

Service Manual

Motor Drive Unit MD0100

*settings - Morcellator - max
Star, StarSK - mid range*

GYNECARE

Serial Numbers

Each motor drive manufactured by Gynecare has a serial number on the back of the instrument.

Alternate Brand Names

The same instrument was previously manufactured under the brand name, FemRx. The Gynecare instrument is the same except for the brand labeling.

Authorized Repair Facilities

All service or repair questions should be directed through Ethicon by phoning

1 (877) ETHICON [1 (877) 384-4266]

Safety Concerns and Warnings

Please read the Instructions for Use before performing any service work on this equipment.

Frequency of Performance Validations

Performance of the MDU should be verified once per year by performing

1. Hi Pot/ Continuity Test
2. Front Panel Function Test
3. RPM Calibration Test

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PRODUCT WARRANTY

This device is warranted against defect in workmanship and material for one year from the date of delivery to the extent that Gynecare will, at our option, replace, repair, or refund in full the purchase price of the device or any part thereof which in our opinion is defective, provided that the device has not been subjected to tampering, modification, or accidental abuse (such as dropping or immersion). A device that has been improperly used cannot be considered under this warranty.

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If a manufacturing defect is found during a period of up to one year from a date of delivery, Gynecare will repair or replace the device or replace any defective part thereof without charge to the purchaser; however, Gynecare's obligation hereunder does not include the cost of transportation which must be borne by the customer. Gynecare assumes no responsibility for damage in transit, and any claims for such damage should be presented to the carrier by the customer.

ABOUT THIS MANUAL

This manual is intended for technical support personnel.

This manual contains information required to test, adjust, and service the Gynecare Motor Drive Unit (MDU). The Users Manual is included for reference. Before attempting any service, please read the users manual to become familiar with safety and operational details.

The Functional Description section describes the major components of the MDU and provides important background for undertaking any adjustment or repair. The Specifications section lists those parameters that require validation as well as other important characteristics of the device. The Validation section describes detailed procedures for validating the key specifications. The Adjustment section describes methods for correcting certain parameters. The repair section provides guidance on diagnosing defects and accomplishing repairs. A recommended parts list gives those parts most convenient to be replaced. The complete set of schematics and assembly drawings and parts lists are provided for reference.

Revision Level

This manual covers an MDU unit at most recent revision levels of 4/20/99.

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FUNCTIONAL DESCRIPTION

Introduction

Purpose

This document describes the Motor Drive Unit (MDU) and provides an overview of the functional components that make up the electronics. The information will aid technical personnel in maintaining and troubleshooting the product.

Scope

This document only describes the MDU.

Reference Schematics

- Motor Driver Circuit, Drawing CD107901

Reference Assembly Drawings

- MDU Top Cover Assembly, Drawing TA127600
- MDU Chassis Assembly, Drawing TA133100

Product Overview

The MDU drives the rotating cutter found in several types of endoscopic surgical tools sold by Gynecare. The MDU contains a variable speed motor that drives the cutters by means of a disposable drive cable similar to a speedometer cable. The drive cable sheath is held in a fitting on the front of the MDU while the drive cable itself engages in a socket mounted on the motor shaft. The socket and the sheath are insulated to maintain patient isolation.

Front panel controls on the MDU allow adjustment of rotational speed and direction at any time. The motor start and stop behavior is determined by the setting of the mode switch on the back of the unit. In the Toggle mode, the motor can be started and stopped from the front panel and successive presses of the foot pedal alternate between starting and stopping the motor. In the Momentary mode, the front panel start is inactive and the motor will run only while the foot pedal is depressed. The toggling mode is used with ablation and resection tools. The momentary mode is used with the larger tissue morcellator.

For more information regarding the procedure set up and operation of the device, refer to the Users Manual.

Functional Sections

The MDU has 4 major sections, Power supply, Motor/Tachometer, Motor drive electronics, and User interface. Each is covered in more detail in the following sections.

Power Supply

The power supply is a commercial switching supply able to accept all voltages from 100 to 230 V and frequencies from 50 to 60 Hz. The primary AC power is switched by a circuit breaker so there are no replaceable fuses. The power supply output is 24 VDC. This voltage powers the cooling fan and the motor drive circuit. The power supply includes fold-back over-current protection. When the motor is stalled or overloaded, the

power supply shuts off momentarily. Several times a second, the power supply re-applies the power to see if the over-current condition still exists. This results in the characteristic pulsing of the driver when stalled.

Motor/Tachometer

The DC motor has an integral optical encoder that produces pulses in proportion to the rotation rate of the motor. Protection against overheating is provided by a self-resetting fuse in series with the motor. This device will shut off the motor if the average current to the motor exceeds 1.7 amps for 10 seconds or less if the current is greater. When the motor drive is shut off, the fuse cools and resets itself automatically.

Motor Drive Electronics

The drive electronics controls the current to the DC motor to regulate speed. When the rotation is on, the driver electronics compares an analog approximation of the speed derived from the tachometer with an analog reference voltage proportional to the speed setting and adjusts the motor current in a direction to minimize the error. A pulse width modulation technique is used to drive the motor. The voltage applied to the motor is switched on and off at about 20 thousand times a second. When the voltage is on a very short time, the current is low. As the time (pulse width) is increased, the current increases. The inductance of the motor tends to average the current so that the speed can be varied smoothly by varying the pulse width. The voltage switching is performed by four-transistors and drivers in a configuration known as an "H bridge". This bridge can apply voltage across the motor in either direction to reverse the direction of the motor. Current is supplied in one direction only while the motor is rotating. The pulses to the "H bridge" are blocked to stop the motor.

A digital pot sets the motor speed. Pressing the up and down buttons adjusts the setting of this pot that generates the reference voltage. The pot includes an internal EEPROM storage of the setting when the power is shut down, thus, the speed setting is retained.

Two trim pots set the minimum and maximum speeds. During manufacturing calibration, these pots are adjusted while reading the motor speed with a tachometer.

A set of flip-flops toggles the motor from on to off depending upon closures of the front panel start and stop buttons, the foot switch, and the foot pedal mode switch. Most of the control logic is powered by an on-board 5V regulated supply.

User Interface

A single membrane panel attached to the cover contains all user interface buttons and indicator LED's. This panel is connected directly to the motor drive electronics board. Each of the LED's is driven from this board. The speed lights are driven by a string of analog comparators that compare the speed reference voltage with a voltage divider. As the speed setting is increased, comparators successively turn on more lights.

SPECIFICATIONS

Performance Specifications

Speed	250 to 2000 RPM +/- 10%
Torque ¹	>15 in-oz peak
Stall Torque ¹	<30 in-oz

General Specifications

Electric Shock protection	Class I
Degree of protection against electric shock	GF (defibrillator proof)
Mode of operation	Continuous
Degree of protection against flammable anesthetics	None provided
Degree of protection against ingress of water	MDU, IPXI (Drip Proof) Foot pedal, IPX8 (watertight)
Power	100 – 240 V., 50 – 60 Hz., 166.6 Vamax
Size	4 x 10 x 10 inches, (102 x 254 x 254 mm.)
Weight	5.0 lbs., (2.27 Kg.)

¹Internal specification for testing only.

