INSTRUCTION MANUAL

OPERATION & SERVICE

326M SERIES

SUCTION APPARATUS, SURGICAL, AND GASTROINTESTINAL ABDOMINAL DRAINAGE

PORTABLE, AC/DC/RECHARGEABLE BATTERY

CONTRACT NO. SPO200-98-D-8703

IMPACT INSTRUMENTATION, INC.
Manual P/N 906-0326-03

Rev. G (12/00)

TABLE OF CONTENTS

TABLE OF CONTENTS (CONT'D)

LIST OF ILLUSTRATIONS

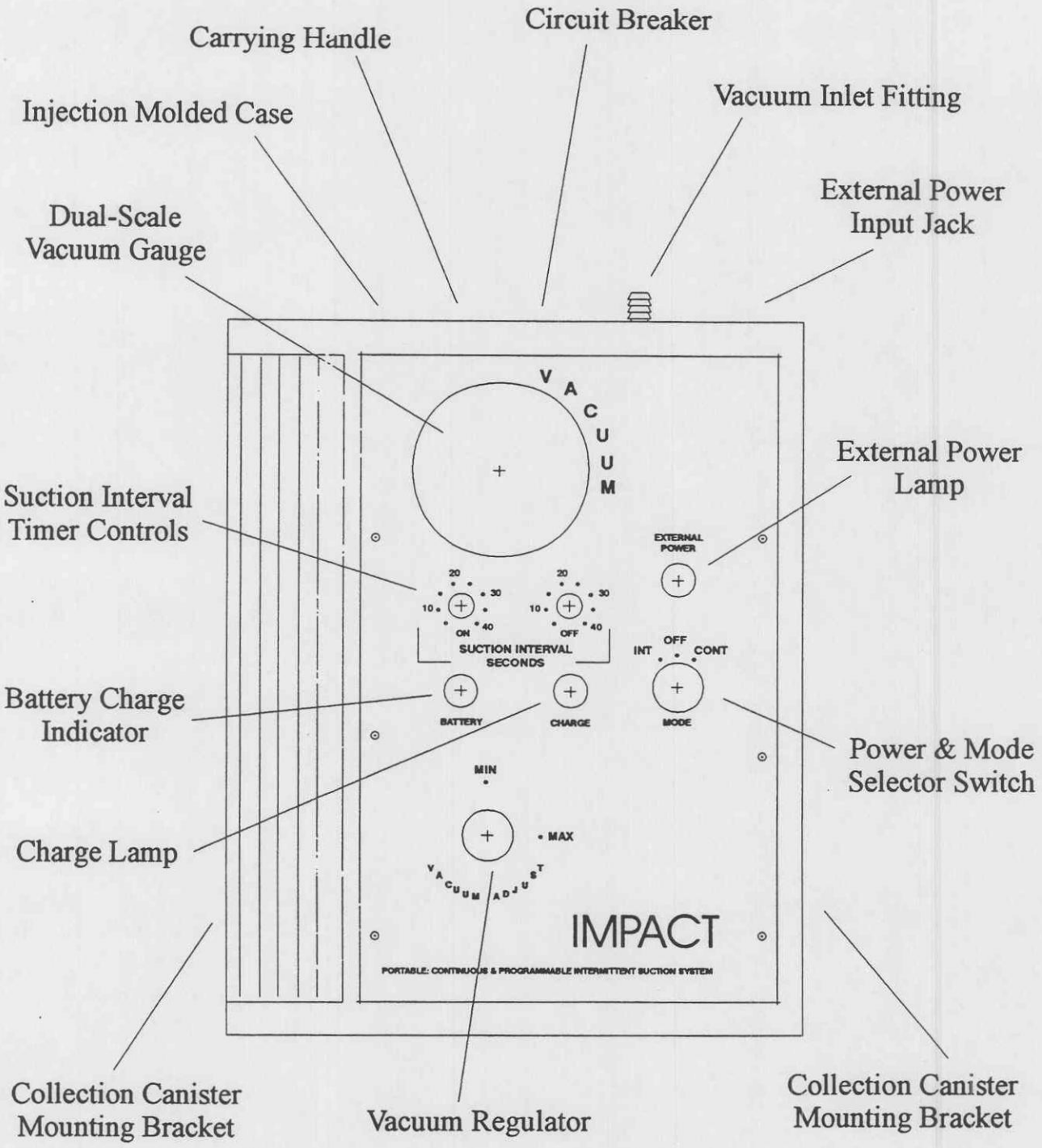

FIGURE 1 MODEL 326/326M MAIN FEATURES

df: 326MFIG1.CDR (Rev 0, 04/97)

SHIPPING CONTENTS

Each Model 326 is shipped with the following contents:

1 ea. Apparatus, Suction, Portable
1 ea. Assembly, Auto Power Cable
1 ea. Suction Hose, Sterile, Clear, 6' Long
1 ea. AC/DC Power Supply (115/230 VAC, 50/60/400 HZ input; nominal 12 VDC output)
1 ea. Hose, Clear, PVC, 1' Long
1 ea. Hose, Clear, PVC, 18" Long
1 ea. Hose, Clear, PVC, 2' Long
1 ea. Universal Canister Attachment Bracket
1 ea. Fuse, Spare
1 ea. Instruction Manual, Operation

Each Model 326M is shipped with the following contents:

1 ea. Apparatus, Suction, Portable
1 ea. Assembly, Auto Power Cable
1 ea. Suction Hose, Sterile, Clear, 6' Long
2 ea. Fuse, Spare
1 ea. AC/DC Power Supply (115/230 VAC, 50/60/400 HZ input; nominal 12 VDC output)
1 ea. Hose, Clear, PVC, 1' Long
2 ea. Hose, Clear, PVC, 18" Long
2 ea. Hose, Clear, PVC, 2' Long
2 ea. Universal Canister Attachment Bracket
2 ea. Instruction Manual, Operation & Service
1 ea. Case, Padded, Aspirator
2 ea. Strap, Velcro®

The following are provided with NSN 6515-01-435-0050

2 ea. Collection Canister Assembly, Autoclavable
2 ea. Filter, Disposable, Hydrophobic/Bacterial/Overflow (for use with reusable canisters only)
1 ea. Carry-all Case with Label

The following are provided with Air Force Accessory Kit

2 ea. Disposable Collection Canister & Lid
1 ea. Catheter, 14 French
1 ea. Catheter, 18 French

ACCESSORIES LIST

The Accessories List contains common items, required from time to time. Each item is preceeded by its part number. Accessories may be ordered direct from Impact. When ordering, please include the part number, description and quantity required.

Send written purchase orders to:

Impact Instrumentation, Inc.
P.O. Box 508
27 Fairfield Place
West Caldwell, New Jersey 07006

Telephone orders: 973/882-1212
FAX orders: 973/882-4993

PART NUMBER	DESCRIPTION
465-0005-00	Filter, Disposable, Hydrophobic/Bacterial/Overflow
540-0068-00	Hose, Clear, PVC, 1' Long
540-0055-00	Hose, Clear, PVC, 18" Long
540-0051-00	Hose, Clear, PVC, 2' Long
703-0326-07	Assembly, Collection Jar
703-0326-06	AC/DC Power Supply
820-0018-00	Tubing, Suction, Sterile, 9/32" I.D. X 6'
906-0326-03	Instruction Manual, Operation & Service, Model 326M
906-0326-01	Instruction Manual, Operation, Model 326
906-0326-04	Instruction Manual, Operation & Service, Model 326

LIMITED COPYRIGHT RELEASE

CALIBRATION NOTICE

This device should be incorporated into a regular preventative maintenance program to insure compliance with operating specifications. Calibration measurements should be made on a biannual basis unless significant usage warrants a shorter period between preventative maintenance inspections. A calibration check should be made following each cumulative period of 300 hours of operation. Recommended maintenance checks can be found in the **SERVICE** section of this Manual.

UNPACKING

Check the contents of the shipping case(s) against the enclosed packing list. Examine the instrument for any obvious signs of shipping damage. If there is no apparent sign of mechanical damage, read the instructions contained within this manual before attempting to operate the instrument.

LOCATION OF USE

The Model 326/326M is a transportable device, therefore, its physical area of use will vary. When operated in a wet environment, user's should take precautions and protect this device by covering it with a protective barrier (small tarp, plastic sheet, etc.).

WARNINGS REGARDING USE

Caution: Federal law restricts this device to sale by or on the order of a physician.

This equipment is intended for use by qualified medical personnel or person(s) under the guidance and instruction of certified medical therapists.

Danger - Possible explosion hazard if used in the presence of flammable anesthetics.

Caution - Electric shock hazard, do not remove inside cover. Refer servicing to qualified biomedical equipment technicians only. See section entitled **SERVICE.**

Do not operate this instrument prior to reading the instructions contained within this manual.

Disposable hydrophobic/bacterial/overflow filter is for use only with reusable, autoclavable, collection canisters.

Do not clean collection canister with abrasive cleansers or **(See ROUTINE CARE AND MAINTENANCE section CLEANING).**

ASSEMBLY, INTERCONNECTIONS AND INITIAL ADJUSTMENTS

ASSEMBLY: No assembly is required before placing this device into operation.

INTERCONNECTIONS: Tubing interconnections are required before placing this device into operation. Figure 2 depicts the interconnections required to connect the Model 326/326M to the reusable collection canisters (in series) and disposable hydrophobic/bacterial/overflow filter.

INITIAL ADJUSTMENTS: Before placing this device into operation read the section entitled **OPERATION, DESCRIPTION OF CONTROLS, CIRCUIT BREAKER, CONNECTORS AND INDICATORS.** Make control settings and verify device performance prior to interfacing with patient.

ASSEMBLY, INTERCONNECTIONS AND INITIAL ADJUSTMENTS (cont'd)

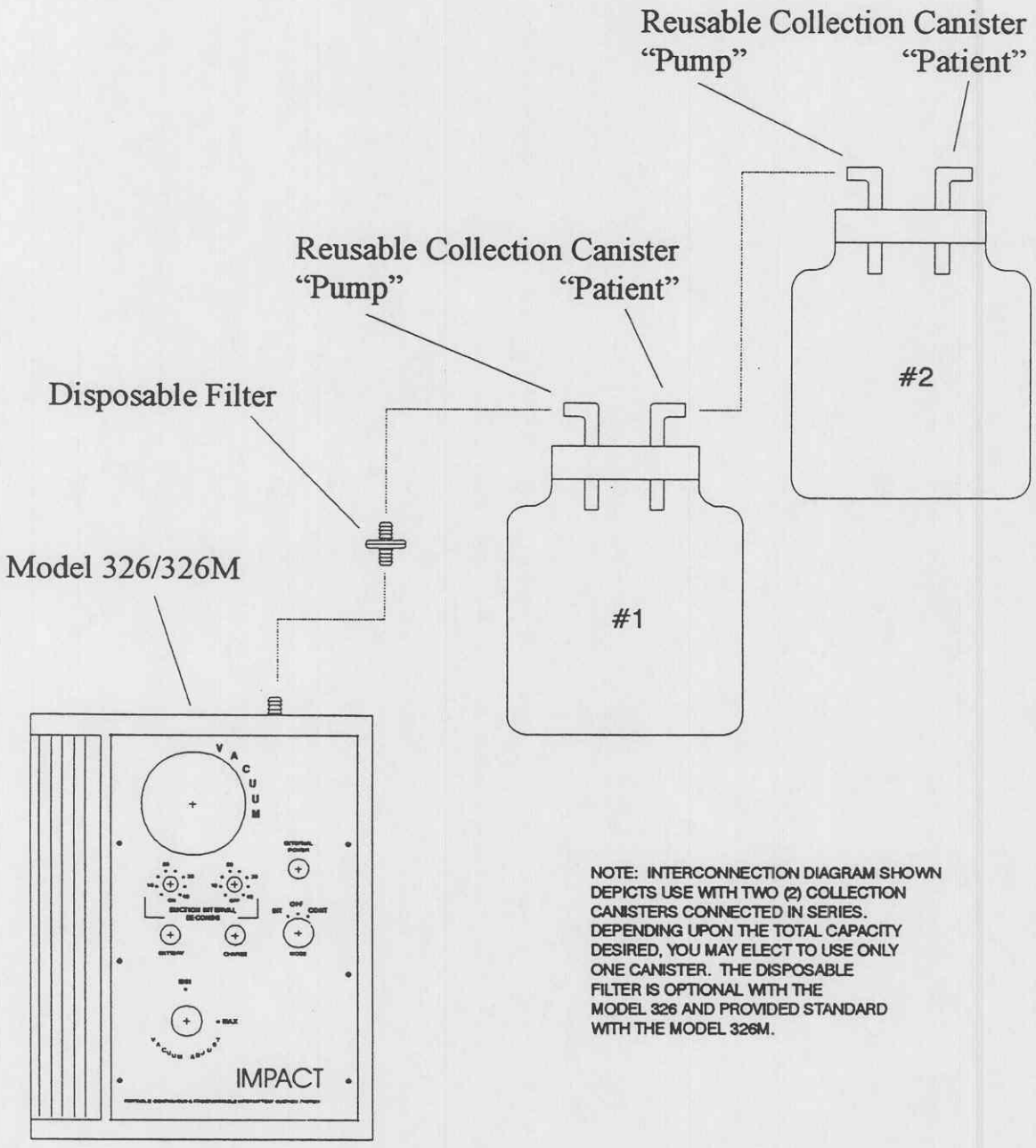

FIGURE 2 INTERCONNECTION DIAGRAM

Suction Apparatus shown with disposable hydrophobic/bacterial/overflow filter.

USAGE APPLICATIONS - DEEP DRAINAGE/GASTRO-INTESTINAL SUCTION

IMPACT MODELS 306/306M AND 326/326M PORTABLE ASPIRATORS

Deep drainage/gastro-intestinal suction, frequently referred to as Wangensteen suction (after Dr. Owen H. Wangensteen*), requires a thorough understanding of "mild suction" procedures including collection bottle placement and tubing lengths. The following data is for reference only and specific applications may warrant deviations and/or additional considerations.

The Impact Models 306/306M and 326/326M are capable of maintaining precise vacuum and airflow levels. ON/OFF cycling times may be varied from patient to patient effectively optimizing drainage intervals. Cycling intervals are somewhat arbitrary. It is recommended that the user select intervals consistent with past practices and protocols.

The gastro-intestinal tract represents a pliable area which when subjected to continuous negative pressure will collapse around an implanted drainage tube. Such a collapse can cause continuous suction in a specific tissue area, thus preventing additional drainage while fluids accumulate and potential ulcerations can lead to perforations and hemorrhage at the collapsed site.

The intended action of intermittent suction is to provide a hydraulic effect whereby drainage fluids are pulled and pushed during ON and OFF cycles. The "pull" effect occurs as suction is applied to the gastro-intestinal tract, thus removing accumulated fluids. The "push" effect occurs when fluid in the elevated connecting tubing (18" maximum height) flows back into the drainage site, "washing" the implanted catheter away from the intestinal wall, thus relocating it in time for the next ON cycle.

It is important to note that the height of the collection canister and placement "dressing" of the connecting tubing each has a critical effect on overall performance. Under normal conditions, vacuum levels of 90 mmHg and 120 mmHg would raise a column of water approximately 4' and 5' respectively. It is possible that mild suction, involving particulate matter (solids), blood clots, and viscous secretions could present a situation whereby the delivered suction strength can only raise the drained contents to a height of roughly 3' to 4'. To compensate for this effect, the user is cautioned not to exceed an 18" height between collection bottle entry point and the distal end of the implanted suction catheter. The user should also be discouraged from using excessive lengths of connecting tubing. Since mild suction consists of minimal airflow, excessive tubing lengths could prevent fluid from actually entering the collection canister prior to the beginning of the next OFF cycle. The actual length of the ON cycle can be extended to compensate for this, however, the clinician must always recognize that an increased possibility of tissue occlusion exists.

The hydraulic action previously discussed is only possible when the collection canister is at a height greater than the distal end of the implanted catheter. During OFF cycles, the Models 306/306M and 326/326M vent to atmospheric pressure, enabling a gravitational backflow to occur. If the collecting jar is positioned below the height of the distal end of the implanted catheter, a siphoning effect can occur. Siphoning will act as a continuous suction presence between patient and collection canister which is undesireable. Cycling between the Models 306/306M and 326/326M and collection canister will continue despite siphoning. Clinicians may have visual objections to the appearance of drained fluids and seek options regarding collection canister placement. The factors involving the time cycles (ON and OFF), collection canister height and connecting tubing must be considered in order to have safe, effective intermittent suction.

*"INTESTINAL OBSTRUCTIONS" by Owen H. Wangensteen, M.D., C.C. Thomas, Publisher, Springfield, Illinois: Chapter VI.

SECTION I. OPERATION

INTRODUCTION

The Impact Model 326/326M is a self-contained, multi-purpose, suction apparatus designed for removing secretions from the upper airway during oropharyngeal, nasopharyngeal and tracheal suctioning procedures; programmable gastrointestinal and abdominal wound drainage; or surgical site debris in field hospitals. The apparatus includes EMI/RFI suppression circuitry and is suitable for use in desert, tropic, arctic or aeromedical environments. Simultaneous operation and battery recharge is permitted from either 115/230 VAC, 50-400 hz using the provided AC-DC Power Supply or 12 VDC using the provided Auto Power Cable accessories. Simultaneous operation and/or recharge from aircraft electrical systems (24 to 28 VDC) is permissible with an appropriate cable. The Model 326/326M is designed to accept DC power sources ranging from 11 to 30 volts, positive or negative ground.

The Model 326/326M is a completely self-contained suction source complete with vacuum pump, controls and DC power supply circuits; a dual-scale vacuum gauge with adjustable vacuum regulator (limiter); circuit breaker, collection canister mounting brackets, accessories and attachment tubing is provided. The complete device is housed within an injection molded case which includes a locking battery compartment door, a locking control panel door (clear), carrying handle and mounting interface for wall, bulkhead, pole or cart mounting.

This device is intended for use in non-explosive atmospheres. Read the instructions contained within this manual before attempting to operate this instrument.

OPERATION

DESCRIPTION OF CONTROLS, CIRCUIT BREAKER, CONNECTORS AND INDICATORS

Refer to the reference pictorial below. Numbers contained within this text (in parenthesis) correspond to the numbers indicated in the pictorial.

(1) Circuit Breaker

(2) Vacuum Inlet Fitting

(3) External Power Input Jack

(4) Dual-scale Vacuum Gauge

(5) "ON TIME" Suction Interval Control

(6) "OFF TIME" Suction Interval Control

(7) Battery Charge Indicator

(8) Charge Lamp

(9) Power & Mode Selector Switch

(10) Vacuum Regulator Control

(11) External Power Lamp

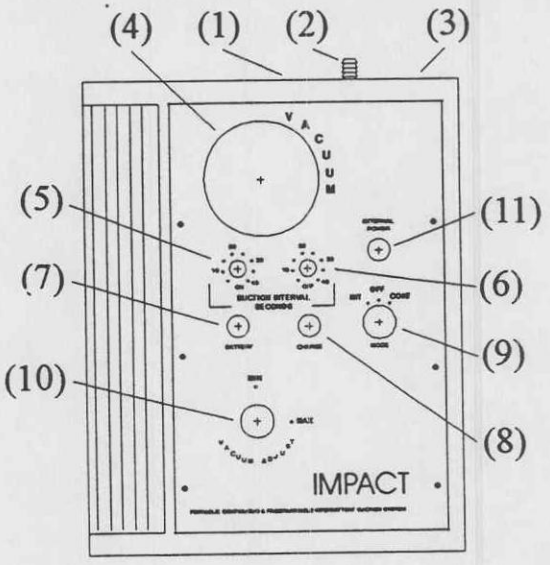

Figure 3. Panel Controls, Circuit Breaker, Connectors and Indicators

OPERATION (cont'd)

DESCRIPTION OF CONTROLS, CIRCUIT BREAKER, CONNECTORS AND INDICATORS (cont'd)

(1) Circuit Breaker - Protects pump motor from drawing excessive current.

(2) Vacuum Inlet Fitting - Vacuum source connection to filter and collection canister(s).

(3) External Power Input Jack - Connection for external operating and battery recharging power. Input accomodates 11 to 30 VDC input, positive or negative ground.

(4) Dual-scale Vacuum Gauge - Displays vacuum developed within the patient circuit.

(5) "ON TIME" Suction Interval Control - Setting determines how long intermittent suction will last.

(6) "OFF TIME" Suction Interval Control - Setting determines how long before the next intermittent cycle begins.

(7) Battery Charge Indicator - Displays battery charge status. Green area portrays the charged zone, the red area portrays the discharged zone.

(8) Charge Lamp - Indicates the presence of battery charging current from an external power source.

(9) Power & Mode Selector Switch - Turns operating power Off or On when the continuous "CONT" or intermittent "INT" suction mode is selected.

CONT - Selects continuous suctioning, vacuum adjustable from 0 to 550 mmHg

INT - Selects intermittent suctioning, vacuum adjustable from 0 to 200 mHg.
Time interval combinations are selectable between 5 and 40 seconds ON, and 5 and 40 seconds OFF.

(10) Vacuum Regulator (Limiter) Control - Limits the maximum deliverable vacuum level.

(11) External Power Lamp - Illuminates when connected to a "live" AC mains.

OPERATING POWER SELECTION & STOPPING

The Model 326/326M is designed to operate from external power or internal rechargeable batteries. The Power & Mode Selector Switch (9) acts as a master power switch to start and stop operation.

