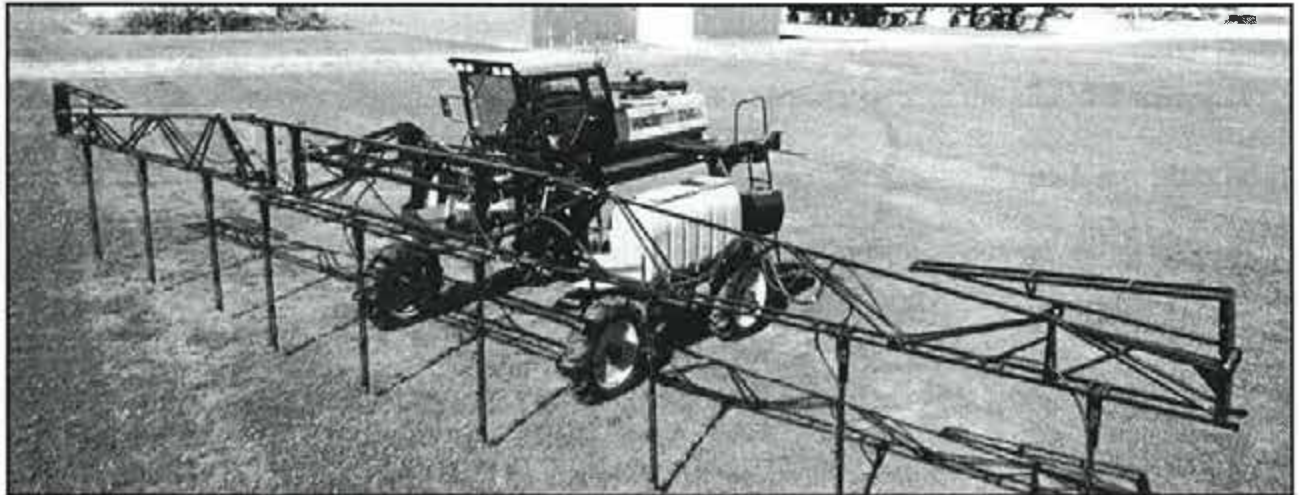


HAGIE

MODEL 254

X-11



**OPERATOR'S MANUAL
FOR
HAGIE MODEL 254X-11 HI-TRACTOR**

HAGIE MANUFACTURING COMPANY

BOX 273 CLARION, IOWA 50525

(515) 532-2861

COVERS MACHINE SERIAL NUMBERS: 037799001 thru 037799200

11-98 493190

ABBREVIATIONS

A/C	AIR CONDITIONING	MPH.....	MILES PER HOUR
ACCUM.....	ACCUMULATOR	MT	MOUNT
ADJ	ADJUST	MTH.....	MONTH
ADPTR.....	ADAPTER	MTR.....	MOTOR
AGI.....	AGITATOR	NO	NUMBER
ALT.....	ALTERNATOR	OD	OUTSIDE DIAMETER
AMP	AMPERE	PLT.....	PLATE
APPROX.....	APPROXIMATELY	POLY.....	POLYETHYLENE
ASSY.....	ASSEMBLY	PRESS.....	PRESSURE
AUX.....	AUXILIARY	PRKNG.....	PARKING
BRKT.....	BRACKET	PSI.....	POUNDS PER SQUARE INCH
BTRY	BATTERY	QT.....	QUART
C	CELSIUS	RAD.....	RADIATOR
CAL	CALIBRATION	REC.....	RECOMMENDED
CCA.....	COLD CRANKING AMPS	REQ.....	REQUIRED
CHEM.....	CHEMICAL	RPM.....	REVOLUTIONS PER MINUTE
CYL.....	CYLINDER	SEC	SECOND
DIA.....	DIAGRAM	SERV.....	SERVICE
DISPL.....	DISPLACEMENT	SLCTR.....	SELECTORQ
EA	EACH	SMV.....	SLOW MOVING VEHICLE
ELECT.....	ELECTRIC	SOLE.....	SOLENOID
F.....	FAHRENHEIT	SOLU.....	SOLUTION
FIG.....	FIGURE	SPCNG.....	SPACING
FLO.....	FLOW	SPEC.....	SPECIFICATION
FRT	FRONT	STRG.....	STEERING
FT.....	FOOT OR FEET	SQ	SQUARE
GA.....	GAUGE	TACH.....	TACHOMETER
GAL.....	GALLON	TEMP.....	TEMPERATURE
GPA.....	GALLONS PER ACRE	TERM.....	TERMINAL
GPM.....	GALLONS PER MINUTE	TRD	TREAD
GPS.....	GLOBAL POSITIONING SATELLITE	TT	TUBE-TYPE
HAL.....	HALOGEN	TU.....	TUBELESS
HR.....	HOUR	VAR.....	VARIABLE
HYD.....	HYDRAULIC	V.....	VOLT
HYDRO.....	HYDROSTATIC	VFC.....	VARIABLE FLOW CONTROL
ID	INSIDE DIAMETER	VLV.....	VALVE
IN	INCH	W.....	WEIGHT
INFO.....	INFORMATION	WD.....	WHEEL DRIVE
Km/H.....	KILOMETERS PER HOUR	WI.....	WITH
LB.....	POUND	W/O.....	WITHOUT
MAINT.....	MAINTENANCE	WHL.....	WHEEL
MIN.....	MINUTE	WK.....	WEEK
M/F.....	MAINFRAME	WLD.....	WELDMENT

TO THE OWNER



Read this manual before operating.

A WORD FROM HAGIE MANUFACTURING COMPANY

Congratulations on your selection of a Hagie Model 254x-11 sprayer. We recommend that you study this Operator's Manual and become acquainted with the adjustments and operating procedures before attempting to operate your new sprayer. As with any piece of equipment, certain operating procedures, service, and maintenance are required to keep it in top running condition.

We have attempted herein to cover all of the adjustments required to fit varying conditions. However, there may be times when special care must be considered.

Hagie Manufacturing Company reserves the right to make changes in the design and material of any subsequent sprayer without obligation to existing units.

We thank you for choosing a Hagie sprayer and assure you of our continued interest in its satisfactory operation for you. If we might be of assistance to you, please call us.

We are proud to have you as a customer.

CAUTION

READ OPERATOR'S MANUAL. BE ALERT. LEARN TO OPERATE THIS MACHINE SAFELY. OBSERVE ALL SAFETY PRACTICES. MACHINES CAN BE HAZARDOUS IN THE HANDS OF AN UNFAMILIAR, UNTRAINED, OR COMPLACENT OPERATOR. SHUT OFF ENGINE BEFORE SERVICING. WHEN MECHANISM BECOMES CLOGGED, SHUT OFF ENGINE BEFORE CLEANING. DON'T RISK INJURY OR DEATH.

TO THE OPERATOR

The following pages and illustrations will help you operate and service your new sprayer. It is the responsibility of the user to read the Operator's Manual and comply with the safe correct operating procedures and lubricate and maintain the product according to the maintenance schedule.

The user is responsible for inspecting the machine and having parts repaired or replaced when continued use of the product causes damage

or excessive wear to other parts.

Keep this manual in a convenient place for easy reference when problems arise. This manual is considered a permanent fixture with this machine. In the event of resale, this manual should accompany the sprayer. If you do not understand any part of the manual or require additional information or service, contact the Hagie Customer Support Department:

Hagie Manufacturing Company
Box 273, Clarion, IA 50525
(515) 532-2861

The following symbols, found throughout this manual, alert you to potentially dangerous conditions to the operator, service personnel, or the equipment.



This symbol indicates an immanently hazardous situation which, if not avoided, will result in death or serious injury.



This symbol indicates a potentially hazardous situation which, if not avoided, could result in death or injury.



This symbol indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury. It may also be used to alert against unsafe practices.

TABLE OF CONTENTS

I.	SAFETY/DECALS.....	4-13
II.	SPRAYER IDENTIFICATION	14-15
III.	SPECIFICATIONS	16-22
IV.	PREPARING TO OPERATE.....	23-29
V.	OPERATING INFORMATION	30-72
VI.	CALIBRATION	73-74
VII.	TRANSPORTING	75-79
VIII.	SERVICE AND MAINTENANCE.....	80-115
IX.	STORAGE	116-117
X.	TROUBLE SHOOTING.....	118-126
XI.	LIMITED WARRANTY	127
	INDEX	128-132

SAFETY/
DECALS

SPRAYER
IDENTIFICATION

SPECIFICATIONS

PREPARING
TO OPERATE

OPERATING
INFORMATION

CALIBRATION

TRANSPORTING

SERVICE/
MAINTENANCE

STORAGE

TROUBLE
SHOOTING

LIMITED
WARRANTY

INDEX

I. SAFETY/DECALS

SAFETY PRECAUTIONS

Most accidents occur as the result of failure to follow simple and fundamental safety rules. For this reason, most accidents can be prevented by recognizing the real cause and doing something about it before the accident occurs.

Many conditions cannot be completely safeguarded against without interfering with efficient operation and/or reasonable accessibility. Therefore, you must study this Operator's Manual

and learn how to use the sprayer controls for safe operation. Likewise, do not let anyone operate without instruction.

Do not make modifications such as weldments, add-ons, adaptations, or changes from the original design of sprayer. Such changes and/or modifications may become safety hazards to you and to others and will void all warranties.

DRIVING

- Before moving sprayer, make sure no persons or obstructions are in path of travel.
- Do not permit passengers on sprayer when it is moving; they may fall off or obstruct operator's view.
- Never drive near ditches, embankments, holes, mounds, or other obstacles.
- Never drive on hills too steep for safe operation.
- Always drive at a reasonable field speed.
- Reduce sprayer's speed before turning.
- Come to a complete stop before reversing direction.
- Pull over to side of road before stopping.
- Additional weight caused from partially full or full solution tanks may cause erratic or increased stopping distance.
- Use flashing/hazard warning lights when traveling on public roads, day or night, unless prohibited by local law.
- Make sure SMV emblem is in place and visible from rear when traveling on public roads.

I. SAFETY/DECALS

OPERATING

TREAD WIDTH

- Select widest tread setting to fit between crop rows.
- Never manually adjust tread width on sprayer until wheels have been properly blocked. Loosen leg clamp bolts only enough for leg to slide on frame.

SPRAYER BOOMS

- Cradle booms when leaving sprayer unattended.
- Select a safe area before unfolding booms. Avoid power lines and overhead structures.

GENERAL OPERATION SAFETY

- Do not adjust factory engine RPM settings.
- Start engine from operator's seat only. Do not by-pass safety-start switch.
- Handle starting fluid with care. Keep it away from open flame. Store it with cap on in a cool place.
- Never run sprayer engine in a closed building. Proper exhaust ventilation is required.
- If equipped with ground speed sensing radar, do not look directly into radar beam. It emits a very low intensity microwave signal which may cause possible eye damage.

I. SAFETY/DECALS

REPAIR/MAINTENANCE

HYDRAULICS

- Use caution when working with hydraulic fluid under pressure. Escaping hydraulic fluid can have sufficient force to penetrate your skin, causing serious injury. This fluid may also be hot enough to burn.
- Always lower load or relieve hydraulic pressure before repairing a hydraulic oil leak.
- Avoid torching, welding, and soldering near pressurized hydraulic lines.

FUELING

- Always turn engine off and allow it to cool before refueling.
- Do not smoke while refueling.
- Do not fill fuel tank completely. Fuel may expand and run over.

GENERAL REPAIR/MAINTENANCE

- Turn off engine before checking, adjusting, repairing, lubricating, or cleaning any part of sprayer.
- When servicing radiator, let engine cool before removing pressurized cap.
- Disconnect battery ground cable before servicing electrical system or welding on machine.
- When charging battery, connect positive cable to positive terminal and negative cable to negative terminal. Failure to do so may result in an explosion and cause injury. Likewise, avoid battery acid contact and incurring injuries.

I. SAFETY/DECALS

CHEMICAL HANDLING

- Never allow chemicals to come in contact with skin or eyes. Wear protective clothing or respirators as recommended by chemical manufacturer. Store this clothing outside the cab so as not contaminate filtered cab environment. Also, clean your boots to remove soil or other contaminated particles prior to entering cab.
- Never pour chemicals into an empty tank, fill tank half full of water first.
- Follow chemical manufacturer's instructions for mixing chemicals.
- Dispose of empty chemical containers properly.
- Wash spilled chemicals or spray residue from sprayer to prevent corrosion and deterioration.
- Select a safe area to fill, flush, calibrate, and clean sprayer where chemicals will not drift or run off to contaminate people, animals, vegetation, or water supply.
- Never place nozzle tips or other parts to one's lips in an attempt to unclog spray tip.
- Do not spray when wind is in excess of chemical manufacturer's recommended speed.
- Store pesticides in their original containers with label intact. Keep them in a separate, locked building.

GENERAL SAFETY

- Keep a fire extinguisher close at all times.
- Keep all shields in place.
- Keep clear of all moving parts and keep others away when operating.
- Do not wear loose fitting clothing that may be blown or drawn into moving parts.

WARNING DECALS 

I. SAFETY/DECALS

WARNING DECALS

Decals warning you of avoidable danger are located on various parts of the sprayer. They are there for your personal safety and protection. DO NOT remove them. They will fracture upon attempted removal and therefore must be replaced.

Following are locations of important safety decals. Replace them if they are torn or missing. All

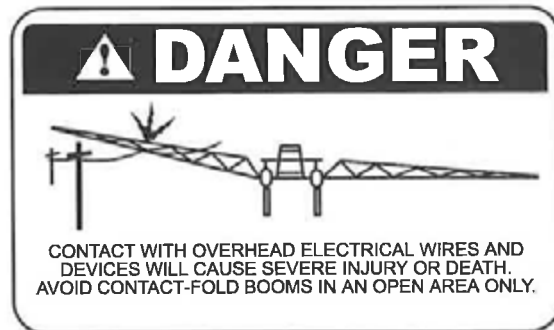
warning decals and other instructional Hagie decals or machine striping may be purchased through the Hagie Customer Support Department. To replace decals, be sure that the installation area is clean and dry; decide on exact position before you remove the backing paper.

DECAL LOCATION



650320

Rear of right cab window.



650337

On cab insulation above control panel.



I. SAFETY/DECALS



Inside cab door.

650339

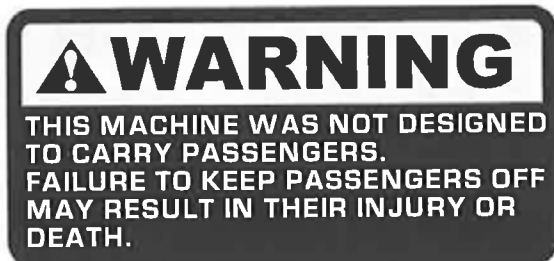


SAFETY/
DECALS



Steering column.

650831



650847

Outside, left-hand, rear panel of cab



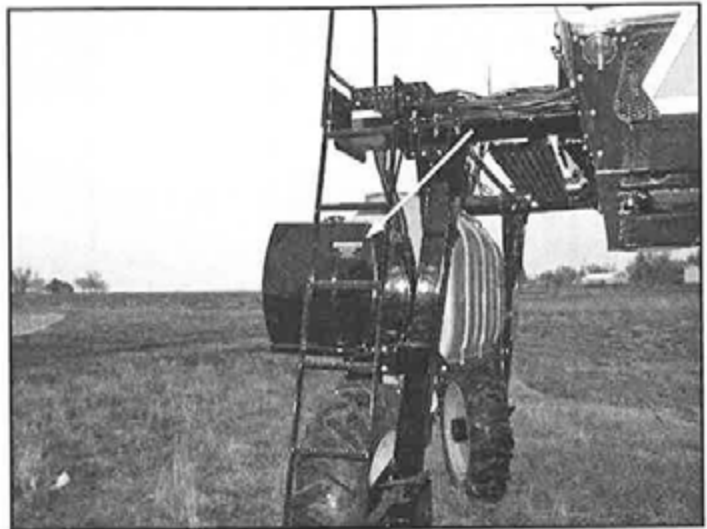
DECALS CONTINUED →

I. SAFETY/DECALS



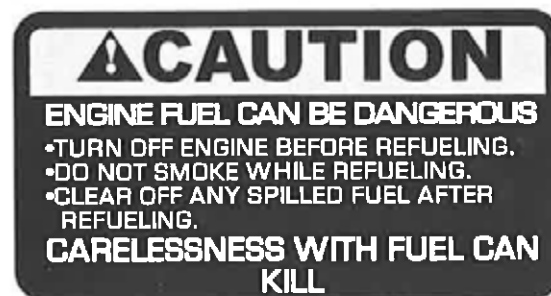
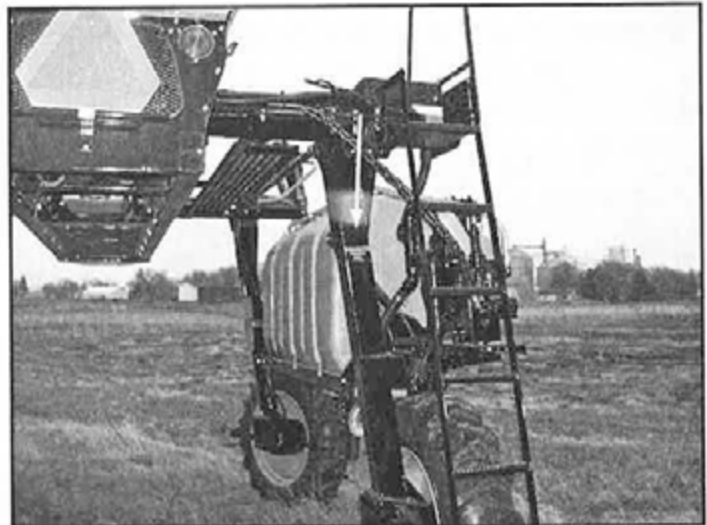
650848

Rear of left-hand fuel tank.



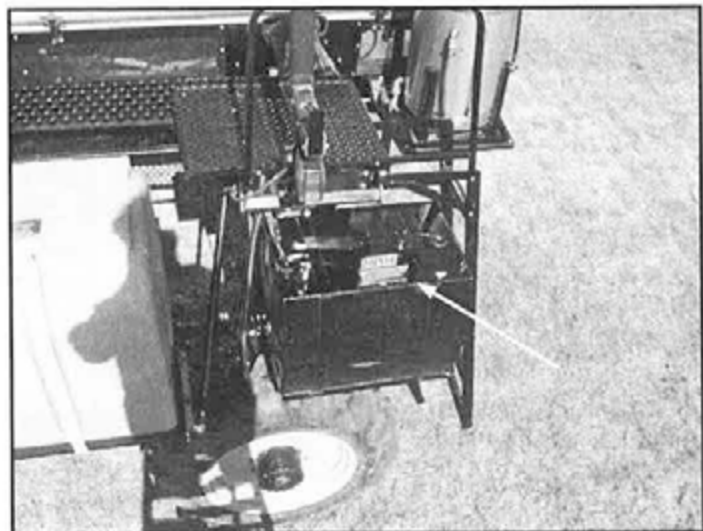
650848

Rear of right-hand leg.



650849

Top of fuel tank.

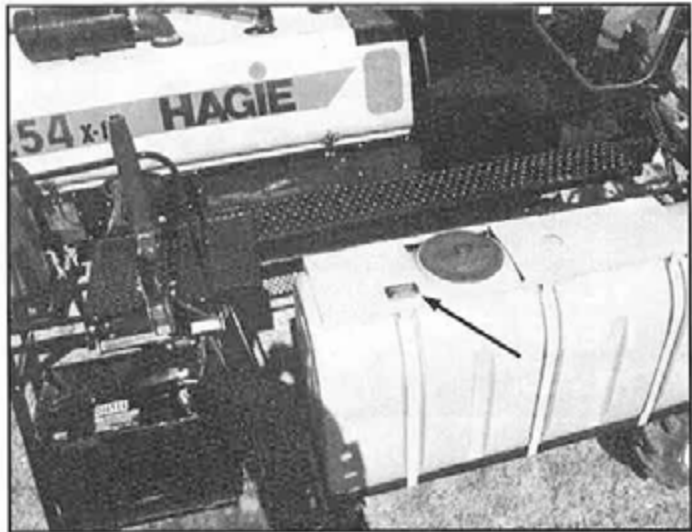


I. SAFETY/DECALS



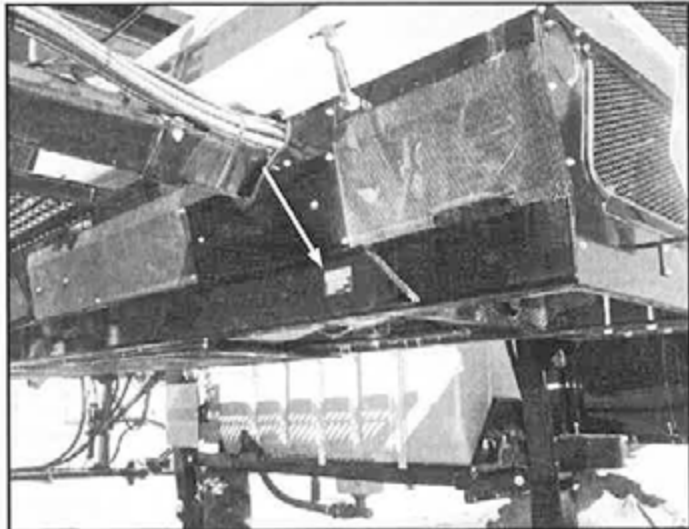
650850

Top of each solution tank.



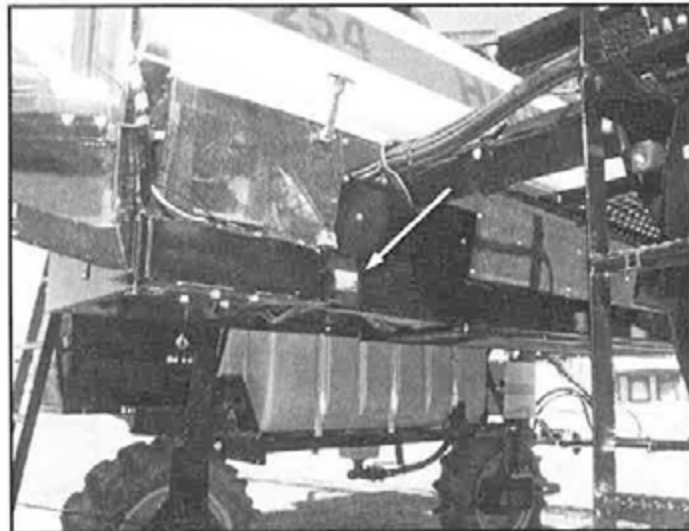
650851

Left rear mainframe



650851

Right rear mainframe.



SAFETY/
DECALS

DECALS CONTINUED →

I. SAFETY/DECALS

CAUTION

SHIELDS ARE FOR YOUR PROTECTION. KEEP THEM IN PLACE.

650851

Two on solution pump.



CAUTION

READ OPERATOR'S MANUAL. BE ALERT. LEARN TO OPERATE THIS MACHINE SAFELY. OBSERVE ALL SAFETY PRACTICES. MACHINES CAN BE HAZARDOUS IN THE HANDS OF AN UNFAMILIAR, UNTRAINED, OR COMPLACENT OPERATOR. SHUT OFF ENGINE BEFORE SERVICING. WHEN MECHANISM BECOMES CLOGGED, SHUT OFF ENGINE BEFORE CLEANING. DON'T RISK INJURY OR DEATH.

650852

Inside cab door.



CAUTION



**Pressure cooling system.
Remove cap slowly.**

650981

Front of mullion to left of radiator cap.



I. SAFETY/DECALS

CAUTION

Electrical system is 12 volt negative ground. When using booster with jumper cables, precautions must be taken to prevent personal injury or damage to electrical parts.

1. Attach one end of jumper cable to positive terminal of booster battery and other end to positive terminal of vehicle battery connected to starter motor.
2. Attach one end of second cable to negative terminal of booster battery and other end to vehicle frame away from battery. Do not attach to cab or cab support.
3. To remove cables, reverse above sequence exactly to avoid sparks. See operator's manual for additional information.

650982

Left of battery on hydraulic oil reservoir



SAFETY/
DECALS

II. IDENTIFICATION NUMBERS

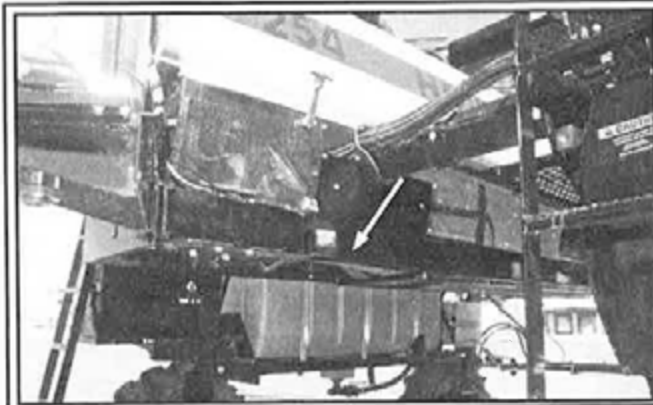
SPRAYER IDENTIFICATION

Each Hagie sprayer is identified by means of a frame serial number. This serial number denotes the model, year in which it was built, and the number of the sprayer. For further identification, the engine has a serial number, the hydrostatic pump has a serial number, the wheel motors have identification tags, and the planetary hubs have

identification plates that describe the type of mount and gear ratio. To ensure prompt, efficient service when ordering parts or requesting service repairs from Hagie Manufacturing Company, record the serial and identification numbers in the space provided below.

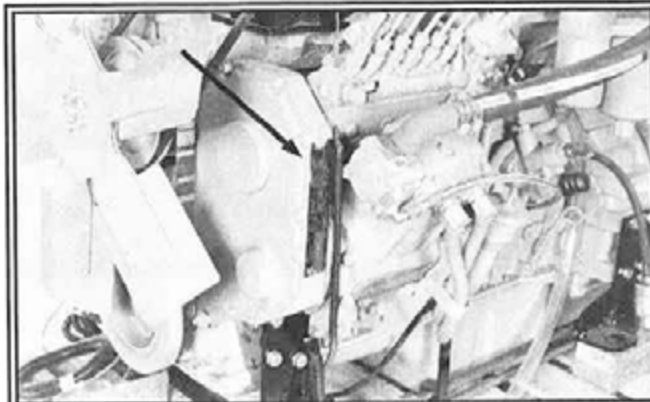
NOTE:

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



Sprayer

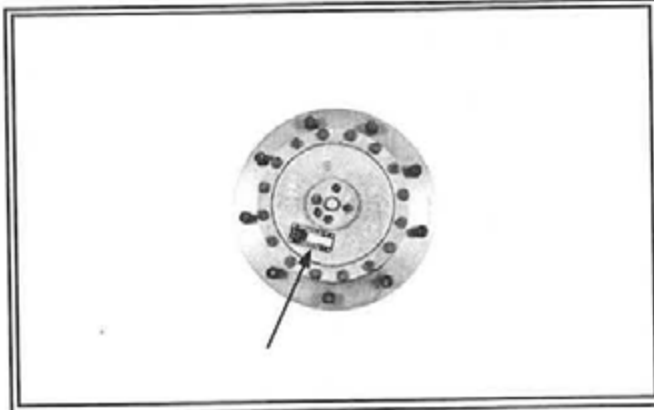
NOTE: Sprayer serial number stamped in the frame on right rear corner.



Engine

NOTE: Diesel engine serial number located on the side of the front left gear housing.

II. IDENTIFICATION NUMBERS



Planetary Hubs

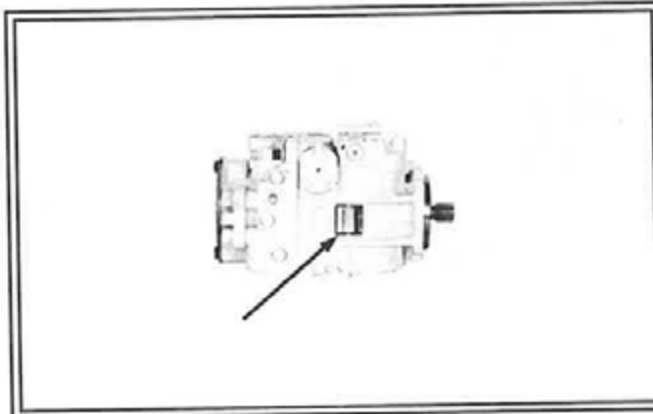
Left

Rear

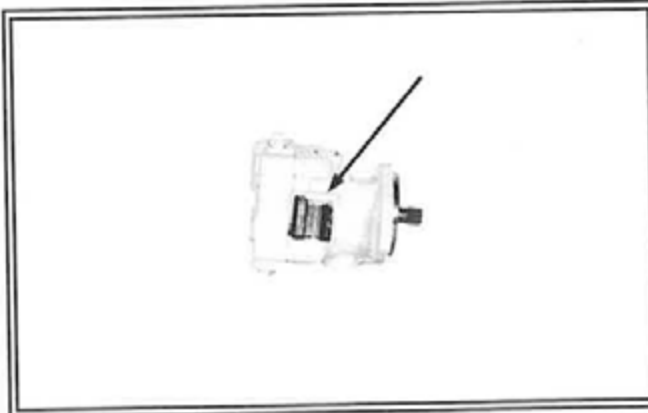
Front: _____

Rear: _____

SPRAYER
IDENTIFICATION



Hydrostatic Pump

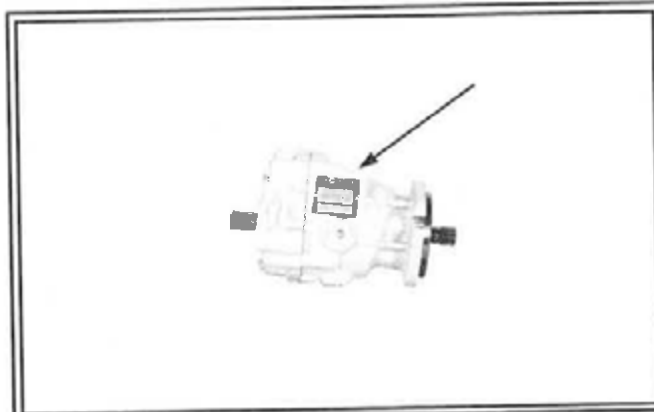


Front Wheel Motors

Left: _____

Right: _____

Refer to parts manual.



Rear Wheel Motors

Left: _____

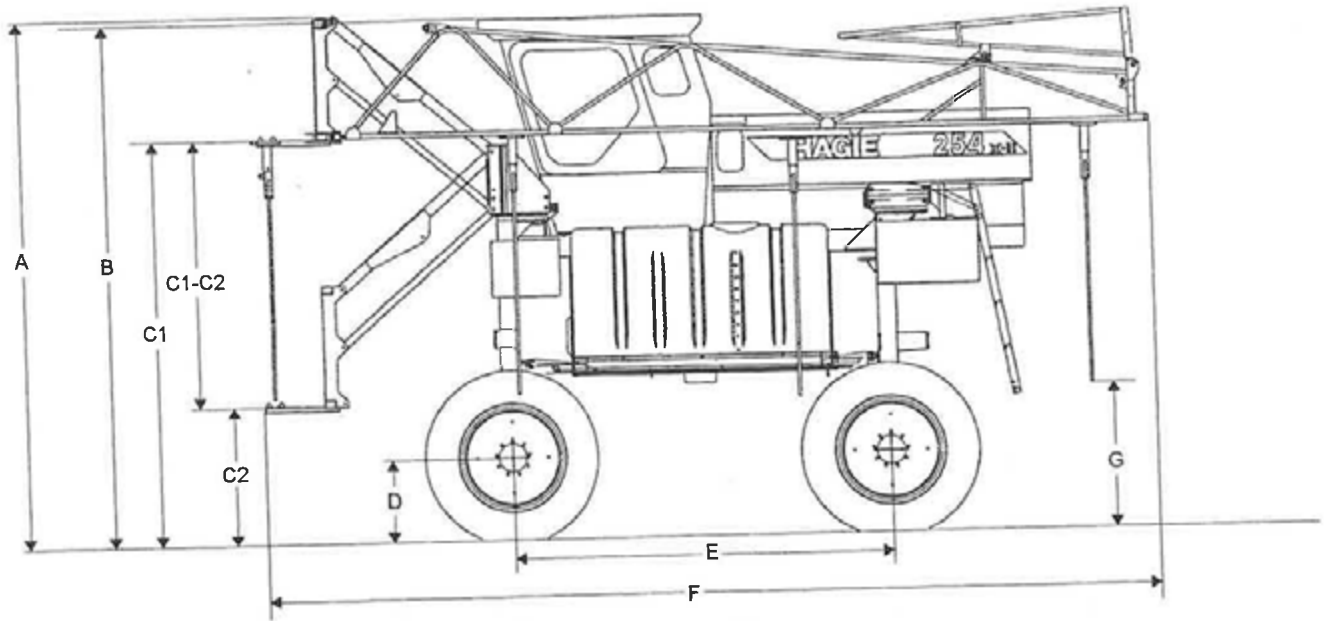
Right: _____

Refer to parts manual.

III. SPECIFICATIONS

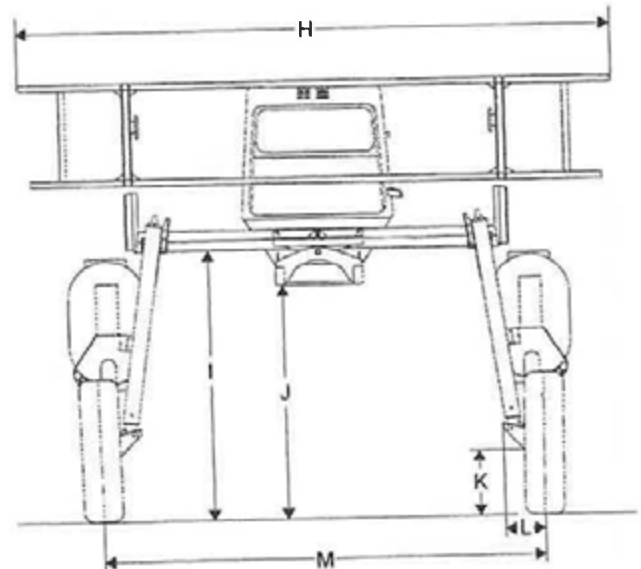
SPRAYER DIMENSIONS

- | | | | |
|----------------------------------|----------------------|--|-------|
| A. Raised transom height | 147" | E. Wheel base..... | 106" |
| B. Cab clearance height..... | 146" | F. Sprayer length | 247" |
| C. Transom lift range* | 36"-112" (76" range) | G. Raised drop assembly clearance..... | 40.3" |
| D. Static loaded hub height..... | 22.6" | | |



*NOTE: Low transom height measured without drop assemblies.

- | | |
|--|--------------------------|
| H. Width (booms folded, 144" tread) | 192" |
| I. Frame clearance | 90" |
| J. Center clearance | 78" |
| K. Lower leg clearance (rear) | 17.75" |
| L. Tire center to inside of lower leg (rear) | 13" |
| M. Tread width** | Adjustable
86" - 144" |



**NOTE: Measure tread width at 1/2 tire height.

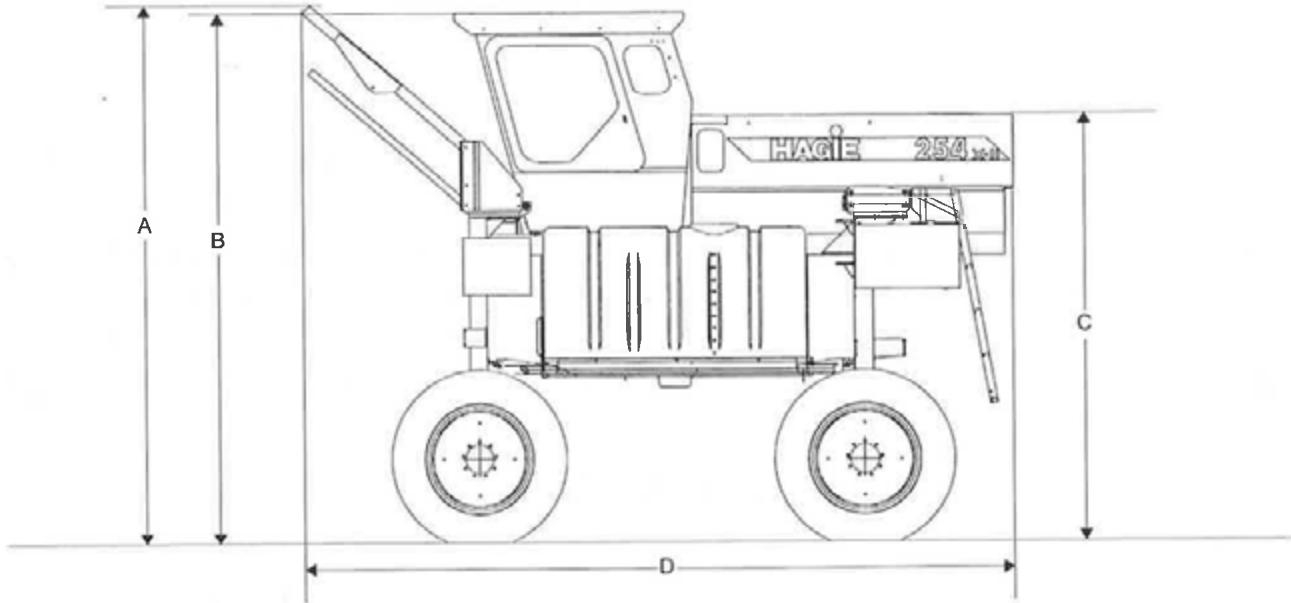
GENERAL SPRAYER INFORMATION

- | | | | |
|--------------------------------|------------|-----------------|--|
| ◆ Frame type..... | Terra-Hug® | ◆ Ladders | (2) Rear mounted with service platform |
| ◆ Approximate dry weight | 9860 lbs. | | |

III. SPECIFICATIONS

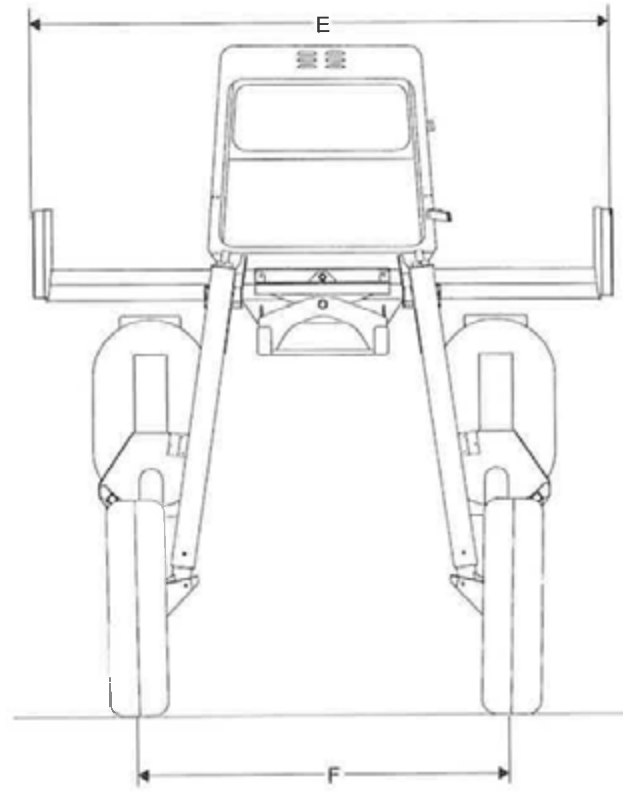
SHIPPING DIMENSIONS

- A. Raised lift arm height..... 147"
- B. Cab clearance height..... 146"
- C. Rear hood height..... 117.5"
- D. Shipping length..... 195"



SPECIFICATIONS

- E. Overall width..... 124"
- F. Tread width*..... 80.5"



*NOTE: Shipping tread is preset at the factory.

III. SPECIFICATIONS

ENGINE

Manufacturer and model	Cummins
Model	4BT3.9
Aspiration	Turbocharged
Type	In line, liquid cooled
Number of cylinders	4
Displacement	3.9 liter
Horsepower	110 @ 2500 RPM
Peak torque	293 lb-ft @ 1500 RPM
Type of fuel	Number 1 or number 2 diesel
Fuel system	Filtered, direct-injected
Air cleaner	Dry-type, single element
Slow idle	1150 RPM
Fast idle	2500 RPM

POWER TRAIN

Drive

Hydrostatic pump	Sauer/Sundstrand 90 series
Range	100cc variable displacement
Drive train	Full-time four wheel drive
Speed	0-8 mph
Hydrostatic wheel motor	
- front	Sauer/Sundstrand M35
- rear	Sauer/Sundstrand M35
Final drives	
Type	Planetary gear reduction hubs
- front	Torque Hub® W1B Drive ratio - 24.85:1
- rear	Torque Hub® W1B Drive ratio - 24.85:1
Lubrication	Oil bath

Brakes

Type	Mechanically actuated Rear wheel caliper disc
------------	--

Steering System

Type	Hydraulic, priority on demand
Control	Full-time power
Steering cylinders	Double action
Turning radius (144" tread setting)	22.9'
(Shipping tread setting)	18.8'

III. SPECIFICATIONS

AUXILIARY HYDRAULIC SYSTEM

Type Open
 Pump type Tandem gear
 Pressure setting 2600 PSI

SPRAY SYSTEM

Booms

Type Dry
 Standard 60 ft. (three spray sections)
 Drops See below
 Controls Electro-hydraulic: fold/lift/level
 Hydraulic level shock absorber Hagie boom level accumulator

Hoses (high-pressure)

	Bean 35 HP	Hypro® D-230
Quick-fill connection (female w/ adapter for male).....	2" I.D.....	2" I.D.
Solution hose from tank	1 1/2" I.D.....	1 1/2" I.D.
Solution pump to manifold.....	3/4" I.D.....	1 1/4" I.D.
Boom section feeder hose	3/4" I.D.....	1" I.D.
Drop assembly nozzle hose	1/2" I.D.....	1/2" I.D.

Solution Tanks

Standard Two 250 gal. polyethylene with sight gauge
 Optional Two 250 gal. stainless steel with sight gauge
 Agitation Mechanical - hydraulically driven with variable speed control

General Spray System

Pump (see below) High pressure - hydraulically driven with variable speed control
 Solution valves Electric ball valves
 Pressure gauge 300 PSI glycerin-filled (Hypro®)
 600 PSI glycerin-filled (Bean)

Options

Hypro® pump 60 GPM @ 200 PSI
 Bean pump 35 GPM @ 300 PSI
 Monitor Raven 460
 Drops (9) 6' spring loaded w/ 6 or 8 nozzles

III. SPECIFICATIONS

ELECTRICAL SYSTEM

General Electrical System

Battery	Single 12V, negative ground
Alternator.....	105 AMP, voltage regulated
Starter.....	12V with solenoid

Circuit Breakers

Front and rear cab lights (see below).....	40 AMP
Auxiliary power points	30 AMP
A/C	30 AMP
Starter relay.....	30 AMP
Wire harness from engine.....	30 AMP
Wire harness from engine.....	50 AMP

Fuses

Traction valve.....	10 AMP
Gauges, AM/FM radio, dome light, and C.B. radio power.....	10 AMP
Boom hydraulic controls.....	20 AMP
Fuel switch, boom solution valves, seat motor, and brake alarm	20 AMP
Hazard/warning lights, turn signal, and wiper.....	10 AMP
Solution tank shutoff valves	10 AMP

Lights

Front of cab.....	4 halogen field lights
Rear of cab.....	2 halogen work lights

Auxiliary Power Supplies

Monitor mount panel	12V binding post-type 12V cigarette lighter-type
---------------------------	---

III. SPECIFICATIONS

CAB AND INSTRUMENTS

Cab

General cab	Tilt steering Windshield wiper Flashing/hazard warning lights Turn signals Side mirrors Dome light Tinted glass
Temperature control	Full-range
A/C charge type	R-134a
Fresh air filtration	Paper and charcoal filter
Seat	Air ride with adjustment for: Fore-aft Seat cushion Backrest Height Lumbar Ride firmness Armrest tilt
Stereo	AM/FM stereo cassette with dual speakers

Instruments

Dial gauges	Hour meter Fuel Temperature Alternator Oil pressure
Digital gauge	Speedometer (MPH-Km/H) Tachometer (RPM)
Engine air filter monitor	Filter Minder®

III. SPECIFICATIONS

TIRES/RIMS

Rims (front and rear)

Standard.....W 10" X 28"

Tires (front and rear)

Standard.....12.4-28 (Bias TT)

Air pressure.....22 PSI

Tire width.....12.5"

Load capacity (at 5 MPH).....3740 lbs.

