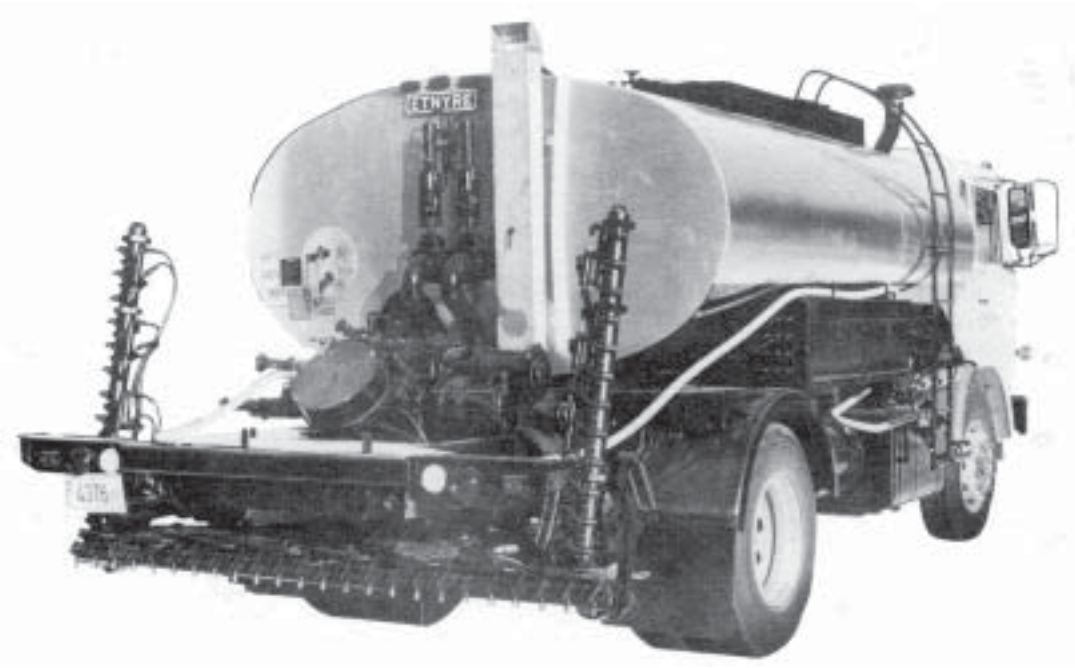
M-111-87R

SAM BLACK-TOPPER

OPERATION, MAINTENANCE, PARTS and SAFETY MANUAL



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

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How To Order Parts

To assure prompt delivery when ordering parts, please furnish the following information: 1) Complete name and address of consignee. 2) Method of shipment preferred. 3) Is shipment to be prepaid or collect? 4) Serial numbers of units to which parts apply. 5) Complete part numbers and descriptions. 6) Any special instructions.

SPECIFY UNIT SERIAL NUMBER WHEN ORDERING PARTS

Warranty

E. D. Etnyre & Co. guarantees for a period of one year from the date of the shipment to repair or replace, F.O.B. its factory, any part which requires replacement due to defect in material or workmanship, but will not be responsible for consequential damages or any further loss by reason of such defect. This guarantee does not cover products that were not manufactured by E. D. Etnyre & Co. except to the extent of the guarantee given by the actual manufacturer.

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

Table Of Contents

Operation

The Sam Model Etnyre Distributor has been designed to include the accuracy obtainable with the BTH models plus time and work saving functions never before available. The following sections will assist you in understanding the unique features of the Sam.

Please note the same safety practices followed to prevent personal injury apply to any Asphalt Distributor.

Located in the truck cab are two instrument control panels containing switches and dials for selecting the desired functions plus two digital counters. On the left a counter for tracking the distance sprayed and on the right a counter displaying the gallons sprayed. (see illustration, page 16.)

Across the top of the upper panel are toggle switches for selecting the portion of the spray bar wings to be used.

Just below the wing switches are 8 switches for selecting the portion of the center bar to be used. Each switch controls a one foot section. Switches in the up position are open, down closed.

To the left of the 8 main bar switches is the master spray switch which will open all of the spray bar sections where the individual switches are in the on position. A green indicator light means the master switch is on.

To the right of the main bar switches are the left and right marker switches.

Along the bottom of the top panel, left to right are: the digital odometer that records the length of spray in feet, the spray bar side shift switch, the spray bar height control switch, the left and right wing raise/lower switches, the auto travel/manual switch and on the right side the digital meter displaying gallons of product sprayed.

The lower panel has indicator lights for excessive temperature of the hydraulic fluid, spray bar centering, spray bar raised position, left and right wings raised, and travel ready light.

To the right of the indicator lights are two control knobs: one for setting the pump speed for spraying, the other for setting pumping speed for other operations.

The bottom row of switches from left to right are:

1. Tank level: This switch, when up will light the red light and give an audible warning that there is only enough remaining space within the tank for 250 gallons.

   When the tank level switch is in the low position the red light will come on when there is 200 gallons left in the tank.

2. The bitumeter wheel switch can be operated up or down in the manual mode or will go to the down position when spraying starts and raise when the spraying stops when in the auto position.

CAUTION

1. Always have dry chemical type extinguisher available and in condition.

3. Lit cigarettes or other sources of combustion must remain clear of open manholes or overflow vents to reduce fire hazard.

4. Sparks from engine exhaust can be a source of ignition to volatile gases.

5. Remain clear of rotating drives when unit is in operation to prevent becoming entangled in machine.

6. Use gloves or insulated material when handling spray bar, sections, or hoses to prevent burns.

7. Monthly check and if necessary clean 3" overflow tube to insure tube has not become clogged.

8. Open manhole slowly to relieve pressure that may exist in tank.

9. All pipe and hose connections must be secure before operating valves to eliminate leaks which may spray hot bitumen on other personnel.

16. If moisture is present in tank, do not load with material having a temperature over 200 degrees F. When filling unit in which moisture may be present in the spray bar or circulating system, allow a small portion of hot material to circulate in bar before filling tank thus prevent foaming.

21. Allow sufficient space in tank for expansion of material when heating.

Note: The specific cautions listed above relate to the operations described on the opposite page.

3 & 4. Switches control the adjustment of the right optional rear view mirror.

5. The gallon counter switch will count all gallons pumped in the up position and gallons sprayed when in the down position.

6. The asphalt flow control selects the mode of operation and displays a white indicator light for the mode selected.

Rear Control Panel

This panel is located near the left rear truck wheel and contains the following switches:

1. Spray bar height control.
2. Spray bar side shift control.

3 & 4. Left and right wing controls.

5. Red push/pull switch: Must be on to furnish power for all other switches, exterior or interior.
6. Power washdown switch. Red indicator light to indicate wash down pump is operating.

Preparing For Operation

Caution: Do not attempt operation of your Sam Distributor until you have read and understand the preceding information.

Filling The Product Tank

Through The Manhole

Switch positions:

1. Red switch on rear panel on.
2. System power in cab on.
3. Auto switch in travel.
4. Asphalt Flow control off.
5. Tank level switch in high mode.

Caution: If moisture is present in the tank or circulating system, do not fill with product having a temperature in excess of 200° F (93° C). Load the tank with approximately 10% of capacity and circulate the high temperature material through the spray bar. After the foaming has subsided proceed with the filling procedure. Allow room for expansion if additional heating is required.

Through The Suction Lines with the Distributor Pump

Switch positions:

1. Both front and rear power switches on.
2. Asphalt Flow control off.
3. Tank level switch in high mode.
4. Auto switch in the travel position.
5. With the truck engine running at a fast idle, engage the P.T.O. if used.
6. Place the set up/run switch in the run position.
7. Move the Asphalt Flow control to distributor pump load.
8. Turn the load rate knob until 200-250 GPM is indicated on the pump tachometer on the dashboard.
9. Connect a loading hose between the product source and to either the right or left suction port. The unused suction port remains closed.
10. Open the valve at the product source end of the loading hose.

CAUTION

1. Always have dry chemical type extinguisher available and in condition.

3. Lit cigarettes or other sources of combustion must remain clear of open manholes or overflow vents to reduce fire hazard.

4. Sparks from engine exhaust can be a source of ignition to volatile gases.

5. Remain clear of rotating drives when unit is in operation to prevent becoming entangled in machine.

6. Use gloves or insulated material when handling spray bar, sections, or hoses to prevent burns.

7. Monthly check and if necessary clean 3" overflow tube to insure tube has not become clogged.

9. All pipe and hose connections must be secure before operating valves to eliminate leaks which may spray hot bitumen on other personnel.

12. Do not stand in a location such that accidental opening of spray bar valves will cause contact with bitumen spray with resulting burns.

15. Operation of spraybar valves, suction and return valves and 4-way valve causes rapid movement. Stay clear at all times to prevent injury.

16. If moisture is present in tank, do not load with material having a temperature over 200 degrees F. When filling unit in which moisture may be present in the spray bar or circulating system, allow a small portion of hot material to circulate in bar before filling tank thus prevent foaming.

21. Allow sufficient space in tank for expansion of material when heating.

Note: The specific cautions listed above relate to the operations described on the opposite page.

11. When loaded, close the product source valve and open the bleeder valve or loosen the loading hose to allow air to help clear the hose.
12. Disconnect the hose from the source and elevate the end to clear the remaining product.
13. Replace the suction port cap and move the flow control to circulate in tank.
14. Turn the load rate knob counter-clockwise to reduce the pump speed to 100 GPM.

Through the Suction Lines with an External Pump

Switch positions:
1. Both front and rear power switches on.
2. Asphalt Flow control off.
3. Tank level switch in high mode.
4. Auto switch in the travel position.
5. Connect a loading hose between the product source to either the right or left suction port. The unused suction port remains closed.
6. Move the Asphalt Flow control to External Pump Load position.
7. Open valves on storage tank and start external pump.
8. When tank is nearly full, shut off external pump and close valves at storage tank.
9. Move the Asphalt Flow control to Distributor Pump Load.
10. Adjust pump rate to 200 gallons per minute with Load Rate knob.
11. Open bleeder valve at storage tank end of hose to clean out hose.
12. Follow same procedure as load with distributor pump for disconnecting.

Circulate In Tank

1. Move the Asphalt Flow control to circulate in tank.
2. Place Setup/Run switch in Run position.
3. Adjust the pump discharge rate to the desired value using the Load Rate knob.

(Circulate in tank is used while setting up to spray and heating.)

Circulate In Spray Bar

1. Move the Asphalt Flow Control to circulate in the bar.
2. Place the Setup/Run switch in Run position.
3. Adjust the pump discharge rate to the desired value using the Load Rate knob.
4. Circulate until the entire spray bar is as hot as the product flowing through it.

CAUTION

3. Lit cigarettes or other sources of combustion must remain clear of open manholes or overflow vents to reduce fire hazard.

4. Sparks from engine exhaust can be a source of ignition to volatile gases.

5. Remain clear of rotating drives when unit is in operation to prevent becoming entangled in machine.

6. Use gloves or insulated material when handling spray bar, sections, or hoses to prevent burns.

9. All pipe and hose connections must be secure before operating valves to eliminate leaks which may spray hot bitumen on other personnel.

11. Keep area clear of open flame or sparks when spraying material with volatile cutbacks to reduce fire hazard.

12. Do not stand in a location such that accidental opening of spray bar valves will cause contact with bitumen spray with resulting burns.

15. Operation of spraybar valves, suction and return valves and 4-way valve causes rapid movement. Stay clear at all times to prevent injury.

Note: The specific cautions listed above relate to the operations described on the opposite page.

Set-Up For Spraying

1. To determine the proper speed and pump discharge use the Etnyre computator. On the top scale find the spray bar length to be used.
2. At the end of the computator, grasp the black portion and move the center slide until the desired application rate is directly below the spray bar length, i.e. 16 feet over .35.
3. In a straight line below the application rate you will find the distributor speed in feet per minute and directly below the feet per minute the pump discharge in gallons per minute.

Example:	Width of spray	16'
	Application rate	.35
	Distributor speed	260 FPM
	Pump discharge	160 GPM

4. Select a transmission gear that will provide 260 FPM at 1200-1400 RPM on the truck engine.
5. Place the setup/run switch in the set up position.
6. With the master spray switch in the off position, turn on all of the individual spray bar switches to be used.
7. Move the Asphalt Flow Control to circulate in tank.
8. Put the Bitumeter Wheel down.
9. Adjust the pump discharge rate to the desired value using the Spray Rate knob, while driving at the pre-determined distributor speed.
10. Place the Setup/Run switch in Run position.

Spraying

1. Move the Asphalt Flow Control to circulate in bar.
2. Place Setup/Run switch in Run position.
3. Start the distributor moving in the pre-selected gear.
4. At the start line move the master spray switch to the On position. While the unit is spraying, the truck speed does not have to remain constant to maintain accuracy and individual or multiple one foot sections may be turned off or on without affecting the accuracy of the application.

(The Load Rate knob should be left at the position for the desired circulate in bar rate.)

Suck Back

1. On completion of the spraying operation move the asphalt flow control to suck back.
2. Place the auto travel/manual switch in the travel position.
3. Rotate the load rate control to a pump speed of 200 GPM.

CAUTION

3 Lit cigarettes or other sources of combustion must remain clear of open manholes or overflow vents to reduce fire hazard.

4 Sparks from engine exhaust can be a source of ignition to volatile gases.

5 Remain clear of rotating drives when unit is in operation to prevent becoming entangled in machine.

6 Use gloves or insulated material when handling spray bar, sections, or hoses to prevent burns.

7 Monthly check and if necessary clean 3" overflow tube to insure tube has not become clogged.

8 Open manhole slowly to relieve pressure that may exist in tank.

9 All pipe and hose connections must be secure before operating valves to eliminate leaks which may spray hot bitumen on other personnel.

14 Before removing fill line cap, pump off cap or suction strainer lid, relieve pressure in system by turning asphalt pump if electric flushing pump has been running.

29 When handspraying, maintain gun in proper position and beware of other personnel.

Note: The specific cautions listed above relate to the operations described on the opposite page.

Flushing

3 4 5 6 9 14

Flushing oil may be put into the system in two ways. It may be pumped in with the electric fuel pump. Turn the switch in the rear control box on for about 5 minutes. Be sure to shut off when finished. Flushing oil may also be poured into the fill line. Be sure to use diesel fuel or kerosene. Do not use gasoline. The flushing oil may be circulated in the circulating system (not spraybar) as follows:

1. On the left rear of the unit are two manual handspray valves. Turn these valves so that both handles are pointing to the right (passenger's side).
2. Move the asphalt flow control to flush/transfer position.
3. Adjust pump output to 50 G.P.M. Circulate as long as desired.
4. Return selector switch to off.
5. Turn both manual valve handles to point rearward.

Unload Distributor To Storage

3 4 5 6 7 8 9

Prior to connecting a hose to the unloading port, move the selector to suckback for several minutes, then turn the selector to off and stop the asphalt pump.

1. Suck back the bar and piping thoroughly.
2. Close the hand operated gate valve on the left side discharge line.
3. Place manual handspray valves with both handles straight back (off).
4. Connect a transfer hose to the discharge line and storage tank.
5. Open the valve at the storage tank and on the discharge line.
6. Move the asphalt flow control to "handspray/unload."
7. The set up/run switch in "run" position.
8. Increase the pump output to 200 GPM with the load rate control.
9. When unloading is complete, decrease the pump rate to zero and turn the asphalt flow control to "off."
10. Close the valve at the storage tank.
11. Turn both manual handspray valve handles to point to the right (passenger's side).
12. Turn the asphalt flow control to "load with Distributor pump."
13. Increase the pump output to 200 GPM to suck back the unloading hose.
14. Open the bleeder valve on the storage tank end of the hose to allow air to clear the line.
15. Close the bleeder valve and the manual gate valve on the discharge line after the hose is emptied.
16. Turn both manual handspray valve handles to point to the rear (off).
17. Decrease the pump rate to zero and turn the asphalt flow control to off.
18. Disconnect the transfer hose.

Handspray

6 9 29

1. On the left rear of the unit, there are two manual valves. When setting up for the hand spray operation the handle of the valve nearest to the center of the unit should be pointed to the right (passenger's side). The left valve handle should be pointed to the left (driver's side).

2. The cab selector switch should be set to the hand spray/unload position, only after the manual valves in #1 are set.
3. Adjust the pump output using the load rate knob to 50 to 75 gallons per minute to get the desired fan from the handspray gun.

Suck Back Hand Spray

1. Upon completion of the hand spray operation, move the selector knob in the cab to the Suck Back position.
2. Set the right manual hand spray valve handle pointing to the right (passenger's side).
3. Set the left valve handle pointing to the rear.
4. Increase the asphalt pump speed to approximately 200 GPM.
5. Elevate the hand spray gun and hose with the valve on the gun open to evacuate residual product.
6. Return the selector switch to the off position.
7. Set both manual valves pointing to the rear to avoid filling the handspray hose with material.

Use gloves or insulated material when handling spray bar, sections, or hoses to prevent burns.

All pipe and hose connections must be secure before operating valves to eliminate leaks which may spray hot bitumen on other personnel.

When handspraying, maintain gun in proper position and beware of other personnel.

Note: The specific cautions listed above relate to the operations described on this page.

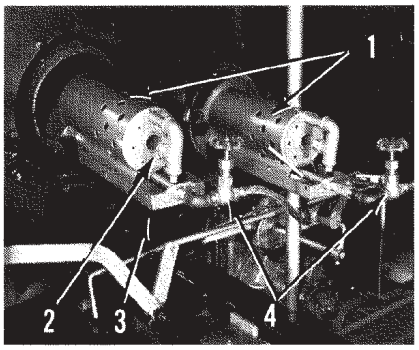
Heating Bitumen In Distributors

High Pressure Generating Burners

1 10 18 21 27

19 1. Use clean, moisture-free kerosene.

5 2. On engine drive units to operate fuel pump; disengage engine clutch, engage fuel pump clutch, then re-engage engine clutch. On hydrostatic drive units the fuel pump is driven off of the hydrostatic pump drive line and regulated by a pressure relief valve. A bypass valve is provided to divert fuel around the pressure regulator and should be opened when burners are not required.



HIGH PRESSURE GENERATING BURNERS

1. Burners
2. Vaporizing Plug
3. Pan
4. Flow Control Needle Valves

3. Circulating bitumen in tank while heating is recommended for faster heating and reduced carbon formation on flues. Only when the asphalt pump is "frozen" is it acceptable to operate burners without circulating material. However, in this case free the asphalt pump by applying heat to pump housing and start circulating as soon as possible.

4. Correct fuel pressure should be between 45 and 60 P.S.I. If less, inspect valve in line from tank to pump, strainers, etc. for possible obstructions. If you are sure pump is getting sufficient fuel, then check pressure relief valve. An adjusting screw with lock nut is inside of dome-shaped cap.

20 5. Do not light burners unless you are sure flues are covered at least 6" the full length of the tank. On tanks having "High-Low" flues it is necessary to cover only the lower flue when using the lower (or inside) burner.

6. Open covers on heat exhaust stacks.

25 7. To light burners, spread wick in pan so that fire will be under coil and 26 vaporizing plug; hold finger over vaporizing plug to prevent fuel from squirting into flue; open needle valve slightly and shut off when pan is 1/4 full. Ignite wick and wait until gas issues from vaporizing plug; then open needle valve slightly. If coil is generating properly, an almost colorless gas will issue from vaporizing plug. Open valve more as necessary to obtain a bright orange flame. (Note: On units having retractable burners, remove holding pin and transfer burner from traveling position in flue to firing position.)

8. A short blue flame that is easily extinguished indicates over-generation in the coils, caused by too small vaporizing plug opening, or carbon formation in coil. Particles of carbon can be cleared from vaporizing plug while burner is in operation with burner cleaner furnished with unit. If flame is still short and blue, bore out vaporizing plug with No. 51 drill.

9. A yellow smoky flame indicates that needle valve is open too far, causing under-generation. It can also be the result of too large a hole in vaporizing plug.

23 10. Do not leave burners unattended.

28 11. Do not heat bitumen over maximum spraying temperature recommended by supplier.

12. Do not remove material from tank while burners are in operation or automatic burner controls are set to operate.

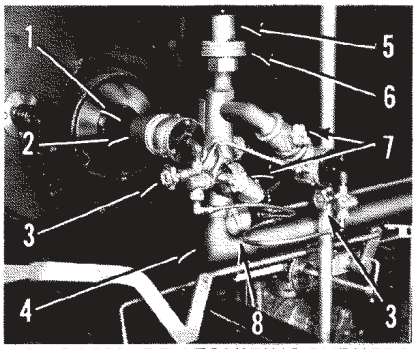
13. When burners are not in use, close heat exhaust stack cover to prevent loss of heat and to keep water from entering stack opening.

Low Pressure Atomizing Burners

1 10 18

1. Clean, moisture-free fuel is important. Use kerosene, fuel oil or diesel fuel. **Do not use gasoline.**

5 2. The blower and fuel pump are an integral unit and engaging the blower will also engage the fuel pump.



LOW PRESSURE ATOMIZING BURNERS

1. Burner Tip
2. Burner
3. Needle Flow Valves
4. Low Pressure Air Supply Line
5. Air Relief Valve
6. Weights
7. Butterfly Valves
8. Air Pressure Gauge

An auxiliary hydraulic motor blower drive is available which is engaged by turning the motor control valve to the "ON" position.

3. Circulating bitumen in tank while heating is recommended for faster heating and reduced carbon formation on flues. Only when the asphalt pump is "frozen" is it acceptable to operate burners without circulating material. However, in this case free the asphalt pump by applying heat to pump housing and start circulating as soon as possible.

4. Air pressure should be sufficient to slightly raise air relief valve.

Excess engine speed will raise relief valve too much, causing excessive pressure. Do not increase weights on air relief valve or wire weights down.

5. Fuel pressure should not be excessive. High fuel pressure will make needle valve adjustment more sensitive. Recommended pressure is 10 to 15 P.S.I. Pressure is determined by pressure relief valve located in return line. An adjusting screw and lock nut are inside dome-shaped cap.

20 6. Do not light burners unless you are sure flues are covered at least 6" the full length of tank. On tanks having "High-Low" flues it is necessary to cover only the lower flue with 6" of material when using the lower (or inside) burner.

7. Open covers on heat exhaust stacks.

25 26 8. To light burners, first turn air butterfly valves to No. 1 or No. 2 open position, light torch and hold under burner tip, turn needle valve about one-half turn. Burner should ignite immediately. If it does not, turn off needle valve and wait until vapor is exhausted from flues; then try again. The correct opening of the needle valve is determined by fuel pressure. Experience is the only way of determining the amount for your particular unit. Flame at first will be yellow and smoky. Adjust the fuel valve so that flame is bright orange with slight smoke in exhaust. More fuel will be needed as flues and tank contents heat up. Keep opening fuel adjustments for slight smoke in exhaust.

Important

27 If burner goes out, turn off fuel valve immediately and do not attempt to relight until vapor is exhausted from flues!

9. For larger flame, increase air butterfly valve opening and fuel valve in equal increments, always keeping mix that will give slight smoke to exhaust.

10. Nozzle of burner is adjustable for amount of secondary air desired. Normally the secondary air is in the full open position. However, on some smaller units it may be desirable to reduce the amount of secondary air. Light burner and turn this nozzle until you secure the type of flame you desire.

23 11. Do not leave burners unattended.

21 28 12. Do not heat bitumen over maximum spraying temperature recommended by supplier.

22 13. Do not remove material from tank while burners are in operation or automatic burner controls are set to operate.

14. To shut off burners, turn fuel off before stopping blower or turning off air.

15. When burners are not in use, close heat exhaust stack cover to prevent loss of heat and to keep water from entering stack opening.

Liquid Petroleum Burners

1 10 18 21

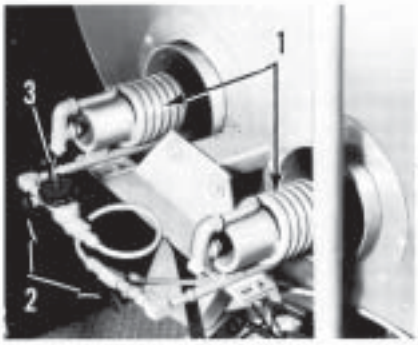
1. The burners are designed for use with liquid only and must not be used with vapor.

2. Circulating bitumen in tank while heating is recommended for faster heating and reduced carbon formation on flues. Only when the asphalt pump is "frozen" is it acceptable to operate burners without circulating material. However, in this case free the asphalt pump by applying heat to pump housing and start circulating as soon as possible.

20 3. Do not light burners unless you are sure flues are covered at least 6" the full length of tank. On tanks having "High-Low" flues it is necessary to cover only the lower flue with 6" of material when using the lower (or inside) burner.

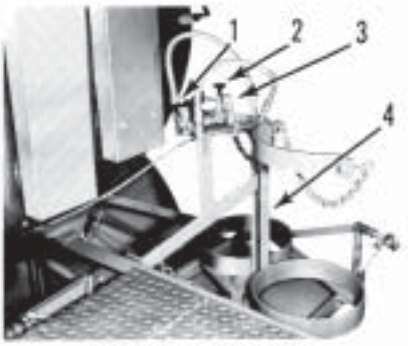
4. Open covers on heat exhaust stacks.

5. Before lighting burner, be sure hand valve at burner is closed tight.



LIQUID PETROLEUM BURNERS (A)

1. Burners
2. Blow and Pilot Hand Valve
3. Auxiliary Shut-Off Hand Valve

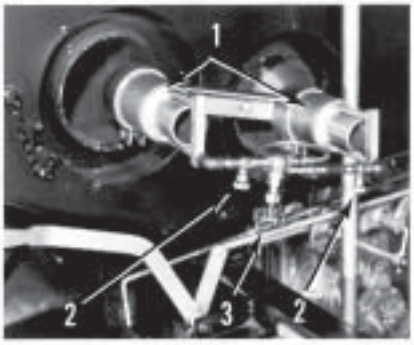


LIQUID PETROLEUM
BOTTLE RACKS AND CONTROLS

1. Manual Throwover Manifold Valve
2. Burner Pressure Regulator Control
3. Regulated Pressure Gauge
4. Bottle Rack

6. The valve on the supply tank or bottle should be opened only a quarter of a turn so that it may be closed quickly in case of a leak.

25 26 7. After opening the supply valve and checking quickly for leaks, light the burners. As soon as the burner is lit, open the hand valve at the burner to the full position. No preheating is necessary.



LIQUID PETROLEUM BURNERS (B)

1. Burners
2. Blow and Pilot Hand Valves
3. Auxiliary Shut-off Hand Valve

27 (Caution: The burner must be lit before opening hand valve at the burner. This valve has a built in by-pass and permits only enough gas to escape to operate as a pilot or stand-by. This by-pass hole must be kept open to prevent damage to the gauge and supply lines. After shutdown and before relighting burner, valve at burner must be closed.)

8. Open supply valve at tank or bottle fully and regulate pressure so that the gauge reads between 25 to 40

P.S.I. (A) Burner or between 20 and 25 P.S.I. (B) Burner, using the lower pressure setting for shorter tanks.

28 9. Adjust fire with hand valve at burner.

23 10. Do not leave burners unattended.

28 11. Do not heat material beyond manufacturers recommended temperature.

22 12. Do not remove material from tank while burners are in operation or automatic burner controls are set to operate.

13. To completely shut down burners, close valve at supply tank or bottle. However, if it is desired to use only the lower burner, the upper burner can be shut off by closing the auxiliary hand valve on the line between burners. Burners will continue to burn until fuel in the lines has been consumed.

Special Notes: When burner is operating properly the first two coils, or bottom side of burners and all of the feed lines and fittings back to the pressure regulator will frost over. If they do not frost over, it shows that the burner is operating on vapor instead of liquid and this must be corrected immediately or you will damage the burner.

In case trouble is experienced with the pressure regulator freezing up, it is due to moisture in the gas and this can be overcome by adding 1 pint of genuine absolute Anhydrous Menthanol (99.85% pure) per 100 gallons of fuel when tank is filled.

Always keep tank valve closed when tank or bottle is empty.

14. When burners are not in use, close covers of heat exhaust stacks to prevent loss of heat and to keep water from entering stack opening.

15. On L.P.G. burners equipped with optional automatic outfire protection, follow the standard L.P.G. lighting instructions, except *depress the control overide switch* and manually light the burners. After 30 to 60 seconds the safety switch should hold and the burners will stay lit.

Should either burner "flame out" the whole system will automatically shut down. To relight, repeat the above lighting procedure.

16. On L.P.G. burners equipped with the optional temperature limiting control, see instructions below.

1. Open L.P.G. bottle shut-off valve and allow automatic ignitors to light pilots.
2. Adjust valves at burners such that one or both burners will operate as desired.
3. Set temperature limiter to desired level.
4. Before pushing start button check to insure BOTH pilots are lit. DO NOT push start button unless both pilots are lit and have been operating for a minimum of one minute. If either pilot is not lit, wait until automatic ignitors relight pilots. Allow sufficient time (approximately 30 seconds) for pilot sensors to cool and turn on automatic ignitors.
5. Once it is confirmed that both pilots are lit, push start button to light main burners. At this time adjust burner pressure to between 25 to 40 P.S.I., using the lower pressure setting for shorter tanks.
6. When material in tank has reached desired temperature burners will automatically stop.
7. Burners can be relit only when material in the tank has cooled sufficiently for the temperature limiter to come ON and the start button is pushed. Again check to insure both pilots are functioning prior to pushing start button.
8. Before moving distributor, close L.P.G. bottle shut-off valve and allow pilots to burn all fuel from supply lines.

CAUTION

1 Always have dry chemical type extinguisher available and in condition.

5 Remain clear of rotating drives when unit is in operation to prevent becoming entangled in machine.

10 Keep unit clean for safety and operation.

18 When heating material, position unit broadside to wind, if possible.

19 Use of gasoline instead of required kerosene or fuel oil on generating or low pressure burners will result in an extreme fire hazard.

20 Cover flues at least 6" before heating material to prevent explosion.

21 Allow sufficient space in tank for expansion of material when heating.

22 Do not remove material from tank while burners are in operation or automatic burner controls are set to operate.

23 Do not operate burners unattended or while vehicle is in transit or in confined area.

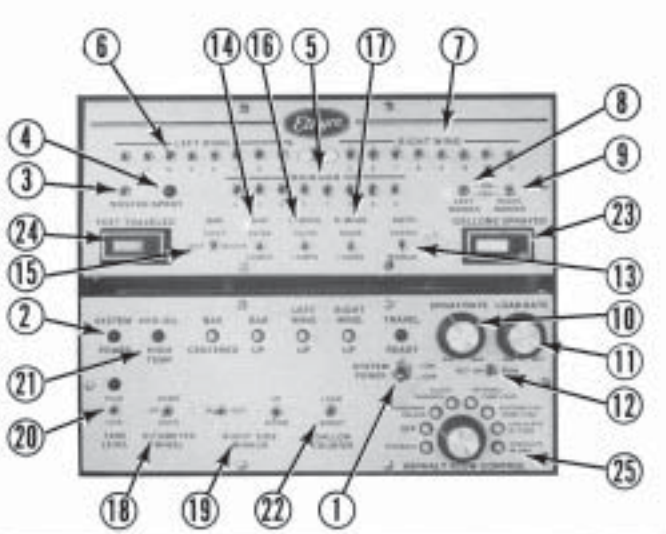
25 Use torch (not match or lighter) to ignite burner for personnel safety.

26 Ignite inside burner first. Do not reach across a lit burner to reignite inside burner.

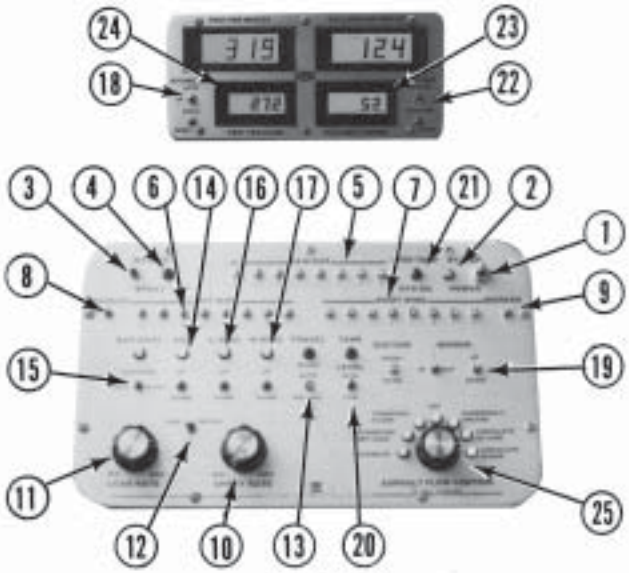
27 When burners go out, allow flues to ventilate before reignition.

