INSTALLATION INSTRUCTIONS

FILLER SPECIALTIES FILLER

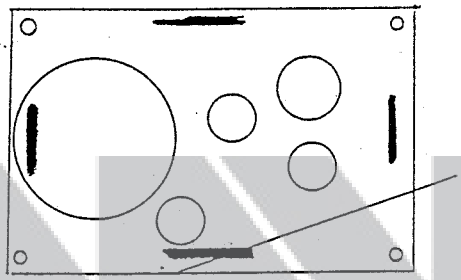
WITH THRU-FEEDTRACK

Checking of Shipment

a. Check packing list to make certain all parts are received and are in good condition.

b. Check to see if there is any damage to machine resulting from shipping.

Installation of Machine



a. Set machine in desired postion and level carefully. NOTE: Important - 4 level positions on drawing. These positions are marked individually on under side of filler. Height adjustment of legs may be made by turning leg screws in or out as required. Make sure that the weight of machine is distributed properly on all four legs.

b. Attach conveyor track and drive. Be certain that connecting track is adequately supported and does not disturb levelling of filler. After track is connected, check to see that wear strip which is attached to inner conveyor rail is flush with transfer table and that there is clearance between wear strip and transfer table. Move filler if necessary to get required clearance.

Checking for Proper Adjustment after Installation and Before First Production Run

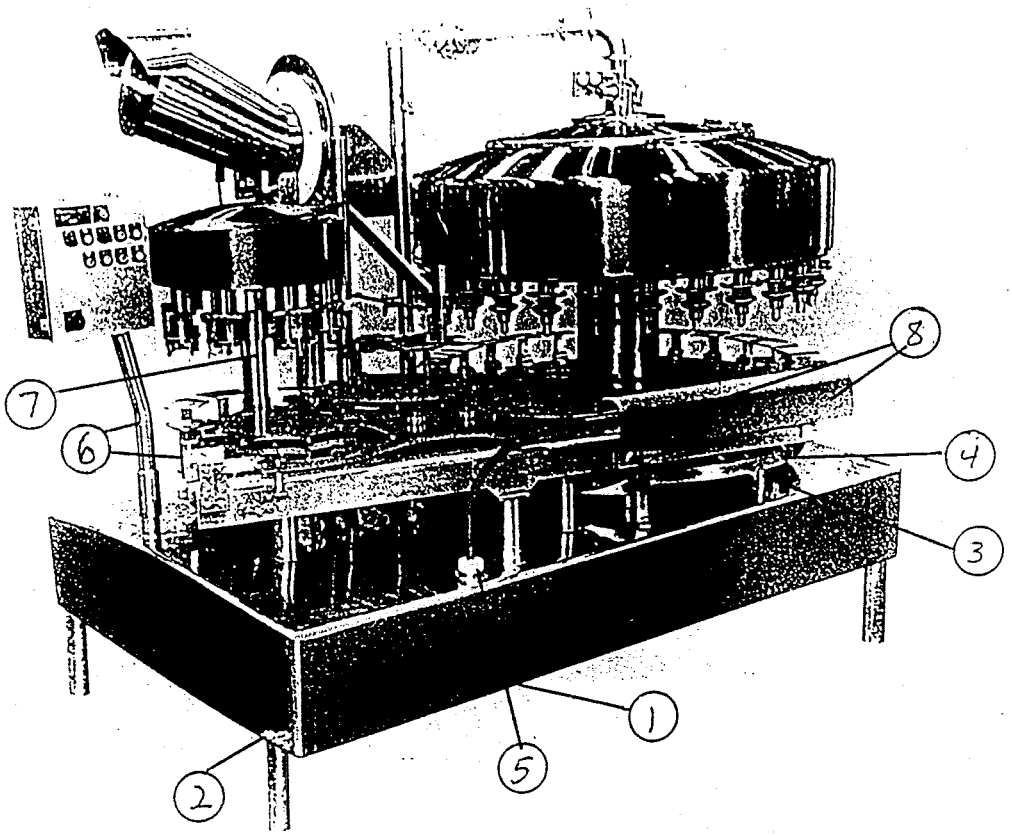
A. Centering of Bottles under valves and cappers.

Run one bottle of each size through machine to check if bottles are centering properly under valves and cappers. If centering is not satisfactory, check the following:

1. If starwheels do not place bottle in center of platform, check to make certain you are using correct starwheels and bottle guides. Make certain none of the starwheels and starwheel hubs are turned out of position. The starwheel hubs can be advanced or retarded by loosening acorn nut, moving hub as required and tightening nut. If the filler was tested with customer's sample bottles, no adjustment should be necessary.

Note to Installation Man.

All of the above adjustments should be checked before first milk run. If it is apparent during milk run that adjustments are necessary, make them if possible before end of run so that results can be observed. Always observe machine during operation after any adjustment is made.



LUBRICATION CHART

1. (Reduction Gear) Drain by removing plug under case. Change oil twice yearly. Use 80 weight, high quality gear lubricant.

2. (Zerk Fitting) Grease liberally, regularly.

3. (Zerk Fitting) This fitting greases ball thrust bearing which supports filler table and bowl assembly. Grease lightly, regularly.

4. (Zerk Fitting) This fitting greases lower table bearing, grease lightly, regulary.

5. (Zerk Fitting) This part supplies grease to the bearing screw feed. Grease lightly, regularly.

6. (Zerk Fitting) This point supplies grease to ball thrust bearing, which supports capper column. Grease lightly, regularly.

7. (Zerk Fitting) This point supplies grease between the capper bracket sleeve and the capper column. Grease just enough to keep sleeve free when adjusting for bottle size changes.

8. (Zerk Fitting) This point supplies grease to the ends of screw infeed.

INSTRUCTIONS FOR PROPER ASSEMBLY OF FILLER SPECIALTIES TYPE FILLING VALVE

1. Install condensate deflector on 1-7/8" diameter of valve flange.

   Note: The condensate deflector is held in place by a rubber grommet.

   a. Assemble rubber grommet and stainless steel condensate deflector. Note one edge of groove in grommet has a chamfered edge, this will be top side. Insert grommet into internal hole of deflector mating groove in grommet onto internal edge of deflector.

   b. Slide deflector and grommet assembly onto valve flange of filler bowl, push upwards until grommet butts against machine shoulder on flange.

   c. Check to see that drain position on deflector is towards center of bowl.

INSTALLATION INSTRUCTIONS FOR FILLER SPECIALTIES VALVES

Place the long tube in the filler bowl opening from the bottom side. To hold tube in place the valve clip must be placed in the groove of the filler tube on the inside of the filler bowl.

Placing of the valve sleeve in the diaphram is done by sliding the short end of the sleeve in the small hole of the diaphram.

Now slide the diaphram with the valve sleeve attached on the filler tube with the rubber part first.

To hold the diaphram and sleeve on filler tube use the o'ring, it must be put in the groove on the end of filler tube.

To seal the bottles upon filling, a sealing rubber must be placed on each valve. This is done by sliding it on the valve from the bottom over the o'ring and up the sleeve until it comes up to the diaphram.

The sealing rubbers are available in 1/8", 1/4", 3/8" and 1/2" thickness. For more product in container, use a thick rubber and for less product use a thin sealing rubber.

QUESTIONS AND ANSWERS ABOUT THE FILLING OPERATION OF YOUR FILLER

FILLING

1. What can cause a bottle to overflow or overfill at the time the bottle comes from under the filling valve?

   A. Sluggish or slow closing of the valves; check for damaged valves (burrs on valve sleeve snout, bent vent tubes.

   B. Ineffective expandable diaphram rubbers. When the expandable diaphram rubber loses its springiness, it loses its ability to draw milk from the bottle.

   C. Excessively high level in the filler bowl. Damaged or improperly adjusted liquid level control or original float valve system allows wide variations in the liquid level in the filler bowl.

   D. Excessive valve rubber or wrong thickness of valve rubber. Valve Rubbers are available in 1/8", 1/4", 3/8" and 1/2" thicknesses.

   E. Improper adjustment of transfer starwheel which could push bottle backwards on the valve. Starwheel may have been advanced or retarded to favor capping turret instead of adjusting turret to proper timing.

   F. Filler platforms may not be raising bottle to full height. This reduction in vertical travel of the bottle will affect the performance of the valve and any be the cause of the fill being higher than desired. Reduced vertical travel may be caused by:

      a. Excessively worn filler cam rollers.

      b. Excessive wear in filler column. Large thrust bearing supporting filler column may have deteriorated. This will cause filler table and filler lift spindles to drop and thus decrease the upward travel of the bottle.

2. How can the fill height in the bottle be adjusted?

   A. The clearance between the bottom of the vent tube and the top of the bottle should be 3/16" - 1/4", to give the lowest fill.

   B. The clearance between the valve and the top of the bottle may be increased to 5/8" to give a higher fill level. Increased clearance will decrease filling speeds.

   C. Valve Rubber may be placed on the valve sleeve to raise the fill level. Valve Rubbers are available in 1/8", 1/4", 3/8" and 1/2" thicknesses. The bowl may have to be raised to compensate for spacers used.

   D. A simple way to increase or decrease the weight of product in the plastic gallon is to raise or lower the height of product in the filler bowl. This adjustment can be easily made with Liquid level control or original float valve supplied with your filler.

E. The original Float valve is not a positive shut off valve, only level control while filler is in operation.

3. What can cause excessive foam in the filler bowl?

A. Air incorporated in the product during processing or pumping to the filler. (Generally this is a very fine foam, depending on whether before or after homogenization) Inlet Pipe should be installed so that bottom of pipe is 1/2" - 1" from bottom of filler bowl.

B. Improperly adjusted level control system. (Air-actuated system) The system should be adjusted to allow milk to enter the bowl at precisely the same rate that it is being taken out. The valve must properly modulate to accomplish this.

C. Improperly installed liquid level control system. The system should be installed so float rods and fill tubes are in a perpendicular position, allowing floats to operate properly. The level control system should not be used to support throttling valves or supply lines to the filler. Supply line and valve should have a rigid style hanger.

* BWC (Ball with control)
The Ladish control should be mounted on the support provided so that the 5" float ball and rod move up and down freely, without binding.

D. Improper pump or gravity flow pressures coming into the filler with original Float valve. Pressure must be reduced.

4. What can cause reduced filling speeds?

A. Excessive foam in the product. Time must be allowed for the foam to work its way to the top of the bottle.

B. Too much clearance between the valve and the top of the bottle. Clearance of 3/16" - 1/4" gives fill valve opening.

C. Low level of product in the filler bowl. Higher level increases filling speeds.

D. Excessive wear in the filler column assembly. The wear of the bushing, bearings and column reduces the amount of lift (travel of the bottle pedestal) to decrease the valve opening.

E. Insufficient product supply.

F. Badly worn filler cam rollers reduce valve opening.

G Vent tubes not properly installed.

H. Valve sleeve installed up side down (long end should be down).

5. The filler cam rollers should glide smoothly onto and off the ends of the filler cam. Excessive thrust bearing or column wear would cause the cam roller to strike the end of the infeed section and drop off the discharge section of cam. (check to see that the position of the cam has not changed)

6. What are some things that can affect cap tightening efficiency?

A. Uneven bottle heights.

B. Uneven wear of capper cam rollers and shafts.

C. Improperly adjusted cap grippers.

D. Dirty capping heads. Collection of oil and fat, on clutch surface.

E. Torque keys worn excessively.

F. Excessively worn cap gripping heads. (The grooves that engage the torque keys)

G. Too light torque springs. Springs are available in extra light, light, medium and heavy weights.

H. Excessive wear in the capper head assembly allowing the head to move up when pressure is applied.

I. Poor centering of bottle under the capping head.

J. Cap not being applied properly; laying on top of bottle crooked and going up into the capping head in this manner. The cap may not right itself and tighten in the time available under the capping head.

SERN° 321093 GWFS1852

OPERATING INSTRUCTIONS

FILLER SPECIALTIES FILLER

Before starting machine or when changing from one bottle size to another, be sure the following five operations have been performed:

1. The height of the filler bowl and cappers above the bottles is adjusted individually.
2. Place the proper bottle guide in position and secure with knob.
3. Set starwheels on hubs. Be sure the starwheels are on right side up.
4. Adjust infeed conveyor guide rail to proper position.
5. Adjust speed to suit size of bottles and type of product.

Operating the Machine

At the end of a day's run, after cleaning the machine, it is a good idea to keep the valve parts, unassembled, on a table. The valve sleeves and vent tubes may be reassembled to the filler bowl after cleaning, but do not assemble valve rubbers. Valve rubbers and seal rings should be exposed to air when not is use. Valve parts should be given careful handling. These parts are machined to precision dimensions and rough handling is almost certain to cause leakage and variations in fill height.

Capper Operation

The cappers should be washed down and cleaned daily.

Infeed Operation

If bottles are tipping over at infeed, check the following:

A. Conveyor chain may be running considerably faster or slower than infeed starwheel. This will cause trouble unless convayor chain is exceptionally smooth.

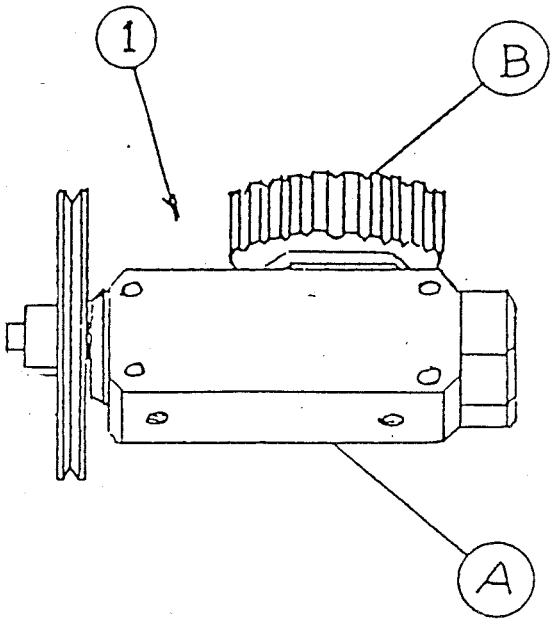
B. When starting and stopping filler, see that conveyor chain continues to run.

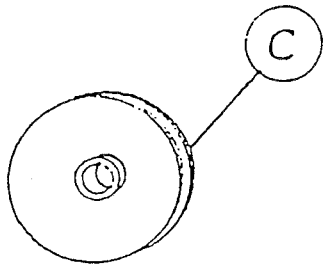
Lubrication

The machine should be greased thoroughly twice a week at each lubricating point. Check lubrication chart.

Safety Precautions

Operators should be warned to avoid injury which might result from placing hands near the bottle platforms when the machine is in operation.





PARTS LIST

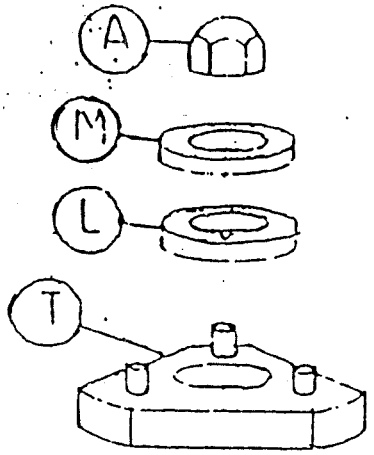
FILLER SPECIALTIES BOTTLE FILLER

GWFS-185

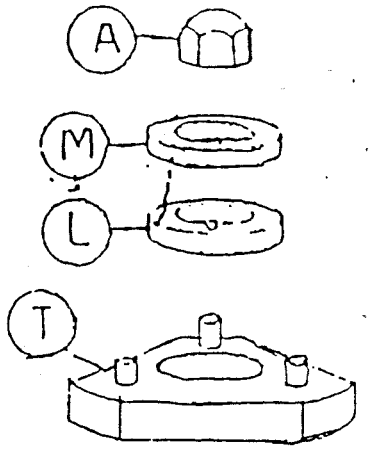
REDUCTION GEAR GROUP

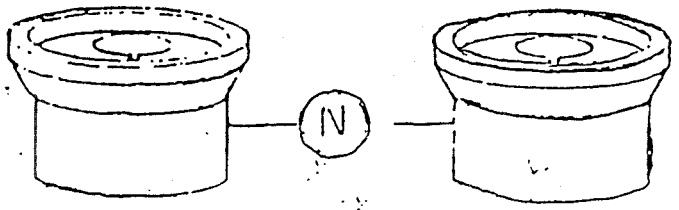
ITEM	DESCRIPTION
1	Gear Box, and Pully Assembly, Complete as shown.
A	Gear Box
B	Pinion
C	Pulley

