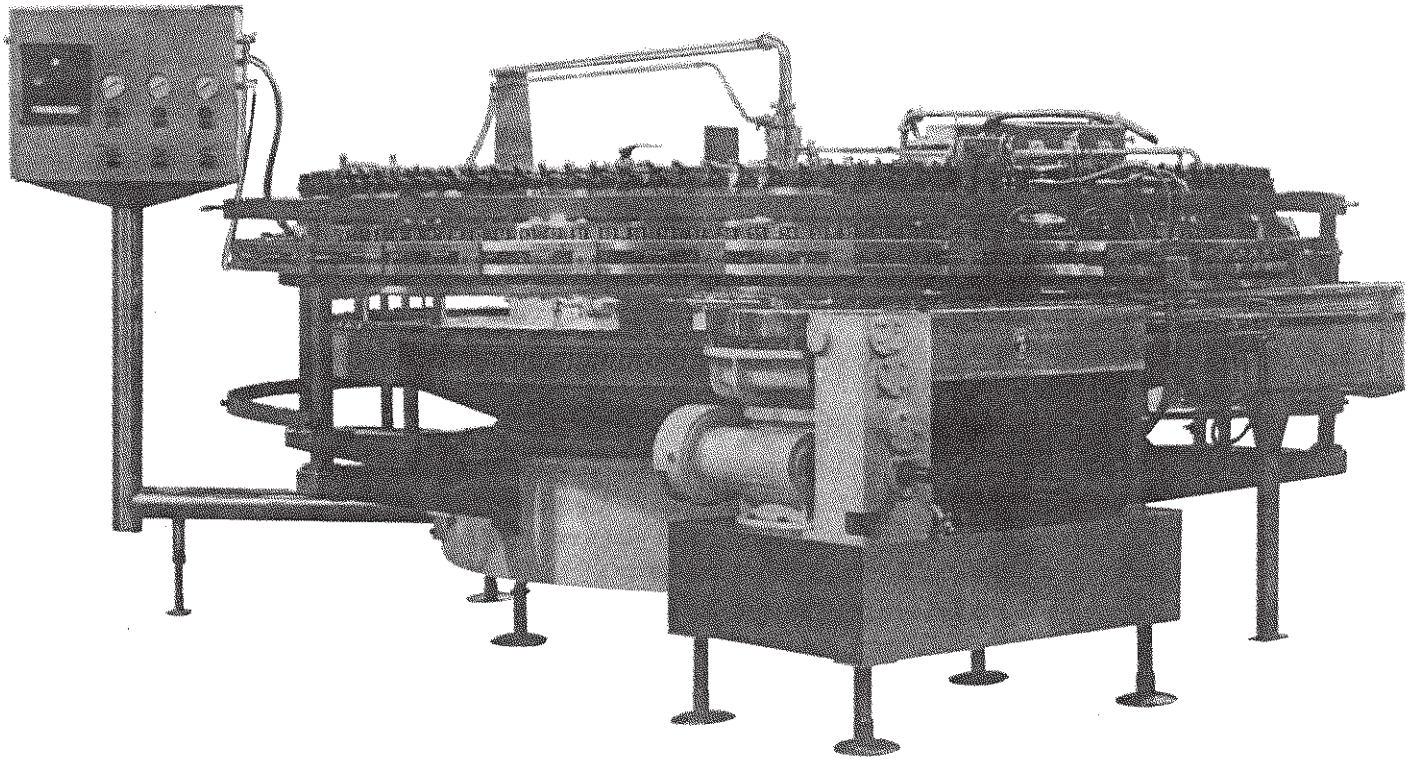
DELTA CF-120 VALVE CAN-FILLER MANUAL



This manual summarizes the operation and maintenance requirements on the H&K CF-120 DELTA CAN-Filling-Machine. The machine is used widely for automatic filling of carbonated soft-drinks and beer into cans. All parts in contact with the beverage are built of high-quality stainless steel to assure easy, effective cleaning. Dead ends have been avoided in the design. In most cases a brief rinsing with hot water is sufficient to clean the filler-bowl and the filling valves, but more thorough cleaning with hot or cold chemical solutions, as well as sterilization using hot water or steam, is permissible. The machine is designed for maximum filling pressure of 100 psi, which makes it suitable for beverages with a high CO_2 content, and for the warm-filling of carbonated soft-drinks.

PAGE

Introduction **1-1**

Can Handling 1-2
Can Handling 1-3
Can Filling 1-4
Can Filling 1-5
Can Filling 1-6
Can Filling 1-7
Can Filling 1-8
Can Filling 1-9
Can Filling 1-10
Operation of Filling Valve & Counter Pressure Control 1-11
Filler Bowl Liquid Level Control 1-12
Technical Data & Transport and Installation 1-13
Installation, Electrical Connections, & Test Run 1-14
Can Change Over 1-15

INTRODUCTION

The sole function of the DELTA CF-120 CAN-FILLER is to automatically fill cans to a precise level. The filler is driven from the seamer, which is located at the discharge of the filler. This means that all start-up, shut-down, and speed-controls are locked into the seamer. Thus, operation of the filler is controlled by the seamer-operator.

The can, from the infeed to the discharge, remains on the same level. There is no vertical movement of the can at any time, as there is with most other can-filling-machines. This along with control of the beverage in the bowl and a controlled release of gas at the can discharge results in minimal beverage loss during the filling process.

Essentially, there are three major processes to consider in understanding the overall concept of the DELTA CF-120 CAN-FILLER:

1) CAN HANDLING
2) CAN FILLING
3) CONTROLLING THE FILLER BOWL LEVER AND PRESSURE

Each of these items are discussed in detail on the following pages in this manual.

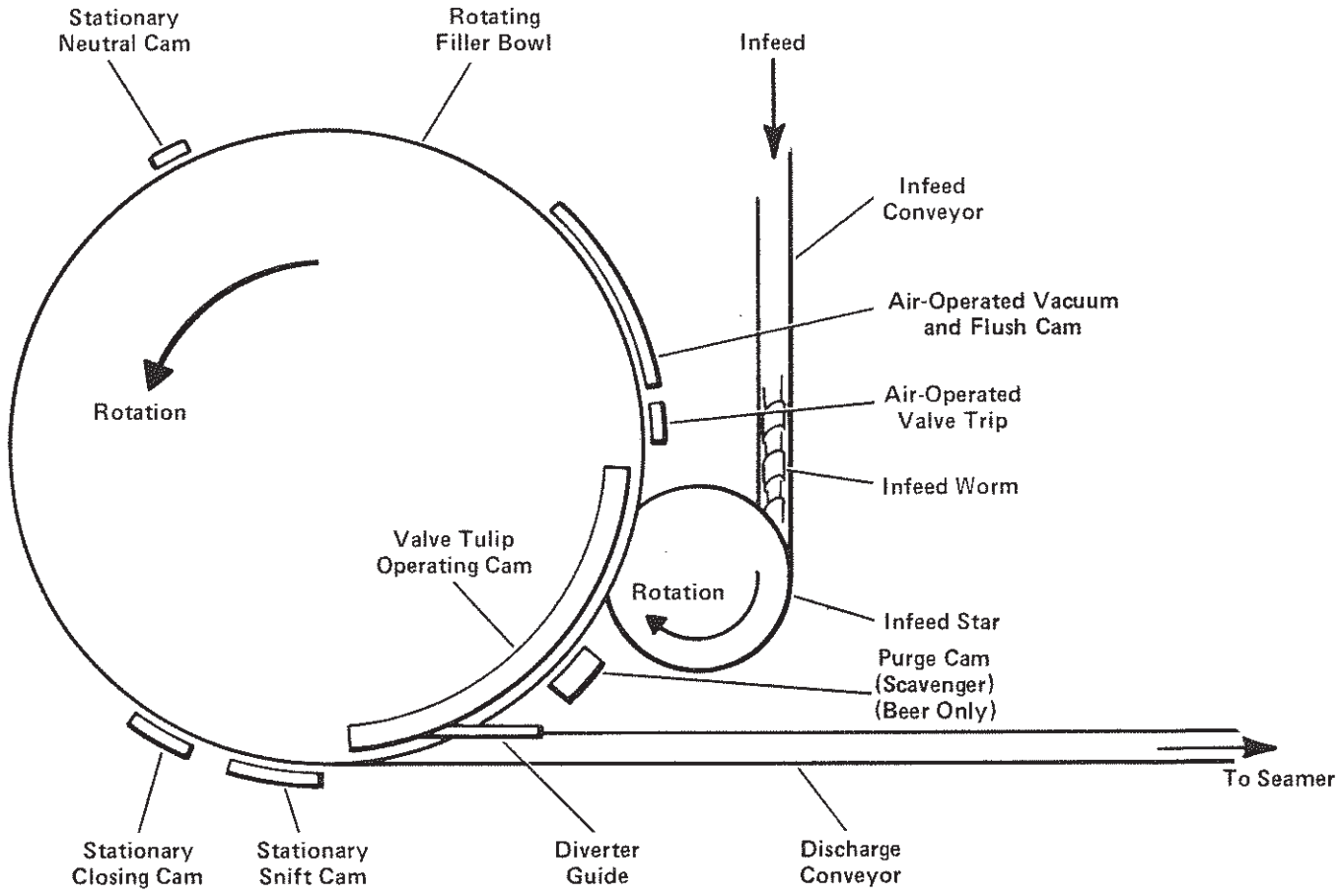


FIGURE 1-1. Cans are fed into the infeed star by an infeed worm for smooth can handling which in turn places the cans onto the filler can platforms. After the can is placed on the platform, the valve tulip operating-cam lowers the tulip onto the can top to hold the can in position and to provide the seal between the filling valve and the can. As the bowl rotates, successive cams remove air from the can, charge the can with gas (CO_2), fill the can with beverage, close the valve and remove residual gas. At the discharge, the valve tulip operating cam again raises the tulip to allow the can to discharge smoothly from the filler. The can stays on the same plane during the entire fill-process.

CAN HANDLING

Can handling is simply the process of feeding cans into the machine, holding the cans in position during the filling process, and discharging the filled cans to the seamer.

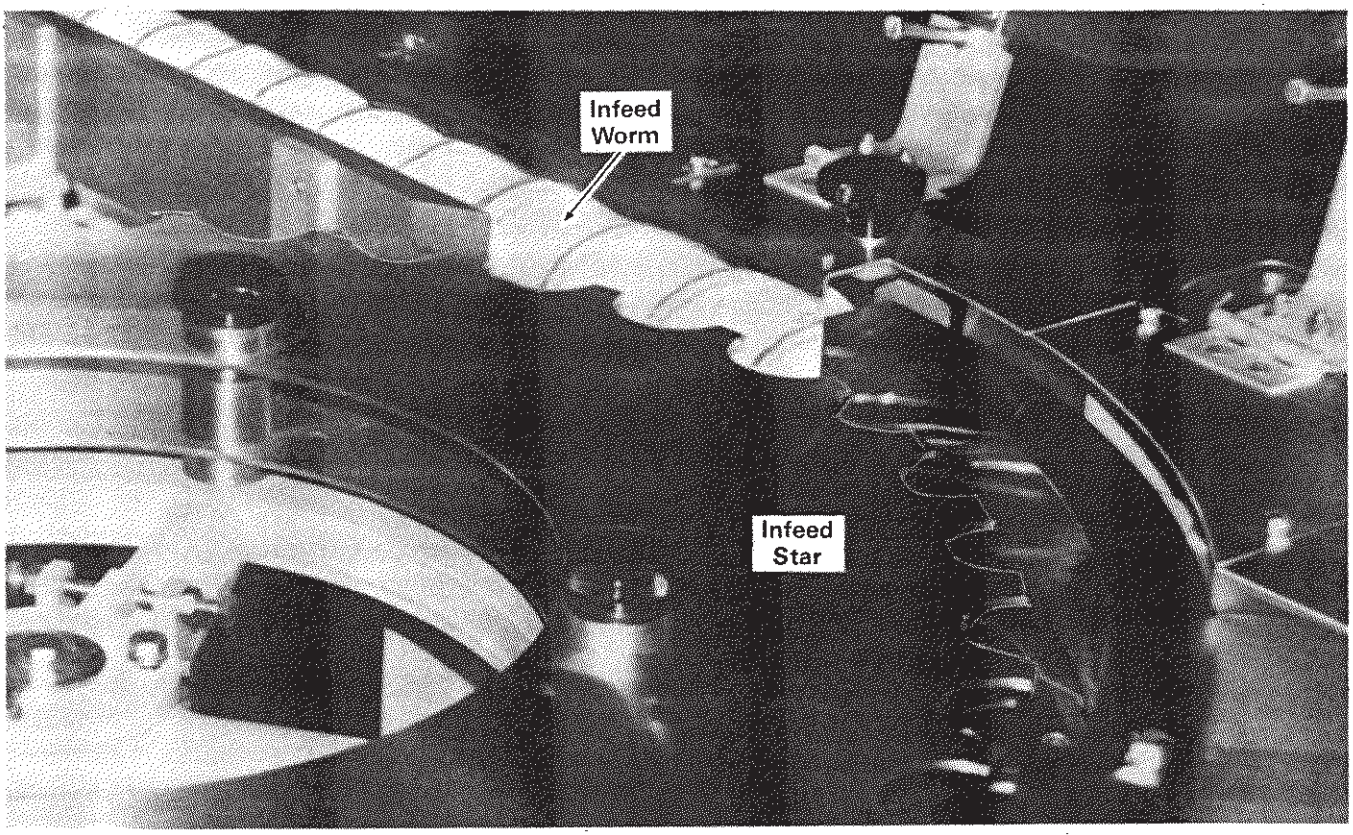


FIGURE 1-2. Cans are fed, single file, into the infeed worm which spaces and moves the cans into the infeed star. The infeed star, in turn, places the cans onto the can platforms located on the rotating table.

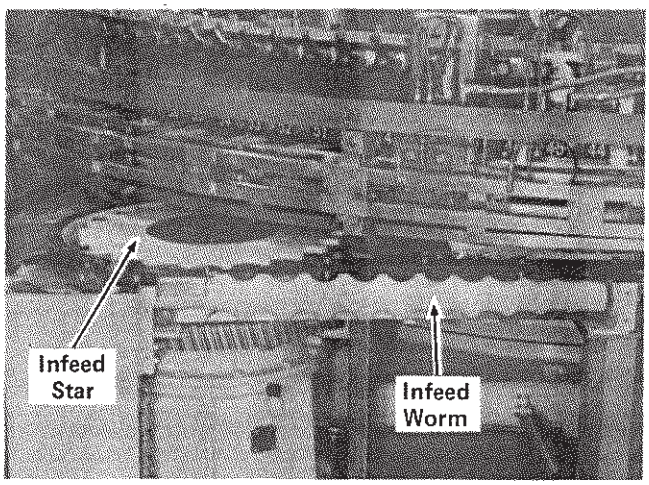


FIGURE 1-3. View of the infeed worm and infeed star with the covers removed.

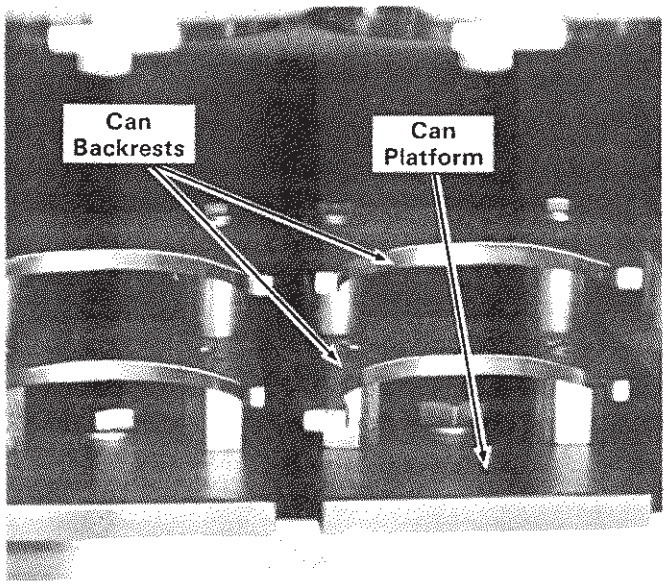


FIGURE 1-4. The can backrests center the can under the filling-valve and holds it in position during the filling process.

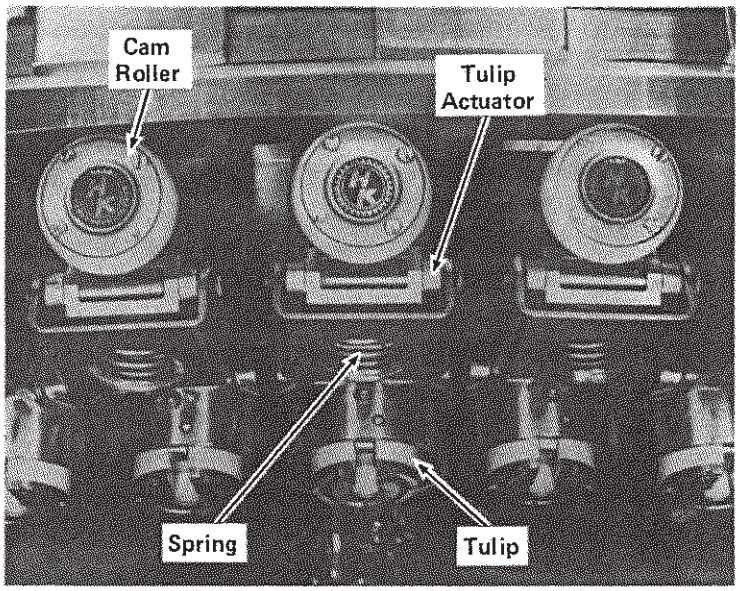
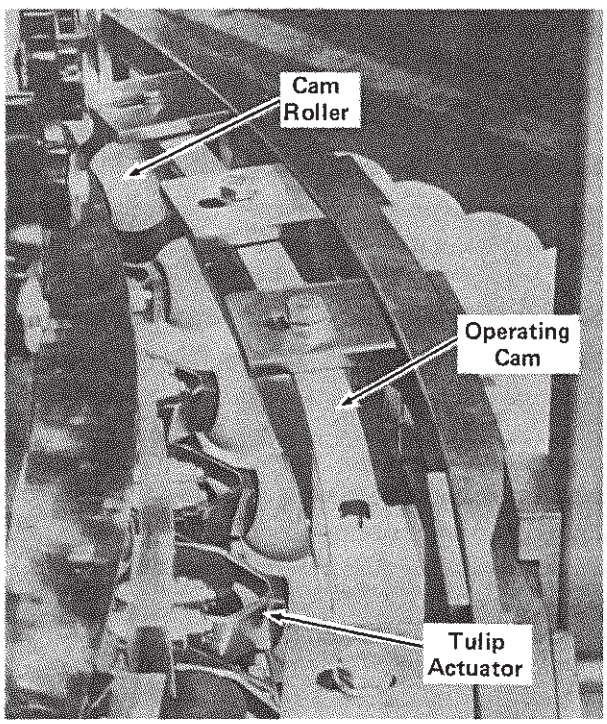


FIGURE 1-5. View of the filling valve tulip mechanism. After the can is placed on the platform, the tulip is lowered onto the can by action of the operating cam. This seals the filling valve to the can and holds the can firmly in position.