28 Do not heat material beyond manufacturers recommended temperature.

Front Control Box Description



SAM I



SAM II

FRONT CONTROL BOX

1. System Power Switch
2. System Power Light
3. Master Spray Switch
4. Master Spray Light
5. Main Bar Switches
6. Left Wing Switches
7. Right Wing Switches
8. Left Marker Valve
9. Right Marker Valve
10. Spray Rate Potentiometer
11. Load Rate Potentiometer
12. Setup/Run Selector Switch
13. Manual/Travel Switch
14. Spray Bar Raise/Lower
15. Spray Bar Shift Left/Right
16. Left Wing Raise/Lower
17. Right Wing Raise/Lower
18. Bitumeter Wheel – Up/Down/Auto
19. Right Side Mirror – In/Out/Up/Down
20. Tank Level Alarm Switch
21. Hydraulic Oil High Temperature Light
22. Gallon Counter Switch
23. Gallons Sprayed Totalizer
24. Feet Traveled Totalizer
25. Asphalt Flow Control Selector Switch

1. SYSTEM POWER:

The system power switch controls all power into the cab control box and also the rear control box. All controls in the cab control box and the rear control box are inoperable when this switch is in the off position. All asphalt tank valves and spray bar valves are closed when this switch is in the off position. Red emergency switch on rear panel must be pulled out – See also rear control box description.

2. SYSTEM POWER LIGHT:

A green light indicates system power switch is on, power is applied to the control boxes and all switches are operable.

3. MASTER SPRAY SWITCH:

"Asphalt Flow Control" selector must be in "Circulate in Bar" position before operating "Master Spray Switch".

The master spray swit h, when pushed up, does the following things simultaneously:

1. Opens the previously selected spray bar feet to spray material.
2. Repositions the rotary actuator on the 4-way valve to change from "circulate in bar" to "spray".

3. Switches the asphalt pump control from the "load rate" potentiometer to the "spray rate" potentiometer.

4. If the bitumeter wheel switch is in the "auto" position automatically lowers the bitumeter wheel onto the ground to begin measuring the length of the shot, and indicating the speed of the vehicle in feet per minute.

4. MASTER SPRAY LIGHT:

A green light indicates that the master spray switch is on.

Selector Switches

5. Main Bar Switches Numbers 4 thru 1 and 1 thru 4

6. Left Wing Switches 12 thru 5

7. Right Wing Switches 5 thru 12

Switches select one foot increments of spray bar numbering from center of bar (center of truck) outwards to left and right ends of bar. The switches also operate incremental control for automatic adjustment of pump rate. For all switches "up" is "on" and "down" is "off".

8. LEFT MARKER VALVE:

9. RIGHT MARKER VALVE:

SAM I:

Switches preselect use of either left marker valve or right marker valve for spraying a boundary line. Actual spraying is controlled by "Master Spray Switch". Marker switches should always be in "off" position except when actually spraying a boundary line. If they are not off - moving the "master spray switch" to the "on" position will result in spraying not only from the spray bar sections but also from the marker nozzles.

SAM II:

Switches turn optional marker valves on and off. This may be done to add a nozzle to the bar while spraying. However, turning the marker valve on will not change the pump speed. To mark a boundry line, turn the marker on while circulating in the tank.

With the "asphalt flow control" knob in the suckback position and the wings folded up, the markers may be opened momentarily by holding the marker switches down. This will let air into the bar to clear it.

10. SPRAY RATE POTENTIOMETER:

Adjusts spray rate (gallons per minute). With the "setup/run" switch on the "run" position this potentiometer only has an effect with the "Asphalt Flow Control" positioned to "circulate in bar" and the "master spray" switch in the "on" position. With the "setup/run" switch in the "setup" position this potentiometer has an effect in any position of the "Asphalt Flow Control" except "off". The preferred position of the Asphalt Flow Control for setting up a shot is "Circulate in Tank" due to the lower hydraulic pressure required.

In order to set up a spray rate, the engine must be held at the constant predetermined rpm. The portion of the bar which is to be sprayed from must be selected, the master spray must be "off". The spray rate knob should then be adjusted to obtain the desired gallons per minute.

11. LOAD RATE POTENTIOMETER:

Adjusts asphalt pumping rate (gallons per minute) with "setup/run" switch in "run" position. Adjusts pumping rate at all times in all positions of "Asphalt Flow Control" except when "master spray" is "on". Does not function with "setup/run" switch in "setup" position.

12. SETUP/RUN SELECTOR SWITCH:

Select control of asphalt pump by either the "spray rate" potentiometer or the "load rate" potentiometer.

With the switch in the "run" position in any position of the Asphalt Flow Control, and the "master spray" "off", control of the asphalt pump is by the "Load Rate" potentiometer. When the "Master Spray" switch is turned "on", control of the asphalt pump automatically is switched to the "Spray Rate" potentiometer and is automatically returned to the Load Rate potentiometer when the Master Spray is turned off.

With the switch in the "setup" position in any position of the "Asphalt Flow Control" with the "Master Spray" switch "off" control of the asphalt pump is by the "Spray Rate" potentiometer.

When in "setup" never turn "Master Spray" switch "on". If the Asphalt Flow Control has been positioned to "circulate in bar" this will result in spraying material.

13. MANUAL/TRAVEL: Select Bar Control Mode

"Manual" enables the controls listed below and their operations to be individually performed as desired. All bar position functions are also duplicated in the rear control box.

"Travel" performs the following functions in the sequence described below. "Travel" disables manual operation of the bar position switches.

1. Centers the bar. White light indicates that bar has centered.
2. Raises the bar fully.
3. Latches the bar in the raised position - white light indicates bar is up and latched.
4. Raises the left wing - white light indicates left wing is fully raised.
5. Raises the right wing - white light indicates right wing is fully raised.
6. Green "travel ready" light indicates all functions have occurred.

14. RAISE/LOWER:

Raises or lowers entire spray bar as desired.

15. LEFT/RIGHT:

Shifts entire bar left or right of truck centerline as desired.

16. LEFT WING:

Raises or lowers left (driver's side) spray bar wing as desired.

17. RIGHT WING:

Raises or lowers right (passenger side) spray bar wing as desired.

18. BITUMETER WHEEL - UP/DOWN/AUTO:

Selects manual "up" position of wheel or "down" position. "Auto" places the operation of the wheel in the control of the "master spray" switch. Turning the "master spray" switch on automatically lowers the wheel at the beginning of a shot and turning "master spray" switch off automatically raises the wheel at the completion of the shot thus giving an accurate measurement of the length of the shot.

19. RIGHT SIDE MIRROR - IN/OUT - UP/DOWN:

Moves passenger side mirror in or out or up and down for normal driving or viewing right end of spray bar.

20. TANK LEVEL ALARM:

A selector switch allows selecting a low level alarm or a high level alarm.

In the "low" position when the material reaches the low set point, the red light above the switch will flash indicating the tank is nearly empty.

In the "high" position when the material reaches the high set point, the red light above the switch will flash and the vehicle horn will blow indicating the tank is nearly full.

21. HYDRAULIC OIL/HIGH TEMPERATURE:

A red light appears when the hydraulic oil temperature rises above a safe operating temperature. Shut Down The System Immediately! Disengage the P.T.O. Check the actual oil temperature thermometer on the tank physically. Allow the oil to cool to below 180° F before attempting to restart system and engage P.T.O.

22. GALLON COUNTER SWITCH:

In the "spray" position the "gallons sprayed" totalizer accumulates only when the "master spray" switch is in the "on" position and thus accumulates automatically only the gallons sprayed during the shot. Turning the "master spray" switch "off" automatically stops the accumulation. Turning the "master spray" "on" will continue the count from the previous number registered.

In the "load" position the "gallons sprayed" will count all gallons pumped regardless of position of any other switch.

NOTE: When loading the tank with the "gallon counter" switch in the "load" position, the unit will count gallons while drawing the air out of the loading hose. It will also count gallons after the transport valve has been closed while the loading hose is being cleaned out. This will display a number higher than what was actually loaded.

23. GALLONS SPRAYED:

This totalizer counts gallons pumped as controlled by position of "gallon counter" switch described above. Pushing the red button on the totalizer resets the totalizer to zero.

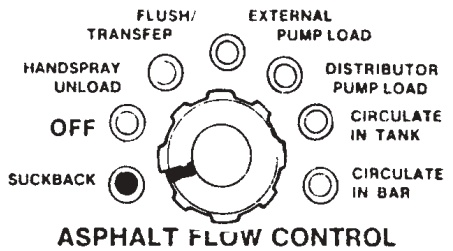
24. FEET TRAVELED:

This totalizer counts feet traveled as controlled by the position of the "bitumeter wheel" switch previously described. Pushing the red button on the totalizer resets the totalizer to zero.

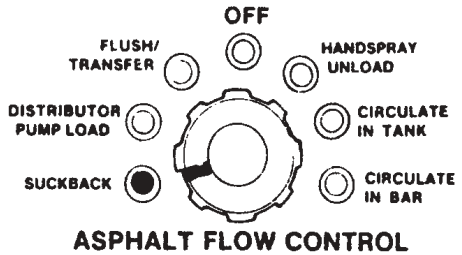
25. Asphalt Flow Control Selector Switch

Suck Back

Sets asphalt flow control valves to draw the material back from the spray bar or handspray and piping and return it to the tank. Spray bar wings should be raised and bar should be raised for most effective suckback. Pump should be run at approximately 200 GPM.



SAM I



SAM II

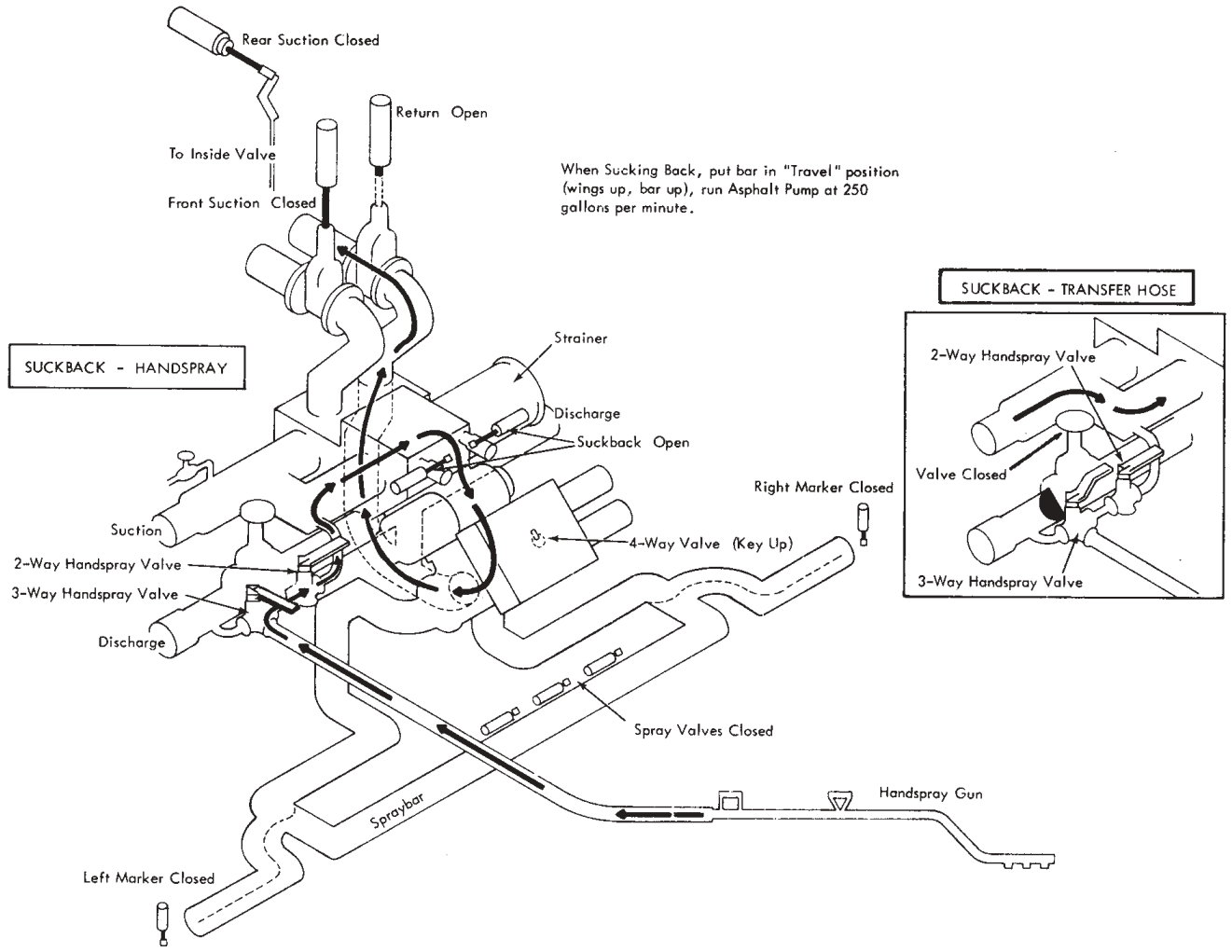
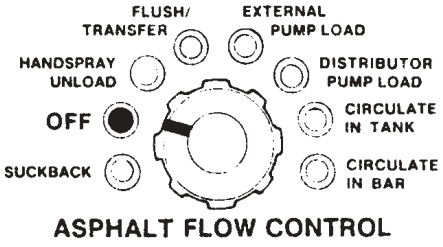


Figure 1

Off

All asphalt flow control valves are closed.



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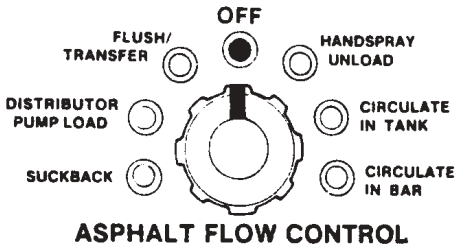

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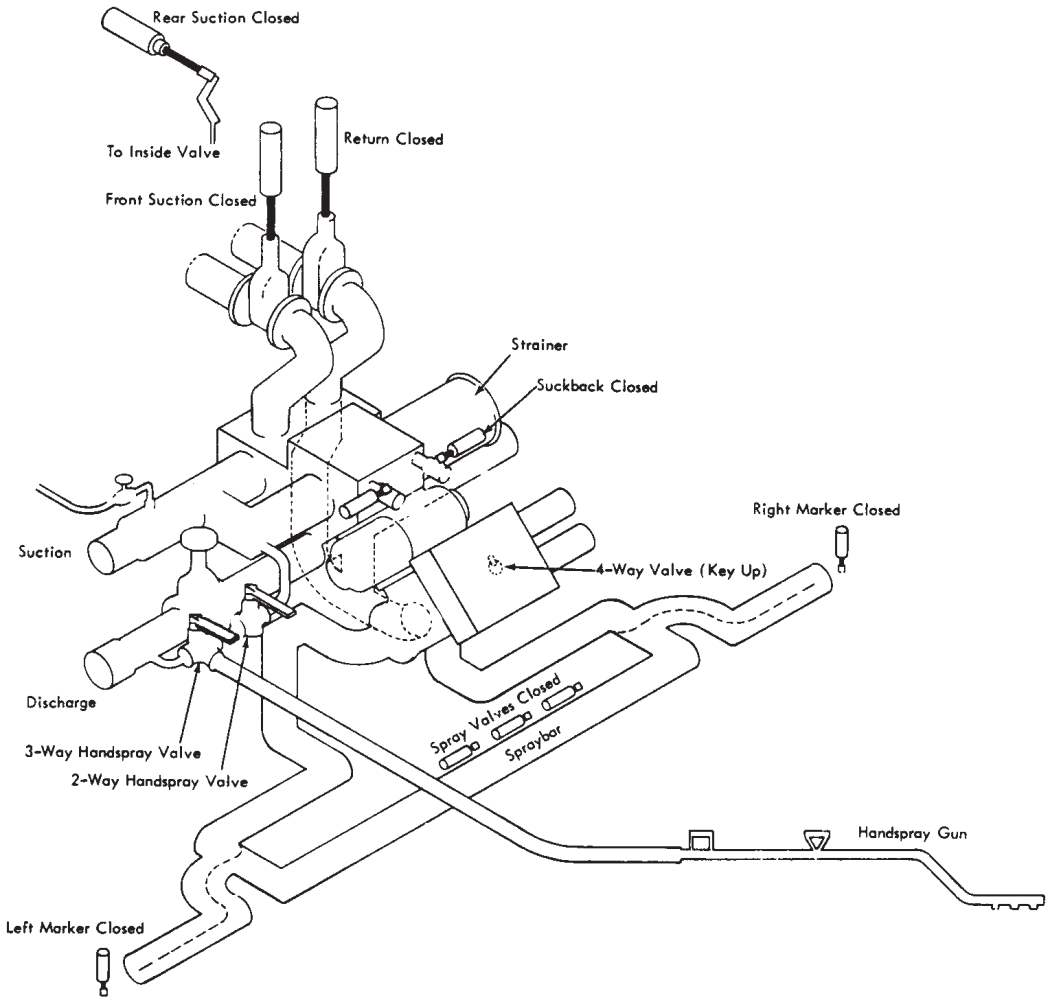
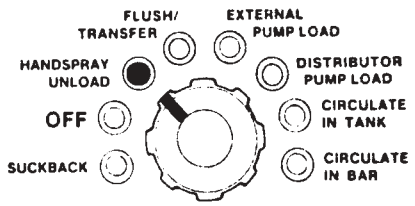


Figure 2

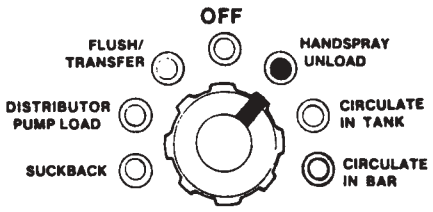
Unload/Handspray

Sets the asphalt flow control valves to take material from the tank and pump out the right or left discharge line, or the hand spray hose, depending on the position of the manual hand spray valves at the rear of the unit. In this position, the control of the pumping rate (GPM) is always by the "Load Rate" potentiometer. Before opening manual valves to hand-spray position, insure that the "Load Rate" potentiometer is fully counterclockwise. Then adjust up (clockwise) to obtain the desired flow rate. Do not exceed 150 gallons per minute when handspraying.



ASPHALT FLOW CONTROL

SAM I



ASPHALT FLOW CONTROL

SAM II

- Leave Handspray Valve Handles pointing to rear (off) when unloading.
- Hose may be connected to either Discharge Line for Unloading (leave opposite side capped).

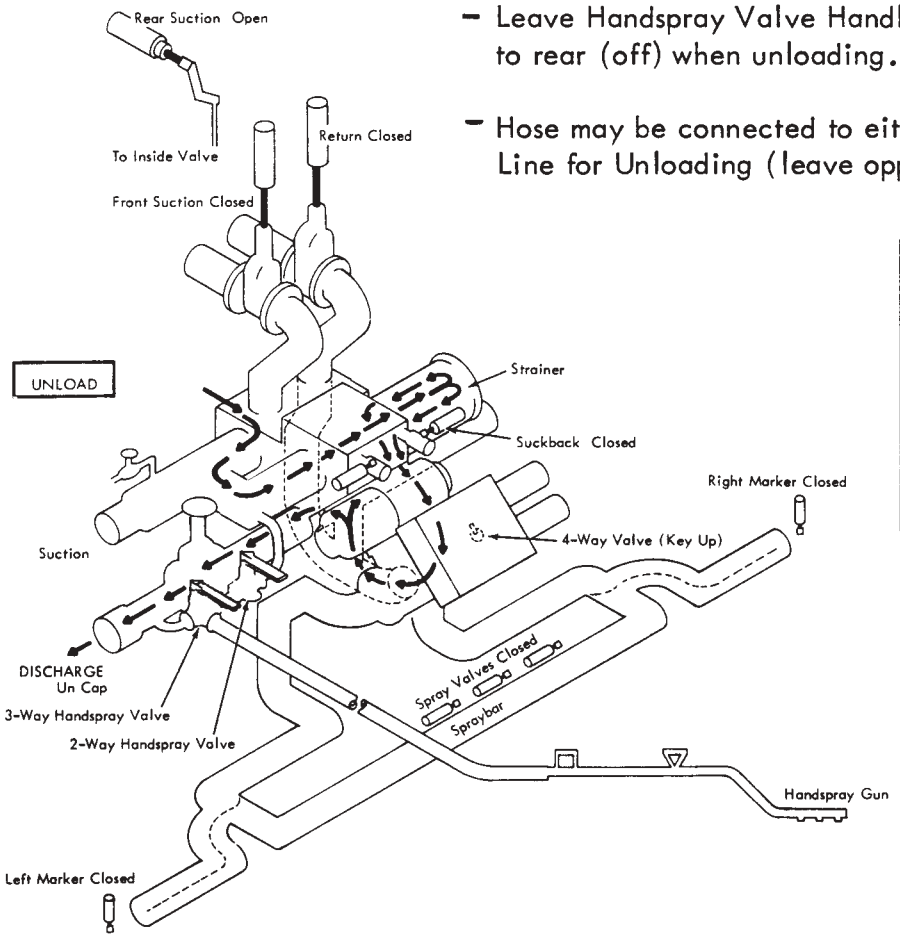
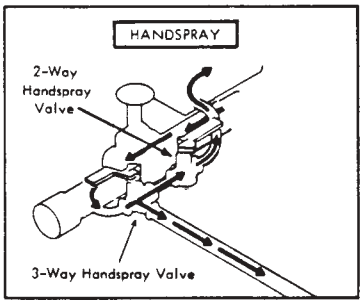


Figure 3



Turn 2-way handspray valve to center of Distributor.

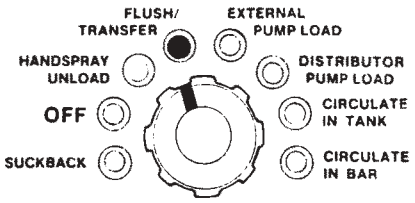
Turn 3-way handspray valve to left side of Distributor as shown above.

DO NOT EXCEED 150 GPM WHILE HANDSPRAYING.

Turn Asphalt Flow Control to Off when moving Distributor during handspray operation.

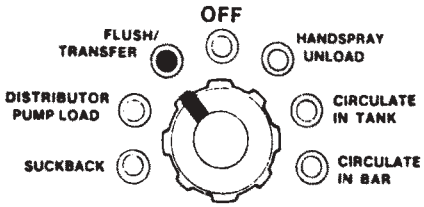
Flush/Transfer

Sets the asphalt flow control valves "closed" for flushing the pump with solvent or using the pump to transfer material from one external source to another external source without material entering either the distributor tank or the spray bar.



ASPHALT FLOW CONTROL

SAM I



ASPHALT FLOW CONTROL

SAM II

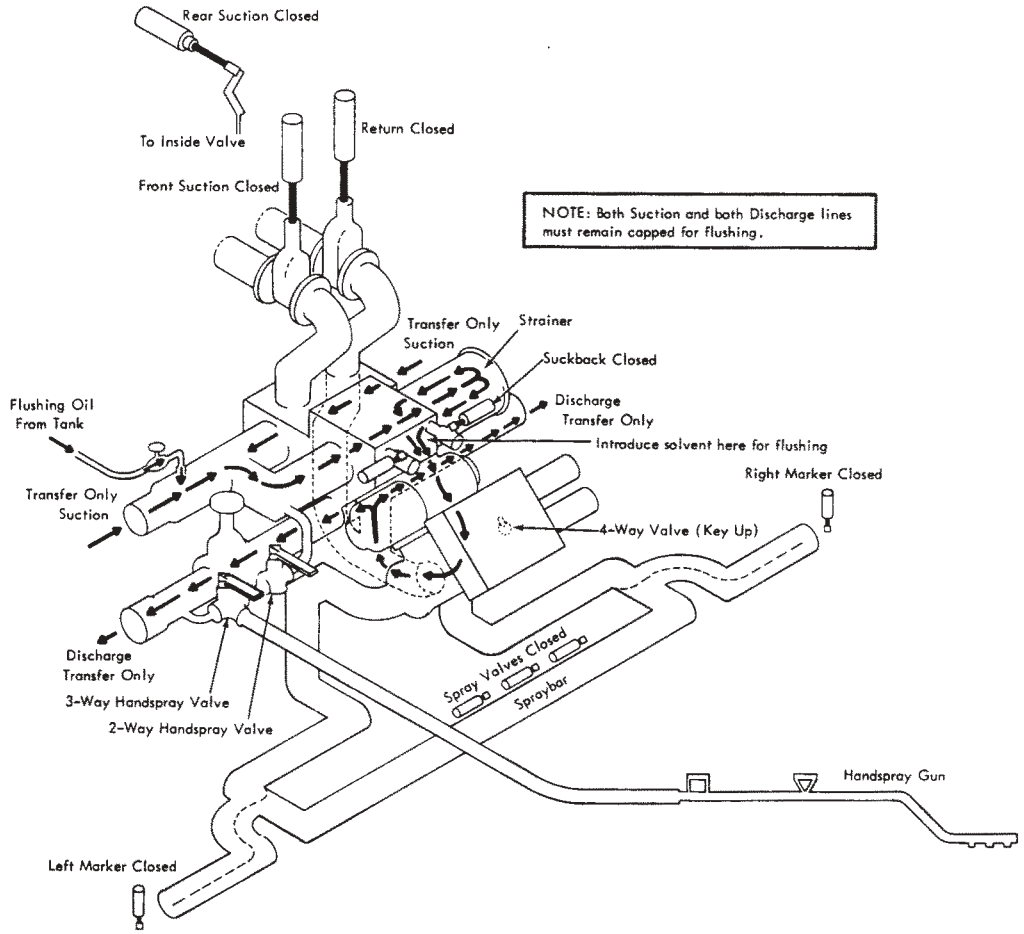
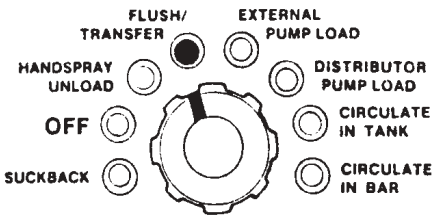


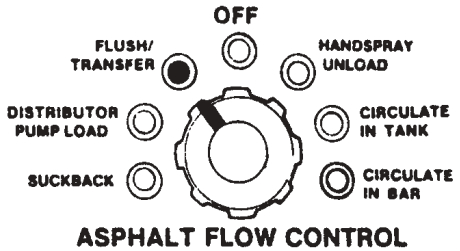
Figure 4

Flush/Transfer: Circulate Flushing Oil

Sets the asphalt flow control valves "closed" for flushing the pump with solvent or using the pump to transfer material from one external source to another external source without material entering either the distributor tank or the spray bar.



SAM I



SAM II

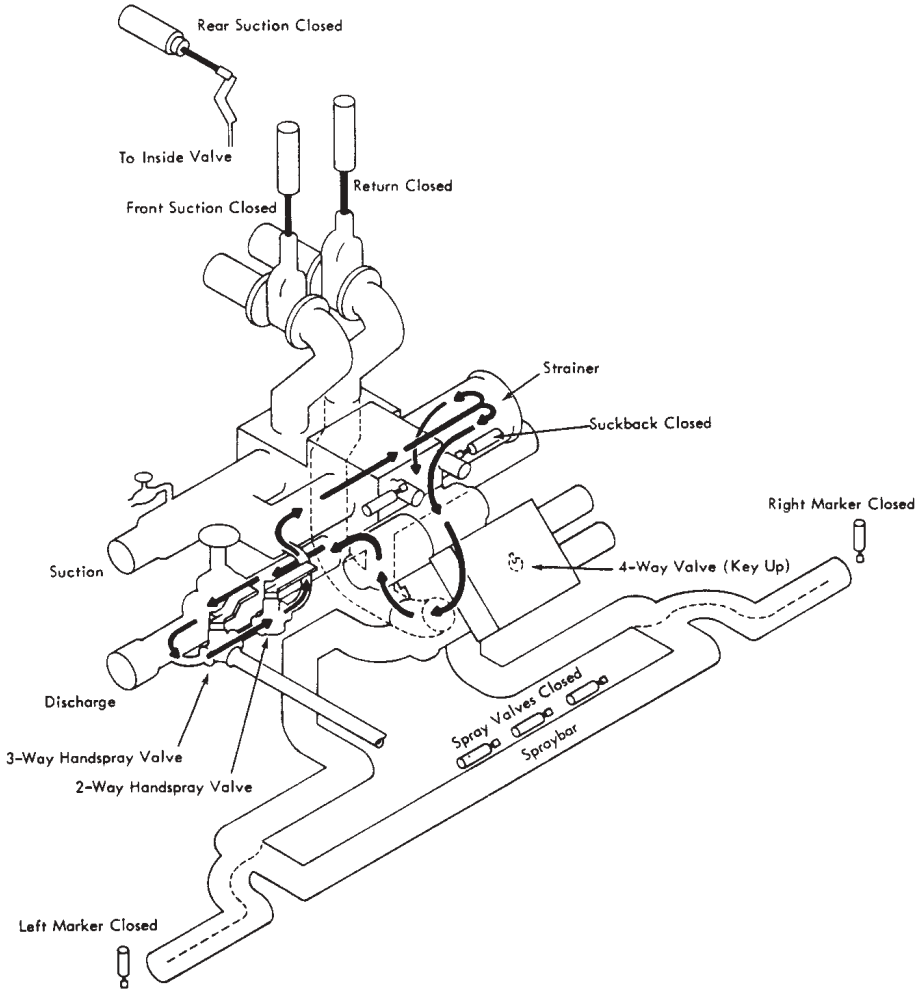
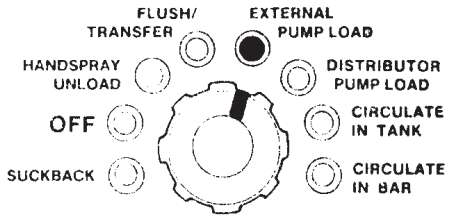


FIGURE 4A.

External Pump Load

Sets asphalt flow control valves to load the tank with a pump other than the pump on the distributor. The external pump's discharge line is connected to either the left or right suction line and discharges into the tank by way of the rear suction valve.



ASPHALT FLOW CONTROL

SAM I

DOES NOT APPLY TO SAM II

SAM II

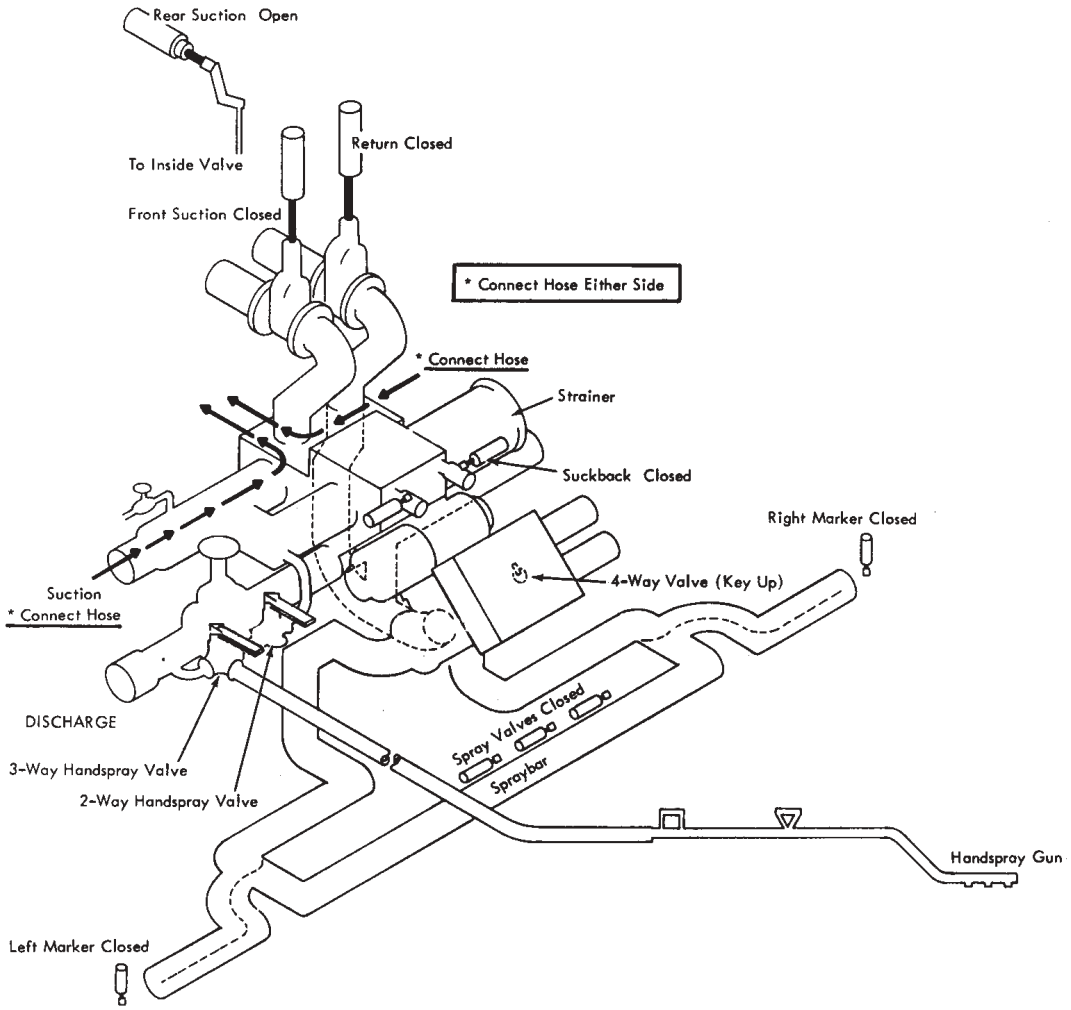
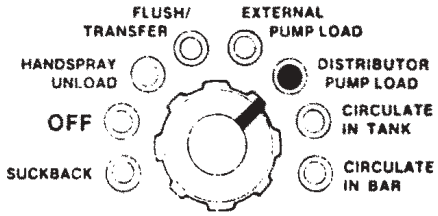


Figure 5

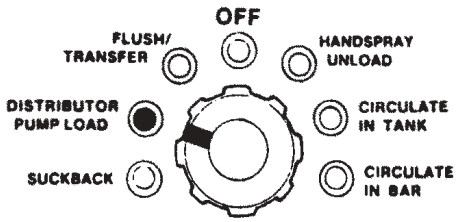
Distributor Pump Load

Sets the asphalt flow control valves to load the tank with the pump on the distributor. External line is connected to either the left or right suction line and discharges into the tank by way of the return line.



