OPERATORS CONTROLS

POWER Start/Stop

With line power to machine turned on, the power switch turns on control power to panel switches.

HEATER Off/On/Down

When heater switch is in ON position, top heater will energize. The bottom heater will also ignite, but only when the machine is cycling. The bottom heater will extinguish itself when the machine stops.

When the heater switch is in the DOWN position this lowers the top heater retractor. The top heater will raise itself when heater switch is put back into the ON position.

INDEX Jog/Off/Run

The machine will cycle when the index switch is held in the JOG position. Release switch from JOG position and machine will stop.

NOTE: Always JOG machine prior to switching to RUN making sure all machine functions are operating satisfactorily.

When the index switch is in RUN position, the machine will sequence through its normal operating cycle.

VACUUM Off/On/Run

The vacuum switch applies vacuum to the outfeed pickoff shaft when in the ON position. In the RUN position, vacuum is also applied to the carton infeed picker manifold to start cartons feeding into the machine.

With vacuum switch in either the ON or RUN position, the self-contained air compressor will supply air to the bottom oven super-heater tube.

NOTE: Always allow bottom heater to warm up prior to switching vacuum to ON position. Otherwise air may extinguish bottom heater.

FILL Off/Run/On

When the fill switch is in the RUN position, the filler will operate when a carton is present at the no-carton/no-fill micro-switch.

While the fill switch is in the ON position, the filler no-carton/no-fill micro-switch is locked out, and cartons may be run through machine without being filled.

With fill switch in the OFF position, the filler will operate when the machine is cycling. This can be used to empty supply tank or for cleaning purposes.

DEFOAMER Off/On

With the defoamer switch ON, this supplies a vacuum suction to the product supply tank, shich is connected to the defoamer tube. This may be used for products aerated during filling.

EMERGENCY STOP

DESCRIPTION OF THE NIMCO FORM-FILL-SEAL OPERATION

NIMCO Packaging Machinery automatically Forms, Fills and Seals Plastic-Coated Paperboard Cartons using only 100% Mechanical Cam, Gear and Lever Operations :

* Carton Blanks, supplied flat, are placed into the horizontal magazine. Total capacity up to 10 minutes operating production time.

* Each Blank is set-up and placed onto a water-cooled forming mandrel.

* The horizontal mandrel wheel indexes 45° and the carton bottom is broken along the scored lines.

* Once broken, the carton bottom is heated by an atmospheric gas bottom oven. A Super-Heater tube accurately distributes controlled blown air focusing on areas only where required for sealing.

* After heating, the carton is indexed over a folding plow where the bottom flaps are closed then compressed and sealed by a mechanical, die spring loaded, floating water-cooled seal plate, allowing for sealing pressure variations. Simultaneously, the carton top is broken along the scored lines.

* The carton then is pulled off the forming mandrel and placed firmly into a conveying pocket within the in-line Filler/Sealer indexing unit.

* The cartons are conveyed to our Positive Displacement Volumetric Piston Fill System where the cartons are filled with very controlled accuracy. The fill volume is adjustable while the machine is running with our MICRO-FILL Adjustment Dial. NO-CARTON-NO-FILL is standard. (Optional Filling Devices can be custom-fitted to fill a variety of food or non-food products.

* A closed Defoaming System, pulling a vacuum on the fill holding tank, is provided for those aerated products which would otherwise limit filling speeds.

* After filled, the carton top is heated by an electric radiant calrod type heater which accurately heats only the required sealing areas. The top heater retracts when the machine is stopped.

* The cartons then move through top folding plows and are sealed twice, on most models, using a positive mechanical cam operation for a perfect top alignment and tight top seal. Cartons are Dated at the same time.

* Cartons may then discharge onto an accumulating table for manual casing, available on most models, or a conveyor discharge system to automatic casing and stacking equipment can be provided.

INSTALLATION AND OPERATING PROCEDURES

INSTALLATION SUPERVISION

For each new installation, NIMCO Corporation will provide a Service Engineer to supervise installation and instruct operating and maintenance personnel who will be responsible for the NIMCO Packaging Machine. Also, training at NIMCO's factory is available.

It is expected that the initial installation will have been completed; that is, machine erected in place, service connections completed and all preparatory steps to actual operation to the machine accomplished. NIMCO Corporation should be informed when ready for a Service Engineer approximately one week prior to start-up.

Strict adherence to the NIMCO Service Engineer's instructions, supplemented by the information provided in this manual will enable personnel to successfully operate and maintain the NIMCO Packaging Machine.

UNPACKING AND INSTALLING

Upon completion of the final testing at the factory, the NIMCO Packaging Machine is partially dis-mantled for ease of shipping. Several parts are removed and boxed separately. These parts along with the Spare Parts Kit and Installation Kit are mounted and fastened to the machine skid.

Inspection Upon Receipt of the Machine:

Examine the skid mounted machine for any damage or loss in transit. If the machine shows indications of being damaged or equipment being lost, notify the freight agent or insurance claims adjuster and have him inspect the shipment and make proper notification on the freight bill.

Machine Placement:

Uncrate and remove machine from skid and place in desired operational location. Avoid excessive shocks or strains to prevent damage to the machine.

After the machine has been installed in place, level the entire machine to insure satisfactory operational results. The machine can be leveled by adjustment of the supporting legs.

Service Connections:

Electrical -

The machine is completely wired internally and requires only an external power supply to the machine electrical control panel.

The standard machine is equipped for 230 volt - 3 phase - 50/60 cycle power supply. Variations from these specifications must be specified when the machine is ordered, in which case the internal wiring will have been revised to conform with the variations.

GENERAL START-UP AND TURN-OFF PROCEDURES

1. Place proper size carton blanks into magazine, bottoms down and side seam facing inwards.

2. Check product in holding tank making sure product is at full level. A constant product level must be maintained to assure an accurate fill. The float liquid level control assembly will balance the product input rate, however, head pressure should not exceed 4 to 5 PSI.

3. Check filler for proper carton size fill setting.

4. Check for correct date stamp inserts in top sealer jaws.

5. Turn line power on to machine.

6. Water supply on.

7. Gas supply on.(Machines with gas bottom heaters.)

8. Set control panel switches as follows:
   a. HEATER - ON
   b. INDEX - OFF
   c. VACUUM - OFF
   d. FILL - RUN
   e. DEFOAMER - OFF

9. Push POWER START switch ON.

10. Allow top heater to warm up.

11. INDEX - JOG machine momentarily to make sure all machine functions are operating satisfactorily.

12. INDEX - RUN, machine will begin to cycle empty.

13. With machine cycling empty, allow sufficient time for bottom heater to warm up before running cartons.

14. Turn FILL switch OFF to purge air from piston filler, then turn switch back to ON position.

15. When heaters are warmed up, turn VACUUM switch ON. In this position, self-contained air compressor will begin supplying air to the super heater tube located on top of the gas heater.

16. VACUUM - RUN, to start carton blanks feeding into machine.

17. HEATER -DOWN, retractor will lower top heater to sealing position.

18. Run several cartons through machine to observe machine operation.
    a. Carton blanks feeding properly.
    b. Formed cartons unloading from mandrels properly.
    c. Cartons feeding into filler conveyor properly and engaging with spreader shoe plates.
    d. Check cartons for correct fill and proper sealing.
    e. If problems are encountered, corrections must be made before starting production run.

GENERAL START-UP AND TURN-OFF PROCEDURES
(cont.)

19. When shutting machine down, turn VACUUM switch to ON position first and allow all cartons to run out of machine. Do not turn vacuum off while a carton blank is being held by the infeed picker manifold.

20. When the product supply is turned off, final cartons are being filled and the level in the supply tank is diminishing. Observe the fill into the last few cartons. Short filled cartons should be disposed.

21. HEATER- ON, top heater will raise to safety position.

22. TURN- OFF procedure:
    a. VACUUM - OFF
    b. DEFOAMER - OFF
    c. HEATER - OFF
    d. FILL - OFF
       (Remaining product in supply tank and piston filler will pump out. Cleaning Solution may be pumped through filler at this time)
    e. INDEX - OFF
    F. POWER START - OFF

NIMCO 500QL& 550QL* CHANGE-OVER PROCEDURE

BOTTOM FORMER

LITER TO 1/2-LITER TO 1/4-LITER

The only change-over required will be for the height of the carton and machine speed. Therefore, all change-over operations will be the same for Liter, 1/2-Liter and 1/4-Liter.

1. Release top crimp blades and fold back.
2. Adjust height of mandrel slides to proper carton size with the provided spacer guage. Make sure all 8 mandrels are set to the same height.
3. Jog machine until carton outfeed suction cup is touching bottom of mandrel pad.
4. With bottom seal under full compression, adjust top crimp to correct height. Bring top crimp blades in to the mandrel slide and tighten bolt securely to assure proper top crimping of the carton.
5. Jog machine to assure top crimp is set properly.
6. Jog machine until outfeed suction cup is at its lowest position.
7. Change position of pin in the three position outfeed arm casting to set outfeed vacuum tube stroke for proper carton size.

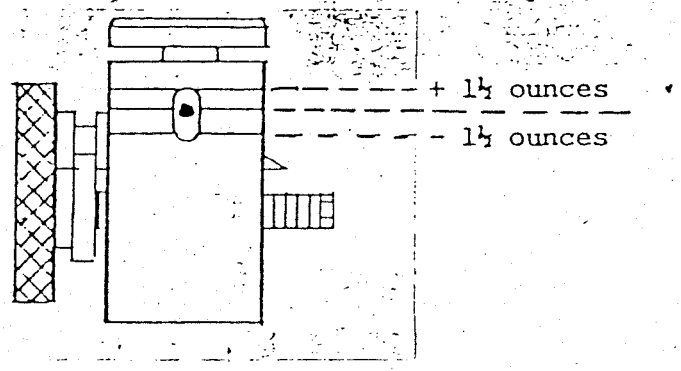
LITERS	- INSIDE HOLE
1/2-LITERS	- CENTER HOLE
1/4-LITERS	- OUTSIDE HOLE

8. Jog machine to make certain all machine operations are functioning satisfactorily.
9. Change speed of machine by turning shaft on variable speed motor base with speed wrench. To INCREASE speed turn shaft Counter-Clockwise, and to DECREASE speed turn shaft Clockwise.
10. Run several cartons through former section to check bottom seal and top crimp quality prior to running production.

CAUTION: Always JOG machine after a change-over to check that each change was made properly.

CAUTION: DO NOT attempt to adjust or make change-over while machine is operating.

MICRO-FILL (FIG. B.) For fine adjustment of Fill Volume.



3. Change top seal jaws for proper carton size. If necessary, change date code slugs and/or dies inserts.

4. Adjust discharge conveyor chute or manual rotary packing table for proper carton height.

NOTE: Run several cartons thru machine after change-over to assure all stations are operating satisfactorily.

CAUTION: DO NOT attempt to adjust or make change-over while machine is running.

NIMCO 550QL * CHANGE-OVER PROCEDURE

FILLER/SEALER

LITER TO 1/2-LITER TO 1/4-LITER

The only Change-Over required will be for the height of the carton and the fill volume.

1. BOTTOM RAIL HEIGHT ADJUSTMENT :

   a.) JOG machine until carton take-off cup is at the lowest position.

   b.) Change bottom rail to proper notch corresponding to carton height and lock rail into position with bottom rail pin.

   c.) Place the proper support spacer into position under the bottom rail.

2. ADJUSTING FILL VOLUME :

   Each fill piston has a maximum capacity of 1/2LT. To INCREASE fill volume turn fill worm assembly Clockwise, and to DECREASE fill volume turn fill worm assembly Counter-Clockwise (Figure A.).

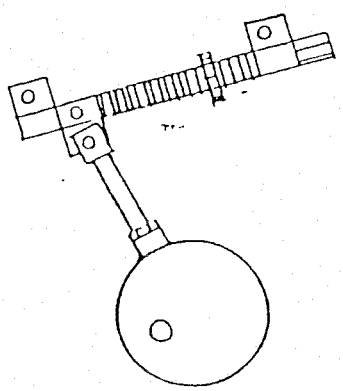
   Use MICRO-FILL micrometer dial for fine fill adjustment (Figure B.).

   1/4-LITER - Use only one piston, closest to heater, fill worm (Figure A.) in 1/4-Liter position. Adjust MICRO-FILL (Figure B.)

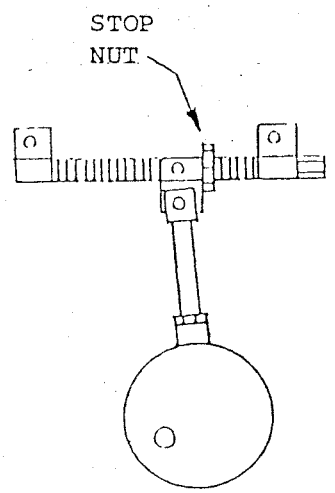
   1/2L - Use both pistons, fill worm (Figure A.) in 1/4-Liter position.

   1/1L - Use both pistons, fill worm (Figure A.) in 1/2-Liter position.

FILL WORM ASSEMBLY (FIG. A.)



1/4-LITER POSITION



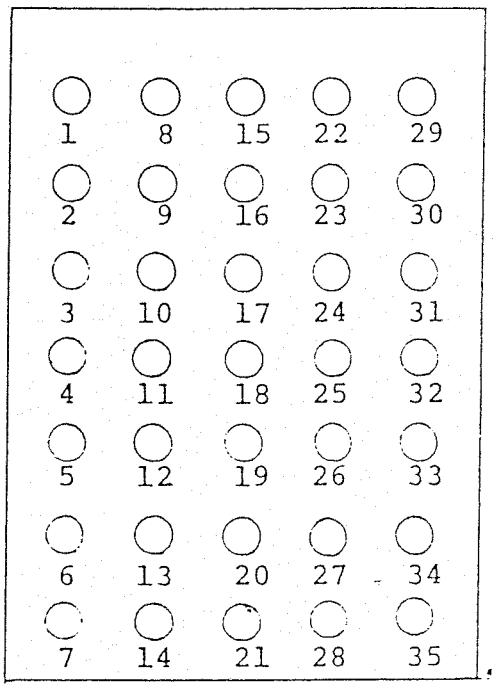
1/2-LITER POSITION

CLEANING SOLUTIONS

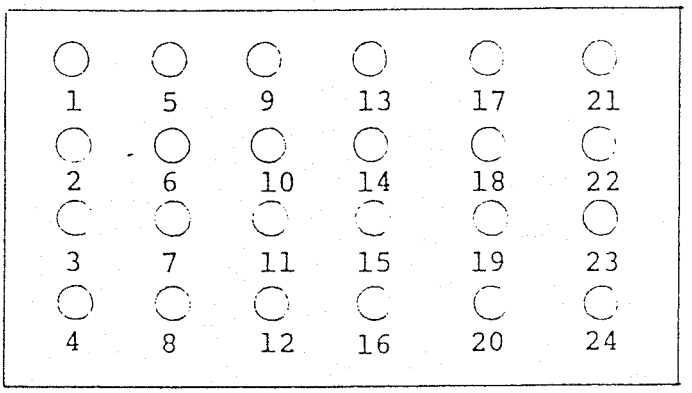
CAUTION: Some Anodized Aluminum parts are used on the machine. Do Not use strong caustic cleaning solutions or agents, as these may cause discoloration or damage to the aluminum parts.

CENTRAL MANIFOLD GREASING SYSTEM -

FORMER SECTION - CENTRAL MANIFOLD GREASE BLOCK



FILLER / SEALER SECTION - CENTRAL MANIFOLD GREASE BLOCK



Checking Grease Injection System -

Successful operation of the Central Mainfold Greasing System is dependent upon the use of clean lubricant. Foreign matter in the grease may cause a clog in the lines. Frozen bearings or absence of grease on parts being serviced by the system usually is the result of infrequent or incorrect lubrication or an obstruction in the lubrication line. Wherever practical when lubricating the machine, the operator or maintenance personnel should make a visual check to see that the lubricant is reaching the machine part being serviced by each line.

If lubricant is not reaching a part connected by a lube line, check for a loose fitting, broken lube line or an obstruction. To locate an obstruction:

a) Disconnect the line fitting where the line enters the machine part. Pump grease into the line at the manifold block. Check to see whether or not grease appears at the disconnected line.

b) If grease doesn't appear, check along the line until the obstruction is localized.

c) Check for corroded, broken or kinked tubing and/or hose.

d) When obstruction is located, clean out or replace fitting or tubing. Fill part with lubricant.

e) Reconnect fitting and tubing making sure that the line fittings are tightened securely.

f) After reconnecting the line, pump fresh lubricant into the line and check to see that the line flow is free and lubricant appears at the lubrication point.

RECOMMENDED DAILY CLEANING PROCEDURES - DEFOAMER MOTOR

Turn off electric power to machine.

Remove shoulder thumb screws and cover from defoamer housing.

Steam &/or wash defoamer impeller housing and impeller thoroughly.

Steam &/or wash defoamer manifold and piping thoroughly.

Check regularly the defoamer housing for contamination.

Defoamer manifold and piping can be removed for inspection

and housing clean-up.

Re-assemble defoamer.

Turn on electric power to machine.

Turn on Defoamer motor to dry out the moisture inside the unit.

This area should be scrubbed to remove all plastic particles from the assembly and immediately rinsed.

S. S. Coverings:

Wash machine thoroughly with mild cleaning solution and rinse.

Lubrication:

When finished with clean-up, lubricate machine by means of central manifold greasing blocks. Also lubricate remote pressure grease fittings to dispel any wash water that may have accumulated in bearings. This fresh lubricant will replace worked out grease and prevent serious damage to bearings and bushings which may have become saturated with water during cleaning procedure. (See PREVENTIVE MAINTENANCE.)

PREVENTIVE MAINTENANCE

General:

The NIMCO Packaging Machine contains rotating, revolving, oscillating and other moving parts that are subject to friction and normal wear. A continued trouble-free operation depends upon a good program of preventive maintenance and it is extremely important that the following service procedures be adhered to:

a) Lubricate machine regularly and thoroughly.

b) Periodically inspect machine for loose parts.

c) Periodically inspect machine for assemblies that may require periodic adjustment.

d) Periodically inspect machine for normal wear of parts; immediately replace those that show signs of excessive wear.

e) Periodically inspect lubrication system to see that all lines are free from obstructions and filled with proper lubricant.

Strict adherence to the above procedures will prevent frozen bearings, prevent machine breakdown, eliminate the need for costly corrective measures caused by excessively worn parts, insures proper operation of all units and will result in efficient and maximum production and lengthen the life of the NIMCO Packaging Machine.

CAUTION: Preventive Maintenance procedures must be performed by, or under the supervision of personnel thoroughly familiar with the operation of NIMCO Packaging Machinery. Failure to comply with this caution may result in damage to the machine.

Precautions:

Strict adherence to the following precautions will aid in preventing injury to personnel or damage to the machine:

a) Periodically check if safety switches are functioning properly.

b) Do not make adjustments or settings while machine is in motion.

c) After making an adjustment or setting, Jog machine at least one complete revolution to check that all machine functions are operating properly.

d) Avoid setting tools or other objects on or about the machine: Damage may result if such objects fall into and jam moving parts.

e) Do not attempt to remove a jammed-up or deformed container while machine is in motion.

CENTRAL MANIFOLD GREASING SYSTEM

Lubrication -

The following information applies to NIMCO Packaging Machines equipped with the Central Manifold Greasing System.

New Machine -

Machines that are to be operated for the first time, must be thoroughly lubricated prior to leaving the NIMCO Factory but it is suggested that operators, or maintenance personnel, check to see that all machine parts requiring lubrication are greased as required.

Check the Central Manifold Greasing System to see that all lines are free from obstructions and filled with the proper lubricant. Inject grease into each line fitting on the former and filler/sealer sections. Check to see that grease appears at machine part supplied by each line.

After the initial operation of a new packaging machine, lubricate the machine as directed in the following instructions

General -

To insure continuous operation of the NIMCO Packaging Machine it is extremely important that the machine be regularly lubricated with clean lubricant. Wipe all excess grease off machine and parts. Types of lubricant to be used are Shell Alvania #2-71012 grease or its equivalent.

To facilitate lubrication of the NIMCO machine, a Central Manifold Greasing System is incorporated in the machine. This system provides for manual grease injection lubrication of the machine from a centrally located lubricating block on the former and filler/sealer sections. Some parts not covered by the system are readily accessible for direct hand lubrication. Strict adherence to the lubricating time intervals specified on the lubricating blocks will aid in eliminating the length and costly "down time" that can result from the excessive wear caused by inadequate lubrication, and will extend the efficient life of the machine.

It is recommended that the lubrication of parts included in the Central Manifold Greasing System be performed while the NIMCO machine is running. This will insure thorough distribution of the lubricant and prevent any accumulation of moisture in the bearings and other friction parts.

Gas - (Machines with Gas Bottom Heaters)

Natural or Bottled Liquid Propane Gas supply line should be connected to the gas shut-off cock and regulator. Refer to the machine specifications and layout sheet for utility requirements and connections.

Air - (Machines without optional Internal Air Resevoir)

The air line should be connected to the regulator. Check machine specifications and layout sheet for utility requirements and connection.

Water -

Water lines must be connected to the inlet valve located on the Rotory Valve above the mandrel wheel and to the manifold block located on the top seal head. Check machine specifications and layout sheet for utility requirements and connections.

PREPARATION FOR TESTING

Hand Indexing:

Before attempting to cycle machine under power, slowly index the machine by hand by turning belt drive pulley connected to the 30:1 right angle gear box several times until it is certain that all machine functions are operating freely and properly.

Lubrication:

Do not operate machine until making sure that the machine is thoroughly lubricated. (See PREVENTIVE MAINTENANCE - Central Manifold Greasing System) Pump each hand fitting on manifold grease blocks until fresh lubricant is visible at all bearings and sliding surfaces. Also, service all remote pressure grease fittings.

PREPARATION PRIOR TO RUNNING

1. Check top seal dater block for correct date inserts.

2. Make required settings and adjustments for running and one of the container sizes within the range of the machine.

3. After the container size adjustments have been completed, and machine mechanical operation has been checked manually, as stated previously, jog machine first, then start the machine under power.

4. With machine operating under power, observe all mechanical operations. Test the operation of the START, JOG, RUN and STOP controls, and safety switches.

5. Place cartons in magazine.

6. Turn on heater switch while machine is cycling. Gas bottom heater will only ignite when machine is cycling.

7. Run several cartons through machine to check bottom seal and top seal prior to running production.

8. After several containers have been run through the machine and seals checked, the machine is production ready.

RECOMMENDED CLEANING PROCEDURES

A well planned and efficient cleaning program will eliminate the possibility of contamination in the packaging of your products.

General:

Turn off electric power to machine

Shut off gas cock

Shut off product supply line and empty product holding tank.

Infeed:

Use air hose to blow paper and plastic particles off and around infeed magazine and cage area.

Bottom Seal:

With NIMCO's Thermo-Sanitation of the mandrels it is only necessary to wipe down mandrels, mandrel pads and bottom seal pad with a damp sponge, although this section may be cleaned with a mild cleaning agent.

Rinse water applied to machine must be controlled as not to spray the electrical control panel and bottom and top ovens which may cause problems when production is resumed. The machine should be immediately greased after rinsing.

Filler:

Disconnect product supply line, vacuum defoamer return line and plastic hoses from fill bowl lid assembly.

Remove lid and float assembly, disassemble and clean.

Disassemble defoamer impeller housing and thoroughtly clean impeller, then re-assemble.

Remove spreader shoe and drip covers from fill assembly and place on holding rack or table.

Flush solution through filler assembly then remove pistons and valves. Check "O"rings, apply a light lubricant to contact surfaces when re-assembling filler.

Conveyor Chains:

Wash conveyor chains with brush and mild cleaning solution then rinse.

Top Seal:

Thoroughly wash all closing guides and areas that contacts carton top seal and dater assembly with mild cleaning solution.

FORMER SECTION - FIRST STATION

First Station consists of:

1. Carton Blank Magazine
2. Infeed Vacuum Picker Head Assembly
3. Carton Square-Up Cages
4. Carton lift Table

1. Carton Blank Magazine

Carton blanks should feed from a fully loaded magazine. Constant tension is applied to cartons by a spring reel tensioner which advances cartons forward in the magazine. Spring reel tension is adjustable by loosening jam nut while holding shaft and turning shaft for more or less tension then retightening jam nut.

2. Infeed Vacuum Picker Head Assembly

This assembly is pulled forward by a large spring which also acts as a safety device. If the spring breaks or interferance occurs this assembly will not advance forward. A positive return stroke pulls the vacuum head assembly backwards. When the picker head is fully extended, it should push the cartons in the magazine about 1/4 - 3/8 inch.

Vacuum for this assembly is controlled by an air valve and cam mounted to the main drive shaft. Vacuum cups should pick up cartons from magazine and pull them into square-up cages. Vacuum must release carton before carton lift table pushes carton onto mandrel.

NOTE: Vacuum valve position to be set so valve opens and closes completely.

Picker head return stroke may be adjusted slightly by adjusting position of infeed arm. After making an adjustment make sure that picker head extends fully to contact cartons in magazine.

3. Carton Square-Up Cages

Cages are set at factory and should require no further adjustment.

4. Carton Lift Table

Lift table raises cartons in square-up cages to forming mandrels. If interferance occurs on the lift stroke, a safety break-away spring loaded sprocket will disengage. Turn sprocket counter-clockwise to rewind, making sure ball bearing engages into sprocket detent and chain remains on all sprockets. If sprocket unwinds during normal operating conditions, additional pressure may be applied by adjusting pressure to the ball bearing in the spring loaded break-away assembly.

Lift table should push carton fully onto mandrel, stopping within 1/16 inch of mandrel carton stop. This height may be adjusted by changing position of clamp on lift shaft.

FORMER SECTION - SECOND STATION

Bottom Crimp Assembly

The bottom crimp assembly will begin to operate as soon as the carton forming mandrel stops above it. This assembly must raise and lower, pre-folding carton bottom score lines, before the mandrel indexes the carton to the next station.

The inside crimp fingers must contact the carton bottom prior to the outside crimp rods to achieve a satisfactory bottom crimp.

The position of the crimp fingers and rods are pre-set at the factory and no additional adjustment should be necessary.

Carton scores should be pre-broken as deeply as possible without causing damage to the carton.

The outside crimp rods, at the top of the stroke, in their fully extended position, should contact the carton at the gusset corners.

FORMER SECTION - THIRD STATION

Blank

No operation is performed.

FORMER SECTION - FOURTH STATION

Bottom Oven & Super Heater Tube

The bottom heater is an atmospheric caloric gas oven which is used as heat source to heat an air distribution tube with nut located in center of the oven.

Holes are drilled into the tube and nut in precise locations so that when air is blown through the tube, super heated air will activate only specific areas of the carton to be sealed.

The super heater nut must be aligned with the center of the mandrel bottom pad and the tube should be square with the outer edge of the mandrel pad.

The amount of heat applied to the super heater tube can be changed by adjusting the gas regulator, and increasing or decreasing the amount of gas pressure supplied to the bottom heater.

Gas mixtures and pressures may vary and will depend upon supplier. It may be necessary to change oven orfice size and then readjust gas pressure for proper amount of heat.

FORMER SECTION - FOURTH STATION (cont.)

Standard Orfice sizes for gas oven:

Natural Gas	.082 inch
Liquid Propane Gas	.055 inch

Standard Gas Pressure settings for oven:

Natural Gas	4-6 inches W.C.
Liquid Propane Gas	9-11 inches W.C.

If size of orfice is enlarged, gas pressure will have to be reduced to avoid oven flame out.

The heater height is pre-set at the factory and no further adjustment should be necessary. The top of the oven should be approximately 4 1/4 inches from top of former table. Carton should just clear center nozzle of super heater tube for 1/2 gallon or 2 liter cartons.

When properly adjusted, the bottom oven will glow bright orange and there should not be any flame present on the top of the oven grid. If a flame is present, check for a cracked ceramic or possibly the ceramic is not properly cemented into the heater housing.

CAUTION:

Never spray water onto heated bottom oven. This may cause ceramic to crack.

Air is supplied to the super-heater tube by a self-controlled air compressor located on the base of the former section frame.

The amount of air blown through the tube is controlled by an air regulator and visual air flow control.

Air Pressure Settings:

Regulator	25 P.S.I.
Flow Control	22-25 cubic feet per hour

FORMER SECTION - FIFTH STATION

Bottom Sealing Station Consists of:

1. Folding Plow
2. Sealing Plate
3. Top Crimp Assembly

1. Folding Plow

The folding plow is pre-set at the factory and no further adjustments should be required.

If carton conditions make it necessary to adjust plow, raising plow will fold carton tighter and moving plow from left to right will change folding of sealing panels.

NOTE - The outside flap must always overlap the inside folding flap for a proper seal.

After an adjustment is made, always jog carton through folding plow making sure that carton will fold properly.

2. Sealing Plate

The sealing plate is relieved for the extra thickness in the carton bottom, down the center and along the carton manufacturers side seam. Sealing dam pins are positioned to strike the carton bottom folds at critical points, to insure a liquid tight seal.

A line is scribed into the sealing plate for ease of seal plate alignment. The carton bottom should be positioned within the parameter of the scribed line for a proper seal.

Caution:

When removing or changing seal plate, remove only hold down clamp nearest to you. The other clamp position is pre-set at the factory to positively locate seal plate with mandrel pad. The seal plate is relieved on that side so the clamp does not have to be loosened or removed.

NOTE-When looking at sealed carton bottom, it may show that the sealing pins are not striking the carton bottom in the correct locations. However, the dam pins are positioned so that a proper seal occurs on the inside of the carton and not on the outside.

To check a sealed carton bottom for proper seal, a dye solution is used. Cut off a sealed carton bottom approximately 1 inch from bottom fold. Pour in dye solution, then remove rinse and check for any leakage.

With a razor blade or knife, cut carton corners and fold bottom flat. Make two small cuts along the raw paper edges on the inside center folding flap and side seam corner. The cuts should come through the carton bottom along side the impression left by the sealing pressure plate on the outside of the carton bottom.

Bottom sealing pressure is achieved by four pre-loaded compression springs located below the seal plate assembly. These springs should compress 1/8 inch maximum to insure a proper sealing pressure. The compression can be adjusted by changing the position of the seal arm connected to the clamp block attached to the sealing post. There is a 1 to 2 ratio between the position of the seal arm and compression springs. An adjustment of 1/8 inch will increase or decrease compression by 1/16 inch.

Compression is pre-set at the factory. It will only be necessary to reset compression if the seal arm is moved to change follower.

Caution:

Compression is pre-set at 1/8 inch at factory. To increase pressure by more than 1/8 inch may cause damage to the machine.

Seal assembly stop nuts are pre-set at the factory so there is clearance between the bottom mandrel pad and seal plate dam pins, allowing for carton thickness. Never decrease clearance between seal plate pins and mandrel pad less than .005 inch. This may cause damage to the mandrel pads or the machine.

A pressure pad is used on the mandrel indexing wheel to absorb pressure applied to the carton when sealing. Under operating conditions this pad may wear. Make sure brake pad is properly adjusted. Tighten adjustment screws to the pressure pad holder only finger tight and lock down. Replace pad if worn.

Caution:

Damage to index box bearings may occur if pressure pad is loose or improperly adjusted.

3. Top Crimp Assembly

The top crimp blades will pre-break carton top scores when bottom seal is fully compressed.

With the mandrel in dwell stopped position, loosen crimp rod housing bolt to release both top crimp blades. After all eight mandrel slides are set for proper carton size, loosen bolts on top crimp housings and reposition height of blades. Move blades in towards mandrel and reposition crimp blade pivot housings so that blades are contacting top of mandrel slides. Tighten bolts on both the top crimp housings and crimp rod housings. Jog machine after change to make sure top crimp is set correctly.

Caution:

When changing carton sizes always release top crimp blades first. This will insure wings do not interfere with mandrel slides and not cause damage to mandrel or crimp assembly.

Caution:

Top crimp must be set only when bottom seal springs are fully compressed, otherwise wings may not full retract to upright position and damage may occur to mandrel or top crimp assembly.

FORMER SECTION - SIXTH STATION

Blank

No operation is performed.

FORMER SECTION - SEVENTH STATION

7th Station Carton Outfeed consists of:

1. Three Position Outfeed Arm
2. Outfeed Vacuum Tube Assembly
3. Carton Turn-around (If Applicable)
4. Vacuum Release Cam

1. Three Position Outfeed

The three position outfeed arm adjusts the stroke of the outfeed vacuum tube. The inner position is the shortest stroke and is used for 1/2-pint and 1/4-liter cartons. The middle position is used for pint and 1/2-liter cartons. The outer position is the longest stroke and is used for quart/liter and 1/2-gallon/2-liter cartons.

2. Outfeed Vacuum Tube Assembly

The outfeed vacuum tube should contact the carton only after the mandrel wheel has come to a complete stop. The carton must be picked off the mandrel and be lowered to the bottom rail of the filler before the mandrel wheel indexes and the filler conveyor chains start to move the carton into the filler section. The outfeed tube has a short dwell position prior to releasing carton onto the filler bottom rail. The filler conveyor chains should not start to move until the carton is firmly placed onto the filler bottom rail, vacuum releases the carton and the outfeed tube has lowered to the bottom of its stroke, below the bottom rail.

The timing for the outfeed tube is controlled by the lift cam located in the main shaft. The lift cam may be adjusted to advance or retard the timing of the outfeed tube.

At the top of the lift cam stroke the outfeed cup should just contact the bottom mandrel pad. An adjustment to the lift chain connected to the outfeed block will raise or lower outfeed tube.

Caution:

Only adjust lift chain at top of cam stroke. Do not adjust lift chain so vacuum screw or outfeed tube contacts mandrel pad. This may cause damage to mandrel pads or outfeed tube assembly.

FORMER SECTION - SEVENTH STATION (cont.)

3. Carton Turn-around (If Applicable)

The carton turn-around is only used for 1/2 -gallon and 2 - liter Pure-Pak or Tetra-Rex cartons.

The outfeed tube should begin to turn as soon as the carton top is clear of the mandrel bottom pad. Timing is regulated by turn-around cam on the main shaft. If turn-around does not occur, check if turn-around spring is broken.

Outfeed tube should turn a full 90-degrees before releasing carton. If this does not occur check turn-around pin for wear, and replace if necessary.

4. Vacuum Release Valve and Cam

Vacuum release is controlled by vacuum cam on main shaft which operates a vacuum valve.

Vacuum should release carton during the short dwell position of the outfeed tube after placing the carton firmly onto the filler bottom rail. Timing of the vacuum cam can be changed to release carton sooner or hold carton longer by retarding or advancing cam on main shaft.

NOTE - Vacuum valve position to be set so valve opens and closes completely.

Caution:

Vacuum must release carton on bottom rail, If vacuum held too long this may cause smaller cartons to jump onto bottom rail and tip backwards when conveyor chains start advancing the carton into the filler section. Re-adjust vacuum com position if this occurs.

If vacuum releases before carton is pulled off mamdrel. check for:

a. improper bottom seal
b. torn vacuum cup
c. height of vacuum cup
d. vacuum screw may be clogged with paper fibers
e. vacuum tube may be clogged with paper fibers
f. vacuum valve not operating properly
g. vacuum cam out of time
h. not sufficient vacuum, must have approximately 15-20 inches of vacuum at vacuum cup with 22-24 inches of closed vacuum at pump
i. vacuum filter bowl may be filled with water or paper dust

FORMER SECTION - EIGHTH STATION

Vacuum Shut-Off Safety Switch

The eighth station has a limit switch that will shut off vacuum to the infeed vacuum picker head assembly if a carton is not pulled off the mandrel at the seventh station carton outfeed.

With no vacuum supplied to the picker head manifold, a carton can not be pulled out of the loading magazine and pushed onto a forming mandrel which already has a carton on it.

Vacuum will only shut off if carton is on mandrel at 8th station. Vacuum supplied to picker head assembly will resume and operate normally if no cartons are present on the following mandrels.

NOTE: If cartons are not pulled off forming mandrels at the seventh station, please refer to that section for correction or to the section referring to the water cooled mandrels.

WATER COOLED MANDRELS

City water with a maximum temperature of 55-degrees F. is recommended for cooling the mandrels. If water temperature is warmer, then supplemental cooling may be required.

It is possible for an air lock to occur causing blockage in water flow to one or more mandrels. Mandrels may then overheat and cartons may stick to mandrel base pads.

If this happens, disconnect a mandrel return line to the water manifold and allow water to flow until air is out of the line. Proper water circulation should then return to the cooling system.

NOTE: To prevent this situation, always turn off water valve located at bottom sealing assembly to avoid drainage of water when the machine is not operating.

If water is too cold, or during high humidity periods, mandrels may sweat and cause carton bottoms not to seal properly. To remedy this, reduce the amount of water flow supplied to the cooling mandrels and allow longer warm-up period to dry mandrels.

Caution:

To avoid mineral and iron deposits in water passages and lines, it is recommended that a water filter be used in-line prior to machine.

If mandrels are overheating and there is no air lock in the cooling system, this may be caused by too warm of water used. Increasing the water flow slightly will help dissipate the heat from the mandrel pads.

FILLER/SEALER SECTION

Cartons are moved through the stations of filling, heating, top folding and sealing by conveyor chain lugs which are indexed by a self-lubricated roller cam indexer protected by an overload clutch.

FILLING ASSEMBLY

The Filling Assembly consists of:

1. Product Holding Supply Tank
2. Fill Cam and Screw Adjustment
3. No Carton - No Fill Sensor Switch
4. Micrometer Fine Fill Adjustment
5. Filler Bowl and Piston Assembly
6. Inlet Valve
7. Outlet Valve & Nozzle

1. Product Holding Supply Tank

The Product holding tank utilizes a float assembly which regulates the product input to the tank.

The level control operates as a result of the buoyancy of the float. As the level in the supply rises, buoyancy pressure raises on the float to shut off product inlet. As the product level diminishes, buoyancy pressure on the float diminishes which opens the inlet valve to increase product input. The product level in the tank is constantly balanced to maintain a constant head pressure to the filler.

2. Fill Cam and Screw Adjustment

The amount of product filled is positively controlled by the movement of the piston in the metering bowl assembly. The fill stroke to the upper fill shaft is set by the position of worm nut on the screw worm lower half of the fill assembly. The position of the worm nut will control the movement of filler shaft and fill disc on top the shaft which activates the fill stud and micro-fill studs. For the shortest stroke, the worm nut is positioned against the worm support housing. For the longest stroke, the worm nut is positioned against the worm stop nut.

Caution:

It is very important that the factory set stop nut on the fill screw worm assembly not be moved to increase fill stroke as this may cause damage to this section of the machine.

Caution:

Machine cycling speed must be reduced to proper relative specified speed when operating at maximum fill stroke otherwise damage may occur to this section of the machine.

3. No Carton - No Fill Sensor Switch

The no carton - no fill limit switch controls an electrical solenoid mounted to the fill casting.

The solenoid is connected to a slide on which a pin is mounted. With no cartons in chain conveyor the solenoid is energized and holding the pin. When a carton is positioned under the filler valve, the limit switch wand will sense the carton and shut off the solenoid. This releases the fill pin. The fill pin is pulled under the fill disc by a return spring so that the fill piston will begin its downward movement dispersing product from the metering bowl.

FILLING ASSEMBLY (cont.)

When the piston reaches the bottom of the fill stroke the fill is complete. The fill cam will then raise the upper fill shaft and a stop collar will lift the fill casting connected to the fill piston back to its most upper position ready for another carton to fill.

Under operating conditions the fill pin will remain under the fill disc. If this does not occur an adjustment to the sensor wand connected to the no carton - no fill limit switch may be necessary.

4. Micro-Fill Micrometer Fine Fill Adjustment

The micrometer fine fill adjustment is afixed to the top of the fill pin and is used to precisely adjust product fill volume after course filler adjustment is made on worm screw. The adjustment is plus or minus 1 1/2 ounces.

5. Filler Bowl and Piston Assembly

The amount of fill depends on the travel of the piston within the metering bowl. O-rings should be examined daily and coated with sanitary lubricant before reassembly. Replace worn or stretched o-rings if necessary.

Caution:

Piston stroke should never be adjusted to allow piston to bottom out on metering bowl manifold or damage may occur to filler mechanism.

6. Inlet Valve

Inlet valve should be assembled as illustrated in parts section. Never force any items into place and replace the spring or o-ring when necessary. Valve must open and close without any interruption.

7. Outlet Valve and Nozzle

Outlet valve must be assembled as shown in parts pages. Valve stem must move freely within nozzle. Replace spring and o-rings when worn or stretched.

When inserting outlet nozzle assembly into metering bowl manifold make sure nozzle is seated properly before tightening nut. When tightening nut do not allow nozzle to turn. This may cause o-ring to not seat properly and create an air leak which may cause excessive foam and fill variance.

Caution:

Quadring on fill valve stem must be inspected and replaced if stretched. If not replaced, quadring may be forced over fill stem mushroom top. This will stop the flow of product from the piston and metering bowl assembly and may cause severe damage to machine.

Fill variance, excessive foam and product splashing will occur if air is permitted to enter filler system. Check the following causes for remedy:

1. Worn O-rings or gaskets
2. Broken spring or weak spring
3. Loose outlet nozzle
4. Not enough product in supply tank
5. Loose clamps on product supply tank or piping
6. Too much pressure from pump to supply tank
7. Bent valve stem

FILLING ASSEMBLY (cont.)

Caution:

When cleaning or handling filler parts be very careful not to drop or damage items.

When assembling filler never force any items into place.

DEFOAMER/TOP RECRIMP MECHANISM

For aerated products to evacuate any foam from the carton prior to top being sealed, a tygon vacuum tube is connected from the defoamer tube to the product supply tank cover, a second tygon tube is connected from the product tank to the defoamer suction pump under the filler/sealer table. An o-ring seals the product tank.

A positive cam controlled action raises and lowers a tube in and out of the carton after filled and before entering cooling rails. A blade that is attached to the end of the tube is used to tuck gable gussets inwards before entering cooling rails.

COOLING RAILS and TOP FOLDING PLOWS

Rails and plows are pre-set at the factory for all carton sizes run on the machine. No adjustment is necessary in this section.

TOP SEAL

The top seal assembly consists of a set of sealing jaws relieved for accumulation of proper thickness in the carton. These jaws are inserted into water cooled jawholder blocks which transfers the heat from the sealing lips of the carton to achieve a positive seal.

The front jawholder block is a stationary type and the rear jawholder block is a moving type. In the sealing position both jawholder blocks are closed together and contact without moving seal springs. When carton is in the jaws the moving jaw will compress the carton sealing lips against the stationary jaw and sealing pressure is applied by the pre-loaded seal springs.

NOTE: Sealing pressure is pre-determined by the preloading of the seal springs and cannot be changed. If a positive seal is not achieved, refer to section on top seal problems and corrections.

Caution:

Over adjusting the shaft seal eccentrics will not increase pressure applied to the carton, but only compress die springs more, which will cause premature wear and possible damage to top seal.

NOTE: If pressure is not evenly applied to the carton, the stationary jaw may not be square to the moving jaw. For proper adjustment of jawholder blocks, loosen the three bolts on the top seal plate connected to the seal spring block. Jog machine into sealing position without a carton in the jaws. Push stationary jaw block square up against moving jaw and retighten bolts,

The top seal jaws are relieved for the build up of 2,4 and 5 paper thicknesses of the carton lip sealing area. If the carton is not positioned properly within the sealing jaws a positive top seal may not occur due to additional paper thickness in a non-relieved area of the jaw. Check location of manufacturer's carton side seam (5th panel) in relationship to the relief in the seal jaws.

TOP SEAL (cont.)

In summary, to achieve a good positive tight leak-proof top seal there cannot be any moisture on the carton sealing lips, the carton must have a sufficient amount of heat applied to activate carton sealing areas and the carton must be located properly in the top seal jaws.

If too much heat is applied to the carton this may cause a separation of the carton manufacturer's side seam (5th panel) and cause a top leaking problem. If this occurs adjust height of top heater for proper amount of heat to be applied to carton.

If carton top sealing lips are mis-aligned horizontally, bottom rail may be moved side to side to square up top alignment or bottom rail may be raised to bring carton higher into top seal jaws. Vertical carton lip lineup can be adjusted by properly locating filler conveyor chain lugs.

Top seal problems may occur if moisture is on the sealing lips which may be caused by product splash or excessive foam in product. Refer to filler section for correction.

POOR TOP SEAL-Probable Causes:

1. Insufficient cooling water flow in jaw blocks
2. Condensation on folding plows or seal jaws
3. Moisture on carton sealing lips
4. Jaws not square
5. Insufficient pressure; broken seal spring
6. Improper sealer timing
7. Location of carton in sealer jaws
8. Too much heat applied to carton
9. Not enough heat applied to carton
10. Code die inserts protruding from seal jaw

NIMCO TIMING INSTRUCTIONS

The machines timing is set and thoroughly tested at the factory. No further adjustment should be required.

The correct timing of the bottom former and the Filler/Sealer sections is important for satisfactory operating efficiency. Each function of the machine must be performed at the required time to assure a quality package will be produced.

CAUTION: Before assuming adjustments need to be made to the machines timing, check all other machine functions to be certain they are timed correctly.

BOTTOM FORMER

The main Cam performs three operations at the same time. This Cam is keyed to the main drive shaft therefore it is impossible for these three operations to be out of time.

The three operations are:

A. Infeed Vacuum Picker Head Assembly
B. Lift Arm and Carton Lift Assembly
C. Bottom Seal and Top Crimp Assembly

All drive sprockets throughout the machine are keyed except the drive sprocket to the former indexing box and sprocket to the bottom crimp station.