Overall diameter.....49.0"

Static load radius (suggested—will vary with load).....22.6"

Rolling circumference.....148.7"

CAPACITIES

Solution tanks (2).....250 gallons each

Fuel tank.....40 gallons

Cooling system.....7 gallons

Hydraulic reservoir.....20 gallons

Engine crankcase (including filter).....11.5 quarts

Torque Hub® (4).....16 oz. each (approx.)

IV. PREPARING TO OPERATE

WHEEL TREAD AND ROW SPACING

Knowing the row spacing of the field one intends to spray, follow the steps below to properly obtain the desired tread setting.

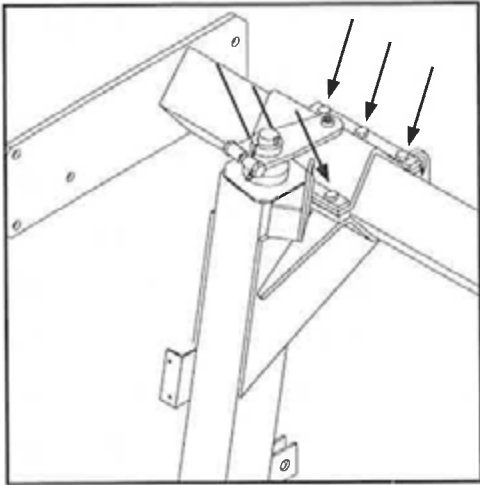


FIG 4.1

CAUTION

Loosen leg mounting bolts only enough to allow for free movement of leg on mainframe. DO NOT remove bolts under any condition.

CAUTION

Empty solution tanks before raising the sprayer.

1. To adjust the tread width in or out, park the sprayer on level ground and shut off the engine.

NOTE:

Steering pivot must be in vertical position (fig. 4.2, item 1).

2. Loosen tie rod bolts (fig 4.2, item 2) and tie rod jam nuts (fig. 4.2, item 3). Remove the bolts and nuts from the tie rod.
3. Loosen the leg mounting bolts on both the front and rear legs on one side of the sprayer only (fig. 4.1).
4. Lubricate the slide path the leg mount will travel along mainframe.

5. Raise the sprayer until the tires on the side being adjusted are just touching the ground.

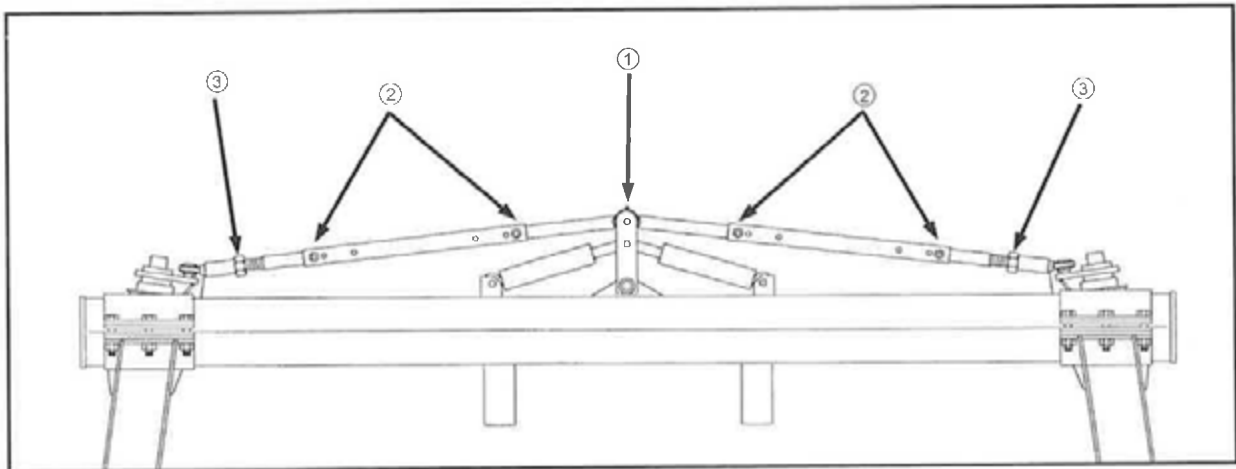


FIG 4.2

IV. PREPARING TO OPERATE

➔ TREAD WIDTH CONTINUED

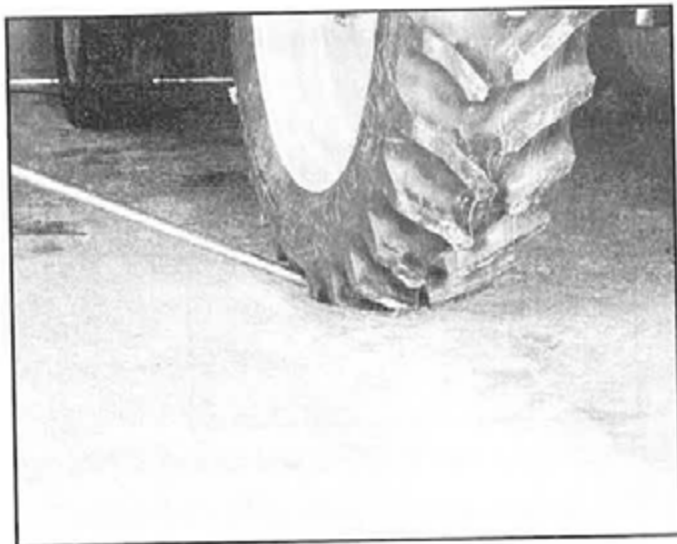


FIG 4.3

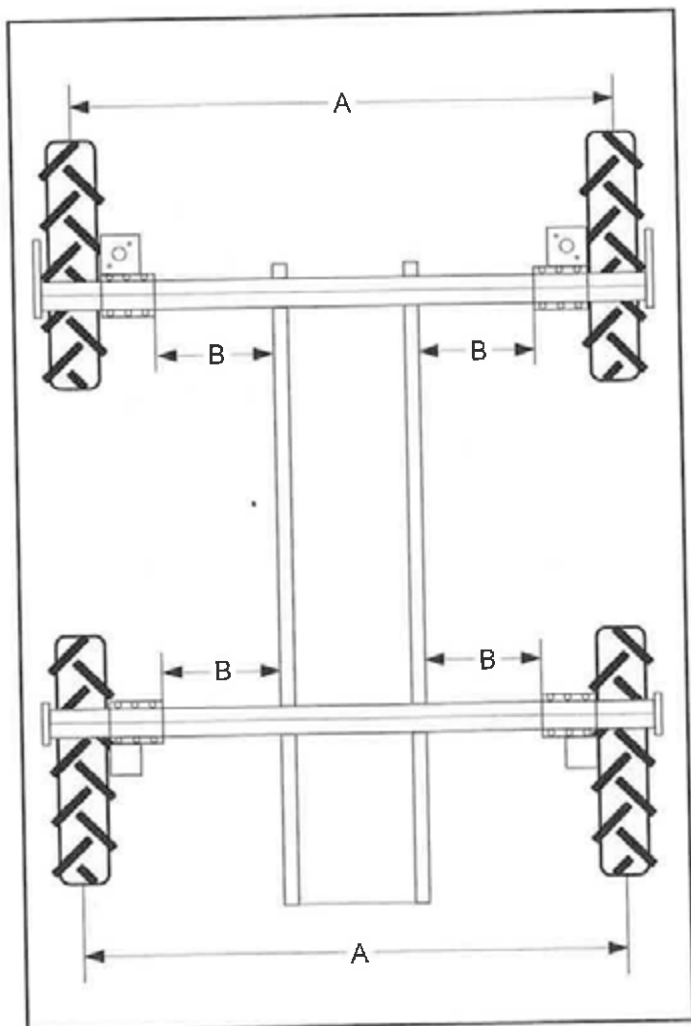


FIG 4.4

6. To adjust the tread out, place a suitable prying tool under the center of the tire and pry out at the same time that you push out at the top of the leg (fig. 4.3). Carefully lower the sprayer to the ground which, in turn will allow the leg to slide outward. Repeat the procedure until the desired tread is obtained.
7. To adjust the tread in, raise the sprayer until the tires on the side being adjusted are just off the ground. Carefully lower the sprayer which, in turn will allow the top of the leg to slide in on the mainframe.
8. Retighten leg mounting bolts following the torque specs and sequence on page 106.
9. Repeat the above procedures to adjust and set the opposite side legs. When finished, all four legs should be the same distance from the mainframe (fig. 4.4, dimension B).
10. Mount correct "wide-tread" tie rods for field use; refer to your Hagie 254x-11 parts manual.
11. Adjust tie rods for correct toe-in. Retighten tie rod bolts and jam nuts. See page 107 for more information on tie rods and toe-in.

IV. PREPARING TO OPERATE

TOE-IN

To correctly gauge toe-in, use a tape measure placed at one-half tire height on the front center seam of the front tire compared to the same measurement of the rear of the front tire (subtract the front measurement from the rear measurement - it must be a positive number). Correct toe-in should fall somewhere between one half and three quarters of an inch.

Toe-in is pre-set at the factory and should not have to be adjusted unless the steering cylinders

are removed.

Difficulty steering one way versus the other may also indicate incorrect toe-in and may require adjustment. For further assistance regarding toe-in measurement and adjustment, contact the Hagie Customer Support Department.

NOTE:
See page 107 for instructions on adjusting toe-in.

PREPARING
TO OPERATE

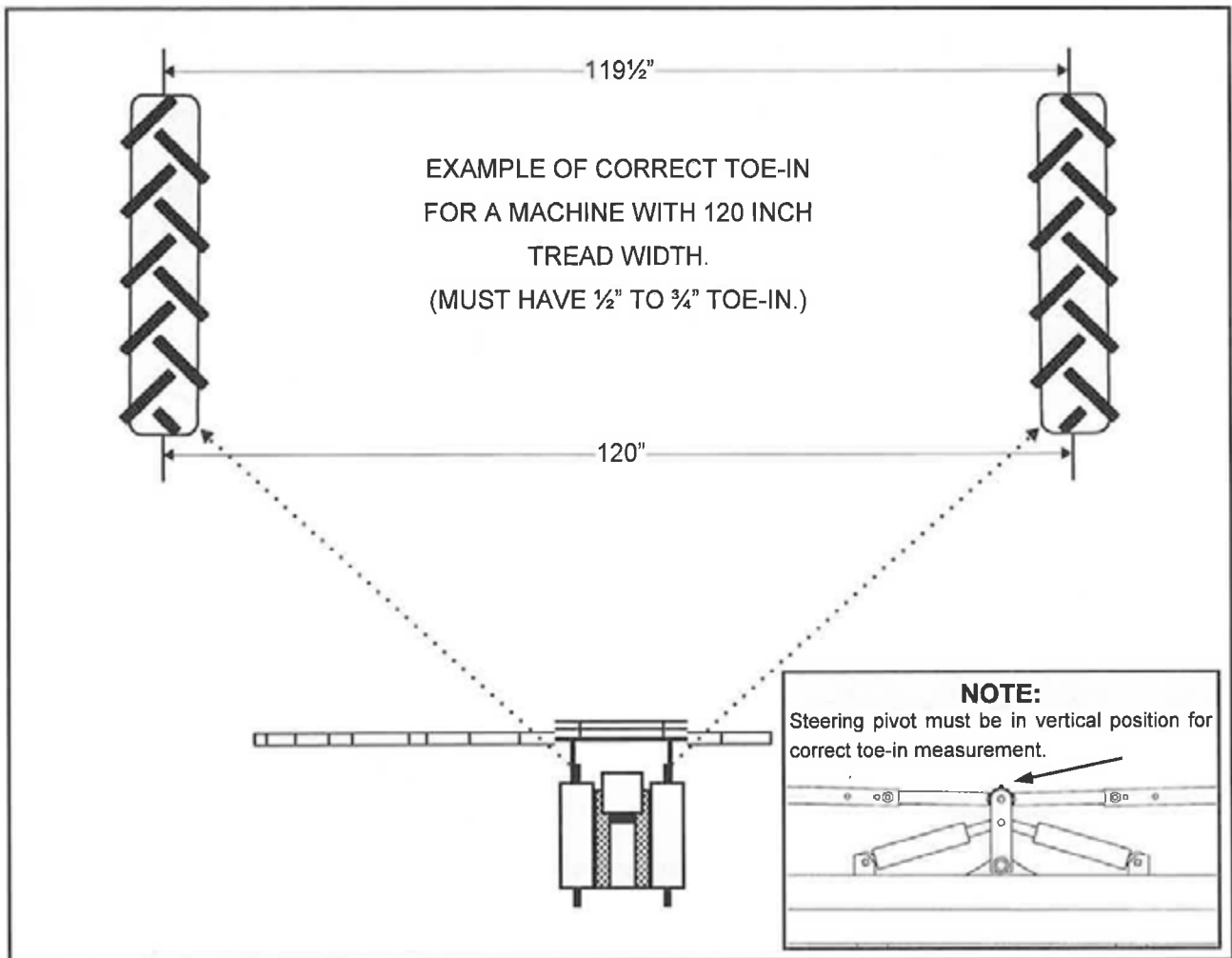


FIG 4.5

IV. PREPARING TO OPERATE

ATTACHING BOOMS AND SETTING NOZZLE SPACINGS

In shipment, some of the sprayer components may not have been assembled and will need to be installed before operating. In order to ensure the proper installation of the components, please read

and comply with the following instructions carefully. Always make sure you have proper equipment and/or help installing the components.

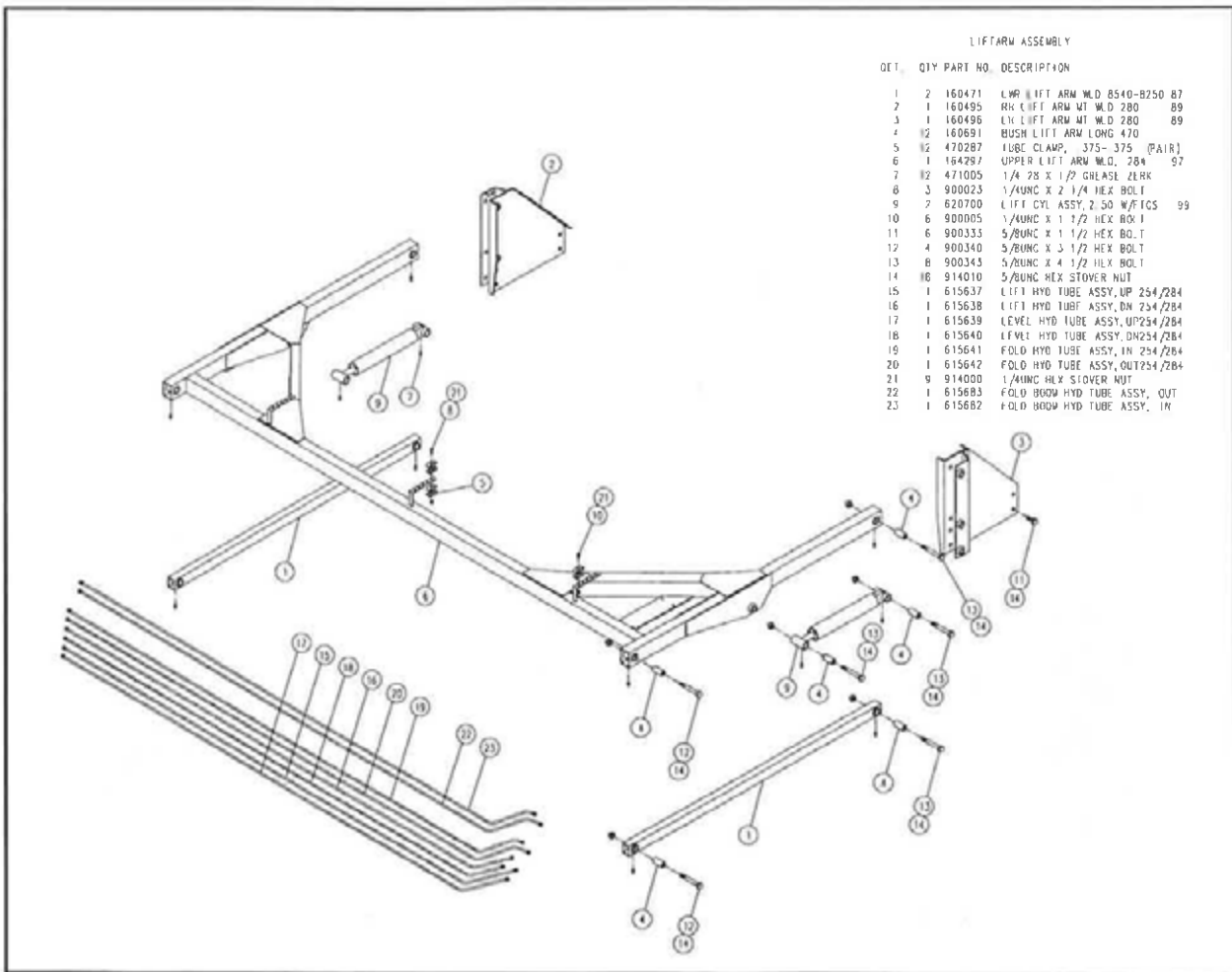


FIG 4.6

1. First, attach right hand (fig. 4.6, item 2) and left hand (fig. 4.6, item 3) lift arm mounts and tighten all bolts.
2. Install upper lift arm weldment (fig. 4.6, item 6) to lift arm mounts using proper bushings and bolts provided.
3. Install two lift cylinders (fig. 4.6, items 9), using correct bushings and bolts.
4. After installing the lift cylinders, install two lower lift arm weldments (fig. 4.6, items 1), using correct bushings and bolts.

IV. PREPARING TO OPERATE

5. Install the transom weldment (fig. 4.7, item 31).

NOTE:
An overhead hoist or fork lift is very useful when installing the transom.

6. After the transom is securely fastened, install the outer booms.

NOTE:
Before attaching outer booms, park the sprayer in an open area.

PREPARING TO OPERATE

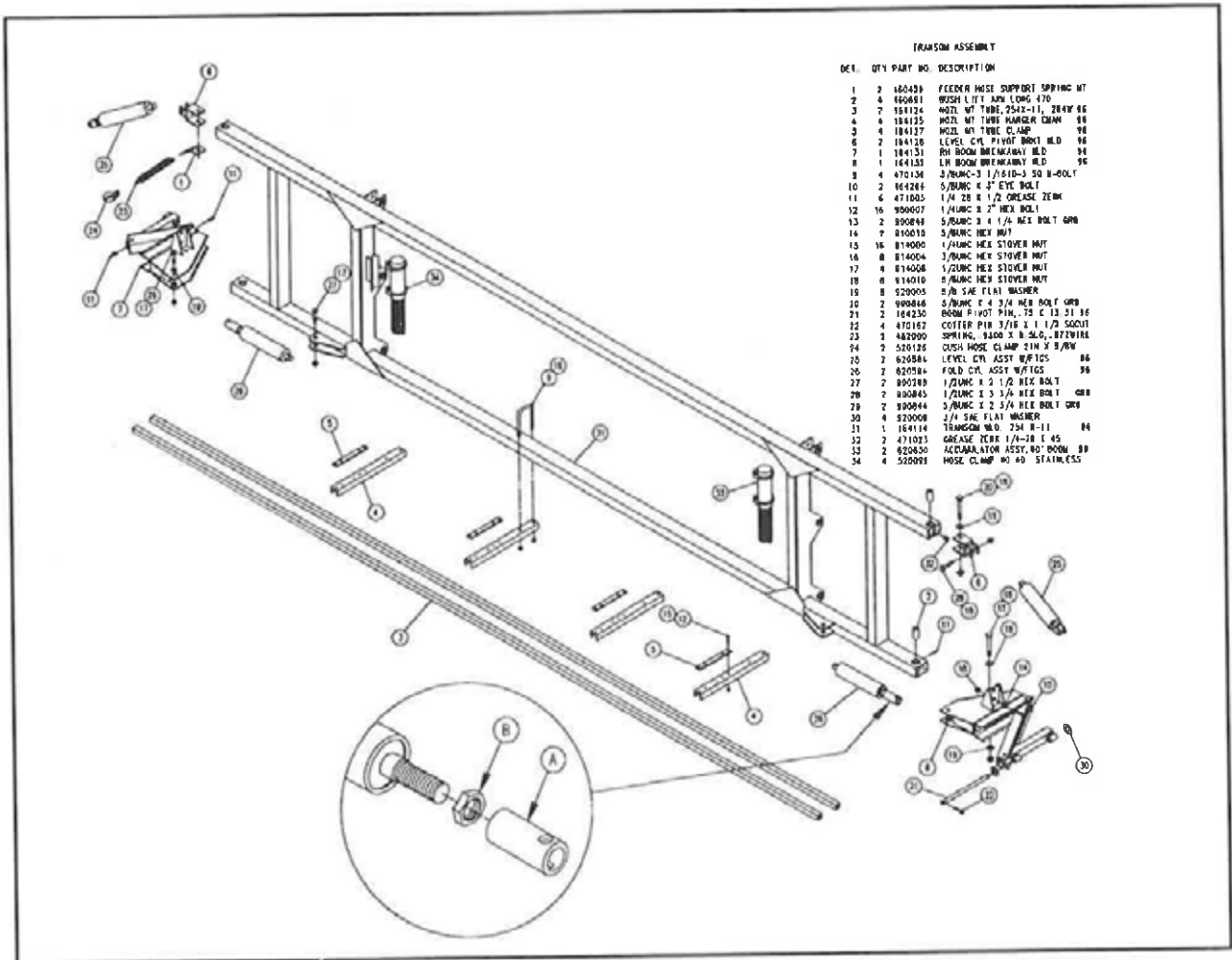


FIG 4.7

ATTACHING BOOMS CONTINUED →

IV. PREPARING TO OPERATE

➔ ATTACHING BOOMS CONTINUED

7. The booms come in a standard 60' length (fig. 4.8). Refer to the parts manual for detailed drawings for the correct hardware and hydraulic components when attaching to the transom.

NOTE:

Tighten the boom springs until daylight shows between the coils. Do not overtighten.

8. After the outer booms have been installed, adjust the fold cylinder sleeve (page 27, fig. 4.7, item A) until the booms are parallel with the transom. Then use this same adjustment to allow the boom to fold in far enough to locate in the boom cradle. Lock the cylinder sleeve in place with the jam nut (page 27, fig. 4.7, item B).
9. After steps 1 through 8 have been completed, mount the nozzle spacings to the outer booms and transom.

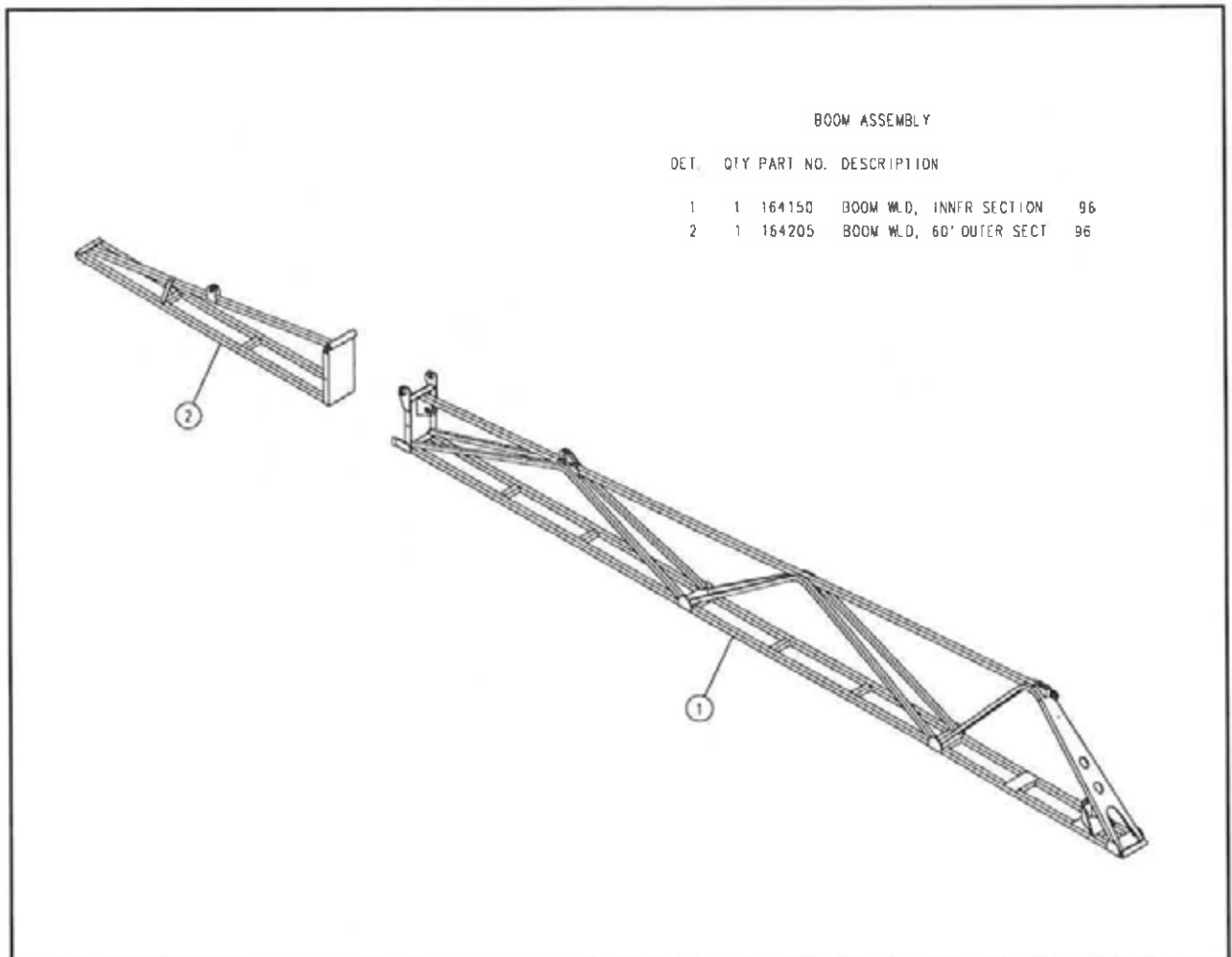


FIG. 4.8

IV. PREPARING TO OPERATE

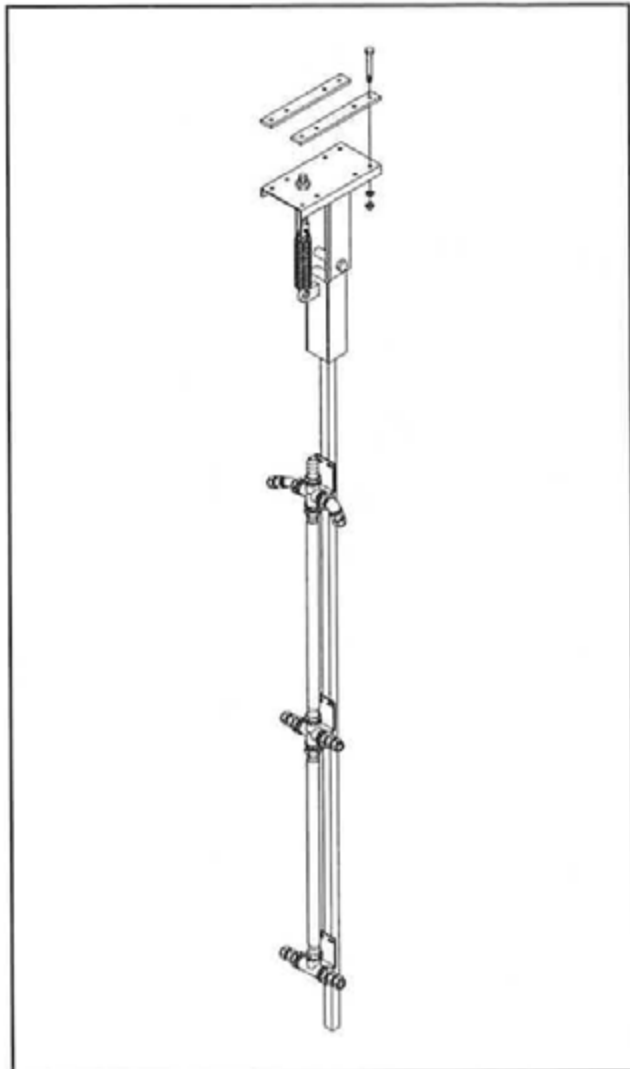


FIG 4.9

Mounting Nozzle Drop Assemblies

The nine nozzle drop assemblies come in six foot lengths with six or eight high-pressure nozzles per drop (fig. 4.9). Determine the correct row spacing for drop assembly spacing on the booms. Refer to the parts manual for correct mounting hardware and correct hose size and length.

PREPARING
TO OPERATE

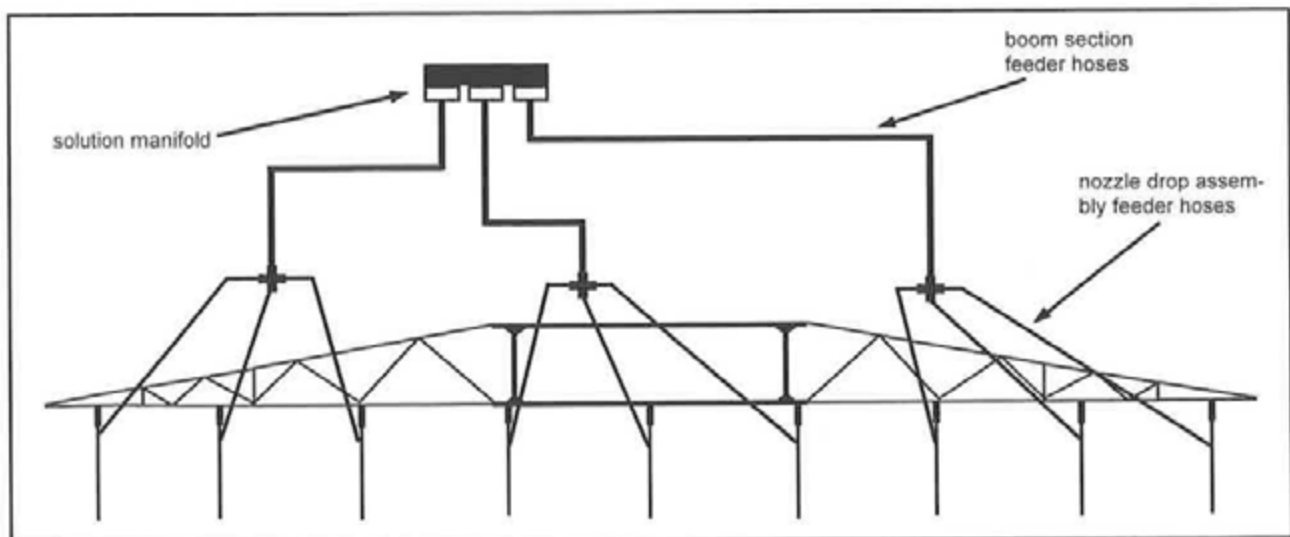


FIG 4.10

V. OPERATING INFORMATION

OPERATING THE ENGINE

Pre-operational Checks	Page Reference
1. Check the engine oil level. Do not operate the engine when oil is below the low mark on dipstick.	84
2. Check the coolant level in the radiator and the coolant overflow reservoir.	86 & 87
3. Check the hydraulic oil reservoir level.	84
4. Check cooling air intake screens.	90
5. Check engine drive belt.	103
6. Drain fuel/water separator.	94
7. Check the Filter Minder [®] .	91
8. Check for any oil or fuel leaks and correct if needed.	

Starting the Engine



1. Position hydrostatic control lever to "N" (neutral) position.
2. Apply parking brake (see page 65). When starting procedure is complete, release parking brake before moving.
3. Start the engine with the throttle at one-half speed.
4. Turn key to the "ON" position to check instruments.

V. OPERATING INFORMATION



CAUTION

Electrical system is 12 volt negative ground. When using booster with jumper cables, precautions must be taken to prevent personal injury or damage to electrical parts.

1. Attach one end of jumper cable to positive terminal of booster battery and other end to positive terminal of vehicle battery connected to starter motor.
2. Attach one end of second cable to negative terminal of booster battery and other end to vehicle frame away from battery. Do not attach to cab or cab support.
3. To remove cables, reverse above sequence exactly to avoid sparks. See operator's manual for additional information.

5. Turn the ignition key switch to the start position to engage the starter. If the engine fails to start after 15 seconds, turn key to "OFF", wait one minute and repeat the procedure. If the engine does not start after three attempts, check fuel supply system. Absence of blue or white exhaust smoke during cranking indicates no fuel is being delivered.
6. When engine starts, immediately reduce throttle lever setting to 1/3.
7. Inspect indicator lights and gauges for correct operation. If any lights or gauges do not operate, shut off engine and determine cause.
8. Always allow at least a five minute warm-up period before operating the engine at high RPM. This means the engine must reach operating temperature and oil pressure must stabilize in the normal operating range before it is run faster than an idle (1250 RPM or less).

NOTE:

Cold oil may not flow in quantities adequate to prevent pump cavitation, thus causing pump failure.

V. OPERATING INFORMATION

COLD WEATHER STARTING

Using starting fluid without metering equipment:

CAUTION

Never use starting fluid near an open flame or pre-heater. This could cause an explosion. Do not breathe starting fluid fumes. Starting fluid fumes can be harmful to your health.

NOTE:

Do not use excessive amounts of starting fluid when starting an engine. The use of too much starting fluid will cause engine damage.

Spray starting fluid into the air cleaner intake while another person starts the engine (fig. 5.1). Do not move the sprayer until the other person is off the sprayer and a safe distance away.



FIG 5.1

CAUTION

When using jumper cables to start engine, make sure to connect cables in parallel: positive (+) to positive and negative (-) to negative. When using an external electrical source to start engine, turn disconnect switch to the "OFF" position. Remove key before attaching jumper cables to prevent unintentional starter engagement.

V. OPERATING INFORMATION

HYDROSTATIC DRIVE

The power for the Hagie 254x-11 is derived from a Cummins diesel engine. The hydrostatic power system consists of a Sauer/Sundstrand heavy duty variable displacement pump and fixed displacement wheel motors.

A manual control lever connected to the pump's swashplate controls the amount and direction of oil flow to the motors determining the speed and direction of the machine.

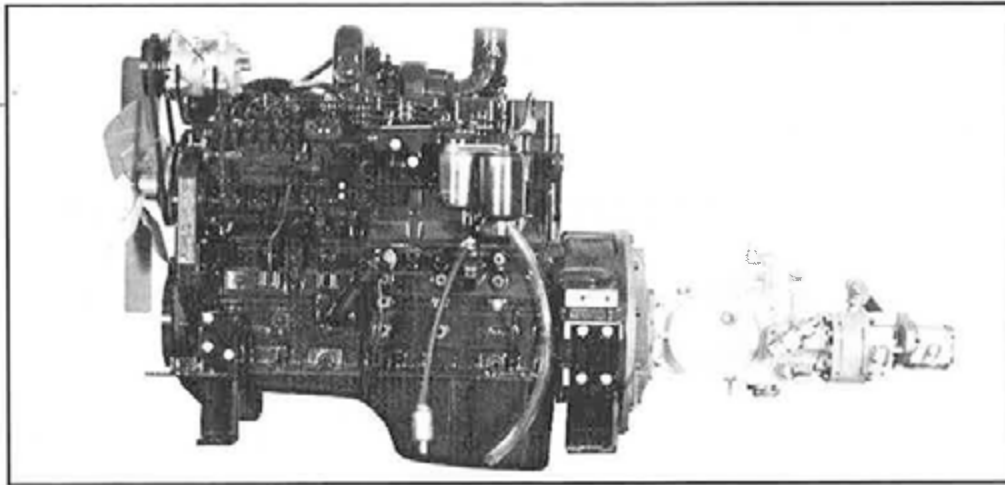


FIG 5.2

OPERATING
INFORMATION

1. Open the throttle slowly to the maximum recommended engine speed setting.

NOTE:

Never operate the sprayer at anything less than full recommended throttle.

2. To move forward, slowly push the hydrostatic control lever (fig. 5.3) forward. The farther the control lever is moved, the faster the sprayer will travel. To stop, slowly pull the lever to the "N" (neutral) position.
3. To reverse the machine, slowly pull the hydrostatic control lever back. To stop, slowly push the lever to the "N" (neutral) position.
4. Before turning off the engine, reduce engine speed and allow the engine to idle at least three minutes.

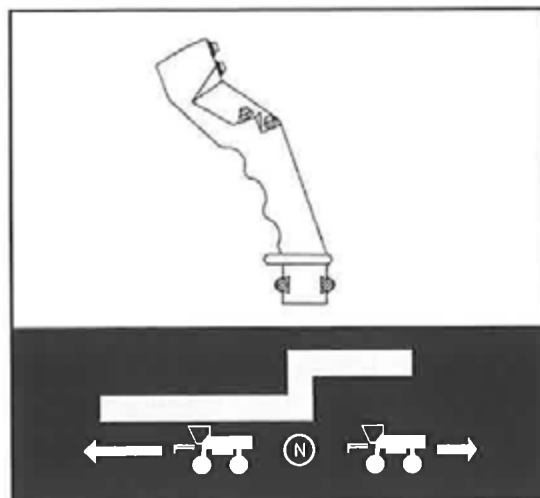
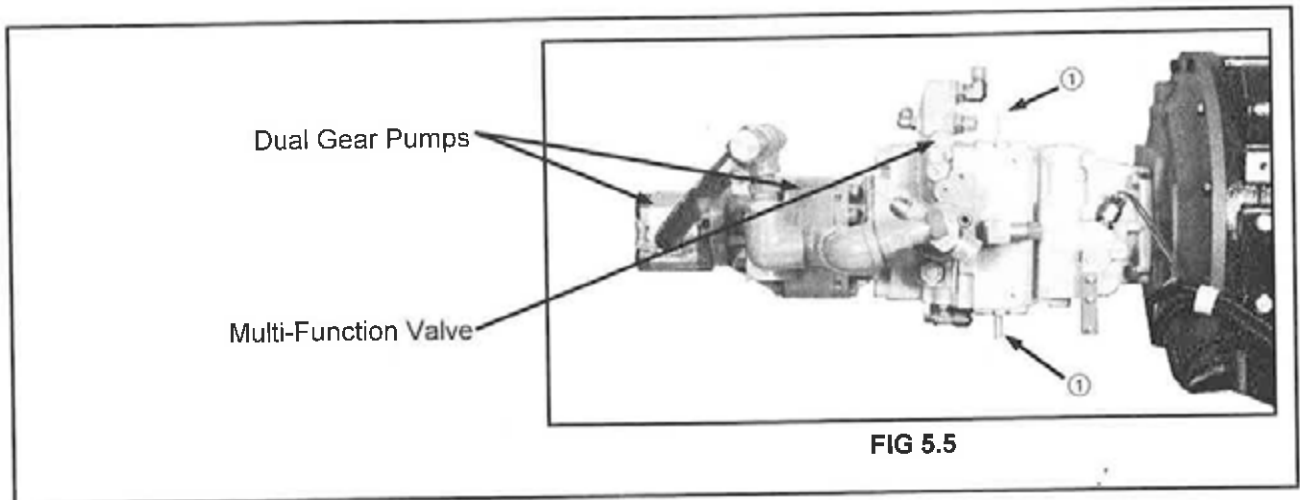
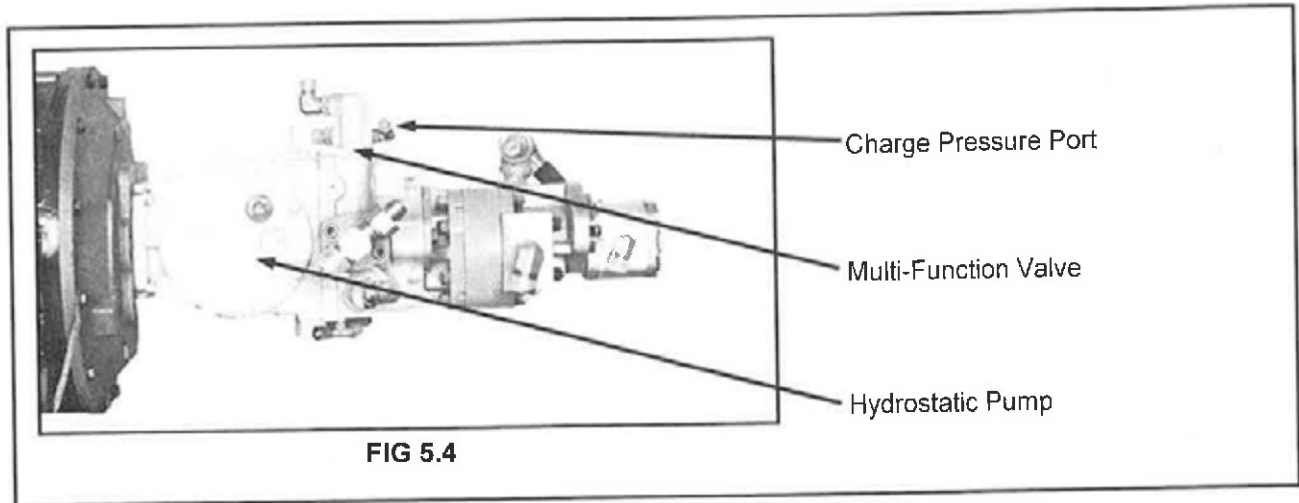


FIG 5.3

HYDROSTATIC SYSTEM CONTINUED →

V. OPERATING INFORMATION

HYDROSTATIC SYSTEM



Displacement Limiter

The Sauer/Sundstrand Series 90 variable pump is equipped with a mechanical displacement (stroke) limiter (fig. 5.5, item 1)

NOTE:

The limiter is factory set and requires no further adjustment. If adjustments are made without contacting the Hagie Customer Support Department, damage may result to the system and void the warranty.

V. OPERATING INFORMATION

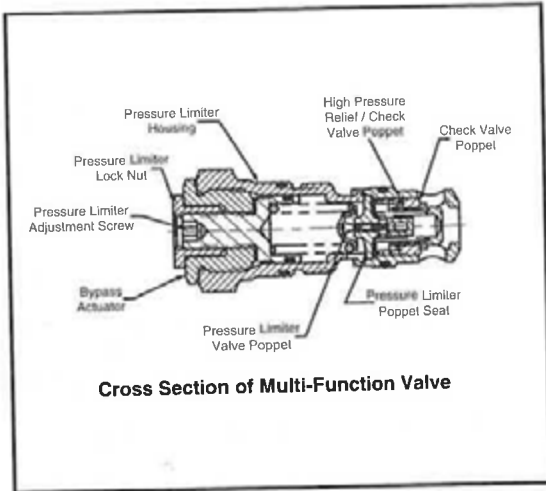


FIG 5.6

Multi-Function Valves

Each Series 90 pump is equipped with two multi-function valves (fig. 5.6). These valves incorporate the system check valve, the pressure limiter valve, the high pressure relief valve, and the bypass valve.

When the pre-set pressure is reached, the pressure limiter system acts to rapidly de-stroke the pump in order to limit the system pressure.