ASPHALT FLOW CONTROL

SAM I



ASPHALT FLOW CONTROL

SAM II

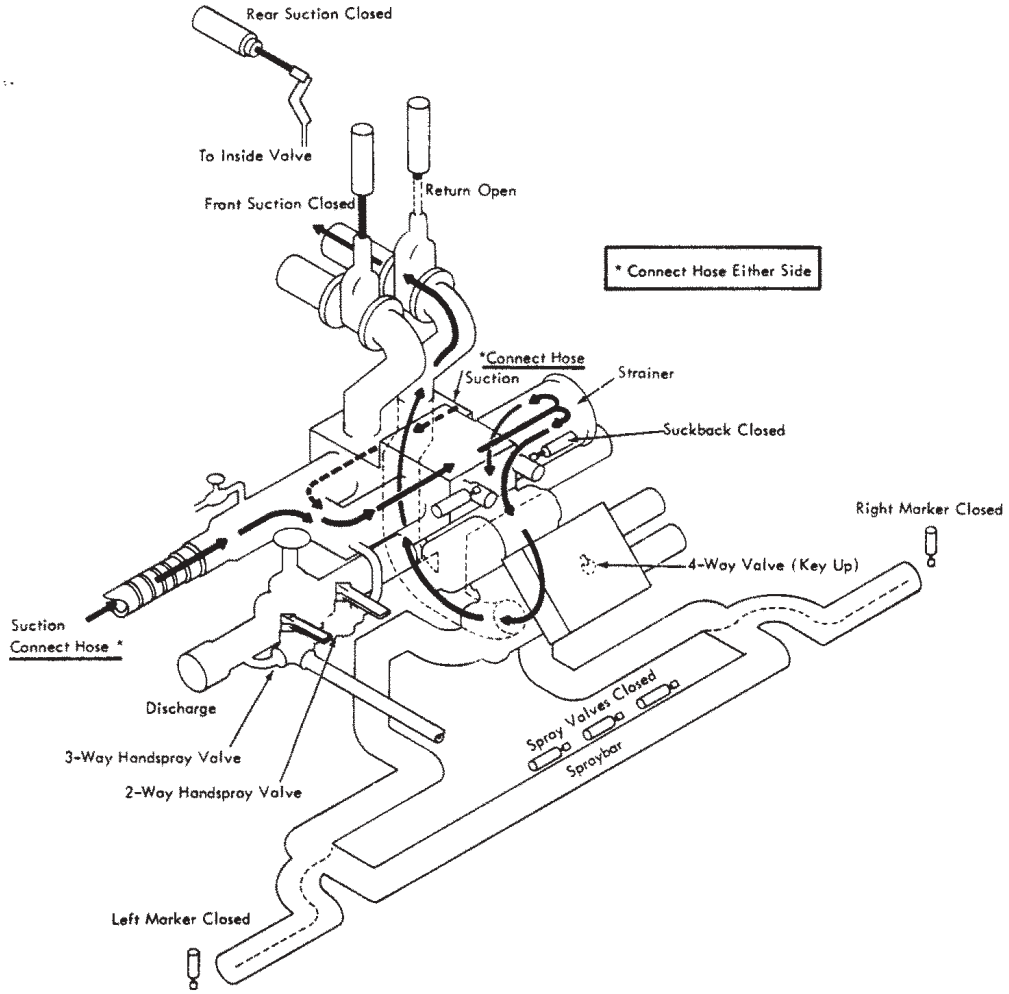
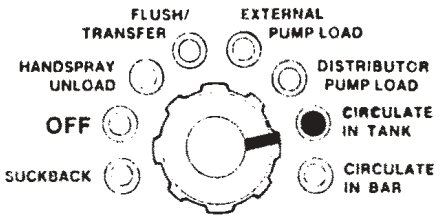


Figure 6

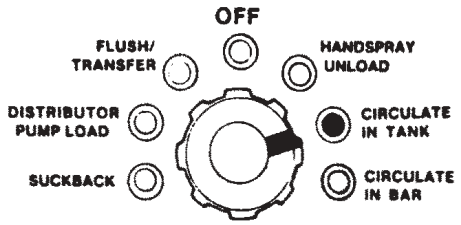
Circulate In Tank

Sets the asphalt flow control valves to remove material through rear suction valve and return it to the tank through the return line.



ASPHALT FLOW CONTROL

SAM I



ASPHALT FLOW CONTROL

SAM II

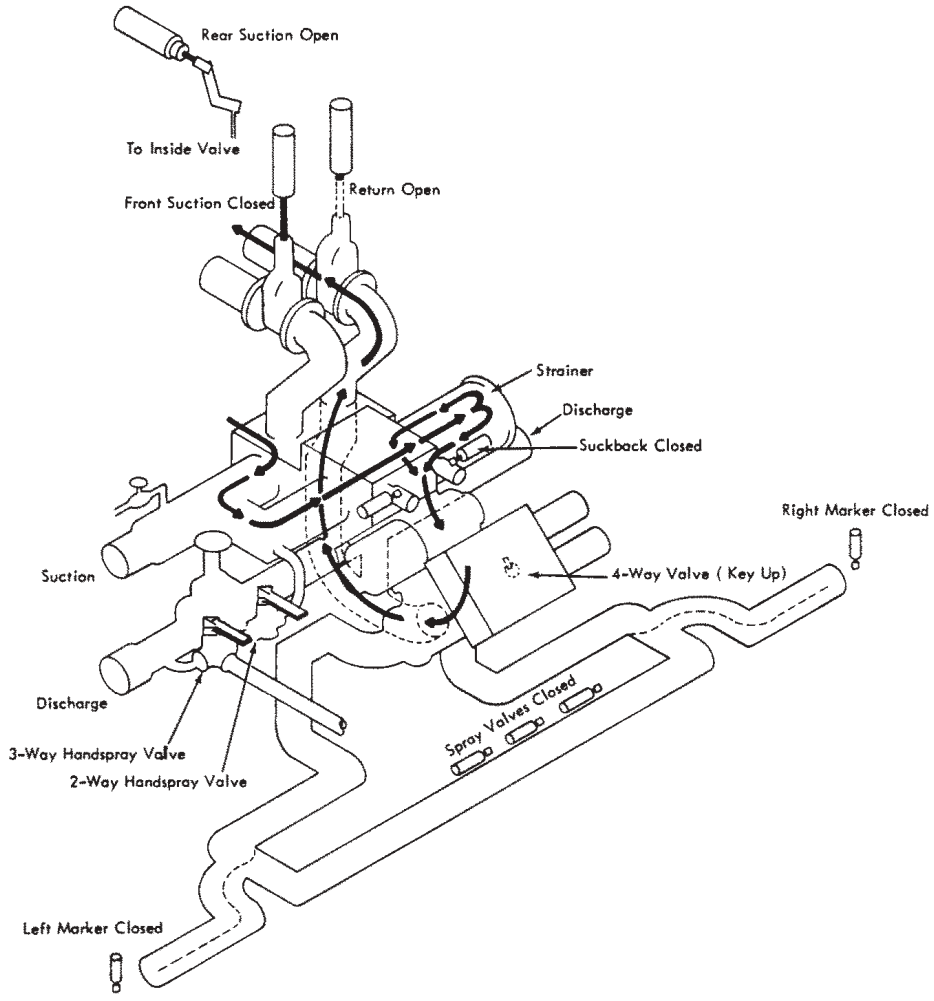
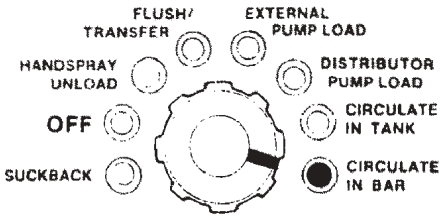


Figure 7

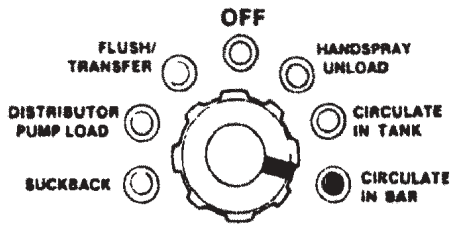
Circulate In Bar

Sets the asphalt flow control valves to remove material through the rear suction valve and pump it out the right drop pipe all the way to the right end of the bar, through the entire bar into the left drop pipe, back to the 4-way valve, down into the return header and up through the return valve, back to the tank.



ASPHALT FLOW CONTROL

SAM I



ASPHALT FLOW CONTROL

SAM II

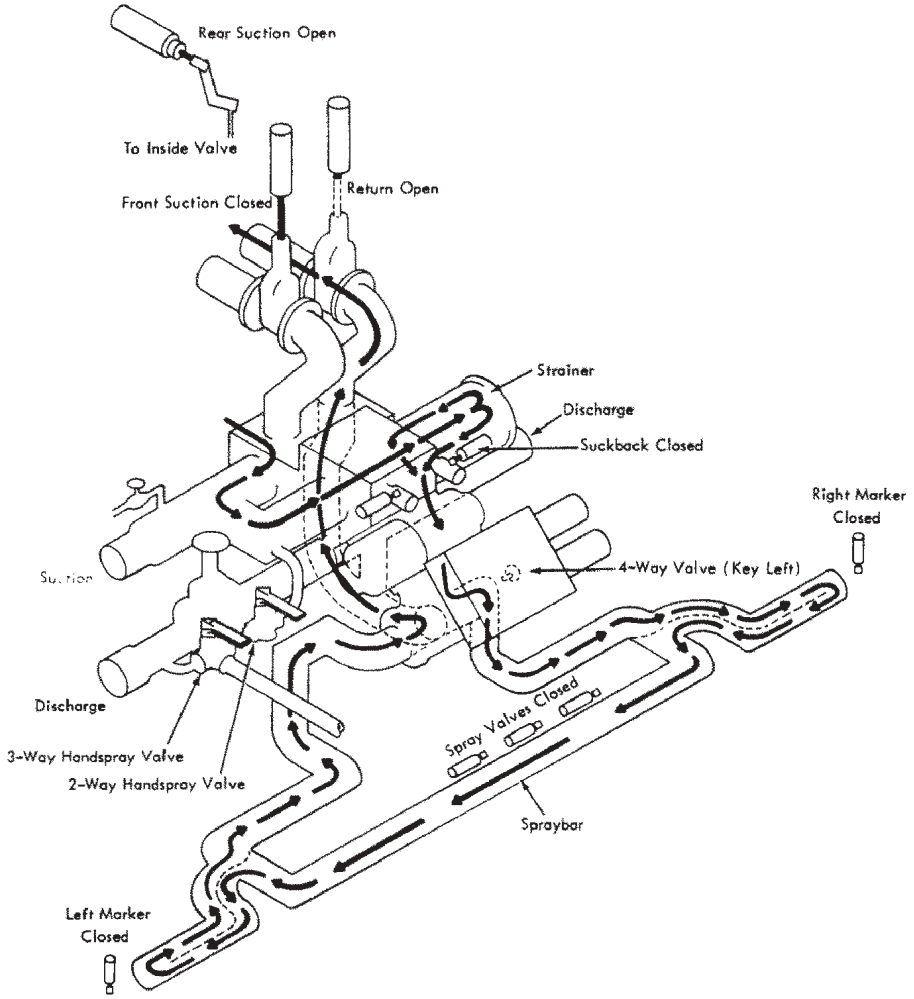
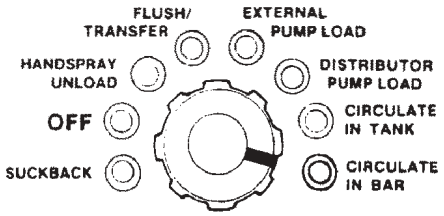


Figure 8

Spray

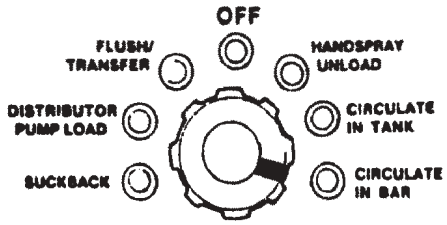
Activating the "master spray" switch while in the "circulate in bar" position resets the 4-way valve to its necessary position for "spray" and opens the spray bar valves.



ASPHALT FLOW CONTROL

SAM I

NOTE: "Asphalt Flow Control" Switch Must be in "Circulate In Bar" position.



ASPHALT FLOW CONTROL

SAM II

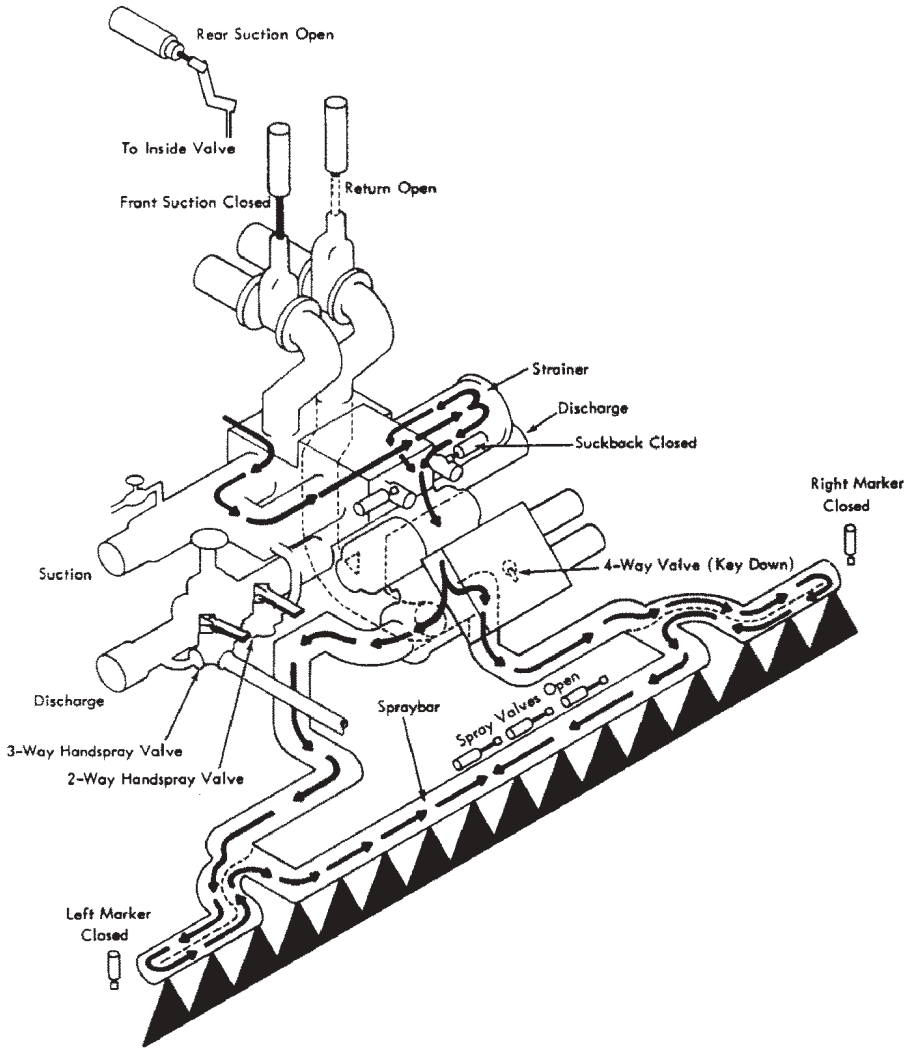


Figure 9

Rear Control Box Description

The rear control box (located at rear on driver's side) contains the following functions:

Master Power/Emergency Shut-off

This red mushroom head switch is wired in series with the "system power" toggle switch in the cab control box "out" is "on" and "in" is "off". Both switches must be "on" in order to apply system power. Turning either switch "off" cuts total system power thus turning off everything at once.

Bar Position Controls:

Left/Right
Up/Down
Left Wing
Right Wing

The above 4 items are the same as described in "Control Box" description and can be manually operated from either location. "Travel/Manual" switch in cab control box must be in "manual" position to enable these switches. These switches are inoperable with the "Travel/Manual" switch in "Travel" as described under "Bar Position Controls".

Flushing Pump:

Operates electric powered solvent pump to pump flushing solvent into piping. "Up" is "on" and "down" is "off". A red indicator light indicates the pump is "on".

All solenoid valves are provided with manual overrides. The hydraulic valve overrides are pins at each end of the valve. Depressing the pin and holding inward moves the spool in one direction. Depressing the pin on the opposite end of the valve moves the spool in the opposite direction.

The air valve overrides are white nylon slotted screw heads at the upper portion of the valve just below the solenoids. Inserting a slotted screw driver and pushing straight in will shift the valve spool. If it is desired to maintain the valve in that position, the override depressed and turn clockwise a quarter turn. This will lock the valve in position. To release the valve, insert screwdriver, depress the override and rotate a quarter turn counter-clockwise.

Maintenance

Clean

The working mechanism of the Etnyre "SAM" Model Distributor should be kept clean for several reasons. A buildup of asphalt will affect the moving parts of the Distributor, requiring excessive forces and pressures to be applied. This buildup will hide problems such as loose bolts or other fasteners. Time required for general maintenance and service work will be increased by the time spent cleaning a dirty machine.

Specific items that need to be kept clean for proper operation are: The running surface of the rubber tired Bitumeter Wheel which needs to be kept clean to assure accuracy. The Bitumeter and Pump Tachometer gears which run past the magnetic pickups, should be kept clean so that they do not pick up stones which could damage the pickups. The hydraulic and air cylinder rods must be kept clean to keep them from sticking and damaging the rod seals. Don't forget the spray bar shift cylinder which is underneath and out of sight. The feeler rods on the bar shift switches must be kept clean so that they will not stick to the actuator rod attached to the spray bar carry mechanism.

Lubricate

There are three (3) oil levels that must be maintained on the Etnyre SAM Model Distributor.

Hydraulic oil should always be visible in the hydraulic tank sight glass. If the level falls below the glass, refill with clean hydraulic oil compatible with Texaco Rando HD46. Be sure the container used for filling is clean. Be sure the drum in which the hydraulic oil has been stored in was sealed. Clean the area around the storage drum opening and the hydraulic tank fill neck before opening them. When filling a cold hydraulic tank, remove the thermometer (after cleaning the area) and fill until the oil comes out the thermometer hole (Fig. 1). Then, screw the thermometer back in.

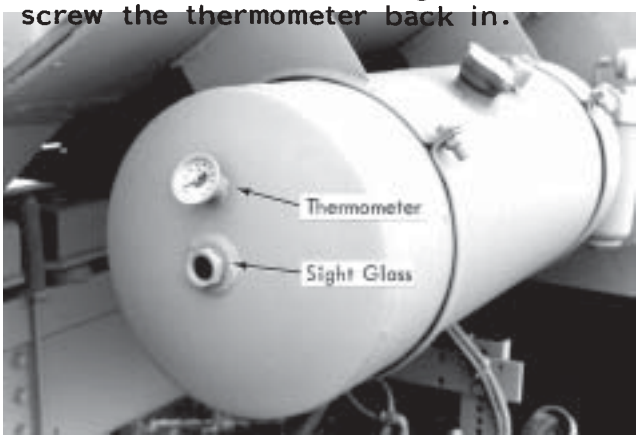


Figure 1. Hydraulic Tank.

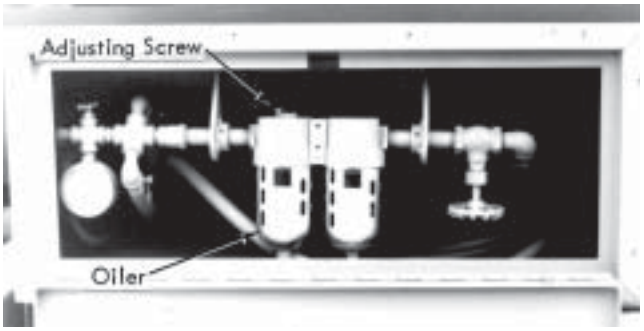


Figure 2. Air System Oiler.

The air system oiler (Fig. 2) should be kept filled with SAE #10 non-detergent oil. Bleed the air system down before removing the oil cup. The oiler should need refilling about once a week if the machine is used regularly. The amount of oil used can be adjusted by turning the small screw on top of the oiler. This is a needle valve. If the needle is turned all the way in, you will shut off the flow of oil. Do not do this.

The hydraulic oil and air oiler level should be checked daily.

The transmission on the Asphalt Pump should be kept full to the oil level hole on the face of the gear case (Fig. 3). Use SAE #90 gear oil here. This oil should be changed after the first 50 to 100 hours of use and

every 2500 hours or six (6) months (whichever comes first), after that. The breather vent on top of the transmission must be kept clean.

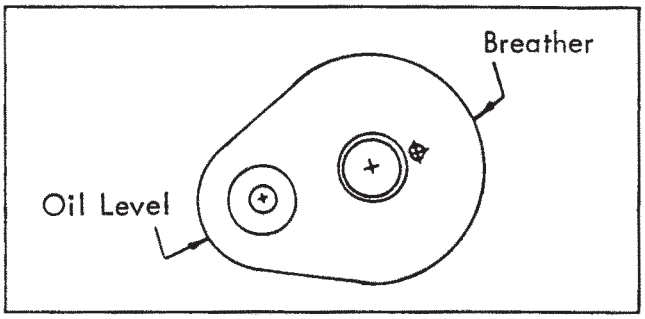


Figure 3. Asphalt Pump Transmission.

The hydraulic and air cylinder rods should be kept clean and lubricated. Any light machine oil, spray lubricant or even diesel fuel will do to keep the seals moist.

The optional front suction valve cylinder should be paid particular attention since it is not used as much as the other cylinders.

Tighten

The unit should be inspected daily for loose bolts. It should be inspected before start-up, after the unit has been driven long distances.

Pay particular attention to:

- The tank mounting bolts and tie rods. Those bolts that attach the tank to the truck chassis (Fig. 4a, 4b, 4c).

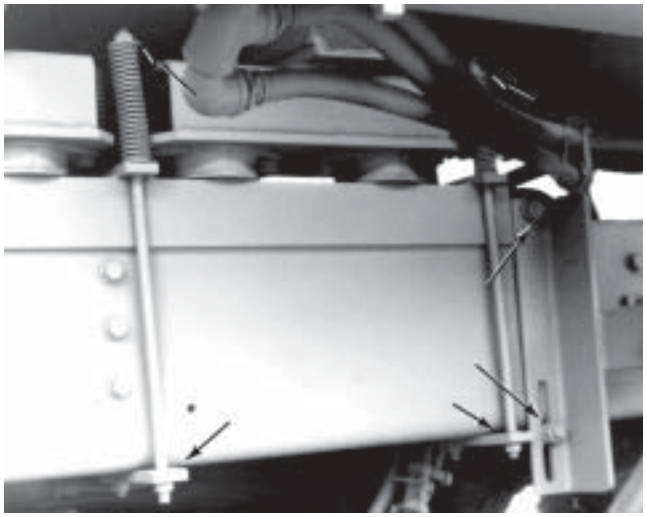


Figure 4a. Tank Mounting Bolts.

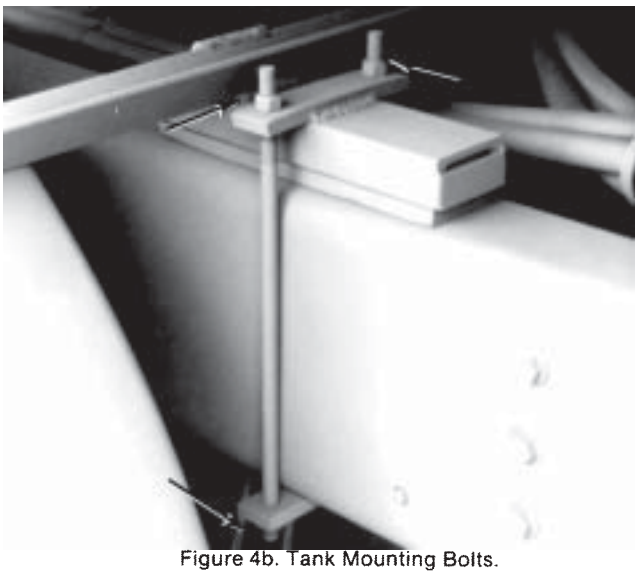


Figure 4b. Tank Mounting Bolts.

Figure 4c. Tank Mounting Bolts.

- The two 3/4 inch bolts that carry the spray bar (Fig. 5).

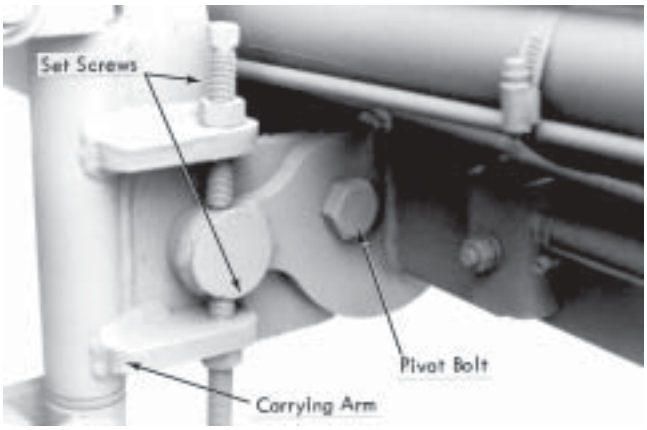


Figure 5. Spray Bar Carrier Bolts.

- The four 1/2 inch set bolts and jam nuts on the vertical carry posts (Fig. 6).

- The two set screws on the asphalt drive transmission collar (Fig. 7).

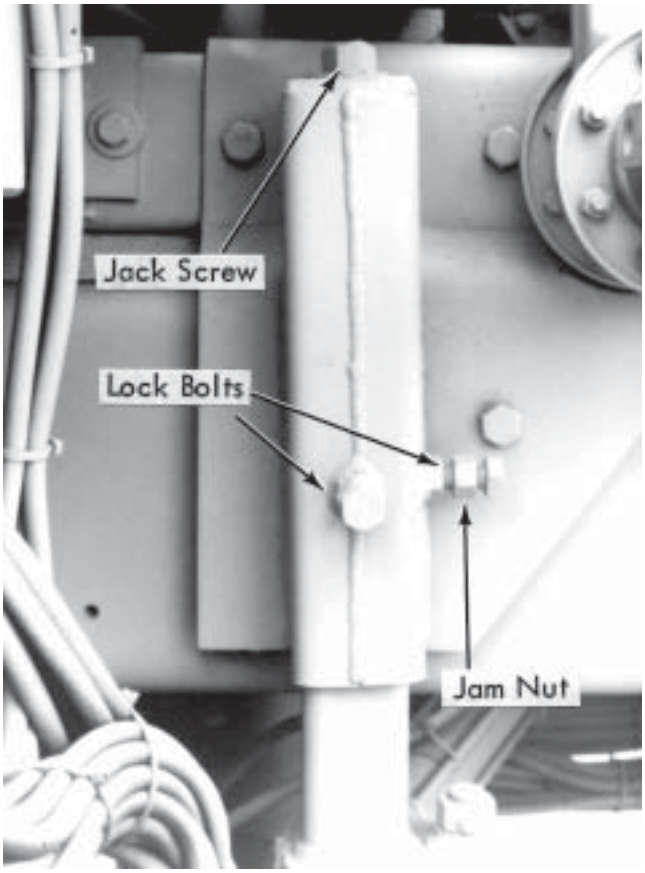


Figure 6. Vertical Carry Post.

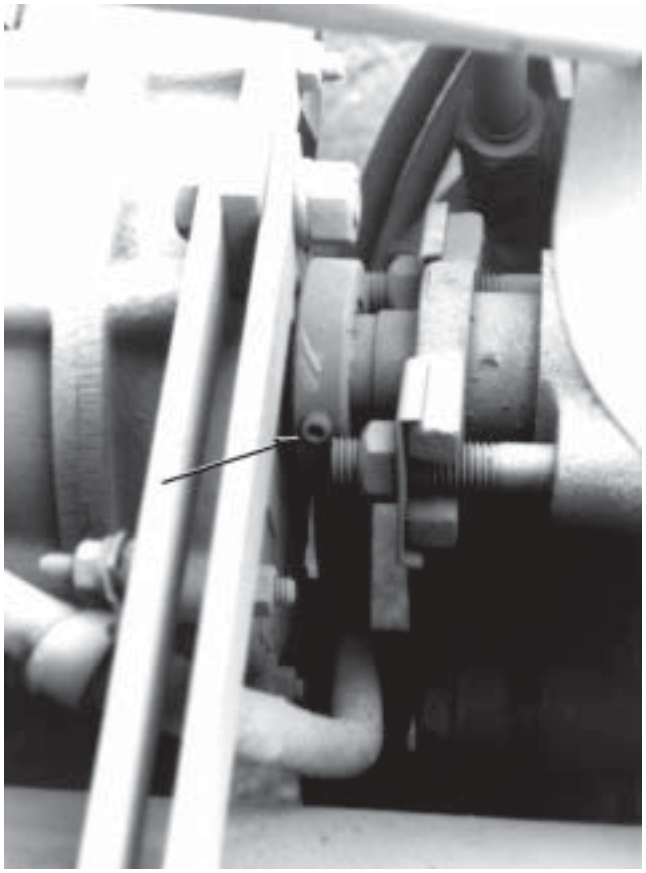


Figure 7. Asphalt Drive Transmission Collar.

Daily

1. Check operation of auto drain on air/water separator.
2. Check air oiler oil level and fill as required with an SAE #10 weight non-detergent oil.
3. Clean accumulated asphalt from gear on bitumeter wheel.
4. Check oil level in hydraulic oil reservoir. Oil should always be visible in sight glass. Refill as required. With oil temperature in tank at ambient temperature, remove thermometer from port and fill until oil comes out of thermometer port. Replace thermometer in port.
5. Check vacuum on both hydraulic oil filters with unit running at normal operating temperature (120° F to 160° F). If needle reaches orange/red area, replace filters.
6. Wash down unit with solvent - particularly cylinder rods.

Check hydraulic filters and change after 20 hours of initial operation or 20 hours after any component repairs are made or the hydraulic system is opened up for any reason.

Weekly

1. Clean asphalt pump suction strainer.
2. Check air compressor filter element at weekly or 100 hour intervals.

Note - For more complete details see remainder of Service Section.

Tachometer

The Pump Tachometer and Bitumeter are driven by magnetic pickup devices. The pickups count the teeth on the cog wheels that turn past them. The cog wheels should be kept clean so that stones do not get stuck to them. Stones stuck to the cog wheels will grind away part of the magnetic pickup causing it to fail. On the end of the pickup is a black dot. This dot must be lined up on the center of the cog wheel. The clearance between the face of the pickups and the ends of the teeth on the cog wheels should be less than 1/16 inch (Fig. 8, 9).