All other machine functions operate from Cams which are clamped to the main drive shaft. These Cams are:

FIRST STATION - Vacuum Cam for Carton Pick-Up and Release

Vacuum timing is regulated by a cam which operates a vacuum valve. Vacuum must be on when the suction discs contact the cartons in the infeed magazine, and vacuum must release the carton when it is pulled into the square-up cages before the carton lift table pushes the carton onto the mandrel. Move the vacuum cam clockwise to advance the vacuum or counter-clockwise to delay release of carton from suction discs.

SECOND STATION - Bottom Crimp

After the mandrel wheel has completed its indexing movement and stops, the bottom crimp will occur. The bottom crimp must be completed before the mandrel wheel indexes again. Timimg can be regulated by adjusting the position of the crimp cam.

THIRD STATION - Blank - No Timing Required

FOURTH STATION - Heater Station - No Timing Required

MANDREL WHEEL INDEXING -

The indexing of the mandrel wheel is very important as it must correspond with all stations of the bottom former and the indexing of the Filler/Sealer conveyor chains. It is recommended that the mandrel wheel indexing be checked prior to assuming any or all the bottom former stations may be out of time.

The mandrel wheel should index and stop, bottom seal come up into seal position, then bottom seal must lower to its lowest position prior to the mandrel wheel indexing again.

If mandrel wheel indexing is other than described above, the correct timing procedure is as follows:

A. Jog machine until mandrel wheel just begins to index.
B. Disconnect indexer drive chain. Mandrel wheel will not turn but all other stations will function.
C. Jog machine until bottom seal has just lowered to its lowest position.
D. Reconnect indexer drive chain and tighten idler.

Now that mandrel wheel indexing is timed to the bottom seal station, other stations should then be checked for respective timing operation.

NIMCO TIMING INSTRUCTIONS

FILLER/SEALER

The drive chain sprockets from the bottom former shaft to the Filler/ Sealer shaft are keyed so no timing changes should occur. If for some reason this chain must be disconnected, the proper timing sequence is as follows:

A. Jog machine until carton conveyor chains just begin to move.
B. Disconnect transfer chain from former to Filler/ Sealer shafts.
C. Jog machine until mandrel indexing wheel just starts to move.
D. Reconnect transfer chain and tighten idler.

NOTE: If carton conveyor chains lugs appear to be out of time with the mandrel indexing wheel, before re-timing transfer chain, check first to see if filling and top sealing assemblies are in time with the bottom former section. It is possible that the pre-set torque limit on the overload clutch, connected to the carton conveyor chain indexer, has been exceeded by an overload or jaming condition. Inside the clutch, this condition will cause a spring loaded cam follower seated in a cam detent to release disconnecting the indexer hub from the clutch body. If this condition occurs, jog machine three complete cycles and the cam follower should re-seat into the detent inside the clutch. The carton conveyor chains lugs should then be in time again with the other functions of the machine. Refer to clutch operating principles in Section IV of this manual for additional information.

FILLER ASSEMBLY

The filler assembly should begin filling the carton just after the conveyor chains advance the complete carton under the filler outlet nozzle. The filling operation must be completed before the conveyor chains begin moving the carton again. Turning the filler cam in the same direction as the shaft rotates will advance filler timing and the carton will be filled sooner. Turning cam in opposite direction will fill carton later.

DEFOAMER TUBE AND TOP RE-CRIMP

The defoamer tube should begin lowering into the carton when the conveyor chains stop, and must be retracted completely from the carton prior to the chain lugs moving the carton again. Advancing defoamer cam in the same direction as the shaft rotates will lower the defoamer tube sooner. Moving cam in opposite direction will lower tube later.

TOP SEAL ASSEMBLY

The top seal moving jaw should begin closing only after the conveyor chains have advanced the carton into sealing position and have stopped. The sealing jaws must be open and release carton before conveyor chains begin moving again. The top seal cam may be advanced in the direction of shaft rotation to close jaws sooner and release carton sooner. Moving cam in opposite direction close jaws and release carton later.

CARTON CONVEYOR CHAIN INDEXING

Both drive chain sprockets from the Filler/Sealer drive shaft to the indexer box input shaft are keyed.

As explained previously, the transfer chain sprockets from the bottom former to the Filler/Sealer section are also keyed to their respective shafts.

Therefore the carton conveyor chains should begin moving at the same time as the mandrel wheel. If this sequence does not occur refer to the mandrel wheel indexing and check for proper timing of the bottom former section prior to making any adjustments to the conveyor chains.

If bottom former section is properly timed, next check if all operations of the Filler/Sealer section are correctly timed. If so, then refer back to the beginning of the Filler/Sealer timing instructions concerning transfer drive chain from bottom former to Filler/Sealer shafts.

However, if only the filler conveyor chains appear not to be in time with other functions of the machine, the proper timing sequence follows:

A. Jog machine until conveyor chains just begin to move forward.
B. Disconnect drive chain from indexer box to Filler/Sealer drive shaft.
C. Jog machine until mandrel wheel just starts to index forward.
D. Reconnect indexer drive chain and tighten idler.

The machine should now be properly timed. If not, refer back to previously explained timing instructions.

CAUTION: After making a timing change to the machine, always jog the machine prior to running machine. Otherwise, if an incorrect adjustment is made, damage may occur to the machine.

COMMON FIELD PROBLEMS AND POSSIBLE CAUSES

1. PROBLEM: CARTON FEEDING FOR MAGAZINE

Possible Causes:

Filling Machine

1. Vacuum pressure insufficient
2. Vacuum release out of time
3. Over/Under spring carriage pressure
4. Worn or hard suction cups
5. Loading cage not in proper position
6. Mandrels not in proper position

2. PROBLEM: BOTTOM FORMATION

Possible Causes:

Filling Machine

1. Carton stops not properly set
2. Bottom breaker not properly set
3. Folding plow not in proper position
4. Sealing temperature too high or too low, or air jets misdirected
5. Loading paddle out of adjustment
6. Loading chute drag
7. Vacuum not releasing
8. Damage to carton flaps
9. Blank flame sealed on the bias
10. Weak or unsymmetrical scoring in bottom area
11. Pressure pad adjustment
12. Heater height not located properly

3. PROBLEM: BOTTOM SEAL QUALITY, DURABILITY AND LEAKING

Possible Causes:

Cartons, Filling Machine and Dairy

1. Breaks in cartons plastic coating before processing through machine.
2. Carton side seam skips at bottom. (Check 25 consecutive containers by rubbing off paper fibre with water and examine for skips.) Heating side seam with a burner so it will open is another way of checking for skips.
3. Poor "Bottom Formation"
4. Sealing temperature too high or low, or air jets misdirected
5. Pressure pad relief areas and stake points out of register
6. Stake points - high
7. Inadequate or uneven pressure
8. Excessive outside bottom wetting due to:

    a. bottom heat activation damage to outside PE coating
    b. outside PE coating damage from machine or conveyor scuffing
    c. penetration of strong lubricants and detergents into board raw edges and breaks in PE coating

. case washer detergents
. machine chain lubricants
. machine sprays
. caser spray lubricants
. conveyor chain lubricants

9. Excessive inside bottom heat activation damage to PE coating (especially critical along bottom horizontal scores)
10. Poor or erratic sealing caused by cold drafts
11. Rough handling
12. Automatic caser damage (cartons dropped or not released from proper height)
13. Oversize dairy delivery case
14. Fluctuation in air or gas pressure.
15. Calrod heater burned out
16. Broken ceramic burner heater
17. Dairy delivery cases stacked over six high in cooler
18. Bent mandrels
19. Worn or uneven mandrel caps
20. Inadequate pressure pad cooling - water supply (circulation and temperature)
21. Condensation on seal plate, folding plow, or mandrel pads
22. Holes plugged in super heater tube or nut
23. Blown out super heater tube
24. Fluctuation in air or gas pressure
25. Inadequate mandrel cooling - water supply (circulation and temperature)
26. Improper clearance between pressure pads and mandrels
27. Wet icing
28. Heaters not properly aligned with mandrels
29. Water or oil in air lines causing contamination of superheat air resulting in a poor seal (oil in water)
30. Excessive mandrel spray lube causing:
    . poor bottom seal
    . wicking into board raw edges and breaks in the coating

Retail Store

Strong household cleaners used to clean display cases - causes outside bottom wetting

Other

1. Diesel fume residue on carton surfaces
2. Product spoilage producing an abnormal wicking tendency

4. PROBLEM: CARTON TRANSFER AT OUTFEED PICKOFF

Possible Causes:

Filling Machine

1. Dirty mandrels
2. Hot mandrels
3. Improper adjustment of transfer plate
4. Timing of 7th Station pickoff tube
5. Pickoff tube adjustment

5. PROBLEM: FILL VARIATION, FOAM AND PRODUCT DRIPPAGE

Possible Causes:

Filling Machine and Dairy

1. Improperly adjusted filler
   a. poor filler maintenance
   b. poor quality control program on fillers
2. Air leaks
   a. leaky suction side of transfer pump
   b. air leak at homogenizer
   c. inadequate holding time in tank to allow air to dissipate prior to transfer of product to filler
   d. filling holding tank from top
   e. pumping directly to filler bowl
   f. loose piping joints from holding tank and supply bowl
   g. faulty O'rings
   h. leaking valves
3. Foam in filler bowl
   a. filler bowl not gravity fed
   b. small holding tank
   c. turbulent flow and surging caused by small transfer lines
   d. high pressure transfer pump
4. Inadequate product supply
   a. insufficient head pressure due to length of supply line
   b. line restrictions
   c. level control not working properly
5. Sticking or leaking filler valves
   a. bent valve stem
   b. broken fill spring
   c. loose valve nozzle
   d. valve improperly assembled
   e. clogged fill screen
   f. loose snubbers
   g. filler out of time
   h. inadequate lubrication
   i. damaged filler parts
6. Defoamer not working

6. PROBLEM: TOP FORMATION, FLAP ALIGNMENT, SEAL QUALITY AND LEAKING

Possible Causes:

Cartons and Filling Machine

1. Heat - high or low
2. Excessive product on top sealing area (inside and outside of carton)- result of product splash, drippage or foam
3. Improper alignment of side seam relief in sealer jaws - resulting in uneven or inadequate pressure
4. Improper alignment of embossing stakes in relation to the side seam
5. Sealer jaws not releasing properly, or improper clearance, resulting in drag on carton causing top flaps to form unevenly
6. Top flaps not properly aligned
7. Heater not properly located
8. Calrod heater burned out
9. Improper carton position in chain
10. Improper carton rail or spacer height

11. Inadequate pressure
12. Excessive pressure causing back-off
13. Inadequate sealer jaw cooling - water supply (circulation or temperature)
14. Condensation on folding rails, folding plows or seal jaws
15. Top breaker or former not properly set
16. Product too cold
17. Improper adjustment of sealer guides
18. Improper adjustment of cooling or water rails
19. Conveyor chains out of adjustment
20. Improper clearance between sealer jaws
21. Defoamer not working
22. Rough carton transfer from filler to top sealer causing product splash on top sealing area
23. Carton blank flame sealed on the bias
24. Weak or unsymmetrical scoring in top area
25. Side seam skip at top of container
26. Side seam opening up at top because of excessive heat
27. Pouring spout release material (abhesive) smeared on top flaps.

Other

Diesel fume residue on carton surfaces

7. PROBLEM: SPOUT OPENING QUALITY

Possible Causes:

Filling Machine

1. High temperature heater setting due to:
   - . heater location
   - . operater judgment that high temperature required for leak-proof top
   - . uneven or inadequate pressure
   - . excessive product on top sealing area (inside and outside of carton)- result of product splash, drippage or foam
2. Improper sealer jaw relief location
3. Improper carton rail or spacer height

Other

Improper opening of carton by consumer

8. PROBLEM: CARTON BULGE

Possible Causes:

Filling Machine

1. Excessive outside bottom wetting due to:
   a. bottom heat activation damage to outside PE coatings
   b. outside PE coating damage from machine or conveyor scuffing
   c. penetration of strong lubricants and detergents into board raw edges and breaks in PE coating

- . case washer detergents
- , machine chain lubricants
- . mandrel and machine sprays
- . caser spray lubricants
- . conveyor chain lubricants

2. Excessive inside bottom heat activation damage to PE coating (especially critical along bottom horizontal scores)*
3. Rough handling*
4. Automatic caser damage (cartons dropped or not released from proper height)*
5. Oversize dairy delivery case*
6. Wet icing
7. Excessive mandrel spray lube causing wicking into board raw edges and breaks in the coating*

Retail Store

Strong household cleaners used to clean display cases - causes outside bottom wetting*

Other

Product spoilage causing a build-up of carbon dioxide gas in carton.

*Causes bottom breakdown which results in a loss of carton structural strength.

5. Channels - A well-formed, sealed bottom will show no stain penetration underneath the gusset flaps and gusset edges will be butted together with no channel or overlap condition. It may be necessary to carefully remove board fibers from the center area of the gusset flap with a knife to check for channels and over-lapped edges. Excessively overlapped edges will hold off sealing pressure of the pressure pad and cause unsealed channel areas which are subject to leaking the same as open gusset channels.

6. Pressure - Observe the outside of the bottom for distinct pressure lines and stake points along the overlap areas of the bottom at the sideseam flap and tuck-in flap edges. Faint pressure marks indicate the lack of pressure. Excessively deep stake marks indicate high stake points which can prevent proper pad pressure in other critical areas of the bottom. A bad tuck-in flap fold can cause the faint and excessively deep stake marks.

7. Knife Check - It is important that the pressure pad be in proper register with the carton bottom so that relief edges of the pad do not ride up on overlap edges of the bottom. On the inside of the sample, with gusset flaps pulled back, insert knife blade through the bottom held perpendicular to the bottom and against the edges of the tuck-in flap and sideseam flap. These cuts should be made in the area of the stake points. Then observe the outside of the bottom to see if cuts split in half the stake points which denoted proper pressure pad register. Pressure pad adjustment is required if knife cut is more than 1/16" off center with the stake point.

8. Damage - Bent or damaged edges of any of the bottom flaps indicates poor adjustment of the machine which should be found and corrected before trouble starts.

9. Good Heat - On most machines, normal bottom heat will produce a glaze pattern that extends out from both gusset flaps over roughly 50% of the bottom area. No excess damage from heat should be noted above the bottom horizontal scores.

10. Low Heat - Insufficient heat will produce unsealed areas beneath the gusset flaps.

11. High Heat - Excessive heat will cause severe pinholing and a heat glaze pattern well above the bottom horizontal scores. This damages the poly film and allows product penetration which could result in bottom durability problems. The likelihood of sideseam separation can be expected from high heat.

12. Outside Bottom Damage - Bottom formed cartons should be checked for outside damage caused by scuffing and excessive or misdirected heat. Dip the formed carton in stain solution for one minute, rinse with cool water and examine the sample for bottom damage. This check should be made prior to production start-up, a minimum of every four hours of production or after machine adjustment.

TOP CHECKS

1. Samples - Remove a top-sealed, filled carton from the conveyor to check carton top forming and sealing.

2. Alignment - Top flap edges should be parallel and in good alignment with each other. Front and back gables should also be aligned to each other.

3. Stake Register - Sealer jaw stake point register is critical. The second stake point at the sideseam must be located next to the sideseam edge but not ride up on the sideseam flap. Insert knife point through the center of this stake point into carton top, holding the knife perpendicular to the gable. Seperate carton top to see that knife cut misses the edge of the sideseam but is no more than 1/16" away from sideseam edge for proper register of sealer jaw stake points.

4. Jaw Register and Pressure - Sealer jaw horixontal relief must be located next to the inside gable edges to produce a well defined pressure line without cutting the board to prevent channel leakers. Adequate pressure is also indicated by well defined stake points and horizontal relief edge.

5. Heat - Sufficient heat to produce tightly sealed tops will not singe tops nor cause excessive over-activation of the polyethylene on front and back gables. Excessive heat is apt to open up

sideseam seal at the top of the seam.

6. Leakers - To check for top leakers, lay the unopened filled carton on its side for several seconds and observe for product drippage.

7. Bond - Tops may be opened up to observe bonded areas of gables and top flaps.

8. Spout Opening Quality - To evaluate a carton for spout opening quality, properly open the spout (see note) and inspect. Good spout opening quality will show a complete and clean seperation of the pouring spout from the inside sealing area. Fair spout opening quality will show a complete seperation of the pouring spout from the inside sealing area but the edge of the spout will show board delamination. Poor spout opening quality will show no seperation of the pouring spout from the inside sealing area. Fair and poor spout opening quality is usually caused by excessive top heat.

(NOTE: Procedure for properly opening the pouring spout of a carton

1. Using both thumbs and forefingers, push back the opening panel until it touches the gable top of the carton.
2. Bring the pouring spout forward by squeezing the edges of the panel and pulling forward.

9. Abhesive Register - An Abhesive film is applied to the inside of the poor spout as an easy opening feature. If the Abhesive is out of register this may cause a pin leaker from the pour spout side.

NOTE:Procedure for evaluating Abhesive print register inside carton

1. Using cigar or cigarette ashes, rub into the inside sealing edges of the pout spout.
2. The Abhesive print will darken in color and clearly define area of application.

The Abhesive should be no closer than 1/16" from the upper edge of the sealing area.

MACHINEABILITY CHECKS

1. Samples - Observe at least 25 or more blanks run through the machine during filling of the product.

OPERATOR MACHINE QUALITY CHECKS

Listed below are the recommended quality checks that should be made by each operator. These checks are very important in achieving a good quality package.

Routine quality checks must be made on the carton forming and sealing properties prior to start-up of production on the filling machine and at least every 15 to 30 minutes during production. This will help insure consistent quality of the filled package.

BOTTOM CHECKS

1. Sample - Prior to machine start-up a minimum of one sample per mandrel should be evaluated for bottom forming and sealing. A minimum of three consecutive samples should be examined during the specified time intervals of the production run for these same properties. Bottom formed samples should be selected before entering the filler unit. A good carton bottom is obtained from proper forming, heat and pressure.

2. Forming - Check the outside of the bottom to see that the tuck-in flap has inserted properly, no excessive gaps are present at either corner of the tuck-in flap and that the bottom is square.

3. Stain - Use Scarlet Moo dye solution purchased from NIMCO Corporation, and follow instructions with the kit for proper mixing. While carton is still warm, pour in 1" of dye solution and hold for EXACTLY ONE MINUTE. Dump the stain solution and rinse thoroughly with cool water. Carefully examine bottom for pinholing and heat activation pattern. After separating gusset flaps, described below check for bottom channels and unsealed areas.

(NOTE: A fresh dye solution should be prepared at least once a week. Dye stain solution must be at proper strength for meaningful results. Make certain solution containers are kept tightly closed when not in use.)

4. Open Sample - After carton bottom has been cut off the carton, approximately 2" up from the bottom, tear open both gusset flaps by lifting from the sealed bottom area.

2. Feeding, Loading, Transferring, etc. - Determine the percentage of troublesome cartons and observe the carton action on the filling machine. Compare these with an equal quantity of standard production cartons. Prebreak by hand 25 or more blanks of the troublesome item and run on the machine to note difference, if any. Note difference in opening force required to open problem container and check for possible biased or tapered sideseams. Cartons run best when in the dairy plant a week to 10 days in proper storage to equalize temperature of the blanks.

GLOSSARY OF PLASTIC-COATED BLANK TERMINOLOGY

A. BOARD

Term	Explanation
Board substance or base stock	Board before extrusion of polyethylene flim
Caliper	Thickness of board usually expressed in thousandths of an inch
Basis Weight	Weight in lbs. of 3,000 sq. ft. of board
Film weight	Amount of polyethylene in lbs. on 3,000 sq. ft. of board
Extruder pinholes	Minute holes in polythylene film normally occurring at extruder
Board delamination	Internal splitting of board
Poor film adhesion	Film separates from board with little or no fiber pull
Profile board	Matte side poly film thickness greater in bottom and top areas than center of panels

B. INK

Term	Explanation
Ink Adhesion	Ability of ink to adhere to polyethylene
Wet scuff	The smearing of ink when the ink film is subjected to conditions of high moisture, rubbing, chemical action, and/or abrasion
Ink Scratch Resistance	Ability of ink film to resist scraping by sharp objects
Ink bleed	Running of color caused by the dissolving of the ink film
Ink blocking	An undesired adhesion between touching films of ink on printed stock or between printed ink film and unprinted stock

C. ABHESIVE

Term	Explanation
Abhesive Print Quality	The uniformity and continuity of the abhesive film in the applied areas of application
Abhesive register	Position of abhesive pattern on blank as compared to its specified location
Abhesive smear	Spreading, transfer, and/or streaking of abhesive from the applied areas
Opening rating	A numerical rating of the ease of opening the pouring spout. A rating of 1.0 is perfect, and a rating of 5.0 means the lip will not release without pulling apart

D. CONVERTING

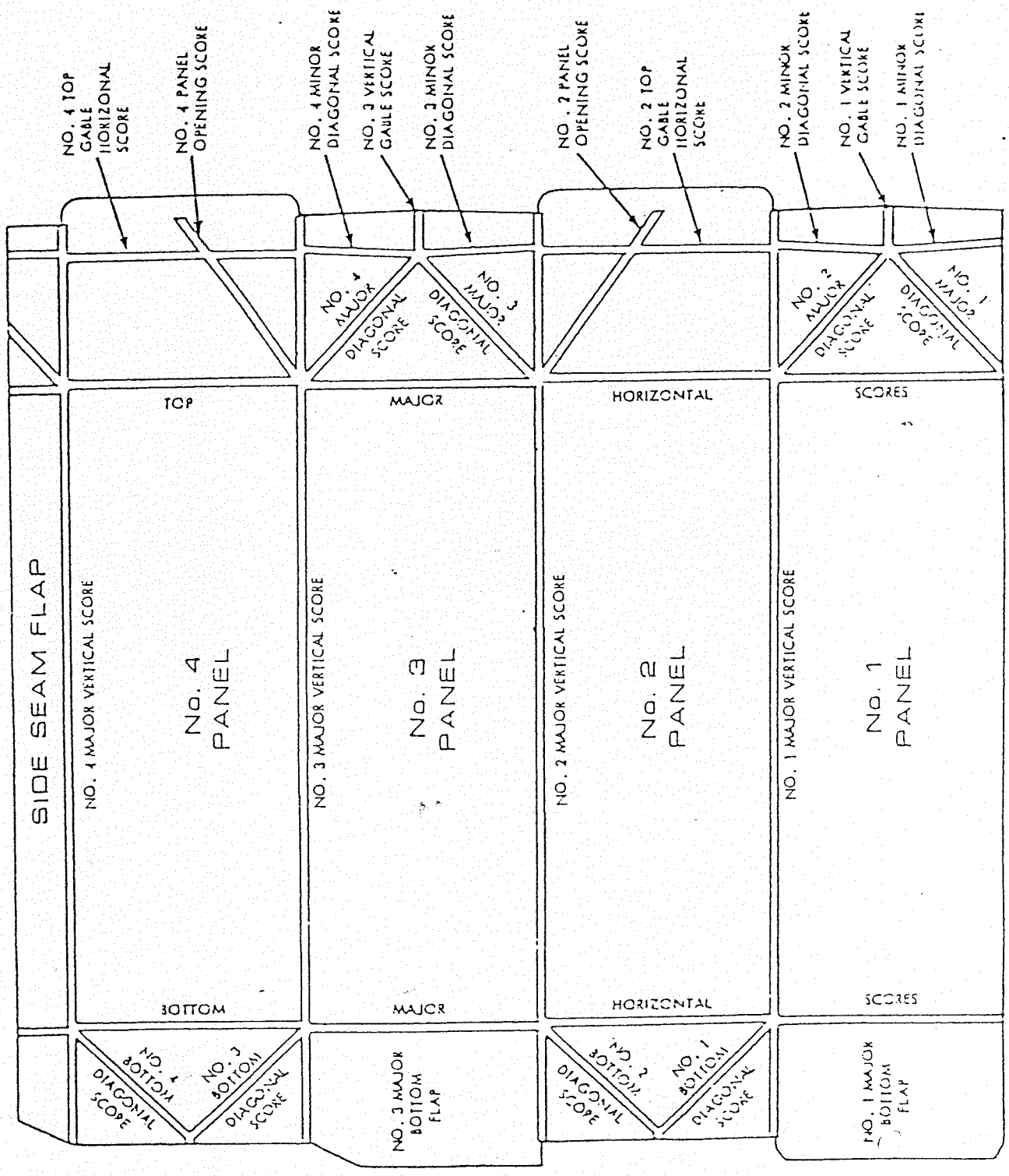
Term	Explanation
Flat blank	Die cut blank before sideseaming
Panel numbers and score designation	See attached sketches
Seamed blank	Blank after sealing sideseam
Tapered blank	A blank sideseam on a bias
Blocking	Seamed blanks stuck together usually due to excessive heat from the flamer but can also be due to poor ink formation
Sticking	Blanks stuck together from excessive case sealer adhesive

E. CARTON

Term	Explanation
Carton	Seamed blank after forming
Diamond shaped	Carton does not square up on forming
Top seal	Seal areas above upper top major horizontal scores
Top channel leaker	Seepage along top edge or back edge

Sideseam leaker	Seepage occurring at the sideseam due to either poor sideseam bond or board separation (exact location required)
Gusset	The triangular area created by the formed minor bottom flap
Staking points (Pressure points)	Points of pressure on the bottom of the carton to seal possible channels along flap edges
Bottom channel leaker	Seepage occuring through various bottom channels which are due to improper bottom forming or sealing (exact channel type required)
Bottom corner leaker	Seepage at any of the four bottom corners of a carton (exact corner required)
Bottom tuck leaker	Seepage due to poor bottom tucking
Bottom horizontal score leaker	Seepage through bottom horizontal score (exact score required)
Score break	Cut or crack of polythylene film on any given score (exact location required)
Overactivation pinholes	Small holes in polyethylene film created by escaping gases from substrate due to localized overheating
Smile	A wrinkled crease formed at and extending outward from any one of the vertical scores (exact location required)
Bulge	Protrusion of panels of a filled carton. This is normally expressed in units 1/32" over original panel widths of 2-7/8" for quarts and 3-7/8" for half gallons
Durability	The ability of a filled container to withstand normal handling and distribution
Raw edge wicking	The absorption of liquids into raw edge of the board

CARTON BLANK TERMINOLGY - QUART SERIES



NOTE: INSIDE OF BLANK SHOWN

arton Storage

provide good storage, the first essential is a tight room
structed of materials which will resist the passage
noisture laden air. Aluminum foil is a very effective
sture vapor barrier.

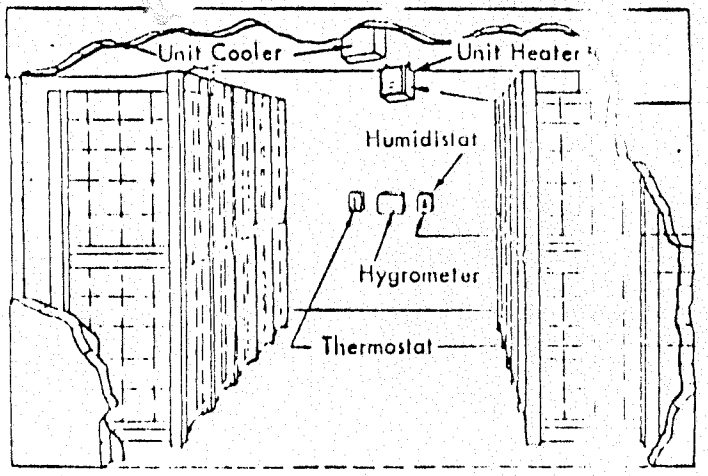
ffectively and economically use the refrigeration
hod to control the humidity, it is necessary to provide
d air circulation throughout the storage area. After
the refrigeration coil can only condense moisture
n the air which passes over it. Therefore, it is essential
the air circulate freely in order to perform its function
icking up moisture from the container blanks and
ying it to the cooler coil where it is discharged as
id water after condensing. You will note, therefore,
the pallets or racks on which the cases of blanks
placed are at least 4" from the floor and 6" from the
walls. This is to promote good air circulation.

desirable that blanks be held in a controlled storage
n for two weeks prior to being used in Pure-Pak
hines. Many dairymen feel that a thirty day blank
ntory is very desirable. Obviously, the size of the
n required will vary depending on the volume of the
duction in the plant under consideration.

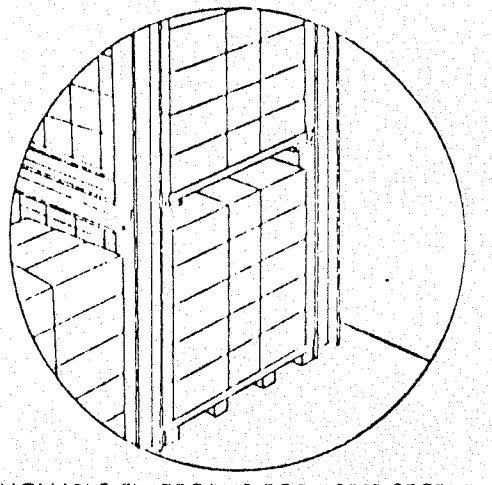
purposes of illustration, we have arbitrarily assumed
the plant involved uses an average of 12,000
tainers per day. In order to save freight and avoid
s than truckload" charges, shipments will be scheduled
ull truckloads of approximately 360,000 blanks.
nerally speaking, when a truckload of new blanks is
vered to the plant, the dairy has a remaining inventory
t least one-third and probably closer to one-half of a
th's supply still on hand. Therefore, the storage room
have to be large enough so that it can satisfactorily
d a maximum of 550/600,000 blanks. Considering the
e space required in order to move the blanks in and
and rotate the inventory, a room 16' x 23' x 15' should
adequate. These dimensions may vary from plant to
nt, depending on whether or not lift trucks are used.
lanks are palletized and trucks used, aisles will have
e made wider.

rder to maintain a relative humidity of 30% in a room
his size, we recommend the installation of the
owing equipment:

1. A unit cooler of 32,000 BTU capacity. This size is based on the unit being in operation 18 hours each day, the remaining 6 hours being

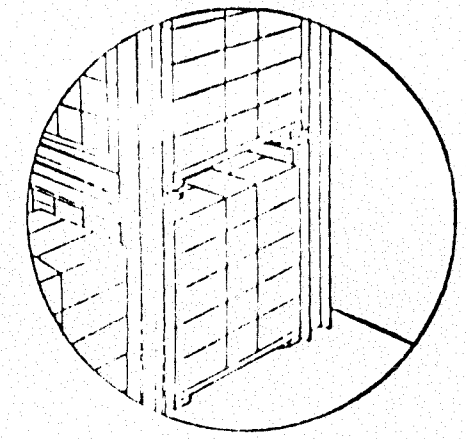


A VIEW OF PURE-PAK CARTON STORAGE ROOM


REMOVABLE PLATFORMS FOR UPPER SECTIONS

2. A unit heater of 42,000 BTU per hour (in cold climates this heater may have to be of a larger size since weather conditions will require the input of more heat units).
3. A humidistat to control the unit cooler.
4. A thermostat for the unit heater.
5. A hygrometer to check the relative humidity.

The figures shown can be used as a guide for any type of storage room. First, decide the quantity of blanks you wish to store. This determines the basic requirements. Secondly, if the cubical content of the room is approximately 10 cubic feet per thousand containers the


STORING PALLETIZED CONTAINERS

cooler capacity and 42,000 BTU heat input per 500/600,000 containers. If the room is such that a larger area is enclosed, a large refrigeration coil and heating unit will be required.

The above calculations are based on a good, tight room! If the walls are not insulated and proper fitting doors are not provided, additional refrigeration capacity and heat input must be added.

	Quantity	Weight	Case Size
Quart	500	45	18 x 12 x 11.50
Pint	1000	59	19 x 16 x 11.50
Half-pint	1000	46	16.25 x 13.25 x 11.50
Third quart	1000	50	20.50 x 13.50 x 11.50
Gallon	200	62	21 x 14.75 x 11.75
Half-gallon	250	37	23.25 x 13 x 8
Half-gallon	300	44	26.75L

Pallets

Two sizes commonly used are:

42" x 48" x 4-1/2" (Half-pint to gallon blanks)
28" x 48" x 4-1/2" (Half-gallon only)

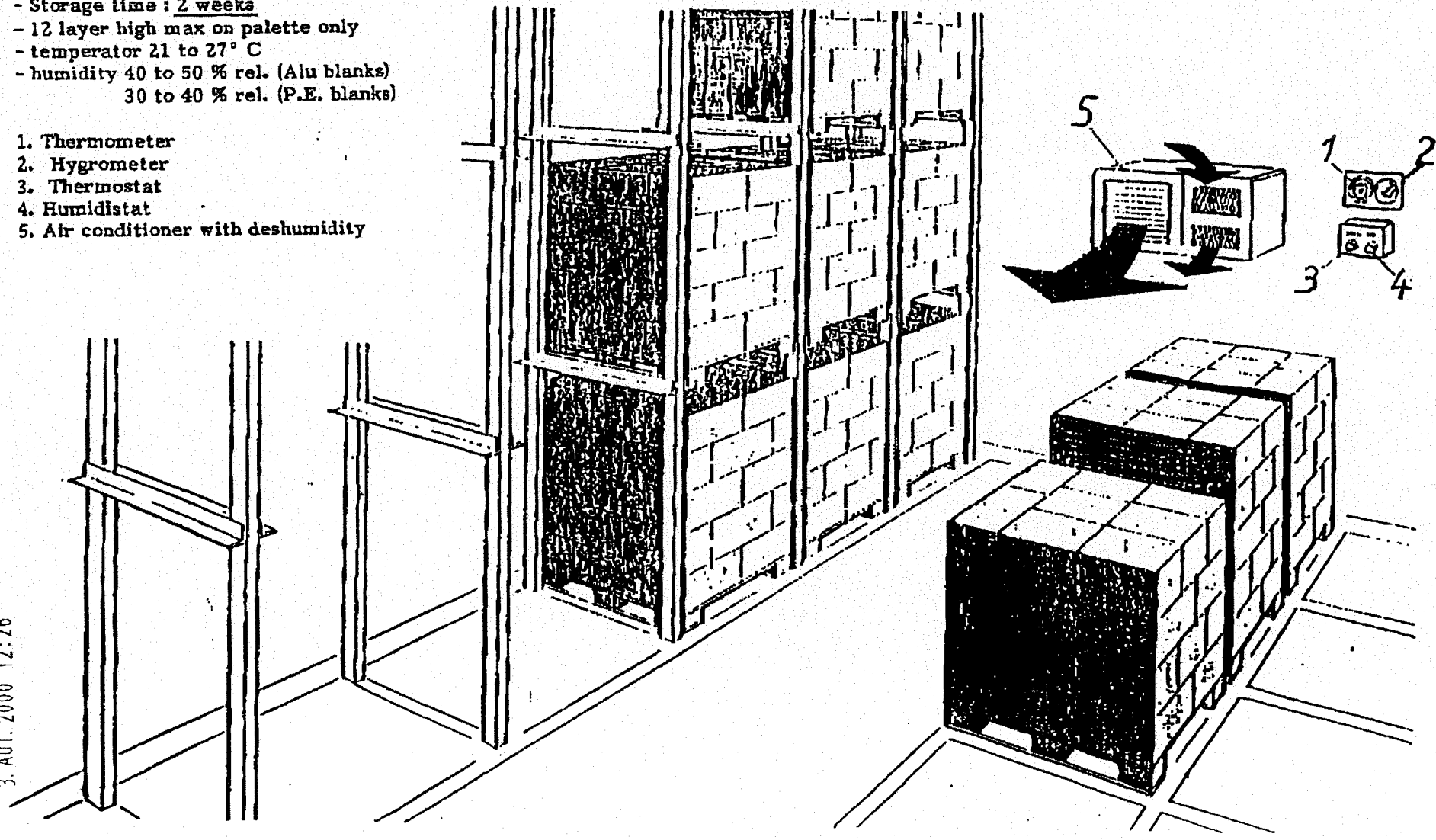
Number of shipping cases per 42" x 48" pallet:

Quarts	48
Pints	24
Half-pints	36
Third quart	24
Gallon	30

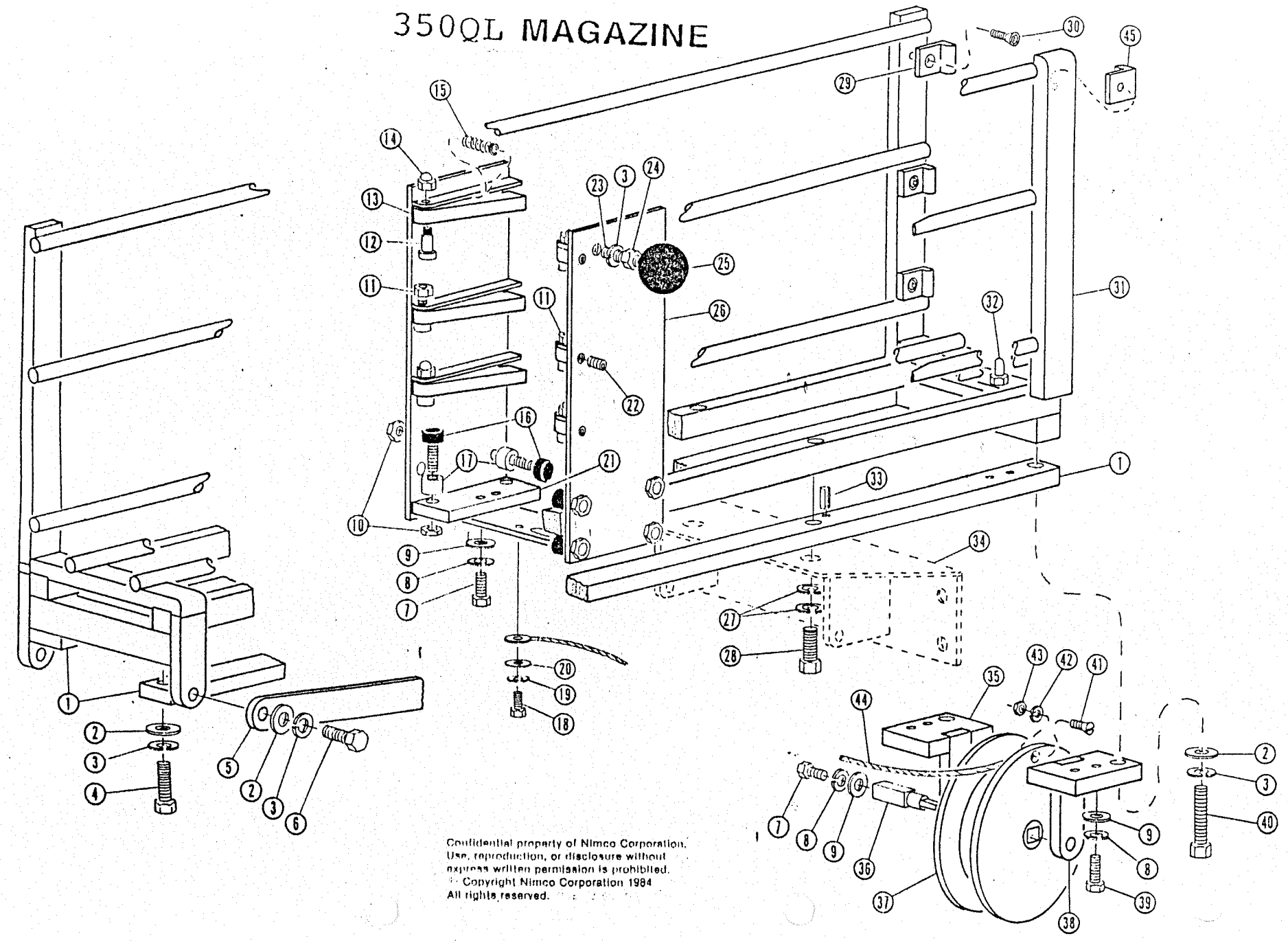
Carton Storage

- Storage time : 2 weeks
- 12 layer high max on palette only
- temperator 21 to 27° C
- humidity 40 to 50 % rel. (Alu blanks)
  30 to 40 % rel. (P.E. blanks)

1. Thermometer
2. Hygrometer
3. Thermostat
4. Humidistat
5. Air conditioner with deshumidity



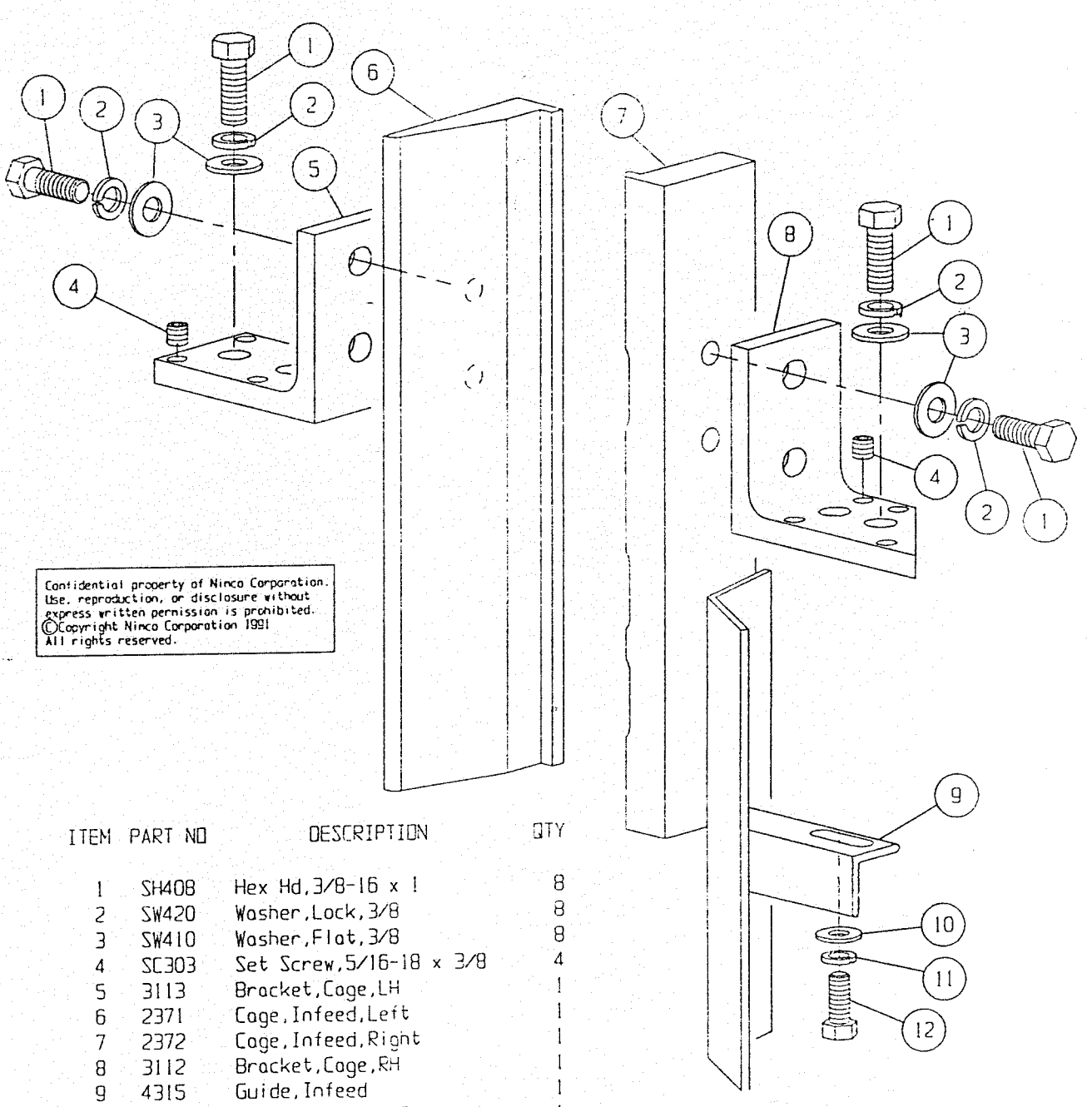
350QL MAGAZINE



350QL MAGAZINE PARTS LIST

ITEM	PART NO.	DESCRIPTION	QTY
1	3055	Bar, Magazine Support	2
2	SW410	Washer, Flat, 3/8	8
3	SW420	Washer, Lock, 3/8	9
4	SH410	Hex Head, 3/8 - 16 x 1 1/4	2
5	3056	Bar, Magazine Support	2
6	SH408	Hex Head, 3/8 - 16 x 1	4
7	SH306	Hex Head, 5/16 - 18 x 3/4	5
8	SW320	Washer, Lock, 5/16	9
9	SW310	Washer, Flat, 5/16	9
10	SN435	Nut, Jam, 3/8 - 24	12
11	SN210	Nut, Hex, 1/4 - 20	2
12	1693	Stripper, Plated, 5/16 x 1/2	6
13	1733	Finger, Magazine	6
14	SN222	Nut, Acorn, 1/4 - 20	4
15	1819	Spring, Magazine Finger	6
16	BE310	Follower, Cam, .75	12
17	1685	Spacer, Roller	12
18	SH204	Hex Head, 1/4 - 20 x 1/2	1
19	SW220	Washer, Lock, 1/4	1
20	SW210	Washer, Flat, 1/4	1
21	1683	Plate, Roller	2
22	SC230	Set Screw, 1/4 - 20 x 1/4 NY-tip	6
23	ST430	Threaded Rod, 3/8 - 16	1
24	SN410	Nut, Hex, 3/8 - 16	1
25	KN003	Knob, 3/8 - 16 x 1 3/8 Dia.	1
26	1682	Pusher, Carton	1
27	SW620	Washer, Lock, 1/2	4
28	SH608	Hex Head, 1/2 - 13 x 1	2
29	1687	Breaker, Carton	3
30	SF204	Flat Head, 1/4 - 20 x 1/2	6
31	3054	Magazine, #250	1
32	1910	Button, Carton Open	1
33	SL206	Roll Pin, 1/4 x 3/4 S.S.T.	2
34	1692	Bracket, Magazine	1
35	1690	Bracket, Magazine Roller	1
36	2216	Stud, Spring Reel	1
37	1602	Reel, Spring	1
38	1691	Bracket, Magazine Roller	1
39	SH308	Hex Head, 5/16 - 18 x 1	4
40	SH414	Hex Head, 3/8 - 16 x 1 3/4	2
41	SF103	Flat Head, 10 - 32 x 3/8	1
42	SW120	Washer, Lock, #10	1
43	SN110	Nut, Hex, 10 - 32	1
44	1882	Wire Rope, Spring Reel, 36"	1
45	2377	Breaker, Carton	3

