



## Electronic Service Manuals

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# Concorde

The battery powered automatic carpet extractor

## Reference Manual

Machine Serial Number:

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**Castex** IND. INC.

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800-253-7871 616-392-6966

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### WARNING:

REVERSED POLARITY CAUSED BY IMPROPER INSTALLATION OF BATTERIES WILL DAMAGE ELECTRONIC CONTROL BOARD AND VOID WARRANTY. FOLLOW BATTERY INSTALLATION PROCEDURE CAREFULLY.

### WARNING:

ALWAYS TURN OFF MASTER BREAKER SWITCH LOCATED UNDER SPEED CONTROL KNOB WHEN CHARGING BATTERIES. FAILURE TO DO SO COULD CAUSE DAMAGE TO ELECTRONIC CONTROL BOARD AND VOID WARRANTY.

# CONCORDE SERVICE MANUAL

## A. RECEIVING AND SETUP:

1. Upon receipt of your Castex Concorde, unpack as follows: Begin by removing the yellow strapping fastening the box and skid together. To remove the shipping carton, pull the bottom of the carton outward to remove the staples from the skid. Raise the carton above the machine and discard the packing insulation. Next, cut the remaining four yellow straps. Do not remove the Concorde from the skid at this time.
2. Remove these contents from the recovery tank:
  - 1 - TR-36 Battery Charger
  - 1 - Drain Assembly
  - 1 - 48" Drain Hose
  - 1 - Literature Packet
3. Lift off the front cover from the machine and remove these contents:
  - 1 - Clear recovery dome
  - 2 - 12" #4 awg. Jumper Cables
  - 1 - Charger connection assembly
  - 2 - Battery tags (Positive & Negative)
4. Remove the ten screws in the rear door panel and set door aside. (See figure 7.) You will notice that the tension control rod (53) has been tie-wrapped to the control arm rod (54). Cut this tie-wrap and pull the tension control rod outwards.
5. Next pull the lift handle (55) from inside the case to the outside into normal operating position. Take the tension control rod in hand and pull the butterfly cotter pin (56) out of the clevis pin (52) which is through the tension control rod clevis (52). Insert tine from handle into adjuster slot, and insert clevis pin back into the hole in the tensioner clevis, then securely lock butterfly pin once again.

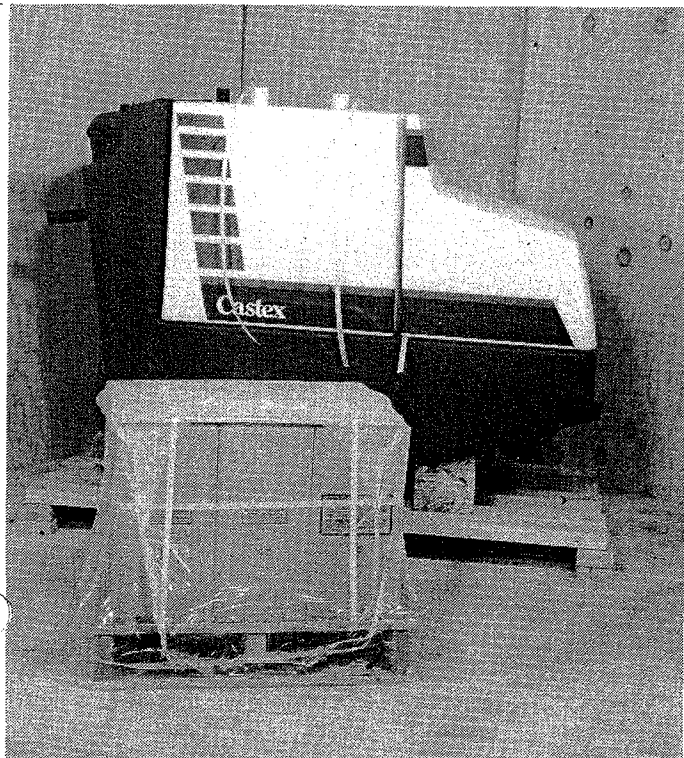


FIG. 1

6. Now you are ready to remove the Concorde from its shipping skid. This is done by lifting the machine off the skid using either a hoist or at least two people. DO NOT USE A FORK LIFT to remove the Concorde from its skid. There are no surfaces underneath the Concorde adequate for the forks to lift.
7. Discard shipping carton and skid.

## B. BATTERY INSTALLATION

Now the Concorde is ready for its power source. The 36 volt system consists of three 12 volt batteries connected in series using the two 12 inch #4 awg. Jumper Cables provided with the machine. To install the batteries, follow this procedure:

1. Carefully lift the batteries and set them in the Concorde's battery compartment with all positive (+), terminal posts towards the front of the machine. (See Fig. 2.)

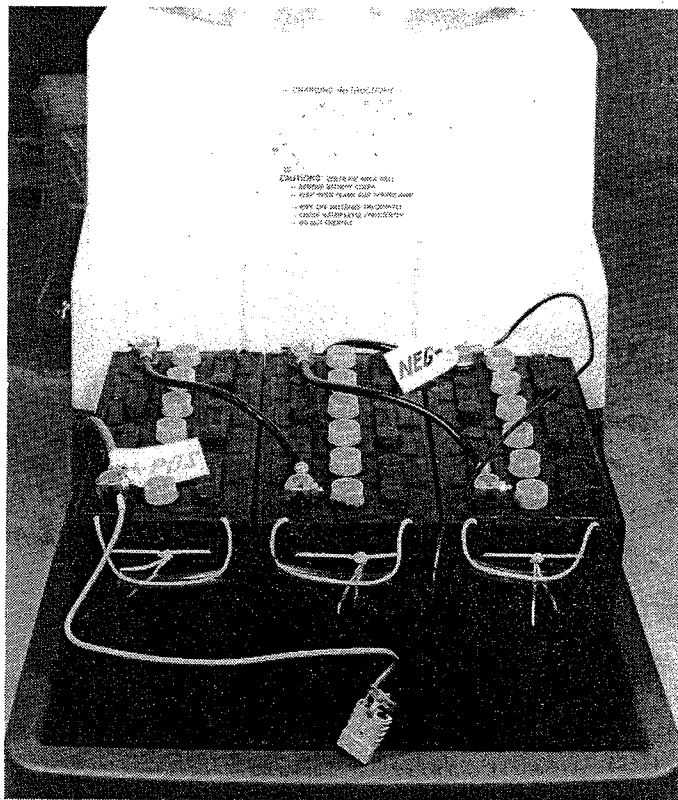


FIG. 2

2. Facing the front of the machine, connect one of the 12" Jumper Cables to the negative (-), battery post of the far left battery and to the positive post on the center battery.
3. Connect the other 12" Jumper Cable to the negative post on the center battery and to the positive post on the far right battery.
4. Connect the red positive cable on the far left side to the front positive post of the far left battery.
5. Connect the black negative cable on the far right side to the rear negative post of the far right battery.

6. Check the master switch for power. If the master switch's green indicator light glows, the wiring is correct. If the master switch's green indicator light does not glow, then check your wiring against steps 1 through 5 for an error in your connections.