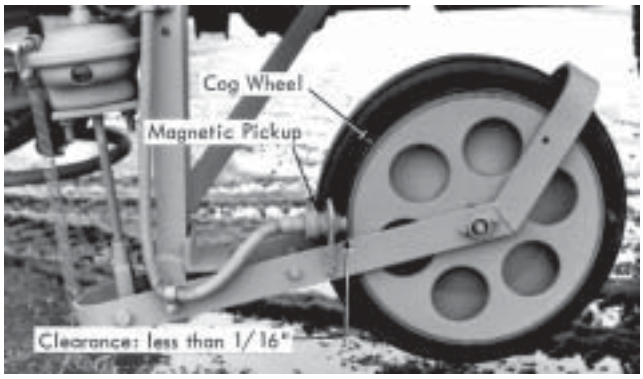


Figure 8. Magnetic Pickup - Bitumeter.

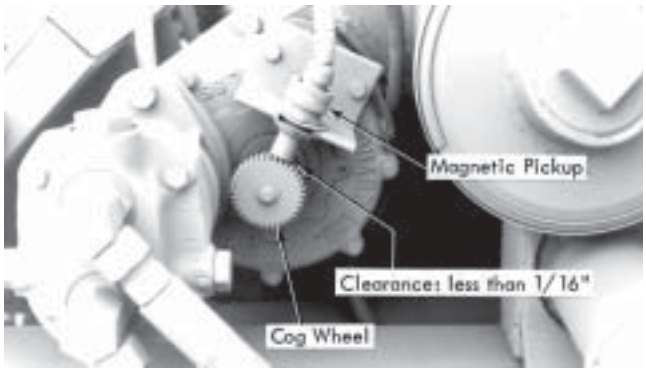


Figure 9. Magnetic Pickup - Pump Tachometer.

Each magnetic pickup has its own shielded cable that runs from the pickup to the display box in the truck cab. The cables connect to the back of the box with individual couplers labeled "B1" for the Bitumeter and "P1" for the Pump Tachometer. If the "Feet Per Minute" or "Gallons Per Minute" display stop working, first check to see that all the switches are in the correct position. Next, determine if the cog wheel is turning. Check the alignment of the pickup and the wheel. Check the clearance between the pickup and the wheel. If all of these appear correct, swap the cables on the back of the display box to check further.

If for instance, the "Feet Per Minute" display quit, but the "Gallons Per Minute" still worked, swapping the cables would determine if the problem was in the pickup/cable or in the display box. If, after swapping the cables the "Feet Per Minute" display showed some number but the "Gallons Per Minute" did not, this would show that the problem is in the pickup/cable. If, after swapping the cables, the "Gallon Per Minute" still showed a display but the "Feet Per Minute" still did not, then the problem is probably in the display box.

Of course, in order to get a display, the cog wheel has to be turning past the pickup that is connected to the display. The numbers displayed with swapped cables will not be correct. Their only value is determining if a signal is coming from the pickup.

There are two batteries in each of the "Feet Per Minute" and "Gallons Per Minute" displays. There are also two batteries in the "Feet Traveled" and "Gallons Sprayed" counters. These batteries are the pickups for very slow speed operation and provide a battery back up to hold the number displayed on the counters. They will normally last several years. The batteries are "N" size Alkaline Batteries. They are available from E. D. Etnyre & Co.'s Parts Department (Part No. 6701867) or they may be purchased locally. (Note - The preceding does not apply to the later version (Sam II) single unit control panel. Batteries are not required).

Travel Systems

The "Travel" circuit is a series of switches and wires that automatically centers, raises and latches the bar and raises the wings. Throwing the single switch in the cab simplifies the

operation at the end of the shot preparing the bar for travel.

There are five limit switches at the rear that sense the position of the spray bar and wings. These switches are in series so that when each switch senses that the bar has reached the proper position, power is sent to the appropriate solenoid valve so that the next step can take place.

There are two shift switches, a right and a left. The shift switch on the left senses when the bar is shifted to the left. The shift switch on the right senses when the bar is shifted to the right. All the switches are double throw switches. If the bar is shifted right or left the switches will power the hydraulic shift solenoid valve to move the bar to center. When the bar reaches center the switches shut off power to the shift solenoid and send power to the bar raise solenoid valve. They also send power to light the bar centered indicator light in the cab. Next, the bar raises. When the bar has reached the fully raised position the magnetic bar raised switch is tripped. Power to the bar raise solenoid is shut off. Power holding the bar latches off is shut off and the latches latch. When the bar raised switch was closed or tripped, power was sent to the two latch magnetic switches. Once the two latch switches are closed indicating the latches have latched then power goes to the cab to light the light saying the bar is up and latched. Power is next sent to raise the left wing. When the wing has raised and tripped its switch, power is sent to the cab to light the indicator light.

Power is shut off from the left wing raise solenoid and sent to the right wing raise solenoid. When the right wing has raised, power is shut off and the wing raised light and travel ready light are lit. The sequence is completed.

If the TRAVEL switch is thrown to start the travel sequence and at some point the sequence stops, (say for instance, the right wing will not come up), then the previous switch in the sequence (the left wing raise switch) has probably not been tripped. It may be damaged or out of adjustment.

The two shift switches are adjusted by moving the switch on its base or by moving the arm that actuates it. With the bar manually centered and the switch rods straight back there should be 1/16 to 1/8 inch gap between the switch rod and the actuator arm (Fig. 10). The bar will continue to shift momentarily after the switch is centered, therefore the shift speed has influence over the centering. The faster the shift speed is set, the more the bar will tend to over shoot the center. This speed can be adjusted with the needle valves (Fig. 11) on the hydraulic valve bank. The shift switch rods and actuator arms should be kept clean so that they do not become "glued" together.

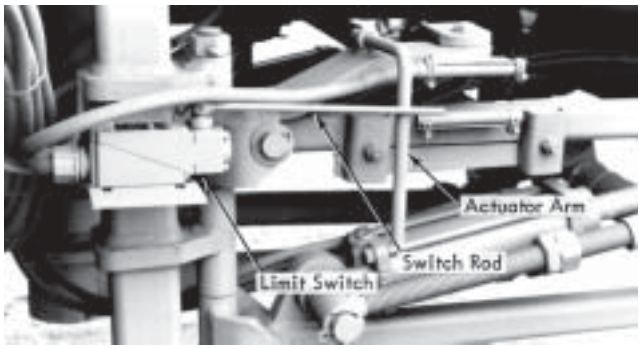


Figure 10. Bar Shift Limit Switch.

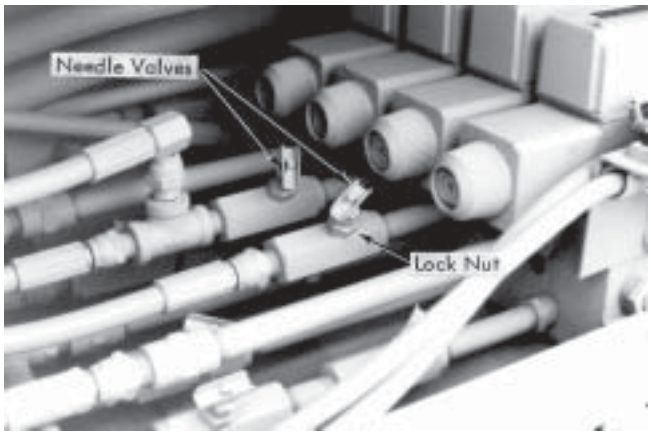


Figure 11. Hydraulic Valve Bank.

To adjust the bar up switch, select the "Manual" position on the "Manual/Travel" switch, center the bar and raise it. At this time, raise

both wings. Loosen the bolts holding the switch magnet bracket (Fig. 12) and slide the magnet away from the switch. With the truck engine off, have someone in the cab turn the travel switch to "Travel". Push the magnet towards the switch until the bar up light comes on in the cab. Tighten the magnet mounting bolts and test the entire sequence. Similar techniques can be used for setting the wing and latch switches.

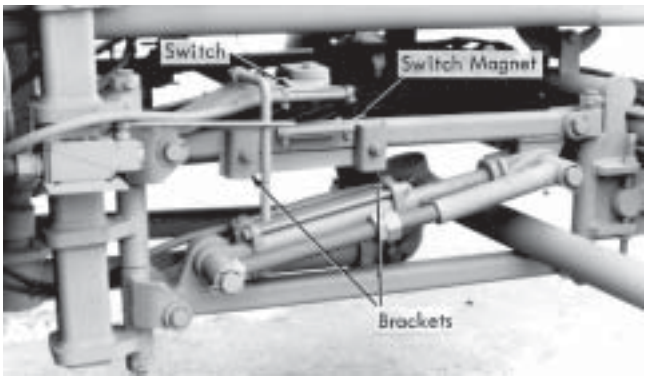


Figure 12. Magnetic Switch Adjustment.

In all cases stay clear of the bar and latches as they may move suddenly.

The magnetic bar raise and wing raise switches will "see through" a coating of asphalt. But, they should be kept clean so that stones do not get stuck to them. A large stone stuck to the magnet will crush the switch when they are brought together.

If the switch is placed in the TRAVEL position but for some reason the sequence fails to be completed, the hydraulic dump valve will remain powered. This causes all of the auxiliary hydraulic circuit oil to go over the relief valve. The hydraulic oil will be over heated if left in this situation for more than a few minutes. If the machine fails to complete the sequence, shift the switch to MANUAL position. Do not leave it in TRAVEL position.

4-Way Valve/Rotary Actuator

The four way asphalt valve is bolted directly to the asphalt pump. It directs the flow of asphalt from the pump back to the tank, to circulate through the spray bar and to both sides of the spray bar to spray. The valve is a ground and lapped tapered plug valve. The primary sealing is done between the lapped surfaces of the plug and case. There is a secondary seal in the form of a spring loaded stem packing. The packing spring also holds the plug in contact with the taper of the case. A pair of jam nuts on the valve stem compress the spring. There should be a gap of 1/16 to 1/8 inch between the top of the valve case and the underside of the bottom nut.

The valve is turned with a roller chain and sprocket by two air cylinders. When the valve is not being turned, there is air pressure on both cylinders keeping the chain tight. To turn the valve clockwise, the pressure is released from the bottom cylinder. The compressed air already in the top cylinder retracts the top cylinder, pulling the chain. To turn counter clockwise, air is released from the top cylinder and the bottom cylinder pulls the chain turning the valve.

The valve moves between three positions. The key in the chain sprocket straight up (Fig. 13a), the top cylinder fully retracted and the bottom cylinder extended is the CIRCULATE IN TANK position. The key to the left side (Fig. 13b) and both cylinders halfway extended is the CIRCULATE IN BAR position. The key straight down (Fig. 13c), the top cylinder extended and the bottom cylinder retracted is the SPRAY position.

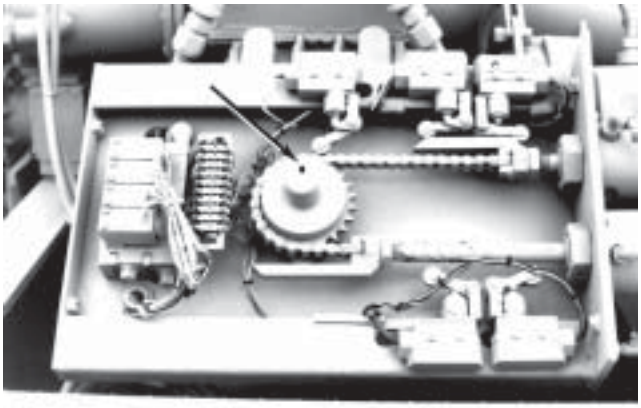


Figure 13a. Rotary Actuator - Circulate In Tank position.

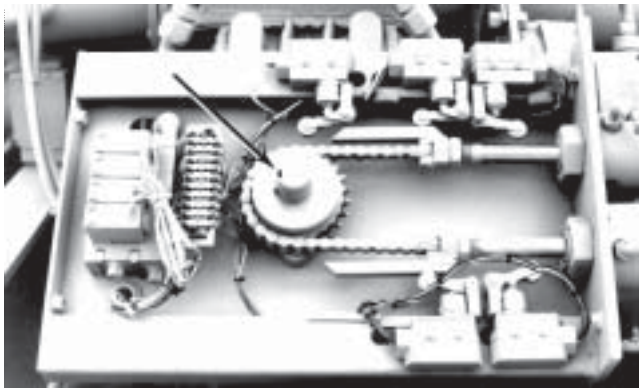


Figure 13b. Rotary Actuator - Circulate In Bar position.

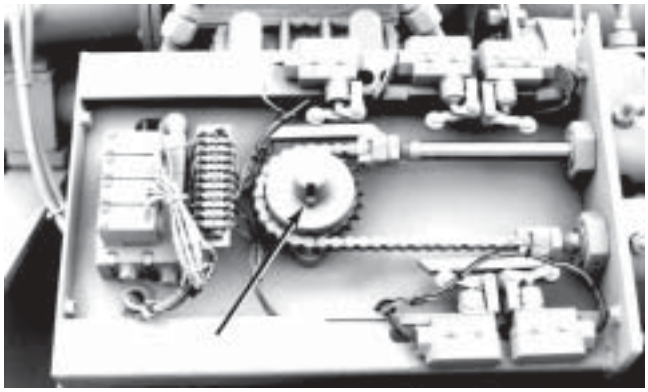


Figure 13c. Rotary Actuator - Spray position.

There are two cams attached to the cylinder rods that trip roller arm limit switches. In the CIRCULATE IN TANK position the #1 and #2 switches should be tripped by the cam. In the CIRCULATE IN BAR position the #2 and #3 switches should be tripped. In the SPRAY position the #3 and #4 switches should be tripped and the spray delay switch should also be tripped.

These switches send power to the appropriate air solenoid valve to turn the valve in the proper direction. They also direct power to the cab to light the control panel lights when the valve has reached the desired position. The spray delay switch turns on the bar valves as the four-way valve comes around to the spray position. Note - Later units (SAM II) use proximity switches instead of mechanical switches shown.

Hydraulic Systems

There are two separate hydraulic systems on the SAM Distributor. One system is the Main High Pressure Hydrostatic System that drives the asphalt pump. The other system is the Auxiliary Hydraulic System that moves the spray bar.

Auxiliary Hydraulic Systems

The auxiliary system is driven by a small hydraulic pump which is piggyback mounted on the back of the main hydrostatic charge pump. The auxiliary pump draws fluid from the reservoir through its own suction filter. It pumps the fluid to a hydraulic valve bank. In the bank is a combined single solenoid pump valve, and system pressure relief valve and four dual solenoid directional control valves. When a low pressure burner system is included, a blower motor control valve is inserted ahead of the combined valve.

When the system is at rest the dump valve is not powered and directs the flow from the pump back to the reservoir. There is a directional valve to raise the bar, shift the bar and one to raise each wing. When any of these are powered, the dump valve is also powered. When the dump valve is powered or closed, fluid is forced to go through the directional valves to one or more of the hydraulic cylinders. Some of the fluid goes over the relief valve. Whenever one of the switches is thrown to move the spray bar, a directional valve is powered and the dump valve is also powered.

On the end of each solenoid is an override button. Pushing this button shifts the valve just as the solenoid does. These override buttons can be used in case electric power is lost and for diagnosing system problems. Whenever one of the buttons on a directional control valve is used, the dump valve button must also be pushed.

In the same block as the dump valve is the auxiliary system relief valve. This relief valve is set at 1000 P.S.I.

Between the directional control valves and the cylinders are a set of needle valves. These needles are used to

adjust the speed of the spray bar movement. After making an adjustment be sure to tighten the lock nut on the stem (Fig. 14).

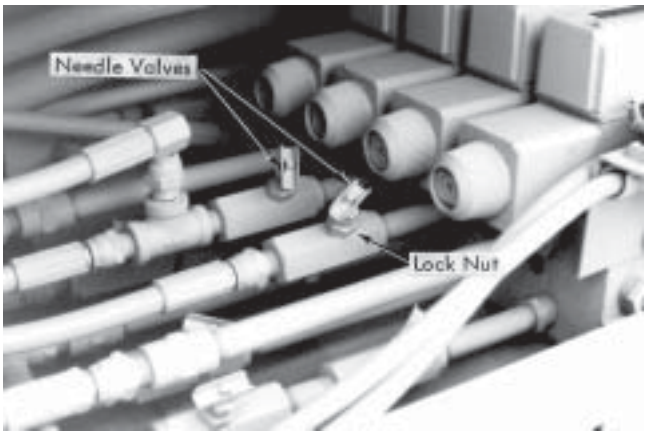


Figure 14. Spray Bar Speed Adjustment Needle Valves.

High Pressure Hydrostatic System

The Asphalt Pump is driven through a shaft mounted gear reducer by a hydraulic motor. The hydraulic motor is powered by a variable displacement hydraulic pump. The hydraulic pump is driven by a transmission mounted power take off or an engine crankshaft power take off.

The two hoses between the hydraulic pump and motor are four wire braid high pressure hoses. These two hoses circulate the fluid in the closed loop between the pump and motor. There are low pressure case drain hoses running from the pump and the motor back to the hydraulic tank. These two hoses drain the internal leakage oil back to the reservoir. There are also two suction hoses. One line draws fluid from the tank to the auxiliary system pump. The other draws fluid to the hydrostatic charge pump.

The charge pump is mounted on the main hydrostatic pump. It supplies make-up oil to the closed loop system and provides power to control the hydrostatic pump.

In each of the suction lines is a 10 micron suction filter. These filters should be changed after the first 20 hours of operation and after the first 20 hours of operation following any repairs made to the hydraulic system.

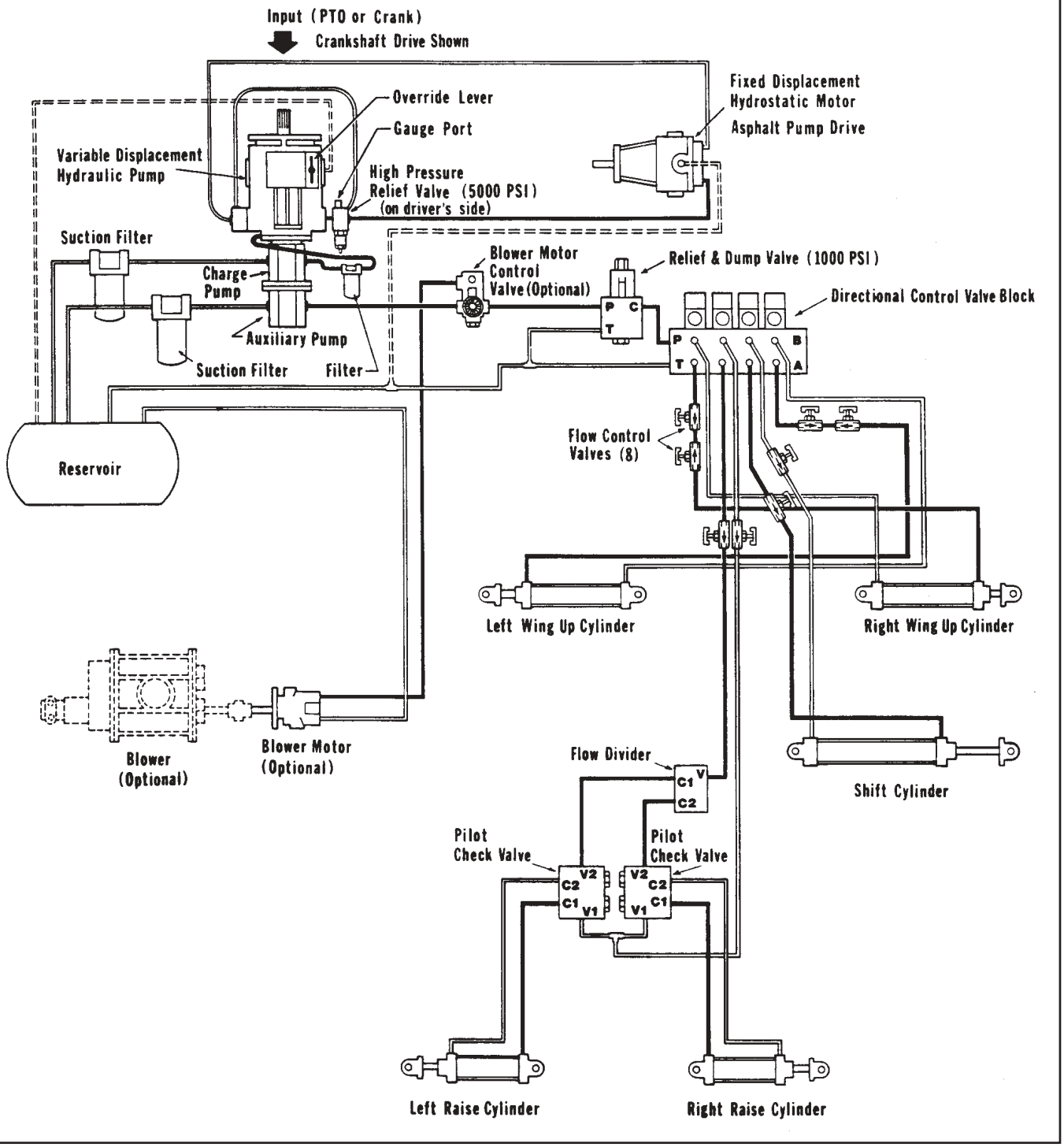
Each filter is equipped with a vacuum gauge. The amount of vacuum displayed on the gauge indicates the filter condition. If the needle reaches the orange/red area while the hydraulic oil is at normal operating temperature (120° F to 160° F) then the filter element should be replaced.

On the side of the hydrostatic pump is a high pressure relief valve. This relief valve is set at 5000 P.S.I. A 10,000 P.S.I. gauge should be plumbed into the gauge port on the side of the relief valve. The asphalt pump must be stalled or overloaded to make an adjustment. See the schematic for the location of the pressure check port.

The displacement of the hydrostatic pump is controlled by an electronic servo valve. As the amount of electrical current through the valve is increased the stroke or displacement of the pump is increased. The servo valve is mounted on top of the hydrostatic pump. On the servo valve is a manual override lever (see schematic). This lever can be used to stroke the hydrostatic pump and make the asphalt pump turn. Care must be taken to move the lever in the proper direction as it is possible to drive the asphalt pump backwards.

On transmission PTO driven Dynapower pumps, if the pump shaft turns clockwise while looking into the shaft or from the front, turn the override lever clockwise to stroke the pump. If the pump shaft turns counter clockwise, then turn the lever counter clockwise. On crankshaft driven Dynapower pumps, turn the manual override lever counter clockwise.

Hydrostatic System Schematic



Mechanical Adjustments
Bar Wing Crown

The bar may be adjusted for road crown at the head end of the wing raise cylinders. The wing raise cylinders are mounted with threaded rods near the center of the bar (Fig. 15). By turning the nuts on the threaded rod the wing can be raised or lowered to match the crown of the road. The bar wing up switches may

have to be adjusted after the crown is changed.

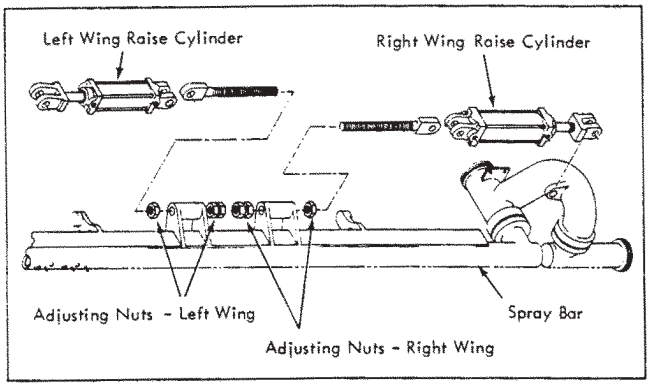


Figure 15. Bar Crown Adjustment.

Bar Level and Height

The level and height of the bar is adjusted by a pair of jack screws (Fig. 16). Near the rear of the asphalt tank are two telescoping square tubes that the spray bar hangs from. There are two half-inch lock bolts screwed into the sides of each outer tube. After loosening the lock bolts, the bar may be raised or lowered by turning the head of the jack screw on top of the square tube. Care must be taken to be sure that the latches still function easily. With the bar raise cylinders fully extended the tops of the latch ears on the spray bar should just clear the bottom of the truck frame (approximately 1/8") as the bar is shifted. The latch cams should engage the ears without banging in. The bar height may be raised slightly to relieve some of the tension on the latches.

Bar Roll

The bar may be rolled in its spray position to aim the nozzles straight down or at an angle toward the rear. The bar pivots on two 3/4 inch bolts at the end of the carrying arms (Fig. 17). Near the pivot bolts are two 1/2 inch set screws. After loosening the 3/4 inch pivot bolts, the angle of the nozzle is adjusted with the set screws. All four set screws and both pivot bolts should be tight when spraying.

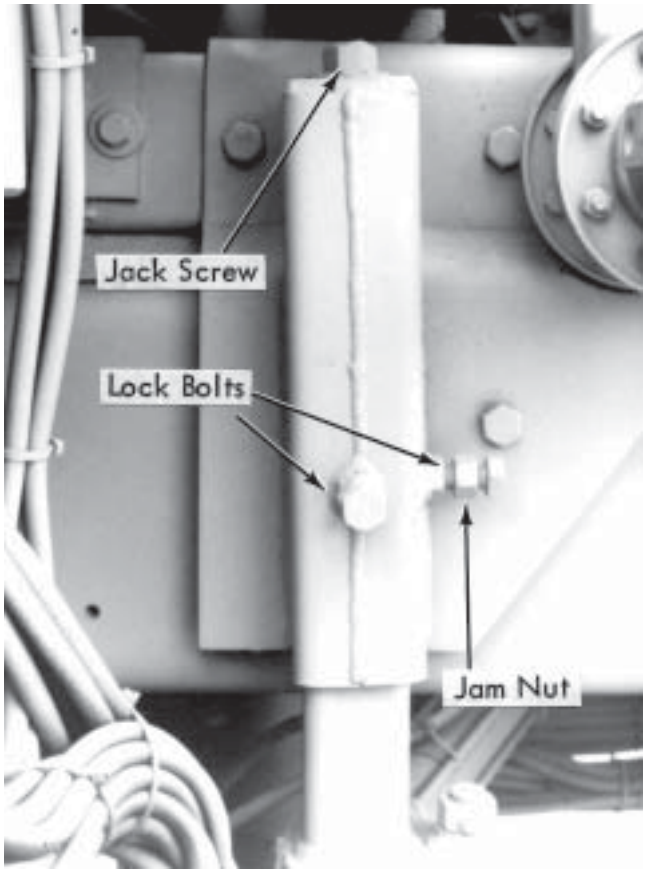


Figure 16. Bar Level and Height Adjustment.

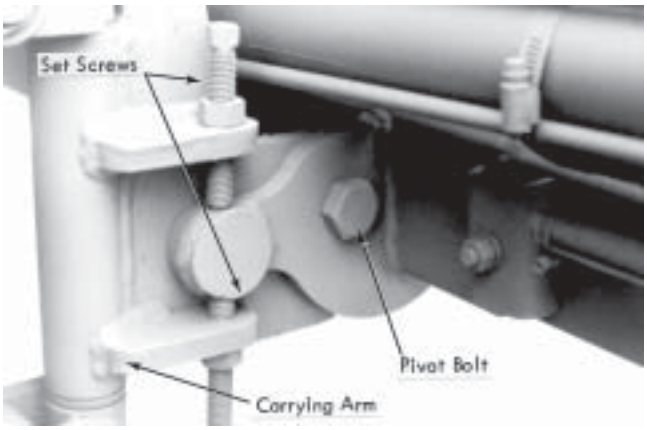


Figure 17. Bar Roll Adjustment.

Air System

Compressed air is used to position the valves on the SAM Distributor. The compressed air is supplied by the truck air brake compressor. The truck air system feeds the Distributor air reservoir through a brake protection valve. This valve will not

allow air to pass to the Distributor's system unless the truck's system has sufficient air (approximately 80 P.S.I.) to operate the air brakes. After the truck's air tanks have been pressurized to 80 P.S.I. the brake protection valve will open allowing the Distributor system to fill.

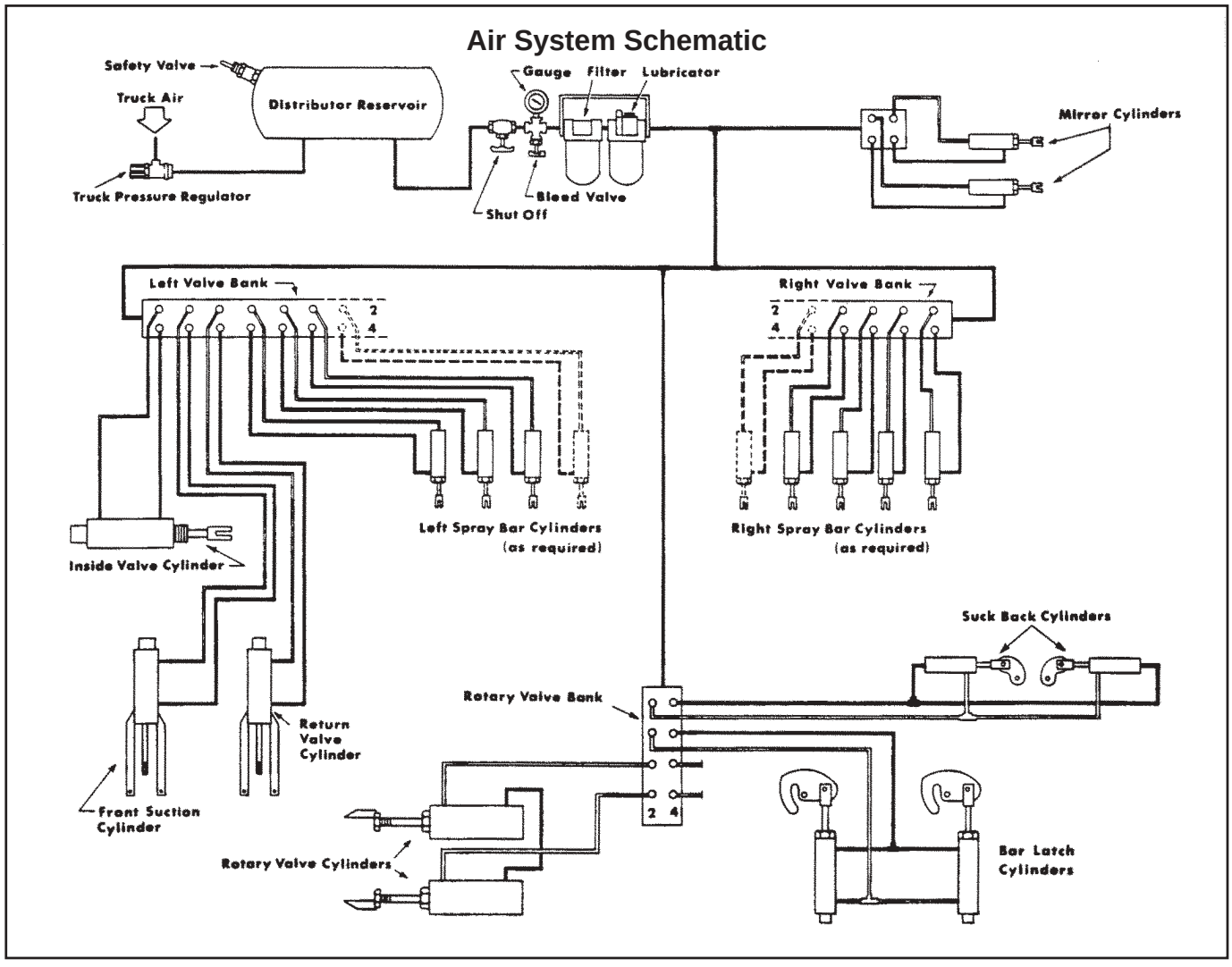
The Distributor air reservoir is equipped with a pop off valve set at about 150 P.S.I. The truck system is usually limited to 120 to 125 P.S.I., so the Distributor's pop off valve should seldom relieve.

The Distributor air system routes air from its own tank through a filter lubricator and to three or four air valve banks.

The filter/separator removes dirt and water from the air. The dirt and water are deposited in the bottom of the clear plastic bowl. There is a valve on the bottom of the bowl which will automatically drain the water. The bowl can be drained manually by pushing up on the stem at the bottom of the bowl.

The lubricator adds oil to the air to lubricate the cylinders and valves. The lubricator bowl should be filled with a SAE #10 non-detergent oil. This bowl should need re-filling about each 40 to 60 hours of operation. A needle valve top of the lubricator adjusts the amount of oil used. If the needle is turned all the way in, no oil will be used. This will cause seal damage.