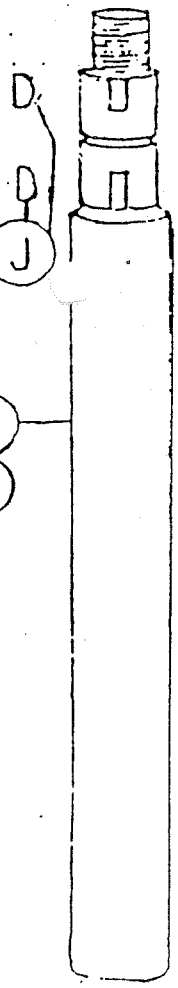
INFEED

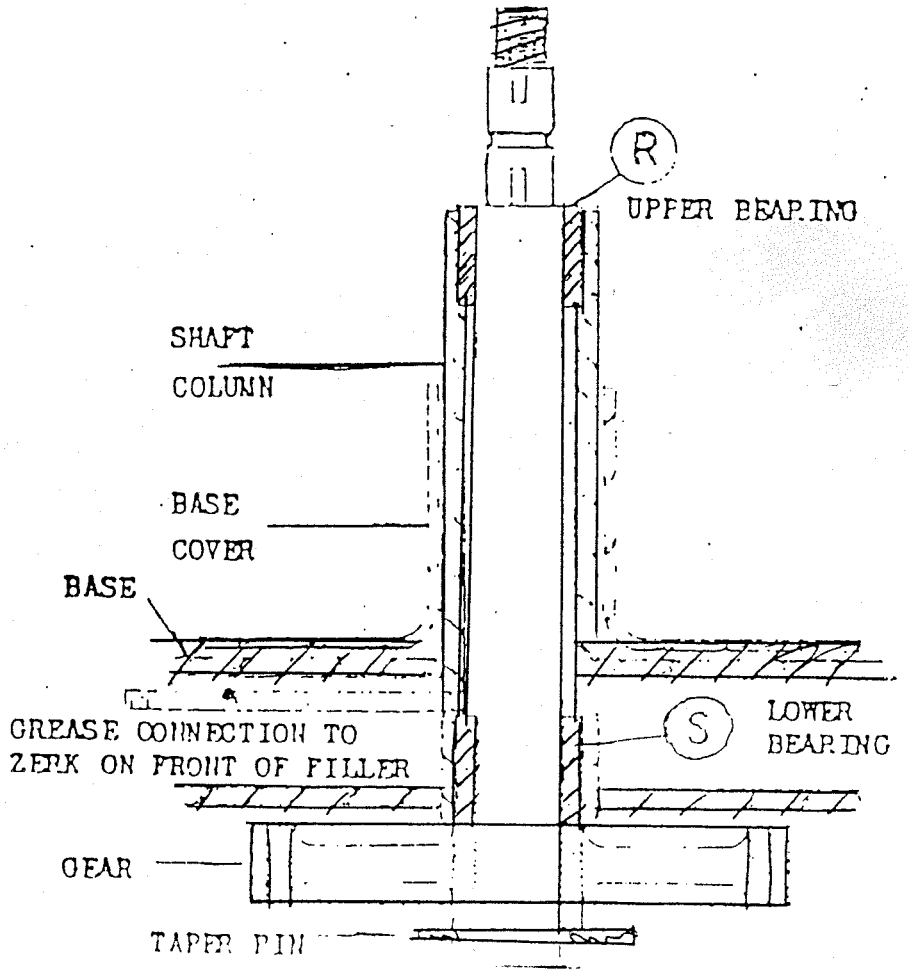


TRANSFER & DISCHARGE





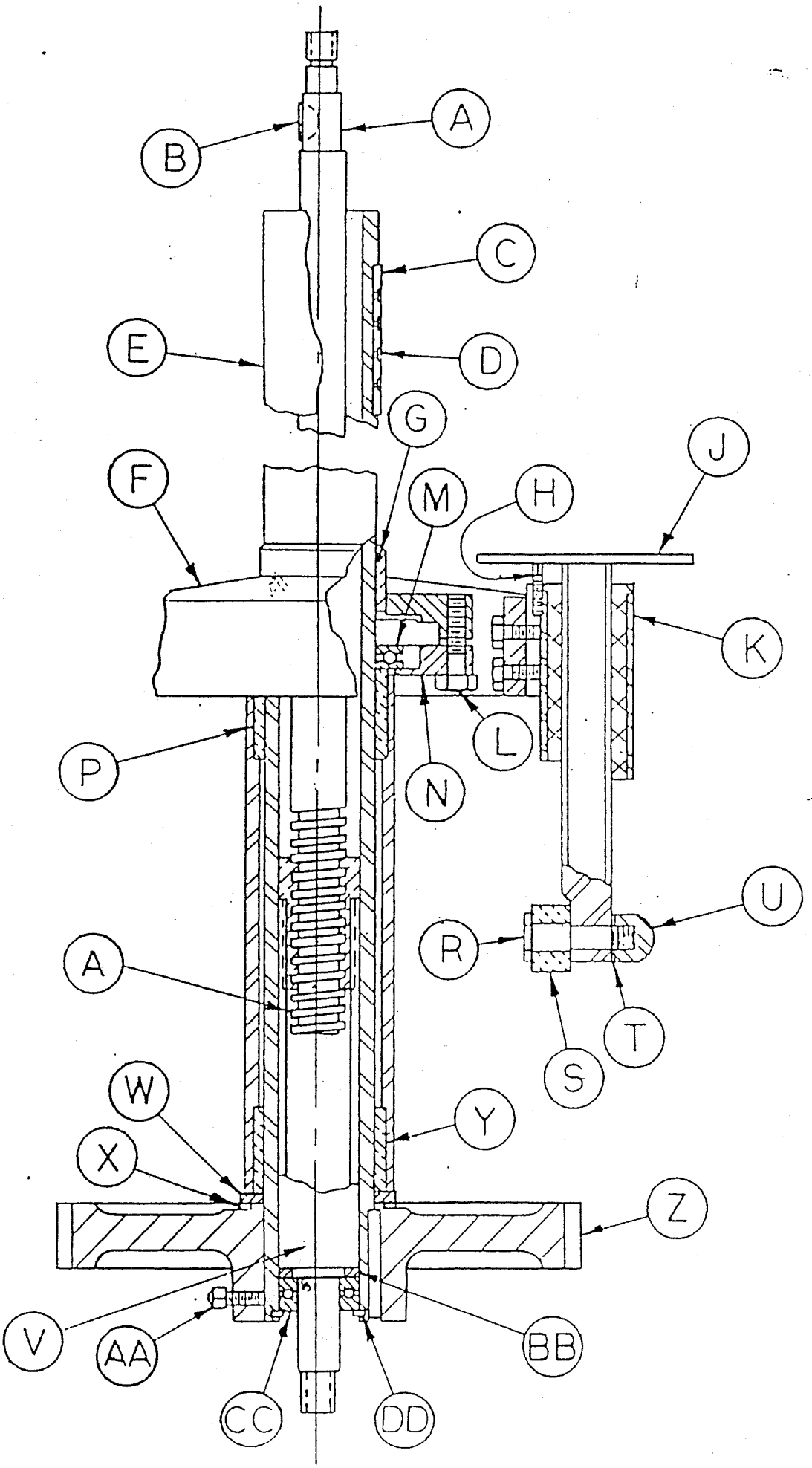




PARTS LIST

FILLER SPECIALTIES BOTTLE FILLER
GWFS-185
STARWHEEL SHAFTS & HUB ASSEMBLIES

Item	Description
	INFEED
AMLTN PRS	Acorn Nut
	Washer
	Starwheel Locator
	Starwheel Drive
	Starwheel Hub
	Woodruff Keys
	Starwheel Shaft
	Upper Starwheel Shaft Bearing
	Lower Starwheel Shaft Bearing
	TRANSFER
AMLTN KRS	Acorn Nut
	Washer
	Starwheel Locator
	Starwheel Drive
	Starwheel Hub
	Woodruff Keys
	Starwheel Shaft
	Upper Starwheel Shaft Bearing
	Lower Starwheel Shaft Bearing
	DISCHARGE
AMLTN KRS	Acorn Nut
	Starwheel Washer
	Starwheel Locator
	Starwheel Drive
	Starwheel Hub
	Woodruff Keys
	Starwheel Shaft
	Upper Starwheel Shaft Bearing
	Lower Starwheel Shaft Bearing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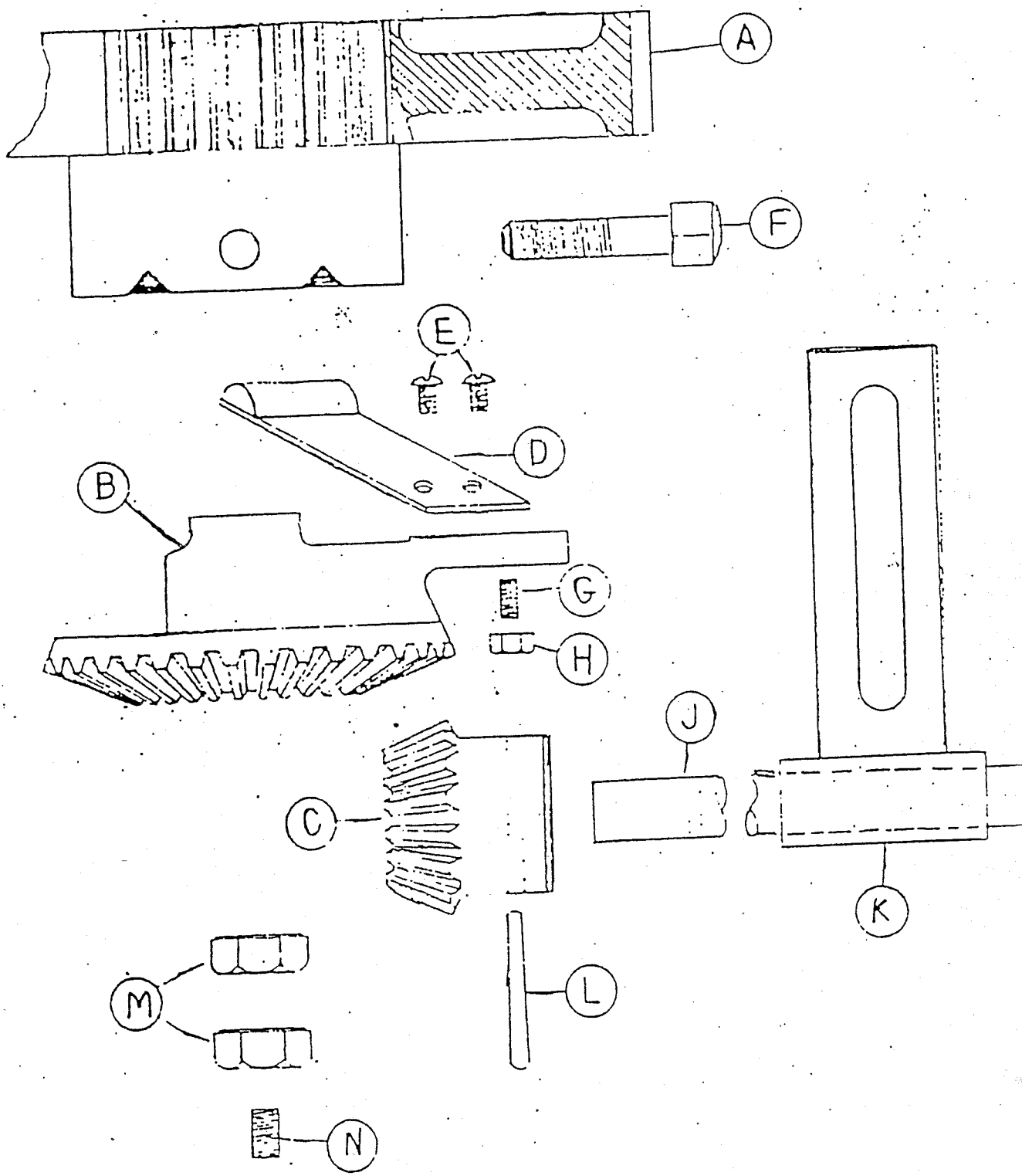
PARTS LIST

FILLER SPECIALTIES BOTTLE FILLER
GWFS-185

CAPPER COLUMN ASSEMBLY

ITEM	DESCRIPTION
A	Capper Raising Screw
B	Woodruff Key
C	Capper Column Key
D	Hex Socket Head Cap Screw
E	Capper Column
F	Capper Table
G	Capper Table Seal Ring
H	Capper Platform Adjusting Screw
J	Capper Platform Assembly
K	Capper Platform Bearing Block With Plastic Insert
L	Hex Head Cap Screw With Lockwasher
M	Upper Capper Ball Thrust Bearing
N	Capper Table Clamp Ring
P	Upper Capper Column Bushing
R	Roller Shaft
S	Roller
T	Lock Washer
U	Acorn Nut
V	Capper Raising Nut Assembly
W	Thrust Washer
X	Thrust Plate
Y	Lower Capper Column Bushing
Z	Capper Gear
AA	Square Head Set Screw
BB	Shoulder Washer
CC	Lower Capper Ball Thrust Bearing
DD	Tru-Arc Ring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PARTS LIST

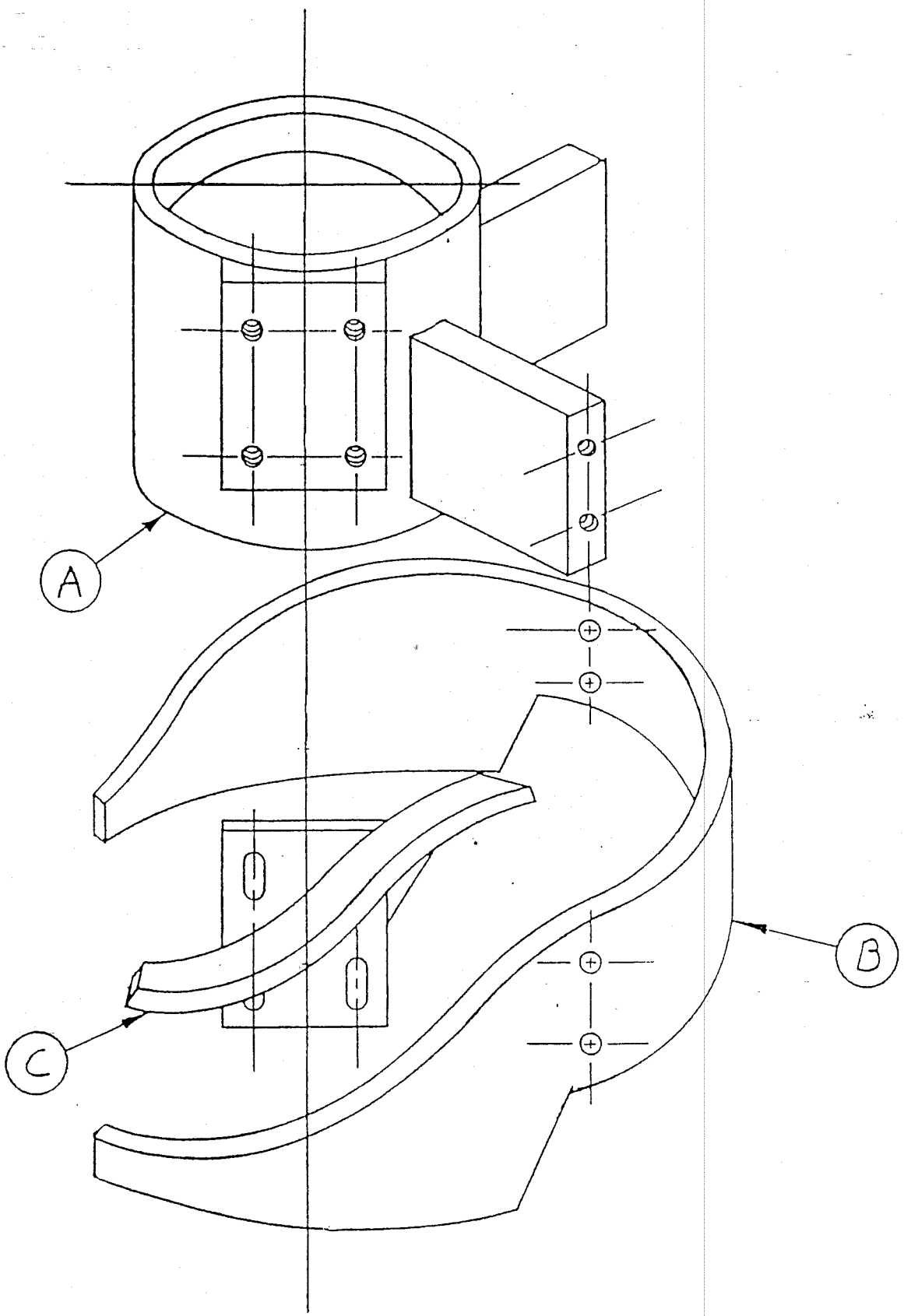
FILLER SPECIALTIES BOTTLE FILLER

CAPPER HEIGHT ADJUSTING GROUP

ALL INDEPENDENT RAISING MODELS

GWFS-185

ITEM	DESCRIPTION
A	Capper Gear
B	Bevel Gear & Spring Holder
C	Bevel Gear Pinion
D	Latch Spring Assembly
E	10-24 x 1/2" Round Head Screws
F	1/2" - 13 x 1" Square Head Set Screws
G	1/4 - 20 x 3/4" Socket Head Set Screw
H	1/4 - 20 Hex Jam Nut
J	Shaft
K	Shaft Support Assembly
L	1-1/2" Long Taper Pin
M	3/4-16 NF Hex Jam Nut
N	1/8" Pressure Relief Fitting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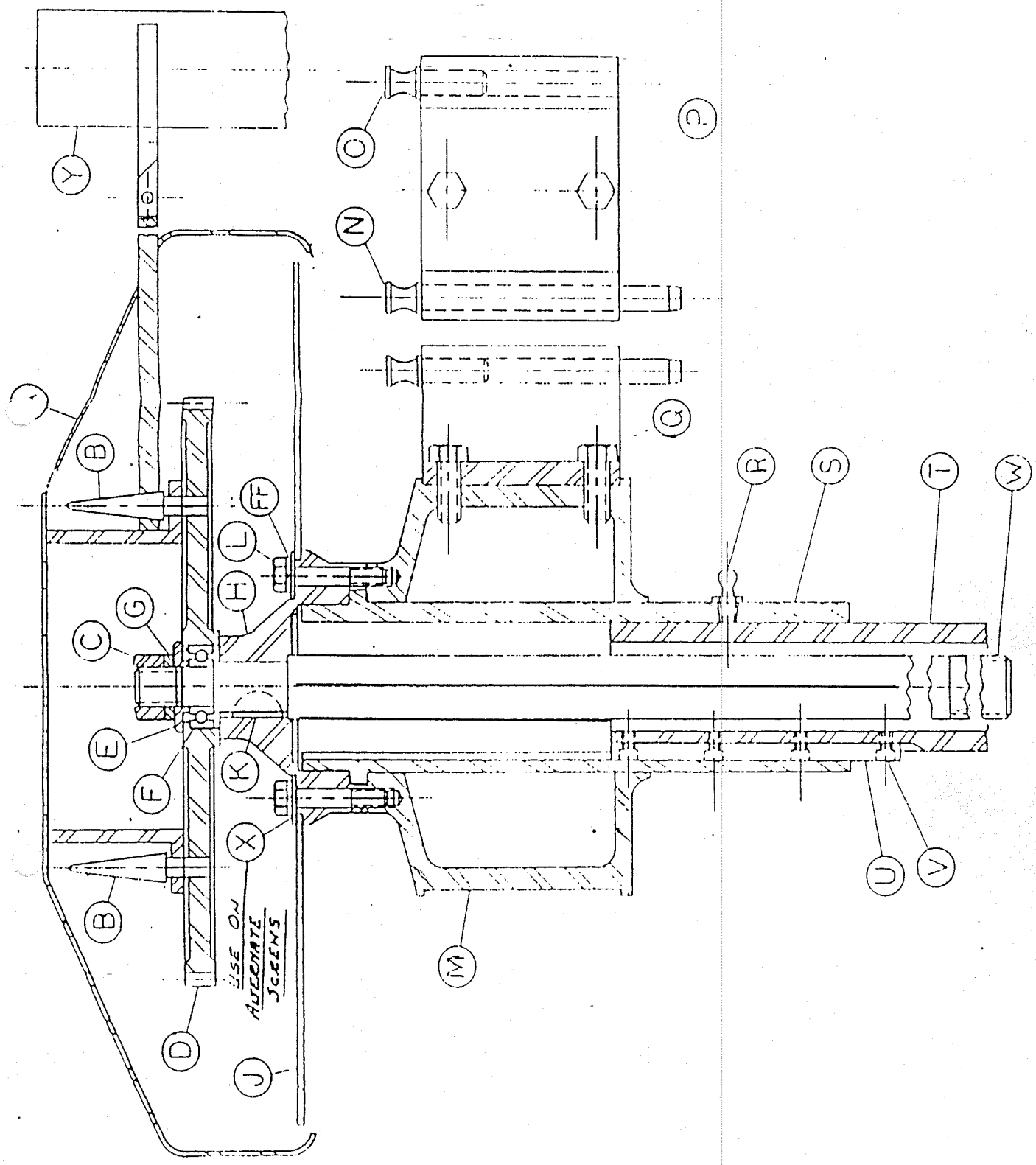
PARTS LIST

FILLER SPECIALTIES

CAPPER CAM ASSEMBLE

GWFS-185

ITEM	DESCRIPTION
A	Capper Cam Support Housing
B	Capper Raising Cam
C	Capper Lowering Cam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USE ON ALTERNATE SCREENS

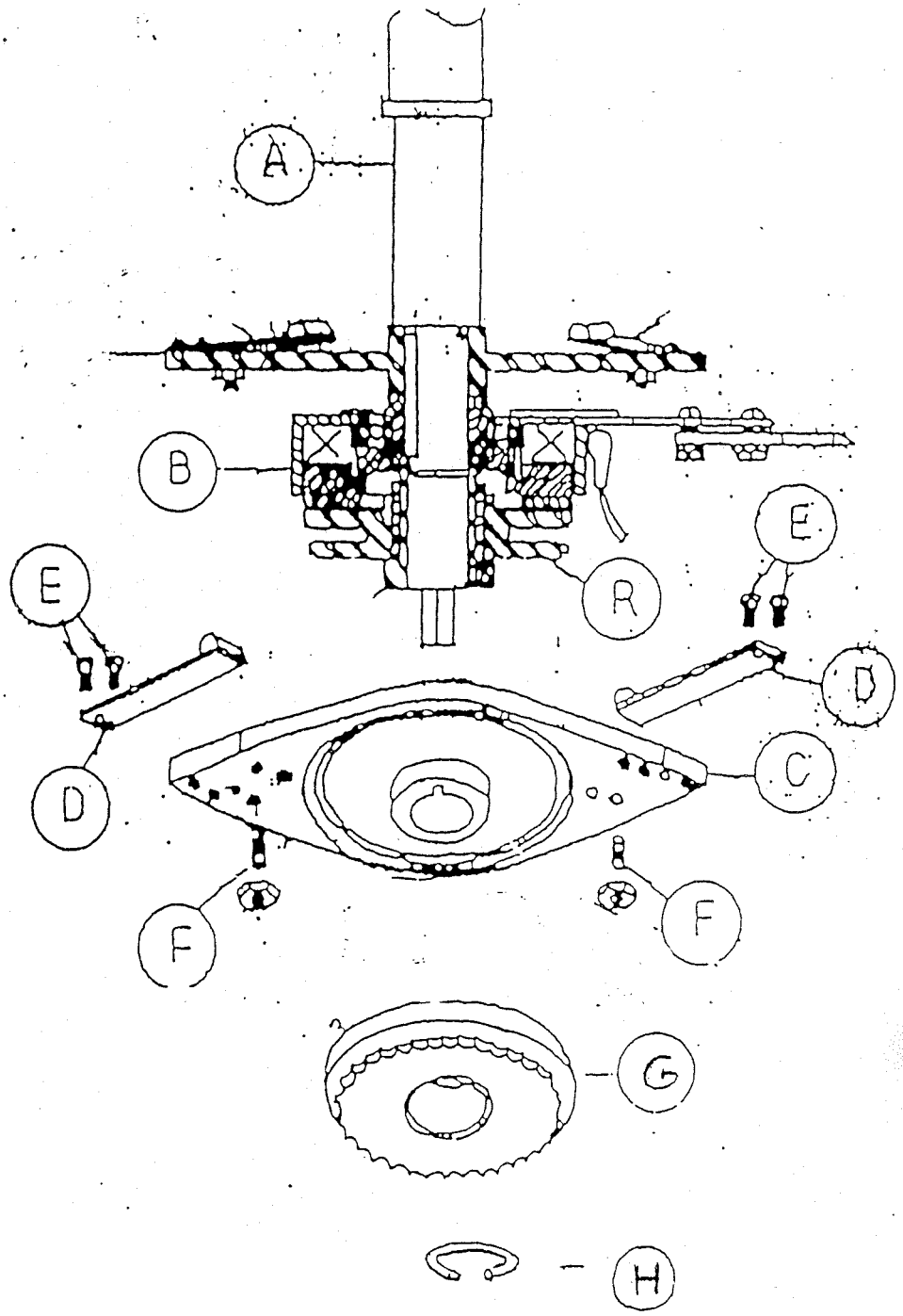
PARTS LIST

FILLER SPECIALTIES

UNIVERSAL CAPPER BRACKET & DRIVE ASSEMBLY

FOR SCREW CAPPER ON GWFS-185

ITEM	DESCRIPTION
A	Cover & Torque Arm Assembly
B	Torque Pin
C	Hex Nut St. St.
D	Stationary Gear
E	Spacer
F	Ball Brg.
G	Lock Washer ST. St.
H	Lock Washer St.St.
J	Base & Guard Plate
K	Woodruff Key
L	Hex Head Cap Screw
M	Adaptor Hub
N	Mounting Pin (Long)
O	Mounting Pin (Short)
P	Adaptor Arms
Q	Hex Head Cap Screws
R	Grease Fitting
S	Drive Sleeve
T	Capper Column Assembly
U	Key
V	Hex Socket Cap Screw
W	Capper Raising Screw
Y	Torque Post
FF	Lock Washer - 6 req.
X	Flat Washer - 3 req.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FILLER SPECIALTIES BOTTLE FILLER