(See Fig. 2 for reference to proper wiring configuration.)

### C. CHARGING INSTRUCTIONS:

1. Remove the charger from its shipping carton. Remove the front hood cover from the machine and locate the charger connection plug.

**WARNING!!! KEEP FIRE OR FLAME AWAY FROM BATTERIES. THEY EMIT FLAMMABLE GASES WHICH COULD CAUSE SERIOUS INJURY!**

2. Connect the charger connection plug into the plug from the charger.
3. Plug the charge power cord into 115 volt A.C. power source.
4. Turn the charger to the "ON" position.
5. Do not turn the charger past the "ON" position on the indicator dial. This charger is totally automatic, and is equipped with a built-in elapsed time indicator. For example, when operating the charger and it shuts off at the number 5 on the dial, this means that the charger has run 5 hours to bring the batteries up to a full charge. The charger senses when the batteries are fully charged and shuts off automatically. In Figure 3, the charger has run for one hour since turning the charger to the "ON" position.

6. After charging, fill the batteries, with distilled water, (if needed), to the sight ring in the battery filling orifice.

**NOTE:** Do not add water to uncharged batteries. As batteries charge, the liquid inside expands which could cause an overflow if the batteries are full before charging.

After running the Concorde for any significant amount of time, we recommend that you return the batteries to the full charge condition.

### Example:

If you run the Concorde for 30 minutes or longer, fully recharge the machine. Do not let the batteries remain uncharged. This will extend the life of your batteries. Also, by recharging the batteries to their full charge capacity, you are assured that the Concorde will be ready for hours of cleaning at a moment's notice.

The batteries recommended for use in the Concorde are three Trojan J185 12 volt batteries.

### D. OPERATING INSTRUCTIONS:

#### 1. Filling the Concorde.

Fill the solution tank with the desired amount of water and add liquid cleaning solution to the proper dilution ratio.

**Do not use powdered cleaning chemicals.** Powders are unlikely to dissolve thoroughly, resulting in clogging the inline solution filter. This can reduce or stop water flow to the pump and spray jets.

**NOTE:** The inline filter below the rear door panel must be cleaned regularly to maintain unrestricted water flow.

#### 2. Operating the Concorde.

Turn on the master control switch as shown in Figure 4. When the master switch is activated, it enables the remaining circuits to become live.

- a. **Forward mode.** (See Figure 4a.) To advance the Concorde in the forward mode, adjust the speed control knob counterclockwise to the stop position. Then move the forward-reverse switch to the forward position, causing the green forward indicator light to glow. Twist the roll grips forward and slowly rotate the speed control knob clockwise until the Concorde reaches the desired speed.
- b. **Reverse mode.** (See Figure 4b.) To make the Concorde back up in the reverse mode, adjust the speed control knob counterclockwise to the stop position. Then move the forward-reverse switch to the reverse position, causing the red reverse indicator light to glow. Twist the roll grips backward and slowly rotate the speed control knob clockwise until the Concorde reaches the desired backup speed. The Concorde will require more power to reach a given speed in the reverse mode than in the forward mode. A safety backup resistor protects the operator from accidental fast starts in reverse mode.
- c. **Activating cleaning functions.** To activate the cleaning functions on your Concorde, follow these steps:
  1. Move the master switch to the "ON" position.
  2. Lower brush unit to the floor using the lift handle.



FIG. 3

3. Move brush switch to the "ON" position. (See Figure 4c.)
4. Move vacuum switch to the "ON" position. (See Figure 4d.)
5. Move pump switch to the "ON" position. (See Figure 4e.)
6. Move forward-reverse switch to the Forward mode as described in part a.
7. Twist roll grips forward and adjust to desired speed by slowly rotating the speed control knob clockwise. (See figure 4f.)

Move slowly with your Concorde at first until you feel comfortable with maneuvering it. It is a powerful machine ready to "take flight" with the right pilot!