PERFORMANCE VERIFICATION

Purpose

This section describes the tests performed on the MDU to assure that the product meets the safety standards and conforms to product requirements. Perform these tests after any adjustment or repair to the MDU and at any time when performance must be validated. All tests must pass. The tests can be performed in any order. Be sure to perform shipping initialization before putting the MDU back into service.

Test Equipment Required

- HiPot Tester, Sotcher Measurement Inc., Model 568 or equivalent
- Torque Tester, FemRx AA239200
- Tachometer, Mitutoyo #982-521 or equivalent
- Cycle Test Fixture, FemRx AA239000

Reference Schematics

- Motor Driver Circuit, Drawing CD107901

Reference Assembly Drawings

- MDU Top Cover Assembly, Drawing TA127600
- MDU Chassis Assembly, Drawing TA133100

Tests

HiPot / Continuity Test

This test confirms the electrical safety.

Setup

Turn unit upside down on bubble wrap to protect case finish.

Plug AC cord into front of HiPot tester.

Attach Ground clip to any screw on bottom of unit.

Test

Perform this action	Expected Result	Pass/ Fail
Turn on MDU power switch.	Nothing energized.	
Push Start on the HiPot tester.	See voltage rise to 1500 volts and hold for 6 seconds.No alarms	

END OF TEST

Front Panel Function Test

This test verifies the correct operation of front panel controls and foot pedal.

Setup

Attach the MDU to the torque tester shaft and align the unit with the shaft.

Set torque to zero or turn off.

Plug AC cord into AC outlet.

Connect foot switch to foot pedal barb at rear panel.

Set the mode switch on rear panel to momentary, (down).

Test

Perform this action	Expected Result	Pass/ Fail
Turn on MDU power switch.	Lights on. Fan turns. Motor not running.	
Press and release the CCW button.	CCW green light on.	
Press and hold the speed up button.	Motor speed lights successively light until all are illuminated.	
Press and hold the speed down button.	Motor speed lights successively turn off until only the bottom light is on.	
Press and hold the speed up button until 4 lights are lit. Press and release the motor run button.	Motor does not turn.	
Press and hold the footswitch.	Motor runs CCW. Green motor on light lit.	
Release the footswitch.	Motor stops. Green motor stop light on.	
Press and release the CW button.	CW green light on.	
Press and release the motor on button.	Motor does not turn.	
Press and hold the footswitch.	Motor runs CW. Green motor on light lit.	
Release the footswitch.	Motor stops. Green motor stop light on.	
Set the mode switch on rear panel to latching (up). Press the	Motor turns. Green motor on light lit.	

Perform this action	Expected Result	Pass/ Fail
motor on button.		
Press the speed up button.	Verify that the motor speed increases.	
Press the speed down button.	Verify that the motor speed decreases.	
Press the motor stop button.	Motor stops. Green motor stopped light lit.	
Press and release the footswitch. May have to press twice to get first response.	Motor turns. Green motor on light lit.	
Press and release the footswitch.	Motor stops. Green motor off light lit.	

END OF TEST

RPM Calibration Test

This test verifies the calibration of speed adjustment.

Setup

Attach the MDU to the torque tester shaft and align the unit with the shaft.

Set torque to zero or turn off.

Plug AC cord into AC outlet.

Set the mode switch on rear panel to latching (up).

Test

Perform this action	Expected Result	Pass/ Fail
Turn on MDU power switch.	Lights Fan turns. Motor not running.	
Adjust the speed to maximum and press the motor on button.	Motor turns fast.	
Measure the RPM of the output shaft.	RPM = 2000 +/- 150	
Adjust the speed to minimum. Measure the RPM of the output shaft.	RPM = 250 +/- 15	
Stop motor.		

END OF TEST

Stall Torque Test

This test verifies that the motor will re-start after a stall.

Setup

Attach the MDU to the torque tester shaft and align the unit with the shaft.

Set torque to zero (current at minimum)

Plug AC cord into AC outlet.

Set the mode switch on rear panel to latching (up).

Test

Perform this action	Expected Result	Pass/ Fail
Turn on MDU power switch.	Lights Fan turns. Motor not running.	
Adjust motor speed setting to maximum and turn on motor. Turn the torque current up slowly until the motor stalls. Observe the motor for a few seconds, then turn the torque current down to zero. Record the maximum current reading.	After motor stalls, it should pulse several times per second attempting to re-start. When the current is reduced the motor should then return to full speed.	
Convert the maximum current to torque using the calibration table supplied with the torque tester.	Torque at stall must be greater than 15 in-oz and less than 30 in-oz. at stall.	
Repeat the above two tests at minimum speed.		

END OF TEST

Power Cycle Test

Setup

Plug in Cycle Tester, AA239000, and turn on power.

Set the cycle time on tester to 0.5.

Plug the MDU power cord into the front of the Cycle tester.

Set the mode switch on rear panel to latching (up).

MDU power switch is off.

Test

Perform this action	Expected Result	Pass/ Fail
Turn on MDU power switch.	Lights Fan turns. Motor not running.	
Press the MDU motor on Start button and wait 5 seconds.	Green motor on light lit.	
Press the green cycle begin button on cycle tester.	The MDU should repeatedly turn off and back on each time starting with the motor running.	
Increase the cycle time 0.25 at a time until the MDU turns on with the motor off. Let the MDU power cycle on/off a few times before increasing cycle time each 0.25 secs. Read the final cycle time off the timer.	$0.5\text{sec} < \text{final cycle time} < 5 \text{ sec.}$	

END OF TEST

Shipping Initialization

Before returning an MDU to service, set controls to these settings.

Set mode switch to momentary

Set speed to 4 lights

ADJUSTMENT PROCEDURES

Test Equipment Required

- Torque Tester, FemRx AA239200
- Tachometer, Mitutoyo #982-521 or equivalent

Reference Assembly Drawings

- MDU Top Cover Assembly, Drawing TA127600
- MDU Chassis Assembly, Drawing TA133100

RPM Adjustment

This adjustment sets the minimum and maximum motor speed. Perform this adjustment only if the RPM test fails. After adjustment, perform the validation tests.

Setup

Remove the top cover.

Connect a temporary membrane panel to motor driver board.

Attach the MDU to the torque tester shaft and align the unit with the shaft.

Set torque to zero or turn off.

Plug AC cord into AC outlet.

Set the mode switch on rear panel to latching (up).

Test

Perform this action	Expected Result	Pass/ Fail
Turn on MDU power switch.	Lights Fan turns. Motor not running.	
Adjust the speed to maximum and press the motor on button.	Motor turns fast.	
Measure the RPM of the output shaft and adjust RPOT2.	RPM = 2000 +/- 100	
Adjust the speed to minimum. Measure the RPM of the output shaft and adjust RPOT1.	RPM = 250 +/- 15	
Alternate between adjusting minimum and maximum speed until both are within tolerance.	Adjustment succeeds.	
Stop motor.		

END

Remove temporary membrane panel and re-install top cover.

REPAIR PROCEDURES

Introduction

Purpose

This document describes repair procedures for Motor Drive Unit (MDU). Repairs should only be attempted if a performance validation test fails and can not be corrected by an adjustment. After repair, perform the validation tests.

Scope

This document is limited to the MDU unit itself.