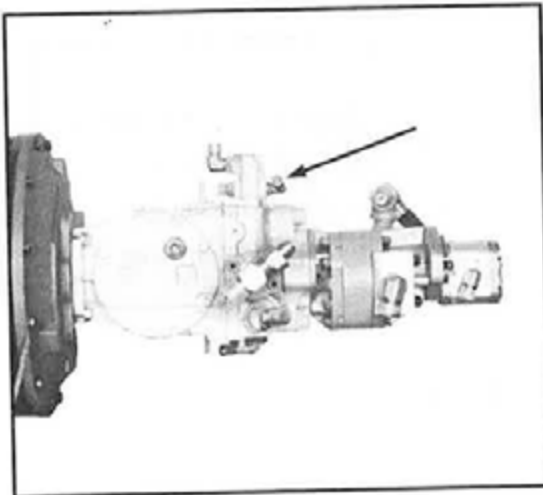


FIG 5.7

Charge Pressure

To monitor the closed loop system (hydrostatic pump), install a 500 PSI pressure gauge at the charge pressure port (see fig. 5.7). Start the engine and open the throttle to full RPM. The charge pressure should be between 348 and 365 PSI. If it is below the required pressure, contact the Hagie Customer Support Department.

Loop Flushing Valve

The hydrostatic pump is equipped with a loop flushing valve (fig. 5.8). It is used to remove fluid from the hydrostatic system for cooling and removal of contamination.

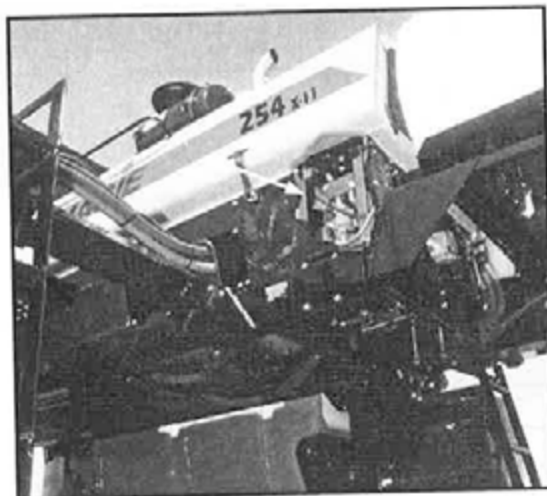


FIG 5.8

NOTE:

The loop flushing valve has been factory set. DO NOT adjust. Damage to the system may result if adjustment is made without contacting the Hagie Customer Support Department.

V. OPERATING INFORMATION

➔ HYDROSTATIC SYSTEM CONTINUED

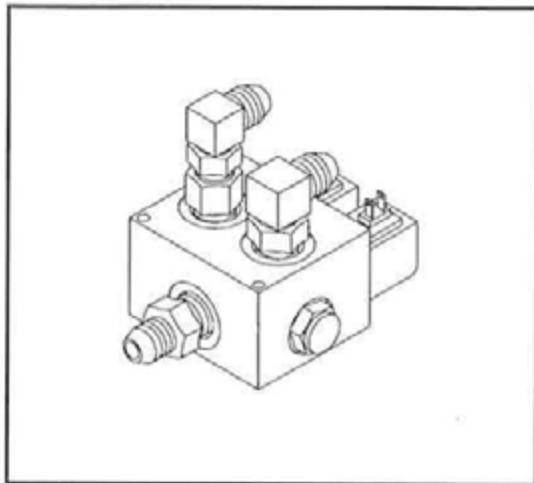


FIG 5.9

Traction Valve

The Model 254x-11 sprayer comes equipped with special hydraulic valves for increased traction (one in the front hydraulic loop and one in the rear hydraulic loop). These valves greatly reduce spin-out if muddy conditions prevail, or if wheels lose traction for any reason. The valve in the rear loop is active at all times. The valve in the front loop (fig 5.9) is activated by a switch on the console (fig 5.10). When the traction valve is activated an indicator on the instrument panel will light up (fig. 5.11).



FIG 5.10

NOTE:

To prevent hydraulic loop damage, do not operate the front traction valve continuously. Activate the front traction valve only when needed. Shut the traction valve switch off when clear of problem area.

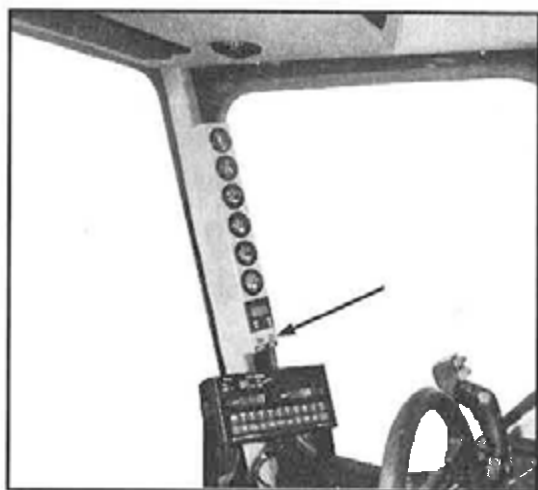


FIG 5.11

V. OPERATING INFORMATION

HYDRAULIC SYSTEM

The auxiliary hydraulic system is an open type directly mounted behind the heavy duty variable displacement pump. This system consists of dual gear pumps that supply the required hydraulics to operate the full time power steering unit, boom control cylinders (lift, level, fold), the solution pump, and mechanical agitation.

After supplying each of these systems, the hydraulic oil is sent to the oil cooler in front of the engine coolant radiator. Here it is cooled and then

sent back to the hydraulic oil reservoir.

The front, larger gear pump (fig. 5.12, item 1) supplies only the solution pump. The rear, smaller gear pump (fig. 5.12, item 2) supplies power steering, boom controls, and mechanical agitation. Keeping these systems separate allows consistently even solution application if the operator activates any of the systems on the other pump.

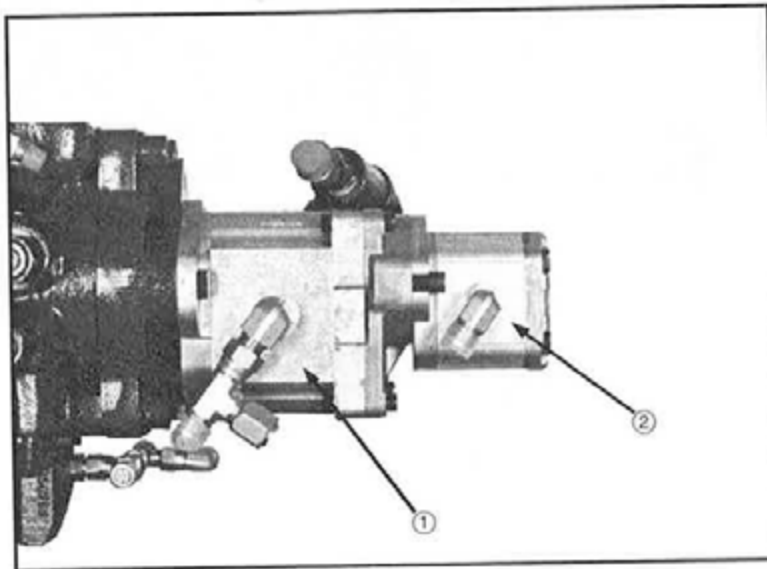


FIG 5.12

CAUTION

DO NOT GO NEAR LEAKS. High pressure oil easily punctures skin causing injury, gangrene, or death. If injured, seek emergency medical help. Immediate surgery is required to remove oil. Do not use finger or skin to check for leaks. Lower load or relieve hydraulic pressure before loosening fittings.

HYDRAULIC SYSTEM CONTINUED →

V. OPERATING INFORMATION

➔ HYDRAULIC SYSTEM CONTINUED

Booms

The sprayer has hydraulic cylinders which aid in lifting the transom and booms for height adjustment (fig. 5.13, item 3), adjusting each boom separately for a level spraying pattern (fig. 5.13, item 2), and folding the booms in toward the machine during transportation and storage (fig. 5.13, item 1). For more information on boom control adjustment see pages 40-43.

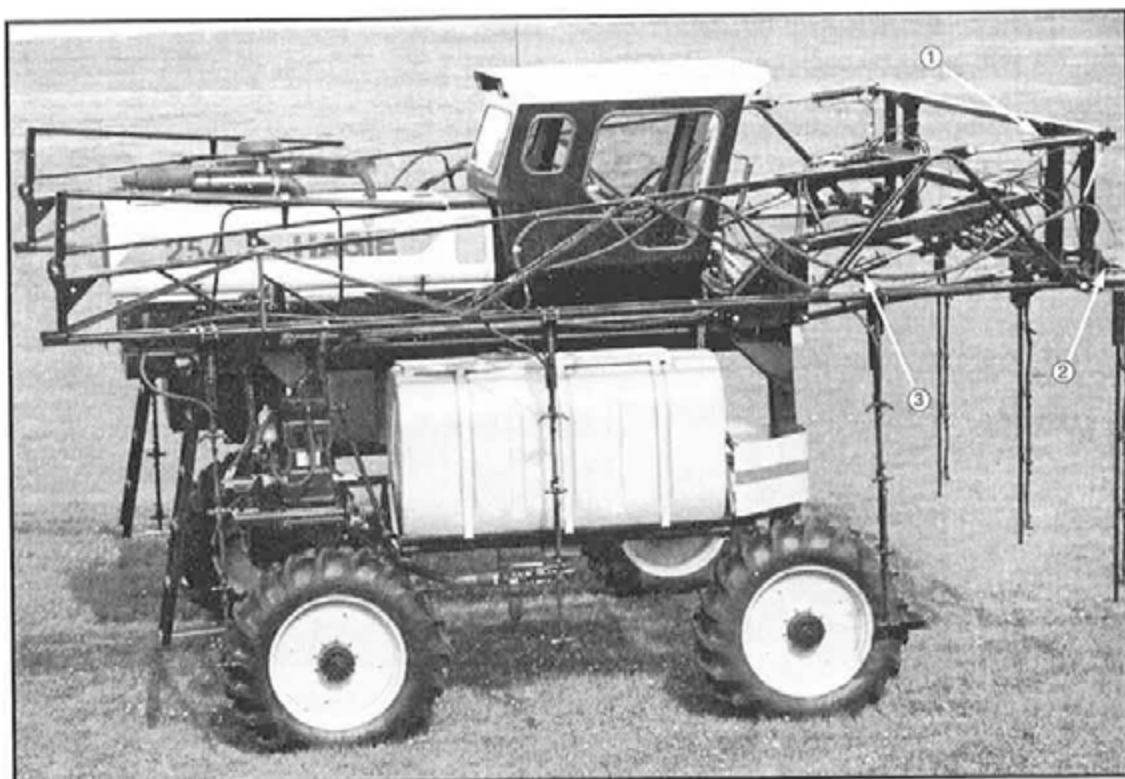


FIG 5.13

V. OPERATING INFORMATION

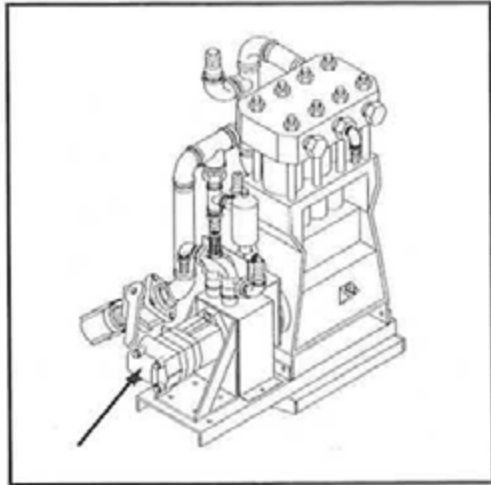


FIG 5.14

Solution Pump

The spray system's solution pump is driven by a hydraulic motor (fig. 5.14) which is powered exclusively by its very own gear pump. This means operation of any another hydraulic system will not affect the solution pump's performance consistency. See page 50 for more information on the solution pump.

Mechanical Agitation

Solution in each of the polyethylene tanks maintain suspension in part to hydraulically driven agitator shaft assemblies (fig. 5.15). See pages 58-59 for more information on the agitation system.

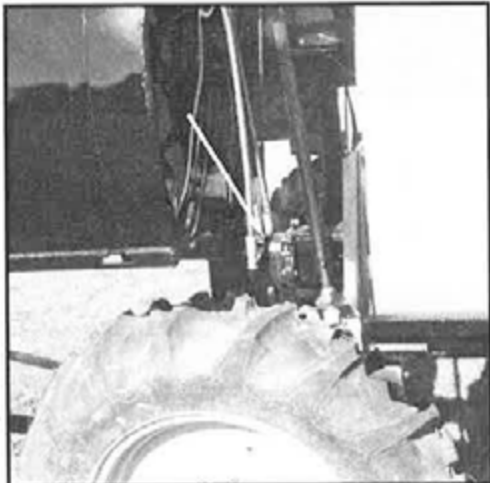


FIG 5.15

Power Steering

The full-time power steering system consists of a hydraulic steering motor (mounted on the end of the steering shaft) which is connected to a pair of double-action steering cylinders (fig. 5.16, item 1) mounted on a steering pivot (fig. 5.16, item 2) which oscillates a pair of tie rods (fig. 5.16, item 3) going to each steering leg. This system is powered by one of the hydraulic dual gear pumps driven by the sprayer's engine. Since these gear pumps are sensitive to engine RPM (the higher the RPM the higher the oil flow), it is best to always operate the sprayer at full recommended RPM to ensure maximum steering responsiveness.

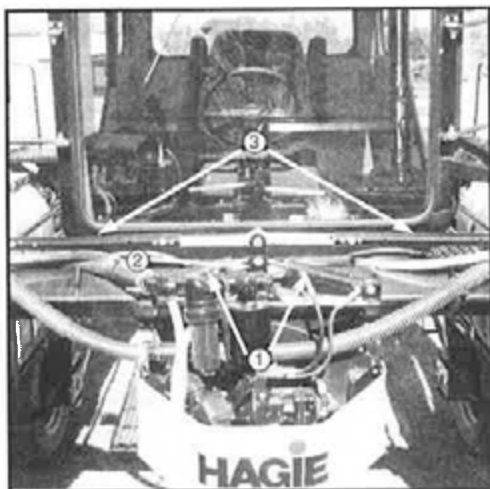


FIG 5.16

V. OPERATING INFORMATION

SPRAY BOOMS

Spray booms come in two sections (fig. 5.17) which along with the transom make a 60 foot boom package.

The spray booms are controlled by an electro-hydraulic system. This system consists of operator

manipulated switches located in the sprayer's cab and hydraulic cylinders attached to the booms. It provides control of lift (page 41), level (page 42), and horizontal fold (page 43).

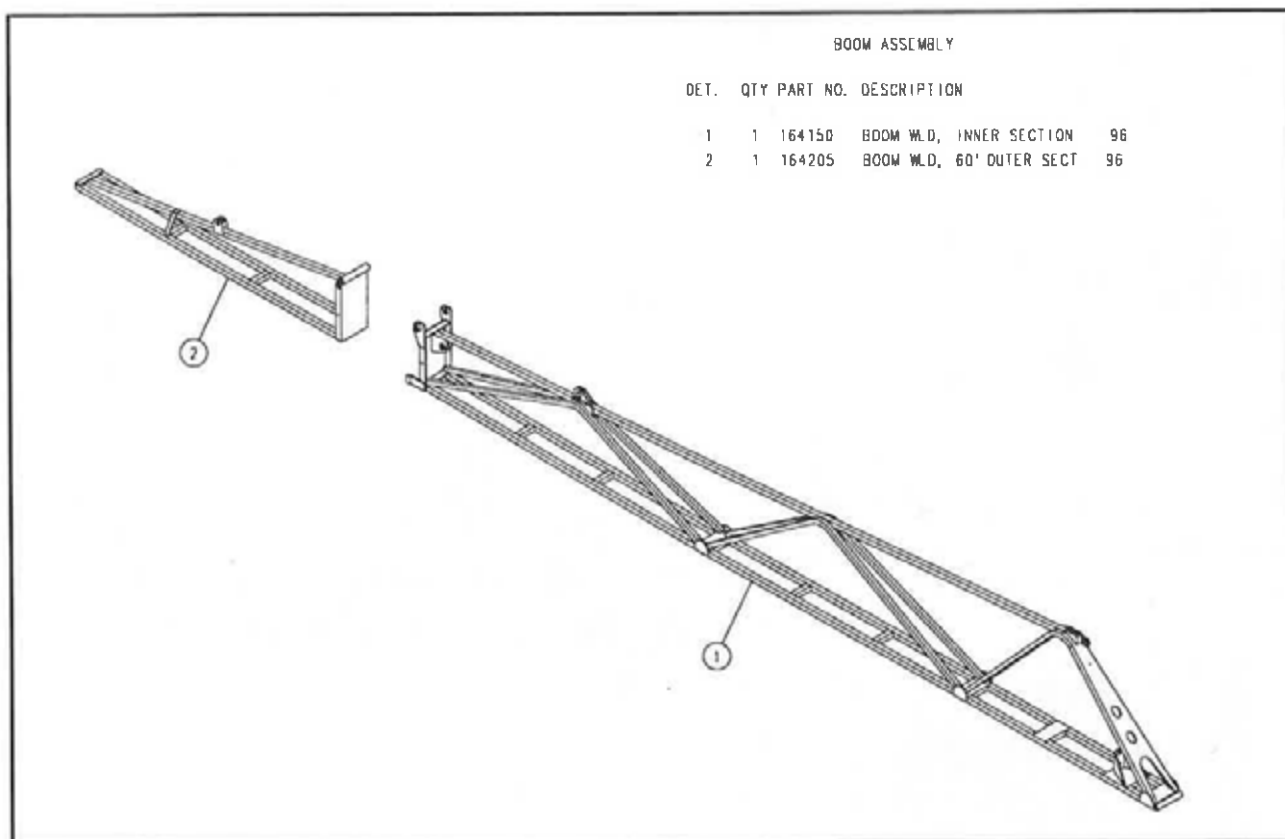


FIG 5.17

V. OPERATING INFORMATION

Lift



FIG 5.18

To raise and lower the transom/boom assembly, depress the "GRAY" (UP) or the "RED" (DOWN) buttons on the hydrostatic drive handle (fig. 5.19, item 1 & 2). While depressed, either button activates the transom lift cylinders (fig. 5.18).

See your spray tip manufacturer's guide for information regarding drop assembly height (fig. 5.20).

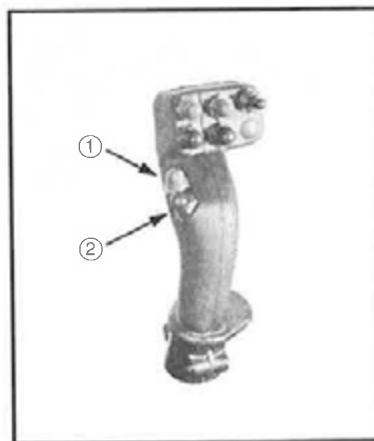


FIG 5.19

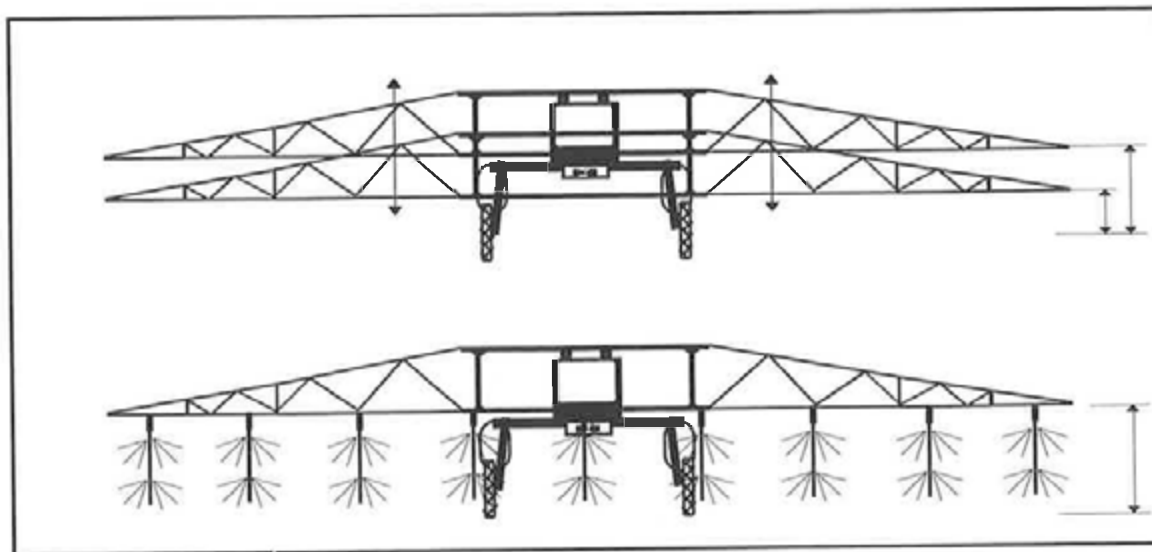


FIG 5.20

BOOM OPERATION CONTINUED →

OPERATING
INFORMATION

V. OPERATING INFORMATION

➔ BOOM OPERATION CONTINUED

Level

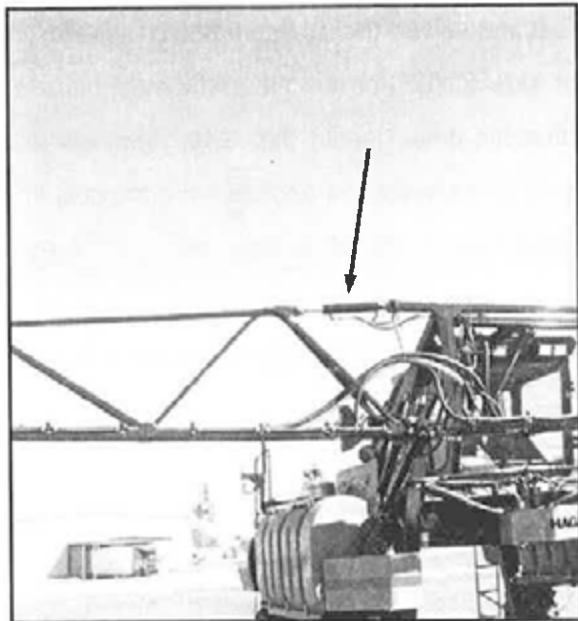


FIG 5.21

To increase or decrease the angle of each individual boom level, depress the left or right "GRAY" (UP) or the left or right "RED" (DOWN) buttons on the hydrostatic drive handle (fig. 5.22, items 1 thru 4). While depressed, these buttons activate the level cylinders connecting either boom to the transom (fig. 5.21).

This adjustment also aids in placing the booms correctly in the cradles for transporting and storing.

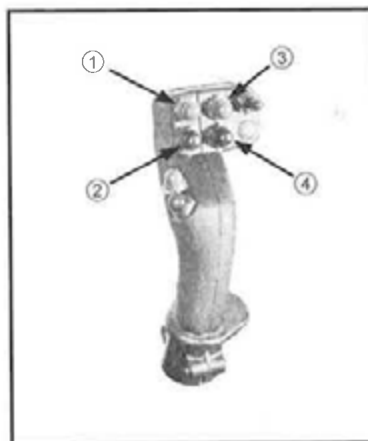


FIG 5.22

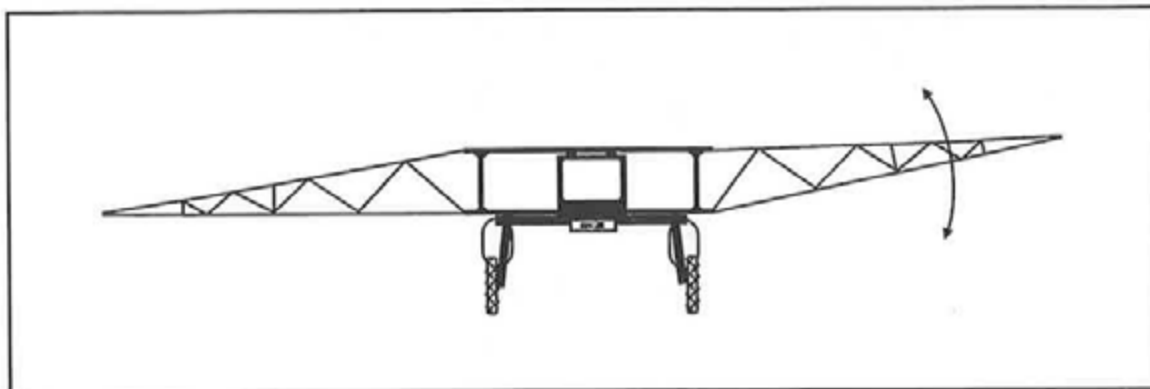


FIG 5.23

V. OPERATING INFORMATION

Fold

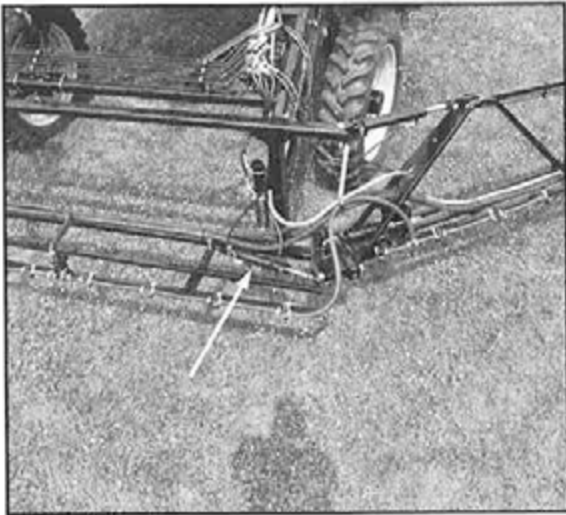


FIG 5.24

HORIZONTAL BOOM FOLD - To fold either boom horizontally in toward the machine or out away from the machine, depress the "IN" or "OUT" of either or both "BOOM FOLD" switches (fig. 5.25, items 1 & 2). While depressed, these switches activate cylinders connecting either boom breakaway mount to the transom (fig. 5.24).

Fold or unfold the booms in an open area only. Make sure no one is standing in the path of the boom fold's travel path.



FIG 5.25

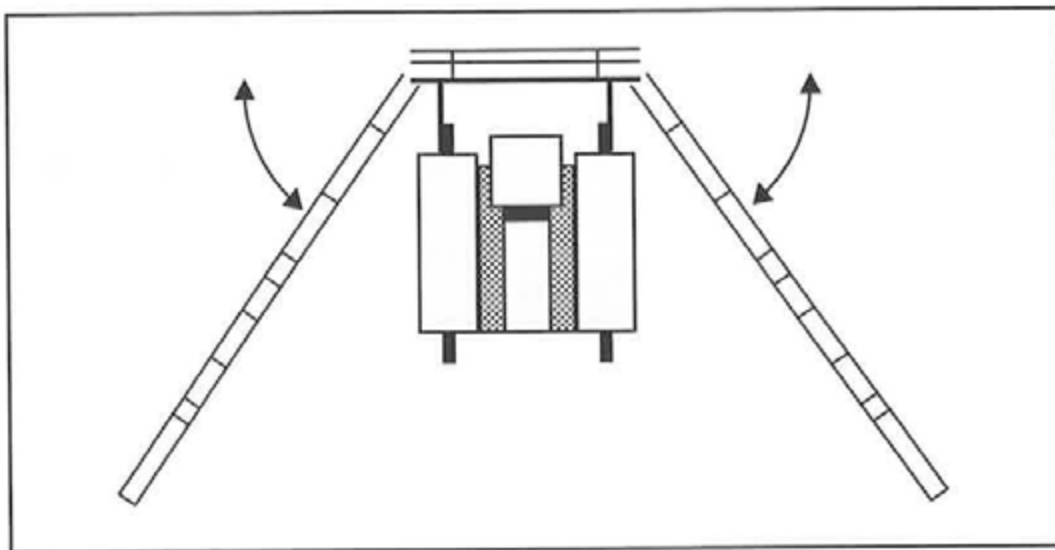


FIG 5.26

BOOM OPERATION CONTINUED ➔

V. OPERATING INFORMATION

➔ BOOM OPERATION CONTINUED

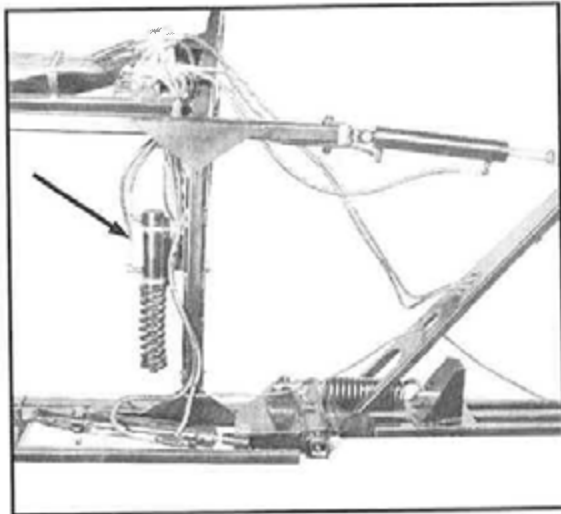


FIG 5.27

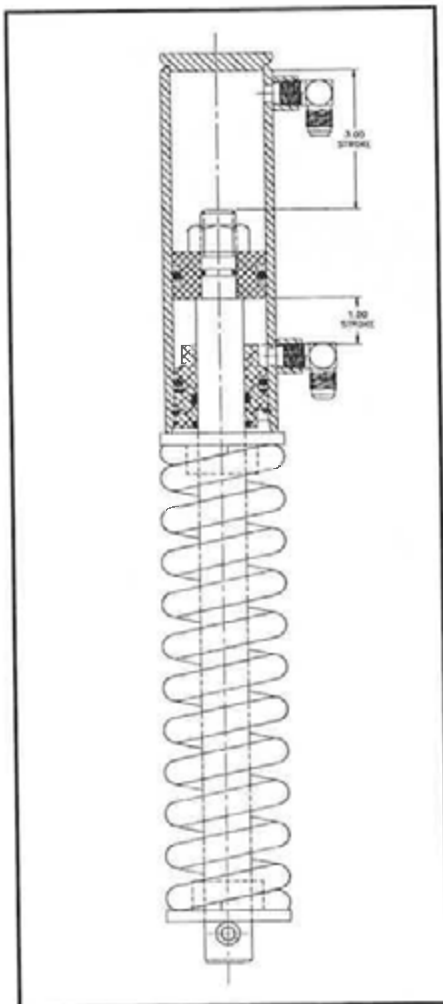


FIG 5.28

Accumulator

Each boom is equipped with an accumulator system. This system acts as a vertical "shock-absorber" for the booms (fig. 5.29). It consists of a spring-cushioned cylinder mounted on the transom (fig. 5.27). Each accumulator is hydraulically connected in parallel to each corresponding level cylinder of each boom.

If jarred up or down suddenly, the boom will push or pull the level cylinder's shaft either in or out. The accumulator cylinder gives the oil on the side of the cylinder being compressed a place to transfer to, absorbing the shock. Without it, the cylinder is rigid and damage may occur.

The transferred oil compresses or extends the accumulator's shaft. After the load of the "jar" has been absorbed, a spring returns the accumulator back to a "home" position and the boom returns to its previous level.

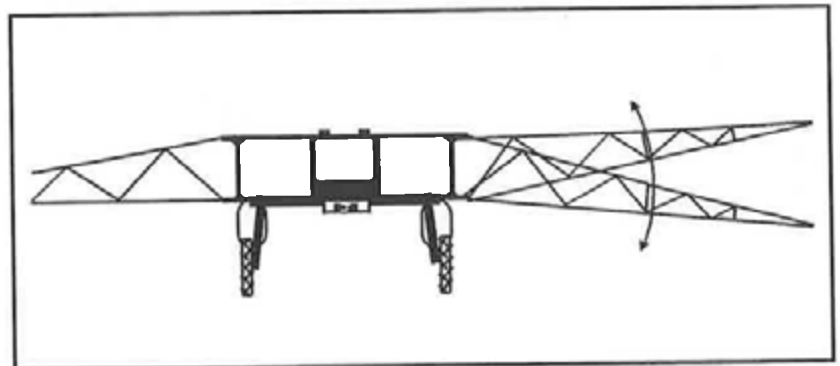


FIG 5.29

V. OPERATING INFORMATION

ACCUMULATOR HOISING DIAGRAM

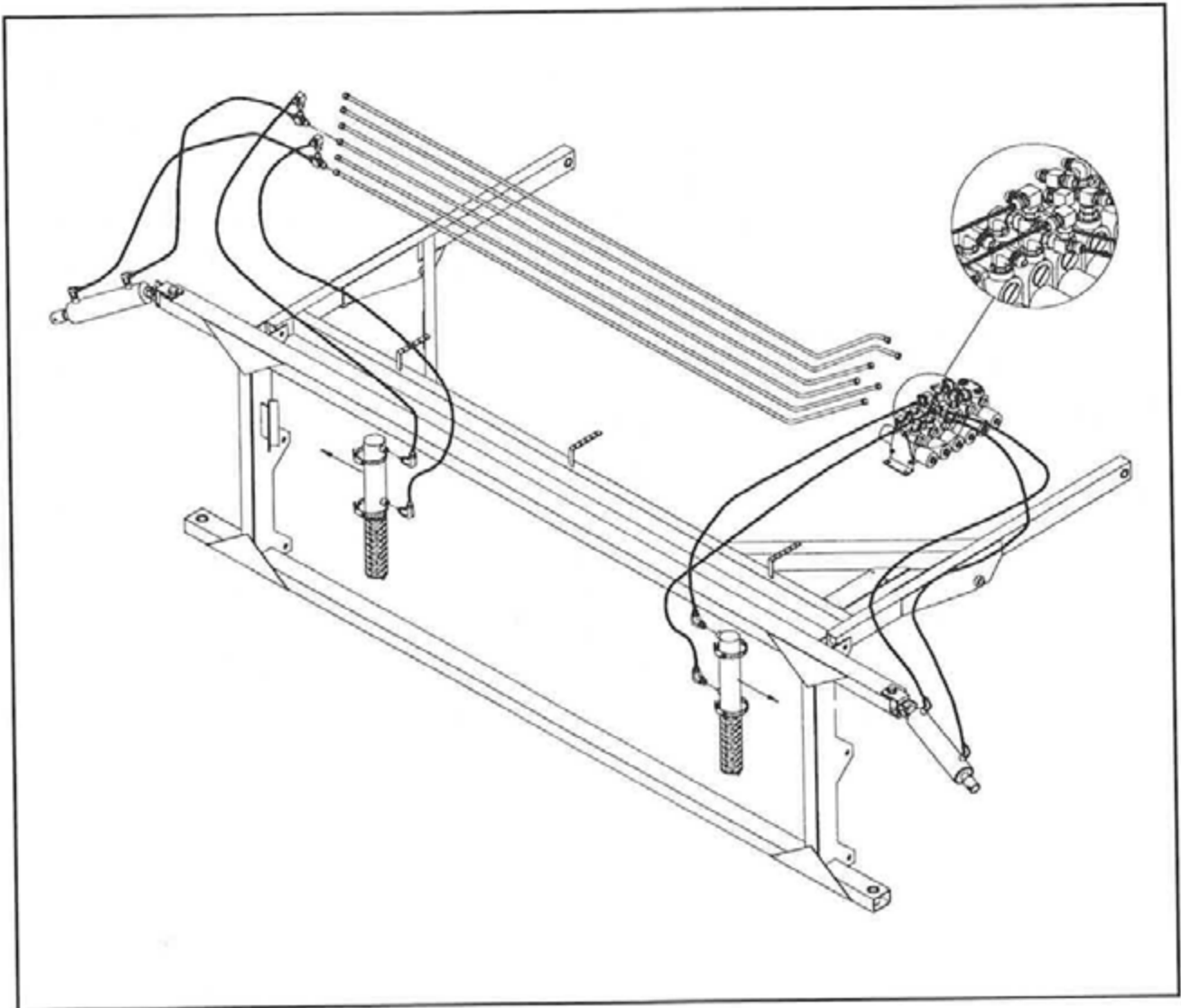


FIG 5.30

BOOM OPERATION CONTINUED →

OPERATING
INFORMATION

V. OPERATING INFORMATION

➔ BOOM OPERATION CONTINUED

Inner Breakaway

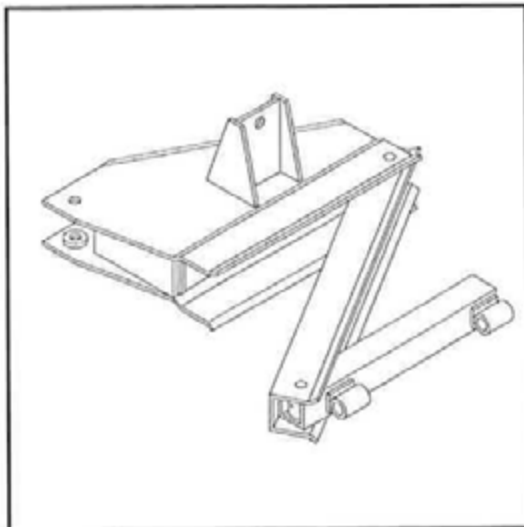


FIG 5.31

Each boom is equipped with an inner breakaway system. This system acts as a horizontal “shock-absorber” for the booms (fig. 5.33). It consists of a two-way hinge (fig. 5.31) and spring combination. Each breakaway connects each corresponding boom to the transom (fig. 5.32).

In event of a sudden stop, the forward momentum of the booms continues to the extent of the breakaway’s springs. As the springs extend they absorb the energy of the momentum transfer. The springs then retract, pulling

the boom back to its previous position.

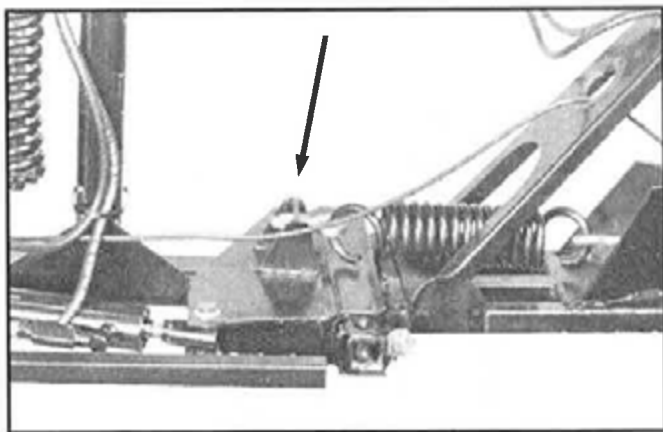


FIG 5.32

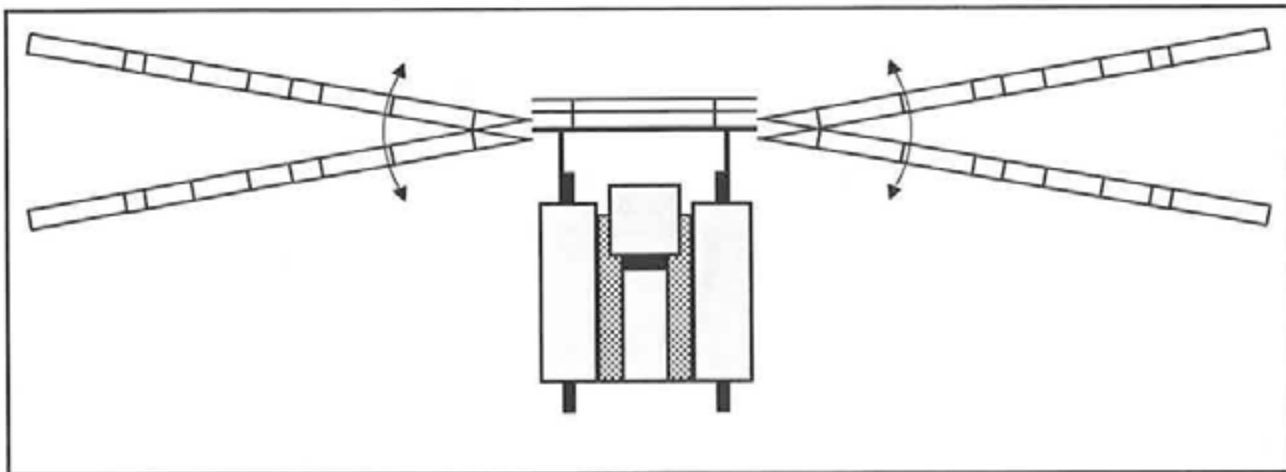


FIG 5.33

V. OPERATING INFORMATION

SPRAY SYSTEM (optional monitor shown)

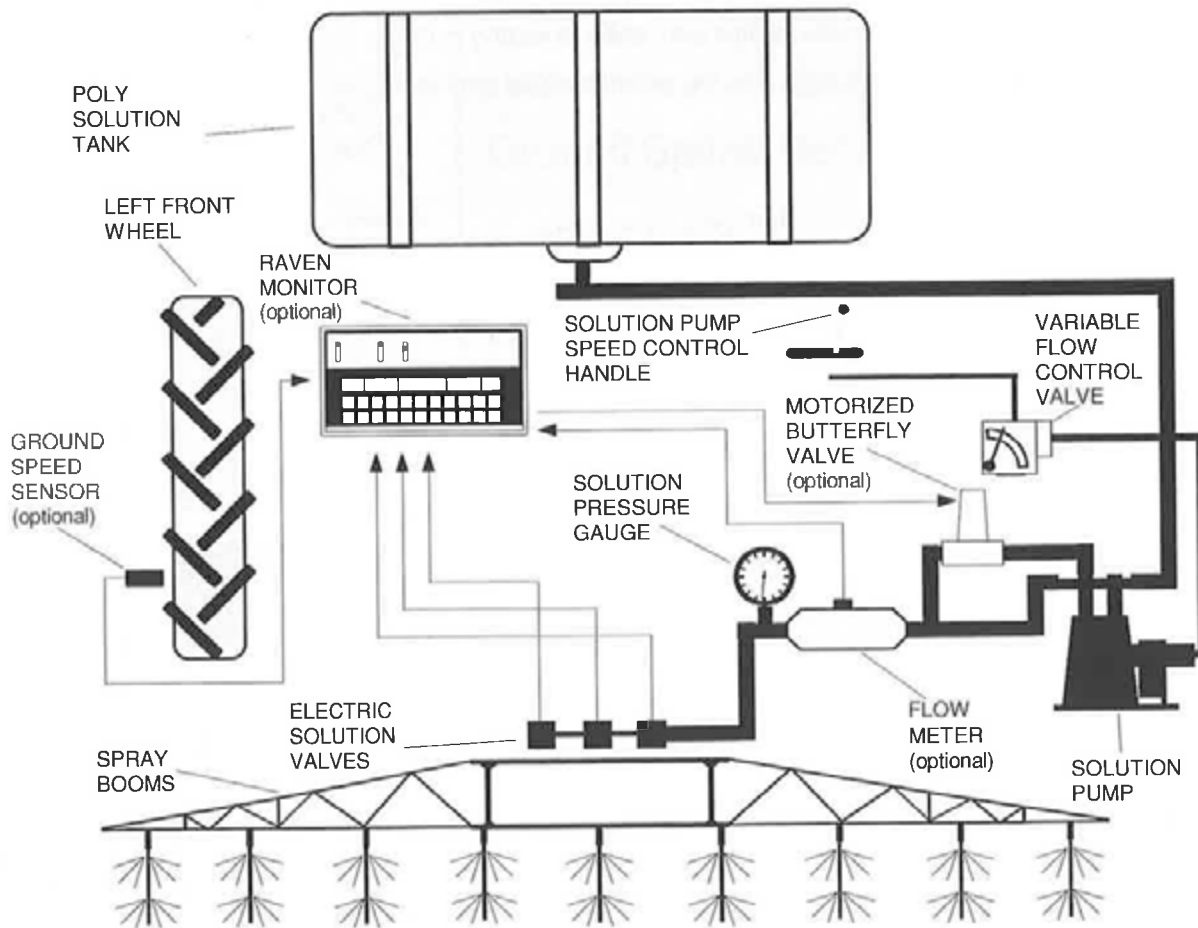
The spraying system is a constantly-monitored and continuously-adjusted, computer-controlled system. The cab-mounted digital monitor receives information from various inputs to help determine GPM (gallons per minute) and GPA (gallons per acre).

