUSTMENTS

Rear Hopper Flow Gate Adjustment (Figure 6)

1. Loosen flow gate retaining bolts.
2. Raise gate to increase conveyor flow to front hopper.
3. Lower gate to decrease conveyor flow to front hopper.
4. These gates can be used to provide a more uniform flow of material to the front hopper when different hopper lengths are installed on the machine and when only a portion of hopper length is being used.
5. Retighten flow gate retaining bolts.

Hopper Spread Roll Wear Plate Adjustment (Figure 13)

1. Loosen all spread roll wear plate hold down bolts and adjust the wear plate until a nominal 1/16 inch clearance exists between the wear plate and spread roll for the hopper width.
2. Retighten all hold down bolts.
3. When one side of a plate has worn away, it is possible to turn the plate over and use the opposite side.

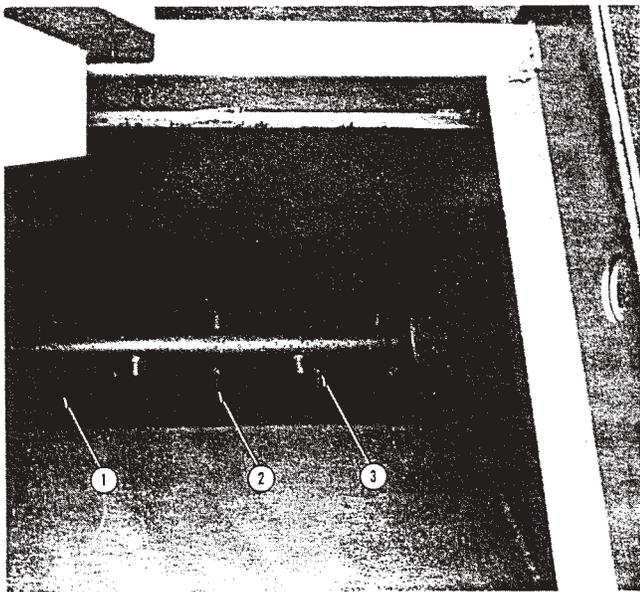


Figure 13
SPREAD ROLL WEAR PLATE

1. Wear Plate
2. Adjustment Slot
3. Adjustment Bolt

Hopper Gate Wear Plate Adjustment (Figures 3 and 4)

1. Loosen wear plate hold down bolts and extend the plate 1/32 inch past the gate edge along the entire gate width.
2. Tighten hold down bolts.
3. As plate wear occurs, additional adjustment will be necessary.
4. When one side of a plate has been worn away, it is possible to turn the plate over and use the opposite side.

Hopper Gate Linkage Adjustment (Figure 3 and 4)

1. Loosen gate adjustment screw jam nuts.
2. With the hopper removed from the spreader or the reach rod disconnected, each gate adjustment screw should be set so as to maintain 1/16 inch clearance between the gate wear plate and spread roll.
3. Tighten gate adjustment screw jam nuts.
4. Adjust the gate linkage length by turning the control lever ball joint connector in or out until the control lever just touches the actuator bar stop while maintaining the 1/16 inch gate clearance.

Reach Rod Adjustment

1. With the hopper installed on the machine, place gate opener control in full closed position. (Figure 5 and 10). NOTE: On units with power gate openers operate engine at half throttle when making this adjustment.
2. Loosen reach rod ball joint connector jam nuts.
3. Disconnect reach rod ball joint from gate opener arm on front hopper.
4. Shift gate actuator bar sufficiently to insert a 1/64 inch (.016) spacer between actuator bar and bar spacer block. (Figure 14).
5. Turn the reach rod ball joint connector in or out as required until it fits squarely into the gate opener arm. Remove ball joint from arm and tighten one turn onto reach rod. Reinstall ball joint onto gate opener arm.

6. Remove 1/64 inch (.016 inch) shim and operate hopper control several times. Check for a clearance of .010 to .015 between the gate actuator bar and bar spacer block each time the gates are closed. If clearance is not present, remove ball joint from gate opener arm and turn onto reach rod until clearance is obtained.

7. Tighten ball joint connector jam nut when adjustment is complete.

Hopper Control Valve Linkage Adjustment

1. Place hopper control lever in the closed position.

2. Disconnect vertical linkage connector (Figure 15) at upper ball joint.

3. Press downward on hopper control valve spool to insure valve is in closed position.

4. Adjust vertical linkage length until ball joint stud fits squarely into actuator arm hole.

5. Reattach vertical connector ball joint.

Conveyor Belt Adjustment

1. If belt tends to move towards one side of the conveyor, tighten tail pulley adjustment on that side until the belt is running in the center.

2. Should it be impossible to obtain centered belt operation by adjusting the tail pulley (Figure 16) it will then be necessary to adjust the head pulley as outlined below. (Figure 17).

For right hand conveyor. (Figure 18).