Reference Schematics

- Motor Driver Circuit, Drawing CD107901

Reference Assembly Drawings

- MDU Top Cover Assembly, Drawing TA127600
- MDU Chassis Assembly, Drawing TA133100

Repair Overview

Read the MDU Functional Description prior to attempting repair of the MDU. The repair approach is to postulate the component failure, isolate the failure by substituting a known good part, and then verify the repair with testing.

The following repair procedures focus on the replacement of major components.

Problem Diagnosis

These diagnosis scenarios are provided as a guide and are not intended to replace the knowledge of an experienced repair technician.

Foot Pedal

Failure of the MDU operation using the foot pedal is either electrical or mechanical in nature. The foot pedal is pneumatic. When the foot switch is depressed, air pressure is developed in the tube to the MDU. A small bellows in the MDU pushes on a SPDT switch to change the motor state.

When the foot pedal does not change the state of the motor in either the momentary or the latching mode, then the foot pedal may be suspect.

With the foot pedal attached to the MDU, press the pedal firmly.

If the pedal has little resistance or bottoms out easily, try replacing the foot pedal.

If the resistance improves and the motor now responds replace the foot pedal.

If the pedal has resistance, listen for a click in the MDU.

If no click is evident when the pedal is depressed, remove the top cover and measure the resistance between the brown and yellow wires on the pneumatic switch.

If the resistance remains the same before and after pressing the foot pedal, replace the pneumatic switch.

If the resistance is less than one ohm when the pedal is depressed and greater than 1000 ohm when released then check the resistance between the brown and white wires on the pneumatic switch.

If the resistance remains the same before and after pressing the foot pedal, replace the pneumatic switch.

If the resistance is less than one ohm when the pedal is released and greater than 1000 ohm when pressed then check the wires from the pneumatic switch and the motor drive PCB. If these are sound, then replace the motor drive PCB.

If the foot pedal operates in the latching mode, but does not operate properly in momentary then check the black wires connecting the mode switch on the back panel to the motor drive PCB.

If any wires are broken, remove the motor drive PCB and repair.

If wires look sound replace the motor drive PCB.

Motor

Failure of the motor is very rare. Possible symptoms include proper operation of all indicator lights with no apparent function of the motor, motor turns on, but runs very fast.

Remove the top cover while leaving the ribbon cable attached. Turn on the AC power, set the mode to latching and press Start.

If the motor does not turn, measure the voltage between the brown and yellow wires on the motor.

If close to 24 volts then replace the motor assembly.

If near zero, check the wires between the motor and the motor drive PCB and if good replace the motor drive PCB.

Membrane Panel

Failures in the membrane panel are very rare. Symptoms may include intermittent operation of one of the buttons or failure of one LED lamps. The membrane panel can be damaged by cuts or sever impact. The best diagnosis is just to temporarily plug in a known good membrane panel and test. If the problem persists, then replace the motor drive PCB.

Power Supply

Failure of a power supply is most often detected by complete absence of lights on the front panel when the power is turned on. Disconnect the AC power. Remove the top

cover. Re-connect the AC power and turn on the breaker. Measure the DC voltage at the power supply output (Between the black and red wires at J2). The voltage should be about 24 Volts.

If there is no voltage, visually check the glass fuse near J1 on the power supply.

If the fuse is blown replace the power supply.

If the fuse is OK, measure the AC voltage between the black and white wire at J1.

If the voltage equals the power line voltage, replace the power supply.

If the voltage is OK, then continue checking for a failed circuit breaker or broken wiring.

MDU Driver Electronics

Failure of the MDU electronics can exhibit a wide variety of symptoms. Consequently, when the observed symptoms fall outside of those described under power supply, motor, membrane panel, or foot switch, the motor drive PCB is most often the cause.

Repair Procedures

These repair procedures assume familiarity with normal terminology used in electronic and mechanical assemblies and the use of standard hand tools. Remove AC power cord before performing any repair. Perform all validation tests after completing repair.

Top Cover Removal

Remove the top cover by removing the 4 screws on the back corners of the cover, the four screws near the black rubber feet, and then lifting slowly to expose the flat ribbon cable to the top of the PCB. Remove the ribbon cable from the motor driver PCB and set the top cover aside.

Top Cover Installation

Connect the flat ribbon cable from the membrane panel to J3 on the motor drive PCB. Pin one (marked with triangle on connector) faces towards the front of chassis. Slide the cover down over the chassis. Flip the MDU upside down and place on a soft surface to protect the paint. Install four 6-32 screws next to the black feet and tighten to 15 in-lbs. Install four 4-40 screws through the back corners of the cover and tighten to 10 in-lbs.

Power Supply Removal

Remove top cover. Remove the wire harnesses from J1 and J2 on the power supply. Loosen the four screws holding the power supply and lift the power supply straight up.

Power Supply Installation

Locate the power supply on the metal standoffs with J1 towards the AC power. Align the four standoffs with holes in the power supply PCB. Replace the four mounting screws (with thread locker) and star washers. Tighten to 8 in-lbs. Connect wire harnesses to J1 and J2. Install the top cover.

Pneumatic Switch Removal

Remove the top cover. Loosen the large nut holding the pneumatic switch to the back panel. Remove the plug from J4 on the motor driver PCB. Cut the tie wrap holding the switch wires if required. Spring the back panel and work the switch out of the hole until it is free.

Pneumatic Switch Installation

Work the new pneumatic switch assembly into the hole in the back panel. Install the plastic retaining nut and tighten. Plug the wire connector into J4 on the motor drive board. Dress the wires over the top of the fan and tie wrap to other cables if required. Install the top cover.

Motor Control Electronics Removal

Remove the top cover. Loosen the four screws holding the power supply and lift and move power supply towards the motor. Remove the screw holding the "H bridge" package to the base plate. Remove the nut from the mode switch using a socket driver. Remove the two screws holding the PCB to the mounting brackets. Swing the PCB away from the mounting brackets and remove all the brown connectors. The PCB is now free.

Motor Control Electronics Installation

Hold the PCB near the mounting brackets. Align the mode switch with the hole in the back panel and insert. Install the three brown connectors to the PCB. Hold the mode switch vertical with the pin from keyed washer in the alignment hole. Re-place the switch guard by tightening the mode switch nut with a socket driver. Align the hole in the "H bridge" with the threaded insert in the base plate, install the mounting screw, and tighten to 8 in-lbs. Insert the two screws and washer through the PCB to the mounting brackets and tighten to 4 in-lbs. Re-align the power supply mounting holes with the standoffs and insert the four mounting screws with thread locker and star washers. Tighten to 8 in-lbs. Attach a temporary membrane panel to the PCB. Connect the AC power and perform the motor speed calibration. Remove the temporary membrane panel and re-install the top cover.

Membrane Panel Removal

Remove the top cover. Loosen the CPC connector by turning the connector with a wrench from the front of the cover. Remove all the CPC connector parts. Pry a corner of the membrane panel away from the top cover using a small screwdriver or similar tool. Peel the membrane panel off of the top cover. Slide the flat cable out of the slotted hole and discard the membrane panel.