SUCTIONING

1. Insure that all suction tubing is properly secured to respective fittings. Verify that collection canister lids are properly secured, fittings in place as shown (Figure 2), and no kinks in connecting tubing.

2. Charge Lamp (8) will illuminate during operation if external operating power is applied.

3. Turn Power & Mode Selector Switch (9) to the appropriate position: CONTinuous or INTermittent. The internal vacuum pump should begin operation.

4. Adjust Vacuum Regulator (Limiter) Control (10) to the maximum desired vacuum level by "pinching" and holding the vacuum tubing going to the collection canister. Deliverable vacuum levels will not exceed the preset maximum level. Adjusted and delivered vacuum levels are displayed on the Dual-scale Vacuum Gauge (4).

OPERATION, (cont'd)

SUCTIONING, (cont'd)

5. A disposable hydrophobic/bacterial/overflow filter is provided for use with Impact's standard autoclavable collection canisters. This filter connects between the Vacuum Inlet Fitting (2) and collection canister (Figure 2). This filter should be replaced when discoloration of its membrane occurs, the membrane contacts aspirate, or following 150 cumulative hours of use. This filter is designed to retain bacteria which would otherwise be exhausted into the immediate vicinity. The filter's retention of aerosolized aspirate and will create more resistance to airflow resistance. It is important that the operator be aware of this and replace the filter accordingly.

6. Disposable collection canisters, traditionally include a built-in filter and may be used with your Model 326/326M. It is not necessary to use the disposable filter in conjunction with disposable canisters.

7. Reusable canisters should be used with the disposable filter to prevent inadvertent overflow, damage or contamination of the pump mechanism.

VACUUM REGULATOR (LIMITER)

The Vacuum Regulator (Limiter) (10) works in conjunction with the Vacuum Gauge (4). Vacuum levels may be selected by rotating the Vacuum Regulator (Limiter) (10): clockwise to increase vacuum; counterclockwise to decrease vacuum. Vacuum regulator adjustments should be made to the maximum desired vacuum level by "pinching" and holding the vacuum tubing going to the patient. Deliverable vacuum levels will not exceed this preset maximum. Adjusted and delivered vacuum levels will continuously display during operation on the dual-scale Vacuum Gauge (4).

COLLECTION CANISTER

Protect the suction mechanism from overflows which may permanently damage the vacuum pump if not properly and promptly cleaned. Use the disposable filter in conjunction with reusable collection canisters.

Collection canisters may be repeatedly sterilized via autoclave, ethylene dioxide gas or cold liquid sterilants (diluted in accordance with their respective instructions). **DO NOT** use abrasive cleansing agents. To determine compatibility with commercially available cleanser/disinfectants please note the following material content:

Collection Canister Bottle: Polysulfone/Polycarbonate
Collection Canister Cap: EPDM
Hose Fittings: Stainless Steel

OPERATOR PERFORMANCE CHECKS

Before placing this device into service, the operator can perform various checks to insure proper device performance.

1. Verify operating power selections from external power sources or internal rechargeable batteries.
2. Verify continuous operation, verify intermittent operation.
3. Test the Vacuum Regulator Limiter (10) for correct operation at various vacuum settings.
4. Insure that all hoses and fittings are properly connected.

BATTERY CARE

The Model 326/326M utilizes sealed GEL cell batteries which offer excellent charge retention characteristics, particularly during long periods of storage. This ensures an ample amount of power during emergencies and transitory procedures. The battery pack in this device is not intended for use as the primary power source, therefore, it should be used with discretion and its design understood. To provide long life and maximum performance capabilities, the Model 326/326M requires 16-hours to fully recharge its fully discharged batteries. Of course, the batteries are rarely discharged this much so the subsequent recharge time is usually less. GEL Cell batteries require little user care to provide optimum performance and life expectancy. Because their self-discharge rate is extremely low (approximately 1 1/2% per month), lengthy periods of disuse without replenishment charging is possible. If long-term disuse is common, it would be adviseable to recharge the unit once every two months. This will insure that battery charge is maintained at 80% capacity or better. Continuous battery recharging from the AC mains is permissible but not required. Recharging from 115 or 230 VAC is accomplished using the AC/DC Power Supply accessory supplied with the Model 326/326M. Batteries can be recharged from an external 12VDC power source too. For external 12VDC operation or recharge, a connecting cable with automotive plug is furnished. The External Power Input Jack (3) is located on the connector panel adjacent to the Vacuum Inlet Fitting (2).

The External Power Input Jack (3) will accept voltages ranging between 11 and 30 VDC for device operation and/or battery recharging. An appropriate cable, to interface between the External Power Input Jack (3) and the power source is required.

The life of these batteries depends, to a great extent, upon the care they receive. Following these simple guidelines will prevent premature charge depletion and reduction of battery life.

1. **DO NOT** operate this instrument where the temperature range exceeds -60°C to 60°C (-76°F to 140°F).
2. **DO NOT** charge this instrument where the temperature range exceeds -20°C to 50°C (-4°F to 122°F).
3. **DO NOT** store this instrument with the batteries discharged. Always store in a charged condition.
4. For long-term storage, the optimum storage temperature range is 10°C to 30°C (50°F to 80°F).

ROUTINE CARE AND MAINTENANCE

CLEANING

Note: Routine decontaminations which do not involve the removal of aspirate can be effected using a spray disinfectant. With the device operating, simply spray a small amount of disinfectant directly into the collection canister and shortly thereafter into the Vacuum Inlet Fitting (2). This should be performed after each use to avoid risk of bacterial growth. In the event of an aspirate overflow, remove the pump head assembly **(SECTION II. SERVICE, DISASSEMBLY/REASSEMBLY).** All pump head components may be sterilized using a liquid disinfectant, a mild spray disinfectant or ethylene oxide gas. **DISCONNECT AC/DC POWER SUPPLY OR AUTO POWER CABLE FROM MODEL 326/326M PRIOR TO CLEANING.**

- **Component Removal**

The collection canister(s) and filter should be detached to facilitate cleaning.

- **Exterior Case**

Periodically or when applicable, clean the exterior case using a mild, non- abrasive cleanser. Disconnect Remove collection canister(s) and filter. **DO NOT** immerse or allow liquids to enter the case. A damp cloth will suffice in most instances. Disinfectant spraying is recommended at regular intervals. Allow to dry.

- **Collection Canister**

Impact's reusable collection canisters may be repeatedly sterilized via autoclave, ethylene oxide gas or cold liquid sterilants (diluted in accordance with their respective instructions). **Do not** use abrasive cleansing agents. To determine compatibility with commercially available cleanser/disinfectants please note the following material content:

Collection Canister Bottle: Polysulfone/Polycarbonate
Collection Canister Cap: EPDM
Hose Fittings: Stainless steel

1. Thoroughly clean collection canister(s), and fittings after each use. Handy hint: Before emptying collection canister, cap both hose fittings with a short length of tubing. This will prevent accidental spillage of aspirate.

2. Tubing is considered disposable and should be discarded following each use.

3. Insure that all parts are securely fastened and properly connected after cleaning.

4. Orient collection canister and route tubing as shown in Figure 2 following cleaning.

5. To prevent risk of cross contamination and the spread of airborne particulate matter, the use of bacterial filters is recommended. If filters are not used, this device should be disinfected and cleaned, following each use, as described earlier within this section.

Disposable filters connect between the collection canister and Vacuum Inlet Fitting (2). The filter contains a hose barb at each end to facilitate quick connections to the collection canister and Vacuum Inlet Fitting (2).

6. Disposable filters may be obtained from Impact. When ordering, specify Impact part number 465-0005-00. Filters may be used repeatedly until discolored or contact with aspirate and/or fluids occurs. As filters become occluded with particulate matter during repeated usages, a reduction in device airflow will become evident. Filter replacement will restore the device to its original airflow levels.

ROUTINE CARE AND MAINTENANCE (cont'd)

- **Bacterial/Overflow Filter**

Do not attempt to clean disposable bacterial/overflow filters. This item is disposable and should be replaced whenever it becomes discolored or contacts aspirate, airflow is impeded, or following 150 cumulative hours of use, whichever comes first.

Do not bypass this filter. Its intended use is to retain bacteria which would be expelled through the exhaust port or allowed to accumulate in the pump head As filters become occluded with particulate matter during repeated usages, a reduction in device airflow will become evident. Filter replacement will restore device performance to its normal airflow levels.

MAINTENANCE

Routine maintenance should be performed on this apparatus at regular intervals and prior to its being placed into service. Routine maintenance should consist of the following:

1. Cleaning checks - as described above.

2. Filter checks - replace when discolored, contact with aspirate occurs, airflow performance diminishes considerably or following 150 hours of cumulative use.

3. Operational checks - as described in **OPERATOR PERFORMANCE CHECKS.**

4. Tubing checks - replace crimped, cracked or worn tubing as required.

IN CASE OF DIFFICULTY

Authorization to service this instrument by other than factory-trained or certified personnel will not be given, nor does Impact Instrumentation, Inc. assume any responsibility and/or liability resulting from such unauthorized servicing.

Impact will, upon request, provide competent biomedical engineering departments with service data and schematics. Such departments are encouraged to contact the factory for assistance when needed and it is recommended that staff members attend a factory training course. Details may be obtained by contacting the Impact Customer Service Department.

OPERATOR CORRECTIBLE PROBLEMS

Common problems may be quickly rectified by users. Should the Model 326/326M fail to operate properly, verify the integrity of all tube connections, tubing, fittings, and control settings. One can quickly isolate problems to an accessory item or the suction apparatus by testing for vacuum at various locations.

To isolate a problem, check for vacuum at the inlet of each item, tracing backwards through the system, i.e.: vacuum from the collection canister to the to the Vacuum Inlet Fitting; or if a filter is used: vacuum from the collection canister to the filter, then vacuum from the filter to the Vacuum Inlet Fitting.

OPERATOR PROBLEMS REQUIRING SERVICE

If the tests described above do not resolve an operating problem, service is required. Should servicing be necessary, contact your nearest Impact representative or the Impact Customer Service Department (973) 882-1212.

Please have the Model and Serial Numbers ready and any other pertinent data you wish to include in your service request. The Model 326/326M Serial Number is located on the outer case identification label.

STORAGE INFORMATION

For prolonged storage periods, the Model 326/326M should be stored indoors. The environment should be clean, and out of direct sunlight. Storage temperatures should range between 5'F and 104'F (-15'C to 40'C), humidity should be low.

When batteries are in extended storage, it is recommended that they receive a refresh charge at recommended intervals:

STORAGE AMBIENT	RECHARGE INTERVAL
Below 68'F (20'C)	18 months
68' to 86'F (20' to 30'C)	12 months
86' to 104'F (30' to 40'C)	6 months

Following periods of extended storage in non-controlled environments, allow the Model 326/326M sufficient time to stabilize to a temperature within its specified operating range **(see BATTERY CARE).**

LIMITED WARRANTY

Impact Instrumentation, Inc. warrants this instrument to be free from all defects in materials and workmanship for a period of one (1) year. Batteries, which by their nature are consumable and subjected to environmental extremes, will be warranted only for defects of manufacturing origin for a period of ninety (90) days. Disposable accessories, consumable in usage, will be warranted only for defects of manufacturing origin prior to their initial use. This warranty is neither assignable nor transferable, nor does it apply if this instrument is tampered with, misused or serviced by unauthorized personnel. All warranty repairs shall be subject to return postage billing.

SPECIFICATIONS

VACUUM RANGE (Continuous):	0-550 mm/Hg (0-22 inches/mercury)
(Intermittent):	0-200 mmHg (0-8 inches/mercury)
FREE AIRFLOW:	30 Liters Per Minute (LPM)
TEMPERATURE OPERATING RANGE:	-20°C to 49°C (-4°F to 120°F)
CONTROLS:	Power & Mode Selector Switch (Power OFF/CONTinuous/INTermittent
	Vacuum Regulator (Limiter)
	"ON TIME" Suction Interval Control (5-40 seconds, continuously variable)
	"OFF TIME" Suction Interval Control (5-40 seconds, continuously variable)
	Power Source Select Switch (115/230 VAC, located on AC/DC Power Supply)
DISPLAYS:	Charge Indicator Lamp
	External Power Lamp
	Battery Charge Indicator (Meter)
	Vacuum Gauge, Dual-Scale (Metric/English), 2 1/2" diameter.
CONNECTORS:	Vacuum Inlet Fitting
	External Power Input Jack
PUMP PROTECTION:	Circuit Breaker
POWER:	
External:	
115/230 VAC, 50-400 Hz:	Continuous operation and/or recharge with supplied AC/DC Power Supply
12 VDC:	Continuous operation and/or recharge with supplied Auto Power Cable
11-30 VDC:	Continuous operation and/or recharge (cable not supplied)
Internal:	
Battery Pack, 12 VDC:	Operating Time, 2-hours (minimum, when cycled as specified)
Recharge Time:	16-hours (maximum)
COLLECTION CAPACITY:	1200 ml X 2 (Air Force)
	1100 ml X 2 (Model 326M NSN: 6515-01-435-0050 only)
WARRANTY:	One (1) year, limited, as specified
CASE:	
Material:	Polycarbonate, color-through, injection-molded
Size:	24.1 cm W x 29.2 cm H x 12.4cm D (9.5" W x 11.5" H x 4.87" D)
Weight:	5.5 kg (12 lbs)

SPECIFICATIONS, (cont'd)

MODEL 326 (Included Accessories):

1 ea. Apparatus, Suction, Portable
1 ea. Suction Hose, Sterile, Clear, 6' Long
1 ea. Hose, Clear, PVC, 18" Long
1 ea. Universal Canister Attachment Bracket
1 ea. AC/DC Power Supply
1 ea. Instruction Manual, Operation
1 ea. Assembly, Auto Power Cable, 6' Long
1 ea. Hose, Clear, PVC, 1' Long
1 ea. Hose, Clear, PVC, 2' Long
1 ea. Fuse, Spare
1 ea. Padded Case, Aspirator

MODEL 326M (Included Accessories):

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2 ea. Hose, Clear, PVC, 18" Long
2 ea. Universal Canister Attachment Bracket
2 ea. Strap, Velcro®
1 ea. Assembly, Auto Power Cable, 6' Long
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2 ea. Hose, Clear, PVC, 2' Long
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2 ea. Collection Canister Assembly, Autoclavable
2 ea. Filter, Disposable, Hydrophobic/Bacterial/Overflow
1 ea. Carry-all Case with Label

The following are provided with Air Force Accessory Kit

2 ea. Disposable Collection Canister and Lid
1 ea. Catheter, 14 French
1 ea. Catheter, 18 French

SPECIFICATIONS CONTAINED HEREIN REPRESENT TYPICAL DEVICE PERFORMANCE

SECTION II. SERVICE

INTRODUCTION

The information contained herein is intended only for use by factory-trained, and certified personnel or military personnel trained in the care and servicing of this product. The manufacturer does not authorize or assume any obligations resulting from unauthorized servicing nor will it be held liable for any injuries or damages incurred therefrom.

Impact Instrumentation will provide service training at the manufacturing site at no schooling charge to users; however, travel and meal costs resulting therefrom shall be borne by the user. Impact will perform training at the customer's site if requested. The customer will be responsible for costs incurred by Impact personnel for travel, meal, and time - at prevailing rates.

The Impact service facility encourages dialogue from user service personnel towards rectifying any service related matter. All service requests may be addressed to the Service Manager, Impact Instrumentation, Inc., 27 Fairfield Place, West Caldwell, New Jersey 07006; via telephone 973/882-1212; or fax 973/882-4993.

CAUTIONARY NOTES

OPERATING VOLTAGES PRECAUTION

Prior to servicing this device, be aware of the presence of potentially dangerous operating voltages.

INTERNAL RECHARGEABLE BATTERY

Military contracts may require this product to be shipped with its battery pack contained within a separate carton. Prior to placing this device into operation, insure that its battery pack is installed and recharged. DO NOT operate this unit until its battery pack is installed.

HELPFUL HINTS

Before attempting to repair/calibrate this instrument, please take a few moments to insure that the problem is not accessory related.

Check the integrity of all vacuum hoses and tubing. Verify that the tubing has no crimps or cuts in it.

Insure that collection canisters seal properly, overflow shut-off valves do not stick, and bacterial filters (if used) are not clogged.

Refer to the enclosed schematic, assembly drawing, and pictorials when electrically troubleshooting. Isolate each problem to a functional segment of the circuitry. Verify the integrity of circuit ground and the presence of correct power supply voltages.

ALWAYS safeguard your personal well being when troubleshooting electronic circuitry. Remove jewelry, such as rings and bracelets, and keep liquids away from the vicinity of live circuitry.

DISASSEMBLY/REASSEMBLY

REQUIRED TOOLS

Screwdriver, slotted, 6" to 8" long, small tip
Screwdriver, phillips head, small #1
Screwdriver, phillips head, medium #2
10mm socket wrench
1/4" socket with drive handle
5/16" socket with drive handle
3/8" socket with drive handle
Pliers, needle nosed
Open-end wrench, adjustable, 10"
Open-end wrench set, 1/4" to 5/8"
Bench vise with smooth jaws
Diagonal Cutter
Cable Tie, miniature
3-32 Allen Key
Retaining Ring Extractor
Teflon Tape
Ruler, 6"
Krytox® Fluorinated Grease

DISSASSEMBLY/REASSEMBLY

BOTTOM COVER

Verify that Mode Selector Switch is in OFF position. Disconnect all hoses and cables. Open Battery Compartment Door, disconnect Battery Pack connector and release Velcro\ holddown strap. Remove Battery Pack.

Unscrew two (2) 6-32 Phillips Bind Head screws and washers (located inside Battery Compartment) securing Bottom and Top Covers. Turn unit over so that its Bottom Cover is facing upward. Unscrew five (5) Phillips Bind Head screws securing Bottom and Top Covers. **DO NOT** unscrew the one (1) 6-32 Phillips Bind Head screw that is located on bottom of Bottom Cover adjacent to the Condensed Operating Instructions label.

Connector Panel secures to Bottom Cover with four (4) 4-40 Phillips Bind Head screws. Remove screws. Bottom Cover can now be lifted from Top Cover Assembly.

To reassemble, reverse above process. Insure that Battery Pack connector wires are not crimped between components.

BATTERY COMPARTMENT, CLEAR FRONT COVER AND TOP COVER

Perform following instructions only if servicing Battery Compartment Separator, Battery Compartment Door, Clear Front Cover or Top Cover. Otherwise proceed to next step.

With Diagonal Cutter, cut miniature cable tie that secures battery connector wires to Battery Compartment Separator. **DO NOT** cut any other cable tie. Using 1/4" socket with drive handle, remove three (3) 4-40 keps nuts and three (3) #6 flat washers that secure Battery Compartment Separator, Battery Compartment Door and Clear Front Cover. Remove Battery Compartment Separator, Battery Compartment Door and Clear Front Cover. Remove remaining three (3) #6 flat washers and three (3) 4-40 keps nuts that secure Front Panel to Top Cover.

Pull bottom of Top Cover upwards until it is inbetween the Regulator and Switcher Printed Circuit Board (**NO HIGHER**). Pull top of Top Cover above Manifold Assembly. Remove Top Cover.

To reassemble, reverse this process exactly. Replace cable tie. Insure that Battery Pack connector wires are not crimped by Top Cover and Front Panel.

SWITCHER PRINTED CIRCUIT BOARD

Unscrew four (4) 4-40 screws and four (4) #4 lock washers securing Switcher Printed Circuit Board to Regulator Printed Circuit Board. Unplug 2-Pin connector. Lift Switcher Printed Circuit Board to separate its header from Regulator Printed Circuit Board.

Follow these instructions in reverse to reassemble.

REGULATOR PRINTED CIRCUIT BOARD

Unscrew four (4) 1/4" hex, male-to-female 4-40 spacers securing Regulator Printed Circuit Board. Unplug 5-pin connector from Regulator Printed Circuit Board. Lift Regulator Printed Circuit Board to separate its header from Main Printed Circuit Board.

Follow these instructions in reverse to reassemble. Make sure that header pins and their respective sockets align.

MAIN PRINTED CIRCUIT BOARD

Unscrew four (4) hex, female-to-female 4-40 spacers and one (1) 4-40 keps nut that secures Main Printed Circuit Board to rear of Front Panel. Carefully turn unit over, with its clear door opened. Remove two (2) small collet knobs by removing their caps and loosening their locking screws. Under each collet knob skirt is a nut. Carefully remove each nut. Separate cable connectors from Main Printed Circuit Board. Remove Mode Selector Switch knob using 10mm Socket Wrench. Carefully remove nut and washer with an open-end wrench. Unscrew the Charge Lamp and External Power Lamp. Carefully remove each nut and washer with an open-end wrench. Main Printed Circuit Board can now be removed.

To reassemble, reverse above steps. Be careful not to scratch Front Panel. When reinstalling collet knobs, insure that each control is in its full couterclockwise position - this will permit proper knob pointer alignment. Make sure that ribbon cable connector is properly aligned and attached.

CONNECTOR PANEL

Connector Panel is attached to Bottom Cover. See Bottom Cover disassembly for initial disassembly instructions.

Remove nut securing Circuit Breaker to Connector Panel. Remove Circuit Breaker. Remove two (2) 4-40 screws, two (2) 4-40 keps nuts and two (2) #4 fiber washers securing the External Power Jack and flange to Connector Panel. Remove External Power Jack and flange. Remove tubing to Suction Port.

Reverse above steps to reassemble.