The wheel-mounted ground speed sensor sends a signal to the monitor. The flow meter calculates the gallons per minute and relays this

information to the monitor. The monitor in-turn adjusts the solution butterfly valve accordingly. The pressure gauge gives the operator a visual check on solution output. The spray boom electric solution valves assist in determining gallons per acre and let the monitor know if they are on or off so it can adjust accordingly.

All of these variables come in to play to determine desired solution application.

OPERATING
INFORMATION



SPRAYING SYSTEM CONTINUED →

V. OPERATING INFORMATION

➔ SPRAYING SYSTEM CONTINUED

SPRAY SYSTEM OPERATION INSTRUCTIONS

OPERATION	PAGE REFERENCE
1. Calibrate spraying system.	73-74
2. Check contents and quantity in spray tanks.	54
NOTE: Never attempt to operate the spray system without solution in the spray tanks. Operating the spray system with no solution in the tanks will cause severe damage and void the warranty.	
3. Completely open the tank valves.	56
4. Start engine and maintain a relatively low engine RPM setting (1150 RPM). Increase engine RPM slowly until full recommended operating RPM is reached.	30-31
5. If desired, activate the agitation system.	58
6. Move pump lever forward to desired solution pressure.	50
7. Turn on the main solution floor switch.	53
8. Place individual boom solution valve switches to the "ON" position.	52
9. Slowly move the hydrostatic control lever forward to obtain the desired ground speed.	33
10. Frequently observe the pressure gauge. When it drops to zero, or spray pattern deteriorates, shut off main solution switch, solution pump, and agitation system until refilling solution.	50, 53, 50, 58, 57

V. OPERATING INFORMATION



FIG 5.34

Spray System Monitor (optional)

The spraying system monitor (fig. 5.34) receives inputs from various sensors including a flow meter, ground speed sensor, and electric boom solution valves. These inputs determine solution flow. For more information regarding the monitor, refer to the handbook that accompanies this manual. For information on calibration see page 73-74.

Flow Meter (optional)

The solution flow meter (fig. 5.35, item 1) is mounted in-line after the solution pump. It monitors solution flow in gallons per minute. If the flow signal it sends to the monitor is too low, the monitor closes the solution flow valve on the pump return line. If it's too high, the monitor opens the solution flow valve.

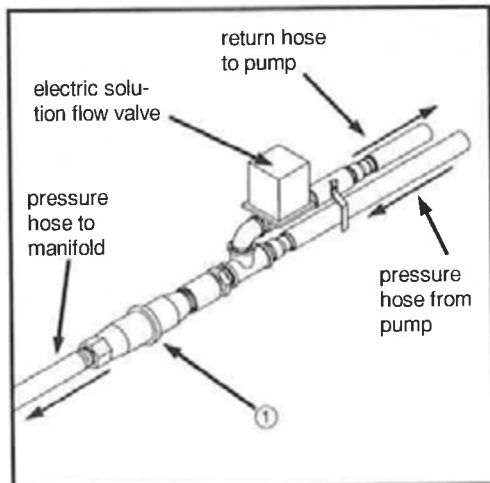


FIG 5.35

Ground Speed Sensor (optional)

A series of magnets mounted on the left front wheel and a sensor mounted on the left front leg aid in determining the sprayer's ground speed (fig. 5.36). The higher the ground speed, the more solution needs to be applied for the gallons per acre to remain the same. The monitor will adjust the solution flow butterfly valve automatically to match ground speed within a preset window of operating speed (see monitor handbook).

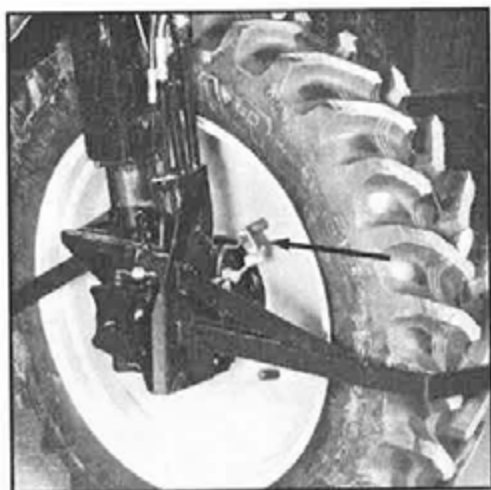


FIG 5.36

SPRAYING SYSTEM CONTINUED ➔

V. OPERATING INFORMATION

➔ SPRAYING SYSTEM CONTINUED

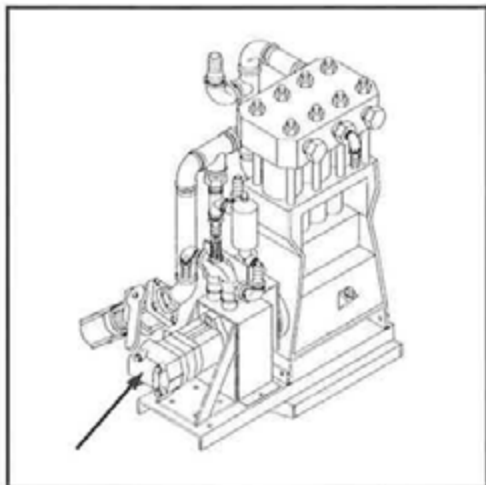


FIG 5.37

Solution Pump

The solution pump is a hydraulically driven high pressure pump (fig. 5.37) with variable speed control. Engage the solution pump while at an engine RPM setting of 1150 RPM. Increase engine RPM slowly and maintain full recommended throttle RPM for field operation.

NOTE:

DO NOT allow the pump to continue running when the boom switches are turned off. Failure to do so will generate over-heating and cause severe pump damage and void the warranty.

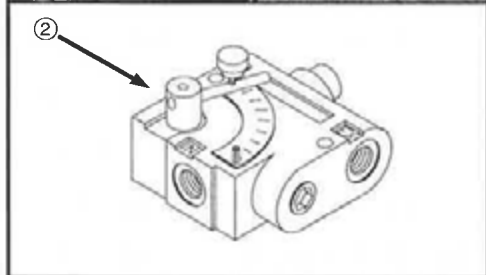
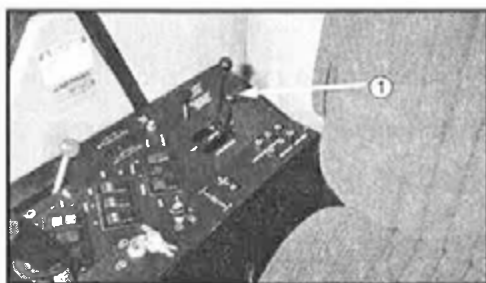


FIG 5.38

Variable Flow Control Lever

To activate the solution pump, push the solution pump lever (fig. 5.38, item 1) forward to open the solution pump variable flow control valve (fig. 5.38, item 2) which delivers oil to the solution pump's hydraulic motor. The farther you move the lever forward, the faster the pump operates.

Solution Pressure Gauge

The solution pressure gauge (fig. 5.39) gives the operator a constant visual display of the amount of solution being applied (measured in PSI). The pressure (if controlled by the optional monitor-controlled butterfly valve) will vary according to ground speed. If applying solution manually, the solution pressure gauge visually informs the operator of needed manual adjustments.

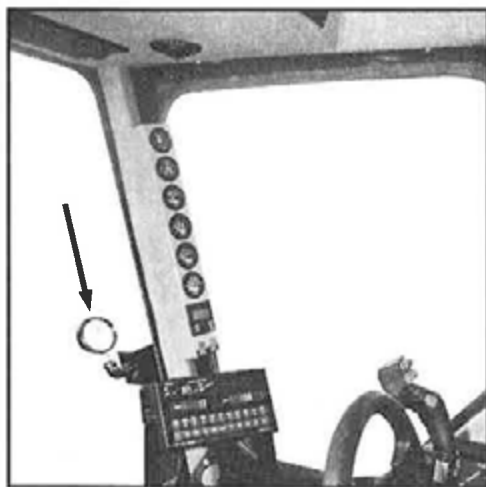


FIG 5.39

V. OPERATING INFORMATION

Bean Pump Relief Valve

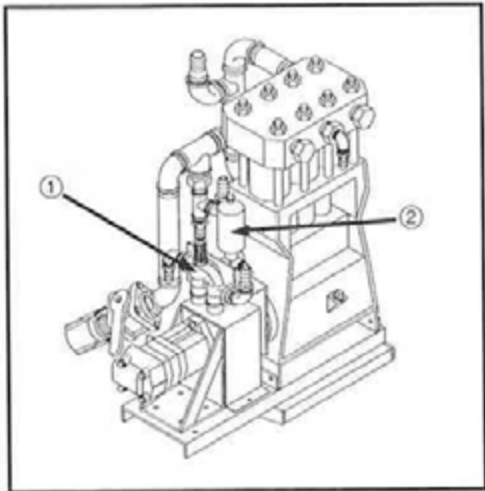


FIG 5.40

The unloader (or relief) valve (fig. 5.40, item 1) on your Bean pump protects your spraying system against the shock of sudden pressure surges caused by sprayer shut-offs or clogged nozzles. The pump pressure drops during the unloading cycle, making it easier on the pump and the entire system. Excess liquid is returned to the suction line until the sprayer shut-off is reopened. The pressure in the discharge line after unloader remains at operating pressure during unloading cycle. Unloader valves are adjustable within their pressure range by tightening or loosening the adjusting spring (fig. 5.41, item 1).

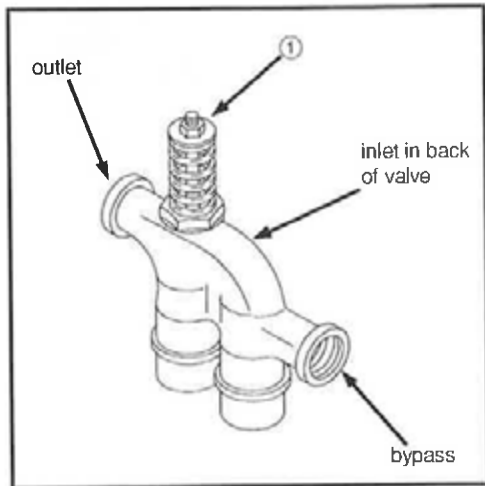


FIG 5.41

To adjust the unloader valve pressure, while the pump is running (with clean water), turn nut below spring with wrench while holding plunger rod with other wrench (fig. 5.43). Check reading on pressure gauge as you turn. All nozzles should be fully opened when adjusting the unloader valve.

NOTE:

If equipped with a monitor option, you must manually close the valve on the solution return line (fig. 5.42) while adjusting relief valve. Re-open the valve before continuing operation.

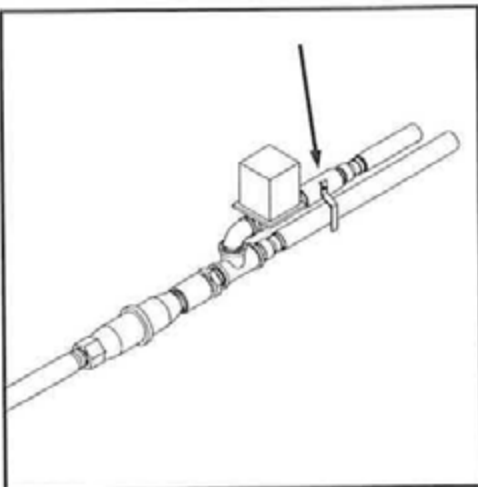


FIG 5.42

Bean Pump Surge Tank

See page 113 for information on the Bean pump surge tank (fig. 8.40, item 2).

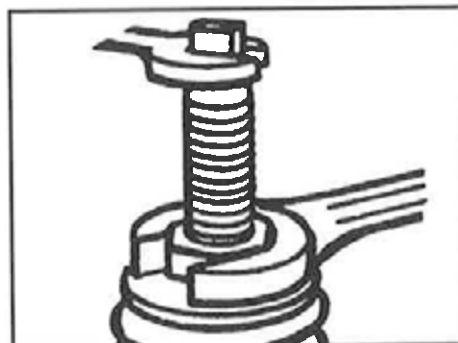


FIG 5.43

SPRAYING SYSTEM CONTINUED →

OPERATING
INFORMATION

V. OPERATING INFORMATION

➔ SPRAYING SYSTEM CONTINUED



FIG 5.44

Electric Solution Valves

The spray booms are divided into three sections that are independently supplied with solution and can therefore independently be shut off or turned on. The solution valve manifold is located on the transom (fig. 5.44).

Boom Valve Switches

The electronic boom solution valves are controlled by a row of switches mounted on the console in the cab (fig. 5.45). When the switches are in the "UP" position they are on and when they are in the "DOWN" position they are off.



FIG 5.45

V. OPERATING INFORMATION



FIG 5.46

Main Solution Switch

The main solution switch is a floor-mounted "dimmer-style" switch (fig. 5.46). It controls the power supply to the panel of boom solution valve switches (fig. 5.47). The main floor switch must be on to supply the panel switches with voltage. This way you can turn all of the boom solution valves "ON" or "OFF" all at once in a hands-free execution such as turning the main solution switch "OFF" as you arrive at the end rows of a field and turning it back "ON" as you enter the field again (fig. 5.48).

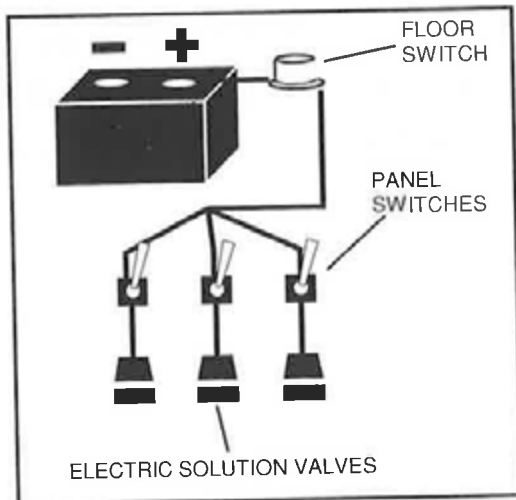


FIG 5.47

When the main solution switch is "ON" a "GREEN" indicator light mounted at the bottom of the instrument panel will light up. When the light is not lit, the main solution switch is "OFF."

OPERATING
INFORMATION

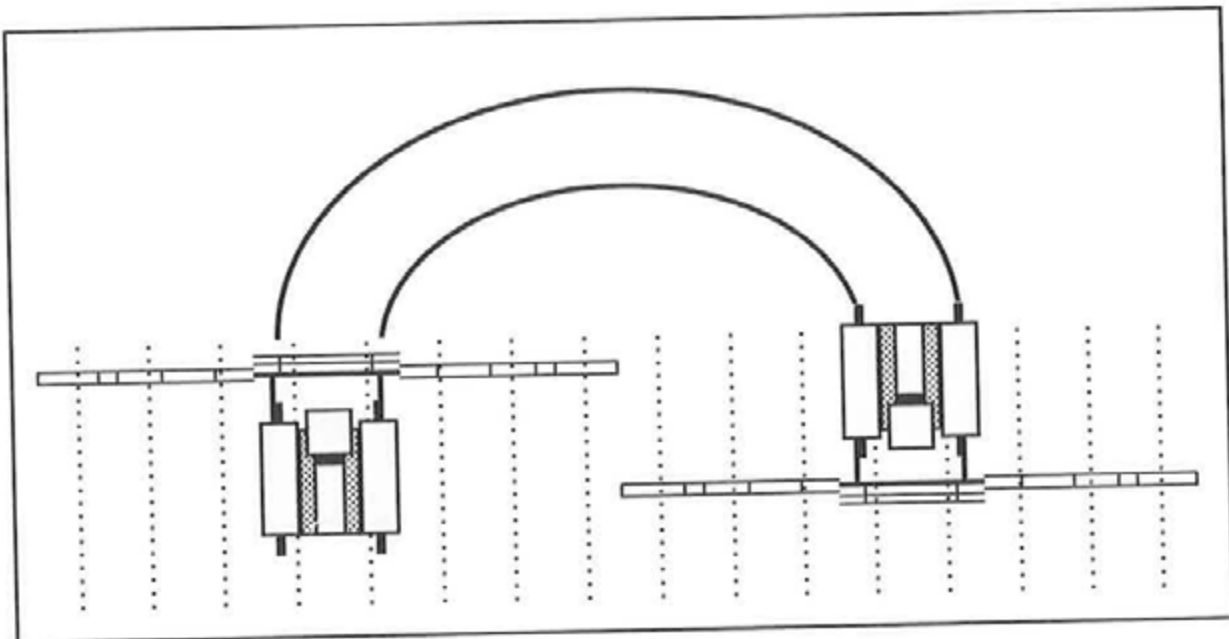


FIG 5.48

V. OPERATING INFORMATION

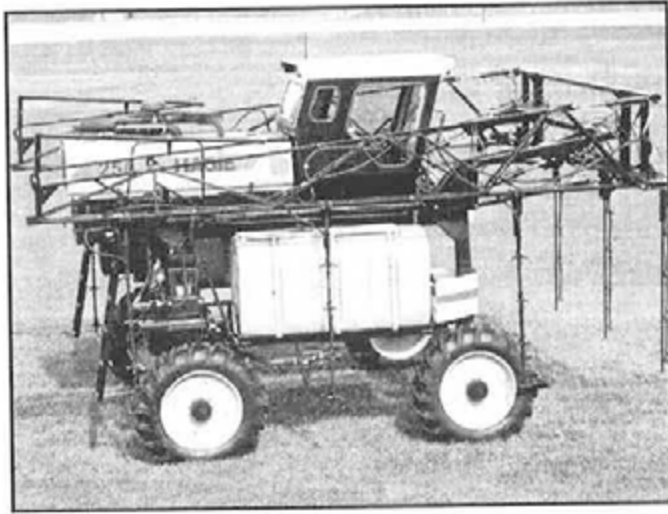


FIG 5.49

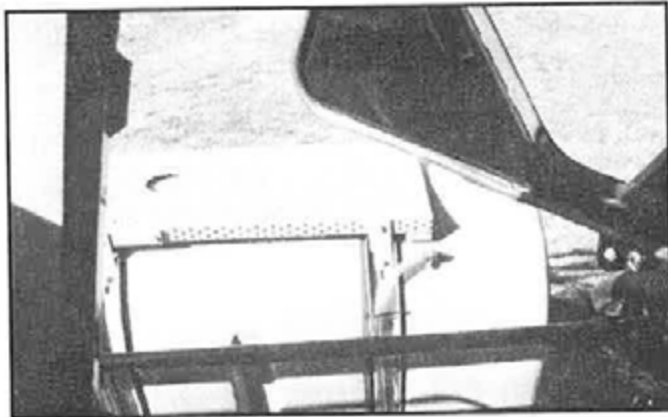


FIG 5.50

Dual Solution Tanks

The model 254x-11 comes equipped with either two 250-gallon polyethylene or stainless steel solution tanks equipped with mechanical agitation (see pages 58-59). These tanks are held in place by a cradle support rod (fig. 5.51, item 2). See the next page for tank cradle adjustment.

The strainer on top of each tank (fig. 5.51, item 1) should always be in place to catch debris or objects from falling into the tank when the tank lid is removed. Both solution tanks come equipped with sight gauges showing solution level (fig. 5.50).

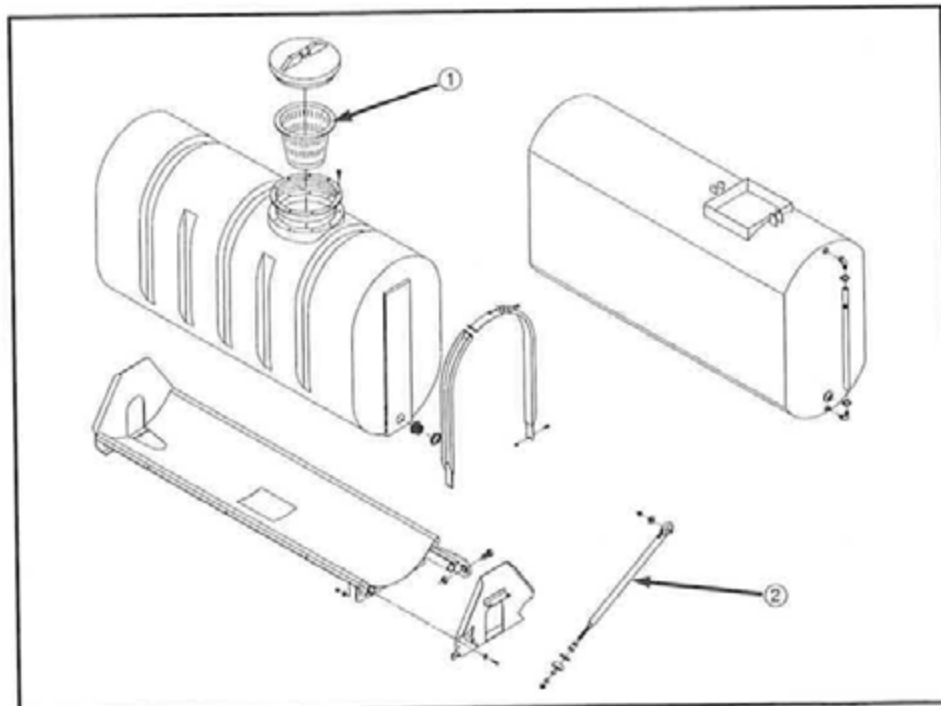


FIG 5.51

V. OPERATING INFORMATION

Solution Tank Rod Adjustment

Loosen the two jam nuts (fig. 5.52, items 2) on the tank support rod (fig. 5.52, item 1) and adjust the nut (fig. 5.52, item 4) until the tank is in a vertical position. Adjust the two jam nuts until the rubber pad (fig. 5.52, item 3) makes contact with the

mounting bracket (fig. 5.52, item 5).

NOTE:

DO NOT compress the rubber pad.

Lock the two jam nuts in place.

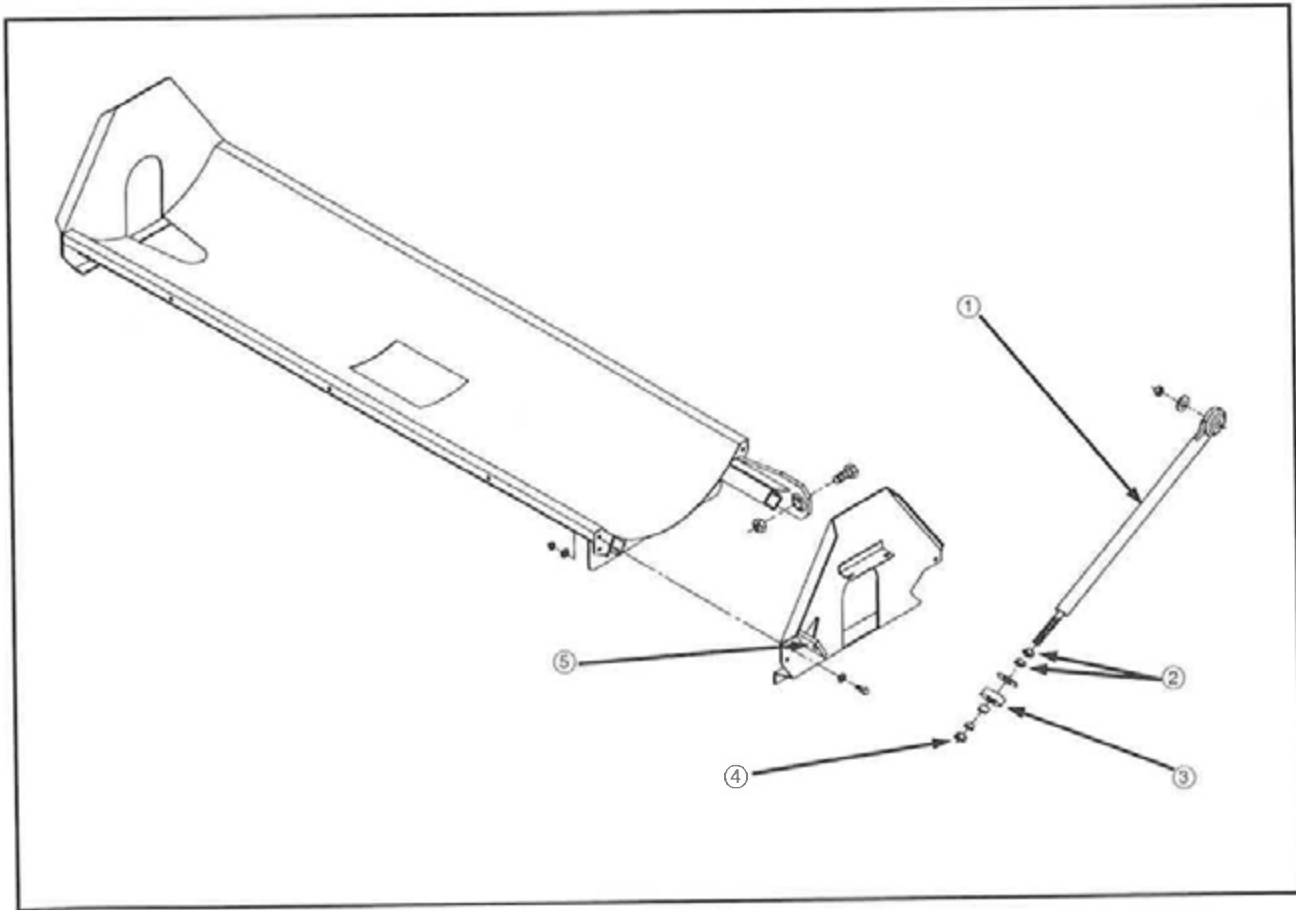


FIG 5.52

OPERATING
INFORMATION

V. OPERATING INFORMATION

▶ SPRAYING SYSTEM CONTINUED

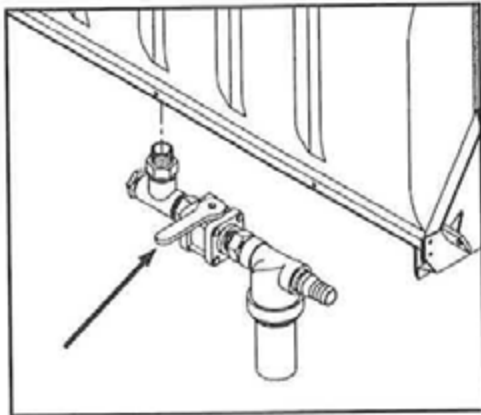


FIG 5.53

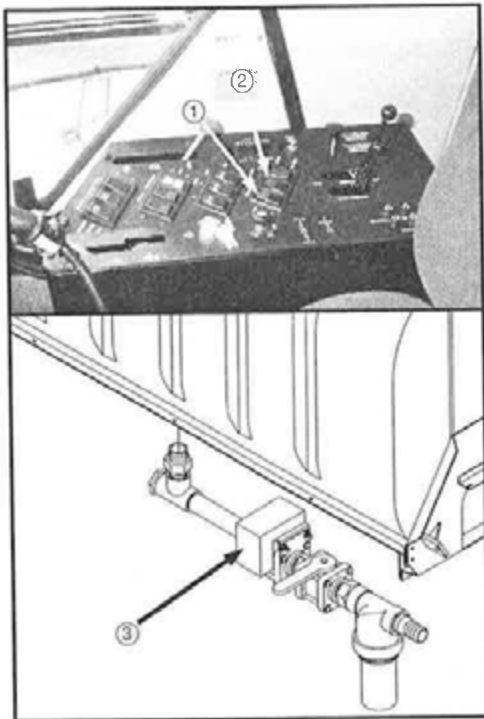


FIG 5.54

Tank Shutoff Valves

To shutoff either or both solution tank sumps, manually close either or both 1½" ball valve(s) located under each solution tank (fig. 5.53). Your sprayer may be equipped with optional 1½" electric tank shutoff valves (fig. 5.54, item 3).

To operate the electric tank shutoff valves, locate the solution tank switches in the console. To open or close the left solution tank, depress the "OPEN" or "CLOSED" side of the left switch (fig. 5.54, item 1). To open or close the right solution tank, depress the "OPEN" or "CLOSED" side of the right switch (fig. 5.54, item 2).

Utilize the tank shutoff valves when: 1 - you wish to draw solution from only one tank or the other; or 2 - you are operating on unlevel ground such as a hillside or terrace and you don't want solution to siphon from one tank to the other (fig. 5.55).

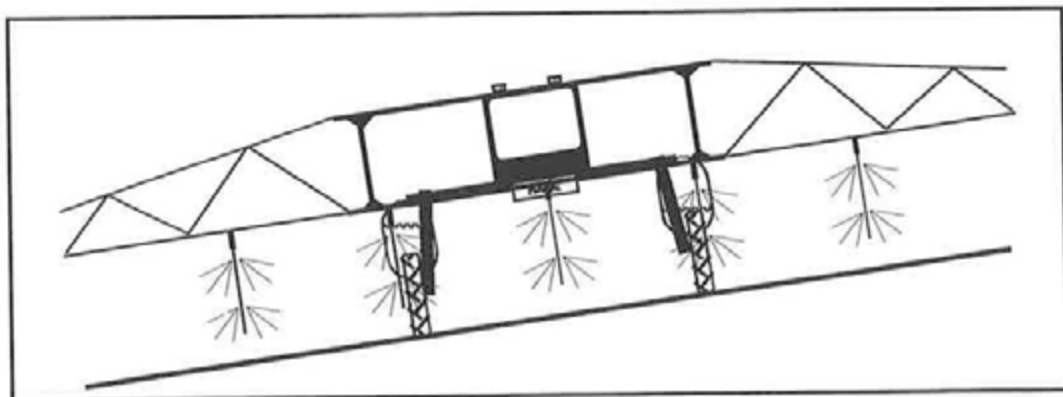


FIG 5.55

V. OPERATING INFORMATION

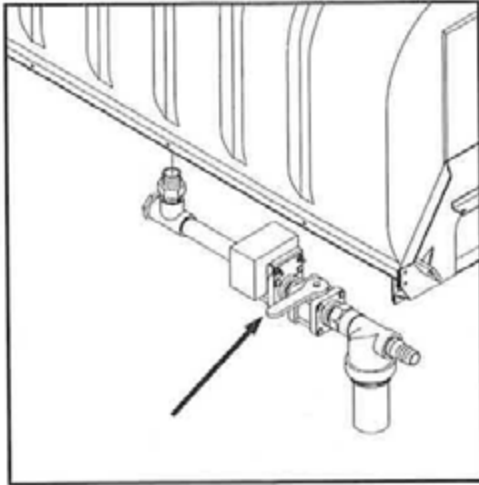


FIG 5.56

Quick Fill

To fill the solution tanks, make sure the tank shutoff valve (fig. 5.56) under the tank you want to fill is open (you may fill both at the same time). Open the valve on the quick fill attachment (fig. 5.57).

Connect your solution supply and fill to the desired level. When done, close the quick fill valve.

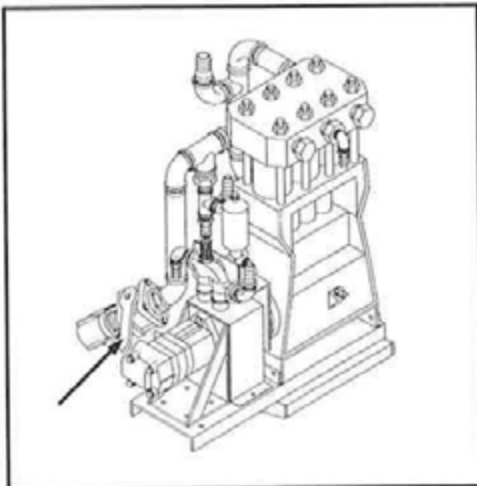


FIG 5.57

OPERATING
INFORMATION

OPERATING INFORMATION CONTINUED →

V. OPERATING INFORMATION

AGITATION SYSTEM



FIG 5.58

The Hagie 254x-11 comes standard with a hydraulically-driven mechanical agitation system to maintain suspension of solution in the sprayer's tanks.

To activate the system push the "TANK AGITATION" lever (fig. 5.58) forward, opening the hydraulic variable flow control valve (fig. 5.59). This will deliver hydraulic fluid to agitator motors on both solution tanks (fig. 5.60) turning the agitator shaft assemblies clockwise. The further you push the lever ahead, the faster the agitation assembly shafts will rotate.

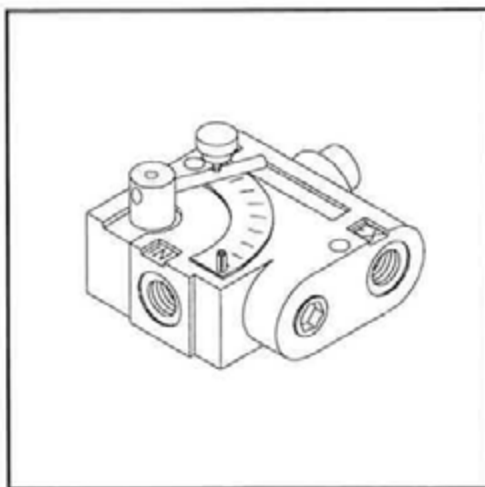


FIG 5.59

NOTE:

Operation of the agitation system with no solution in the spray tanks will void the warranty on the agitation system.

To turn the agitation system off, return the "TANK AGITATION" lever back to its original position.

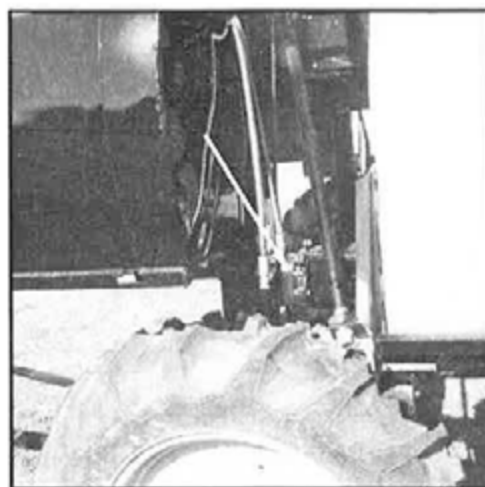


FIG 5.60

V. OPERATING INFORMATION

The gland packing (fig. 5.61, item 1) may require adjustment during start-up. If adjustment is required, shut off the agitation system and adjust the gland nut (fig. 5.61, item 2).

CAUTION

DO NOT adjust the gland nut with the agitation system running.

When replacing the packing, be sure to wrap the packing clockwise on the agitator shaft

(reference to direction when seated in the operator's seat facing forward).

The agitator motors for the solution tanks are held in place with a motor mount yoke (fig. 5.61, item 3). The yoke tap must extend through the motor mounting plate (fig. 5.61, item 4). This allows the motor to float with the agitator shaft.

NOTE:

Damage will occur to the agitator system if the motor mounting yoke is not properly installed in the motor mounting plate.

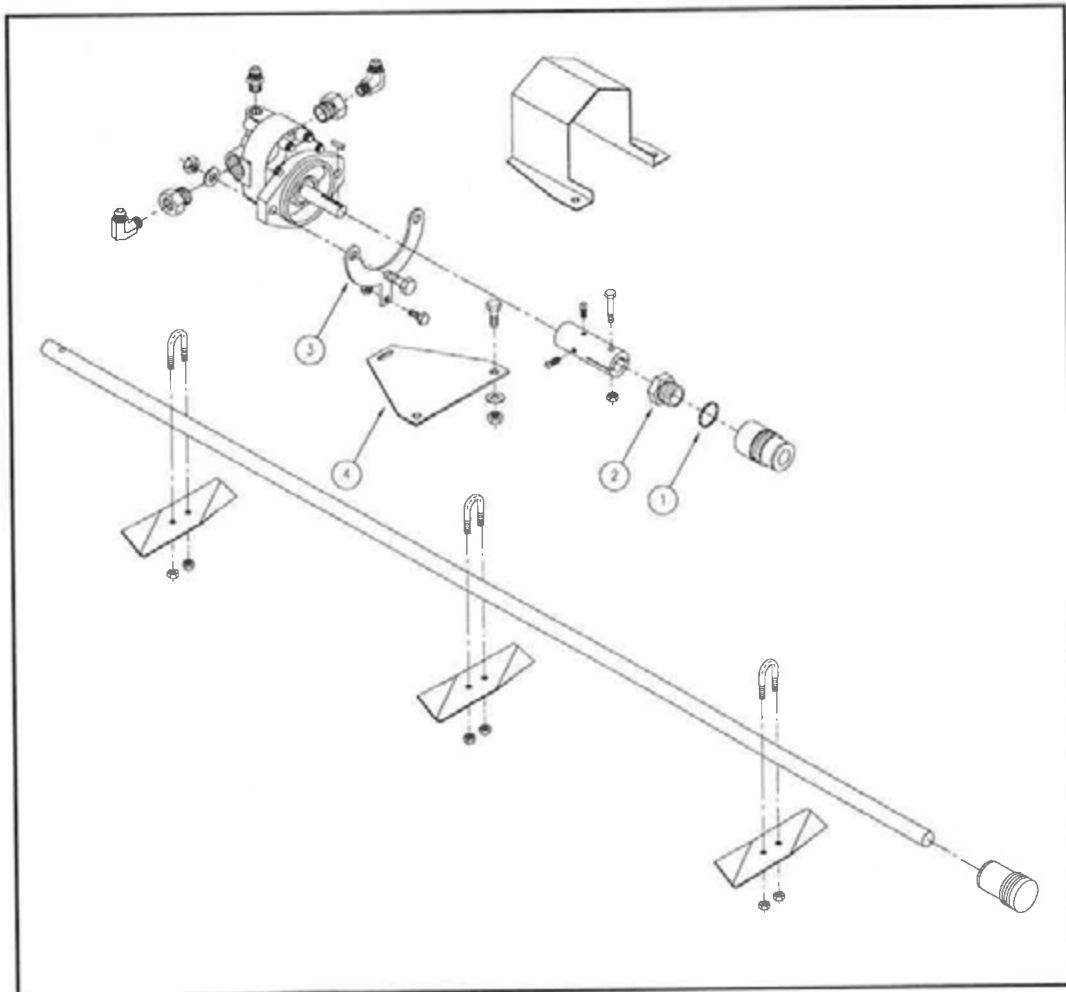


FIG 5.61

V. OPERATING INFORMATION

LIGHTS



FIG 5.62

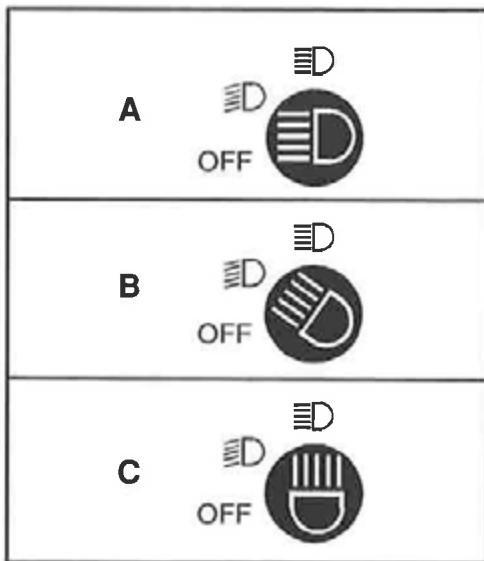


FIG 5.63



FIG 5.64

CAB LIGHTS – The front of the cab houses four halogen field lamps (fig. 5.65) and the rear houses two halogen work lamps (fig. 5.64). Locate the light switch on the console panel (fig. 5.62). Rotating the switch clockwise to the first “ON” position (fig. 5.63B) will activate two of the front cab lights. Rotating the switch clockwise to the second “ON” position (fig. 5.63C) will activate the other two front cab lights in addition to the two rear cab lights.

The ignition key does not have to be on in order to operate any of the cab lights, but extended use without the engine operating to charge the battery is not recommended.

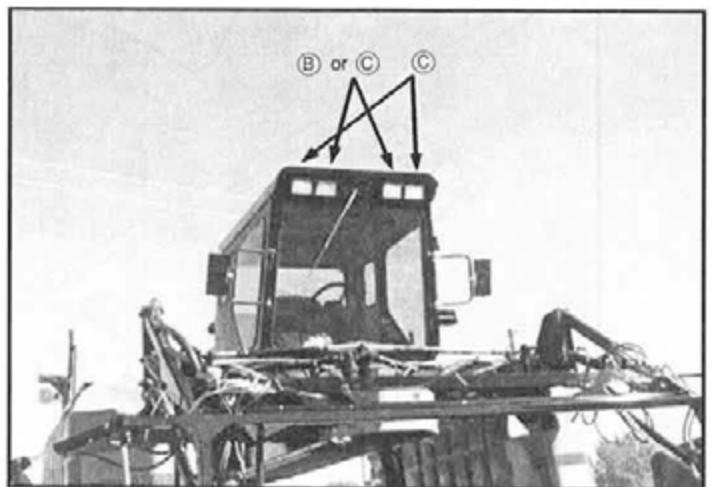


FIG 5.65

V. OPERATING INFORMATION

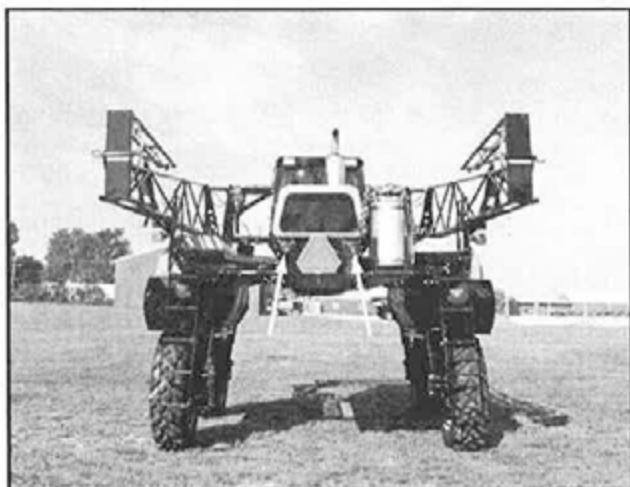


FIG 5.66

Running Lights

Activating any of the cab lights (see page 60) will also turn on the "RED" running lights on the rear of the machine (fig. 5.66).

Interior Lighting

Interior lighting is provided by a ceiling mounted dome light (fig. 5.67). The ignition key must be in the "OPERATING" position for the interior light to operate.

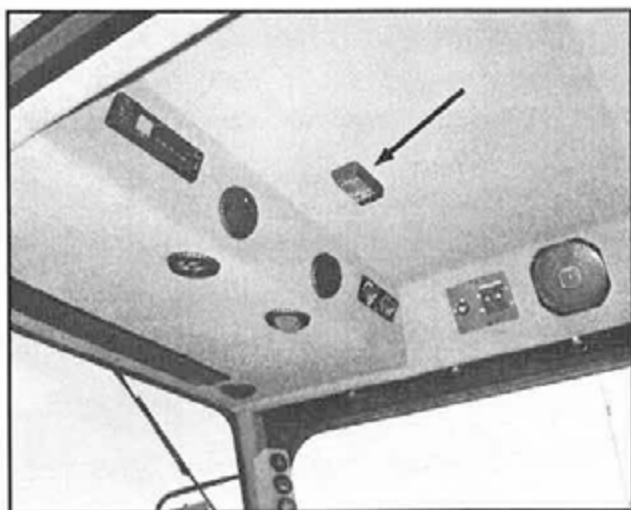


FIG 5.67

OPERATING
INFORMATION

LIGHTS CONTINUED →

V. OPERATING INFORMATION

➔ LIGHTS CONTINUED

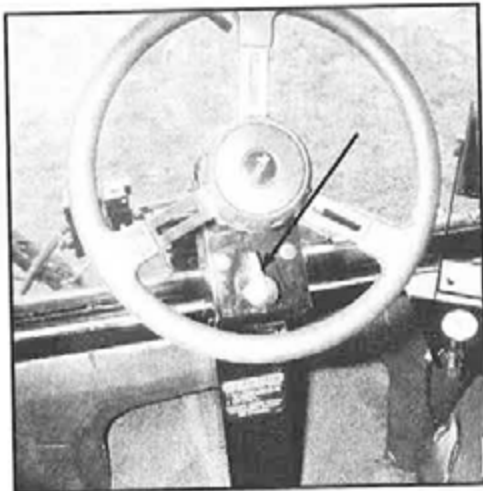


FIG 5.68

Turn Signals

To activate the front (fig. 5.70) and rear turning signals (fig. 5.71) move the turn signal lever (fig. 5.68) right during a right-hand turn and left during a left-hand turn. Steering column-mounted turn signal indicators will correspondingly flash when either side of the turn signals is activated. The turn signal lever is not a self-centering switch; you must return it to the "OFF" position by hand after completing your turn.

