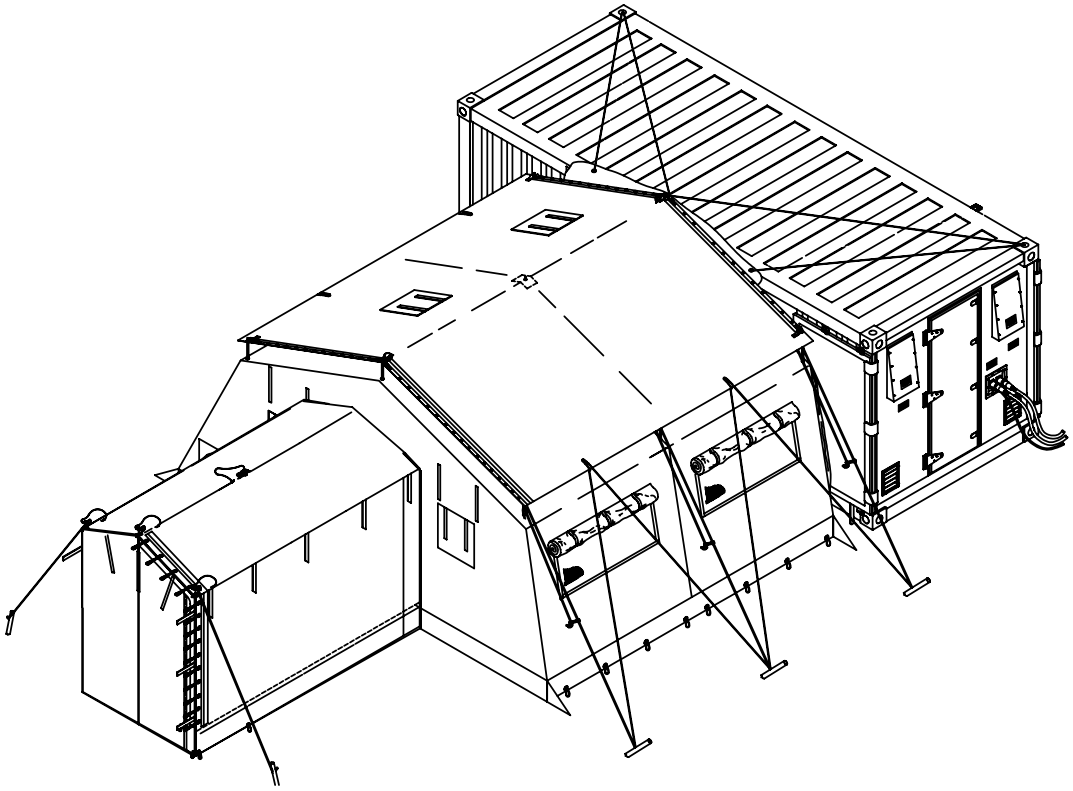
TM 10-3510-226-23

TECHNICAL MANUAL

UNIT AND DIRECT SUPPORT MAINTENANCE MANUAL FOR

CONTAINERIZED BATCH LAUNDRY (CBL)

NSN 3510-01-527-2209
NSN 3510-01-527-2210



HEADQUARTERS, DEPARTMENT OF THE ARMY

30 SEPTEMBER 2005

WARNING SUMMARY

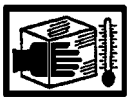
This warning summary contains general safety warnings and hazardous materials warnings that must be understood and applied during operation of this equipment. Failure to observe these precautions could result in serious injury, illness, or death to personnel. Also included are explanations of safety and hazardous materials icons used within this technical manual.

EXPLANATION OF SAFETY WARNING ICONS

BIOLOGICAL - abstract symbol bug shows that a material may contain bacteria or viruses that present a danger to life or health.

CHEMICAL - drops of liquid on hand shows that the material will cause burns or irritation to human skin or tissue.

CRUSHED HANDS – keep hands and fingers away from frame assembly ridges and eaves.



CRYOGENIC - hand in block of ice shows that the material is extremely cold and can injure human skin or tissue.

ELECTRICAL - electrical wire to arm with electricity symbol running through human body shows that shock hazard is present.

EXPLOSION - rapidly expanding symbol shows that the material may explode if subjected to high temperatures, sources of ignition or high pressure.

EYE PROTECTION - person with goggles shows that the material will injure the eyes. Eye protection must be worn to prevent injuries to eyes.

EYE PROTECTION - Particles flying through the air will harm face. Eye protection must be worn to prevent injuries to eyes.

FINGERS JAMMED – hinges can pinch, crush, or amputate hands and fingers.

WARNING SUMMARY-CONTINUED

FINGERS CRUSHED - Injury to personnel may occur if fingers between the washer drum and the washer cabinet.

FIRE - flame shows that a material may ignite and cause burns.

HEAVY OBJECT - human figure stooping over heavy object shows physical injury potential from improper lifting technique.

HEAVY PARTS - heavy object on human figure shows that heavy parts present a danger to life or limb.

HEAVY PARTS - heavy object on human figure shows that heavy parts present a danger to life or limb.

HELMET PROTECTION - arrow bouncing off head with helmet shows that falling parts present a danger.

HOT AREA - hand over object radiating heat shows that part is hot and can burn.

POISON - skull and crossbones shows that a material is poisonous or is a danger to life.

SHARP OBJECT - pointed object in hand shows that a sharp object presents a danger to limb.

SHARP OBJECT - pointed object in hand shows that a sharp object presents a danger to limb.

SLICK FLOOR - wavy line on floor with legs prone shows that slick floor presents a danger for falling.

VAPOR - human figure in a cloud shows that material vapors present a danger to life or health.

WARNING SUMMARY-CONTINUED

GENERAL SAFETY WARNINGS DESCRIPTION

WARNING

Electrical voltage and current cannot be seen, but contact with energized equipment can kill you, render you unconscious, or severely burn you. Electricity is unlike most other dangerous things you can come in contact with because it gives no warning. To ensure your safety and that of other maintenance personnel, always observe the following precautions:

Electrical power must be disconnected before any electrical system work is performed to prevent electrical shock, injury, or death (electrocution). Only trained and qualified personnel (MOS 51R, 52C, 52D, or 52G) may perform maintenance or attempt to correct electrical discrepancies on the electrical system.

The CBL must be electrically grounded. Failure to ground the CBL may result in serious injury or death from electrical malfunction.

ALWAYS place POWER OFF warning tags on circuit breakers or power supply switches so that no one will apply power while you are performing maintenance.

FOR ARTIFICIAL RESPIRATION, SEEK MEDICAL ATTENTION AND REFER TO FM 21 – 11.