350QL INFEED CAGE
PARTS LIST

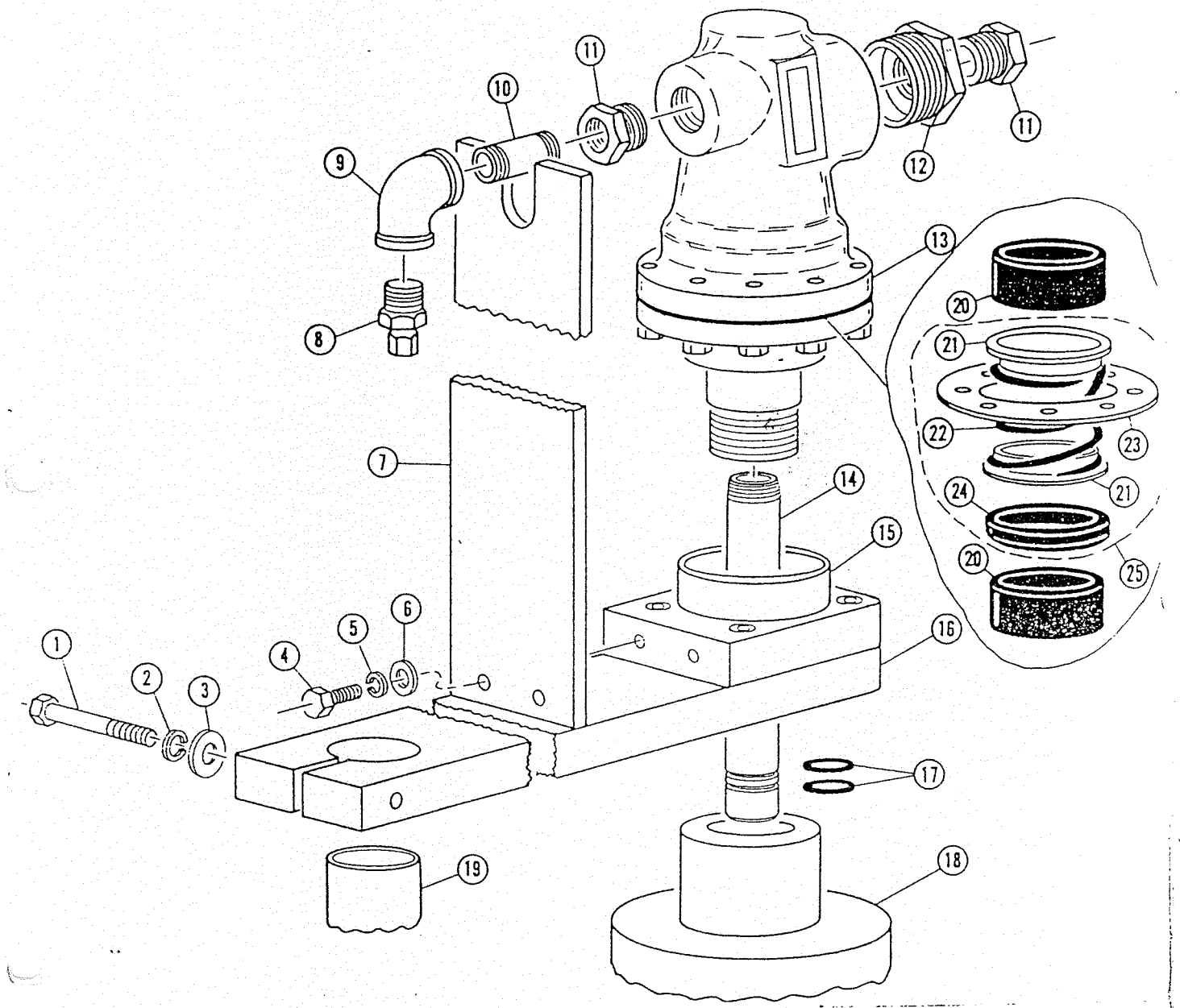


ITEM	PART NO	DESCRIPTION	QTY
1	SH408	Hex Hd,3/8-16 x 1	8
2	SW420	Washer,Lock,3/8	8
3	SW410	Washer,Flat,3/8	8
4	SC303	Set Screw,5/16-18 x 3/8	4
5	3113	Bracket,Cage,LH	1
6	2371	Cage,Infeed,Left	1
7	2372	Cage,Infeed,Right	1
8	3112	Bracket,Cage,RH	1
9	4315	Guide,Infeed	1
10	PW310	Washer,Flat,5/16	1
11	PW320	Washer,Lock,5/16	1
12	PH306	Hex Hd,5/16 x 3/4	1

55Q07

MAN\350QL\104A

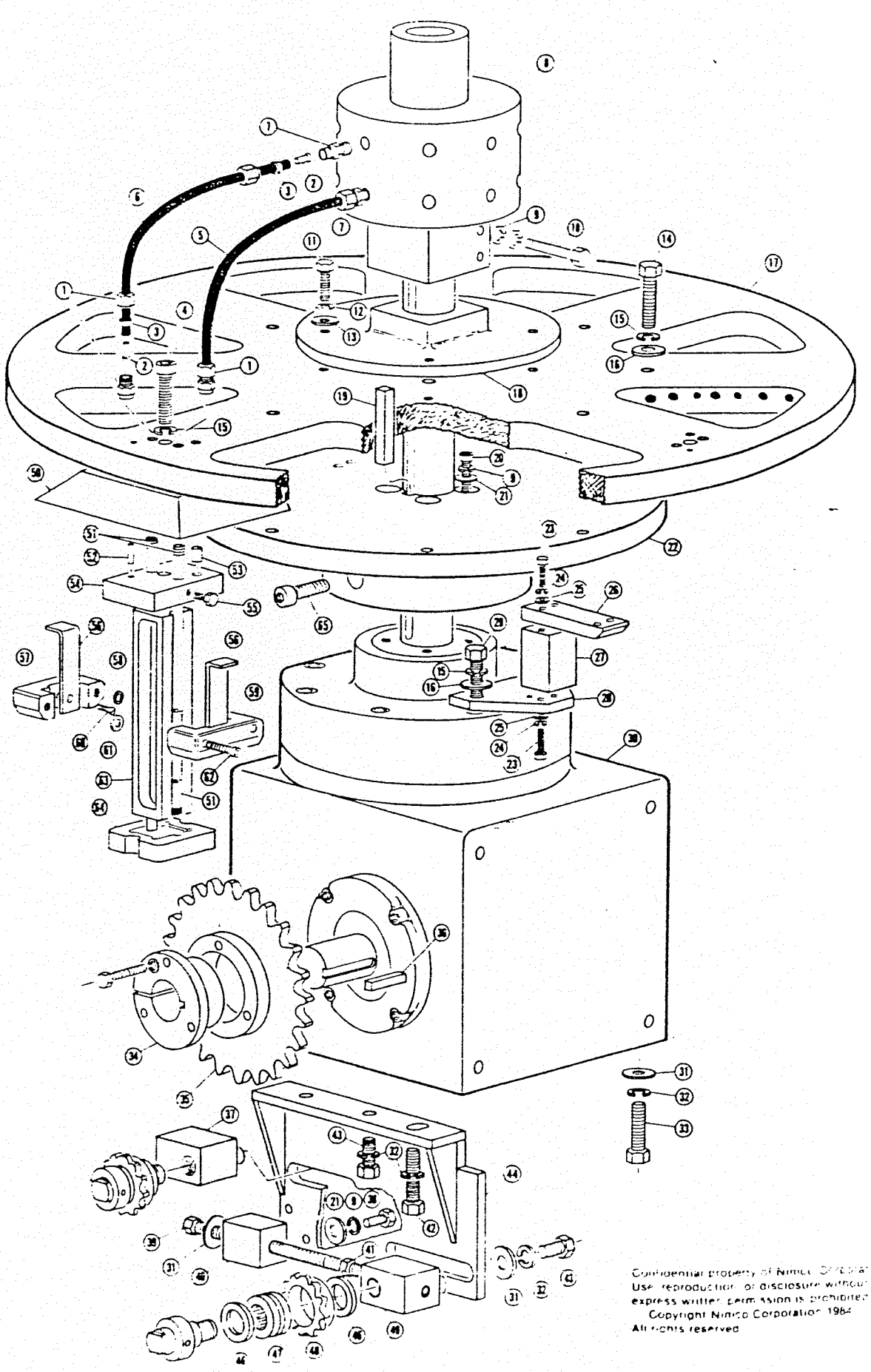
250Q WATER VALVE & SUPPORT ARM PARTS LIST



ITEM	PART NO.	DESCRIPTION	QTY
1	PH422	Hex Head, 3/8 - 16 x 3-1/2	1
2	PW410	Washer, Lock 3/8	1
3	PW420	Washer, Flat, 3/8	1
4	SH308	Hex Head, 5/16 - 18 x 1	2
5	SW320	Washer, Lock, 5/16	2
6	SW310	Washer, Flat, 5/16	2
7	0046	Plate, Anti-Rotation	1
8	FC256	Connector, 3/8 T x 1/2 MP	1
9	FP566	Elbow, 1/2 Female	1
10	FP162	Nipple, Pipe, 1/2 x 2	1
11	FP267	Bushing, 1/2 FP x 3/4 MP	2
12	FP27A	Bushing, 3/4 FP x 1-1/2 MP	1
13	VL040	Valve, Rotary Water	1

ITEM	PART NO.	DESCRIPTION	QTY
14	0072	Pipe, Syphon	1
15	BE017	Oilite, 3 x 3-1/4 x 2	1
16	0071	Arm, Manifold Support	1
17	OR004	O-Ring, 3/32 x 1-1/16	2
18	0064	Manifold, Water	1
19	0164	Tube, Support	1
20	VL043	Bearing, Rotary Valve	2
21	VL044	Spring Guide, Rotary Valve	2
22	VL045	Spring, Rotary Valve	1
23	VL042	Gasket, Rotary Valve	1
24	VL041	Seal, Rotary Valve	1
25	VL046	Repair Kit, Rotary Valve	1

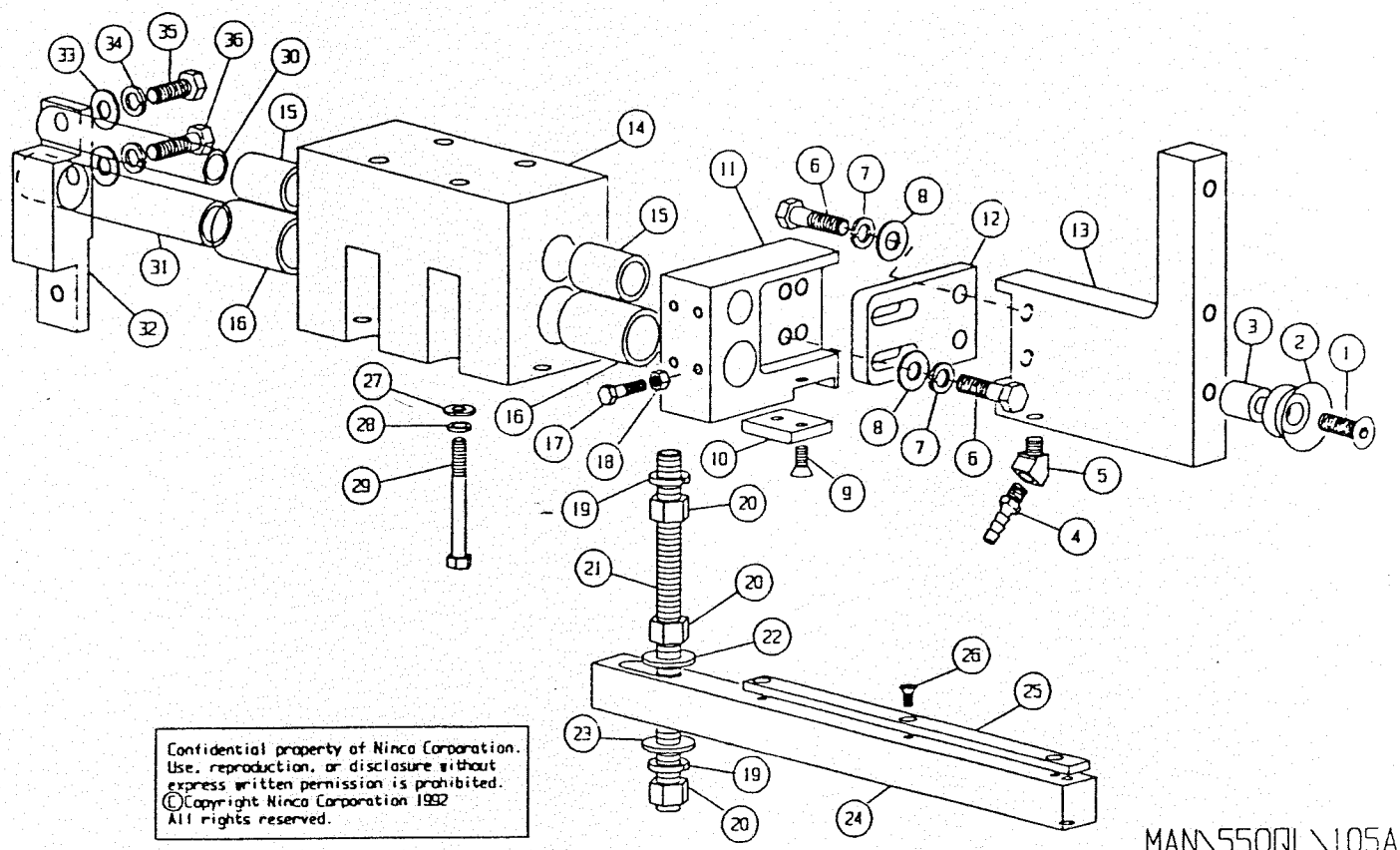
550QL INDEX WHEEL & MANDREL



550QL INDEX WHEEL & MANDREL PARTS LIST

ITEM	PART NO.	DESCRIPTION	QTY
1	FC051	Connector, 3/8 T x 1/8 FP	16
2	FC945	Tube Support, 3/8	32
3	FC935	Sleeve, 3/8 Plastic	32
4	SK618	Socket Head, 1/2 - 13 x 2-1/2	8
5	1744	Tubing, Lower, 12"	8
6	1745	Tubing, Upper, 13"	8
7	FC253	Connector, 3/8 T x 1/4 MP	16
8	0064	Manifold, Water	1
9	PW420	Washer, Lock, 3/8	10
10	PH419	Hex Head, 3/8 - 16 x 2-3/4	2
11	SH410	Hex Head, 3/8 - 16 x 1-1/4	4
12	SW420	Washer, Lock, 3/8	4
13	SW410	Washer, Flat, 3/8	4
14	SH616	Hex Head, 1/2 - 13 x 2	8
15	SW620	Washer, Lock, 1/2	18
16	SW610	Washer, Flat, 1/2	10
17	0033	Wheel, Mandrel	1
18	0034	Casting, Wheel Cover	1
19	1717	Key, Wheel Riser, 1/2 x 3	1
20	PK473	Socket Head, 3/8 - 24 x 4	4
21	PW410	Washer, Flat, 3/8	6
22	1147	Casting, Wheel Riser	1
23	SH208	Hex Head, 1/4 - 20 x 1	4
24	SW220	Washer, Lock, 1/4	4
25	SW210	Washer, Flat, 1/4	4
26	0693	Block, Crimp Tie	1
27	0692	Block, Crimp Spacer	1
28	0337	Plate, Crimp Tie	1
29	SH623	Hex Head, 1/2 - 13 x 4	2
30	DR020	Indexer, Former, CCM	1
31	PW610	Washer, Flat, 1/2	8
32	PW620	Washer, Lock, 1/2	10
33	PH614	Hex Head, 1/2 - 13 x 1-3/4	3
34	SP308	Bushing, SK - 1-5/8	1
35	SP305	Sprocket, 60SK26	1
36	1716	Key, Indexer Input, 3/8	1
37	0057	Block, Idler	1
38	PH410	Hex Head, 3/8 - 16 x 1-1/4	2
39	0059	Screw, Idler	1
40	0058	Block, Idler	1
41	PN610	Nut, Hex, 1/2 - 13	1
42	PH616	Hex Head, 1/2 - 13 x 2	1
43	PH608	Hex Head, 1/2 - 13 x 1	6
44	0053	Block, Idler	1
45	BE401	Shaft, Idler, #2	2
46	0193	Washer, Thrust	4
47	BE304	Bearing, Roller, MR-16	2
48	1062	Sprocket, Idler, 60B13	2
49	0056	Block, Idler	1
50	0309	Cover, Mandrel	8
51	0457	Tube, Mandrel Water	16
52	SL206	Roll Pin, 1/4 x 3/4	8
53	SL406	Roll Pin, 3/8 x 3/4	8
54	1996	Plate, Mandrel	8
55	SH205	Hex Head, 1/4 - 20 x 5/8	16
56	1697	Stop, Carton, IMP	16
57	1701	Slide, Mandrel, IMP QT	8
58	SW220	Washer, Lock, 1/4	8
59	1702	Slide, Mandrel, IMP QT	8
60	SF103	Flat Head, 10 - 32 x 3/8	16
61	SW210	Washer, Flat, 1/4	8
62	SK214	Socket Head, 1/4 - 20 x 1-3/4	16
63	1987	Stem, Mandrel	8
64	1514	Pad, Mandrel	8
65	SK616	Socket Head, 1/2 - 13 x 2	1

550QL INFEED VACUUM MANIFOLD ASSEMBLY PARTS LIST

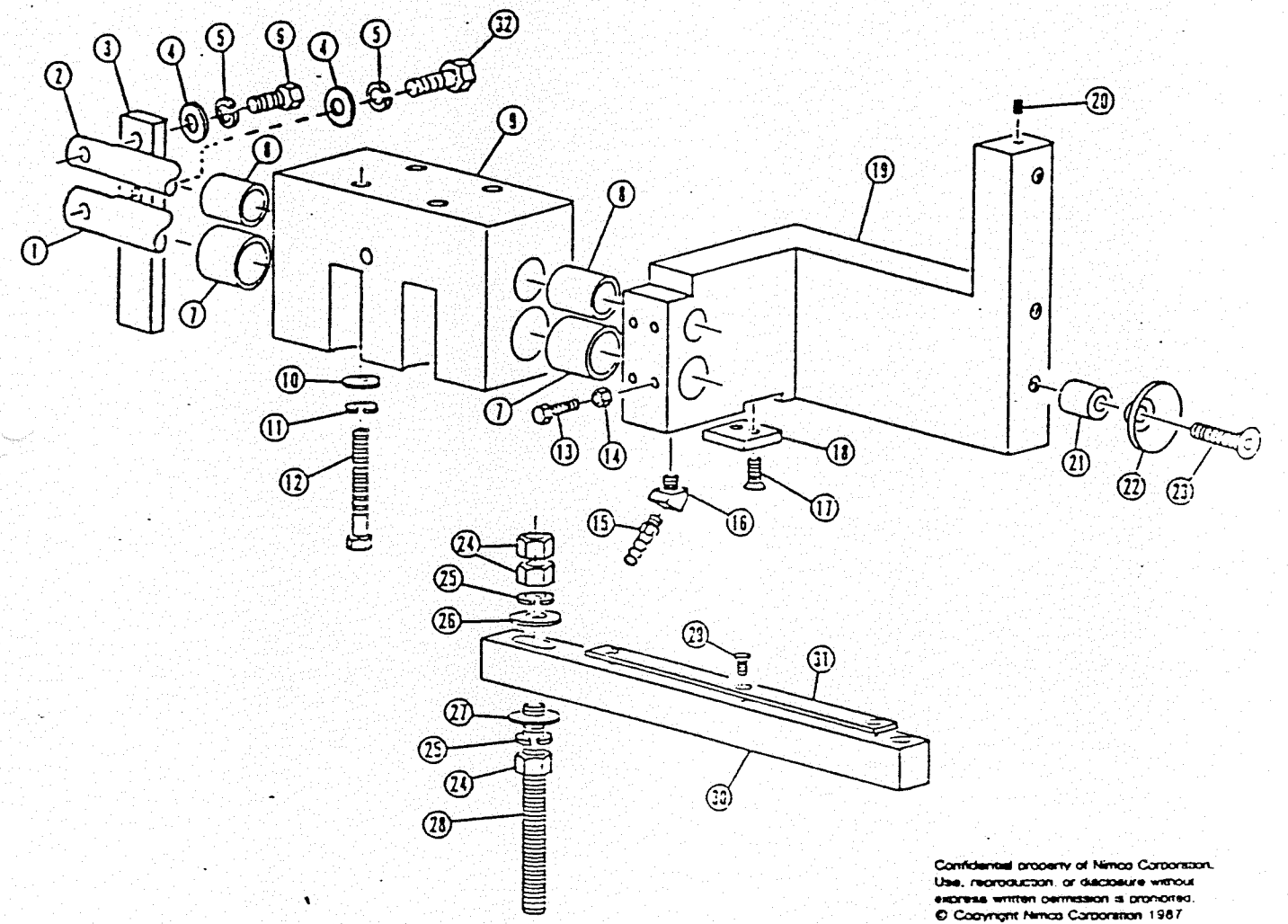


MAN\550QL\105A

ITEM	PART NO	DESCRIPTION	QTY
1	0107	Screw,Vacuun	3
2	VA052	Disk,Infeed Vacuun	3
3	1166	Spacer,Vacuun Disk	3
4	FB131	Barb Ftg,1/48 x 1/8MP	1
5	FP411	Street Elbow,1/8 x 45'	1
6	SH412	Hex Hd,3/8-16 x 1-1/2	4
7	SW420	Washer,Lock,3/8	4
8	SW410	Washer,Flat,3/8	4
9	SF204	Flat Hd,1/4-20 x 1/2	2
10	0106	Plate,Wear	1
11	0105a	Base,Vacuun Head	1
12	0105c	Plate,Conn,Vacuun Head	1
13	0105b	Head,Vacuun	1
14	0104	Housing,Infeed Shaft	1
15	BE214	Duralon,3/4 x 1 x 1-1/2	2
16	BE216	Duralon,1 x 1-1/4 x 2	2
17	PH208	Hex Hd,1/4-20 x 1	6
18	PN210	Nut,Hex,1/4-20	6

ITEM	PART NO	DESCRIPTION	QTY
19	PW620	Washer,Lock,1/2	2
20	PN610	Nut,Hex,1/2-13	3
21	SST630	Threaded Rod,1/2-13	6.25
22	PW615	Washer,Flat,1/2 SAE	1
23	PW610	Washer,Flat,1/2 STD	1
24	0108	Bar,Slide	1
25	0109	Wear Strip	1
26	SF103	Flat Hd,10-32 x 3/8	3
27	PW310	Washer,Flat,5/16	4
28	PW320	Washer,Lock,5/16	4
29	PH318	Hex Hd,5/16-18 x 2-1/2	4
30	1718	Shaft,Infeed,3/4	1
31	1719	Shaft,Infeed,1	1
32	2774	Bracket,Infeed	1
33	PW410	Washer,Flat,3/8	2
34	PW420	Washer,Lock,3/8	2
35	PH408	Hex Hd,38-16 x 1	1
36	PH410	Hex Hd,3/8-16 x 1-1/4	1

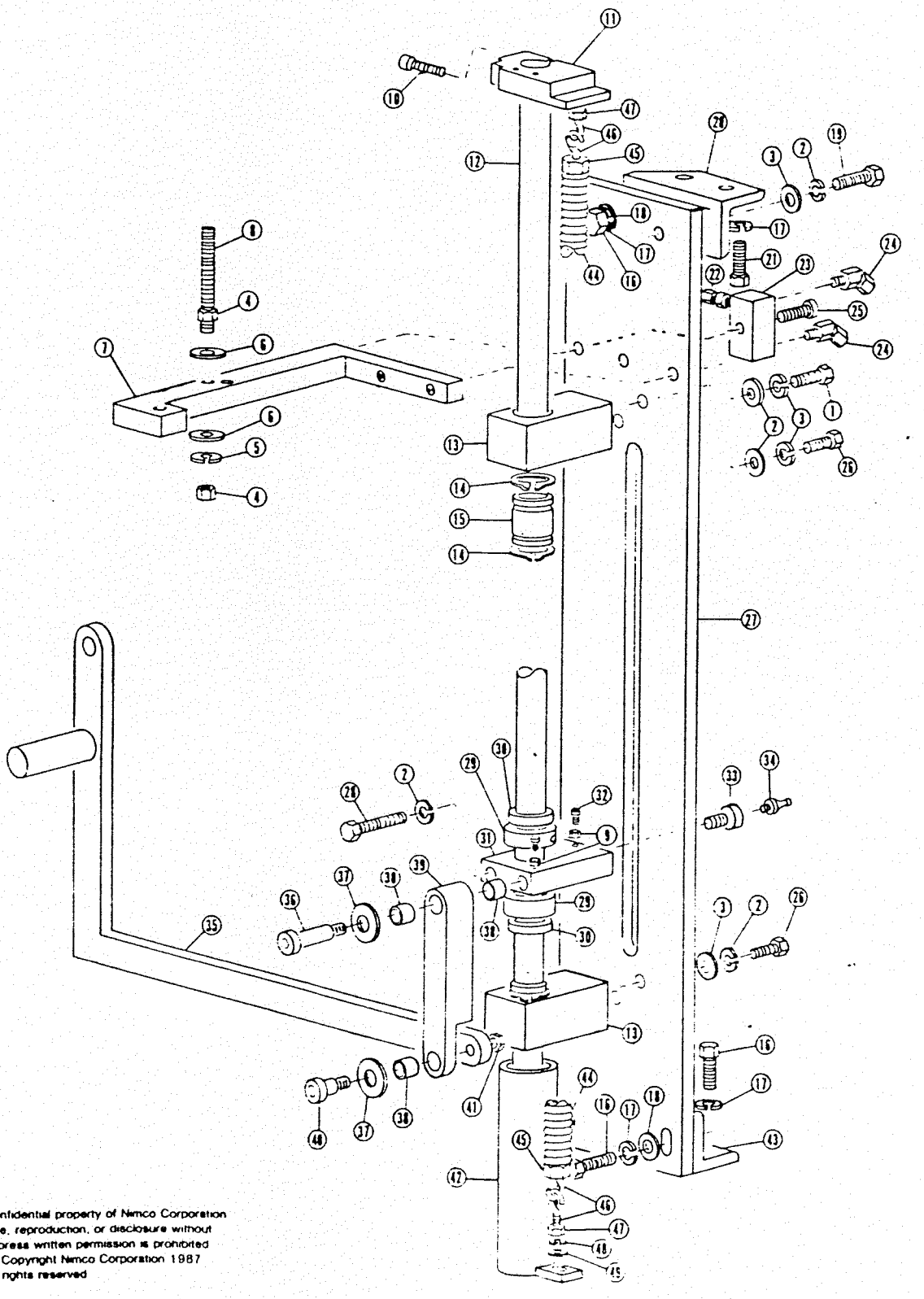
INFEED VACUUM MANIFOLD ASSEMBLY PARTS LIST



ITEM	PART NO.	DESCRIPTION	QTY
1	1720	Shaft, Infeed, 1	1
2	2772	Shaft, Infeed, 3/4	1
3	2774	Bracket, Infeed	1
4	PW410	Washer, Flat, 3/8	2
5	PW420	Washer, Lock, 3/8	2
6	PH408	Hex Head, 3/8-16 x 1	1
7	BE216	Duralon, 1 x 1 1/4 x 2	2
8	BE214	Duralon, 3/4 x 1 x 1 1/2	2
9	0104	Housing, Infeed Shaft	1
10	PW310	Washer, Flat, 5/16	4
11	PW320	Washer, Lock, 5/16	4
12	PH318	Hex Head, 5/16-18 x 2 1/2	4
13	PH208	Hex Head, 1/4-20 x 1	6
14	PN210	Nut, Hex, 1/4-20	6
15	FB131	Barb FTG, 1/4B x 1/8MP	1
16	FP411	Street Elbow, 1/8 x 45°	1

ITEM	PART NO.	DESCRIPTION	QTY
17	SF204	Flat Head, 1/4-20 x 1/2	2
18	0106	Plate, Wear	1
19	0105	Manifold, Vacuum Head	1
20	PPS21	Pipe Plug, Socket, 1/8	2
21	1166	Spacer, Vacuum Disk	3
22	VA052	Disk, Infeed Vacuum	3
23	0107	Screw, Vacuum	3
24	PN610	Nut, Hex, 1/2-13	3
25	PW620	Washer, Lock, 1/2	2
26	PW615	Washer, Flat, 1/2 SAE	1
27	PW610	Wasner, Flat, 1/2	1
28	ST630	Threaded Rod, 1/2-13	1
29	SF103	Flat Head, 10-32 x 3/8	3
30	0108	Bar, Slide	1
31	0109	Wear Strip	1
32	PH410	Hex Head, 3/8-16 x 1 1/4	1

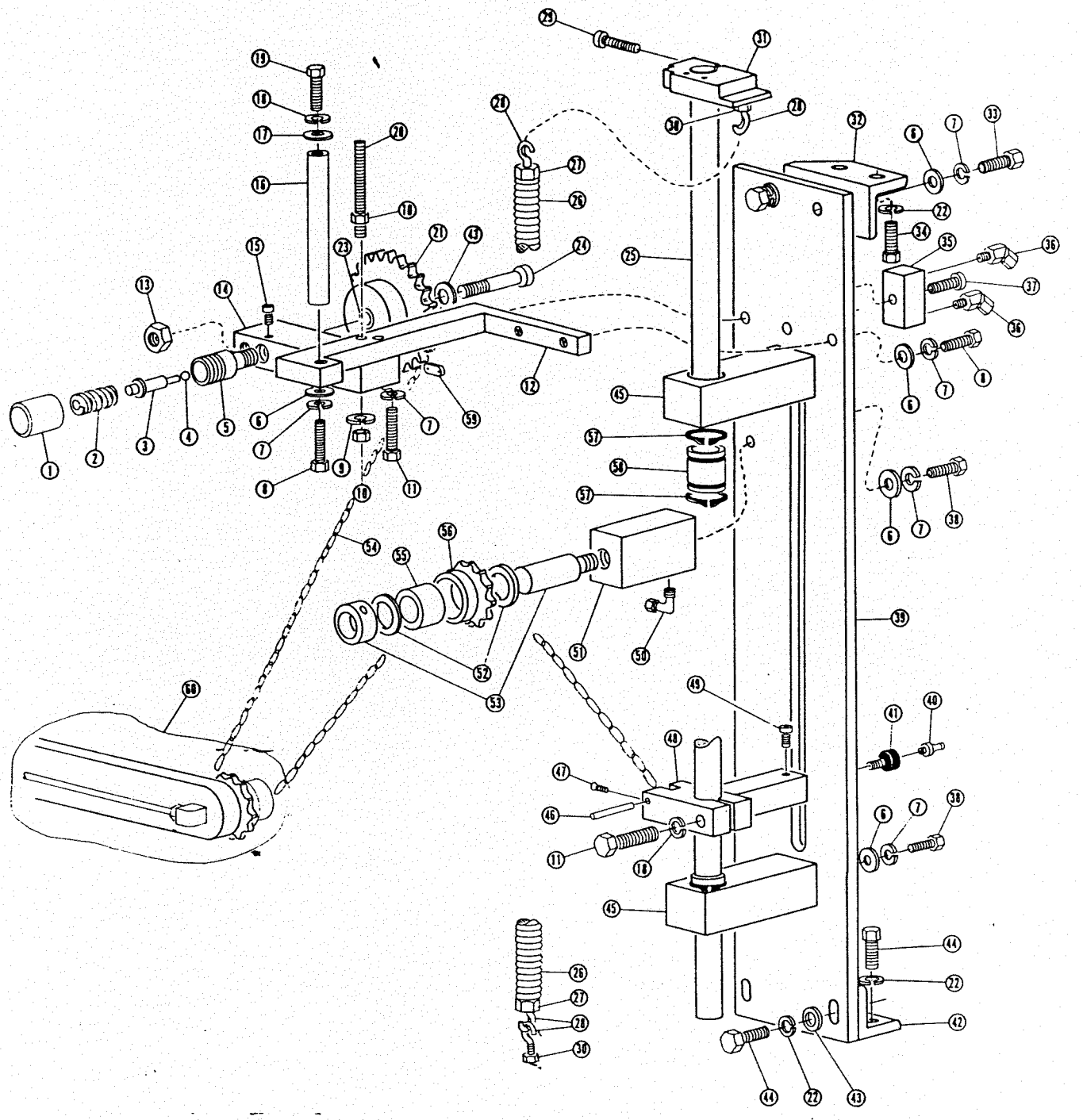
550QL CARTON LIFT ASSEMBLY



350QL CARTON LIFT ASSEMBLY PARTS LIST

ITEM	PART NO.	DESCRIPTION	QTY
1	PH412	Hex Head, 3/8-16 x 1 1/2	2
2	PW420	Washer, Lock, 3/8	7
3	PW410	Washer, Flat, 3/8	7
4	PN310	Nut, Hex, 5/16-18	2
5	PW320	Washer, Lock, 5/16	2
6	PW310	Washer, Flat, 5/16	2
7	0318	Bracket, Breakaway	1
8	ST330	Threaded rod, 5/16-18	3.5
9	SN110	Nut, Hex, 10-32	2
10	PK314	Socket Head, 5/16-18 x 1 3/4	1
11	3074	Table, Lift, Quart	1
12	0476	Shaft, Infeed Lift, 34	1
13	0317	Block, Bearing	2
14	SG019	Ring, Retaining	4
15	BE218	Duralon, 1 x 1.562 x 2.25	2
16	PH610	Hex Head, 1/2-13 x 1 1/4	5
17	PW620	Washer, Lock, 1/2	7
18	PW610	Washer, Flat, 1/2	3
19	PH408	Hex Head, 3/8-16 x 1	1
20	0315	Bracket, Lift Plate	1
21	PH608	Hex Head, 1/2-13 x 1	2
22	FC211	Connector, 1/8T x 1/8MP	2
23	0177	Block, Grease	1
24	FU411	Union, Swivel, 1/8 x 45°	2
25	PK414	Socket Head, 3/8-16 x 1 3/4	1
26	PH410	Hex Head, 3/8-16 x 1 1/4	4
27	0316	Plate, Lift	1
28	PH416	Hex Head, 3/8-16 x 2	1
29	CL010	Collar, Shaft, SST, 1	2
30	2597	Bumper, Lift Clamp	2
31	2544	Clamp, Lift	1
32	SK103	Socket Head, 10-32 x 3/8	2
33	BE310	Follower, Cam, 3/4	1
34	FG102	Zerk, 3/16 Drive Straight	1
35	2542	Arm, Lift	1
36	0688	Stripper, Plated, 1/2 x 1-3/4	1
37	SW610	Washer, Flat, 1/2	2
38	BE213	Duralon, 1/2 x 5/8 x 1/2	3
39	2546	Link, Lift Arm	1
40	1234	Stripper, Plated, 1/2 x 5/8	1
41	PN430	Nut, Jam, 3/8-16	1
42	2594	Guard, Shaft	1
43	0018	Bracket, Plate	1
44	SG010	Spring, Lift	1
45	0045	Screw, Lift Spring	2
46	PE208	Eyebolt, 1/4-20 x 1	4
47	PN210	Nut, Hex, 1/4-20	2
48	PW220	Washer, Lock, 1/4	1
49	PW210	Washer, Flat, 1/4	1

550Q CARTON LIFT ASSEMBLY

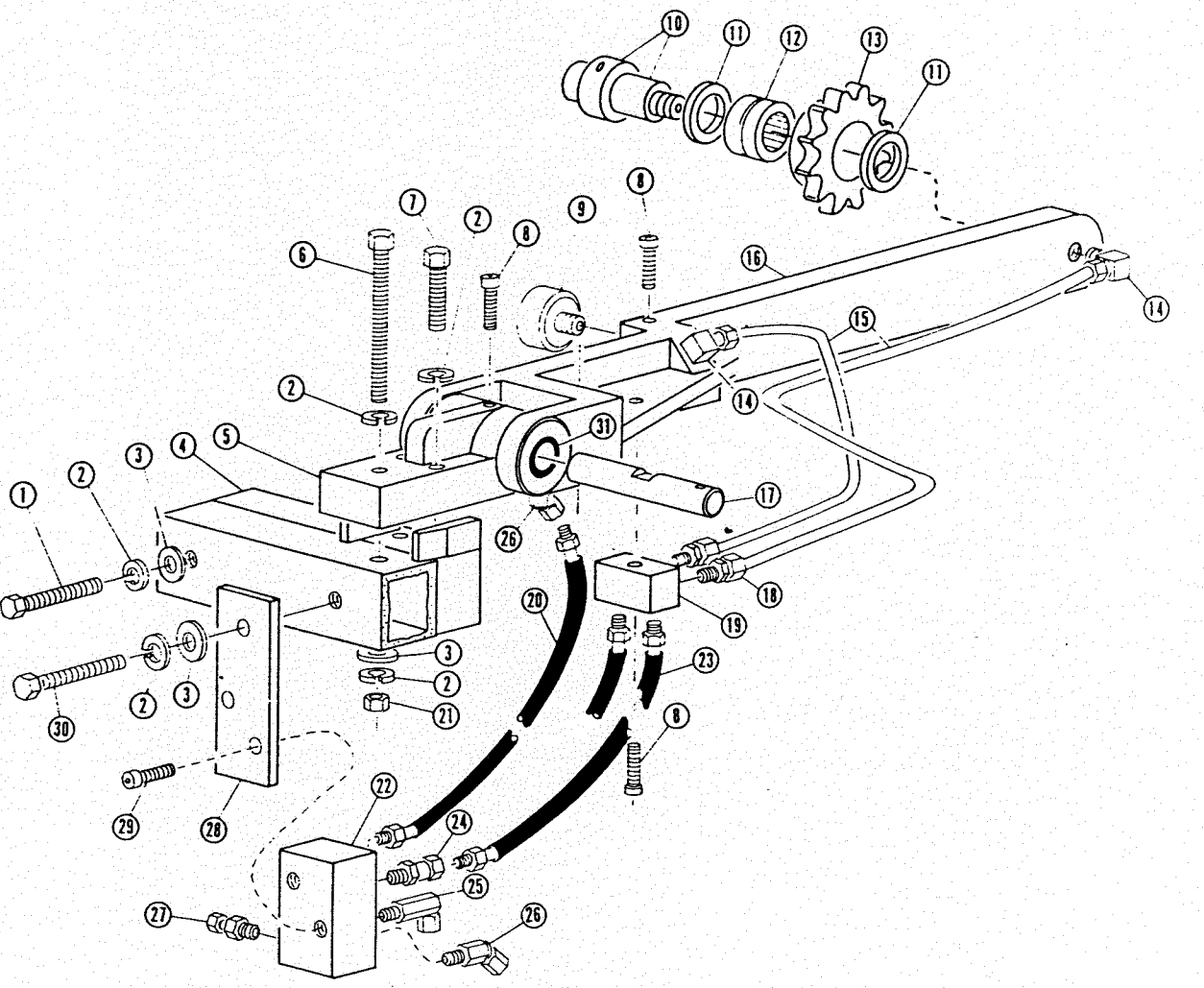


550Q CARTON LIFT ASSEMBLY PARTS LIST

ITEM	PART NO.	DESCRIPTION	QTY
1	0101	Nut, Breakaway Clutch	1
2	SG001	Spring, Breakaway	1
3	0102	Pin, Breakaway Clutch	1
4	BE309	Bearing, Ball	1
5	0100	Housing, Breakaway Clutch	1
6	PW410	Washer, Flat, 3/8	8
7	PW420	Washer, Lock, 3/8	11
8	PH412	Hex Head, 3/8 - 16 x 1-1/2	3
9	PW320	Washer, Lock, 5/16	1
10	PN310	Nut, Hex, 5/16 - 18	2
11	PH414	Hex Head, 3/8 - 16 x 1-3/4	2
12	0318	Bracket, Breakaway	1
13	PN630	Nut, Jam, 1/2 - 13	1
14	0013	Arm, Breakaway	1
15	PK204	Socket Head 1/4 - 20 - 1/2	1
16	1064	Post, Breakaway Support	1
17	SW410	Washer, Flat 3/8 - 13/16	1
18	SW420	Washer, Lock 3/8	1
19	SH410	Hex Head, 3/8 - 16 x 1-1/4	1
20	ST330	Threaded Rod, 5/16 - 18	3.5
21	1272	Sprocket, Breakaway, 40B30	1
22	PW620	Washer, Lock, 1/2	7
23	BE005	Oilite, 1/2 x 3/4 x 7/8	1
24	1752	Skt. Hd, 1/2 - 13 x 3, Zinc Pltd	1
25	0478	Shaft, Infeed Lift, 34	1
26	SG010	Spring, Lift	1
27	0045	Screw, Lift Spring	2
28	PE208	Eyebolt, 1/4 - 20 x 1	4
29	PK314	Socket Head, 5/16 - 18 x 1-3/4	1
30	PN210	Nut, Hex, 1/4 - 20	2

ITEM	PART NO.	DESCRIPTION	QTY
31	0327	Table, Lift	1
32	0315	Bracket, Lift Plate	1
33	PH408	Hex Head, 3/8 - 16 x 1	1
34	PH608	Hex Head, 1/2 - 13 x 1	2
35	0177	Block, Grease	1
36	FU411	Union, Swivel, 1/8 x 45°	2
37	PK414	Socket Head, 3/8 - 16 x 1-3/4	1
38	PH410	Hex Head, 3/8 - 16 x 1-1/4	6
39	0316	Plate, Lift	1
40	FG102	Zerk, 3/16 Drive Straight	1
41	BE310	Follower, Cam, 3/4	1
42	0018	Bracket, Plate	1
43	PW615	Washer, Flat, 1/2 SAE	3
44	PH610	Hex Head, 1/2 - 13 x 1-1/4	5
45	0317	Block, Bearing	2
46	—	Drill Blank, 5/32	1
47	SC102	Set Screw, 10/32 x 1/4	2
48	0313	Clamp, Lift Shaft	1
49	SK203	Socket Head, 1/4 - 20 x 3/8	1
50	FC611	Elbow, 1/8 T x 1/8 MP	1
51	0314	Block, Idler Sprocket	1
52	0193	Washer, Thrust	2
53	1473	Shaft, Idler	1
54	1804	Chain, 1st Station Lift 60½" → 1 EXCLUDE CONNECTING LINK	
55	BE304	Bearing, Roller, MR - 16	1
56	0194	Sprocket, Idler, 40B14	1
57	SG019	Ring, Retaining	4
58	BE218	Duralon, 1 x 1.562 x 2.2	2
59	CH021	Link, #40 Connecting	1
60	—	See Lift Arm Assembly	—