Hazard/Warning Lights

To activate the flashing hazard/warning lights (fig. 5.70) depress the "FLASHER" switch to the "ON" position (fig. 5.69). Activate the hazard/warning lights anytime traveling on a public road, day or night, unless prohibited by law.



FIG 5.69



FIG 5.70

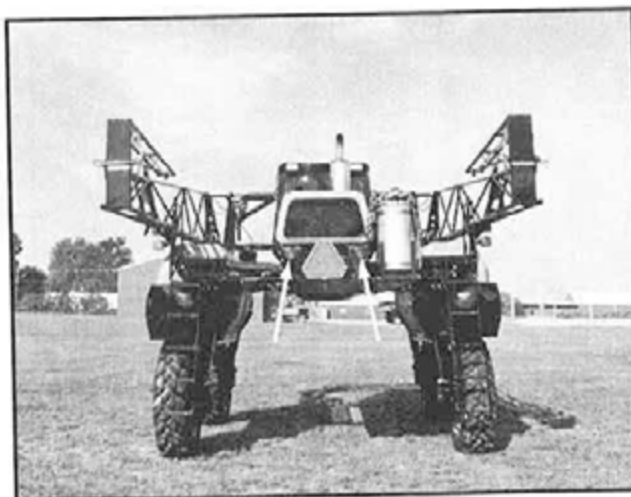


FIG 5.71

V. OPERATING INFORMATION

HAGIE 254x-11 CAB

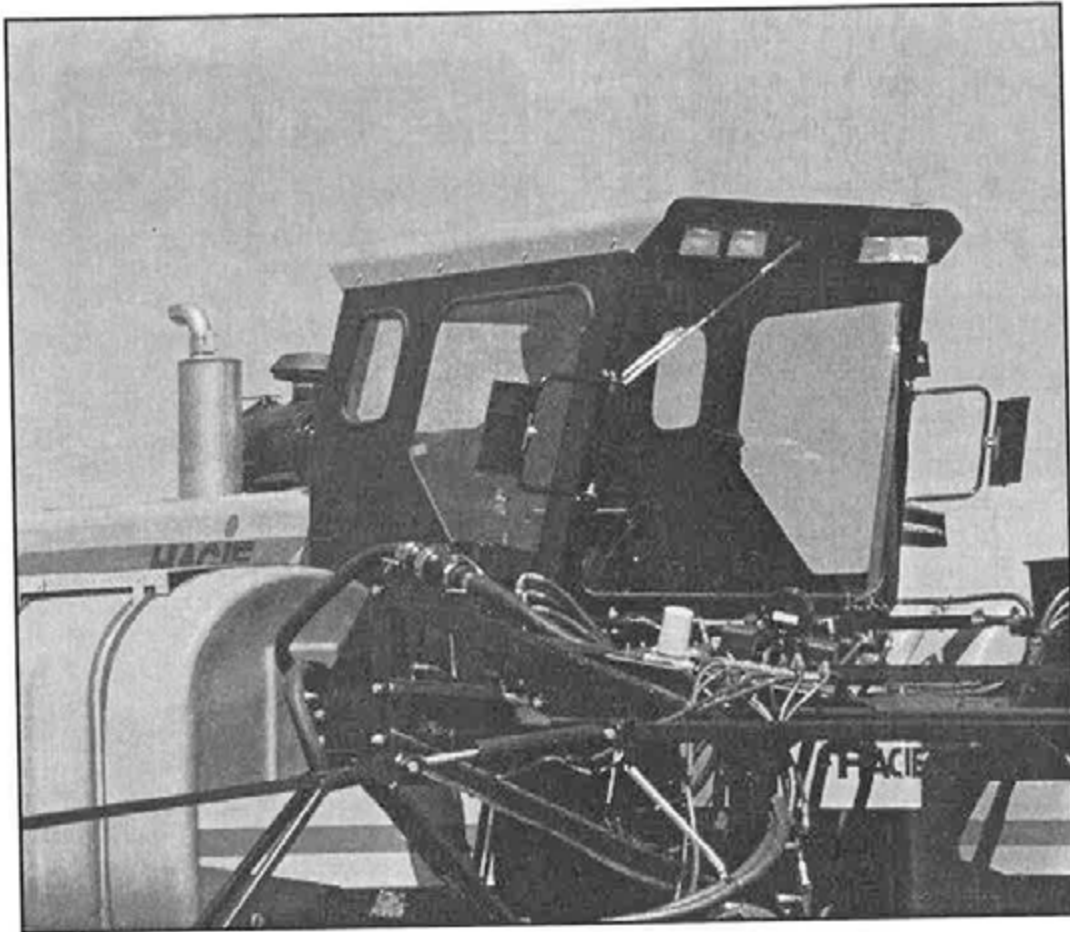


FIG 5.72

Emergency Exit.....	64
Parking Brake	65
Climate Controls	66
Radio	67
Windshield Wiper.....	67
Instrumentation	68
Air Suspended Seat	71
Steering Column	72
Auxiliary Power Supplies.....	72

OPERATING
INFORMATION

CAB OPERATION CONTINUED →

V. OPERATING INFORMATION

➔ CAB OPERATION CONTINUED

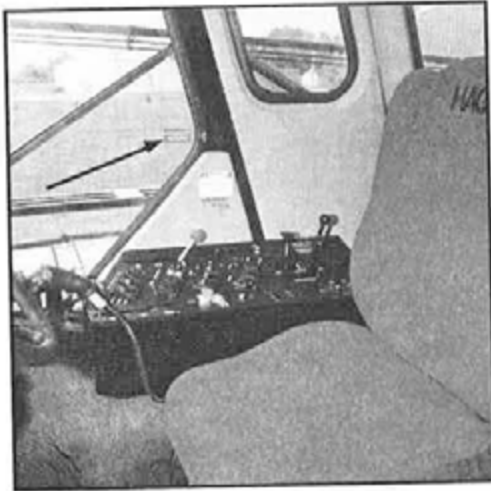


FIG 5.73



FIG 5.74

EMERGENCY EXIT

PULL TAB
REMOVE FILLER STRIP
PUSH WINDOW OUT

650320

Emergency Exit

The right window in the cab is removable in the event that an emergency exit is required. To remove the right window:

1. Grasp and pull the tag of the nylon ring next to the emergency exit decal (fig. 5.74) to remove the extrusion cord (fig. 5.75, item 1).
2. Push window outward until clear of window opening.
3. Climb out through window and away from hazardous situation.

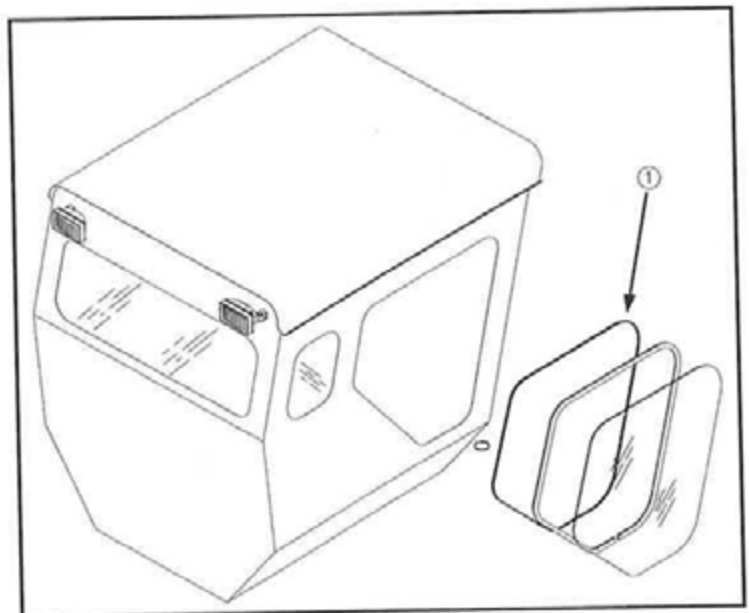


FIG 5.75

V. OPERATING INFORMATION

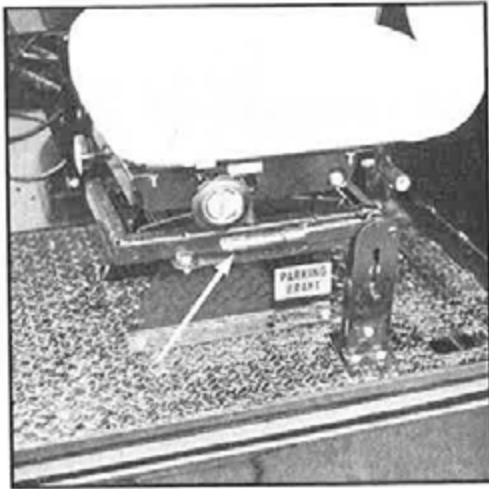


FIG 5.76

Parking Brake

The mechanically applied parking brake is located on the floor to the left of the operator's seat (fig. 5.76).

Activate the parking brake by pulling it up and back (fig. 5.77) If it is difficult to pull back, you can adjust the tension by adjusting the knob on the end of the lever (fig. 5.78). Turn it counter-clockwise to loosen and clockwise to tighten. DO NOT over loosen the parking brake adjusting knob.

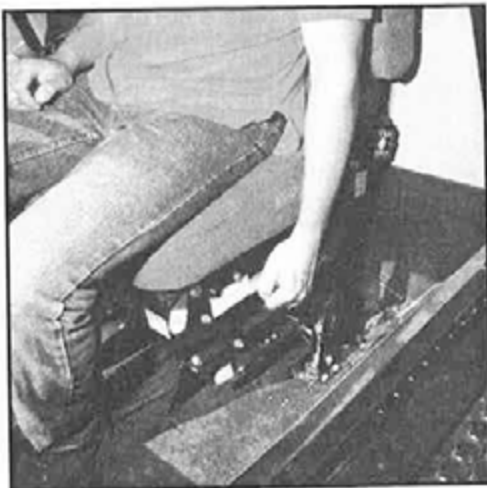


FIG 5.77

⚠ CAUTION
Over loosening of the parking brake adjustment knob may cause the brake to be ineffective.

OPERATING INFORMATION

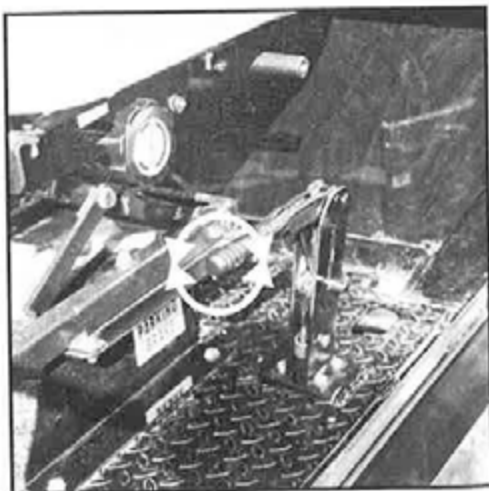


FIG 5.78

CAB OPERATION CONTINUED →

V. OPERATING INFORMATION

➔ CAB OPERATION CONTINUED

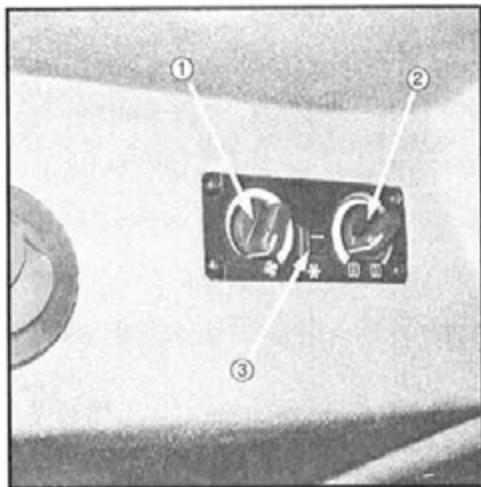


FIG 5.79

Climate Controls

ADJUSTING FAN BLOWER SPEED - Fan blower speed is controlled by the left rotary dial on the cab climate control panel (fig. 5.79, item 1). The fan blower speed is a continuously variable adjustment. To increase fan speed, rotate fan blower dial clockwise. To reduce fan speed, rotate fan blower dial counterclockwise. To shut fan blower off, rotate fan blower dial all the way counterclockwise.

ADJUSTING TEMPERATURE SETTING - Forced air temperature adjustments are controlled by the right rotary dial on the cab climate control panel (fig. 5.79, item 2). Temperature control is a continuously variable adjustment. To increase forced air temperature, rotate temperature dial clockwise. To decrease forced air temperature, rotate temperature dial counterclockwise.

OPERATING AIR CONDITIONING - To activate the air conditioner, depress the air conditioning switch (fig. 5.79, item 3). Adjust fan speed and temperature accordingly.

ADJUSTING VENTS - Air vents may be adjusted by rotating them for desired direction (fig. 5.80) or individually turned on or off with the directional fins (fig. 5.81).

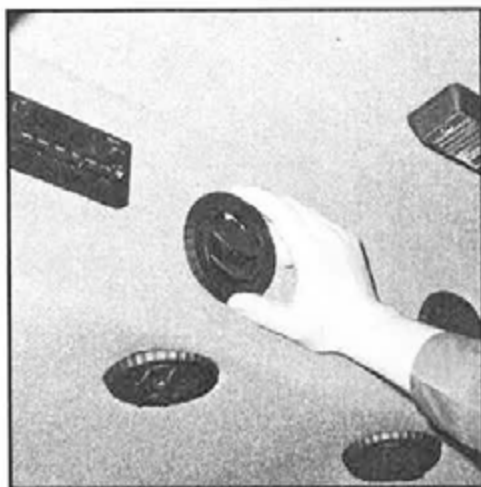
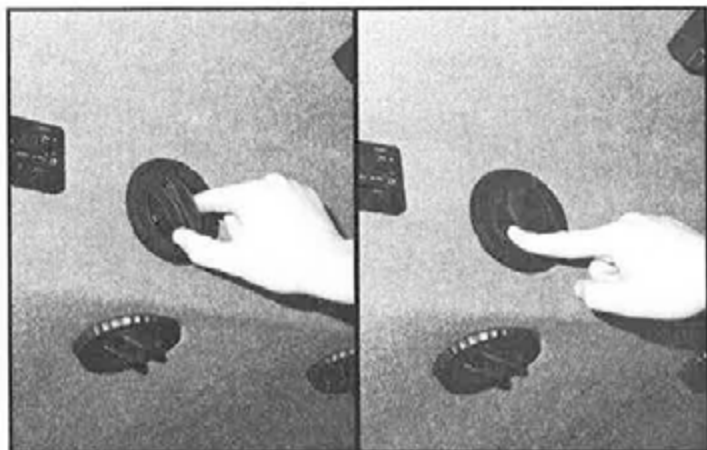


FIG 5.80

SERVICING A/C SYSTEM - See page

89 and page 93 for service information.



A

B

FIG 5.81

V. OPERATING INFORMATION

Radio

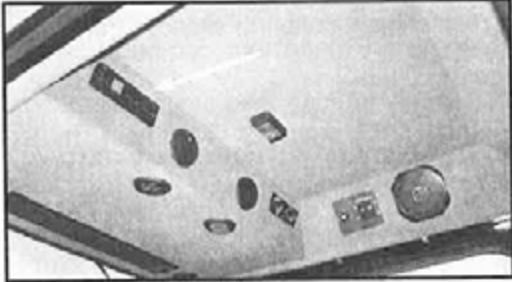


FIG 5.82

Your Hagie 254x-11 is equipped with an auto reverse AM/FM cassette tuner (fig. 5.82) and two speaker system. For stereo system operation and installation information refer to the radio owner's manual that accompanies this operator's manual.

Windshield Wiper

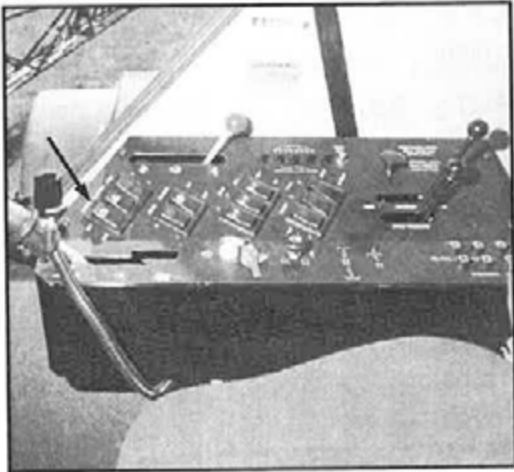


FIG 5.83

To turn the windshield wiper on, locate the windshield switch toward the front of the console panel (fig. 5.83). Depress the switch to the "ON" position. The wiper will continue to operate until the switch is returned to the "OFF" position.

OPERATING
INFORMATION

CAB OPERATION CONTINUED →

V. OPERATING INFORMATION

➔ CAB OPERATION CONTINUED

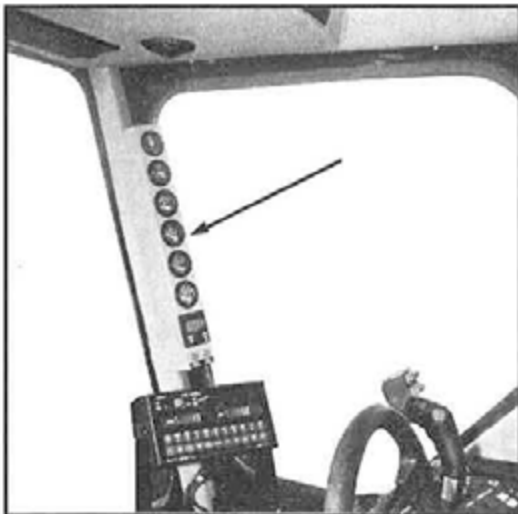


FIG 5.84

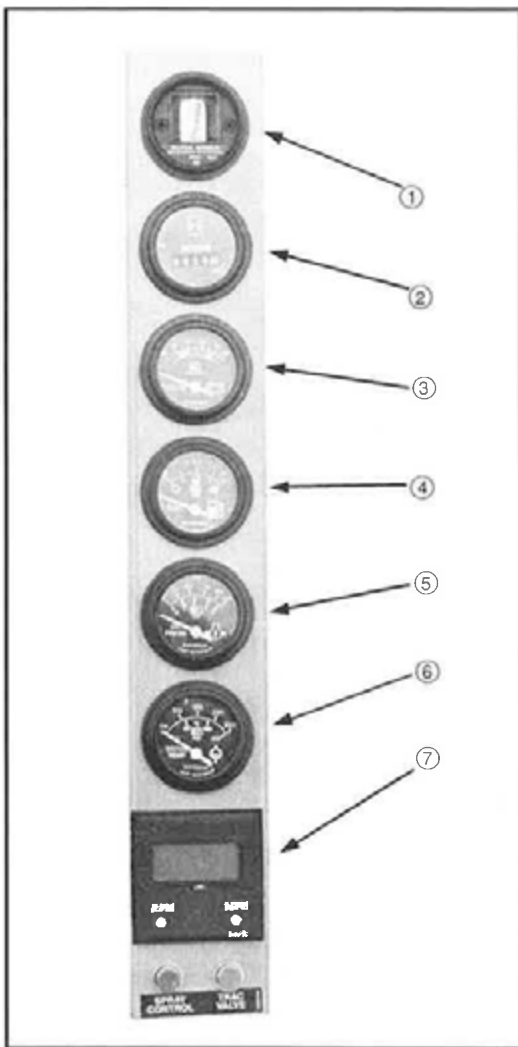


FIG 5.85

Gauge Panel

Filter Minder® - (fig. 5.85 item 1) The Filter Minder® is an engine air filter restriction monitoring device. For more information, see page 91.

Hour Meter - (fig. 5.85, item 2) The hour meter progressively records elapsed time of sprayer operation. It is useful for determining service intervals.

Volt Meter - (fig. 5.85, item 3) The volt meter measures voltage from the alternator on the diesel engine. A "RED" indicator light will alert the operator if the system is operating either too low or too high.

Fuel Gauge - (fig. 5.85, item 4) The fuel gauge measures the amount of fuel in the fuel tank. A "YELLOW" indicator light alerts operator of low level operation.

Engine Oil Pressure - (fig. 5.85, item 5) The oil pressure gauge monitors pressure of the engine lubricating system. A "RED" indicator light alerts the operator of low level operation.

Water Temperature - (fig. 5.85, item 6) The water temperature gauge monitors the engine cooling system. A "RED" indicator light alerts the operator of unsafe operating temperatures.

Speedometer/Tachometer - (fig. 5.85, item 7) Unit will display either engine RPM or speed of travel depending on operator's selection. See next page for more information on the speedometer/tachometer.

NOTE:

Immediately reduce engine speed and shut off ignition if any of the above "RED" indicator lights illuminate. Determine cause and correct before continuing operation.

V. OPERATING INFORMATION

Speedometer/Tachometer

The speed/tach unit is programmable with a digital read-out indicating MPH or RPM. The parameters have been factory set.

Turn the ignition key to the "ON" position. The display will show "0000", which indicates RPM. Press the MPH button; the readout will display "00.0" which indicates MPH.

To check the parameter settings, press the desired button and hold until four "8"s are shown, then release (fig. 5.86B). The parameter setting will be displayed for four seconds.

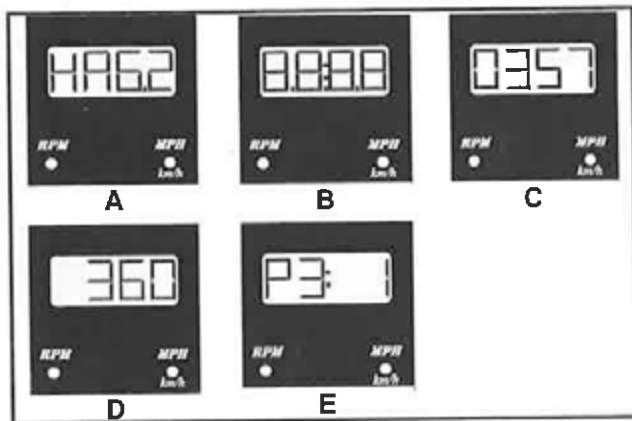


FIG 5.86

A = Torque-Hub® reduction	$\frac{168 \times A \times B}{C} = X$
B = speedometer ring pick-up	
C = tire static load radius	
Y = MPH parameter setting	$\frac{600,000}{X} = Y$

FIG 5.87

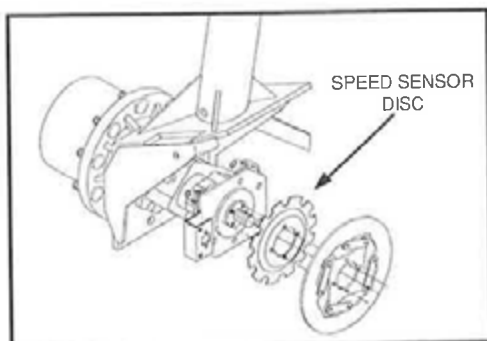


FIG 5.88

PARAMETER SETTING

RPM 357 (fig. 5.86C)

MPH (12.4-28 tire) - 360 (fig. 5.86D)

To change or re-enter the parameters, press the desired button and hold in until the four "8"s are displayed. Release the button and the parameter setting will appear. If you want to increase the setting, press the RPM button. To decrease, press the MPH button.

PROGRAMMING MPH - To program the MPH, use the formula from figure 5.87. Example (12.4-28 tires): 168 divided by rear tire static load radius of 22.6 inches times Torque Hub® reduction of 24.85 times number of speedometer ring pick-up sensors on wheel motor (fig. 5.88) of 9 equals 1662.5; 1662.5 divided into 600,000 equals parameter setting of 360.

This parameter setting should be checked when you receive your sprayer.

ADDITIONAL PARAMETERS - To access the miscellaneous parameters screen (fig. 5.86E), hold down both buttons at the same time until the screen with four "8's" appears.

Use the RPM button to scroll the parameter settings (P3 = power-up display, P4 = signal tracking speed, P5 = input device). Use the MPH button to change the setting of the displayed parameter (either 0 or 1).

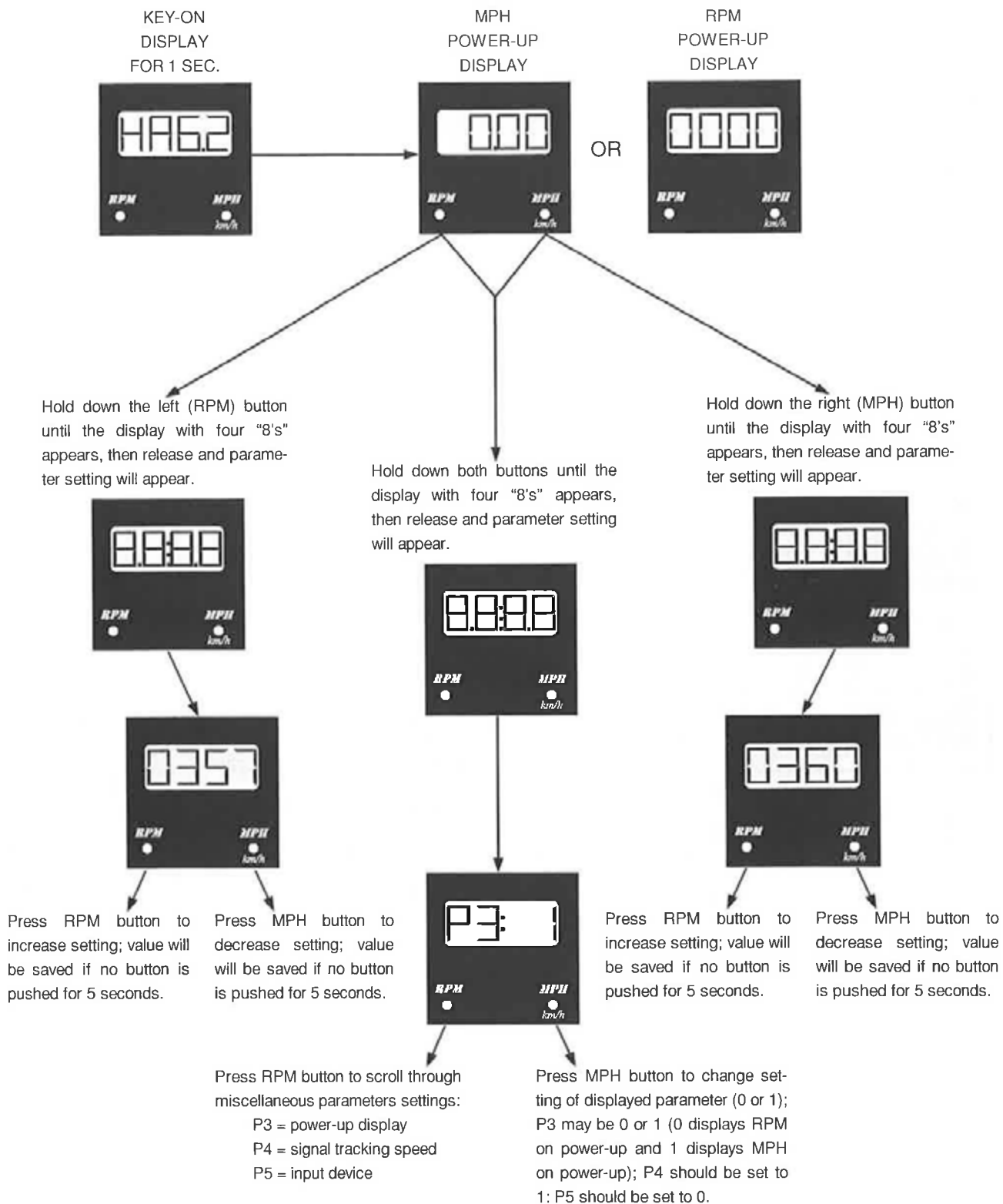
See the next page for more information.

SPEEDOMETER/TACHOMETER CONTINUED ➔

V. OPERATING INFORMATION

➔ SPEEDOMETER/TACHOMETER CONTINUED

Speedometer/Tachometer Display Screen Quick Reference Chart



V. OPERATING INFORMATION

Air Suspended Cab Seat

- 1- **Ride Firmness.** Pull knob out to release air and "soften" ride. Push knob in to pump air and "stiffen" ride. (Ignition key must be in the "ON" position in order to activate the seat pump.)
- 2- **Fore-Aft Adjustment.** Release fore-aft lock by pulling lever out. Slide forward or back to desired position. Release lever to lock.
- 3- **Height Adjustment.** Release height lock by pulling lever up. Apply body weight slowly to lower seat position or remove body weight slowly to raise seat position. When at desired height release lever to lock.
- 4- **Back Angle Adjustment.** Rotate knob counter-clockwise to tilt backrest forward and clockwise to tilt backrest back.
- 5- **Armrest Adjustment.** Unzip either armrest to expose the armrest adjustment bolt. Turn bolt in to raise armrest tilt and out to lower armrest tilt (fig. 5.89, item 6).

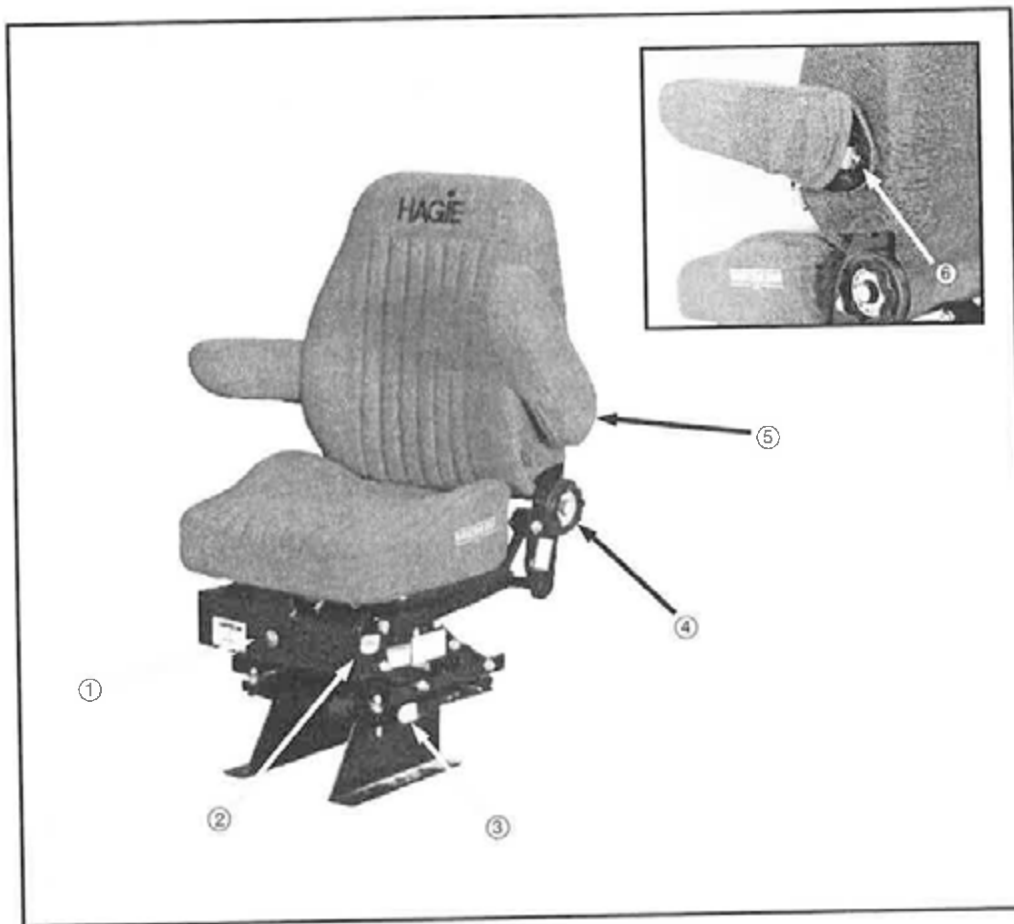


FIG 5.89

CAB OPERATION CONTINUED →

OPERATING
INFORMATION

V. OPERATING INFORMATION

➔ CAB OPERATION CONTINUED



FIG 5.90

Steering Column

To adjust the Hagie 254x-11's steering column for driver comfort or to ease cab exit and entry, locate the tilt lock lever in the center of the column (fig. 5.90). Push down on the lever to release the lock (fig. 5.91). Pull or push the column to the desired position and release the lever to re-lock the steering column.



FIG 5.91

Auxiliary Power Supplies

The Hagie 254x-11 has two auxiliary power supplies in the cab for powering 12 volt accessories. They are both "hot" regardless of ignition key position. Turn the accessory off if the engine is not running for an extended period of time.

The cigarette lighter-type (fig 5.93, item 1) and the binding post-type power (fig. 5.93, item 2) supplies are located in the panel below the spray system monitor mount. Replace the insulated plug when not using the cigarette lighter-type power supply. Auxiliary power supplies are protected by a 30 AMP circuit breaker (see page 101).



FIG 5.92



FIG 5.93

VI. CALIBRATION

CALIBRATING YOUR SPRAYING SYSTEM

It is important to apply chemicals as recommended by the manufacturers of the product. In order to do so, the spraying system must be properly calibrated. Determine the speed at which the sprayer will be driven while applying chemicals.

To select the best speed, consider the lay of the land, the condition of the soil, the type of crops, the height of the crops, etc. Select the nozzle spacing (distance between each nozzle on the spray boom) best suited for the intended spraying

job.

For help in determining the nozzle spacing and height of boom, refer to the spray product catalog that accompanies this manual. There are several types and sizes of nozzles. Select (as recommended by the catalog) and install the type and size of nozzles best suited for the intended spraying job. The type and size of nozzles selected will depend upon the speed the sprayer will travel, the nozzle spacing, and the number of gallons one intends to apply per acre.

IMPORTANT:
DO NOT ADD CHEMICALS UNTIL
CALIBRATION IS COMPLETED.

VERIFYING CALIBRATION

Check with manufacturer on recommended spray pressure. To test your system, fill the solution tanks with clean water. Do not add chemicals until calibrated and verified.

With brakes applied, start the engine of the sprayer; throttle the engine to operating speed and

remain parked. Turn on all boom section solution switches. Make sure there are no leaks and that all nozzles are spraying a desirable pattern. Continue spraying in the stationary position for at least 10 minutes for proper warm-up of the sprayer and its system. Use the Hagie Calibration Tube (fig. 6.1)

VI. CALIBRATION

► CALIBRATION CONTINUED

to catch one nozzle's spray for one minute. If the flow rate is more than the tube will hold, catch the spray in a larger container and then measure the contents with the calibration tube.

The numbered marks on the side of the calibration tube show the flow rate. The measured flow rate should be the same as the flow rate shown on the chart near the bottom of the calibration tube (also shown below). The chart shows rate of discharge in gallons per minute for various field speeds and row spacings to apply 10 gallons per

acre. If the measured flow rate is not the same as that on the calibration tube's chart, consult the

trouble shooting guide in the service manual for the spray system's monitor.

All nozzles should be spraying at about the same flow rate. If one drives the sprayer at the proper speed and maintains the right pressure setting while spraying, the desired gallons per acre will be applied.



FIG. 6.1

VII. TRANSPORTING

A. DRIVING

When driving the sprayer on a public road or highway, drive carefully and follow these steps.

1. Always have the booms in the folded position and cradled when driving or transporting.

NOTE:

The booms are equipped with an accumulator system. When sitting in the cradle, do not allow the booms to bounce. If they do, damage will occur to the booms and void the warranty. When cradled, adjust the accumulator spring for maximum free travel (fig. 7.1). By adjusting the level cylinders, this will allow the weight of the boom to rest in the cradle.

2. Flashing hazard/warning lights have been placed on the sprayer to warn other drivers.
3. A SMV (Slow Moving Vehicle) emblem has been mounted on the sprayer to warn other drivers that one is moving slowly. Keep it properly displayed, unless prohibited by law.
4. Know and obey all state laws for driving farm equipment on a public road or highway.
5. Adjust the sprayer's speed to suit the conditions.
6. Slow down and use turn signals before turning.
7. Pull over to side of road before stopping.
8. Keep a proper lookout, and maintain control of the sprayer.
9. Do not drive under trees, bridges, wires, or other obstructions unless there is clearance.
10. Use extra care before entering or leaving a public road or highway.

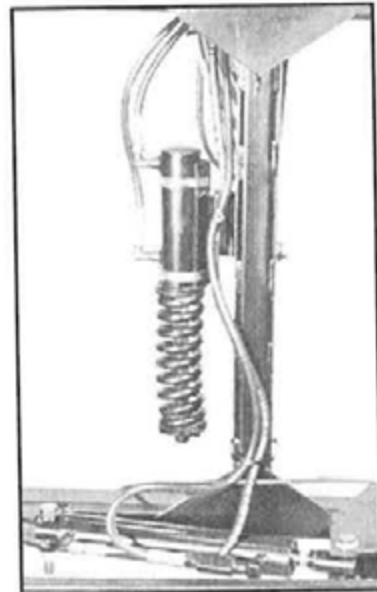


FIG 7.1

VII. TRANSPORTING

B. TRAILERING:

NOTE:

Extra care should be taken when loading the sprayer onto any trailer. Consider whether it is best to back the sprayer on or drive the sprayer forward.

1. Loading:

 **WARNING**

Never load or unload a sprayer
with solution in the tanks.

NOTE:

Be sure to read and understand the trailer's owner and operator manual. Hitch the trailer to the pulling vehicle as shown in the trailer's owner and operator manual.

When moving the sprayer onto a trailer, follow these steps completely:

- a. Pull the trailer to flat ground. Apply the pulling vehicle's parking brake and turn off the engine. Use tire chocks to keep the trailer from moving.
- b. Fold in the sprayer's booms and lower to the boom cradle.
- c. Lower the trailer ramps and set the ramp spacing for the sprayer's tread setting.
- d. Get someone to help guide you onto the trailer. Keep everyone a safe distance from the sprayer.

 **WARNING**

Stopping the sprayer on the trailer load-
ing ramps may result in sprayer tip-over.

- e. Allow enough room between the sprayer and the pulling vehicle for turning.
- f. Secure the sprayer to the trailer. See the trailer's owner and operator manual for instructions.
- g. Cover or remove the SMV (Slow Moving Vehicle) emblem when traveling over 25 miles per hour.

VII. TRANSPORTING

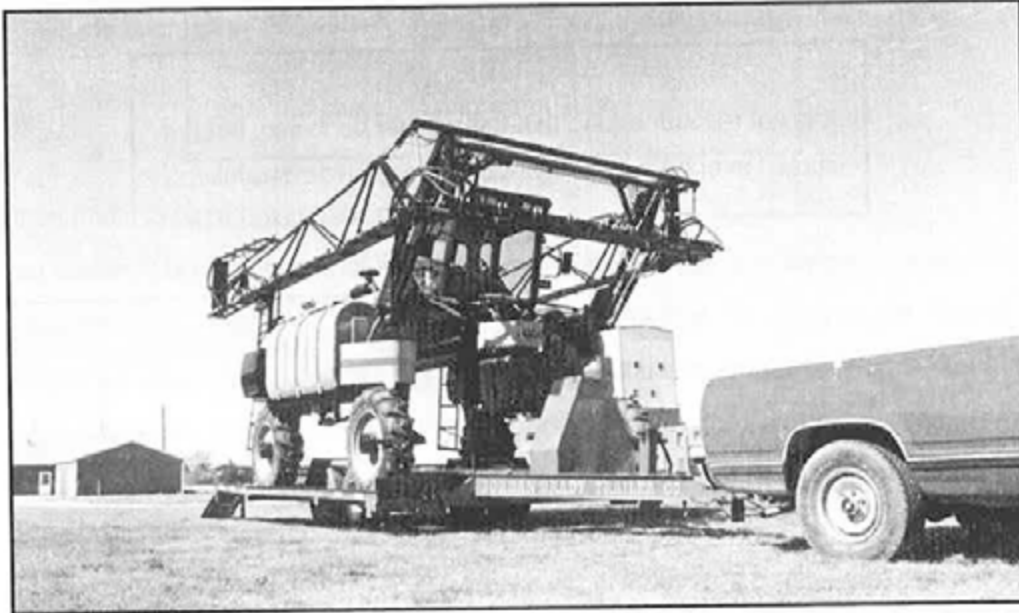


FIG 7.2

NOTE:

The loaded height and width of the trailer must conform to the law of the state in which it is being used.

2. Unloading:

When moving the sprayer off of a trailer, follow these steps completely:

- a. Pull the trailer to flat ground. Apply the pulling vehicle's parking brake and turn off the engine. Use tire chocks to keep the trailer from moving.
- b. Lower the trailer ramps and set ramp spacing for the sprayer's tread setting.
- c. Release securing restraints carefully.
- d. Get someone to help guide off the trailer. Keep everyone a safe distance from the sprayer.
- e. Uncover or replace the SMV (Slow Moving Vehicle) emblem.

VII. TRANSPORTING

C. TOWING:

NOTE:

It is not recommended that the sprayer be towed, but if it should ever be necessary, follow these steps carefully:

1. Fold the booms in and lower to the boom cradle.
2. Disengage each Torque Hub[®] by removing two outer cap bolts, turning the outer cap with the extended center in towards the hub and re-installing the two outer cap bolts. This process pushes on a spring-loaded splined shaft, disengaging the Torque Hub[®] (fig. 7.3).

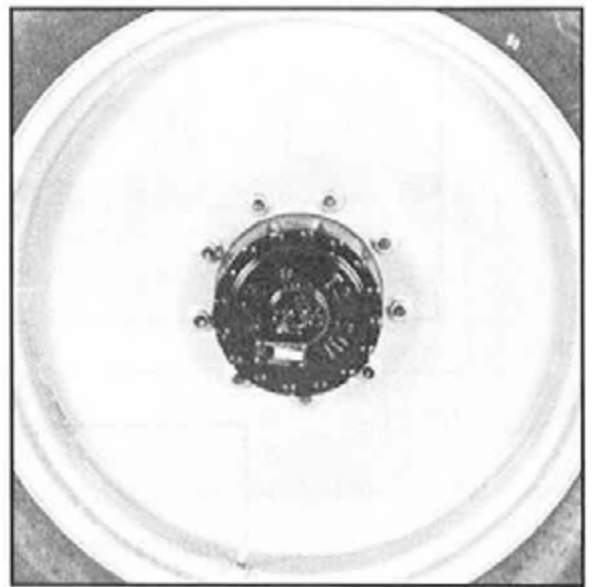


FIG 7.3

NOTE:

Wheel motors will be damaged if these steps are not taken.

! CAUTION

When re-engaging Torque Hubs[®], make sure spring-loaded splined shaft has returned to its extended position.

VII. TRANSPORTING

NOTE:

In order for the power steering system to function, the sprayer's engine must be running.

3. Turn on flashing hazard/warning lights.
4. When towing, it is necessary that two vehicles of sufficient size and weight for adequate pulling and braking are used. One of these vehicles is used for pulling the sprayer; the second vehicle for braking if the sprayer starts to overtake the towing vehicle, such as going downhill. The reason for this is the sprayer, once the Torque Hubs[®] have been disengaged, has no braking power of its own. Use extreme caution.