WARNING

Use extreme caution when handling soiled hospital laundry. The CBL is designed to service hospital units, and the chance of exposure to laundry contaminated with blood and other body fluids is high. Soiled hospital laundry items may also contaminate clean laundry and operator clothing if not handled with adequate precautions. Inspect Personal Protection Clothing and Individual Equipment (PPCIE) prior to use, ensure immediate removal of contaminated or penetrated PPCIE. Follow your unit's SOP regarding personal contamination prior to leaving area or continuing with subsequent activities. Always wear supplied safety equipment such as gloves, apron, and mask. Always wash hands after handling soiled laundry. Failure to comply may result in serious illness or death to personnel.

WARNING SUMMARY-CONTINUED

WARNING

Use extreme caution when handling soiled hospital laundry. The CBL is designed to service hospital units, and the chance of exposure to sharp objects such as needles, knives, or medical instruments is likely. Sharp objects of this nature may be contaminated with body fluids such as blood, and may carry the chance of infection with disease as well. Use extreme caution when handling soiled hospital laundry items, and inspect each and every item for the presence of sharp objects. Always wear supplied safety equipment such as gloves, apron, and mask. Always wash hands after handling soiled laundry. Failure to comply may result in serious illness or death to personnel.

WARNING

A single 10-pound dry chemical fire extinguisher is supplied with the CBL. Ensure the fire extinguisher is located adjacent in the TEMPER, just outside the CBL container door, and is visible and readily accessible in case of a fire. Do not allow the fire extinguisher to be obstructed by laundry or other operating equipment. If fire occurs, send for help immediately, shut down power to the CBL, and try to fight the fire from outside if possible. Failure to observe safety precautions may result in serious injury or death to personnel.

WARNING

The CBL weighs approximately 16,200 pounds with a full packout. Always use a properly rated lifting device to move and stack the CBL. Ensure the slings used in the lift are properly rated for the load, crane or lifting device. Do not allow personnel below a suspended or swinging system if using an overhead lift.

WARNING

Some items associated with or installed in the CBL require two or more personnel to lift/move. Use the appropriate number of personnel when moving large, bulky, or heavy items. To avoid serious injury, lift with your legs, and not your back, and never attempt to lift an item alone if it requires more than one person.

WARNING SUMMARY-CONTINUED

WARNING

The CBL operates with hot water at approximately 120 ° F. Allow pipes and water to cool before conducting any type of work on the system. Failure to follow this warning could result in serious burn injury to personnel from scalding.

WARNING

Avoid eye, skin, and clothing contact with graywater. Graywater is to be considered hazardous at all times. Full protection in the form of rubber gloves, apron, face shield, and safety glasses MUST be used when performing any type of maintenance that involves graywater. Remove any contaminated clothing. If graywater contacts eyes or skin, flush with clean water and seek immediate medical attention. Failure to wear proper protective clothing and equipment may result in serious illness.

WARNING

Leather gloves and face/eye protection must be worn when performing maintenance. If contact with eyes or skin is made, flush with clean water and seek immediate medial first aid for eyes. Failure to do so could result in serious injury to eyes or hands.

WARNING

Rubber gloves, face/eye protection, and dust mask should be worn when handling chemicals such as Sodium Bisulfite and Nanofilter Membrane Cleaning agent. Failure to wear proper clothing and equipment may result in skin irritation and/or serious eye injury. If chemicals contact eyes or skin, flush with clean water and seek immediate medical attention.

WARNING

Always secure container doors open or closed. Unsecured container doors may be accidentally moved by wind, gravity, or personnel. If no means of securing a container door is provided, dunnage may be wedged to secure a door open. Unsecured container doors may injure personnel and damage equipment.

WARNING SUMMARY-CONTINUED

WARNING

Use caution when operating the washers. The washers are equipped with a suspension to dampen vibration, and the washer drum may be observed to move in the washer cabinet. Injury to personnel may occur if fingers are slipped between the washer drum and the washer cabinet.

WARNING

Inspect all PPCIE for damage prior to use. Ensure immediate removal of contaminated or penetrated PPCIE. Follow unit SOP regarding personal contamination prior to leaving area or continuing with subsequent activities. Failure to comply may result in serious illness or death to personnel.

WARNING

When using a generator place it at least 50 feet from the CBL container. Failure to observe safety precaution may result in serious injury or death to personnel from carbon monoxide poisoning.

CHANGE NO. 1

HEADQUARTERS, DEPARTMENT OF THE ARMY
WASHINGTON, DC, 31 DECEMBER 2005

TECHNICAL MANUAL

UNIT AND DIRECT SUPPORT MAINTENANCE MANUAL FOR CONTAINERIZED BATCH LAUNDRY (CBL) NSN: 3510-01-527-2209 NSN: 3510-01-527-2210

DISTRIBUTION STATEMENT A: - Approved for public release; distribution is unlimited.

TM 10-3510-226-23, 30 September 2005, is updated as follows:

1. File this sheet in front of the manual for reference.

2. This change is a result of identifying a specific type of antifreeze for preserving the system, nomenclature changes, and a part number change.

3. New or updated text is indicated by a vertical bar in the outer margin of the page.

4. Remove old pages and insert new pages as indicated below:

Remove Pages	Insert Pages
A/(B Blank)	A/(B Blank)
	DA 2028

5. Replace the following work packages with their revised version:

Work Package Number	Work Package Number
WP 0001 00	WP 0074 00
WP 0011 00	WP 0075 00
WP 0068 00	WP 0077 00
WP 0073 00	WP 0087 00

By Order of the Secretary of the Army:

PETER J. SCHOOMAKER
General, United States Army
Chief of Staff

Official:

SANDRA R. RILEY
Administrative Assistant to the
Secretary of the Army
0534801

Distribution: To be distributed in accordance with initial distribution number (IDN) 256847 requirements for TM 10-3510-226-23.

INSERT LATEST CHANGED PAGES/WORK PACKAGES. DESTROY SUPERSEDED DATA.

LIST OF EFFECTIVE PAGES/WORK PACKAGES

NOTE: The portion of text affected by the changes is indicated by a vertical line in the outer margins of the page. Changes to illustrations are indicated by a vertical line adjacent to the title.