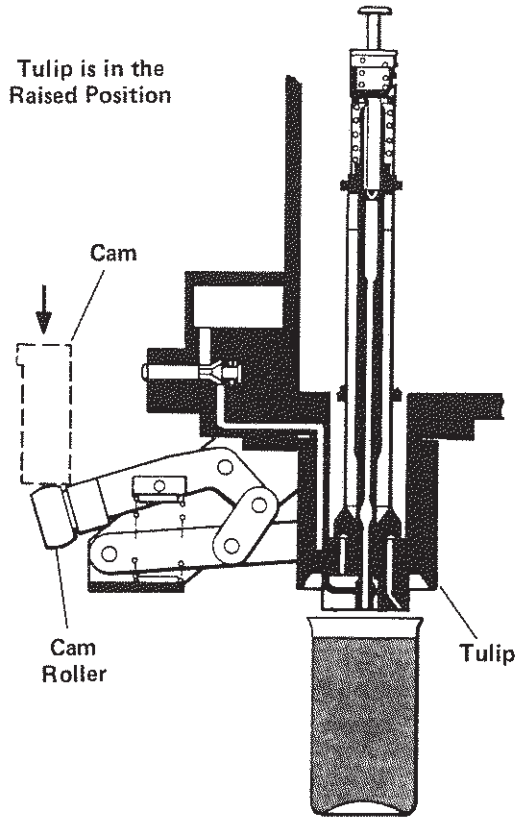
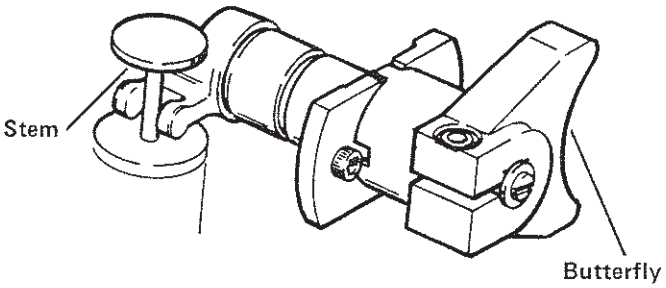
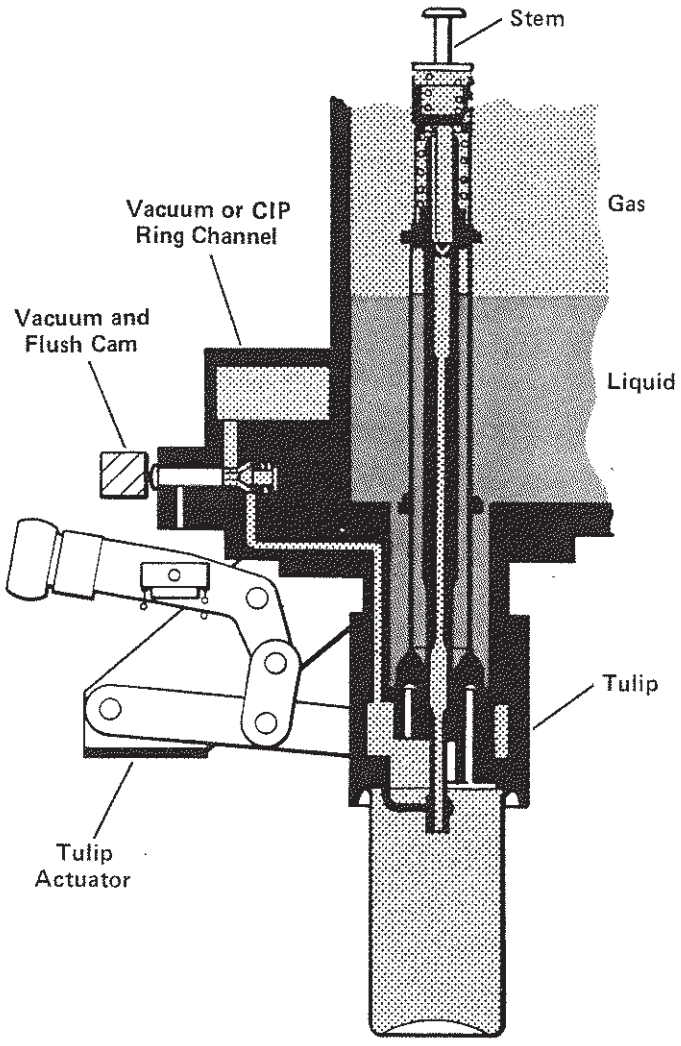


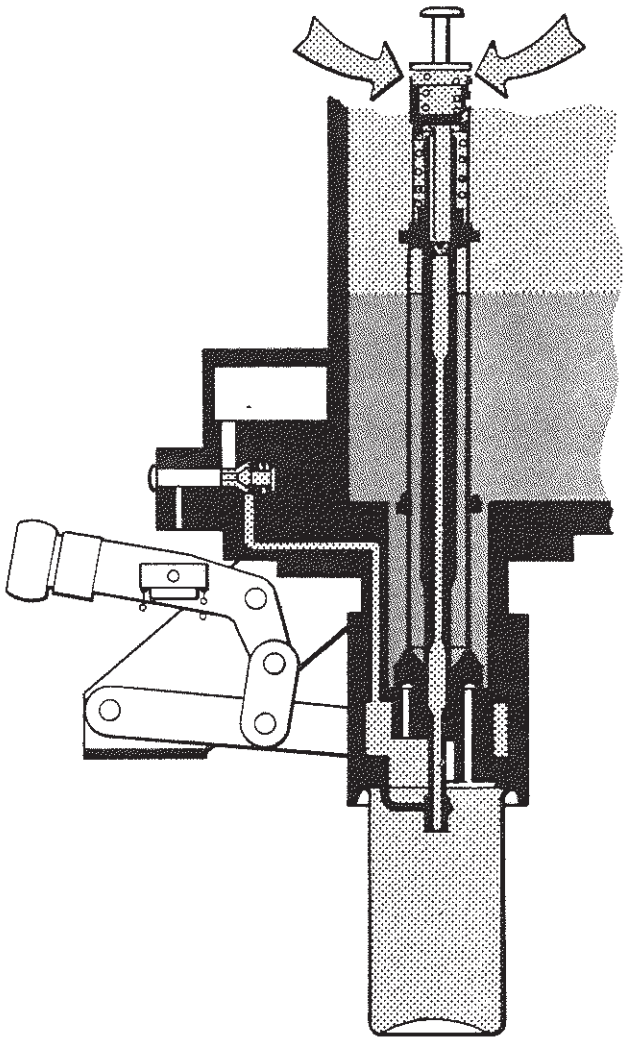
FIGURE 1-6. As the can, on the platform, moves with the filler-bowl away from the infeed, the tulip actuator cam releases the actuator. This allows the tulip to be smoothly lowered onto the can. The cam again causes the tulip to raise at the discharge, which also allows the next empty can to be placed on the platform.

CAN FILLING

OPERATING LEVER TO ACTUATE THE FILLING VALVE: The valve operating lever (BUTTERFLY) reaches the valve needle in the inside of the filler-bowl to open and close the gas (CO_2) needle for applying filler-bowl gas to the can.







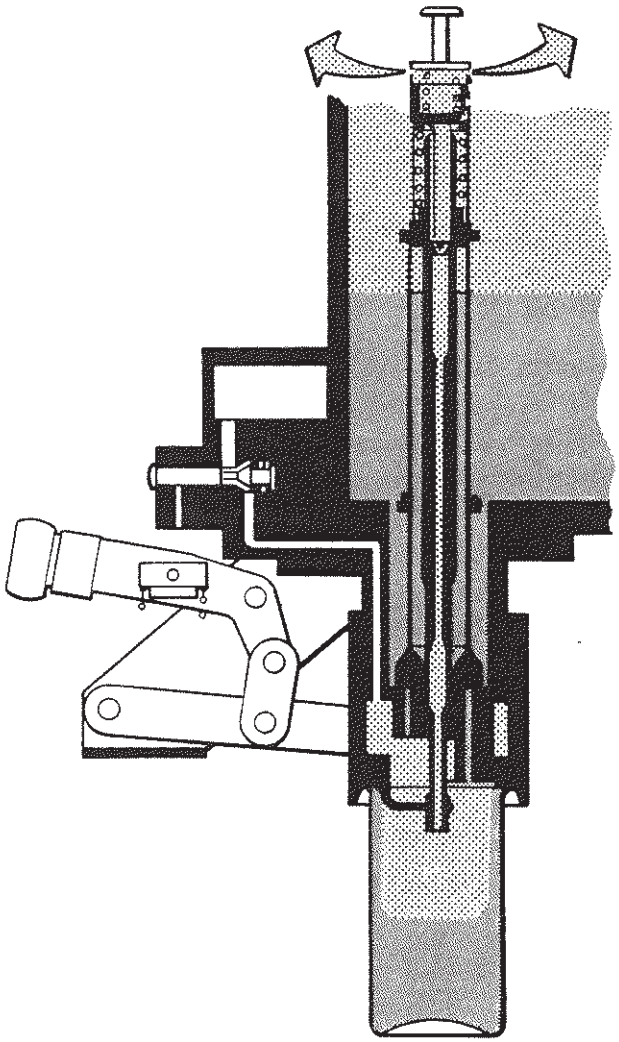
PICTURE 1

1. As the can leaves the infeed star, and the valve tulip is in position on the can, a valve trip opens the valve needle (stem) to allow gas to flow into the can. At the same time the two buttons (CIP-VACUUM and SNIFT) contact the cam, which allows the mixture of gas and air to escape into the CIP-VACUUM channel and to atmosphere.

PICTURE 2

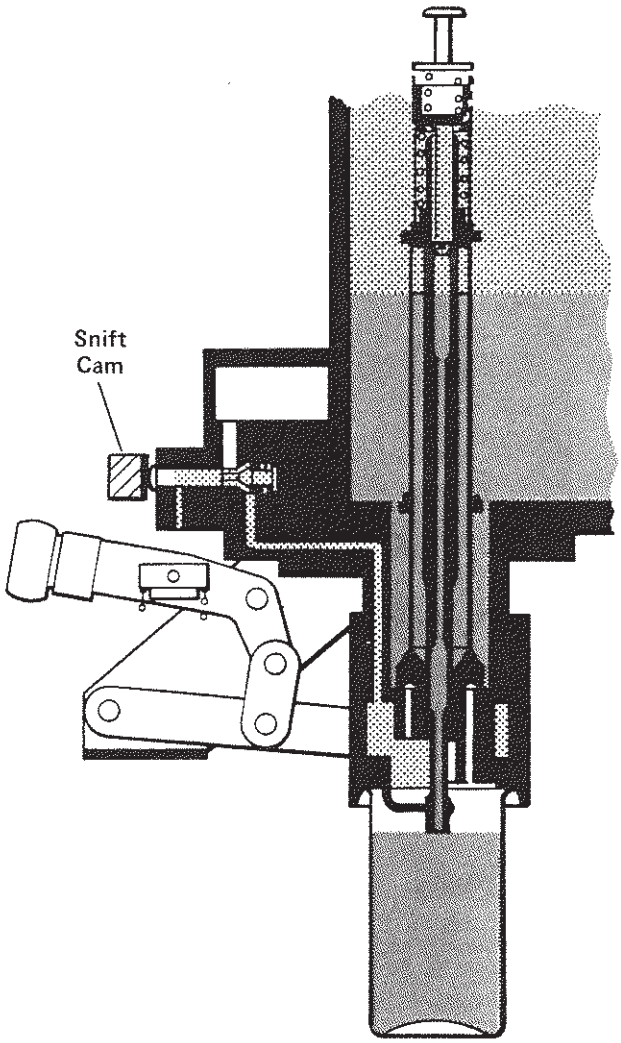
2. After the valve leaves the cam, gas continues to flow into the can until the pressure inside the can equals the gas pressure inside the filler-bowl. This is called charging the can.

FIGURE 1-7. Pictures 1 and 2.



PICTURE 3

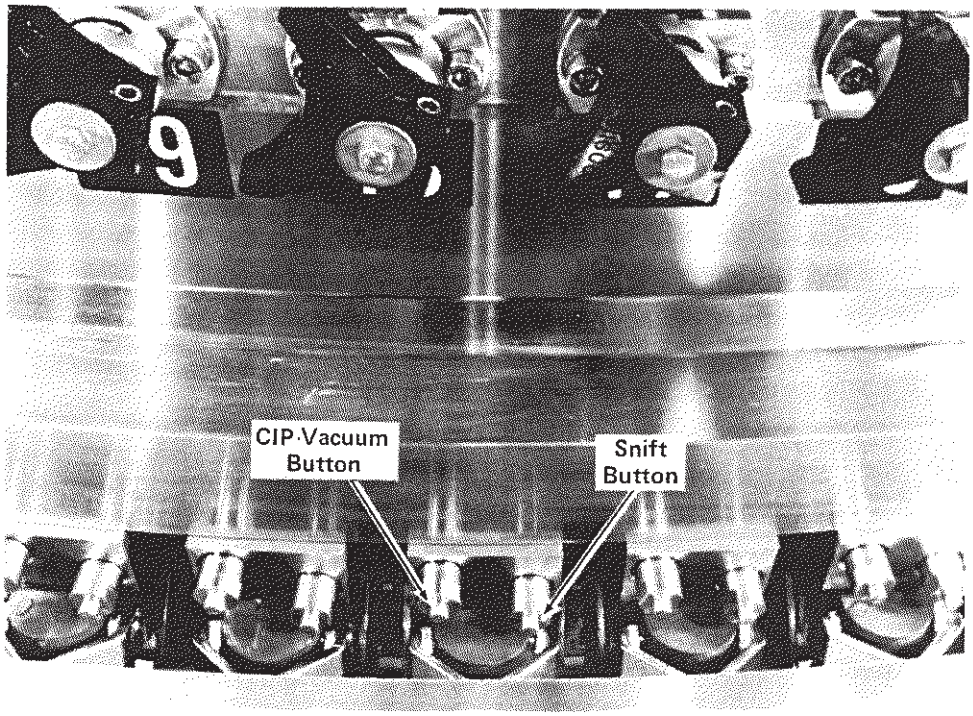
When the pressures are equalized, beverage automatically flows into the can (down the inside wall) under gravity feed. As the liquid enters the can, the displaced gas returns through the vent tube back into the filler-bowl. The filling process stops automatically when the liquid level in the can reaches the vent tube opening, which blocks the return of the gas to the filler-bowl. Thus, the fill height in the can is controlled by the length of the vent tube. The can remains in this condition until the valve reaches the mechanical valve closing cam.



PICTURE 4

After the filling valve is closed, the snift cam contacts the valve snift button to allow controlled release of the pressure in the can before the can discharges.

FIGURE 1-7. Pictures 3 and 4 continued.



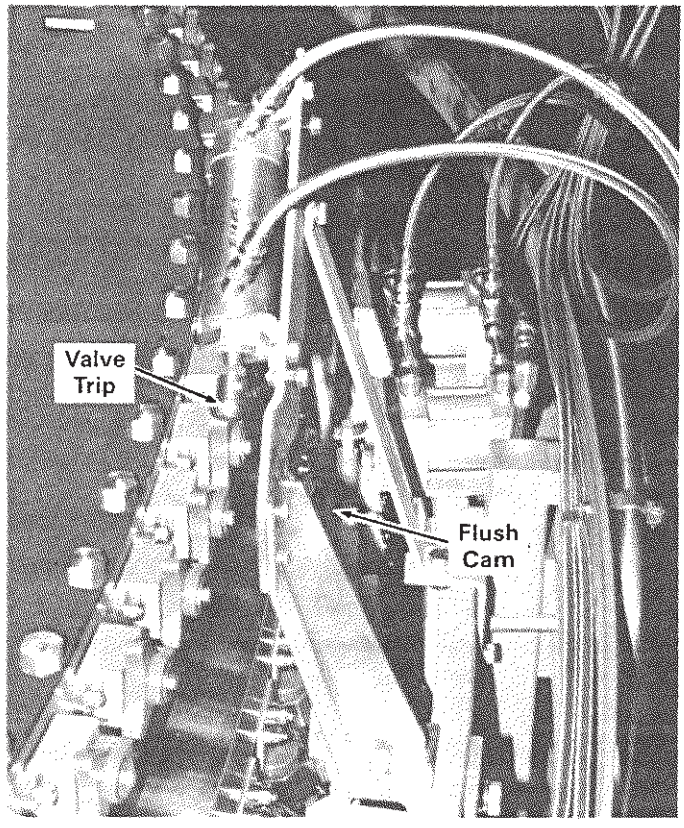


FIGURE 1-8. These pictures show the valve button locations, the valve trip and the flush-cam.

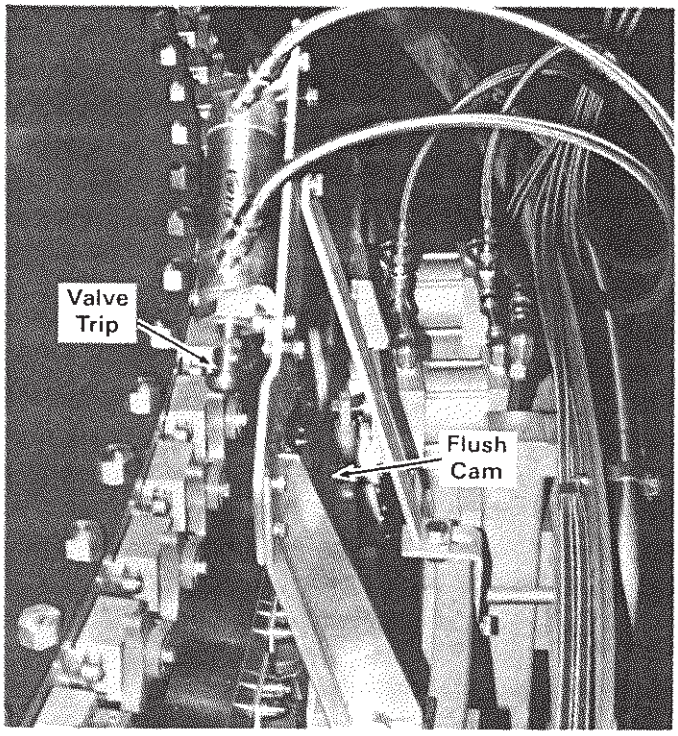


FIGURE 1-9. Top view of the valve trip, which opens the filling-valve just ahead of the flush-cam (vacuum). This valve trip is air operated and is interlocked with a "no can" sensor. If a can is not present on the platform the valve trip will not operate.

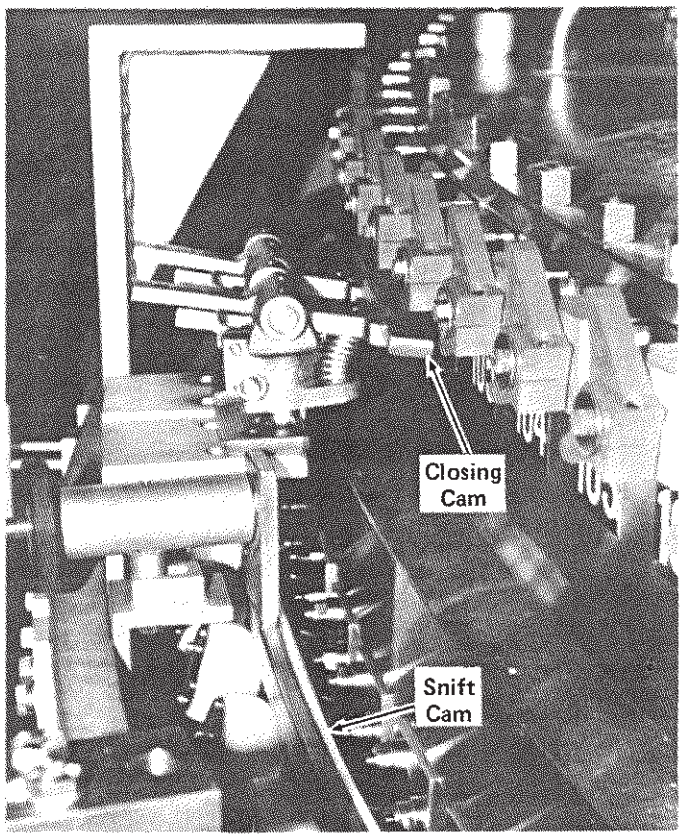


FIGURE 1-10. This is the stationary closing cam, which closes the filling-valve just before the can reaches the snift cam. The location of the snift-cam is such that the filling-valve is held closed by the closing cam when the beginning of the snifting starts. Both cams are located close to the filler-discharge.

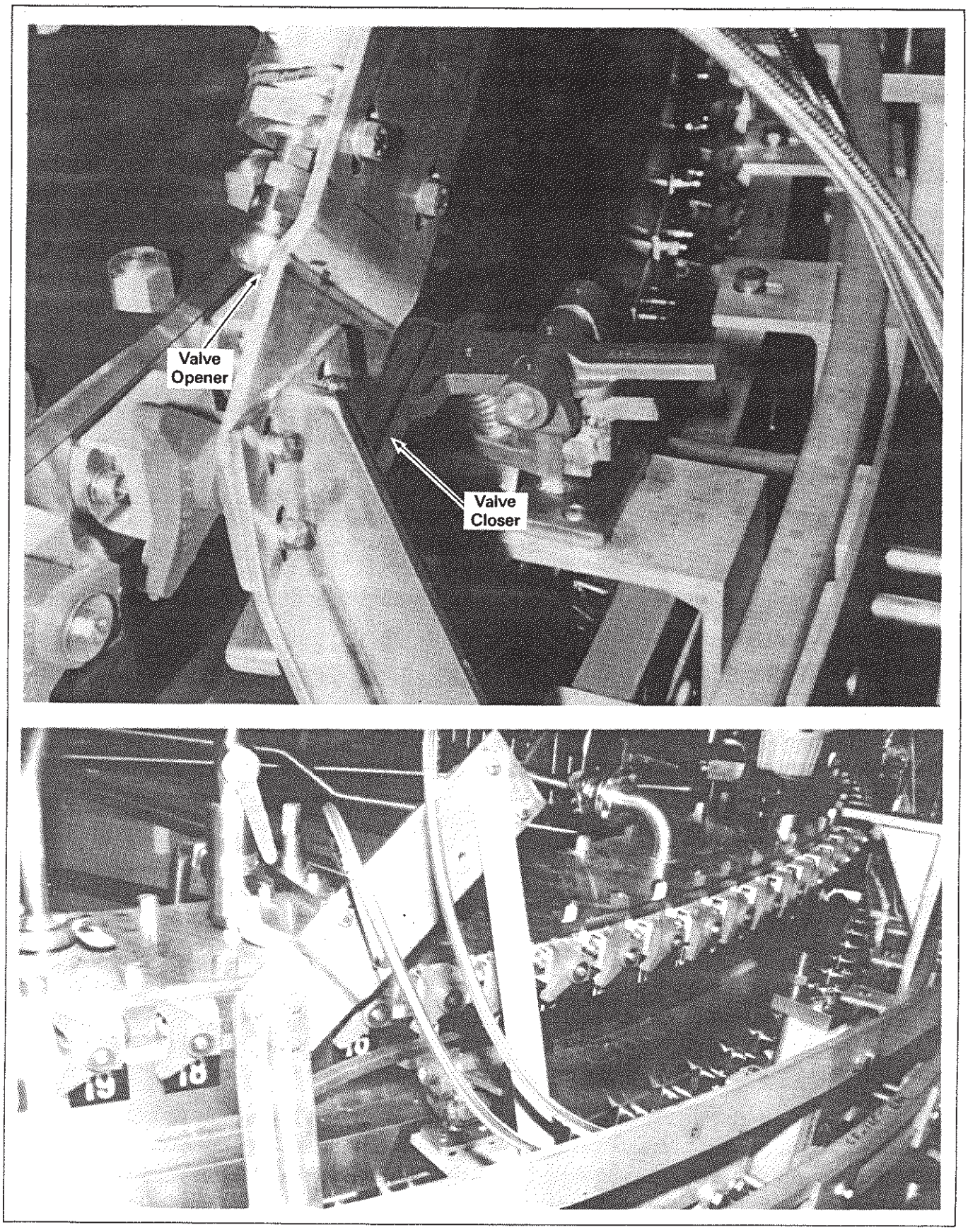


FIGURE 1-11. These pictures show the purge cam (SCAVENGER) used for beer only. It consists of a valve trip and one closing cam.