 **WARNING**

Secure items (tow straps, chains, etc.) between towing vehicle, braking vehicle, and sprayer to ensure that they will not dislodge.

5. If necessary, relocate the SMV emblem so that it is visible from the rear.
6. Always reduce towing speed well in advance of any anticipated turns.
7. Know and obey the state laws for towing farm equipment on public roads and highways.

NOTE:

Excessive speed may cause damage to the Torque Hubs[®] as well as the hydrostatic system. Do not exceed 25 MPH when towing sprayer.

VIII. SERVICE AND MAINTENANCE

PAGE NO	Service Point	C L E A N	C H A N G E	C H E C K	G R E A S E	D R A I N
84	ENGINE OIL		A	DAILY		
86	RADIATOR COOLANT LEVEL			DAILY		
87	COOLANT OVERFLOW RESERVOIR LEVEL			DAILY		
86	COOLANT CONCENTRATION		AS REQ	500 HRS*		
90	RADIATOR GRILLE SCREENS	AS REQ				
103	ENGINE DRIVE BELT		AS REQ	DAILY		
103	A/C COMPRESSOR BELT		AS REQ	250 HRS		
89	A/C COMPRESSOR		B			
93	A/C DRYER		AS REQ			
94	PRIMARY FUEL FILTER (WATER SEPARATOR)		500 HRS*			DAILY
94	SECONDARY FUEL FILTER		500 HRS*			
94	IN-LINE FUEL PRE-FILTER		AS REQ			
91	AIR INTAKE FILTER	NOT REC	C			
91	FILTER MINDER®		D	DAILY		
84	HYDRAULIC RESERVOIR OIL LEVEL		500HRS**	DAILY		
92	HYDRAULIC SUCTION FILTER		E*			
92	HYDROSTATIC CHARGE PRESSURE FILTER		E*			
104	NEUTRAL SETTING OF HYDROSTATIC PUMP		AS REQ	DAILY		
93	HIGH-PRESSURE IN-LINE FILTER (BOOM CTRL VALVES)	AS REQ				
93	SOLUTION LINE STRAINERS (2)	AS REQ		DAILY		
88	SOLUTION PUMP OIL (BEAN 35 HP)		E			
88	SOLUTION PUMP OIL (HYPRO® D-230)		F	F		
85	TORQUE HUB® OIL LEVEL		G	100 HRS		
96	TORQUE HUB® ZERK (4 PLACES - 1 EACH)				DAILY	
95	FRONT LEG BEARING ZERKS (4 PLACES - 2 EACH)				DAILY	
95	TIE ROD LINKAGE (FOUR PLACES)			DAILY	50 HRS	
97	TRANSOM, LIFT ARM, AND LIFT CYL ZERKS (12 PLACES)				25 HRS	
98	BOOM/BREAKAWAY ZERKS (8 PLACES - 4 EACH)				AS REQ	
96	TERRA-HUG® PIVOT PIN ZERK				50 HRS	
106	LEG MOUNT BOLT TORQUE			DAILY		
99	BATTERY	100 HRS	AS REQ	DAILY		
105	LUG NUT TORQUE			H		
22	TIRE PRESSURE			50 HRS		
94	FRESH AIR CAB FILTER	AS REQ*	AS REQ			
94	CHARCOAL CAB FILTER		AS REQ			
94	RECIRCULATION FILTER	AS REQ				
100-101	FUSES/CIRCUIT BREAKERS		AS REQ			
112	DROP ASSY SPRAY TIPS		AS REQ	I		
108	DIAPHRAGMS ON HYPRO® PUMP (6)		F	F		
108-109	CYLINDER PACKING ON BEAN PUMP (3)		I			
110-111	SUCTION & DISCHARGE VALVES ON BEAN PUMP (3 EA)		AS REQ			
113	SURGE TANK ON BEAN PUMP					AS REQ

*OR YEARLY, WHICHEVER COMES FIRST; OR AS REQUIRED

**OR AT THE BEGINNING OF THE SEASON, WHICHEVER COMES FIRST; OR AS REQUIRED

NOTE A: SEE ENGINE MANUFACTURER'S HAND BOOK

NOTE B: CHARGE AS REQ; USE PROPER EQUIPMENT

NOTE C: FOLLOW FILTER MINDER READINGS

NOTE D: RESET EACH TIME YOU SERVICE AIR FILTER

NOTE E: 1ST 50 HRS, THEN 250 HRS THEREAFTER

NOTE F: REFER TO HYPRO® SERVICE BULLETIN

NOTE G: 1ST 50 HRS, THEN 500 HRS THEREAFTER

NOTE H: IMMEDIATELY, THEN 50 HRS THEREAFTER

NOTE I: ACCORDING TO REFERENCE PAGE

VIII. SERVICE AND MAINTENANCE

SERVICE INTERVALS

Initial checks after receiving machine

IMMEDIATELY  then 

- 1) Check lug nut torque, then every 50 hours (page 105)

FIRST 50 HOURS  then  or 

- 1) Change Torque Hub[®] oil, then every 500 hours (page 85)
- 2) Change hydrostatic charge pressure filter, then every 250 hours (page 92)
- 3) Change hydraulic suction filter, then every 250 hours (page 92)
- 4) Change oil in Bean 35 HP spray pump, then every 250 hours (page 88)

Daily

- 1) Check engine oil (page 84)
- 2) Drain primary fuel filter (water separator) (page 94)
- 3) Check radiator coolant level (page 86)
- 4) Check radiator coolant overflow reservoir level (page 87)
- 5) Check engine drive belt (page 103)
- 6) Check Filter Minder[®] (page 91)
- 7) Check hydraulic oil reservoir level (page 84)
- 8) Check for neutral setting of hydrostatic pump (page 104)
- 9) Check solution line strainers (page 93)
- 10) Grease Torque Hub[®] seal boot (page 96)
- 11) Grease all leg bearings (page 95)
- 12) Check tie rod linkage (page 95)
- 13) Check leg mount bolts (page 106)
- 14) Check battery (page 99)

Every other day

- 1) Grease transom, lift arm, and lift cylinder zerks (page 97)

SERVICE/
MAINTENANCE

SERVICE INTERVALS →

VIII. SERVICE AND MAINTENANCE

➔ SERVICE INTERVALS

As Required



- 1) Change coolant concentration (page 86)
- 2) Clean radiator grille screens (page 90)
- 3) Change engine drive belt (page 103)
- 4) Change A/C compressor belt (page 103)
- 5) Change A/C dryer (page 93)
- 6) Charge A/C compressor (page 89)
- 7) Change primary fuel filter (water separator) (page 94)
- 8) Change secondary fuel filter (page 94)
- 9) Change in-line fuel pre-filter (page 94)
- 10) Change hydraulic reservoir oil (page 84)
- 11) Adjust neutral setting of hydrostatic pump (page 104)
- 12) Clean high-pressure in-line filter on boom control stack valve (page 93)
- 13) Clean solution line strainers (page 93)
- 14) Grease transom, lift arm, and lift cylinder zerks (page 97)
- 15) Grease all boom folding and breakaway zerks (page 98)
- 16) Change battery (page 99)
- 17) Clean fresh air intake cab filter (page 94)
- 18) Change fresh air intake cab filter (page 94)
- 19) Change charcoal cab filter (page 94)
- 20) Clean recirculating cab filter (page 94)
- 21) Replace fuses and circuit breakers (pages 100-101)
- 22) Check and replace spray nozzle tips (page 112)
- 23) Drain surge tank on Bean pump (page 113)
- 24) Replace discharge and suction valves on Bean pump (pages 110-111)
- 25) Change cylinder packing on Bean pump (pages 108-109)

VIII. SERVICE AND MAINTENANCE

Every 25 HOURS



- 1) Grease transom, lift arm, and lift cylinder zerks (page 97)

Every 50 HOURS



- 1) Check tire pressure (page 114)
- 2) Check lug nut torque (page 105)
- 3) Grease all tie rod zerks (page 95)
- 4) Grease Terra-Hug® frame pivot zerk (page 96)

Every 100 HOURS



- 1) Check Torque Hub® oil level (page 85)
- 2) Clean battery (page 99)
- 3) Visually inspect spray nozzle patterns (page 112)

Every 200 HOURS



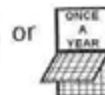
- 1) Flow check random sample of nozzle tips (page 112)

Every 250 HOURS



- 1) Check A/C compressor belt (page 103)
- 2) Change hydrostatic charge pressure filter (page 92)
- 3) Change hydraulic suction filter (page 92)
- 4) Change oil in Bean spray pump (pump 88)

Every 500 HOURS



- 1) Check coolant concentration (page 86)
- 2) Change primary fuel filter (water separator) (page 94)
- 3) Change secondary fuel filter (page 94)
- 4) Change hydraulic reservoir oil (page 84)
- 5) Change Torque Hub® oil (page 85)

VIII. SERVICE AND MAINTENANCE

FLUIDS

Engine oil

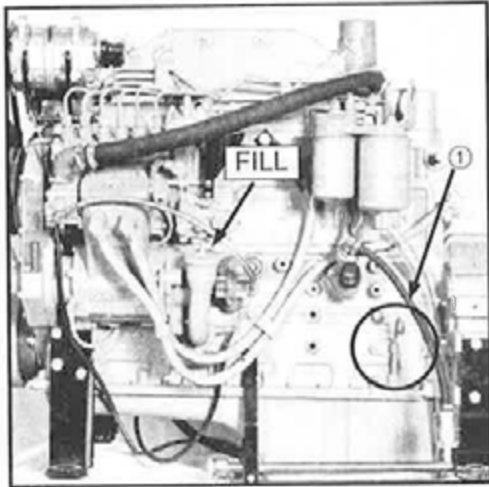


FIG 8.1

OIL LEVEL - The engine oil level dipstick is located on the left-hand side of the engine (fig. 8.1, item 1). Never operate the engine with the oil level below the "L" (low) mark or above the "H" (high) mark. Wait at least five minutes after shutting off the engine to check the oil level; this allows time for the oil to drain to the oil pan. Check the engine oil level daily.

CAPACITY - Low to high mark capacity is 1.0 quart. Engine oil pan capacity is 10 quarts. Refer to Engine Operation and Maintenance manual for maintenance schedule.

NOTE:

The engine must be level when checking the oil level to make sure the measurement is correct.



FIG 8.2

Hydraulic Oil Reservoir

OIL LEVEL - Check the hydraulic oil level in the reservoir daily (fig. 8.2). Add just enough fluid so the level reaches the bottom tip of the dipstick. Always check the hydraulic oil level when it is cool. Hydraulic oil will expand when heated in a system and measuring the reservoir by these levels allows for expansion.

TYPE - Premium hydraulic fluids containing high quality rust/oxidation/and foam inhibitors are required. Hydraulic oil must conform to one of the following types: anti-wear hydraulic oil, type F automatic transmission fluid, or agricultural hydraulic transmission fluid. Replace the oil in the hydraulic reservoir at 500 hours or at the beginning of each spraying season, whichever comes first.

VIII. SERVICE AND MAINTENANCE

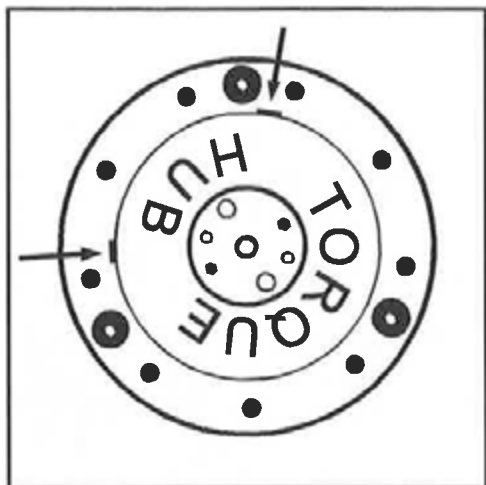


FIG 8.3

Torque Hub[®] Oil

OIL LEVEL - Each Torque Hub[®] should maintain an oil level of half full at all times. Less than that would limit lubrication, and over half full could cause overheating and damage. To check oil level, position Torque Hub[®] so one of the face plugs is positioned at 12 O'clock (fig. 8.3). The other plug will be either at 9 O'clock or 3 O'clock. Remove the lower plug: if no oil comes out, oil level is too low. Check Torque Hub[®] oil level every 100 hours.

If EP-90 oil is needed, remove the top plug also and fill just until it starts to come out the lower hole (fig. 8.4). With the oil at a satisfactory level, re-install plugs.

CHANGE - Torque Hub[®] oil should be changed after the first 50 hours of operation, preferably in a loaded condition. Subsequently, it should be changed every 500 hours after that, or once a year whichever comes first.

To change the Torque Hub[®] oil, position one of the plugs at 6 O'clock, and the other at either 3 O'clock or 9 O'clock. Remove the bottom plug to drain the oil. Once all of the oil is drained, re-install the bottom plug and remove the top plug. Refill Torque Hub[®] with EP-90 oil as described above.

GENERAL MAINTENANCE - If your sprayer is going to sit for an extended period of time, occasionally rotate the hubs by driving the sprayer forward or backward a few feet to adequately coat all internal hub parts (fig. 8.5). This will prevent rusting if moisture inadvertently entered the hub during an oil change. Failure to rotate hub and disperse oil may cause rusting and internal damage.



FIG 8.4



FIG 8.5

FLUIDS CONTINUED ➔

SERVICE/
MAINTENANCE

VIII. SERVICE AND MAINTENANCE

➔ FLUIDS CONTINUED



FIG 8.6

Cooling System

COOLANT TYPE - Your cooling system should always be sufficiently charged with an adequate mixture of antifreeze and water, regardless of the climate, in order to maintain a broad operating temperature range. Your cooling system has been factory-charged with an ethylene glycol-based antifreeze.

NOTE:

Ethylene glycol-based antifreeze and propylene glycol-based antifreeze should never be mixed.



FIG 8.7

CHECKING CONCENTRATION - The radiator cap is located immediately behind the rear of the cab (fig. 8.6). Never remove a cap from a hot engine. Always allow the engine to cool before servicing cooling system.

A 50/50 antifreeze/water mixture is a conservative mixture which allows good protection against both overheating and freezing. If a stronger antifreeze mixture is required, be sure not to exceed the engine manufacturer's guidelines for antifreeze mixing. The table in figure 8.8 gives a few examples of ethylene glycol antifreeze/water mixture protection values. Consult the engine manufacturer's handbook for further information.

Concentration should be checked every 500 hours or at the beginning of each winter, whichever comes first. It should be checked using a refractometer; "floating ball"-type density testers or hydrometers are not accurate enough for use with heavy duty diesel cooling systems.

Ethylene Glycol		
40%	-23°C	-10°F
50%	-23°C	-34°F
60%	-23°C	-65°F

FIG 8.8

VIII. SERVICE AND MAINTENANCE

▶ FLUIDS CONTINUED



FIG 8.9

COOLANT RESERVOIR - The coolant reservoir is located under the right-hand hood behind the radiator (fig. 8.9). Check its level everyday while the engine is cold. Maintain the coolant reservoir level within the normal cold range marks.

CHANGING COOLANT - Your coolant should periodically be changed to eliminate the buildup of harmful chemicals. Drain and replace the coolant every other spraying season or every 1,000 hours of operation, whichever comes first. Refill only with ethylene glycol coolant. Antifreeze should be mixed only with soft water because hard water contains minerals which breakdown the anti-corrosion properties of antifreeze.

Fuel

TYPE - No. 2 diesel fuel is recommended for the best economy and performance under most operating conditions. In operating conditions under 32° F, use a blend of No. 1 and No. 2 diesel fuel. The addition of No. 1 diesel fuel may cause loss of power and/or fuel economy.

STORING - See section 9 on sprayer storage.

REFILLING - Always turn off the engine and allow it to cool before refueling. Never smoke while fueling. Keep a fire extinguisher within reach while refueling.

The fuel tank holds 40 gallons - do not fill it completely: fuel can expand and run over. Wipe up all spilled fuel and clean with detergent and water before starting the engine.

PRIMING - If the fuel system should happen to run dry and lose its prime, there is a priming bulb located on the left side of the engine for use in filling the engine fuel filters (fig. 8.11).



FIG 8.10

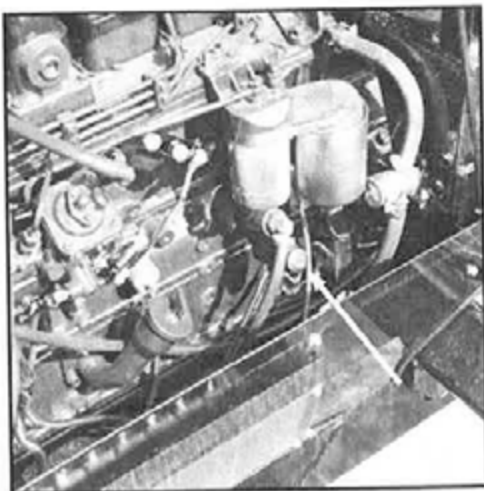


FIG 8.11

FLUIDS CONTINUED ▶

SERVICE/
MAINTENANCE

VIII. SERVICE AND MAINTENANCE

➔ FLUIDS CONTINUED

Solution Pump Oil Level

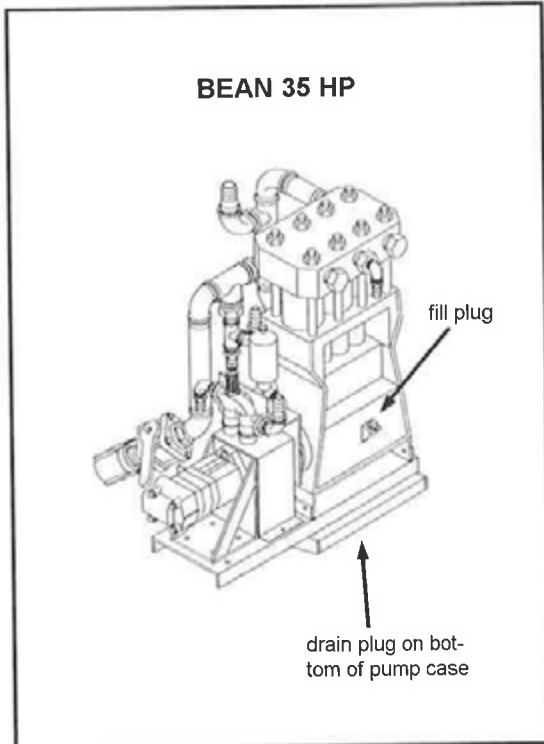


FIG 8.12

BEAN 35 HP

Change the oil in the pump case after the first 50 hours of use, then it should be changed every 250 hours after that. To change the oil remove the drain plug located under the pump case and allow the oil to drain. Replace the drain in the bottom of the pump case and refill the case through either of the side fill plugs with two quarts of clean high grade SAE 30 oil.

HYPRO® D-230

If equipped with a Hypro® pump, refer to the accompanying service bulleting for information regarding pump oil maintenance.

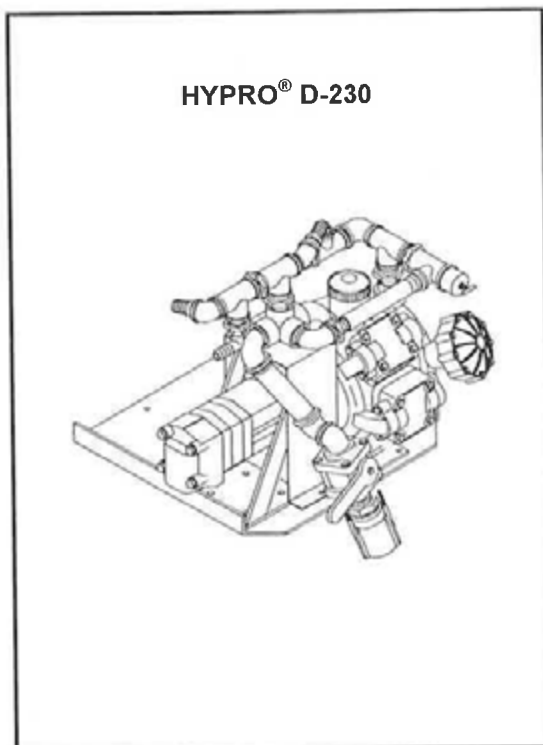


FIG 8.13

VIII. SERVICE AND MAINTENANCE



FIG 8.14



FIG 8.15

Air Conditioning

TYPE - The cab on your sprayer is equipped with a R-134a air conditioning system.

RECHARGING - Recharge it only with R-134a refrigerant. If your air conditioning system is mistakenly charged with R-12 refrigerant, serious problems, such as compressor seizure, may result. Therefore, confirm refrigerant before recharging system.

If you do not have the proper recharging equipment, it is recommended that you allow an independent service agent service your air conditioning system.

FLUID CAPACITIES AND TYPES

Engine oil pan (including filter).....	11.5 quarts SAE 15W-40
Engine oil dipstick, L-H mark	1 quart
Hydraulic oil reservoir	20 gallons anti-wear hydraulic oil
Torque Hub® oil level (4).....	approx. 16 oz. EP-90 each
Engine cooling system	7 gallons ethylene glycol
Fuel tank	40 gallons No. 1 or 2 diesel

SERVICE/
MAINTENANCE

VIII. SERVICE AND MAINTENANCE

FILTERS

Grille Screens

In order to maintain maximum air flow through the engine cooling system's radiator, oil cooler, and air conditioning condenser, the cooling air intake grille screens must be inspected often and periodically removed for cleaning.



FIG 8.16

NOTE:

Failure to keep cooling systems clean can cause over heating and damage to the hydrostatic system and/or engine.

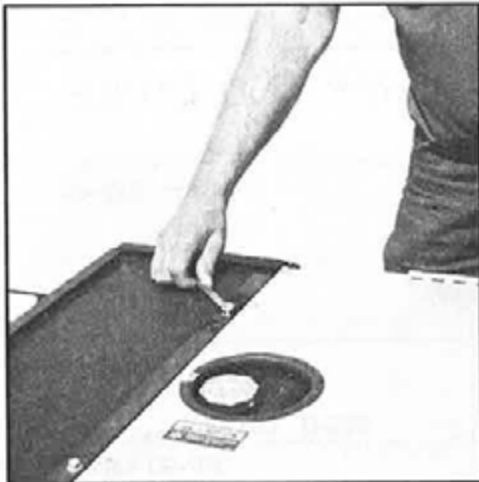


FIG 8.17

REMOVAL - The side grille screens are easily removed by sliding them up out of their housings (fig. 8.16). The top screen is held in place by two bolts (fig. 8.17) and may also be removed for cleaning.

CLEANING - Compressed air will dislodge most large trash or loose dirt after the screens have been removed (fig. 8.18). Blow out the screens away from the machine. Water from a pressurized hose may also be used, or if necessary the screens may be soaked in soapy water and scrubbed with a brush.

NOTE:

When cleaning cooling fins of the radiator, oil cooler, or A/C condenser with compressed air or water, be careful not to damage cooling fins which may impair cooling capabilities.



FIG 8.18

VIII. SERVICE AND MAINTENANCE



FIG 8.19

Engine Air Intake

REMOVAL - The engine air intake filter element should only be removed if it is going to be replaced. After loosening the air cleaner clamp and removing the end cap, carefully remove the filter so as to not knock any dust off the filter and into the air intake passage (fig. 8.20).

REPLACEMENT - Your sprayer is equipped with a Filter Minder[®] to notify you of filter element efficiency. Follow its guidelines for servicing. (See below.) At appropriate service time, install the new element carefully to ensure proper sealing.

CLEANING - It is not recommended to clean the air filter element. However, a clean damp cloth should be used to wipe dust and foreign material from the air cleaner housing before a new element is installed.



FIG 8.20

Filter Minder[®]

The Filter Minder[®] is an air restriction monitoring system that progressively and constantly indicates how much air filter capacity remains. It is mounted at the top of the instrument panel in the cab (fig. 8.21). Check its reading daily.

Service the air cleaner when the Filter Minder[®] reads 20" (80% of average dirt holding capacity). Reset the Filter Minder[®] to zero each time you replace the air filter element.



FIG 8.21

NOTE:

Service the air cleaner before the yellow indicator reaches the red line of the Filter Minder[®].

FILTERS CONTINUED ➔

SERVICE/
MAINTENANCE

VIII. SERVICE AND MAINTENANCE

➔ FILTERS CONTINUED



FIG 8.22

Suction Filter

Remove and install a new 10 Micron rated suction filter (fig. 8.22) at the end of the first 50 hours of use; subsequently, replace the filter every 250 hours, or once a year, whichever comes first.

Charge Pressure Filter

Remove and install a new 4 Micron rated charge pressure filter (fig. 8.22) at the end of the first 50 hours of use; subsequently, replace the filter every 250 hours, or once a year, whichever comes first.

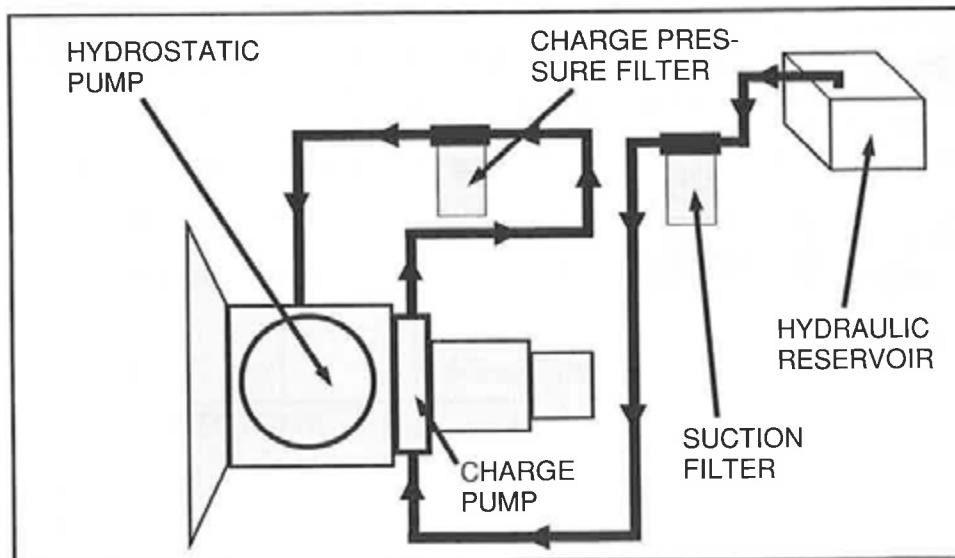


FIG 8.23

VIII. SERVICE AND MAINTENANCE

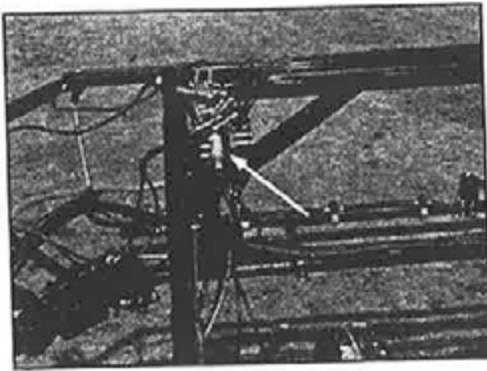


FIG 8.24

High-Pressure Hydraulic In-line Filter

STACK VALVES - The valves on the boom control stack valve are protected by a 90 Micron in-line sintered bronze filter (fig. 8.24). When the filter element is removed for cleaning, caution should be taken so the gasket is in the proper place when re-installing (fig. 8.25). Also, re-install filter paying attention to direction of flow so the end marked "OUT" is oriented correctly.

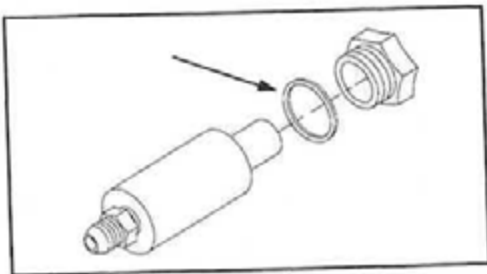


FIG 8.25

Solution Line Strainers

To help maintain consistent application rates, check the solution line strainers (fig. 8.26, item 2) under each solution tank daily for blockage. Close the tank shutoff valve (fig. 8.26, item 1) before removing the strainer. Clean the strainer screen as required. Be sure to wear the appropriate clothing while

removing and cleaning the line strainer screen. Confirm the gasket is in place before re-installing the screen.

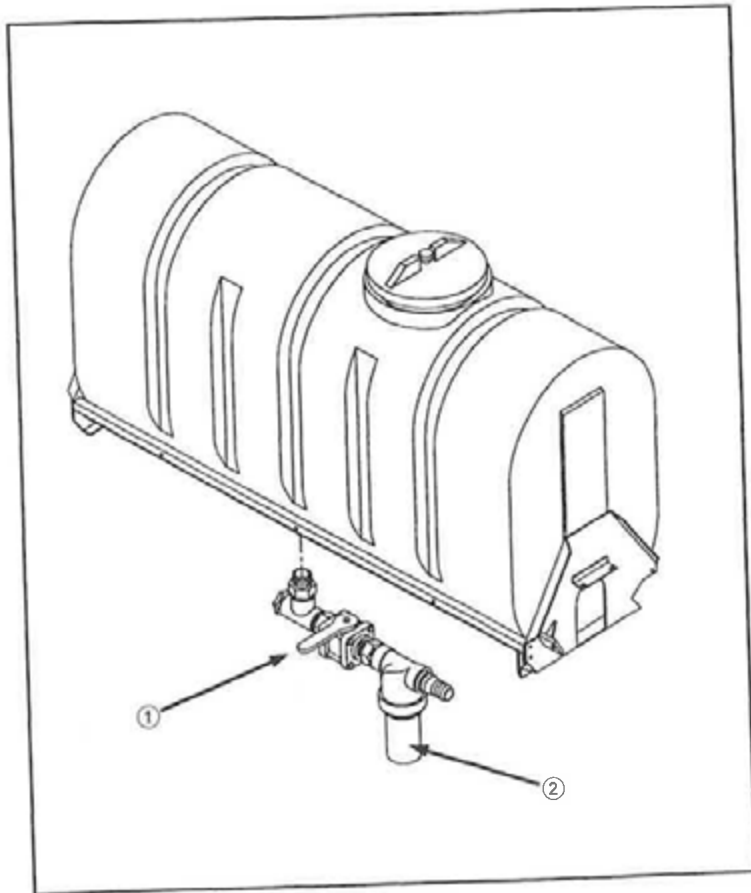


FIG 8.26

A/C System Dryer

The A/C system receiver/dryer (fig. 8.27) should be replaced if the A/C loop is ever opened such as replacing a compressor or condenser line, etc.

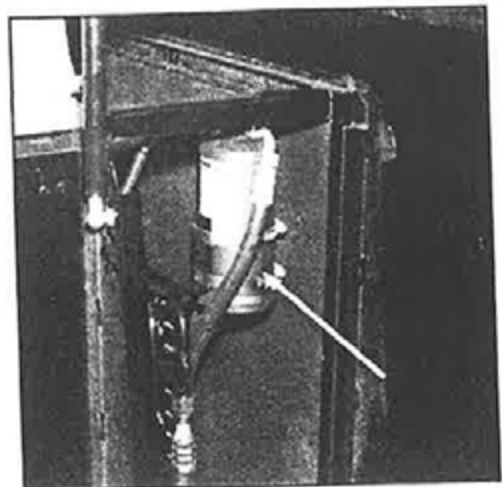


FIG 8.27

VIII. SERVICE AND MAINTENANCE

➔ FILTERS CONTINUED

Fuel Filters

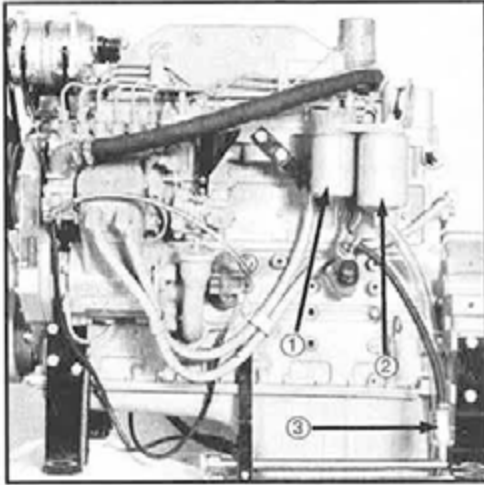


FIG 8.28

PRIMARY (WATER SEPARATOR) - (fig. 8.28, item 1) Drain water and sediment from the separator daily. Replace every 500 hours or once a year, whichever comes first.

SECONDARY - (fig. 8.28, item 2) Replace every 500 hours or once a year, whichever comes first.

IN-LINE STRAINER - (fig. 8.28, item 3) Note direction of fuel flow arrow when replacing.

Fresh Air Cab Filters

PAPER FILTER - (fig. 8.29, item 1) The paper filter should be cleaned once a year, or more often if necessary. Remove the paper element and gently tap it against a flat surface. Direct low

pressure compressed air through the filter to remove larger particles. Replace the paper filter if necessary.

CHARCOAL FILTER - (fig. 8.29, item 2) Remove and replace at the first sign of chemical odor entering the cab.

RECIRCULATING FILTER - (fig. 8.29, item 3) The recirculating filter may be cleaned with soap and water. Replace, if it becomes worn.

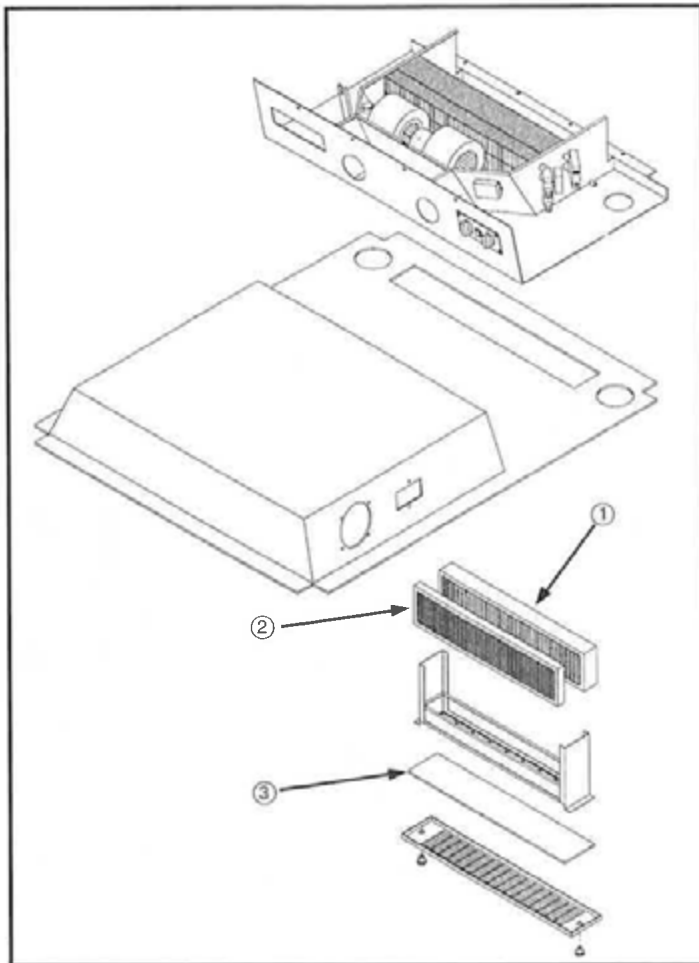
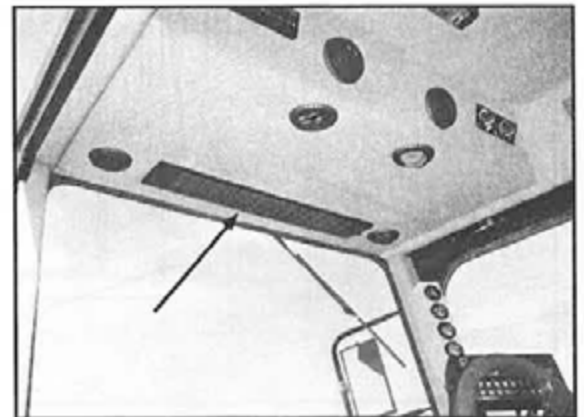


FIG 8.29



CAB FILTER LOCATION
FIG 8.30

VIII. SERVICE AND MAINTENANCE

LUBRICATION

Leg Bearings

Hagie 254x-11 leg assemblies are constructed with upper and lower nylon bearings. To steer, the inner leg weldment pivots inside the outer leg weldment. These bearings must be lubricated to avoid bearing failure. There are grease zerks located on the front of the leg assemblies, one for the upper bearing (fig. 8.31, item 1) and one for the lower bearing (fig. 8.31, item 2). Greasing both bearings on both front legs daily is very important.

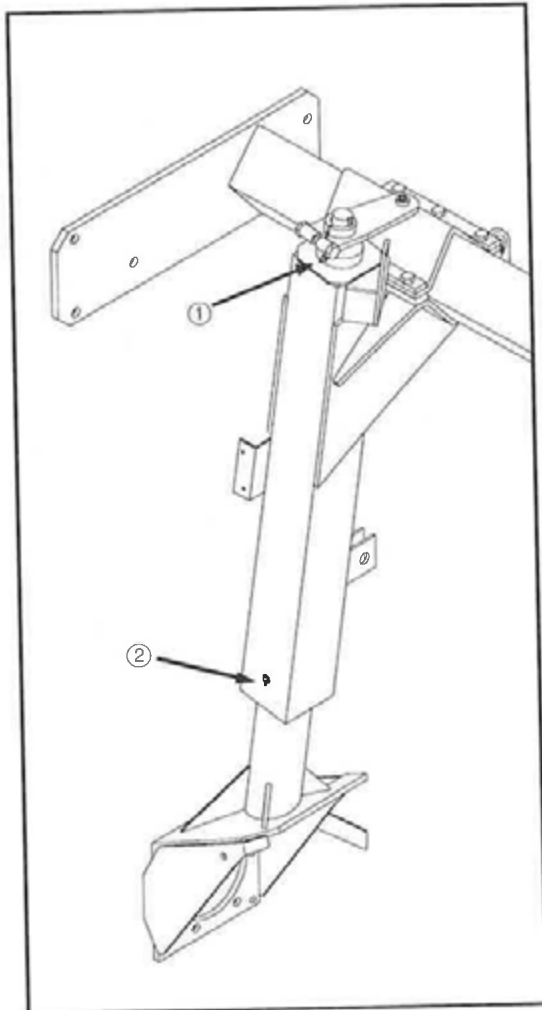


FIG 8.31

Tie Rods

The tie rods connected to the steering legs have grease zerks on both each inner tie rod end (fig 8.32, item 1) and each outer tie rod end (fig. 8.32, item 2). To maintain freely operating steering, they should be serviced every 50 hours; check tie rod linkage daily.

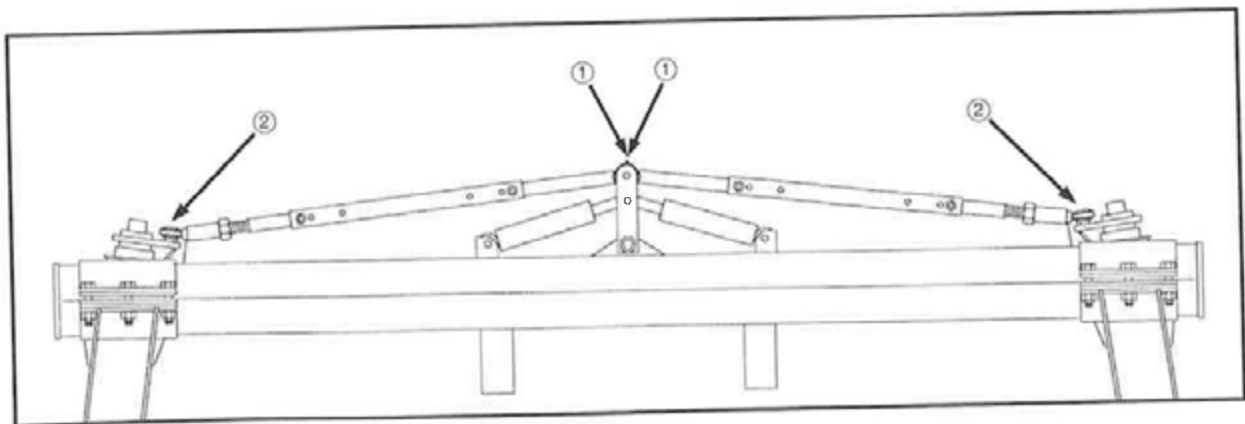


FIG 8.32

VIII. SERVICE AND MAINTENANCE

➔ LUBRICATION CONTINUED

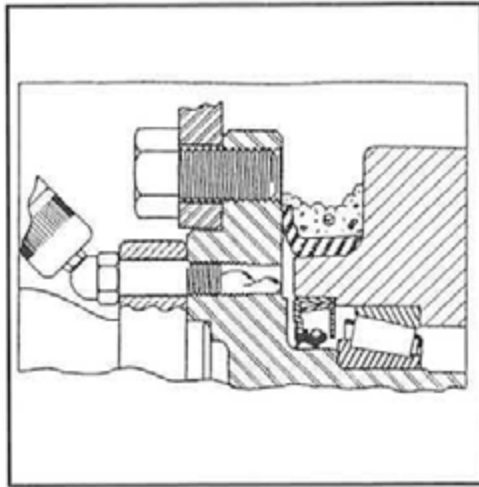


FIG 8.33

Torque Hub[®] Seal Boot

Each leg has a seal boot located between the wheel motor and Torque Hub[®]. It should be lubricated daily to optimize the hub's life duration.

An over-greased seal boot will leak some grease out around the seal and when heated may cause the appearance of a failed wheel motor leaking hydraulic fluid. Wipe off any excess grease after servicing. It is better to over-grease the seal boot than under-grease it.

The zerks are tapped into a "hollow" wheel motor mounting bolt (fig. 8.33) This bolt allow grease through and into the seal boot.

Terra-Hug[®] Pivot Pin

To provide adequate and consistent ground contact, the front cross member and legs pivot on a bolster pin (fig. 8.34, item 1) connected to the frame. Grease this zerk every 50 hours.