Dates of issue for the original manual and changed pages/work packages are:

Original .. 0 .. 30 September 2005
Change … 1… 31 December 2005

TOTAL NUMBER OF PAGES FOR FRONT AND REAR MATTER IS 58 AND TOTAL NUMBER OF WORK PACKAGES IS 88, CONSISTING OF THE FOLLOWING:

Page/WP No.	*Change No.	Page/WP No.	*Change No.	Page/WP No.	*Change No.
Title (2 pgs)	0	WP 0029 00 (6 pgs)	0	WP 0060 00 (2 pgs)	0
a-f (6 pgs)	0	WP 0030 00 (4 pgs)	0	WP 0061 00 (12 pgs)	0
i-iv (4 pgs)	0	WP 0031 00 (16 pgs)	0	WP 0062 00 (8 pgs)	0
WP 0001 00 (4 pgs)	1	WP 0032 00 (2 pgs)	0	WP 0063 00 (26 pgs)	0
WP 0002 00 (20 pgs)	0	WP 0033 00 (6 pgs)	0	WP 0064 00 (6 pgs)	0
WP 0003 00 (18 pgs)	0	WP 0034 00 (10 pgs)	0	WP 0065 00 (5 pgs)	0
WP 0004 00 (4 pgs)	0	WP 0035 00 (8 pgs)	0	WP 0066 00 (6 pgs)	0
WP 0005 00 (8 pgs)	0	WP 0036 00 (28 pgs)	0	WP 0067 00 (10 pgs)	0
WP 0006 00 (26 pgs)	0	WP 0037 00 (14 pgs)	0	WP 0068 00 (20 pgs)	1
WP 0007 00 (12 pgs)	0	WP 0038 00 (16 pgs)	0	WP 0069 00 (24 pgs)	0
WP 0008 00 (16 pgs)	0	WP 0039 00 (6 pgs)	0	WP 0070 00 (4 pgs)	0
WP 0009 00 (12 pgs)	0	WP 0040 00 (10 pgs)	0	WP 0071 00 (6 pgs)	0
WP 0010 00 (8 pgs)	0	WP 0041 00 (8 pgs)	0	WP 0072 00 (2 pgs)	0
WP 0011 00 (14 pgs)	1	WP 0042 00 (18 pgs)	0	WP 0073 00 (2 pgs)	1
WP 0012 00 (2 pgs)	0	WP 0043 00 (4 pgs)	0	WP 0074 00 (4 pgs)	1
WP 0013 00 (2 pgs)	0	WP 0044 00 (16 pgs)	0	WP 0075 00 (2 pgs)	1
WP 0014 00 (8 pgs)	0	WP 0045 00 (16 pgs)	0	WP 0076 00 (2 pgs)	0
WP 0015 00 (6 pgs)	0	WP 0046 00 (6 pgs)	0	WP 0077 00 (2 pgs)	1
WP 0016 00 (4 pgs)	0	WP 0047 00 (2 pgs)	0	WP 0078 00 (2 pgs)	0
WP 0017 00 (12 pgs)	0	WP 0048 00 (4 pgs)	0	WP 0079 00 (8 pgs)	0
WP 0018 00 (6 pgs)	0	WP 0049 00 (8 pgs)	0	WP 0080 00 (2 pgs)	0
WP 0019 00 (10 pgs)	0	WP 0050 00 (6 pgs)	0	WP 0081 00 (2 pgs)	0
WP 0020 00 (2 pgs)	0	WP 0051 00 (4 pgs)	0	WP 0082 00 (2 pgs)	0
WP 0021 00 (6 pgs)	0	WP 0052 00 (4 pgs)	0	WP 0083 00 (4 pgs)	0
WP 0022 00 (6 pgs)	0	WP 0053 00 (8 pgs)	0	WP 0084 00 (2 pgs)	0
WP 0023 00 (6 pgs)	0	WP 0054 00 (10 pgs)	0	WP 0085 00 (4 pgs)	0
WP 0024 00 (6 pgs)	0	WP 0055 00 (6 pgs)	0	WP 0086 00 (16 pgs)	0
WP 0025 00 (34 pgs)	0	WP 0056 00 (10 pgs)	0	WP 0087 00 (4 pgs)	1
WP 0026 00 (26 pgs)	0	WP 0057 00 (2 pgs)	0	WP 0088 00 (2 pgs)	0
WP 0027 00 (2 pgs)	0	WP 0058 00 (16 pgs)	0	Glossary 1–Glossary 2 (2 pgs)	0
WP 0028 00 (2 pgs)	0	WP 0059 00 (6 pgs)	0	Index-1–Index-20 (20 pgs)	0
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*Zero in this column indicates an original page.

HEADQUARTERS,
DEPARTMENT OF THE ARMY
WASHINGTON, D.C., 30 SEPTEMBER 2005

TECHNICAL MANUAL

UNIT AND DIRECT SUPPORT MAINTENANCE MANUAL

FOR

CONTAINERIZED BATCH LAUNDRY (CBL)
NSN 4510-01-527-2209
NSN 4510-01-527-2210

REPORTING ERRORS AND RECOMMENDING IMPROVEMENTS

You can help improve this manual. If you find any mistakes or if you know of a way to improve the procedures, please let us know. Mail your letter or DA Form 2028 (Recommended Changes to Publications and Blank Forms), located in the back of this manual, directly to: Commander, U.S. Army Tank-automotive & Armaments Command, ATTN: AMSTA-LC-CECT, Kansas Street, Natick, MA 01760-5052. You may also send in your recommended changes via electronic mail or fax. Our fax number is 1 (508) 233-5205. Our e-mail address is amssbriml@natick.army.mil. A reply will be furnished to you.

TABLE OF CONTENTS

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HOW TO USE THIS MANUAL

This manual contains Unit and Direct Support Maintenance instructions for the Containerized Batch Laundry (CBL).

Chapter 1 contains introductory information on the Containerized Batch Laundry and its associated equipment as well as a Theory of Operation. Chapter 2 contains Unit Maintenance troubleshooting procedures. Chapter 3 contents include Unit Maintenance instructions and PMCS. Chapter 4 contains Direct Support maintenance instructions. Chapter 5 contains references and other supporting information.

Manual Organization and Page Numbering System. The manual is divided into five major chapters that detail the topics mentioned above. Within each chapter are work packages covering a wide range of topics. Each work package is numbered sequentially starting at page 1. The work package has its own page numbering scheme and is independent of the page numbering used by other work packages. Each page of a work package has a page number of the form XXXX YY-ZZ where XXXX is the work package number (e.g. 0010 is work package 10) and YY is reserved to permit unlimited expansion of the TM to incorporate new configuration data without affecting the WP sequence numbers already assigned, and to permit adding one or more WPs between any two existing WPs during any revision cycle. ZZ represents the number of the page within that work package. A page number such as 0010 00-1/2 blank means that page 1 contains information but page 2 of that work package has been intentionally left blank.

Finding Information. The Table of Contents permits the reader to find information in the manual quickly. The reader should start here first when looking for a specific topic. The Table of Contents lists the topics contained within each chapter and the Work Package Sequence Number where it can be found.

Example: If the reader were looking for instructions on “Preventive Maintenance Checks and Services”, which is an Unit Maintenance topic, the Table of Contents indicates that Operator Maintenance information can be found in Chapter 3. Scanning down the listings for Chapter 3, “Preventive Maintenance Checks and Services” information can be found in WP 0013 00 (i.e. Work Package 13).

Repair parts and special tools for the CBL may be ordered using TM 10-3510-226-23P, “Repair Parts and Special Tools List for Containerized Batch Laundry”.

A Glossary has been provided with brief descriptions and definitions of terms and components associated with the CBL

An Alphabetical Index can be found at the back of the manual. It lists specific topics with the corresponding work package.