A. Loosen the four bolts holding the left hand side head pulley bearing.

B. Loosen adjusting bolt jam nuts.

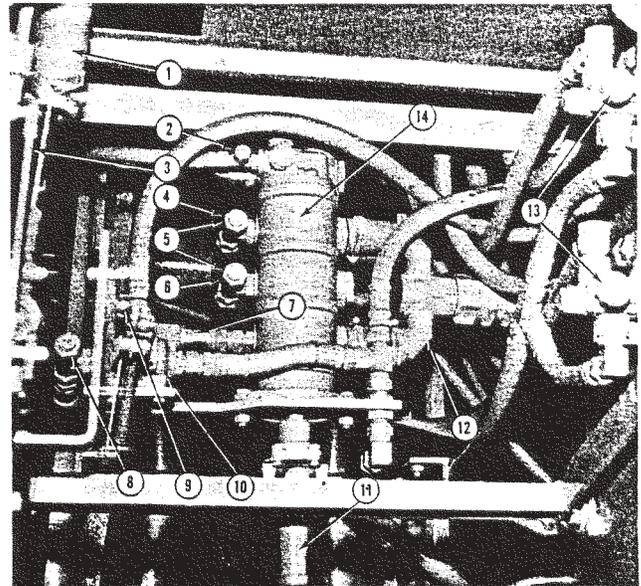


Figure 15

- | | |
|---|--|
| 1. Hopper Opener Cylinder (Optional on Left Hand Drive) | 8. Hopper Pressure Check Tee |
| 2. Power Steering Pressure Check Tee | 9. Hopper Control Valve Linkage Assembly |
| 3. Power Gate Position Linkage | 10. Hopper Control Valve |
| 4. Right Conveyor Line | 11. Drive Shaft |
| 5. Conveyor Pressure Check Tee (2) | 12. Suction Manifold |
| 6. Left Conveyor Line | 13. Belt Speed Control Valve (Option) |
| 7. Relief Valve (Hopper Drive) | 14. Hydraulic Pump |

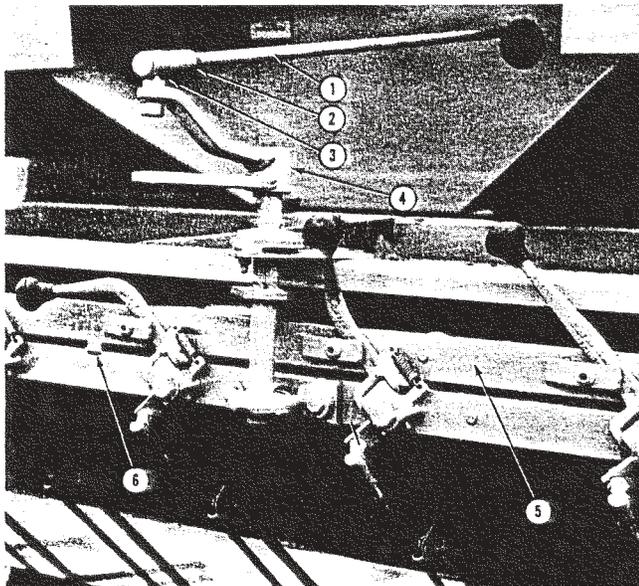


Figure 14
HOPPER

- | | |
|--------------------------|---|
| 1. Reach Rod | 5. Gate Actuator Bar |
| 2. Jam Nut | 6. Bar Spacer Block (Insert Shim Here For Adjustment) |
| 3. Ball Joint | |
| 4. Control Arm and Shaft | |

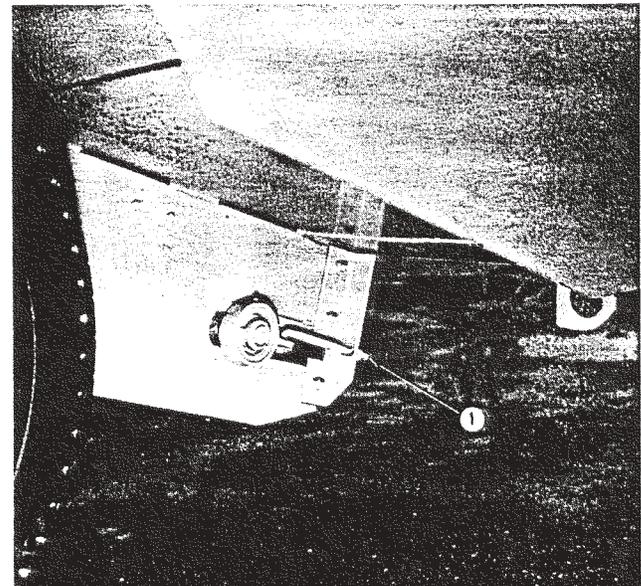


Figure 16
CONVEYOR TAIL PULLEY

1. Conveyor Belt Tail Pulley Adjustment Bolt (4 Places)

- C. Start conveyor belt at this time. CAUTION: *Remain clear of moving parts.*
- D. If belt runs to the right hand side of the conveyor, loosen adjusting screws until belt is centered on head pulley.
- E. If belt runs to the left side of conveyors, tighten adjusting screws until belt is centered on head pulley.

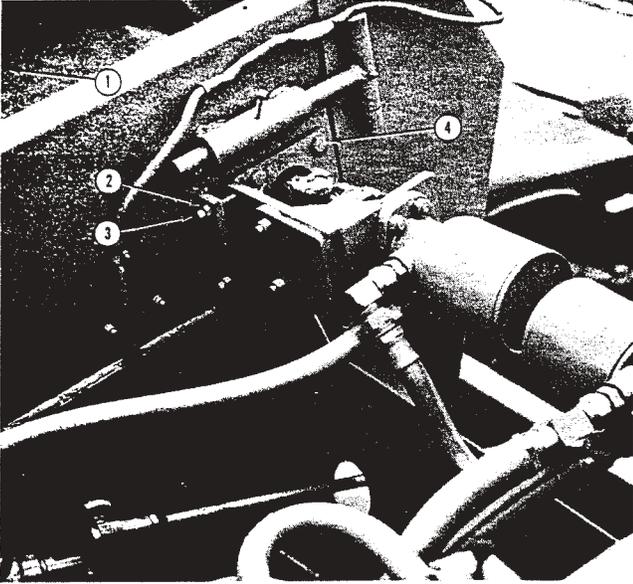


Figure 17
CONVEYOR HEAD PULLEY ADJUSTMENT

- 1. Left Conveyor
- 2. Jam Nut
- 3. Adjusting Screw
- 4. Bearing Bolts

- F. Retighten adjusting screw jam nuts.
- G. Stop conveyor belt operation at this time.
- H. Tighten head pulley bearing bolts.