PUMP/MANIFOLD

The Pump/Manifold Assembly should not be disassembled unless it is absolutely necessary. Its alignment and correct positioning of the Vacuum Adjust Knob are important. Under normal conditions treat the Pump/Manifold and Front Panel as one assembly.

PUMP/MANIFOLD/PUMP HEAD

IMPORTANT: Note the orientation of all components prior to disassembly/reassembly. After reassembly, test this device to insure proper operation before returning it for patient use.

Remove 1/8" ID PVC tubing from black swivel barb at end of manifold, and 3/8" ID corrugated hose from 3/8 ID hosebarb attached to manifold. Hold 3/8" hose by cuff when removing, pulling on corrugated section may damage hose.

Remove retaining ring from Plug Valve in manifold using a retaining ring extractor. Remove Plug Valve by carefully pulling and twisting from front side of panel.

PUMP/MANIFOLD/PUMP HEAD (cont'd)

Using nut driver, remove four (4) 6-32 keps nuts securing pump brackets. Lift pump slightly for access to both solenoid valves screws. Using the 3/32 allen key, remove both sets of screws (two per valve). Pull solenoids from manifold. The square-shaped valve has a rubber gasket. The rectangular valve has a metal rod, a circular rubber seal, and a metal disk under the seal. Save these parts for reassembly with the same solenoid and manifold; they are a matched set.

With pump still soldered to wiring, carefully lift pump off of 6-32 stud. Do not pinch wiring attached to pump or solenoid valves. Rotate pump to have access to bottom of pump head. Remove four (4) 8-32 x 3/4 phillips head screws and lockwashers securing pump head to pump body. Pull pump head and manifold from the pump body. Pump head may stick, slightly, to pump body, this is normal

Note: The distance between the manifold and the beginning of the pump head should be 0.150 +/- .020 inches. This will insure proper fit during reassembly.

To remove manifold from pump head, use hands to rotate pump head counterclockwise while holding manifold steady. Use of wrench(es) or a vise should not be necessary. Remove two (2) small phillips flat head screws securing valve plate to head plate. Separate plates to access die cut valve.

To reassemble: Follow the disassembly instructions in reverse. Observe the following notes and cautions.

Make sure die cut valve is seated properly before securing between valve plate and head plate.

Use teflon tape on 1/8" NPT close nipple (no more than 2 1/2 wraps). Use hands when rotating pump head onto manifold. Tighten slowly until you reach the 0.150 +/- .020 inches between pump head and manifold, and bottom of pump head is even with manifold bottom. **CAUTION:** Do not over tighten, pump head could crack. Do not tighten with wrench or secure in vise.

Make sure pump diaphragm is top, dead center, and that it is laying properly on pump before reattaching pump head.

After reattaching solenoids, position pump in its proper setting and slide pump with brackets onto four (4) 6-32 studs. Align stop pin in manifold with notch in vacuum adjust hole on front panel. Manifold and pump head should lay flat on underside of front panel. Check o-rings on plug valve for damage, replace if necessary. Lubricate plug valve o-rings with Krytox®. Carefully insert plug valve, making sure it is in completely. Check for proper 90° rotation.

Note: you may have to loosen the 6-32 X 5/16 phillips head screws securing brackets to pump to align pump/manifold. Tighten screws and four (4) 6-32 keps nuts holding brackets to front panel.

Reattach retaining ring and hoses to complete reassembly.

FRONT PANEL

Unscrew six (6) 4-40 keps nuts. The Front Panel can now be removed from the Top Cover.

Reverse above steps to reassemble.

CALIBRATION PROCEDURE

REQUIRED EQUIPMENT

A. Oscilloscope, DC, Triggered, with a minimum 5-second horizontal sweep, storage capability desirable.

B. Small, slotted screwdriver.

C. Stopwatch, minimum 0.1 second resolution.

D. Regulated DC-Power Supply (5-Ampere minimum rated output)

PROCEDURES

A. MAXIMUM LOW VACUUM LEVEL LIMIT

- 1. Set controls for either AC or DC operation (insure that batteries have been fully charged if calibrating from battery power).
- 2. Select INTermittent operation.
- 3. Turn VACUUM ADJUST control to MAXimum (fully clockwise).
- 4. Occlude VACUUM INLET fitting and adjust R20 until Front Panel vacuum gauge reads 200 mmHg.
- 5. This reading may be verified using a calibrated vacuum gauge applied to the vacuum inlet.

B. INTERMITTENT ON/OFF TIMING CIRCUITS

NOTE: An oscilloscope may be used to calibrate ON/OFF Timing Circuits as described below. However, technicians may find it easier to calibrate this unit using a stopwatch. When using a stopwatch, utilize pump turn on and turn off as timing reference points.

- 1. Set controls for either AC or DC operation (insure that batteries have been fully charged if calibrating from battery power).
- 2. Select INTermittent operation.
- 3. Set ON/OFF times for 5-seconds ON, 5-seconds OFF.
- 4. Turn VACUUM ADJUST control to MAXimum (fully clockwise).
- 5. Trigger oscilloscope sweep to begin when motor turns on and adjust R7 to set ON Time circuit for a 5-second sweep. Close verification can be made using a storage type oscilloscope. Adjustments should be to within +/- 0.5 seconds.
- 6. Trigger oscilloscope to begin when motor turns off and adjust R12 to set OFF Time circuit for a 5-second sweep. Adjustments should be to within +/- 0.5 seconds. Again, the use of a storage type oscilloscope will simplify measurement.

NOTE: Steps 5 and 6 above may be monitored at various points. For simplicity and convenience, the positive voltage motor input should be used and the oscilloscope triggering slope set for the ON circuit, then reset for OFF circuit.

C. LOW BATTERY INDICATOR ADJUSTMENT

- 1. Disconnect and remove battery pack from Aspirator.
- 2. Preset external power supply for 12 VDC and attach to Aspirator battery connector.
- 3. Turn external power supply on, set Aspirator Mode Select Switch to CONTinuous.
- 4. Adjust external power supply for 11.1-volts, and adjust R36 until the Low Battery Indicator needle is centered directly between the red and green divisions.
- 5. Disconnect the external power supply, reconnect battery pack.

CIRCUIT DESCRIPTIONS

Refer to enclosed schematic diagrams.

EXTERNAL AC POWER SUPPLY - Components P1, F1, VS1, T1, BR1, and C20 represent a full wave bridge rectifier circuit which enables simultaneous instrument operation and battery recharging. All components except C20 are located in an external enclosure, while C20 is mounted on the Connector Panel inside the instrument. VS1 allows selection of either nominal 115 VAC or 230 VAC input power.

INTERNAL POWER SUPPLIES - The instruments' internal power supply consists of five separate sections: a DC to DC Converter section which provides pre- regulation for externally applied power, plus separate 6-volt, 5-volt, 25.6- volt and isolated 6-volt sections. Connector J1 incorporates a switch that switches from battery power to external power whenever an external power plug is inserted into the jack. If no power is available at the plug when it is inserted into the power jack, the unit will not function even if a charged battery is installed. For the instrument to operate, the external power supply must be energized with the plug inserted, or the plug must be removed to allow battery operation.

DC TO DC CONVERTER - The DC to DC Converter consists of FLT1, U7, Rtrim, D4, D5 and LP2. Its function is to allow a wide external input voltage range of 11 to 30 VDC, while maintaining a stable 13.5 VDC output. This section of the power supply is energized whenever a valid external DC power source is connected. The output of this section also has two blocking diodes, D4 and D5, that prevents reverse voltage from being applied to the converter during battery operation.

6-VOLT POWER SUPPLY - The 6-volt Power Supply consists of C8 thru C11, and U4. It powers the timing circuitry, and is only operational for the INTermittent mode. Switch SW1C turns on this section when in the INTermittent position.

5-VOLT AND 25.6-VOLT POWER SUPPLIES - The 25.6-volt Power Supply powers the battery charge monitoring circuit. The higher voltage is required to prevent the amplifiers from operating at the power rail. The 5-volt Supply provides a stable reference for the comparator circuit that controls the charge indicating lamp. The 5-volt Power Supply consists of C21, C22 and U8, and the 25.6-volt supply of U9, C23, C24, D6 and D7. The 5-volt supply is a simple fixed three terminal regulator. The 25.6-volt supply consists of a voltage doubling circuit built around the ICL7662 integrated circuit. Both power supplies are active whenever external power is present.

ISOLATED 6-VOLT POWER SUPPLY - The isolated 6-volt supply consists of C33, C34, and U13. It is utilized in the battery monitoring circuit, and is active in the CONTinuous and INTermittent operating modes.

PUMP CIRCUIT - The pump circuit consists of R17, Q4, Q5, C16 thru C19, U6, R19, R20, SW1B, CB1, FLT2, D3 and M1. When set to CONTinuous mode, switch SW1B supplies full system power to the pump. Circuit breaker CB1 provides resettable overload protection, while D3 suppresses reverse EMF when the pump's motor is turned off. Filter FLT2 is required for EMI suppression. In the INTermittent mode, R17, Q4 and Q5 turn on power to U6 whenever the timing circuit is in an "ON" cycle. U6 is a 3-terminal adjustable regulator. R20 allows adjustment of the voltage applied to the pump, and when properly calibrated, will limit the maximum pump output vacuum to 200mmHg.

SOLENOID CIRCUITS - There are two solenoids with respective circuitry. Both are active only in the INTermittent mode. The bleed solenoid circuit consists of S1, Q2 and D1. The dump solenoid circuit consists of S2, Q3, C12 thru C14, R15, R16, R18, U5 and D2. When the timing circuit is in the "ON" cycle, the bleed solenoid is activated to prevent the pump from stalling when flow is restricted. The same signal that turns on the pump also turns on Q2 which drives solenoid S1. D1 is a suppression diode that suppresses reverse EMF when the solenoid turns off. The dump solenoid activates at the beginning of an "OFF" cycle to bring the vacuum collection system to atmospheric pressure. It turns off after approximately 3-seconds to conserve power during battery operation. U5 is a 555-timer circuit that is connected to operate as a monostable multivibrator, which means that it will provide a single output pulse when it is triggered. R15 and C12 provide a trigger input pulse to the
device. The 555 is negative edge triggered, so it will trigger only when Q1 turns off. Normally, the output of the timer is off (0-volts). When the device is triggered, its output goes high (to Vcc = 6-volts), and stays high for the programmed time duration. R16 and C14 set the time duration that the output stays on. D2, like D1, is a suppression diode.

TIMING CIRCUITS - The timing circuitry consists of a master clock, two timers and interconnecting circuitry. The clock is a 50 Hz, self-starting square wave generator consisting of U1C, U1D, R1, R2, and C1. The "ON" timer controls how long the pump stays on during an "ON" cycle, and consists of U2, R3 thru R7, C3, C4, and C35. U2 is a 555-timer circuit that is connected to operate as a monostable multivibrator, which means that it will provide a single output pulse when it is triggered. R3 and C2 are driven by buffer U1A, and provide a trigger input pulse to the 555. C4, R4, and R5 set the time period that the timer output is on after it is triggered. R5 is brought out on the instrument front panel to allow user adjustment of the "ON" time. C3, R6, and R7 are used to adjust the delay multiplier in the time period equation T = RC. The output of the "ON" timer triggers the "OFF" timer by means of R8 and C5. The "OFF" timer functions essentially the same as the "ON" timer. It consists of U3, R8 thru R12, C6, C7 and C36. The output of the "OFF" timer drives buffer U1B, and gates on buffer U1A whenever its output is low (off). The "ON" and "OFF" timers are slaved to each other, so that the "ON" timer triggers the "OFF" timer whenever the former times out, and the "OFF" timer gates the master clock to only trigger the "ON" timer when the "OFF" timer has timed out. U1B and Q1 act as an output buffer for the timing circuitry, while R13 is a pulldown resistor for the CMOS transistors Q2 and Q4.

BATTERY CHARGER CIRCUIT - The battery charging circuit consists of R21 thru R26, U10, U11A, C25, Q6, and LP1. R21 is a 1-ohm resistor that provides current limiting and also acts as the current sense resistor for the battery charge monitor. The battery charger is a simple charger that provides higher initial charging current when a battery is depleted, and later tapers downward to about 50-75ma as the battery replenishes. U10 is a differential amplifier that amplifies and ground references the small voltage that appears across R21 as the battery is charging. R22 is the gain resistor for U10. U11A is connected as a comparator, and drives charging lamp LP1 through R26 and Q6. R24, R25 and C25 provide a stable reference voltage for the comparator. Since the signal being measured across R21 is essentially at system supply potential, a higher supply (25.6V) powers U10 and U11 to prevent the amplifiers from operating at the power supply rail. The battery charging and monitoring circuit is active whenever an external power source is present.

BATTERY LEVEL MONITORING CIRCUIT - The battery level monitoring circuit consists of SW1A, R27 thru R36, U12, and Meter1. It is powered by the actual battery voltage. Switch SW1A powers this circuitry in both INTermittent and CONTinuous mode. The nominal battery voltage being monitored is 12-volts. To allow the circuit to operate with good sensitivity at an operating point away from the power rail, the isolated 6-volt supply is used to supply a virtual ground for this circuit. R27 and R29 divide the battery voltage in half. R31 and R32 provide an offset signal. Both signals are fed into summing amplifier U12A via R28 and R30. R33 provides gain for this stage in conjunction with R28 and R30. U12B is an inverting amplifier with a gain of 1. R34 and R35 are part of this stage. R36 can be trimmed to center the meter with a battery voltage of 11.1V being present.

NOTE

Waveforms and voltage measurements have been noted at various locations on each schematic drawing. In most cases, considerable leeway has been given as to what constitutes an acceptable voltage value in order to maintain device performance over a broad range of conditions.

PREVENTATIVE MAINTENANCE INSPECTIONS

Preventative maintenance inspections should be incorporated on a routine basis to insure proper device performance. These inspections should consist of both visual and performance checks, and cleaning when warranted.

Preventative maintenance inspections (PMI) should be made as follows:

If monthly usage is less than 50 hours - PMI bimonthly.
If monthly usage is greater than 100 hours - PMI monthly.

VISUAL CHECKS: Visual checks should include, but not be limited to:

1. Exterior case housing. Examine exterior of unit for cleanliness and general physical condition. Be sure that housing is intact, that all assembly hardware is tight, and that there are no signs of spilled liquids or other abuse.

2. AC Power Supply Plugs. Examine incoming AC plug for visible signs of damage. Verify that plug blades are secure. Examine the output power plug for visible signs of damage.

3. Input and output line cords. Inspect cords for signs of damage. If evidence of damage exists, replace entire cord. **NOTE:** This device may contain shielded line cords to meet EMI/RFI criteria. Contact Impact Customer Service Department before replacing any defective line cord.

4. Strain reliefs. Examine strain reliefs at both ends of each line cord. Each line cord should be held securely by its respective strain relief.

5. Circuit breaker. This device has a switch type circuit breaker. Verify the free movement of its "red" stem.

6. Inspect all tubing to insure that they are not cracked, crimped or dirty. Replace defective tubing immediately.

7. Inspect all fittings and connectors. Replace fittings and connectors that exhibit evidence of wear or suspected leaks.

8. Controls and switches. Examine all controls and switches. Check their positions to verify correct alignment. Record the settings of all controls and switches that must be returned to their original positions following the inspection. Check for physical damage, loose mounting and inappropriate motion. If the control has fixed-limit stops, check for proper alignment and postive stopping. During this inspection, insure that each control and switch performs its proper operation.

Verify correct operation of the vacuum adjustment control and that it is usable over entire suction range indicated in device specifications. Perform this test with vacuum port occluded.

9. Vacuum pump/motor. Confirm proper operation of vacuum pump/motor. Verify deliverability of maximum vacuum as indicated in device specifications.

10. Battery Pack and AC Power Supply. Inspect physical condition of batteries and battery connectors. Check operation on battery power for several minutes to check that battery is charged and can hold a charge. Note battery charge indicator reading. Check condition of AC Power Supply and confirm that it charges the battery. When it is necessary to replace a battery, label it with the date of replacement.

11. Indcators and displays. Confirm the operation of all indicators, meters, gauges and visual displays. Inspect the vacuum gauge for cracks and scale visibility. Make sure the indicator rests on zero without vacuum applied.

12. Labeling. Verify that all labeling is intact and legible.

13. Accessories. Verify that clean canisters, suction catheters, and tubing are available. Inspect canisters for cracks, chips, leaks and general wear. Replace when necessary.

14. Mechanical overflow protection. To verify operation of mechanical overflow protection, liquids must be aspirated into collection canister until protective device is activated. (Observe when performing this test so that liquid is not aspirated into pump if overflow mechanism fails.)

Place a bucket of water on floor adjacent to unit. Connect a short length of hose to patient fitting on collection canister. Turn unit on and suction water into collection canister. Verify activation of overflow protection mechanism.

15. Disposable bacterial and hydrophobic filters. Replace when discolored or contacted with aspirate.

PERFORMANCE CHECKS: Performance checks should include, but not be limited to:

1. Grounding resistance. Perform this test with AC Power Supply connected. Using an ohmmeter, electrical safety analyzer, or multimeter with good resolution of fractional ohms, measure and record resistance between grounding pin of power cord and exposed (*unpainted and not anodized*) metal surfaces. Grounding resistance should not exceed 0.5 ohms.

2. Leakage current. Measure leakage current to ground with the grounding conductor of plug-connected equipment temporarily opened. Record the maximum leakage current with the unit off and on. Leakage current should not exceed 100 microamperes.

3. Maximum flow. Measure the maximum free airflow with a flowmeter. Perform this test with collection canister in place (*do not connect filter when performing this test*). **DO NOT** perform this test with a disposable canister having its own filter. Filters cause restrictions resulting in reduced free airflow. Connect flowmeter to "patient" fitting on collection canister using a small length of connecting hose. Use connecting hose having an inside diameter properly sized to collection canister fitting. Vacuum adjust valve must be set to its maximum vacuum position. This device should produce about 30 liters per minute free airflow.

4. Rate of vacuum rise (pumpdown). With collection canister in place and using a stopwatch, record the amount of time it takes to reach 300 mmHg when the "patient" fitting is occluded. Make sure that vacuum adjust valve is set to the maximum vacuum position. This device should reach 300 mmHg within 4- seconds when connected to a 1000 ml collection canister. **DO NOT** perform this test with a filter or with a collection canister that has its own integral filter.

5. Maximum vacuum. With collection canister in place, turn unit on, occlude "patient" fitting and note the maximum attainable vacuum. Make sure that vacuum adjust valve is set to the maximum vacuum position. This unit should produce about 550 mmHg. If lower vacuums are noted, check for air leaks in collection canister, hoses, and around fittings.

6. Vacuum gauge accuracy. Using a test gauge, compare vacuum readings at various vacuum settings. Readings between the unit's vacuum gauge and the test gauge should be within 10%.

CLEANING: Refer to the ROUTINE CARE AND MAINTENANCE "CLEANING" section in the OPERATION portion of this Manual.

1. Clean the exterior case and reusable collection canister as needed.

2. The vacuum pump/motor requires no lubrication.

3. Replace filters, hoses, tubing, fittings and connectors as required.

TROUBLESHOOTING

Continuous Suction

Symptom: No Vacuum or Weak Vacuum.

Controls: Mode Selector Switch - CONTinuous
Vacuum Adjust - MAXimum, fully clockwise.

Check: Hose and hose connections for cracks or crimps.
Verify that pump runs freely.
Check interconnections with collection canister(s). Verify that canister lid(s) is/are sealed tight.
Momentarily select INTermittent Mode and verify voltage at M1.
If no vacuum is present, check CB1 (3A), reset if necessary, and S1B for voltage presence.
If voltage is not present, verify that EXTernal POWER Jack is not damaged.

Symptom: No Internal Battery Power.

Controls: Mode Selector Switch - OFF/CHARGE

Check: Check for charging current going through R16 into BATT. See that L1 illuminates.
Remove AC Charger Rectifier. Select Internal 12 VDC power (CONTinuous Mode) and test output of BATT through S1A (allow adequate recharge time before testing for battery output).

Intermittent Suction

Symptom: Poor Intermittent Operation.

Controls: Mode Selector Switch - INTermittent
Vacuum ADJUST - MAXimum, fully clockwise.
ON Time - 5 seconds
OFF Time - 5 seconds

Check: Check 6-volt regulator (U4) for proper output.
Check U1D, pin 11, for proper clock signal (approximately 50Hz).
Check output of U1D, pin 4, for proper switching.
Check input to U6 for proper switching.
Check output of U6, and try to adjust R20 until motor operates. Adjust R20 for 200 mmHg.
Check overall appearance of PC Boards for shorts, bad solder connections and/or loose connector cables when erratic operation occurs.

Symptom: Motor does not turn on.

Check: Check circuit breaker CB1, reset if necessary.
Perform same checks as for poor intermittent suction above.
Check integrity of switch SW1B.

Symptom: ON or OFF Cycle does not end.

Check: Perform same checks as for poor intermittent suction above.
Check that clock signal appears at U1A, pin 3; verify that when U1A, pin 3, goes low, a trigger signal signal appears at the trigger input of U2, pin 2.
Check output of ON timer (U2, pin 3); verify that when U2, pin 3, goes low, a trigger pulse appears at U3, pin 4.
Check connections of timing resistors R4 and R5, and R9 and R10.