CHAPTER 1

GENERAL INFORMATION, EQUIPMENT DESCRIPTION, AND THEORY OF OPERATION

CONTAINERIZED BATCH LAUNDRY (CBL)

UNIT AND DIRECT SUPPORT MAINTENANCE
CONTAINERIZED BATCH LAUNDRY (CBL)
NSN 3510-01-527-2209
NSN 3510-01-527-2210
GENERAL INFORMATION

SCOPE

This manual contains an equipment description and maintenance procedures for the Containerized Batch Laundry (CBL) Model 1, Model 2, and Model 3, which is designed to accommodate general laundering requirements as well as special laundering requirements of hospital units. This manual also includes references to publications that contain information on separately documented components of the CBL.

MAINTENANCE FORMS, RECORDS, AND REPORTS

Department of the Army forms and procedures used for equipment maintenance will be those prescribed by (as applicable) by DA PAM 750-8, The Army Maintenance Management System (TAMMS) Users Manual; DA PAM 738-751, Functional Users Manual for the Army Maintenance Management System – Aviation (TAMMS-A); or AR 700-138, Army Logistics Readiness and Sustainability.

REPORTING EQUIPMENT IMPROVEMENT RECOMMENDATIONS (EIR)

If your CBL needs improvement, let us know. Send us an EIR. You, the user, are the only one who can tell us what you don't like about your equipment. Let us know why you don't like the design or performance. Put it on a SF 368 (Product Quality Deficiency Report). Mail it to the address specified in DA PAM 750-8, The Army Maintenance Management System (TAMMS) Users Manual, or as specified by the acquiring activity. We will send you a reply.

HAND RECEIPT (HR) INFORMATION

This manual has a companion document with a TM number followed by "-HR" (which stands for Hand Receipt). TM 10-3510-226-10-HR consists of preprinted hand receipts that lists end item related equipment (i.e., COEI, BII, and AAL) that must be accounted for. As an aid to property accountability, additional HR manuals may be requisitioned through normal publication channels.

CORROSION PREVENTION AND CONTROL (CPC)

Corrosion Prevention and Control (CPC) of U.S. Army materiel is a continuing concern. It is important that any corrosion problems with this item be reported so that the problem can be corrected and improvements made to prevent the problem in future items.

Corrosion specifically occurs with metals. It is an electrochemical process that causes the degradation of metals. It is commonly caused by exposure to moisture, acids, bases, or salts. An example is the rusting of iron. Corrosion damage in metals can be seen, depending on the metal, as tarnishing, pitting, fogging, surface residue, and/or cracking.

Plastics, composites, and rubbers can also degrade. Degradation is caused by thermal (heat), oxidation (oxygen), solvation (solvents) or photolytic (light, typically UV) processes. The most common exposures are excessive heat or light. Damage from these processes will appear as cracking, softening, swelling, and/or breaking.

The form should be submitted to the address specified in DA PAM 750-8, The Army Maintenance Management System (TAMMS) Users Manual.

DESTRUCTION OF ARMY MATERIEL TO PREVENT ENEMY USE

Destruction of Army materiel to prevent enemy use shall be in accordance with TM 750-244-3.

PREPARATION FOR STORAGE OR SHIPMENT

Before placing the CBL in administrative storage or preparing the system for shipment, current maintenance services must be applied; defects and failures corrected; and Modification Work Orders (MWO's) applied. Prepare the system for storage and shipment as described in Chapter 2 of TM 10-3510-226-10.

Placement of Equipment in Storage
Equipment should be placed in storage for limited periods only, when a shortage of maintenance capability exists. Items should be mission ready within 24 hours, or within time factors set by directing authority. During storage periods, maintenance records must be kept current.

Storage Site Selection
Covered space is preferred. When sufficient covered space is not available, priority should be given to items that are most susceptible to deterioration from the elements. Open sites should be improved hardstand, if available. Unimproved sites should be firm, well-drained locations, free of excessive vegetation.

WARRANTY INFORMATION

No warranty.

NOMENCLATURE CROSS-REFERENCE LIST

The following lists cross-reference common names used throughout this manual to official nomenclature.

COMMON NAME	OFFICIAL NOMENCLATURE
Air Compressor	Compressor, Unit Reciprocating
Analog Input Module	Computer Subassembly
Analog Output Module	Computer Subassembly
Antifreeze	Glycol
Army Space Heater	Heater 12000 BTU Port
Bootwall	Modified TEMPER endwall
Breaker Box	Main Breaker Panel
CBL	Containerized Batch Laundry
Electric Box Heater	Heating Element, Electrical
FDECU	Field Deployable Environmental Control Unit
Nanofilter Canister	Filter Unit, Water Purification
Phase Indicator	Light, Indicator
Dryer Transformer	Power Transformer
PLC	Programmable Logic Controller
QD, QDC	Quick Disconnect Coupling
Sump Pump	Pump, Submersible
TEMPER	Tent, Extendable, Modular, Personnel
Thermistor	Resister, Thermal
Tube	Lamp, Fluorescent
WTS	Water Treatment System

LIST OF ABBREVIATIONS/ACRONYMS

AAL	Additional Authorization List
AC	Alternating Current
AMP, A	Ampere(s)
AR	Army Regulation
ASH	Army Space Heater
AVIM	Aviation Intermediate Maintenance
AVUM	Aviation Unit Maintenance
BDU	Battle Dress Uniform
BII	Basic Issue Item
BOI	Basis of Issue
^{0}C	Degree(s) Celsius (Centigrade)
CAD	Cadmium Sulfide
CAGEC	Commercial And Government Entity Code
CARC	Chemical Agent Resistant Coating
CB	Circuit Breaker
CCW	Counterclockwise
CBL	Containerized Batch Laundry
cm	Centimeter(s)
COEI	Components of End Item
CPC	Corrosion Prevention Control
CPVC	Chlorinated Polyvinyl Chloride
CTA	Common Table of Allowances
CW	Clockwise
DA	Department of the Army
DC	Direct Current
DIP	Dual Inline Package
DISE	Distribution Illumination Systems, Electrical
DMWR	Depot Maintenance Work Requirement
DPDT	Double Pole Double Throw switch
DP/MPI	Data Processing/Message Passing Interface
DS	Direct Support
ea	Each
ECU	Environmental Control Unit
EIR	Equipment Improvement Recommendation
EMP	Electromagnetic Pulse
ESD	Electrostatic Discharge
^{0}F	Degree(s) Fahrenheit
FC	Female Connection
FDECU	Field Deployable Environmental Control Unit
FM	Field Manual
FP	Force Provider
ft	Foot, feet
GFCI	Ground Fault Circuit Interrupt
gl	Gallon(s)
GPM	Gallons per Minute
HCI	Hardness Critical Item
HMI	Human Machine Interface
hp	Horsepower
h	Hour
HR	Hand Receipt
Hz	Hertz
IAW	In Accordance With
in	Inch(es)
ISO	International Organization for Standardization
JTA	Joint Table of Allowance
Kg	Kilogram(s)
kPa	Kilopascal(s)
kw	Kilowatt(s)
lb	Pound()s
LED	Light Emitting Diode
lt	Liter(s)
MAC	Maintenance Allocation Chart
m	Meter(s)
MC	Male Connection
MOS	Military Occupational Specialty
MSDS	Material Safety Data Sheet
MTD	Munitions Technologies Division
MTOE	Modified Table of Organization and Equipment
MWO	Modification Work Order
N/A	Not Applicable
NBC	Nuclear, Biological, Chemical
NC	Normally Closed
NHA	Next Higher Assembly
NIIN	National Item Identification Number
NO	Normally Open
NSN	National Stock Number
PAM	Pamphlet
PC Board	Printed Circuit Board
PDISE	Power Distribution Illumination System, Electrical
PLC	Programmable Logic Control
PMCS	Preventive Maintenance Checks and Services
P/N	Part Number
POL	Petroleum, Oil and Lubricant
PR	Pair
psi	Pound(s) per Square Inch
psig	Pound(s) per Square Inch, Gauge
PVC	Polyvinyl Chloride
QDC	Quick Disconnect
qt(s)	Quart
Qty	Quantity
rpm	Revolutions per Minute
RPSTL	Repair Parts and Special Tools List
RTV	Room Temperature Vulcanized