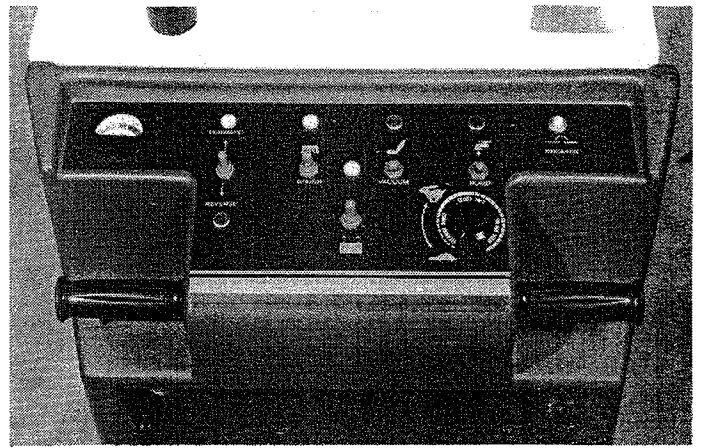


FIG. 4c

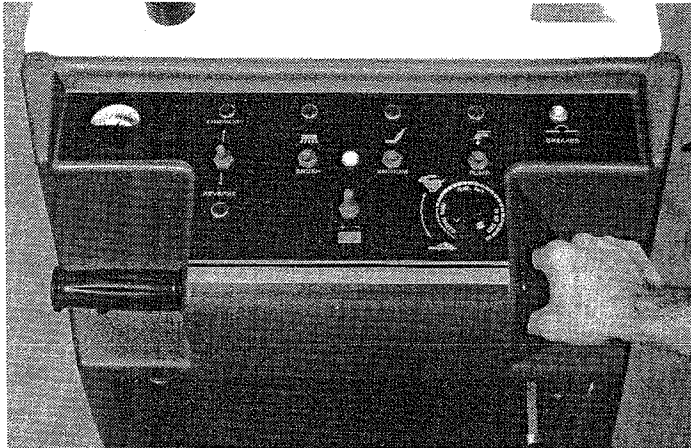


FIG. 4

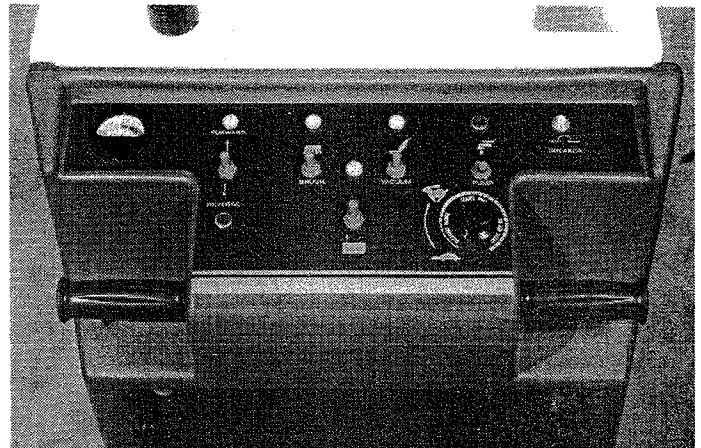


FIG. 4d

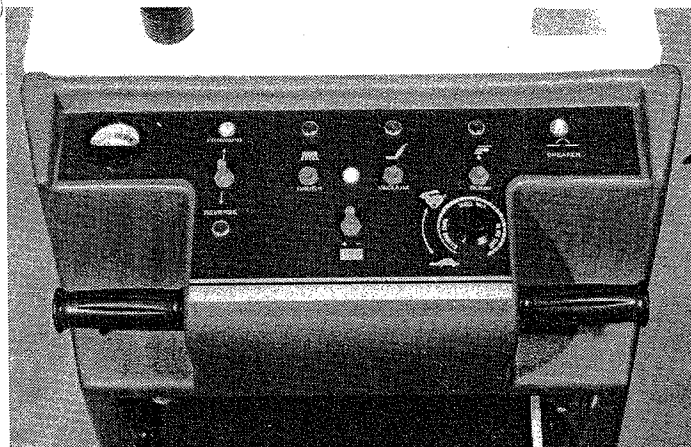


FIG. 4a

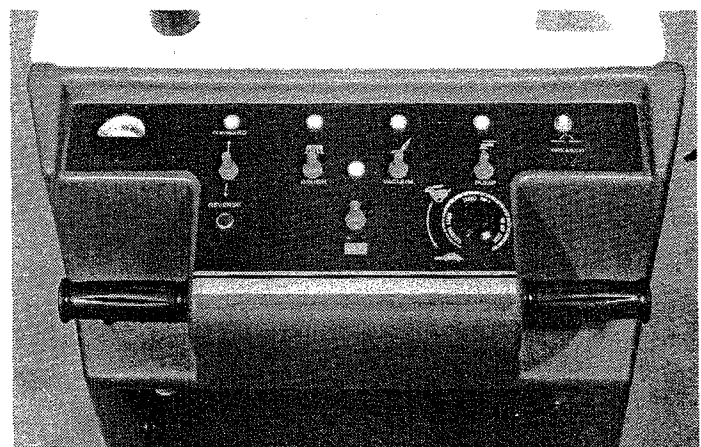


FIG. 4e

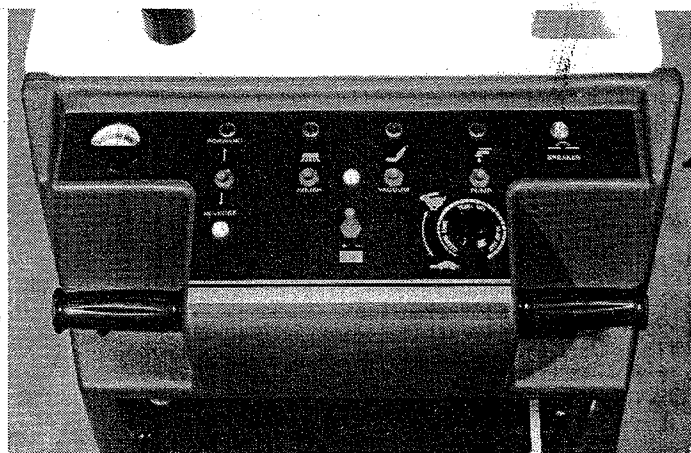


FIG. 4b

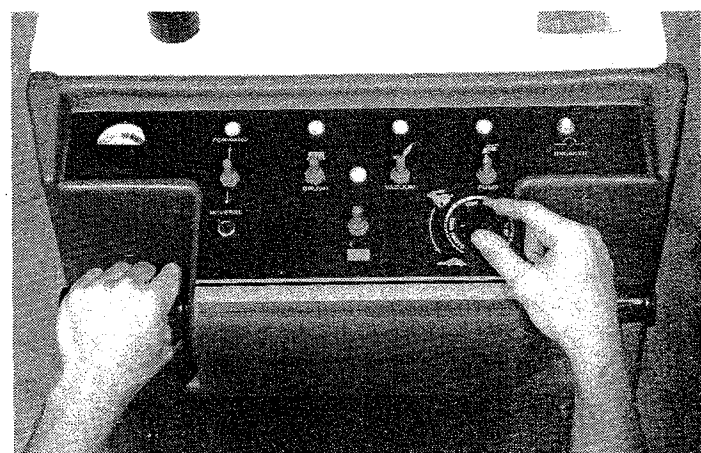


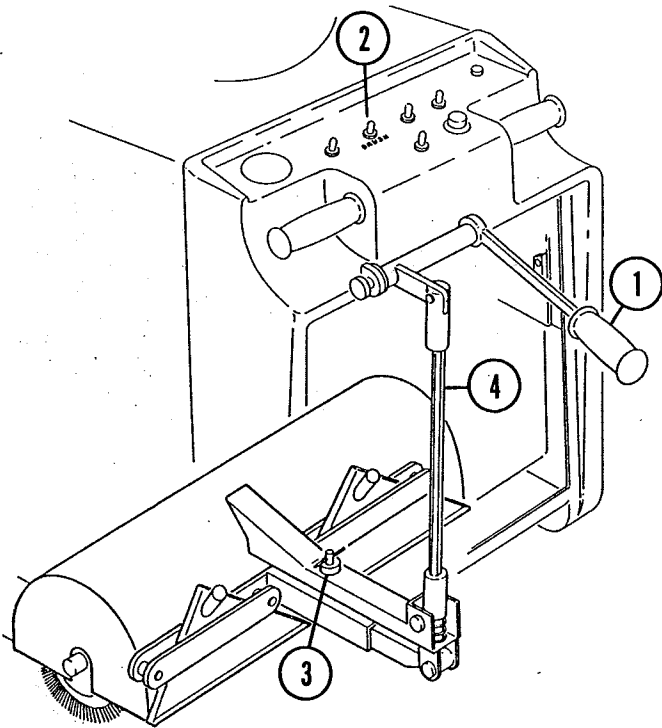
FIG. 4f

**d. Draining the Concorde.** When you have nearly exhausted the cleaning solution, you will need to drain the discharge water. At this time, simply shut down all cleaning functions and propel the Concorde under its own power back to a janitor's closet where you can refill the solution tank and empty the discharge tank. Connect the drain hose provided with the machine to the drain valve located under the Concorde at left rear. With the hose adapter securely inserted into the drain valve collar and the hose over a drain sink, carefully open the T-handle and allow the discharge water to drain out of the discharge tank. When the discharge tank is empty, use your filling hose to rinse the discharge tank of lint and other debris. **Then, be sure to close the T-handle completely!**

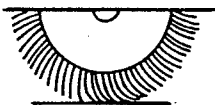
### E. VACUUM HEAD AND BRUSH HEIGHT ADJUSTMENT:

To adjust the brush height and vacuum heads, follow this 4-step process:

1. Release the lift handle to lower brush housing and vacuum head assembly.
2. Move the brush switch to "ON" to check brush height. See brush illustration for proper height. (See Fig. 5.) Then turn off. If the brush height is too low, premature brush wear will occur.
3. Turn T-bar clockwise to lower for more brush, counter-clockwise to raise for less brush contact.