Membrane Panel Installation

Remove all remains of old membrane panel. Remove the release liner from the new membrane panel. Guide the flat cable through the slotted hole and carefully align the bottom edge of the panel with the bottom edge and sides of the recess in the top cover. Gradually press the membrane firmly against the top cover working from the bottom to

the top. The membrane panel must fit completely within the recess and be free of trapped air bubbles. Re-assemble the CPC connector parts (see TA127600) and hand-tighten the CPC connector from the front. Replace the top cover. Sight down the hole in the CPC connector and press on the front nut to visually align the CPC connector with the hole in the end of the motor coupler. Hold in place while tightening the front CPC connector. Rotate until the release lever is on the top of the connector. (Note: experiment with different positions of the CPC nut in the back washer until the CPC connector is just tight when the release lever is on top.) Visually check the alignment after tightening and correct is required. Verify by inserting a section of resectoscope drive cable and listening for excessive noise when the motor is turning.

Fan Removal

Remove top cover. Remove four mounting screws. Disconnect wire harness from J1 on motor driver PCB and J2 on the power supply. Remove the fan and attached wire harness.

Fan Installation

Align fan with the four mounting holes with the wires exiting from the top of the fan. Attach with four screws, eight washers, and four nuts as shown in the assembly drawing. Torque to 8 in-lbs. Dress the wire lead towards the motor drive board and plug brown connector into J1 on the motor driver PCB. Continue leading the longer wire between the power supply and the motor drive board and plug the larger white connector into J2 on the power supply. Be sure that the locking ribs face the power supply. Install the top cover.

Breaker Switch Removal

Remove top cover. Pull off the four wires from the back of the breaker. Depress retainer fingers on the top and bottom of the breaker and work out of the back panel.

Breaker Switch Installation

Snap the breaker into the hole in the rear panel being sure to align the on side "1" towards the top of the unit. Press on the four wires according to the chassis wiring diagram. Install the top cover.

AC Socket Removal

Remove top cover. Pull off the three wires attached to the module. Remove the two retaining screws and remove the module.

AC Socket Installation

Slide the AC socket into the hole in the back panel being sure to place the ground lug towards the outside of the chassis. Insert the two mounting screws and tighten to 6 in-lbs. Plug the white wire to the bottom tab. Plug the green/Yellow wire to the outside tab. Plug the black wire to the top tab. Install the top cover.

Motor Removal

Remove the top cover. Remove the power supply. Remove the motor driver PCB. Remove the coupler clamp, the coupler, and the four screws holding the motor to its mounting bracket. Remove the motor and attached cable.

Motor Installation

Attach the new motor to the mounting bracket with 4 screws and washers. Tighten to 14 in-lbs. Center clamp on small diameter of coupler. Mount coupler on motor. Torque clamp screw to 18 in-lbs. Dress the motor cable as shown in assembly drawing. Install the motor drive PCB. Install the power supply. Install the top cover.

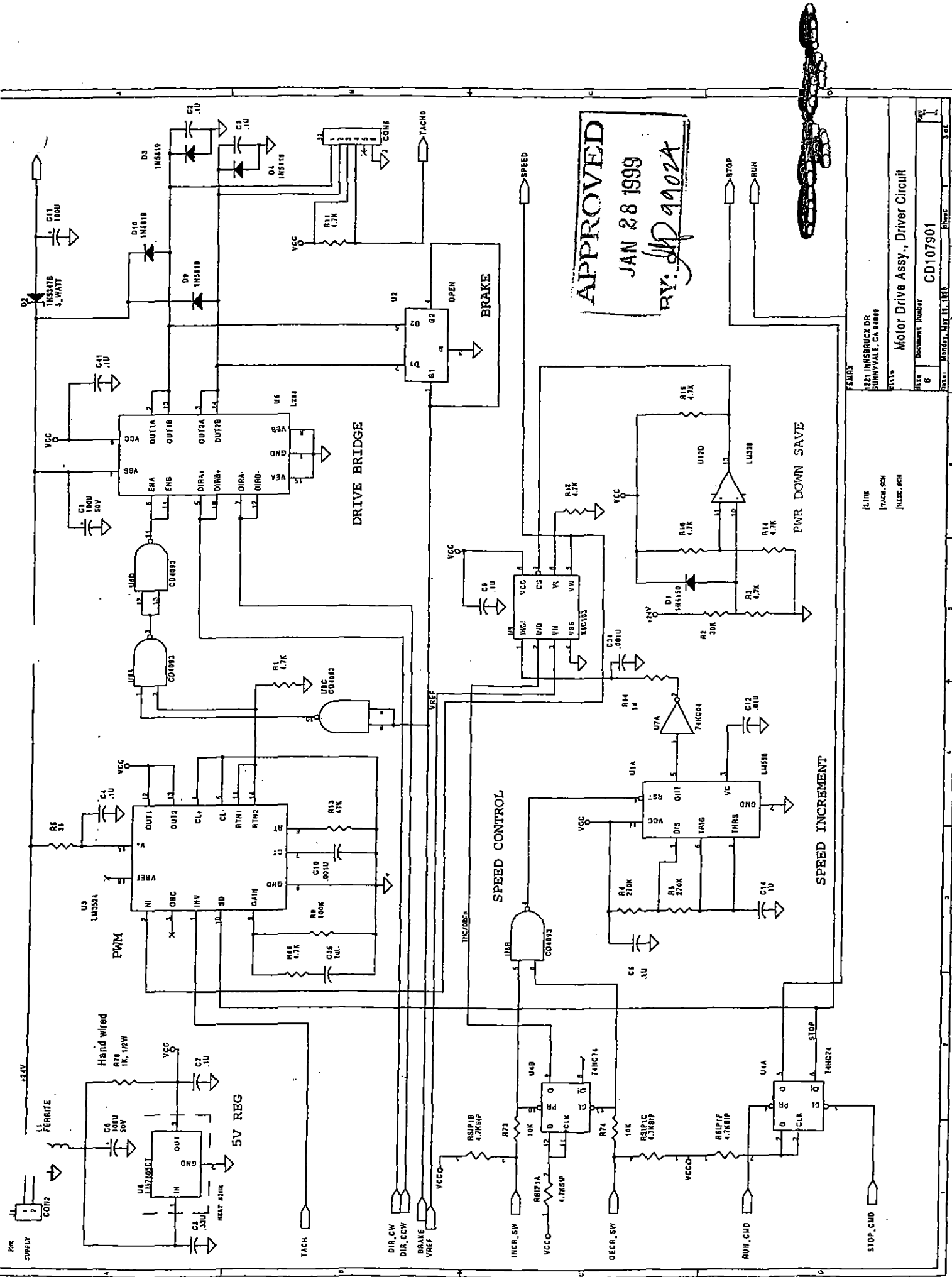
REPAIR PARTS

Introduction

This list includes the most likely parts required for repair of the Motor Drive Unit. The complete list of parts is given in sections 6 and 7.