Ahead of the filter/lubricator is a pressure gauge, shutoff valve and bleeder valve. The pressure gauge should read the same as the gauge in the cab after the system has been completely filled. With the shut off valve, the system at the rear can be

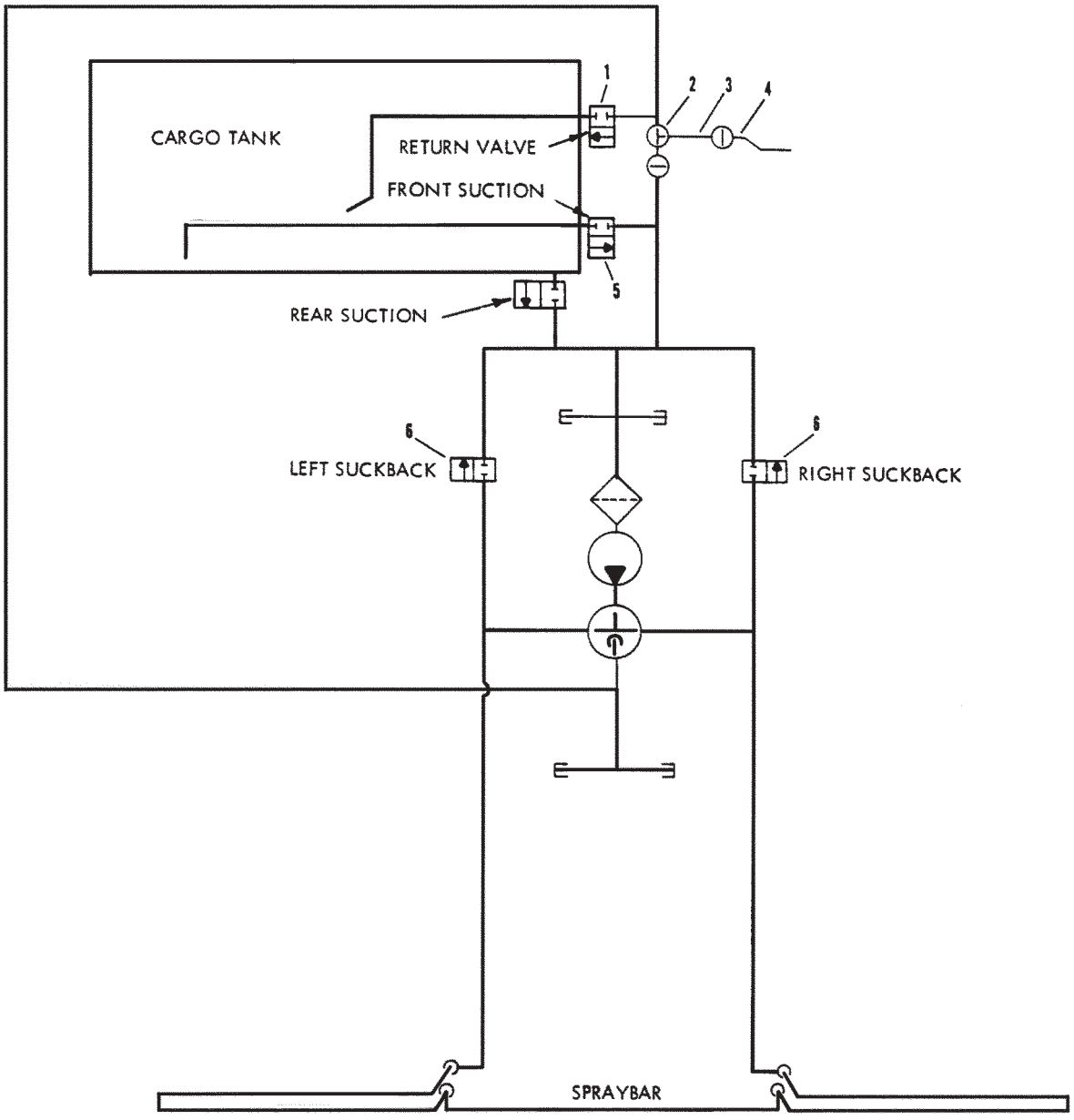


isolated from the Distributor reservoir for service. This valve must be closed and the system bled off before filling the oiler. Using this valve allows work to be done on the valves and cylinders without draining the air tanks.

There are three sets of air valves on the machine, two main banks, one on each side behind the rear fender and one set in the four way valve rotary actuator. Each set contains a series of valves bolted together with a common supply and exhaust. The valve bank on the left controls the left half of the spray bar, the rear suction and return valve, the optional front suction and optional left marker valve. The valve bank on the right controls the right half of the spray bar and optional right marker valve. On some machines the bar latch and suckback valves are also controlled from the right bank. Inside the rotary actuator are two valves. One valve drives the actuator in each direction. On later machines the bar latch and suckback air valves are mounted in the rotary actuator. There are also two valves mounted under the truck hood, on the firewall, to operate the optional remote controlled mirror.

On the end of each valve section is a manual override button. Pushing the button shifts the valve just as the electric solenoid does. Pushing the button and turning one quarter turn will lock the valve on.

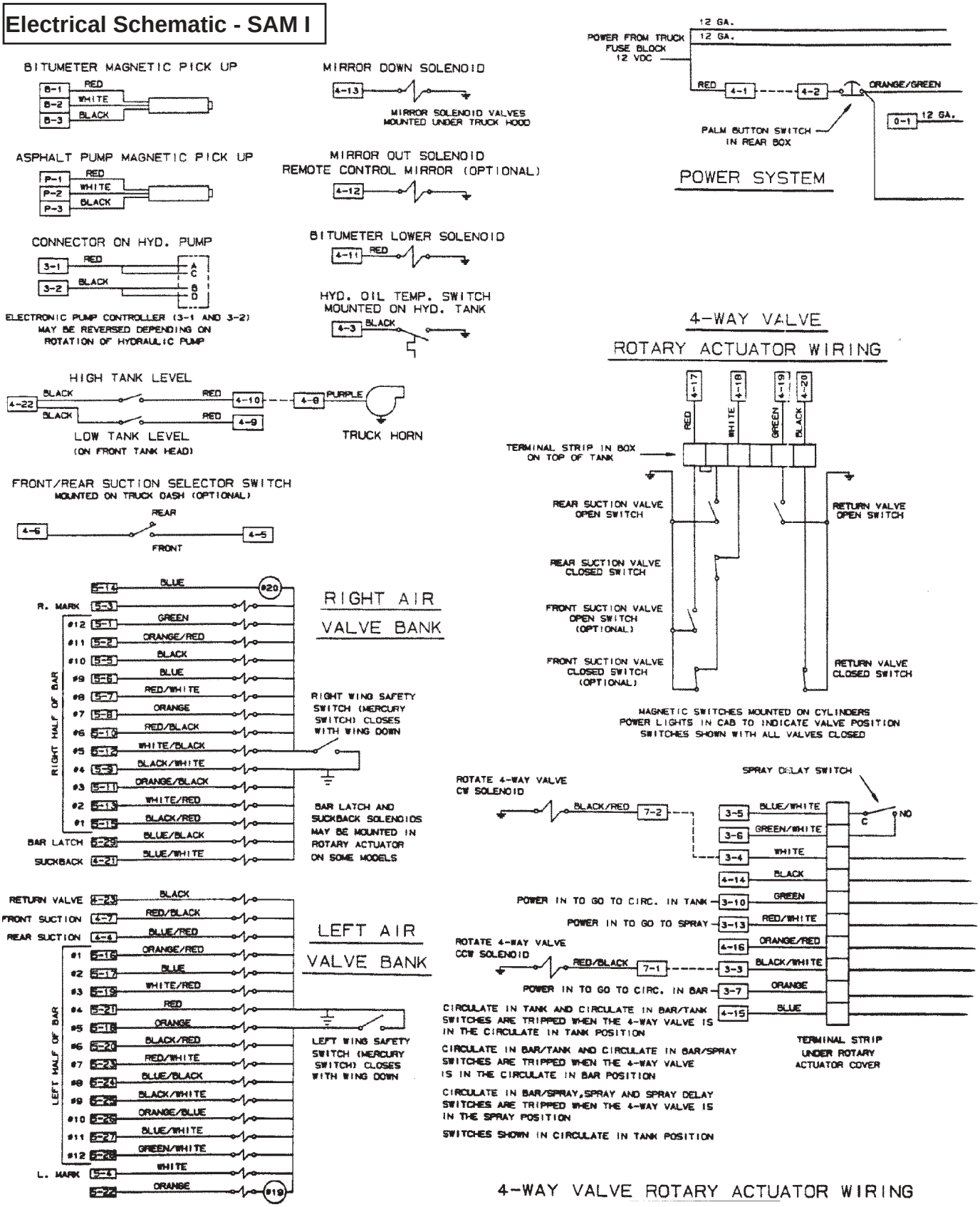
Asphalt System Schematic

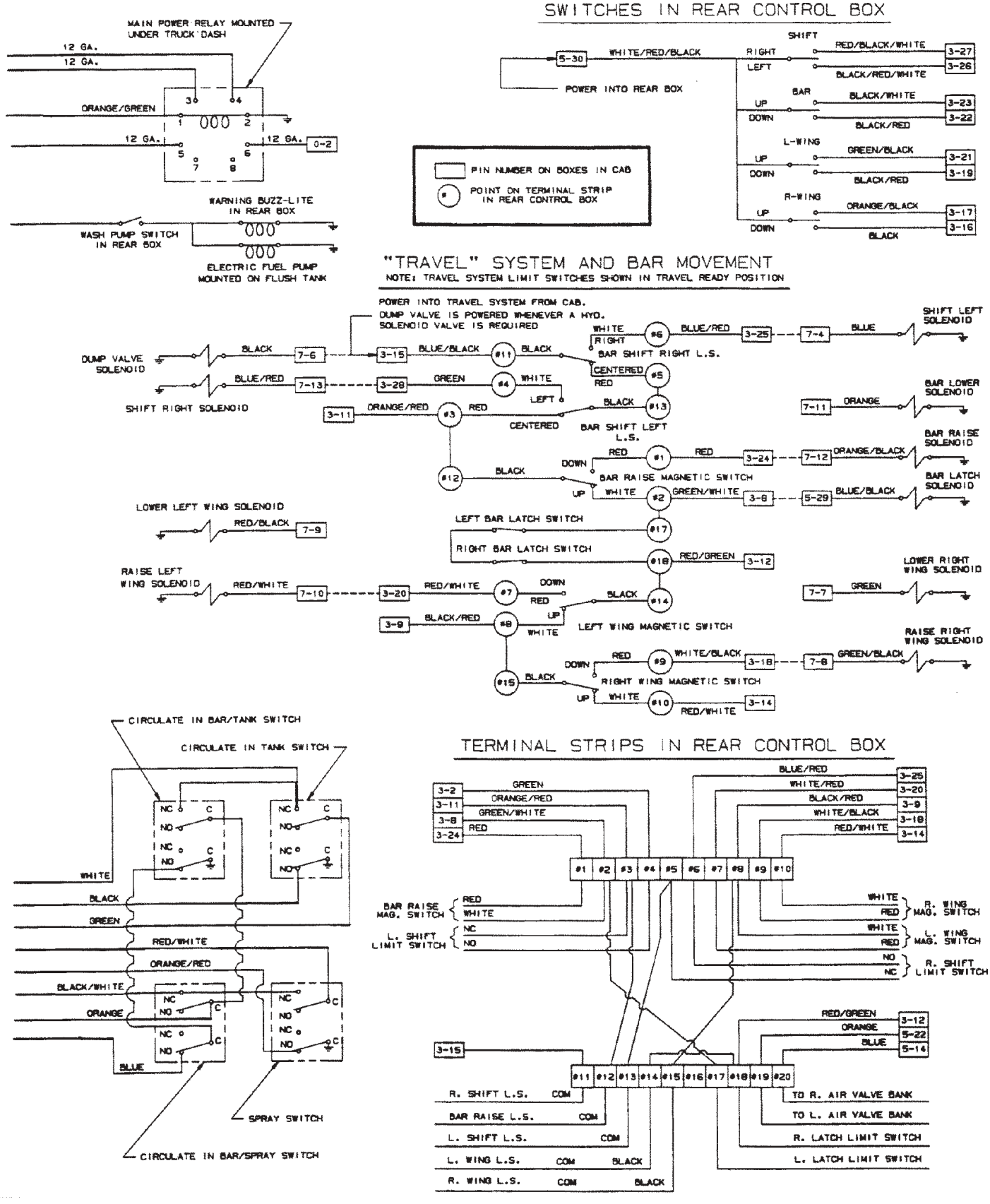


REF.	PART NO.	QTY.	DESCRIPTION
1	6601801	2	VALVE-GATE,3IN,SLIDE STEM
2	6601367	1	VALVE-1" 3-WAY,BRASS
3	6601367	1	VALVE-1" 3-WAY,BRASS
4	3380017	1	GUN ASSEMBLY- HAND SPRAY
5	6600726	1	COCK-STEAM 1 IN 2WAY SQ HD SRS
6	6601177	2	VALVE,BALL,1IN,HAND SPRAY

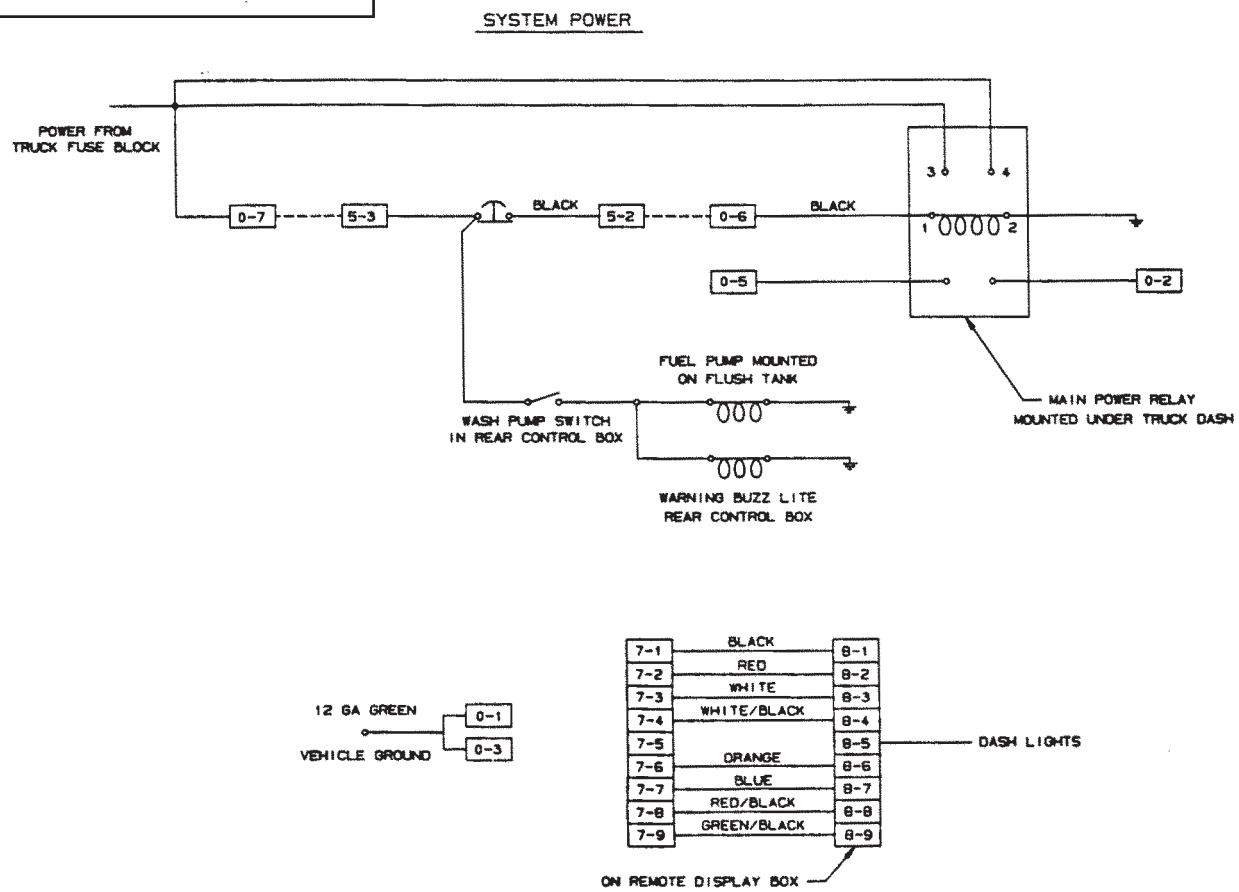
REF.	PART NO.	QTY.	DESCRIPTION

Electrical Schematic - SAM I

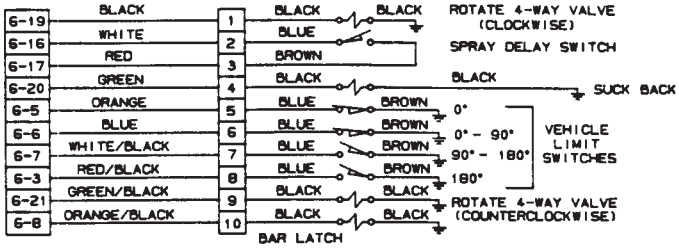



SWITCHES IN REAR CONTROL BOX
MAIN POWER RELAY MOUNTED UNDER TRUCK DASH
12 GA.
12 GA.
ORANGE/GREEN
12 GA.
12 GA.
0-2
WARNING BUZZ-LITE IN REAR BOX
WASH PUMP SWITCH IN REAR BOX
ELECTRIC FUEL PUMP MOUNTED ON FLUSH TANK
PIN NUMBER ON BOXES IN CAB
POINT ON TERMINAL STRIP IN REAR CONTROL BOX
5-30
WHITE/RED/BLACK
POWER INTO REAR BOX
SHIFT
RIGHT
RED/BLACK/WHITE
3-27
LEFT
BLACK/RED/WHITE
3-26
BAR
UP
BLACK/WHITE
3-23
DOWN
BLACK/RED
3-22
L-WING
UP
GREEN/BLACK
3-21
DOWN
BLACK/RED
3-19
R-WING
UP
ORANGE/BLACK
3-17
DOWN
BLACK
3-16
"TRAVEL" SYSTEM AND BAR MOVEMENT
NOTE: TRAVEL SYSTEM LIMIT SWITCHES SHOWN IN TRAVEL READY POSITION
POWER INTO TRAVEL SYSTEM FROM CAB.
DUMP VALVE IS POWERED WHENEVER A HYD. SOLENOID VALVE IS REQUIRED
DUMP VALVE SOLENOID
BLACK
7-6
3-15
BLUE/BLACK
#11
BLACK
SHIFT RIGHT SOLENOID
BLUE/RED
7-13
3-28
GREEN
#4
WHITE
LEFT
3-11
ORANGE/RED
#3
RED
CENTERED
BLACK
#13
BAR SHIFT LEFT L.S.
WHITE
#6
BLUE/RED
3-25
7-4
BLUE
SHIFT LEFT SOLENOID
RIGHT
BAR SHIFT RIGHT L.S.
CENTERED
RED
#5
BAR LOWER SOLENOID
7-11
ORANGE
BAR RAISE SOLENOID
RED
#1
RED
3-24
7-12
ORANGE/BLACK
DOWN
#12
BLACK
BAR RAISE MAGNETIC SWITCH
UP
WHITE
#2
GREEN/WHITE
3-8
5-29
BLUE/BLACK
BAR LATCH SOLENOID
LOWER LEFT WING SOLENOID
RED/BLACK
7-9
LEFT BAR LATCH SWITCH
#17
RIGHT BAR LATCH SWITCH
#18
RED/GREEN
3-12
LOWER RIGHT WING SOLENOID
7-7
GREEN
RAISE LEFT WING SOLENOID
RED/WHITE
7-10
3-20
RED/WHITE
#7
DOWN
RED
BLACK
#14
3-9
BLACK/RED
#8
UP
WHITE
LEFT WING MAGNETIC SWITCH
RAISE RIGHT WING SOLENOID
DOWN
RED
#9
WHITE/BLACK
3-18
7-8
GREEN/BLACK
#15
BLACK
RIGHT WING MAGNETIC SWITCH
UP
WHITE
#10
RED/WHITE
3-14
CIRCULATE IN BAR/TANK SWITCH
CIRCULATE IN TANK SWITCH
NC
C
NO
WHITE
BLACK
GREEN
RED/WHITE
ORANGE/RED
BLACK/WHITE
ORANGE
BLUE
SPRAY SWITCH
CIRCULATE IN BAR/SPRAY SWITCH
TERMINAL STRIPS IN REAR CONTROL BOX
3-2
GREEN
3-11
ORANGE/RED
3-8
GREEN/WHITE
3-24
RED
BLUE/RED
3-25
WHITE/RED
3-20
BLACK/RED
3-9
WHITE/BLACK
3-18
RED/WHITE
3-14
#1 #2 #3 #4 #5 #6 #7 #8 #9 #10
BAR RAISE MAG. SWITCH
RED
WHITE
L. SHIFT LIMIT SWITCH
NC
NO
WHITE
RED
R. WING MAG. SWITCH
WHITE
RED
L. WING MAG. SWITCH
NO
NC
R. SHIFT LIMIT SWITCH
RED/GREEN
3-12
ORANGE
5-22
BLUE
5-14
3-15
#11 #12 #13 #14 #15 #16 #17 #18 #19 #20
R. SHIFT L.S. COM
BAR RAISE L.S. COM
L. SHIFT L.S. COM
L. WING L.S. COM BLACK
R. WING L.S. COM BLACK
TO R. AIR VALVE BANK
TO L. AIR VALVE BANK
R. LATCH LIMIT SWITCH
L. LATCH LIMIT SWITCH

Electrical Schematic - SAM II

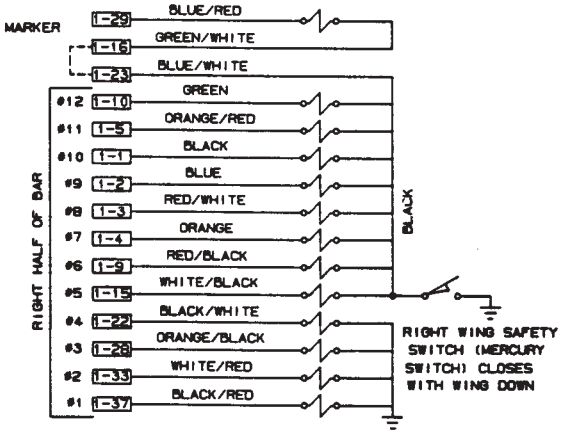


TERMINAL STRIP
(ROTARY ACTUATOR HOUSING)

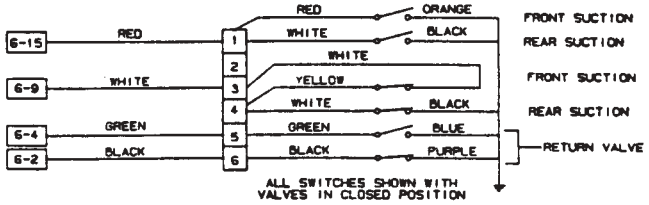


ALL LIMIT SWITCHES SHOWN IN "OFF" POSITIONS

RIGHT AIR VALVE BANK

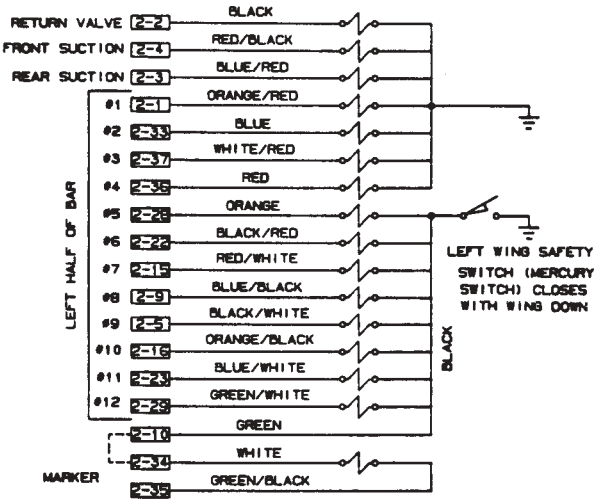


TERMINAL STRIP
(TOP OF TANK)



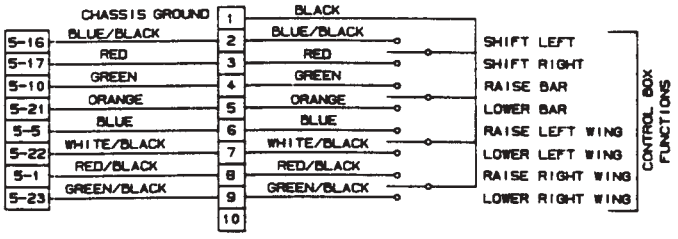
ALL LIMIT SWITCHES SHOWN IN "OFF" POSITIONS

LEFT AIR VALVE BANK

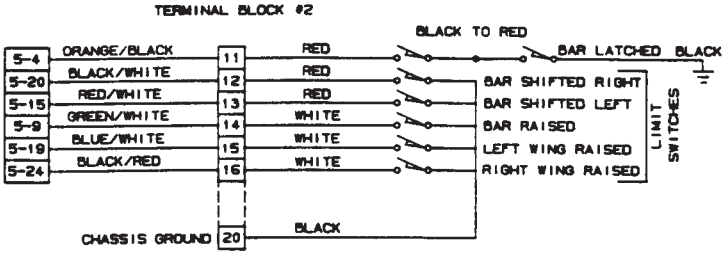


REAR CONTROL BOX

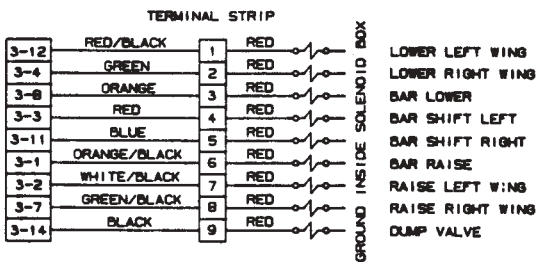
TERMINAL BLOCK #1



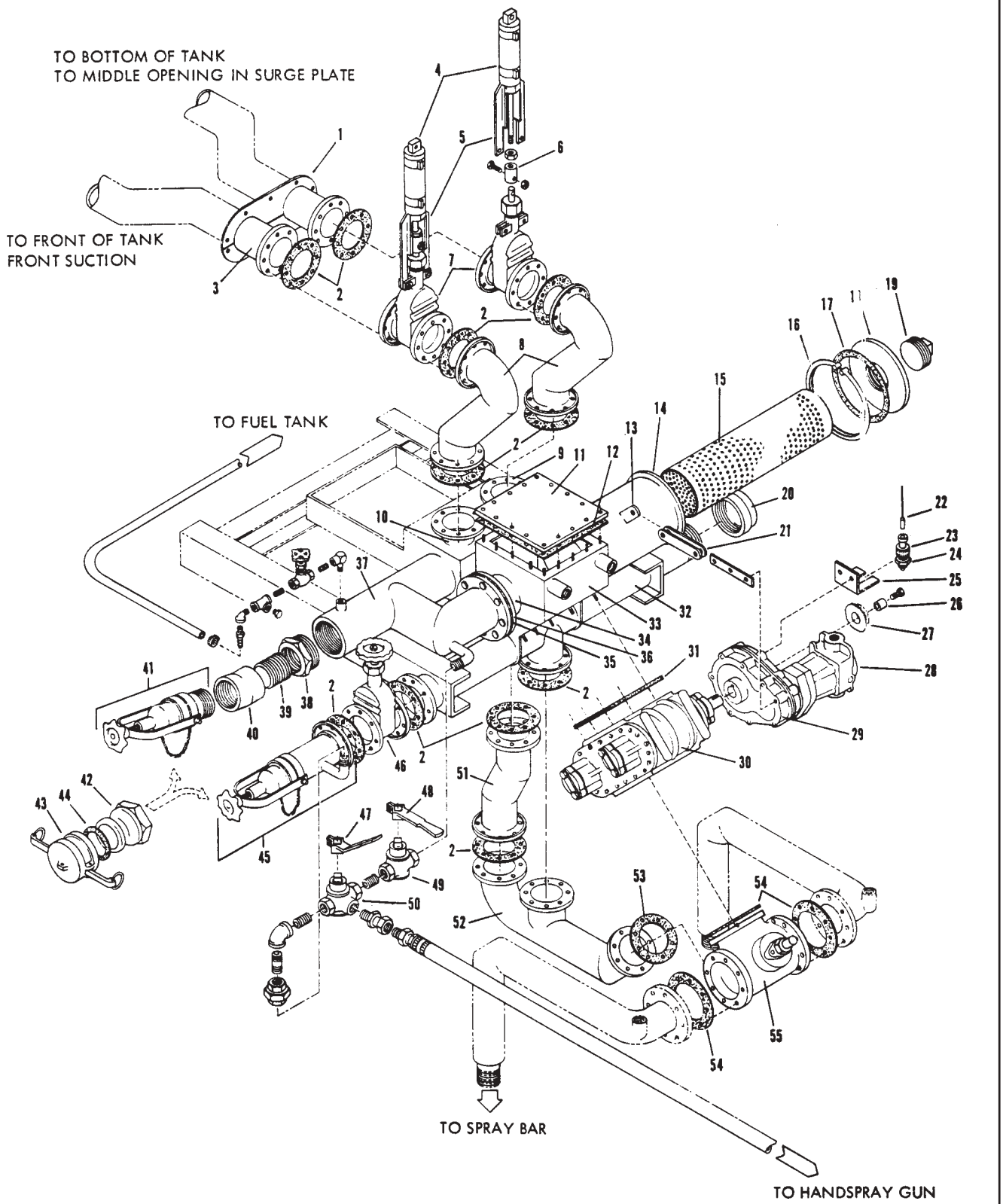
TERMINAL BLOCK #2



HYDRAULIC SOLENOID VALVES



Circulating System



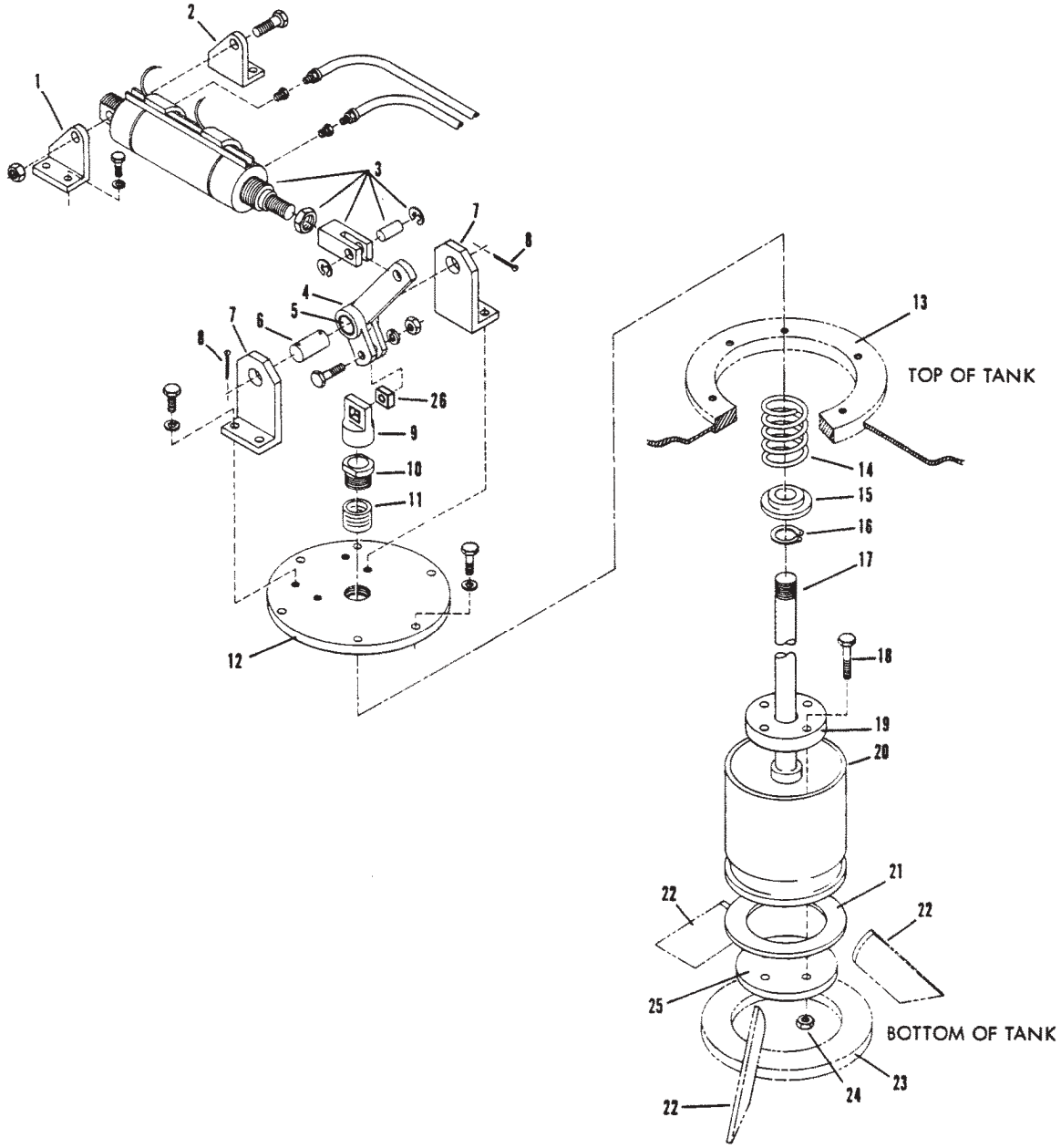
Specify Unit Serial No., Part No., & Part Description