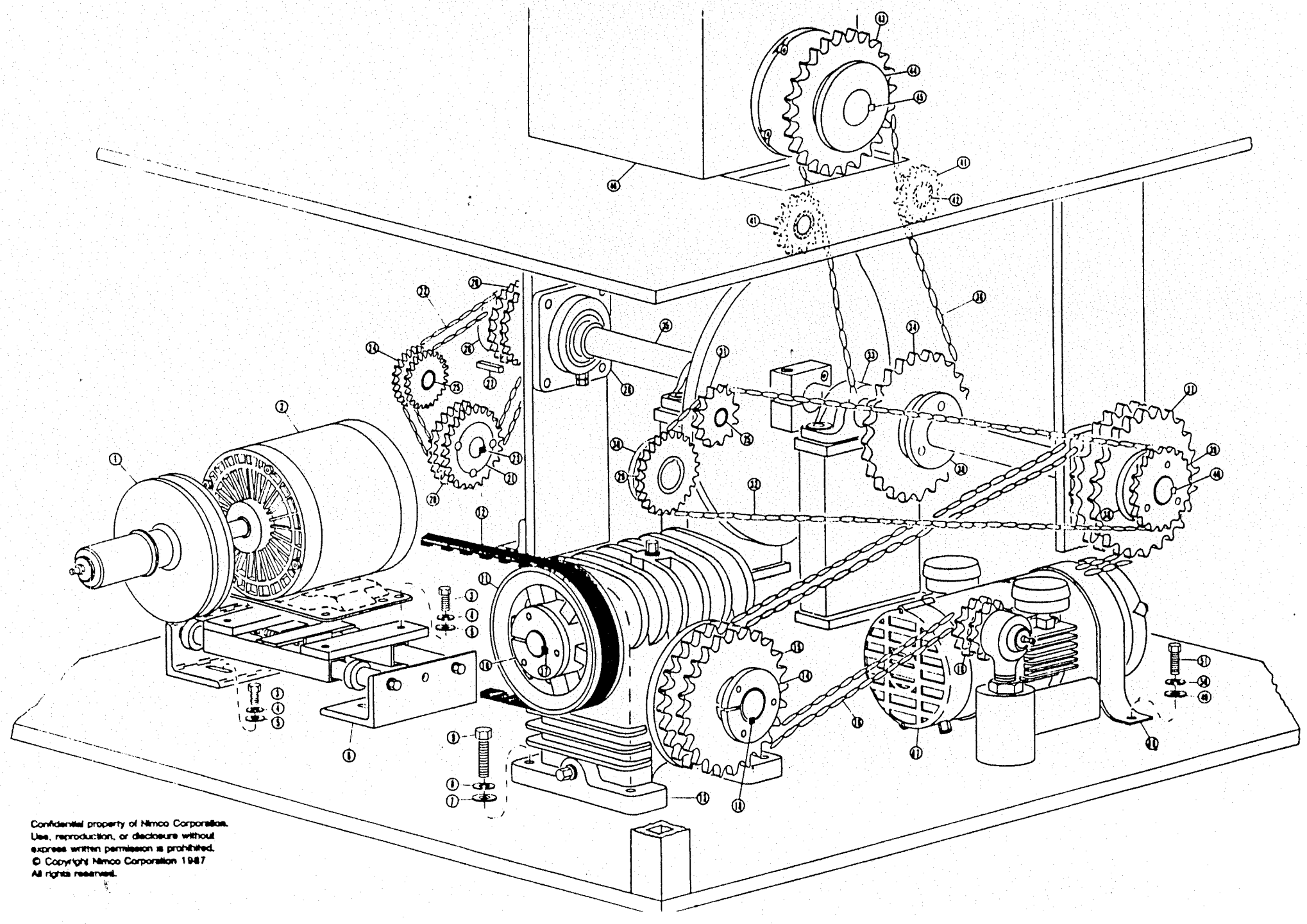
550Q LIFT ARM ASSEMBLY PARTS LIST



ITEM	PART NO.	DESCRIPTION	QTY
1	PH419	Hex Head, 3/8-16 x 2-3/4	1
2	PW420	Washer, Lock, 3/8	6
3	PW410	Washer, Flat, 3/8	3
4	0124	Bracket, Pivot Block	1
5	0087	Block, Lift Arm Pivot	1
6	PH423	Hex Head, 3/8-16 x 4	1
7	PH414	Hex Head, 3/8-16 x 1-3/4	2
8	PK308	Socket Head, 5/16-18-1	3
9	BE314	Follower, Cam, 1-1/2	1
10	1473	Shaft, Idler	1
11	0193	Washer, Thrust	2
12	BE304	Bearing, Roller, MR-1	1
13	0194	Sprocket, Idler, 40B14	1
14	FC631	Elbow, 1/4 T x 1/8 MP	2
15	AU030	Alum Tubing, 1/4 (IN)	30
16	0078	Arm, Lift, Assembly	1

ITEM	PART NO.	DESCRIPTION	QTY
17	0077	Shaft, Lift Arm Pivot	1
18	FC231	Connector, 1/4 T x 1/8 MP	2
19	1193	Block, Grease	1
20	1896	Hose, Grease, 5-1/2	2
21	PN410	Nut, Hex, 3/8-16	1
22	0176	Block, Grease	1
23	1897	Hose, Grease, 7-1/2	2
24	FU211	Union, Swivel, 1/8 x Straight	2
25	FU611	Union, Swivel, 1/8 x 90°	1
26	FU411	Union, Swivel, 1/8 x 45°	3
27	FC211	Connector, 1/8 T x 1/8 MP	6
28	0175	Plate, Grease Block	1
29	PK206	Socket Head, 1/4-20 x 3/4	2
30	PH421	Hex Head, 3/8-16 x 3-1/4	1
31	BE102	Bronze, 3/4 x 1 x 3/4	2

550QL FORMER MAIN DRIVE COMPONENTS

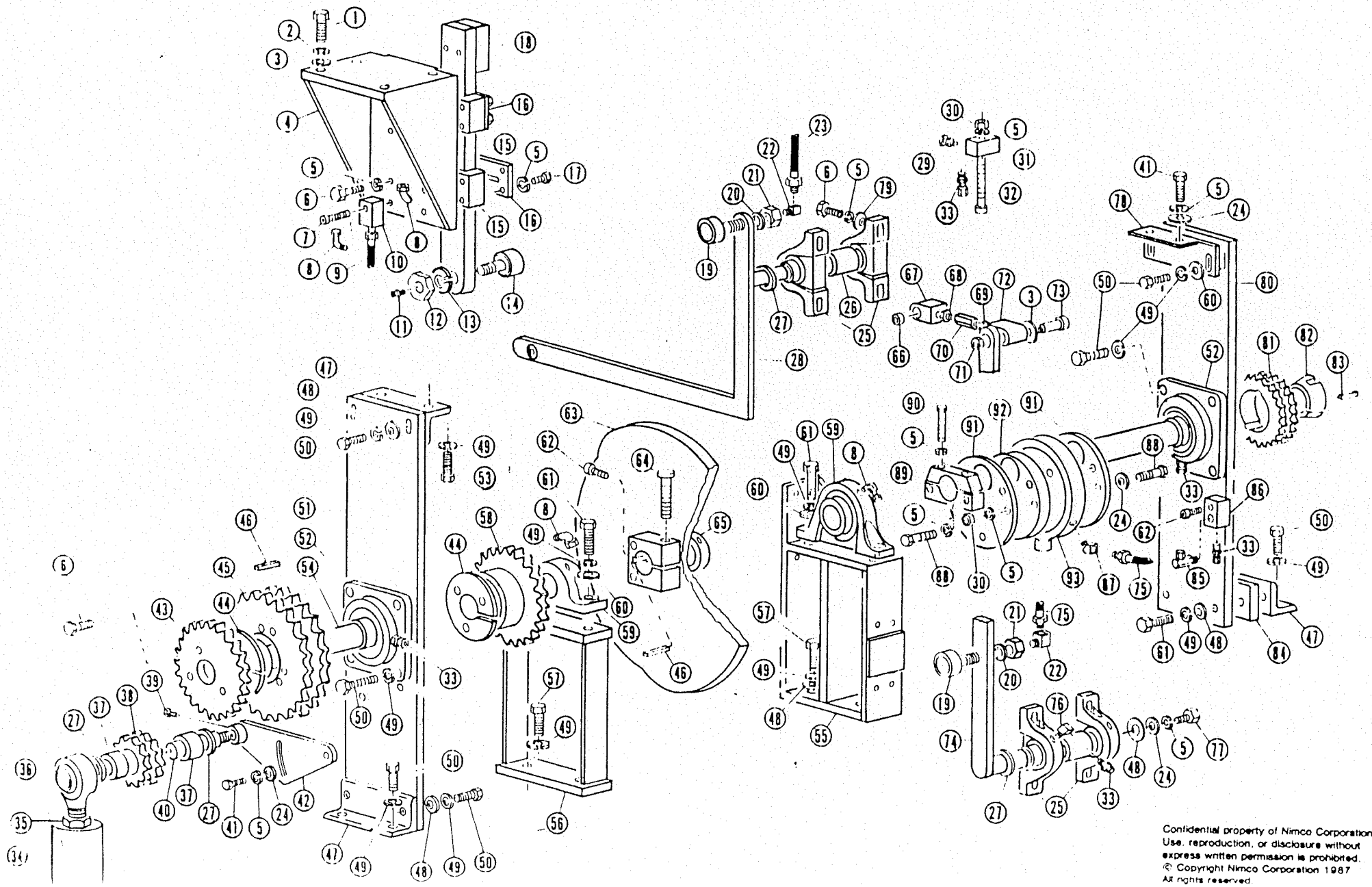


550QL FORMER MAIN DRIVE COMPONENTS PARTS LIST

ITEM	PART NO.	DESCRIPTION	QTY
1	DR500	Pulley, Variable Speed	1
2	MT005	Motor, Drive, 2HP - 3PH	1
3	PH408	Hex Head, 3/8 - 16 x 1	8
4	PW420	Washer, Lock, 3/8	8
5	PW410	Washer, Flat, 3/8	8
6	0076	Base, Motor	1
7	PW610	Washer, Flat, 1/2	4
8	PW620	Washer, Lock, 1/2	4
9	PH616	Hex Head, 1/2 - 13 x 2	4
10	DR515	Bushing, Sheave, 1 3/16	1
11	DR511	Sheave, 1 3/16 x 9 O.D.	1
12	DR520	Belt, Drive, 66.6	1
13	DR050	Reducer, Speed, CD	1
14	SP313	Bushing, No. Q1 - 1 7/8	1
15	SP310	Sprocket, No. D60Q36	1
16	1801	Chain, Main Drive, D60	1
17	1737	Key, Reducer Input, ¼x2 ½	1
18	1713	Key, Reducer Output, ½x2 3/8	1
19	0060	Sprocket, Idler, D60A13	1
20	SP219	Sprocket, No. D50TLB20H	2
21	SP221	Bushing, No. 2012-1	1
22	1807	Chain, Filler, Main Drive, D50	1
23	1714	Key, Filler Shaft, 1/4 x 1 1/4	1
24	0389	Sprocket, Idler, D50A11	1
25	BE010	Oilite, .75 x 1 x 1	2
26	SP223	Bushing, No. 2012 - 1 1/2	1

ITEM	PART NO.	DESCRIPTION	QTY
27	1711	Key, Sprocket, Index	1
28	BE227	Bearing, Flange, 1.5	2
29	SP233	Sprocket, No. 50SDS26H	1
30	SP212	Bushing, No. SDS - 1 1/2	1
31	SP203	Sprocket, No. 50B15-1	1
32	3061	Chain, Bottom Crimp, No. 50	1
33	BE328	Bearing, Pillow, 1.5	2
34	SP303	Sprocket, No. 60Q26	1
35	0292	Shaft, Former Drive	1
36	1803	Chain, Index Drive	1
37	SP309	Sprocket, No. D60Q35	1
38	SP311	Bushing, No. Q1 - 1 1/2	2
39	3040	Sprocket, Crimp Drive	1
40	1715	Key, Main Cam, 3/8 x 2 3/8	1
41	1062	Sprocket, Idler, 60B13	2
42	BE304	Bearing, Roller, MR-16	4
43	SP305	Sprocket, No. 60SK26	1
44	SP308	Bushing, No. SK - 1 5/8	1
45	1716	Key, Indexer Input, 3/8	1
46	DR020	Indexer, Former CCM	1
47	CM001	Compressor, 1/4 HP - 3 PH	1
48	1063	Strap, Compressor	1
49	PW310	Washer, Flat, 5/16	2
50	PW320	Washer, Lock, 5/16	2
51	PH310	Hex Head, 5/16-18 x 1 1/4	2

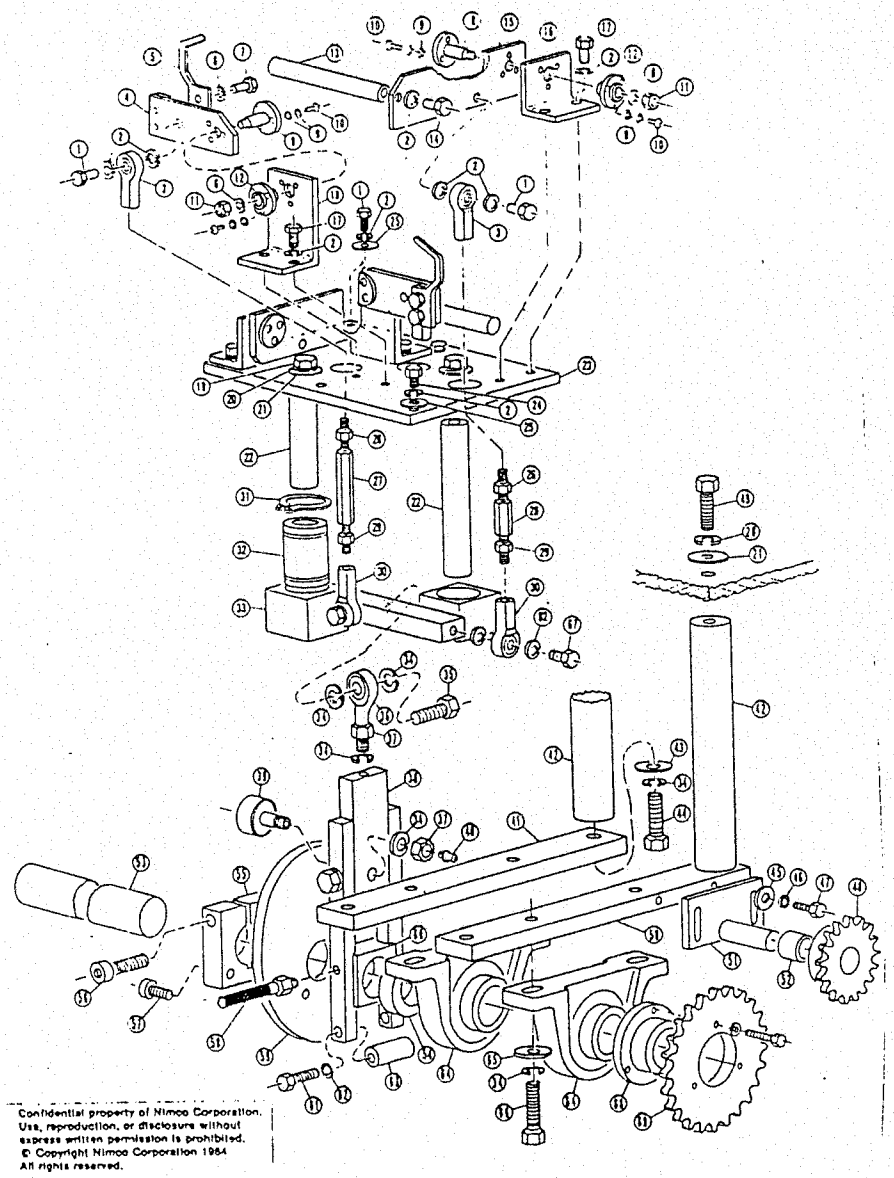
550QL MAIN SHAFT & INFEED PARTS LIST



550QL MAIN SHAFT & INFEED PARTS LIST

ITEM	PART NO.	DESCRIPTION	QTY	ITEM	PART NO.	DESCRIPTION	QTY	ITEM	PART NO.	DESCRIPTION	QTY
1	SH612	Hex Head, 1/2-13 x 1 1/2	4	32	SK420	Socket Head, 3/8-16 x 3	1	63	0024	Cam, Main Assembly	1
2	SW620	Washer, Lock, 1/2	4	33	FC211	Connector, 1/8T x 1/8MP	9	64	PK619	Socket Head, 1/2-13 x 2 3/4	1
3	SW610	Washer, Flat, 1/2	6	34	0051	Post, Idler Shaft	1	65	CL009	Collar, Shaft, 1 1/2	2
4	0012	Casting, Seal Guide	1	35	PND35	Nut, Jam, 1 1/4-12	1	66	BE213	Duralon, .5 x .625 x .5	4
5	PW420	Washer, Lock, 3/8	37	36	BE415	Rod, End, Male, 1	1	67	2545	Link, Infeed Arm	1
6	PH412	Hex Head, 3/8-16 x 1 1/2	18	37	BE304	Bearing, Roller, MR-16	2	68	PN415	Nut, Hex, Right, 3/8-24	1
7	PK414	Socket Head, 3/8-16 x 1 3/4	1	38	0060	Sprocket, Idler, D60A13	1	69	PN416	Nut, Hex, Left, 3/8-24	1
8	FC611	Elbow, 1/8T x 1/8MP	5	39	PK204	Socket Head, 1/4-20 x 1/2	1	70	0126	Stud, Connecting, 3.250	1
9	1897	Hose, Grease, 7 1/2	1	40	BE402	Shaft, Idler, No. 3	1	71	PN430	Nut, Jam, 3/8-16	1
10	0180	Block, Grease	1	41	PH410	Hex Head, 3/8-16 x 1 1/4	4	72	2593	Link, INfeed Arm	1
11	FG102	Zerk, 3/16 Drive Straight	1	42	0049	Bracket, Idler	1	73	0279	Stripper, Plated, 1/2 x 1/2	2
12	PN935	Nut, Jam, 3/4-16	1	43	3040	Sprocket, Crimp Drive	1	74	2541	Arm, Infeed	1
13	PW920	Washer, Lock, 3/4	1	44	SP311	Bushing, No. Q1 - 1 1/2	1	75	1899	Hose, Grease, 9 1/2	1
14	BE315	Follower, Cam, 1.75	1	45	SP309	Sprocket, D60Q35	1	76	FP610	Street Elbow, 1/8F x 1/4-28	4
15	0139	Block, Bearing	2	46	1715	Key, Main Cam, 3/8 x 2 3/8	1	77	PH406	Hex Head, 3/8-16 x 3/4	2
16	0140	Plate, Bearing Block	2	47	0018	Bracket, Plate	3	78	0028	Bracket, Plate	1
17	PH408	Hex Head, 3/8-16 x 1	8	48	PW610	Washer, Flat, 1/2	10	79	PW310	Washer, Flat, 5/16	8
18	0143	Table, Bottom Seal	1	49	PW620	Washer, Lock, 1/2	30	80	0020	Plate, End	1
19	1269	Follower, Cam, 1 1/2-30	2	50	PH610	Hex Head, 1/2-13 x 1 1/4	18	81	SP219	Sprocket, No. D50TLB20H	1
20	PW820	Washer, Lock, 5/8	2	51	0019	Plate, End	1	82	SP223	Bushing, No. 2012-1 1/2	1
21	PN815	Nut, Hex, 5/8-18	2	52	BE327	Bearing, Flange, 1.5	2	83	1711	Key, Sprocket, Index	1
22	FP611	Street Elbow, 1/8FP x 1/8MP	2	53	PH608	Hex Head, 1/2-13 x 1	2	84	1070	Plate, Spacer, End	1
23	1909	Hose, Grease, 14	1	54	0292	Shaft, Former Drive	1	85	FU611	Union, Swivel, 1/9 x 90'	1
24	PW410	Washer, Flat, 3/8	9	55	2540	Bracket, Pivot, Infeed/Lift	1	86	0195	Block, Grease	1
25	2599	Bearing, Pivot	4	56	0021	Casting, Pillow Block	1	87	FP411	Street Elbow, 1/8 x 45	1
26	2543	Spacer, Bearing	2	57	PH612	Hex Head, 1/2-13 x 1 1/2	4	88	PH416	Hex Head, 3/8-16 x 2	5
27	0193	Washer, Thrust	4	58	SP303	Sprocket, No. 60Q26	1	89	3516	Clamp, Cam	1
28	2542	Arm, Lift	1	59	BE328	Bearing, Pillow, 1.5	2	90	PH417	Hex Head, 3/8-16 x 2 1/4	2
29	FU211	Union, Swivel, 1/8 STR	2	60	PW615	Washer, Flat, 1/2 SAE	6	91	3517	Plate, Retainer	2
30	PN410	Nut, Hex, 3/8-16	4	61	PH614	Hex Head, 1/2-13 x 1 3/4	4	92	3518	Cam, Eccentric, 1 5/8	1
31	0177	Block, Grease	1	62	PK208	Socket Head, 1/4-20 x 1	2	93	2728	Housing, Cam, Outfeed	1

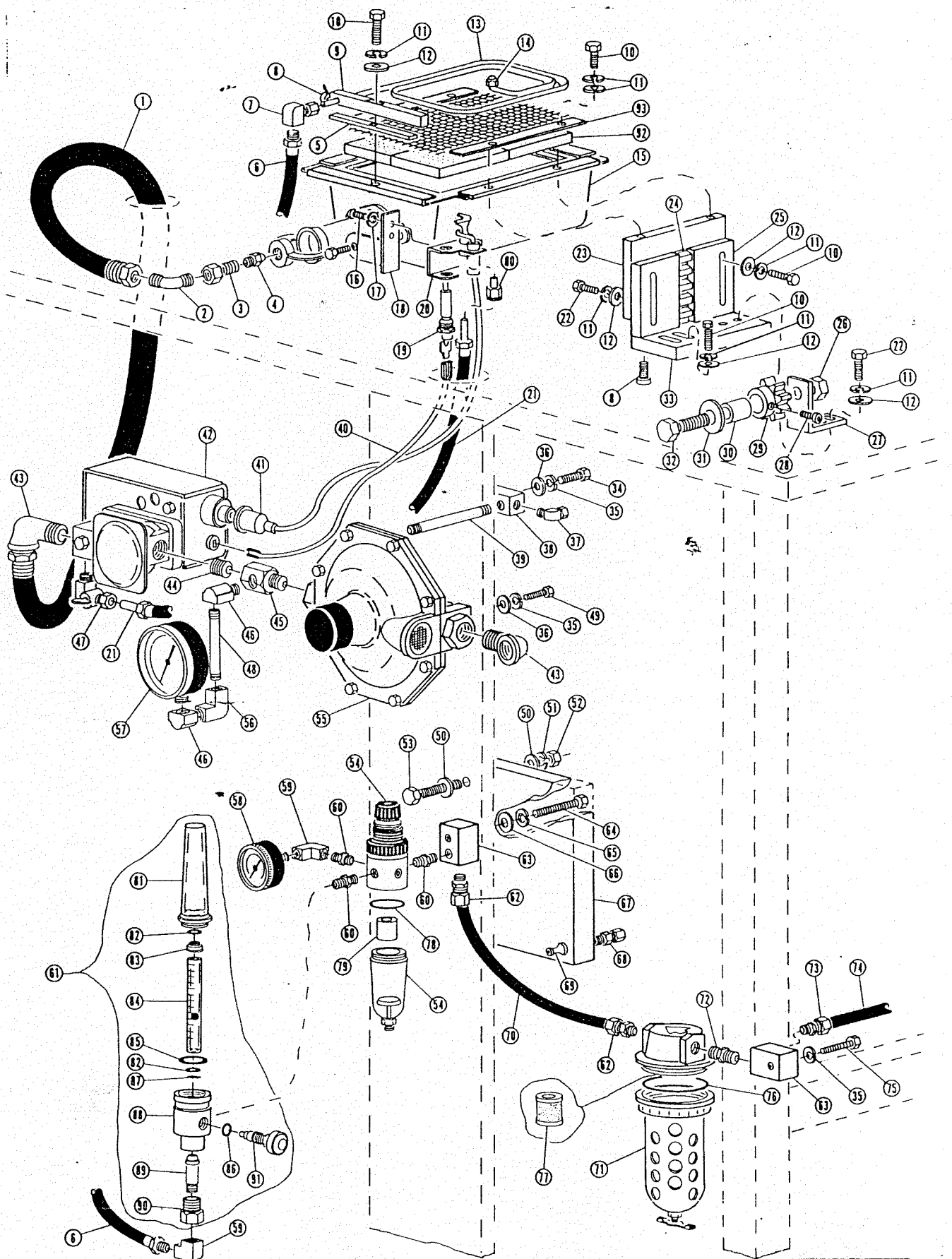
250Q BOTTOM CRIMP



250Q BOTTOM CRIMP PARTS LIST

ITEM	PART NO.	DESCRIPTION	QTY
1	SH408	Hex Head, 3/8 - 16 x 1	5
2	SW420	Washer, Lock, 3/8	22
3	BE411	Rod End, Female, 3/8, Right	4
4	0127	Arm, Crimp	2
5	0336	Finger, Crimp	2
6	SW320	Washer, Lock, 5/16	8
7	SH306	Hex Head, 5/16 - 18 x 3/4	4
8	0128	Bolt, Shoulder	4
9	SW020	Washer, Lock, #8	48
10	SR004	Round Head, 8 - 32 x 1/2	24
11	SN310	Nut, Hex, 5/16 - 18	4
12	0129	Bearing, Shoulder Bolt	4
13	0335	Rod, Crimp	2
14	SH406	Hex Head, 3/8 - 16 x 3/4	2
15	0332	Arm, Crimp	2
16	0333	Bracket, Crimp Arm	2
17	SH405	Hex Head, 3/8 - 16 x 5/8	8
18	0334	Bracket, Crimp Arm	2
19	SH610	Hex Head, 1/2 - 13 x 1-1/4	2
20	SW620	Washer, Lock, 1/2	6
21	SW610	Washer, Flat, 1/2	6
22	0134	Shaft, Crimp Guide	2
23	0131	Plate, Crimp	1
24	SH410	Hex Head, 3/8 - 16 x 1-1/4	3
25	SW410	Washer, Flat, 3/8	4
26	PN415	Nut, Hex, Right, 3/8 - 24	4
27	0133	Stud, Connecting, 5"	2
28	0126	Stud, Connecting, 3-1/2"	2
29	PN416	Nut, Hex, Left, 3/8 - 24	4
30	BE412	Rod End, Female, 3/8, Left	4
31	SG019	Ring, Retaining	4
32	BE218	Duralon, 1 x 1-9/16 x 2-1/4	2
33	0132	Casting, Crimp Drive	1
34	PW620	Washer, Lock, 1/2	12
35	PH612	Hex Head, 1/2 - 13 x 1-1/2	1
36	BE413	Rod End, Male, 1/2	1
37	PN615	Nut, Hex, 1/2 - 20	2
38	0138	Fork, Crimp	1
39	BE313	Follower, Cam, 1-1/4	1
40	FG102	Zerk, 3/16 Drive Straight	1
41	0119	Bar, Support	1
42	0118	Post, Support	4
43	PW610	Washer, Flat, 1/2	4
44	PH612	Hex Head, 1/2 - 13 x 1-1/2	4
45	PW310	Washer, Flat, 5/16	2
46	PW320	Washer, Lock, 5/16	2
47	PH308	Hex Head, 5/16 - 18 x 1	2
48	SP203	Sprocket, 50B15 - 1	1
49	SH612	Hex Head, 1/2 - 13 x 1-1/2	4
50	0120	Bar, Support	1
51	0121	Bracket, Idler	1
52	BE010	Oilite, 3/4 x 1 x 1	1
53	0122	Shaft, Crimp	1
54	CL009	Collar, Shaft, 1-1/2	1
55	0136	Clamp, Crimp Cam	1
56	PK619	Socket Head, 1/2 - 13 x 2-3/4	1
57	PK408	Socket Head, 3/8 - 16 x 1	2
58	1902	Hose, Grease, 12"	2
59	0135	Cam, Crimp	1
60	0130	Bearing, Fork	1
61	PH412	Hex Head, 3/8 - 16 x 1-1/2	2
62	PW420	Washer, Lock, 3/8	10
63	0137	Post, Fork Spacer	1
64	BE328	Bearing, Pillow, 1-1/2	2
65	PW615	Washer, Flat, 1/2 SAE	4
66	PH614	Hex Head, 1/2 - 13 x 1-3/4	4
67	PH410	Hex Head, 3/8 - 16 x 1-1/4	4
68	SP212	Bushing, SDS - 1-1/2	1
69	SP233	Sprocket, 50SDS26H	1

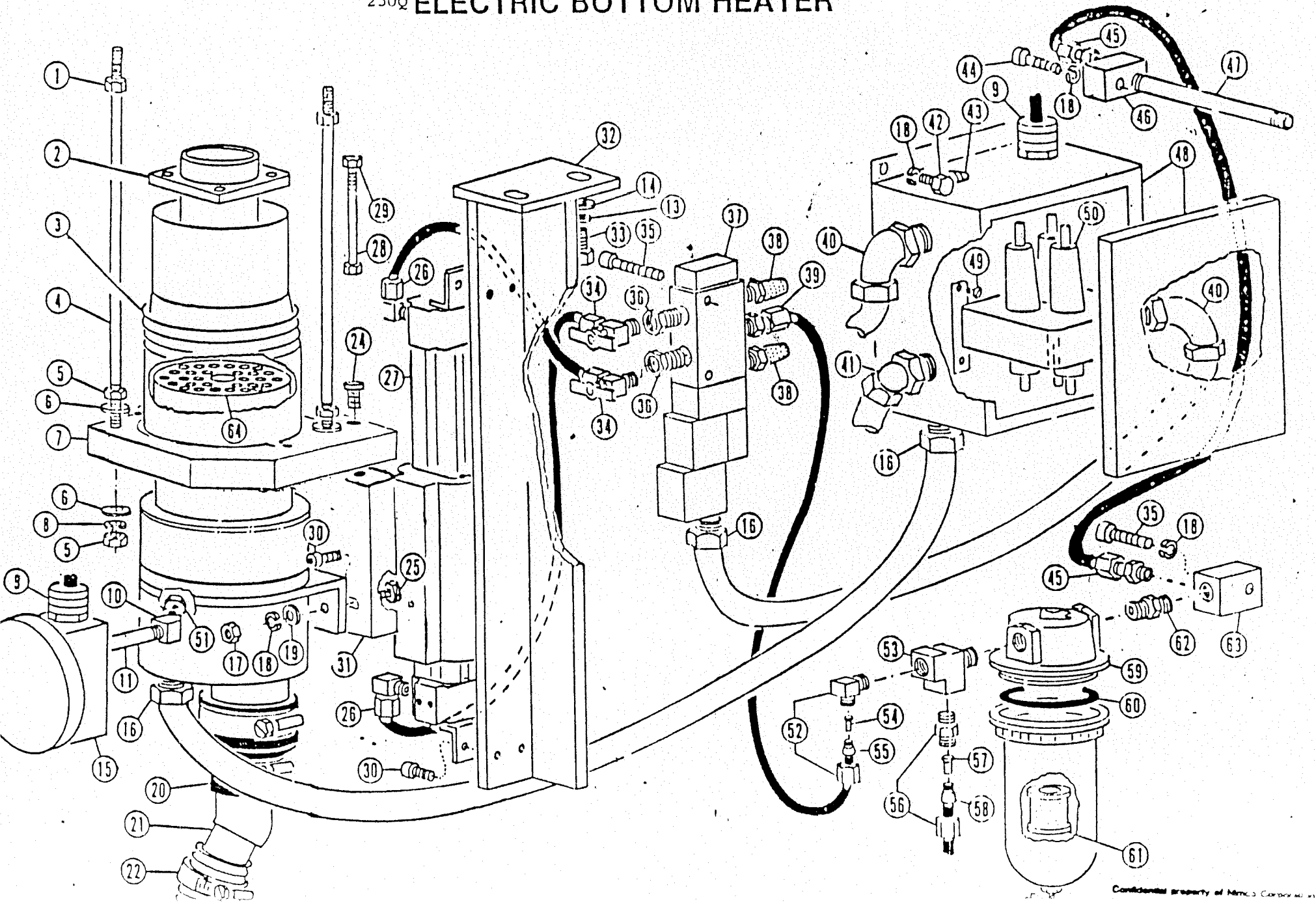
550Q BOTTOM HEATER GAS & AIR LINES



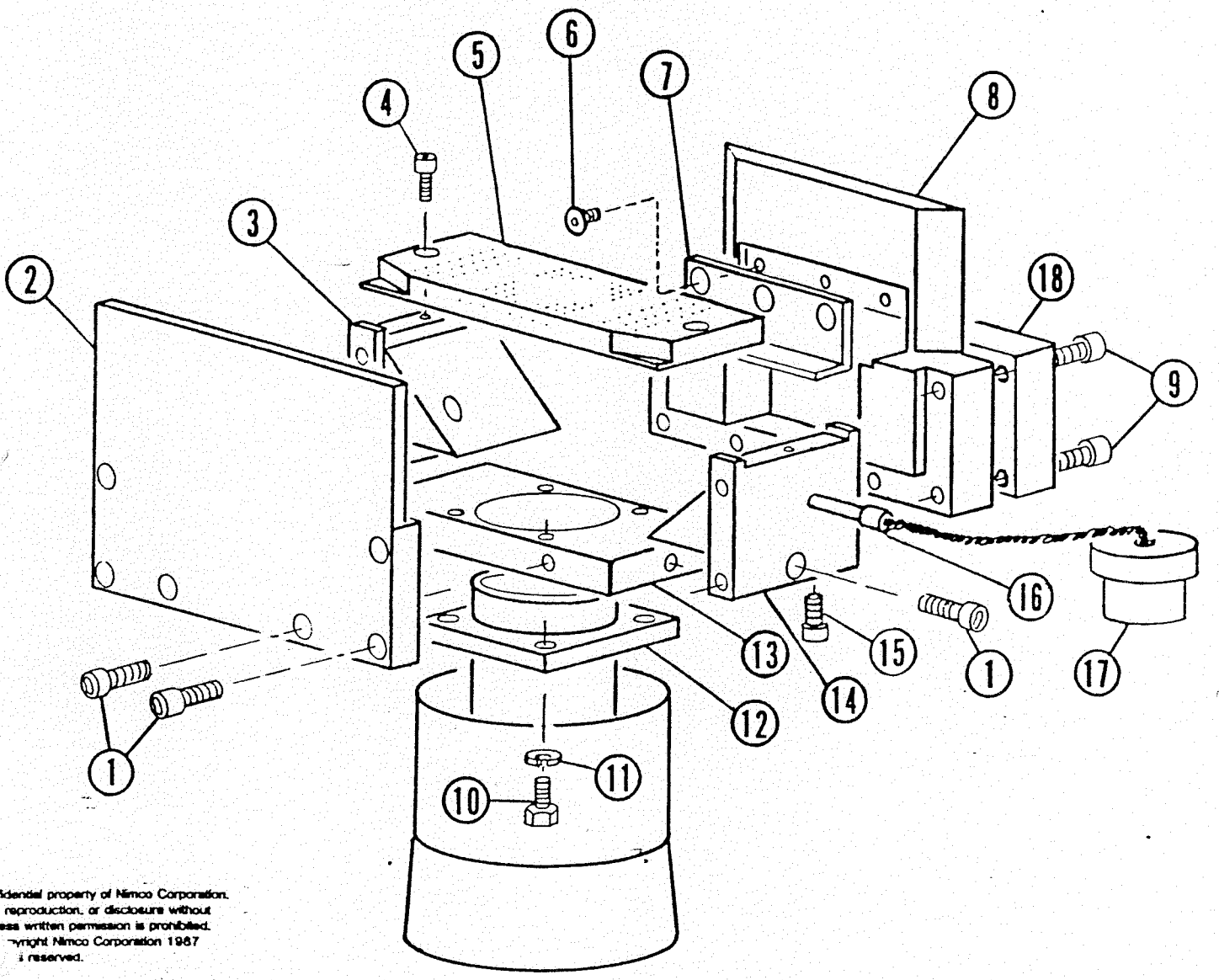
550Q BOTTOM HEATER GAS & AIR LINES PARTS LIST

ITEM	PART NO.	DESCRIPTION	QTY
1	1792	Hose, Gas, 21	1
2	FF553	Elbow, 3/8 S.A.E. 45° x 1/4 MP	1
3	HE207	Holder, Orifice	1
4	1637	Orifice, Burner, Natural	1
—	1638	Orifice, Burner, LP	1
5	0163	Spacer, Super Heat	1
6	1904	Hose, Air, 22	1
7	FC531	Elbow, 1/4 T x 1/8 FP	1
8	SK204	Socket Head, 1/4 - 20 x 1/2	5
9	0352	Bracket, Super Heat	1
10	SH208	Hex Head, 1/4 - 20 x 1	7
11	SW220	Washer, Lock, 1/4	13
12	SW210	Washer, Flat, 1/4	9
13	0351	Tube, Super Heat	1
14	0041	Nut, Super Heat	1
15	1192	Burner, Bottom	1
16	SR102	Round Head, 10 - 32 x 5/16	2
17	SW120	Washer, Lock, #10	2
18	0165	Bracket, Pilot Burner	1
19	HE104	Probe, Sensing	1
20	HE101	Burner, Pilot	1
21	1907	Hose, Gas, 13 1/2	1
22	SH206	Hex Head, 1/4 - 20 x 3/4	4
23	0157	Plate, Oven Adjust	1
24	0160	Rack, Burner	1
25	0158	Plate, Oven Adjust	2
26	SN610	Nut, Hex, 1/2 - 13	1
27	0159	Bracket, Adjusting	1
28	SK405	Socket Head, 3/8 - 16 x 5/8	1
29	0156	Gear, Oven Adjust	1
30	BE004	Oilite, 1/2 x 5/8 x 3/4	1
31	SW610	Washer, Flat, 1/2	1
32	SH616	Hex Head, 1/2 - 13 x 2	1
33	0155	Plate, Oven Adjust	1
34	PH210	Hex Head, 1/4 - 20 x 1 1/4	1
35	PW220	Washer, Lock, 1/4	4
36	PW210	Washer, Flat, 1/4	3
37	FC631	Elbow, 1/4 T x 1/8 MP	1
38	1315	Manifold, Air	1
39	FP112	Nipple, Gal, 1/8 x 6	1
40	HE103	Cable, Sensor	1
41	HE102	Boot, Cable	1
42	HE100	Control, Gas, G60	1
43	FP666	Street Elbow, 1/2 FP x 1/2 MP	2
44	FP161	Nipple, Galv, 1/2 x short	1
45	HE012	Adapter, Gauge	1
46	FP633	Street Elbow, 1/4 FP x 1/4 MP	2
47	HE002	Valve, Pilot	1
48	FP132	Nipple, Galv, 1/4 x 3	1
49	PH208	Hex Head, 1/4 - 20 x 1	2
50	PW410	Washer, Flat, 3/8	2
51	PW420	Washer, Lock, 3/8	1
52	PN410	Nut, Hex, 3/8 - 16	1
53	PH417	Hex Head, 3/8 - 16 x 2 1/4	1
54	CM030	Regulator, Filter	1
55	HE010	Regulator, Gas	1
56	FP533	Elbow, 1/4 Female	1
57	HE013	Gauge, Gas	1
58	CM032	Gauge, Regulator	1
59	FP511	Elbow, 1/8 Female	2
60	FP111	Hex Nipple, 1/8	3
61	CM040	Flowmeter	1
62	FC253	Connector, 3/8 T x 1/4 MP	2
63	0182	Block, Regulator	2
64	PH317	Hex Head, 5/16 - 18 x 2 1/4	1
65	PW320	Washer, Lock, 5/16	1
66	PW310	Washer, Flat, 5/16	1
67	0174	Block, Grease	1
68	FC211	Connector, 1/8 T x 1/8 MP	24
69	FG101	Zerk, 1/8 NPT Grease Straight	24
70	1932	Tubing, Air, 7 1/2	1
71	VA041	Filter, Vacuum-Air	1
72	FP133	Hex Nipple, 1/4	1
73	FC251	Connector, 3/8 T x 1/8 MP	1
74	1931	Tubing, Air	1
75	SH212	Hex Head, 1/4 - 20 x 1 1/2	1
76	OR003	O-Ring, 1/16 x 2 1/4	1
77	VA042	Element, Filter	1
78	CM033	O-Ring, Filter Bowl	1
79	CM031	Element, Filter Regulator	1
80	HE110	Orifice, Pilot, Natural	1
—	HE109	Orifice, Pilot, LP	1
81	—	Cover, Flowmeter	1
82	CM043	O-Ring, Flowmeter	2
83	CM044	Burst Capsule, Flowmeter	1
84	CM045	Tube, Flowmeter	1
85	—	O-Ring, .133 x 1 O.D.	1
86	—	O-Ring, .058 x 15/32	1
87	—	Screen, Flowmeter	1
88	—	Body, Flowmeter	1
89	—	Swivel, Inlet	1
90	—	Nut, Inlet	1
91	—	Valve, Flowmeter	1
92	HE201	Ceramic, Burner, Large	1
93	HE202	Screen, Burner	1

250Q ELECTRIC BOTTOM HEATER



ELECTRIC BOTTOM HEAT PARTS LIST

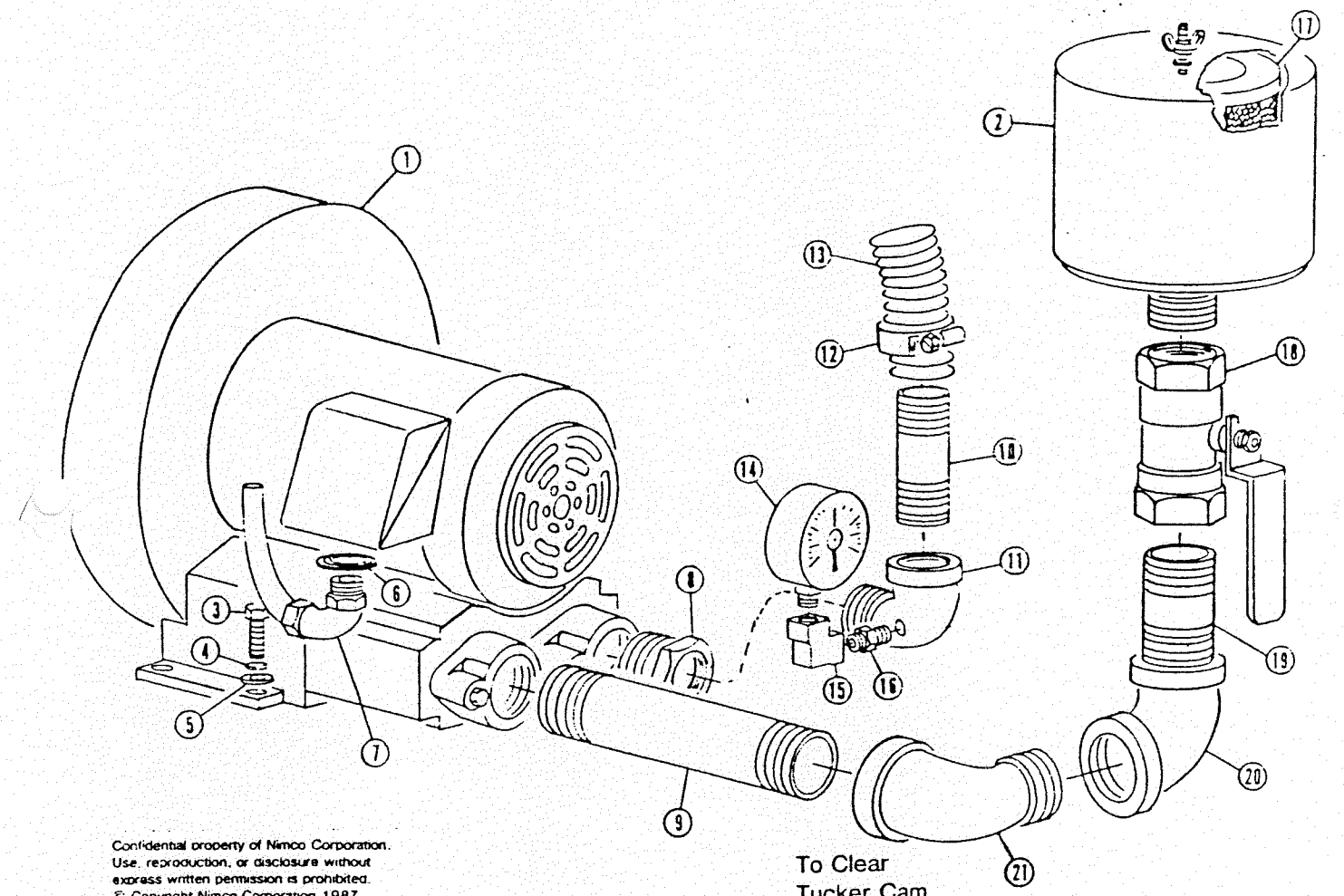


ITEM	PART NO.	DESCRIPTION	QTY
1	SK206	Socket Head, 1/4 - 20 x 3/4	8
2	2609A	Plate, Front	1
3	2609F	Block, End	1
4	SK104	Socket Head, 10 - 32 x 1/2	2
5	2619	Grate, Heater, Bottom	1
6	SF103	Flat Head, 10/32 x 3/8	3
7	2618	Grate, Side	1
8	2609B	Plate, Rear	1
9	SK212	Socket Head, 1/4 - 20 x 1 1/2	6
10	SH206	Hex Head, 1/4 - 20 x 3/4	4
11	SW220	Washer, Lock, 1/4	4
12	2615	Venturi, Bottom Heat	1
13	2609C	Plate, Bottom	1
14	2609D	Block, End	1
15	SK105	Socket Head, 10 - 32 x 5 8	1
16	CN253	Probe, Sensing, Controller	1
17	2601	Plug, Probe	1
18	2609E	Guide	1