GWFS - 185

FILLER BOWL

RAISING AND LOWERING MECHANISM

A. Bowl raising screw for filler - righthand and leftland

B. Filler bowl raising clutch assembly

C. Deflector and Latch spring holder

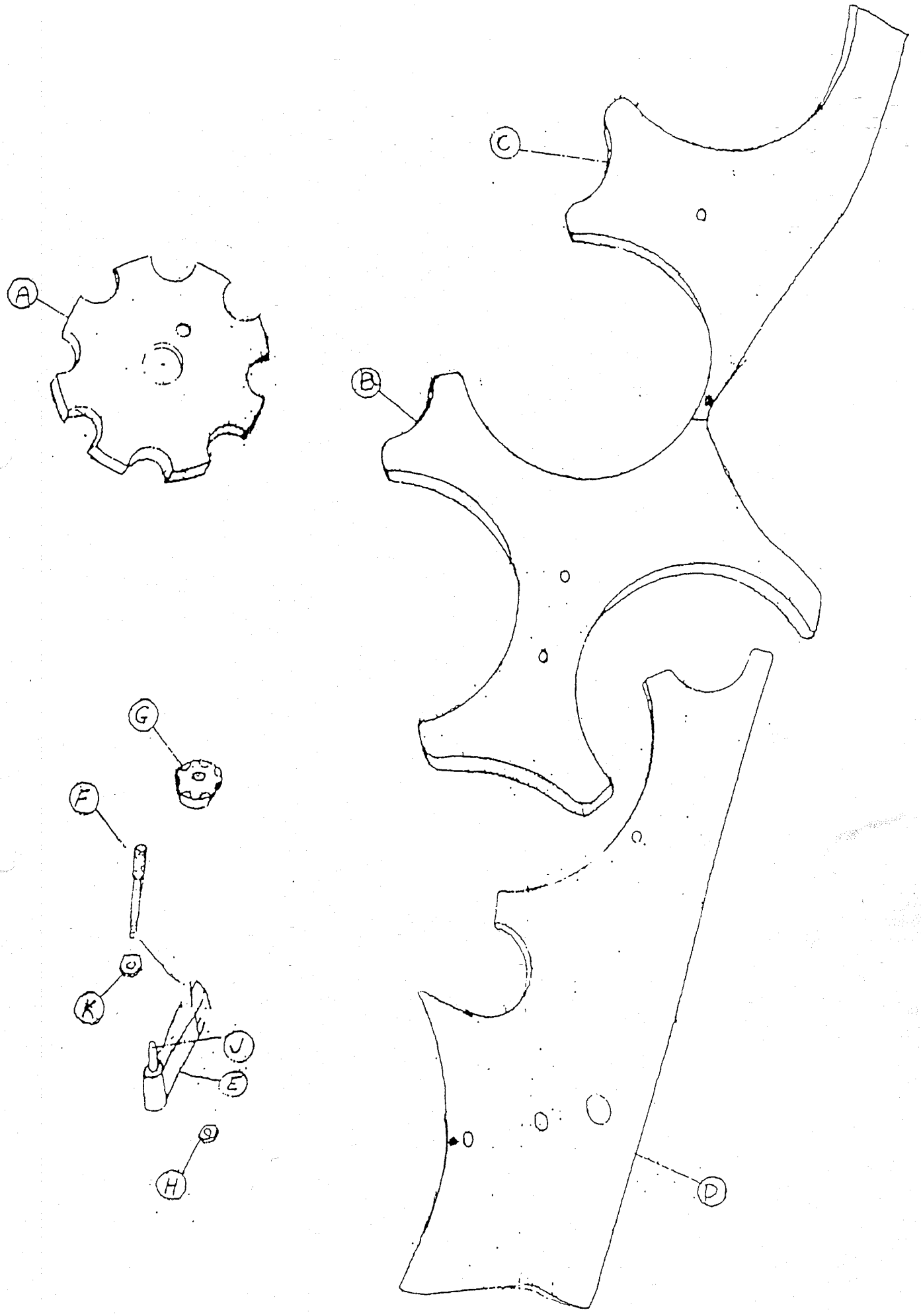
D. Latch spring Assembly

E. 1/4" - 20 x 1/2" round head screws with lockwasher

F. 1/4" - 20 x 1/2" socket set screws with lock nut.

G. Sprocket

H. Snap ring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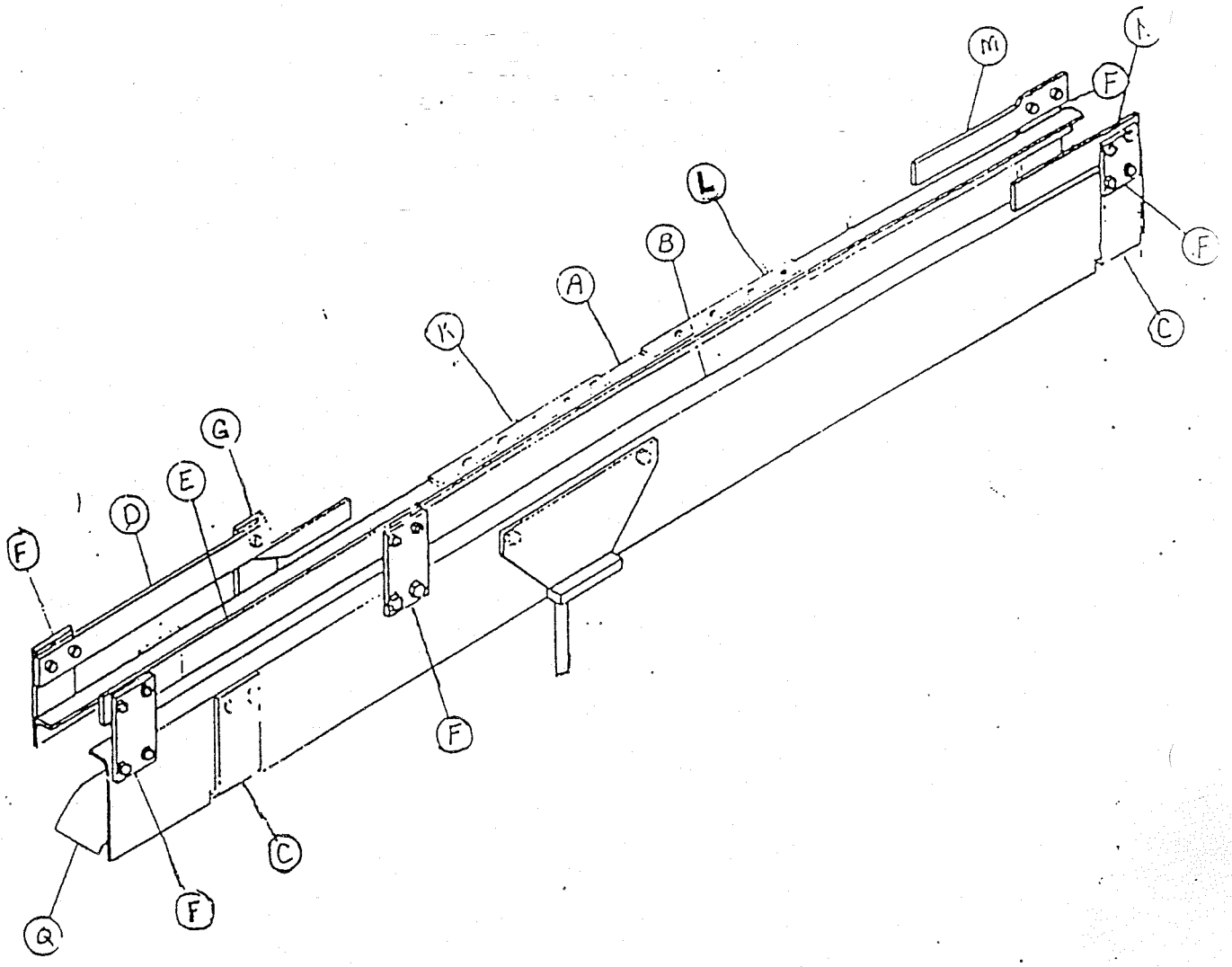
PARTS LIST

FILLER SPECIALTIES BOTTLE FILLER

GWFS-185

BOTTLE GUIDES, STARWHEELS AND TRANSFER TABLE

ITEM	PART NO.	DESCRIPTION
A		Starwheels - When ordering be sure to state bottle style and capacity.
B	Infeed Section	Bottle Guides - When ordering be sure to state container style and capacity.
C	Discharge Section	
D		Transfer Table Assembly
E		Bottle Guide Support
F		Bottle Guide Stud
G		Bottle Guide nut
H		Bottle Guide Support Hex Nut
J		Bottle Guide Pin Pressed in
K		Bottle Guide Stud nut and lockwasher 3/8 - 24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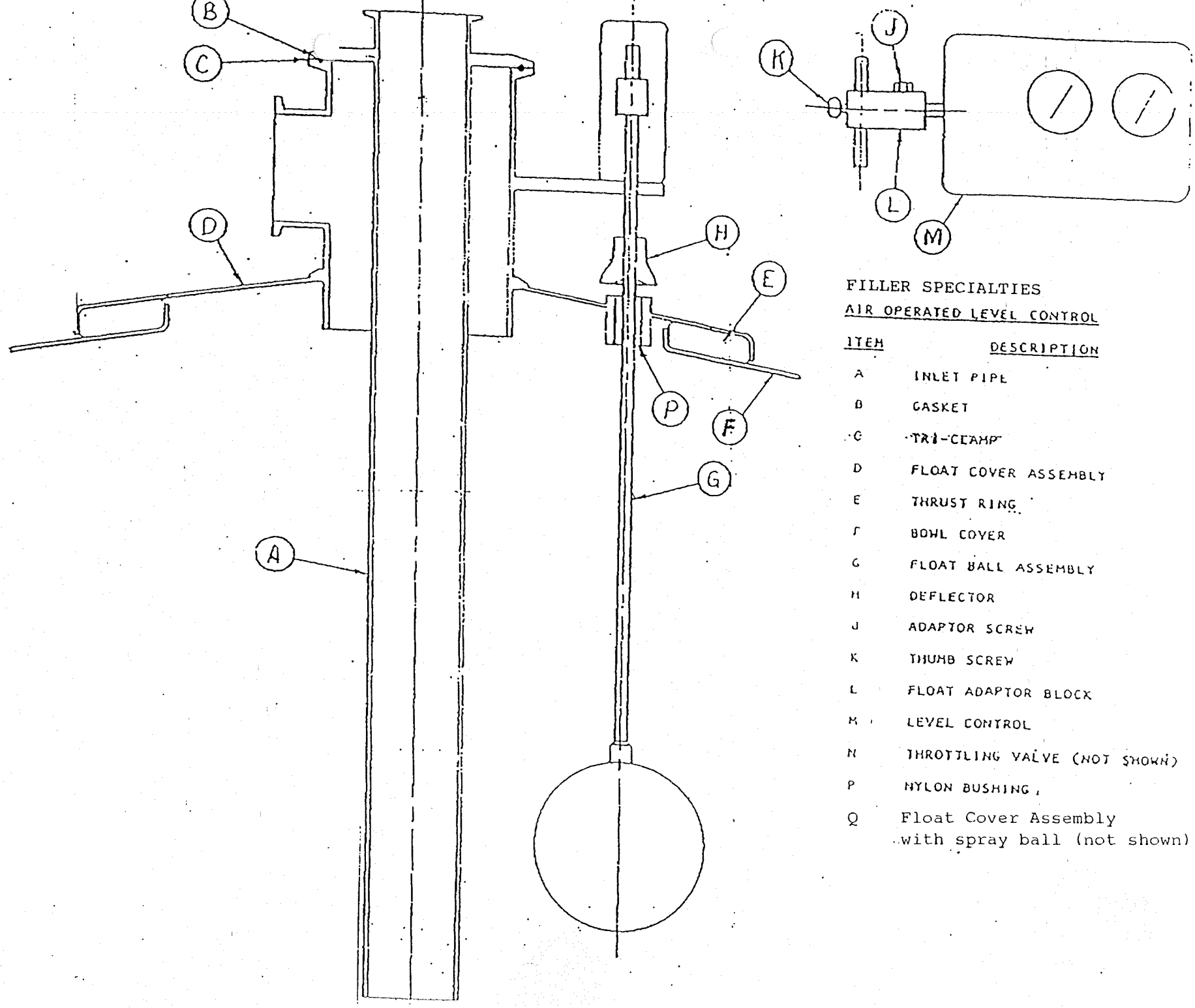
PARTS LIST

FILLER SPECIALTIES

GWFS-185

CONVEYOR TRACK ASSEMBLY

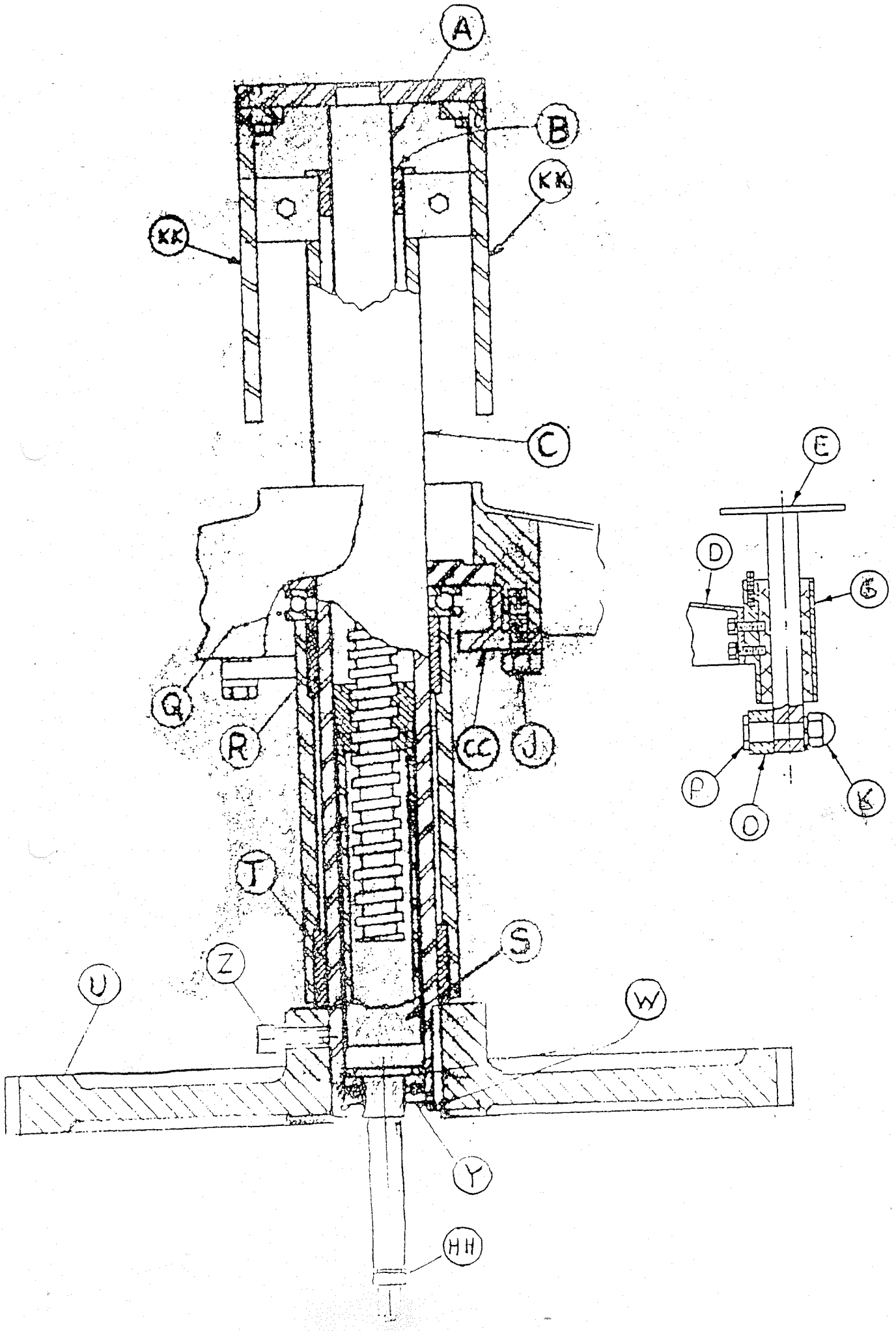
ITEM	DESCRIPTION
A	Inner Conveyor Angle
B	Outer Conveyor Angle
C	"U" Bracket
D	Inner Infeed Rail
E	Outer Infeed Rail
F	Rail Bolting Plate
G	Rail Bolting Plate
H	Spacer (Inner) - Not Shown
J	Spacer (Outer) - Not Shown
K	Wear Strip
L	Wear Strip
M	Inner Discharge Rail
N	Outer Discharge Rail
O	Spacer (Discharge End) Not Shown
P	Slice Bar - Not Shown
Q	Chain Return Plate



FILLER SPECIALTIES

AIR OPERATED LEVEL CONTROL

ITEM	DESCRIPTION
A	INLET PIPE
B	GASKET
C	TRI-CLAMP
D	FLOAT COVER ASSEMBLY
E	THRUST RING
F	BOWL COVER
G	FLOAT BALL ASSEMBLY
H	DEFLECTOR
J	ADAPTOR SCREW
K	THUMB SCREW
L	FLOAT ADAPTOR BLOCK
M	LEVEL CONTROL
N	THROTTLING VALVE (NOT SHOWN)
P	NYLON BUSHING
Q	Float Cover Assembly with spray ball (not shown)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PARTS LIST

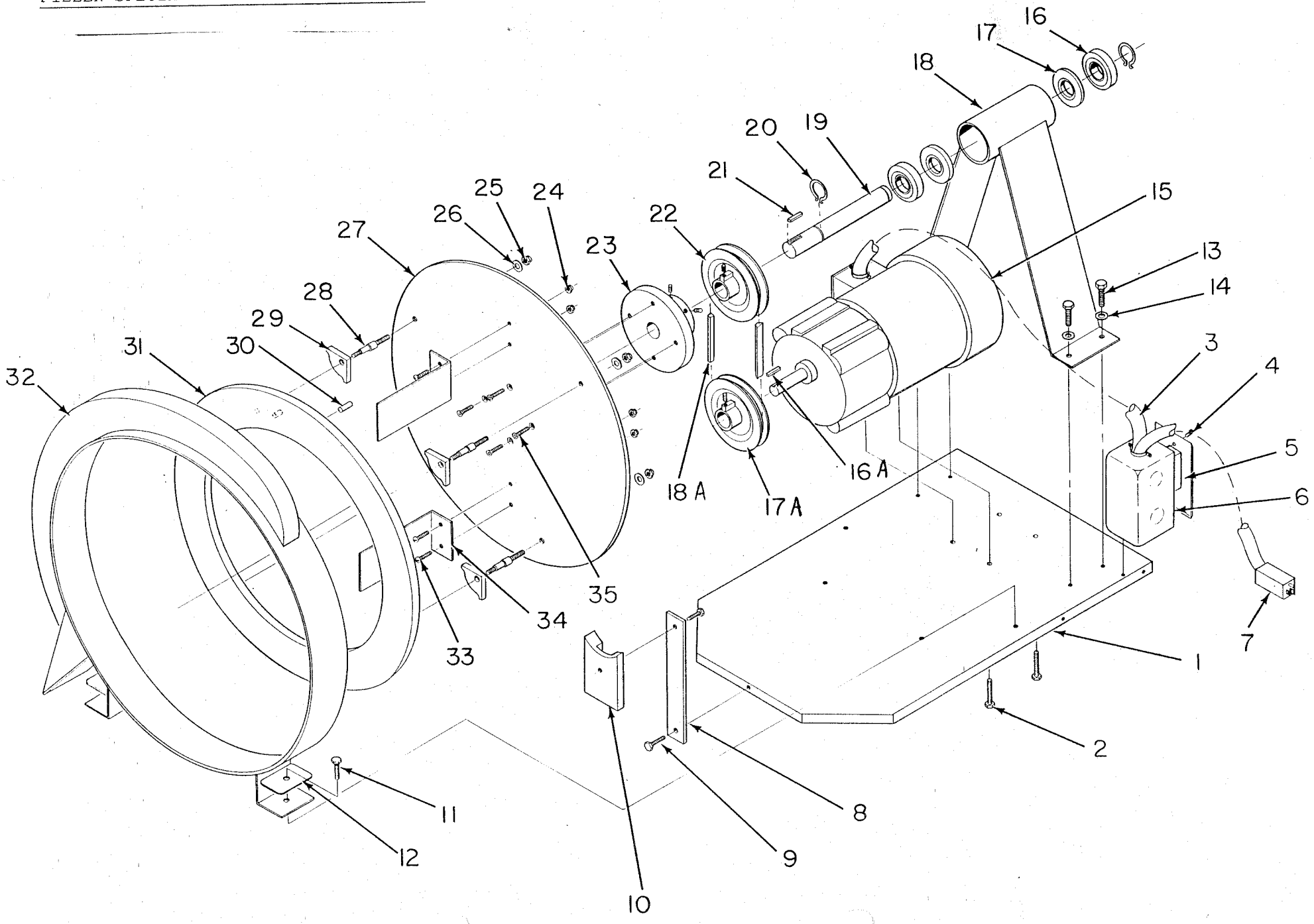
FILLER SPECIALTIES BOTTLE FILLER

BOWL RAISING & FILLER TABEL ASSEMBLY

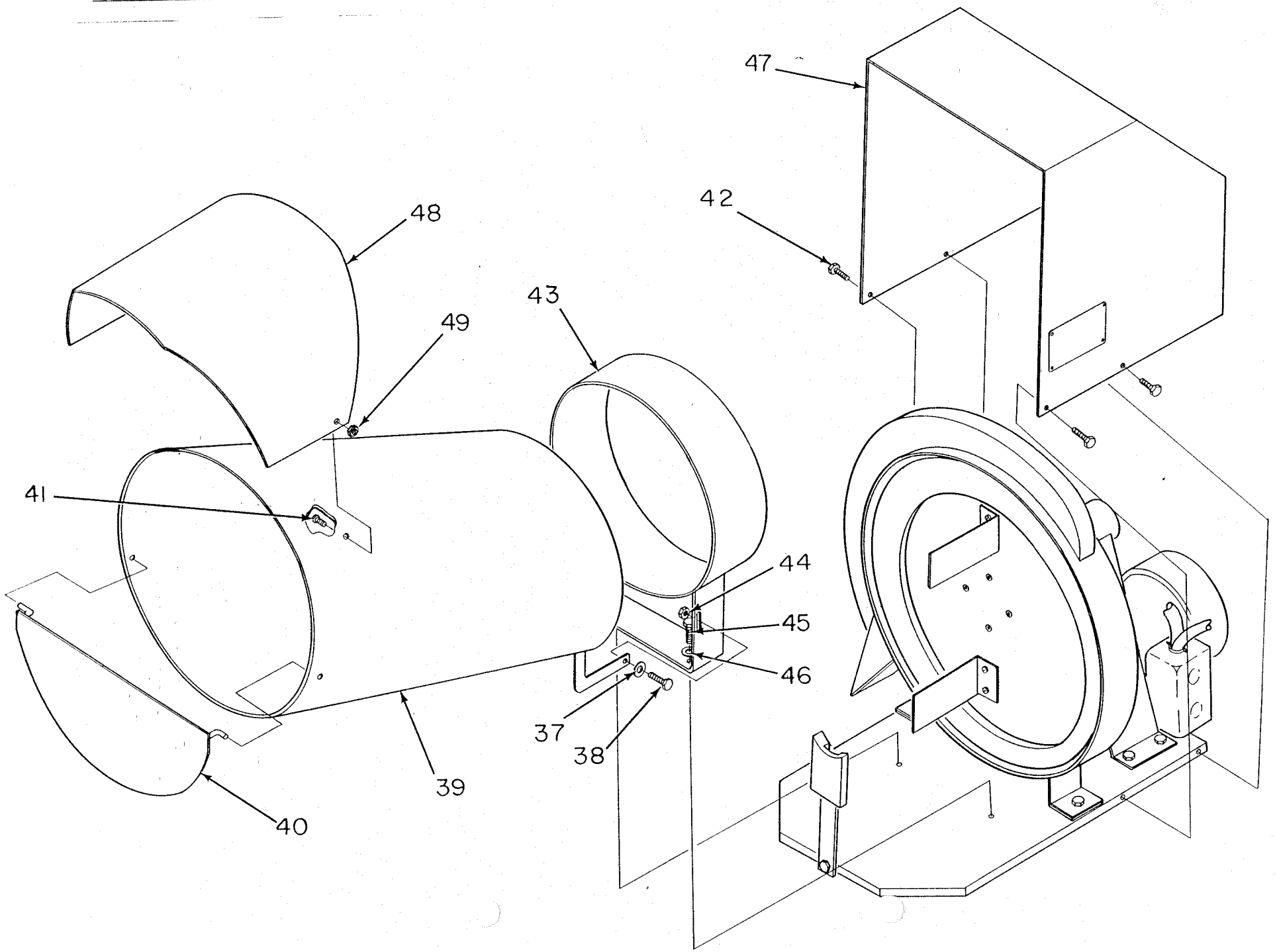
MODEL GWFS185

ITEM	DESCRIPTION
A	Bowl Raising Screw
B	Bowl Raising Screw Guide Bushing
C	Filler Table Column
D	Filler Table
E	Bottle Lifter Platform Assembly
G	Bottle Platform Bearing Block with Nylon Insert
J	1/2-13 x 1 3/4 Hex head cap screw
K	Acorn Nut
O	Roller with nylon bushing
P	Roller Shaft
Q	Large Ball Thrust Bearing
R	Housing Bushing - Upper
S	Bowl Raising Nut
T	Housing Bushing - Lower
U	Filler Gear
V	
W	Truarc Ring
X	Raising Pinion Support with Bushings
Y	Lower Ball Thrust Bearing
Z	1/2 - 13 x 1-1/2 Square Head Set Screw
CC	Clamp Ring
HH	Truarc Ring
KK	Torque Rods