Circulating System

REF.	PART NO.	QTY.	DESCRIPTION
1	3300936	2	FINISH RING-TANK LINES
2	6000071	11	GASKET-3 FLANGE,AV#102338,ASB.
3	3341132	2	CIRCULATING LINE ASM.
4	6601772	2	CYLINDER-AIR,2.0X4.0W/SWITCHES
5	3341124	2	GATE VALVE MOUNT. BRACKET ASM.
6	3360829	2	COUPLING-GATE VALVE-CYL,SAM
7	6601801	2	VALVE-GATE,3IN,SLIDE STEM
8	3341129	2	GOOSENECK ASM.
9	6000068	2	FLG#20056A,3FLUED ALEGNY CPLG
10	3341157	2	PIPE-SUCTION LINE
11	3341127	1	LID-STRAINER BOX
12	3341126	1	GASKET-STRAINER BOX LID
13	3341245	1	LUG-GEARBOX LINK
14	3341154	1	FLANGE ASM-STRAINER BOX
15	3341243	1	STRAINER-SUCTION
16	6001075	1	CLAMP-V BAND,9.0 DIA,SS
17	3341112	1	GASKET-STRAINER BOX LID
18	3341111	1	LID ASM-STRAINER BOX,SAM
19	6200153	1	PLUG-PIPE,SQ HD,3.00NPT,PN
20	6200053	1	CAP-PIPE,3.00NPT,PN
21	3341244	2	LINK-BRACE,GEARBOX
22	6701838	1	SENSOR-PROXIMITY PICK-UP 12VDC
23	6700959	1	CORD GRIP-FITTING,0.75 X 0.75
24	6701838	1	SENSOR-PROXIMITY PICK-UP 12VDC
25	3360820	1	BRACKET-MTG SEN PUMP TACH SAM
26	3360803	1	BUSHING-SPROCKET PUMP TACH,SAM
27	6430322	1	SPROCKET-RC25X1,36T,B,STOCK
	6425022	1	GEAR-SPUR,70T,20D.P.,.38WIDE
28	6601769	1	MOTOR-HYD,PISTON,2.5 CU.IN.
29	6415103	1	GEAR REDUCER-SHAFT MT,3:1
30	3341215	1	PUMP ASM-400GPM,SAM,P153340645
31	3352222	1	GASKET-PUMP-STRAINER BOX SAM
32	3341131	1	PUMP OFF LINE ASM.
33	3341137	1	STRAINER BOX ASM.
34	3341183	1	PIPE-SUCTION
35	3341125	1	5 IN. GASKET-SUCTION PIPE
36	3341158	1	FLANGE-SUCTION PIPE
37	3341135	1	SUCTION PIPE ASM.
38	6200044	1	BUSHING-PIPE,4.00X3.00NPT,PN
39	6200121	1	NIPPLE-SHORT,3.00
40	3341256	1	COUPLING-FILL LINE,SAM
41	3340039	1	FILLING LINE ASSEMBLY
42	6600227	AR	HOSE-9FT,12MCS,16SF90-45
43	6600281	AR	CAP-DUST,3 IN,ALUM, W/CHAIN
44	6600279	AR	GASKET-3.00ID PIPE,SILICONE
45	3341229	1	PIPE ASM-LOWER
46	6600045	1	VLV-GATE,G1013,3 ALLEGHENY VLV
47	3380481	1	VALVE HANDLE ASM-HD SP OFFSET
48	3380480	1	VALVE HANDLE ASM-HAND SPRAY
49	6600726	1	COCK-STEAM 1 IN 2WAY SQ HD BRS
50	6601367	1	VALVE-1" 3-WAY,BRASS
51	3341128	1	LOWER RETURN LINE ASM.
52	3341130	1	RETURN LINE-HORIZONTAL ASM.
53	3340519	1	GASKET-COVER,3 WAY VALVE
54	3340515	3	GASKET-FLANGE, 3 WAY VALVE
55	3341239	1	4" 3-WAY VALVE ASM.

AR = AS REQUIRED

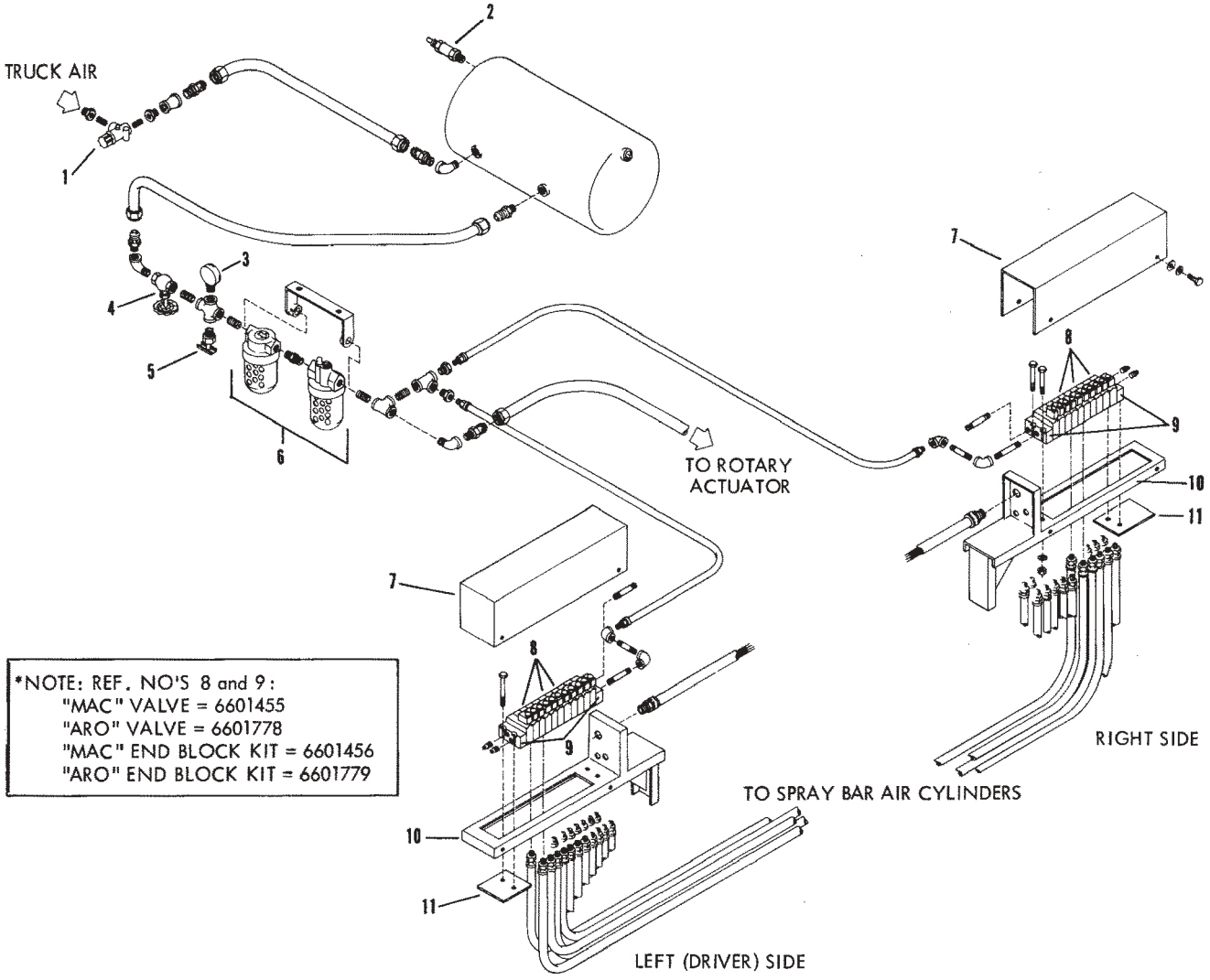
Inside Valve (Rear Suction)



REF.	PART NO.	QTY.	DESCRIPTION
1	3341121	1	BRKT-LH REAR CYL MOUNT,SAM
2	3341122	1	BRKT-RH REAR CYL MOUNT,SAM
3	6601776	1	CYLINDER-AIR,2.5X4.0W/SWITCHES
4	3341118	1	LEVER ASM-INSIDE VALVE,SAM
5	6001071	1	BUSHING-BRONZE.38IDX.500DX.5LG
6	3341119	1	SHAFT-LEVER ASM,INSIDE VAL SAM
7	3341123	2	BRACKET-SUPPORT,LEVER,VAL SAM
8	0103409	2	PIN-COTTER,0.19X1.50,PD
9	3341113	1	LINK ASM-INSIDE VALVE,SAM
10	3340436	1	NUT-PACKING, INSIDE VALVE
11	3340474	1	PACKING
12	3341214	1	GLAND ASM-INSIDE VALVE,SAM
13	3341116	1	RING-INSIDE VALVE,SAM
14	3351186	1	SPRING-TAPER
15	3341117	1	RETAINER-SPRING,INSIDE VAL SAM
16	6100333	1	SNAP RING-EXTERNAL
17	3341203	1	SHAFT-INSIDE VALVE,SAM
18	0122188	4	SCREW-HEX,0.38NCX2.25,GR2,PD
19	3341115	1	RETAINER-PLUG,INSIDE VALVE,SAM
20	3341198	1	SKIRT-PLUG INSIDE VALVE
	3341114	1	PLATE-PLUG,INSIDE VALVE,SAM
21	3341238	1	GASKET-INSIDE VALVE
22	3300943	3	GUIDE-TANK VALVE,SAM
23	3300942	1	PLATE-VALVE,INSIDE VALVE
24	0274993	4	NUT-HEX,LOCK,0.38NC,EA,PD
25	3341197	1	PLATE-GUIDE ASM,INSIDE VALVE
26	3341259	1	BEARING-INSIDE VALVE

Specify Unit Serial No., Part No., & Part Description

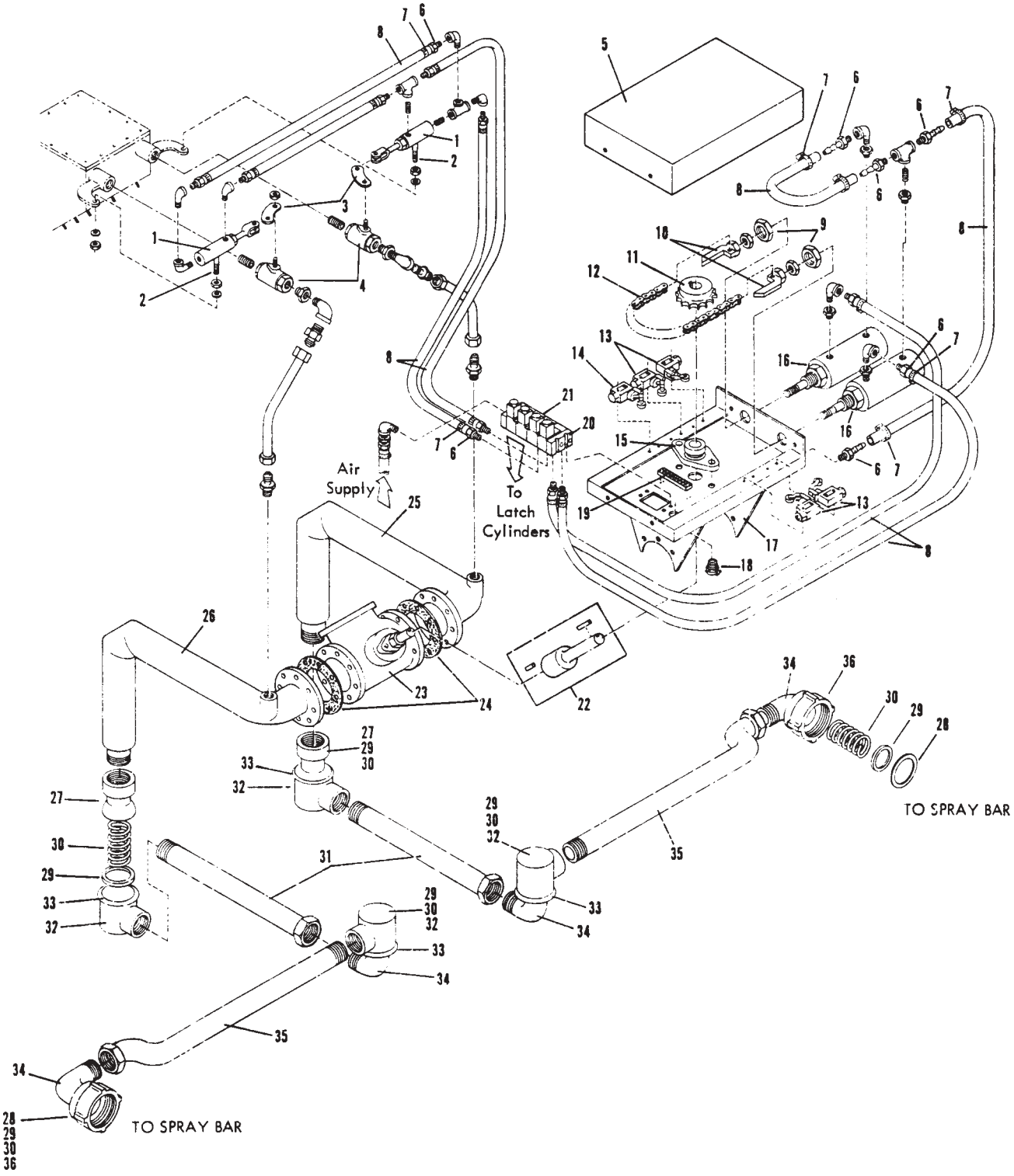
Air System



REF.	PART NO.	QTY.	DESCRIPTION
1	6600304	1	VALVE-PRESSURE REGULATOR
2	6600299	1	VLV-SAFETY, MIDLAND 110715
3	6600168	1	GAUGE-PRESS,2.5IN,0-160 PSIG
4	6600343	1	VALVE-GLOBE,SCR,.50,BRZ,125PSI
5	6600162	1	COCK-DRAIN,0.25 IN SPANCO BRS.
6	6601777	1	FILTER/LUBRICATOR-AIR,1/2 INCH
7	3360059	2	LEVER-AIR CONTROL
*8	6601455	AR	VALVE-AIR,2POS,4WAY,12VDC,MAC
	6601778	AR	VALVE-AIR,2POS,4WAY,12VDC
*9	6601456	AR	PLATE-END,SPRAYBAR CONT VALVE
	6601779	AR	KIT-END BLOCK,1/4,AIR VALVE
10	3360841	2	AIR VAL MOUNT BRKT ASM RIGHT
11	3360832	2	SUPPORT PLATE-AIR VAL MOUNT BR

AR = AS REQUIRED

Distributing Lines



Specify Unit Serial No., Part No., & Part Description

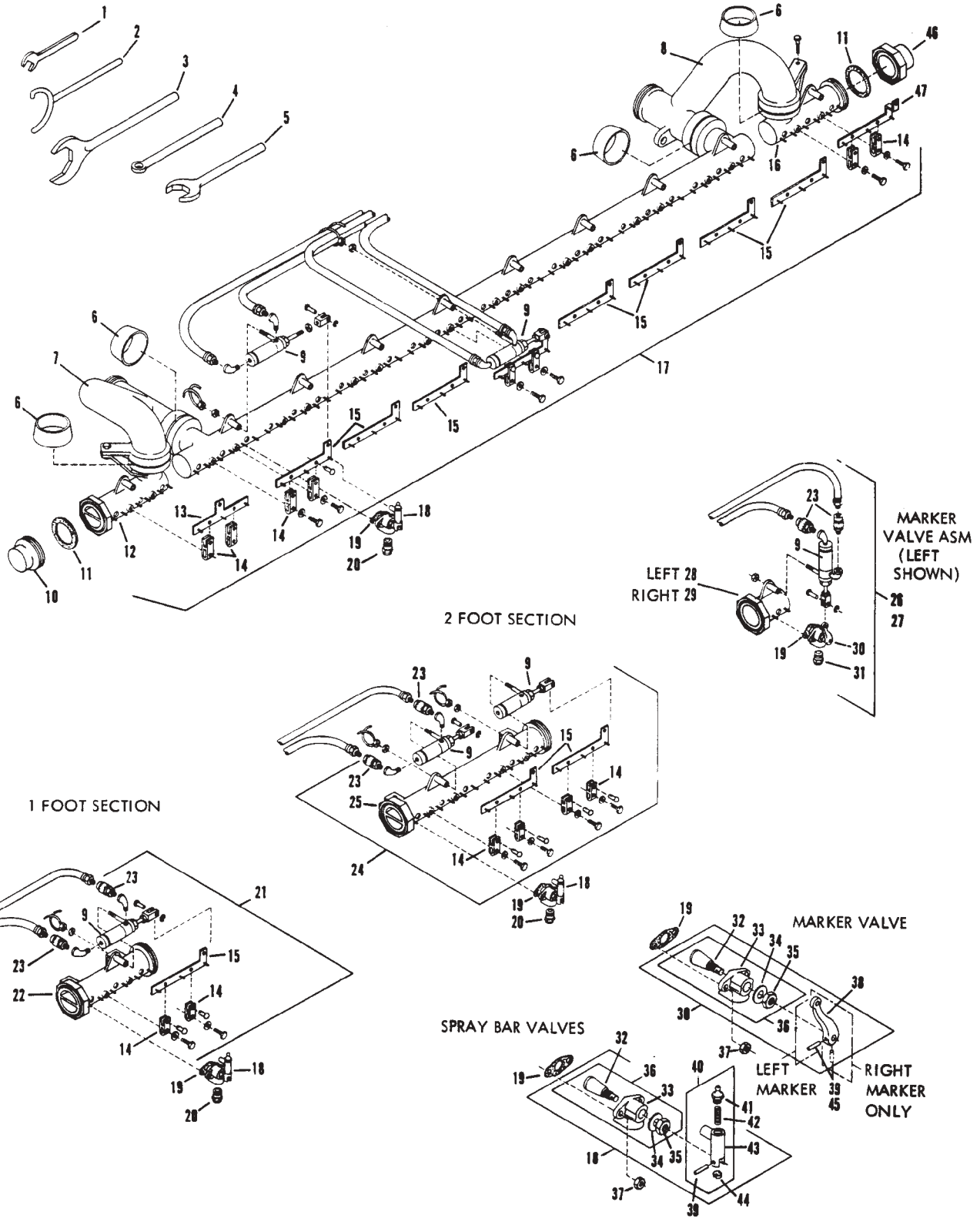
Distributing Lines

REF.	PART NO.	QTY.	DESCRIPTION
1	6601768	2	CYLINDER-AIR,1.06X2
2	6100337	2	BOLT-EYE,0.31NCX1.00,PD
3	3360806	3	HANDLE ASM-VALVE SUCKBACK,SAM
4	6601177	2	VALVE,BALL,1IN,HAND SPRAY
5	3360883	1	COVER-ROTARY ACTUATOR
6	6445028	18	HOSE END-04X04MP,ST,LP
7	6001005	18	CLAMP-HOSE,SCREW TYPE
8	6601452	AR	HOSE-AIR SOL-CYL BAR ON-OFF
9	0427547	2	NUT-HEX,JAM,1.38NF,PD
10	3360819	2	BEAM ASM-3IT WHEEL,SAM
11	3360880	1	SPROCKET-RC40X1,24T,B,1.25
12	3360891	1	CHAIN-ROTARY ACTUATOR
13	6701953	4	SWITCH-DPDT,ROLLER LEVER,SEAL
14	6700748	1	SWITCH-ACTUATING LOW LEVEL IND
15	6420191	1	FLANGE BRG-BALL,2 BLT,1.25
16	6600140	2	CYLINDER-AIR,ARO,0330-1000-060
17	3360888	1	ROTARY ACTUATOR MT. ASM.
18	6700958	1	CORD GRIP-FITTING,0.75 X 0.50
19	6700306	1	STRIP-TERMINAL,10 BAR
20	6601456	1	PLATE-END,SPRAYBAR CONT VALVE
21	6601455	4	VALVE-AIR,2POS,4WAY,12VDC,MAC
22	3360876	1	EXT SHAFT ASM-ROTARY ACTUATOR
23	3341239	1	4" 3-WAY VALVE ASM.
	3340029	AR	PACKING- VALVE
24	3340515	2	GASKET-FLANGE, 3 WAY VALVE
25	3341254	1	DISTRIBUTING LINE ASM,RIGHT
26	3341255	1	DISTRIBUTING LINE ASM,LEFT
27	6600259	2	BALL&CPLG-BARCO #JRS-4338
28	6000252	2	GASKET-4.38X3.88,COPPER ASB.
29	6600258	2	GASKET-2.00,AQ#01-09190,TPE11X
30	3351186	2	SPRING-TAPER
31	3341133	2	DISTRIBUTING LINE ASM.
32	3341236	2	ASM-HOUSING,RT ANGLE BALL JT
33	3341233	2	LID-BALL JOINT ASM.
34	3341231	4	BALL ASM-ANGLE 90 DEG.,SAM
35	3341134	2	DISTRIBUTING LINE ASM.
36	3350062	2	NUT-BALL JOINT

REF.	PART NO.	QTY.	DESCRIPTION

AR = AS REQUIRED

Spray Bar Assembly



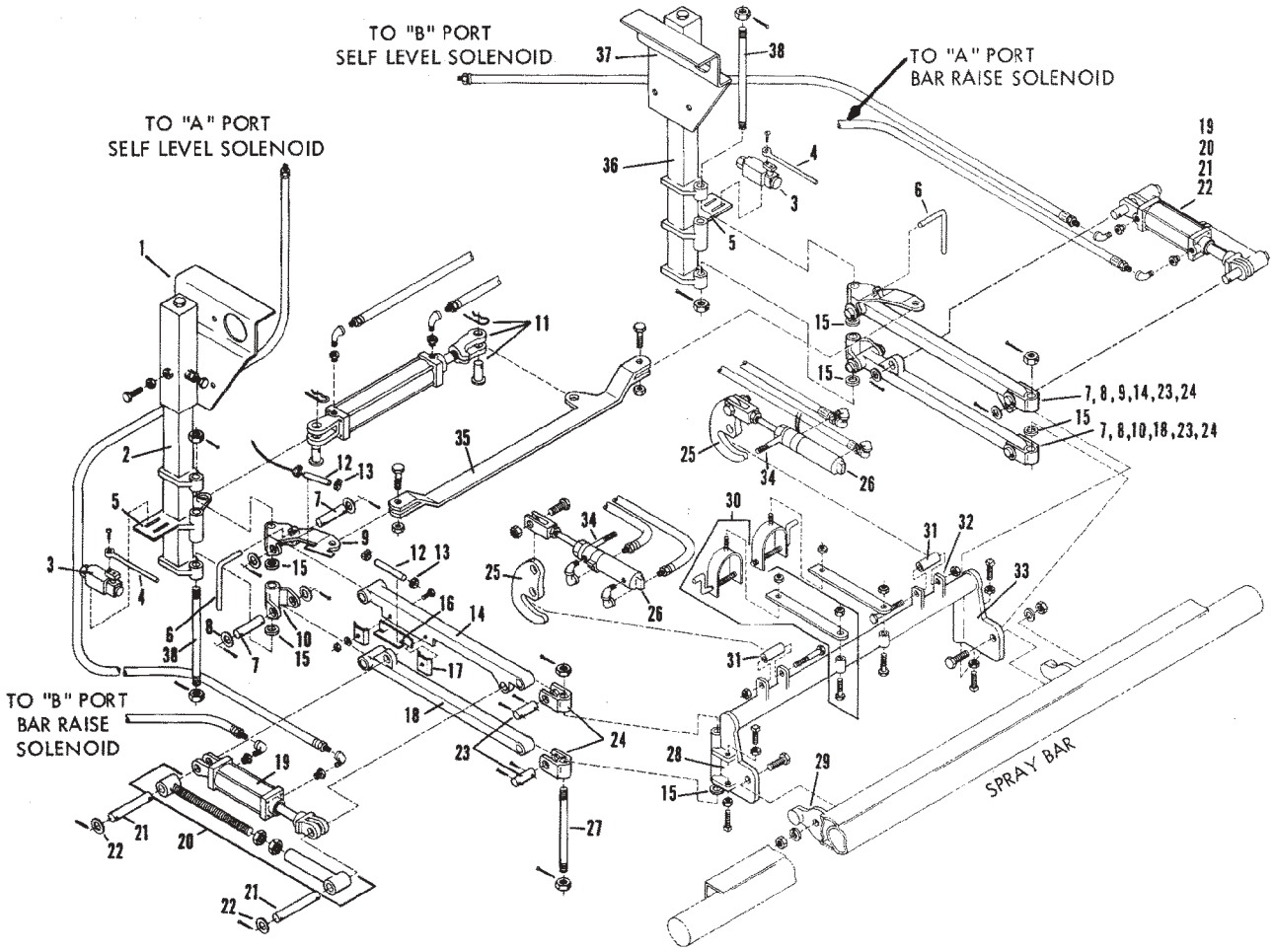
Specify Unit Serial No., Part No., & Part Description

Spray Bar Assembly

REF.	PART NO.	QTY.	DESCRIPTION
1	3380442	1	WRENCH-OPEN END,1.25,SAM
2	3380081	1	WRENCH ASM-SPANNER,BALL JOINT
3	3380443	1	WRENCH-OPEN END,4.25,SAM
4	3380090	1	PIN ASSEMBLY-ALIGNING
5	3380459	1	WRENCH-OPEN END 2.00IN,SAM
6	3352251	4	LINER-SWIVEL JOINT,SPRAYBAR
7	3352285	1	HINGE ASM-LEFT,SPRAY BAR,SAM
8	3352284	1	HINGE ASM-RIGHT,SPRAY BAR,SAM
9	6601768	AR	CYLINDER-AIR,1.06X2
10	3352216	1	END CAP ASM-SPRAY BAR,LEFT
11	3352214	AR	GASKET-3.50X3.00XCOPPER ASB.
12	3352232	1	END SECTION ASM-SPRAY BAR,LH
13	3352264	1	BUSS BAR ASM-LEFT END
14	3352259	AR	GUIDE LEVER ASM.
15	3352219	AR	BUSS BAR ASM-SPRAY BAR,SAM
16	3352233	1	END SECTION ASM-SPRAY BAR,RH
17	3352283	1	SPRAY BAR ASM-10FT CENTER,SAM
18	3350579	AR	FLIP VALVE ASM-CENTER TUBE
19	3350316	AR	GASKET-NOZZLE VALVE
20	3352205	AR	NOZZLE-5/16, SPRAY BAR
	3351008	AR	NOZZLE-1/4, SPRAY BAR
	3352204	AR	NOZZLE-3/16, SPRAY BAR
	3351011	AR	NOZZLE-1/8, SPRAY BAR
	3351015	AR	NOZZLE-.093 SPRAY BAR
	3351013	AR	NOZZLE-1/16, SPRAY BAR
21	3352289	AR	SPRAY BAR ASM-1FT EXTEN.,SAM
22	3352215	AR	TUBE ASM-BASIC,1 FOOT,SAM
23	6601820	AR	NIPPLE-QUICK CONNECT,1/4 HOSE
	6601821	AR	COUPLING-QUICK CONNECT,1/4 NPT
24	3352288	AR	SPRAY BAR ASM-2FT EXTEN.,SAM
25	3352218	AR	TUBE ASM-BASIC,2FOOT,SAM
26	3352286	1	MARKER ASM-LEFT,SPRAY BAR,SAM
27	3352287	1	MARKER ASM-RIGHT,SPARY BAR,SAM
28	3352221	1	TUBE ASM-MARKER,LEFT,SAM
29	3352220	1	TUBE ASM-MARKER,RIGHT,SAM
30	3350452	2	VALVE ASM-STD,END SECTION
31	3351005	2	NOZZLE ASSEMBLY-END
32	3350454	1	PLUG-NOZ.VLV,W/3 1/2 TAPR,SECT
33	3350453	1	BODY-VALVE,NOZZLE,1.156 RAD
	3350577	1	BODY-VALVE,NOZZLE,1.406 RAD
34	3351480	1	WASHER-USE 3351620
35	0274637	1	NUT-HEX,LOCK,0.50NF,EA,GRA,PD
36	3351572	1	VALVE ASM-1.1562 RAD,TUC
	3351573	1	VALVE ASM-1.406 RAD.,TUC CNTR
37	0120376	AR	NUT-HEX,0.31NC,PD
38	3350455	1	LEVER-NOZ VALVE,W/3.5 TAPER
39	0443139	1	PIN-GROOVED,0.16X0.75,E,PD
40	3351241	1	LEVER ASM-DETACH,VALVP00022581
41	0127800	1	FITTING-LUBE,ST,0.12PTFX0.69PN
42	3350319	1	SPRING-DETACH LVR SB NOZZLE
43	3350318	1	LEVER ASM-DETACH,NOZZLE VALVE
44	3350325	1	PLUNGER-DETACH LVR SB NOZZLE
45	6100233	1	PIN-GROOVED,DRIV-LOCK .156X1C
46	3352217	1	END CAP ASM-SPRAY BAR,RIGHT
47	3352268	1	BUSS BAR ASM-RT HINGE SECTION