250Q ELECTRIC BOTTOM HEATER PARTS LIST

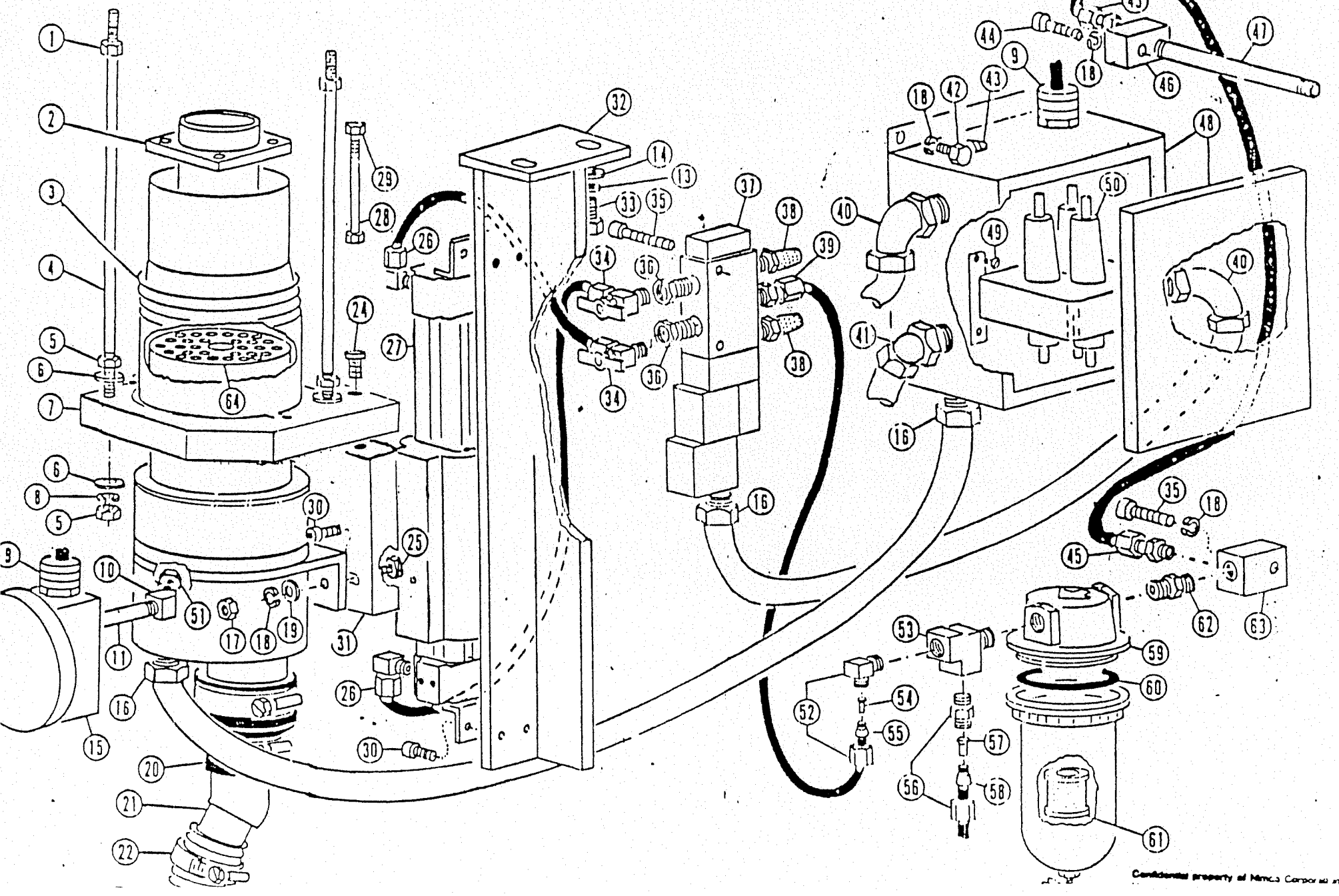
ITEM	PART NO.	DESCRIPTION	QTY
1	SN310	Nut, Hex, 5/16 - 18	3
2	2615	Venturi, Bottom Heater	1
3	HE310	Heater, Air, 10000W	1
4	2621	Rod, Oven Support	3
5	PN310	Nut, Hex, 5/16 - 18	6
6	PW310	Washer, Flat, 5/16	6
7	3946	Block, Electric BTM Heat	1
8	PW320	Washer, Lock, 5/16	3
9	WI060	Connector, CGB 1/2 x 3/8	2
10	FP411	Street Elbow, 1/8 x 45	1
11	1444	Tube, Mandrel, Water, 2.5	1
12	PH412	Hex Head, 3/8 - 16 x 1 1/2	1
13	PW420	Washer, Lock, 3/8	3
14	PW410	Washer, Flat, 3/8	3
15	CN255	Switch, Pressure	1
16	WI055	Connector, EMT, 1/2	3
17	PN210	Nut, Hex, 1/4-20	2
18	PW220	Washer, Lock, 1/4	6
19	PW210	Washer, Flat, 1/4	2
20	FP281	Reducer, Boot, 2.- 1 1/2	1
21	4998	Connector, 1 1/4MP X 1 1/4OD	1
22	CL101	Clamp, Hose, SST, No. 20	1
23	TU 075	Tubing, Ribbed, 1 1/4	26
24	PK308	Socket Head, 5/16-18X1	3
25	PH208	Hex Head, 1/4-20 X 1	2
26	FC631	Elbow, 1/4 T x 1/8 MP	2
27	CY004	Cylinder, Air, 1 x 3	1
28	PH417	Hex Head, 3/8-16 X 2 1/4	1
29	PN410	Nut, Hex, 3/8-16	1
30	PK204	Socket Head, 1/4 - 20 x 1/2	6
31	2830	Plate, Bottom Heater Mount	1
32	2828	Bracket, Cylinder Mount	1
33	PH406	Hex Head, 3/8 - 16 x 3/4	2
34	FV631	Valve, Elbow, 1/4 T x 1/8 MP	2
35	PK212	Socket Head, 1/4 - 20 x 1 1/2	3
36	FP213	Bushing, 1/8 FP x 1/4 MP	2
37	VL008	Valve, Solenoid, 4-way, 24V	1
38	VL004	Muffler, Filter, 1/4	2
39	FC233	Connector, 1/4 T x 1/4 MP	1
40	WI056	Elbow, EMT, 1/2	2
41	WI064	Connector, LT 1/2 - 45	1
42	PH204	Hex Head, 1/4 - 20 x 1/2	2
43	WI074	Louver, Vent	2
44	PK210	Socket Head, 1/4 - 20 x 1 1/4	1
45	FC251	Connector, 3/8 T x 1/8 MP	2
46	1315	Manifold, Air	1
47	FP112	Nipple, Gal, 1/8 x 6	1
48	WI005	Wire Box, A-606LP	1
49	SR102	Round Head, 10-32 x 5/16	4
50	CN252	Relay, Mercury, Controller	1
51	PN435	Nut, Jam, 3/8 - 24	1
52	FC633	Elbow, 1/4 T x 1/4 MP	1
53	FP833	Street Tee, 1/4 MP x FP x FP	1
54	FC943	Tube Support, 1/4	6
55	FC933	Sleeve, 1/4 Plastic	6
56	FC253	Connector, 3/8 T x 1/4 MP	1
57	FC945	Tube Support, 3/8	3
58	FC935	Sleeve, 3/8 Plastic	3
59	VA041	Filter, Vacuum - Air	1
60	OR003	O-ring, 1 1/16 x 2 1/4	1
61	VA042	Element, Filter	1
62	FP133	Hex Nipple, 1/4	1
63	0182	Block, Regulator	1
64	HE312	Element, Heater, 3x3150W-230V	1
	HE316	Element, Heater, 3x3300W-380V	1

ELECTRIC BOTTOM HEATER PARTS LIST

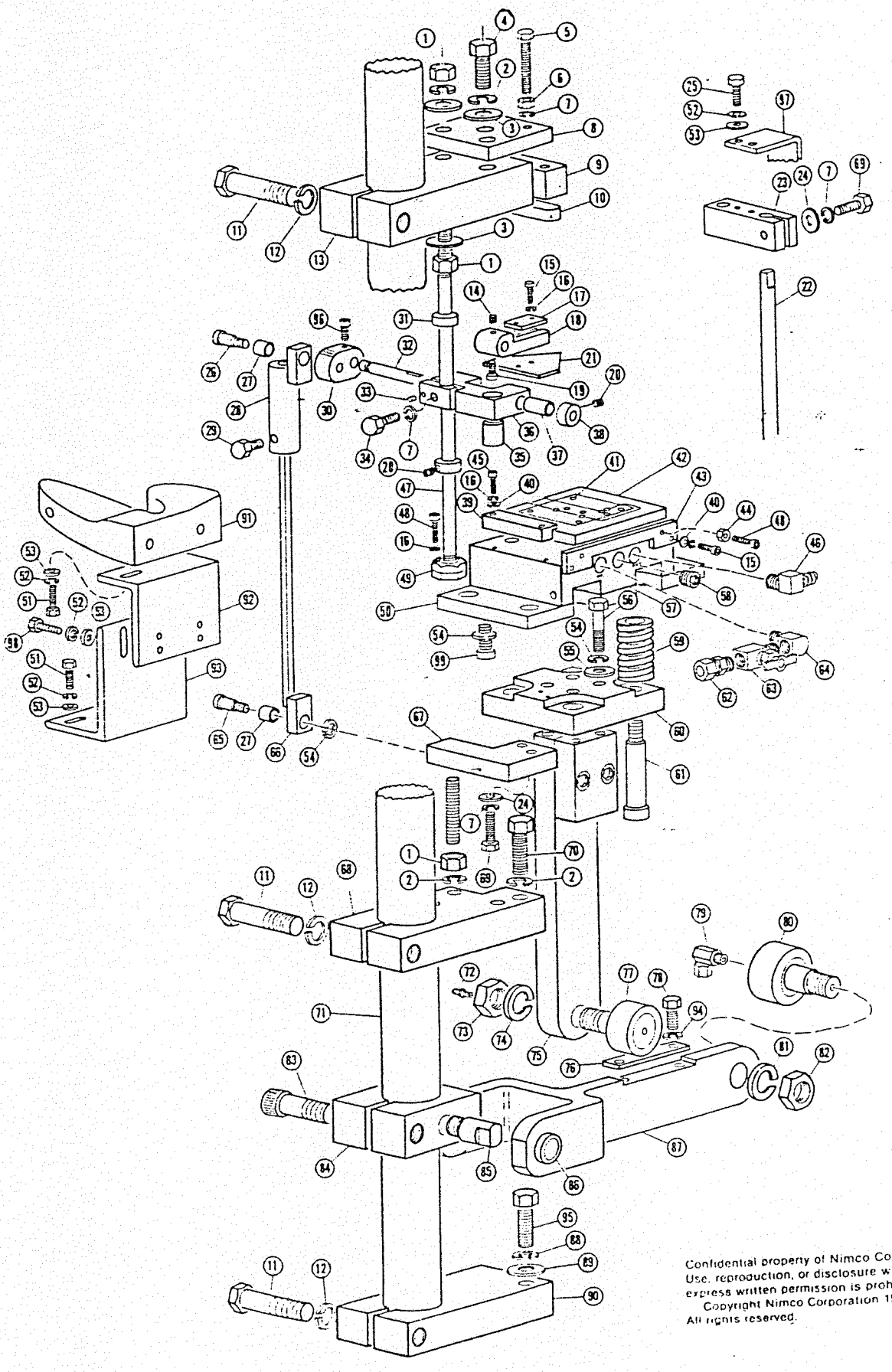


ITEM	PART NO.	DESCRIPTION	QTY
1	BL100	Blower, VFC303A	1
2	BL052	Filter, Blower Air, 1 1/4	1
3	PH308	Hex Head, 5/16-18 x 1	4
4	PW320	Washer, Lock, 5/16	4
5	PW310	Washer, Flat, 5/16	4
6	WI061	Washer, Reducing, .75 -.5	2
7	WI056	Elbow, EMT, 1/2	1
8	FP280	Bushing, 1 FP x 1 1/4 MP	1
9	FP192	Nipple, Galv, 1 1/4 x 8	1
10	FP182	Nipple, Galv, 1 x 3	1
11	2931	St.El. 1FPx1MP, Tapped ¼NPT	1
12	CL101	Clamp, Hose, SST, No. 20	1
13	TU075	Tubing, Ribbed, 1 1/4	26
14	HE313	Gauge, Pressure	1
15	FP533	Elbow, 1/4 Female	1
16	FP133	Hex Nipple, 1/4	1
17	BL053	Element, Blower Filter, 1 1/4	1
18	VL051	Valve, Ball, 1 1/4	1
19	FP191	Nipple, Galv, 1 1/4 x 2	1
20	FP599	Elbow, 1 1/4 Female	1
21	FP699	St. Elbow, 1 1/4FP x 1 1/4MP	1

250Q ELECTRIC BOTTOM HEATER



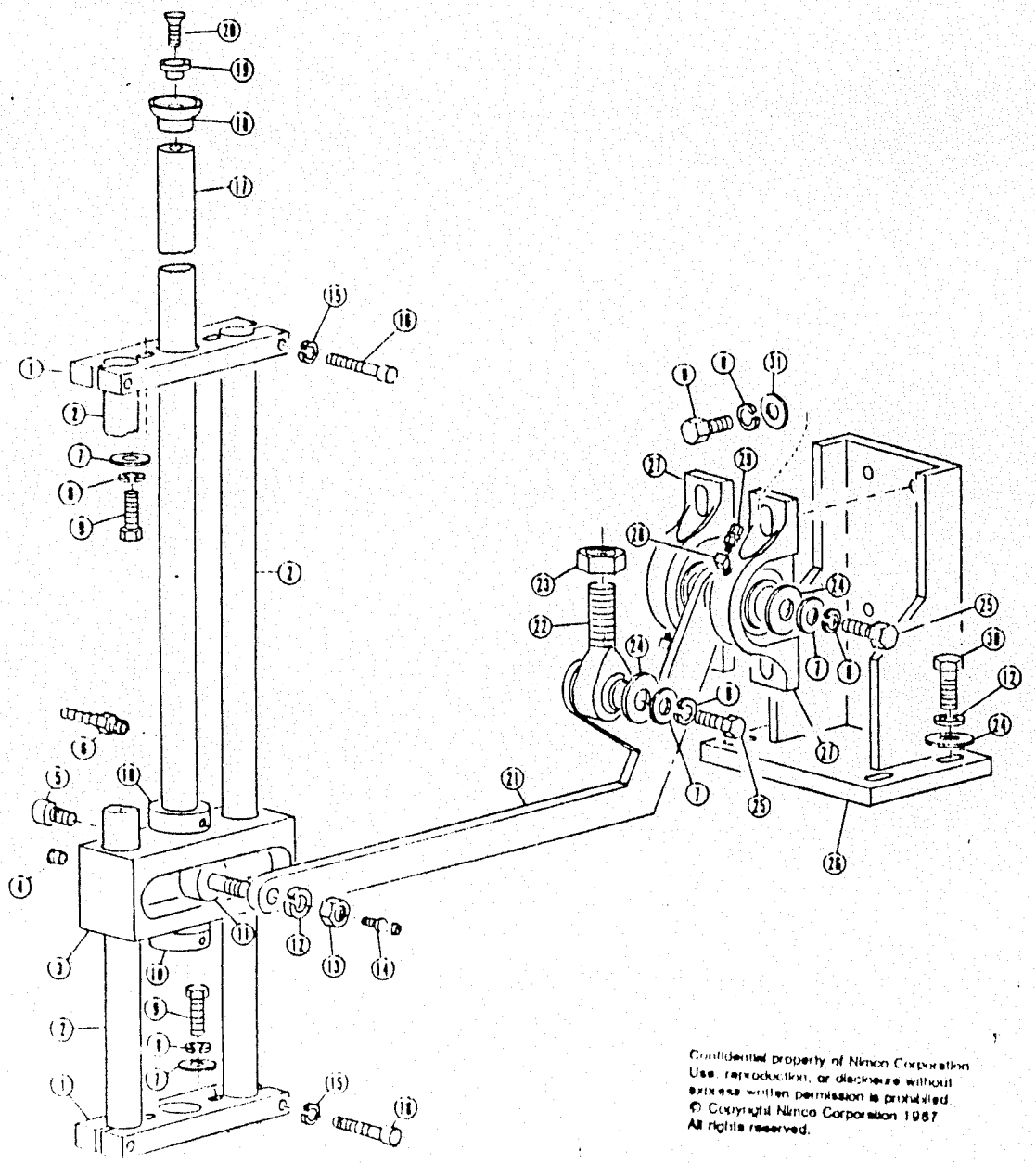
350QL BOTTOM SEAL & TOP CRIMP



350QL BOTTOM SEAL & TOP CRIMP PARTS LIST

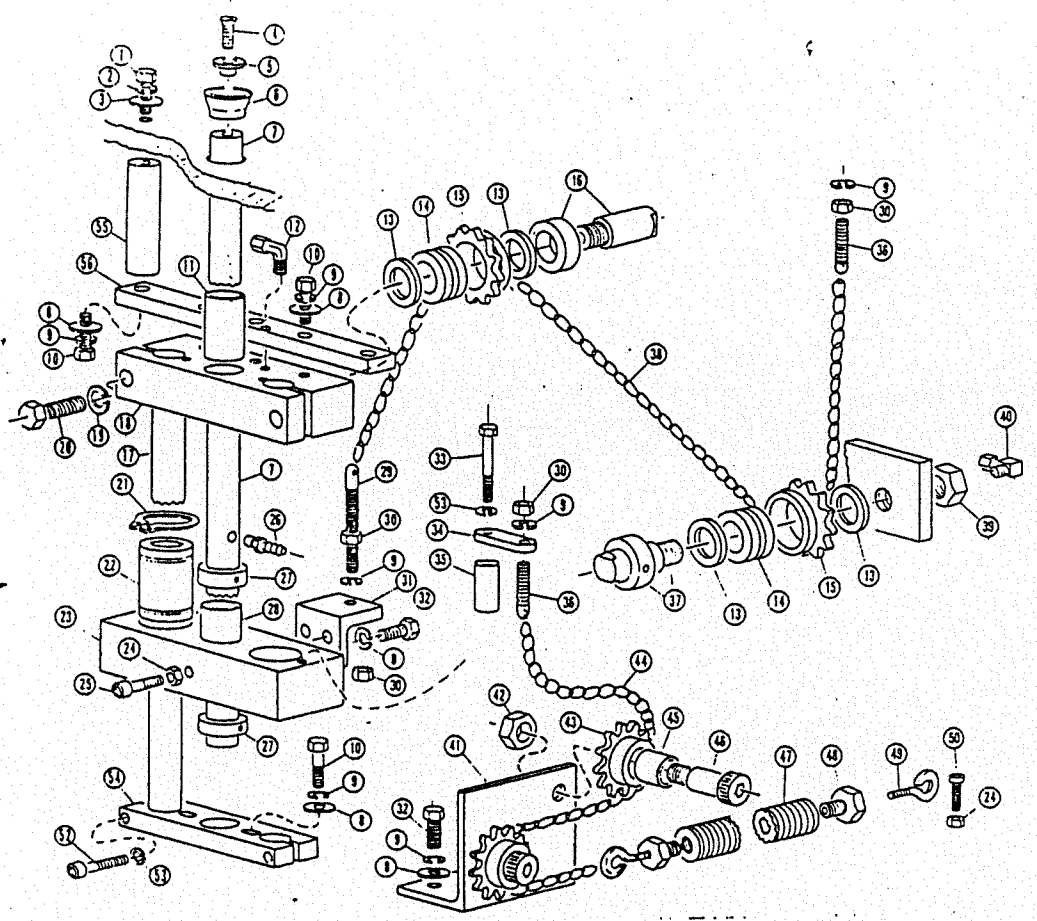
ITEM	PART NO.	DESCRIPTION	QTY
1	SN610	Nut, Hex, 1/2 - 13	8
2	SW620	Washer, Lock, 1/2	8
3	SW610	Washer, Flat, 1/2	6
4	SH610	Hex Head, 1/2 - 13 x 1-1/4	1
5	1768	Hex Head, Full Thrd, 5/16-18x2	2
6	SN310	Nut, Hex, 5/16 - 18	2
7	SW320	Washer, Lock, 5/16	9
8	0312	Plate, Brake Pad	1
9	0035	Housing, Brake Pad	1
10	0036	Pad, Brake	1
11	PH820	Hex Head, 5/8 - 11 x 3	3
12	PW820	Washer, Lock, 5/8	3
13	0338	Clamp, Post	1
14	SC202	Set Screw, 1/4 - 20 x 1/4	2
15	SK105	Socket Head, 10 - 32 x 5/8	6
16	SW120	Washer, Lock, #10	14
17	0162	Plate, Crimp Arm	2
18	0154	Arm, Top Crimp	2
19	SK203	Socket Head, 1/4 - 20 x 3/8	2
20	SC254	Set Screw, 1/4-28 x 1/4	10
21	0688	Blade, Top Crimp	2
22	0344	Shaft, Crimp Guide, 18-1/2	2
23	0148	Clamp, Crimp Rod	1
24	SW310	Washer, Flat, 5/16	5
25	SH208	Hex Head, 1/4 - 20 x 1	2
26	0301	Stripper, Plated, 3/8 x 1/2	2
27	BE210	Duralon, 3/8 x 1/2 x 1/2	4
28	0152	Housing, Crimp Rod	2
29	0065	Bolt, Lock, 5/16 x 5/8	2
30	1758	Block, Crimp Pivot	2
31	CL003	Collar, Shaft, 1/2	8
32	0150	Shaft, Crimp	2
33	SC103	Set Screw, 10-32 x 3/8	2
34	0066	Bolt, Lock, 5/16 x 1	2
35	BE004	Oilite, 1/2 x 5/8 x 3/4	2
36	0153	Housing, Top Crimp	2
37	BE211	Duralon, 3/8 x 1/2 x 1	4
38	CL001	Collar, Shaft, 3/8	2
39	0350	Clamp, Seal Plate	2
40	SW110	Washer, Flat, #10	6
41	1076	Pin, Seal	11
42	0341	Plate, Seal, Quart	1
—	0734	Plate, Seal, 1/2 Gal.	1
43	0353	Plate, Stop	1
44	SN110	Nut, Hex, #10 - 32	2
45	SK108	Socket Head, 10 - 32 x 1	4
46	FB533	Barb Elbow, 1/4 B x 1/4 MP	1
47	0345	Shaft, Crimp Guide, 23	2
48	SK104	Socket Head, 10 - 32 x 1/2	6
49	1448	Collar, Threaded Clamp	4
50	1813	Plate, Seal Stop	1
51	SH206	Hex Head, 1/4 - 20 x 3/4	7
52	SW220	Washer, Lock, 1/4	11
53	SW210	Washer, Flat, 1/4	11
54	SW420	Washer, Lock, 3/8	9
55	SW410	Washer, Flat, 3/8	4
56	SH414	Hex Head, 3/8 - 16 x 1-3/4	4
57	4039	Manifold, Seal	1
58	PPS23	Pipe Plug, Socket, 1/4	5
59	0283	Spring, Seal	4
60	0340	Block, Seal Spring	1
61	0295	Stripper, Plated, 5/8 x 2-1/4	4
62	FC253	Connector, 3/8 T x 1/4 MP	1
63	FV233	Pet Cock, 1/4	1
64	FP633	Street Elbow, 1/4 FP x 1/4 MP	1
65	0302	Stripper, Plated, 3/8 x 5/8	2
66	0151	Rod, Top Crimp	2
67	0343	Arm, Crimp Actuate	2
68	0339	Clamp, Post	1
69	SH310	Hex Head, 5/16 - 18 x 1-1/4	5
70	SH616	Hex Head, 1/2 - 13 x 2	2
71	0164	Tube, Support	1
72	FG102	Zerk, 3/16 Drive Straight	1
73	PN935	Nut, Jam, 3/4 - 16	1
74	PW920	Washer, Lock, 3/4	1
75	0143	Table, Bottom Seal	1
76	0144	Plate, Wear	1
77	BE315	Follower, Cam, 1-3/4	1
78	PH406	Hex Head, 3/8 - 16 x 3/4	2
79	FD611	Union, Swivel, 1/8 x 90°	1
80	1263	Follower, Cam, 2 - 48	1
81	PWA20	Washer, Lock, 7/8	1
82	PNA35	Nut, Jam, 7/8 - 14	1
83	PK817	Socket Head, 5/8 - 11 x 2-1/4	1
84	0142	Clamp, Post Pivot	1
85	0145	Bolt, Pivot	2
86	BE010	Oilite, 3/4 x 1 x 1	2
87	0147	Arm, Compression Seal	1
88	PW620	Washer, Lock, 1/2	2
89	PW610	Washer, Flat, 1/2	2
90	0141	Clamp, Post	1
91	0348	Plow, Bottom	1
92	0347	Bracket, Plow	1
93	0346	Bracket, Plow	1
94	PW420	Washer, Lock, 3/8	2
95	PH616	Hex Head, 1/2 - 13 x 2	2
96	SK204	Socket Head, 1/4-20 x 1/2	2
97	0693	Block, Crimp Tie	1
98	SH205	Hex Head, 1/4-20 x 5/8	2
99	SK408	Socket Head, 3/8-16 x 1	4

550QIL CARTON OUTFEED PARTS LIST



ITEM	PART NO.	DESCRIPTION	QTY
1	0167	Plate, Outfeed	2
2	1314	Shaft, Outfeed Guide	2
3	2735	Block, Outfeed	1
4	PPS21	Pipe Plug, Socket, 1/8	1
5	PK404	Socket Head, 3/8-16 x 1/2	1
6	FB131	Barb FTG, 1/4B x 1/8MP	1
7	PW410	Washer, Flat, 3/8	7
8	PW420	Washer, Lock, 3/8	11
9	PH410	Hex Head, 3/8-16 x 1 1/4	8
10	CL011	Collar, Clamp, SST, 1	2
11	BE313	Follower, Cam, 1 1/4	1
12	PW620	Washer, Lock, 1/2	5
13	PN615	Nut, Hex, 1/2-20	1
14	FG102	Zerk, 3/16 Drive Straight	1
15	PW320	Washer, Lock, 5/16	4
16	PK316	Socket Head, 5/16-18 x 2	4
17	2923	Tube, Outfeed IMP GAL	1
18	0098	Screw, Vacuum	1
19	0170	Button, Vacuum Cup	1
20	VA053	Cup, Outfeed Vacuum	1
21	7719	Arm, Lift, Outfeed IMP GAL	1
22	BE414	Rod End, Male, 3/4	1
23	PN935	Nut, Jam, 3/4-16	1
24	PW610	Washer, Flat, 1/2	7
25	PH408	Hex Head, 3/8-16 x 1	3
26	2733	Bracket, Lift Arm	1
27	2599	Bearing, Pivot	2
28	FP610	Street Elbow, 1/8FP x 1/4-28	2
29	FC211	Connector, 1/8T x 1/8MP	2
30	PH610	Hex Head, 1/2-13 x 1 1/4	4
31	PW310	Washer, Flat, 5/16	4

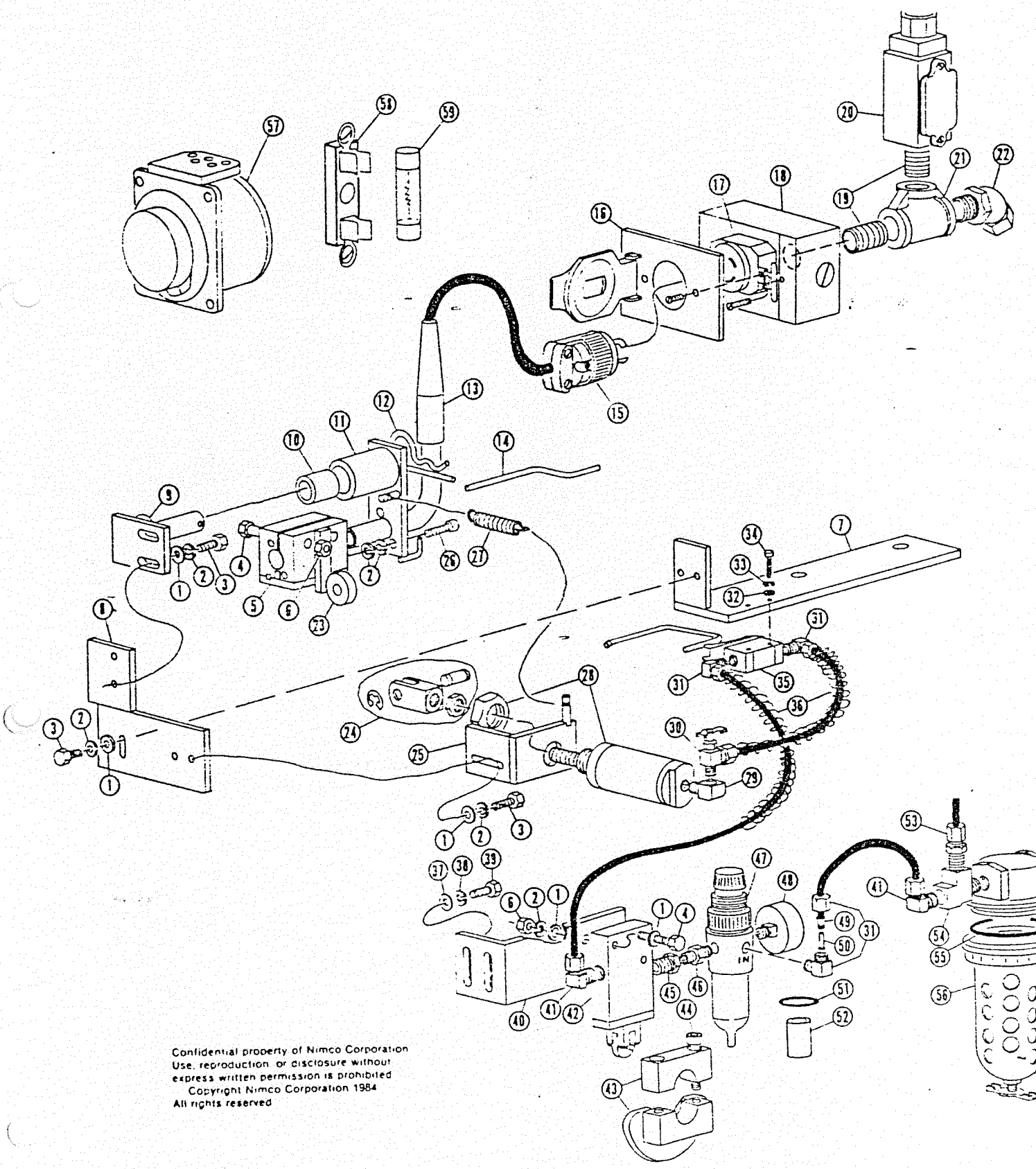
250Q CARTON OUTFEED



250Q CARTON OUTFEED PARTS LIST

ITEM	PART NO.	DESCRIPTION	QTY
1	SH410	Hex Head 3/8 - 16 x 1-1/4	2
2	SW420	Washer, Lock, 3/8	2
3	SW410	Washer, Flat, 3/8	2
4	0098	Screw, Vacuum	1
5	0170	Button, Vacuum Cup	1
6	VA053	Cup, Outfeed Vacuum	1
7	0691	Tube, Outfeed	1
8	PW410	Washer, Flat, 3/8	9
9	PW420	Washer, Lock, 3/8	14
10	PH410	Hex Head, 3/8-16 X 1 1/4	7
11	BE216	Duralon, 1 X 1 1/4 X 2	1
12	FC611	Elbow, 1/8 T X 1/8 MP	1
13	0193	Washer, Thrust	4
14	BE304	Bearing, Roller, MR-16	2
15	0194	Sprocket, Idler, 40B14	2
16	1473	Shaft, Idler	1
17	3052	Shaft, Outfeed Guide	2
18	3050	Clamp, Idler	1
19	PW620	Washer, Lock, 1/2	2
20	PH616	Hex Head, 1/2-13 X 2	2
21	SG019	Ring, Retaining	4
22	BE218	Duralon, 1 X 1 916 X 2 1/4	2
23	0244	Block, Outfeed	1
24	PN310	Nut, Hex, 5/16-18	2
25	PK312	Socket Head, 5/16-18 X 1 1/2	1
26	FB131	Barb FTG, 1/4 B X 1/8 MP	1
27	CL007	Collar, Shaft, 1	2
28	BE024	Oillite 1 X 1 1/4 X 1 1/2	1
29	0029	Stud, Chain, 3 1/2	1
30	PN410	Nut, Hex, 3/8-16	4
31	0245	Bracket, Outfeed	1
32	PH408	Hex Head, 3/8-16 X 1	4
33	PH318	Hex Head, 5/16-18 X 2 1/2	1
34	0062	Plate, Spring Return	1
35	0063	Tube, Spring Return	1
36	0017	Stud, Chain, 1 3/4	2
37	1474	Shaft, Idler, Tapped	1
38	1805	Chain, 7th Station Lift	1
39	PN930	Nut, Jam, 3/4-10	1
40	FC631	Elbow, 1/4 T X 1/8 MP	1
41	0061	Bracket, Spring Return	1
42	PN830	Nut, Jam, 5/8-11	2
43	SP108	Sprocket, 40B13-1	2
44	1806	Chain, 7th Station Return	1
45	BE010	Oillite, 3/4 X 1 X 1	2
46	0289	Stripper, Plated, 3/4 X 1 1/2	1
47	SG010	Spring, Lift	1
48	0045	Screw, Lift Spring	2
49	PE208	Eyebolt, 1/4-20 X 1	2
50	PK308	Socket Head, 5/16-18 X 1	1
51	0739	Bolt, Spring Return	1
52	PK316	Socket Head, 5/16 - 18 X 2	2
53	PW320	Washer, Lock, 5/16	3
54	0167	Plate, Outfeed	1
55	3053	Post, Support, 7th Station	2
56	3051	Bracket, 7th Station	1

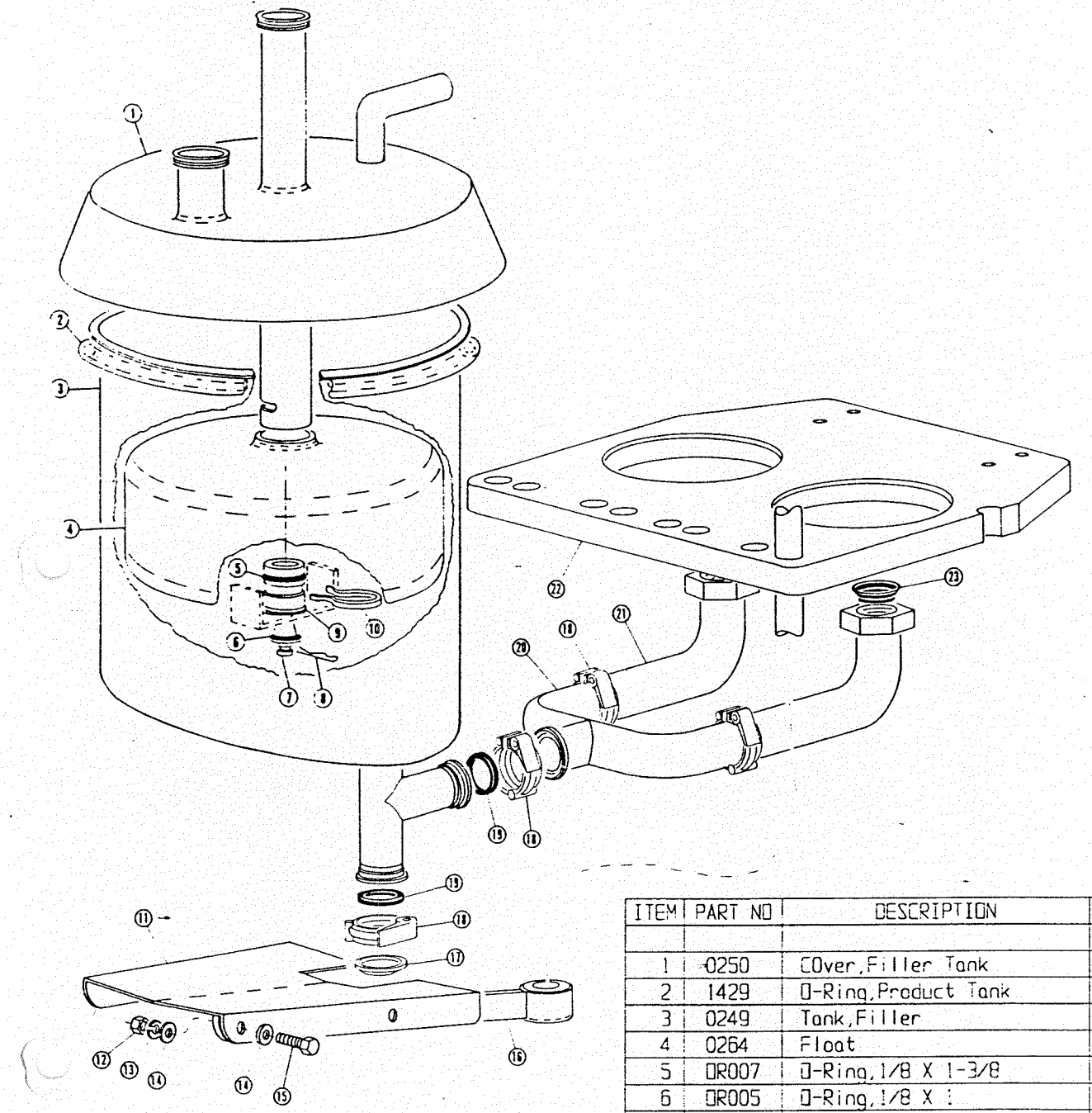
350QL BRANDING CODER



350QL BRANDING CODER PARTS LIST

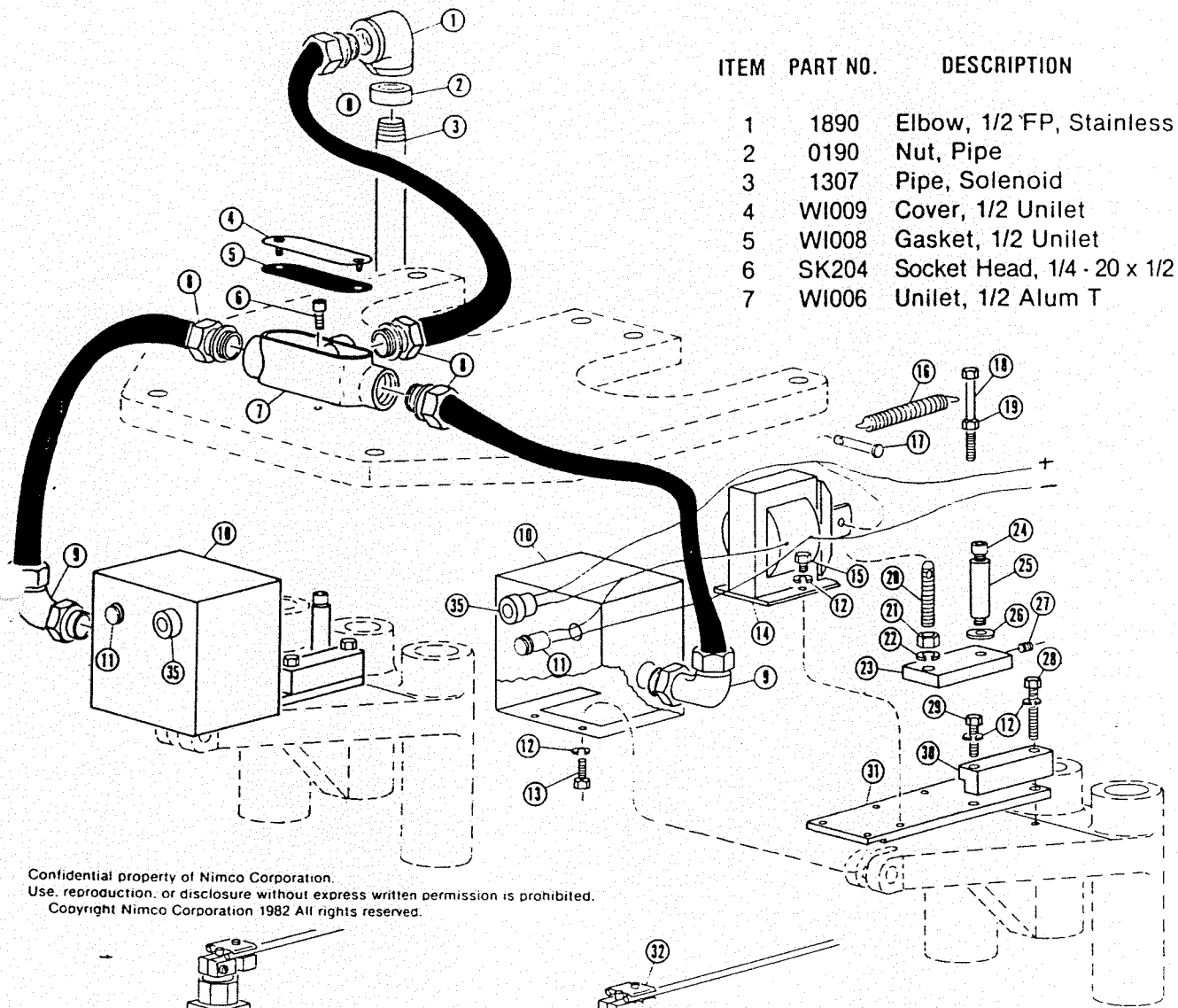
ITEM	PART NO.	DESCRIPTION	QTY
1	SW210	Washer, Flat, 1/4	10
2	SW220	Washer, Lock, 1/4	12
3	SH205	Hex Head, 1/4-20 x 5/8	6
4	SH212	Hex Head, 1/4-20 x 1 1/2	4
5	1924	Block, Code	1
6	SN210	Nut, Hex, 1/4-20	4
7	3107	Bracket, Brander	1
8	4621	Plate, Mounting	1
9	1926	Bracket, Pivot	1
10	BR014	Bushing, Brander	2
11	1925	Bracket, Pivot Bushing	1
12	SG027	Clip, Hairpin, 3/8	1
13	1960	Heater, Brander Cartridge	1
14	1919	Pin, Code	1
15	BR015	Plug, Twist Lock	1
16	BR019	Cover, Receptacle, Single	1
17	BR016	Receptacle, Single Turnlock	1
18	BR018	Bell Box, Brander	1
19	FS161	Nipple, SST, 1/2 x 1 1/8	2
20	CN103	Switch, Limit, Vertical	1
21	1891	Tee, 1/2 FP, Stainless	1
22	1838	Connector, LT, 3/8 x 45, Plated	1
23	1920	Roller, Cylinder	1
24	BR024	Clevis, Piston Rod	1
25	1943	Bracket, Cylinder	1
26	SK207	Socket Head, 1/4-20 x 7/8	2
27	SG026	Spring, Brander	1
28	BR013	Cylinder, Brander, 1 1/4 x 1	1
29	FP611	Street Elbow, 1/8FP x 1/8MP	1
30	FV631	Valve, Elbow, 1/4T x 1/8MP	1
31	FC631	Elbow, 1/4T x 1/8MP	3
32	SW110	Washer, Flat, #10	2
33	SW120	Washer, Lock, #10	2
34	SK106	Socket Head, 10 - 32 x 3/4	2
35	1956	Valve, Carton Sensing	1
36	4556	Spring, Tube Guard	2
37	PW210	Washer, Flat, 1/4	2
38	PW220	Washer, Lock, 1/4	2
39	PH206	Hex Head, 1/4-20 x 3/4	2
40	1921	Bracket, Cam Valve	1
41	FC633	Elbow, 1/4T x 1/4MP	2
42	BR010	Valve, Air, 3-Way	1
43	1922	Cam, Brander, 1	1
44	PK312	Socket Head, 5/16-18 x 1 1/2	2
45	FP213	Bushing, 1/8FP x 1/4MP	1
46	FP111	Hex Nipple, 1/8	1
47	CM030	Regulator, Filter	1
48	CM032	Gauge, Regulator	1
49	FC933	Sleeve, 1/4 Plastic	6
50	FC943	Tube Support, 1/4	6
51	CM033	O-Ring, Filter Bowl	1
52	CM031	Element, Filter Regulator	1
53	FC233	Connector, 1/4T x 1/4MP	1
54	FP733	Tee, Galv, 1/4FPx1/4FPx1/4FP	1
55	OR003	O-Ring, 1/16 x 2 1/4	1
56	VA041	Filter, Vacuum-Air	1
57	CN251	Power Control, Powerstat	1
58	WI216	Block, Fuse #4407	1
59	CN164	Fuse, 5 Amp	1

550QL PRODUCT SUPPLY TANK PARTS LIST

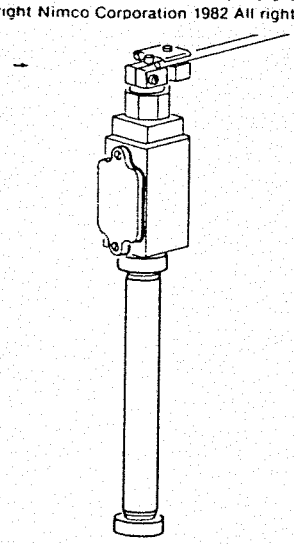


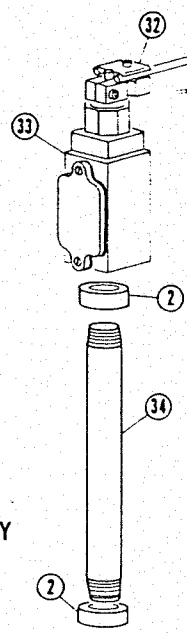
ITEM	PART NO	DESCRIPTION	QTY
1	0250	COver,Filler Tank	1
2	1429	O-Ring,Product Tank	1
3	0249	Tank,Filler	1
4	0264	Float	1
5	OR007	O-Ring,1/8 X 1-3/8	1
6	OR005	O-Ring,1/8 X 1	1
7	0248	Valve,Float	1
8	SG024	Clip,Hair Pin	1
9	0256	Valve Seat,Float	1
10	0257	Clip,Float	1
11	1496	Support,Filler Tank	1
12	SN310	Nut,Hex,5/16-18	4
13	SW320	Washer,Lock,5/16	4
14	SW310	Washer,Flat,5/16	8
15	SH306	Hex Head,5/16-18 X 3/4	4
16	0253	Arm,Tank Support	2
17	SY001	Cap,Clamp,1-1/2	1
18	SY007	Clamp,1-1/2	4
19	SY013	Gasket,1-1/2 Sani. Clamp	4
20	0716	Crossover,Sanitary	1
21	0715	Elbow,Sanitary,6-7/8"	2
22	0585	Plate,Fill,Lower	1
23	SY014	Gasket,1-1/2 Bevel Seat	2

550QL FILL SOLENOID PARTS LIST



ITEM	PART NO.	DESCRIPTION	QTY
1	1890	Elbow, 1/2 FP, Stainless	1
2	0190	Nut, Pipe	6
3	1307	Pipe, Solenoid	1
4	WI009	Cover, 1/2 Unilet	1
5	WI008	Gasket, 1/2 Unilet	1
6	SK204	Socket Head, 1/4 - 20 x 1/2	1
7	WI006	Unilet, 1/2 Alum T	1