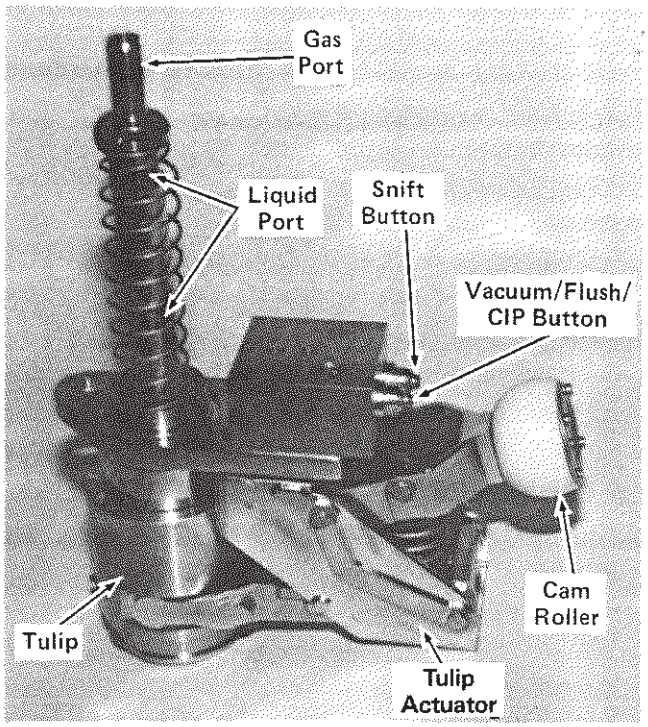


FIGURE 1-12. Filling valve removed from the filler bowl.

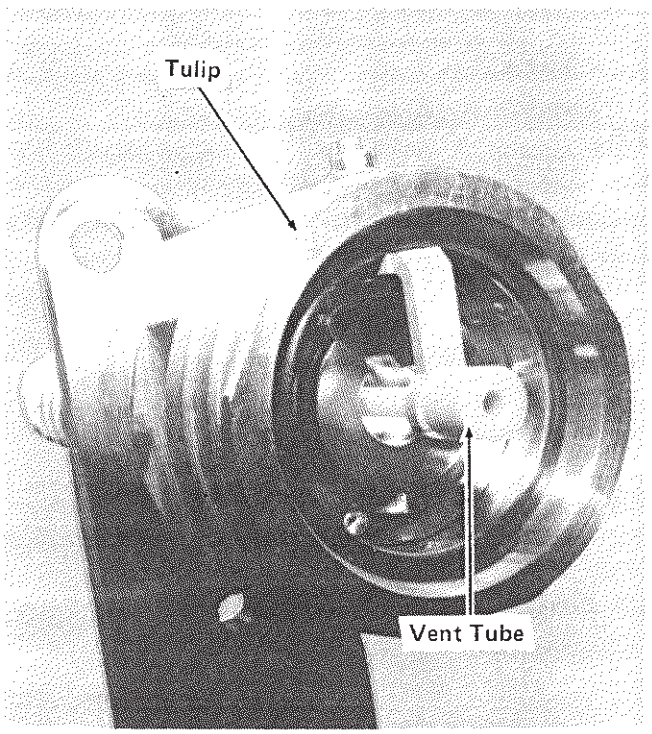


FIGURE 1-13. Bottom view of the filling valve.

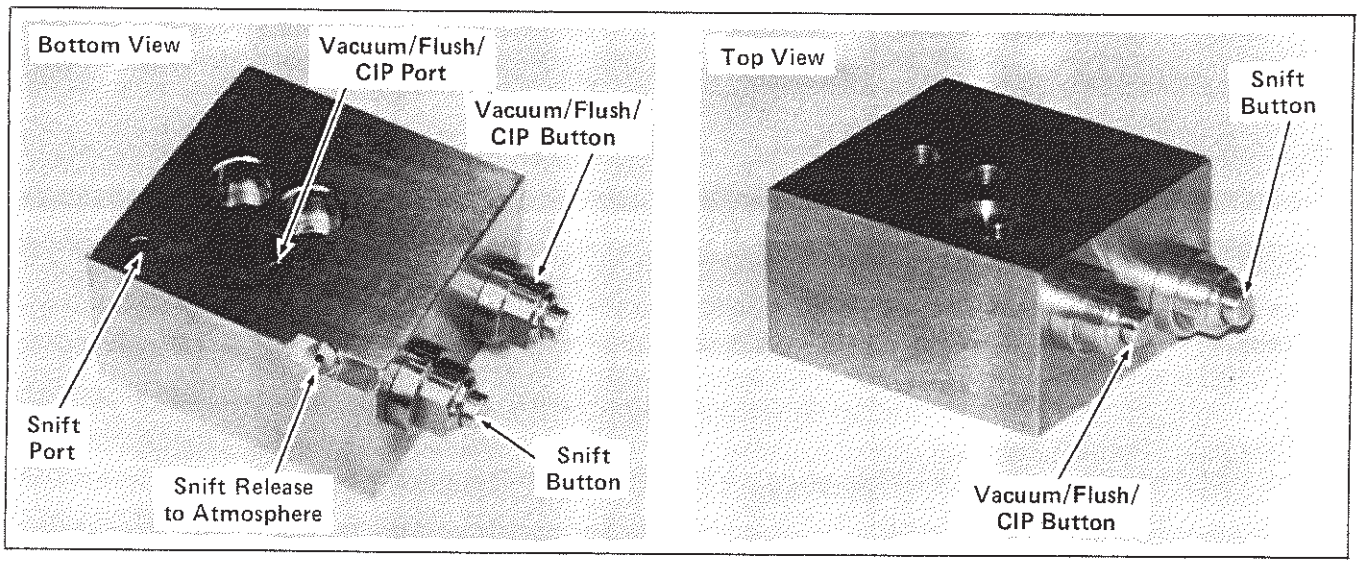


FIGURE 1-14. Control block removed from the filling valve.

CAN FILLING

The can is filled in four basic steps under control of a series of cams mounted on the control-ring around the filler-bowl.

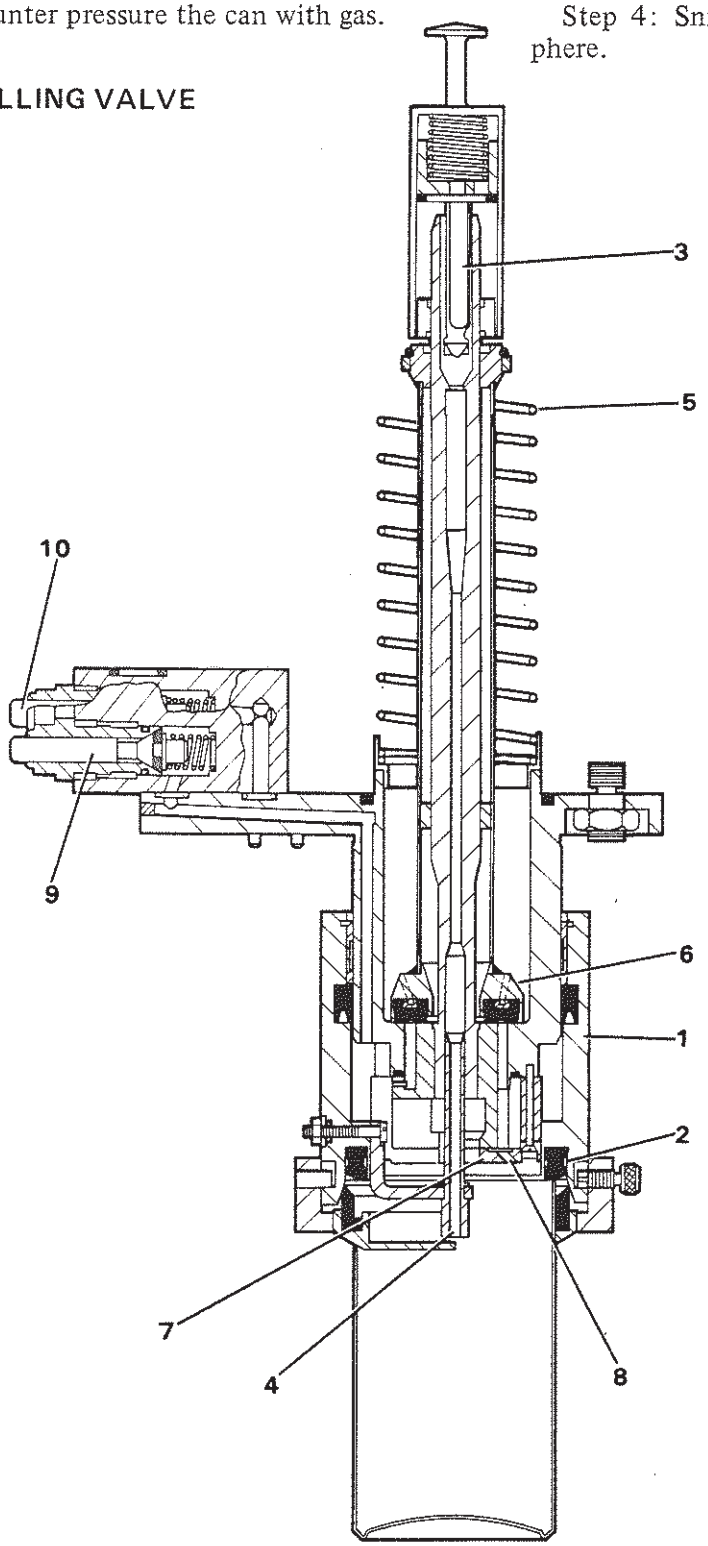
Step 1: Flushing the can with gas.

Step 2: Counter pressure the can with gas.

Step 3: Filling the can with beverage.

Step 4: Snifting the can head space to atmosphere.

CAN FILLING VALVE



OPERATION OF THE FILLING VALVE

Liquid and CO_2 pressure in the filler-bowl keep the filling valve closed. As soon as the can has been brought under the filling valve and sealed by the centering tulip 1, a guide cam presses the CIP (Vacuum) button 10 and snift button 9 to open. The can at this time is being flushed with CO_2 gas to achieve a high CO_2 purity in the can. The valve needle 3 is lifted by the butterfly lever at the same time the two buttons were pressed in. This allows gas from the filler-bowl to enter the can thru the vent-tube. After the two buttons leave the flushing-cam, no gas can escape and the can will pressurize. At this time the spring 5 lifts up the liquid seal 6 and the beverage flows smoothly through the slotted section at the valve outlet and is directed towards the inside wall of the can.

The CO_2 displaced by the beverage flowing into the can is returned to the filler-bowl thru the vent-tube. Filling stops when the beverage reaches the lower edge of the vent-tube. Some liquid rises in the vent-tube due to pressure equalization. This liquid is blown out later by the scavenger. (BEER FILLER ONLY.)

The length of the vent-tube determines the filling level in the can. The ring gap plus a wire mesh screen 8 prevents the can from being overfilled. The liquid valve 6 and the valve needle 3 are closed by the closing cams. The filling valve is kept closed until the can pressure is released by pressing the snift-button 9 on a cam.

The liquid and the CO_2 pressure in the filler-bowl keeps the filling valve closed.

DAMAGED CANS WILL NOT BE FILLED SINCE PRESSURE EQUALIZATION CANNOT TAKE PLACE.

Because of the design of the soft-drink filling valve no blow out is required. (NO SCAVENGER NEEDED.)

Explanation: The liquid, after reaching the lower edge of the vent-tube continues to rise in the vent-tube to a height determined by the height of the liquid level in the filler-bowl. The seal on the valve needle 3 is located so high, that a CO_2 column remains between the elevated liquid and the valve needle seat.

With the mechanical closing of the filling-valve and then snifting of the can the trapped CO_2-gas can expand and drives the liquid into the corresponding can.

It is essential for the operation with this type of filling valve that the liquid level in the filler-bowl stays constant at a predetermined height.

COUNTER PRESSURE CONTROL

The valve trip, when a can is present, automatically opens the valve charging needle by rotating the operating lever (BUTTERFLY) about a quarter turn. The cans are sensed by a proximity switch.

The flushing (purging)-cam which pushes both buttons to open is located directly under the valve-trip. The flushing-cam automatically retracts in case the filler stops with cans. This prevents excessive gas loss and guarantees a constant filler-bowl-level during a stop. At start-up the cam immediately engages for normal fill-conditions.

A neutral cam, located ten valve-pitches after the valve-trip, returns the BUTTERFLY half-way. This allows the valve needle to close in case of a damaged or missing cam.

The spring loaded closing cam closes the filling-valve after completion of the filling process. A snift-cam releases the pressure in the can to atmosphere.

At this point the open and filled can leaves the filler and moves on the transfer to the seamer.

DELTA CF-120 CAN-FILLER FOR BEER ONLY

The vent-tube blow-out control (SCAVENGER) is located at the front of the filler between filler discharge and filler infeed mounted on the control-ring. The vent-tube can be blown out by opening and closing the valve needle briefly.

The DELTA CF-120 CAN-FILLER for carbonated soft-drinks has no need for a vent-tube blow-out control (SCAVENGER).

The product pipe connection is run through the center of the machine where a rotary-seal distributes the product to the filler-bowl. The special seals (packing) do not require extra maintenance. The rotary-seal also has two extra channels for CO_2-gas and CIP-return (Vacuum).

FILLER-BOWL LIQUID LEVEL CONTROL

The liquid level in the filler-bowl is maintained through a pressure control system which balances the flow of liquid into the filler-bowl with liquid leaving the filler-bowl. This allows precise control of the liquid into and out of the filler-bowl. With an empty filler-bowl, gas is continuously exhausted to atmosphere because the gas exhaust float is open. Exhausting of the gas causes the pressure to drop which is sensed by the pressure controller. As pressure drops below the set point of the controller a pneumatic signal causes the beverage control-valve to open. Under this condition liquid will enter the filler-bowl in a controlled way, under pressure.

Liquid entering the filler-bowl raises the gas exhaust float, cutting off the flow of gas leaving the filler-bowl. The liquid, however, will continue to enter the filler-bowl until the pressure controller senses a pressure above its set-point. At this time a signal is sent to close the beverage valve.

Under running condition, liquid flows continuously out of the filling-valves into the cans, the gas exhaust float valve is slightly below cut-off, and the pressure controller holds the beverage valve open. This allows the precise amount of liquid to enter the filler-bowl. Thus, under these conditions, the amount of liquid entering the filler-bowl is balanced with the amount of liquid leaving the filler-bowl.

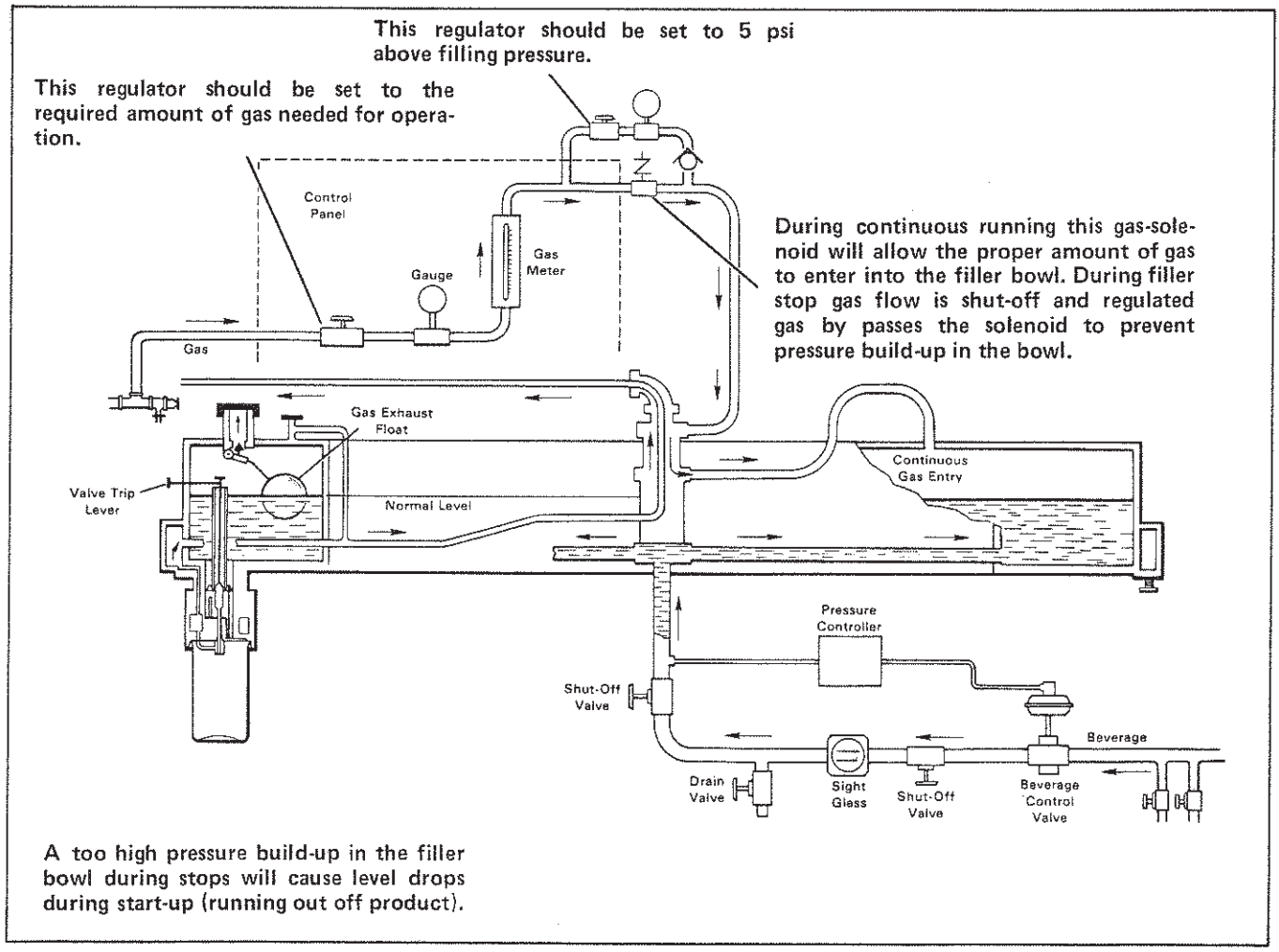
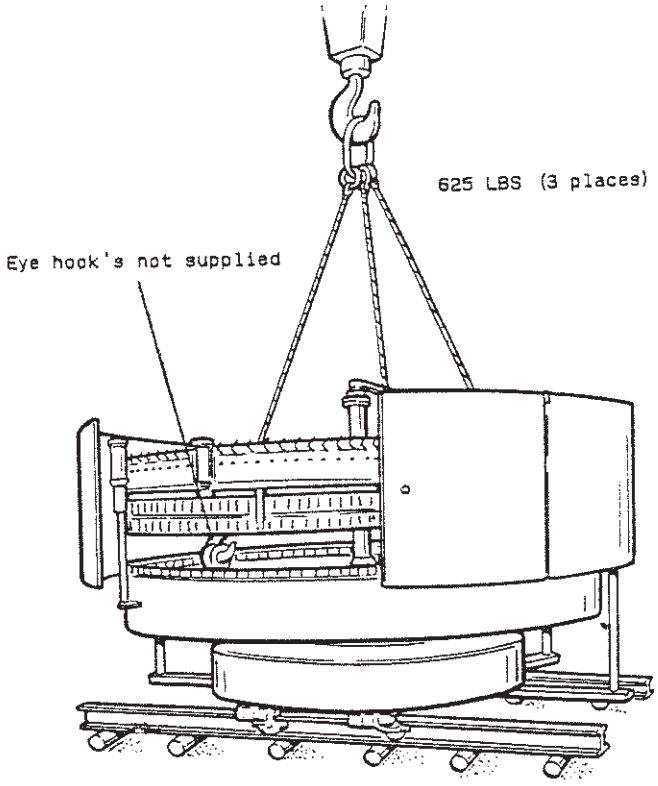


FIGURE 1.15. Bowl liquid level control.