RIGHT



WRONG



FIG. 5

4. Adjust tension control rod for desired pickup head pressure.
  - a. Adjust the rod clockwise to raise the vacuum heads and avoid a rolling effect of the carpet ahead of the vacuum heads.
  - b. Adjust the rod counter-clockwise to lower the vacuum heads to obtain a better vacuum seal of the heads on the carpet.

On plush-pile carpeting where the vacuum heads sink deep into the carpeting, it may be necessary to readjust the brush vacuum heads separately to compensate.

### F. ACCESSORY ATTACHMENTS:

To use the full potential of the Concorde's cleaning capabilities, we have included a connection for a remote tool, (tool optional) which makes cleaning small, hard-to-reach areas easy. This connector is located at the left of the rear door panel at knee height when standing in the operator's position: The small handle nearby is the manifold selector which changes the direction of water flow through the machine.

To use a remote tool, follow these steps:

1. Turn the master switch to the "OFF" position.
2. Disconnect the Concorde's vacuum hose from the clear recovery dome.
3. Attach vacuum hose from the remote tool into the clear recovery dome.
4. Connect solution hose from the remote tool into the solution quick-connector on the Concorde.
5. Turn the manifold selector handle to an outward position. This directs the flow of water to the quick-connector for the remote tool. Now when you activate the solution pump, the Concorde's spray jets will not spray.
6. Move the master switch to the "ON" position.
7. Move the pump switch to the "ON" position. The pump will run for several seconds until the solution line to the tool fills with water. Now you can spray solution onto the carpet by simply squeezing the trigger on the remote tool.
8. Move the vacuum switch to the "ON" position.

Now your remote tool has both solution pressure and vacuum power at your fingertips.

### G. CONCORDE SERVICING:

#### 1. General Notes:

This Owner's/Service Manual will assist you in making simple, quick repairs in the event repairs become necessary.

**Whenever maintaining or repairing the Concorde, make certain you have disconnected both battery cables!** This will prevent both electrical shock hazard and prevent moving parts from activating while you are servicing them.

Most repairs you will make to your Concorde will not require elaborate tools. However, the bearing pullers necessary to remove different bearings on the machine are available by part numbers.

Call Castex Customer Service for assistance. Our toll-free number is 800/253-7871.

## 2. General Service Policy:

Whenever ordering parts or requesting any type of service PLEASE SPECIFY:

1. The model of the machine.
2. The serial number of the machine.
3. The part number.
4. The quantity of each part(s) needed.

## 3. Preventive Maintenance:

**Battery Life:** To maintain the life of the 185 amp/hour 12 volt battery in the 36 volt system, it is important to always keep the Batteries in a fully charged condition whenever the Concorde is not in use. Equally important is good cable contact at the battery posts. Small amounts of corrosion can interfere with a strong connection and reduce the Concorde's running time and performance. Use lithium grease or petroleum grease on all battery posts to maintain the best possible connection.

Keeping the batteries filled with water is also important. The 185 amp/hour battery should not normally use much water. However, maintaining proper water levels can be a significant factor in extending battery life. **Remember to use distilled water and to ONLY FILL THE BATTERIES IN A FULLY CHARGED CONDITION!**

4. **Mechanical Maintenance:** Frequent checks of other mechanical parts are also recommended for prolonged life of your Concorde.

- a. Drive chain tension. The Concorde's drive chain should not sag when the Concorde is not in operation. If the drive chain loses proper tension, loosen the four bolts connecting the drive motor (18) to the drive motor weldment (13). Reposition the drive motor to tighten the drive chain, then lock the motor into place by retightening the four connecting bolts.
- b. Drive chain lubrication. Since the drive chain is self lubricating, no further lubrication is necessary.
- c. Brush drive-belt tension. This belt, located to the operator's right side of the Concorde, should be checked frequently. This belt is likely to wear excessively if not properly maintained.

The drive-belt needs tightening if it flexes more than ½ inch from normal position when stretched with the fingers.

To inspect the belt, remove the two white screws from the belt guard and pull the guard away. Check for obstructions in the belt-pulley assembly, and also inspect for wear or damage. If the belt tension needs adjustment, loosen the four bolts connecting the belt drive motor to its weldment. Reposition the drive motor to the correct tension on the belt, then lock the motor into place by retightening the four connecting bolts.

- d. Care of polyformed chassis parts. To keep the Concorde polyethylene parts looking their best, wash these surfaces with a non-abrasive cleaner such as "Armour-All" periodically. **Do NOT use solvents or abrasive cleaners.** These can damage the finish of your Concorde!

## H. THE CONCORDE'S ELECTRICAL SYSTEM:

The Concorde has a voltage regulating system which maintains a constant voltage flow to the drive motor. This means that as the batteries discharge from their fully charged condition, (45 to 47 volts), to a discharged condition below 36 volts, the voltage regulator tells the drive motor that it is receiving a constant 36 volts. This enables the Concorde to propel itself at almost any charge level.

An additional feature is the safety backup resistor. This resistor reduces power to the drive motor while the Concorde is in reverse mode. The operator is thereby protected from an accidental fast start in reverse.

The brush drive motor is wired directly into the power source and is protected by the 9 amp circuit breaker located on the right hand side of the control panel.

On latest models, an additional safety feature is the Master circuit breaker, located under the roll throttle housing. This 60 amp breaker is wired directly into the positive (+), battery cable and serves two functions:

1. **Provides lockout protection.** If the Concorde is to be left unattended where unauthorized persons could tamper with or inadvertently start it, the Master circuit breaker should be pulled. The Master circuit breaker will completely disable the Concorde to prevent injury to unauthorized persons.

Simply pull the circuit breaker handle downward to disable the Concorde. When the operator returns to operate the Concorde, push the circuit breaker handle up. Now the Concorde is ready to run again.

2. **Provides overload protection.** Protects the Concorde's systems against transient voltage spikes.