LIST OF ABBREVIATIONS/ACRONYMS– CONTINUED

SF	Standard Form
SMR	Source, Maintenance and Recoverability
SOP	Standard Operating Procedure
SRA	Specialized Repair Activity
TAMMS	The Army Maintenance Management System
TB	Technical Bulletin
TB MED	Technical Bulletin, Medical
TDA	Table of Distribution and Allowances
TM	Technical Manual
TEMPER	Tent, Extendable, Modular, Personnel
TMDE	Test, Measurement, and Diagnostic Equipment
TOE	Table of Organization and Equipment
U/I	Unit of Issue
U/M	Unit of Measure
UOC	Usable On Code
UUT	Unit Under Test
UV	Ultra Violet
V	Volt(s)
VAC	Volt Alternating Current
VDC	Volts Direct Current
W	Watt(s)
WP	Work Package
wt	Weight
WTS	Water Treatment System

SAFETY, CARE, AND HANDLING

Be alert and note **WARNINGS**, **CAUTIONS**, and **NOTES**. These provide for safe operation of the equipment, and protect you and your equipment from injury and damage. No precautions regarding radioactive components or electrostatic discharge (ESD) are advised.

QUALITY OF MATERIAL

Material used for replacement, repair, or modification must meet the requirements of this TM. If qualities of material requirements are not stated in this TM, the material must meet the requirements of the drawings, standards, specifications, or approved engineering change proposals applicable to the subject equipment.

SUPPORTING INFORMATION FOR REPAIR PARTS, SPECIAL TOOLS, TMDE, AND SUPPORT EQUIPMENT

Common Tools and Equipment

For authorized common tools and equipment, refer to the Modified Table of Organization and Equipment (MTOE), CTA 50-970, Expendable/Durable Items (Except: Medical, Class V, Repair Parts, and Heraldic Items), or CTA 8-100, Army Medical Department Expendable/Durable items, as applicable to your unit.

Refer to the Maintenance Allocation Chart (MAC) in WP 0086 00 for a listing of maintenance items and tools or test equipment. Any special tools required in the maintenance of the CBL have been included with the system.

Repair parts are listed and illustrated in the repair parts and special tools list (RPSTL), TM 10-3510-226-23P.

UNIT AND DIRECT SUPPORT MAINTENANCE
CONTAINERIZED BATCH LAUNDRY (CBL)
NSN 3510-01-527-2209
NSN 3510-01-527-2210
EQUIPMENT DESCRIPTION AND DATA

EQUIPMENT CHARACTERISTICS, CAPABILITIES AND FEATURES

The CBL contains two commercial type washers and dryers and is capable of handling 150-200 pounds of laundry per hour. An advanced water reuse system allows water used after the first wash cycle to be reused. The CBL is assembled, operated, and disassembled by personnel in MOS 57E (Laundry and Shower Specialist) with unit level and direct support maintenance being performed by personnel in MOS 63J, (Quartermaster and Chemical Equipment Repairer).

Characteristics

- Two industrial frontloading washers.
- Two industrial frontloading dryers.
- Three person assembly and disassembly (not including TEMPER).
- A 16-foot by 20-foot TEMPER with modified endwall (bootwall) attaches to the CBL for use as a work station.

Capabilities and Features

- Can continuously process 150-200 pounds of laundry per hour – approximately 75 sets of BDU's hourly.
- Programmable electronic controls provide fully automated operation of washers and dryers.
- Contains utility connections for source water, graywater, and electrical power.
- Wall mounted exhaust fans allow removal of excess heat as needed.
- Water Reuse System recovers over 50% of the laundry wastewater.
- Nano-filtration system removes biotoxins that may be found in soiled hospital clothing and linens.
- On-board source water pump and water boiler.
- Dedicated FDECU and ASH for temperature control and ventilation.
- Programmable Logic Control (PLC) provides automatic monitoring and control of reuse filtration system.
- Automatic soap dispensing system.

EQUIPMENT CHARACTERISTICS, CAPABILITIES AND FEATURES-CONTINUED

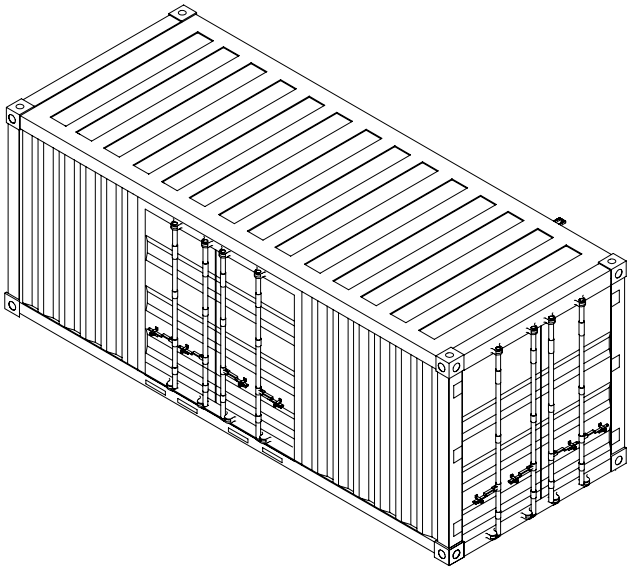


Figure 1. Containerized Batch Laundry (CBL) in Stowed Configuration.