TECHNICAL DOCUMENTATION

NOTE: Refer to applicable Bill of Material for Part Number Description

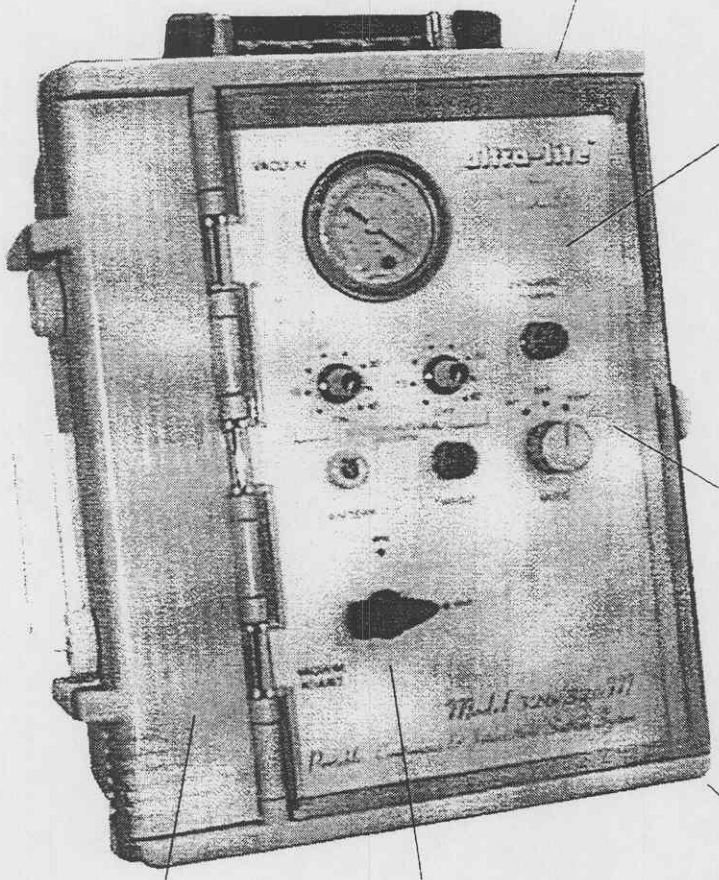
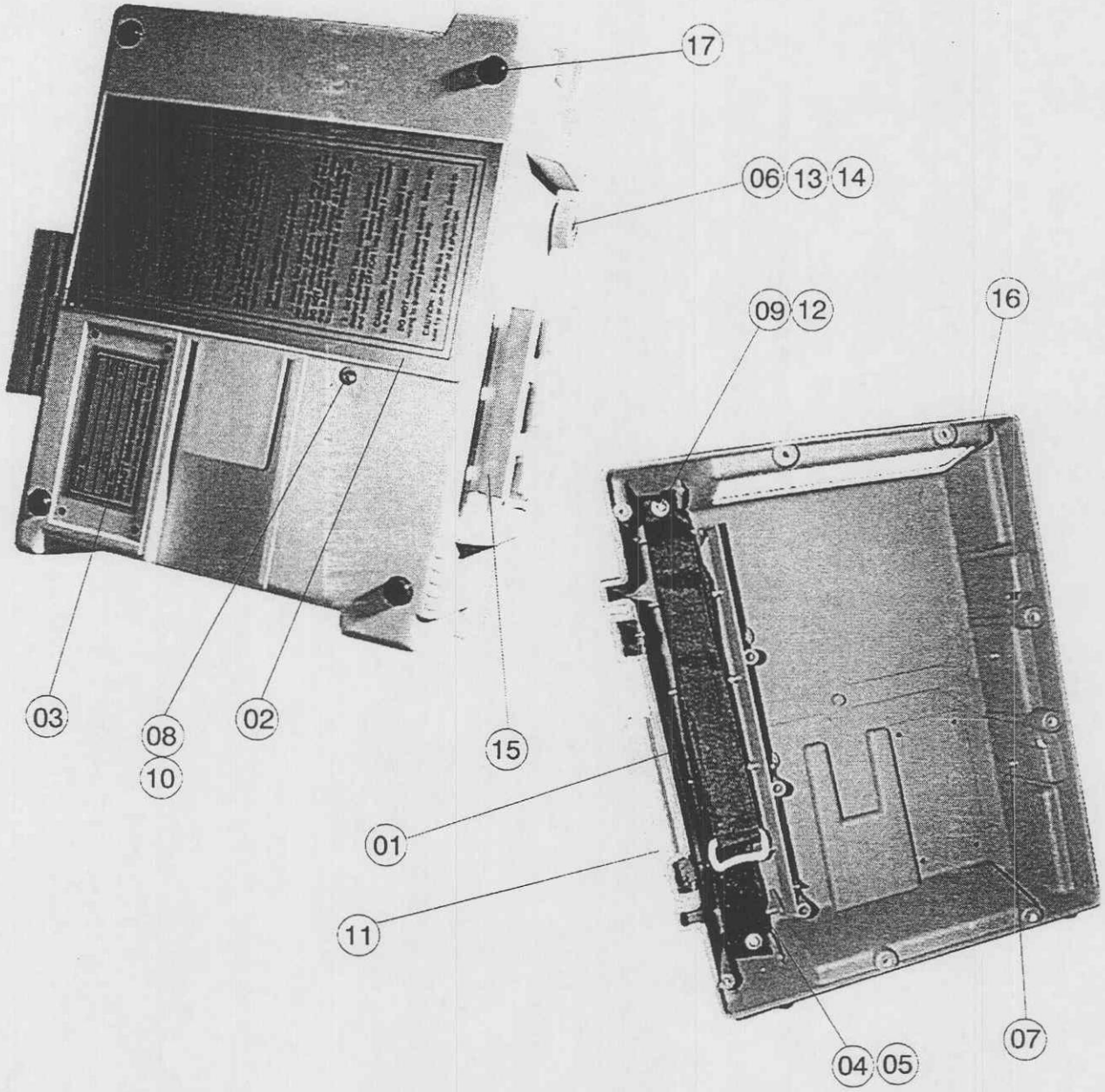


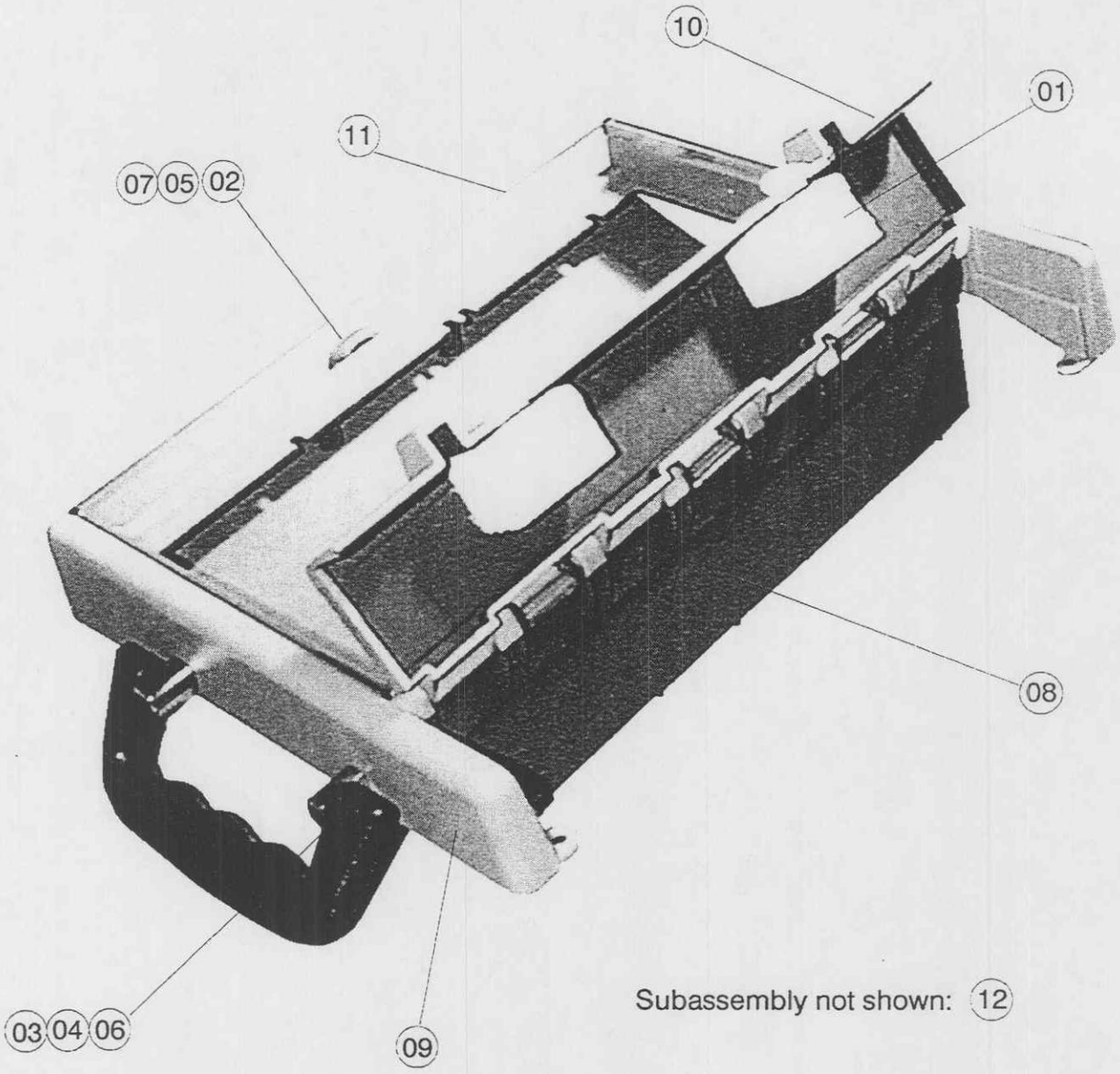
FIGURE 4, COMPOSITE ILLUSTRATION DEPICTING MAJOR SUB-ASSEMBLIES



ITEM	IMPACT P/N	ITEM	IMPACT P/N	ITEM	IMPACT P/N	ITEM	IMPACT P/N
1	312-0018-00	6	338-0007-00	11	362-0440-06	16	416-0326-11
2	325-0326-01	7	346-0440-01	12	376-0007-00	17	450-0008-00
3	325-0326-02	8	346-0632-01	13	376-0008-00		
4	334-0053-00	9	358-0632-06	14	392-0750-11		
5	334-0054-00	10	358-0632-08	15	404-0326-11		

SEE BILL OF MATERIAL 703-0326-01 (PAGE 13 - 21) FOR COMPLETE PART NUMBER DESCRIPTION

FIGURE 5, ASSEMBLY, BOTTOM COVER



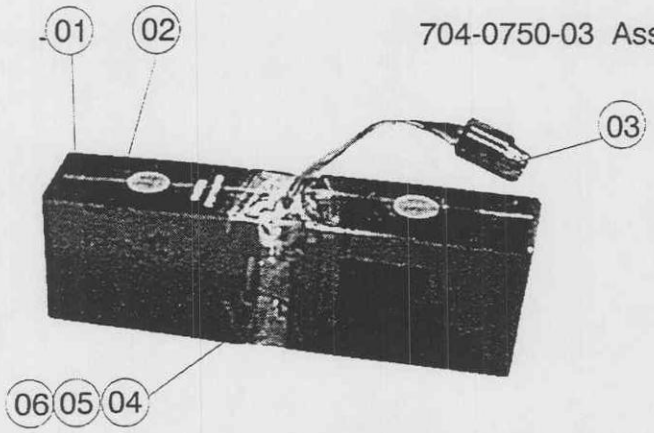
Subassembly not shown: 12

ITEM	IMPACT P/N	ITEM	IMPACT P/N	ITEM	IMPACT P/N	ITEM	IMPACT P/N
1	312-0041-00	4	376-0007-00	7	392-0750-11	10	418-0750-31
2	338-0007-00	5	376-0008-00	8	404-0750-91	11	418-0750-41
3	358-0632-06	6	390-0002-00	9	416-0326-21	12	703-0326-02

SEE BILL OF MATERIAL 703-0326-03 (PAGE 13 - 23) FOR COMPLETE PART NUMBER DESCRIPTION

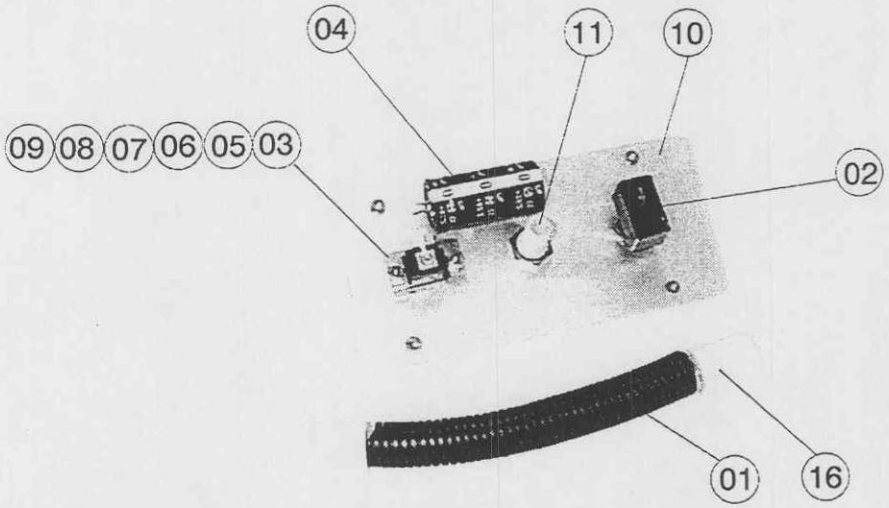
FIGURE 6, ASSEMBLY, TOP COVER

704-0750-03 Assembly, Battery Pack



ITEM	IMPACT P/N	ITEM	IMPACT P/N	ITEM	IMPACT P/N
1	016-0029-00	3	099-0009-02	5	600-0003-00
2	021-0019-00	4	310-0016-00	6	700-0326-17

703-0326-15 Assembly, Connector Panel



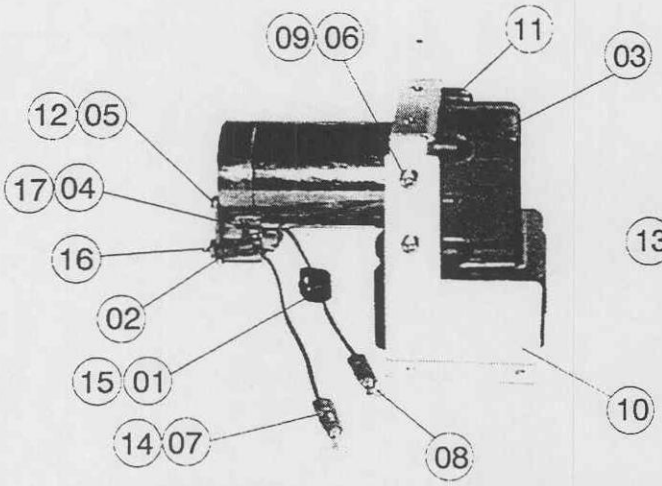
Subassemblies &
Sealants Not Shown:

12 13 14 15

ITEM	IMPACT P/N	ITEM	IMPACT P/N	ITEM	IMPACT P/N	ITEM	IMPACT P/N
1	016-0062-00	5	335-0003-00	9	404-0326-61	13	700-0326-01
2	081-0017-00	6	346-0440-01	10	422-0326-21	14	700-0326-24
3	089-0011-00	7	358-0440-08	11	480-0220-00	15	704-0326-01
4	253-1096-41	8	376-0035-00	12	602-0001-00	16	820-0037-00

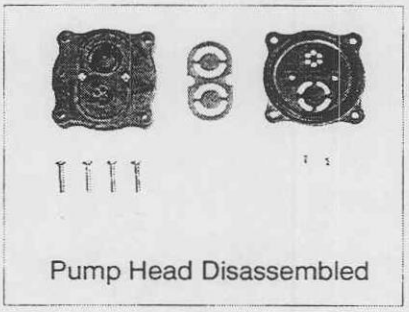
SEE BILLS OF MATERIAL 703-0326-15 (PAGE 13 - 28)and 704-0750-03 (PAGE 13 - 31)
FOR COMPLETE PART NUMBER DESCRIPTION

FIGURE 7, ASSEMBLY, CONNECTOR PANEL
& ASSEMBLY, BATTERY PACK



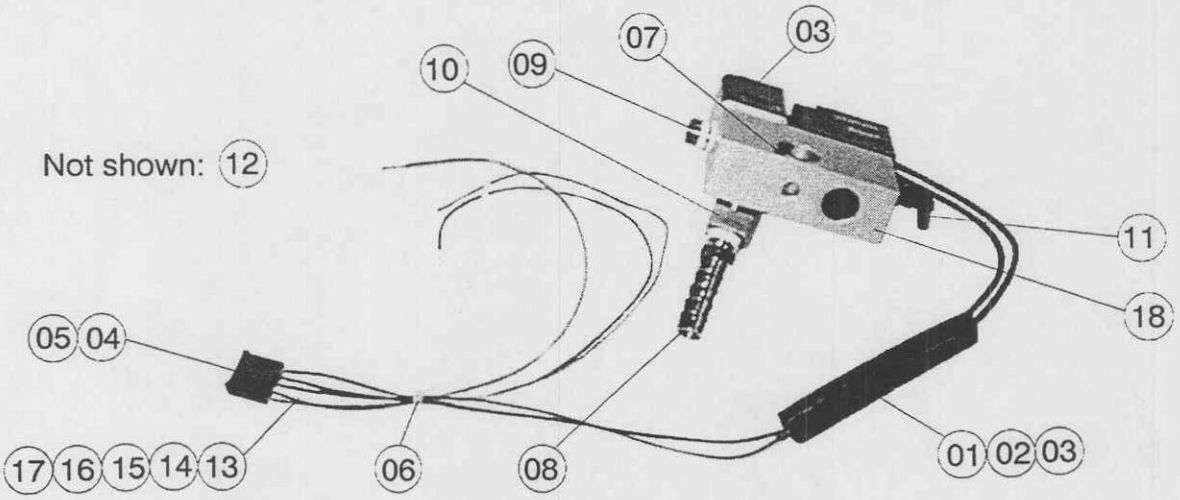
Items Not Shown

13 16 17 18



Pump Head Disassembled

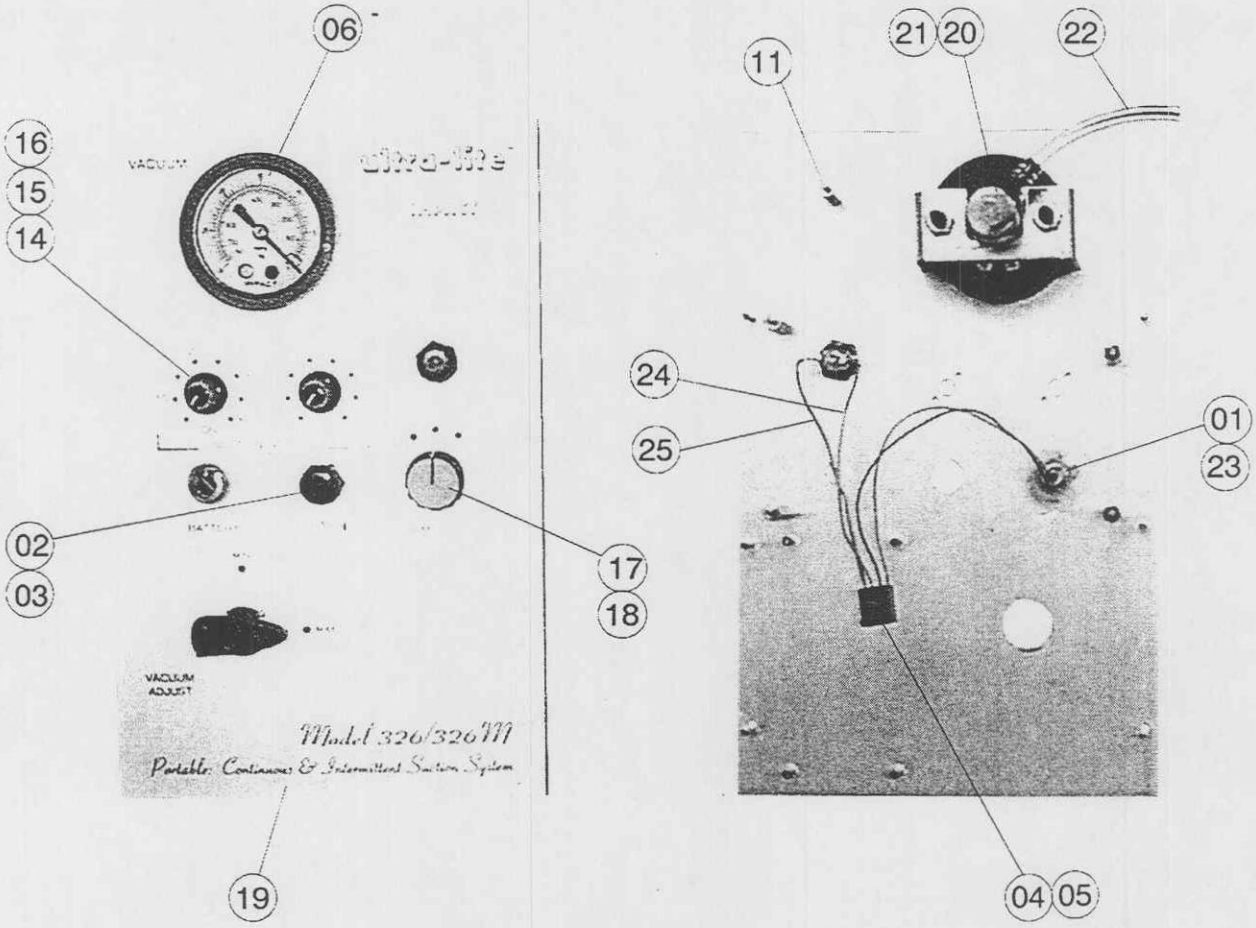
ITEM	IMPACT P/N	ITEM	IMPACT P/N	ITEM	IMPACT P/N	ITEM	IMPACT P/N
1	031-0002-00	6	358-0632-05	11	404-0326-41	16	700-0326-14
2	031-0010-00	7	374-0017-00	12	404-0326-51	17	700-0326-16
3	041-0013-00	8	374-0026-00	13	602-0006-00	18	703-0326-09
4	047-4935-00	9	376-0004-00	14	700-0326-03		
5	358-0632-04	10	404-0326-31	15	700-0326-07		