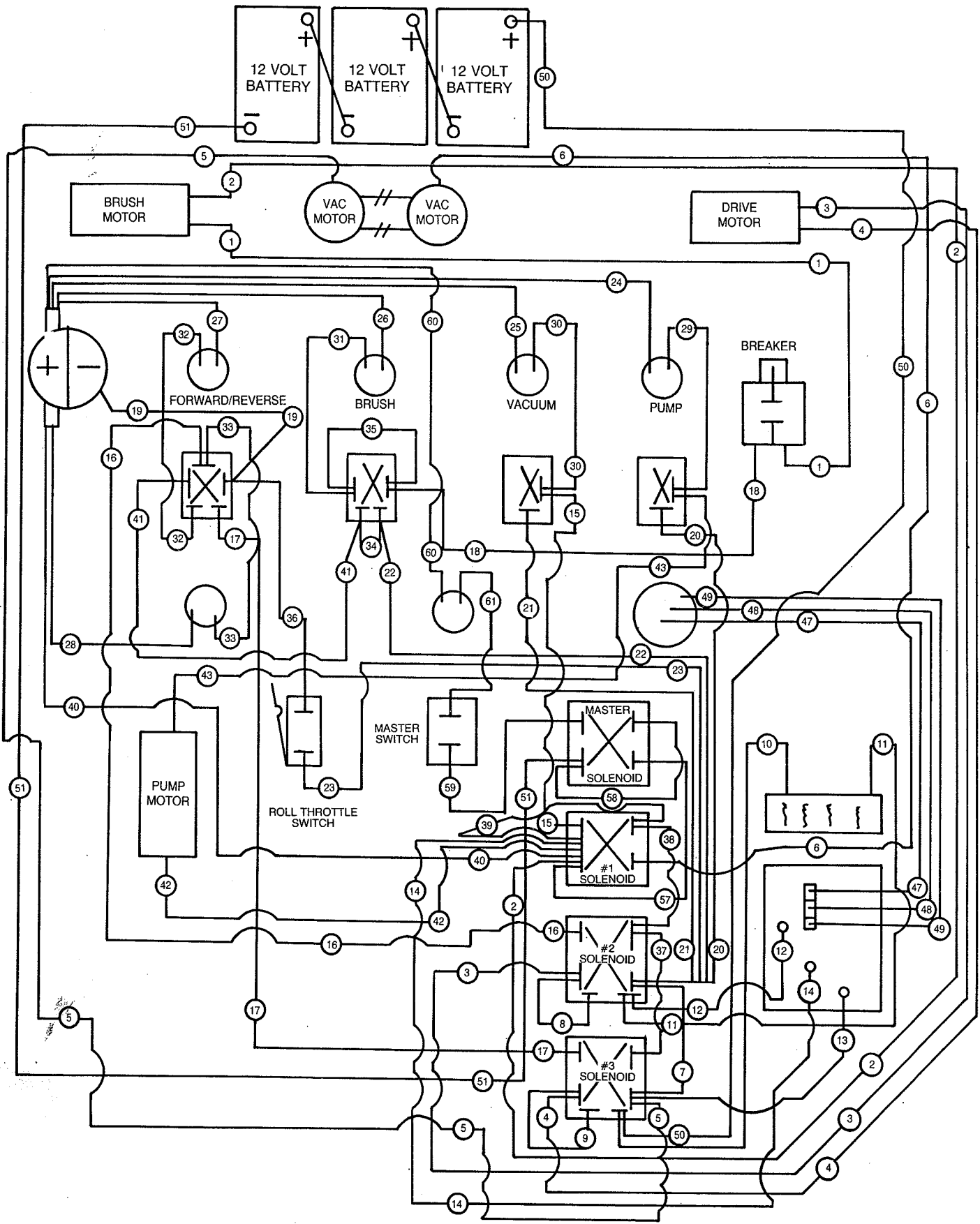
The Concorde's various electrical functions are controlled by a series of solenoids. The master switch on the control panel activates the master solenoid. The master solenoid then enables the remaining three solenoids to become active to power the individual operating functions.

All motors on the Concorde, with the exception of the brush drive motor, are controlled by the three solenoids.

Here is the list of the motors run from each solenoid:

MASTER SOLENOID:	Accepts Negative main power input. Controls amperage draw of the three remaining solenoids.
#1 SOLENOID:	Supplies power to one vacuum motor. Supplies power to the positive battery armature on the controller board.
#2 SOLENOID:	Supplies drive motor in forward mode. Supplies all control panel indicator lights.
#3 SOLENOID:	Supplies power to one vacuum motor. Supplies drive motor in reverse mode. Accepts Positive main power input.

# Concorde Electrical Schematic



## I. THE CONCORDE VACUUM SYSTEM

1. The vacuum system is powered by two 36 volt 3 stage vac motors.
2. There are 4 filters which must be kept clean for them to function properly.
3. The air is removed from the recovery tank by each vacuum through an independent stand pipe #3. This provides maximum airflow for the best drying results.
4. On top of each stand pipe is a screen filter #3A. They can be viewed through the clear dome. Lint that collects on them must be removed immediately.
5. The air travels through the stand pipe and through another filter #5 which is attached directly to the vacuum motor. Any lint passing through screen #3A will end up on this filter and plug it. To clean this final filter the vacuum motor must be removed.
6. To service the final vacuum filter, remove all liquid from both tanks and clear recovery dome. Using the 5 foot drain hose provided, vacuum any water out of the solution tank into the recovery tank and drain it out. Remove waste tank drain #26 by disconnecting coupling #24 underneath the waste tank.
7. Now both tanks will hinge off to the operator's left. Slowly raise right hand side about 2 feet and disconnect solution hose quick disconnect #13 at the bottom of the tank. Then disconnect the two vacuum hoses #15 from the vacuum heads #27.
8. Tank will now pivot out completely and rest on the floor.
9. Remove vacuum motors and clean or replace filters. **IMPORTANT: WHEN REASSEMBLING MACHINE BE SURE SOLUTION HOSE IS PROPERLY CONNECTED. TEST CONNECTION BY TUGGING ON HOSE. IF QUICK DISCONNECT STAYS INTACT, CONNECTION IS PROPERLY MADE.**
10. Reassemble drain valve system, vacuum hoses, and recovery dome.
11. To check each vac's performance, remove clear dome, turn vacs on and hold hand over stand pipe screens #3A and compare suction of one to the other.

## J. THE CONCORDE PUMP SYSTEM

A 36 volt, demand style diaphragm pump #46 injects the solution into the carpet. The solution flows from the outer tank through a screen located in the bottom of the tank through a hose to a bowl style filter #2 and to the pump. The quick disconnect pictured #13 must be released when tipping tank out for vacuum service, covered in vacuum service in this manual. Sometimes lint and foreign matter will collect in this quick disconnect, starving the pump and causing streaking and/or improper cleaning. After going through the filter the water is pumped to the spray jets. The jets have check valve screens in them, also to act as a final filter and keep the Concorde from dripping when not in use. Keep all foreign matter out of the solution tank as it will plug up the system and cause poor cleaning results. Clean tip screens and bowl filter regularly. After each use, vacuum out remaining water in solution tank with 5 foot drain hose provided.

Place one end in recovery dome #1 and place other in solution tank.