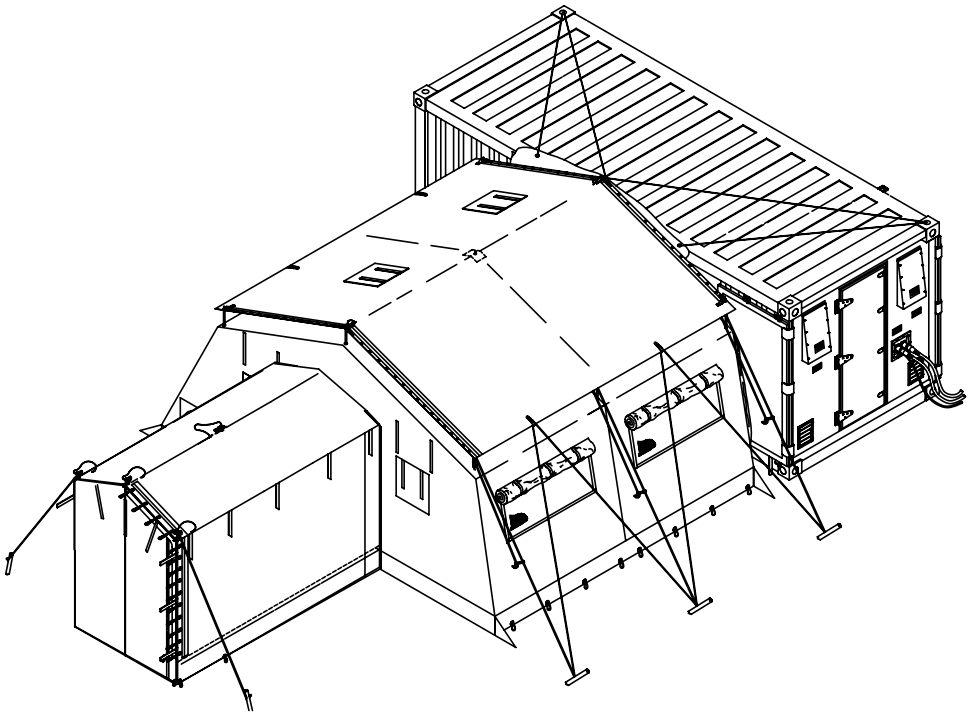
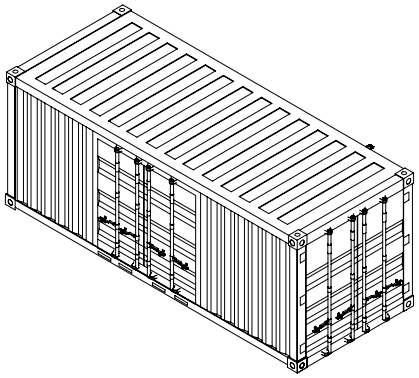
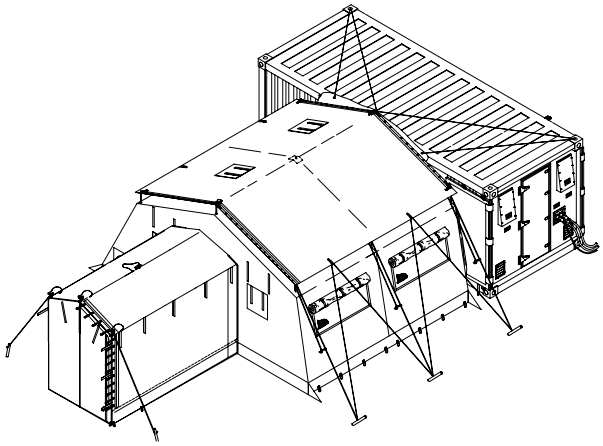


Figure 2. Containerized Batch Laundry (CBL) in Deployed Configuration.

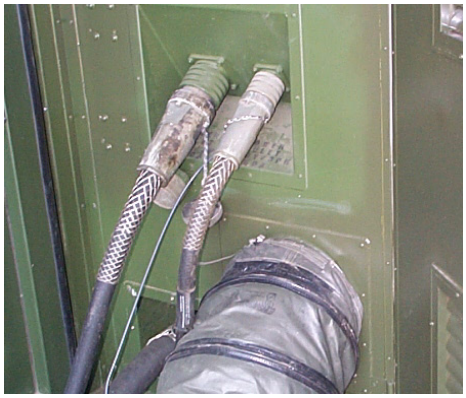
LOCATION AND DESCRIPTION OF MAJOR COMPONENTS

Table 1. Location and Description of Major Components.

Modified ISO Container The CBL is built into a modified general cargo container with forklift pockets and ISO fittings for moving and lifting the container. Two false walls with personnel doors are fitted to the container, providing access to the rear of the washers and the dryers. A forklift with a capacity of 17,500 pounds or a dolly mobilizer is required for lifting.	
TEMPER A standard 16-ft x 20-ft TEMPER is fitted to the CBL for use as a work station for laundry operations. A modified TEMPER endwall (bootwall) forms a weather tight connection between the TEMPER and CBL container.	
Main entrance doors The CBL main entrance doors serve as the operational access to the CBL washer and dryer facilities.	

LOCATION AND DESCRIPTION OF MAJOR COMPONENTS-CONTINUED

Table 1. Location and Description of Major Components – Continued.

Washer Endwall The washer endwall features panels for power input, source water inlet, graywater outlet, fuel inlet, water boiler exhaust vent, ASH return air connection, and air vents.	
Washer and CBL Subsystem Power Entry Panel The washer and CBL subsystem power entry panel is located on the service panel on the washer endwall. External power is connected to the large power connector to operate the washers and all CBL subsystems except the dryers. The smaller power connector is provided to power the FDECU as well as the interior TEMPER lights.	
Water Boiler Exhaust A water boiler exhaust vent is located on the washer endwall to exhaust combustion gases to the outside air.	

LOCATION AND DESCRIPTION OF MAJOR COMPONENTS-CONTINUED

Table 1. Location and Description of Major Components – Continued.

Dryer Endwall The CBL employs weathertight wall panels just inside the outer container end doors. The dryer endwall has a door with upper and lower latches that permits access to the rear of the dryers. The dryer endwall has a power input panel for the dryer, two exhaust fans, and dryer vents.	
Dryer Power Entry Panel The dryer power entry panel is located on the dryer endwall. External power is connected to the power entry panel to operate the two dryers.	
Exhaust Fans Two exhaust fans are mounted at the top of the dryer endwall. The exhaust fans provide for flow-through ventilation and help to remove hot air from the interior of the CBL.	
Dryer Vents The two dryer vents are located on the dryer endwall. Warm air from the drying process is vented outside the CBL.	