ITEM	IMPACT P/N	ITEM	IMPACT P/N	ITEM	IMPACT P/N	ITEM	IMPACT P/N
1	016-0004-00	6	305-0001-00	11	480-0229-00	16	700-0326-20
2	016-0016-00	7	348-0002-00	12	490-0045-01	17	700-0326-21
3	047-4935-00	8	480-0068-00	13	700-0326-08	18	704-0326-03
4	092-0006-00	9	480-0132-00	14	700-0326-12		
5	100-0002-00	10	480-0210-00	15	700-0326-19		

SEE BILLS OF MATERIAL 703-0326-05 (PAGE 13 - 24); and 703-0326-09 (PAGE 13 - 27) FOR COMPLETE PART NUMBER DESCRIPTION

FIGURE 8 ASSEMBLY, PUMP & ASSEMBLY, MANIFOLD



Hardware Items Not Shown
(for connecting Printed Circuit Board and Pump Assemblies):

07 08 09 10 12 13

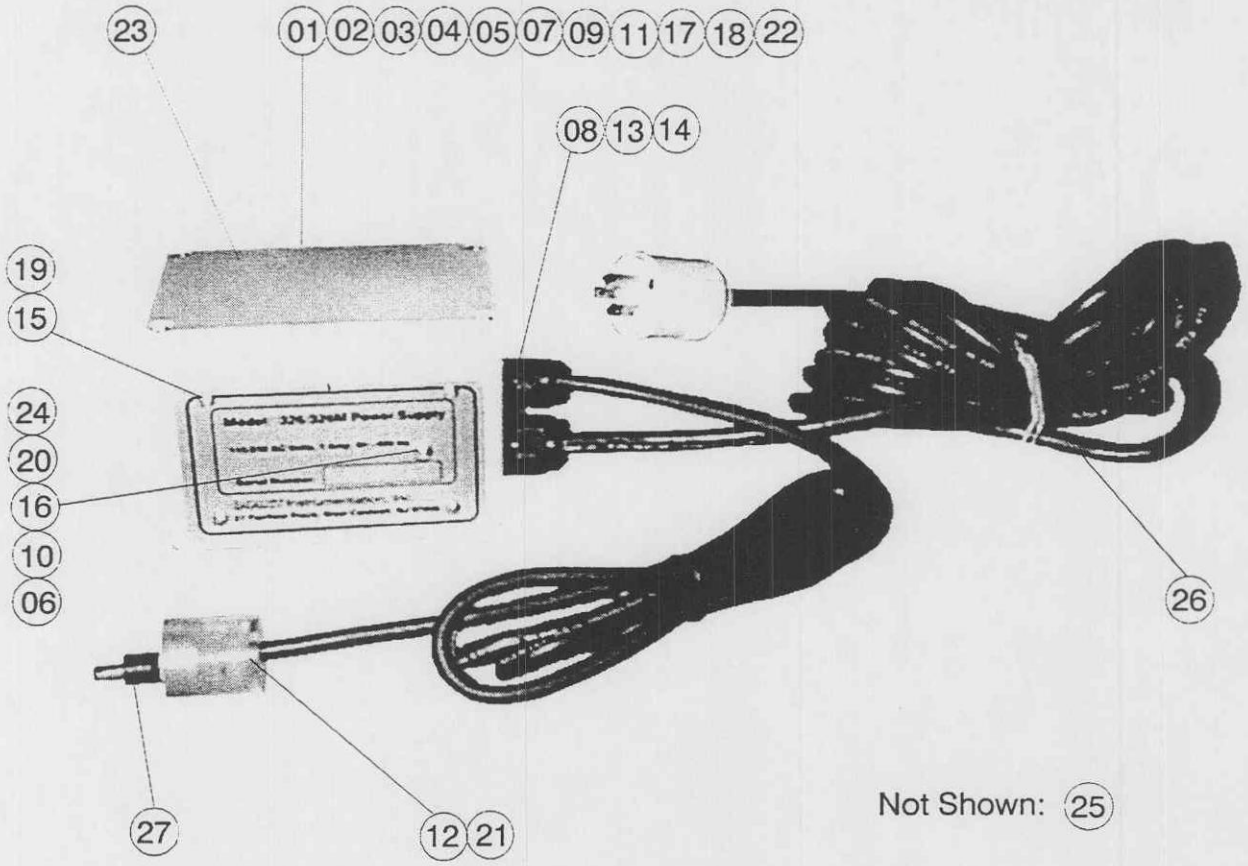
Sub-Assemblies Not Shown:

702-0326-01
702-0326-02
702-0326-03
703-0326-05

ITEM	IMPACT P/N	ITEM	IMPACT P/N	ITEM	IMPACT P/N	ITEM	IMPACT P/N
1	035-0002-00	8	346-0632-01	15	392-0026-00	22	540-0083-00
2	068-0004-00	9	358-0440-06	16	392-0029-00	23	602-0001-00
3	068-0005-00	10	368-0010-00	17	392-0032-00	24	700-0326-22
4	092-0006-00	11	368-0025-00	18	392-0033-00	25	700-0326-23
5	100-0010-00	12	368-0028-00	19	422-0326-31		
6	315-0008-00	13	376-0019-00	20	478-0002-00		
7	346-0440-01	14	392-0025-00	21	480-0219-00		

SEE BILL OF MATERIAL 703-0326-02 (PAGE 13 - 22)
FOR COMPLETE PART NUMBER DESCRIPTION

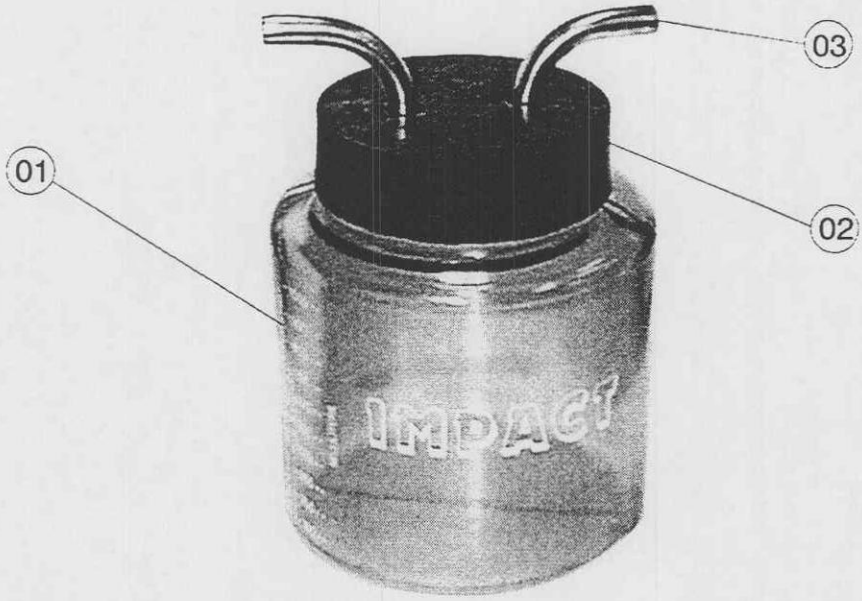
FIGURE 9 ASSEMBLY, FRONT PANEL



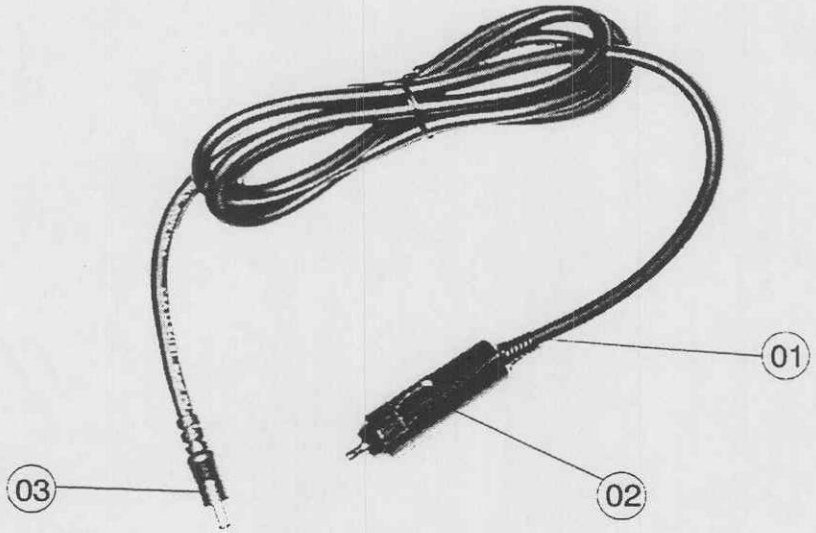
ITEM	IMPACT P/N	ITEM	IMPACT P/N	ITEM	IMPACT P/N	ITEM	IMPACT P/N
1	016-0004-00	8	117-0013-00	15	346-0440-01	22	374-0016-00
2	016-0034-00	9	312-0034-00	16	346-0632-01	23	402-0326-11
3	016-0043-00	10	325-0326-03	17	346-0832-01	24	414-0326-11
4	023-0020-00	11	334-0034-00	18	358-0440-04	25	606-0001-00
5	031-0009-00	12	334-0067-00	19	358-0440-06	26	708-0014-00
6	047-0005-00	13	340-0030-00	20	358-0632-10	27	708-0750-01
7	081-0020-00	14	340-0048-00	21	368-0045-00		

SEE BILL OF MATERIAL 703-0326-06 (PAGE 13 - 25)
FOR COMPLETE PART NUMBER DESCRIPTION

FIGURE 10 ASSEMBLY, AC CHARGER RECTIFIER



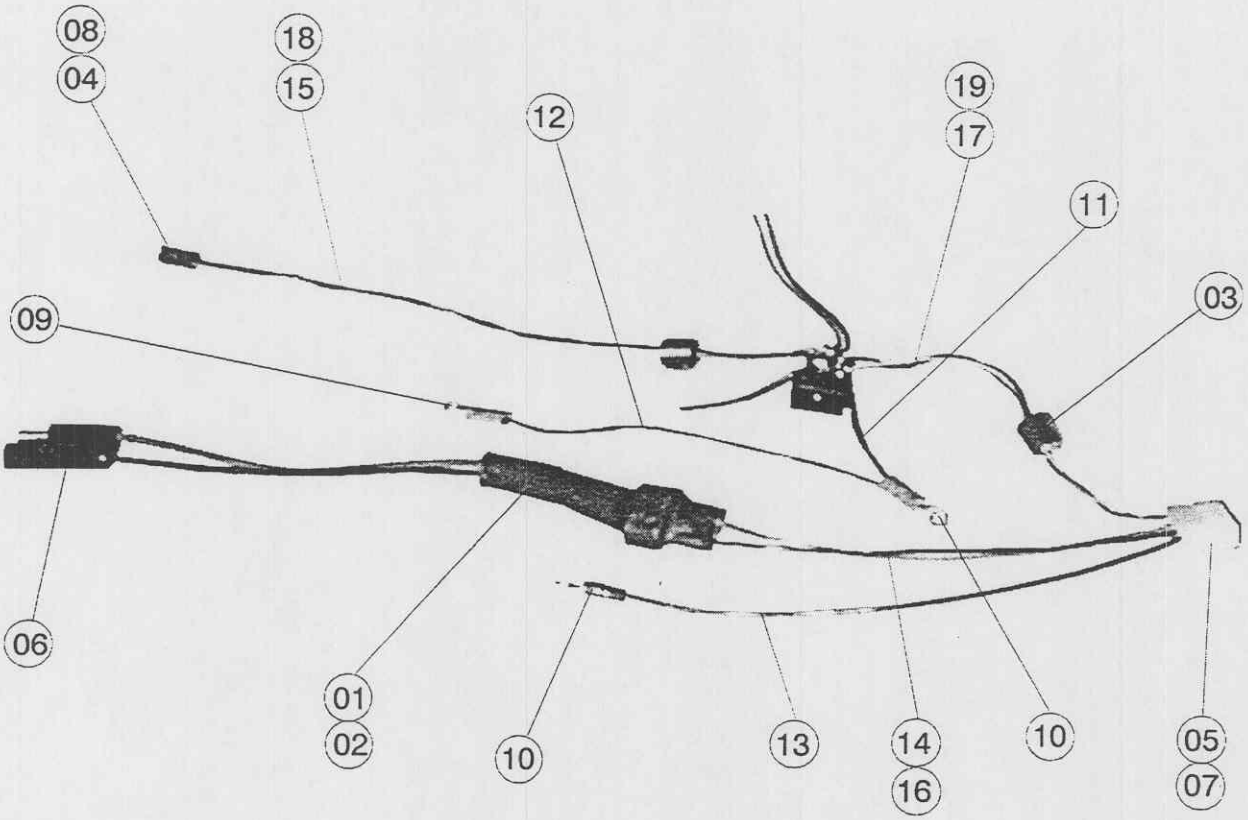
ITEM	IMPACT P/N	ITEM	IMPACT P/N	ITEM	IMPACT P/N
1	410-0010-04	2	416-0016-00	3	540-0066-00



ITEM	IMPACT P/N	ITEM	IMPACT P/N	ITEM	IMPACT P/N
1	016-0068-00	2	099-0004-02	3	708-0750-01

SEE BILLS OF MATERIAL 703-0326-07 (PAGE 13 - 26); and 708-0326-01 (PAGE 13 - 32) FOR COMPLETE PART NUMBER DESCRIPTION

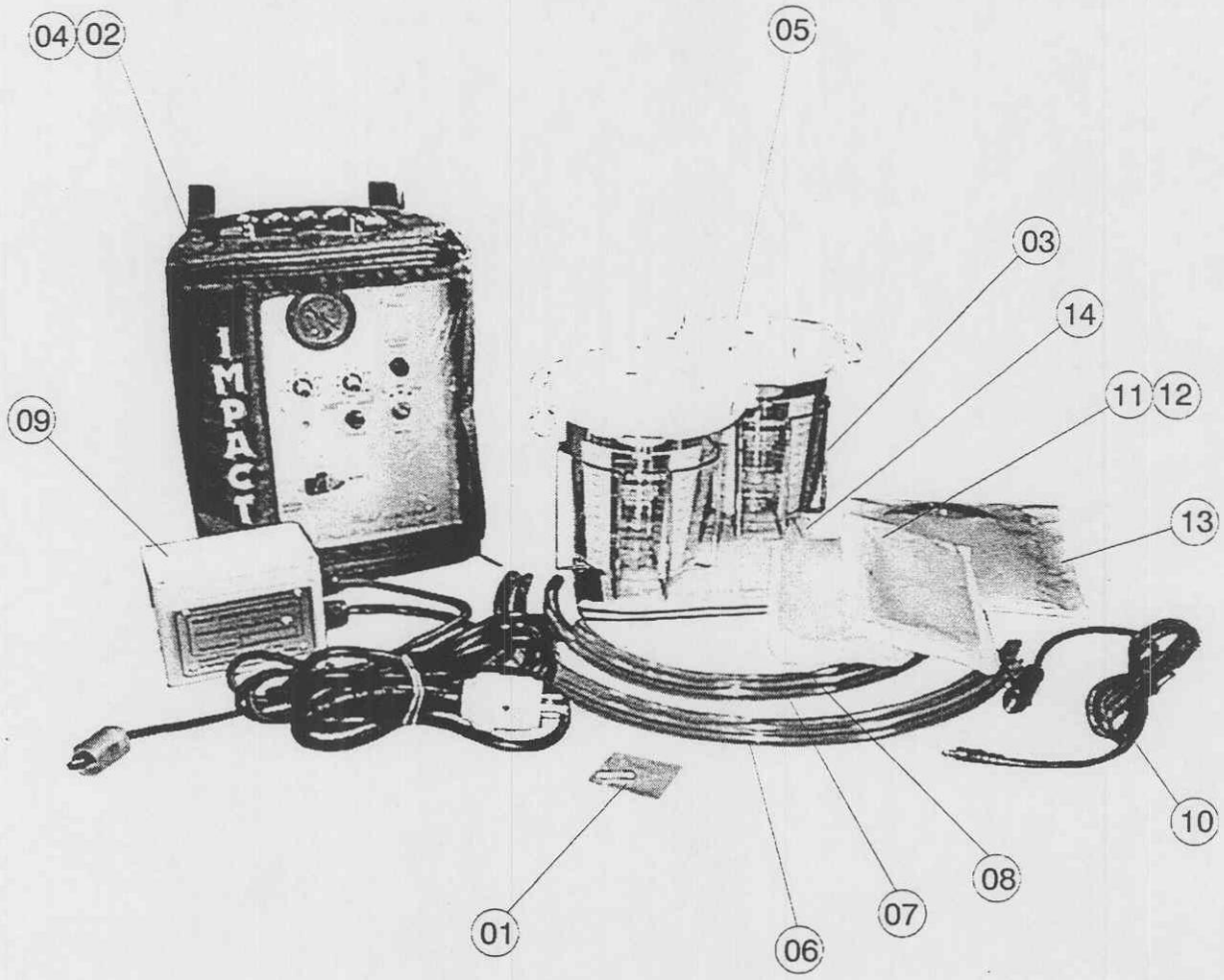
FIGURE 11 ASSEMBLY, COLLECTION CANISTER & AUTO POWER CABLE



ITEM	IMPACT P/N	ITEM	IMPACT P/N	ITEM	IMPACT P/N	ITEM	IMPACT P/N
1	016-0004-00	6	099-0010-02	11	700-0326-02	16	700-0326-10
2	016-0044-00	7	100-0008-00	12	700-0326-04	17	700-0326-11
3	031-0002-00	8	100-0009-00	13	700-0326-05	18	700-0326-13
4	092-0006-00	9	374-0017-00	14	700-0326-06	19	700-0326-18
5	092-0007-00	10	374-0018-00	15	700-0326-09		

SEE BILL OF MATERIAL 704-0326-01 (PAGE 13 - 30)
FOR COMPLETE PART NUMBER DESCRIPTION

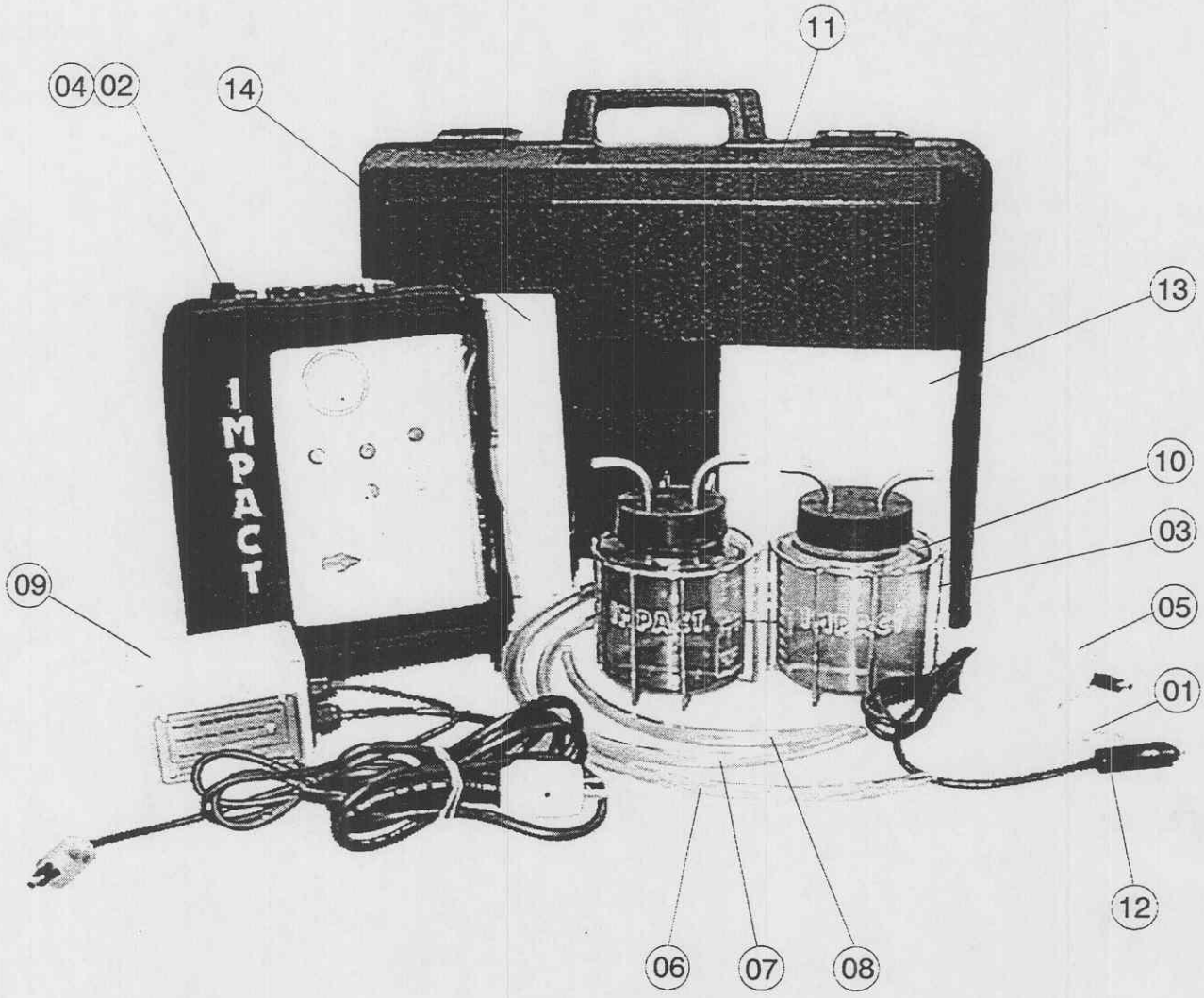
FIGURE 12 ASSEMBLY, WIRE HARNESS



ITEM	IMPACT P/N	ITEM	IMPACT P/N	ITEM	IMPACT P/N	ITEM	IMPACT P/N
1	081-0020-00	5	410-0004-00	9	703-0326-06	13	820-0018-00
2	334-0020-00	6	540-0051-00	10	708-0326-01	14	906-0326-03
3	334-0030-00	7	540-0055-00	11	820-0004-00		
4	402-0017-00	8	540-0068-00	12	820-0005-00		