FILLER SPECIALTIES ROTARY CAP-FEEDER



FILLER SPECIALTIES ROTARY CAP-FEEDER



RE: Filler Specialties Rotary Cap Feeder Parts List

MESSAGE:

Base Plate

2 Hex head cap screw 1/4 20x1

3 Electric wire

4 Motor switch cover

5 Motor switch

6 Motor switch electric box

7 Electric plug 110v

8 Hopper support

9 Hex head cap screw 1/4 20x1½

10 Hopper support block

11 Hex head cap screw 1/4 20x1

12 Support plate

13 Hex head cap screw 1/4 20x1

14 Lock washer 1/4

15 NA

16 Bearing

16A Key

17 Seal

17A Motor drive pully

18 A frame support

18A Drive belt

19 Shaft

20 Snap ring

21 Key

22 Pully

23 Drive hub

24 1/4 20 self lock nut

25 1/4 20 self lock nut

26 1/4 20 lock washer

27 Back plate assembly

28 Hex head cap screw 1/4 20x2½

29 Flipper arm

30 Sorting pin

31 Sorting wheel

32 Sorting wheel chamber

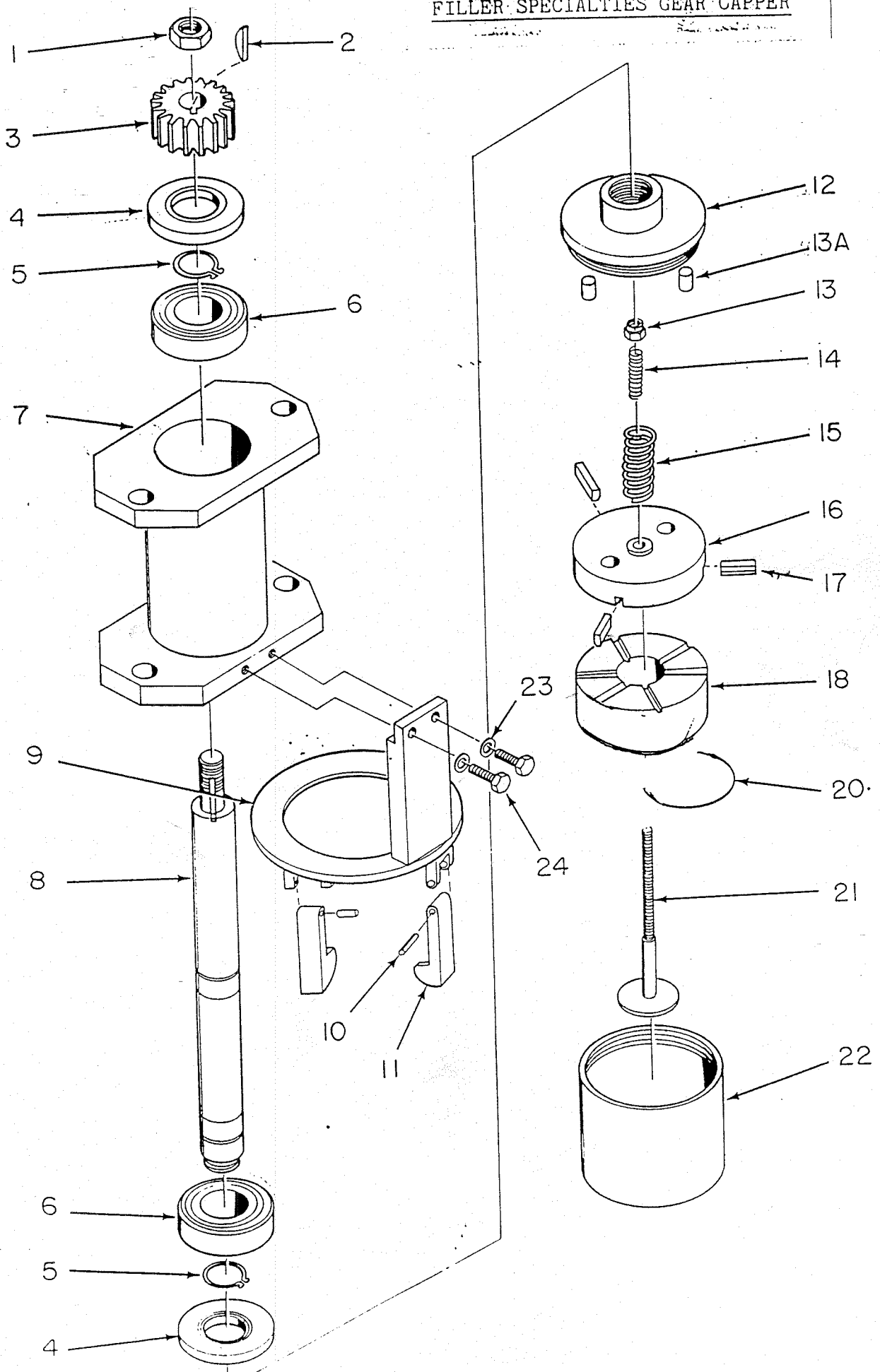
33 Hex head cap screw 1/4x20x3/4

34 Cap flipper arm

35 Hex head cap screw 1/4x20/3/4

37 1/4 20 flat washer
38 NA
39 Cap hopper
40 Hopper door
41 Hex head cap screw 1/4 20x3/4
42 Hex head cap screw 1/4 20x3/4
43 Cap hopper extension
44 1/4 20 hex self locking nut
45 Hex head cap screw 1/4 20x1
46 1/4 20 flat washer
47 Motor belt cover
48 Dust cover
49 1/4 20 hex self lock nut

FILLER SPECIALTIES GEAR CAPPER



GEAR CAPPER PARTS

(1)	MAIN SHAFT HEX NUT
(2)	KEY
(3)	18 TOOTH GEAR 1/2" 24 TOOTH GEAR 1/2" - #18890A
(4)	BEARING SEAL
(5)	SNAP RING
(6)	CAPPER BEARING
(7)	CAPPER BODY
(8)	DRIVE SHAFT
(9)	STOPPER ARM HOLDER
(10)	STOPPER ARM PIN - ROLL PIN
(11)	STOPPER ARM (HINGE STYLE)
(12)	GRIPPER BODY TOP
(13)	PLUNGER SELF LOCK NUT
(13A)	CLUTCH PIN
(14)	PLUNGER SPRING
(15)	LIGHT TORQUE SPRING
(15)	HEAVY TORQUE SPRING #18790
(16)	TORQUE DRIVE CLUTCH
(17)	TORQUE KEY
(18)	GRIPPER
(20)	C SPRING
(21)	PLUNGER
(22)	GRIPPER BODY
(23)	WASHER SS
(24)	BOLT SS

BEARING FOR LG. CENTER DRIVE GEAR

LG. CENTER DRIVE GEAR

GEAR CAPPER (COMPLETE)

RETAINING SPRING

SPRING RETAINER

24 TOOTH IDLER (DOUBLE WIDE)

COMPLETE HEAD (ONLY) (#12 TO #22)

COMPLETE (#1 TO #24)

ii. Tachometer Connection—All Models (Note: DC Tachs Only)

(1) For tach feedback, cut jumper J1 on Printed Circuit Board.
(2) Connect tach as follows:
(a) 7 volts/1000 RPM Connect (+) lead to Terminal "T"
Connect (–) lead to Terminal I_2 or F–
(b) 50 volts/1000 RPM Connect (+) lead to Terminal "B"
Connect (–) lead to Terminal I_2 or F–

Note: Set IR Comp to minimum for tach feedback.

TROUBLESHOOTING GUIDE - KBMM CONTROLS

Note: It is not recommended that repairs to this control should be attempted unless you are a qualified technician. **Read Safety Warning on Page 2.**

SYMPTOM	POSSIBLE CAUSE	CORRECTIVE ACTION
1. No output	1. Plug-in Horsepower Resistor® not installed.	1. Install correct Plug-in Horsepower Resistor® (see page 5)
	2. Fuses not installed	2. Install proper AC line and armature fuses (see page 11)
	3. Fuses blown	3. Check wiring and motor for grounds or shorts
2. Erratic motor performance	1. Plug-in Horsepower Resistor® wrong size	1. Replace with proper value
	2. IR Comp Trimpot set too high	2. Rotate trimpot CCW to approx. 9 o'clock position
3. Motor slows down substantially when load is applied-CL LED light	1. Plug-in Horsepower Resistor® wrong size	1. Replace with proper value
	2. CL trimpot set too low	2. Rotate trimpot CW to approx. 1 o'clock position
	3. Motor armature and field connections interchanged (Shunt motors only)	3. Correct wiring (armature has lower resistance field)
	4. Control voltage rating does not match AC line or motor voltage	4. Use proper control and/or motor
	5. Motor H.P. too low for application	5. Use larger horsepower motor
4. Motor runs in wrong direction	1. Armature leads reversed	1. Reconnect armature leads

Prima Fruit Juices Limited

Technical Department

Faraday Road, Wesfield Trading Estate, Granstand Road, Hereford, HR4 9NZ, UK.

Telephone: 44+ (0) 1432 35 93 50 Fax: 44+ (0) 1432 27 94 90

To: NEIL From: Bob MOORE

Company: C. WAIT Time: 14.20

Date: 18/9/97 No. of Pages: 2 off

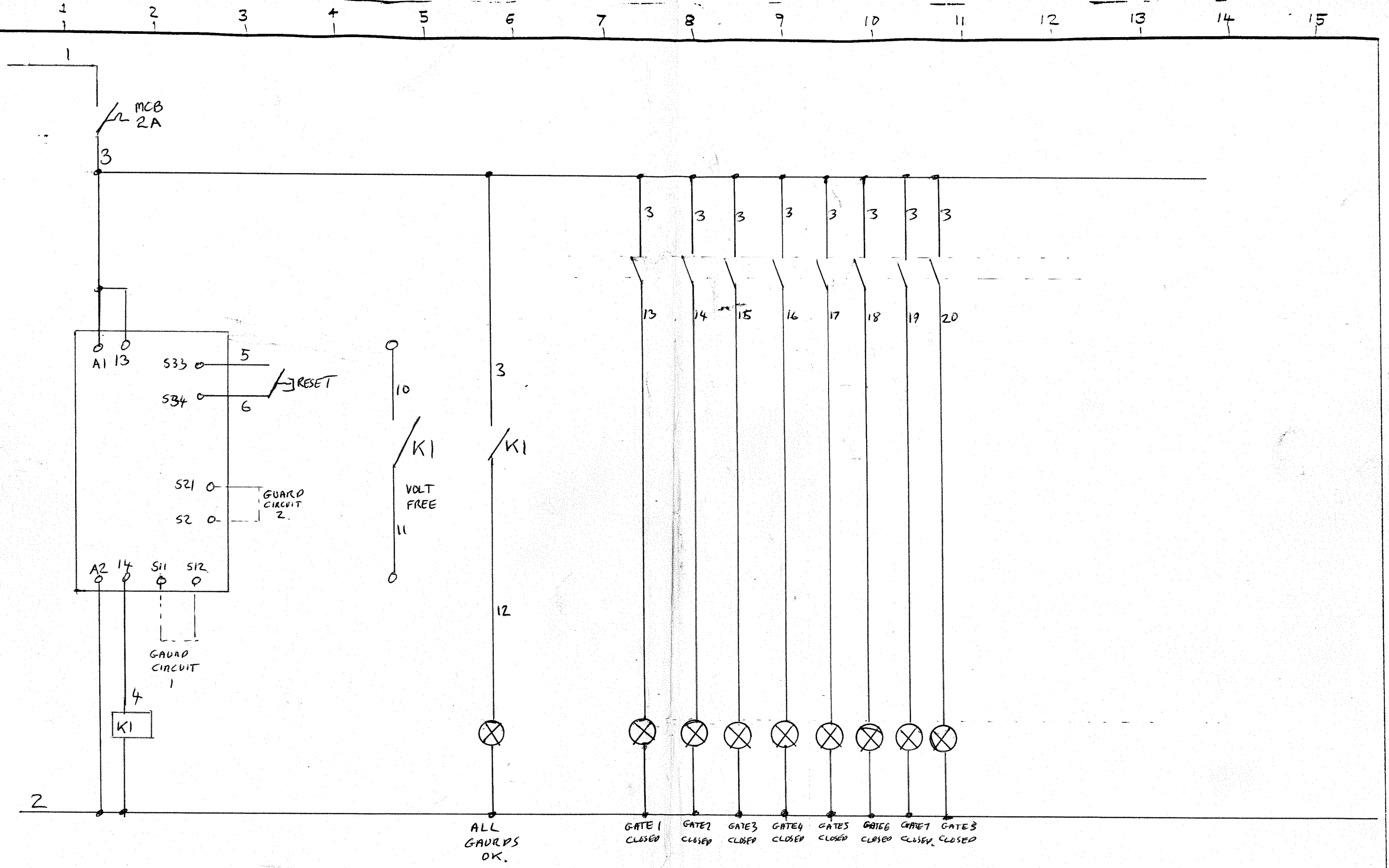
Fax Message

Neil :-

As requested the trouble shooting page for our faulty speed control PCB.

Not much help tho'.

R. Moore.



Nº	DATE	REVISION	INITIAL

TITLE: DC DRIVE FILLER.

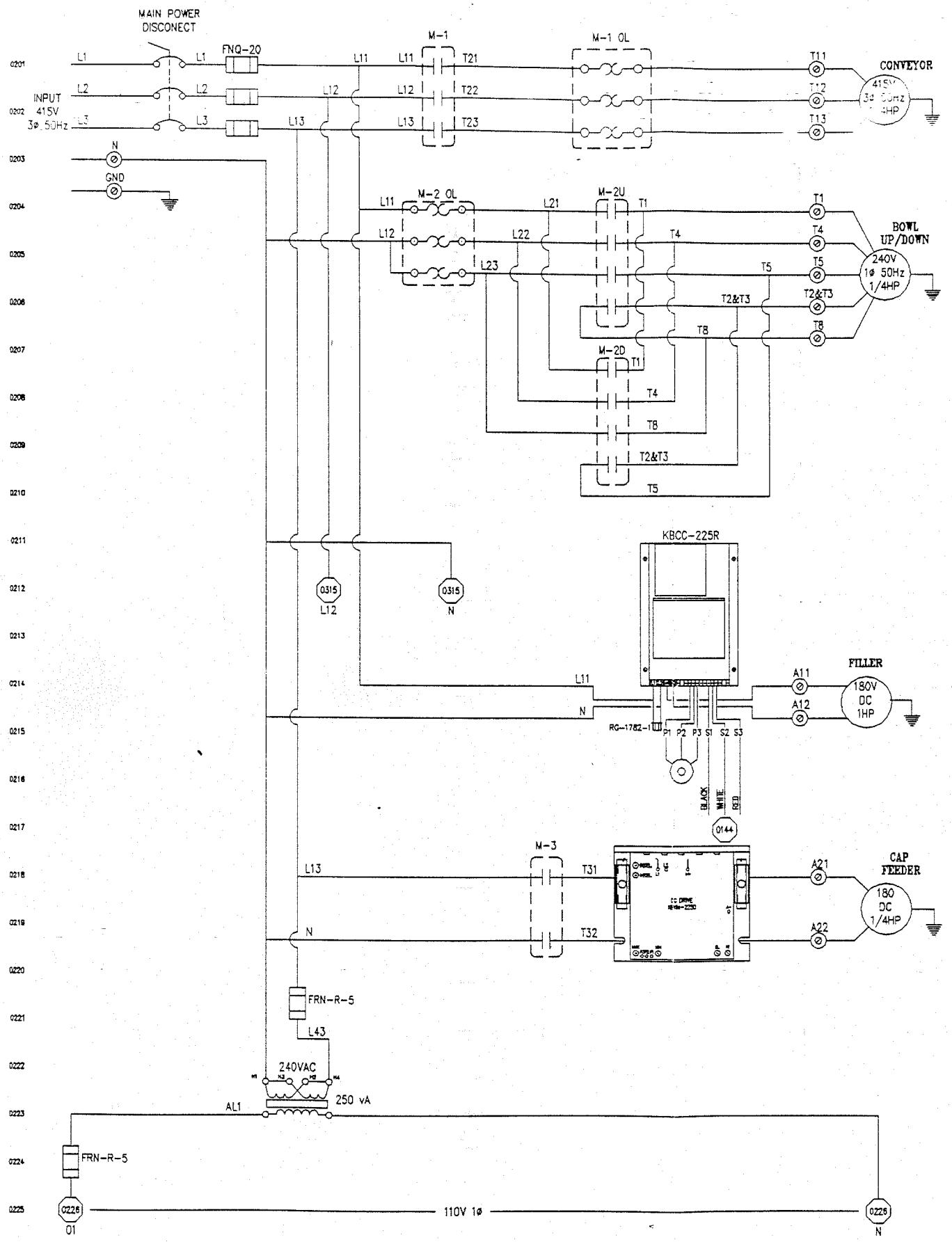
SCALE:

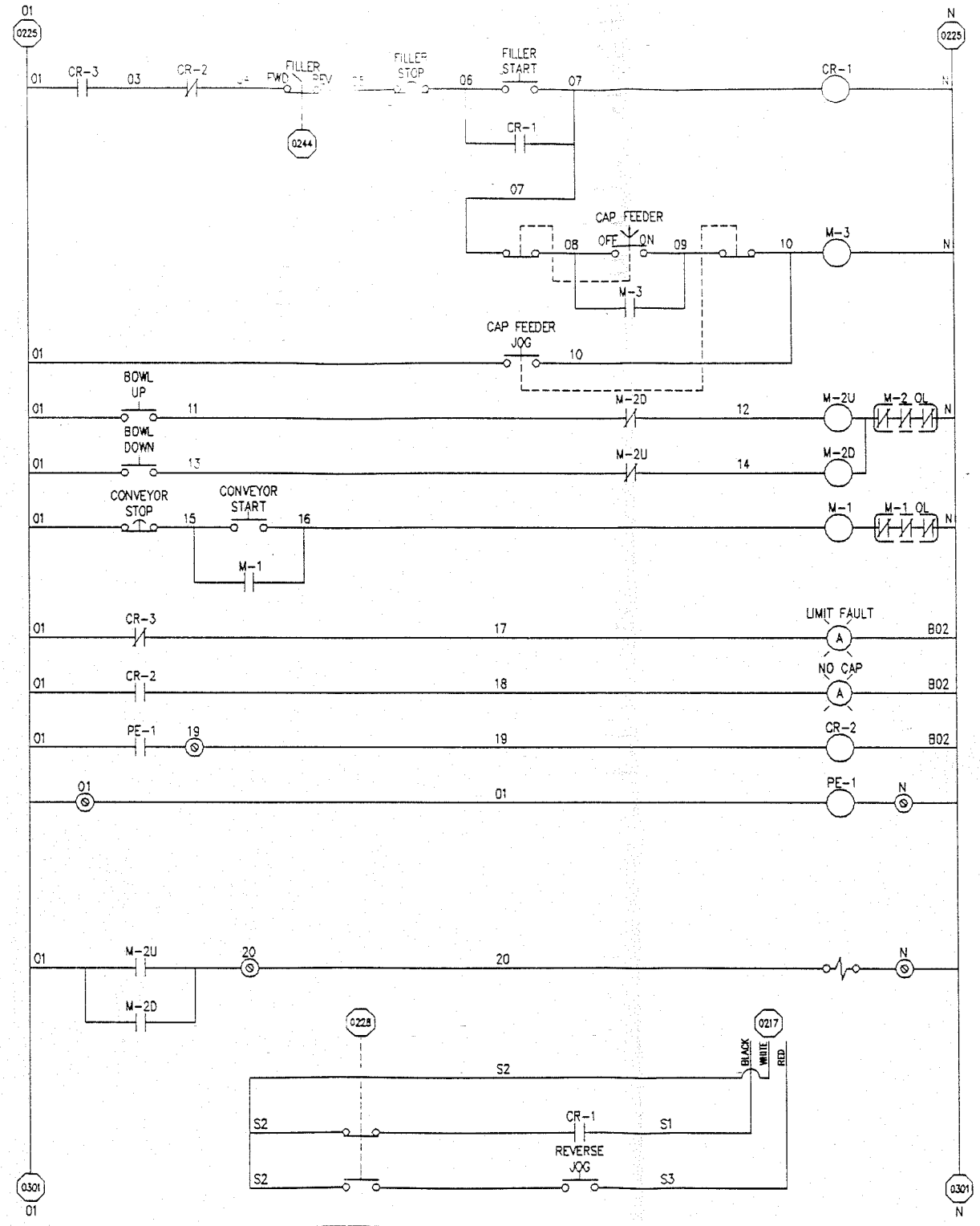
CHARLES WAIT (PROCESS PLANT) LTD
SOUTHPORT ENGLAND
TEL: 01704 211273 FAX: 01704 25875

DRAWN: N L

DATE: 29/9/97

DRWG Nº: E2689





Options

NOTE: CHECKED OFF ITEMS INDICATE THE OPTIONS INSTALLED ON THIS MACHINE.