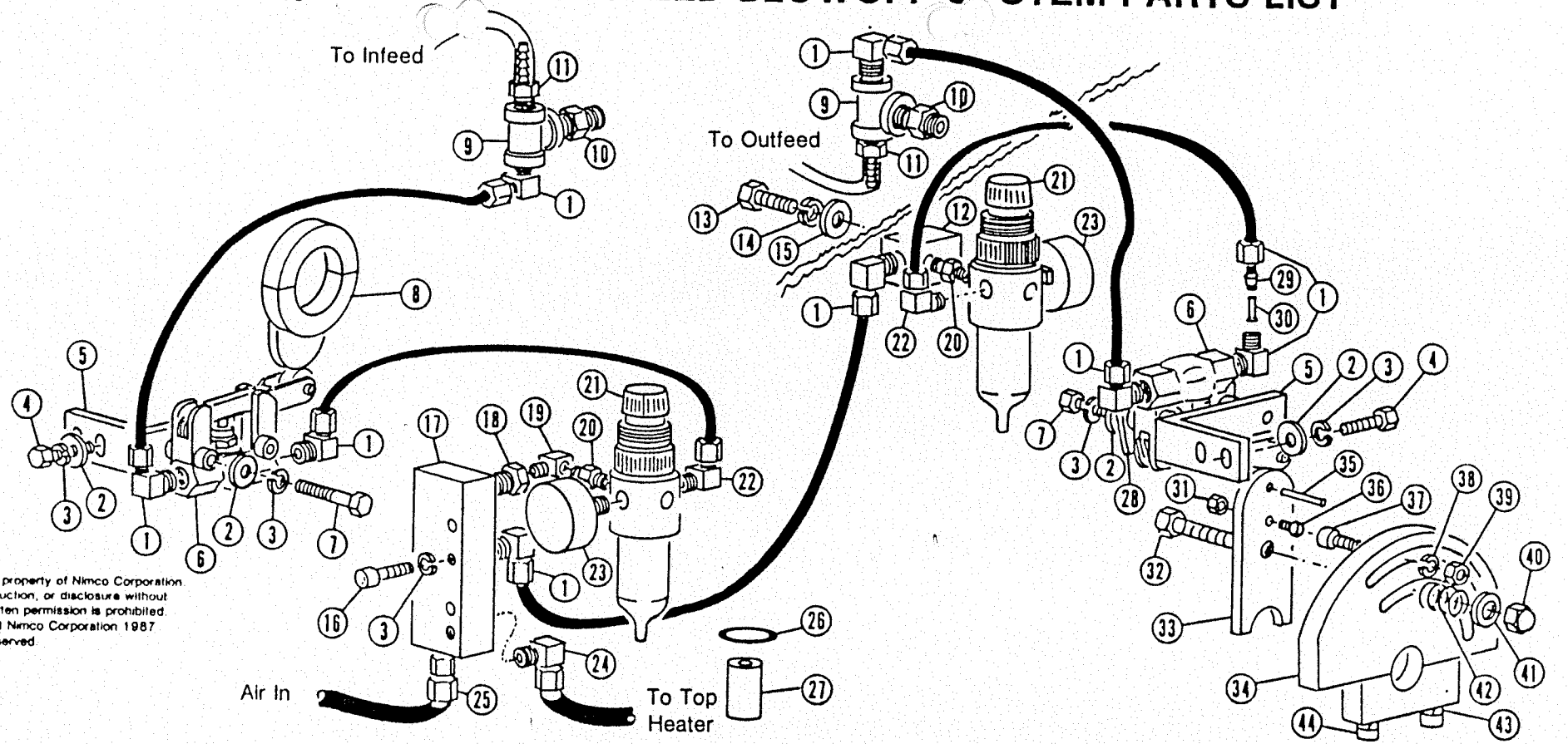




ITEM	PART NO.	DESCRIPTION	QTY
8	1835	Connector, EMT, 1/2 Plated	4
9	1837	Elbow, EMT, 1/2 Plated	2
10	0238	Cover, Solenoid	2
11	CN106	Light, Pilot, Red	2
12	SW220	Washer, Lock, 1/4	16
13	SH204	Hex Head, 1/4 - 20 x 1/2	4
14	CN200	Solenoid, Fill	2

ITEM	PART NO.	DESCRIPTION	QTY
15	SH203	Hex Head, 1/4 - 20 x 3/8	4
16	SG007	Spring, Solenoid	1
17	1617	Pin, Solenoid	2
18	SH218	Hex Head, 1/4 - 20 x 2 1/2	2
19	SN210	Nut, Hex, 1/4 - 20	2
20	1322	Stud, Solenoid, 1 3/4	2
21	SN410	Nut, Hex, 3/8 - 16	2
22	SW420	Washer, Lock, 3/8	2
23	0228	Plate, Fill Slide	2
24	SK316	Socket Head, 5/16 - 18 x 2	2
25	0229	Stud, Fill Slide	2
26	SW310	Washer, Flat, 5/16	2
27	PC202	Set Screw, 1/4 - 20 x 1/4	2
28	SH212	Hex Head, 1/4 - 20 x 1 1/2	4
29	SH208	Hex Head, 1/4 - 20 x 1	4
30	0227	Clamp, Slide	4
31	1190	Plate, Solenoid Base	2
32	CN104	Lever, Switch Actuate	2
33	CN103	Switch, Limit, Vertical	2
34	1305	Pipe, Fill Switch	2
35	CN172	Protector, Solenoid	2

3500L INFEED & OUTFEED BLOWOFF SYSTEM PARTS LIST

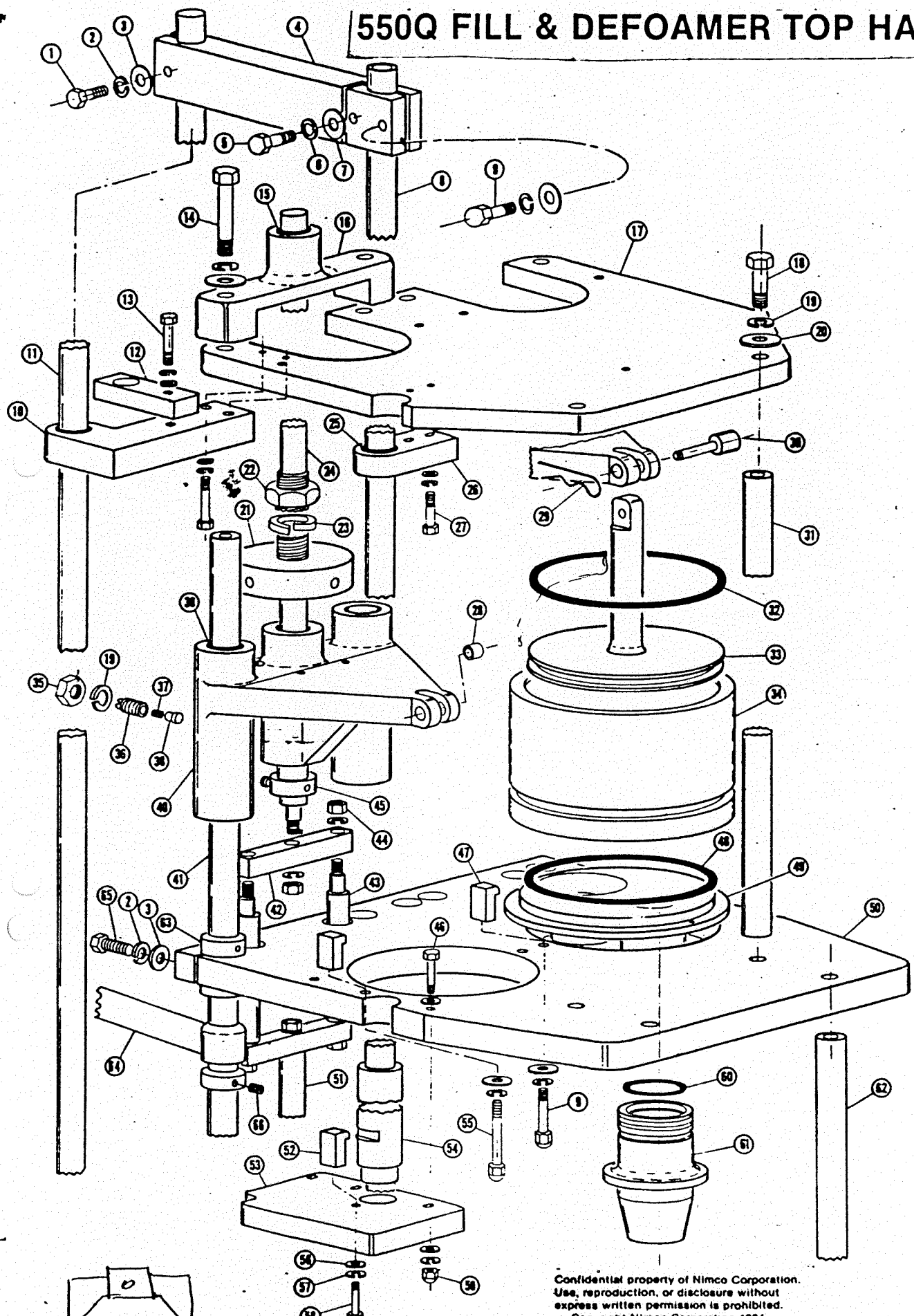


ITEM	PART NO.	DESCRIPTION	QTY
1	FC633	Elbow, 1/4 T x 1/4 MP	8
2	PW210	Washer, Flat, 1/4	8
3	PW220	Washer, Lock, 1/4	10
4	PH206	Hex Head, 1/4 - 20 x 3/4	4
5	2745	Bracket, Blow off	2
6	VL020	Valve, Pressure - Vacuum	2
7	SH214	Hex Head, 1/4 - 20 x 1-3/4	4
8	2744	Cam, Infeed Blowoff, 1 1/2 Fixed	1
9	FP733	Tee, Galv, 1/4 FP x 1 1/4FP x 1 1/4FP	2
10	FP133	Hex Nipple, 1/4	2
11	FB133	Barb FTG, 1/4B x 1/4MP	2
12	0182	Block, Regulator	1
13	PH308	Hex Head, 5/16 - 18 x 1	1
14	PW320	Washer, Lock, 5/16	1
15	PW310	Washer, Flat, 5/16	1

ITEM	PART NO.	DESCRIPTION	QTY
16	PK208	Socket Head, 1/4 - 20 x 1	2
17	0040	Manifold, Vacuum	1
18	FP213	Bushing, 1/8 FP x 1/4 MP	1
19	FP611	Street Elbow, 1/8 FP x 1/8 MP	1
20	FP111	Hex Nipple, 1/8	2
21	CM030	Regulator, Filter	2
22	FC631	Elbow, 1/4 T x 1/8 MP	2
23	CM032	Gauge, Regulator	2
24	FC653	Elbow, 3/8 T x 1/4 MP	1
25	FC253	Connector, 3/8 T x 1/4 MP	1
26	CM033	O-Ring, Filter Bowl	2
27	CM031	Element, Filter Regulator	2
28	2981	Stop, Valve Lever	1
29	FC933	Sleeve, 1/4 Plastic	10
30	FC 943	Tube Support, 1/4	10

ITEM	PART NO.	DESCRIPTION	QTY
31	SN110	Nut, Hex, 10-32	1
32	SH314	Hex Head, 5/16 - 18 x 1 3/4	1
33	2742	Finger, Vacuum Adjust	1
34	2741	Cam, Blowoff Adjust	1
35	SL008	Roll Pin, 1/8 x 1 SST	1
36	SR103	Round Head, 10-32 x 3/8	1
37	2768	Bolt, Blowoff Cam	4
38	SW220	Washer, Lock, 1/4	4
39	SN210	Nut, Hex, 1/4 - 20	4
40	SN320	Nut, Acorn Cap, 5/16 - 18	1
41	SW310	Washer, Flat, 5/16	1
42	2888	Spring, Blowoff Cam	1
43	PW420	Washer, Lock, 3/8	2
44	PK414	Socket Head, 3/8 - 16 x 1 3/4	2

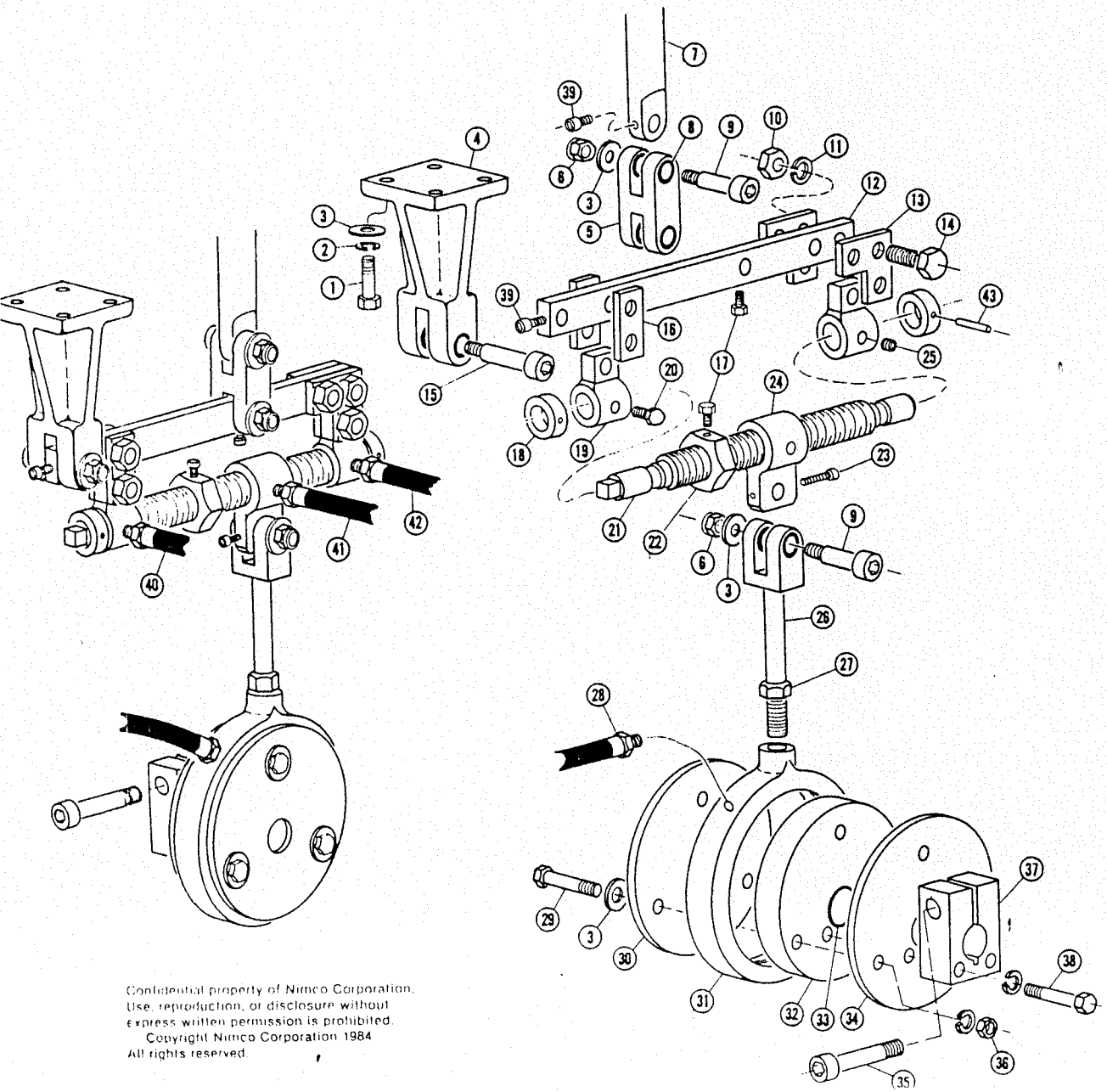
550Q FILL & DEFOAMER TOP HALF



550Q FILL & DEFOAMER TOP HALF PARTS LIST

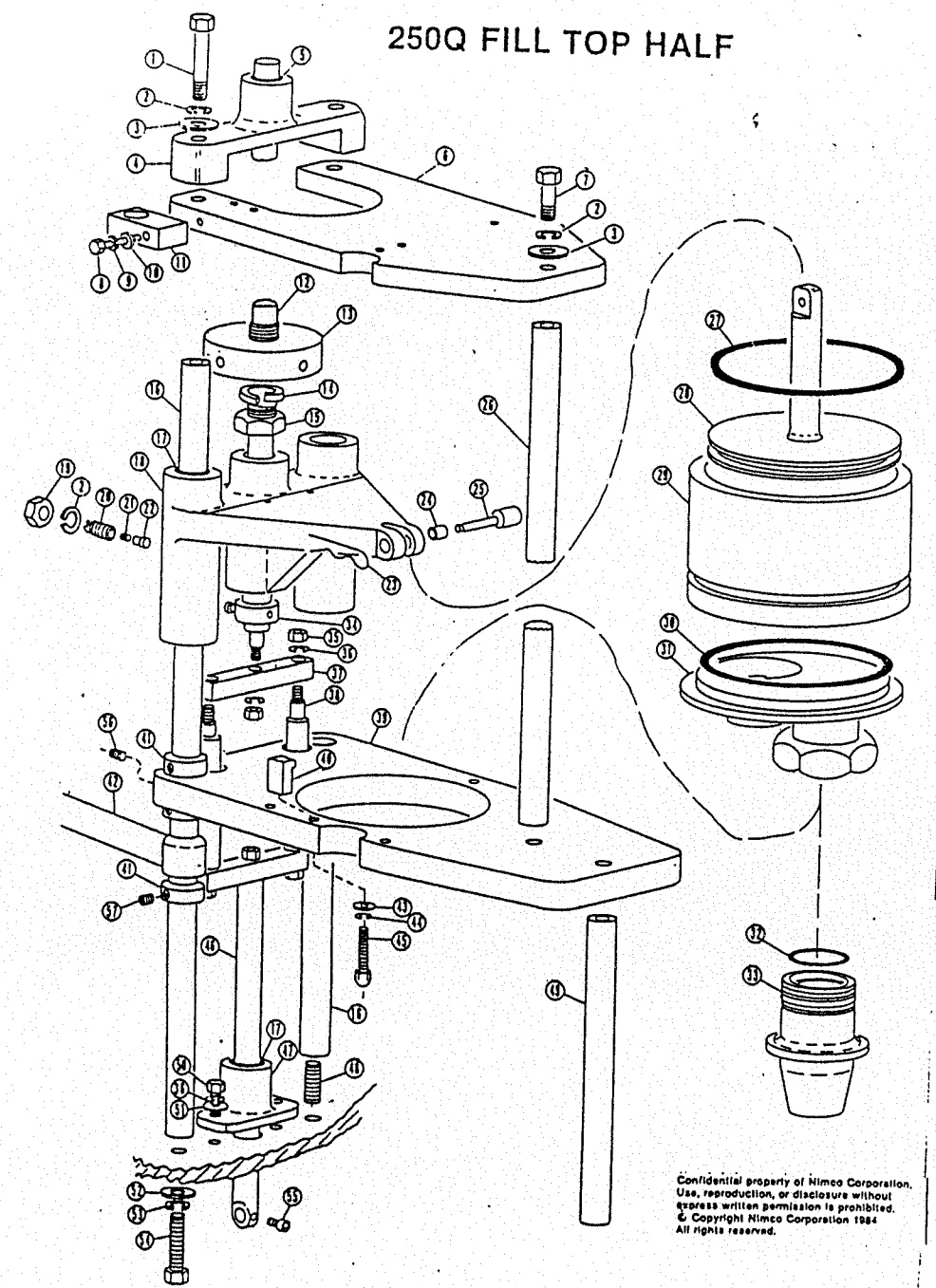
ITEM	PART NO.	DESCRIPTION	QTY
1	SH412	Hex Head, 3/8 - 16 x 1½	1
2	SW420	Washer, Lock, 3/8	9
3	SW410	Washer, Flat, 3/8	3
4	1119	Arm, Defoamer Clamp	1
5	SH312	Hex Head, 5/16 - 18 x 1½	1
6	SW320	Washer, Lock, 5/16	9
7	SW310	Washer, Flat, 5/16	9
8	0254	Tube, Defoamer	1
9	0067	Bolt, Lock, 5/16 - 18 x 1½	4
10	0592	Block, Defoamer Guide	1
11	1067	Shaft, Defoamer	1
12	1127	Arm, Pipe Support	1
13	SH314	Hex Head, 5/16 - 18 x 1¾	3
14	SH620	Hex Head, 1/2 - 13 x 3	4
15	BE201	Bostone, 7/8 x 1 1/8 x 1¼	2
16	0222	Housing, Bearing	2
17	0599	Plate, Fill, Upper	1
18	SH614	Hex Head, 1/2 - 13 x 1¾	12
19	SW620	Washer, Lock, 1/2	16
20	SW610	Washer, Flat, 1/2	16
21	0219	Disk, Fill	2
22	PNB35	Nut, Jam, 1 - 14	2
23	PWB20	Washer, Lock, 1"	2
24	0217	Shaft, Fill, Upper	2
25	0393	Bearing, Defoamer Guide	2
26	1128	Block, Defoamer Guide	1
27	SH212	Hex Head, 1/4 - 20 x 1½	3
28	1066	Bearing, Fill Casting	4
29	SG024	Clip, Hair Pin	2
30	0230	Pin, Fill Piston	2
31	1734	Post, Fill Plate, Upper	2
32	OR104	O-Ring, Piston	2
33	0239	Piston, fill	2
34	1170	Bowl, Metering 4 7/8	2
35	SN610	Nut, Hex, 1/2 - 13	4
36	0210	Housing, Fill Snubber	4
37	1471	Spring, Fill Snubber	4
38	0209	Snubber, Fill Casting	4
39	BE216	Duralon, 1 x 1¼ x 2	8
40	0601	Casting, Fill	2
41	0225	Post, Fill Plate	4
42	0218	Bar, Fill	4
43	0216	Shaft, Fill	4
44	SN410	Nut, Hex, 3/8 - 16	12
45	0240	Collar, Fill Shaft	2
46	SH217	Hex Head, 1/4 - 20 x 2¼	2
47	0211	Clamp, Fill Bowl	4
48	OR103	O-Ring, Bowl Manifold	2
49	0242	Manifold, Metering Bowl	2
50	0585	Plate, Fill, Lower	1
51	0215	Shaft, Fill, Lower	2
52	1169	Clamp, Guide Tube	1
53	1120	Plate, Defoamer Drip	1
54	1126	Guide, Defoamer Tube	1
55	0069	Bolt, Lock, 5/16 - 18 x 2½	1
56	SW210	Washer, Flat, 1/4	8
57	SW220	Washer, Lock, 1/4	6
58	SH210	Hex Head, 1/4 - 20 x 1¼	1
59	SN220	Nut, Acorn, 1/4 - 20, Hi-Crown	2
60	OR101	O-Ring, Inlet & Nozzle	4
61	0259	Nozzle, Outlet Valve	2
62	1736	Post, Fill Plate, Lower	2
63	CL007	Collar, Shaft, 1"	10
64	0253	Arm, Tank Support	2
65	SH414	Hex Head, 3/8 - 16 x 1-3/4	2
66	SC302	Set Screw, 5/16 - 18 x 1/4	6

50QL FILL SECTION LOWER HALF PARTS LIST



ITEM	PART NO.	DESCRIPTION	QTY
1	PH408	Hex Head, 3/8 - 16 x 1	8
2	PW420	Washer, Lock, 3/8	18
3	PW410	Washer, Flat, 3/8	22
4	0224	Bracket, Pivot Arm	2
5	0220	Clevis	2
6	PN440	Nut, Jam, 3/8 - 16	8
7	0215	Shaft, Fill, Lower	2
8	BE018	Ironite, 1/2 x 5/8 x 1/2	16
9	0279	Stripper, Plated, 1/2 x 1-1/2	6
10	PN610	Nut, Hex, 1/2 - 13	10
11	PW620	Washer, Lock, 1/2	10
12	0387	Lever, Fill	2
13	0235	Plate, Worm Support	4
14	PH614	Hex Head, 1/2 - 13 x 1-3/4	10
15	0280	Stripper, Plated, 1/2 x 2	2
16	0234	Plate, Worm Support	4
17	PH204	Hex Head, 1/4 - 20 x 1/2	4
18	CL006	Collar, Shaft, 3/4	4
19	0233	Housing, Worm Support	4
20	0065	Bolt, Lock, 5/16 x 5/8	2
21	0231	Worm, Fill	2
22	0214	Nut, Worm Stop	2
23	PK106	Socket Head, 10 - 32 x 3/4	2
24	0232	Nut, Worm	2
25	SC302	Setscrew, 5/16 - 18 x 1/4	2
26	0252	Yoke, Fill	2
27	PN830	Nut, Jam, 5/8 - 11	2
28	1901	Hose, Grease, 11	2
29	PH416	Hex Head, 3/8 - 16 x 2	6
30	0368	Plate, Retainer, F-7/16	2
31	0212	Housing, Cam	2
32	0369	Cam, Eccentric, 7/16	2
33	BE011	Oilite, 1 x 1-1/8 x 1	2
34	0367	Plate, Retainer, R-7/16	2
35	PK616	Socket Head, 1/2 - 13 x 2	2
36	PN410	Nut, Hex, 3/8 - 16	6
37	0366	Clamp, Cam	2
38	PH417	Hex Head, 3/8 - 16 x 2-1/4	4
39	PK204	Socket Head, 1/4 - 20 x 1/2	4
40	1899	Hose, Grease, 9-1/2	2
41	1902	Hose, Grease, 12	2
42	1902	Hose, Grease, 12	2

250Q FILL TOP HALF



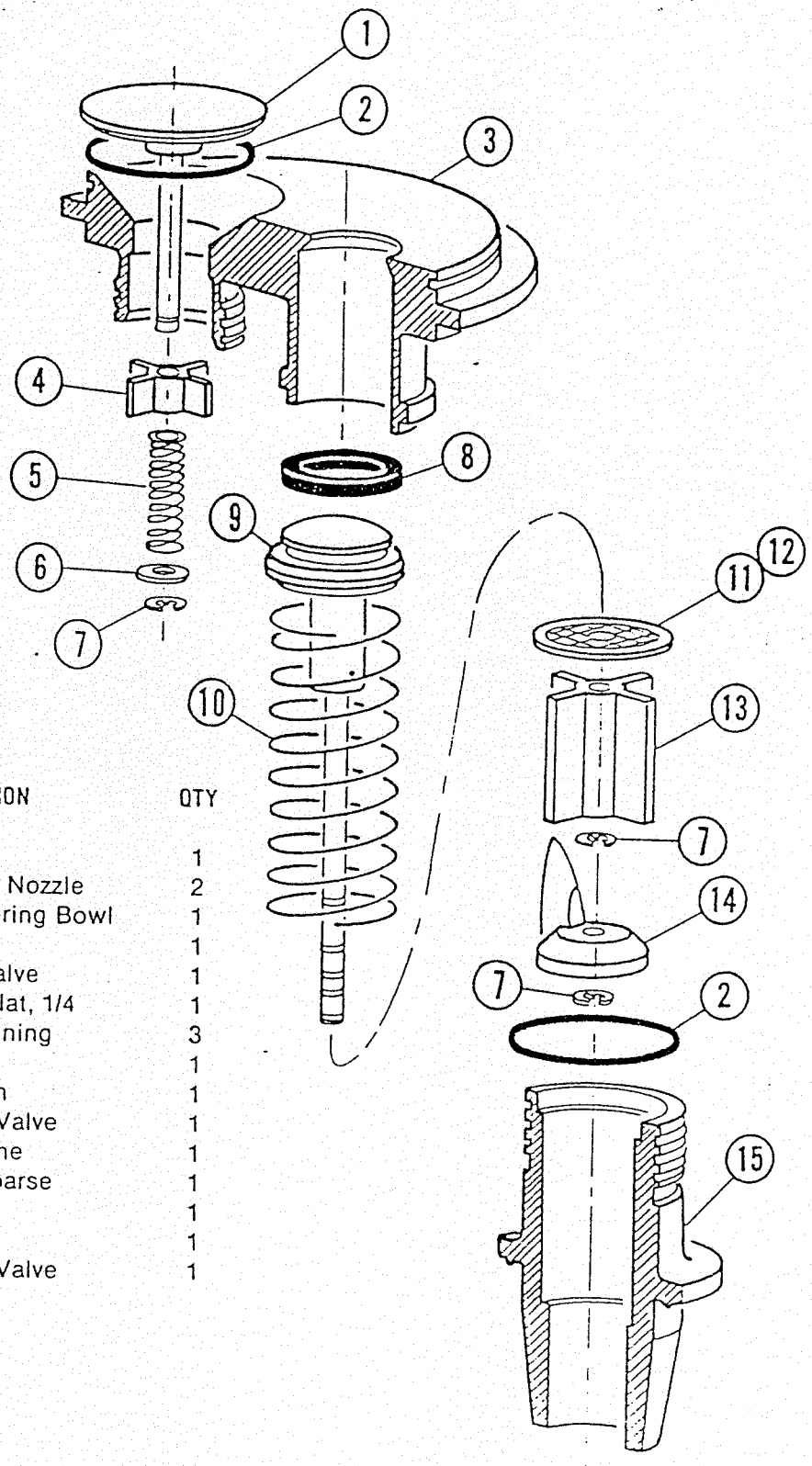
250Q FILL TOP HALF PARTS LIST

ITEM	PART NO.	DESCRIPTION	QTY
1	SH620	Hex Head, 1/2 - 13 x 3	2
2	SW620	Washer, Lock, 1/2	7
3	SW610	Washer, Flat, 1/2	5
4	0222	Housing, Bearing	1
5	BE201	Bostone, 7/8 x 1-1/8 x 1-1/4	1
6	3083	Plate, Fill, Upper	1
7	SH614	Hex Head, 1/2 - 13 x 1-3/4	3
8	SH216	Hex Head, 1/4 - 20 x 2	1
9	SW220	Washer, Lock, 1/4	1
10	SW210	Washer, Flat, 1/4	1
11	3093	Bracket, Pipe Support	1
12	0217	Shaft, Fill Upper	1
13	0219	Disk, Fill	1
14	PWB20	Washer, Lock, 1	1
15	PNB35	Nut, Jam, 1-14	1
16	0225	Post, Fill Plate	2
17	BE216	Duralon, 1 x 1-1/4 x 2	5
18	0601	Casting, Fill	1
19	SN630	Nut, Jam, 1/2 - 13	2
20	0210	Housing, Fill Snubber	2
21	1471	Spring, Fill Snubber	2
22	0209	Snubber, Fill Casting	2
23	SG024	Clip, Hair Pin	1
24	1066	Bearing, Fill Casting	2
25	0230	Pin, Fill Piston	1
26	1123	Post, Fill Plate, Upper	1
27	OR104	O-Ring, Piston	1
28	0239	Piston, Fill	1
29	0247	Bowl, Metering, 4-7/8	1

ITEM	PART NO.	DESCRIPTION	
30	OR103	O-Ring, Bowl Manifold	
31	0242	Manifold, Metering Bowl	
32	OR101	O-Ring, Inlet & Nozzle	
33	0259	Nozzle, Outlet Valve	
34	0240	Collar, Fill Shaft	
35	SN410	Nut, Hex, 3/8 - 16	
36	SW420	Washer, Lock, 3/8	
37	0218	Bar, Fill	
38	0216	Shaft, Fill	
39	1121	Plate, Fill, Lower	
40	0211	Clamp, Fill Bowl	
41	CL007	Collar, Shaft, 1	
42	0253	Arm, Tank Support	
43	SW310	Washer, Flat, 5/16	
44	SW320	Washer, Lock, 5/16	
45	0067	Bolt, Lock, 5/16 - 18 x 1-1/2	
46	0215	Shaft, Fill, Lower	
47	0221	Housing, Bearing,	
48	ST630	Threaded Rod, 1/2 - 13	11
49	0786	Post, Fill Plate, Lower	1
50	SH408	Hex Head, 3/8 - 16 x 1	2
51	SW410	Washer, Flat, 3/8	2
52	PW610	Washer, Flat, 1/2	2
53	PW620	Washer, Lock, 1/2	2
54	PH616	Hex Head, 1/2 - 13 x 2	2
55	PK204	Socket Head, 1/4 - 20 x 1/2	1
56	SC303	Set Screw, 5/16 - 18 x 3/8	2
57	SC302	Set Screw, 5/16 - 18 x 1/4	6

350

250Q FILLBOWL MANIFOLD & NOZZLE PARTS LIST



ITEM	PART NO.	DESCRIPTION	QTY
1	0243	Valve, Inlet	1
2	OR101	O-Ring, Inlet & Nozzle	2
3	0242	Manifold, Metering Bowl	1
4	0246	Spider, Inlet	1
5	0275	Spring, Inlet Valve	1
6	1292	Washer, SST Flat, 1/4	1
7	.SG018	Clip, SST Retaining	3
8	OR102	Quadring	1
9	1965	Valve, Fill Stem	1
10	~~1964~~	Spring, Outlet Valve	1
11	0258	Screen, Fill, Fine	1
12	0262	Screen, Fill, Coarse	1
13	0260	Spider, Fill	1
14	0392	Deflector, Fill	1
15	0259	Nozzle, Outlet Valve	1

NIMCO CORPORATION
4012A Route 14 - Box J • Crystal Lake, Illinois 60014
Phone (815) 459-4200
Telex 72-2425 Cable NIMCOCORP

NIMCO TECHNICAL NEWSLETTER

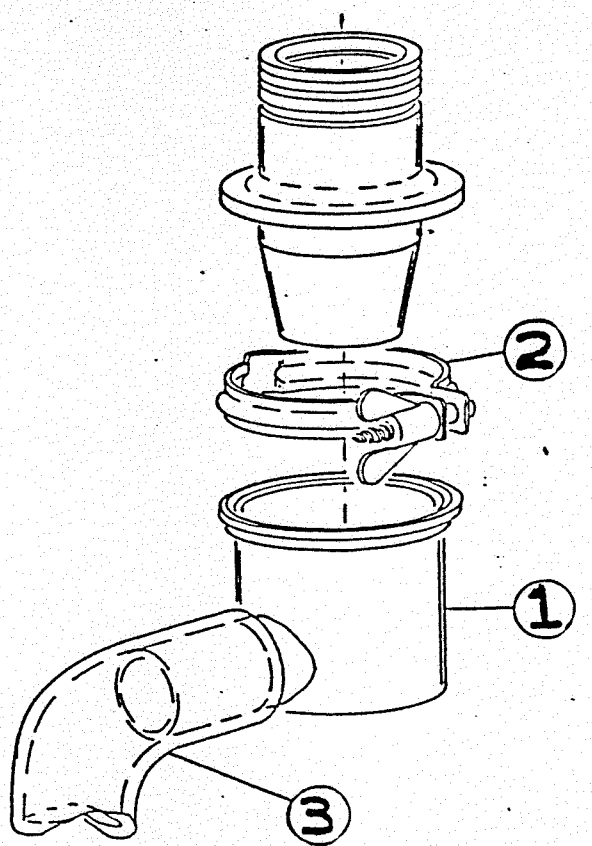
NO.: 85/002

DATE: 5 Feb 1985

NEW FILLER AUTO CLEANING MANIFOLD CUP

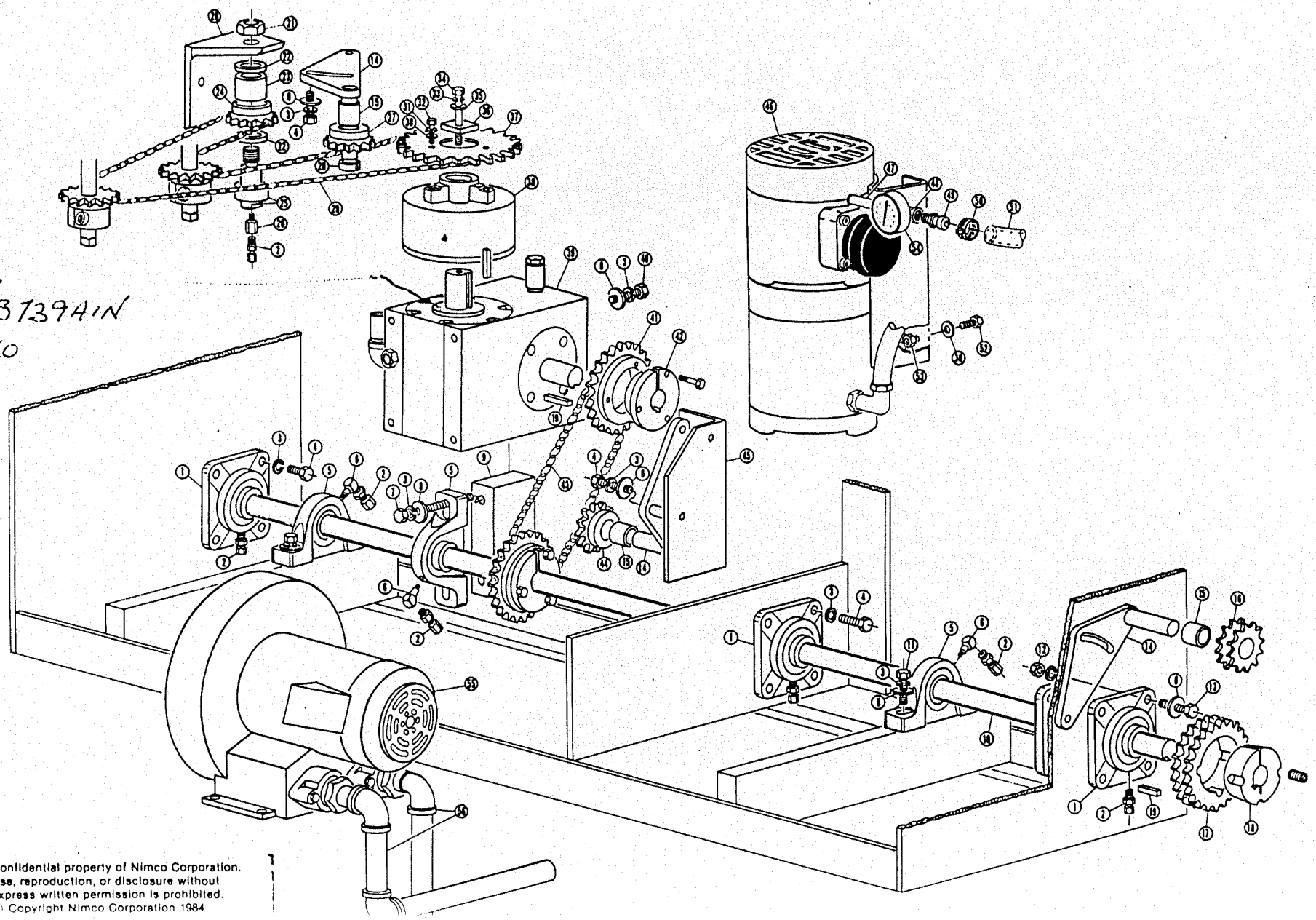
Now available. Cleaning Cup replaces cleaning trough. One cup is required for each filling valve.