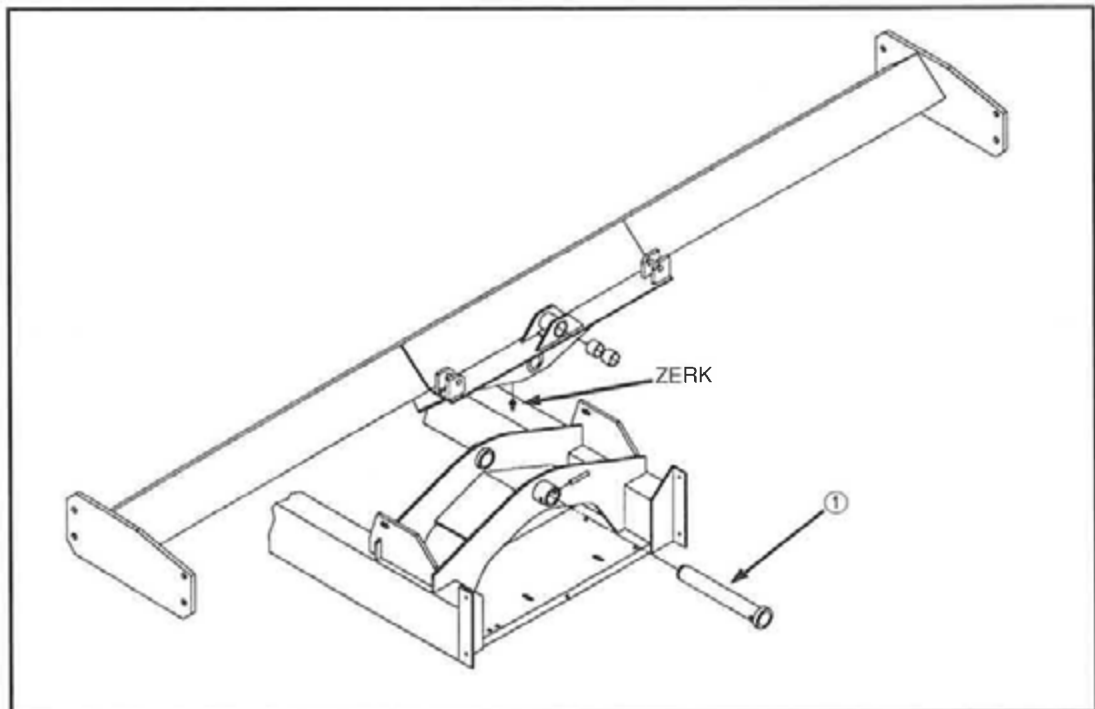


FIG 5.34

VIII. SERVICE AND MAINTENANCE

Transom/Lift Arm/Lift Cylinders

The transom, lift arm, and lift cylinders are fitted with grease zerks that should be lubricated ever other day or 25 hours, whichever comes first. They are located as follows:

Lift arm lift pivots: eight places (fig. 8.35, items 1)

Lift cylinder pivots: four places (fig. 8.35, items 2)

Boom fold pivots on transom: four places (fig. 8.35, items 3)

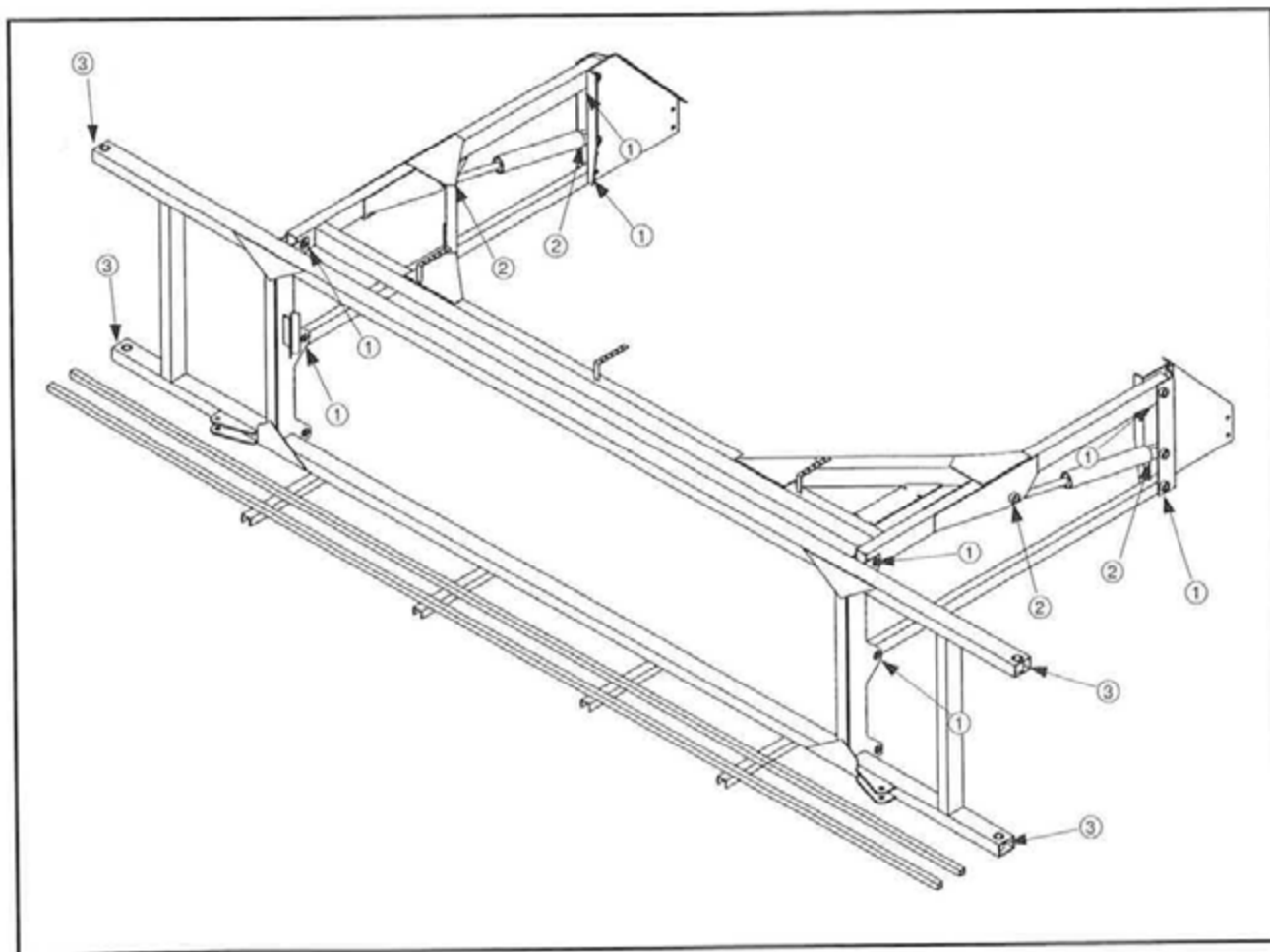


FIG 8.35

LUBRICATION CONTINUED →

SERVICE/
MAINTENANCE

VIII. SERVICE AND MAINTENANCE

➔ LUBRICATION CONTINUED

Boom Hinge and Breakaway Pivots

Each breakaway located between the transom and each inner boom section has two zerks (four total) that need to be greased as required (fig. 8.36).

Sixty foot boom options have a grease zerk on the boom level pivot point connected to the breakaway (fig. 8.37, item 2) and on the boom extension vertical folding pivot point (fig. 8.37, item 1). Check all and grease as required.

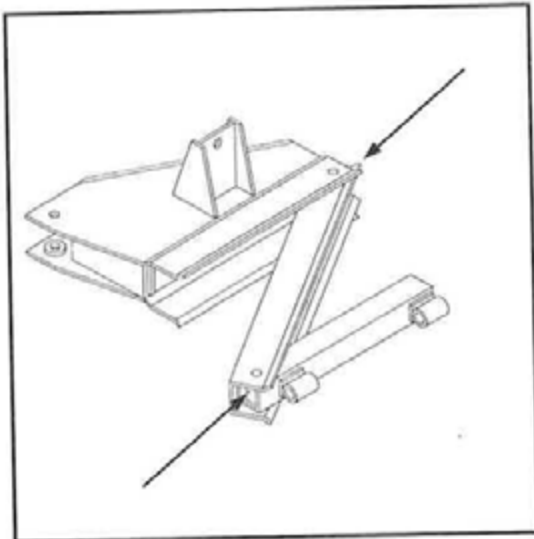


FIG 8.36

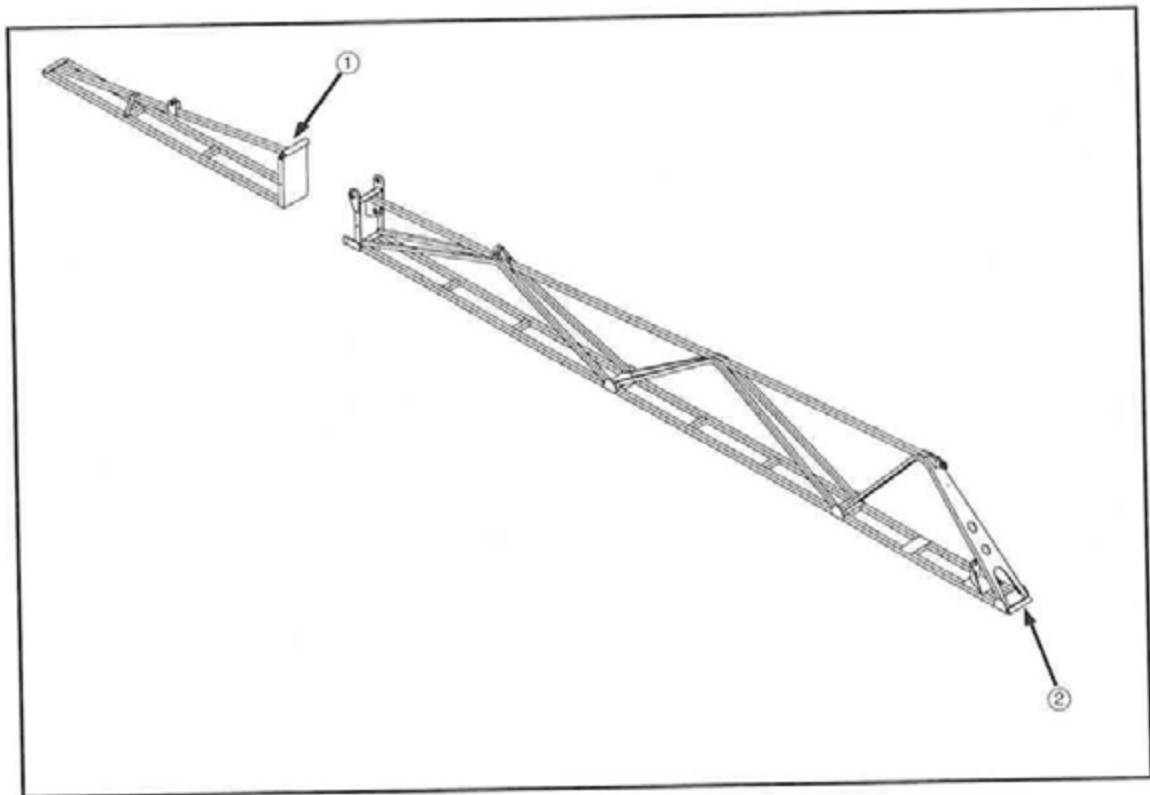


FIG 8.37

VIII. SERVICE AND MAINTENANCE

ELECTRICAL

Battery SAFETY

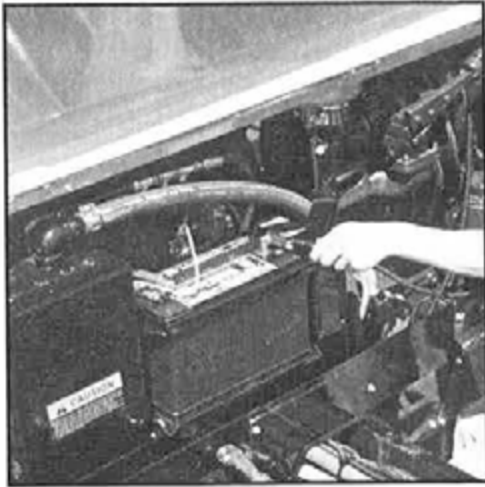


FIG 8.38

CAUTION

Batteries contain sulfuric acid. Avoid contact with skin, eyes, or clothing. Do not inhale fumes or ingest liquid. Batteries contain gases which can explode. Keep sparks and flame away while servicing.

NOTE:

When servicing electrical system always disconnect the battery. Remove ground cable first and connect it last.

CLEANING - Disconnect battery cables from battery.

Remove all corrosion with a wire brush or battery post brush (fig. 8.38). Wash the cable connections and battery posts with a weak solution of baking soda or ammonia. Apply petroleum jelly or grease to prevent future corrosion. Reconnect the cables to the battery making sure they are tight. Clean every 100 hours.



FIG 8.39

CAUTION

Electrical system is 12 volt negative ground. When using booster with jumper cables, precautions must be taken to prevent personal injury or damage to electrical parts.

1. Attach one end of jumper cable to positive terminal of booster battery and other end to positive terminal of vehicle battery connected to starter motor.
2. Attach one end of second cable to negative terminal of booster battery and other end to vehicle frame away from battery. Do not attach to cab or cab support.
3. To remove cables, reverse above sequence exactly to avoid sparks. See operator's manual for additional information.

SERVICE/
MAINTENANCE

VOLTAGE 12 V (only)

COLD CRANKING AMPS
(30 sec. at 0° F).....950 CCA

RESERVE
CAPACITY185 min.
at 25 amps

FIG 8.40

STORAGE - See page 116 for proper battery storage.

REPLACEMENT - When replacing the battery, install a battery with ratings equivalent to or higher than the specs listed in figure 8.40.

NOTE:

To ensure the best electrical contact, battery terminal connections should be as clean and as tight as possible.

VIII. SERVICE AND MAINTENANCE

➔ ELECTRICAL CONTINUED

Fuses

Fuses protect individual lighter duty electrical circuits. They are located toward the rear of the console panel to the right of the operator's seat (fig. 8.41).

If a fuse blows, remove it by rotating the fuse cap counterclockwise as you push down. Then pull the fuse straight out (fig. 8.43). Replace each blown fuse with the same amperage fuse only.

Correct fuse location and amperage is shown in figure 8.42. If the fuse continues to blow, determine the cause and correct it.

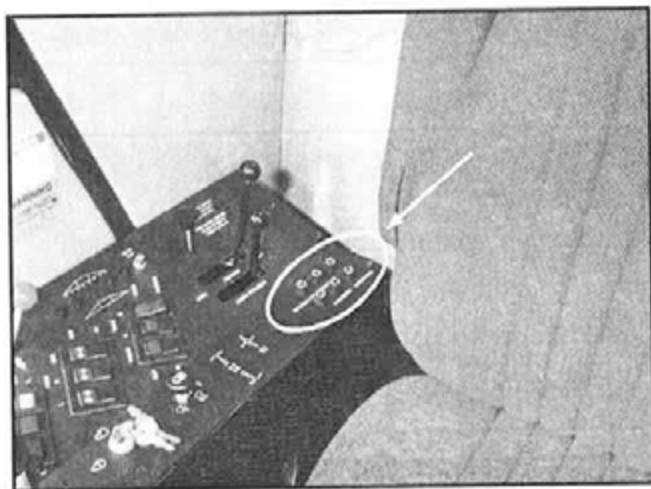


FIG 8.41

Traction valve.....	10 AMP
Gauges, AM/FM radio, dome light, and C.B. radio power	10 AMP
Boom hydraulic controls.....	20 AMP
Fuel selector switch, boom solution valves, Seat motor, and parking brake alarm	20 AMP
Hazard/warning lights, turn signal, and Windshield wiper	10 AMP
Solution tank shutoff valves.....	10 AMP







 TRACT VLV	 GAUGES AM/FM RADIO DOME LIGHT C.B. RADIO	 BOOM CTRLS
 FUEL SWITCH BOOM SOL VLVS SEAT PRKG BRK ALARM	 FLASHER TURN SIGNAL WIPER	 SOL TANK SHUTOFF VALVES

FIG 8.42

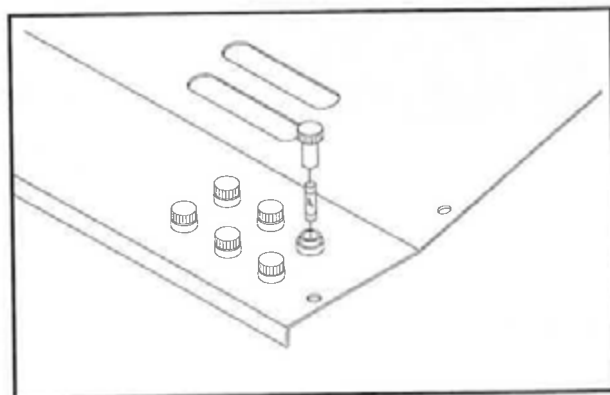


FIG 8.43

VIII. SERVICE AND MAINTENANCE

Circuit Breakers

MOUNTED IN CAB

Circuit breakers handle the functions of the heavier duty electrical circuits on the sprayer. They trip when overloaded and automatically reset themselves after they cool down. They will continue to trip and reset as long as the overload or short exists. If the circuit breaker does not reset, replace it with the same amperage breaker only. Correct circuit breaker location and amperage is shown in figure 8.46.

To access the circuit breakers remove the hydrostatic handle (fig. 8.44, item 1), engine throt-

tle knob (fig. 8.44, item 2), VFC lever knobs (fig. 8.44, item 3), four wheel drive knob (fig. 8.44, item 4), and panel screws (fig. 8.44, item 5). The circuit breakers are located toward the rear of the console. If a circuit breaker does not reset and continues to trip, determine the cause and correct it.

MOUNTED ON ENGINE

The wire harnesses are protected by circuit breakers mounted on the engine (fig. 8.45). If the breakers do not reset and continue to trip, determine the cause and correct it.

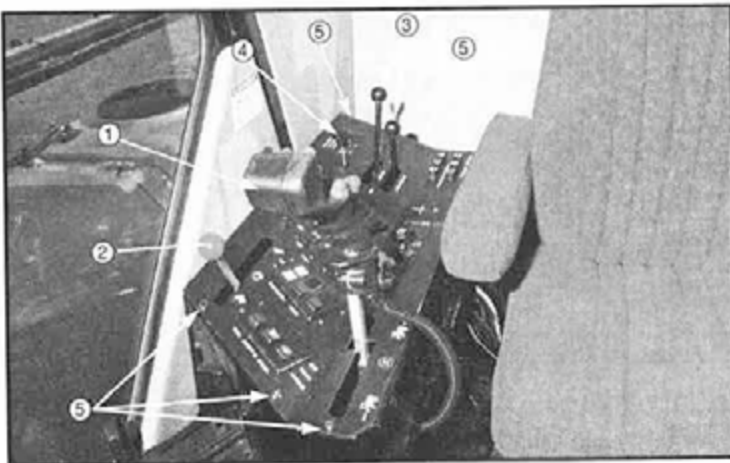


FIG 8.44

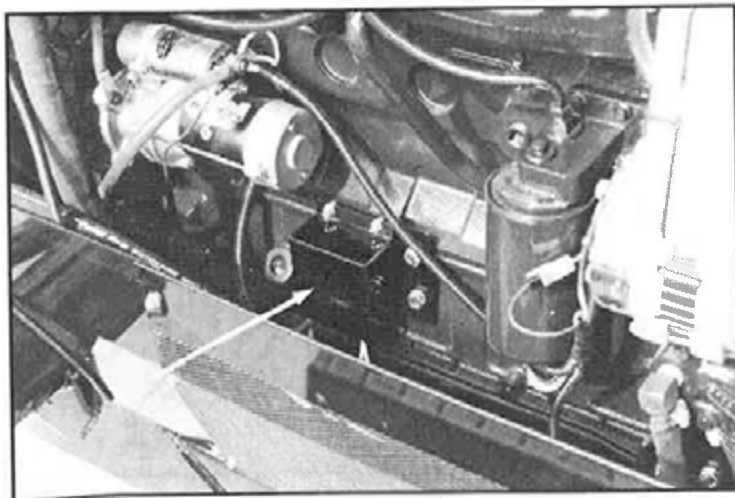


FIG 8.45

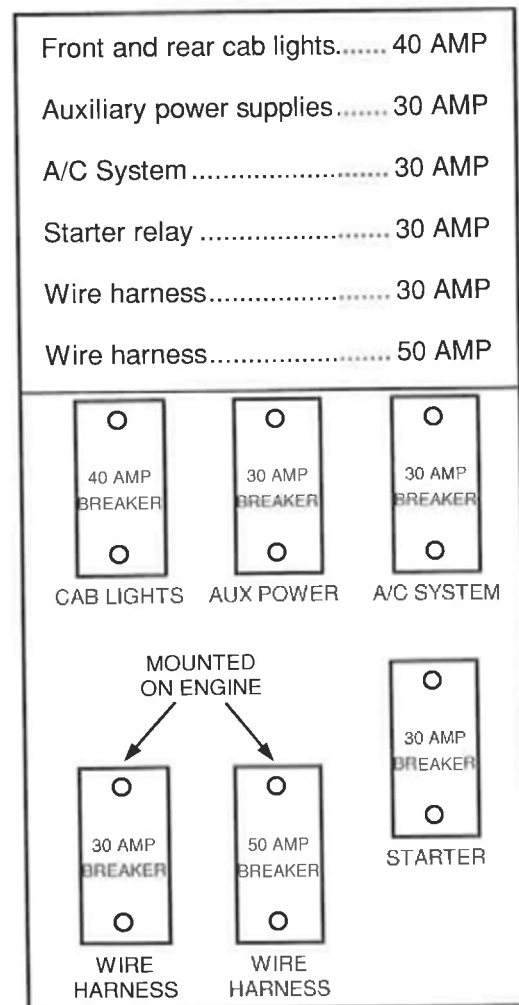


FIG 8.46

VIII. SERVICE AND MAINTENANCE

➔ ELECTRICAL CONTINUED

Circuit Relays

Relays carry large electrical loads and are controlled by switches. They can be replaced, if necessary. It is recommended to contact the Hagie Customer Support Department or your local authorized Hagie Service Technician when servicing electrical relays. This will ensure maintaining proper wire location on the relay panel (fig. 8.47).

Remove the console panel as described on page 101 to access the relay panel (fig. 8.48). If it is necessary to remove a relay, tag all the wires going to that relay.

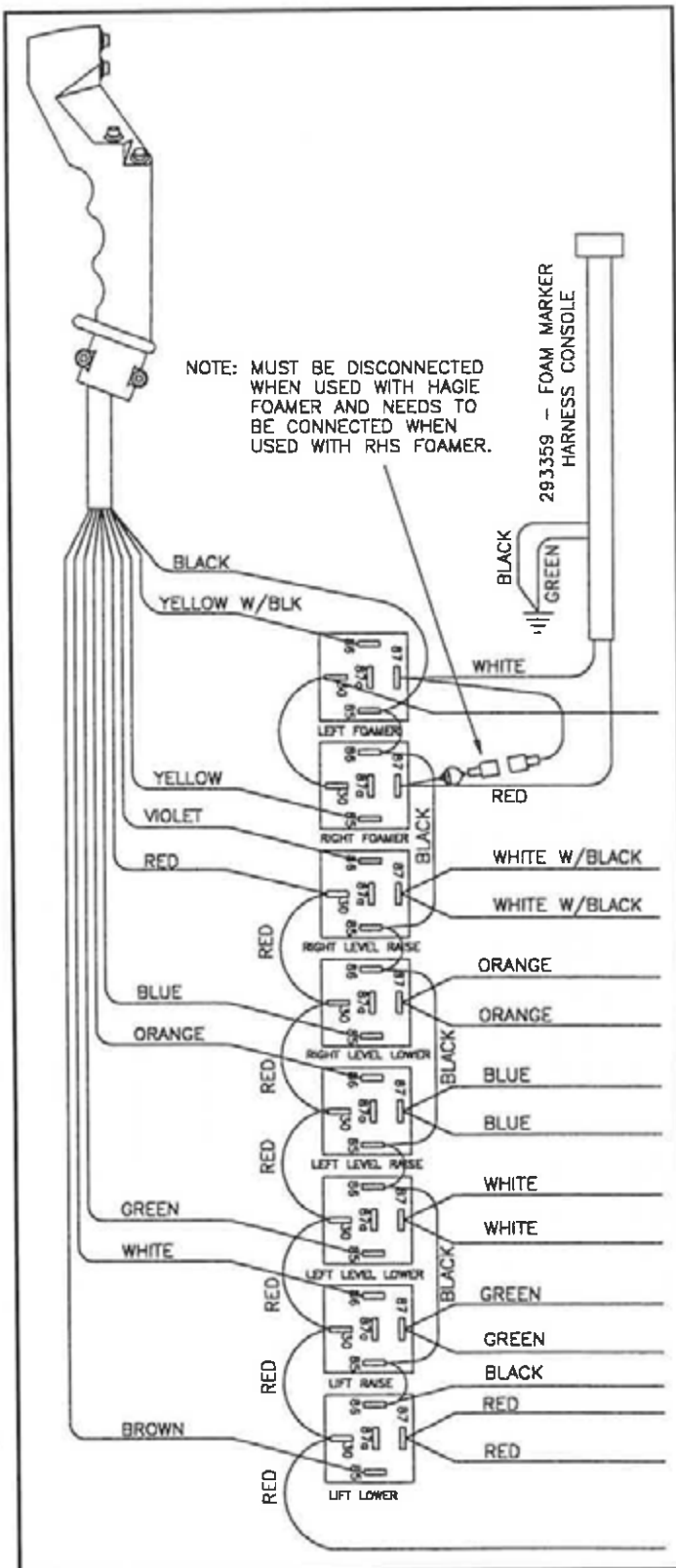


FIG 8.47

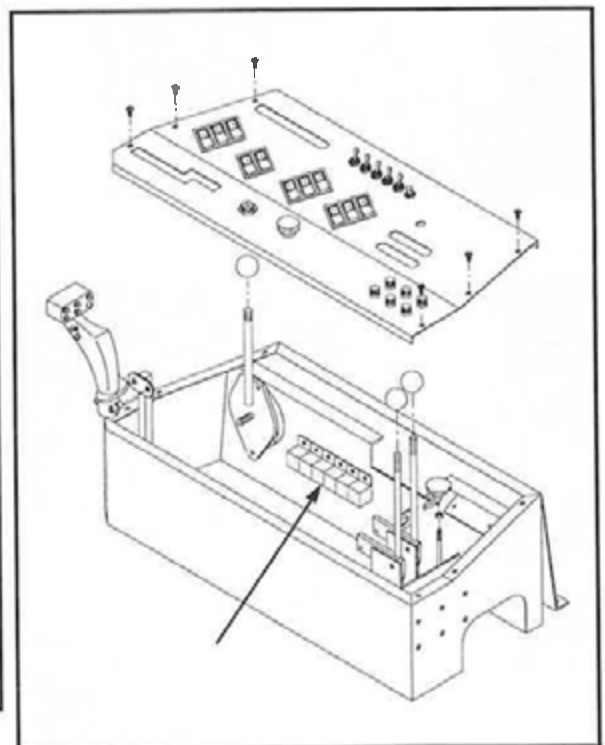


FIG 8.48

VII. SERVICE AND MAINTENANCE



FIG 8.49



FIG 8.50

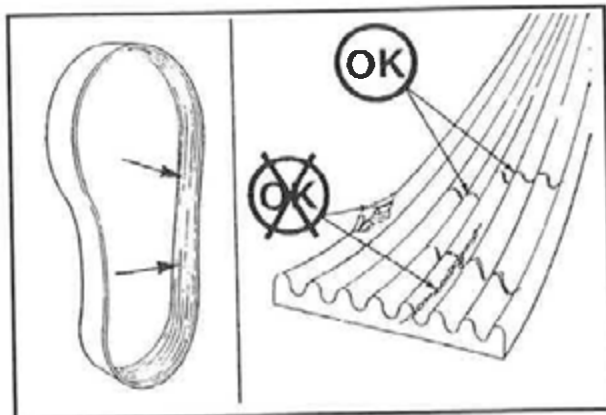


FIG 8.51

BELTS

Engine Drive Belt

REMOVAL - Insert a 3/8 inch square ratchet drive into the belt tensioner and lift upward to remove the belt (fig. 8.49).

INSPECTION - Visually inspect the belt daily (fig. 8.50). Check the belt for intersecting cracks (fig. 8.51). Transverse (across the belt width) cracks are acceptable. Longitudinal (direction of belt length) cracks that intersect with transverse cracks are not acceptable. Replace the belt if it is frayed or has pieces of material missing.

A/C Compressor Belt

To tighten air conditioner compressor belt, loosen the two pivot bolts (fig. 8.52, item 1) and the two slide bolts (fig. 8.52, item 2). Using a suitable prying tool, adjust tension on belt to desired tautness. While maintaining tension, re-tighten all four bolts. Inspect belt every 250 hours.

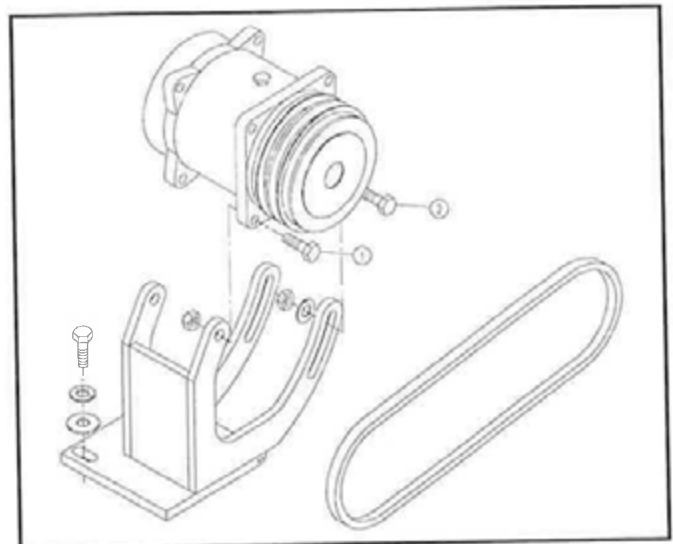


FIG 8.52

VIII. SERVICE AND MAINTENANCE

DRIVE TRAIN

Hydrostatic Pump

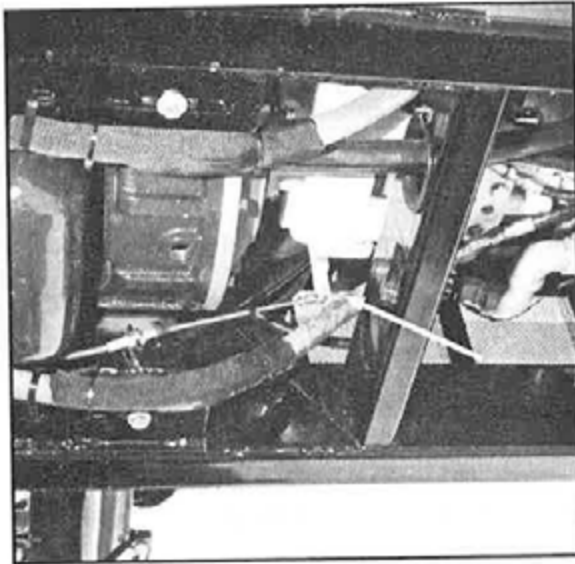


FIG 8.53

NEUTRAL SETTING - When the hydrostatic lever is in the neutral position, the machine should not be moving in either direction. If it does, the neutral setting of the lever (fig. 8.53) on the hydrostatic pump needs to be adjusted. See accompanying pump manual.

CHECK CHARGE PRESSURE - See page 35.

REPAIR/REPLACEMENT - See pump handbook accompanying this operator's manual. Hydrostatic pumps are available as a core exchange item from Hagie Manufacturing Customer Support Department.

Auxiliary Gear Pumps

REPAIR/REPLACEMENT - See pump handbook accompanying this operator's manual. Gear pumps are available from the Hagie Manufacturing Customer Support Department.

Wheel Motors

REPAIR/REPLACEMENT - See wheel motor handbook accompanying this operator's manual. Wheel motors are available as a core exchange item from Hagie Manufacturing Customer Support Department.

Torque Hubs[®]

GREASE - Grease according to page 96.

OIL - Maintain oil level according to page 85.

REPLACEMENT - Torque Hubs[®] are available as a core exchange item from Hagie Manufacturing Customer Support Department.

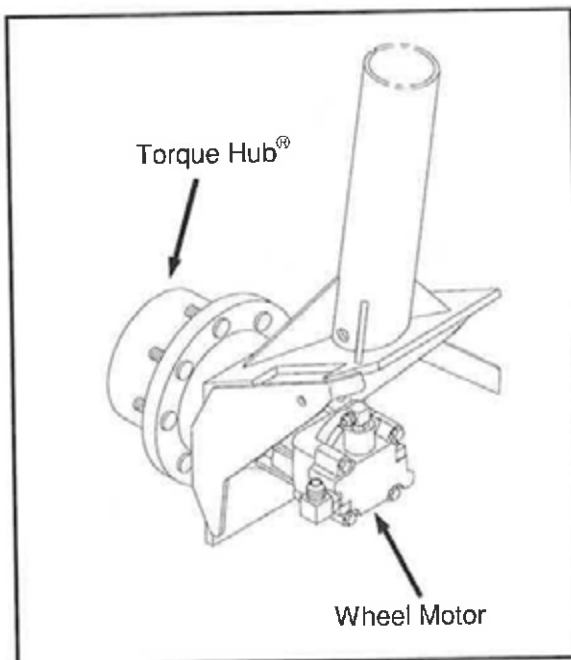


FIG 8.54

VIII. SERVICE AND MAINTENANCE

BOLT TORQUE

Wheel Bolts



FIG 8.55

To install wheel and tire assembly on the Torque Hub[®], lubricate studs with anti-seize grease. Align the wheel bolt holes with the Torque Hub[®] studs and mount the wheel on the hub.

NOTE:

To achieve even torquing consistency, the tire should be completely off the ground.

Start all of the lug nuts on and tighten them until they are just snug. Following the torque sequence in figure 8.56, first turn each lug nut to a torque value of 120 dry foot-pounds. Use slow, even pressure on the torque-wrench. Quick or jerky movements cause inaccurate values. Repeat the same sequence to 150 dry foot-pounds and again finally to 180 dry foot-pounds.

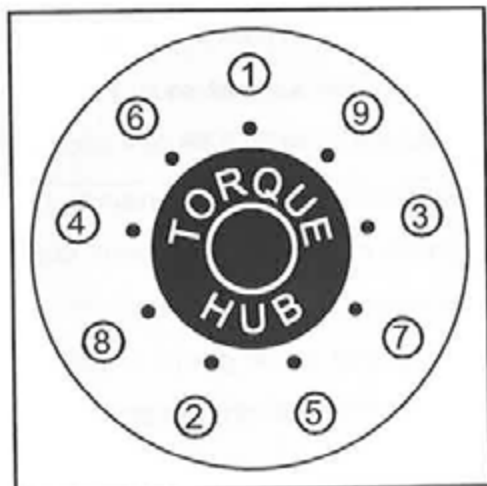


FIG 8.56

CAUTION

Check lug nut torque immediately after receiving machine and every 50 hours thereafter.

If the wheel turns during lug nut torquing, lower the machine to the ground just enough for the tire to touch and prevent rotation or preferably, place a suitable wedge between the tire and the ground.

Lower the machine and resume operation. Recheck torque after 30 minutes of operation.

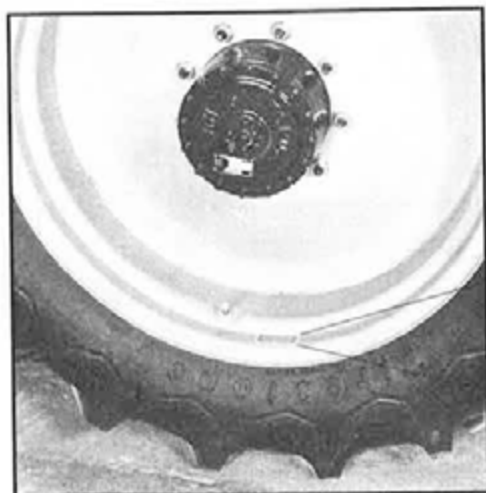


FIG 8.57

Keep wheel bolts tight.
See owner's manual for
torque specifications.

BOLT TORQUE CONTINUED ➔

VIII. SERVICE AND MAINTENANCE

➔ BOLT TORQUE

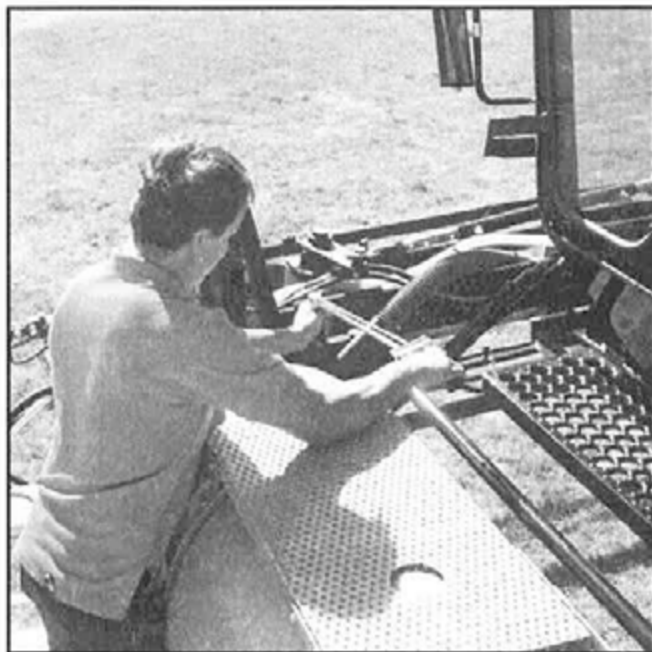


FIG 8.58

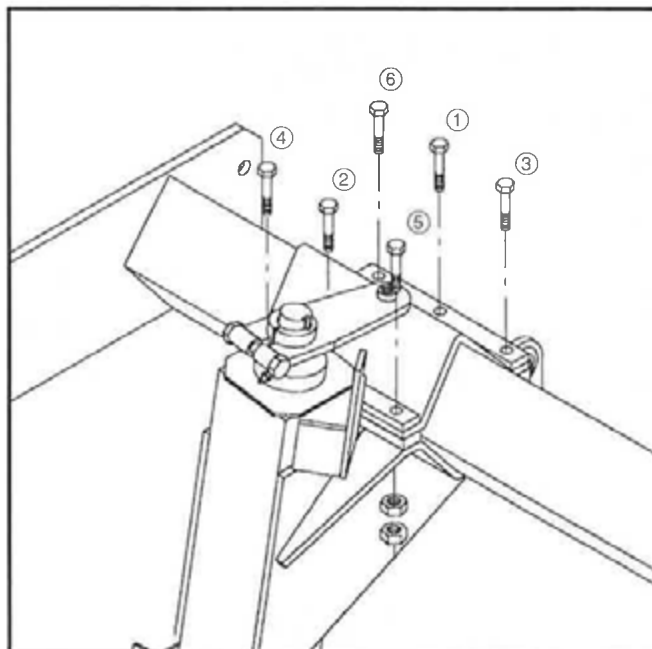


FIG 8.59

Leg Mounting Bolts

After loosening the leg mounting bolts for tread adjustment, or for any other reason, follow these procedures for torquing the leg mounting bolts:

CAUTION

Never remove more than three leg mounting bolts from any single leg mount.

Start the nuts on the mounting bolts and tighten them until they are just snug. Following the torque sequence in figure 8.59, turn each lug nut to a torque value of 100 dry foot-pounds. Use slow, even pressure on the torque wrench. Quick or jerky movements cause inaccurate values.

Lower the sprayer to the ground and repeat the same sequence to 130 dry foot-pounds and again finally to 160 dry foot-pounds.

Resume operation and recheck torque values after 30 minutes of operation.

VIII. SERVICE AND MAINTENANCE

TOE-IN ADJUSTMENT

1. Turn steering wheel until center steering pivot (fig. 8.60, item 1) is vertical.
2. Loosen tie rod jam nuts (fig. 8.60, item 5).
3. Remove tie rod bolts (fig. 8.60, item 3) on outer end of tie rod tube (fig. 8.60, item 2).
4. Manually pry each front wheel in or out until each is lined up exactly with the corresponding rear tire.
5. Turn inner tie rod (fig. 8.60, item 4) in or out until the bolt hole lines up with the bolt hole in the tie rod tube. Then turn one more full turn **OUT**.
6. Tighten jam nut.
7. Line up bolt holes on each side one at a time by turning the steering wheel one way or the other. Reinstall bolts and nuts as you line up each hole; tighten firmly.
8. Drive sprayer forward for approximately 100 yards as you cycle the steering back and forth repeatedly. Recheck toe-in (page 25) and readjust if necessary.

NOTE:

A tight string placed across the face of the tires on each side will help line them up.

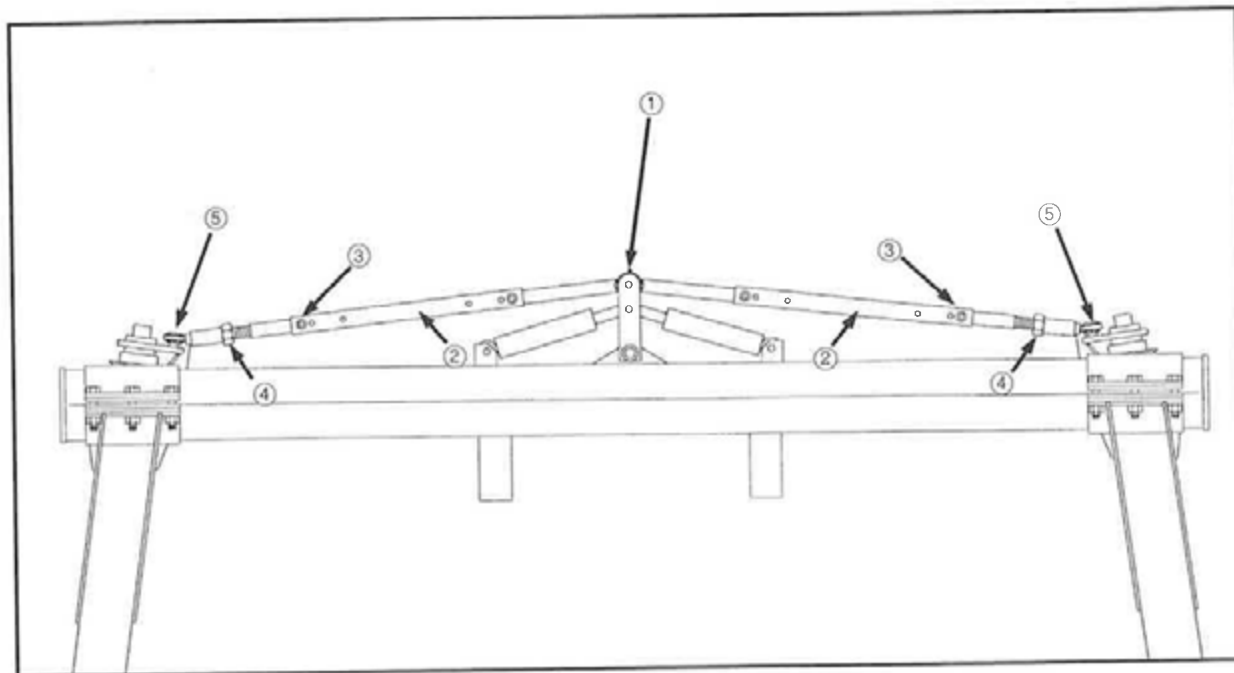


FIG 8.60

VIII. SERVICE AND MAINTENANCE

SPRAY SYSTEM

Solution Pump

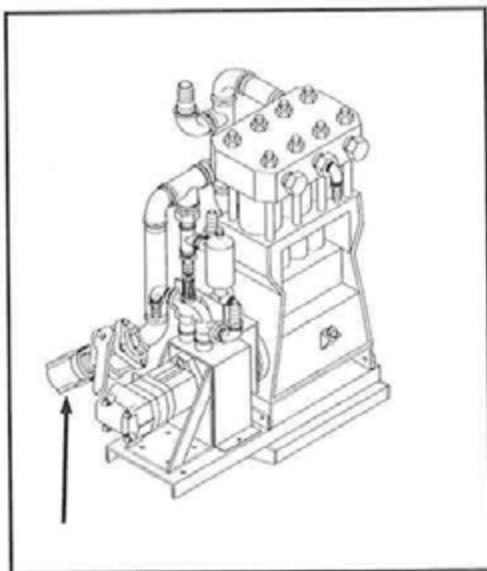


FIG 8.61

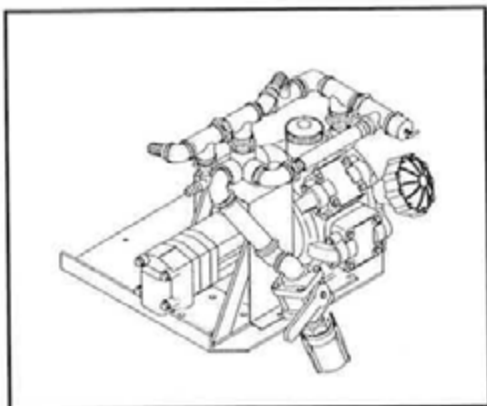


FIG 8.62

Bean 35 HP (fig. 8.61) – Maintain oil level according to page 88. Cylinder packing should be replaced whenever it reaches a leakage rate of 15 to 20 drops per minute or whenever the pump begins to cavitate due to air being drawn past the packings on the suction stroke. See page 109 for information on changing cylinder packings. See pages 110 and 111 for information on changing suction and discharge valves.