✓ 1.	Safety Limit Switch on Guard	✓ 9.	Filler Forward/Reverse Select
_ 2.	Safety Limit Warning Light	✓ 10.	Filler Reverse Jog
_ 3.	No Cap Photo Eye(Adj. Time Dly.)	✓ 11.	Filler Speed
_ 4.	No Cap Warning Light	✓ 12.	Cap Feeder On/Off
_ 5.	Low Level Sensor	✓ 13.	Cap Feeder Jog
_ 6.	Low Level Warning Light	✓ 14.	Cap Feeder Speed
_ 7.	Digital B.P.M. display	_ 15.	Conveyor Start/Stop
✓ 8.	Filler Start/Stop	_ 16.	Conveyor Speed

PLOTTED
OCT 27 1993

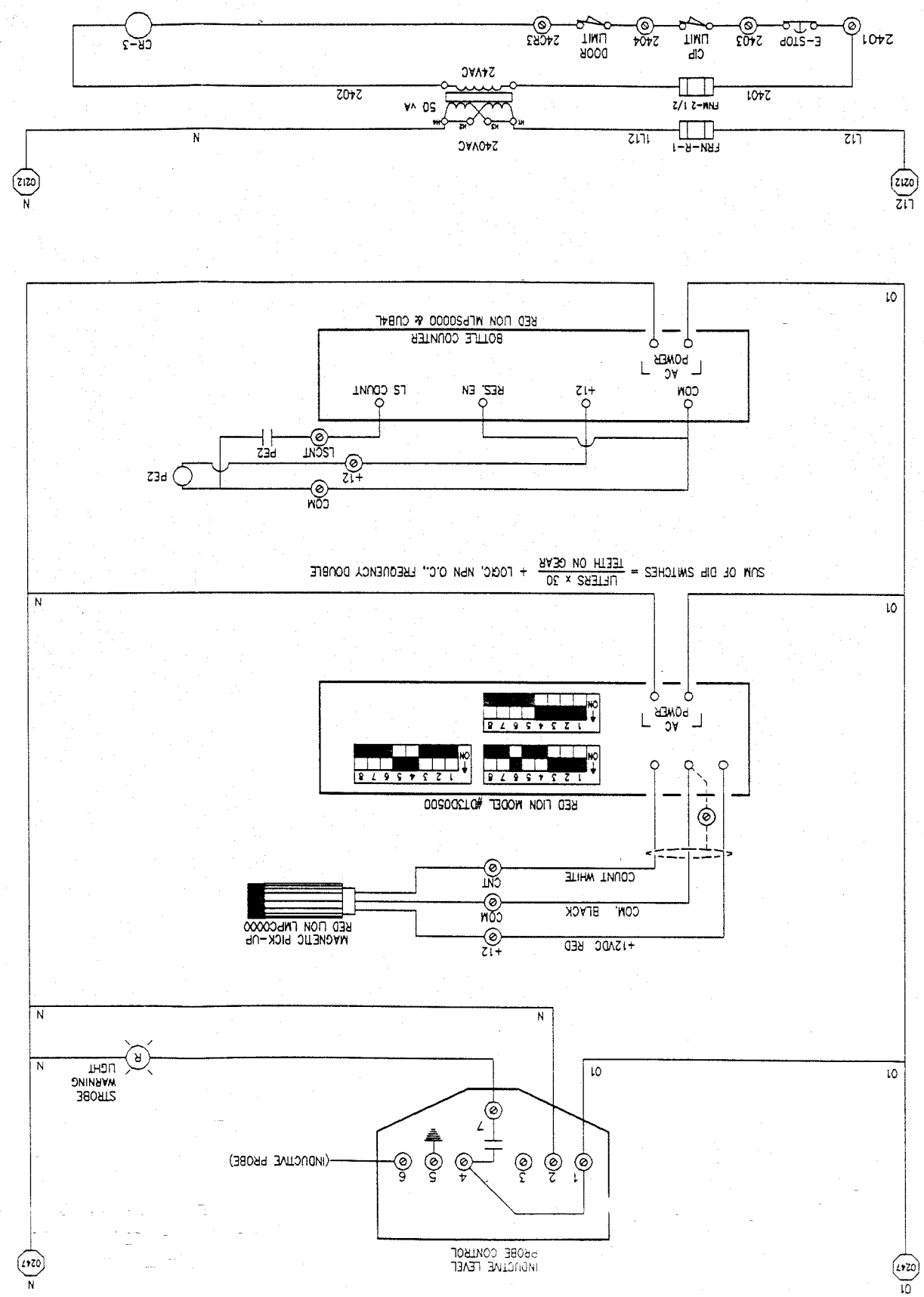
CAD ORIGINAL DO NOT ALTER MANUALLY

REVISIONS
10-25-93 ISSUED FOR REVIEW

PEC TECHNOLOGIES inc.
11598 East Lakewood, Holland, Michigan
Telephone (616) 394-9151
Fax (616) 392-6880

FILLER SPECIALTIES
ZEELAND, MICHIGAN
MACHINE # 321093GWFS185L
SCHEMATIC WIRING DIAGRAM

FILE NAME	F02001-F35501
DRAWN	ABS
DATE	10-25-93
SCALE	NONE
JOB NO.	F355
SHEET	01
OF	2 SHEETS



FILLER SPECIALTIES

ZEELAND, MICHIGAN

MACHINE # 321093GWFS185L

SCHEMATIC WIRING DIAGRAM

PEC TECHNOLOGIES INC.
11598 East Lakewood, Holland, Michigan
Telephone (616) 394-9151
Fax (616) 392-6880

REVISIONS
10-25-93 ISSUED FOR REVIEW

FILE NAME
F02001-F3550Z
DRAWN
ABS
DATE
10-25-93
SCALE
NONE
JOB NO.
F355
SHEET
02
OF 2 SHEETS

SERVICE BULLETIN
371-215-87

TRI-CLOVER ACTUATOR TYPE 215 for Series 371 Valves

DISASSEMBLY AND REASSEMBLY - TYPE 215 ACTUATOR

INTRODUCTION

The 215 actuator is an air to close-spring to open unit, which utilizes a diaphragm for reduced friction.

Actuator disassembly can be accomplished by inserting the two flats on the actuator bonnet ferrule in a vise. This will prevent the actuator bonnet from turning when removing the actuator cylinder. See Figure 1.

ACTUATOR DISASSEMBLY

WARNING

WARNING SPRING UNDER LOAD
Actuator cylinder may eject with sufficient force to cause serious injury. Remove actuator from valve before disassembling actuator.

The actuator spring is not contained. Although the preload force is low, caution should be used when the spring force is released. Hand pressure should be applied to the top of the cylinder to restrict its travel.

1. Apply air to the actuator, to extend the stem. Unscrew the coupler. Release air.
2. Remove actuator cylinder from bonnet by applying a strap wrench to the cylinder and turning in a counterclockwise direction until cylinder and bonnet can be separated. See Figure 1.

   When the cylinder is completely unscrewed the spring force will push it up. Apply hand pressure as noted in the "Warning" note above. See Figure 2.
3. Remove the cylinder from the bonnet.
4. Remove the spring from the bonnet.
5. Remove air coupler adapter, gasket, and sealing nut.
6. Slide cylinder off actuator internals.
7. Slide body insert and diaphragm from outer diaphragm clamp/retainer.
8. Remove stem, adapter, and retainer assembly nut. Retainer nut may be readily removed by inserting a punch in a hole in the retainer nut face, and tapping the nut in a counterclockwise direction. See Figure 3.
9. Separate top and inner diaphragm clamp/retainers, freeing diaphragm.

INSPECTION

Examine diaphragm and gasket for cuts, abrasions, and excessive wear.

Inspect the actuator stem for galling, nicks, and scratches. Check the bushing bore in the bonnet for wear.

NOTE

If inspection reveals a worn bushing in the bonnet, press out the bushing. These components may be damaged when removed. Remove only if necessary.

Replace all worn or damaged parts.

Check the inside walls of the actuator cylinder and the diaphragm clamps to be sure they are free from score or scratch marks.

Check the coupler, to see that the balls are in place and move freely when the coupler sleeve is raised.

Inspect all air lines and fittings for leaks and tighten when and where necessary.

ACTUATOR REASSEMBLY

1. Spray diaphragm with a silicone spray lubricant and install between top and inner diaphragm clamp/retainers.
2. Install retainer nut assembly, adapter and stem.
3. Roll diaphragm onto outer diaphragm clamp/retainer. Slide body insert onto outer diaphragm clamp/retainer.
4. Carefully slide cylinder over diaphragm so that diaphragm is not abraded or torn.
5. Spray gasket with silicone spray lubricant. Install sealing nut, gasket, and air coupler adapter.

   NOTE

   Now insert the two flats of the actuator bonnet back into a vise.
6. Place spring in bonnet.
7. IMPORTANT

   Lubricate the cylinder threads with Tri-Clover C137 lubricant. This will prevent the stainless steel threads from galling.

   Place cylinder on spring.

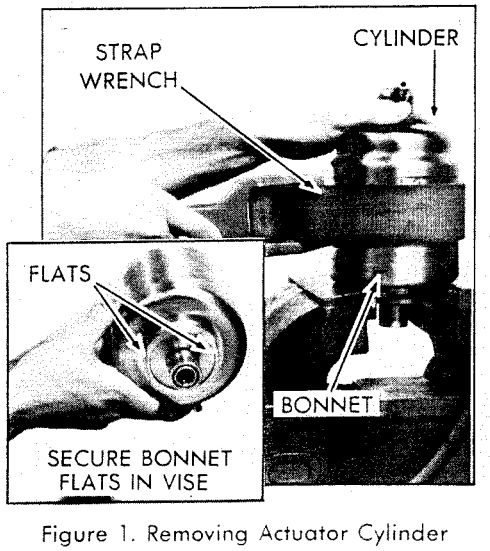


Figure 1. Removing Actuator Cylinder

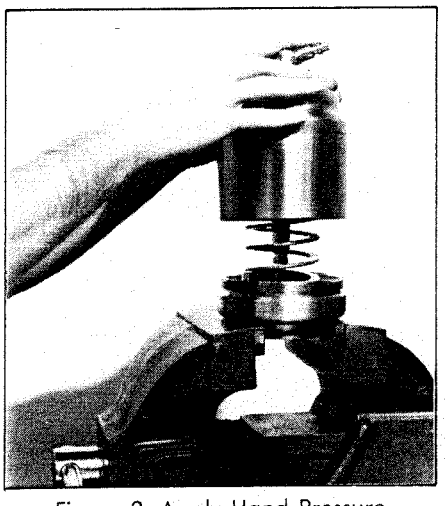


Figure 2. Apply Hand Pressure to Restrict Cylinder

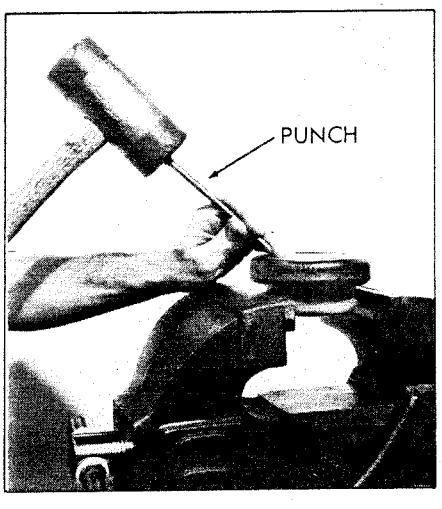


Figure 3. Tap Retainer Nut to Remove

8. Compress spring by hand. Thread the cylinder into the bonnet, and tighten it until it "bottoms". It will be necessary to use a strap wrench for the last few turns.

9. IMPORTANT

Attach air line with regulator set to 0 p.s.i. to the actuator. Slowly increase air pressure to extend stem toward bushing. Guide stem through bushing, being careful not to damage stem or bushing. Attach coupler assembly to stem. Release air.

The following exploded view and accompanying parts list facilitate ordering repair parts from the factory. All parts illustrated are indexed to the parts list.

NOTE

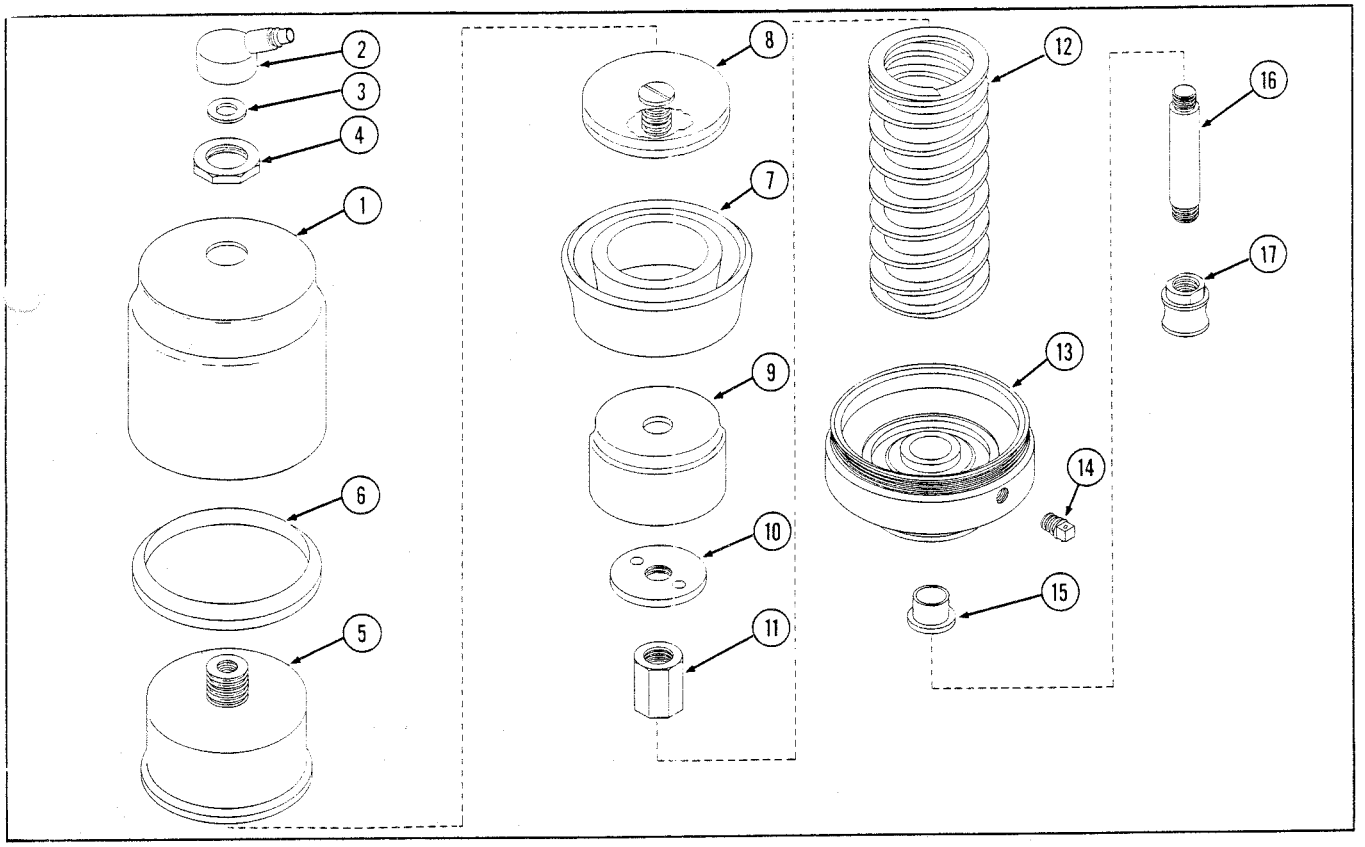
To assure replacement of the correct part, the serial number on the nameplate must be included in any correspondence to the factory.

PARTS LIST TYPE 215

HOW TO ORDER

All orders for repair parts must contain the following data:
1. Complete model number (from nameplate).
2. Serial number (from nameplate).
3. Index number and description from the parts list.

Actuator Air Supply Specifications:
Air pressure range is 35-50 p.s.i. (normal).



Index No.	Description	Part Number	No. Req.
1	Actuator body cylinder	25-263B-01-S	1
2	Air coupler adapter	37-5-S	1
3	Gasket	17-88	1
4	Sealing nut	13-78-S	1
5	Outer diaphragm clamp/ retainer	36-55	1
6	Body insert	37-88	1
7*	Diaphragm	35-1	1
8	Top diaphragm clamp/ retainer	36-15	1

Index No.	Description	Part Number	No. Req.
9	Inner diaphragm clamp/ retainer	36-3	1
10	Nut-retainer assembly	13-15	1
11	Adapter	37-89-316	1
12	Compression spring	4-2-S	1
13	Bonnet	12-283A	1
14	Vented plug	MS-105-58A-CP	1
15*	Bushing	40-4	1
16	Actuator stem	19-600-01	1
17*	Coupler	37-95A-SS	1

*It is recommended that one spare part be stocked for each item marked (*).
NOTE: It is also recommended that a tube of C137 lubricant be stocked for servicing stainless steel actuators.

Tri-Clover, Inc.
Kenosha, Wisconsin 53141
Alfa-Laval Group

2.5M 6/87 KCC

PRINTED IN U.S.A.

TRI-FLO AIR ACTUATED THROTTLING VALVES SERIES 371

WARNING SPRING UNDER LOAD
Actuator cylinder may eject with sufficient force to cause serious injury. Remove actuator from valve before disassembling actuator.

INTRODUCTION

This manual contains disassembly and reassembly instructions, with parts lists, for the Series 371 Tri-Flo Clean-In-Place Air Actuated Throttling Valves (Sanitary), designed and manufactured by Tri-Clover, Inc., Kenosha, Wisconsin.

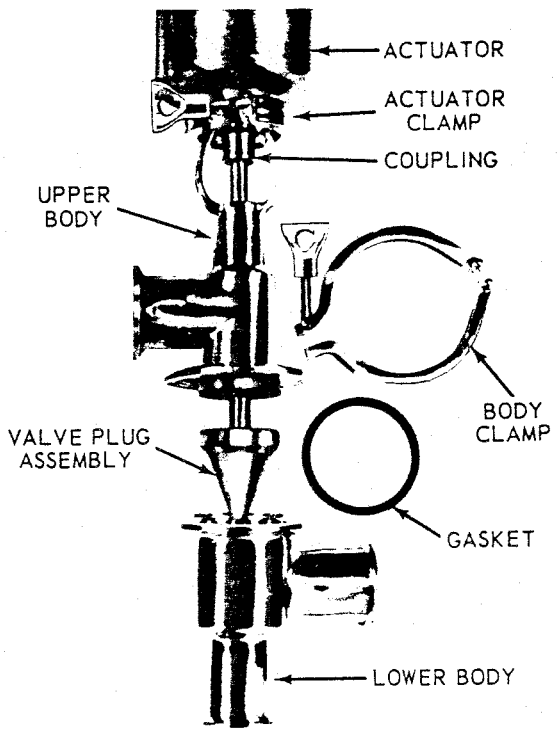


Figure 1. Valve Disassembly

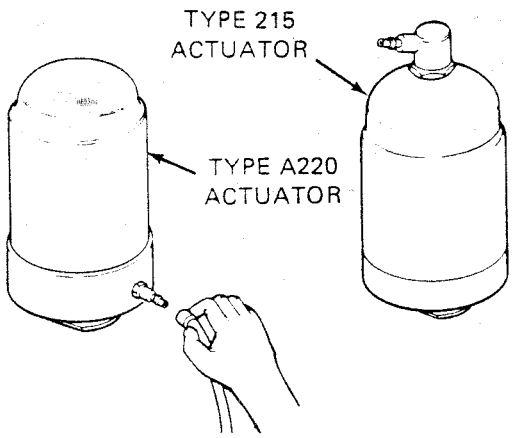


Figure 2. Applying Air to Actuator

DISASSEMBLY AND REASSEMBLY

CAUTION

Keep hands away from valve coupling and upper body when applying or releasing air. The actuator stem assembly may move with extreme force and suddenness when air pressure is applied or released.

Spray stem and "O" ring with No. L-1011 Sanitary Lubricant.

Make sure all valve bodies are mated properly before securing with clamps. Tighten all clamps securely to assure proper alignment.

When disassembling and assembling valve, bench area should be clean to prevent marring and nicking of seats.

Valve Disassembly (Models 371-10, 21, 27, 30, and with type 215 actuators). See Figure 1, Valve Disassembly.

1. Remove body clamp, lower body and gasket.
2. Apply air to actuator. See Figure 2.
3. Lift sleeve on coupling unit and remove valve stem and remove "O" ring from valve stem. See Figure 3.
4. Release air supply.
5. Remove actuator clamp and upper body. See Figure 4 for 371-10 and 371-30 valves.

Valve Reassembly

1. Clamp actuator to upper body with actuator clamp.
2. Install "O" ring on valve stem.
3. Apply air supply to actuator, lift sleeve on coupling unit and insert stem into coupling unit. Release coupling sleeve and air supply.
4. Replace gasket, lower body and body clamp.

Valve Disassembly (Models 371-10, 21, 30, and with type A220 actuator). See Figure 1, Valve Disassembly.

1. Apply air to actuator.
2. Remove body clamp, lower body and gasket.
3. Release air supply, lift sleeve on coupling unit and remove valve stem. Remove "O" ring from valve stem.
4. Remove actuator clamp and upper body. See Figure 4 for 361-10 and 361-30 valves.

Valve Reassembly

1. Clamp actuator to upper body with actuator clamp and install "O" ring on valve stem.
2. Lift sleeve on coupling unit, insert valve stem into coupling unit and release sleeve.
3. Apply air to actuator. Replace gasket lower body and body clamp. Release air supply.

INSPECTION

Carefully examine the metal valve plug seats for nicks or scratches.

Inspect the valve stem and stem bore in valve upper body or bonnet for signs of galling.

Inspect the valve seats in the valve bodies for nicks, scratches and other irregularities that can damage the metal valve seat.

Examine the gaskets used at the port connections and body gasket for cuts, abrasions or other damage that could cause leakage or ineffective cleaning.

Carefully examine all "O" rings for cuts, abrasions or damage that would allow leakage or ineffective cleaning.

Check the coupler to see that the balls are in place and move freely when the coupler sleeve is raised. If replacement is required see actuator service bulletin.

Inspect all air lines and fittings for leaks, and tighten when and where necessary.

Replace worn or damaged parts.

erate all valves after assembly to be sure they are operating correctly.

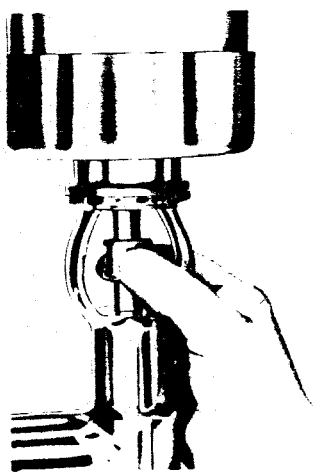


Figure 3. Releasing Coupler

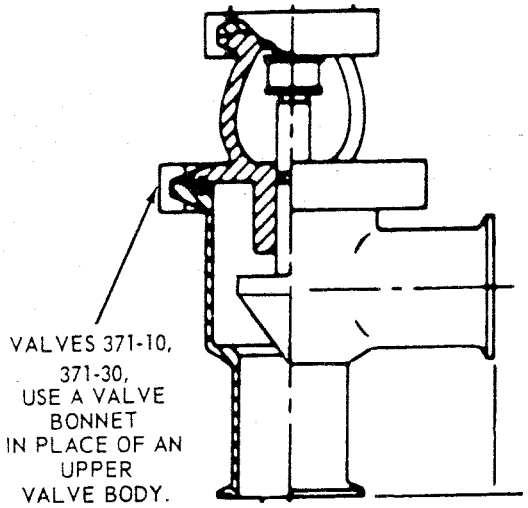


Figure 4. Valve Bonnet

PARTS LIST

How to Use the Parts List

The following exploded views (Figures 5 and 6) and accompanying parts list facilitate ordering replacement parts from the factory. All parts of the valve are exploded and keyed to the parts list.