Item No.	Part No.	Qty.	Description
1	2362	1	Manifold, Cleaning
2	SY008	1	Clamp
3	TU030	1	Tubing, 1 x 1-1/2



NIMCO Technical Sales Department

550Q FILLER TABLE MAIN SHAFT



L SEAL
25033739AIN
WYKO

550Q FILLER TABLE MAIN SHAFT PARTS LIST

ITEM	PART NO.	DESCRIPTION	QTY
1	BE320	Bearing, Flange, 1	4
2	FC211	Connector, 1/8 T x 1/8 MP	8
3	PW420	Washer, Lock, 3/8	30
4	PH408	Hex Head, 3/8 - 16 x 1	16
5	BE322	Bearing, Pillow, 1	3
6	FP610	Street Elbow, 1/8 FP x 1/4-28	3
7	PH424	Hex Head, 3/8 - 16 x 4½	2
8	PW410	Washer, Flat, 3/8	22
9	1065	Block, Bearing Support	1
10	0373	Shaft, Filler Drive	1
11	PH412	Hex Head, 3/8 - 16 x 1½	4
12	PN410	Nut, Hex, 3/8 - 16	4
13	PH416	Hex Head, 3/8 - 16 x 2	4
14	0022	Bracket, Idler	3
15	BE010	Oilite, 3/4 x 1 x 1	3
16	0389	Sprocket, Idler, D50B11	1
17	SP219	Sprocket, D50TLB20H	1
18	SP221	Bushing, 2012-1	1
19	1714	Key, Filler Shaft	3
20	0200	Bracket, Idler	1
21	PN930	Nut, Jam, 3/4 - 10	1
22	0193	Washer, Thrust	2
23	BE304	Bearing, Roller, MR-16	1
24	0194	Sprocket, Idler	1
25	BE401	Shaft, Idler #2	1
26	FP210	Extender, 1/8 FP x 1/4 - 28	1
27	SP108	Sprocket, 40B13-1	1
28	CL006	Collar, Shaft, 3/4	1

ITEM	PART NO.	DESCRIPTION	QTY
29	1809	Chain, Rail Sprocket Drive, #40	1
30	PW210	Washer, Flat, 1/4	7
31	PW220	Washer, Lock, 1/4	3
32	PH206	Hex Head, 1/4 - 20 x 3/4	3
33	PW320	Washer, Lock, 5/16	1
34	PH318	Hex Head, 5/16 - 18 x 2½	1
35	PW310	Washer, Flat, 5/16	1
36	1308	Plate, Clutch	1
37	1188	Sprocket, Drive, 40A36	1
38	DR350	Clutch, Overload, #60	1
39	DR040	Indexer, Filler, #350	1
40	PH410	Hex Head, 3/8 - 16 x 1¼	4
41	SP208	Sprocket, 50SDS20H	2
42	SP209	Bushing, SDS-1	2
43	1808	Chain, Filler, Index Drive, #50	1
44	SP201	Sprocket, 50B11-1	1
45	0192	Bracket, Idler	1
46	VA001	Vacuum Pump, 1/2 HP - 3 PH	1
47	FP132	Nipple, Galv, 1/4 x 3	1
48	FP733	Tee, Galv, 1/4 FP x 1/4 FP	1
49	FB153	Barb Ftg, 3/8 B x 1/4 MP	1
50	—	Clamp, Tubing, Vacuum	1
51	TU010	Tubing, Vacuum, 3/8	38
52	PH208	Hex Head, 1/4 - 20 x 1	4
53	PN240	Nut, Jam Stop, 1/4 - 20	4
54	VA040	Gauge, Vacuum	1
55	BL101	Defoamer, VFC301Z	1
56	1871	Manifold, Defoamer	1

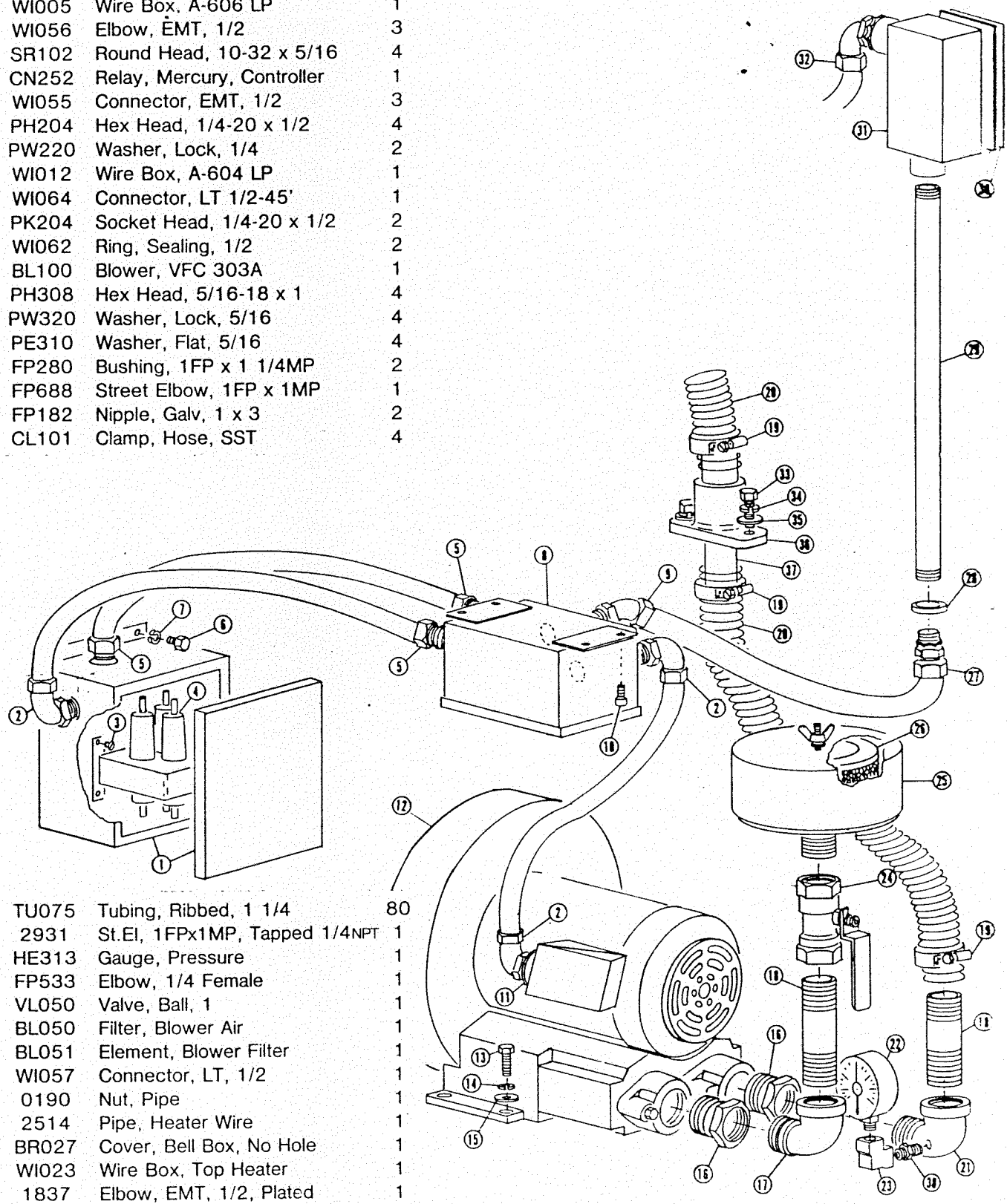
= 59 3/4 long

→ 30" + Con Link + 1/2 Link

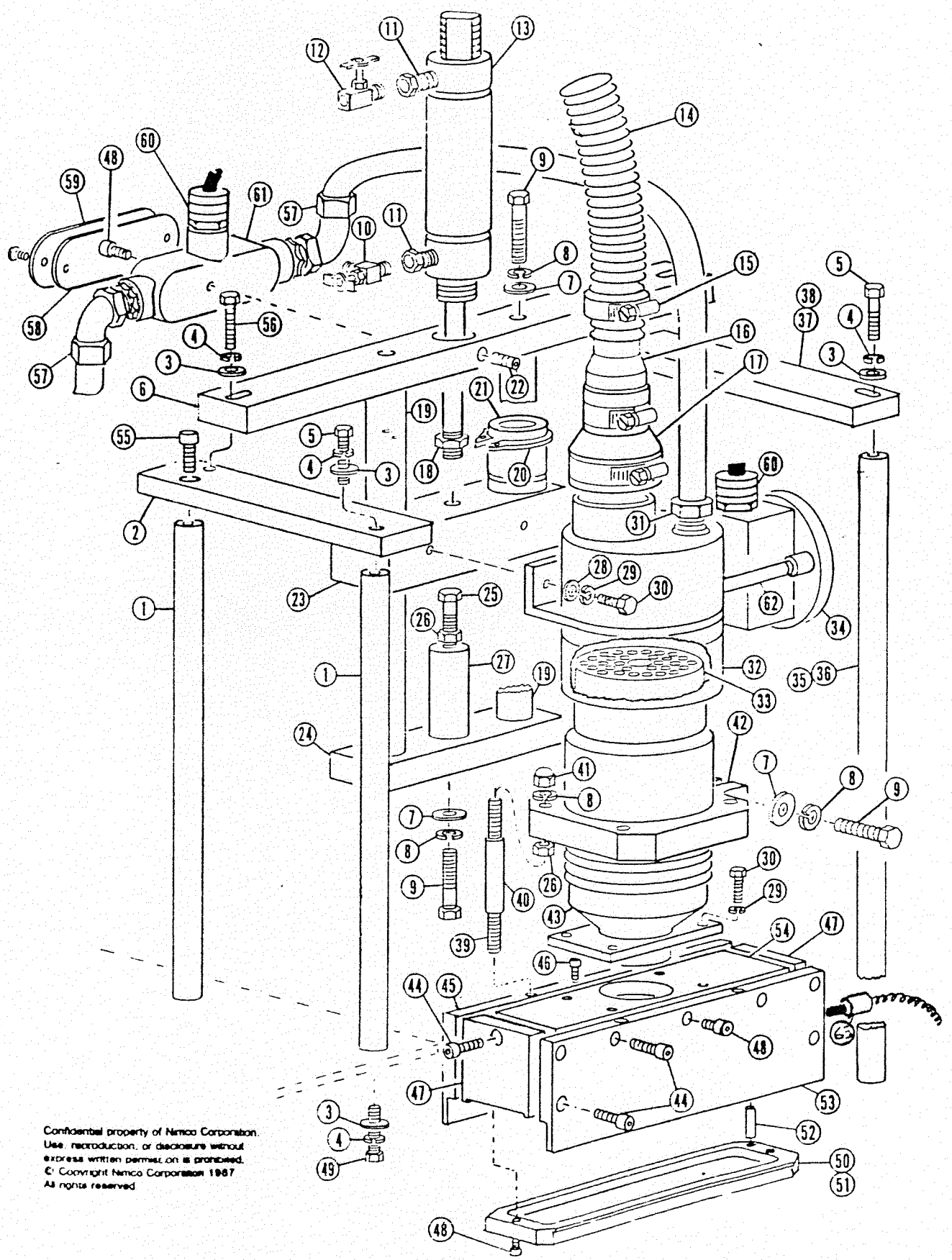
CAST ROTARY PUMP
1023-703 & CR76

ELECTRIC TOP HEATER PARTS LIST

ITEM	PART NO.	DESCRIPTION	QTY
1	WI005	Wire Box, A-606 LP	1
2	WI056	Elbow, EMT, 1/2	3
3	SR102	Round Head, 10-32 x 5/16	4
4	CN252	Relay, Mercury, Controller	1
5	WI055	Connector, EMT, 1/2	3
6	PH204	Hex Head, 1/4-20 x 1/2	4
7	PW220	Washer, Lock, 1/4	2
8	WI012	Wire Box, A-604 LP	1
9	WI064	Connector, LT 1/2-45'	1
10	PK204	Socket Head, 1/4-20 x 1/2	2
11	WI062	Ring, Sealing, 1/2	2
12	BL100	Blower, VFC 303A	1
13	PH308	Hex Head, 5/16-18 x 1	4
14	PW320	Washer, Lock, 5/16	4
15	PE310	Washer, Flat, 5/16	4
16	FP280	Bushing, 1FP x 1 1/4MP	2
17	FP688	Street Elbow, 1FP x 1MP	1
18	FP182	Nipple, Galv, 1 x 3	2
19	CL101	Clamp, Hose, SST	4
20	TU075	Tubing, Ribbed, 1 1/4	80
21	2931	St.El, 1FPx1MP, Tapped 1/4NPT	1
22	HE313	Gauge, Pressure	1
23	FP533	Elbow, 1/4 Female	1
24	VL050	Valve, Ball, 1	1
25	BL050	Filter, Blower Air	1
26	BL051	Element, Blower Filter	1
27	WI057	Connector, LT, 1/2	1
28	0190	Nut, Pipe	1
29	2514	Pipe, Heater Wire	1
30	BR027	Cover, Bell Box, No Hole	1
31	WI023	Wire Box, Top Heater	1
32	1837	Elbow, EMT, 1/2, Plated	1
33	SH408	Hex Head, 3/8 - 16 x 1	2
34	SW420	Washer, Lock, 3/8	2
35	SW410	Washer, Flat, 3/8	2
36	0221	Housing, Bearing	1
37	4918	Tube, Heater Hose, Top	1
38	FP133	Hex Nipple 1/4	1



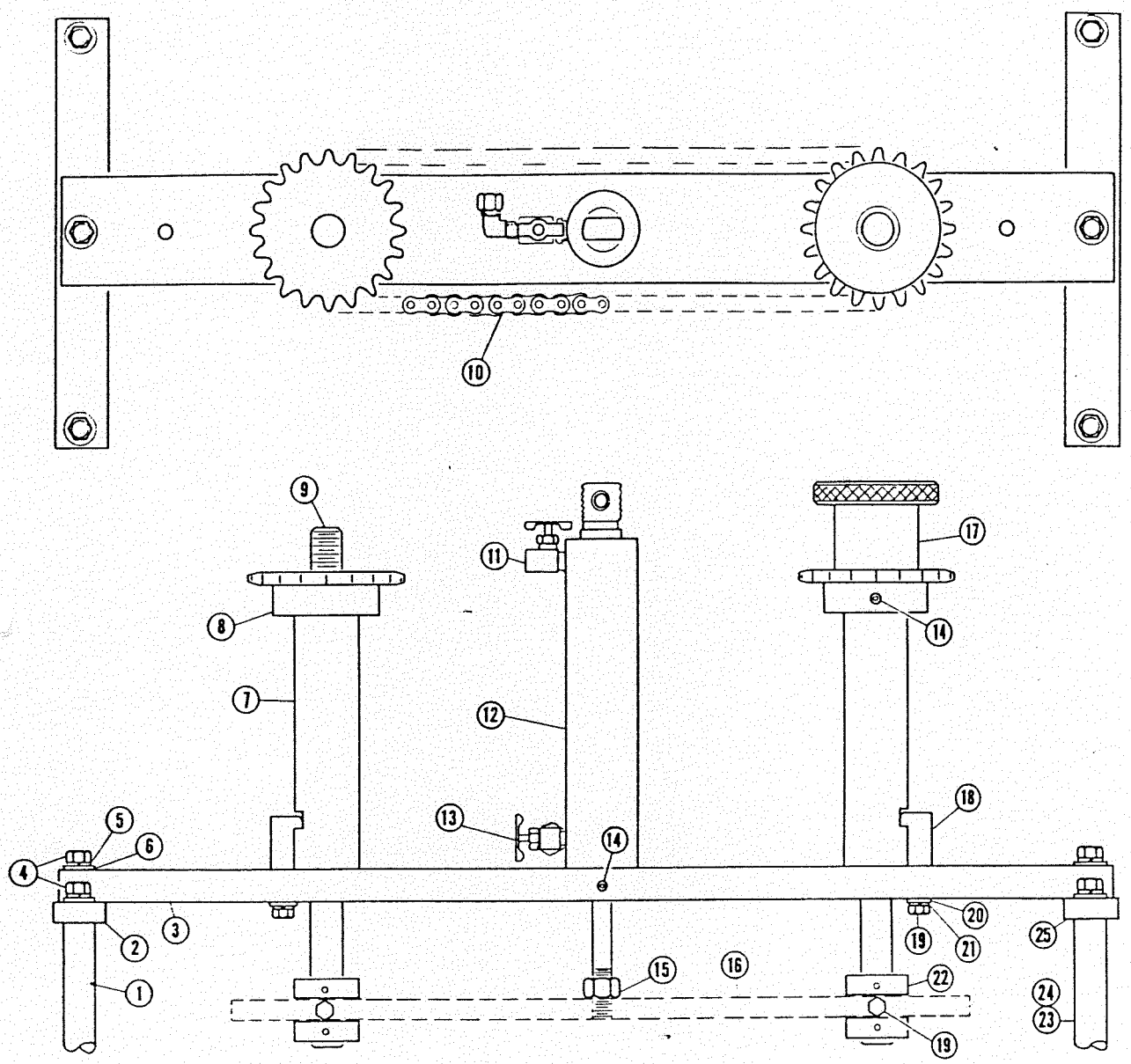
ELECTRIC TOP HEAT



ELECTRIC TOP HEAT PARTS LIST

ITEM	PART NO.	DESCRIPTION	QTY
1	2645	Post, Heater	2
2	2648	Bracket, Support	1
3	SW310	Washer, Flat, 5/16	6
4	SW320	Washer, Lock, 5/16	6
5	SH310	Hex Head, 5/16-18 x 1 1/4	2
6	SPK22	Bracket, Cylinder Mount	1
7	SW410	Washer, Flat, 3/8	6
8	SW420	Washer, Lock, 3/8	10
9	SH412	Hex Head, 3/8-16 x 1 1/2	6
10	FV631	Valve, Elbow, 1/4T x 1/8MP	1
11	FP213	Bushing, 1/8FP x 1/4MP	2
12	FV211	Pet Cock, 1/8	1
13	CY017	Cylinder, Air, 1 1/2 x 3.00	1
14	TU075	Tubing, ribbed, 1 1/4	106
15	CL101	Clamp, Hose, SST. No. 20	1
16	FP29A	Reducer, Plastic, 1 1/4 x 1 1/2	1
17	FP281	Reducer, Boot, 2 - 1 1/2	1
18	PN635	Nut, Jam, 1/2 - 20	1
19	2650	Shaft, Guide, Top Heater	2
20	SG019	Ring, Retaining	4
21	BE218	Duralon, 1 x 1.562 x 2.25	2
22	SC330	Set Screw, 5/16-18 x 3/4NY-TIP	1
23	2607	Block, Heater Slide	1
24	2651	Plate, Support	1
25	SH417	Hex Head, 3/8-16 x 2 1/4	1
26	SN410	Nut, Hex, 3/8-16	5
27	2652	Post, Cylinder Stop	1
28	SW210	Washer, Flat, 1/4	2
29	SW220	Washer, Lock, 1/4	6
30	SH206	Hex Head, 1/4-20 x 3/4	6
31	WI055	Connect, EMT, 1/2	1
32	HE310	Heater, Air, 10000W	1
*33	HE312	Element, Heater, 3x3150W-230V	1
34	CN255	Switch, Pressure	1
35	2646	Post, Heater	1
36	2667	Post, Heater	1
37	2726	Bracket, Support, Quart	1
38	2647	Bracket, Support, 1/2G	1
39	2642	Stud	4
40	2643	Spacer	4
41	SN420	Nut, Acorn Cap, 3/8-16	4
42	2644	Clamp, Heater, Top	1
43	2641	Venturi, Top Heater	1
44	SK208	Socket Head, 1/4-20 x 1	14
45	2797B	Plate, Rear	1
46	SK104	Socket Head, 10 32 x 1/2	1
47	2797D	Block, End	2
48	SK204	Socket Head, 1/4-20 x 1/2	4
49	SH314	Hex Head, 5/16-18 x 1 3/4	2
50	2833	Grate, DBL Top Heat, Quart	1
51	2834	Grate, DBL Top Heat, 1/2Gal	1
52	SL006	Roll Pin, 1/8 x 3/4 SST	1
53	2797A	Plate, Front	1
54	2797C	Plate, Bottom	1
55	SK306	Socket Head, 5/16-18 x 3/4	2
56	SH312	Hex Head, 5/16-18 x 1 1/2	2
57	1837	Elbow, EMT, 1/2, Plated	2
58	WI008	Gasket, 1/2 Unilet	1
59	WI009	Cover, 1/2 Unilet	1
60	WI060	Connector, CGB 1/2 x 3/8	2
61	WI006	Unilet, 1/2 Alum T	1
62	1444	Tube, Mandrel	1
63	CN253	Probe, Sensing, Controller	1
*	HE316	Element, Heater 3x3300W-380V	1
	HE317	Element, Heater 3x3300W-440V	1

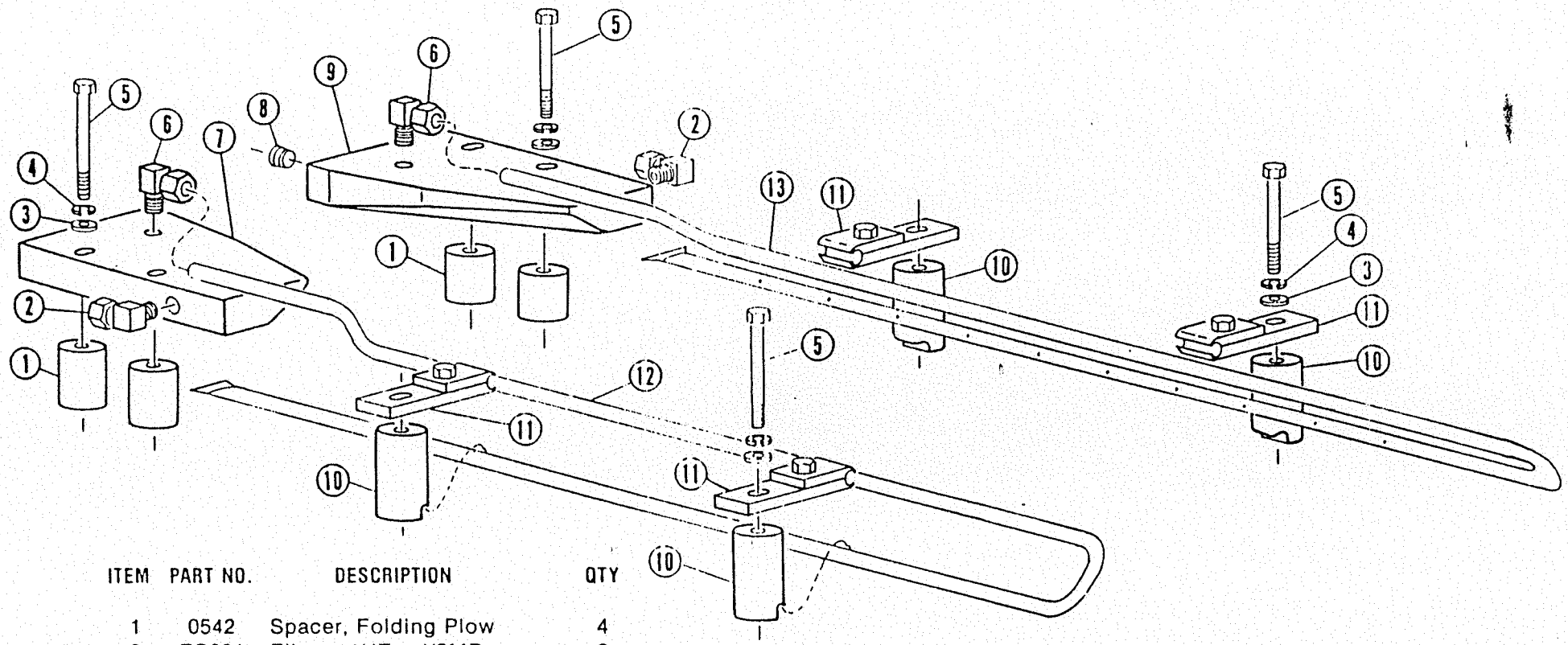
550QL TOP HEATER SUPPORT PARTS LIST



ITEM	PART NO.	DESCRIPTION	QTY
1	1202	Post, Heater	2
2	0413	Bar, Heater Support	1
3	0425	Bar, Heater Cylinder	1
4	SH310	Hex Head, 5/16 - 18 x 1-1/4	6
5	SW320	Washer, Lock, 5/16	6
6	SW310	Washer, Flat, 5/16	6
7	0268	Tube, Guide	2
8	0272	Sprocket, Heater Adjust	1
9	0271	Rod, Heater Adjust	2
10	0273	Chain, Heater Adjust	1
11	FV211	Pet Cock, 1/8	1
12	CY021	Cylinder, Air, 1-1/2 x 5	1
13	FV631	Valve, Elbow, 1/4 T x 1/8 MP	1

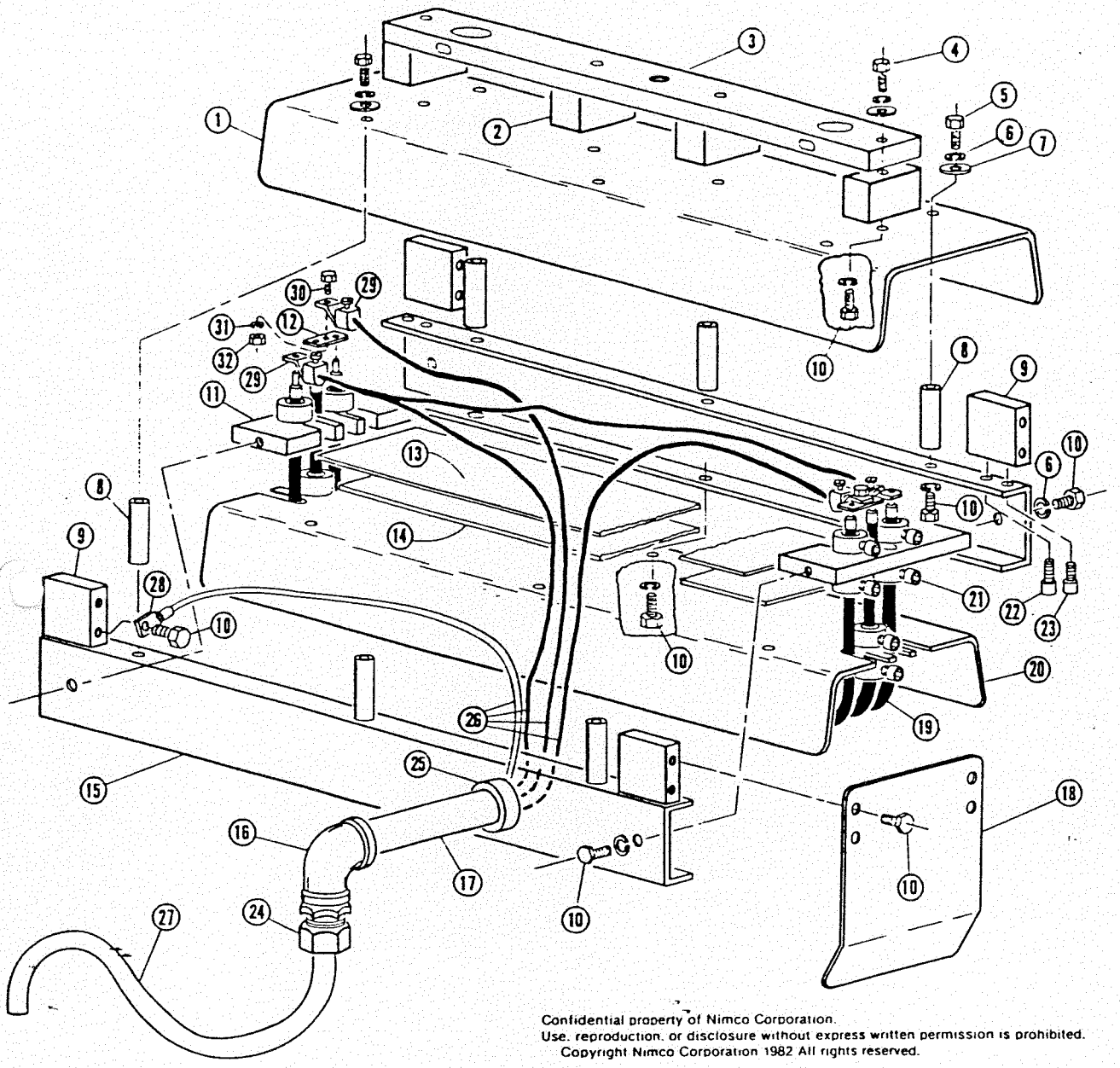
ITEM	PART NO.	DESCRIPTION	QTY
14	SC330	Set Screw, 5/16-18x3/4 NY-TIP	2
15	SN630	Nut, Jam, 1/2 - 13	1
16	0397	Bar, Heater Lift	1
17	0270	Sprocket, Heater Knob	1
18	1169	Clamp, Guide Tube	2
19	SH210	Hex Head, 1/4 - 20 x 1-1/4	4
20	SW210	Washer, Flat, 1/4	2
21	SW220	Washer, Lock, 1/4	2
22	CL006	Collar, Shaft, 3/4	4
23	0398	Post, Heater, Front	1
24	1201	Post, Heater, Rear	1
25	0414	Bar, Heater Support	1

550QL COOLING TUBES AND PLOWS PARTS LIST



ITEM	PART NO.	DESCRIPTION	QTY
1	0542	Spacer, Folding Plow	4
2	FC631	Elbow, 1/4T x 1/8MP	2
3	SW210	Washer, Flat, 1/4	8
4	SW220	Washer, Lock, 1/4	8
5	SH217	Hex Head, 1/4-20 x 2-1/4	8
6	FC641	Elbow, 5/16T x 1/8MP	2
7	4157	Plow, Front	1
8	PPS21	Pipe Plug, Socket, 1/8	2
9	4156	Plow, Rear	1
10	1108	Spacer, Tube Clamp	4
11	4155	Clamp, Cooling Tube	4
12	1480	Tube, Cooling, Front	1
13	1481	Tube, Cooling, Rear	1

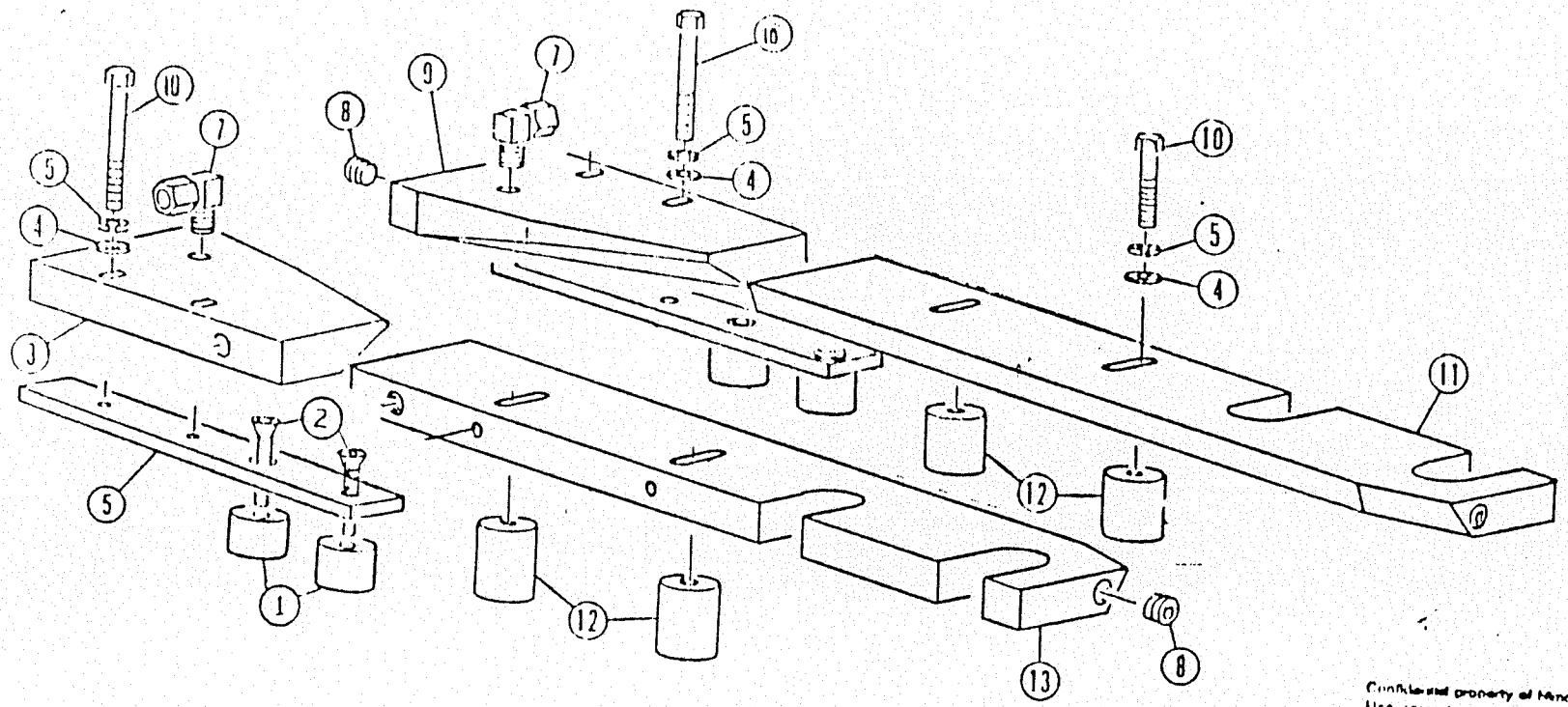
550QL TOP HEATER PARTS LIST



ITEM	PART NO.	DESCRIPTION	QTY
1	0423	Cover, Heater	1
2	0269	Block, Heater	4
3	0397	Bar, Heater Lift	1
4	SH208	Hex Head, 1/4 - 20 x 1	4
5	SH205	Hex Head, 1/4 - 20 x 5/8	6
6	SW220	Washer, Lock, 1/4	30
7	SW210	Washer, Flat, 1/4	10
8	0426	Post, Heater Spacer	6
9	0401	Spacer, Heater	4
10	SH204	Hex Head, 1/4 - 20 x 1/2	29
11	0407	Block, Support, Heater	2
12	0391	Connector, Heater	2
13	0399	Insulator, Heater	1
14	0411	Insulator, Heater	1
15	0410	Channel, Heater	2
16	1216	Elbow, 1/2" Plated Pipe	1

ITEM	PART NO.	DESCRIPTION	QTY
17	1130	Pipe, Top Heater	1
18	0400	Skin, Heater End	2
19	0404	Heater, Tubular, 230V	3
20	0412	Deflector, Heater	1
21	1492	Collar, Heater	12
22	SK204	Socket Head, 1/4 - 20 x 1/2	4
23	SK203	Socket Head, 1/4 - 20 x 3/8	4
24	1264	Connector, LT, 1/2" Pltd	1
25	0190	Nut, Pipe	1
26	WI110	Wire, #10 Heater [IN]	408
27	WI050	Liquid-Tight, 3/8 [IN]	26
28	WI178	Terminal, Compression, 1/4	1
29	WI176	Terminal, Lug-It Clamp	4
30	SH103	Hex Head, 10-32 x 3/8	2
31	SW120	Washer, Lock, #10	2
32	SN110	Nut, Hex, 10-32	2

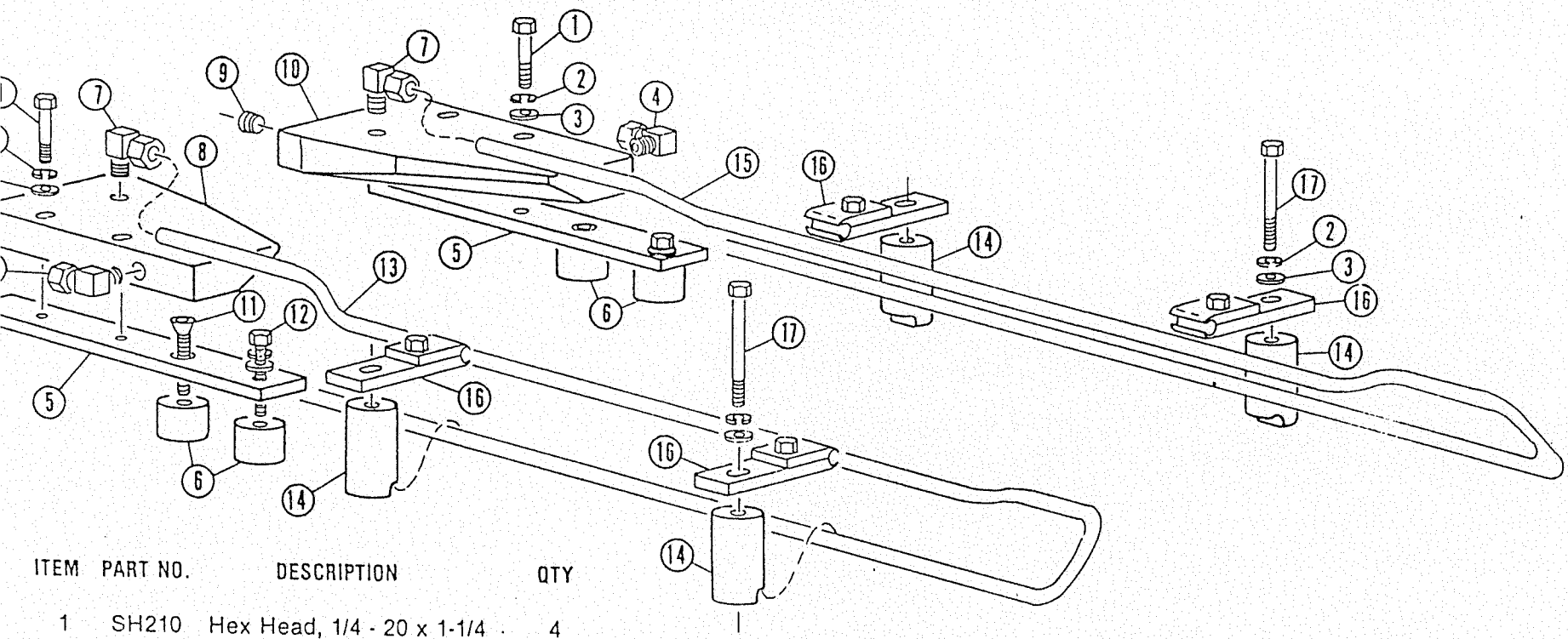
COOLING TUBES AND PLOWS PARTS LIST



EM	PART NO.	DESCRIPTION	QTY
1	3088	Spacer, Folding Plow	4
2	SF212	Flat Head, 1/4-20 x 1 1/2	4
3	4157	Plow, Front	1
4	SW210	Washer, Flat, 1/4	8
5	SW220	Washer, Lock, 1/4	8
6	3089	Support, Folding Plow	2
7	FC631	Elbow, 1/4T x 1/8MP	6

ITEM	PART NO.	DESCRIPTION	QTY
8	PPS21	Pipe Plug, Socket, 1/8	6
9	4156	Plow, Rear	1
10	SH210	Hex Head, 1/4-20 x 1 1/4	8
11	2799	Plow, Rear	1
12	2720	Spacer, Folding Plow	4
13	2798	Plow, Front	1

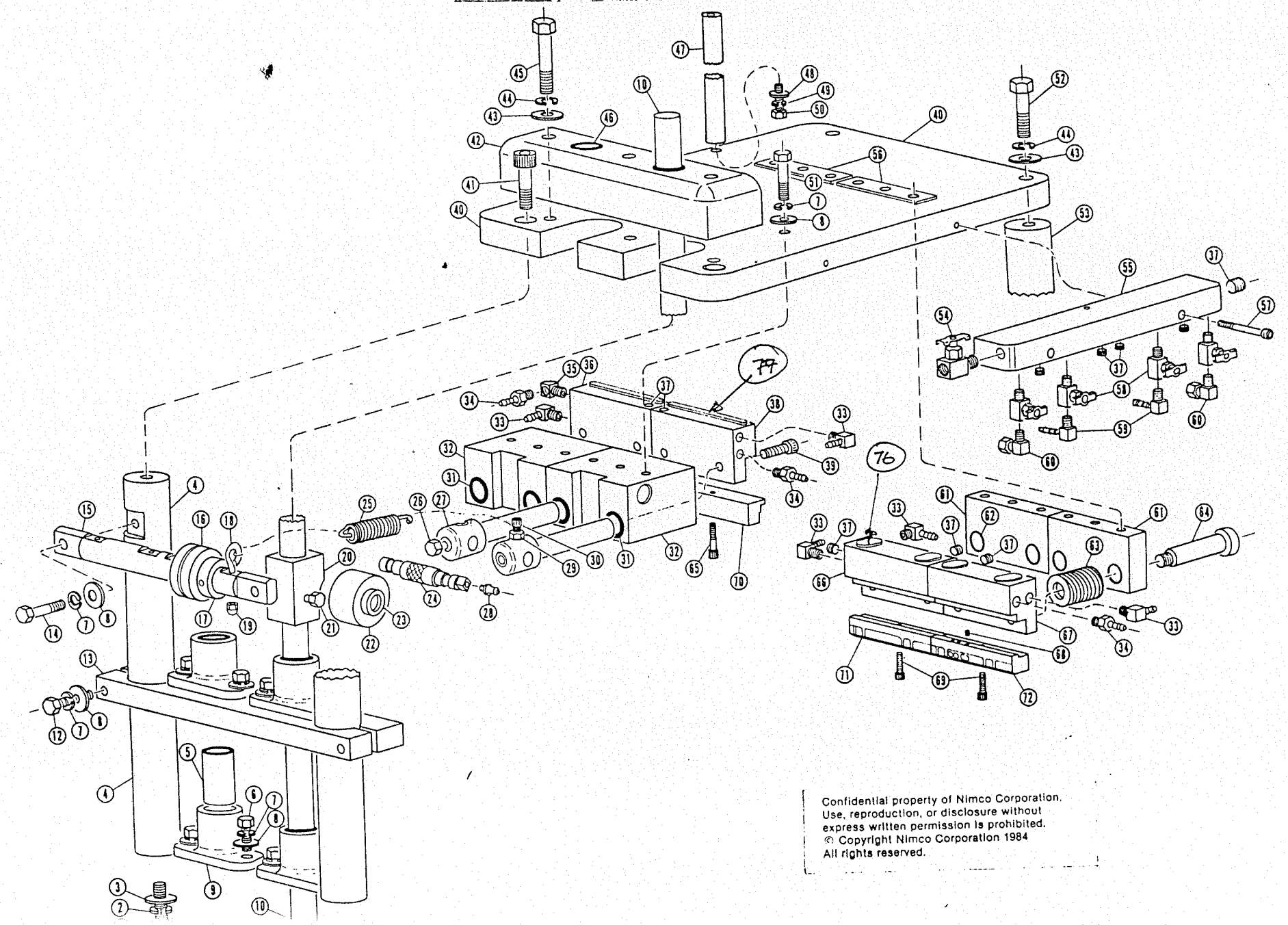
250Q COOLING TUBES & PLOWS PARTS LIST



ITEM	PART NO.	DESCRIPTION	QTY
1	SH210	Hex Head, 1/4 - 20 x 1-1/4	4
2	SW220	Washer, Lock, 1/4	10
3	SW210	Washer, Flat, 1/4	10
4	FC631	Elbow, 1/4 T x 1/8 MP	2
5	3089	Support, Folding Plow	2
6	3088	Spacer, Folding Plow	4
7	FC641	Elbow, 5/16 T x 1/8 MP	2
8	4157	Plow, Front	1
9	PPS21	Pipe Plug, Socket, 1/8	2
10	4156	Plow, Rear	1
11	SF212	Flat Head, 1/4 - 20 x 1-1/2	2
12	SH212	Hex Head, 1/4 - 20 x 1-1/2	2

ITEM	PART NO.	DESCRIPTION	QTY
13	1480	Tube, Cooling, Front	1
14	1108	Spacer, Tube Clamp	4
15	1481	Tube, Cooling, Rear	1
16	4155	Clamp, Cooling Rod	4
17	SH217	Hex Head, 1/4 - 20 x 2-1/4	4

550Q TOP SEAL TOP HALF

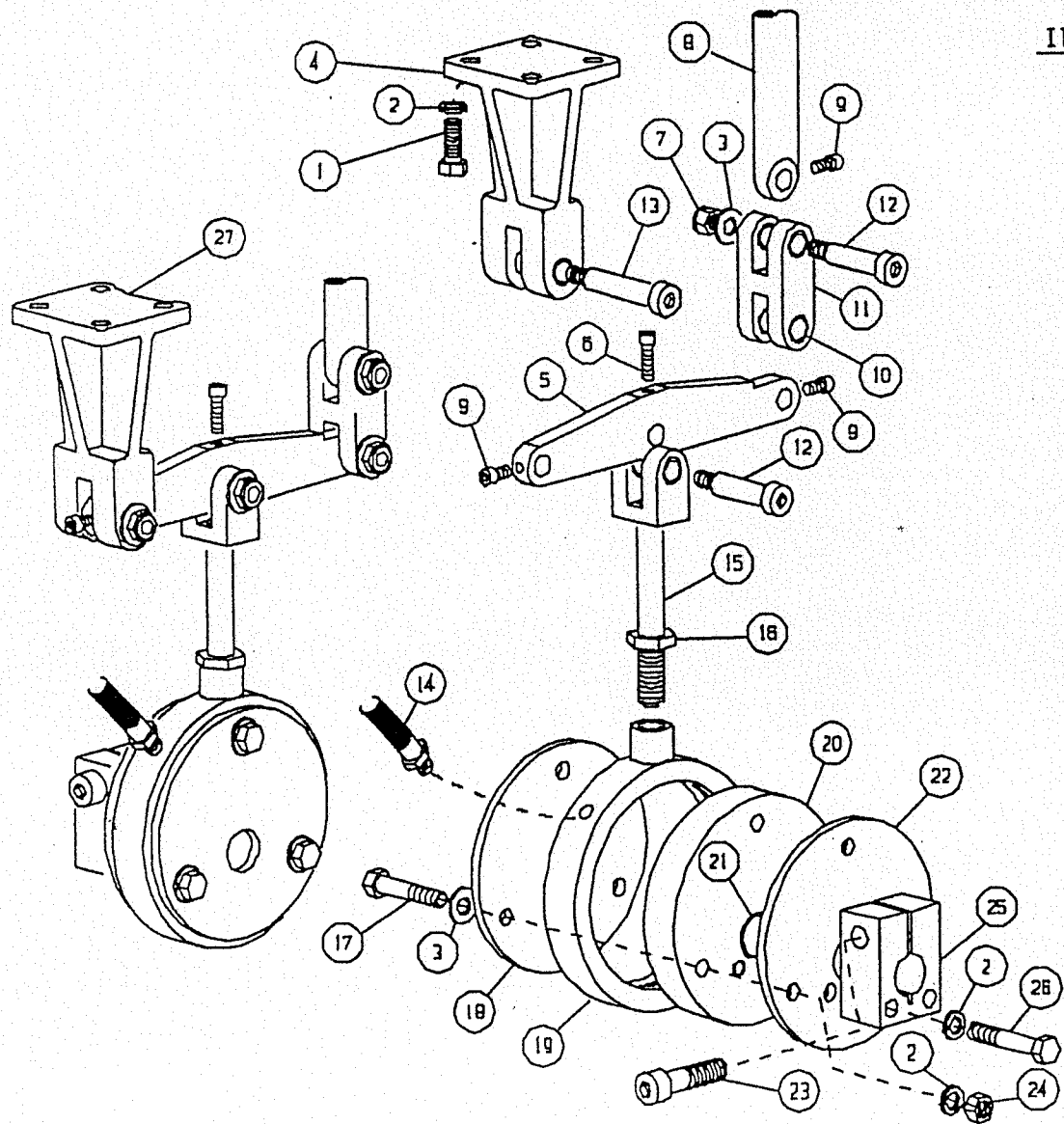


550Q TOP SEAL TOP HALF PARTS LIST

ITEM	PART NO.	DESCRIPTION	QTY
1	PH614	Hex Head, 1/2-13 x 1 3/4	4
2	PW620	Washer, Lock, 1/2	4
3	PW610	Washer, Flat, 1/2	4
4	1143	Post, Seal Plate, Rear	2
5	BE216	Duralon, 1 x 1 1/4 x 2	4
6	SH408	Hex Head, 3/8-16 x 1	8
7	SW420	Washer, Lock, 3/8	24
8	SW410	Washer, Flat, 3/8	24
9	0221	Housing, Bearing	4
10	1142	Shaft, Seal	2
11	SK204	Socket Head, 1/4-20 x 1/2	2
12	SH416	Hex Head, 3/8-16 x 2	2
13	1133	Clamp, Seal Post	1
14	SH412	Hex Head, 3/8-16 x 1 1/2	2
15	1132	Bar, Guide Bearing	1
*16	BE307	Bearing, Roller, KP16A	4
17	CL007	Collar, Shaft, 1	4
18	PE208	Eyebolt, 1/4-20 x 1	4
19	SN220	Nut, Acorn, 1/4-20 Hi Crown	4
20	0416	Cam, Seal	2
21	SH303	Hex Head, 5/16-18 x 3/8	4
22	BE317	Roller, Cam, 2"	2
*23	1164	Collar, Eccentric Shaft	4
24	0427	Shaft, Seal Eccentric	2
25	SG005	Spring, Extension, 3 3/8	4
26	SH306	Hex Head, 5/16-18 x 3/4	4
*27	1141	Plunger, Seal	4
28	FG105	Zerk, 1/4 - 28 x Straight	2
29	SN310	Nut, Hex, 5/16-18	4
30	SK306	Socket Head, 5/16-18 x 3/4	4
*31	BE214	Duralon 3/4 x 1 x 1 1/2	8
32	1135	Block, Plunger Bearing	2
33	FB531	Barb Elbow, 1/4B x 1/8MP	5
34	FB131	Barb FTG, 1/4B x 1/8MP	3
35	FP611	Street Elbow, 1/8FP x 1/8MP	1
36	1162	Block, Moving Jaw	1
37	PPS21	Pipe Plug, Socket, 1/8	10
38	0421	Block, Moving Jaw	1
39	SK408	Socket Head, 3/8-16 x 1	4
40	1131	Plate, Top Seal	1
41	SK610	Socket Head, 1/2-13 x 1 1/4	2
42	1134	Block, Shaft Bearing	1
43	SW610	Washer, Flat, 1/2	5
44	SW620	Washer, Lock, 1/2	5
45	SH620	Hex Head, 1/2-13 x 3	3
46	BE216	Duralon, 1 x 1 1/4 x 2	2
47	1202	Post, Heater	2
48	SW310	Washer, Flat, 5/16	2
49	SW320	Washer, Lock, 5/16	2
50	SH314	Hex Head, 5/16-18 x 1 3/4	2
51	SH414	Hex Head, 3/8-16 x 1 3/4	12
52	SH616	Hex Head, 1/2-13 x 2	2
53	1144	Post, Seal Plate, Front	2
54	FV233	Pet Cock, 1/4	1
55	0265	Manifold, Water	1
56	2360	Cover, Top Seal	1
57	SK217	Socket Head, 1/4-20 x 2 1/4	2
58	FV211	Pet Cock, 1/8	4
59	FB531	Barb Elbow, 1/4B x 1/8MP	2
60	FC631	Elbow, 1/4T x 1/8MP	2
*61	0417	Block, Seal Spring	2
62	BE006	Oilite, 5/8 x 3/4 x 1	4
*63	0283	Spring, Seal	4
*64	1091	Bolt, Seal Spring	4
65	SK207	Socket Head, 1/4-20 x 7/8	2
66	1163	Block, Stationary Jaw	1
67	0420	Block, Stationary Jaw	1
68	SC102	Set Screw, 10-32 x 1/4	3
69	SK206	Socket Head, 1/4-20 x 3/4	2
70	0424	Jaw, Moving, Quart	2
71	1203	Jaw, Quart	1
72	0419	Jaw, Code, Quart	1
73	0799	Jaw, Moving, 1/2 Gal	2
74	1256	Jaw, 1/2 Gal	1
75	1073	Jaw, Code, 1/2 Gal	1