Parts List

Part Number	Part Name
TA127800	Fan Assembly
TA127900	Foot Switch Assembly
NA114400	Breaker Switch
TA107901	Motor Drive PCB assembly
NA117400	Power Supply
NA114100	AC Socket
PA127200	Top Case
NA113000	MDU Membrane Panel
TA127400	Motor Drive Assembly
TA186900	Toggle Switch Assembly



APPROVED
 JAN 28 1999
 RV: *[Signature]* 99024

2221 INNSBRUCK DR
 SUNNYVALE, CA 94089
 Motor Drive Assy, Driver Circuit
 CD107901

LINE
 TACHO, SW
 INCR, DECR

REV B
 DOCUMENT NUMBER
 SHEET 1 OF 1

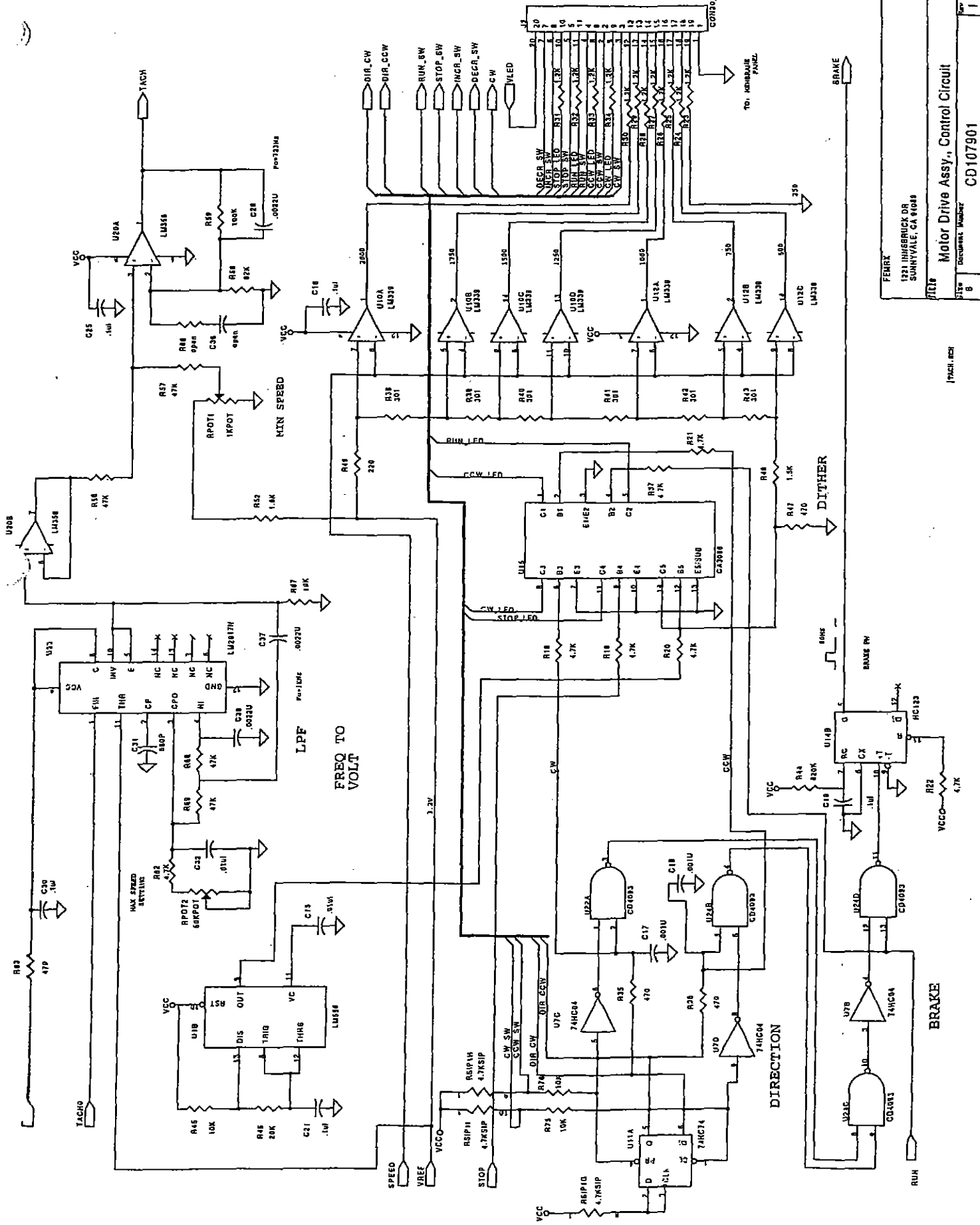
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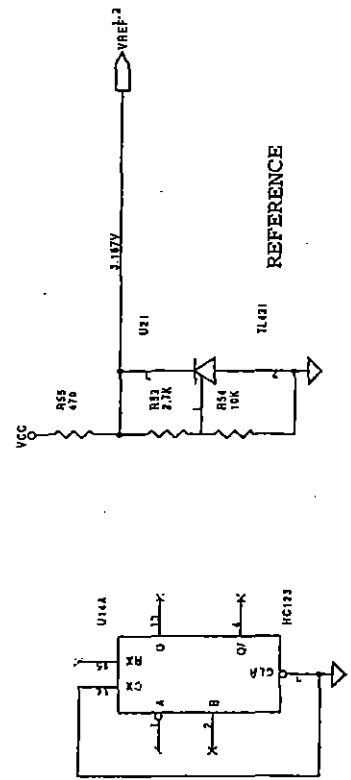
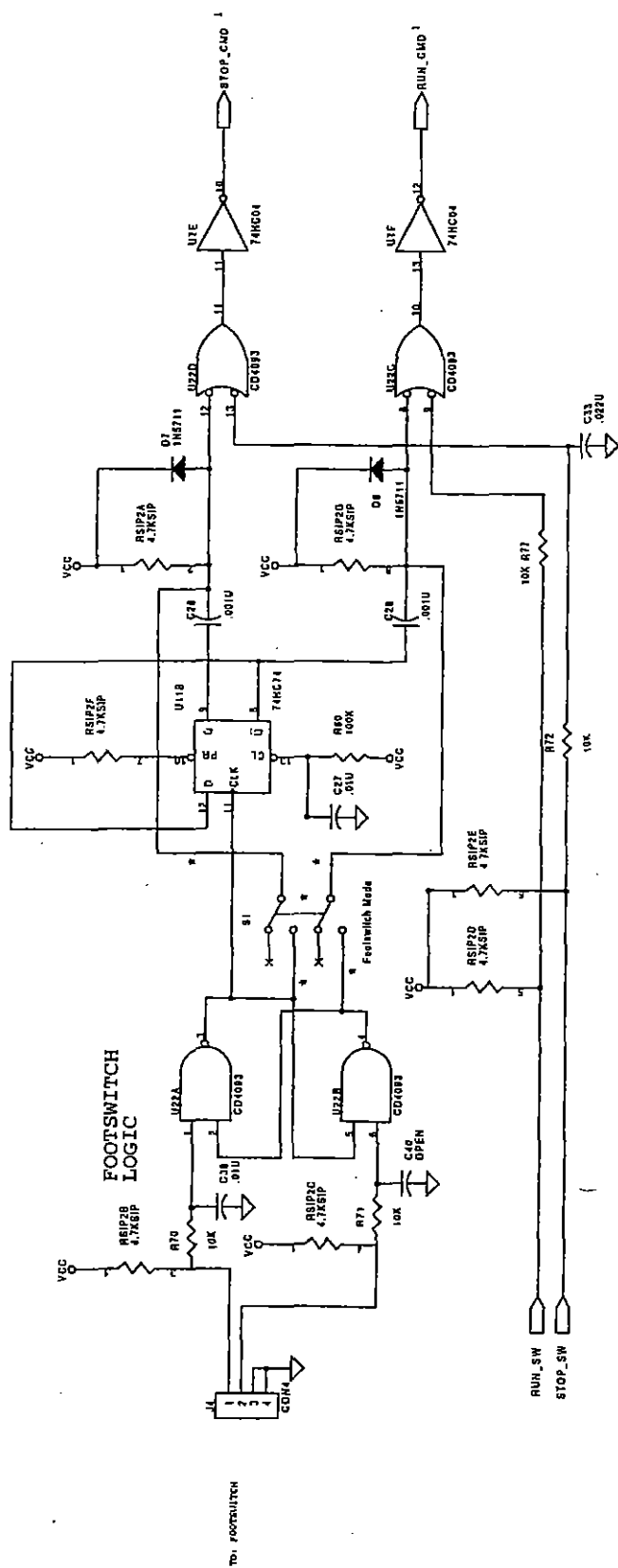