NOTE:

To increase the life of Bean pump, fill the solution tanks through the quick-fill (fig. 8.61).

Hypro® D-230 (fig. 8.62) – If equipped with Hypro® pump, refer to accompanying service bulletin for information regarding pump maintenance.

VIII. SERVICE AND MAINTENANCE

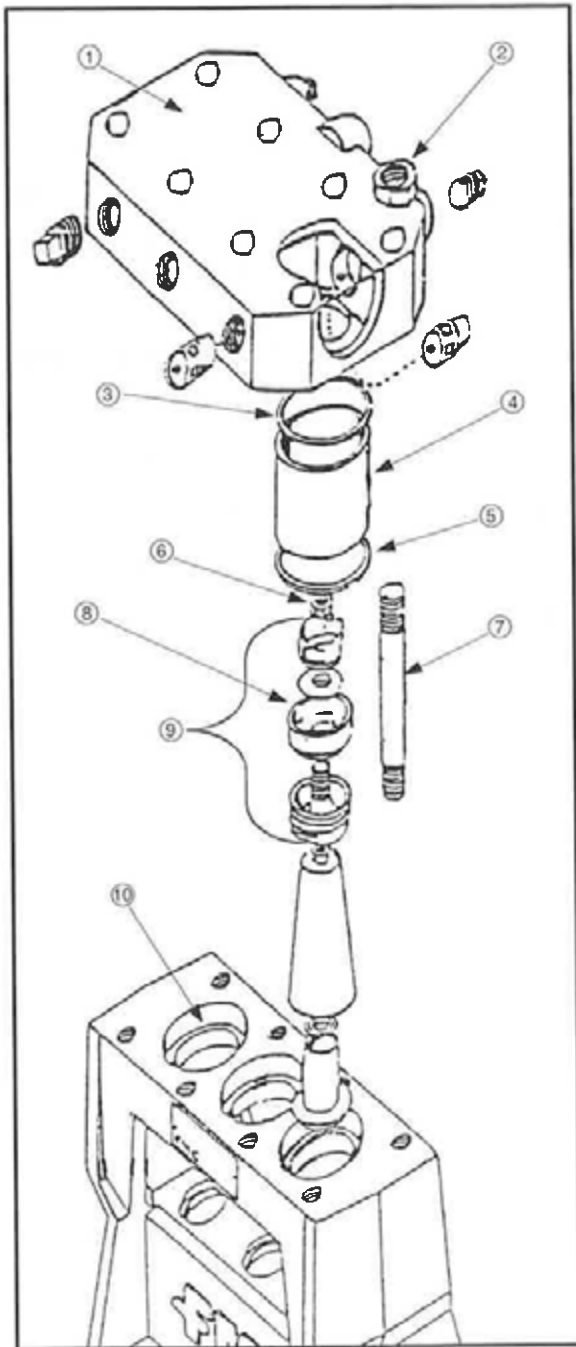


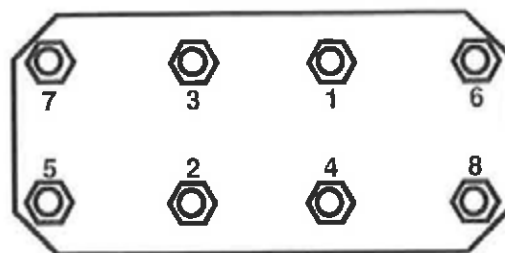
FIG 8.63

Changing Plunger Packings

When changing plunger packings, refer to your HAGIE 254x-11 parts manual for detailed listing of parts involved.

Follow these steps carefully:

- 1) Remove the valve chamber (fig. 8.63, item 1) from pump case by unscrewing valve chamber nuts (fig. 8.63, item 2) and lifting off of studs (fig. 8.63, item 7).
- 2) Remove the packing nut (fig. 8.63, item 6) and separate the packing assembly (fig. 8.63, item 9) from cylinder (fig. 8.63, item 4).
- 3) Install the new packing (fig. 8.63, item 8) in the holder assembly. Torque packing nut to 35–40 ft-lbs. Before installing new packing in cylinders, the cylinders should be cleaned to remove buildup of materials that would injure new packings. Lubricate the packing and push it into the cylinder. For greater ease of installation, soak the packing assembly in hot water for two to three minutes prior to installation in the cylinder.
- 4) Check that the gaskets (fig. 8.63, item 5) are in the pump case (fig. 8.63, item 10) and install cylinders.
- 5) Clean gasket recesses in the valve chamber thoroughly and install new gaskets (fig. 8.63, item 3).
- 6) Install valve chamber and nuts on studs and torque nuts according to sequence shown below. Torque to 50 ft-lbs first, then 70 ft-lbs, and finally to 100 ft-lbs. Recheck torque after five minutes of pump operation.



SPRAY SYSTEM MAINTENANCE →

SERVICE/
MAINTENANCE

VIII. SERVICE AND MAINTENANCE

➔ SPRAYING SYSTEM MAINTENANCE

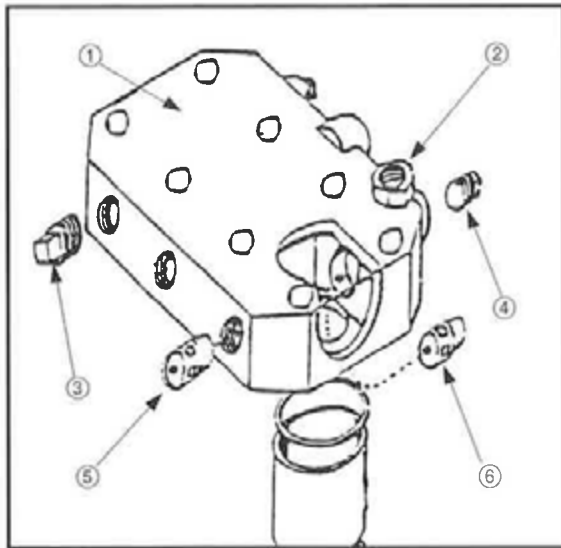


FIG 8.64

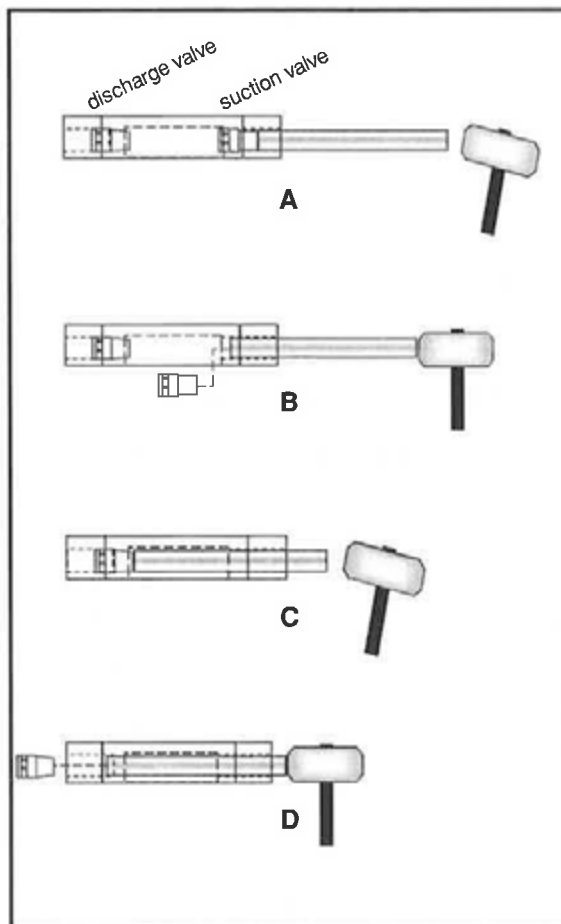


FIG 8.65

Servicing Suction and Discharge Valves on Bean Pump

When removing suction and discharge valves, refer to your HAGIE 254x-11 parts manual for detailed listing of parts involved. Follow these steps carefully:

- 1) Remove the valve chamber (fig. 8.64, item 1) from pump case by unscrewing valve chamber nuts (fig. 8.64, item 2) and lifting off of studs (fig. 8.64, item 7).
- 2) Gently drive the suction valve (fig. 8.64, item 6) loose and push it into the valve chamber area and remove it (fig. 8.65, A & B).
- 3) Continue through the valve chamber and repeat for procedure for the discharge valve (fig. 8.64, item 5), driving it through the discharge opening (fig. 8.65, C & D).
- 4) Repeat procedures two and three for each set of valves.
- 5) See next page for valve replacement.

VIII. SERVICE AND MAINTENANCE

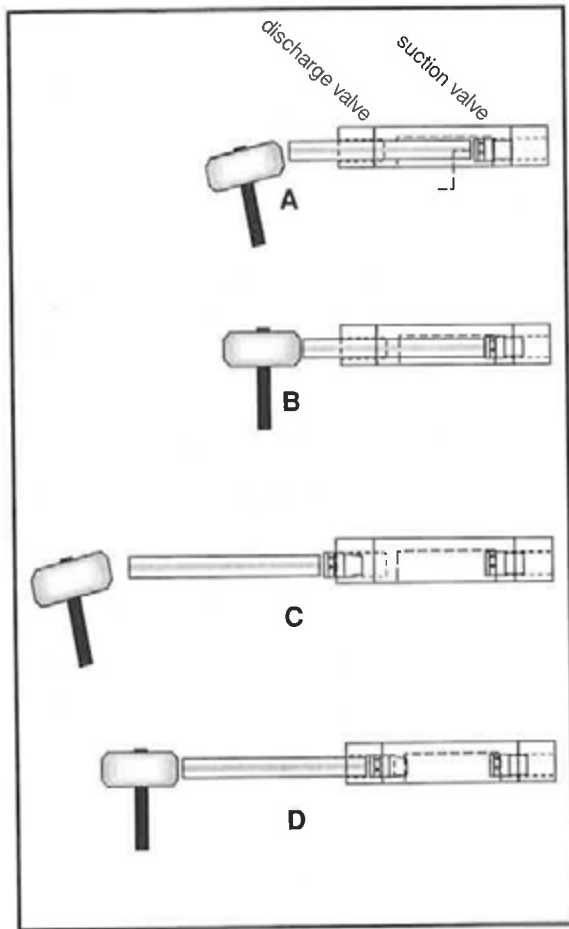


FIG 8.66

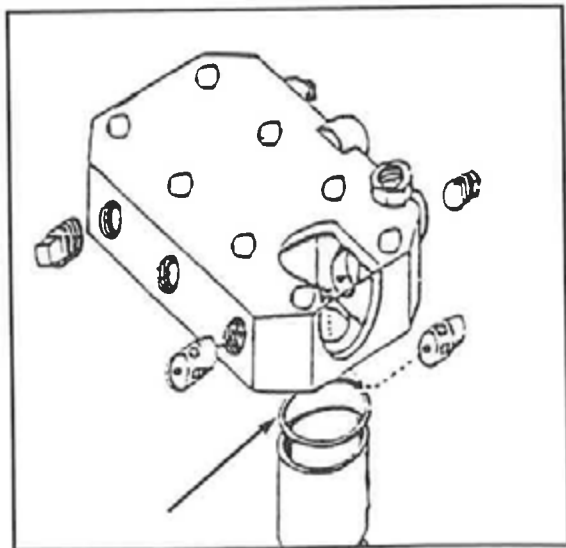
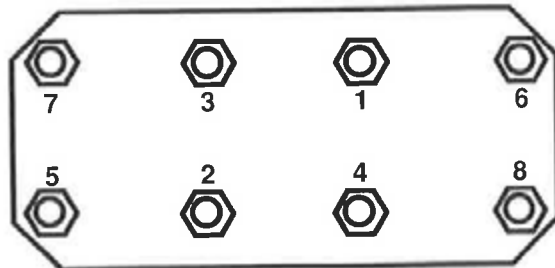


FIG 8.67

When replacing suction and discharge valves, refer to your HAGIE 254x-11 parts manual for detailed listing of parts involved. Follow these steps carefully:

- 1) To replace valves, start by inserting a suction valve into the tapered opening. Gently drive the valve into place squarely and tightly (fig. 8.66, A & B).
- 2) Insert the discharge valve in the discharge opening and repeat the above procedure (fig. 8.66 C & D).
- 3) Repeat procedures one and two for each set of valves.
- 4) Clean gasket recesses in the valve chamber thoroughly and install new gaskets (fig. 8.67).
- 5) Install valve chamber and nuts on studs and torque nuts according to sequence shown below. Torque to 50 ft-lbs first, then 70 ft-lbs, and finally to 100 ft-lbs. Recheck torque after five minutes of pump operation.



VIII. SERVICE AND MAINTENANCE

➔ SPRAYING SYSTEM MAINTENANCE

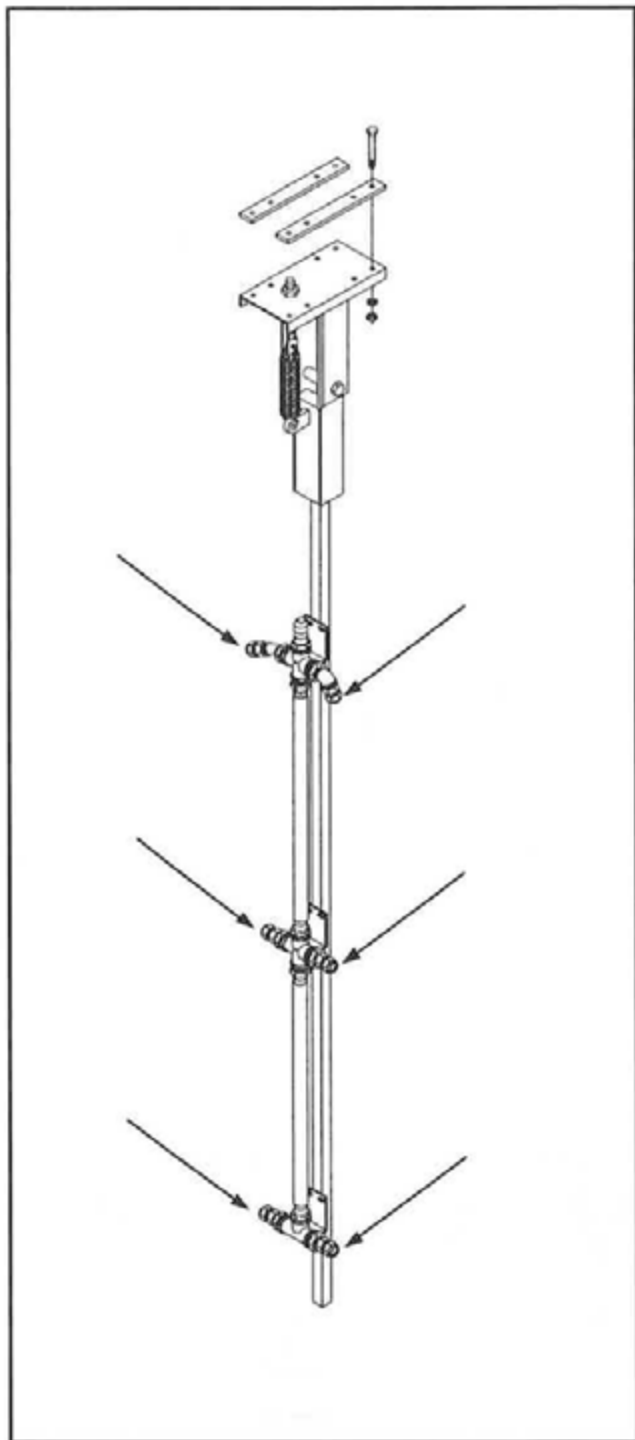


FIG 8.68

Line strainers

See page 93 for information concerning solution line strainers.

Spray Tips

In order to assure proper solution application the spray tips should be inspected for accurate flow.

Every 100 hours of operation visually inspect the flow of each nozzle while spraying clean water through the spray system. The spray pattern from each nozzle should be identical. If any nozzle differs from the others, use your Hagie calibration tube and catch the flow from that nozzle for one minute. Compare it to the flow measurement of some of the other nozzles. Replace the nozzle if necessary.

Every 200 hours, regardless of visual inspection, take flow samples from a random selection of nozzles. Replace any nozzles with inaccurate flow.

Calibration

See pages 73-74, section six on spray system calibration.

Storage

See page 117 on cold weather storage of spray system.

VIII. SERVICE AND MAINTENANCE

Surge Tank on Bean Pump

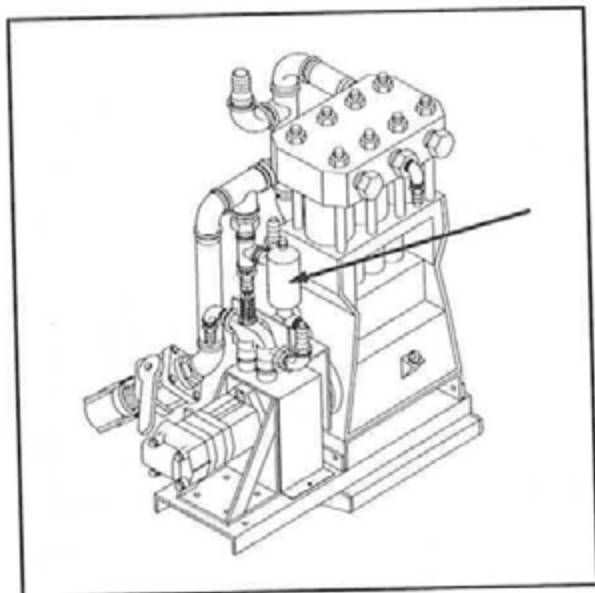


FIG 8.69

The surge tank mounted on the Bean pump (fig. 8.69) dampens piston pulsations and pressure surges to provide smoother, more even flow of liquid being pumped. Smoothing out pressure peaks helps protect the spray system and adds to equipment life. In order to operate correctly, the tank must remain mounted in the vertical position.

When the surge tank becomes waterlogged, the spray system pump should be stopped and surge tank should be drained (see next paragraph). Waterlogged condition is indicated by excessive line vibration and fluctuation of gauge pressure needle, which result from undampened high pressure peaks.

To recharge a waterlogged surge tank, shut off the spray system pump. Open the drain cock (fig. 8.70), located toward the bottom of the tank, by turning it clockwise. Allow liquid to drain, then close drain cock and resume pump operation.

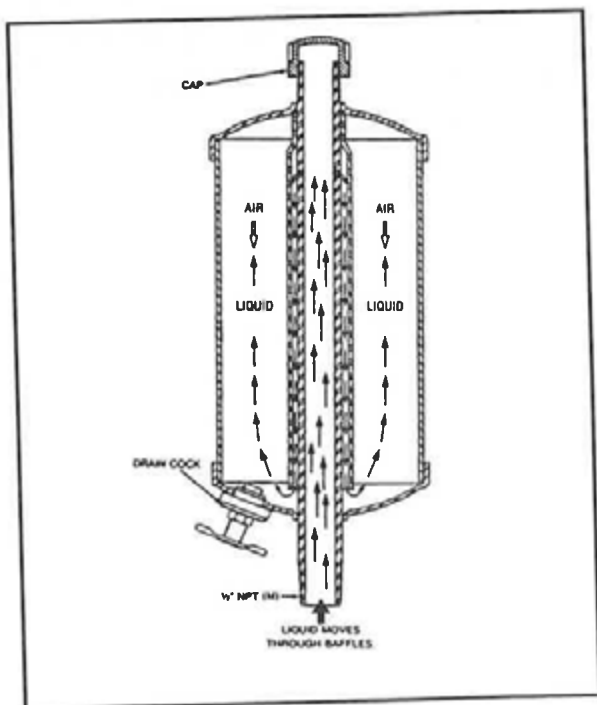


FIG 8.70

VIII. SERVICE AND MAINTENANCE

TIRES



FIG 8.71

Air Pressure

Check tire pressure once a week or every 50 hours of operation (fig. 8.71). Never inflate a tire more than the recommended maximum air pressure. Use an air line with a locking air chuck and stand behind tire tread while filling (fig. 8.72).

NOTE:

Tire pressure will depend on load quantity and type in solution tanks. Refer to page 22 for tire specifications.



FIG 8.72

WARNING

When inflating tire use extension hose with in-line air gauge and clip-on air chuck, which allow operator to stand clear of tire side wall explosion trajectory.

Wheel Bolts

See page 105 for recommended wheel bolt torque specifications and torquing pattern.

Mounting

If you do not have proper mounting equipment, let your local qualified tire sales/service dealer mount the tire for you. Tire should be mounted on rim according to figure 8.73 for best traction and tread cleaning action.

Toe In

See pages 25 and 107 for information regarding toe-in measurement and adjustment.



FIG 8.73

VIII. SERVICE AND MAINTENANCE

DAILY INSPECTION

Inspection Point	Action (if necessary)
Check	
Engine oil level.....	Add oil
Radiator coolant level.....	Add antifreeze solution
Coolant overflow reservoir level	Add antifreeze solution
Engine drive belt	Replace belt
Filter Minder®	Replace air filter element
Hydraulic reservoir oil level	Add hydraulic oil
Neutral setting of hydrostatic pump	Adjust setting
Solution line strainers.....	Remove and clean
Visual inspection of leg mounting bolts.....	Tighten
Battery	Clean and/or tighten
Radiator grille screens.....	Remove and clean
Visually inspect tie rod linkage	Tighten
Look for loose or missing items such as shields.....	Tighten or replace
Look for any fluid leaks pooled on machine or ground	Determine cause and correct

Grease

Upper and lower leg bearings.....	See page 95
Tie rod linkage	See page 95
Torque Hub® seal boots.....	See page 96

Drain

Fuel/water separator.....	See page 94
---------------------------	-------------

IX. STORAGE

A. Preparing the sprayer for storage.

1. Perform daily level checks, lubrication, and bolt and linkage inspections as required in this manual in section eight on maintenance.
2. Every other season, drain the coolant from the engine and radiator. Probe the drain holes during draining to ensure they are not clogged by sludge, scale, or other deposits. Fill the cooling system to the top with a 50/50 water/antifreeze mixture. Run engine to operating temperature and re-check level.

NOTE:

If antifreeze is added, make sure the engine is then run to operating temperature to assure proper mixing of solution.

3. Add a fuel stabilizer to the fuel and fill fuel tank.
4. Run the engine until it is at operating temperature, then drain the engine oil. Refill with fresh oil of recommended weight and install a new lubricating oil filter element.
5. With the engine at normal operating temperature, cycle all hydraulic functions including the steering.
6. Release tension on all belts. For more detailed information, consult the manufacturer's handbook that accompanies this manual.
7. Use plastic bags and water-resistant adhesive tape to seal the air intake opening, all exhaust manifold openings, engine oil filler cap, hydraulic oil tank breather cap, and fuel tank caps.
8. Disconnect and remove battery or batteries. Completely clean and charge the battery. Coat the terminals with petroleum jelly and store battery in cool, dry place.
9. Thoroughly clean the sprayer. Touch up any painted surfaces that are scratched or chipped. For touch-up paint recommendations contact the Hagie Manufacturing Customer Support Department.
10. Replace worn or missing decals. See pages 8-13 for proper location of warning decals and their corresponding part number. Warning decals and all other Hagie decals are available through the Hagie Manufacturing Customer Support Department.

NOTE:

For replacement decals contact:
Hagie Manufacturing Company
Box 273, Clarion, IA 50525
Ph. 1-800-247-4885

IX. STORAGE

11. Use a multi-purpose grease to coat exposed hydraulic cylinder rods to prevent rusting which could result in cylinder damage.
12. To winterize the spray system, it is recommended that you use an environmentally-safe type antifreeze and water mixture that will give you adequate protection to minus 30 degrees below zero. Drain any remaining solution in the system and run the antifreeze mixture through the spray system until it comes out all boom openings.
13. If the sprayer must be stored outside, cover it with a waterproof cover.

B. Removing the sprayer from storage.

1. Inspect the condition, and test the air pressure, of all tires. Please see page 114 for information regarding proper tire maintenance.
2. Carefully unseal all openings that were sealed in the storage process.
3. Clean and reinstall the battery. Be sure to attach the battery cables to the proper terminals.
4. Tighten all belts. Inspect and replace any worn belts. For information on belts, see page 103.
5. Check engine oil, hydraulic oil, and engine coolant levels; add, if necessary. A mixture of 50/50 antifreeze and water will cool adequately in summer as well as protect in winter.

NOTE:

Protective compounds such as grease can harden under exposure to weather conditions.

6. Completely clean the sprayer.
7. Review section eight on maintenance (pages 80-115), and perform all needed services as instructed.
8. For starting instructions, see pages 30-31 in section five on operating information.

NOTE:

See Warranty on page 127 concerning **improper storage**.

X. TROUBLE SHOOTING

A. ENGINE



Start engine from operator's seat only. When running engine in a building, be sure there is adequate ventilation.

PROBLEM	POSSIBLE CAUSE	SUGGESTED REMEDY
Engine won't crank	Dead battery Poor battery connections Neutral safety switch (located in the Sauer/Sundstrand pump) Starter or starter relay	Recharge or replace battery Clean and tighten Adjust and/or replace if needed Test; rebuild or replace
Engine won't start	Out of fuel Clogged fuel filters Cold weather Low starter speed	Fill fuel tank Replace fuel filters Refer to engine manual for cold weather starting information Check starter and battery

X. TROUBLE SHOOTING

PROBLEM	POSSIBLE CAUSE	SUGGESTED REMEDY
Engine overheats	<p>Engine overloaded</p> <p>Dirty radiator core or dirty grill screens</p> <p>Faulty radiator cap</p> <p>Loose or faulty fan belt</p> <p>Faulty thermostat</p> <p>Low coolant level</p>	<p>Reduce load</p> <p>Remove all foreign material and clean all items</p> <p>Replace cap</p> <p>Tighten or replace fan belt</p> <p>Replace thermostat</p> <p>Refill to proper level with recommended coolant</p>
Engine misfires: runs uneven, low power	<p>Water in fuel</p> <p>Dirty air cleaner element</p> <p>Poor grade of fuel</p> <p>Fuel tank vent clogged</p> <p>Clogged fuel filter</p>	<p>Drain, flush, replace filter, fill system</p> <p>Replace element</p> <p>Drain system; change to good grade</p> <p>Open fuel tank vent in cap</p> <p>Replace fuel filter</p>
Engine knocks	<p>Low oil level in crankcase</p> <p>Cold engine</p>	<p>Add oil to full mark</p> <p>Allow proper warm-up period; refer to engine owner's handbook</p>

NOTE:

For additional engine information, consult engine manufacturer's manual.

X. TROUBLE SHOOTING

B. SPRAY SYSTEM

WARNING

CHEMICALS ARE DANGEROUS

Read The Chemical manufacturer's labels to avoid injury or damage.

PROBLEM	POSSIBLE CAUSE	SUGGESTED REMEDY
Solution pump will not prime	Low water level in pump	Making sure the solution tanks are not empty, add solution through the quick-fill connection on solution pump; solution pumps are normally self-priming once filled
	Air leak in suction line	Inspect and tighten all fittings on suction line
	Solution valves turned off	Turn solution valves to open position, allowing air to leave the system
Erratic reading on pressure gauge	Orifice in back of gauge clogged	Remove gauge; clean orifice; re-install
	Hose from manifold to pressure gauge clogged	Remove hose; unclog and re-install; or replace
	Faulty gauge	Replace gauge
	Air leak in suction line	Inspect and tighten all fittings in suction line
	Glycerin leaking from gauge	Replace gauge

X. TROUBLE SHOOTING

PROBLEM	POSSIBLE CAUSE	SUGGESTED REMEDY
Solution pump not producing normal pressure	Clogged line strainer screen	Remove screen; clean thoroughly; tighten strainer cap to avoid air leak
	Air leak in suction flow to pump	Inspect and tighten all fittings on suction line
	Restricted solution flow to pump	Main solution tank shut-off valve or valves not completely open
	Suction hose collapsed	Obstruction at inlet end of hose, causing high vacuum on hose
	Faulty hydraulic pump	Replace hydraulic pump
	Faulty hydraulic motor on solution pump	Replace motor
	Internal restriction of diaphragm (Hypro [®] only) such as build up of chemical	Disassemble; inspect; clean; reassemble
Malfunction of electric solution valve	Blown fuse	Replace fuse
	Faulty ground	Clean and tighten ground
	Dirty contact terminals	Clean contact terminals
	Separation in wire	Check continuity and replace wire
	Faulty switch	Replace switch
	Short in solenoid coil	Replace valve
	Bad valve	Replace valve

X. TROUBLE SHOOTING

C. HYDROSTATIC SYSTEM

CAUTION

DO NOT GO NEAR LEAKS. High pressure oil easily punctures skin causing injury, gangrene, or death. If injured, seek emergency medical help. Immediate surgery is required to remove oil. Do not use finger or skin to check for leaks. Lower load or relieve hydraulic pressure before loosening fittings.

PROBLEM	POSSIBLE CAUSE	SUGGESTED REMEDY
Machine won't move in either direction	Engine speed too low	Set engine at operating RPM before trying to move machine
	Oil level in reservoir low	Fill reservoir to proper level w/ approved oil; see section on Service and Maintenance
	Control linkage	Repair or replace
	Clogged filter	Replace filter
	Hydrostatic pump not turning	Check drive coupling
	Faulty hydrostatic pump	Replace pump
	Air leak in suction line	Inspect and tighten all fittings on suction line
	Low charge pressure	See section under charge pressure
Machine will move in only one direction	Faulty high pressure relief valve	Switch relief valves from side to side; If problem reverses, replace faulty valve (Pages 34 & 35)

X. TROUBLE SHOOTING

PROBLEM	POSSIBLE CAUSE	SUGGESTED REMEDY
Hydrostatic system responding slowly	<p>Engine speed too low</p> <p>Oil level in reservoir low</p> <p>Cold oil</p> <p>Plugged filter</p> <p>Partially restricted suction line</p> <p>Internal damage</p>	<p>Set engine at operating RPM before trying to move machine</p> <p>Fill reservoir to proper level with approved oil; see section on Service and Maintenance</p> <p>Allow for adequate warm-up period</p> <p>Check and replace filter</p> <p>Inspect for collapsed suction hose</p> <p>Replace hydrostatic pump or motor</p>
Noisy hydrostatic system	<p>Cold oil</p> <p>Low engine speed</p> <p>Oil level in reservoir low</p> <p>Air in system</p> <p>Internal damage to pump</p>	<p>Allow for adequate warm-up period</p> <p>Increase engine speed</p> <p>Fill reservoir to proper level with approved oil; see section on Service and Maintenance</p> <p>Inspect and tighten all fittings on suction line</p> <p>Replace pump</p>
External oil leaks	<p>Loose or faulty fittings</p> <p>Damaged O-ring</p> <p>Faulty hose</p>	<p>Tighten or replace</p> <p>Inspect; if damaged replace</p> <p>Replace hose</p>

X. TROUBLE SHOOTING

D. HYDRAULIC SYSTEM



CAUTION

DO NOT GO NEAR LEAKS. High pressure oil easily punctures skin causing injury, gangrene, or death. If injured; seek emergency medical help. Immediate surgery is required to remove oil. Do not use finger or skin to check for leaks. Lower load or relieve hydraulic pressure before loosening fittings.

PROBLEM	POSSIBLE CAUSE	SUGGESTED REMEDY
Entire hydraulic system fails to function	Oil level in reservoir low	Fill reservoir to proper level with approved oil; see section on Service and Maintenance
	Oil not reaching pump	Prime the pump by removing suction hose from reservoir; hold removed end higher than pump; hand feed two (2) quarts approved oil through suction hose by bumping engine w/ starter (careful not to start engine); re-install hose; tighten all fittings
	Faulty hydraulic pump	Replace hydraulic pump
Noisy hydraulic pump	Collapsed suction hose caused by cold oil	Allow for adequate warm-up period
	Oil level in reservoir low	Fill reservoir to proper level with approved oil; see section on Service and Maintenance
	Air leak in suction line	Inspect and tighten all fittings on suction hose

X. TROUBLE SHOOTING

E. ELECTRICAL

CAUTION

Batteries contain sulfuric acid. Avoid contact with skin, eyes, or clothing. Do not inhale fumes or ingest liquid. Batteries contain gases which can explode. Keep sparks and flame away while servicing.

NOTE:

Disconnect battery when servicing any part of electrical system to prevent system damage.

PROBLEM	POSSIBLE CAUSE	SUGGESTED REMEDY
Entire electrical system is dead	Dead battery Poor battery connection Low charging rate No charging rate	Charge or replace Clean and tighten Tighten alternator belt Replace alternator
All gauges on instrument panel not working	Blown fuse Poor ground	Replace fuse Clean and tighten ground
Tachometer/MPH Indicator not working	Blown fuse Loose connections at sensor/alternator Faulty sensor	Replace fuse Tighten or replace connectors Replace sensor
Light system does not function	Blown fuse Poor ground Burned-out bulb Separation or short in wire Faulty switch	Replace fuse Clean and tighten ground Replace bulb Check continuity and replace wire Replace switch

X. TROUBLE SHOOTING

NOTES

XI. LIMITED WARRANTY

1. The Warranty

- a. This warranty gives you specific legal rights. You may also have other rights which may vary from state to state.
- b. Hagie makes this warranty only to the original purchaser of its new equipment.
- c. The warranty period ends 12 months from the date of delivery of equipment to the original purchaser. When requesting warranty service, the original purchaser must present evidence of the date of delivery of the equipment.
- d. Parts or rebuilt assemblies furnished under the terms of this warranty are not warranted beyond the original warranty period.
- e. Exceptions to this warranty must be covered by separate warranty agreements.

2. Items not covered by Hagie Warranty

- a. Used equipment.
- b. Tires, tubes, engines, and batteries (under separate manufacturer's warranty).
- c. Depreciation or damage caused by normal wear, accident, improper maintenance, improper storage, or improper use.
- d. Service calls and transporting the equipment to and from the place where the warranty work is performed.

3. Unapproved service or modification

NOTE:

All obligations of Hagie Manufacturing Company under this warranty shall be terminated if:

- a. ... service is performed by someone other than Hagie authorized personnel.
or
- b. ... the equipment is modified or altered without Hagie approval.

4. No commercial loss coverage

- a. Hagie shall not be liable for incidental or consequential damages or injuries (damage and repairs of equipment itself, loss of profits, rental or substitute equipment, loss of good will, etc.).
- b. SOME STATES DO NOT ALLOW THE EXCLUSION OR LIMITATION OF INCIDENTAL OR CONSEQUENTIAL DAMAGES, SO THE ABOVE LIMITATION MAY NOT APPLY TO YOU.

5. Merger clause

- a. The entire warranty agreement is included in this writing.
- b. Any oral agreements that are made by the selling persons about the equipment are not warranties, and are not to be relied upon by the purchaser.

6. No representations or implied warranty

- a. The parties agree that the implied warranties of merchantability and fitness for a particular purpose and all other warranties expressed or implied, are excluded from this transaction and shall not apply to the equipment sold.

LIMITED
WARRANTY

INDEX

A	PAGE	C	PAGE
Adjusting		Cab	63
Agitation Speed	58	Auxiliary Power Supplies	72
Boom Lock Collar	28	Climate Controls	66
Cab Climate Controls	66	Emergency Exit	64
Spray System Pressure	50	Filters	
Solution Tank Support Rods	55	Charcoal Filter	94
Tread Width, Manually	23-24	Fresh Air Intake Filter	94
Air Conditioning System		Recirculation Filter	94
Belt	103	Seat Operation	71
Cab Filters		Calibration	73
Fresh Air Intake	94	Charcoal Filter, Cab	94
Charcoal	94	Charge Pressure Filter	93
Recirculation	94	Cigarette Lighter-Type Power Supply	72
Charging System	89	Circuit Breakers	101
Climate Controls	66	Climate Controls, Cab	66
Dryer	93	Cold Weather Starting	32
Vents	66	Cooling System	
Agitation System	58-59	Coolant	86
Antifreeze	86	Radiator Grille Screens	90
Attaching		D	
Boom Assembly	28	Drop Assemblies	
Drop Assemblies	29	Attaching	29
Lift Arm Assembly	26	Nozzle Maintenance	108
Transom Assembly	27	E	
Auxiliary Hydraulic Gear Pumps	37	Electrical System	
Auxiliary Power Supplies		Battery	
Binding Post	72	Cleaning	99
Cigarette Lighter	72	Charging	99
B		Circuit Breakers	101
Battery		Fuses	100
Cleaning	99	Relays	102
Charging	99	Engine	
Belts		Cold Weather Starting	32
Engine		Fuel	87
Removal	103	Filters	94
Inspection	103	Oil	84
A/C Compressor	103	Operation	30
Binding Post Power Supply	73	Engine Oil Pressure Gauge	68
Bolt Torque Values		F	
Leg Mounting Bolts	106	Filter Minder®	91
Wheel Lug Nuts	105		
Boom			
Accumulator	44		
Hosing Diagram	45		
Breakaway, Inner	46		
Lubrication, Boom	98		
Operation, Boom			
Fold, Horizontal	43		
Level	42		
Lift	41		
Option, Boom	40		

INDEX

	PAGE		PAGE
Filters		I	
Air Conditioning Dryer.....	93	Instrument Panel Gauges.....	68
Cab		L	
Charcoal Filter.....	94	Lift Arm Assembly.....	26
Fresh Air Intake Filter.....	94	Lights	
Recirculation Filter.....	94	Cab Lights.....	60
Engine Air Intake Filter.....	91	Switch.....	60
Fuel Filters.....	94	Hazard/Warning Lights.....	62
Hydraulic High-Pressure In-Line Filter		Switch.....	62
Boom Control Stackvalve.....	93	Interior Lights.....	61
Hydraulic Suction Filter.....	92	Running Lights.....	61
Hydrostatic Charge Pressure Filter.....	92	Turn Signal.....	62
Solution Line Strainer.....	93	Lever.....	62
Radiator Grille Screens.....	90	Lubrication	
Fresh Air Intake Filter, Cab	94	Boom Hinge.....	98
Flow Meter	49	Breakaway.....	98
Fluid Capacities	89	Leg Bearings.....	95
Fluids		Tie Rods.....	95
Air Conditioning Charge.....	89	Torque Hub® Seal Boot.....	96
Cooling System Coolant.....	86	Transom, Lift Arm, & Lift Cylinder Assembly.....	97
Engine Oil.....	84	Limited Warranty	127
Fuel.....	87	Lug Nuts	105
Hydraulic Oil.....	84	M	
Solution Pump Oil.....	88	Maintenance Schedule.....	80
Torque Hub® Oil.....	85	O	
Fuel Filters	94	Operating Information.....	30-72
Fuel Gauge	68	Oil Pressure Gauge, Engine.....	68
Fuses	100	P	
G		Parking Brake.....	65
Gauges		Parameters, Speedometer/Tachometer.....	69
Engine Oil Pressure.....	68	Preparing to Operate.....	23-29
Filter Minder®.....	68	Pressure Gauge, Spray System.....	50
Fuel Gauge.....	68	Programming	
Hour Meter.....	68	Speedometer.....	69
Speedometer.....	68	Tachometer.....	69
Programming.....	69	Power Steering	39
Tachometer.....	68	Pumps	
Programming.....	69	Auxiliary Gear Pumps.....	37
Volt Meter.....	68	Hydrostatic Pump.....	34
Water Temperature.....	68	Solution Pump.....	39
Ground Speed Sensor, Spray System	49	Q	
H		Quick Fill.....	57
High Pressure In-Line Filter		R	
Boom Control Stackvalve.....	93	Radiator Grille Screens.....	90
Hour Meter	68	Radio.....	67
Hydraulic Auxiliary Gear Pumps	37	Recirculation Filter, Cab.....	94
Hydrostatic Drive System		Relays.....	102
Charge Pressure.....	35		
Displacement Limiter.....	34		
Hydrostatic Pump.....	34		
Neutral Setting.....	104		
Service.....	104		
Loop Flushing Valve.....	35		
Multi-Function Valves.....	35		
Operation.....	35		

INDEX

	PAGE	PAGE
S		
Safety		
Chemical Handling Safety	7	
Driving Safety	4	
General Safety	7	
Operating Safety	5	
General Operating Safety	5	
Spray Boom Safety	5	
Tread Width Safety	5	
Repair/Maintenance Safety	6	
Fuel Safety	6	
General Repair Safety	6	
Hydraulic Safety	6	
Seat		
Comfort Controls	71	
Seal Boot, Torque Hub®	96	
Serial Number Location		
Engine	14	
Hydrostatic Pump	15	
Sprayer	14	
Torque Hubs®		
Front	15	
Rear	15	
Wheel motors		
Front	15	
Rear	15	
Service/Maintenance	80-115	
Solution Line Strainers	93	
Solution Pump	39	
Solution Tank		
Lid Strainer	54	
Shutoffs		
Electric	56	
Operation	56	
Switches	56	
Valves	56	
Manual	56	
Valves	56	
Sight Gauge	54	
Support Rod	55	
Adjustment	55	
Specifications	16-22	
Speed Sensors		
Spray System Ground Speed	49	
Wheel Motor Sensor	69	
Speedometer	68	
Spray Booms		
Accumulator	44	
Hosing Diagram	45	
Breakaway, Inner	46	
Operation		
Fold, Horizontal	43	
Level	42	
Lift	41	
Sprayer Dimensions		
Field Operation Tread Width	16	
Shipping Tread Width	17	
Spray System		
Boom Solution Valves	52	
Flow Meter	49	
Ground Speed Sensor	49	
Hydraulic Variable Flow Control	50	
Maintenance		
Bean Pump		
Plunger Packing	109	
Suction and Discharge Valves	110-111	
Surge Tank	113	
Flow Test Nozzles	112	
Solution Pump Oil	88	
Monitor 49		
Operating Instruction	48	
Solution Pump		
Pressure	50	
VFC Lever	50	
Solution Switches		
Boom Solution Switches	52	
Main Solution Switch	53	
Solution Tanks	54	
Sight Gauge	54	
Shutoff Valves	56	
Steering		
Column Tilt	72	
Cylinder	39	
Power	39	
Suction Filter	92	
Switches		
Boom Operation Switches		
Fold, Horizontal	43	
Level	42	
Lift	41	
Electric Shutoff Switch, Solution Tank	56	
Light Switches		
Cab Lights	60	
Hazard/Warning Lights	62	
Running Lights	61	
Turn Signal	62	
Solution Switches		
Boom Switches	52	
Main Solution Switch	53	
Windshield Wiper Switch	67	
T		
Table of Contents	3	
Tachometer	68	
Tires		
Air Pressure	22	
Filling	114	
Mounting	114	

INDEX

	PAGE	PAGE
Toe-In		
Adjusting	25	
Checking	107	
Torque Hubs®		
Core Exchange	104	
Disengaging	78	
Oil Level	85	
Seal Boot Lubrication	96	
Torque Values		
Leg Mount Bolts	106	
Wheel Lug Nuts	105	
Traction Valve		
Operation	36	
Switch	36	
Transom Assembly	27	
Transporting Sprayer		
Driving	75	
Trailing	76-77	
Loading	76	
Unloading	77	
Towing	78-79	
Tread Width		
Adjusting, Manually	23-24	
Measuring	24	
Trouble Shooting Guide		118-126
	V	
Valves		
Boom Solution Supply		52
Solution Tank Shutoff		56
Variable Flow Control		
Agitation		58
Solution Pump		50
Volt Meter		68
	W	
Warning Decal Location		8-13
Warning Symbol Definitions		2
Warranty		127
Water Temperature Gauge		68
Wheel Lug Nuts		105
Wheel Motors		
Core Exchange		104
Speed Sensor		69
Windshield Wiper		67
Winter Storage Directions		116-117

NOTES