For left hand conveyors. (Figure 17).

- A. Loosen the four bolts holding the right hand side head pulley bearing.
- B. Loosen adjusting bolt jam nuts.
- C. Start conveyor belt at this time. CAUTION: *Remain clear of moving parts.*
- D. If belt tends to run to the right hand side of the conveyor, tighten adjusting screws until belt is centered on head pulley.
- E. If belt runs to left side of conveyor, loosen adjusting screws until belt is centered on head pulley.
- F. Retighten adjusting screw jam nuts.
- G. Stop conveyor belt operation at this time.
- H. Tighten head pulley bearing bolts.

NOTE: Only a small amount of head pulley adjustment should be necessary to center conveyor belt.

3. Conveyor belts should be sufficiently tight to prevent head pulley slippage when the belts are loaded and operating at full governed speed. It should be noted, however, that excessive belt tightness will result in shortened belt and pulley bearing life. It may be necessary to tighten the belts several times during the first few weeks of operation until most of the initial belt stretch has been removed.

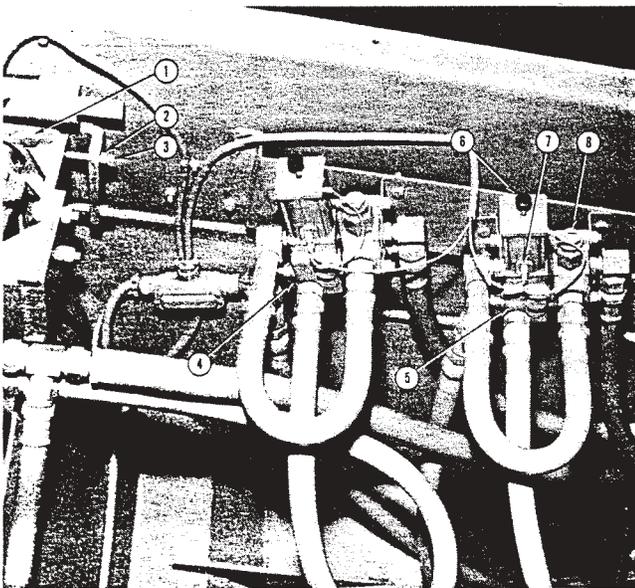


Figure 18
CONVEYOR CONTROL VALVE
AND RIGHT CONVEYOR ADJUSTMENT

- 1. Bearing Bolts
- 2. Jam Nut
- 3. Adjustment Screw
- 4. Right Conveyor Valve
- 5. Left Conveyor Valve
- 6. Palm Button (Override)
- 7. Solenoid
- 8. Relief Valve

Relief Valve Pressure Adjustment

Before making any relief valve adjustments check to insure there is sufficient oil in hydraulic reservoir and both suction and return filter elements are free of contamination.

1. Conveyor control relief valve adjustment. (Figure 18). Conveyor relief valve adjustments should be made with engine operating at 1500 R.P.M. On units not equipped with tachometer, 1500 R.P.M. can be obtained by placing throttle in full open position and depressing and releasing clutch. This will set engine speed to 1500 R.P.M.

- A. With engine off, remove pressure check tee cap and install necessary adaptors (Anchor Coupling Company adaptor 12F-12JUFS or equivalent and 3/4 inch to 1/4 inch reducing pipe thread bushing. Etnyre P/N 6600943 and 0144033 respectively) in supply line from pump to con-

veyor control valve being checked. (Figure 15). Once adapters are connected, install a 0-3000 P.S.I. pressure gauge in reducing bushing and start engine.

B. Hold (lock) appropriate head pulley with a pipe wrench or other suitable tool. (Figure 19 showing pipe wrench). Use caution when doing this operation.

C. Loosen outermost jam nut.

D. Turn adjusting screw in or out as required until 1500 P.S.I. is indicated on pressure gauge.

E. Retighten jam nut.

F. If relief pressure cannot be obtained remove conveyor control relief valve cartridge and check for contamination or damaged elements. Clean or replace cartridge as required.

G. NOTE: There are two conveyor control valves, one for the left and one for the right conveyor, located on the left side of right hand conveyor.

2. Hopper control relief valve adjustment. (Figure 15). This relief valve should be checked while engine is running at a slow idle (throttle closed).

A. With engine off, remove pressure check tee cap and install necessary adaptors (Anchor Coupling Company adaptor 12F-12JUFS or equivalent and 3/4 inch reducing pipe thread bushing. Etnyre P/N 6600943 and 0144033 respectively) in sup-

ply line from pump to hopper control valve. Once adaptors are connected, install a 0-3000 P.S.I. pressure gauge in reducing bushing and start engine.

B. Hold (lock) hopper spread roll by placing a drift punch through the drive chain and into the drive sprocket. (Figure 20).