FERRY
 1221 INNSBRUCK DR
 SUNNYVALE, CA 91089
 Motor Drive Assy., Control Circuit
 CD107901

INCH. HCH

Size	8	Rev	1
Date	Monday, May 11, 1988	Drawn	1

Footswitch Mode - up is toggle, down is momentary



SPARES:

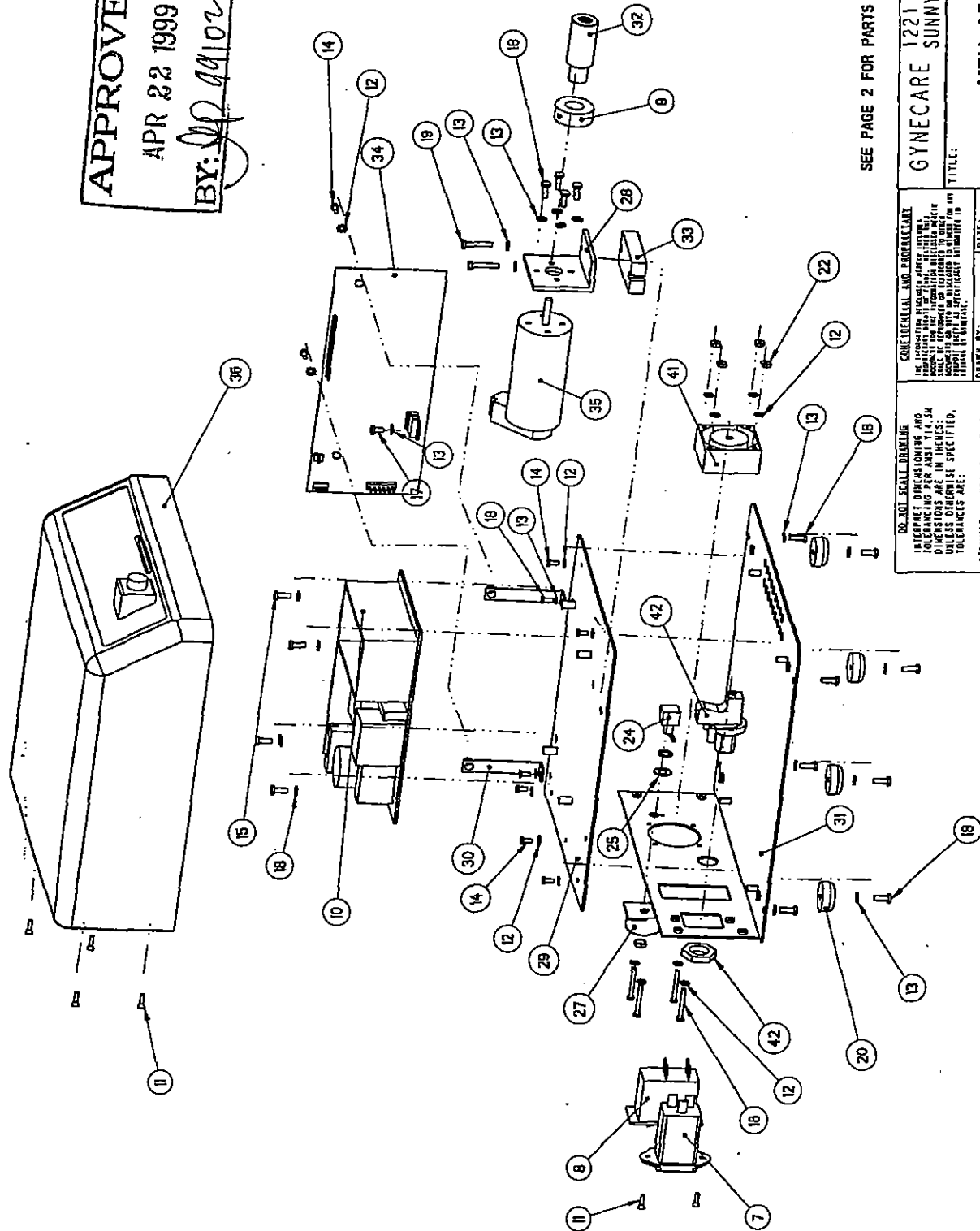
* Hand wired - not on PCB

FEMRX 1221 HINBRUCK DR SUNNYVALE, CA 94088	
Part	Motor Drive Assy, footswitch circuit
Rev	CD107901
Date	Monday, July 19, 1993
Page	3 of 3

1432-401

DATE: 4/26/99
 BY: [Signature]
 TITLE: [Signature]

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SEE PAGE 2 FOR PARTS LIST

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DRAWN BY: TDD/T DATE: 22-Apr-99	ENGINEER: TDD/T DATE: 25-Apr-99	STATE: C	REV: F
APPROVED BY: [Signature]	FILE NAME: TDD/TDD/F	PART No. 7423300	SCALE: 1 of 2
MATERIAL: NA	FINISH: NA	SCALE: 1 of 2	SHEET 1 of 2

Overall MDU Assembly (TA133100)

Part #	Ref Des	QPA	Description
JA120900	1	1	Label, MDU Serial, Info
JA128100	2	1	Label, CE-TUV-CUL
JA128200	3	1	Label, Caution
JA128300	4	1	Label, Foot switch
JA143500	5	1	Label, UL Approved marks
JA185800	6	1	Label, Foot switch mode
NA114100	7	1	AC Socket, Power entry
NA114400	8	1	Breaker Switch
NA117007	9	1	Clamp, 0.5" ID
NA117400	10	1	Power Supply
NA124501	11	6	Screw, 4-40 x 3/8 oval head phillips
NA124810	12	17	Washer, star #4
NA124812	13	18	Washer, star #6
NA124901	14	9	Screw, 4-40 x 1/4"
NA124906	16	4	Screw, 4-40 x 1"
NA124907	17	1	Screw, 6-32 x 1/4"
NA124908	18	12	Screw, 6-32 x 3/8"
NA124909	15	4	Screw, 6-32 x 1/2"
NA124911	19	1	Screw, 6-32 x 3/4"
NA125601	20	4	Rubber foot (bumper)
NA131608	21	2	Ring, Tongue terminal
NA132201	22	4	Nut, 4-40
NA132901	23	0.1	Tubing, Heat shrink
NA132902	23	0.16	Tubing, Heat shrink
NA185400	24	1	Toggle switch, DPDT
NA185500	25	1	Lock ring
NA185610	26	0.67	Hook up wire
PA185700	27	1	Switch guard
RA114600	28	1	Motor bracket
RA116600	29	1	Sub chassis
RA116800	30	2	Mounting bracket, PCB
RA117200	31	1	Chassis bottom, MDU
RA117300	32	1	Coupler, shaft assembly
RA118100	33	1	Riser, motor mount
TA107901	34	1	PCB, MDU motor driver
TA127400	35	1	Motor sub-assembly
TA127600	36	1	Top case sub-assembly
TA127701	37	1	Switch harness
TA127702	38	1	Neutral Lead
TA127703	39	1	Hot Lead
TA127704	40	1	Ground Lead
TA127800	41	1	Fan assembly
TA127900	42	1	Pneumatic Switch sub-assembly
TA186900	43	1	Momentary switch assembly
TRV004			Traveler, MDU
CD127300			MDU, overall schematic
MPI 019			MDU label placement
MPI 020			MDU layout