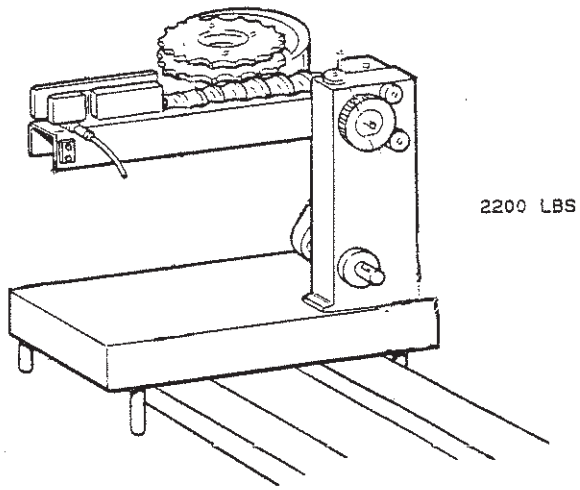
TECHNICAL MACHINE DATA
DELTA CAN-FILLER CF-120

MACHINE WEIGHT	9500 KG	20,950 POUNDS
SHIPPING WEIGHT	10500 KG	23,150 POUNDS
LOAD PER LEG ON THE FLOOR	1700 KG	3,750 POUNDS
LARGEST MACHINE PART SHIPPING		
LENGTH	4400 MM	173 INCHES
WIDTH	4200 MM	165 INCHES
HEIGHT	2220 MM	88 INCHES
WEIGHT	8500 KG	18,740 POUNDS
MINIMUM OPENING IN BUILDING		
WIDTH	4500 MM	177 INCHES
HEIGHT	2320 MM	92 INCHES
PIPE CONNECTIONS		
PRODUCT LINE	100 MM	4 INCH OD
COMPRESSED AIR		3/4 INCH
CO_2		3/4 INCH
WATER		1/2 INCH

TRANSPORT AND INSTALLATION



Picture shows filler hanging from the crane.



Picture shows front table transported by fork lift.

INSTALLATION

The machine should be set up by a skilled H&K service technician. Due to its considerable weight it is not necessary to mount the filler and the seamer onto a common base. Also there is no need to anchor the filler to the floor. The machine consists of two assembly groups, the filler assembly and the front-table. Both parts are connected during installation. Dowel pins will locate the two parts correctly to each other. The filler portion and the front-table should be leveled with a machine-level or a transit.

After leveling the machine all moving parts should be checked for easy movement.

It is not advisable to set up the machine on an asphalt floor as the surface tends to be unstable.

PIPE CONNECTIONS

The necessary pipe connections are shown in the floor-plan drawing of the filler. Connections for CO_2, AIR and WATER are located at the pneumatic control-cabinet. See technical machine data page for pipe sizes of the connections.

The product line connection should include a strainer 20 MESH, a manual shut-off-valve and two drain-valves. The drain-valves should be installed in front and in back of the manual shut-off-valve. A beverage control valve is furnished with the machine and should be located as shown on the floor-plan drawing. Machines with a vacuum-pump need connection from the filler to the pump and a water connection for the sealing water. Machines without vacuum-pump need a pipe connection from the filler to the CIP-System.

ATTENTION

Before any liquid enters the filler-bowl; after installation is completed, break the product line at the closest filler connection and run water for at least 5 minutes to the floor. This will prevent any foreign particles from the pipe connections to enter the filler-bowl and get caught in the screen of the filling-valve.

The product pressure in the beverage pipe to the filler at any given time should not fall below 10 PSI under the saturation pressure of the product. Flow resistance should be given consideration when sizing the pipe connection from the product tank.

Should the filling pressure not reach sufficient height due to the use of low pressure from the product tank, a booster-pump should be installed.

Tank connections should be dimensioned large enough to permit a sufficient product flow in the event of a rapid increase in the throughput rate, normal during start-up.

ELECTRICAL CONNECTIONS

In most installations a separate electrical control cabinet is furnished with the machine. This panel can be mounted away from the machine on a wall in the building. The internal wiring of the machine has no terminals, all the wires are routed from the components and run together to a central box located at the front-table. The wires are of sufficient length to reach to the control-panel location and all wires are numbered for easy identification.

An electrical wiring diagram is attached and located in the inside of the panel.

Upon special request the electrical components can be located in the seamer control-panel.

TEST RUN OF THE FILLER

Check all electrical components for proper functioning. Make sure the machine rotates counter-clockwise.

Make a leakage test by filling up the complete filling system with water under pressure.

Check the can handling equipment for proper sizing and easy passage of the cans.

Make a fill test-run with water.

Clean the filler with 1% CAUSTIC solution. See cleaning instruction.

Determine the vent-tube length by putting real product into the filler-bowl and run cans thru the machine. Cut the vent-tubes close to the desired fill-point and repeat running cans thru the machine. Repeat this procedure until the cans are within the range of specs. Continue to run cans for a longer period for a better statistic and then make a final cut to achieve a quality fill. The filler should operate under normal run conditions while determining the length of the vent-tubes.

Never cut the vent-tubes too short. A new set of vent-tubes would be needed for lowering the fill-point in the can.

CAN CHANGE OVER

Change over from one size can to another size can is done easily. The infeed-worm, infeed-guide and infeed-star apply for only one can-diameter. If the can-diameter changes all three items have to be changed.

The filler-bowl has a height-adjustment. (Motor drive optional.) For different can heights the filler-bowl must be adjusted in height. Rotate the filler-bowl to a position that all 5 carrying assemblies (A) can be attached close to posts at the control-ring.

Loosen all the bolts (B) which clamp the control-ring to the posts. Loosen and remove all holding bolts at the filler bowl supports and the height adjustment gearboxes.

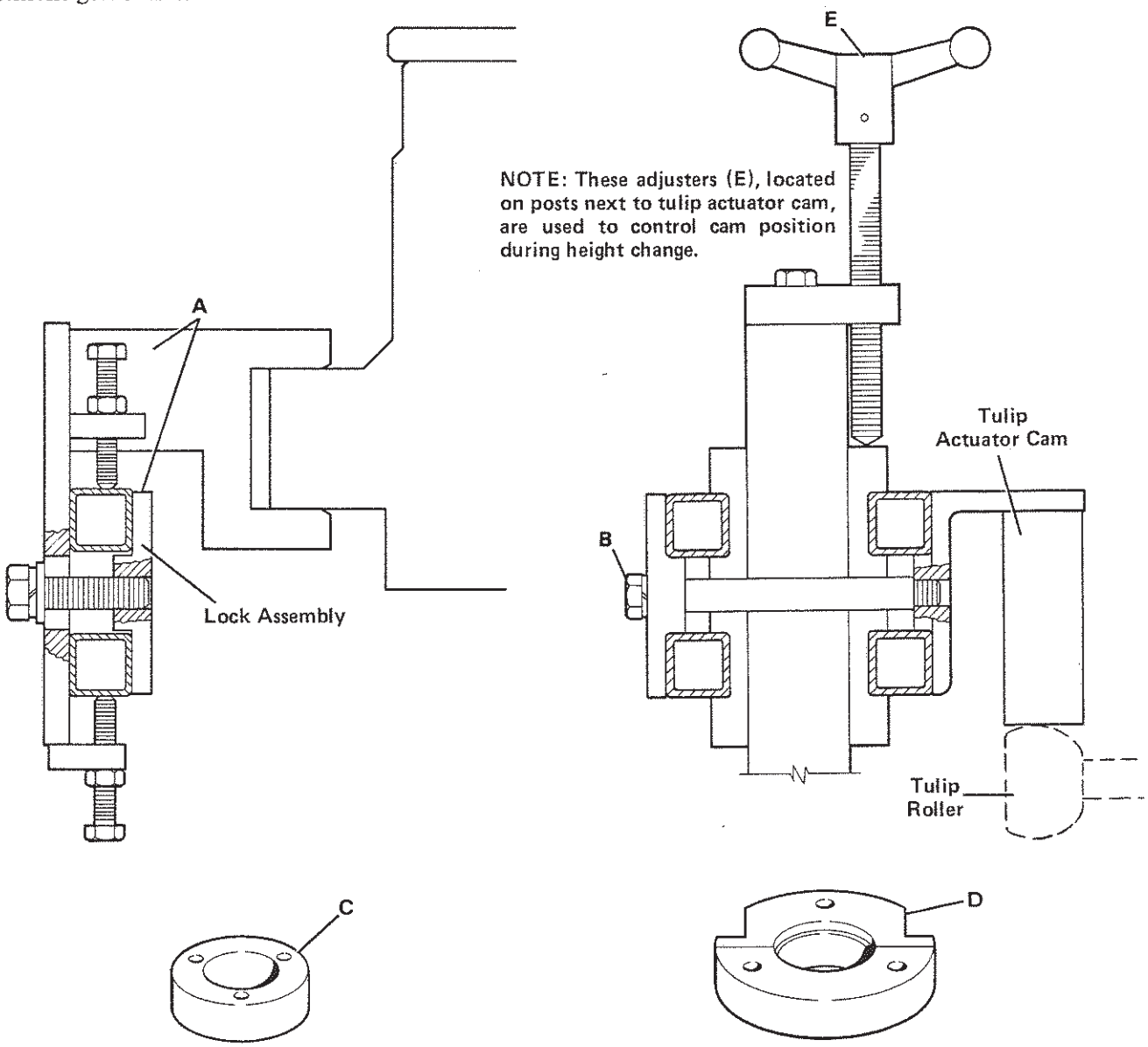
Raise the filler-bowl by using a hand-crank. (Optional motor.) Install the proper spacer (C), 9 required, one for each support and spacer (D), 3 required, one for each height adjustment gearbox.

Lower the filler-bowl until the filler-bowl-support touches the spacer. Now use the corresponding bolts to tighten up the filler-bowl-supports.

All the clamp-screws on the control-ring should be fastened. Remove the 5 carriers (A) from the control-ring.

ATTENTION

NEVER ROTATE THE FILLER WITH THE CARRIERS MOUNTED ON THE CIP-CHANNEL.



PAGE

Operation of Beer-Filler 2-1
Operation of Soft-Drink Filler 2-2
Rinsing and Cooling Down Filler 2-3
Rinsing Procedure Picture 2-4
Prestart 2-5
Prestart Procedure Picture 2-6
Control-Panel Settings (Beer) 2-7
Control-Panel Settings (Soft-Drink) 2-8
CIP Filler-Bowl Preparation 2-9
CIP Procedure Picture 2-10

OPERATION

Operation of the DELTA CF-120 VALVE CAN-FILLER for BEER-FILLING is shown in the following illustration.

1. PRESSURE CONTROLLER. The pressure controller senses the filler-bowl pressure and adjusts the opening of an air operated beverage valve to maintain a constant liquid level in the filler-bowl.

2. VACUUM GAUGE. Connected to the vacuum-pipe crossing the filler-bowl.

3. VACUUM PUMP WATER PRESSURE GAUGE. This gauge shows the pressure of the sealing water for the vacuum-pump.

4. AIR PRESSURE GAUGE. Used to read air pressure for the valve-trip and control cams.

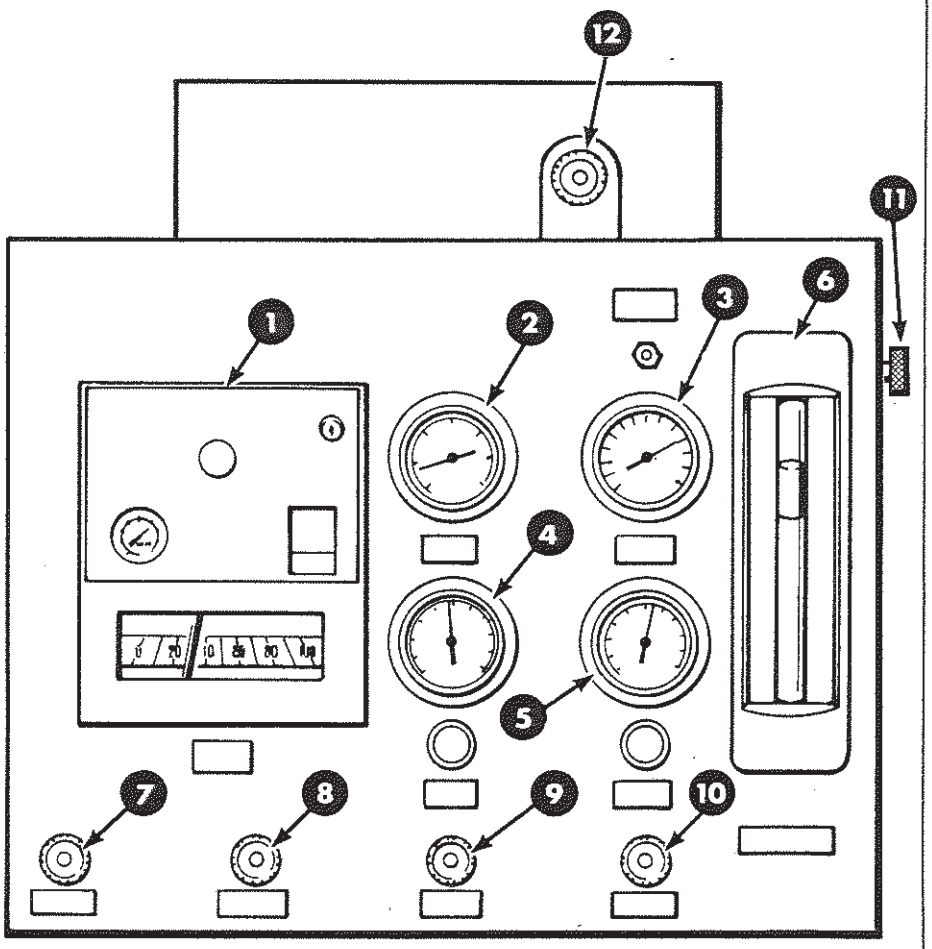
5. GAS COUNTER PRESSURE REGULATOR, GAUGE AND SHUT-OFF VALVE. These are used to adjust, check and turn on the flow of gas to the filler-bowl.

6. GAS FLOW METER. Indicates the amount of gas flowing to the filler-bowl.

7. CONTROL-AIR VALVE. Supplies filtered air to the pressure controller.

8. COMPRESSED AIR SUPPLY TO FILLER CONTROLS.

9. COMPRESSED MAIN AIR SUPPLY.



10. Gas (CO_2) SUPPLY. Main gas supply shut-off valve.

11. CLEANING VALVE. This valve is open for sanitizing to clean the gas line from the panel to the filler-bowl. During running this valve must stay closed.

12. GAS (CO_2) BYPASS. This regulator should be set 5 PSI above the filling pressure. During continuous running a solenoid valve in the main gas supply line to the filler-bowl is open for unrestricted gas supply. At a filler stop, the gas flow is shut off and regulated gas passes through the regulator (12) to prevent a high pressure build-up in the filler-bowl.

FIGURE 2-1.

OPERATION

Operation of the DELTA CF-120 VALVE CAN-FILLER for SOFT-DRINK-FILLING is shown in the following illustration.

1. PRESSURE CONTROLLER. The pressure controller senses the filler-bowl pressure and adjusts the opening of an air operated beverage valve to maintain a constant liquid level in the filler-bowl.

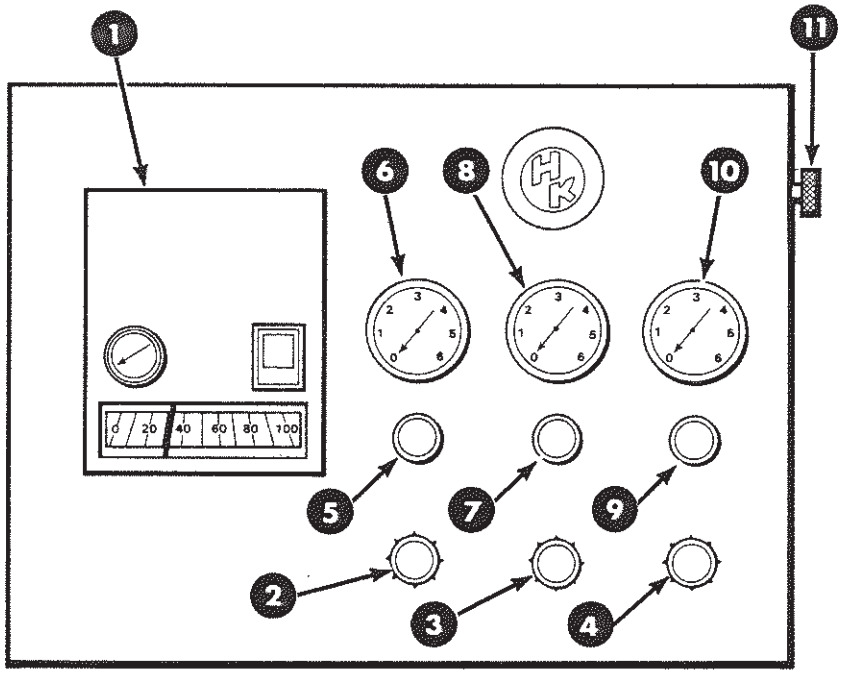
2. COMPRESSED MAIN AIR SUPPLY. Main air supply cut-off valve. (Must be open during normal run condition.)

3. CLEANING VALVE. Permits cleaning solution to flush thru product sensing line. (Must be closed in normal run condition.)

4. GAS (CO_2) SUPPLY. Main gas supply shut-off valve. (Must be open during normal run condition.)

5. AIR PRESSURE ADJUST. Air regulator set for pneumatic controls on filler, (can-stop, valve trip, etc.).

6. AIR PRESSURE GAUGE. Used to read air pressure for the valve-trip and control cams. (Set to 30 PSI.)



7. GAS (CO_2) BY-PASS. This regulator should be set 5 PSI above the filling pressure. During continuous running a solenoid in the main gas supply line to the filler-bowl is open for unrestricted gas supply. At filler stop the gas flow is shut off and regulated gas passes through the regulator (7) to prevent a high pressure build-up in the filler-bowl.

8. GAS (CO_2) BY-PASS GAUGE. Pressure set by by-pass regulator (7).

9. GAS (CO_2) COUNTER PRESSURE REGULATOR. High pressure gas, utilized when in the run mode. Set to required pressure, usually between 10 to 25 PSI above filling pressure.

10. GAS (CO_2) PRESSURE GAUGE. Pressure reading set by regulator (9).

11. CLEANING VALVE. This valve is open for sanitizing to clean the gas line from the panel to the filler-bowl. During running, this valve must stay closed.

FIGURE 2-2.

RINSING OR COOLING DOWN FILLER-BOWL

1. Open the CIP-valves at the top of the filler-bowl. There are three or five CIP-valves depending on the type of filler.

2. Turn the CIP-knob on the exhaust-float assembly clockwise until it stops. This will keep the float-needle from seating against the teflon orifice. Close the vent cap (black cap) to prevent water from running out of the float. Make sure CIP-valve connected to the exhaust-float is open to allow water to flow back to the center column.

3. On machines with a vacuum-pump open the by-pass valve at the vacuum-pump to protect the pump.

4. Open up the eight drain valves (5) in the CIP-channel around the filler-bowl.

5. Open the cold water supply to the filler.

6. Start the cold water flow. Permit the water to enter the filler-bowl and emerge through the top of the filler-bowl at the valves and run to waste.

7. Start rotating the filler.

NOTE

While cooling down the filler-bowl, cleaning out the filler-bowl, or sterilizing the filler-bowl, the machine should rotate at a slow speed.

8. After the cooling down, rinsing process is completed, stop the filler, close all the CIP-valves on top of the filler-bowl, and close all the drain-valves around the CIP-channel.

9. Close manual valve (9) in the supply-line to the filler. After the manual valve (9) is closed, observe the indicated water pressure at the pressure controller in the control-panel. When the pointer shows "0", disconnect the quick-disconnects from the cleaning ports and reconnect them to the running ports.

10. Turn the CIP-knob on the exhaust float counter-clockwise until it stops. This will allow the float needle to seat itself against the teflon orifice. Close the CIP-valve connected to the exhaust float. The black vent-cap should remain closed until the operator is ready to bring product into the filler-bowl.