C. Remove acorn nut from relief valve on right hand side of hopper control valve.

D. This valve has a cracking pressure of 1500 P.S.I. With engine running at a slow

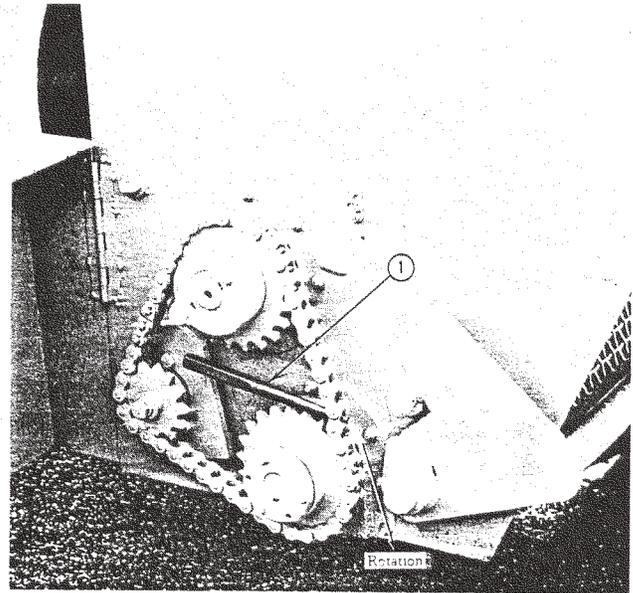


Figure 20

1. Drift Punch Thru Chain

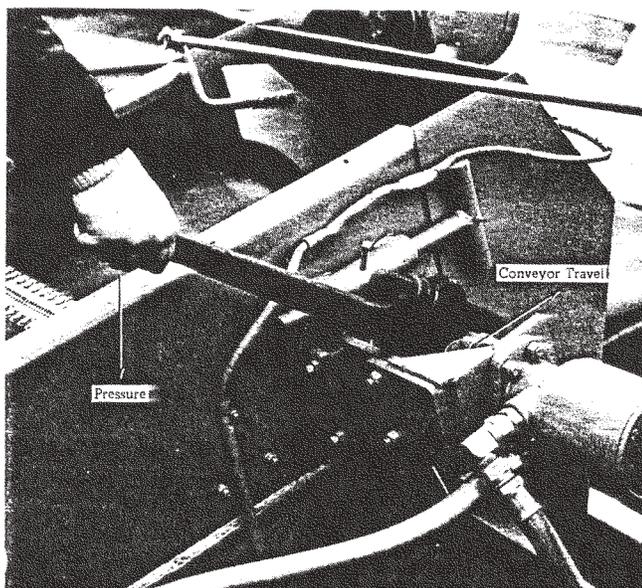


Figure 19

DRIVE JOINT LOCKED

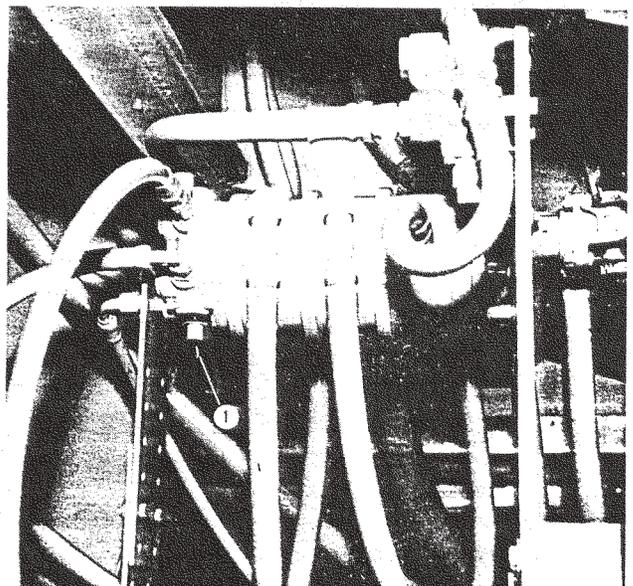


Figure 21

1. Power Steering Relief Valve

idle the bypass pressure will be approximately 1700 P.S.I. Turn adjustment screw in or out as required until this pressure is indicated on pressure gauge.

E. Replace acorn nut.

F. If relief pressure cannot be obtained remove hopper control relief cartridge and check for contamination or damaged car-

tridge elements. Clean or replace cartridge as required.

3. Power steering relief valve adjustment (Figure 21). This relief valve should be checked while engine is running at a slow idle (throttle closed).

A. With engine off, remove pressure check tee cap and install necessary adaptors (Anchor Coupling Company adaptor 8F-8JUFS or equivalent and 1/2 inch to 1/4 inch reducing pipe thread bushing. Etnyre P/N 6600944 and 0116524 respectively) in supply line from pump to steering control valve. (Figure 15). Once adaptors are connected install a 0-3000 P.S.I. pressure gauge in reducing bushing and start engine.

B. Remove acorn nut on underside of pump forward section (Figure 21).

C. Turn steering wheel full left or right until wheels are against stops. Hold against stop.

D. With engine running at 1500 R.P.M. the by-pass pressure should be approximately 1300. (± 50 P.S.I.). Turn adjustment screw in or out as required until this pressure is indicated on the test gauge.

E. Replace acorn nut.

F. If relief pressure cannot be obtained, remove steering relief valve cartridge and check for contamination or damaged cartridge elements. Clean or replace cartridge as required.