Parts illustrated in solid lines are standard on all valves regardless of body styles. Broken line illustrations depict parts that vary depending on body style.

Example: 371-10-Actuator-Size, Throttling Valve with Tee Body utilizes a valve bonnet, Index No. 10, a lower body, Index 1 and a plug assembly, Index 4.

NOTE

To assure replacement of the correct part for your valve, the serial number, model number and size, located on the actuator nameplate, must be included in any correspondence to the factory.

IMPORTANT

How to Order

All orders for repair parts must contain the following data.

1. Complete model number (located on actuator nameplate), including size.
2. Valve serial number (located on nameplate).
3. Description and part number from the parts list.

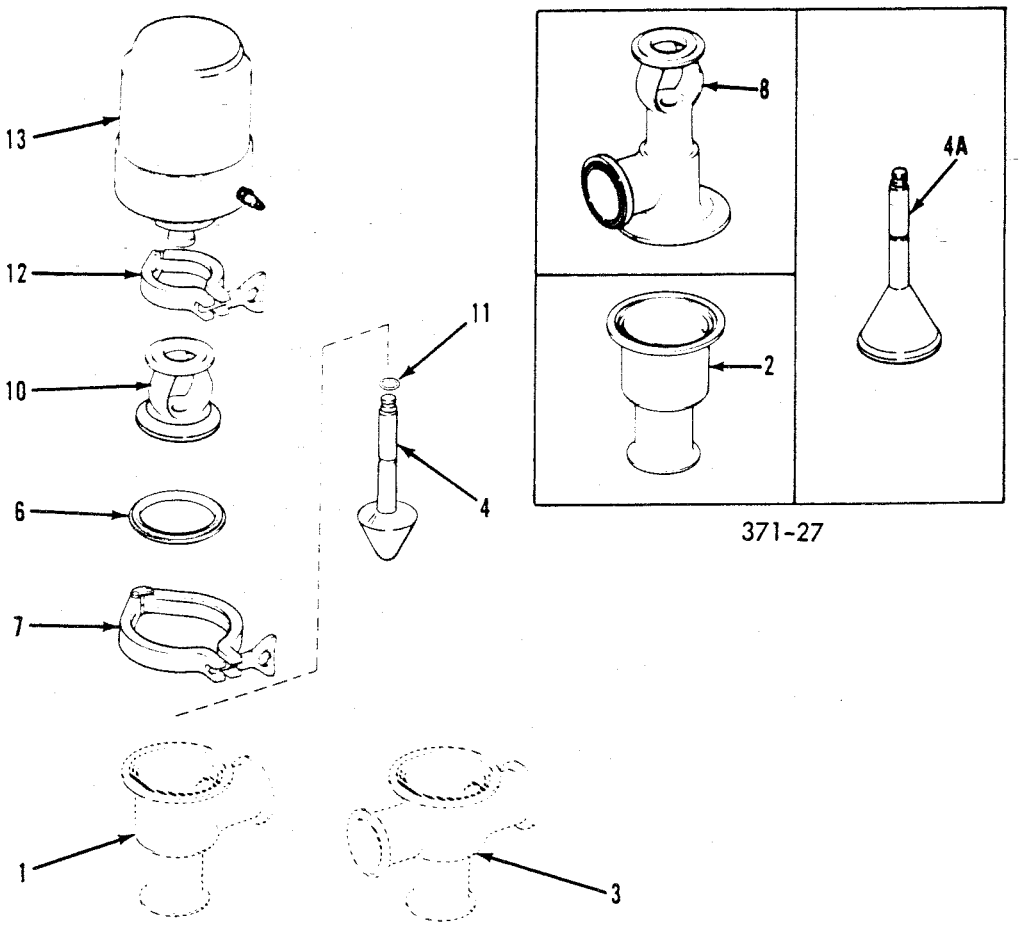


Figure 5. Type 371-10, 371-30 & 371-27 Throttling Valve, Exploded View

PARTS LIST FOR TYPES 10, 27, AND 30 THROTTLING VALVE

Index No.	Description	Valve Port Size				
		1"	1-1/2"	2"	2-1/2"	3"
*1	Valve, lower body - Model 10	7-225T-1-316	7-184T-1½-316	7-184T-2-316	7-184T-2½-316	7-184T-3-316
*2	Valve, lower body - Model 27		7-200A-1½-316	7-200A-2-316	7-200A-2½-316	7-200A-3-316
*3	Valve, lower body - Model 30	7-225C-1-316	7-184C-1½-316	7-184C-2-316	7-184C-2½-316	7-184C-3-316
•4	Valve, plug assembly - Models 10 & 30	19-1215-1-316	19-1215-1½-316	19-1215-2-316	19-1215-2½-316	19-1215-3-316
•4A	Valve, plug assembly - Model 27		19-1059-1½-316	19-1059-2-316	19-1059-2½-316	19-1059-3-316
•6	Body, gasket	17-62-1½-316	17-62-2-316	17-62-2½-316	17-62-3½-316	17-62-4-316
7	Body, clamp	H13MHHM-1½-S	13MHHM-3-S	13MHHVM-3-S	13MHHVM-4-S	13MHHM-5-S
*8	Valve, upper body - Model 27		7-192T-1½-316	7-192T-2-316	7-192T-2½-316	7-192T-3-316
10	Valve, bonnet - 10 & 30	12-146-1-316	12-146-1½-316	12-146-2-316	12-146-2½-316	12-146-3-316
•11	"O" ring - valve plug stem	17-1-U**	17-1-U**	17-1-U**	17-5-U**	17-5-U**
12	Actuator clamp	13MHHM-2-S	13MHHM-2-S	13MHHM-2-S	13MHHM-2-S	13MHHM-2-S
13	Actuator - Type 215 Normally Open, Air to Close	25-263B-S	25-263B-S	25-263B-S	25-263B-S	25-263B-S
13	Actuator - Type A220 Normally Closed, Air to Open	25-361-220-S	25-361-220-S	26-361-220-S	25-361-220-S	25-361-220-S

* Note: Specify the type of port connections required.
• It is recommended that one each of these items be stocked as spare parts.
** U = Buna Matl.

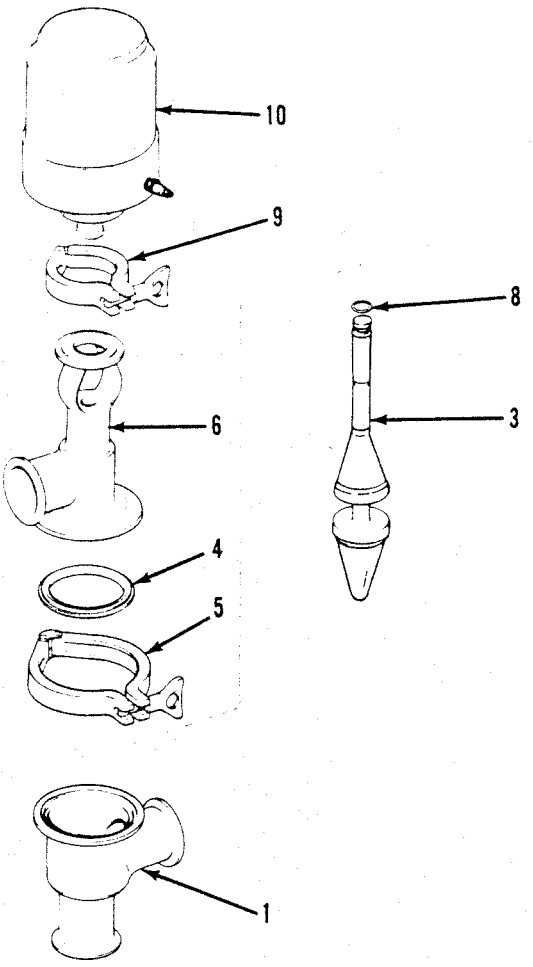


Figure 6. Type 371-21 Throttling Divert Valve, Exploded View

PARTS LIST FOR 371-21 THROTTLING DIVERT VALVE

Index No.	Description	Valve Port Size			
		1-1/2	2	2-1/2	3
*1	Valve, lower body	7-184T-1½-316	7-184T-2-316	7-184T-2½-316	7-184T-3-316
•3	Valve, plug assembly	19-983-1½-316	19-983-2-316	19-983-2½-316	19-983-3-316
	Body, gasket	17-62-2-316	17-62-2½-316	17-62-3½-316	17-62-4-316
5	Body, clamp	13MHHM-3-S	13MHHVM-3-S	13MHHVM-4-S	13MHHM-5-S
*6	Valve, upper body	7-192T-1½-316	7-192T-2-316	7-192T-2½-316	7-192T-3-316
•8	"O" ring - valve plug stem	17-1-U**	17-1-U**	17-5-U**	17-5-U**
9	Actuator clamp	13MHHM-2-S	13MHHM-2-S	13MHHM-2-S	13MHHM-2-S
10	Actuator - Type 215 Normally Open, Air to Close	25-263B-S	25-263B-S	25-263B-S	25-263B-S
10	Actuator - Type A220 Normally Closed, Air to Open	25-361-220-S	25-361-220-S	25-361-220-S	25-361-220-S

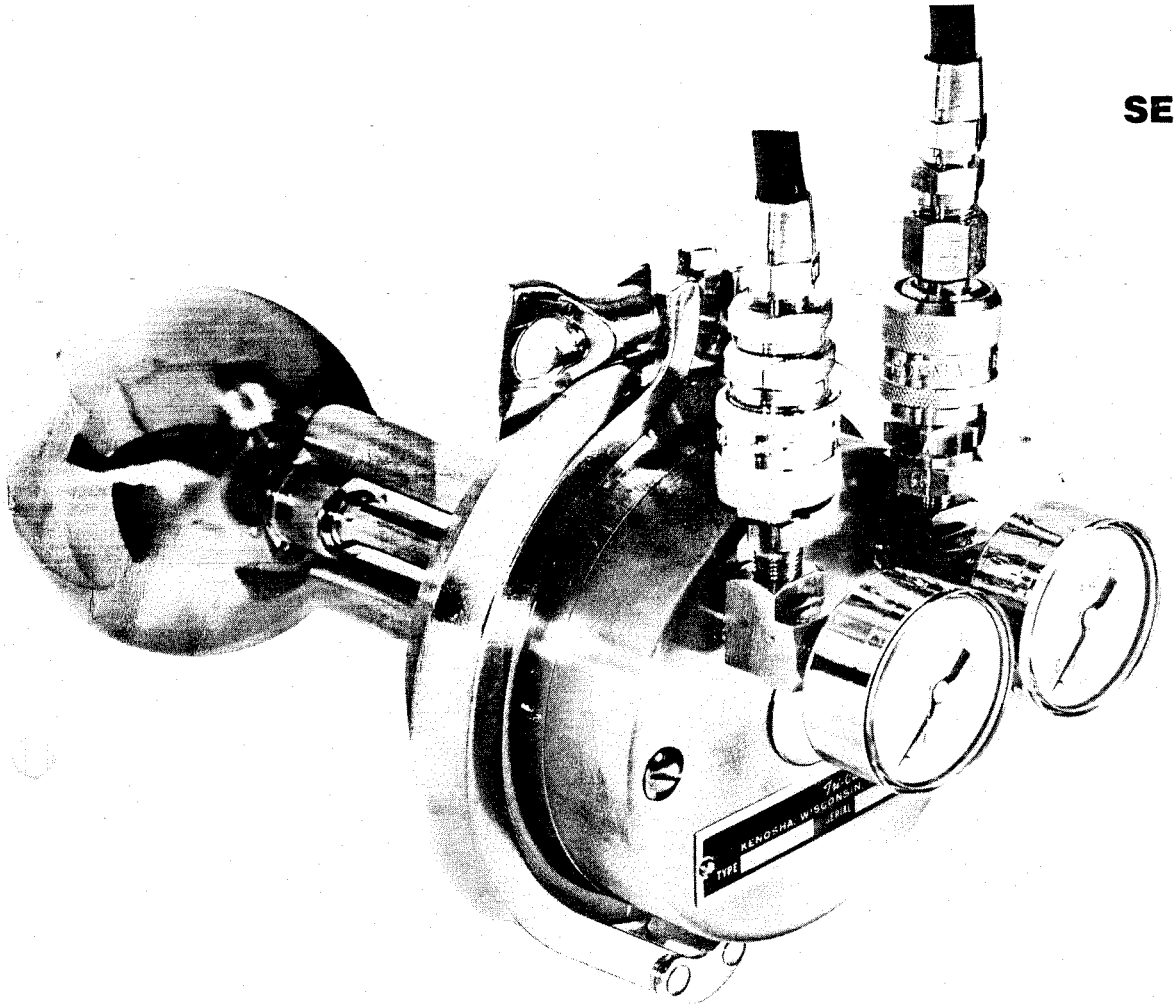
* Note: Specify the type of port connections required.
• It is recommended that one each of these items be stocked as spare parts.
** U = Buna Matl.

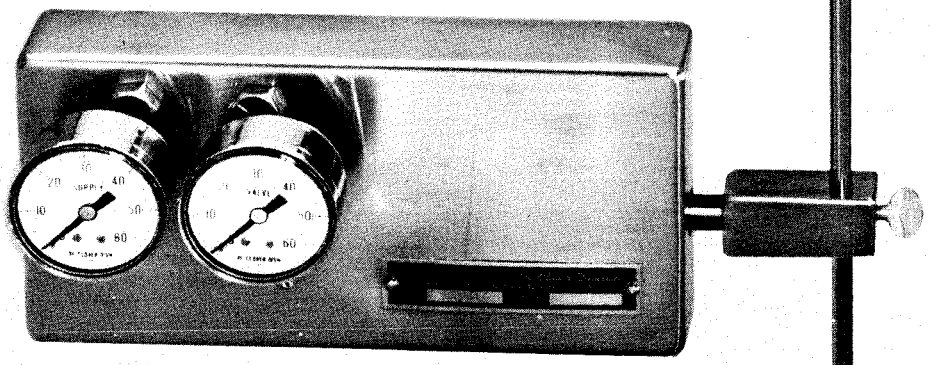
Tri-Clover, Inc.
Kenosha, Wisconsin 53141
Alfa-Laval Group

2.5M KCC 2/87

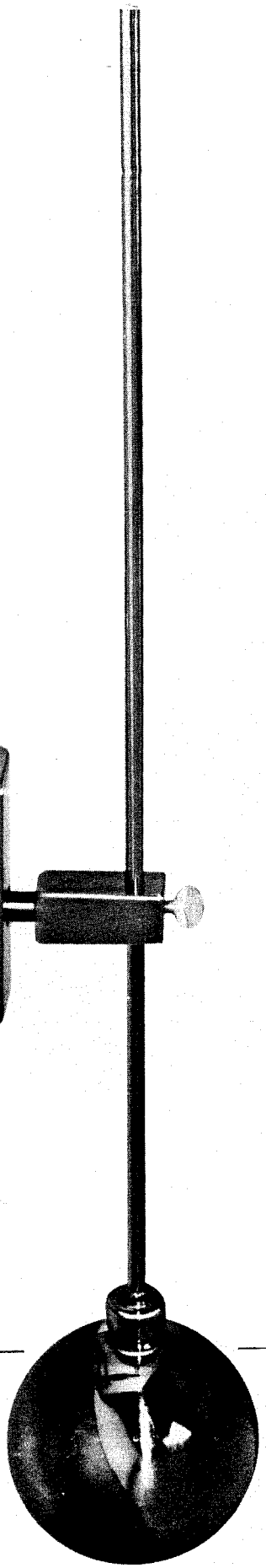
PRINTED IN U.S.A.

SERVICE MANUAL
NO. LLC-87





LIQUID LEVEL CONTROL



Tri-Clover, Inc.
Kenosha, Wisconsin 53141
∝ *Alfa-Laval Group*

TABLE OF CONTENTS

This service manual covers the following level controllers:

CLOSED TANK MOUNTING	OPEN TANK MOUNTING
30-101 - Standard	30-103 - Standard
30-101R - Has 5" ferrule for replacement of 30-3 controller	30-103-01 - Less float and rod assembly
30-102 - Standard	30-104 - Standard
30-102R - Has 5" ferrule for replacement of 30-4 controller	30-104-01 - Less float and rod assembly

INTRODUCTION

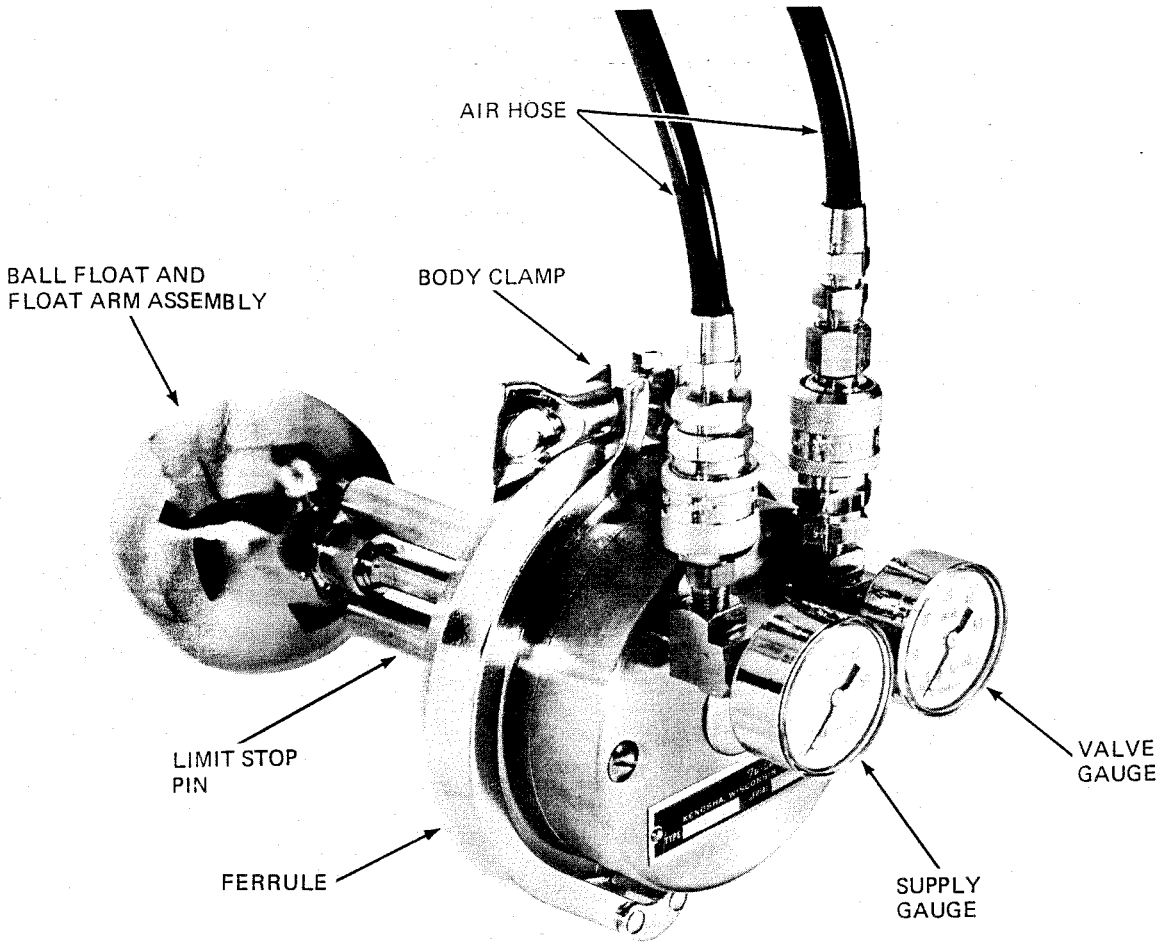


Figure 1. Model 30-101 and 30-102 Level Control

General

This manual contains installation, operation, and repair instructions, trouble shooting, with parts list, for Models 30-101, 30-102, 30-103, and 30-104 Level Controls manufactured by Tri-Clover, Inc., Kenosha, Wisconsin.

All Tri-Clover Level Controls should be considered in the same category as precision instruments and are to be handled in the same manner. While it is a rugged instrument, any abuse, rough handling or improper installation may affect its operating efficiency. The air pilot valve assembly, which is the heart of the Level Control, is a precision made three-way pilot valve. This pilot valve controls the flow of air to and from the throttling valve. The actual movement of the plunger is .007 of an inch. Because of the short travel any small particle or foreign material could affect plunger travel and cause erratic operation.

Description

The Tri-Clover Level Controls are designed to provide responsive and accurate control of liquid levels in open and closed tanks and kettles. Models 30-101 and 30-102 (Figure 1) are designed for closed tank mounting. Models 30-103 and 30-104 (Figure 2) are easily adaptable to open tank mounting by means of a simple bracket.

Principle of Operation

The float arm or "packless flexible shaft" with the ball float is the force (when actuated by a change in liquid level) that positions the plunger in the pilot valve - which in turn controls the air signal required to regulate the throttling valve. The packless flexible shaft has a flattened section of tube which is the fulcrum and also provides the tension required to keep the float riding on the liquid level. Any strain or force exerted on this shaft in any other way than a vertical motion will cause malfunction of the unit by destroying this built-in tension. The vertical motion of the shaft is protected by limit stop pins to keep the shaft well within its elastic limit during operation. These Level Controls operate on the change of force which results from the buoyancy of the float - not on the motion of a float riding on a liquid level. (The actual motion of the float is approximately 1/32".) The response of the Level Controls is such that a buoyancy change of less than six ounces will provide full actuation of the pilot valve.