11. The main supply valves located in the control-panel should be open at this time. (Air, Gas, CO_2). A second gas valve on the panel should also be opened, thereby permitting the gas to pass through the flow-meter (BEER FILLER ONLY) and into the filler-bowl. Soft-drink fillers are not equipped with a CO_2 flow-meter.

12. Open drain-valve (15) to permit water from the filler-bowl to flow to waste. The water will be forcibly pushed out of the filler-bowl by the incoming gas. The drain-valve should remain open until all traces of water have disappeared from the filler-bowl.

13. BEER FILLER ONLY. After all water has been removed from the filler-bowl, the valve at the suction of the vacuum-pump (4) should be changed to the opposite position. Now the pump will draw vacuum from the vacuum-channel (CIP-channel) of the filler-bowl and exhaust air to the atmosphere.

NOTE

This procedure is also used at the end of the operating day to clean out the filler-bowl and remove all traces of product. Keep the water running to waste until the water is clear of all traces of product.

14. Set the gas regulator (3) 5 PSI higher than the filling pressure in the filler-bowl during production. Solenoid (10) opens when the can-stop opens. Set regulator (11) 10 to 25 PSI higher than the filling pressure under running conditions.

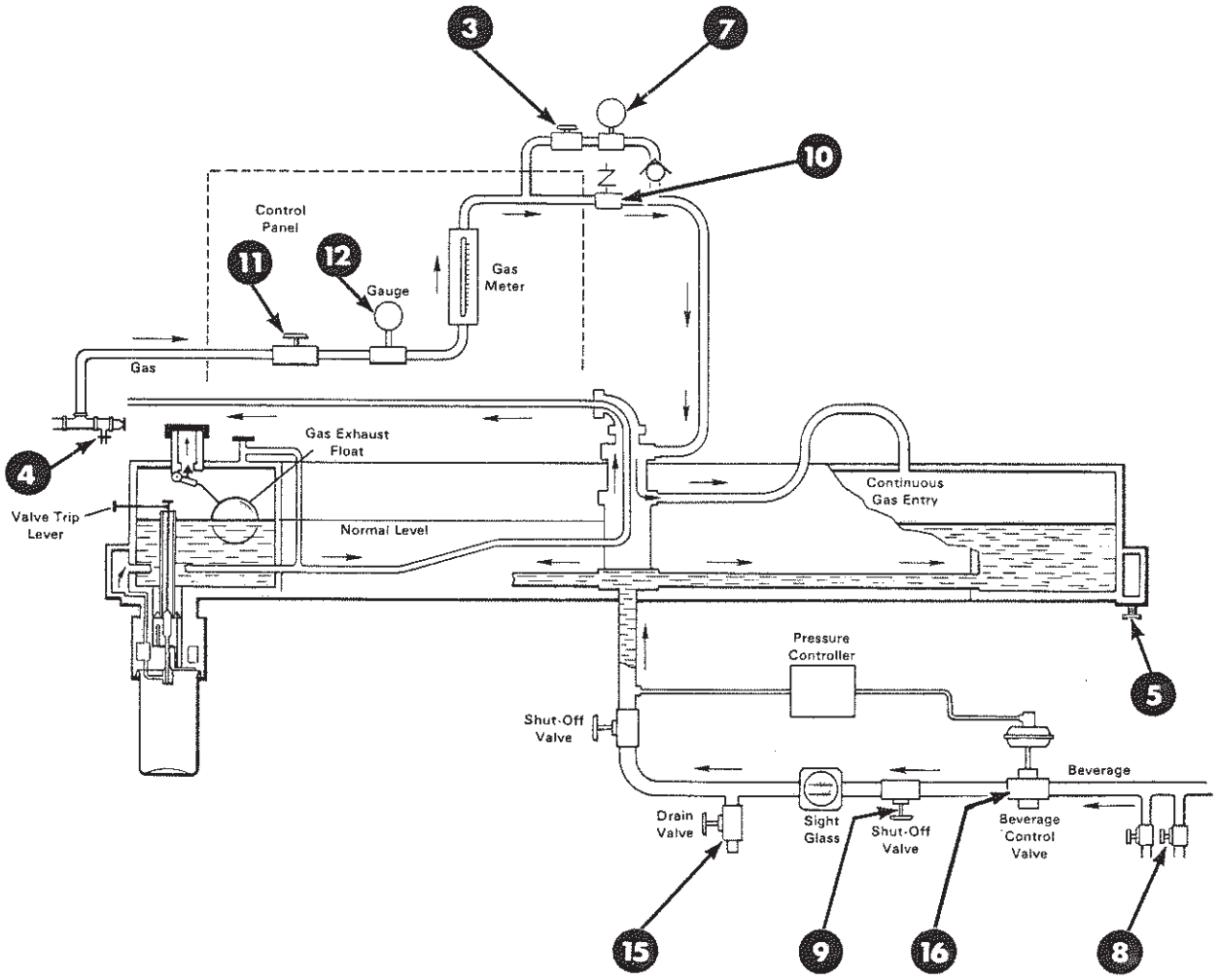


FIGURE 2-3. Rinsing procedure.

PRESTART

1. After all traces of water from the cool-down-cycle is pushed out of the filler-bowl through the drain valve (1), close the drain valve (1).

2. Make sure the gas and air valves at the pneumatic control panel are open.

3. BEER-FILLER ONLY. Start the vacuum-pump motor.

4. BEER-FILLER ONLY. Make sure the water gauge in the pneumatic control panel indicates that the water line for the sealing-water is open. Gauge must read between 0 and 6 PSI pressure.

5. Set the liquid pressure controller (2) set point to its operating position. The controller is located in the pneumatic control-panel.

6. Keep the cap on the exhaust float closed. This prevents gas from escaping out of the filler-bowl.

7. Start the machine and allow the filler to rotate.

8. Open and close the drain valve (1) several times until only a fine mist of water and gas discharges. This assures all the water is drained out of the filler-bowl.

9. At this time the filler-bowl gas-pressure should be above the set point at the pressure controller (2). The beverage control valve (16) is now closed. Now the manual beverage valve (10) should be opened and no beverage will enter the filler-bowl.

10. Open the cap at the gas exhaust float valve to allow the filler-bowl pressure to drop. As the filler-bowl pressure drops below the set point, the beverage control valve will automatically open. This allows the beverage to flow into the filler-bowl without foam.

11. The rising beverage level in the filler-bowl will lift up the exhaust float and close off the orifice. Pressure will build up above the set point, and the beverage control valve closes.

START-UP

1. Verify that the discharge conveyor is operating.

2. Verify that a sufficient supply of cans is available at the filler infeed conveyor.

3. Be sure the filling line is ready to resume production.

4. Set the can-stop switch to the AUTO position.

5. Turn the valve trip selector switch to the AUTO position.

6. Turn the flushing cam selector switch to the AUTO position.

7. Press the START button to put the machine in operation.

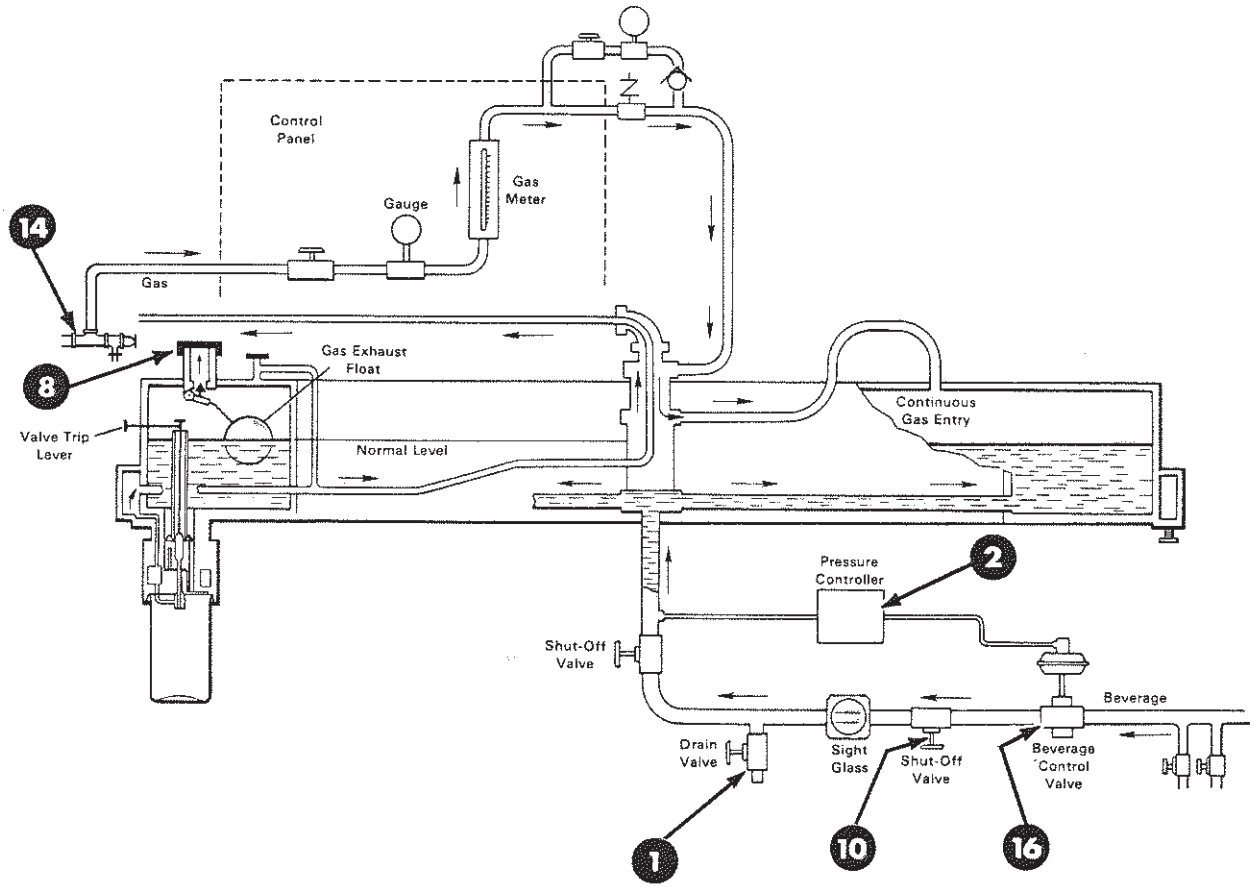
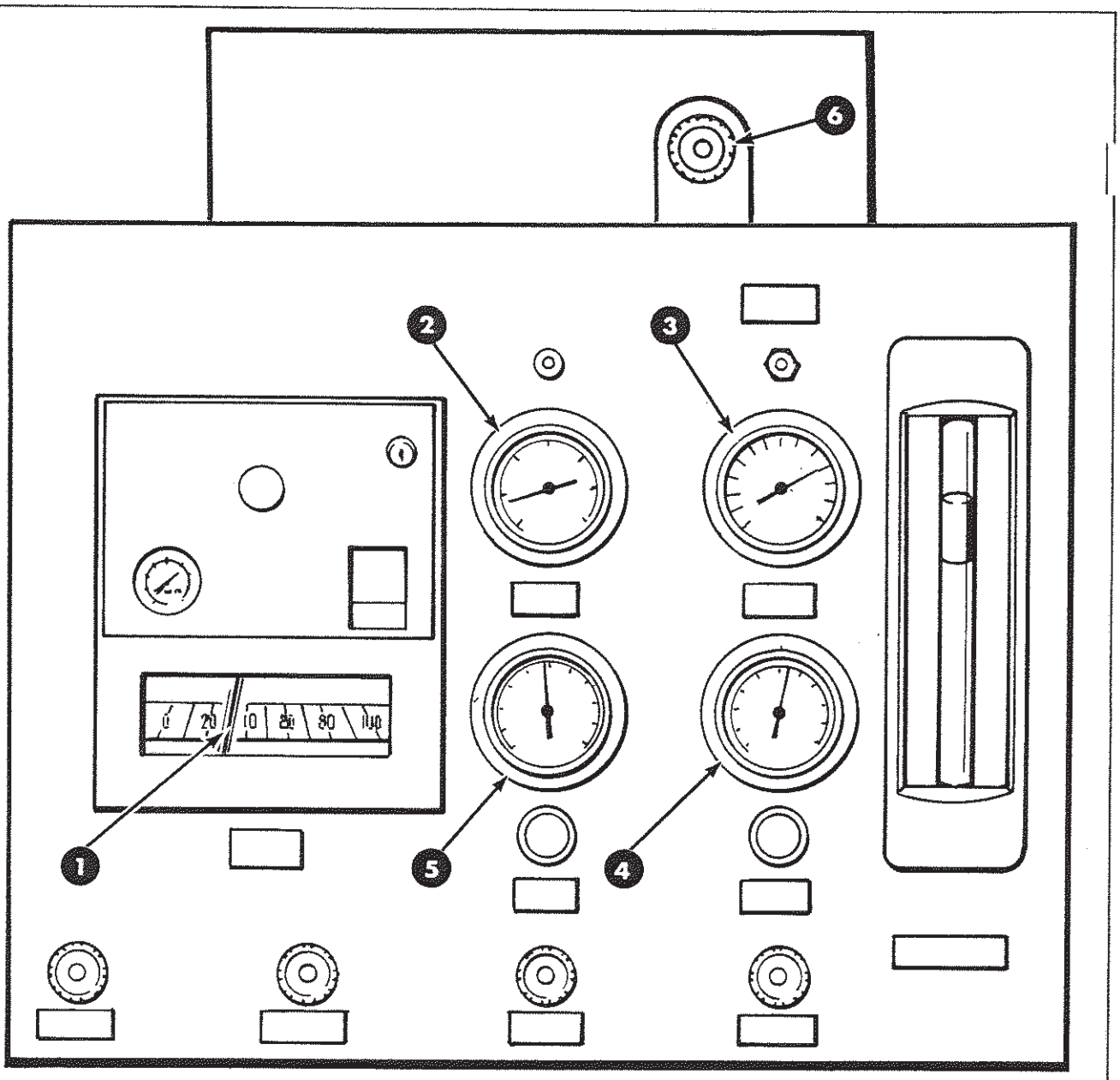


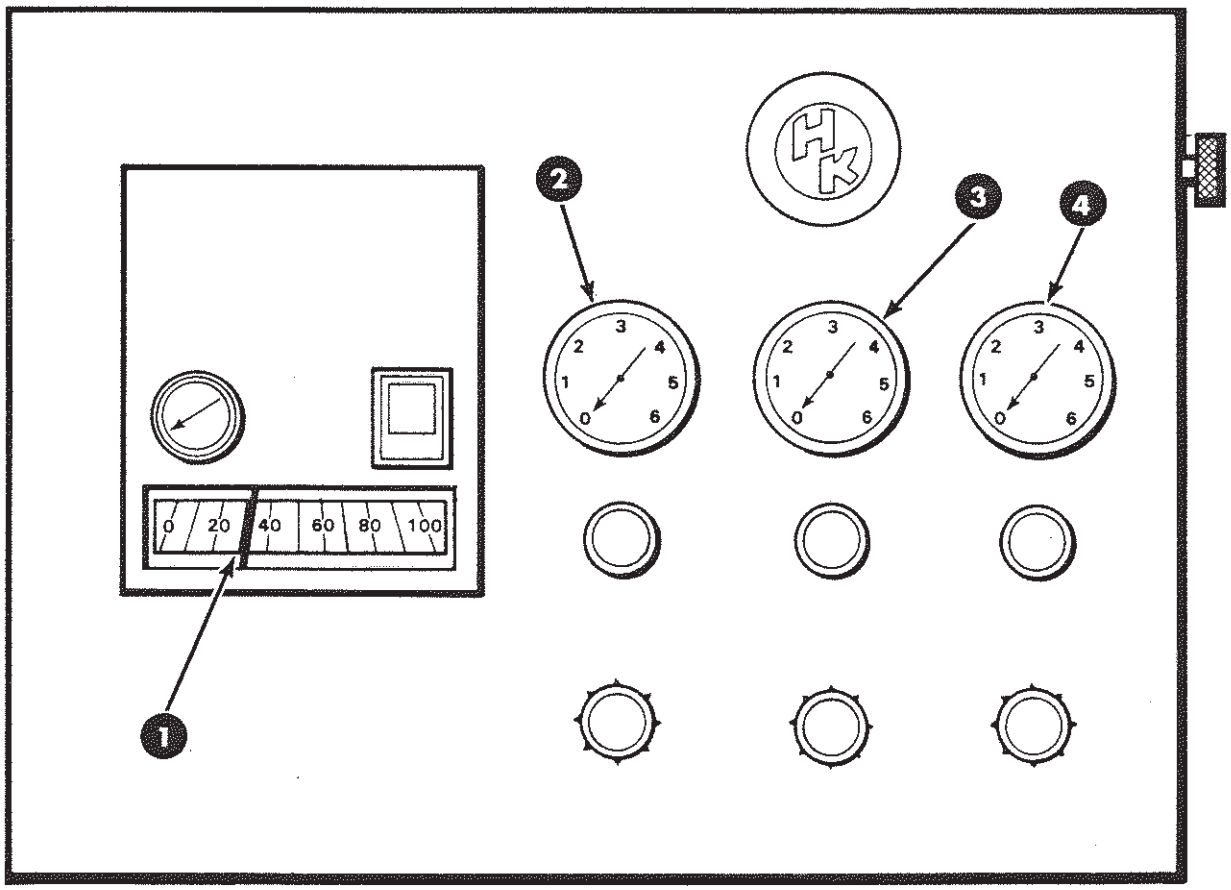
FIGURE 2-4. Prestart and start-up procedures.



1. Liquid pressure is at its set point.
2. Vacuum gauge is at ≈10 inches Hg.
3. Vacuum pump water pressure is between 0 and 6 psi.
4. Gas supply pressure should be 10 to 25 psi above beverage pressure when the filler is running with cans.
5. Counter pressure trip pressure is 30 psi.
6. CO_2 by-pass should be 5 psi above liquid pressure set point.

[BEER MACHINE ONLY.]

FIGURE 2-5. Run condition.



1. Liquid pressure is at its set point.
2. Counter pressure trip pressure is 30 psi.
3. CO_2 by-pass set 5 psi above set point.
4. Gas supply pressure should be 10 to 15 psi above beverage pressure when the filler is running with cans.

[SODA MACHINE ONLY.]

FIGURE 2-6. Run condition.

CIP-FILLER-BOWL PREPARATION

1. After production, rinse out the filler-bowl thoroughly by following the rinsing or cooling down steps described earlier in this manual.

A. Open the CIP-valves at the top of the filler-bowl. There are three or five CIP-valves depending on the type of filler.

B. Turn the CIP-knob on the exhaust-float assembly clockwise until it stops. This will keep the float-needle from seating against the teflon orifice. Close the vent cap (black cap) to prevent water from running our of the float. Make sure CIP-valve connected to the exhaust-float is open to allow water to flow back to the center column.

C. On machines with a vacuum-pump open the by-pass valve at the vacuum-pump to protect the pump.

D. Open up the eight drain valves (5) in the CIP-channel around the filler-bowl.

E. Open the cold water supply to the filler.

F. Start the cold water flow. Permit the water to enter the filler-bowl and emerge at the top of the filler-bowl through the cleaning valves and run to waste.

G. Start rotating the filler.

NOTE

While cooling down the filler-bowl, cleaning out the filler-bowl, or sterilizing the filler-bowl, the machine should rotate at a slow speed.

2. After the water appears to be free of beverage mix, stop the filler and start installing the CIP-ADAPTERS.

3. Disengage all valve (BUTTERFLY) closing-cams.

4. Move all cleaning cams in back of the filler into place. (According to filler size there are 1 to 3 cleaning cams.)

5. Keep flushing cam and snift cam in running position.

6. Close the four drain valves in the CIP channel around the filler-bowl.

7. Set the pressure controller in the pneumatic control-panel to manual position. This will keep the beverage control-valve open.

8. The CIP-solution should enter the filler-bowl through the beverage supply line. The return line coming from the center rotary seal crossing the filler-bowl should be connected to a cleaning tank for recirculation of the solution.

9. For hot water sterilization, the filler-bowl temperature, should be maintained at 185 degree F for twenty minutes.

10. During the CIP-mode the valve trip should be engaged to open all the filling-valves. The snift of each filling-valve is automatically cleaned as the filling-valve passes by the snift-cam.

11. CLEANING WITH CAUSTIC SOLUTION. A 1% caustic solution is recommended for periodic cleaning of the filler-bowl. The caustic solution at 185 degree F is a very effective way to clean the filler-bowl.

The concentrated caustic, being liquid, is either added to the circulating hot water or is prepared in a solution tank and then fed to the system. In case a large enough solution tank is used the caustic solution can be stored for reuse.

After keeping the filler-bowl at a temperature of 185 degree F for 20 minutes, the system must be rinsed with hot water until all residues of the caustic solution are washed off.

12. PLEASE NOTE. Upon completion of the CIP-process the CIP-ADAPTERS can be left attached to the filling-valves until the next production starts. A final rinse however must take place before start-up.