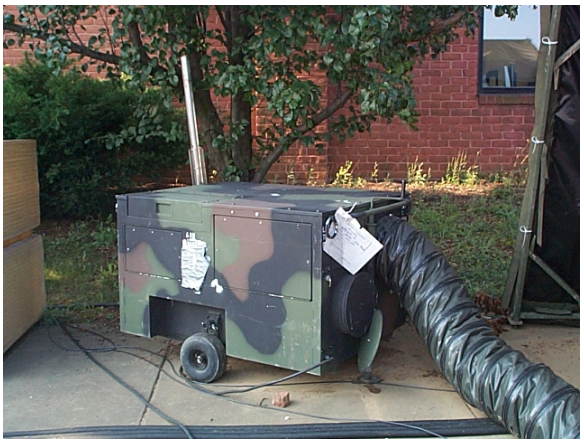
LOCATION AND DESCRIPTION OF MAJOR COMPONENTS-CONTINUED

Table 1. Location and Description of Major Components – Continued.

Power Cables Three 50 foot, 100 Amp cables, three 100 Amp Pigtails, and one 50 foot, 60 Amp cable are included with the CBL in order to power the CBL and its subsystems.	
Water Hoses and Miscellaneous Fittings Hoses with quick disconnect couplings (QDC) conduct source water from the 3,000 gallon source water bag to the CBL as well as conduct graywater from the CBL to a 3,000 gallon graywater collection bag.	
3000-Gallon Source Water Tank A 3000-gallon fabric water tank is supplied with the CBL for source water, and is marked accordingly.	

LOCATION AND DESCRIPTION OF MAJOR COMPONENTS-CONTINUED

Table 1. Location and Description of Major Components – Continued.

3000-Gallon Graywater Tank A 3000-gallon fabric water tank is supplied with the CBL to receive graywater, and is marked accordingly.	
Army Space Heater (ASH) The Army Space Heater (ASH) is used to heat the TEMPER during cold weather operation.	
FDECU The FDECU is installed outside the TEMPER and controls the climate inside the TEMPER.	

LOCATION AND DESCRIPTION OF MAJOR COMPONENTS-CONTINUED

Table 1. Location and Description of Major Components – Continued.

Ramp Two folding ramps are provided to allow easy entry to the CBL and to make the use of laundry carts more efficient. Each ramp has a set of two pins that engage in holes located in the threshold of the CBL entryway.	
Interior and Blackout Lights The CBL is fitted with three fluorescent light fixtures mounted to the ceiling and controlled through the Programmable Logic Control (PLC). The center fixture is equipped with a blue lens for blackout conditions. A battery backup keeps the blackout lights illuminated in a power outage situation.	

LOCATION AND DESCRIPTION OF MAJOR COMPONENTS-CONTINUED

Table 1. Location and Description of Major Components – Continued.

Main Electrical Panel The main electrical panel distributes power throughout the CBL. A series of circuit breakers control and protect the various subsystems.	
Dryer Electrical Panel The dryer electrical panel and protects the two dryers with independent circuit breakers.	

LOCATION AND DESCRIPTION OF MAJOR COMPONENTS-CONTINUED

Table 1. Location and Description of Major Components – Continued.

Programmable Logic Control (PLC) The Programmable Logic Control is placed in a control panel located to the left of the F-1A filter. The PLC monitors and provides control of all operation of the CBL through touch screens. The control panel integrates an emergency shutdown switch that permits the total shut down of all CBL systems in the event of an emergency.	
Washers Two washers are used in the CBL, each capable of processing 50 pounds of laundry at a time, or approximately 18 full sets of BDU's. Each washer has a programmable microprocessor controller which regulates the operating cycles. Wash and rinse water from the washers is processed through a filtration system that permits water reuse and conserving source water use. The washers rest on frames with heavy duty casters that allow the washer to be rolled out for maintenance. The washers have also been fitted with braces to lock the washer's suspension during transit. The CBL is fitted with isolation valves for each washer, which allows one washer to function while another is inoperable or being maintained in place.	

LOCATION AND DESCRIPTION OF MAJOR COMPONENTS-CONTINUED

Table 1. Location and Description of Major Components – Continued.

Dryers Two electric dryers are installed in the CBL. Each dryer is capable of drying 75 pounds of laundry at a time and is equipped with a programmable microprocessor controller which regulates the dryer's operating cycles. The dryer exhaust discharges outside the CBL through 8 inch ducts. The CBL dryer exhausts are located on the false wall on either side of the single service door at the dryer end of the container.	

LOCATION AND DESCRIPTION OF MAJOR COMPONENTS-CONTINUED

Table 1. Location and Description of Major Components – Continued.

Automatic Soap Dispenser Laundry detergent, bleach, and laundry sour are automatically dispensed as required by the laundry program. In the event of a failure of this system, laundry detergent, bleach, and sour may still be dispensed through the washer dispensers.	
Water Inlet Pump P-1 The water inlet pump is located at the washer end of the CBL behind the service panel on the left side. This pump accepts source water from the external water supply and pumps it to the water boiler and to the cold water inlet on the washer.	

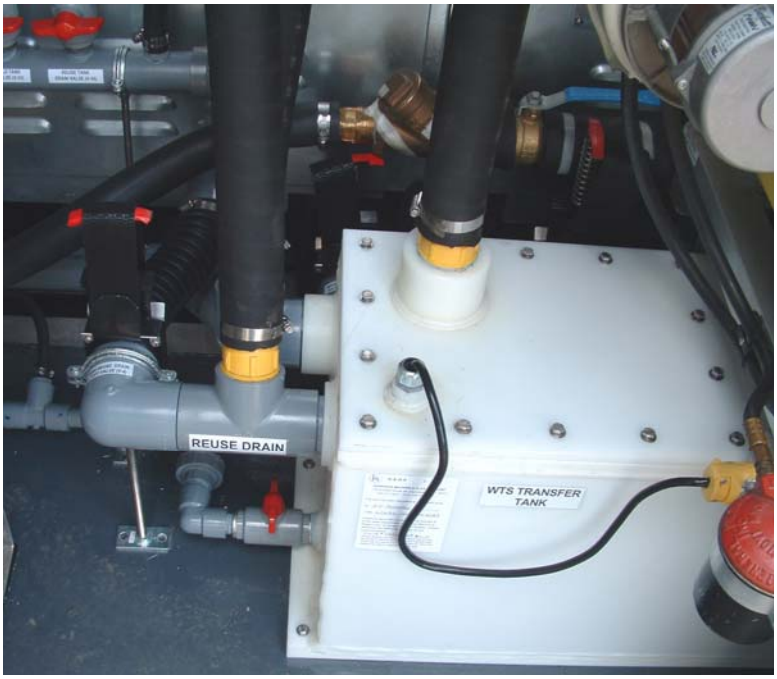
LOCATION AND DESCRIPTION OF MAJOR COMPONENTS-CONTINUED

Table 1. Location and Description of Major Components – Continued.

Water Boiler The water boiler is located at the washer end of the CBL behind and to the right of the service wall. The boiler heats the fresh potable water that is being supplied to the washers. A mixing valve on the top of the boiler controls the temperature of the outgoing water. A second mixing valve controls the temperature of the reuse water being supplied to the washer.	
P-3 Filtration Pump The P-3 filtration pump is located at the washer end of the CBL behind the service panel on the left side. The pump accepts the recyclable graywater from the WTS hold tank and pumps it to the F-1A/F-1B and F-2 filters.	