WEAR PADS *76 0420B
*77 0421B

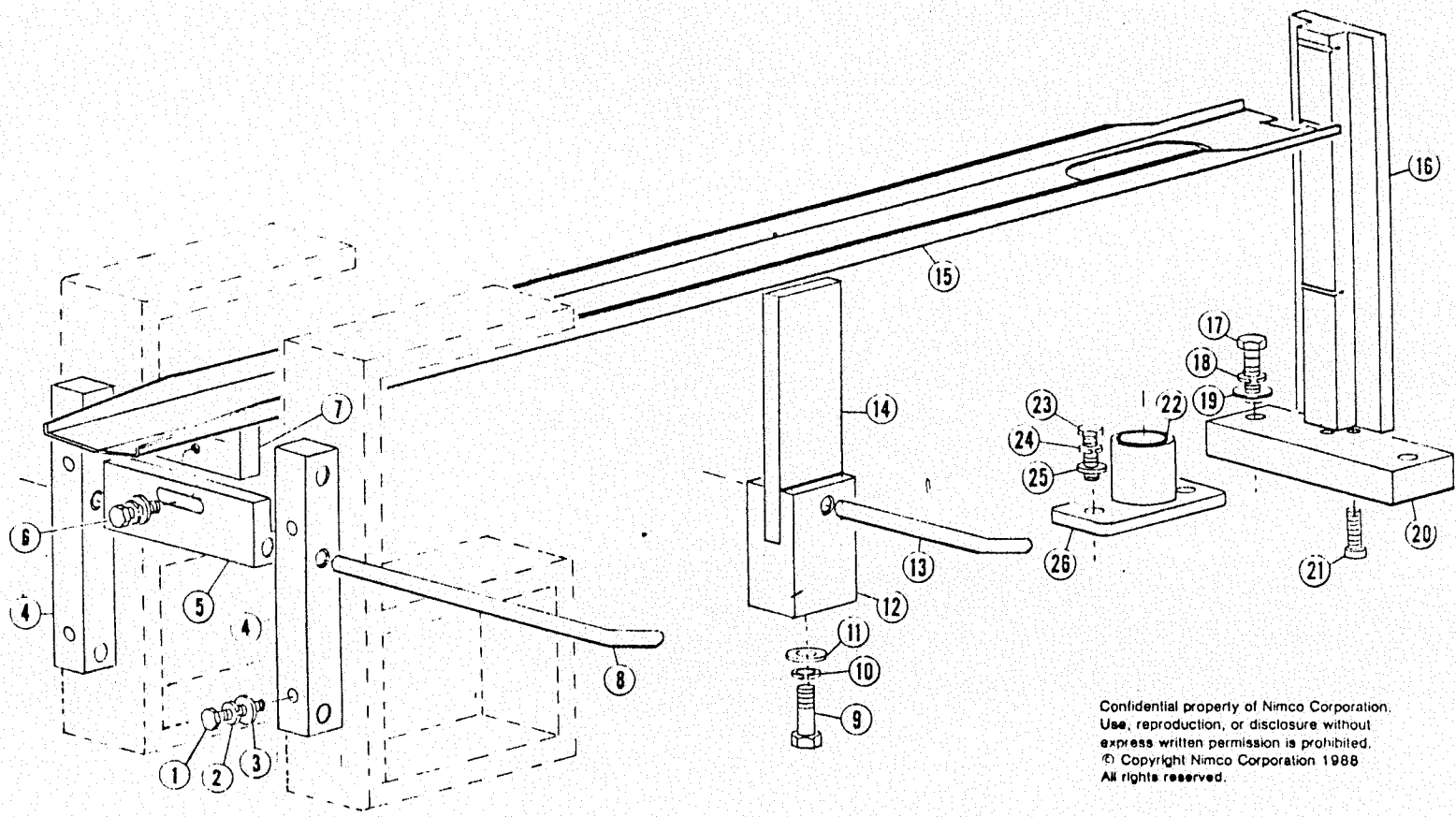
650QLCP TOP SEAL LOWER HALF PARTS LIST



ITEM	PART NO	DESCRIPTION	QTY
1	PH408	Hex Hd,3/8-16 x 1	8
2	PW420	Washer,Lock,3/8	18
3	PW410	Washer,Flat,3/8	14
4	0224	Bracket,Pivot Arm	1
5	1140	Lever,Seal	2
6	PK208	Soc Hd,1/4-20 x 1	2
7	PN440	Nut,Jam,3/8-16	8
8	1142	Shaft,Seal	2
9	PK204	Soc Hd,1/4-20 x 1/2	6
10	BE018	Ironite,1/2 x 5/8 x 1/2	16
11	0220	Clevis	2
12	0279	Stripper,PLTD,1/2 x 1-1/2	6
13	0280	Stripper,PLTD,1/2 x 2	2
14	1900	Hose,Grease,10-1/2	2
15	0223	Yoke,Top Seal	2
16	PNB30	Nut,Jam,5/8-11	2
17	PH416	Hex Hd,3/8-16 x 2	6
18	0368	Plate,Retainer,F-7/16	2
19	0212	Housing,Cam	2
20	0369	Can,Eccentric,7/16	2
21	BE011	Oilite,1 x 1-1/8 x 1	2
22	0367	Plate,Retainer,R-7/16	2
23	PK616	Soc Hd,1/2-13 x 2	2
24	PN410	Nut,Hex,3/8-16	6
25	0366	Clamp,Can	2
26	PH417	Hex Hd,3/8-16 x 2-1/4	4
27	2361	Bracket,Pivot Arm	1

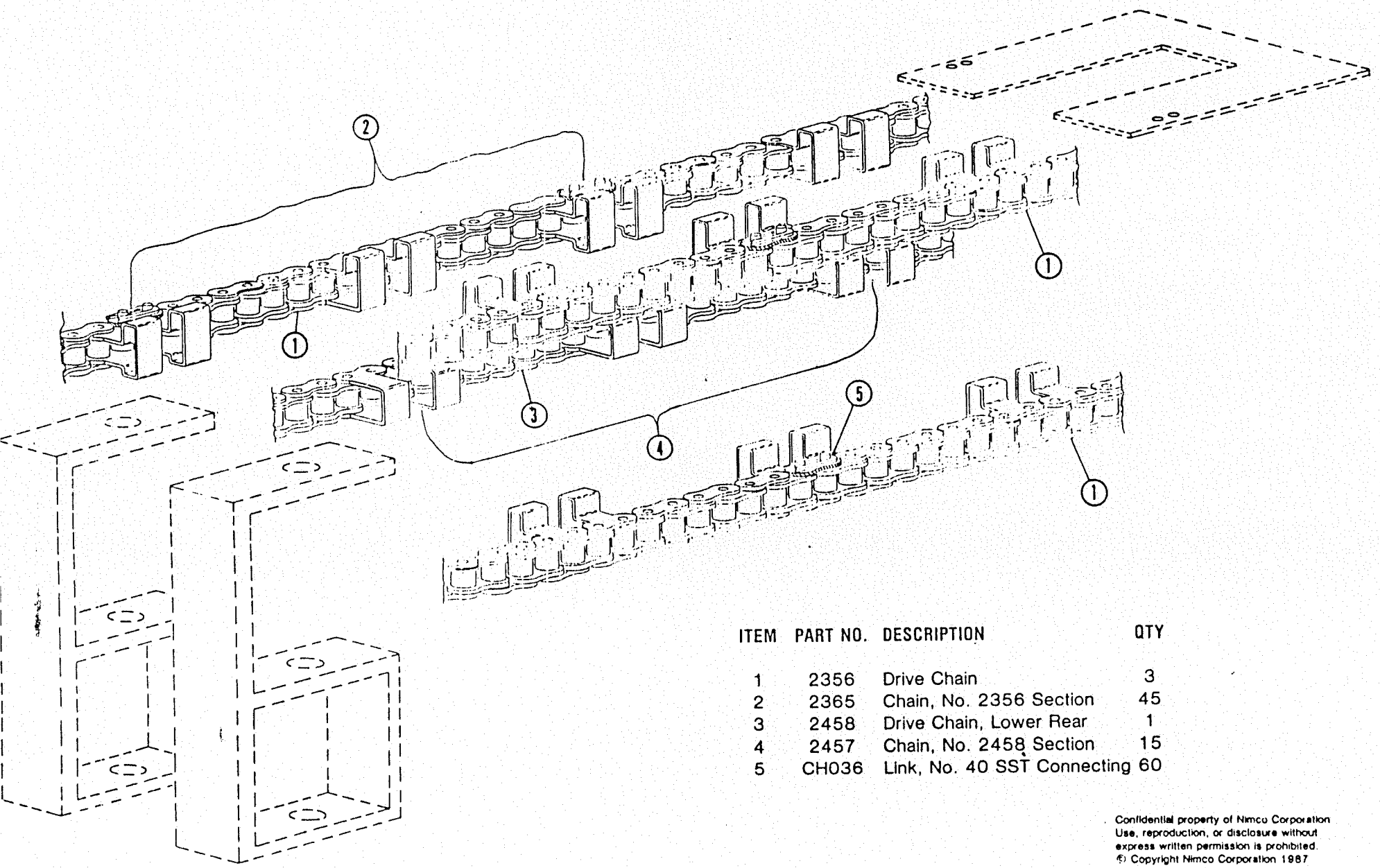
MAN\650QLCP\166A

550QIL BOTTOM RAIL PARTS LIST



ITEM	PART NO.	DESCRIPTION	QTY
1	SH212	Hex Head, 1/4 - 20 x 1-1/2	4
2	SW220	Washer, Lock, 1/4	5
3	SW210	Washer, Flat, 1/4	5
4	1800	Block, Rail Adjust, Britain	2
5	0381	Clamp, Rail	1
6	SH208	Hex Head, 1/4 - 20 x 1	1
7	0198	Block, Bottom Rail	1
8	0374	Pin, Rail	1
9	PH412	Hex Head, 3/8 - 16 x 1-1/2	1
10	PW420	Washer, Lock, 3/8	1
11	PW410	Washer, Flat, 3/8	1
12	0380	Block, Rail Spacer	1
13	0372	Pin Locking	1
14	1694	Spacer, Rail, Imperial Pint	1
—	1695	Spacer, Rail, Imperial 1/2 Pint	1
—	1826	Spacer, Rail, 1 Liter-Britain	1
—	1827	Spacer, Rail, 1/2 Liter-Britain	1
—	1267	Spacer, Rail, 1/4 Liter-Britain	1
15	0379	Rail, Bottom	1
16	1799	Support, Bottom Rail, Britain	1
17	SH412	Hex Head, 3/8 - 16 x 1-1/2	2
18	SW420	Washer, Lock, 3/8	2
19	SW410	Washer, Flat, 3/8	2
20	0375	Plate, Rail Adjust	1
21	SK308	Socket Head, 5/16 - 18 x 1	2
22	BE202	Bostone, 1 x 1.25 x 2	1
23	SH308	Hex Head, 5/16 - 18 x 1	2
24	SW320	Washer, Lock, 5/16	2
25	SW310	Washer, Flat, 5/16	2
26	1954	Housing, Bearing	1

550QL DRIVE CHAINS PARTS LIST



ITEM	PART NO.	DESCRIPTION	QTY
1	2356	Drive Chain	3
2	2365	Chain, No. 2356 Section	45
3	2458	Drive Chain, Lower Rear	1
4	2457	Chain, No. 2458 Section	15
5	CH036	Link, No. 40 SST Connecting	60

VARIOPAK

Memo referring to service-report number.....

(for internal use only)

PRESS + HOLD 'UP' AND 'DOWN' KEY UNIT 'LOC' APPEARS.
PRESS 'MODE' KEY UNTIL

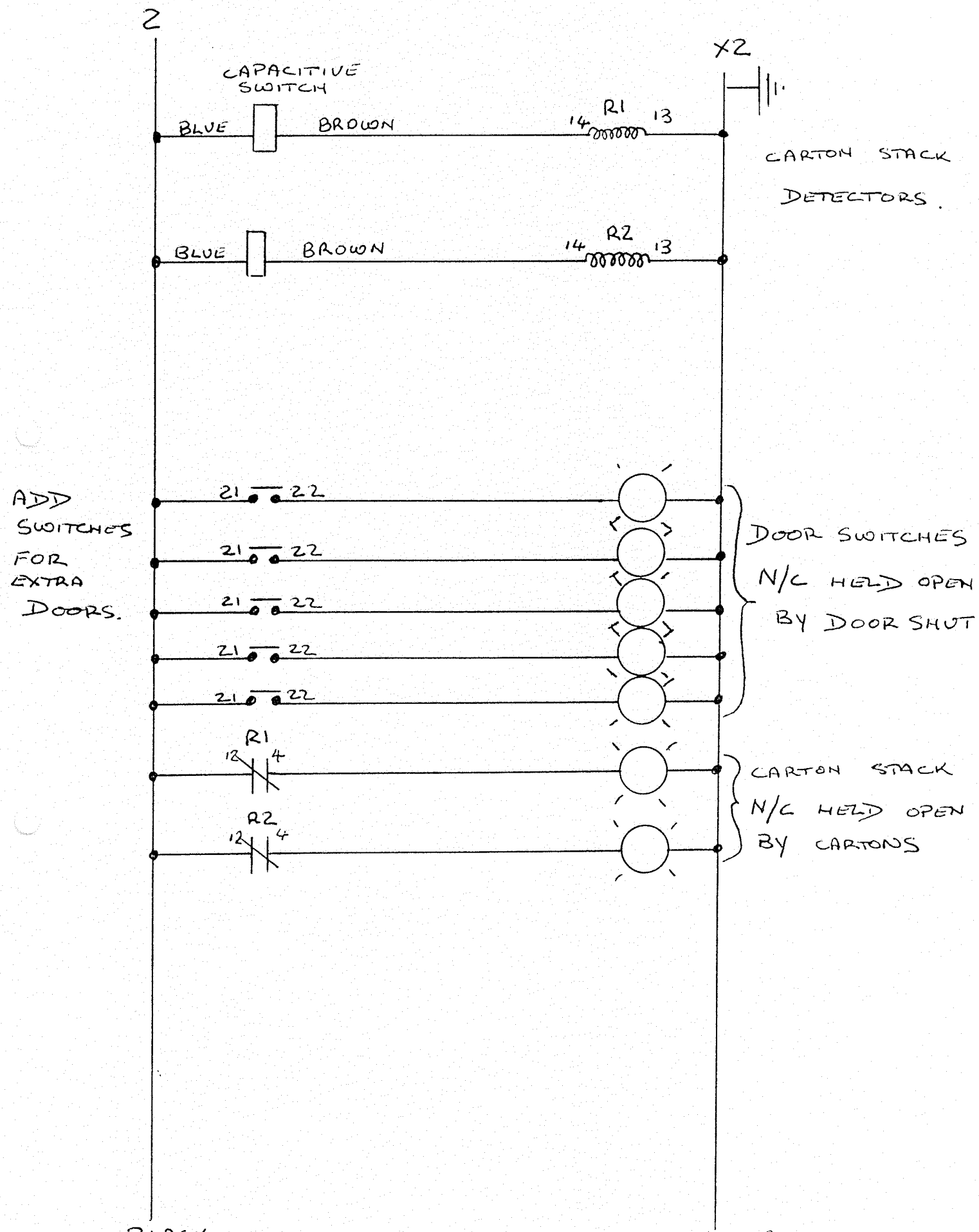
		SET
'LOC'	=	0 IF 'CAL' WAIT 1 MIN.
THERMOCOUPLE	=	J
C-F	=	C
r L	=	0
r H	=	600
OT1	=	ht
HSC-HYS	=	2
OT2 -ALT	=	dE
HSA -LAt	=	NLA
SIL	=	OFF

WAIT 1 MIN
SET DESIRED TEMP. STEP ON WITH 'MODE' KEY TO

OT1	=	2
ALO	=	−10
AHI	=	+10
CAL	=	0
AUT	=	3

TURN ON HEATER AND PRESS 'MODE' 'AT' WILL FLASH AND TEMP RISE + FALL UNTIL FLASHING STOPS
PRESS + HOLD 'UP' AND 'DOWN' KEYS UNTIL 'LOC' APPEARS AND SET AT 2
PRESS 'MODE' TO RETURN TO TEMP AND TEMP SETTING DISPLAY.

Date:


Z
X2
CAPACITIVE SWITCH
BLUE
BROWN
14
R1
13
CARTON STACK DETECTORS.
BLUE
BROWN
14
R2
13
ADD SWITCHES FOR EXTRA DOORS.
21
22
21
22
21
22
21
22
21
22
DOOR SWITCHES N/C HELD OPEN BY DOOR SHUT
R1
12
4
R2
12
4
CARTON STACK N/C HELD OPEN BY CARTONS
BLACK.
YELLOW

DOOR SWITCHES N/O TERMS 33+34
HELD CLOSED BY DOOR SHUT

ADD SWITCHES FOR
EXTRA DOORS

R1 5 9 N/O CAPACITIVE SWITCHES TO DETECT CARTON STACK IN MAGAZINE

R2 5 9 N/O HELD CLOSED CARTONS IN PLACE

N KED WIRE
Nº2

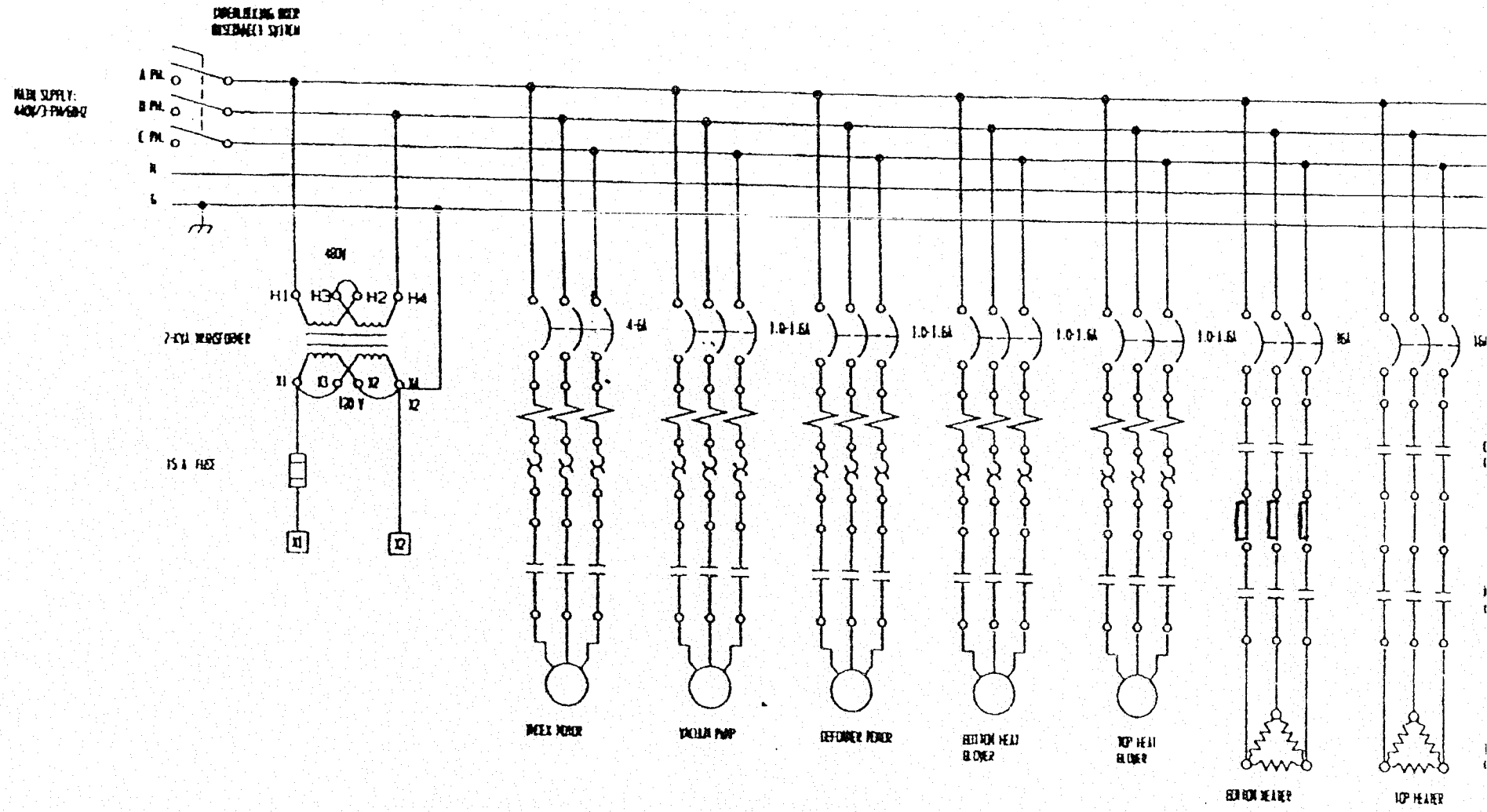
BLUE

5

BROWN OR MARKED CABLE Nº3

10

STOP CIRCUIT
IN PANEL
MAIN MOTOR
CONTACTOR

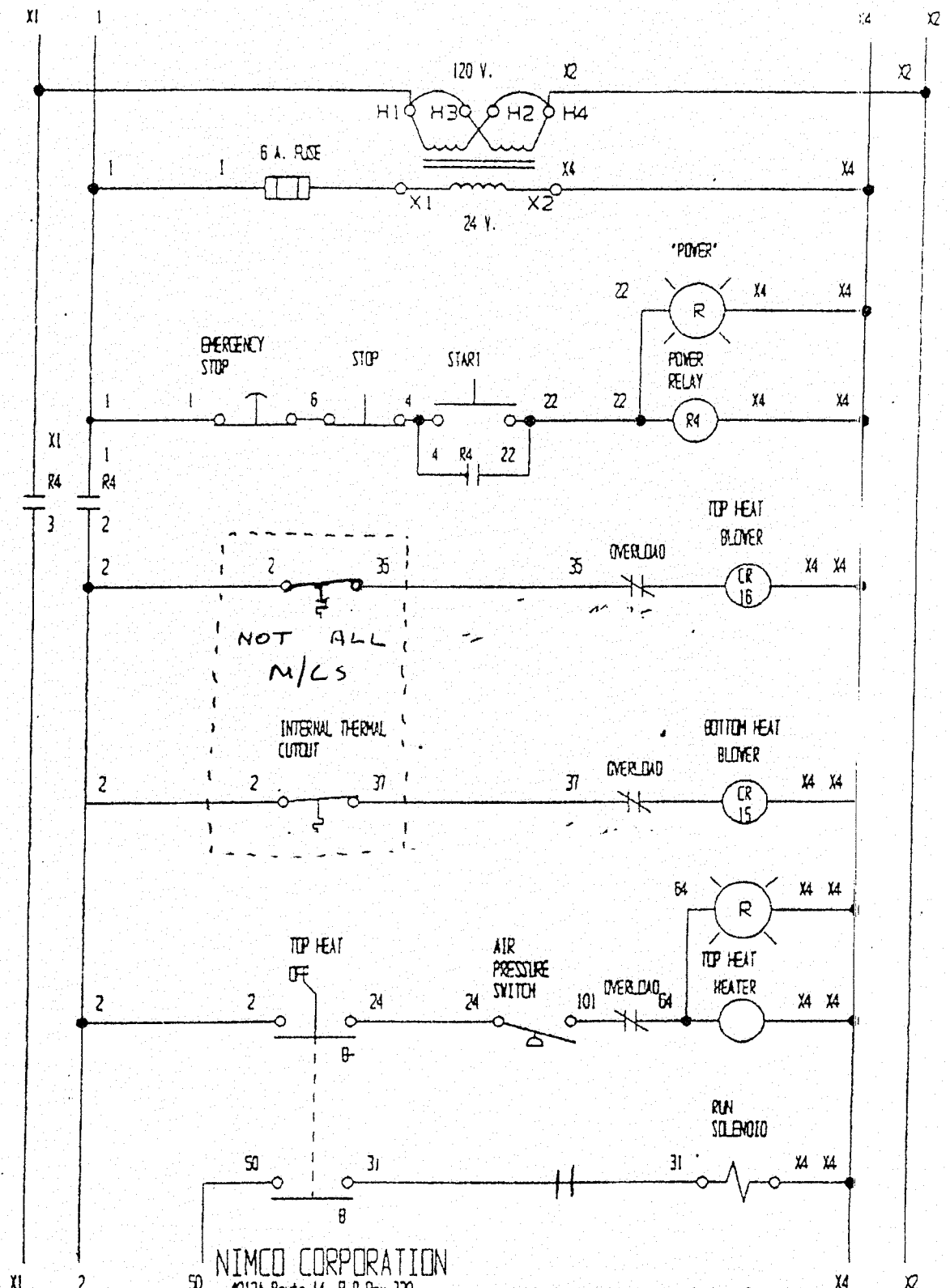


NIMCO CORPORATION

OVERLOAD> NOT FAST ENOUGH TO PROTECT HEATER WATLOW S 20A QR FUSE.

SH 1 of 9

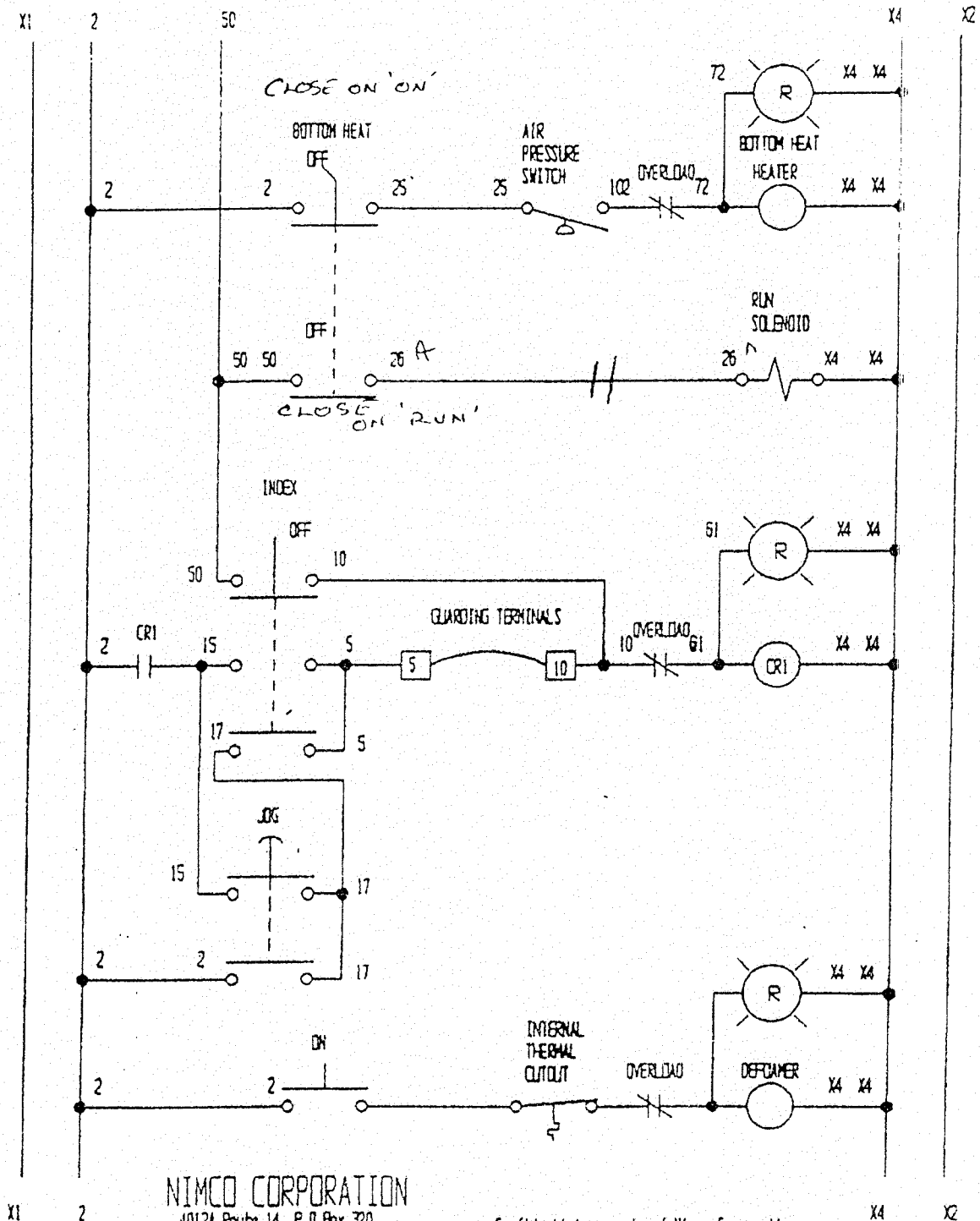
STH 2 of 6



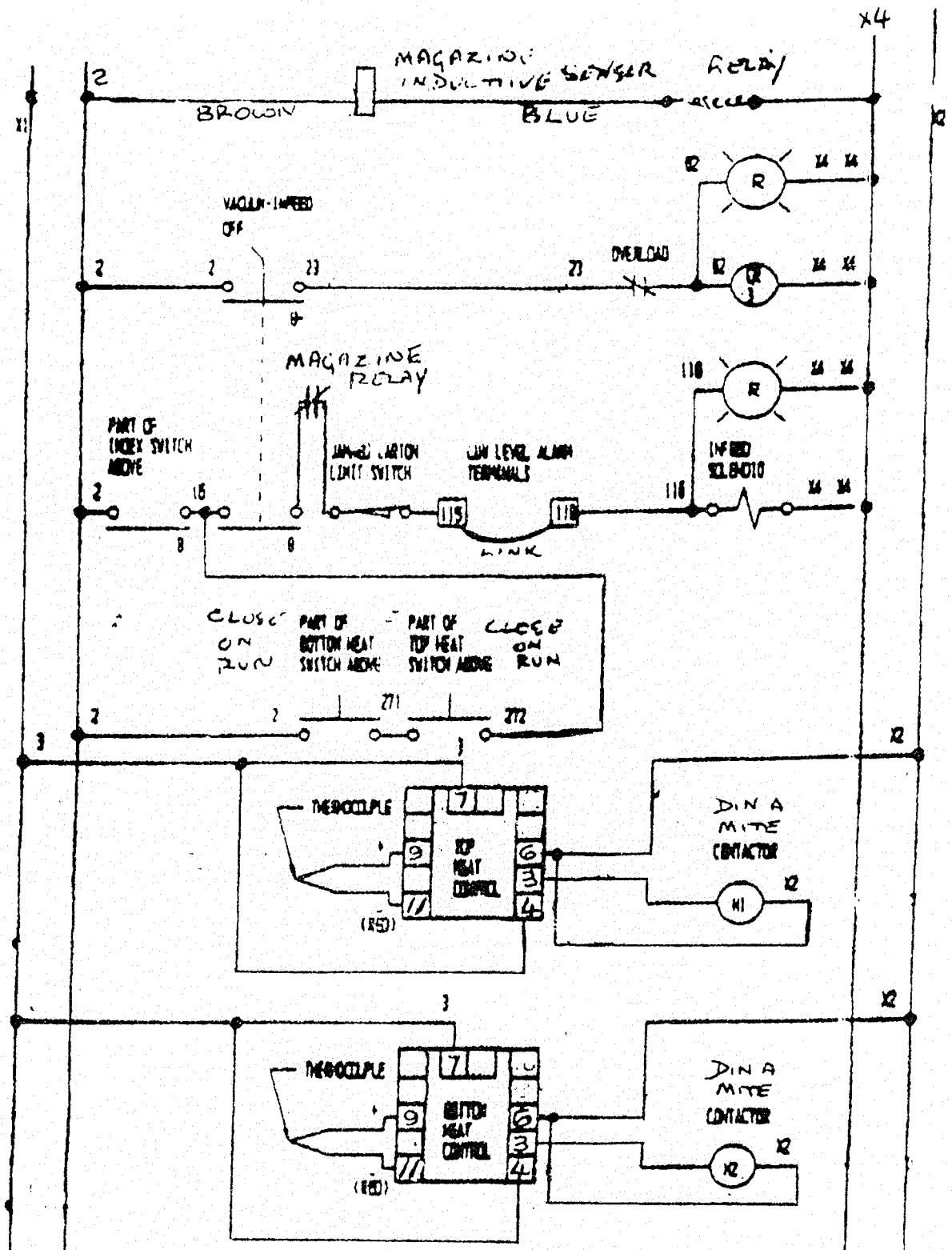
NIMCO CORPORATION
4012A Route 14, P.O.Box 320
Crystal Lake, Illinois 60039-320
Phone (815)459-4200 Fax (815)459-8119

DATE REVISION PAGE OF

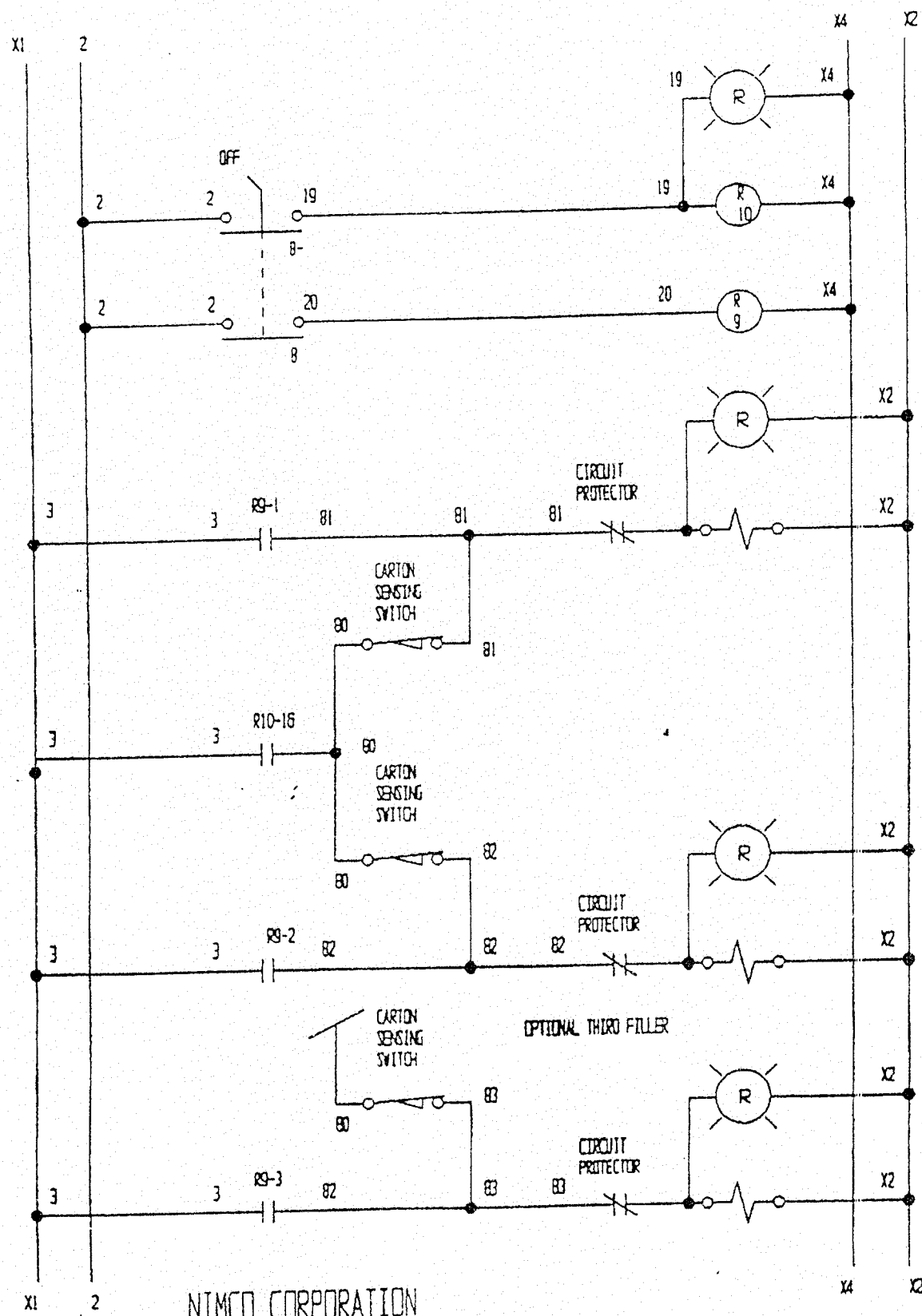
SH 1 3 of 6



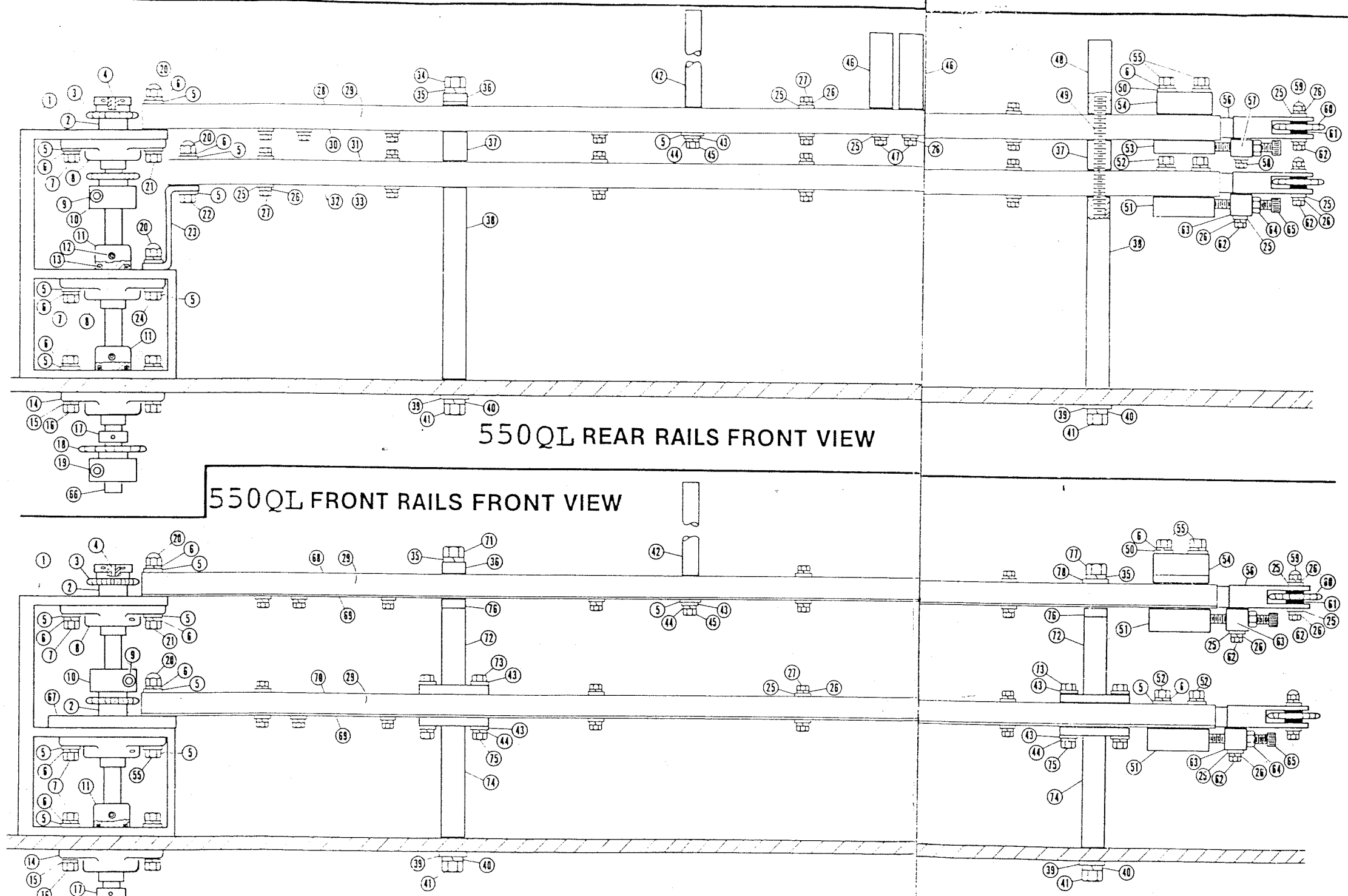
NIMCO CORPORATION
4012A Route 14, P.O.Box 320
Crystal Lake, Illinois 60039-320
Phone (815)459-4200 Fax (815)459-8119



NIMCO CORPORATION
4012A Route 14, P.O. Box 320
Crystal Lake, Illinois 60039-320
Phone (815)459-4208 Fax (815)459-8119



NIMCO CORPORATION
4012A Route 14, P.O.Box 320
Crystal Lake, Illinois 60039-320
Phone (815)459-4200 Fax (815)459-8119



550QL REAR RAILS FRONT VIEW

550QL FRONT RAILS FRONT VIEW

ITEM	PART NO.	DESCRIPTION	QTY
1	0662	Casting, Rail Support, Rear	2
2	1072	Washer, Sprocket	3
3	1431	Sprocket, Rail, 40B12	2
4	1712	Key, Rail Sprocket, 3/16 x 5/8	2
5	SW410	Washer, Flat, 3/8	28
6	SW420	Washer, Lock, 3/8	27
7	SH408	Hex Head, 3/8 - 16 x 1	12
8	0251	Bearing, Flange, 3/4 Pltd	4
9	SK408	Socket Head, 3/8 - 16 x 1	2
10	0960	Sprocket, Clamp, 40N12	2
11	0188	Collar, Index Shaft	3
12	SC203	Set Screw, 1/4 - 20 x 3/8	3
13	OR007	O-Ring, 1/8" x 1-3/8"	3
14	BE318	Bearing, Flange, 3/4	2
15	PW420	Washer, Lock, 3/8	4
16	PH408	Hex Head, 3/8 - 16 x 1	4
17	CL006	Collar, Shaft, 3/4	2
18	0957	Sprocket, Clamp, 40N16	2
19	PK408	Socket Head, 3/8 - 16 x 1	2
20	SN420	Nut, Acorn Cap, 3/8 - 16	5
21	SH418	Hex Head, 3/8 - 16 x 2-1/2	2
22	SH414	Hex Head, 3/8 - 16 x 1-3/4	1
23	1103	Bracket, Chainrail	1
24	SH412	Hex Head, 3/8 - 16 x 1-1/2	1
25	SW210	Washer, Flat, 1/4	55
26	SW220	Washer, Lock, 1/4	55
27	SH204	Hex Head, 1/4 - 20 x 1/2	37
28	1259	Frame, Chainrail, UR	1
29	1097	Bar, Chainrail Insert	3
30	2358	Skin, Chainrail, UR	1
31	1098	Frame, Chainrail, LR	1
32	1095	Bar, Chainrail Insert	1
33	2357	Skin, Chainrail, LR	1
34	SH624	Hex Head, 1/2 - 13 x 4-1/2	1
35	SW620	Washer, Lock, 1/2	3
36	1759	Spacer, Cooling Tube	2
37	1105	Spacer, Chainrail	2
38	2380	Post, Chainrail, 550	2
39	PW610	Washer, Flat, 1/2	4
40	PW620	Washer, Lock, 1/2	4
41	PH612	Hex Head, 1/2 - 13 x 1-1/2	4
42	1201	Post, Heater	2
43	SW310	Washer, Flat, 5/16	10
44	SW320	Washer, Lock, 5/16	6
45	SH314	Hex Head, 5/16 - 18 x 1-3/4	2
46	1116	Post, Spreader Arm	2
47	SH214	Hex Head, 1/4 - 20 x 1-3/4	2
48	1118	Post, Spreader Arm	1
49	ST630	Threaded Rod, 1/2 - 13 [IN]	5
50	SW415	Washer, Flat, 3/8-1" OD	4
51	0385	Block, Tightener	3
52	SH416	Hex Head, 3/8 - 16 x 2	4
53	0196	Block, Chainrail	1
54	1101	Spacer, Transfer Guide	2
55	SH420	Hex Head, 3/8 - 16 x 3	5
56	1963	Yoke, Chainrail	4
57	0236	Block, Tightener	1
58	SH210	Hex Head, 1/4 - 20 x 1-1/4	2
59	SN220	Nut, Acorn Cap, 1/4 - 20	4
60	0184	Sprocket, Idler, 40A12	4
61	BE311	Roller, Cam, 7/8	4
62	SH212	Hex Head, 1/4 - 20 x 1-1/2	10
63	0183	Block, Tightener	3
64	SN410	Nut, Hex, 3/8 - 16	4
65	0263	Skt Hd, 3/8 - 16 x 2-1/2 Fl Thd	4
66	0199	Shaft, Chain Drive	2
67	1102	Spacer, Chainrail	1
68	1094	Frame, Chainrail, UF	1
69	2359	Skin, Chainrail, F	2
70	1096	Frame, Chainrail, LF	1
71	SH620	Hex Head, 1/2 - 13 x 3	1
72	1261	Bracket, Chainrail	2
73	SH317	Hex Head, 5/16 - 18 x 2-1/4	4
74	1104	Bracket, Chainrail	2
75	SN310	Nut, Hex, 5/16 - 18	4
76	3094	Spacer, Rail Support	2
77	SH618	Hex Head, 1/2 - 13 x 2-1/2	1
78	SW610	Washer, Flat, 1/2	1

USED ON	QTY
5180	
5110 E 655/755	
555 550	
500 Q 580 E	
560 QH 500 QH	

NIMCO CORPORATION
4012A Route 14 Box J • Crystal Lake Illinois 60014
phone (815) 459-4200

DRAWN BY	DATE
APPROVED	REVISED
SCALE	TOLERANCE: Unless Specified Otherwise ±.015 on Fractions ±.005 on Decimals
FINISH	
MTL.	
NAME	
OLD NO.	PART NO.