COLD STERILIZATION

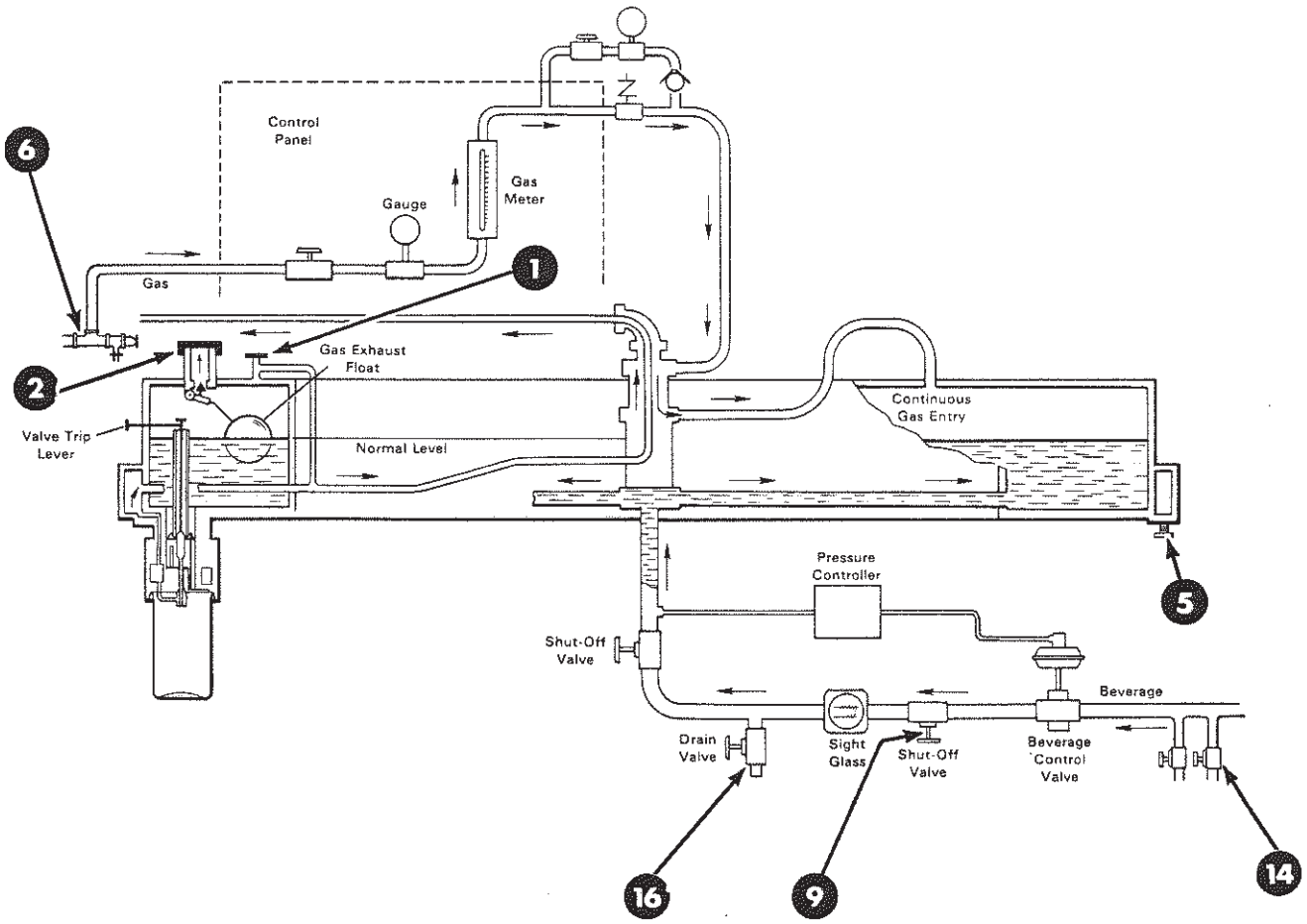
1. Cold sterilization can be carried out with the customary **neutral** agents. Follow the same steps as in the CIP procedure.

2. After sterilization the filler-bowl must be rinsed thoroughly. Halogenous sterilization agents should be used with extreme caution, as high quality stainless steel may get pitted by these agents.

The supplier should be required to certify that the agents used are generally recognized as safe for the use with stainless steel.

NOTE

Prior to the actual cleaning operation (CIP) it is recommended to flush the filler-bowl with fresh water immediately after production stop. By actuating the valve-trip to open the filling-valves water will flush through the filling-valves to the floor. This should be done several times during flush-out. Keeping the filling-valves open at all times would require too much water. Make sure no more product is mixed with the water before going into the recirculating mode.



ATTENTION

During CIP with cleaning cap adapters the pressure in bowl can not exceed 25 psi. (Tulip actuators will get damaged with higher pressure.)

Keep filler running in slow speed and open filling valves with valve trip. Disengage closing cams so filling valves will stay open to prevent hydraulic action in the tulip. (Hydraulic action will damage the tulip actuators.)

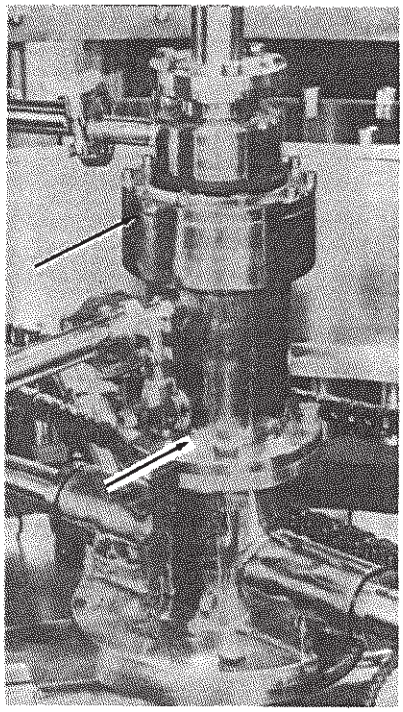
PAGE

Lubrication **3-1**

Lubrication Drive Gears 3-2
Preventive Maintenance Infeed 3-3
Preventive Maintenance Infeed 3-4
Preventive Maintenance Platform & Tulips 3-5
Preventive Maintenance Cam Controls 3-6
Preventive Maintenance Valve Tulip Actuator 3-7
Preventive Maintenance Cams & Valve Trips 3-8
Preventive Maintenance & Mechanical Maintenance 3-9
Filling Valve Installation 3-10
Cleaning Cam & Snift Cam Adjustment 3-11

LUBRICATION

There are a number of areas of concern in lubricating the filler. These, along with the recommended frequency and lubricant type, are illustrated below.



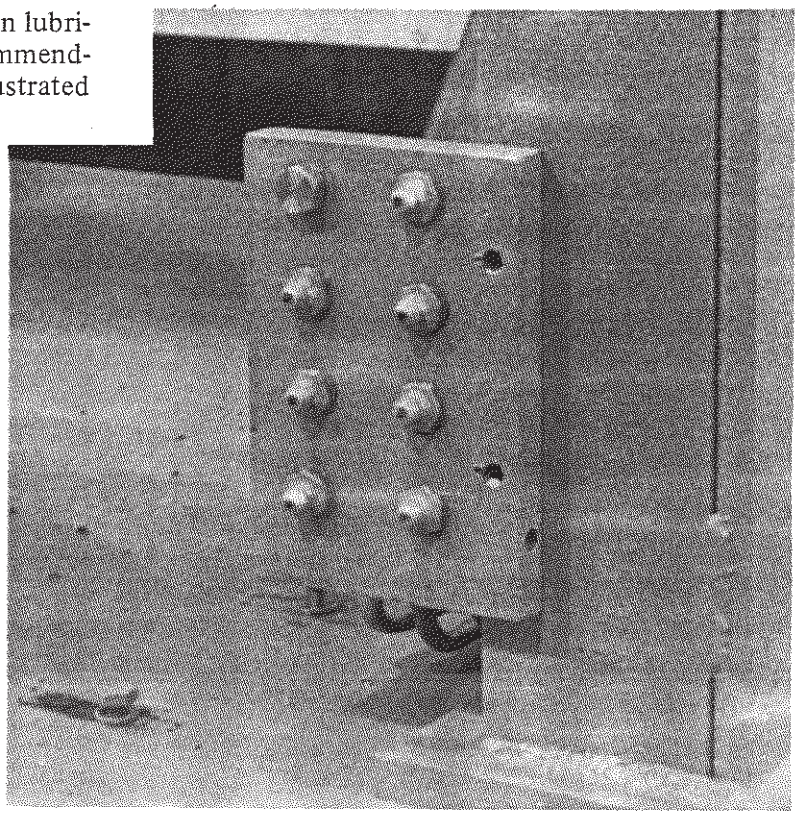


FIGURE 3-1. Grease center column bearings every 4 weeks and grease fittings located at the infeed of the machine once each shift.

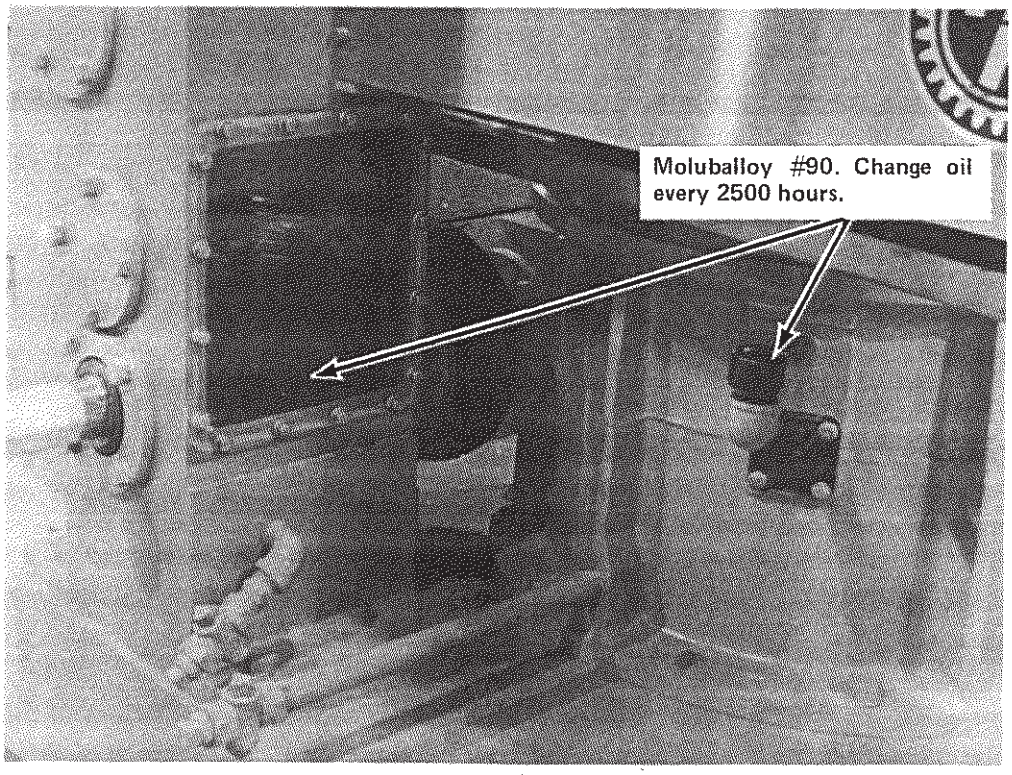
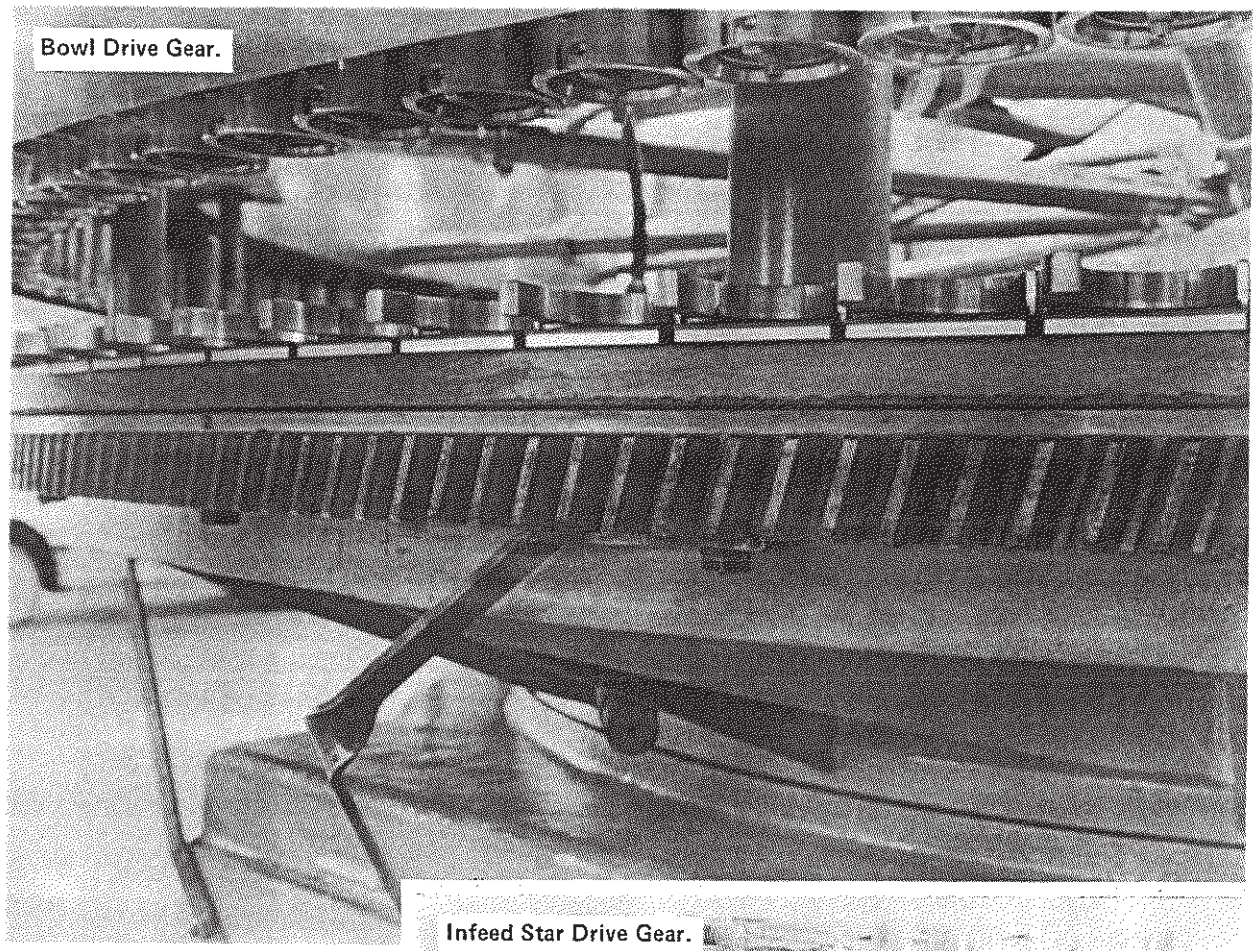
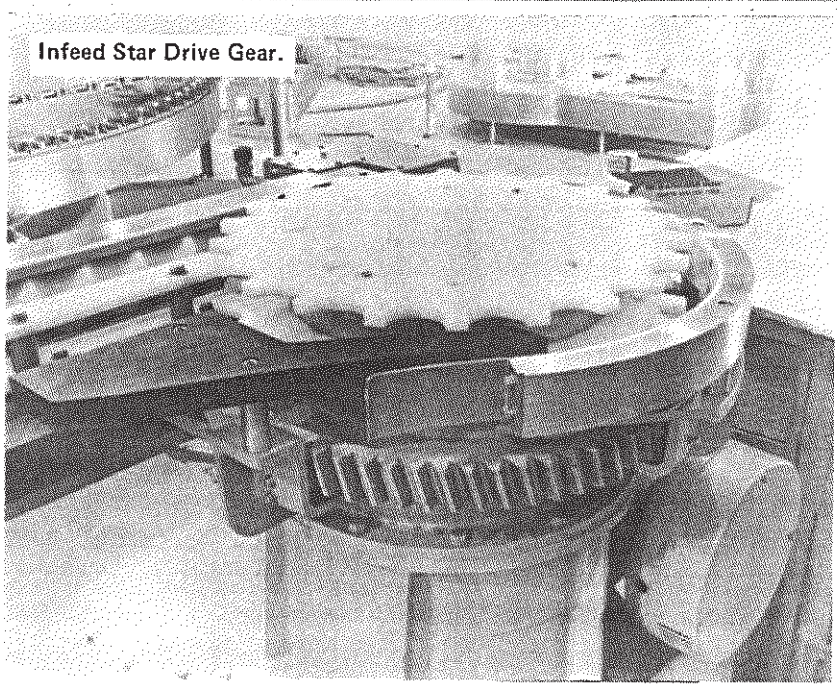


FIGURE 3-2. Gearbox lubrication points.





Brush with grease every 120 hours.

FIGURE 3-3. Both drive gears are hand lubricated.

PREVENTIVE MAINTENANCE

As is the case with any precision, high-production machine, it is important to periodically check the machine for wear, alignment, or out-of-tolerance conditions. The following examples and illustrations are offered as a suggested check list which should be included in the scheduled maintenance program.