SEE BILL OF MATERIAL 802-0326-02 (PAGE 13 - 33)
FOR COMPLETE PART NUMBER DESCRIPTION

FIGURE 13 ASSEMBLY, ACCESSORY KIT - AIR FORCE



ITEM	IMPACT P/N	ITEM	IMPACT P/N	ITEM	IMPACT P/N	ITEM	IMPACT P/N
1	081-0020-00	5	465-0005-00	9	703-0326-06	13	820-0018-00
2	334-0020-00	6	540-0051-00	10	703-0326-07	14	906-0326-03
3	334-0030-00	7	540-0055-00	11	703-0326-16		
4	402-0017-00	8	540-0068-00	12	708-0326-01		

SEE BILL OF MATERIAL 703-0326-16 (PAGE 13 - 29) and 802-0326-03 (PAGE 13 - 34)
FOR COMPLETE PART NUMBER DESCRIPTION

FIGURE 14 ASSEMBLY, ACCESSORY KIT, ARMY (NSN 6515-01-435-0050)

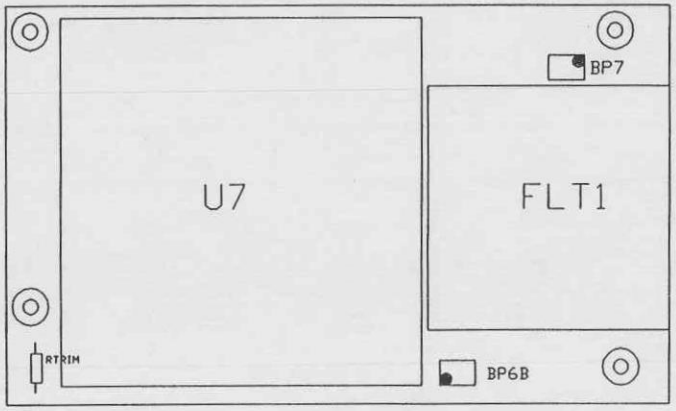


FIGURE 15

See Bill of Material 702-0326-03, Page 13-20, for complete Part Number Description

df:70203263.DWG

TOLERANCES UNLESS OTHERWISE SPECIFIED FRACTION +/- DEC +/- ANGLES +/-		IMPACT		
APPROVALS	DATE	ASSEMBLY SWITCHER PRINTED CIRCUIT BOARD		
DRAWN AG	2-14-96			
CHECKED LS	2-14-96	SCALE NONE	SIZE B	DRAWING NO. 702-0326-03
		Rev. D		SHEET 1 OF 1

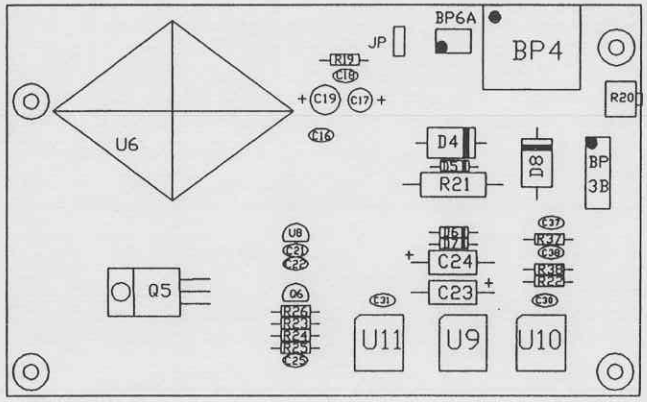


FIGURE 16

See Bill of Material 702-0326-02, Page 13-19, for complete Part Number Description

df:70203262.DWG

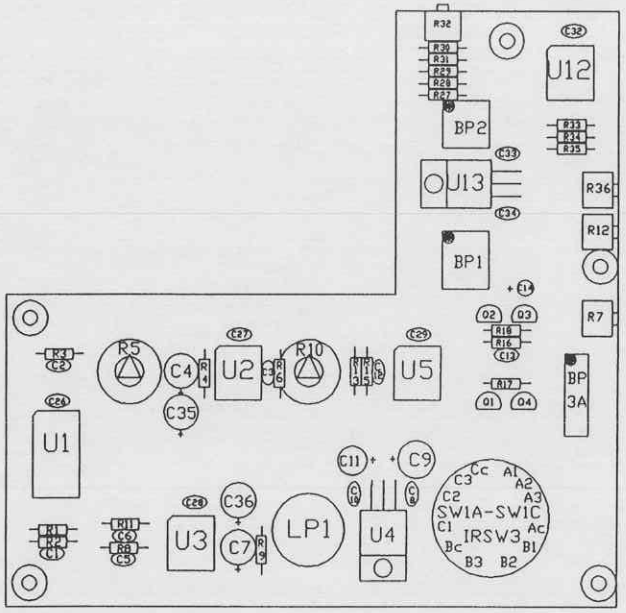
TOLERANCES UNLESS OTHERWISE SPECIFIED
FRACTION +/- DEC +/- ANGLES +/-

APPROVALS	DATE
DRAWN	10/4/00
CHECKED	12/4/00

IMPACT

ASSEMBLY, REGULATOR
PRINTED CIRCUIT BOARD

SCALE	SIZE	DRAWING NO.
NONE	B	702-0326-02
Rev. E		SHEET 1 OF 1



See Bill of Material 702-0326-01, Page 13-18, for complete Part Number Description

df:70203261.DWG

TOLERANCES UNLESS OTHERWISE SPECIFIED
FRACTION +/- DEC +/- ANGLES +/-

APPROVALS	DATE
DRAWN AG	2-14-96
CHECKED LS	2-14-96

IMPACT

ASSEMBLY, MAIN
PRINTED CIRCUIT BOARD

SCALE	SIZE	DRAWING NO.
NONE	B	702-0326-01
Rev. E		SHEET 1 OF 1

FIGURE 17

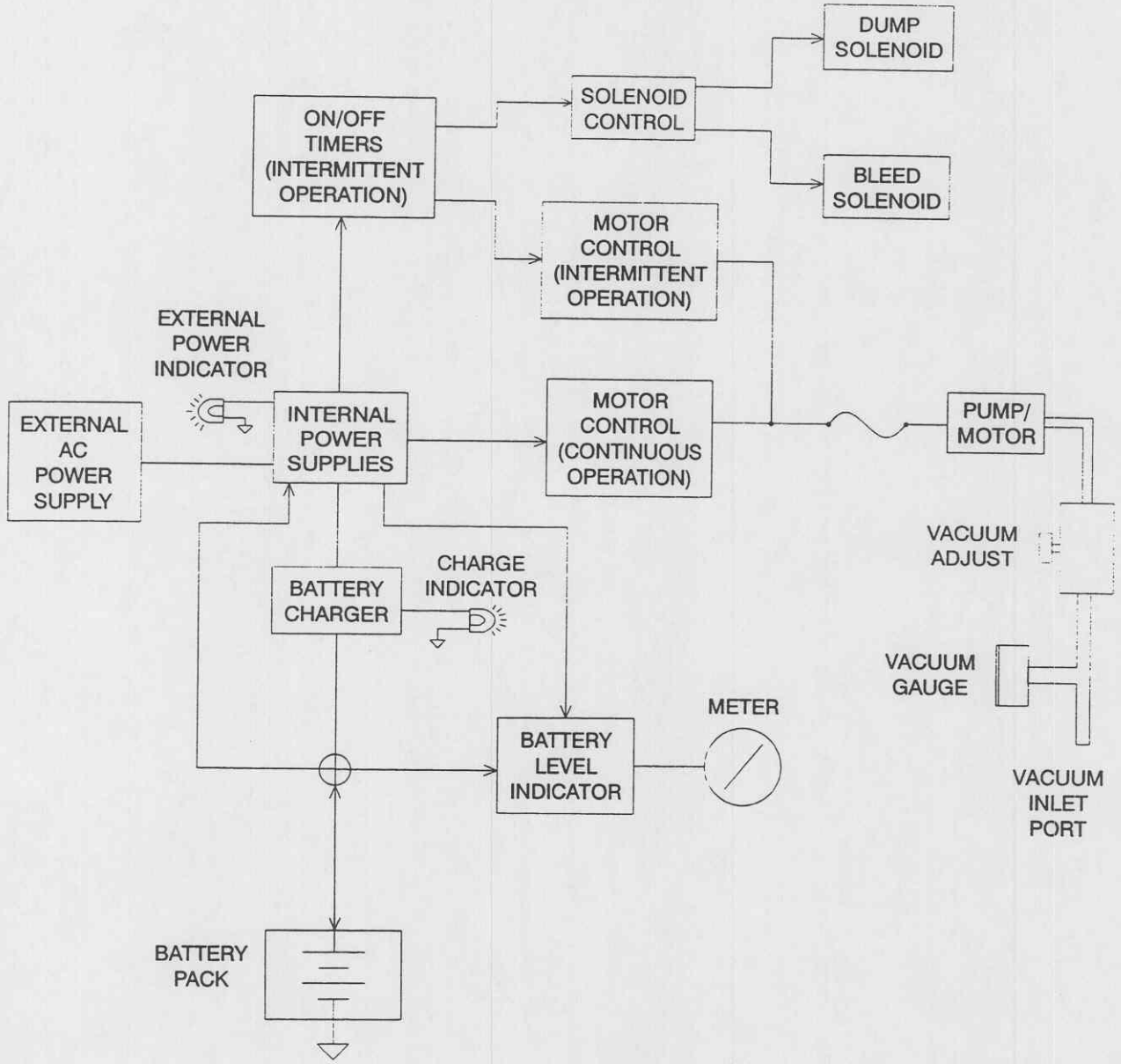


FIGURE 18 BLOCK DIAGRAM

IMPACT Instrumentation, Inc.

MASTER BOM
Model 326M

Approved By: AG

Date: 12-4-00

ITEM NUMBER	PART NUMBER	QTY	REV	ITEM NAME / DESCRIPTION	DESIGNATION	DRAWING NUMBER
0001	701-0326-01	1	B	Assembly, Final Mechanical	N/A	PL701-0326-01
0002	702-0326-01	1	C	Assembly, Main Printed Circuit Board	N/A	PL702-0326-01
0003	702-0326-02	1	E	Assembly, Regulator Printed Circuit Board	N/A	PL702-0326-02
0004	702-0326-03	1	B	Assembly, Switcher Printed Circuit Board	N/A	PL702-0326-03
0005	703-0326-01	1	A	Assembly, Bottom Cover	N/A	PL703-0326-01
0006	703-0326-02	1	C	Assembly, Front Panel	N/A	PL703-0326-02
0007	703-0326-03	1	A	Assembly, Top Cover	N/A	PL703-0326-03
0008	703-0326-05	1	A	Assembly, Pump	N/A	PL703-0326-05
0009	703-0326-06	1	B	Assembly, AC Charger Rectifier	N/A	PL703-0326-06
0010	703-0326-07	1	0	Assembly, Collection Canister	N/A	PL703-0326-07
0011	703-0326-09	1	A	Assembly, Manifold	N/A	PL703-0326-09
0012	703-0326-15	1	0	Assembly, Connector Panel	N/A	PL703-0326-15
0013	703-0326-16	1	0	Assembly, Carry Case, Hard	N/A	PL703-0326-16
0014	704-0326-01	1	0	Assembly, Wire Harness	N/A	PL704-0326-01
0015	704-0750-03	1	0	Assembly, Battery Pack, 4AH or 5AH	N/A	PL704-0750-03
0016	708-0326-01	1	A	Assembly, Auto Power Cable	N/A	PL708-0326-01
0017	802-0326-02	1	B	Assembly, Accessory Kit, Air Force	N/A	PL802-0326-02
0018	802-0326-03	1	B	Assembly, Accessory Kit, Army	N/A	PL802-0326-03
0019	802-0326-05	1	0	Assembly, Accessory Kit, DEPMEDS	N/A	PL802-0326-05

ITEM NUMBER	PART NUMBER	QTY	ITEM NAME / DESCRIPTION	DESIGNATION	DRAWING NUMBER
0001	016-0004-00	2	Tubing, Shrink, 3/16" I.D. X 1" Long	N/A	
0002	305-0001-00	2	Tie Wrap, Miniature, 4" Long	N/A	
0003	312-0014-00	1	Tape, Foam, White, P/S, 2" Long	N/A	
0004	346-0440-01	2	Nut, Keps, 4-40	N/A	
0005	358-0632-08	7	Screw, Phillips, Pan Head, SS, 6-32 X 1/2	N/A	
0006	376-0007-00	8	Washer, Flat, SS, #6	N/A	
0007	602-0006-00	ASREQ	Sealant, Vibratite	N/A	
0008	703-0326-01	1	Assembly, Bottom Cover	N/A	PL703-0326-01
0009	703-0326-03	1	Assembly, Top Cover	N/A	PL703-0326-03
0010	703-0326-15	1	Assembly, Connector Panel	N/A	
0011	704-0750-03	1	Assembly, Battery Pack, 4AH or 5AH	N/A	PL704-0750-03

ITEM NUMBER	PART NUMBER	QTY	ITEM NAME / DESCRIPTION	DESIGNATION	DRAWING NUMBER
0001	012-0003-00	ASREQ	Busswire, 18 AWG, Solid	N/A	
0002	051-3643-00	1	Transistor, 2N3643	Q1	
0003	054-4001-00	1	IC, DIP, CMOS, CD4001AE; Quad, 2-Input, NOR	U1	
0004	055-0358-00	1	IC, DIP, LM358N	U12	
0005	055-0555-00	3	IC, Timer, DIP, MOS, LM555CN	U,2,3,5	
0006	055-4310-00	3	IC, ZVN4310A N-Channel, J-FET	Q2,3,4	
0007	055-7806-00	2	IC, Case TO-220, 7806, +6V Voltage Regulator	U4,13	
0008	068-0005-00	1	Lampholder w/lens, Green	LP1	
0009	093-0013-05	1	Header, Right Angle, Friction Lock, 5-Pin, .100 Centers	BP1	
0010	093-0029-04	1	Header, Right Angle, Friction Lock, 4-Pin, .100 Centers	BP2	
0011	093-0039-07	1	Header, Straight, Dual Row, Male, 7 X 2 Pins, .1 Centers	BP3A	
0012	109-0007-00	1	Socket, IC, DIP, 14-Pin, Hi-Rel	N/A	
0013	109-0008-00	4	Socket, IC, DIP, 8-Pin, Hi-Rel	N/A	
0014	117-0018-00	1	Switch, Rotary, 3-Pole, 3-Position, Non-Shorting, PCB	SW1	
0015	200-0103-02	3	Resistor, Fixed, Carbon Film, 1/4W, 5%, 10K	R3,8,17	
0016	200-0104-02	1	Resistor, Fixed, Carbon Film, 1/4W, 5%, 100K	R2	
0017	200-0203-02	2	Resistor, Fixed, Carbon Film, 1/4W, 5%, 20K	R6,11	
0018	200-0223-02	1	Resistor, Fixed, Carbon Film, 1/4W, 5%, 22K	R1	
0019	200-0473-02	2	Resistor, Fixed, Carbon Film, 1/4W, 5%, 47K	R13, 18	
0020	200-0474-02	1	Resistor, Fixed, Carbon Film, 1/4W, 5%, 470K	R15	
0021	200-0564-02	1	Resistor, Fixed, Carbon Film, 1/4W, 5%, 560K	R16	
0022	213-1002-00	1	Resistor, Fixed, Precision, Metal Film, 1/4W, 1%, 10K	R31	
0023	213-1003-00	4	Resistor, Fixed, Precision, Metal Film, 1/4W, 1%, 100K	R28,30,33,35	
0024	213-1212-00	1	Resistor, Fixed, Precision, Metal Film, 1/4W, 1%, 12.1K	R34	
0025	213-3482-00	2	Resistor, Fixed, Precision, Metal Film, 1/4W, 1%, 34.8K	R4,9	
0026	213-4701-00	2	Resistor, Fixed, Precision, Metal Film, 1/4W, 1%, 4.7K	R27, 29	
0027	214-0254-01	2	Resistor, Variable, PM, Linear Taper, 1/2W, 250K	R5, 10	
0028	216-0202-00	1	Resistor, Vertical Mounting, Trim, 2K	R36	
0029	216-0203-00	1	Resistor, Vertical Mounting, Trim, 20K	R32	
0030	216-0204-10	2	Resistor, Vertical Mounting, Trim, 200K	R7, 12	
0031	240-0326-01	1	Printed Circuit Board, Main	N/A	
0032	253-1076-21	2	Capacitor, Aluminum, Electrolytic, Radial, 100 ufd, 16V	C35, 36	
0033	253-2276-11	1	Capacitor, Aluminum, Electrolytic, Radial, 220 ufd, 10V	C11	
0034	253-2276-21	1	Capacitor, Aluminum, Electrolytic, Radial, SU, 220 ufd, 16V	C9	
0035	253-3366-21	2	Capacitor, Aluminum, Electrolytic, Radial, SU, 33 ufd, 16V	C4, 7	
0036	255-4756-11	1	Capacitor, Tantalum, Radial, 4.7 ufd, 10V	C14	
0037	257-1034-12	6	Capacitor, Mylar, 10%, .01 ufd, 100V	C2, 3, 5, 6, 12, 13	
0038	259-1044-51	10	Capacitor, Metallized Film, 5%, .1 ufd, 50V	C1,8,10,26-29,32-34	
0039	346-0440-01	2	Nut, Keps, 4-40	N/A	
0040	358-0440-04	2	Screw, Phillips, Pan Head, Zinc Plated, 4-40 X 1/4	N/A	

ITEM NUMBER	PART NUMBER	QTY	ITEM NAME / DESCRIPTION	DESIGNATION	DRAWING NUMBER
0001	012-0008-00	1	Busswire, 18 AWG, 1/2" Long	JP	
0002	047-4004-00	3	Diode, 1N4004, (1A, 400PIV)	D5, 6, 7	
0003	047-5825-00	2	Diode, Schottkey, (5A, 40V)	D4, D8	
0004	051-3643-00	1	Transistor, 2N3643	Q6	
0005	055-0003-00	1	IC, DIP, AMP02EP, Instrumentation Amplifier	U10	
0006	055-0338-00	1	IC, Regulator, 5A, LM338K	U6	
0007	055-0340-00	1	IC, TO-42, LM340LAZ-5.0, Voltage Regulator	U8	
0008	055-0358-00	1	IC, DIP, LM358N	U11	
0009	055-7662-00	1	IC, DIP, ICL7662, 8V Voltage Converter	U9	
0010	055-9540-00	1	IC, Case 221A-03, IRF9540, P-Channel J-Fet	Q5	
0011	093-0036-03	1	Header, Straight, Dual Row, Male, 3 X 2 Pins, .1 Centers	BP6A	
0012	093-0037-05	1	Header, Right Angle, 5 Pin, .156 Centers	BP4	
0013	093-0038-07	1	Header, Straight, Dual Row, Female, 7 X 2 Pins, .1 Centers	BP3B	
0014	109-0008-00	3	Socket, IC, DIP, 8-Pin, Hi-Rel	N/A	
0015	200-0102-02	1	Resistor, Fixed, Carbon Film, 1/4W, 5%, 1K	R23	
0016	200-0181-02	1	Resistor, Fixed, Carbon Film, 1/4W, 5%, 180	R26	
0017	200-0241-02	1	Resistor, Fixed, Carbon Film, 1/4W, 5%, 240	R19	
0018	204-0010-02	1	Resistor, Fixed, Metal Oxide Film, 1W, 5%, 1.0	R21	
0019	213-1003-00	3	Resistor, Fixed, Precision, Metal Film, 1/4W, 1%, 100K	R25, 37, 38	
0020	213-1823-00	1	Resistor, Fixed, Precision, Metal Film, 1/4W, 1%, 182K	R24	
0021	213-5600-00	1	Resistor, Fixed, Precision, Metal Film, 1/4W, 1%, 560	R22	
0022	216-0502-00	1	Resistor, Vertical Mounting, Trim, 5K	R20	
0023	240-0326-02	1	Printed Circuit Board, Regulator	N/A	
0024	252-1066-41	2	Capacitor, Aluminum, Electrolytic, Axial, 10 ufd, 35V	C23, 24	
0025	253-2276-11-1	1	Capacitor, Aluminum, Electrolytic, Radial, KA, 220 ufd, 10V	C19	
0026	255-1066-11	1	Capacitor, Tantalum, Radial, 10 ufd, 16V	C17	
0027	257-1034-12	2	Capacitor, Mylar, 10%, .01 ufd, 100V	C37, 38	
0028	259-1044-51	7	Capacitor, Metallized Film, 5%, .1 ufd, 50V	C16,18,21,22,25,30,31	
0029	310-0024-00	1	Insulator, Heat Sink Pad, TO-220	N/A	
0030	310-0025-00	1	Insulator, Heat Sink Pad, TO-3	N/A	
0031	310-0326-00	1	Heat Sink 6051B, For TO-3 Pkg	N/A	
0032	310-0326-10	1	Heat Sink 6072B, For 220A Pkg	N/A	
0033	344-0003-00	1	Lug, Solder, #10	N/A	
0034	346-0632-01	4	Nut, Keps, 6-32	N/A	
0035	358-0632-06	4	Screw, Phillips, Pan Head, SS, 6-32 X 3/8	N/A	
0036	700-0326-15	1	Jumper, Red, 18AWG, 1" Long.	N/A	