## TROUBLE SHOOTING THE PUMP SYSTEM

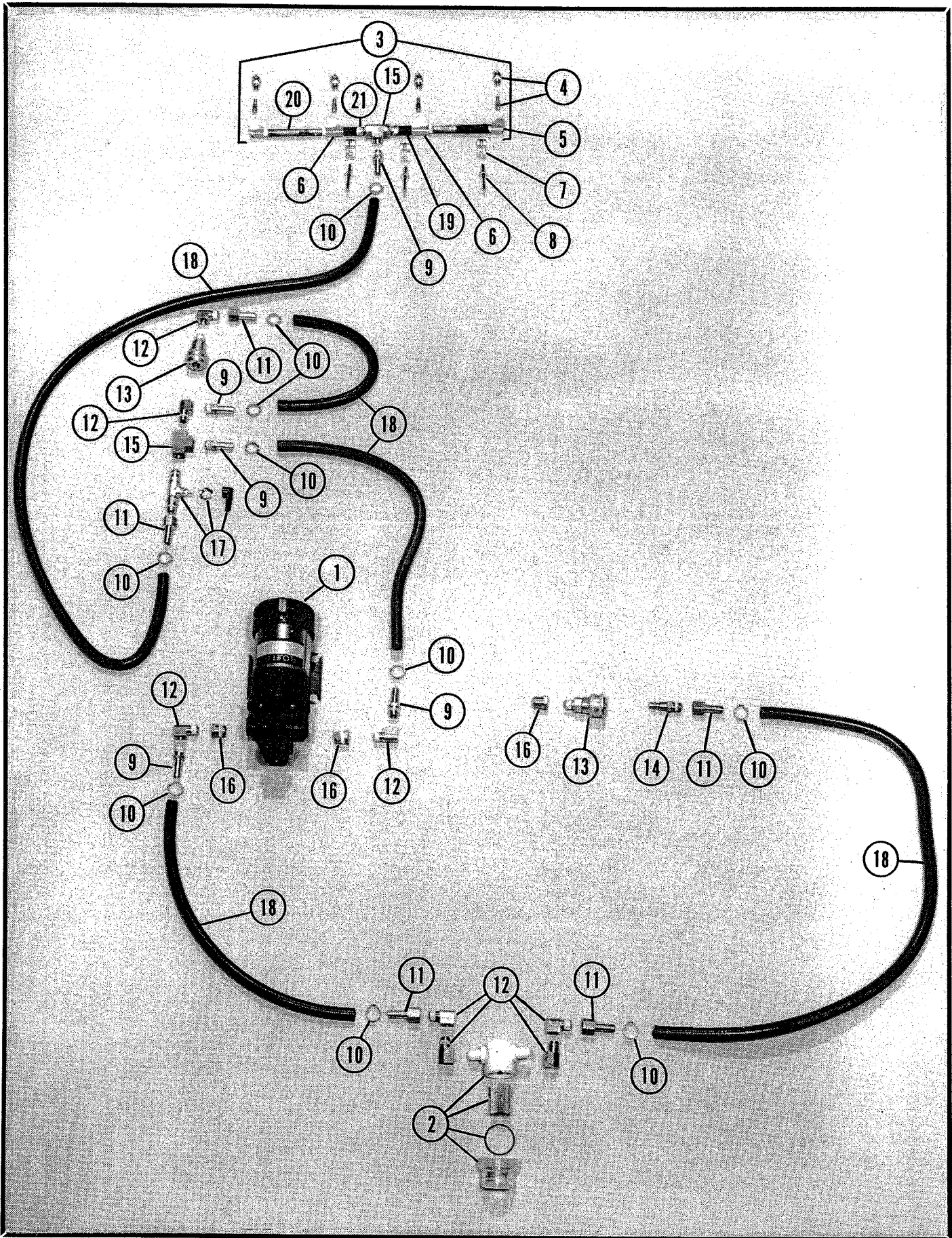
1. Be sure remote tool valve is in normal operating position #48
2. Be sure pump runs. If it does not, go to #8 below. Turn on master switch and pump switch. Pump makes a low whirring sound. A pump starving for water makes more noise than when it is not.
3. If the pump runs for a very short period and shuts off or pulsates, the system beyond the pump is plugged somewhere. Probably a kinked line to the spray tips or plugged spray tips.
4. If the pump continues to run and no water comes out of the jets the pump is either defective or being starved.
5. To check for a starved pump, remove the bowl filter bottom. Water should run freely out. If not, force air back through the system or dismantle it to remove obstruction. Also check quick disconnect under solution tank #13 to insure proper connection. (See #7-10 in "Concorde Vacuum System"). Some cleaning chemicals have thickened up and caused pump feed line to plug.
6. If this fails to solve the problem the line from the filter to the pump should be checked.
7. If the system still is not functioning a qualified serviceman should inspect the pump for foreign matter in the valves, faulty valves, or faulty diaphragm.
8. If the pump does not run, a qualified serviceman should check the wiring as indicated on schematic. Be sure wiring is complete and power is reaching the pump. Check pump switch solenoid #2 and be sure continuity is made through pressure switch on lower end of pump.
9. If continuity is not made through pressure switch on pump, by pass it. If pump runs, the pressure switch is faulty or the system beyond the pump is plugged leaving pressure in the system causing the switch not to make contact. (Go to #3 above)
10. If pump still refuses to run, replace it.

## SPECIFICATIONS:

### Drive Motor:

36 volt D.C. Gear motor.  
3/4 Horsepower Variable speed  
1800 RPM max.  
Amperage draw: 8 amps.  
Class "F" insulation 320 T.E.N.V.  
Overload protection by master solenoid.  
Mounted to drive wheel weldment & adjustable for chain tension.  
Mounted with four 3/8" - 18 x 1" hex bolts use 1/16" wrench or socket to adjust.

THE CONCORDE PUMP SYSTEM





**Battery Charger:**

Charger type - TR-36 36 volt automatic.  
 20 amp initial output.  
 115 volt A.C. power input.

**Solenoids:**

Two 50 amp SPDT contactor w/36 volt isolated coil four terminals.  
 Two 50 amp SPDT contactor w/36 volt isolated coil six terminals.

**Resistor:**

Ohm rating - .9 ohms.  
 Watt rating - 225 watts.

**Sprocket Gears:**

Drive Wheel - 1/2" pitch 48 teeth.  
 Drive Motor - 1/2" pitch 13 teeth.

**Circuit Breaker:**

Amp rating - 9 amps.