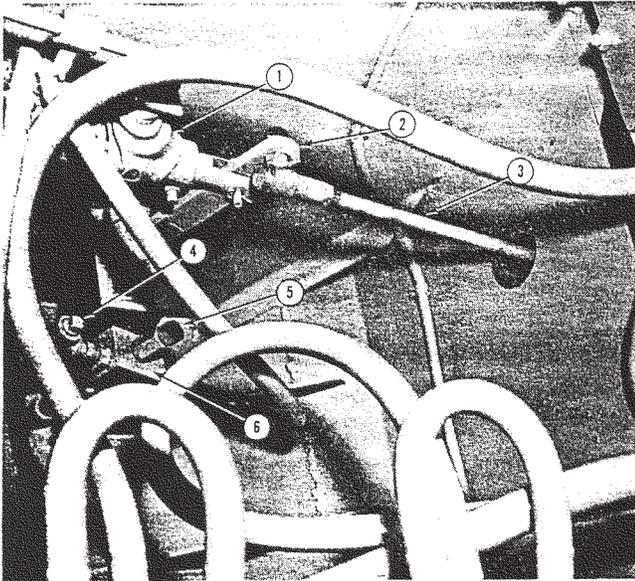


Figure 22
POWER GATE RELIEF VALVE

- | | |
|----------------------------------|-----------------------|
| 1. Power Gate Opener Cylinder | 4. Pressure Check Tee |
| 2. Power Gate Actuator Pivot Arm | 5. Relief Adjustment |
| 3. Linkage to Hopper | 6. Relief Valve |

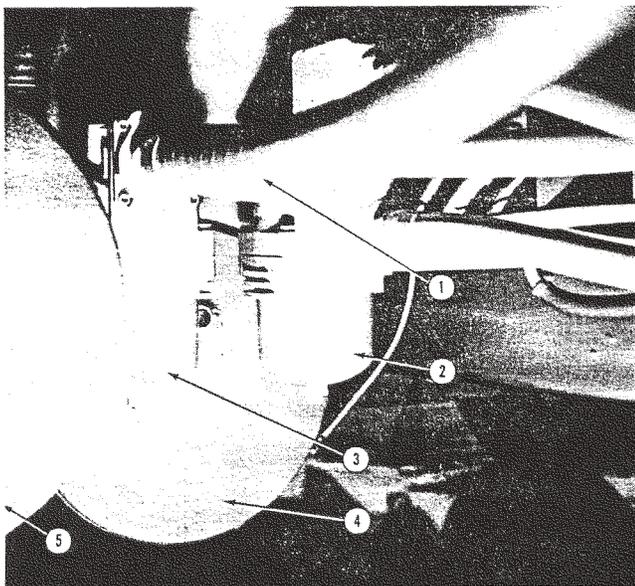


Figure 23

- | | |
|---------------------|------------------------|
| 1. Suction Line | 4. Hydraulic Reservoir |
| 2. Return Filter | 5. Fuel Tank |
| 3. Suction Strainer | |

4. Power gate relief valve adjustment. This relief valve should be checked while engine is running at a slow idle (throttle closed).

A. With engine off remove pressure check tee plug and install a 1/2 inch to 1/4 inch pipe thread reducing bushing (Etnyre P/N 0116524). Next install a 0-3000 P.S.I. pressure gauge in bushing. (Figure 22).

B. Disconnect power gate actuator at pivot arm. (Figure 22).

C. Disconnect actuator position linkage at rear of actuator. (Figure 15).

D. Start ChipSpreader engine.

E. Collapse actuator to closed position by pulling on position linkage.

F. Remove acorn nut on top of power gate relief valve.

G. Pull on positioner linkage while adjusting relief valve.

H. This valve has a cracking pressure of 1500 P.S.I. With engine running at a slow idle, turn adjustment screw in or out as required until this pressure is indicated on pressure gauge.

I. Replace acorn nut, reconnect actuator and linkage.

J. If relief pressure cannot be obtained remove relief valve cartridge and check for contamination or damaged cartridge elements. Clean or replace cartridge as required.

LUBRICATION

Interval	Point	Identification	No. of Points	Lubricant	Quantity
Weekly	1	Bearing-Disconnect	1	#2M-AG	Sparingly
	2	Front Hopper Gates	A/R	#2M-AG	Sparingly
	3	Return Idler Flange Bearing (Both Conveyors)	4	#2M-AG	Sparingly
	4	Drive Line-Universal Joints	3	#2M-AG	Sparingly
	5	Drive Line-Universal Joints	3	#2M-AG	Sparingly
	6	14" Clutch Throw-Out Pivot Shaft	2	#2M-AG	Sparingly
	7	Tail Pulley Bearings (Both Conveyors)	4	#2M-AG	Sparingly
	8	Drive Line-Universal Joints	3	#2M-AG	Sparingly
	9	Drive Line-Universal Joints	3	#2M-AG	Sparingly
	10	Flange Bearings (Both Conveyors)	4	#2M-AG	Sparingly
	11	Double Universal Joint (Both Sides)	4	#2M-AG	Sparingly
	12	14" Clutch Grease Cup	1	#2M-AG	1-Turn
	13	Shifting Mechanism	6	#2M-AG	Sparingly
	14	Rear Hitch Levers	2	#2M-AG	Sparingly
	15	Rear Hitch	4	#2M-AG	Sparingly
	16	Tie Rod	2	#2M-AG	Sparingly
	17	Center-Axle Pivot Shaft	1	#2M-AG	Sparingly
	18	Spindle Assembly (Both Sides)	4	#2M-AG	Sparingly
	19	Spread Hopper Latches (Both Sides)	2	#2M-AG	Sparingly
	20	Cartridge Bearing (Both Ends)	2	#2M-AG	Sparingly
	21	Cartridge Bearing (Both Ends)	2	#2M-AG	Sparingly
	22	Baffle Shaft (Both Hoods)	2	#2M-AG	Sparingly
	23	Throttle Control	1	#2M-AG	Sparingly
Check Weekly	24	5-Speed Transmission	—	#90M-ATG	Fill
	25	Offset Transmission	2	#90M-ATG	Fill
	26	2-Speed Differential	—	#90M-ATG	Fill
	27	Master Brake Cylinder	—	Brake Fluid	Fill
	28	Hydraulic Reservoir	—	Type A TF	Fill
	29	Hydraulic Oil Cooler	—	—	Clean A/R
6 mo.	30	Electric Two-Speed	—	#10ND Oil	Fill
	31	Gate Latch Control Handle	A/R	#2M-AG	Sparingly
1 Yr.	32	Wheel Bearings	—	#2M-AG	Pack
	33	Wheel Bearings	—	#2M-AG	Pack
	34	*Suction-Strainer	1	—	Strainer Element
	35	*Return-Filter	1	—	Filter Element