ITEM NUMBER	PART NUMBER	QTY	ITEM NAME / DESCRIPTION	DESIGNATION	DRAWING NUMBER
0001	026-0001-00	1	Module, Switcher, 11-30 V-in, 13.8 VDC-out	U7	
0002	031-0011-00	1	Filter, Input Module	FLT1	
0003	093-0034-02	1	Header, Right Angle, Friction Lock, .1 Centers, 2-pin	BP7	
0004	093-0035-03	1	Header, Straight, Dual Row, Female, 3 x 2 Pin, .100 Centers	BP6B	
0005	200-0513-02	1	Resistor, Fixed, Carbon Film, 1/4W, 5%, 51K	RTRIM	
0006	240-0326-03	1	Printed Circuit Board, Switcher	N/A	
0007	312-0058-00	ASREQ	Tape, Copper, EMI/RFI, 1" Wide, 50' Long	N/A	
0008	602-0001-00	ASREQ	Sealant, Silicone Rubber, RTV, Translucent	N/A	

ITEM NUMBER	PART NUMBER	QTY	ITEM NAME / DESCRIPTION	DESIGNATION	DRAWING NUMBER
0001	312-0018-00	1	Tape, Foam, White, P/S, 4" Long	N/A	
0002	325-0326-01	1	Label, P/S, Mylar, Condensed Operating Instructions & Warning	N/A	
0003	325-0326-02	1	Label, I.D.	N/A	
0004	334-0053-00	1	Strap, Velcro, 9" Long, w/D-Ring	N/A	
0005	334-0054-00	1	Strap, Velcro, 10" Long, w/ Hook	N/A	
0006	338-0007-00	2	Rivet, Blind, 1/8" Dia, Aluminum, Dome Head, 19/32" Long	N/A	
0007	346-0440-01	4	Nut, Keps, 4-40	N/A	
0008	346-0632-01	2	Nut, Keps, 6-32	N/A	
0009	358-0632-06	2	Screw, Phillips, Pan Head, SS, 6-32 X 3/8	N/A	
0010	358-0632-08	2	Screw, Phillips, Pan Head, SS, 6-32 X 1/2	N/A	
0011	362-0440-06	4	Screw, Truss Head, Phillips, SS, 4-40 X 3/8	N/A	
0012	376-0007-00	2	Washer, Flat, SS, #6	N/A	
0013	376-0008-00	2	Washer, Flat, SS, #4	N/A	
0014	392-0750-11	2	Knob, Molded, Door	N/A	
0015	404-0326-11	2	Bracket, Slide, Molded, 3.20"	N/A	
0016	416-0326-11	1	Cover, Bottom, EMI/RFI, (Nickel Coated)	N/A	
0017	450-0008-00	8	Bumper, Rubber, Foot, P/S, Round, 1/2" Dia. X 1/8", Blk	N/A	

ITEM NUMBER	PART NUMBER	QTY	ITEM NAME / DESCRIPTION	DESIGNATION	DRAWING NUMBER
0001	035-0002-00	1	Meter, Low Battery Indicator	N/A	
0002	068-0004-00	2	Bulb, Incandescent, 14V, 80mA	N/A	
0003	068-0005-00	1	Lampholder w/lens, Green	N/A	
0004	092-0006-00	4	Crimp Terminal, .1 Spacing	N/A	
0005	100-0010-00	1	Connector, 4-Pin, .100 Centers	N/A	
0006	315-0008-00	1	Gauge, Vacuum, 2" O.D. CBM, Dual Scale, 1/4" NPTM	N/A	
0007	346-0440-01	1	Nut, Keps, 4-40	N/A	
0008	346-0632-01	4	Nut, Keps, 6-32	N/A	
0009	358-0440-06	4	Screw, Phillips, Pan Head, SS, 4-40 X 3/8	N/A	
0010	368-0010-00	4	Spacer, Hex, Threaded, Female, 4-40 X 5/8" Long, Brass/Zinc	N/A	
0011	368-0025-00	5	Spacer, Hex, Threaded, Male-to-Female, 4-40 X 3/4" Long, Brass/Nickel	N/A	
0012	368-0028-00	4	Spacer, Hex, Threaded, Male to Female, 4-40 X 1/2 Long, Alum.	N/A	
0013	376-0019-00	4	Washer, Lock, Internal Tooth, SS, #4	N/A	
0014	392-0025-00	2	Knob, Collet, Gray w/Indicator, 1/8" Shaft	N/A	
0015	392-0026-00	2	Knob, Cap, Black w/Indicator, 1/8" Shaft	N/A	
0016	392-0029-00	2	Knob, Nut Cover, Black	N/A	
0017	392-0032-00	1	Knob, Collet, Black Matte w/Indicator, 21mm 1/4" Shaft	N/A	
0018	392-0033-00	1	Knob, Cap, Gray w/Indicator, 1/4" Shaft	N/A	
0019	422-0326-31	1	Panel, Front, Square Hole	N/A	
0020	478-0002-00	1	Orifice Restrictor, .010" Orifice, 10/32 THD X 1/8 ID Hose Barbs	N/A	
0021	480-0219-00	1	Cap, Brass, 1/4" NPTF	N/A	
0022	540-0083-00	1	Hose, 8" Long	N/A	
0023	602-0001-00	ASREQ	Sealant, Silicone Rubber, RTV, Translucent	N/A	
0024	700-0326-22	1	Jumper, Red, 22AWG, 5" Long	N/A	
0025	700-0326-23	1	Jumper, Green, 22 AWG, 5" Long	N/A	
0026	702-0326-01	1	Assembly, Main Printed Circuit Board	N/A	
0027	702-0326-02	1	Assembly, Regulator Printed Circuit Board	N/A	
0028	702-0326-03	1	Assembly, Switcher Printed Circuit Board	N/A	
0029	703-0326-05	1	Assembly, Pump	N/A	

ITEM NUMBER	PART NUMBER	QTY	ITEM NAME / DESCRIPTION	DESIGNATION	DRAWING NUMBER
0001	312-0041-00	2	Tape, Foam, White, P/S, 1 1/2" Lg	N/A	
0002	338-0007-00	1	Rivet, Blind, 1/8" Dia, Aluminum, Dome Head, 19/32" Long	N/A	
0003	358-0632-06	2	Screw, Phillips, Pan Head, SS, 6-32 X 3/8	N/A	
0004	376-0007-00	2	Washer, Flat, SS, #6	N/A	
0005	376-0008-00	1	Washer, Flat, SS, #4	N/A	
0006	390-0002-00	1	Handle (With Mounting Flanges)	N/A	
0007	392-0750-11	1	Knob, Molded, Door	N/A	
0008	404-0750-91	1	Bracket, Battery Compartment Divider EMI/RFI (Nickel Coated)	N/A	
0009	416-0326-21	1	Cover, Top, EMI/RFI, (Nickel Coated)	N/A	
0010	418-0750-31	1	Door, Battery Compartment Divider, (Nickel Coated)	N/A	
0011	418-0750-41	1	Door, Top Cover	N/A	
0012	703-0326-02	1	Assembly, Front Panel	N/A	

ITEM NUMBER	PART NUMBER	QTY	ITEM NAME / DESCRIPTION	DESIGNATION	DRAWING NUMBER
0001	031-0002-00	1	Ferrite	N/A	
0002	031-0010-00	1	Filter, Low Pass, EMI	N/A	
0003	041-0013-00	1	Pump, Vacuum, Diaphragm, In-Line Ports, 12V	N/A	
0004	047-4935-00	1	Diode, 1N4935, Fast Recovery	N/A	
0005	358-0632-04	2	Screw, Phillips, Pan Head, SS, 6-32 X 1/4	N/A	
0006	358-0632-05	4	Screw, Phillips, Pan Head, SS, 6-32 X 5/16	N/A	
0007	374-0017-00	2	Terminal, Insulated, Ring, #6 Stud, 16-14 AWG, Blue	N/A	
0008	374-0026-00	1	Terminal, Insulated, Ring, 1/4" Stud, 16-14 AWG, Blue	N/A	
0009	376-0004-00	6	Washer, Lock, Internal Tooth, SS, #6	N/A	
0010	404-0326-31	1	Bracket, Left	N/A	
0011	404-0326-41	1	Bracket, Right	N/A	
0012	404-0326-51	1	Bracket, Filter Mounting	N/A	
0013	602-0006-00	ASREQ	Sealant, Vibratite	N/A	
0014	700-0326-03	1	Jumper, Black, 18AWG, 4" Long.	N/A	
0015	700-0326-07	1	Jumper, Black, 18AWG, 8" Long.	N/A	
0016	700-0326-14	1	Jumper, Red, 18AWG, 11" Long.	N/A	
0017	700-0326-16	1	Jumper, Red, 18AWG, 1 1/2" Long.	N/A	
0018	703-0326-09	1	Assembly, Manifold	N/A	

ITEM NUMBER	PART NUMBER	QTY	ITEM NAME / DESCRIPTION	DESIGNATION	DRAWING NUMBER
0001	016-0004-00	5	Tubing, Shrink, 3/16" I.D. X 1" Long	N/A	
0002	016-0034-00	2	Tubing,Shrink, 1/8" I.D. X 1" Long	N/A	
0003	016-0043-00	1	Tubing, Shrink, 3/16 I.D. X 4" Long	N/A	
0004	023-0020-00	1	Transformer, Power, 115/230VAC Primary to 14VAC, 3A Secondary	N/A	
0005	031-0009-00	1	Attenuator, Split Channel, Assembly	N/A	
0006	047-0005-00	1	Diode, Bridge Rectifier, 12A, 50PIV	N/A	
0007	081-0020-00	1	Fuse, Midget, 2A, 250V	N/A	
0008	117-0013-00	1	Switch, Rotary, Voltage Select	N/A	
0009	312-0034-00	1	Tape, Foam, White, 3" Lg	N/A	
0010	325-0326-03	1	Label, Serial Number, & Heat Sink, 326/326M Power Supply	N/A	
0011	334-0034-00	1	Fuseholder, Universal, In-line, Red Leads	N/A	
0012	334-0067-00	1	Collar, Strain Relief, Cable Mounting	N/A	
0013	340-0030-00	1	Bushing, Strain Relief, Nylon, Lg. w/Nut, LTF 11, Black	N/A	
0014	340-0048-00	1	Bushing, Strain Relief, Nylon, Lg. W/Nut, LFT9, Black	N/A	
0015	346-0440-01	4	Nut, Keps, 4-40	N/A	
0016	346-0632-01	1	Nut, Keps, 6-32	N/A	
0017	346-0832-01	2	Nut, Keps, 8-32	N/A	
0018	358-0440-04	4	Screw, Phillips, Pan Head, Zinc Plated, 4-40 X 1/4	N/A	
0019	358-0440-06	4	Screw, Phillips, Pan Head, SS, 4-40 X 3/8	N/A	
0020	358-0632-10	1	Screw, Phillips, Pan Head, SS, 6-32 X 5/8	N/A	
0021	368-0045-00	1	Spacer, Nylon, .625" O.D. X .342 I.D. X .375" Long	N/A	
0022	374-0016-00	2	Terminal, Insulated, Ring, #10 Stud, 16-14 AWG, Blue	N/A	
0023	402-0326-11	1	Case, AC Charger Rectifier	N/A	
0024	414-0326-11	1	Chassis, Charger/Rectifier	N/A	
0025	606-0001-00	ASREQ	Silicone Grease Or Heat Sink Compound	N/A	
0026	708-0014-00	1	Line Cord, SJT, 18 AWG, 3 Cord, 120" Long	N/A	
0027	708-0750-01	1	Assembly, Cable, Shielded, 2-Con-w/molded 2.5 MM Plug, 5ft	N/A	

ITEM NUMBER	PART NUMBER	QTY	ITEM NAME / DESCRIPTION	DESIGNATION	DRAWING NUMBER
0001	410-0010-04	1	Jar, Collection, Polysulfone/Polycarbonate,	N/A	
0002	416-0016-00	1	Cap, Molded, 83mm	N/A	
0003	540-0066-00	2	Tube, Elbow, SS, .319" I.D. X .375" O.D.	N/A	

ITEM NUMBER	PART NUMBER	QTY	ITEM NAME / DESCRIPTION	DESIGNATION	DRAWING NUMBER
0001	016-0004-00	2	Tubing, Shrink, 3/16" I.D. X 1" Long	N/A	
0002	016-0016-00	1	Tubing, Shrink, 3/8" I.D. X 1 1/2" Long	N/A	
0003	047-4935-00	2	Diode, 1N4935, Fast Recovery	N/A	
0004	092-0006-00	5	Crimp Terminal, .1 Spacing	N/A	
0005	100-0002-00	1	Connector, 5-Pin	N/A	
0006	305-0001-00	3	Tie Wrap, Miniature, 4" Long	N/A	
0007	348-0002-00	1	Pin, Stop, Knob	N/A	
0008	480-0068-00	1	Hose Barb, Chrome, 1/8" NPTM to 3/8" I.D. Tube	N/A	
0009	480-0132-00	1	Nipple, Close, Chrome, 1/8" NPTM X 1/8" NPTM , .500 Long	N/A	
0010	480-0210-00	1	Elbow, 45 Deg., Street, 1/8"NPTM x 1/8"NPTF	N/A	
0011	480-0229-00	1	Elbow, Swivel, 10-32 x 1/8" Tube, Black	N/A	
0012	490-0045-01	1	Valve, Plug	N/A	
0013	700-0326-08	1	Jumper, Black, 22AWG, 9" Long.	N/A	
0014	700-0326-12	1	Jumper, Red, 22AWG, 9" Long.	N/A	
0015	700-0326-19	1	Jumper, Orange, 22AWG, 9" Long.	N/A	
0016	700-0326-20	1	Jumper, Orange, 22AWG, 11" Long.	N/A	
0017	700-0326-21	1	Jumper, Grey, 22AWG, 11" Long.	N/A	
0018	704-0326-03	1	Assembly, Manifold/Valve	N/A	

ITEM NUMBER	PART NUMBER	QTY	ITEM NAME / DESCRIPTION	DESIGNATION	DRAWING NUMBER
0001	016-0062-00	1	Tubing Cable Wrap, Blk, 1/2" X 5"	N/A	
0002	081-0017-00	1	Circuit Breaker, 5A, 32VDC, 250VAC	N/A	
0003	089-0011-00	1	Connector, PMF, 2.5mm PIN, Moulded PC Mount w/Switch	N/A	
0004	253-1096-41	1	Capacitor, Aluminum, Electrolytic, Radial, 10,000 ufd, 35V	N/A	
0005	335-0003-00	1	Flange, Panel Mounting	N/A	
0006	346-0440-01	6	Nut, Keps, 4-40	N/A	
0007	358-0440-08	6	Screw, Phillips, Pan Head, SS, 4-40 X 1/2	N/A	
0008	376-0035-00	2	Washer, Flat, Fiber, #4	N/A	
0009	404-0326-61	2	Bracket, Jack, Power-Type	N/A	B404-0326-61
0010	422-0326-21	1	Panel, Connector	N/A	B422-0326-21
0011	480-0220-00	1	Hose Barb, Union Bulkhead, PM, 3/8" X 3/8	N/A	
0012	602-0001-00	ASREQ	Sealant, Silicone Rubber, RTV, Translucent	N/A	
0013	700-0326-01	1	Jumper, Black, 18AWG, 2 1/2" Long.	N/A	
0014	700-0326-24	1	Jumper, Red, 18 AWG, 3" Long	N/A	
0015	704-0326-01	1	Assembly, Wire Harness	N/A	
0016	820-0037-00	1	Hose, Spiral, 8" Long	N/A	

ITEM NUMBER	PART NUMBER	QTY	ITEM NAME / DESCRIPTION	DESIGNATION	DRAWING NUMBER
0001	313-0009-00	1	Foam, Die Cut, Pad, Lid, 19 3/8" x 12 3/8" x 1"	N/A	
0002	313-0010-00	1	Foam, Die Cut, Pad, Base, 18 1/4" x 14 1/4" x 1	N/A	
0003	313-0013-00	1	Foam, Die Cut, Pad, Insert	N/A	
0004	325-0300-07	1	Label, P/S, Anodized Mylar, Name & Model	N/A	
0005	402-0005-00	1	Case, HDPE, Black, 23" X 16" X 7"	N/A	

ITEM NUMBER	PART NUMBER	QTY	ITEM NAME / DESCRIPTION	DESIGNATION	DRAWING NUMBER
0001	016-0004-00	2	Tubing, Shrink, 3/16" I.D. X 1" Long	N/A	
0002	016-0044-00	1	Tubing, Shrink 3/4 I.D. X 3" Long	N/A	
0003	031-0002-00	4	Ferrite	N/A	
0004	092-0006-00	2	Crimp Terminal, .1 Spacing	N/A	
0005	092-0007-00	5	Crimp Terminal, .156 Spacing	N/A	
0006	099-0010-02	1	Plug, Black Wire Insulated,	N/A	
0007	100-0008-00	1	Connector, 5-Pin, .156 Centers	N/A	
0008	100-0009-00	1	Connector, 2-Pin, .100 Centers	N/A	
0009	374-0017-00	1	Terminal, Insulated, Ring, #6 Stud, 16-14 AWG, Blue	N/A	
0010	374-0018-00	2	Terminal, Insulated, Ring, #4 Stud, 22-18 AWG, Red	N/A	
0011	700-0326-02	1	Jumper, Black, 18AWG, 3" Long.	N/A	
0012	700-0326-04	1	Jumper, Black, 18AWG, 6" Long.	N/A	
0013	700-0326-05	1	Jumper, Black, 18 AWG, 7" Long	N/A	
0014	700-0326-06	1	Jumper, Black, 18AWG, 9" Long.	N/A	
0015	700-0326-09	1	Jumper, Black, 22AWG, 11" Long.	N/A	
0016	700-0326-10	1	Jumper, Red, 18AWG, 9" Long.	N/A	
0017	700-0326-11	1	Jumper, Red, 22AWG, 7" Long.	N/A	
0018	700-0326-13	1	Jumper, Red, 22AWG, 11" Long.	N/A	
0019	700-0326-18	1	Jumper, Orange, 22AWG, 7" Long.	N/A	

ITEM NUMBER	PART NUMBER	QTY	ITEM NAME / DESCRIPTION	DESIGNATION	DRAWING NUMBER
0001	016-0029-00	1	Tubing, Shrink, 123mm Flat X 9 3/4" Long	N/A	
0002	021-0019-00	2	Battery, Gel-Cel, 6VDC, 5.0AH, 6VDC, 5.6AH	N/A	
0003	099-0009-02	1	Plug, Red Wire Insulated,	N/A	
0004	310-0016-00	1	Insulator, Battery	N/A	
0005	600-0003-00	ASREQ	Glue, Stick	N/A	
0006	700-0326-17	1	Jumper, Orange, 18AWG, 3" Long.	N/A	

ITEM NUMBER	PART NUMBER	QTY	ITEM NAME / DESCRIPTION	DESIGNATION	DRAWING NUMBER
0001	016-0068-00	1	Tubing, Shrink, 3/8" I.D. X 5/8" Long,	N/A	
0002	099-0004-02	1	Plug, CMM, 2-Cond, Auto Type	N/A	
0003	708-0750-01	1	Assembly, Cable, Shielded, 2-Con-w/molded 2.5 MM Plug, 5ft	N/A	