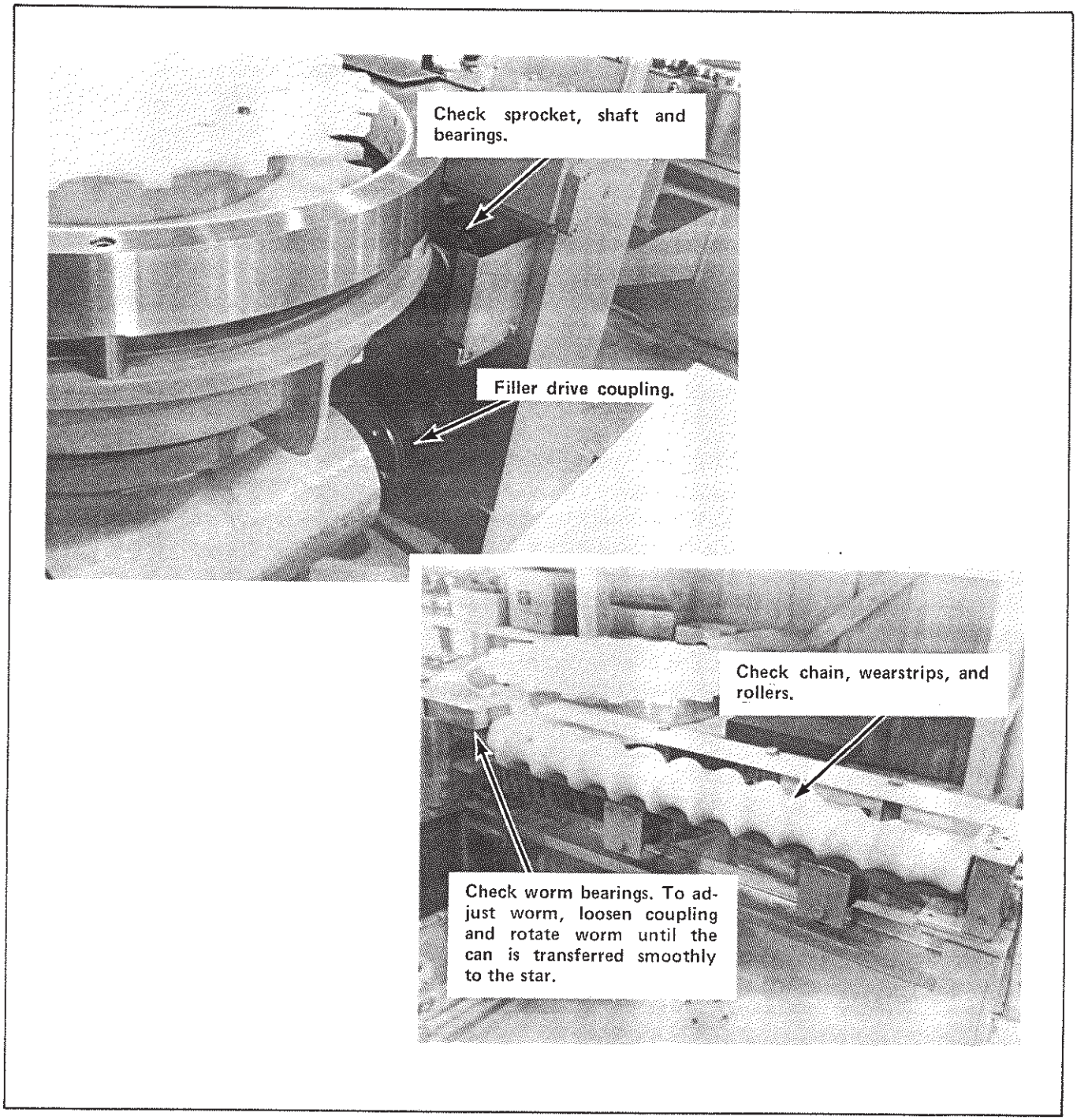
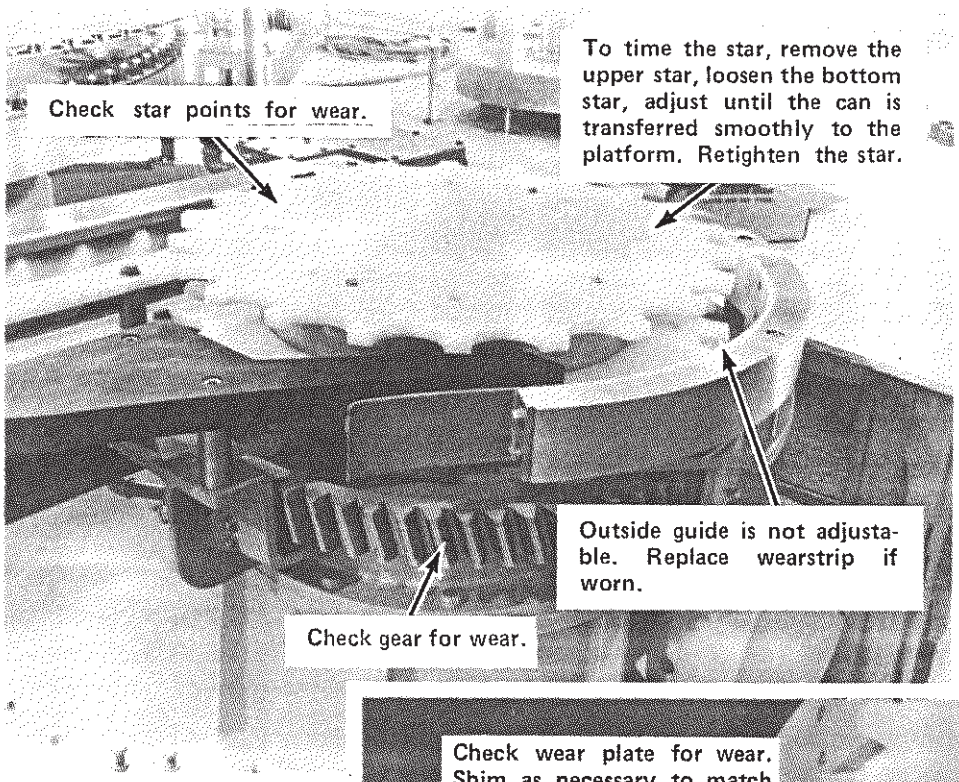
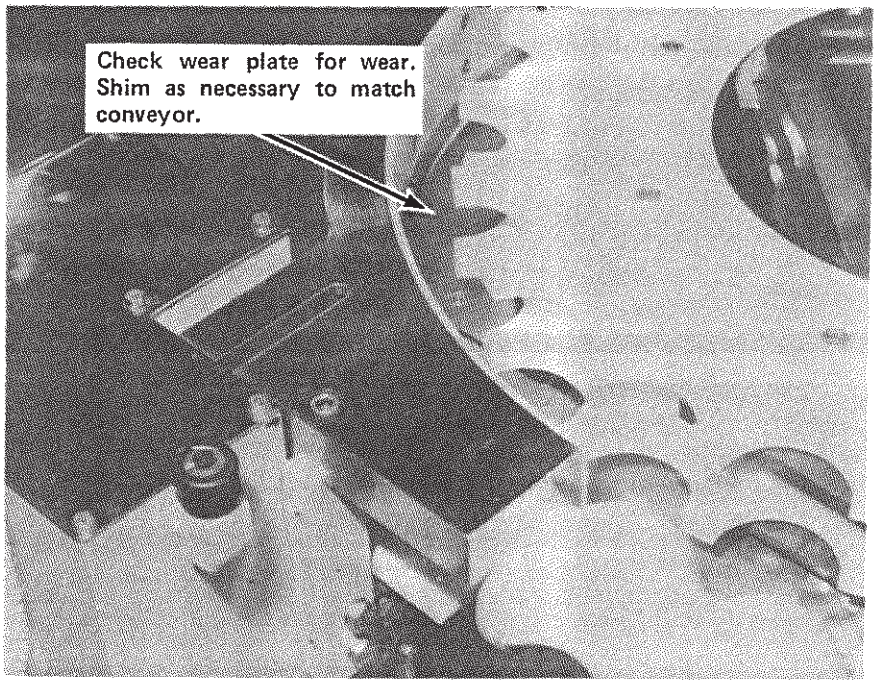


FIGURE 3-4. Infeed section.

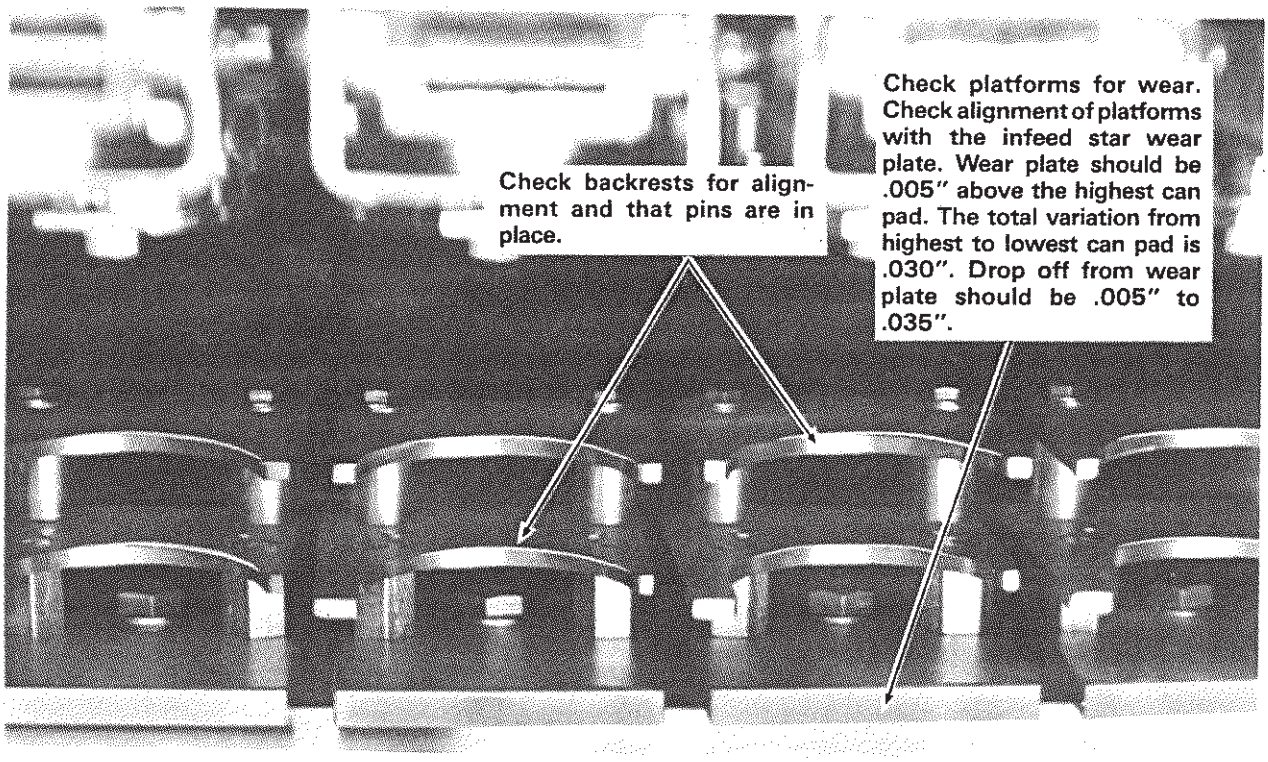




To time the infeed section, proceed as follows:

1. Time the star to the can platform on the filler bowl.
2. Time the infeed worm to the star.

FIGURE 3-4. Infeed section (Continued).



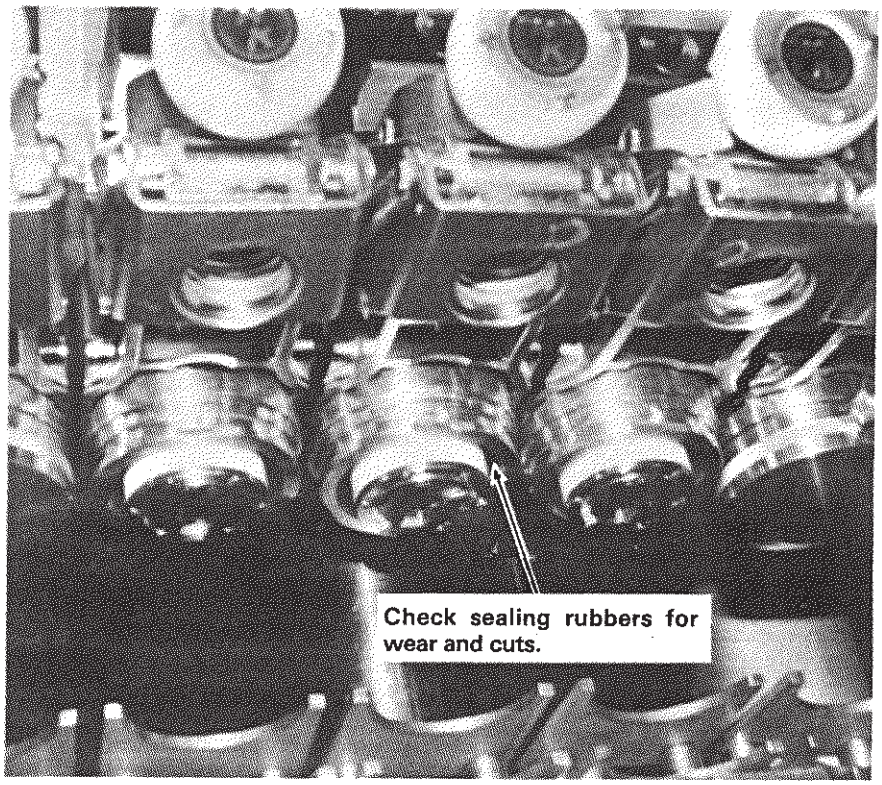
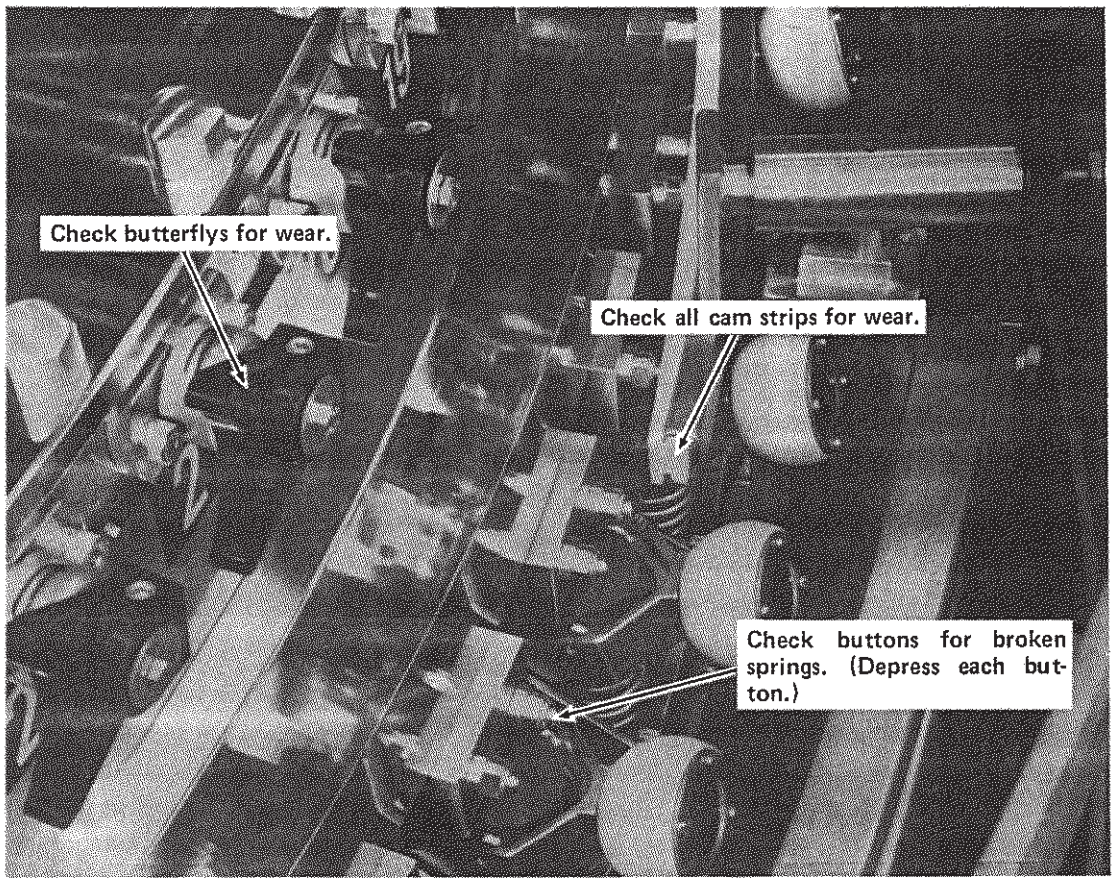


FIGURE 3-8. Platforms and tulips.



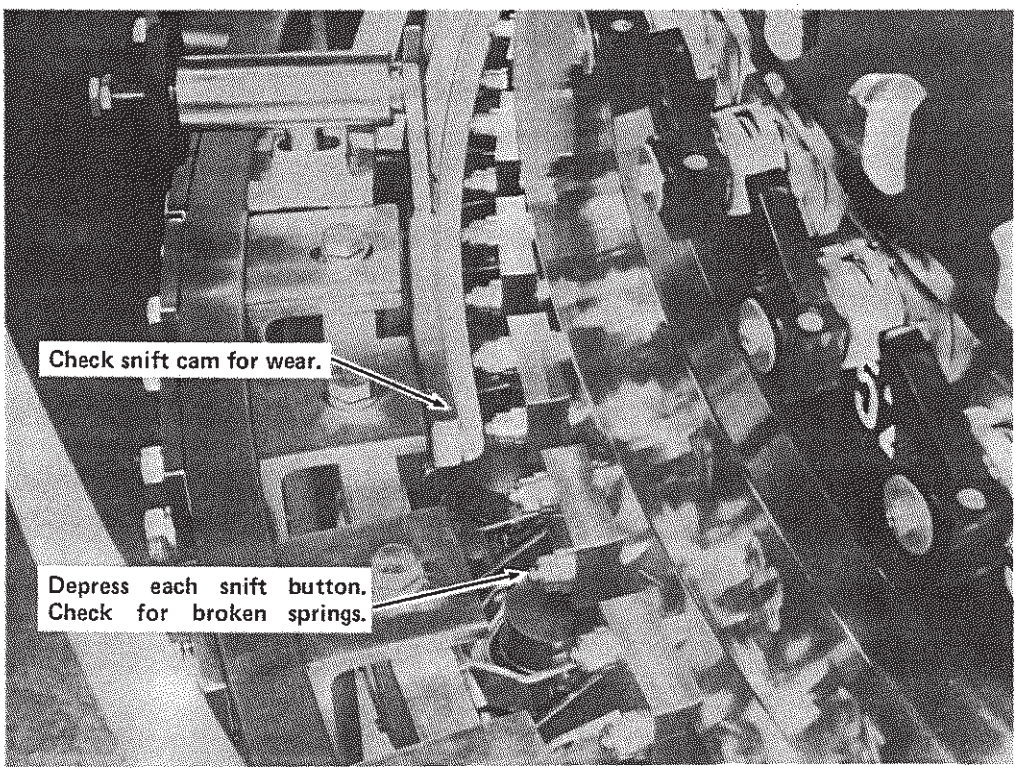
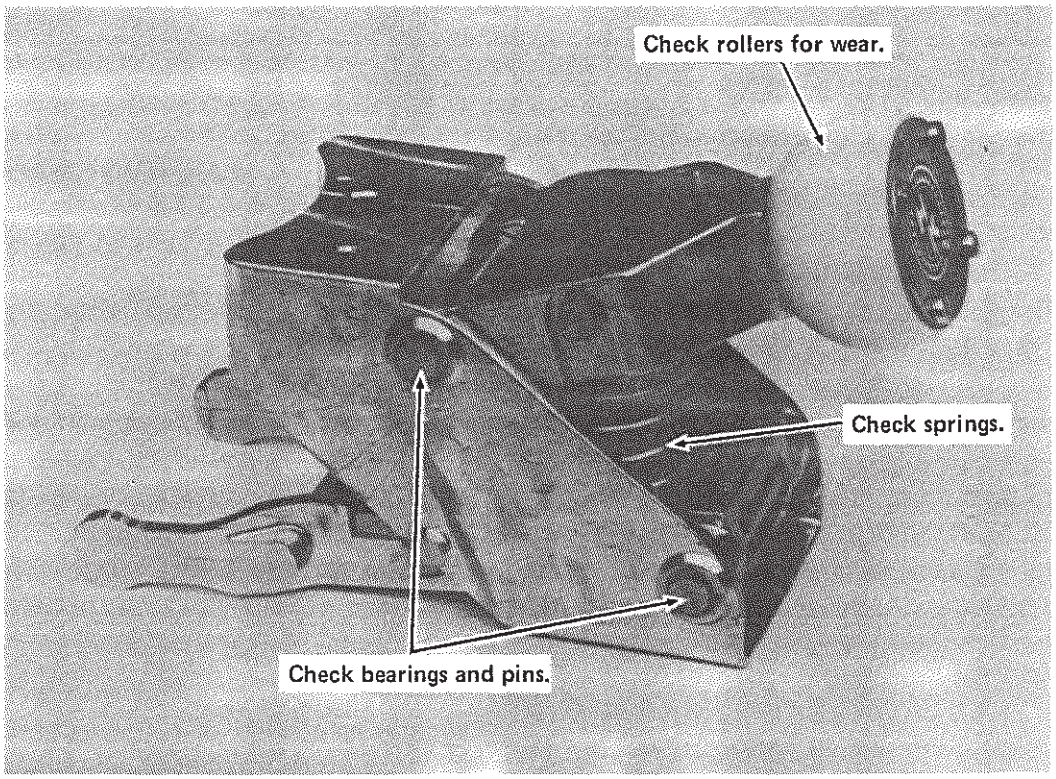


FIGURE 3-6. Cam controls.



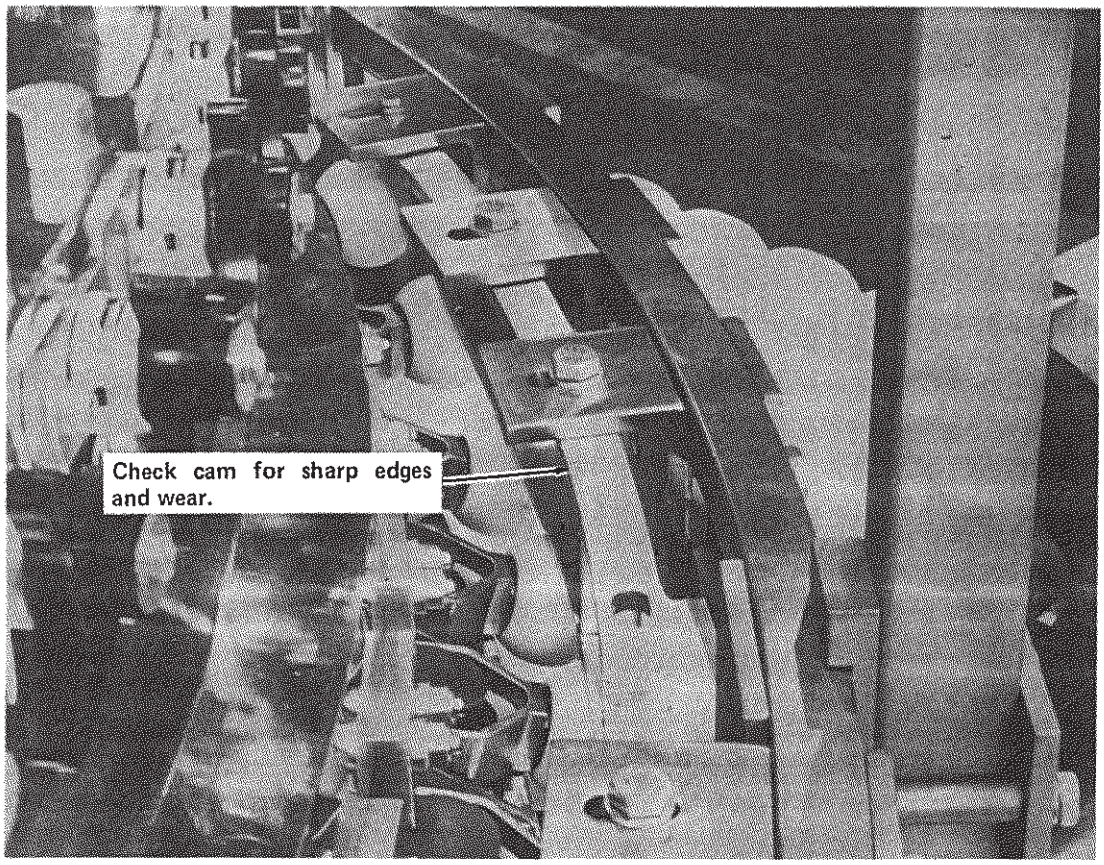


FIGURE 3-7. Valve tulip actuator.