AR = AS REQUIRED

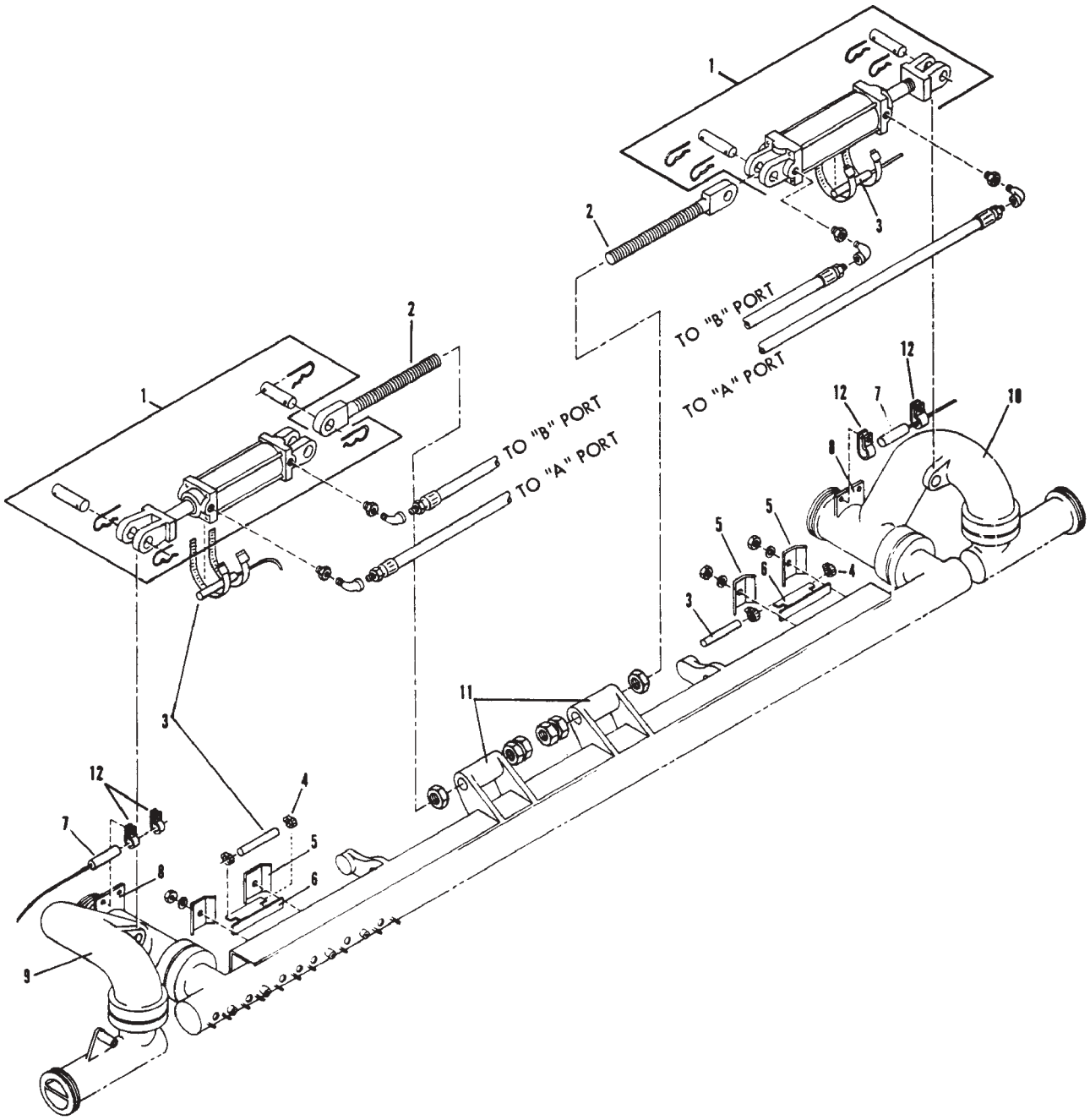
Raise And Shift Assembly



REF.	PART NO.	QTY.	DESCRIPTION
1	3311350	1	CHANNEL PL & OUTER TUBE ASM LT
2	3311399	1	INNER TUBE&BRACKET ASM-LEFT
3	6701868	2	SWITCH-DPST,LEVER,SPRING RET.
4	3360849	2	ACTUATOR ROD ASM-SHIFT SWITCH
5	3360860	2	BRACKET-MTG,SHIFT LIMIT SWITCH
6	3360913	1	ROD-ACTUATE,SHIFT SWITCH,SAM
7	3311393	4	ROD-CARRY ASM SUPPORT
8	3311424	8	WASHER-0.88,1.50 OD
9	3311396	2	SHIFT LEVER ASM.
10	3311394	2	3"HUB&BRKT ASM-CARRY ARM SUP
11	6601775	1	CYLINDER-HYD,2.0X12.0
12	6701832	2	SWITCH-SPDT MAGNETIC,3AMP EF
13	6001005	4	CLAMP-HOSE,SCREW TYPE
14	3311423	2	CYLINDER ARM ASM-UPPER
15	6100015	6	WA-BRASS,.19 IN WRGT WA1.5X.89
16	3370149	1	BRKT ASM-MTG,MAG SW,1.25 BRKT
17	3370147	2	CLAMP-MTG BRKT,MAG. SWITCH
18	3311397	2	CYLINDER ARM ASM-LOWER
19	6601774	2	CYLINDER-HYD,2.0X5.0
20	3311383	2	BACK BRACE ASM-SPRAYBAR MOUNT
21	3311379	4	PIN-SPRAY BAR HEIGHT ADJ.
22	3311425	8	WASHER-1.00,1.50 OD
23	3311374	4	HINGE PIN-CARRY ARMS,SPRAYBAR
24	3311348	4	HUB & BRACE ASM.
25	3380453	2	LATCH CAM-SPRAYBAR,SAM
26	6601772	2	CYLINDER-AIR,2.0X4.0W/SWITCHES
27	3311373	2	ROD - SPRAYBAR SUPPORT
28	3352297	1	CARRY&LATCH ASM-SPRBAR MECH,LT
29	3352279	2	BRKT-SPRBAR CARRY&LATCH MECH
30	3352305	2	HOSE CARRIER ASM-SPRAYBAR
31	3380449	2	TUBE-BAR LATCH
32	3380458	4	EAR-LATCH,SPRAYBAR
33	3352298	1	CARRY&LATCH ASM-SPRBAR MECH,RT
34	3380452	2	LATCH CYL MOUNTING BOLT ASM.
35	3360831	1	SPRAY BAR SHIFT LINK. BAR ASM.
36	3311389	1	INNER TUBE&BRACKET ASM-RIGHT
37	3311349	1	CHANNEL PL & OUTER TUBE ASM RT
38	3311358	2	SHAFT ASM-CARRY ARM SUPPORT

Specify Unit Serial No., Part No., & Part Description

Spray Bar Wing-Up



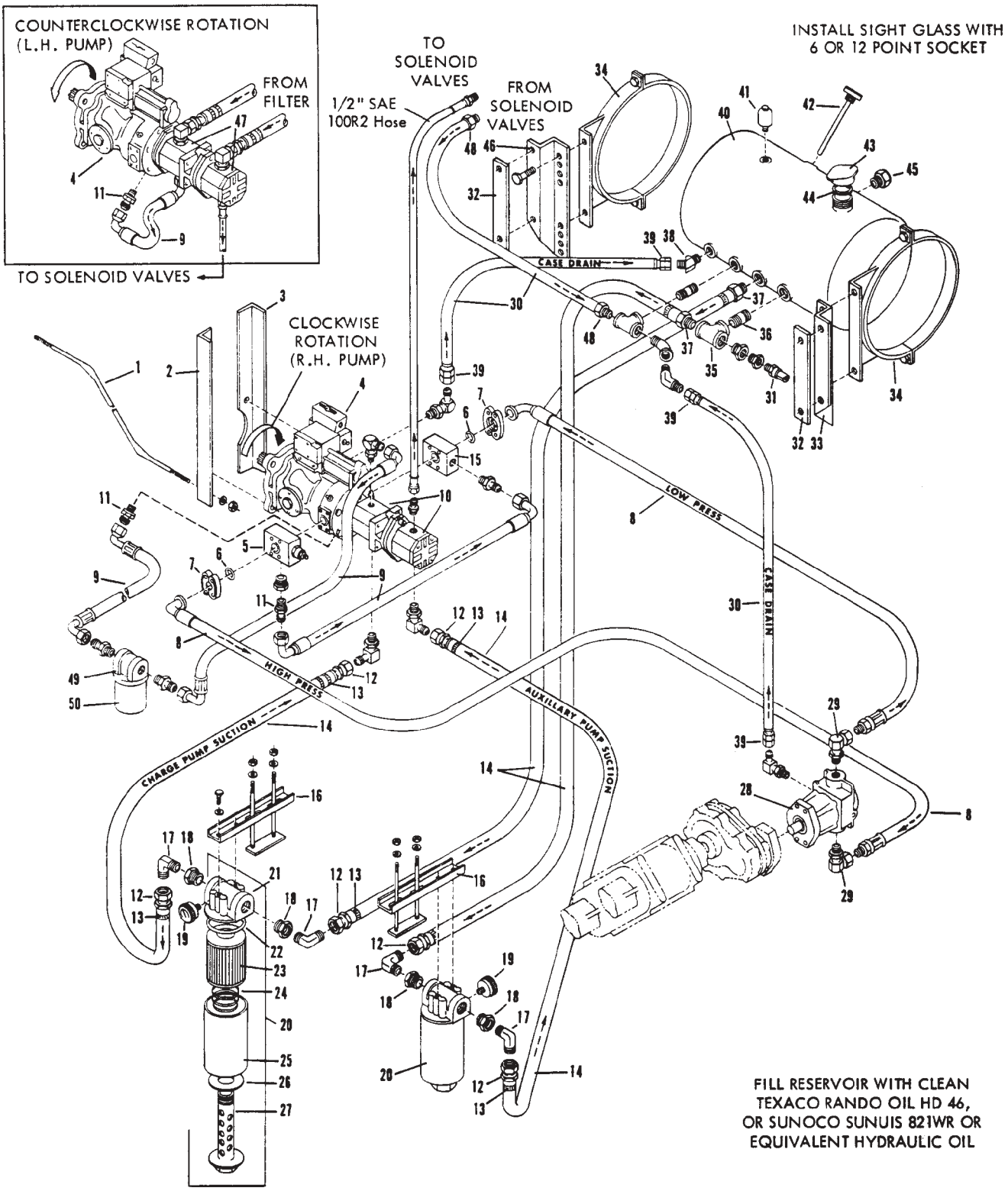
REF.	PART NO.	QTY.	DESCRIPTION
1	6601775	2	CYLINDER-HYD,2.0X12.0
2	3360863	2	ROD END ASM-CYLINDER MOUNT,SAM
3	6701832	2	SWITCH-SPDT MAGNETIC,3AMP EF
4	6001005	4	CLAMP-HOSE,SCREW TYPE
5	3370147	4	CLAMP-MTG BRKT,MAG. SWITCH
6	3370149	2	BRKT ASM-MTG,MAG SW,1.75 BRKT
7	6701869	2	SWITCH-MERCURY,5 AMP,ENCLOSED
8	3380868	2	BRACKET-SWITCH
9	3352285	1	HINGE ASM-LEFT,SPRAY BAR,SAM
10	3352284	1	HINGE ASM-RIGHT,SPRAY BAR,SAM
11	3352274	2	GUSSET-SPRBAR WG RAISE CYL MTG
12	6000057	4	CLAMP

Hydrostatic Drive System - PTO Drive

With Dynapower Pump

Piping And Installation

DYNAPOWER R.H. PUMP SHOWN. FOR L.H. PUMP, CHARGE PUMP AND AUXILLARY PUMP SUCTIONS ARE ON TOP. AUXILLARY DISCHARGE TO SOLENOID VALVES AND CHARGE PUMP DISCHARGE TO MAIN PUMP ARE ON BOTTOM.



Specify Unit Serial No., Part No., & Part Description

Hydrostatic Drive System - PTO Drive

With Dynapower Pump

Piping And Installation

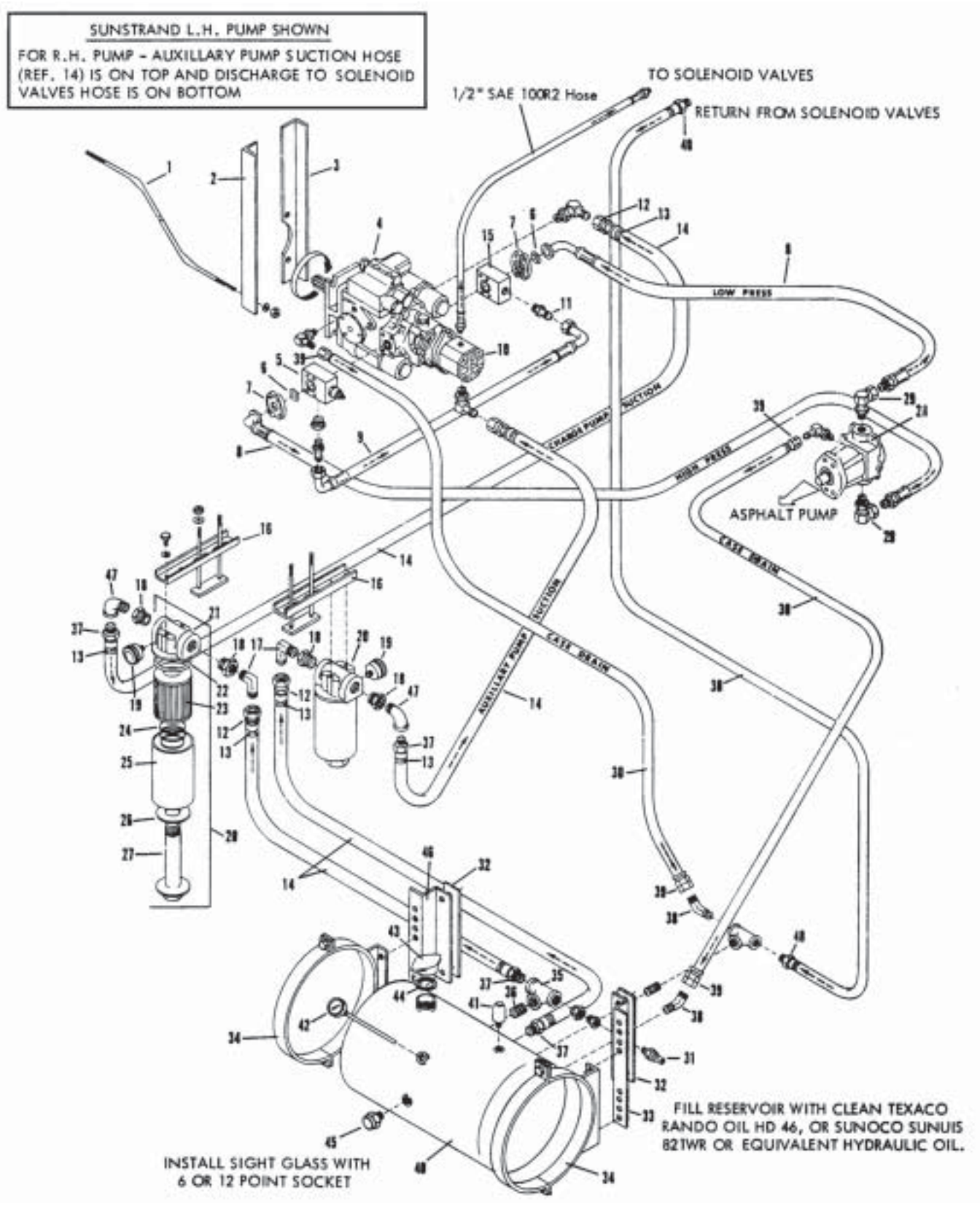
REF.	PART NO.	QTY.	DESCRIPTION
1	6303119	1	ROUND-0.50 CR,LEDLOY 300,LB.
2	3320275	1	ANGLE-MT.,VERT,L.PUMP/HNGR
3	3320276	1	ANGLE-MT.,VERT,R.PUMP/HNGR
4	6601782	1	PUMP-4.8,SPLINED,GEN II,W/MOOG
5	6601771	1	VALVE-RELIEF,HYD,5000PSI,150GP
6	0274253	2	O RING-TUBE FITTING,1.50
7	6600236	4	FLANGE ASM-1.00,4BLT,SPLIT
8	—	2	HOSE-HIGH PRESS(SPECIFY LENGTH)
9	6601561	2	HOSE ASM-12X28,12FJX90-12FJX90
10	6601785	1	PUMP-GEAR,.68/1.17,A PAD,L.H.
11	6600897	2	ADAPTER-HYDR,ST,08MB-12MJ
12	6601566	6	HOSE END-16-16FJX,ST,LP100R4
13	6000792	6	CLAMP-HOSE,WORM DRV,1.06 TO 2
14	6601564	AR	HOSE-SUCTION1.0 ID SAE100R4
15	2940298	1	ADAPTER-HYD.MTR,FLUSHER
16	3320335	2	CHANNEL-MOUNTING, FILTER
17	6601135	4	ELBOW-HYDR,90,16MJ-16MP
18	0125915	4	BUSHING-PIPE,1.25X1.00NPT,PN
19	7420042	2	INDICATOR-FILTER,GRESEN#1589
20	6600225	2	FILTER-GRESEN,#201NR
21	7420136	2	HEAD CASTING W/PLUG REL VLV PT
22	7420004	2	O RING-GRESEN#1576
23	7420007	2	PAPER-#10MICRON,GRESEN#1509
24	7420046	2	CONICAL SPRING,GRESEN
25	7420076	2	HOUSING-GRESEN #K23013
26	7420008	2	GASKET-SEAL,GRESEN#1575
27	7420009	2	POST-CENTER,GRESEN#1561
28	6601769	1	MOTOR-HYD,PISTON,2.5 CU.IN.
29	4470276	2	ELBOW-HYDR,90,12FPX-16MB
30	6600646	AR	HOSE-SELF GRIP PARKER H-801
31	6600237	1	SWITCH-THERMO,GM#TG-6401080
32	3320814	2	CLIP-FRAME,HYD RESVR MTG.
33	3320813	1	BRACKET-LT HYD RESVR MTG
34	3320323	2	CLA ASMBLY-MTG, L,HYD TANK
35	0115237	1	TEE-PIPE,1.00NPT,PN
36	0191492	1	NIPPLE-PP,SCH 40,1.00X2.00,PN
37	6601565	1	HOSE END-16-16MP,ST,LP100R4
38	9402828	1	ELBOW-HYDR,45,12MJ-12MP
39	6600648	AR	HOSE END-12X12FJX,ST,PUSH-LOK
40	3320319	1	TANK ASSEMBLY-HYDRAULIC
41	6600223	1	BREATHER-CRENLO#1577AL
42	6500039	1	THERMOMETER-2IN DIAL,9IN STEM
43	3330026	1	CAP-FILLING, BLANK
44	6000233	1	GASKET-2.18 FILLER CAP,LEATHER
45	6600224	1	PLUG-OIL,EYE SITE TCH DEV HM34
46	3320813	1	BRACKET-LT HYD RESVR MTG
47	6601786	1	PUMP-GEAR,.68/1.17,A PAD R.H.
48	6600647	AR	HOSE END-12X12MP,ST,LPSP
49	6601921	1	FILTER HEAD
50	6601922	1	ELEMENT-FILTER,.003 MICRON

AR = AS REQUIRED

Hydrostatic Drive System - PTO Drive

With Sundstrand Pump

Piping And Installation



Specify Unit Serial No., Part No., & Part Description

Hydrostatic Drive System - PTO Drive

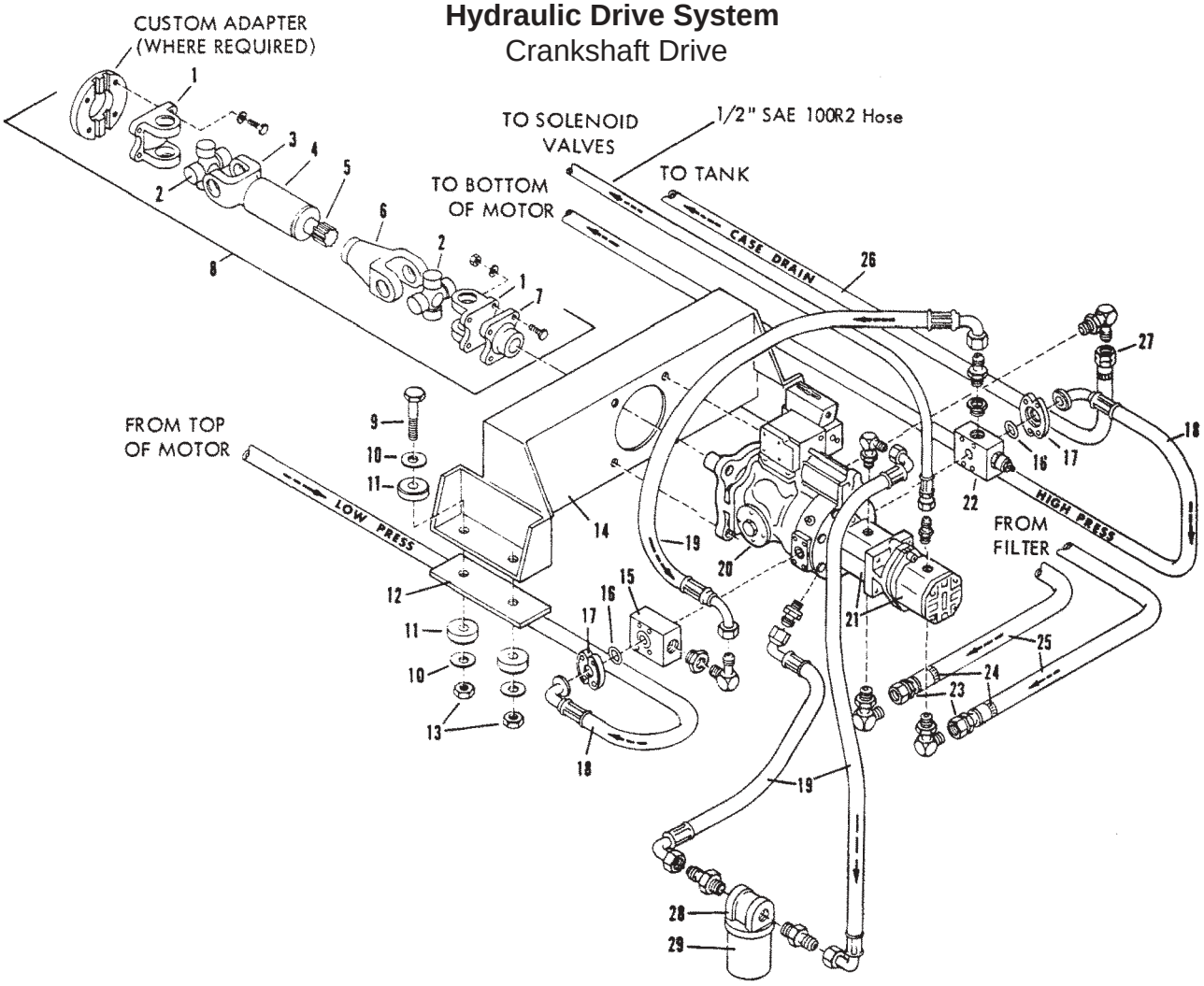
With Sundstrand Pump

Piping And Installation

REF.	PART NO.	QTY.	DESCRIPTION
1	6303119	1	ROUND-0.50 CR,LEDLOY 300,LB.
2	3320275	1	ANGLE-MT.,VERT,L.PUMP/HNGR
3	3320276	1	ANGLE-MT.,VERT,R.PUMP/HNGR
4	6601783	1	PUMP-4.26,SPLINED,22,W/EDC
5	6601771	1	VALVE-RELIEF,HYD,5000PSI,150GP
6	0274253	2	O RING-TUBE FITTING,1.50
7	6600236	4	FLANGE ASM-1.00,4BLT,SPLIT
8	——	2	HOSE-HIGH PRESS (SPECIFY LENGTH)
9	6601561	2	HOSE ASM-12X28,12FJX90-12FJX90
10	6601787	AR	PUMP-GEAR,.38,A PAD+SHAFT,L.H.
	6601788	AR	PUMP-GEAR,.88,A PAD+SHAFT,R.H.
11	6600897	2	ADAPTER-HYDR,ST,08MB-12MJ
12	6601566	4	HOSE END-16-16FJX,ST,LP100R4
13	6000792	8	CLAMP-HOSE,WORM DRV,1.06 TO 2
14	6601564	AR	HOSE-SUCTION1.0 ID SAE100R4
15	2940298	1	ADAPTER-HYD.MTR,FLUSHER
16	3320335	2	CHANNEL-MOUNTING, FILTER
17	6601135	2	ELBOW-HYDR,90,16MJ-16MP
18	0125915	4	BUSHING-PIPE,1.25X1.00NPT,PN
19	7420042	2	INDICATOR-FILTER,GRESEN#1588
20	6600225	2	FILTER-GRESEN,#201NR
21	7420136	2	HEAD CASTING W/PLUG REL VLV PT
22	7420004	2	O RING-GRESEN#1576
23	7420007	2	PAPER-#10MICRON,GRESEN#1509
24	7420046	2	CONICAL SPRING,GRESEN
25	7420076	2	HOUSING-GRESEN #K23013
26	7420008	2	GASKET-SEAL,GRESEN#1575
27	7420009	2	POST-CENTER,GRESEN#1561
28	6601769	1	MOTOR-HYD,PISTON,2.5 CU.IN.
29	4470276	2	ELBOW-HYDR,90,12FPX-16MB
30	6600646	AR	HOSE-SELF GRIP PARKER H-801
31	6600237	1	SWITCH-THERMO,GM#TG-6401080
32	3320814	2	CLIP-FRAME,HYD RESVR MTG.
33	3320813	1	BRACKET-LT HYD RESVR MTG
34	3320323	2	CLA ASMBLY-MTG, L,HYD TANK
35	0115237	1	TEE-PIPE,1.00NPT,PN
36	0191492	1	NIPPLE-PP,SCH 40,1.00X2.00,PN
37	6601565	4	HOSE END-16-16MP,ST,LP100R4
38	9402828	1	ELBOW-HYDR,45,12MJ-12MP
39	6600648	AR	HOSE END-12X12FJX,ST,PUSH-LOK
40	3320319	1	TANK ASSEMBLY-HYDRAULIC
41	6600223	1	BREATHER-CRENLO#1577AL
42	6500039	1	THERMOMETER-2IN DIAL,9IN STEM
43	3330026	1	CAP-FILLING, BLANK
44	6000233	1	GASKET-2.16 FILLER CAP,LEATHER
45	6600224	1	PLUG-OIL,EYE SITE TCH DEV HM34
46	3320813	1	BRACKET-LT HYD RESVR MTG
47	0108687	2	ELBOW-PIPE,90,ST,1.00NPT,PN
48	6600647	2	HOSE END-12X12MP,ST,LPSP

AR = AS REQUIRED

Hydraulic Drive System
Crankshaft Drive

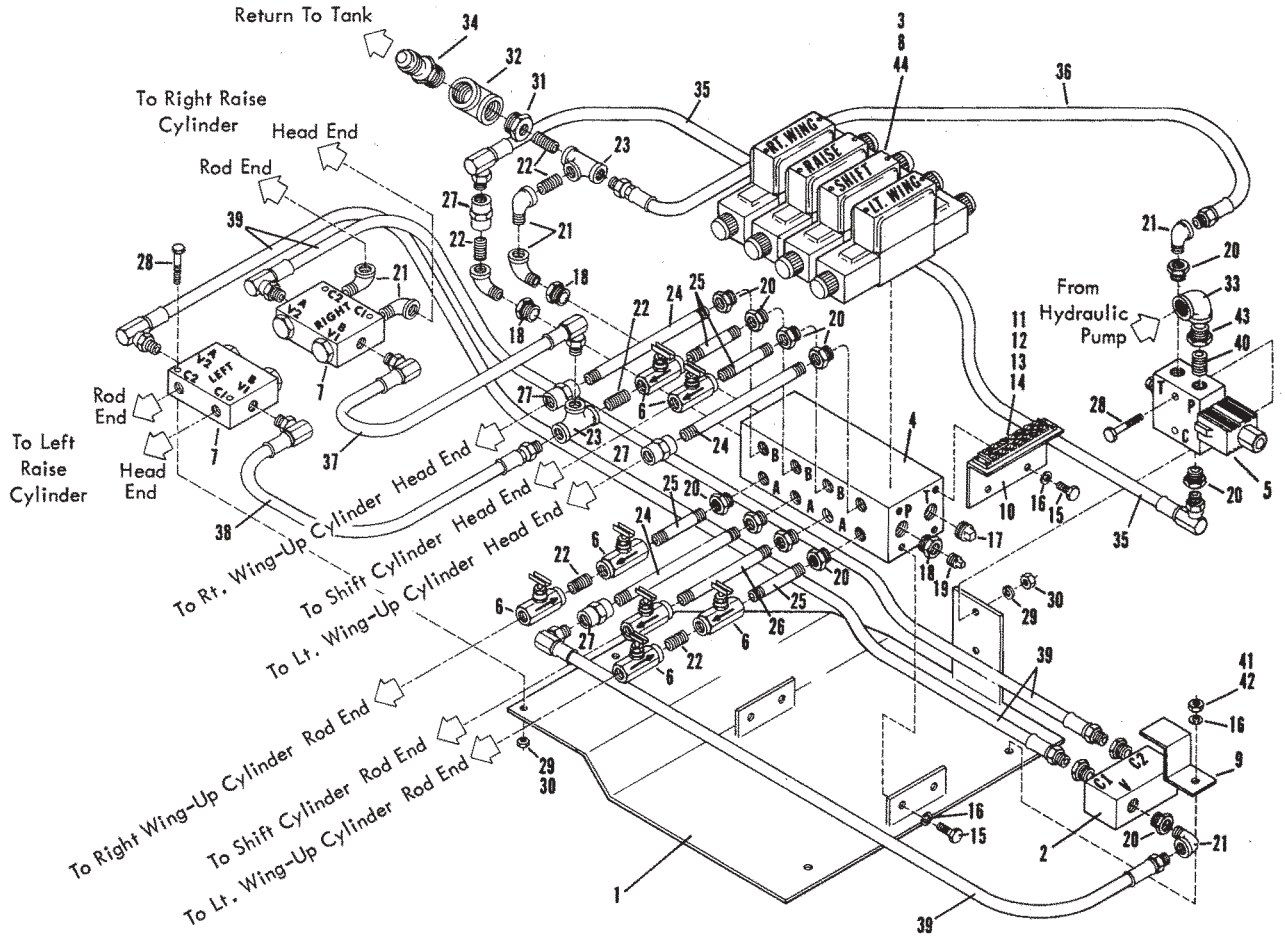


REF.	PART NO.	QTY.	DESCRIPTION
1	3170021	2	YOKE-FLANGE,SPLICER 2-2-329
2	3170013	2	JOURNAL+BRG.KIT-SPICER 5-200X
3	6440161	1	YOKE-STUB,SPICER 2-23-277
4	6303295	AR	TUBE-2.50X16GA,DOM,FT.
5	3110032	1	SHAFT-SLIP STUB
6	3110034	1	YOKE-SLVASM,SPICER #2-3-1421KX
7	6440162	1	FLANGE-COMPANION,TAPED HOLE
8	9300558	1	LINE ASM-DRIVE,PUMP HYD,CRK.DR
9	0428715	4	SCREW-HEX,0.62NCX4.00,GR2,PD
10	0130999	8	WASHER-FLAT,0.62A(0.69X1.75)PD
11	6000889	4	MOUNT-SHOCK HYD PUMP CRK.DRIVE
12	3321004	2	FILLER-MTG,HYD PUMP CRK DRIVE
13	9413948	4	NUT-HEX,LOCK,0.62NC,EA,GRA,PD
14	3320960	1	CHANNEL-MTG CRANK DR,HYD PUMP
15	2940298	1	ADAPTER-HYD.MTR,FLUSHER
16	0274253	2	O RING-TUBE FITTING,1.50
17	6600235	4	FLANGE ASM-1.00,4BLT,SPLIT
18	6600236	2	FLANGE ASM-1.00,4BLT,SPLIT
19	6601561	2	HOSE ASM-12X28,12FJX90-12FJX90
20	6601847	1	PUMP-4.6,TAPERED,GEN II,W/MOOG
21	6601785	1	PUMP-GEAR,.88/1.17,A PAD,L.H.
22	6601771	1	VALVE-RELIEF,HYD,5000PSI,150GP
23	6601566	3	HOSE END-16-16FJX,ST,LP100R4
24	6000792	3	CLAMP-HOSE,WORM DRV,1.06 TO 2
25	6601564	AR	HOSE-SUCTION1.0 ID SAE100R4
26	6600646	AR	HOSE-SELF GRIP PARKER H-801
27	6600648	2	HOSE END-12X12FJX,ST,PUSH-LOK
28	6601921	1	FILTER HEAD
29	6601922	1	ELEMENT-FILTER,.003 MICRON