**Drive Chain:**

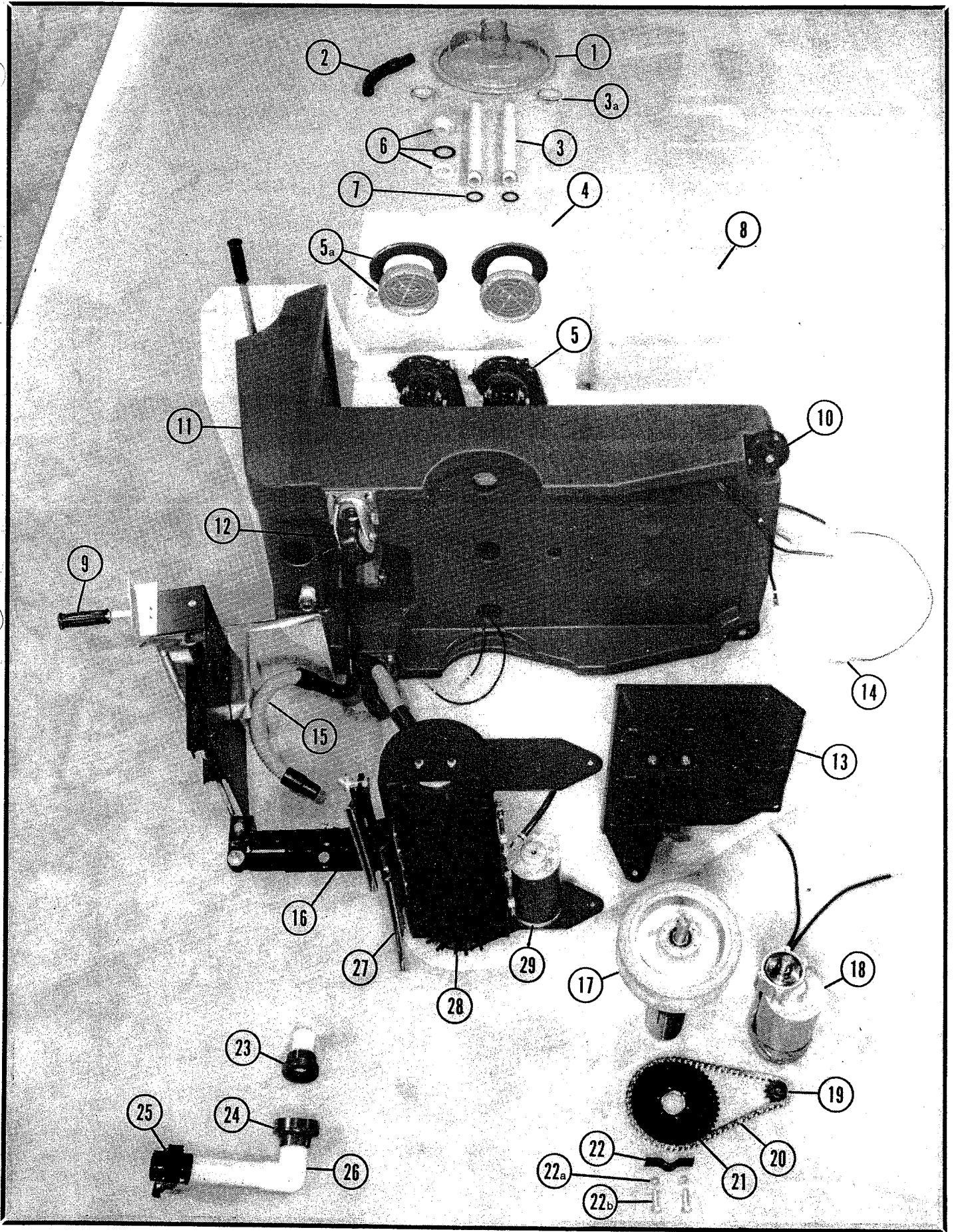
72 Links, - 1/2" pitch, 36" length with master link.

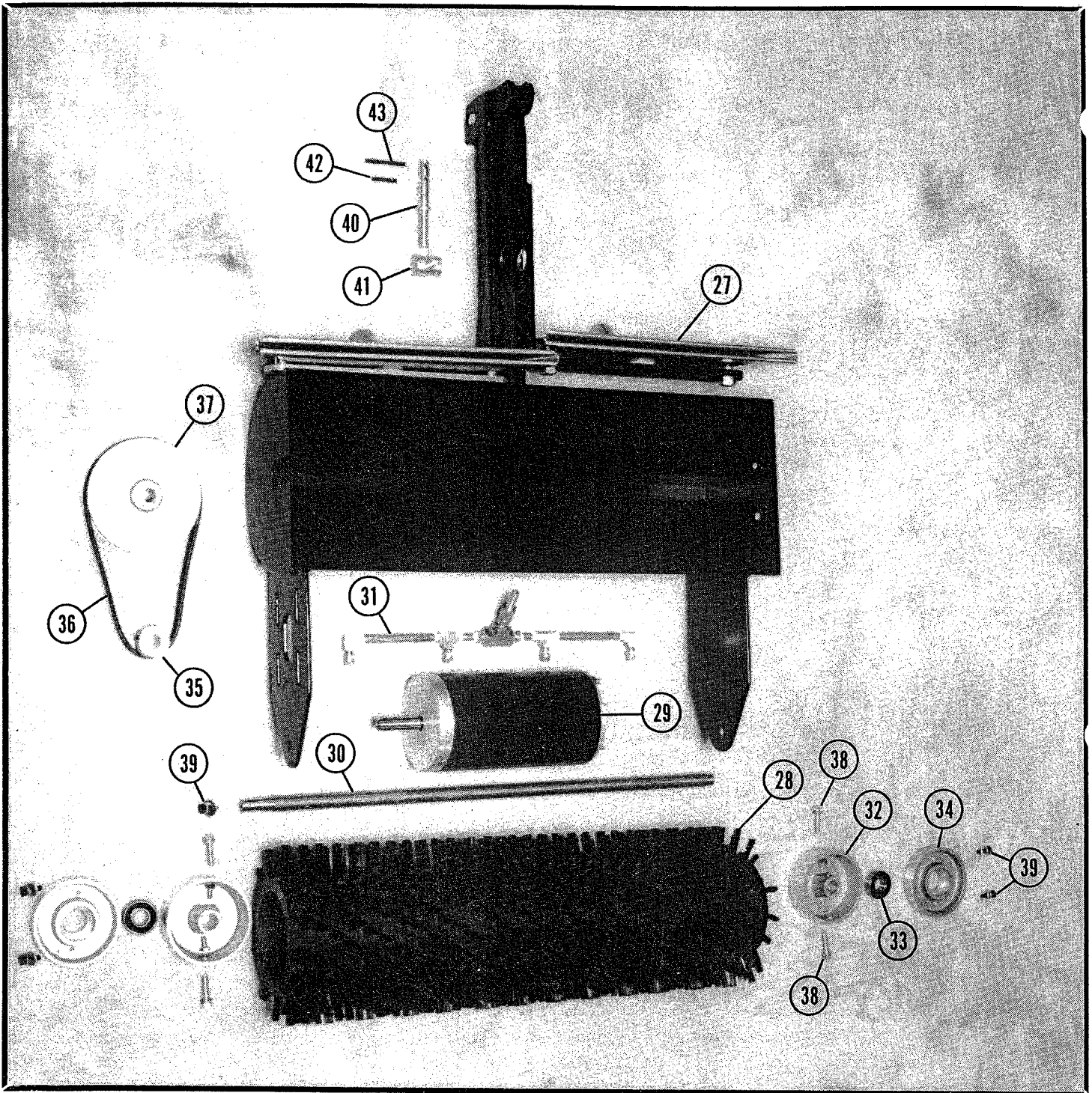
**Bearings:**

Drive Wheel - two rubber contact double shielded.  
 Brush Drive - two rubber contact double shielded.