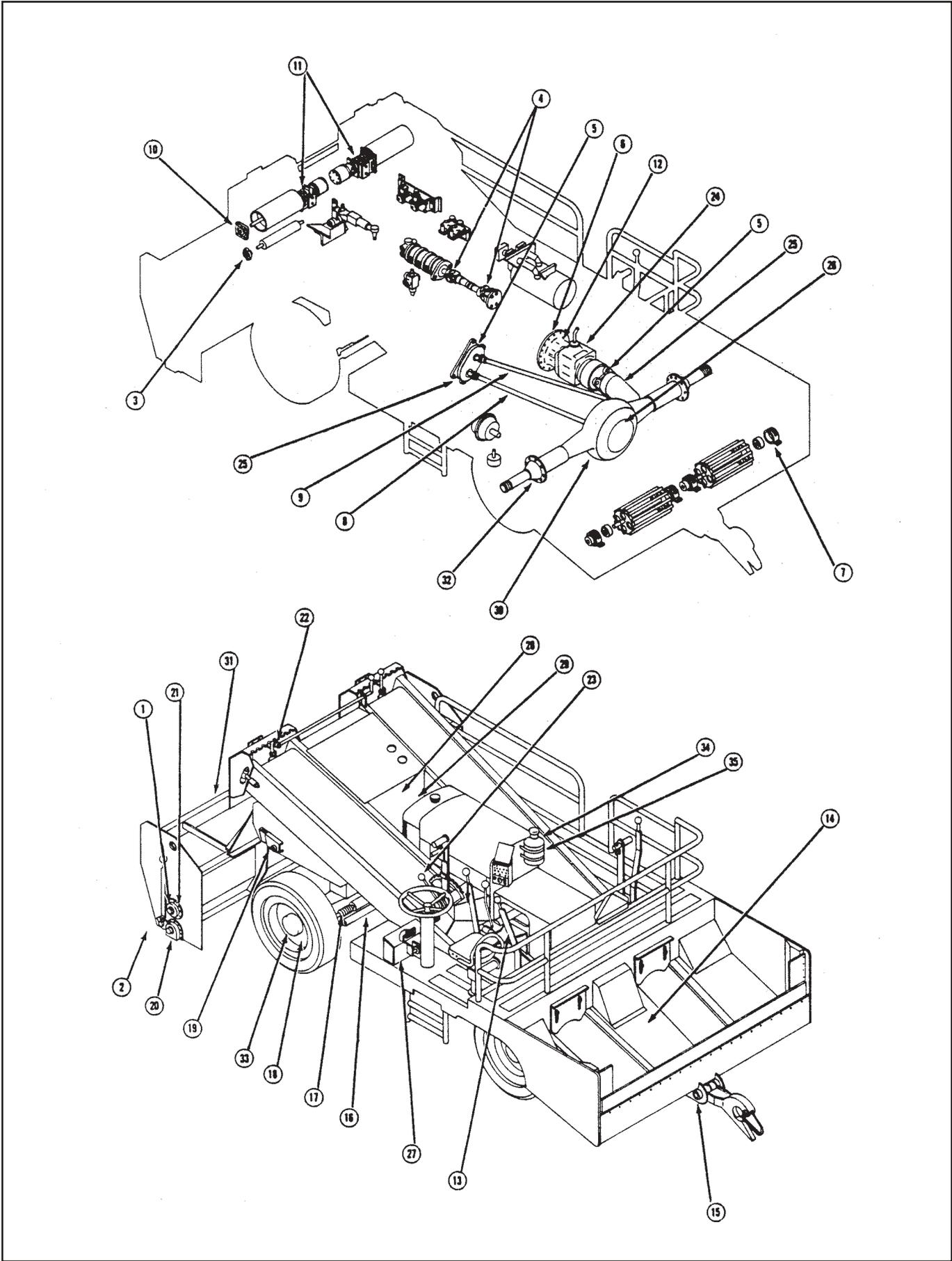
#2M-AG—#2 Molub-Alloy Grease

#90M-ATG—#90 Molub-Alloy Transmission Lubricant

#10ND Oil—#10 Non-Detergent Oil

Type A TF—Type A Transmission Fluid

*On new machines change suction strainer element and return line filter element after first two weeks of operation. After initial change (two weeks) replace elements on an annual basis unless hydraulic system has been worked on and contamination introduced into the system.



TROUBLE SHOOTING

IF CONVEYOR BELT IS NOT RUNNING IN CENTER OF CONVEYOR:

1. Check conveyor belt adjustment and adjust as indicated in adjustment section of this manual.

IF BRAKES ARE NOT OPERATING PROPERLY:

1. Check brake fluid level in master cylinder.
2. Check hydrovac vacuum tank and connection for leaks.
3. On units equipped with diesel engines check vacuum pump for:
 - A. Excessive vacuum leaks in vacuum lines and fittings.
 - B. Inadequate lubrication in vacuum pump.
 - C. Low pump speed due to belt slippage.
 - D. Excessive clearances in vacuum pump.

With adequate lubrication vacuum pump should provide minimum of 20 inches of mercury vacuum at 1500 R.P.M. engine speed.