AR = AS REQUIRED

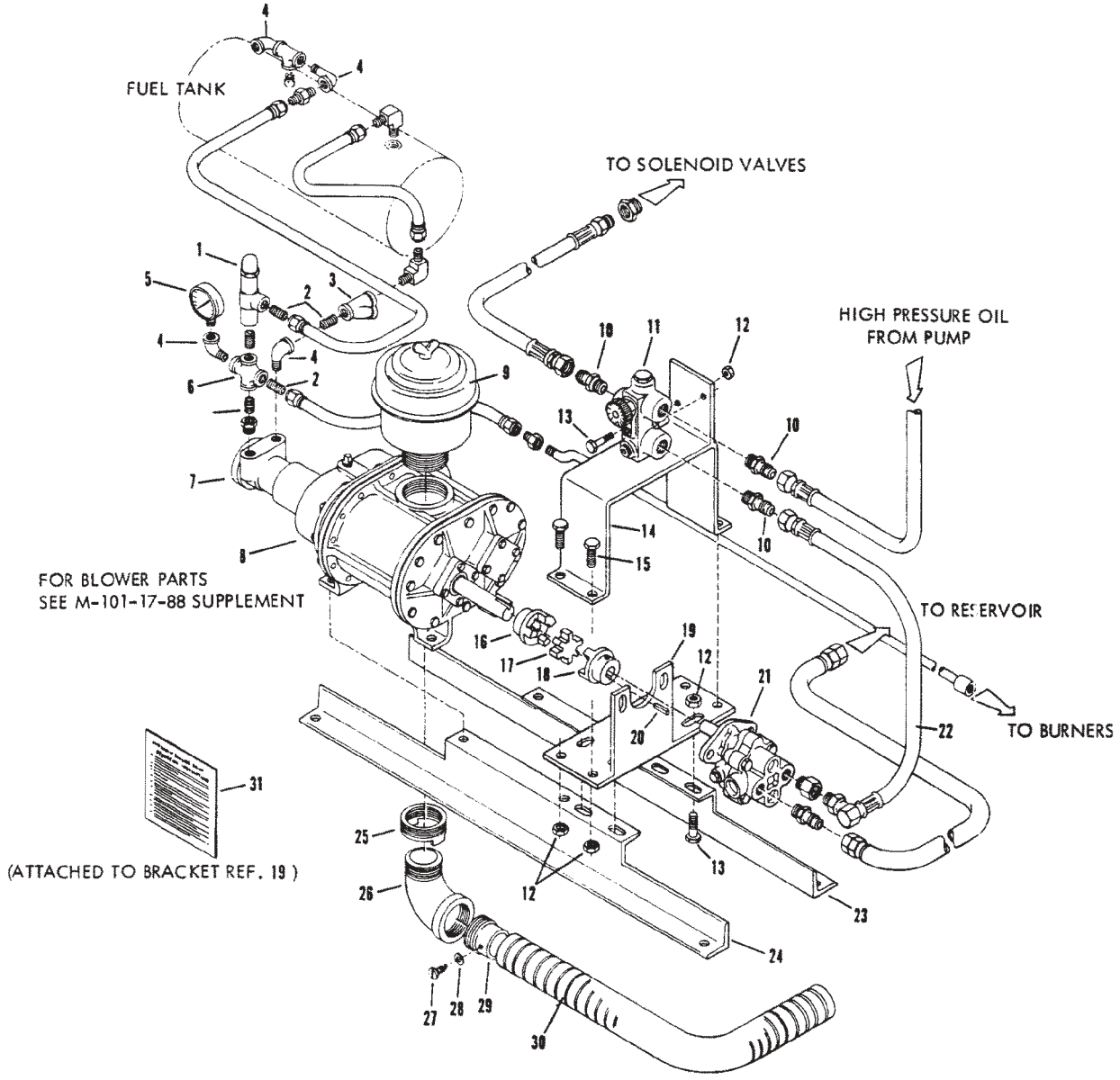
Specify Unit Serial No., Part No., & Part Description

Hydraulic Manifold Assembly



REF.	PART NO.	QTY.	DESCRIPTION
1	3321188	1	PLATE ASM-MTG,HYD VALVES
2	6601409	1	VALVE-FLOW DIVIDER
3	6601796	4	VALVE-HYD,SOL,3POS,4WAY,CLSD
4	6601797	1	MANIFOLD-PARALLEL,4STATION,D01
5	6601798	1	VALVE ASM-HYD,RV/DUMP,12VDC
6	6601822	7	VALVE-NEEDLE,.25,W/CHECK
7	6601850	2	VALVE-CHECK,PILOT,DOUBLE,1/4
8	6700015	4	CONNECTOR-ROMEX 0.375
9	3380472	1	2-CLAMP-RETAINER,FLOW DIVIDER
10	3370135	1	BRKT-MTG,TERM. STRIP,HYD.80X
11	6700306	1	STRIP-TERMINAL,10 BAR
12	0436665	2	SCREW-MACH,PNSL,6NCX0.50,PD
13	0134530	2	NUT-HEX,MACH,6NC,PD
14	0131044	2	WASHER-LOCK,NO 6,SPRING,PD
15	0122119	6	SCREW-HEX,0.38NCX0.75,GR2,PD
16	0120382	8	WASHER-LOCK,0.38,SPRING,PD
17	0219199	1	PLUG-PIPE,SQ HD,0.50NPT,PN
18	0144045	3	BUSHING-PIPE,0.50X0.25NPT,PN
19	0219189	1	PLUG-PIPE,SQ HD,0.25NPT,PN
20	0119931	13	BUSHING-PIPE,0.38X0.25NPT,PN
21	0105423	7	ELBOW-PIPE,90,ST,0.25NPT,PN
22	0105405	6	NIPPLE-SCH 40,0.25X0.87 CL,PN
23	0105417	2	TEE-PIPE,0.25NPT,PN
24	0127726	3	NIPPLE-PP,SCH 40,0.25X8.00,PN
25	0121209	4	NIPPLE-PP,SCH 40,0.25X3.00,PN
26	0119291	1	NIPPLE-PP,SCH 40,0.25X6.00,PN
27	6200302	4	COUPLING-PIPE,0.25,FRG STLNPSC
28	0121960	4	SCREW-HEX,0.25NCX2.25,GR2,PD
29	0120380	4	WASHER-LOCK,0.25,SPRING,PD
30	9413946	4	NUT-HEX,LOCK,0.25NC,EA,PD
31	0144033	1	BUSHING-PIPE,0.75X0.25NPT,PN
32	0119099	1	ELBOW-PIPE,90,0.75NPT,PN
33	0119098	1	ELBOW-PIPE,90,0.50NPT,PN
34	9402711	1	ADAPTER-HYDR,12MJ-12MP
35	3360907	1	HOSE ASM-04X17,04MPX90,04MPX90
36	3360908	1	HOSE ASM-04X24,04MPX,04MPX
37	3360909	1	HOSE ASM-04X21,04MPX90,04MPX90
38	3360910	1	HOSE ASM-04X19,04MPX90,04MPX
39	3360911	3	HOSE ASM-04X23,04MPX90,04MPX
40	0121207	1	NIPPLE-SCH 40,0.38X1.00,CL,PN
41	0120233	2	SCREW-HEX,0.38NCX1.00,GR2,PD
42	0120377	2	NUT-HEX,0.38NC,PD
43	0142269	1	BUSHING-PIPE,0.50X0.38NPT,PN
44	6601846	4	BOLT KIT-NFPA D01 VALVE

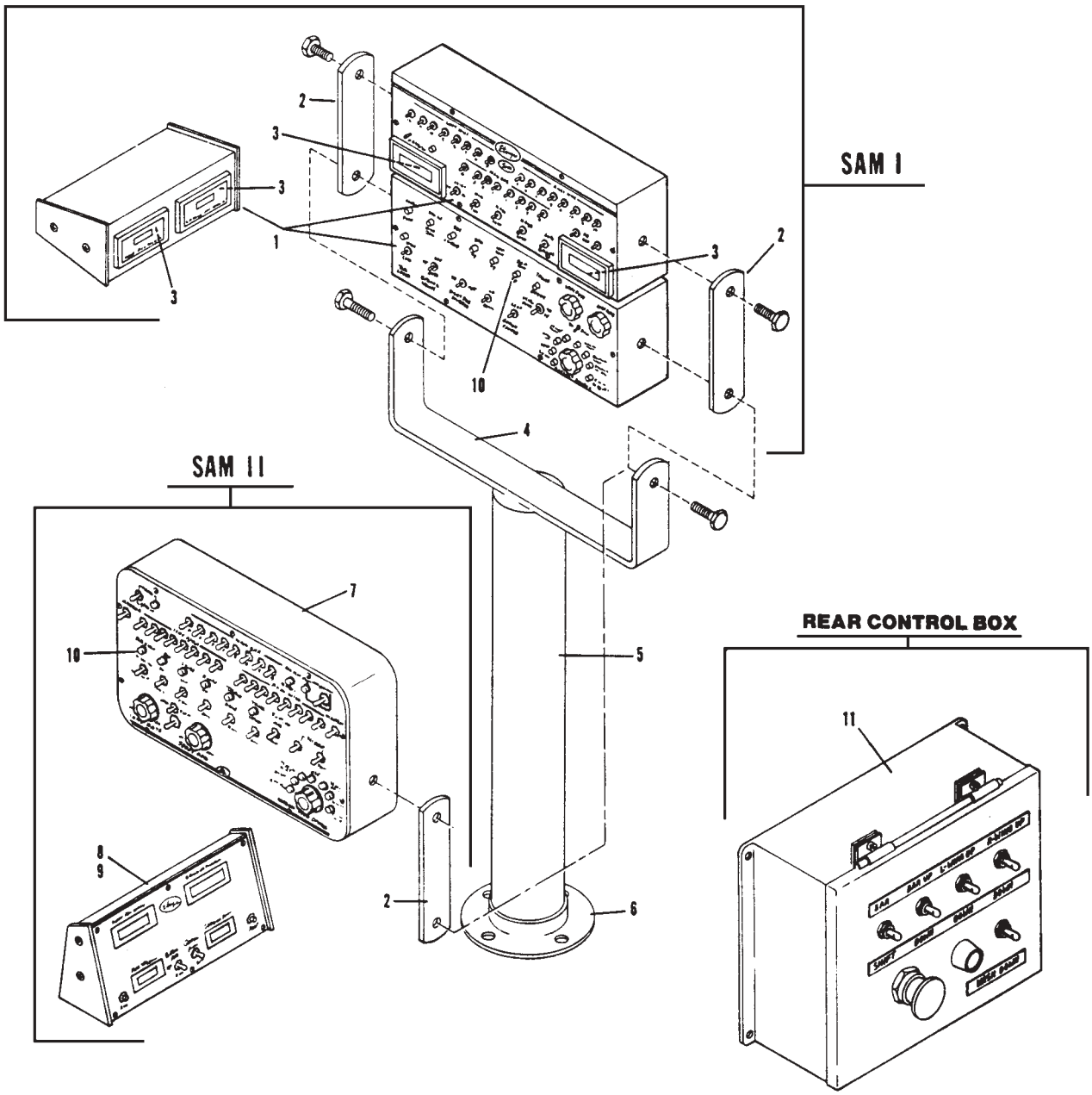
Hydrostatic Blower Drive - Low Pressure Burners



REF.	PART NO.	QTY.	DESCRIPTION
1	6600197	1	VLV-RELIEF,.38 IN,FULFLOWVE-2
2	0121207	5	NIPPLE-SCH 40,0.38X1.00,CL,PN
3	6600199	1	STRAIN.-STY B,TYP Y, W.D.ALLEN
4	0120063	4	ELBOW-PIPE,90,ST,0.38NPT,PN
5	6600196	1	GAUGE-PRESS,2.0IN,0-100PSIG
6	0115193	1	CROSS-PIPE,0.38NPT,PN
7	7030150	1	PUMP-OIL,VIKING
8	6601987	1	BLOWER-36 U-RAI
9	6600136	1	FILTER-AIR MAZE#F140S
10	6600921	3	ADAPTER-HYDR,ST,06MJ-12MB
11	6600877	1	VALVE-MOTOR CONTROL
12	0274993	20	NUT-HEX,LOCK,0.38NC,EA,PD
13	0120918	6	SCREW-HEX,0.38NCX1.50,GR2,PD
14	3331162	1	BRACKET ASM-CONTROL VALVE MTG
15	0120233	14	SCREW-HEX,0.38NCX1.00,GR2,PD
16	3320976	1	COUPLING-BLOWER DRIVE HALF
17	6445009	1	SPIDER-NEOPRENE,LOVEJOY#2
18	3320983	1	COUPLING-HALF,HYD MTR,BLWR DRV
19	3331159	1	MOUNTING ASM-HYDRAULIC MOTOR
20	3100118	1	KEY-0.12X0.12 CRX1.00
21	6600878	1	MOTOR-BLOWER DRIVE
22	6600872	1	HOSE ASM-06X18,08FJX-06MBX90
23	3331154	1	SUPPORT ASM-BLOWER MTG. LH
24	3331155	1	SUPPORT ASM-BLOWER MTG. RH
25	6200047	1	BUSHING-PIPE,FACE,2.50X2NPT,PN
26	0187154	1	ELBOW-PIPE,90,ST,2.00NPT,PN
27	9426110	1	SCREW-TAP,PNSL,10X0.75,AB,PD
28	0120386	1	WASHER-FLAT,0.25A(0.31X0.73)PD
29	3330202	1	ADAPTER ASM-BLOWER DISCHARGE
30	3330202	1	ADAPTER ASM-BLOWER DISCHARGE
31	3390572	1	PLATE-HYD BLOWER DRIVE INSTR

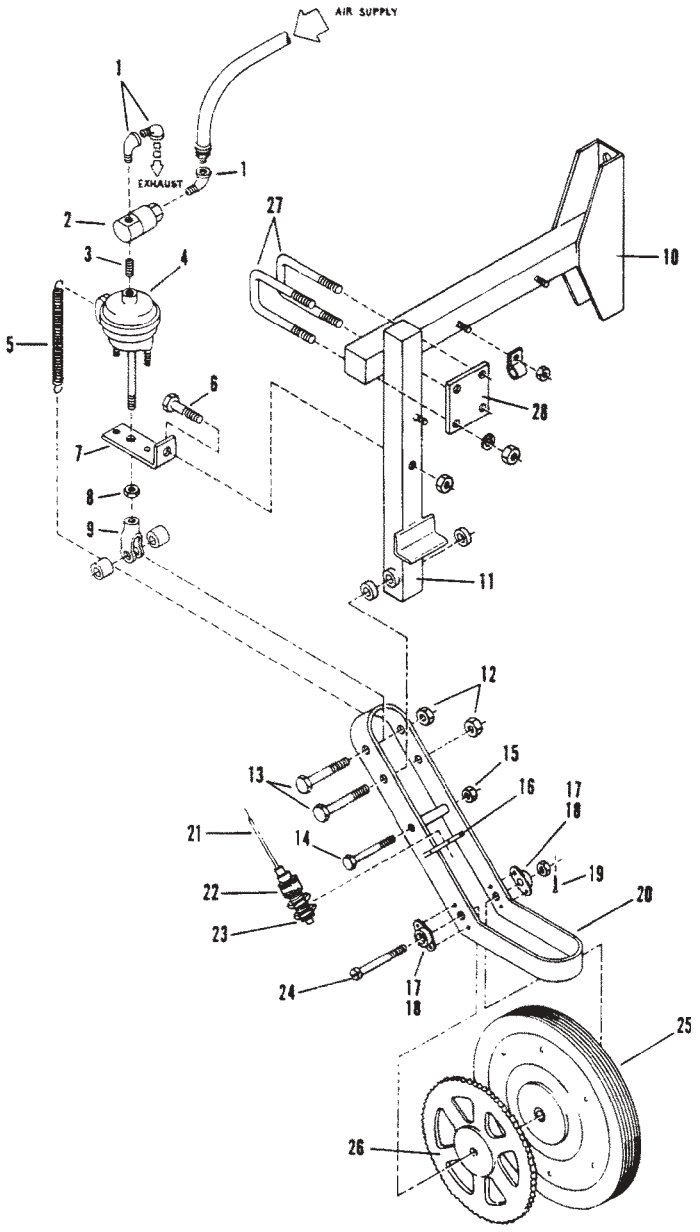
Specify Unit Serial No., Part No., & Part Description

Control Panel Assembly



REF.	PART NO.	QTY.	DESCRIPTION
1	3370134	1	CONTROL BOX KIT,CNTRL,FUNC,RMT
2	3370150	2	PLATE-TIE,CONTROL BOX MOUNT
3	6701867	8	BATTERY-ALKALINE,N,1.5V
4	3370137	1	BRACKET-MTG,CONTROL BOX
5	3370138	1	TUBE-POST,CONTROL MTG.
6	3370136	1	PLATE-POST MTG,CONTROL BOX
7	3370151	1	CONTROL BOX KIT,MAIN
8	3370167	1	REMOTE PANEL
9	6309262	AR	VELCRO MOUNTING
10	6701848	AR	BULB-LIGHT
11	3370142	1	CONTROL BOX ASM-REAR,SAM I AND SAM II

Bitumeter Assembly

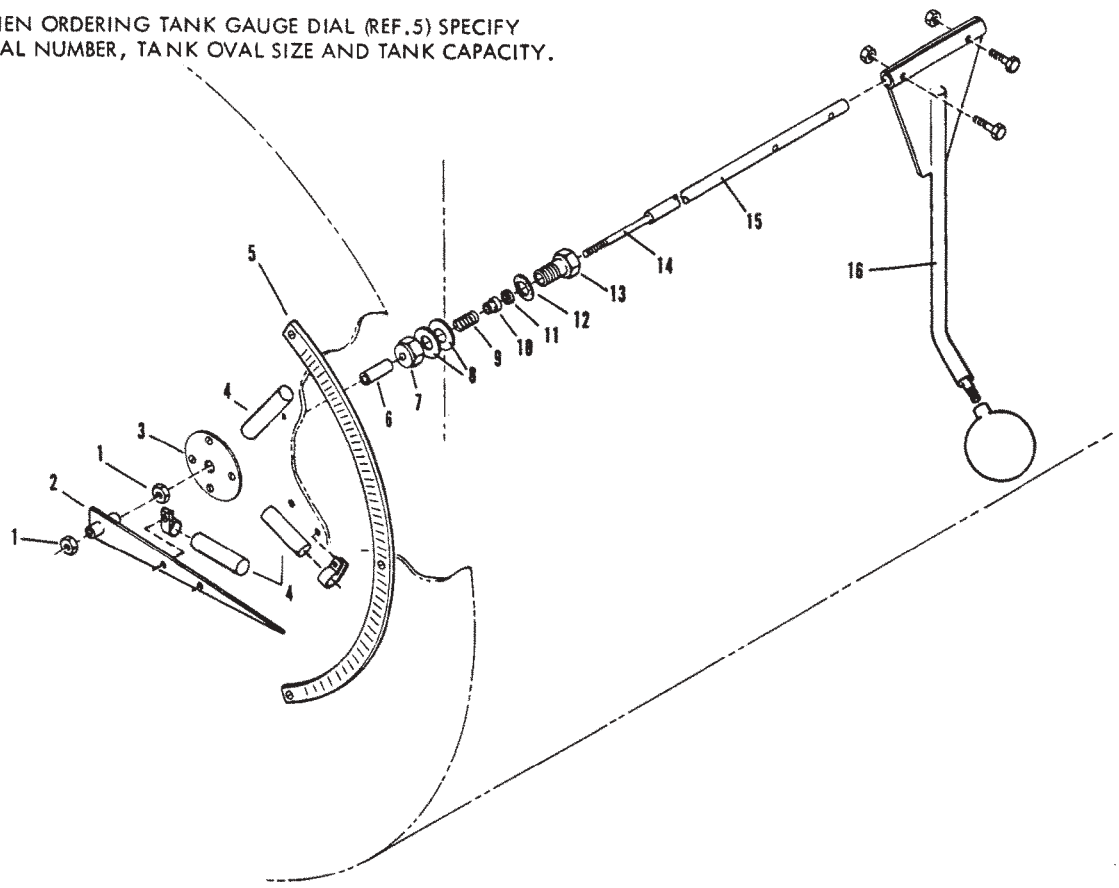


REF.	PART NO.	QTY.	DESCRIPTION
1	0105423	3	ELBOW-PIPE,90,ST,0.25NPT,PN
2	6600538	1	VALVE-SOL,12V DC,V55-100
3	0105407	1	NIPPLE-PP,SCH 40,0.25X1.50,PN
4	3360673	1	BITUM'R RAISE-AIR C.P007-17-80
5	3360672	1	SPRING-BIT WHEEL,AIR BRAKE
6	0122433	1	SCREW-HEX,0.50NCX1.50,GR2,PD
7	3360671	1	BRACKET-MTG.PAN CAKE CYL,BIT
8	0120371	1	NUT-HEX,0.50NF,PD
9	6600545	1	YOKE-BRAKE CHAMBER,5TH WHL LFT
10	3360363	1	BRKT.ASM-BITUMETER MOUNTING
11	3360264	1	SUPT ASM-CHAN BITUMETER WHL
12	3360264	2	SUPT ASM-CHAN BITUMETER WHL
13	0111300	2	SCREW-HEX,0.50NCX4.50,GR2,PD
14	0190428	1	SCREW-HEX,0.31NCX4.50,GR2,PD
15	0120376	1	NUT-HEX,0.31NC,PD
16	3360889	1	BRKT-MTG,BIT MAGNETIC PICKUP
17	3360344	2	BRG-OUTER, BITUMETER FORK&WHL.
18	6420035	2	BEARING-BALL,RAD,SGL,NA,0.3750
19	0137204	2	PIN-COTTER,0.12X1.50 PD
20	3360283	1	FORK ASM-BIT FOR 16 IN DIA WHL
21	6701048	1	CABLE-SHIELDED,22-3,STRANDED
22	6700959	1	CORD GRIP-FITTING,0.75 X 0.75
23	6701838	1	SENSOR-PROXIMITY PICK-UP 12VDC
24	3360281	1	SPINDLE-16 IN. BITUMETER WHL.
25	3360886	1	WHEEL/TIRE ASM-BITUMETER,SAM
26	3360864	1	TONE WHEEL-BITUMETER,SAM
	3360897	1	TONE WHEEL-BITUMETER,METRICSAM
27	3360816	2	U-BOLT-SQ BEND 1/2X2 1/8X5 1/2
28	3360817	1	PLATE-BACK UP U-BOLT BIT WHL

Specify Unit Serial No., Part No., & Part Description

Tank Gauge Assembly

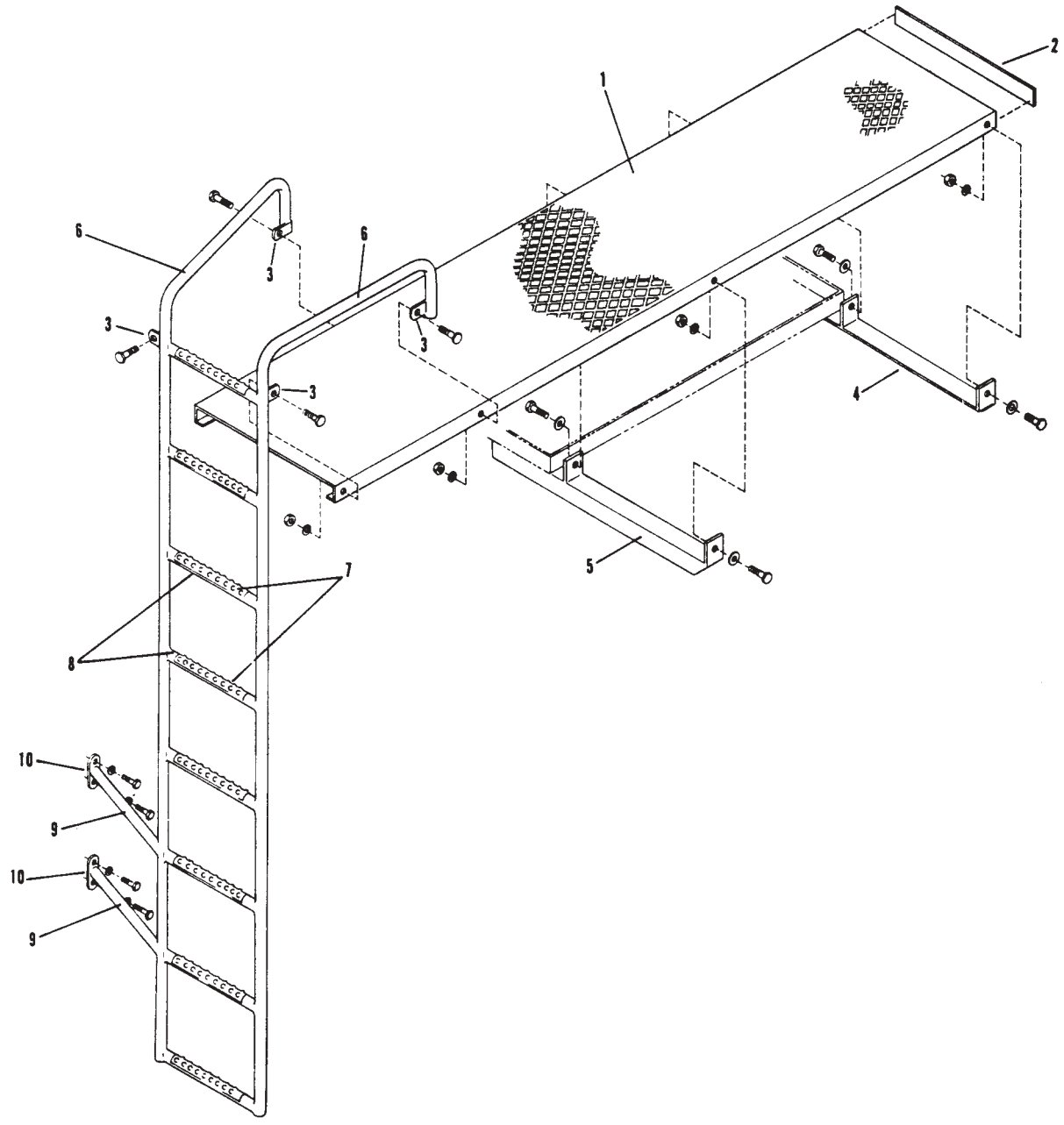
NOTE: WHEN ORDERING TANK GAUGE DIAL (REF.5) SPECIFY UNIT SERIAL NUMBER, TANK OVAL SIZE AND TANK CAPACITY.



REF.	PART NO.	QTY.	DESCRIPTION
1	0120376	2	NUT-HEX,0.31NC,PD
2	3360851	1	POINTER ASM-SAM DIAL
3	3341199	1	COVER-JKT,DRIVE,SHAFT TK GAGE
4	6701832	3	SWITCH-SPDT MAGNETIC,3AMP EF
5	3380438	1	DIAL-BLANK,SAM
6	3360826	1	SPACER-POINTER,TANK GAUGE,SAM
7	3360828	1	NUT ASM-PACKING RETAINER,SAM
8	0131002	2	WASHER-FLAT,1.00A(1.06X2.50)PD
9	3360192	1	SPRING-PACKING, TANK GAUGE
10	3360187	1	SLEEVE-PACKING,TANK GAUGE
11	3360204	1	PACKING-TANK GAUGE
12	3360825	1	GASKET-ABS. 1 3/4X1X1/16
13	3360822	1	SCREW-FITTING TANK GA,1 NC SAM
14	3360824	1	SHAFT-DRIVE TANK GAGE,SAM
15	6303353	1	PIPE-SCH 40,0.25,FT
16	3360837	1	STEM ASM-TANK GAGE 44X64 OVAL
	3360835	1	STEM ASM-TANK GAGE 46X78 OVAL
	3360833	1	STEM ASM-TANK GAGE 48X70 OVAL
	3360839	1	STEM ASM-TANK GAGE 49X33 OVAL
	3360836	1	STEM ASM-TANK GAGE 50X90 OVAL
	3360834	1	STEM ASM-TANK GAGE 56X90 OVAL
	3360838	1	STEM ASM-TANK GAGE 64X90 OVAL

REF.	PART NO.	QTY.	DESCRIPTION

Ladder And Walkway



REF.	PART NO.	QTY.	DESCRIPTION
1	6303603	1	GRATING-14 GA,SERRATED /FT
2	3380468	1	PLATE-END,WALKWAY
3	2780136	4	PLATE-MOUNTING,LADDER
4	3380469	1	ANGLE ASM-SUPPORT,WALKWAY,RT
5	3380470	1	ANGLE ASM-SUPPORT,WALKWAY,LT
6	2750233	2	SIDERAIL-LADDER, REAR
7	2780444	8	GRIP-NON SLIP,LADDER RUNG
8	3310171	8	RUNG-LADDER
9	6303356	2	PIPE-SCH 40,0.75,FT
10	3310152	2	PLATE ASMBLY-LADDER MT

Specify Unit Serial No., Part No., & Part Description

Decimal Equivalent Chart

Decimal	Fraction	Decimal	Fraction	Decimal	Fraction
.06	1/16	.31	5/16	.69	11/16
.09	3/32	.38	3/8	.75	3/4
.12	1/8	.44	7/16	.81	13/16
.16	5/32	50	1/2	.88	7/8
.19	3/16	.56	9/16	.94	15/16
.25	1/4	.62	5/8	1.00	1

Hydraulic Fitting Code

LETTER DESIGNATION

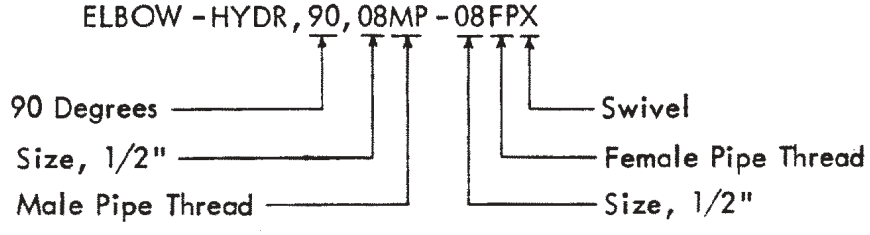
MP - Male Pipe Thread	FL - "O" Ring Flange
FP - Female Pipe Thread	MS - Male SAE, 45
MB - Male "O" Ring Boss	FS - Female SAE, 45
MJ - Male JIC, 37	C - Compression Fitting (Ferrule Type)
FJ - Female JIC, 37	X - Swivel

SIZE

Size is represented in sixteenths of an inch. One inch equals 16, one half inch equals 08.

02 - 1/8	10 - 5/8	18 - 1 1/8
04 - 1/4	12 - 3/4	20 - 1 1/4
06 - 3/8	14 - 7/8	24 - 1 1/2
08 - 1/2	16 - 1	28 - 1 3/4

EXAMPLE: The description for a "1/2" 90 degree Hydraulic Elbow, Male NPT to Female NPT Swivel, would be as follows:



⚠WARNING

Safety Precautions

The use of a bituminous distributor normally requires the handling of liquid materials at elevated temperatures. Additionally, these materials may be of a volatile nature. A heating system is supplied to provide or maintain these temperatures and these systems use highly combustible fuels. The bituminous distributor is a piece of operating equipment and must be carefully maintained and operated. Because these requirements involve potentially hazardous situations, we are calling attention to them for your safety. Appropriate cautions are listed below; and, wherever they occur in the operating instructions, they will be identified by a Caution Symbol.

1. To quickly extinquish any fire, always have dry chemical type extinguisher available and in good condition.
2. After one week, and then monthly, check on all body tie downs and fasteners. On trailer units check king pin plate fasteners and all suspension and running gear components.
3. To reduce fire hazard, burning cigarettes or other sources of combustion must be kept clear of open manholes and overflow vents.
4. To prevent ignition of volatile gases, eliminate sparks from engine exhausts.
5. To prevent becoming entangled in machinery, remain clear of rotating drives.
6. To prevent burns to the hands, use gloves or insulated material when handling heated spray bar sections or hoses.
7. To insure that overflow tube has not become clogged, inspect monthly and clean if necessary.
8. Since pressure may build up in asphalt tank, always open manhole cover slowly.
9. To eliminate leaks which may spray hot bitumen on yourself or others, secure all pipe and hose connections before opening valves.
10. To prevent fire hazards, burns and falls, keep unit clean for safe operation.
11. To reduce fire hazard, keep spraying area clear of open flames or sparks when spraying with volatile materials.
12. To prevent possible burns from asphalt spray, do not stand so that accidental opening of spray bar valves will permit contact.
13. Disconnect all cables on distributor control panels before welding on Distributor or truck.
14. Before removing fill line cap, pump off or suction strainer lid, relieve pressure in system by turning asphalt pump if electric flushing pump has been running.
15. Operation of spraybar valves, suction and return valves and 4-way valve causes rapid movement. Stay clear at all times to prevent injury.
16. To prevent foaming or violent eruption, do not load with material over 200°F if water is present in the tank or if an emulsion was used in the previous load. Clean and throughly drain first. When filling a unit in which moisture or emulsion may be present in the spray bar or cirulating system, allow a small portion of hot material to circulate in bar before filling tank.
17. To prevent foaming or violent eruption, do not heat material over 200°F if moisture or emulsion is present.
18. To avoid volatile fumes drifting toward burners, position unit broadside to wind when heating material.
19. To avoid an extreme fire hazard or explosion, do not use gasoline instead of kerosine or fuel oil on generating or low pressure burners.
20. To prevent an explosion, flues must be covered by a minimum of 6 inches of material when heating.
21. To avoid having hot material overflow from the tank, allow sufficient space in the tank for expansion of the material when heating.
22. To prevent an explosion from exposure of hot flues, do not remove material from the tank while burners are in operation.
23. To prevent an explosion or possible fire from raw fuel from an extinquished burner flame, do not operate burners unattended, while vehicle is in motion or in a confined area.
24. To avoid a possible fire, do not heat material in a leaking tank.
25. To prevent possible hand burns, use a torch (not a match or lighter) to light burners.
26. To prevent possible hand or facial burns, light inside burner first. Do not reach across a lit burner to relight inside burner. Shut off outer burner and restart sequence.
27. To avoid a possible explosion, when burners go out, allow flues to ventilate for several minutes before relighting burners.
28. To prevent a possible explosion, do not heat material beyond manufacturers recommended temperature.
29. To avoid spraying other people with hot material when handspraying, hold handspray gun in proper position and watch for other people.