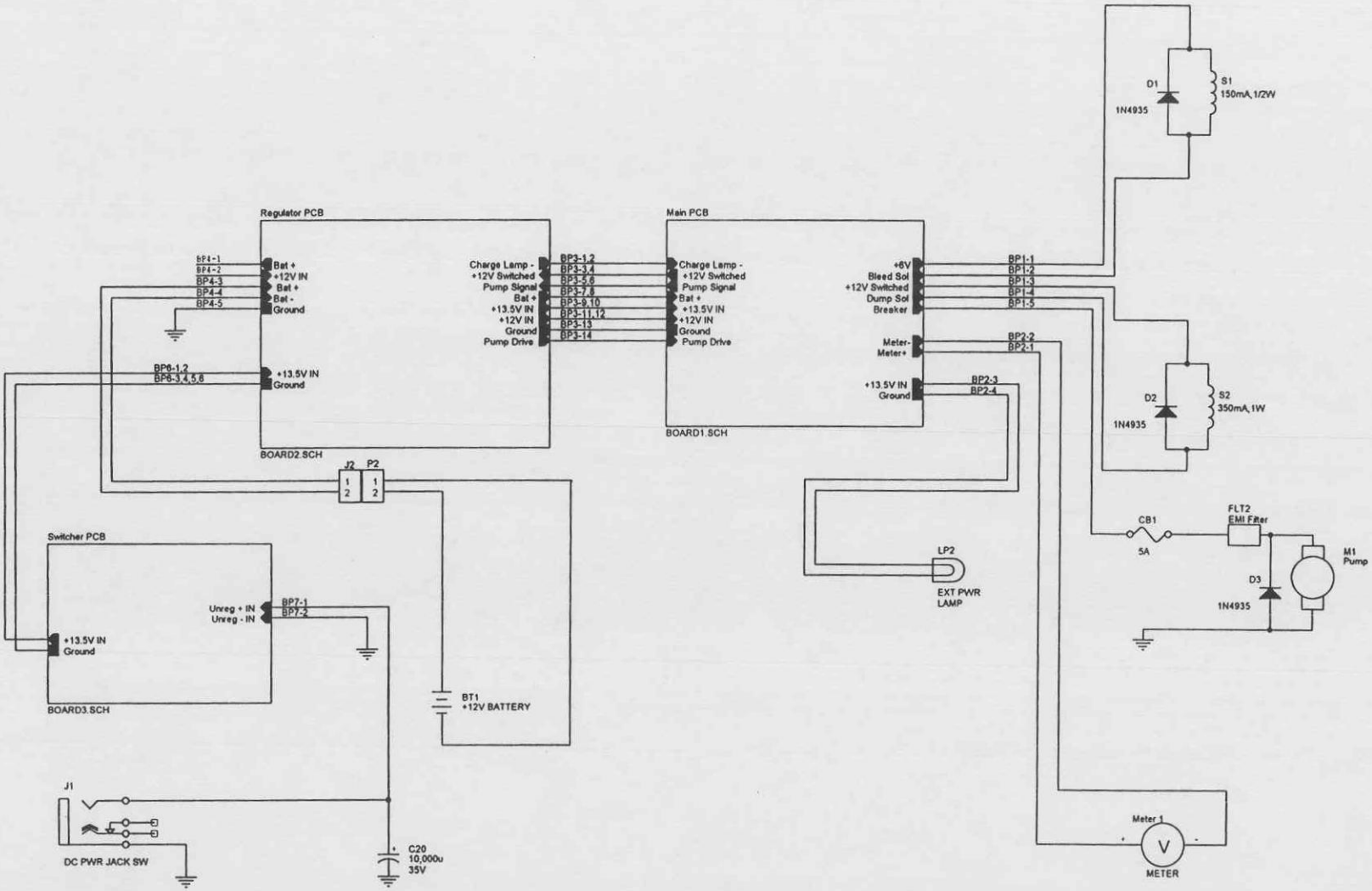
ITEM NUMBER	PART NUMBER	QTY	ITEM NAME / DESCRIPTION	DESIGNATION	DRAWING NUMBER
0001	081-0020-00	2	Fuse, Midget, 2A, 250V	N/A	
0002	334-0020-00	2	Strap, Velcro/Webbing 1"W X 24"L	N/A	
0003	334-0030-00	2	Holder, Collection Bottle, Chrome Plated	N/A	
0004	402-0017-00	1	Case, Padded, Aspirator, W/O Accessories	N/A	
0005	410-0004-00	2	Jar, Disposable, w/Lid, 1200cc, w/ Impact Name	N/A	
0006	540-0051-00	2	Hose, 2' Long	N/A	
0007	540-0055-00	2	Hose 18" Long	N/A	
0008	540-0068-00	1	Hose, 12" Long	N/A	
0009	703-0326-06	1	Assembly, AC Charger Rectifier	N/A	
0010	708-0326-01	1	Assembly, Auto Power Cable	N/A	
0011	820-0004-00	1	Catheter, 14 French	N/A	
0012	820-0005-00	1	Catheter, 18 French	N/A	
0013	820-0018-00	1	Tubing,Suction, Sterile, 9/32" I.D. X 6' Long	N/A	
0014	906-0326-03	2	Manual, Operation/Service, Model 326M	N/A	

ITEM NUMBER	PART NUMBER	QTY	ITEM NAME / DESCRIPTION	DESIGNATION	DRAWING NUMBER
0001	081-0020-00	2	Fuse, Midget, 2A, 250V	N/A	
0002	334-0020-00	2	Strap, Velcro/Webbing 1"W X 24"L	N/A	
0003	334-0030-00	2	Holder, Collection Bottle, Chrome Plated	N/A	
0004	402-0017-00	1	Case, Padded, Aspirator, W/O Accessories	N/A	
0005	465-0005-00	2	Filter, Hydro/Bact, Disposable, w/Hose Barbs	N/A	
0006	540-0051-00	2	Hose, 2' Long	N/A	
0007	540-0055-00	2	Hose 18" Long	N/A	
0008	540-0068-00	1	Hose, 12" Long	N/A	
0009	703-0326-06	1	Assembly, AC Charger Rectifier	N/A	
0010	703-0326-07	2	Assembly, Collection Canister	N/A	
0011	703-0326-16	1	Assembly, Carry Case, Hard	N/A	
0012	708-0326-01	1	Assembly, Auto Power Cable	N/A	
0013	820-0018-00	1	Tubing,Suction, Sterile, 9/32" I.D. X 6' Long	N/A	
0014	906-0326-03	2	Manual, Operation/Service, Model 326M	N/A	

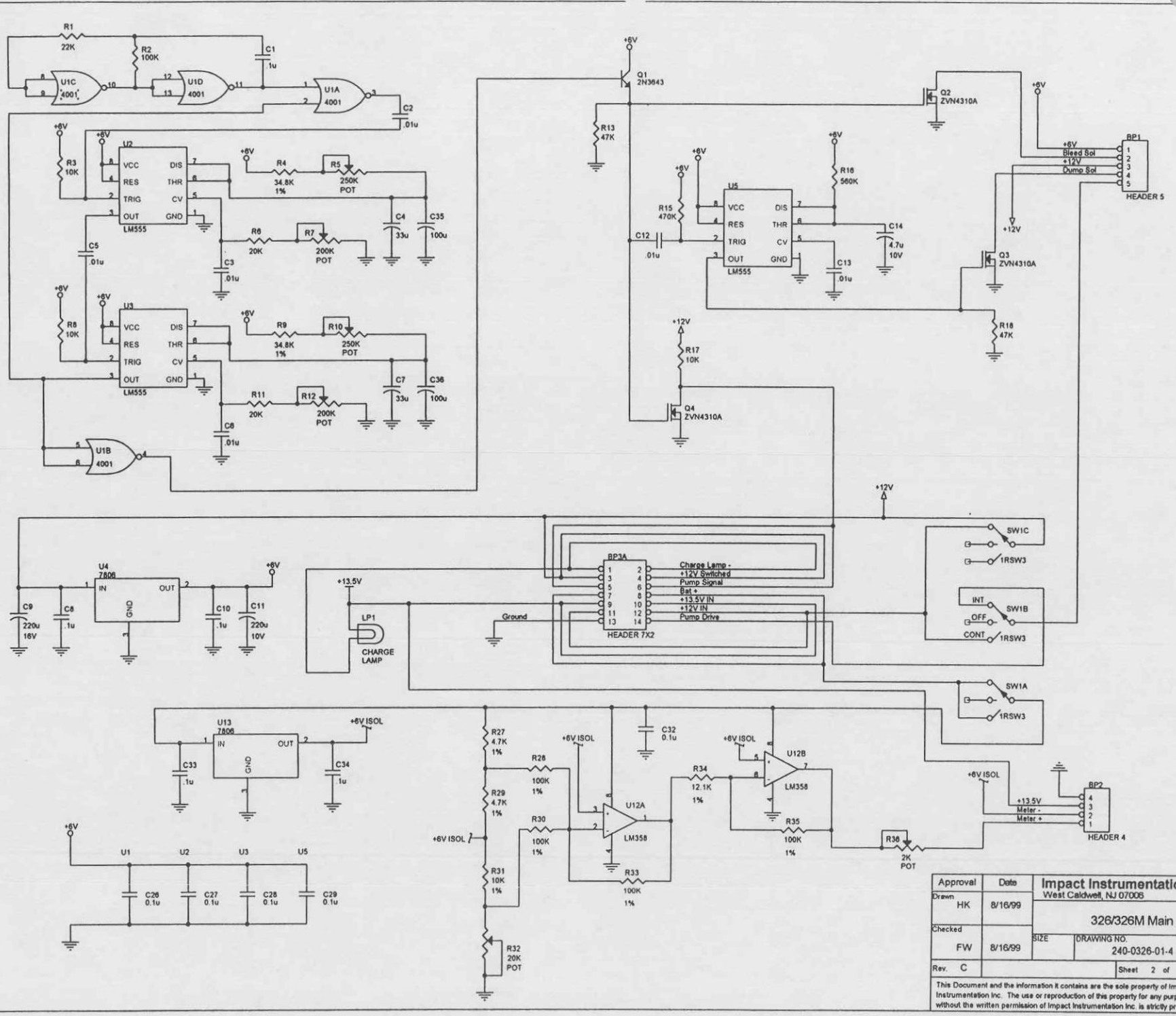
ITEM NUMBER	PART NUMBER	QTY	ITEM NAME / DESCRIPTION	DESIGNATION	DRAWING NUMBER
0001	081-0020-00	2	Fuse, Midget, 2A, 250V	N/A	
0002	334-0020-00	2	Strap, Velcro/Webbing 1"W X 24"L	N/A	
0003	334-0030-00	2	Holder, Collection Bottle, Chrome Plated	N/A	
0004	402-0017-00	1	Case, Padded, Aspirator, W/O Accessories	N/A	
0005	402-0326-02	1	Case, Reusable Transit, 326M	N/A	
0006	465-0005-00	2	Filter, Hydro/Bact, Disposable, w/Hose Barbs	N/A	
0007	540-0051-00	2	Hose, 2' Long	N/A	
0008	540-0055-00	2	Hose 18" Long	N/A	
0009	540-0068-00	1	Hose, 12" Long	N/A	
0010	703-0326-06	1	Assembly, AC Charger Rectifier	N/A	
0011	703-0326-07	2	Assembly, Collection Canister	N/A	
0012	708-0326-01	1	Assembly, Auto Power Cable	N/A	
0013	820-0018-00	1	Tubing,Suction, Sterile, 9/32" I.D. X 6' Long	N/A	
0014	906-0326-03	2	Manual, Operation/Service, Model 326M	N/A	

Model 326M Wire List

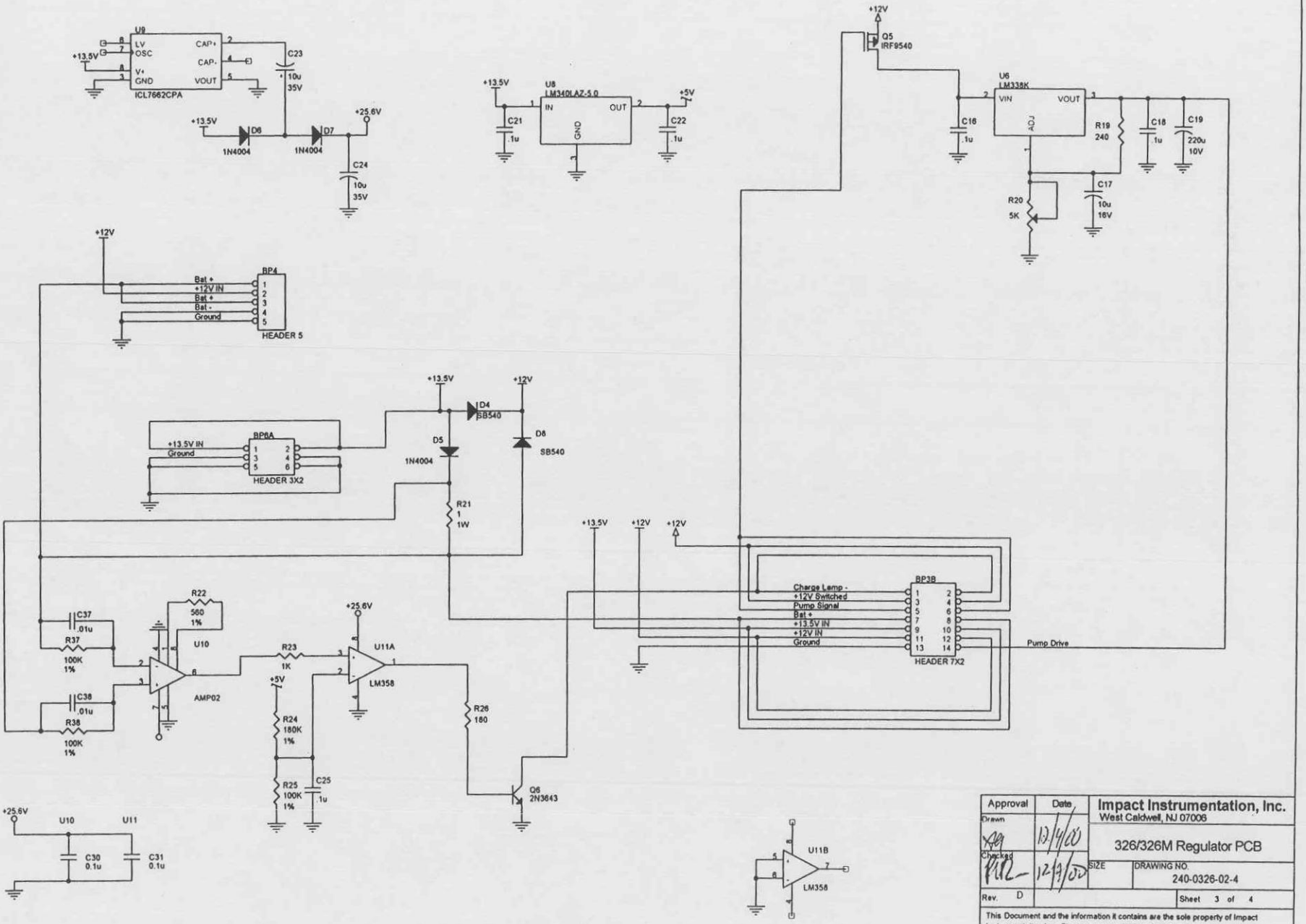
Part #	Sub Assy #	Description	Color	Gauge	Length	Strip	Tin	Origin	Strip	Tin	Destination
700-0326-01	703-0326-15	Jumper, Black, 18AWG, 2 1/2" Long.	BLK	18	2 1/2	3/8	Y	J1-1	3/8	Y	CASE C20(-)
700-0326-02	704-0326-01	Jumper, Black, 18AWG, 3" Long.	BLK	18	3	3/8	Y	J1-1	3/8		CASE CONN.PANEL(-)
700-0326-03	703-0326-05	Jumper, Black, 18AWG, 4" Long.	BLK	18	4	3/8		LOW PASS(-)	3/8		CASE (-)
700-0326-04	704-0326-01	Jumper, Black, 18AWG, 6" Long.	BLK	18	6	3/8	Y	CONN PANEL (-)	3/8		CASE (-)
700-0326-05	704-0326-01	Jumper, Black, 18 AWG, 7" Long	BLK	18	7	3/8		BP4-5	3/8		CASE (-)
700-0326-06	704-0326-01	Jumper, Black, 18AWG, 9" Long.	BLK	18	9	3/8		BP4-4	3/8	Y	BATT (-)
700-0326-07	703-0326-05	Jumper, Black, 18AWG, 8" Long.	BLK	18	8	3/8	Y	PUMP(-)	3/8		CASE (-)
700-0326-08	703-0326-09	Jumper, Black, 22AWG, 9" Long.	BLK	22	9	3/8		BP1-4	3/8	Y	DUMP (-)
700-0326-09	704-0326-01	Jumper, Black, 22AWG, 11" Long.	BLK	22	11	3/8	Y	J1-1	3/8		SWITCHER (-)
700-0326-10	704-0326-01	Jumper, Red, 18AWG, 9" Long.	RED	18	9	3/8	Y	BATT (+)	3/8		BP4-3
700-0326-11	704-0326-01	Jumper, Red, 22AWG, 7" Long.	RED	22	7	3/8	Y	J1-4	3/8		BP4-1
700-0326-12	703-0326-09	Jumper, Red, 22AWG, 9" Long.	RED	22	9	3/8	Y	DUMP (+)	3/8		BP1-3
700-0326-13	704-0326-01	Jumper, Red, 22AWG, 11" Long.	RED	22	11	3/8	Y	J1-2	3/8		SWITCHER (+)
700-0326-14	703-0326-05	Jumper, Red, 18AWG, 11" Long.	RED	18	11	3/8	Y	CB	3/8	Y	LOW PASS B(+)
700-0326-15	702-0326-02	Jumper, Red, 18AWG, 1" Long.	RED	18	1	3/8	Y	U6-3	3/8	Y	C19 (+)
700-0326-16	703-0326-05	Jumper, Red, 18AWG, 1 1/2" Long.	RED	18	1 1/2	3/8	Y	MOTOR (+)	3/8	Y	LOW PASS A(+)
700-0326-17	704-0750-03	Jumper, Orange, 18AWG, 3" Long.	ORG	18	3	3/8	Y	B1 (-)	3/8	Y	B2 (+)
700-0326-18	704-0326-01	Jumper, Orange, 22AWG, 7" Long.	ORG	22	7	3/8	Y	J1-3	3/8		BP4-2
700-0326-19	703-0326-09	Jumper, Orange, 22AWG, 9" Long.	ORG	22	9	3/8	Y	CB	3/8		BP1-5
700-0326-20	703-0326-09	Jumper, Orange, 22AWG, 11" Long.	ORG	22	11	3/8	Y	BLEED (+)	3/8		BP1-1
700-0326-21	703-0326-09	Jumper, Grey, 22AWG, 11" Long.	GRY	22	11	3/8	Y	BLEED (-)	3/8		BP1-2
700-0326-22	703-0326-02	Jumper, Red, 22AWG, 5" Long	RED	22	5	3/8	Y	EXTPWR+	3/8		BP2-3
700-0326-23	703-0326-02	Jumper, Green, 22 AWG, 5" Long	GREEN	22	5	3/8	Y	EXTPWR-	3/8		BP2-4
700-0326-24	703-0326-15	Jumper, Red, 18 AWG, 3" Long	RED	18	3	3/8	Y	J1-2	3/8	Y	C20+



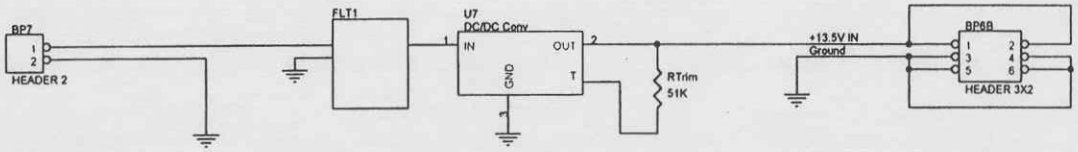
Approval	Date	Impact Instrumentation, Inc. West Caldwell, NJ 07006	
Drawn	12/4/00	326/326M Aspirator	
Checked	12/4/00	SIZE	DRAWING NO. 240-0326-00-4
Rev. C			Sheet 1 of 4



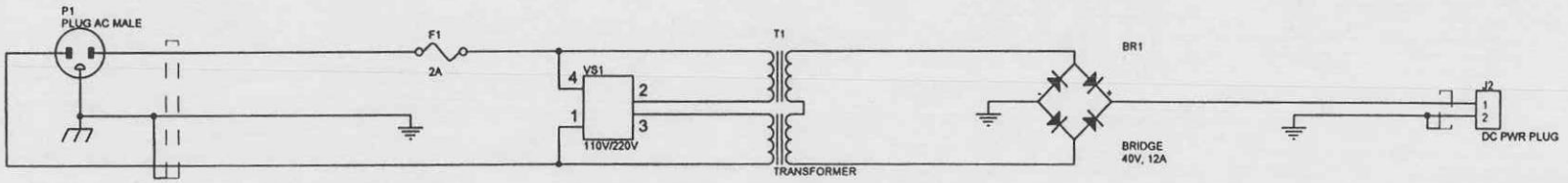
Approval	Date	Impact Instrumentation, Inc. West Caldwell, NJ 07006
Drawn HK	8/16/99	326/326M Main PCB
Checked FW	8/16/99	SIZE — DRAWING NO. 240-0326-01-4
Rev. C		Sheet 2 of 4



Approval	Date	Impact Instrumentation, Inc. West Caldwell, NJ 07006
Drawn	12/4/00	326/326M Regulator PCB
Checked	12/7/00	SIZE / DRAWING NO. 240-0326-02-4
Rev. D		Sheet 3 of 4



Approval	Date	Impact Instrumentation, Inc. West Caldwell, NJ 07006	
Drawn HK	8/16/99	326/326M Switcher PCB	
Checked FW	8/16/99	SIZE	DRAWING NO. 240-0326-03-4
Rev. B			Sheet 4 of 4



Approval	Date	Impact Instrumentation, Inc. West Caldwell, NJ 07006	
Drawn HK	8/16/99	326/326M AC/DC Power Supply	
Checked FW	8/16/99	SIZE	DRAWING NO. 703-0326-06-4
Rev. A			Sheet 1 of 1