12.84

X

RA114500
 NA113901
 TA133100 Rev.F CO 99102

CPC NUT 31.63
 CPC CONNector \$25.00
 CPC FRONT WASHER RA114700 #45
 CPC BACK WASHER RA125100 #25
 Page 2 of 2

GYNECARE

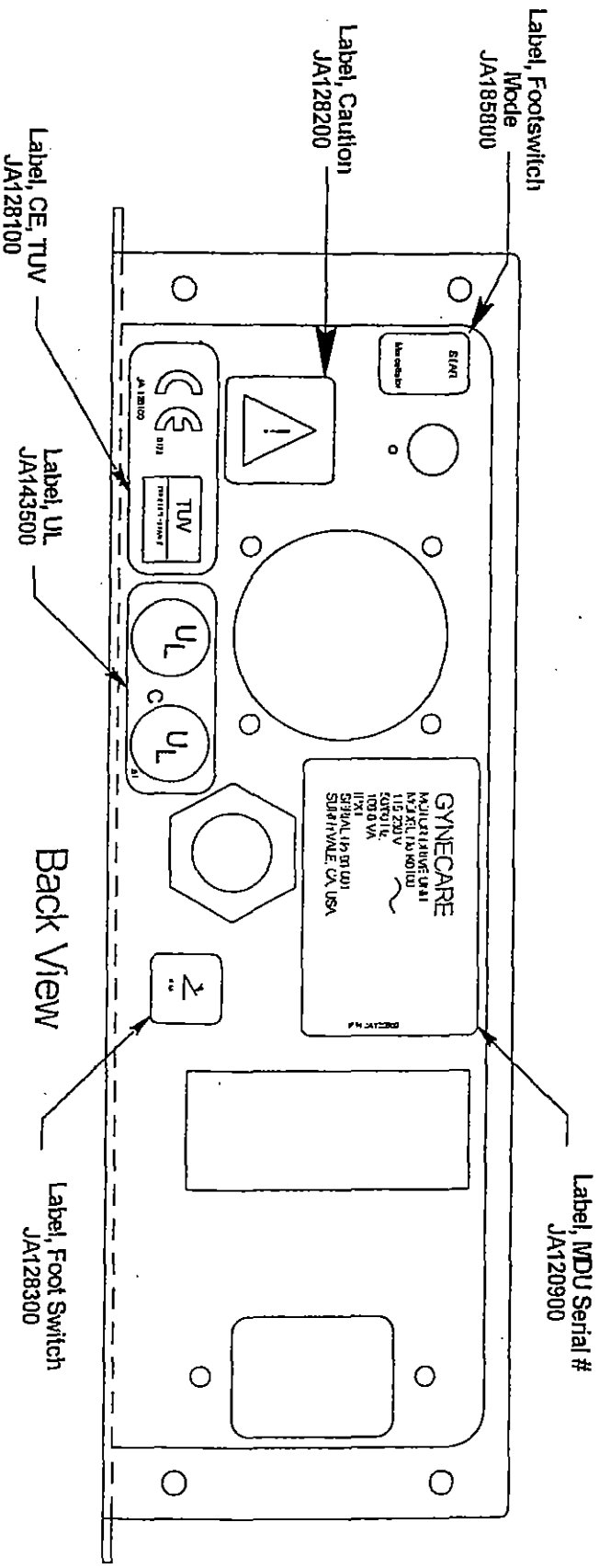
MPI 019

Rev 1

MDU Label Placement

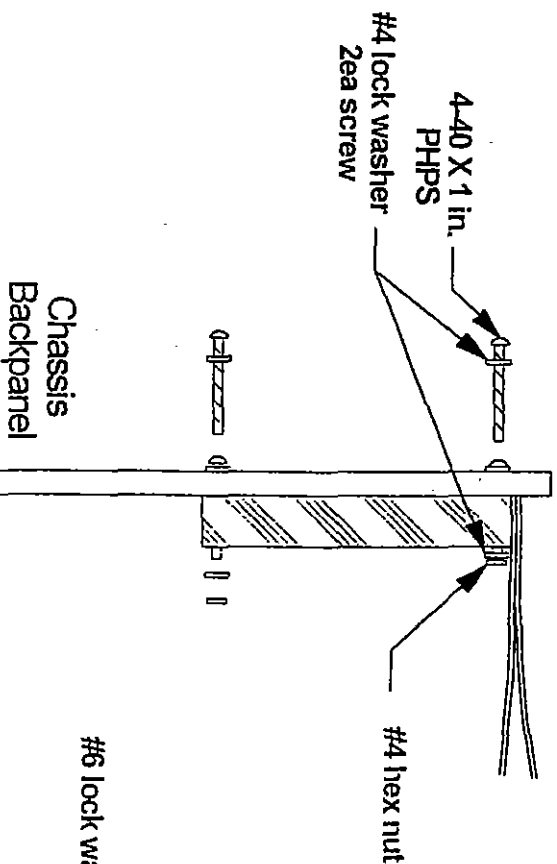
Sheet 1 of 1

CO 99099



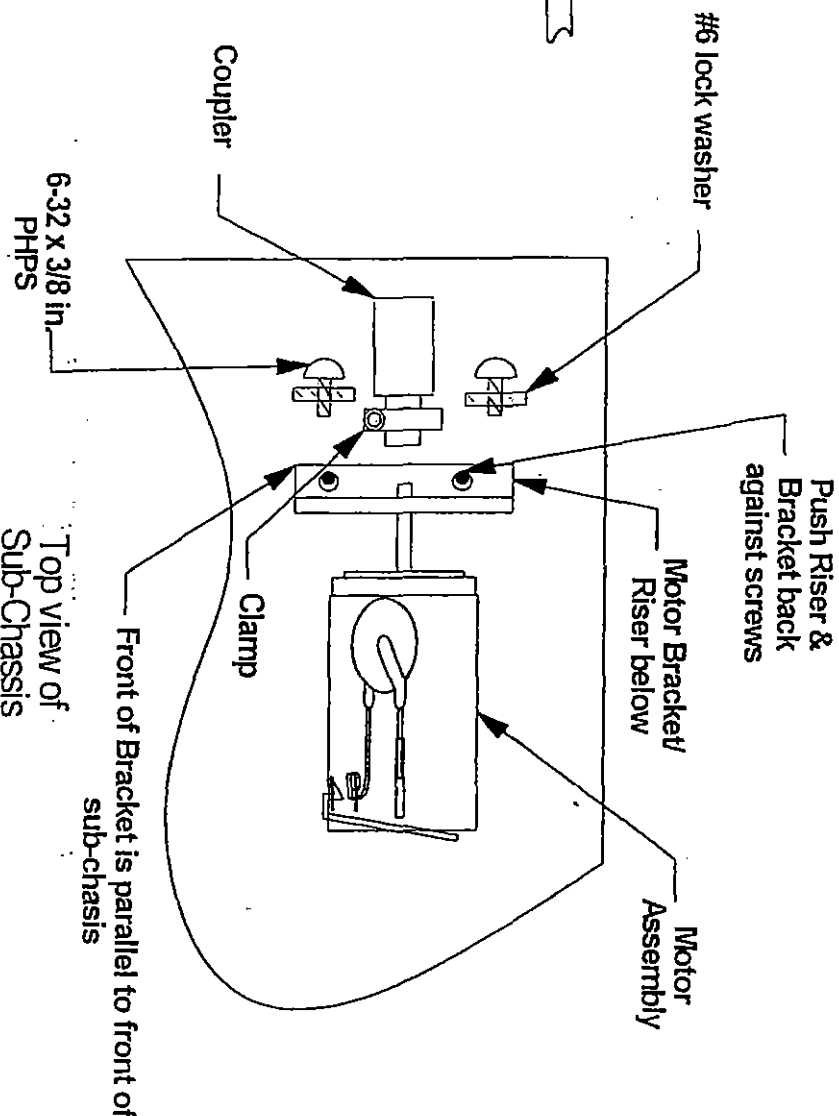
APPROVED
 APR 20 1999
 RY: *[Signature]* 99099

Fan Installation



Motor Installation

APPROVED
 APR 20 1998
 BY: *[Signature]* 99099



Power Switch NA114400
Power Socket NA114100

#1
Foot Switch Harness

Foot Switch TA127900

The Wrap NA125401
to keep wires out of fan

Green Pig Tail TA127704

Motor RA128002

Fan TA127800

Toggle Switch NA185400

Make Sure No Wires are in Front of Fan !!

Motor Assy Wires under Fan must not pinch between fan and Sub-Chassis

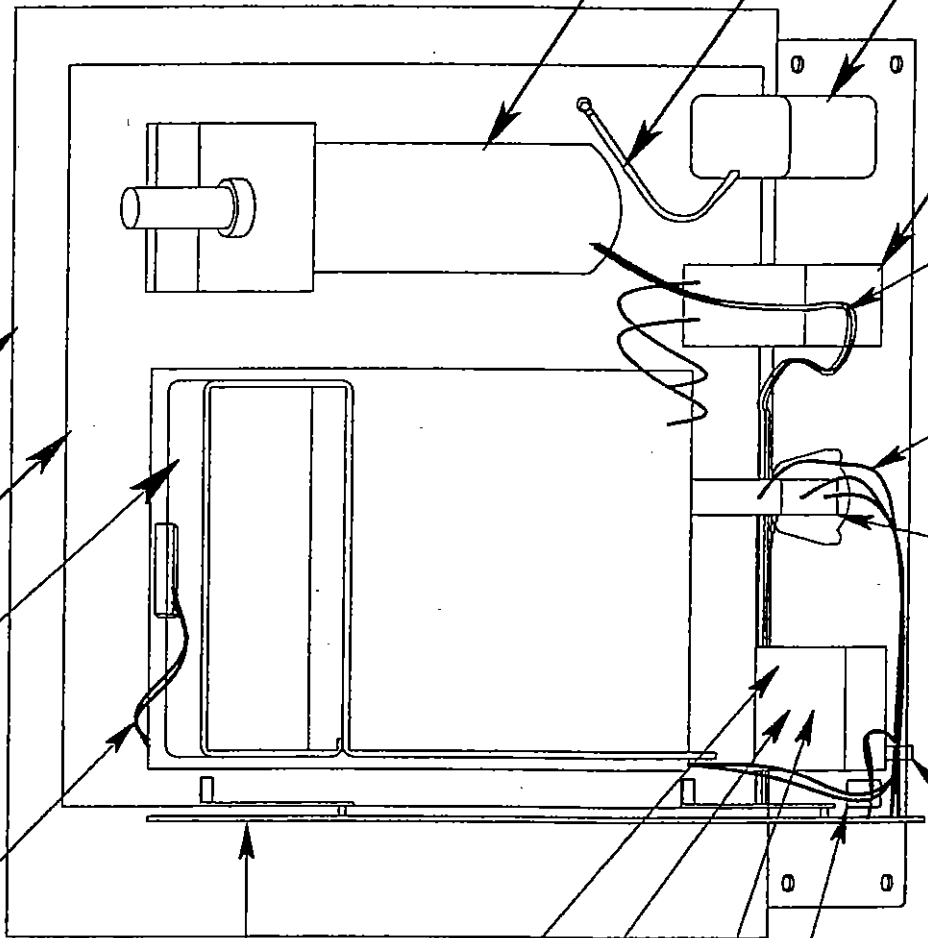
PCB TA107901

#1 Keep Motor Low Voltage wires away from high voltage wires. Route wires above Power Switch, then down under Foot Switch & Fan. Bend Power Supply wires from Switch down away from LV wires (use extra tie wraps if necessary to hold wires in position).

Chassis RA117200

Power Supply NA117400
Sub-Chassis RA116000

Fan Harness Above Sub-Chassis



GYNECARE® Fluid Management System Hardware

NO.	DESCRIPTION	U/M	PRICE