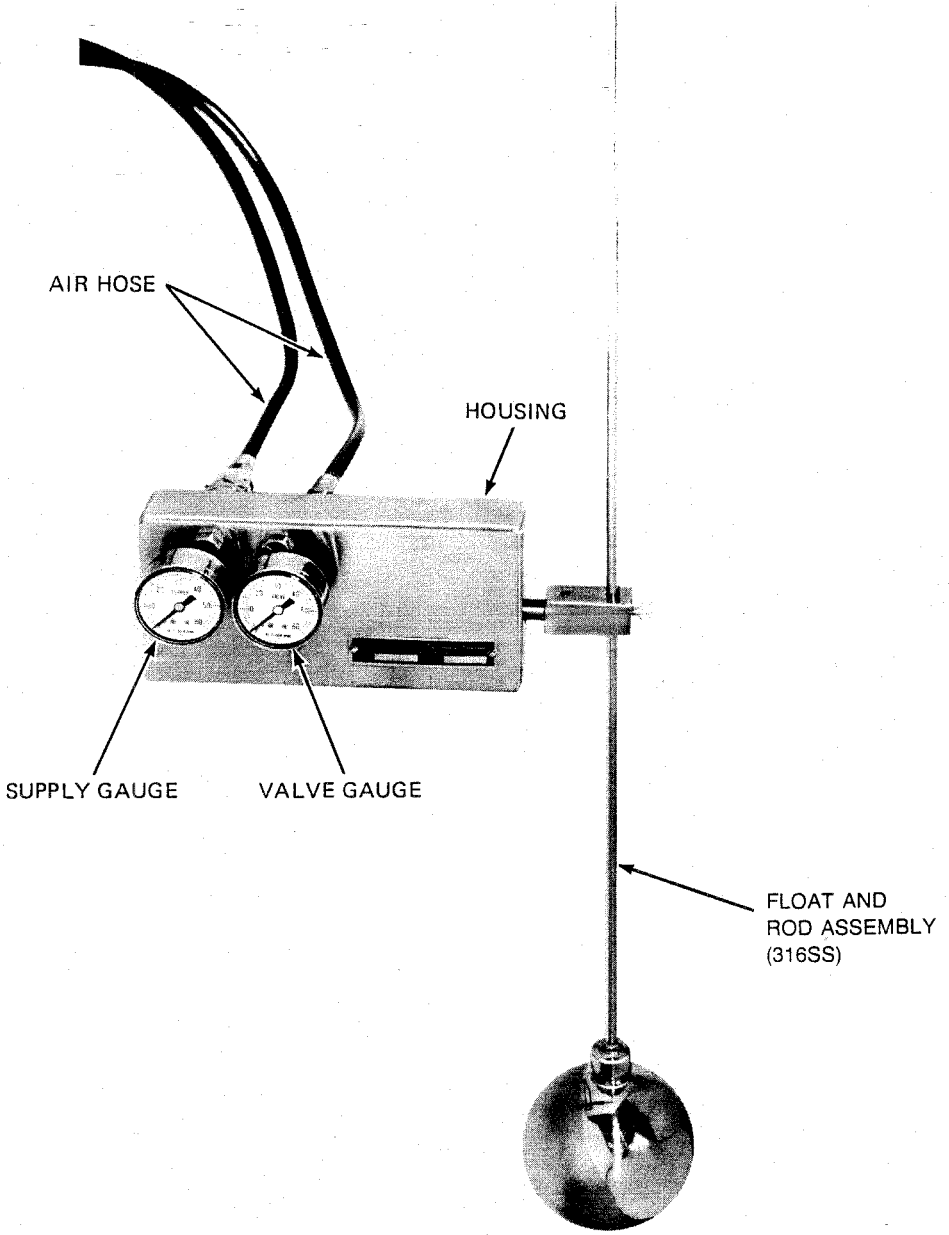


Figure 2. Model 30-103 and 30-104 Level Controls

Advantages

There are no pivots - no rubbing parts. The buoyant force is transmitted by the tongue of the flexible shaft from inside a pressure vessel. There is no friction, because the tongue does not touch the shaft.

There are no packing glands or stuffing boxes which reduces maintenance problems and provides a complete sanitary unit.

There is no need for adjustment after the system is installed even if the float is submerged or left dry for long periods.

INSTALLATION

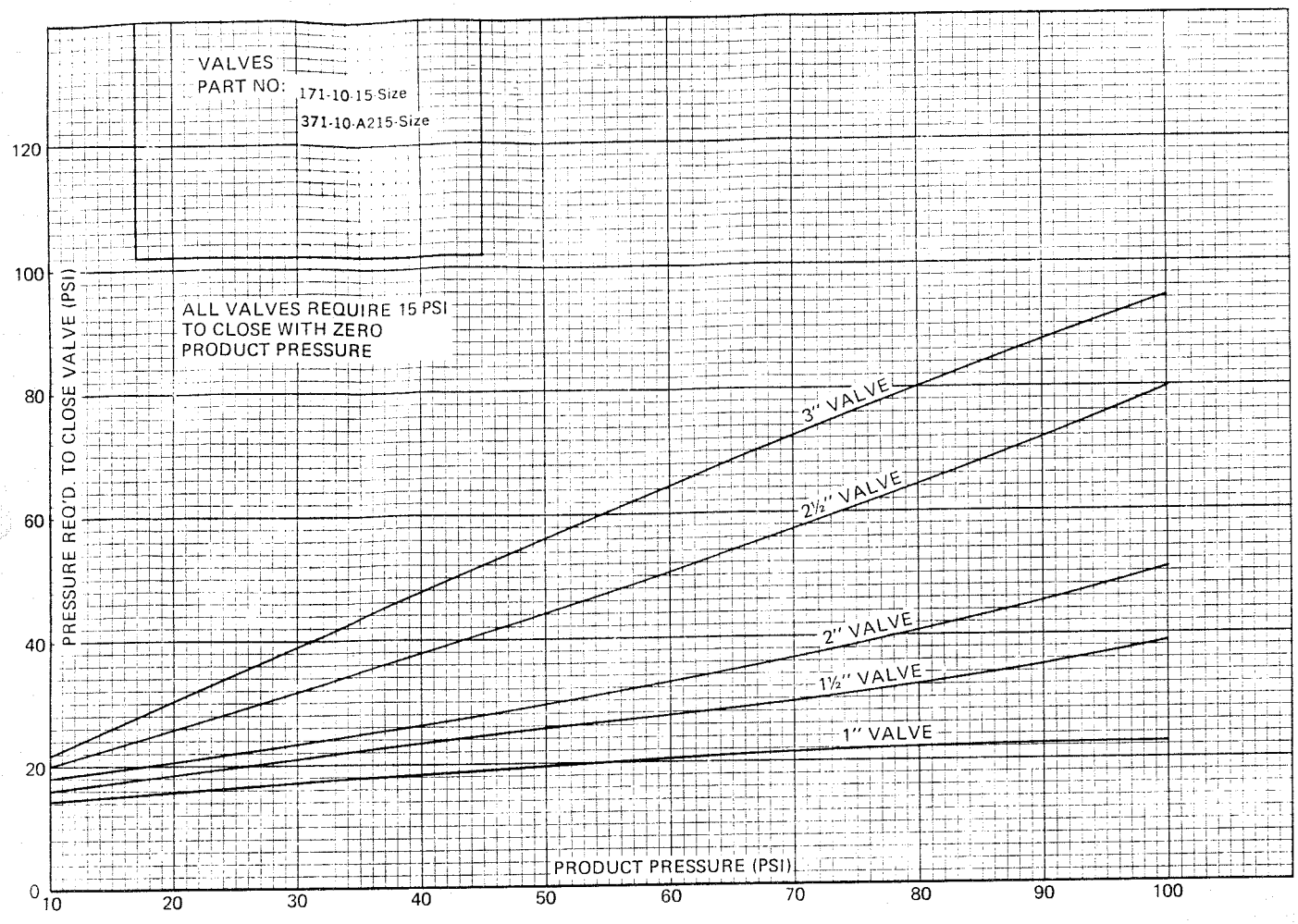


Figure 3. Valve Supply Pressure vs. Product Pressure

General

These Level Controls must be mounted with the flexible shaft in a horizontal position. The flattened section of the flexible shaft must be parallel to the liquid level. In installations where there is the possibility of constant or severe agitation and surging, the Level Control ball float should be suitably baffled or mounted in a float chamber.

The air supply must be dry, filtered, and regulated. For best results the 33-13A Filter and Regulator should be used. Depending on valve style, several different actuators can be used - Type 15 & A215 diaphragm (normally open type) or A20 & A220 Piston (normally closed type). Refer to Figure 3 for operating pressures for valves with diaphragm actuators.

The Type 15 & A215 Diaphragm Actuator can usually be actuated with a standard air supply of 20 PSI. This reading should appear on the "Supply" gauge of the Level Control. If the unit is used in an installation having high product pressure, the air pressure supply to the Level Control can be increased to 30-32 PSI (maximum). The Level Control will require readjustment in this case. When valves (using 20 PSI air pressure) are located twenty feet or more from the Level Control, there is usually a time lag between level change and valve action. This time lag can be shortened by using a 1.1 booster relay (Figure 4) to speed the valve action.

The Type A20 & A220 Piston Actuator requires an air pressure supply in excess of 30 PSI to function properly. To achieve this high pressure, while using a standard 20 PSI air supply from the Level Control, a booster relay of the proper ratio (2.1) must be used (see Figure 4). . . .

Mounting

The Models 30-101 and 30-102 Controls can be mounted to side of tank by use of a 4" Tri-clamp connection. The ferrule should be welded in the tank at the proper position to maintain the desired level. The level to be maintained will be approximately ½ of the way up on the float ball.

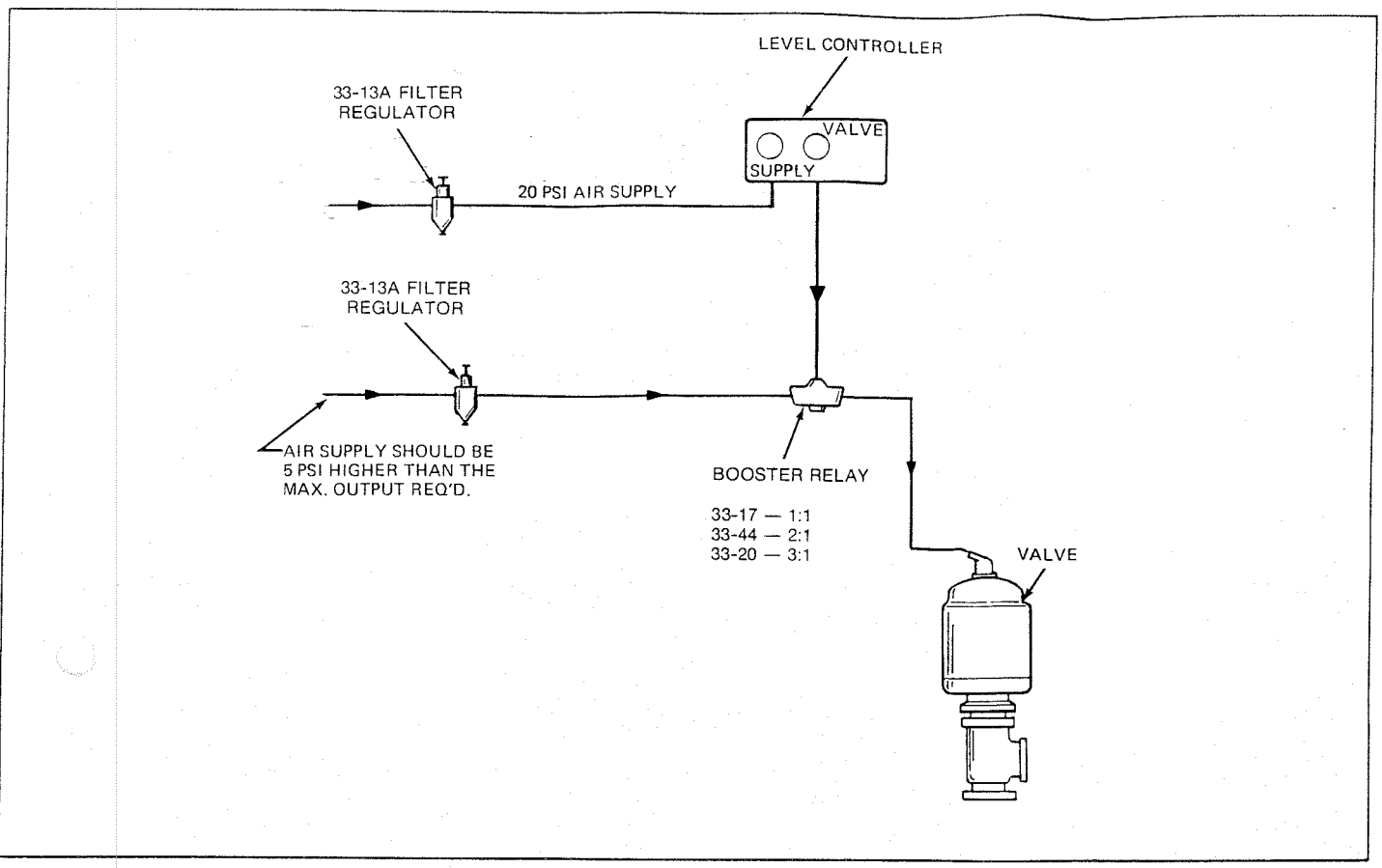


Figure 4. Typical Installation Using Booster Relay

The Models 30-103 and 30-104 Controls can be rigidly mounted over the tank by use of 10-13 mounting bracket. The user can supply a bracket if desired. There are two 1/4 x 20 bolts in the bottom of the housing for mounting. After the controller housing is mounted insert the float rod assembly in the float adapter, adjust the proper height for maintaining the liquid level and tighten the thumbscrew. All level controls are furnished with 4 foot hoses and couplers to facilitate easy removal for cleaning or inspection. Before connecting air to Level Control, all air lines should be blown clear of scale, chips and foreign material.

ADJUSTMENTS

Adjusting Level Controls 30-101 and 30-103. Level rise decreases valve air)

1. Level Control should be mounted in a horizontal position. Check horizontal alignment and relation of flattened section to liquid level. Vessel, hopper or filler bowl should be empty. Model 30-103 should have the float connected to the flexible shaft.

2. Make air connections to Level Control and Valve. (Check for leaks at all connections between Level Control and Valve.)

3. Air supply gauge should read 20 PSI (or other than standard 20 PSI as required).

4. Remove hole plug.

5. If "Valve" gauge reads less than pressure rating shown on "Supply" gauge, turn adjusting screw (Figure 5 or 6) counter-clockwise until both readings are the same, or until air stops escaping from the unit. If "Valve" gauge reads the same as "Supply" gauge, turn adjusting screw clockwise until reading is less than supply gauge - then turn adjusting screw counter-clockwise until both readings are the same or until air stops escaping from the unit.

IMPORTANT

Do not turn adjusting screw too far - it takes less than 1/3 of a turn to cause full actuation of pilot valve. If adjusting screw is turned too far, back-off until air starts to bleed again.

6. Replace hole plug. Level Control is ready to operate.

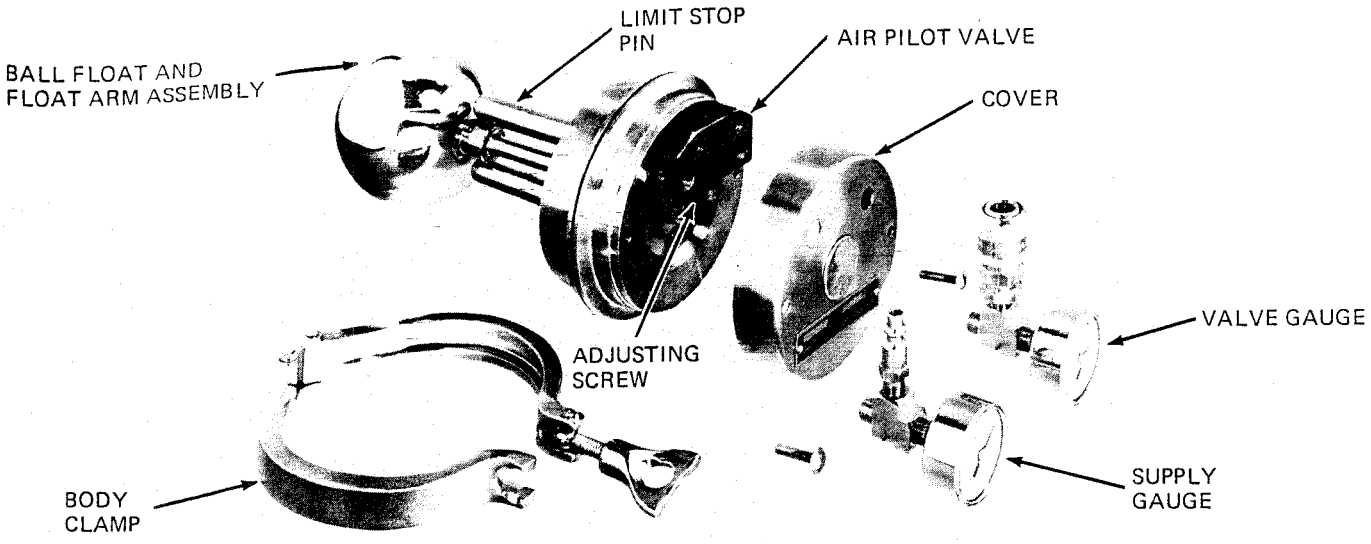


Figure 5. Model 30-101 and 30-102 Level Control - Disassembled

Adjusting Level Controls 30-102 and 30-104. (Level rise increases valve air)

1. Level Control should be mounted in a horizontal position. Check horizontal alignment and relation of flattened section to liquid level. Vessel, hopper or filler bowl should be empty. Model 30-104 should have the float connected to the flexible shaft.

2. Make air connections to Level Control and Valve. (Check for leaks at all connections between Level Control and Valve.)

3. Air Supply Gauge should read 20 PSI (or other than standard 20 PSI as required).

4. Remove hole plug.

5. If "Valve" gauge shows a reading, turn adjusting screw (Figure 5 or 6) counter-clockwise until reading is zero or until air stops escaping from the unit. If "Valve" gauge reads zero, turn adjusting screw clockwise until there is a reading - then turn the adjusting screw counter-clockwise until reading is zero or until air stops escaping from the unit.

IMPORTANT

Do not turn adjusting screw too far - it takes less than 1/3 of a turn to cause full actuation of pilot valve. If adjusting screw is turned too far–back-off until air starts to bleed again.

6. Replace hole plug. Level Control is ready to operate.

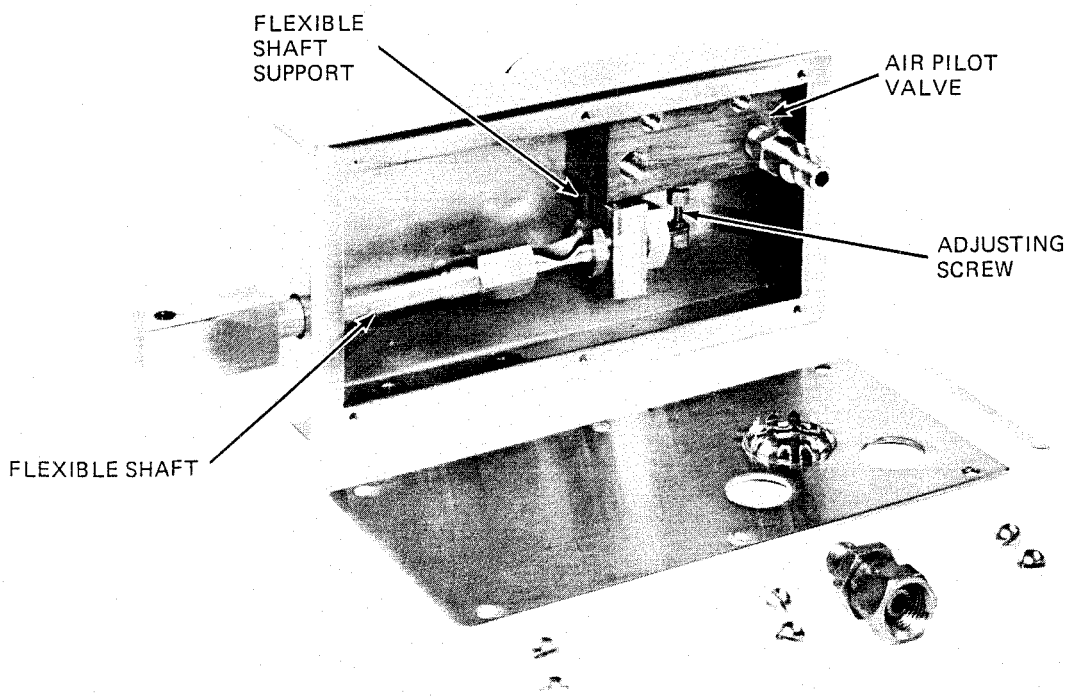


Figure 6. Model 30-103 and 30-104 Level Control - Disassembled

TROUBLE SHOOTING

The Tri-Clover Liquid Level Controls are relatively maintenance free. Like any piece of machinery, however, occasional problems can arise. The trouble shooting chart, Figure 7, provides a means of determining and correcting most of your Level Control problems. Any service or repair above and beyond what has been mentioned should be performed at Tri-Clover. The control should be returned to the factory for reconditioning.

Trouble	Cause	Remedy
1. Valve gauge reads less than supply gauge on Models 30-101 and 30-103.	Controller "zero" adjustment is not correct.	Make the adjustment as outlined under "Adjusting Level Controls" Models 30-101 and 30-103.
2. Valve gauge reads other than zero on Models 30-102 and 30-104.	Controller "zero" adjustment is not correct.	Make adjustment as outlined under "Adjusting Level Controls" Models 30-102 and 30-104.
3. Normally open valve does not close off completely.	a. Insufficient air pressure from the controller. b. Foreign material in line. c. Damaged seat.	a. Refer to chart for required air pressure to close off against product pressure. b. Inspect valve and remove foreign material. c. Inspect valve and relap valve seat.
4. Valve action is sluggish or too slow.	a. Air supply line is too small. b. Valve is located too far from controller. c. Dirt or foreign material in the air pilot block assembly. d. Models 30-101 and 30-102, float arm assembly is bent and hitting limit stop pins. e. Models 30-103 and 30-104, flexible shaft assembly is bent or misaligned and hitting the housing assembly.	a. Increase air supply line to 3/8" polyflow or larger. b. Use a 1:1 booster relay to the valve. c. Clean air pilot block assembly with solvent. d. Repair or replace float arm assembly. e. Repair or replace flexible shaft.
5. Constant hunting or excessive pulsation of the valve.	a. Throttling valve is too large. b. Excessive turbulence in the vessel. c. Excessive air pressure. d. Valve is located too far from controller.	a. Contact Tri-Clover for proper recommendation. b. Install baffle to eliminate turbulence on the float bulb. c. Lower the air pressure to 20 psi or consult the chart. d. Use a 1:1 booster relay to the valve.