4. Check brake shoe adjustment.

IF SPREAD ROLL FAILS TO OPERATE WHEN GATES ARE OPENED:

1. Check to insure hopper agitator or spread roll are not jammed with rock left in the front hopper while changing job sites.

2. Check hydraulic oil level and add if necessary.

3. Check hydraulic system suction strainer and return line filter for contamination and replace if necessary. (Figure 23).

4. Check hopper control valve linkage and adjust if necessary per instructions of this manual.

5. Check hopper control valve relief pressure and adjust if necessary per instructions of this manual.

6. Should low pressure persist after replacement and adjustment of the relief valve cartridge, a worn pump or motor may be the cause. To check pump wear, place a hand controlled valve between the hydraulic pump and hopper control valve. With pressure gage in place, close hand valve slowly until 1500 P.S.I. is reached. If this pressure cannot be reached, excessive pump wear is the probable cause for low system pressure.

7. If 1500 P.S.I. pump pressure is obtainable check for hydraulic motor wear by disconnecting the motor return line coupling while system is at 1500 P.S.I. or maximum obtainable pressure and motor is locked. Remove return line coupling. Return flow should not exceed 4 G.P.M. when engine is operating at full governed speed. Excessive return line flow indicates a worn hydraulic motor.

IF CONVEYORS FAIL TO OPERATE:

1. Check fuse panel for blown or shorted fuses. If consistent fuse failure occurs check for shorts in electrical wiring.

2. Check hydraulic oil level and add if necessary.

3. Check hydraulic system suction strainer and return line filter for contamination and replace if necessary.

4. Check to insure electrical power is being supplied to conveyor control valves when front control switch is in "ON" position. This may be done with a voltmeter, test light, or by sparking the supply wire against a bare metal area of the ChipSpreader. If latter procedure is used, recheck fuse panel before further checking of electrical system is completed. If power is not available at the conveyor control valves, check to determine if power is available at valve control switches. If power is available at conveyor control switch but not at valve solenoid, control switch may need replacement. If power is not available at front control switches check control panel wiring for shorts or loose wires.

5. Should electrical supply check satisfactory, operate conveyor control valve emergency override palm button. (Figure 18). IF conveyor then operates, there is a

good possibility the conveyor failure was caused by a shorted control valve solenoid.

6. Check conveyor control valve relief pressure and adjust if necessary per instruction of this manual.

7. Should low pressure persist after replacement and adjustment of the relief valve cartridge, a worn pump or motor may be the cause. To check for pump wear, place a hand controlled valve in high pressure line from hydraulic pump to appropriate conveyor control valve. With pressure gauge in place, close hand valve slowly until 1500 P.S.I. is reached. If this pressure cannot be reached, excessive pump wear is the probable cause for low system pressure.

8. If 1500 P.S.I. pump pressure is obtainable check for hydraulic motor wear by disconnecting the appropriate motor return line while system is at 1500 P.S.I. or maximum obtainable pressure and motor is locked. On units equipped with belt speed control, set control to full open (FAST) position. Return flow should not exceed 3 G.P.M. when engine is operating at full governed speed. Excess return line flow indicates a worn hydraulic motor.

IF POWER STEERING IS NOISY OR NOT OPERATING:

1. Check hydraulic oil level and add if necessary.

2. Check hydraulic system inline suction strainer and return line filter for contamination and replace if necessary.

3. Check power steering relief pressure and adjust if necessary per instructions of this manual.

4. Check power steering pump wear by placing a hand controlled valve in the supply line from pump to power steering control valve. With pressure gauge in place, close hand valve slowly until 1500 P.S.I. is reached. If this pressure cannot be reached, excessive pump wear is the probable cause for steering system inoperation.

5. If 1500 P.S.I. pump pressure is obtainable, check for steering control valve wear by disconnecting the pump supply line and connecting it directly to one port of steering cylinder with opposite port open to drain. Excessive steering control valve wear is indicated if steering cylinder operates and does not show more than 2 G.P.M. drain, after initial surge of fluid in the steering cylinder has been discharged.

6. Excessive steering cylinder wear or leakage is indicated by a cylinder drain rate greater than 2 G.P.M.

IF MATERIAL BEING SPREAD FAILS TO FORM EVEN DISTRIBUTION IN FRONT HOPPER:

1. Check conveyor hood adjustment and adjust if necessary per instructions of this manual.

OPTIONAL EQUIPMENT

AUTOMATIC CONVEYOR CONTROL

IF CONVEYORS FAIL TO OPERATE:

1. Check conveyor operation as outlined under standard unit check list with selector switch in "Front" position.

2. Check to insure electrical power is available at paddle switch when selector switch is in "automatic" position. (Figure 8). If not, check selector switch wiring per wiring diagram, i.e. look for shorts, loose or incorrectly connected wires. Correct selector switch wiring but no power at paddle switch indicates a need to replace selector switch. If power is available at paddle switch but not at solenoid a need to replace the paddle switch is indicated.

3. Check to insure electrical power is available at control panel conveyor switch when selector switch is in "Driver" position. (Figure 8). If not check selector switch wiring per wiring diagram, i.e., look for shorts, loose or incorrectly connected wires. Correct selector switch wiring but no power at panel control switch indicates a need to replace selector switch. If power is available at control panel conveyor switch but not at solenoid, a need to replace the control panel switch is indicated.