FS0900	Controller	1 each	\$4,950
FS0910	Fluid Receptacles: 8-liter, high-capacity receptacles	2 each	200
FS0940-US	Power Cable	1 each	25
FS0990-UD	Upper Dome	1 each	2,495
FS0625-LD	Lower Dome/Upgrade Kit	1 each	3,495

GYNECARE® STAR (Specialized Tissue Aspirating Resectoscope) and Fluid Management System Accessories

NO.	DESCRIPTION	U/M	PRICE
FS0920	Vac Tubing: Single-use vacuum filter tubing set	1 case/24 each	\$595
FS0950	Liner: Single-use receptacle liner	1 case/6 each	189
FS0980	Link Tubing: Single-use tubing for tandem receptacle setup	1 case/24 each	149
OS2750	Reusable electrosurgical cord with standard ESU adapter (for use with STAR)	1 each	99
JP2750	Reusable electrosurgical cord with standard ESU adapter and ground plug (for use with STARSL)	1 each	99
TU0750	Outflow Tubing: High-flow, outflow tubing set with in-line tissue trap	1 case/12 each	235
TU0725	Inflow Tubing: High-flow, 4-spike inflow tubing set with electronic patient sensor	1 case/6 each	420

GYNECARE® Laparoscopic Morcellator

NO.	DESCRIPTION	U/M	PRICE
DV0015	Laparoscopic Morcellator, 15 mm	1 case/5 each	\$1,975

GYNECARE® Motor Drive Unit

NO.	DESCRIPTION	U/M	PRICE
MD0100-US	Motor Drive Unit	1 each	\$2,500
MD0140-US	Motor Drive Unit Power Cord	1 each	25
MD0120	Motor Drive Unit Foot Pedal	1 each	35