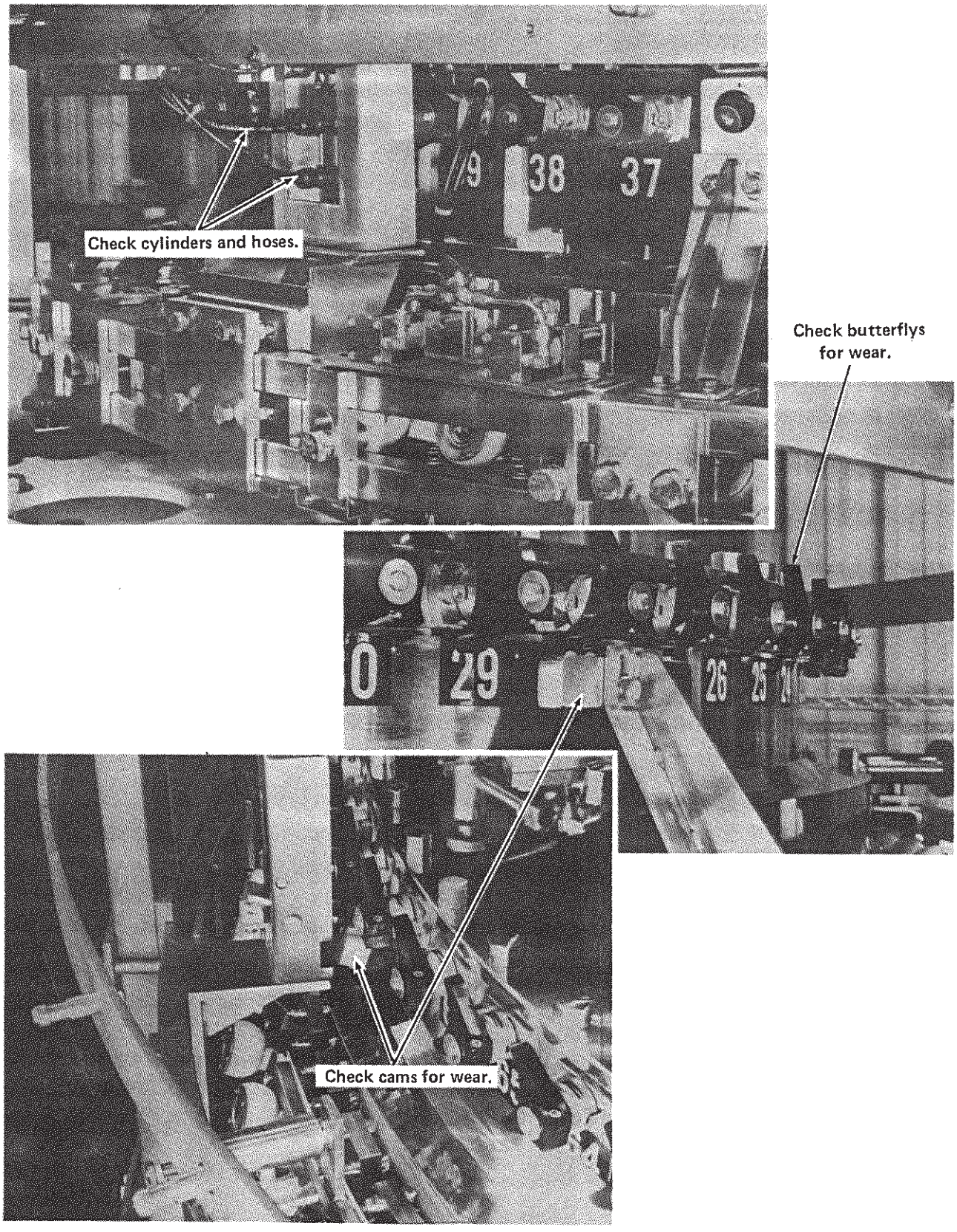


FIGURE 3-8. Cams and trips.

PREVENTIVE MAINTENANCE

Daily or every 8 hours of operating the filler the following items should be checked after the end of production.

1. Clean the screen in the strainer in the product-line to the filler.
2. Rinse down the entire filler with water.
3. Check all the vent-tubes.
4. Check the tulip-rubbers for cuts.
5. Check infeed-guide and infeed-star.
6. Check infeed-worm.
7. Check infeed-worm-guide.
8. Check can-pads at the filler-table.

If there are external damages replace the part.

Weekly maintenance or every 40 hours of filler running time.

1. Check the timing of the infeed-worm.
2. Check the timing of the infeed-star.

Monthly maintenance or every 170 hours of filler operation.

1. Check gear-boxes for condensate. Drain for condensate is provided.
2. Check oil-level in the gear-boxes.

Annual maintenance or every 2000 hours of filler operation.

1. Change oil in the gear-boxes.

MECHANICAL MAINTENANCE

TURNING MACHINE BY HAND. In special cases, for instance during repairs, it might be necessary to turn the filler by hand. For this purpose a hand-wheel is provided with the seamer.

Never rotate the machine against its normal running direction. Should this be absolutely necessary, disengage all the controls on the control-ring around the filler-bowl.

INFEED-STAR-WHEEL TIMING. The infeed-star-wheel can be timed with its adjustable center-hub.

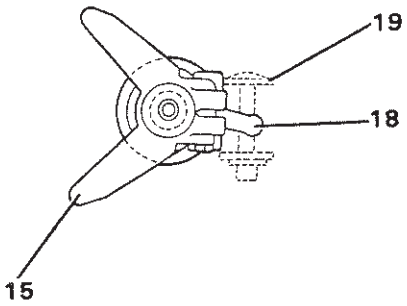
INFEED-WORM TIMING. The infeed-worm can be timed to the infeed-star by loosening the coupling and rotating the worm to its proper position.

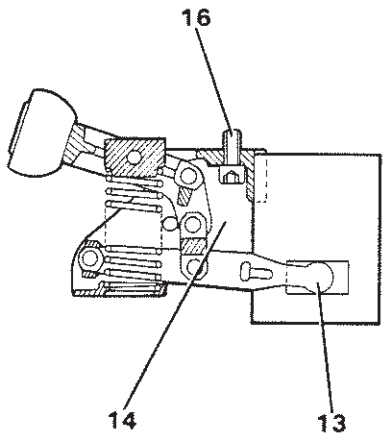
EXHAUST-FLOAT ADJUSTMENT. The disassembly of the exhaust-float should be carried out with great care. The float-arm should not be bent and thus change the height of the liquid level in the filler-bowl.

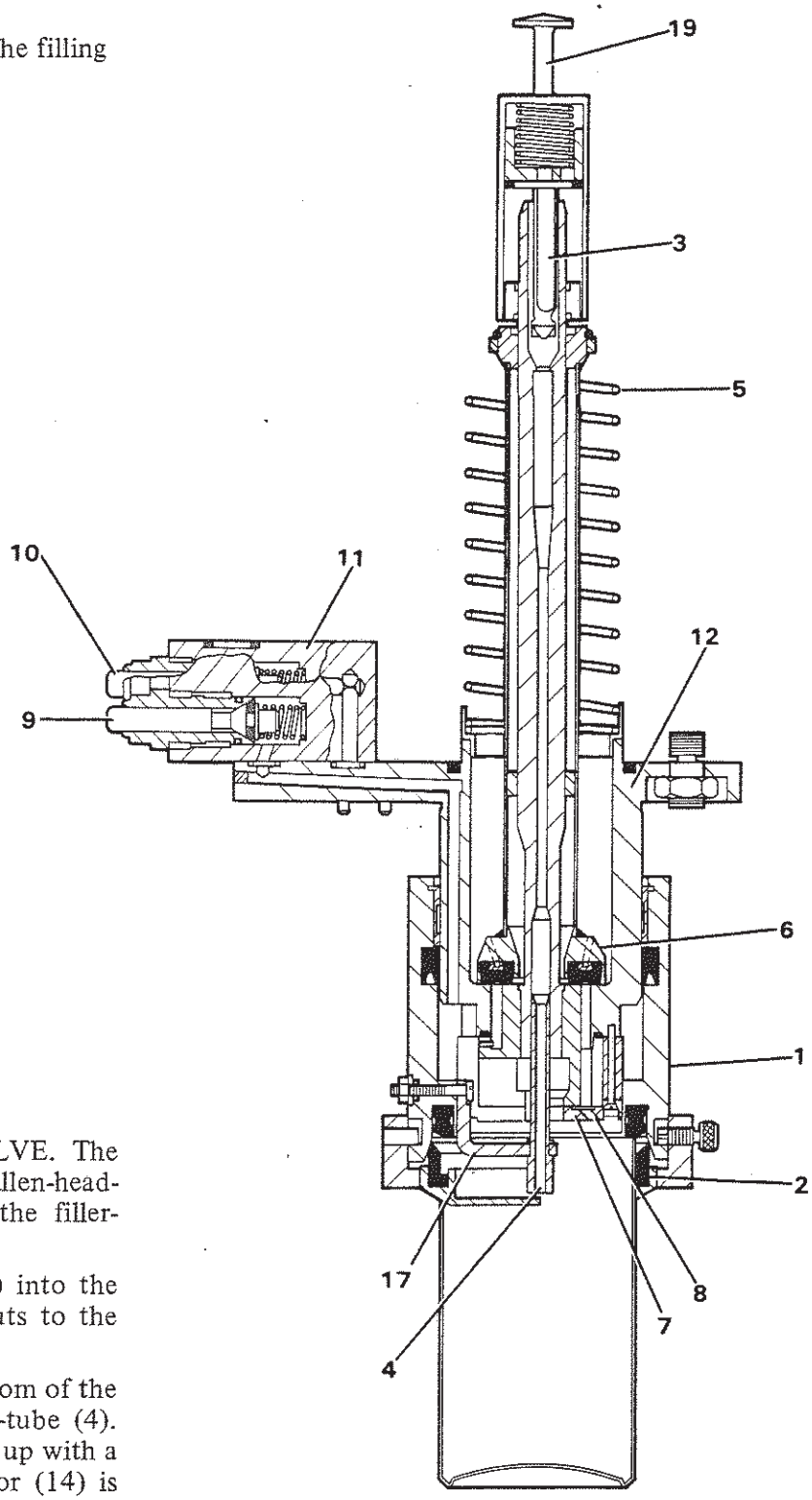
The exhaust-float should be adjusted in such a way that venting is stopped as soon as the liquid in the filler-bowl has reached the desired level. Normal is middle of the sight-glass.

FILLING VALVE INSTALLATION. The filling valve consist of three main parts.

1. Snift and CIP block (11).
2. Valve body (12).
3. Can tulip (1).







MECHANICAL MAINTENANCE

MOUNTING OF THE FILLING-VALVE. The snift-block (11) is mounted with 2 allen-head-screws underneath the CIP-channel of the filler-bowl.

Next insert the filling-valve-body (12) into the filler-bowl and fasten with two M12 nuts to the underside of the filler-bowl.

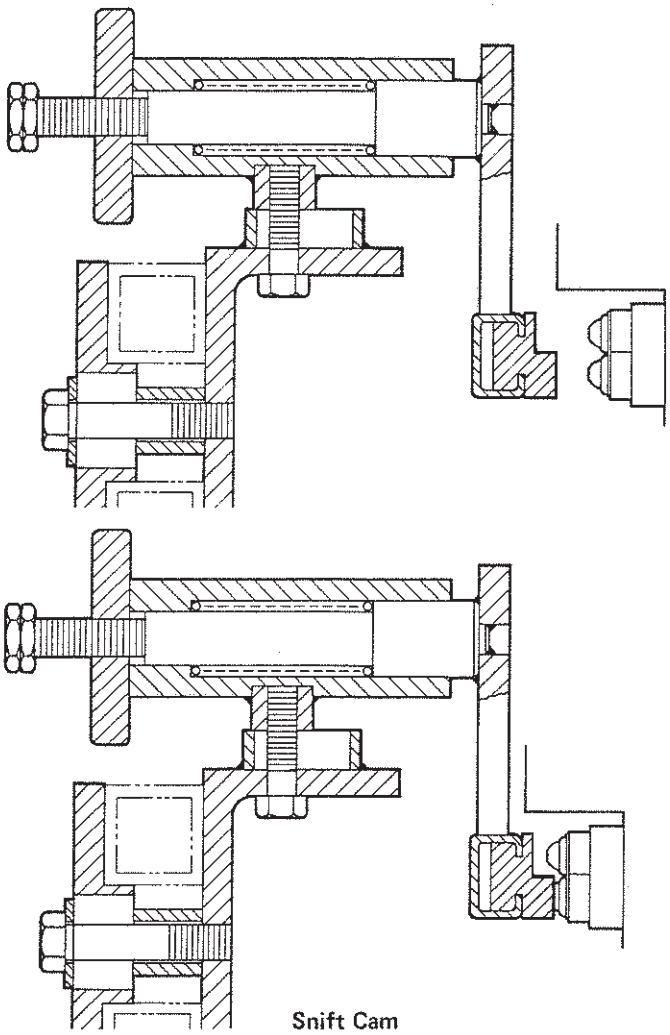
The tulip is now pushed onto the bottom of the valve-body (12) together with the vent-tube (4). The vent-tube holder (17) must be lined up with a slot in the valve-body. The tulip-actuator (14) is guided into slot (13) of the tulip and one 12MM allen-head-screw (16) holds the tulip-actuator together with the tulip and the vent-tube in place.

CHANGING THE VENT-TUBE. The tulip-actuator together with the tulip can be removed by loosening the M12 allen-head-screw (16). The vent-tube (4) then can be taken out of the vent-tube-holder (17).

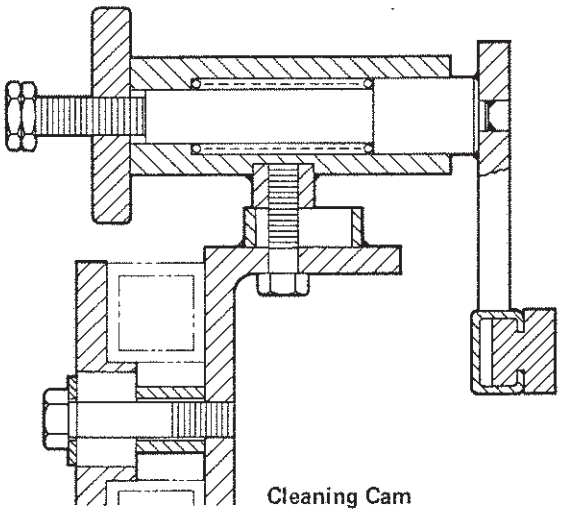
ATTENTION

When installing a filling-valve into the filler-bowl the internal operating lever (18) must be engaged properly to the valve needle (19). This should be checked by manual operation of the external operating lever (butterfly) (15). Incorrect positioning of the valve needle will lead to bending of the filling-valve.

CLEANING CAM AND SNIFT-CAM ADJUSTMENT. The plastic wear-strip in the cleaning cams and in the snift-cam should be checked regularly for wear. The leading edge of the cams must have a chamfer at least 4 inches long for a smooth pressing in of the buttons. The trailing edge must have a chamfer of about 1 inch. The cams are spring loaded for uniform contact to the buttons.



Snift Cam



Cleaning Cam

PAGE

Introduction **4-1**

Troubleshooting Guide . . . . . 4-2 to 4-5

INTRODUCTION

This troubleshooting section provides a ready reference for some of the more common and serious operating problems. There are several important rules which should be kept in mind when troubleshooting and adjusting equipment. These are discussed below. Also, note that there are several blank entries under each problem analysis. These are provided so that you can enter any additional suggestions encountered during trouble analysis.

Analyze Carefully. Carefully analyze each problem to determine its most likely and logical cause before making any adjustments or repairs. Do not jump to conclusions. No two problems or defects are likely to be exactly alike, and each one requires careful and persistent analysis. Do not solve symptoms, but solve the problem.

Follow A Logical Sequence. Proceed with corrective measures and adjustments in a logical sequence from the most likely to least likely causes. Haphazard adjustments merely waste time. Do not make unnecessary adjustments when housekeeping problems are responsible for the troubles encountered. The equipment must be kept clean at all times.

Do One Step At A Time. Make only one correction or adjustment at a time and observe results before proceeding to another adjustment. If the adjustment does not correct the situation, restore the original setting before making a different adjustment. Consider the effect of any adjustment upon related settings before and after making it.

TROUBLESHOOTING GUIDE

SYMPTOM	CAUSE	SOLUTION
A. Overfill	1. Damaged sealing rubber	a. Replace rubber
	2. Snift button leaks	a. Installation should be tight b. Damaged gasket
	3. CIP button leaks	a. Installation should be tight b. O-ring may be damaged on poppit
	4. Can damaged	a. Check filler infeed alignment
	5. Screen damaged	a. Replace screen b. Check for proper vent-tube installation
	6. Valve block leaks	a. Valve O-ring could be installed incorrectly
B. Underfill	1. Screen damaged or dirty	a. Replace screen, check vent-tube installation
	2. Bowl level low	a. Set bowl level correctly with float b. Check pressure valve
	3. Valve lever too low	a. Loose clampscrew adjust lever
	4. Neutral cam too high	a. Lower neutral cam
	5. Sealing rubber worn or cut	a. Replace sealing rubber
C. No fill	1. Can damaged	a. Check infeed
	2. Contact rubber damaged	a. Replace rubber
	3. CIP valve stuck open	a. Vacuum valve must be clean
	4. Snift valve stuck open	a. Snift valve must be clean
	5. Filling valve sticking	a. Remove bent top works. This indicates installation problem
	6. Filling valve spring broken	a. Replace spring
	7. Tulip seal worn	a. Replace seal
	8. Neutral cam too high	a. Adjust cam

TROUBLESHOOTING GUIDE (Continued)

SYMPTOM	CAUSE	SOLUTION
D. Heavy foaming while can leaves filler	1. CO_2 flushing cam not working	a. CO_2 flushing cam must operate correctly
	2. Product too warm	a. After prolonged stoppage product pressure in filler may need to be increased
	3. Filler pressure low	a. Check pressure controller and pressure valve
	4. Cans not clean	a. Foreign substance can react with product
	5. Bowl level too high	a. Check float orifice for damage
	6. Dirty screen	a. Clean screen
	7. Damaged can	a. Check infeed
E. High air in can	1. High air may be in product entering filler	a. Check air in product entering filler
	2. CO_2 flushing not working	a. Check cam
	3. Can underfilled	a. Too little liquid allows larger % of air reading
F. High bowl level	1. Damaged orifice on float	a. Replace orifice insert
	2. Gas pressure too low	a. Adjust regulator to provide sufficient gas supply
	3. Exhaust float does not close orifice	a. Float may be stuck in down-position b. Float may be leaking
	4. Excessive product pressure	a. Check pressure valve and controller
	5. Gas not entering bowl	a. Broken gas hose b. Plugged center column
	6. Float not adjusted	a. Remove float and readjust correctly
	7. Gasket and butterflys leaking	a. Replace gaskets
	8. Controller	a. Not calibrated b. Air signal to valve incorrect

TROUBLESHOOTING GUIDE (Continued)

SYMPTOM	CAUSE	SOLUTION
G. Low bowl level	1. Float not adjusted correctly	a. Remove float and readjust correctly
	2. Product valve not operating	a. Check air supply to instruments controller must operate correctly
	3. Over pressure on bowl	a. Float cap must be opened for venting during start up
	4. Controller	a. Not calibrated b. Air signal to valve incorrect
H. Erratic bowl level	1. Pressure controller not adjusted	a. Pressure system should be properly tuned with position of adjustments recorded
I. Damage at can stop	1. Can stop positioned incorrectly	a. Adjust can stop gate
	2. Rail positioned incorrectly	a. Check rail distance from can stop
J. Damage at infeed worm	1. Infeed worm not properly timed	a. Time worm with infeed star
	2. Can not fed smoothly into infeed worm	a. Wear strips may be worn a. Replace worm
	3. Infeed worm damaged	a. Replace worm
	4. Wrong infeed worm	

TROUBLESHOOTING GUIDE (Continued)

SYMPTOM	CAUSE	SOLUTION
K. Damage at infeed star	1. Star not timed with infeed worm	a. Time worm with infeed star
	2. Wear plates not proper height	a. Plates should be replaced periodically b. Watch for bent plate
	3. Screw head protruding	a. Screw heads need to be flush with wear plates
	4. Star pocket vs. guide clearance insufficient	a. Guide casting loose and shifted
	5. Star not timed with platforms	a. Star needs to be adjusted