IF AGGREGATE TENDS TO BUILD UP BEHIND AUTOMATIC CONVEYOR CONTROL PADDLE AND PREVENTS CONVEYOR FROM SHUTTING OFF AUTOMATICALLY WHEN HOPPER IS FULL:

1. Check conveyor hood adjustment and adjust for better material distribution by sliding hood forward.
2. Check to insure control paddle is not bent forward of a vertical position. If paddle is bent forward, bend to a position slightly rearward of vertical.
3. On units equipped with belt speed control, it may be possible to improve automatic conveyor control operation by slowing the conveyor belt which is delivering material to the side of the hopper which is closed.
4. When a large number of gates are closed on one side of hopper for an extended period of time, it may be necessary to operate the belts manually with the front conveyor belt control switches until spread width is increased.

BELT SPEED CONTROL

IF SPEED CONTROL VALVE FAILS TO CHANGE BELT SPEED:

1. Check to insure engine is being operated at full governed speed when checking belt speed variation.
2. Replace valve if necessary.

IF GATE OPENER FAILS TO OPERATE:

POWER GATE OPENER FAILS TO FUNCTION

1. Check hydraulic oil level and add if necessary.
2. Check hydraulic system inline suction strainer and return line filter for contamination and replace if necessary.
3. Check to insure gate opener is not jammed with rock or other foreign material.
4. Check gate opener relief valve setting and adjust if necessary per instructions of this manual.

IF BRAKE LOCK ON DUAL STATION UNITS FAILS TO OPERATE:

1. Check for blown or shorted inline fuse or front side of engine firewall.
2. Check to insure electrical power is available at actuation switch. If not, check for short in supply line.
3. Check for electrical power at brake lock solenoid when actuator switch is in the lock position. (Held in spring returned position). Should switch fail to supply power, a defective switch is indicated. If switch supplies power to brake lock solenoid, but unit still fails to operate, a need to replace brake lock solenoid is indicated.

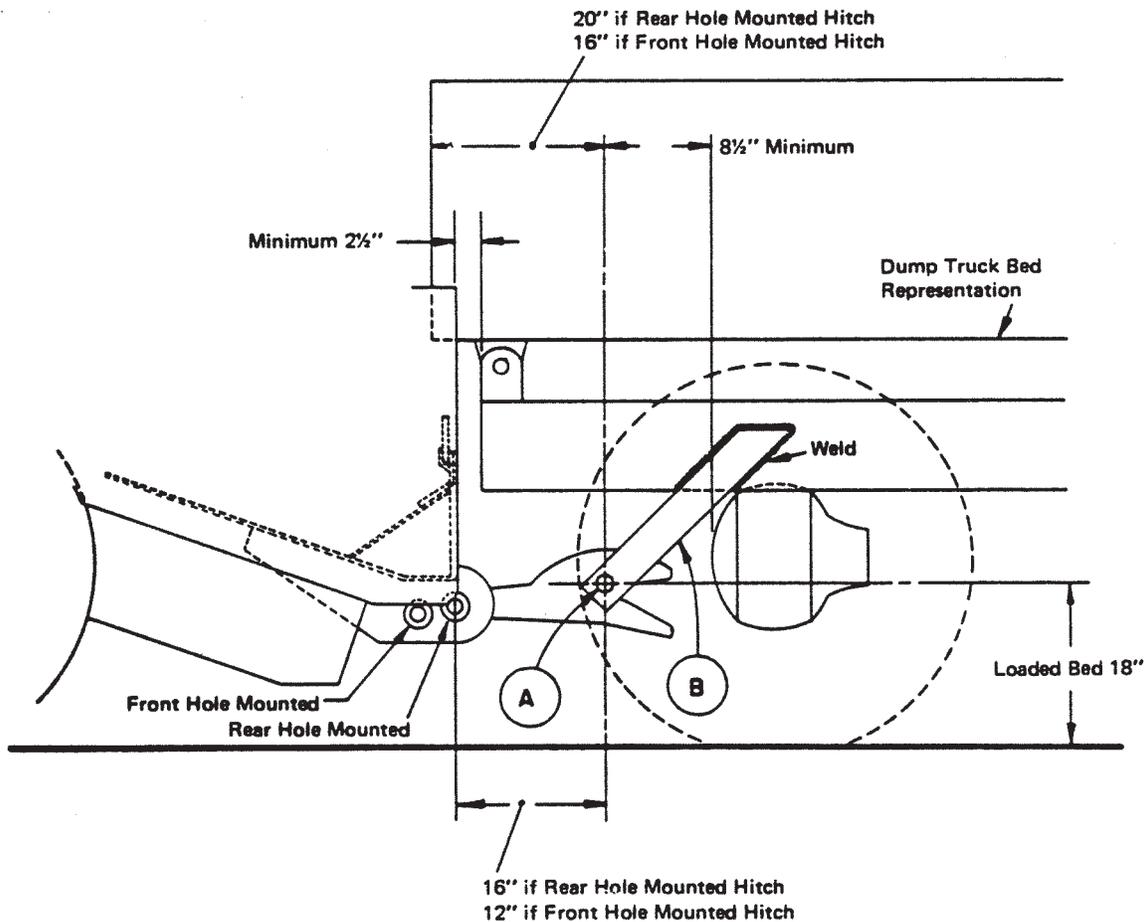
TRUCK SIZE AND ARRANGEMENT

1. Trucks ranging in size from four to ten yards are handled easily by an ETNYRE ChipSpreader.

2. An apron on the rear of each truck will be quite helpful.

3. For truck hitch arrangement, see truck hitch tow bar illustration.

Truck Hitch Tow Bar Illustration



A. 3390451-Cold Rolled Round 1 3/4" dia. x 36" long

B. 3390450-Hot Rolled Flat 1/2" x 4" x 18" long (2) Req'd