Figure 7. Trouble Shooting Chart

PARTS LIST

How to Use the Parts List

The following exploded views (Figures 8 and 9) and accompanying parts list facilitate ordering repair parts from the factory. All parts of the control are exploded and keyed to the parts list.

NOTE

To assure replacement of the correct part for your control, the model number and serial number, located on the nameplate, must be included in any correspondence to the factory.

IMPORTANT

How to Order

All orders for repair parts must contain the following data:

1. Complete model number (located on nameplate).
2. Control serial number (located on nameplate).
3. Description and part key number from the parts list.

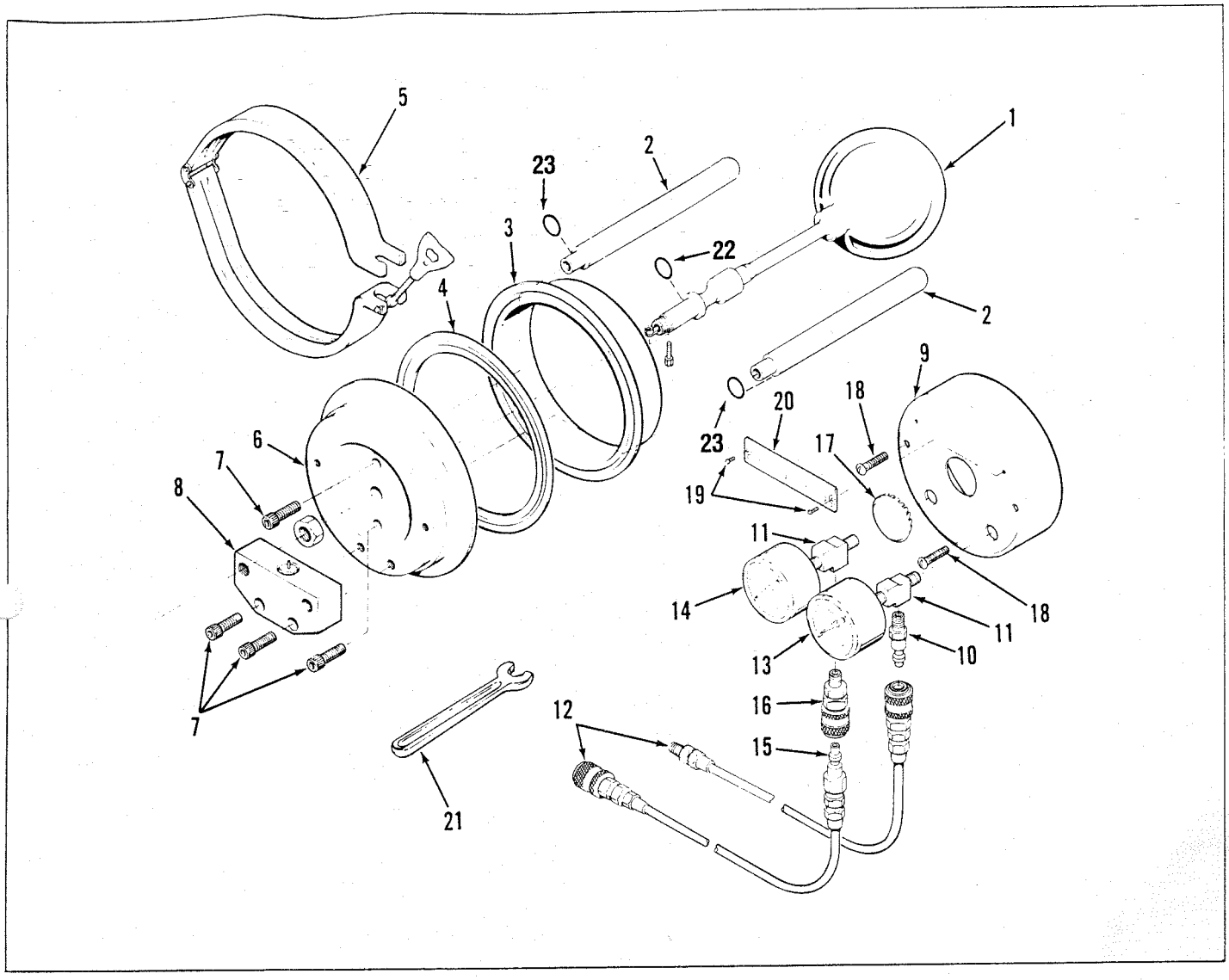


Figure 8. Models 30-101 and 30-102 Level Controls - Exploded View

FIG. & INDEX NO.	PART NUMBER	DESCRIPTION	UNITS PER ASSY
1	55-4-316	Ball Float and Float Arm Assembly	1
2	9-12	Limit Stop Pin	2
3	L14AM-4-S	Ferrule	1
4	40MP-U-4	Gasket	1
5	13MHHM-4-S	Clamp	1
6	32-481	Cap - Special 4 inch	1
7	14-16	Screw, Socket Head Cap	4
8	54-2	Air Pilot Assembly	1
9	23-3-SS	Cover	1
10	25-361-210-06-S	Plug - Coupler	1
11	42-15-58CP	Tee - Street	2
12	41-10-4'	Hose Assembly - Air	2
13	54-53-V	Gauge - Valve, 0-60 PSI	1
14	54-53-S	Gauge - Supply, 0-60 PSI	1
15	37-19	Plug - Coupler	1
16	37-91	Body - Coupler	1
17	13-28	Plug - Hole	1
18	14-46	Screw - Truss Head	2
19	14-1	Screw - Drive	2
20	38-8	Name Plate	1
21	07-1152	Wrench	1
22	17-322	Gasket	1
23	17-323	Gasket	2

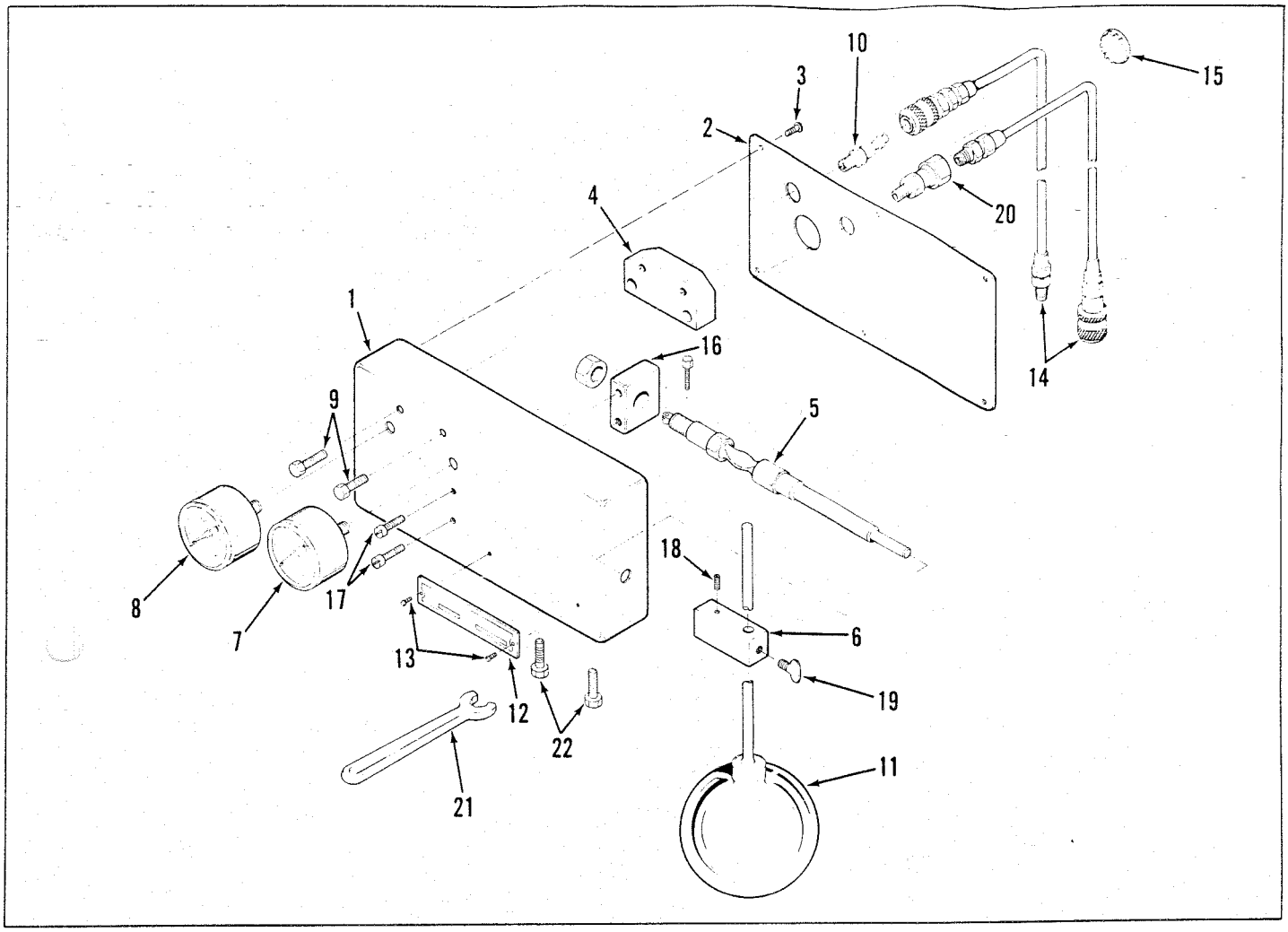


Figure 9. Models 30-103 and 30-104 Level Controls - Exploded View

FIG. & INDEX NO.	PART NUMBER	DESCRIPTION	UNITS PER ASSY
1	44-195-01	Housing Assembly (Used on Model 30-103)	1
1	44-93-01	Housing Assembly (Used on Model 30-104)	1
2	44-195-02	Cover (Used on Model 30-103)	1
2	44-93-02	Cover (Used on Model 30-104)	1
3	14-103	Screw	6
4	54-41	Air Pilot Assembly	1
5	19-123	Flexible Shaft	1
6	37-17-SS	Float Adapter	1
7	54-53-V	Gauge - Valve, 0-60 PSI	1
8	54-53-S	Gauge - Supply, 0-60 PSI	1
9	SC1309H-SS	Screw	2
10	25-361-210-06-S	Adapter - Air Coupler	1
11	55-3-316	Float and Rod Assembly	1
12	38-8	Name Plate	1
13	14-1	Screw - Drive	2
14	41-10-4	Hose Assembly - Air	2
15	13-28	Plug - Hole	1
16	10-208	Support - Flexible Shaft	1
17	14-88	Screw	2
18	SC1003A-SS	Setscrew	1
19	14-17	Thumbscrew	1
20	42-7	Connector	1
21	07-1152	Wrench	1
22	SC1108H-SS	Screw - Hex Head	2

MAINTENANCE NOTES

TRI-CLOVER

manufactures

a complete line of

TRI-WELD® fittings

TRI-CLAMP® fittings

BEVEL SEAT fittings

POSITIVE PUMPS

CENTRIFUGAL PUMPS

AUTOMATIC Air Actuated VALVES

STAINLESS STEEL TUBING

AUTOMATED FLOW CONTROL SYSTEMS

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Each Tri-Clover item is warranted to be free from manufacturing defects for a period of one (1) year from the date of shipment, providing it has been used as recommended and in accordance with recognized piping practice, and providing it has not been worn out due to severe service, such as encountered under extremely corrosive or abrasive conditions.

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Tri-Clover, Inc.
Kenosha, Wisconsin 53141
Alfa-Laval Group

BULLETIN LLC-87 Printed in USA 1/87

IMPORTANT

CHECK YOUR AIR SUPPLY BEFORE INSTALLING THIS VALVE

Air-Actuated Valves Require Clean, Filtered Air to Operate Properly

Commonly used air compressors can pickup moisture/humidity in the air, dirt, and oil used in the compressor itself, and pass them along throughout your system, if not filtered properly. While some newer air compressors are oil-free, many commonly used are not. In the past few years, compressor manufacturers have switched from standard petroleum based lubricating oils to SYNTHETIC OILS, as they are thought to make the compressor run more efficiently, and can be changed less often.

However, SYNTHETIC OILS, which can get into the air supply, can cause damage to valves and solenoids, as well as other processing equipment, by affecting the elastomers and/or plastics that come in contact with the air supply.

Special "coalescing" filter regulators and solenoid guards are commercially available to help avert this potential problem, and remove oils and other damaging elements from the air downstream from the air compressor. One source that we are aware of is Wilkerson Corp. of Englewood, Colorado (ph. 303-761-7601). These filters and other components can be installed downline from the compressor, as well as on control panels, to help minimize the problem, by further cleaning the air before it gets to your valves and system components. Filter elements should be changed at least once a year, as part of your normal plant maintenance program.

Tri-Clover Inc.
An Alfa Laval Flow Company
Kenosha, Wisconsin 53141

IMPORTANT

WHY YOU SHOULD USE C137 LUBRICANT ON YOUR NEW STAINLESS STEEL ACTUATOR FROM TRI-CLOVER

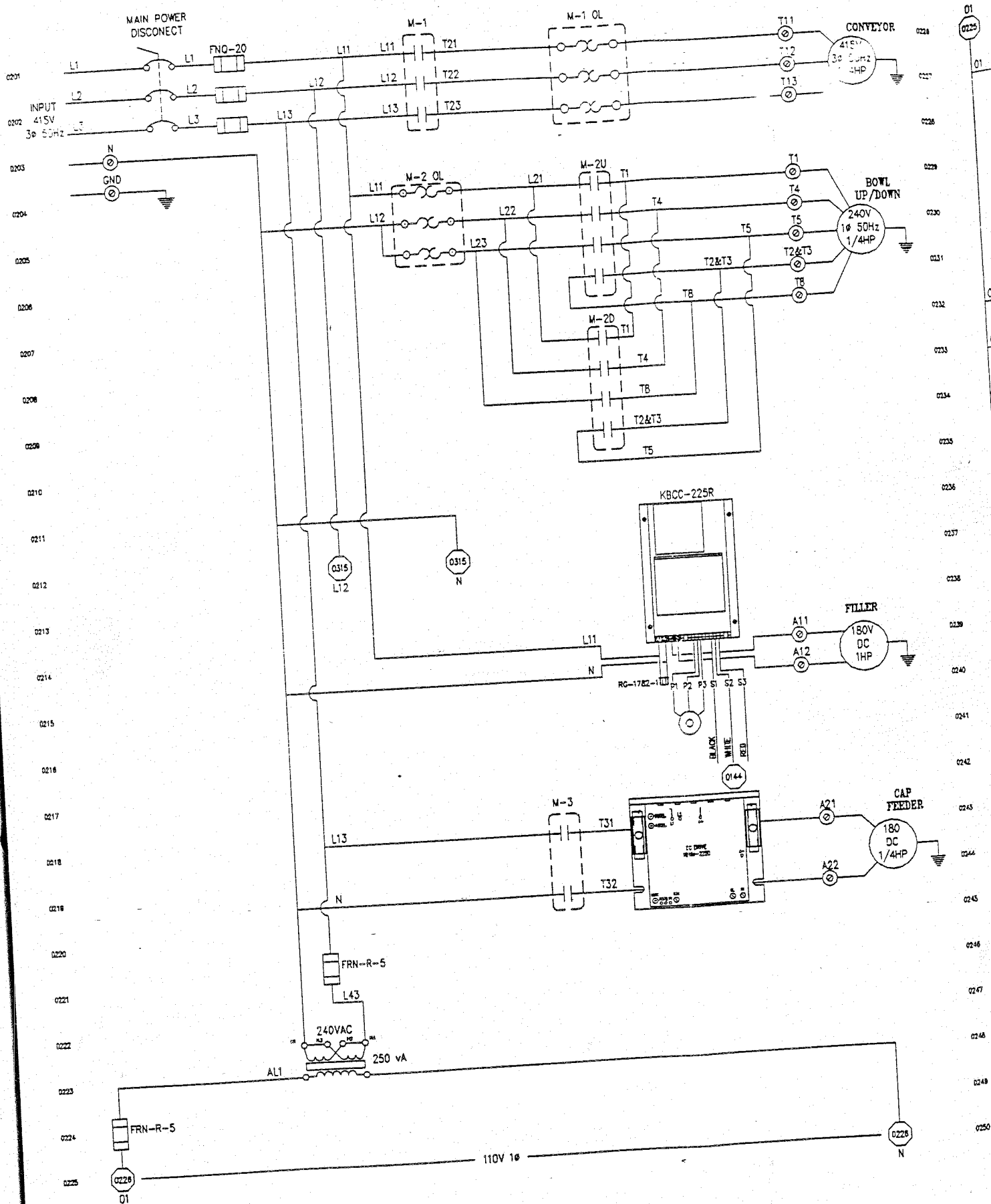
This lubricant has been formulated especially to insure trouble free assembly of Tri-Flo® Stainless Steel Actuators. It helps to eliminate galling and wear to the threads — it is also an excellent lubricant for the piston.

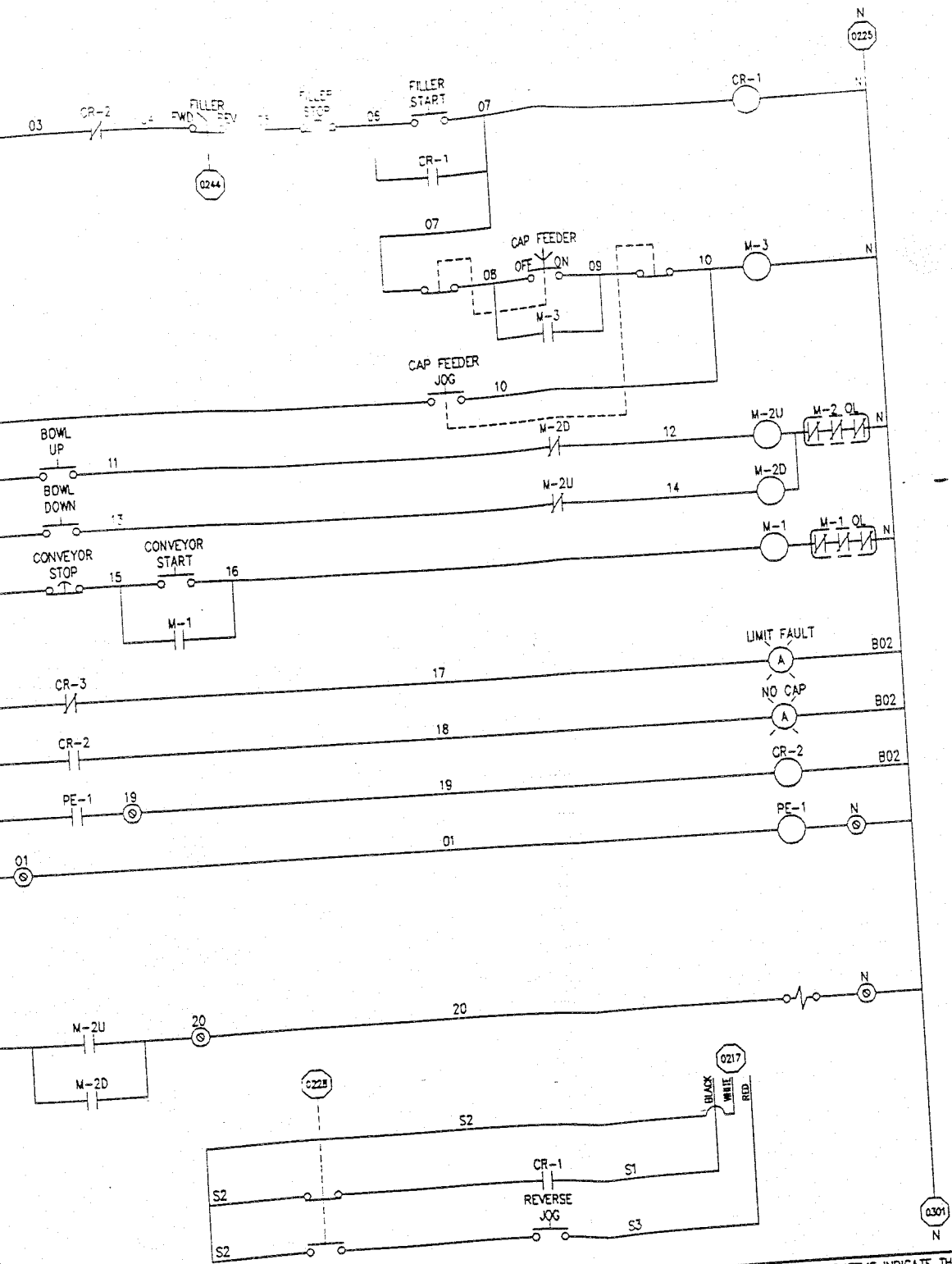
HOW TO USE

Before re-assembly of any Tri-Flo Actuator with a stainless steel cylinder, place a small bead of No. C137 lubricant on the lower threads of the cylinder. Also lightly coat the O.D. of the piston packing and felt ring. On actuators with valve positioners, place a light bead of C137 on the lower threads of the positioner housing.

C137 is now available in 8 oz. tubes from Tri-Clover. For further information refer to your Tri-Flo Actuator Service Bulletin, or contact your Tri-Clover distributor. No other applications of this product are implied or intended.

Tri-Clover Inc.
An Alfa Laval Flow Company
Kenosha, Wisconsin 53141





REVISIONS	
	ISSUED FOR REVIEW

RC TECHNOLOGIES inc.
11598 East Lakewood, Holland, Michigan
Telephone (616) 394-9151
Fax (616) 392-6880

FILLER SPECIALTIES
ZEELAND, MICHIGAN
MACHINE # 321093GWFS185L
SCHEMATIC WIRING DIAGRAM

NOTE: CHECKED OFF ITEMS INDICATE THE OPTIONS INSTALLED ON THIS MACHINE.

Options

✓	1. Safety Limit Switch on Guard	✓	9. Filler Forward/Reverse Select
–	2. Safety Limit Warning Light	✓	10. Filler Reverse Jog
–	3. No Cap Photo Eye(Adj. Time Dly.)	✓	11. Filler Speed
–	4. No Cap Warning Light	✓	12. Cap Feeder On/Off
–	5. Low Level Sensor	✓	13. Cap Feeder Jog
–	6. Low Level Warning Light	✓	14. Cap Feeder Speed
–	7. Digital B.P.M. display	–	15. Conveyor Start/Stop
✓	8. Filler Start/Stop	–	16. Conveyor Speed

FILE NAME	F02001-F35501
DRAWN	ABS
DATE	10-25-93
SCALE	NONE
JOB NO.	F355
SHEET	01
OF	2 SHEETS

PLOTTED
OCT 27 1993

CAD ORIGINAL DO NOT ALTER MANUALLY