**CONCORDE PARTS LIST:**

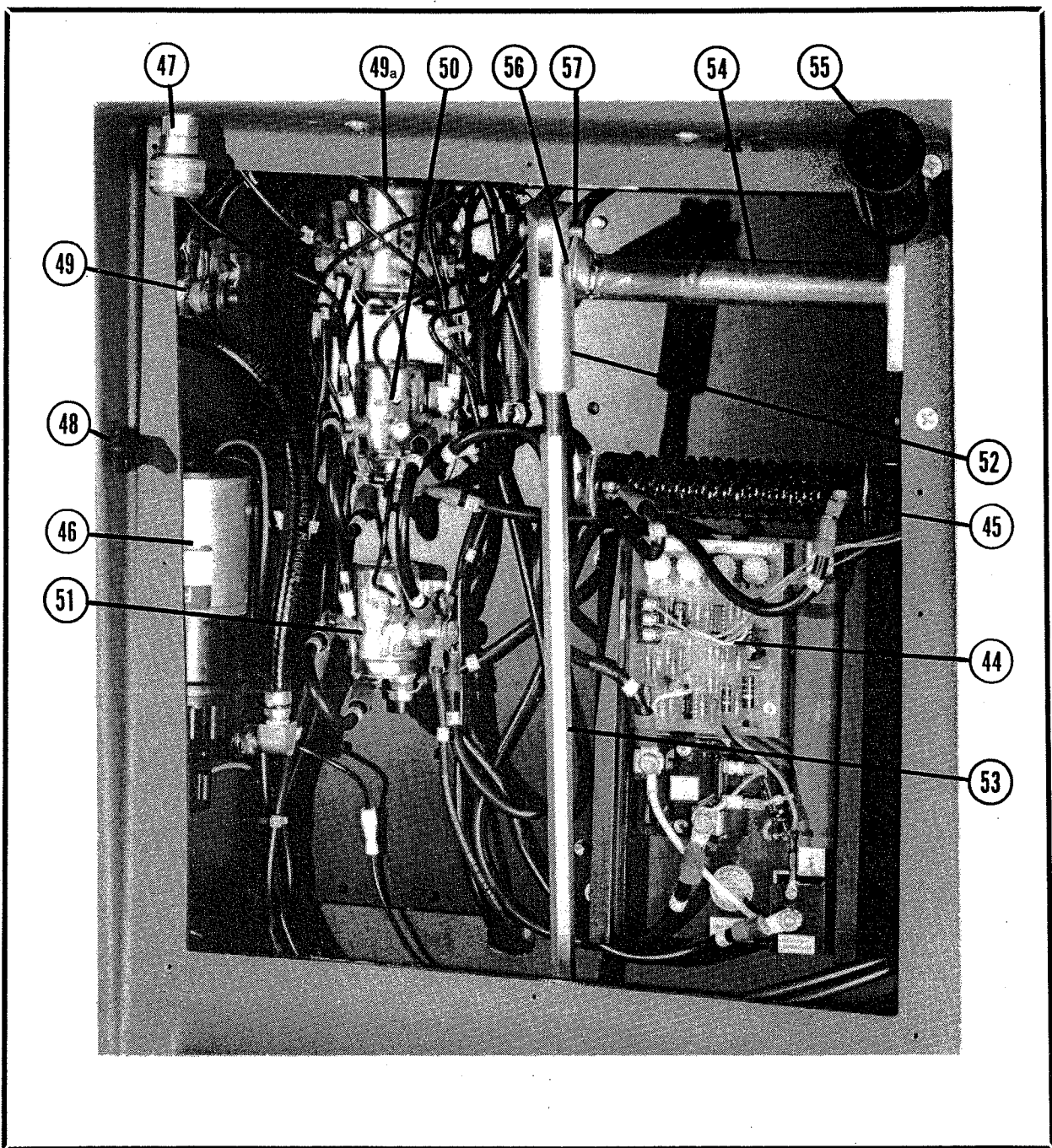
Code Number:	Part Number:	Description:
1	100111	Clear Recovery Dome
2	160420	Intake Vacuum Hose
3	230172	Vacuum Stack
3a	100006	Screen
4	100712	Solution Tank
5	130413	Vacuum Motor, 3 Stage 36 volt
5a	180626	Filter for Vac. Motor, w/gasket
6	150301	Drain Assembly w/Gasket
7	101714	Gasket, for Vac. Stand Pipe
8	100711	Cover, Front Hood
9	240175	Handle, Lift
10	103026	Wheel, Bumper
11	100710	Chasis
12	103002	Caster, Rear, 4" Swivel
13	220107	Weldment, Drive Motor
14	130505	Plug, Charger
15	160422	Hose, Pick-Up
16	220109	Weldment, Brush Housing
17	103027	Wheel, Drive 10"
18	130443	Motor, Drive, 3/4 Horsepower, 36 volt
19	240018	Sprocket, Drive Motor, 13 tooth
20	240019	Chain, 72 Link, Stainless Steel
21	240017	Sprocket, Drive Wheel
22	140311	Clamp, Axle
22a	140525	3/8" - 16 nut w/washer
22b	140232	3/8" - 16 x 1 1/4" bolt
23	210247	Union, Drain 2" Male
23a	210249	O-Ring for Male Union, (not shown)
24	210248	Union, Drain 2" Female
25	210241	Valve, Drain
26	230174	Elbow, Drain, 1 1/2" Street Elbow
27	200225	Head, Vacuum Pickup
28	240001	Brush, 8" Rotating
29	130444	Motor, Brush, Drive





Code Number:	Part Number:	Description:
27	200225	Head, Vacuum Pickup
28	240001	Brush, 8" Rotating
29	130444	Motor, Brush, Drive
30	230206	Shaft, Brush
31	210002	Spray Bar
32	240014	Adaptor, Brush Mounting
33	140123	Bearing, Brush
34	240015	Cap, Bearing
35	240016	Pulley, Motor

Code Number:	Part Number:	Description
36	240126	Belt, Poly-Vee
37	240013	Pulley, Brush Shaft
38	140221	Bolt, 5/16" - 18 x 1 1/4" for Brush Adaptor
39	140210	Bolt, 1/4 20 x 3/4 for Bearing Cap
40	240190	Shaft, Adjuster
41	140910	Nut, Pivot Brass
42	140621	Pin, Roll 3/16 x 1 1/4
43	140622	Pin, Roll 3/16 x 2



Code Number:	Part Number:	Description
44	103306	Control, Speed
45	130732	Resistor, Silicone
46	180143	Motor, Pump 50 psi 36 volt
47	150900	Coupler, Quick Disconnect
48	210001	Valve, Manifold
49	130733	Solenoid #1
49a	130733	Master Solenoid
50	130217	Solenoid #2
51	130217	Solenoid #3
52	230215	Clevis, Tensioner
53	230216	Rod, Tension Control
54	230207	Rod, Control Arm
55	230210	Handle, Lift
56	140616	Pin, Butterfly, Cotter
57	140615	Pin, Clevis

## BLEEDING THE PUMP

After receiving your concorde you must bleed the pump. This is a self priming pump. However, when the spraying system is dry the pump can not pump enough air pressure to release the air lock. To Bleed the Pump follow these steps:

1. Activate solution pump
2. Verify that #48 manifold valve is in the down position. This allows concorde jets to spray.
3. Insert Bleeder Hose into Auxiliary Quick Disconnect and hold other end into solution tank to release all air.
4. When water comes out the Bleeder Hose and Spray Tips, the air is released.

Caution: Black Metal Electrical Panel cover must be in place while bleeding to keep water off Electrical Component.