LOCATION AND DESCRIPTION OF MAJOR COMPONENTS-CONTINUED

Table 1. Location and Description of Major Components – Continued.

Nanofilter Feed Pump P-4 The nanofilter feed pump is located in the operator compartment to the right of Filter F-3 and against the back wall. Pump P-4 is a multistage pump that is designed to pump water from the nanofilter feed tank to the nanofiltration vessels mounted to the ceiling of the CBL.	
Water Treatment System (WTS) Transfer Tank and Pump The WTS transfer tank is located below the water boiler. The WTS transfer tank collects all graywater that is to be recycled and routes it to the WTS hold tank located above the washers. Refiltered graywater is pumped to the WTS hold tank by means of a sump pump installed inside the WTS transfer tank.	

LOCATION AND DESCRIPTION OF MAJOR COMPONENTS-CONTINUED

Table 1. Location and Description of Major Components – Continued.

Water Treatment System (WTS) Hold Tank The water treatment system holding tank is mounted above the washers and collects the recyclable graywater from the washers. Water from the WTS holding tank is then sent through the filtration system.	
Nanofilter Feed Tank The nanofilter feed tank collects rinse water that has been filtered by filters F-1A/F-1B and F-2. Water is held in the nanofilter feed tank and supplied to the nanofiltration vessels on the ceiling of the CBL.	

LOCATION AND DESCRIPTION OF MAJOR COMPONENTS-CONTINUED

Table 1. Location and Description of Major Components – Continued.

Reuse Tank The recycle tank is located over the washers and collects the filtered and purified rinse water that will be recycled through the washers during a subsequent wash cycle.	
Waste Tank and Pump The waste tank is located at the washer end of the CBL behind the service panel. The waste tank collects all graywater that has not been recycled and routes it to a 3K fabric water bag located outside the CBL. Waste water is pumped to the water bag by means of a sump pump installed inside the waste tank.	

LOCATION AND DESCRIPTION OF MAJOR COMPONENTS-CONTINUED

Table 1. Location and Description of Major Components – Continued.

Filter F-1A and F-1B Filters F-1A and F-1B are located in the operator compartment against the far wall near the dryers. Filters F-1A and F-1B are designed to filter gross impurities from water originating from the water treatment system holding tank.	

LOCATION AND DESCRIPTION OF MAJOR COMPONENTS-CONTINUED

Table 1. Location and Description of Major Components – Continued.

Filter F-2 Filter F-2 is located in the operator compartment to the right of Filter F-1A. Filter F-2 has a string filter cartridge and is designed to continue the filtering process by further purifying the water from Filter F-1A or F-1B. It also protects the system by filtering gross impurities if there is ever a failure with the F-1A or F-1B filters. **Filter F3** Filter F-3 is located in the operator compartment and to the right of Filter F-2. Filter F-3 has a carbon filter cartridge and is designed to filter the reuse water a final time before storing in the recycle tank.	
Nanofilters Three nanofilters are used to filter impurities and biotoxins from the reuse water. The nanofilters are mounted in the overhead, and they are accessible from both the operating area and the dryer endwall service door.	

LOCATION AND DESCRIPTION OF MAJOR COMPONENTS-CONTINUED

Table 1. Location and Description of Major Components – Continued.

Air Compressor A portable air compressor is fitted to the CBL to evacuate water for the system. The air compressor is stored under the dryer circuit breaker panel.	
Safety Items Various safety items are included with the CBL that include, safety goggles, replacement safety lenses, full face shields, dust masks, heavy duty rubber gloves, latex surgical gloves, rubber aprons, which are stored in the footlocker. An MSDS binder is stored in the manual bins located on the dryer endwall service door.	

EQUIPMENT DATA

External dimensions:		
Length	20 feet	(6.10 meters)
Width	8 feet	(2.44 meters)
Height	8 feet	(2.44 meters)
Internal dimensions:		
Length	19 feet, 4 inches	(5.80 meters)
Width	7 feet, 6 inches	(2.25 meters)
Height (Canadian Container)	7 feet, 3-3/8 inches	(2.18 meters)
Height (Turkish Container)	7 feet, 1-3/8 inches	(2.16 meters)
Door dimensions:		
Main entrance door		
Height	6 feet, 11-5/8 inches	(2.12 meters)
Width	7 feet, 7 inches	(2.31 meters)
Double Service doors (Washer and Dryer Access)		
Height	6 feet, 11-5/8 inches	(2.12 meters)
Width	7 feet, 7 inches	(2.31 meters)
Weight:		
CBL, Minimum Packout weight	14,960 pounds	(6786 kilograms)
CBL, Full Packout weight	16,200 pounds	(7348 kilograms)
CBL, empty	12,800 pounds	(5806 kilograms)
Required electrical input:		
Containerized Batch Laundry (CBL)	300 Amp, 208 V, three phase AC	
Washer (each)	15 Amp, 208 V, single phase AC	
Dryer (each)	100 Amp, 208 V, three phase AC	
Fan, Ventilating (each)	10 Amp, 110 V, single phase AC	
Lighting	10 Amp, 110 V, single phase AC	
Required Fresh Water Flow Rate	30 gallons/minute	114 liters/minute
Environmental:		
Operating temperature range	-25° to 120° Fahrenheit	-32° to 49° Celsius
Maximum operating elevation (with factory boiler settings)	3000 feet	914 meters

UNIT AND DIRECT SUPPORT MAINTENANCE
CONTAINERIZED BATCH LAUNDRY (CBL)
NSN 3510-01-527-2209
NSN 3510-01-527-2210
THEORY OF OPERATION

THEORY OF OPERATION

General

The Containerized Batch Laundry (CBL) operates as a standalone system, and is comprised of two washers, two dryers, an internal water boiler, a water reuse filtration system, utility connectors (source water, graywater, and electrical), a circuit breaker panel to distribute power and provide circuit protection, and a Programmable Logic Control (PLC) which provides centralized control of all components outside of the washers and dryers. The system is a manned station designed to process 150 to 200 pounds of laundry per hour, including batches of uniforms and hospital linens.

CBL

The CBL is housed in a modified 8-ft x 8-ft x 20-ft ISO cargo container **(Figure 1, Item 1)**. Two 50-pound capacity automatic washers and two 75-pound capacity automatic electric dryers are housed within the CBL container. Main access to the CBL is through double entrance doors, which are opened before attachment of the TEMPER **(Figure 1, Item 2)** and bootwall. Service entry doors **(Figure 1, Item 3)** at each end of the CBL allow access to the back of both the washers and dryers.

TEMPER

The 16-ft x 20-ft TEMPER **(Figure 1, Item 2)** is used as a work station for accepting, sorting, and distributing laundry. The TEMPER attaches to the CBL container **(Figure 1, Item 1)** by means of a modified endwall.

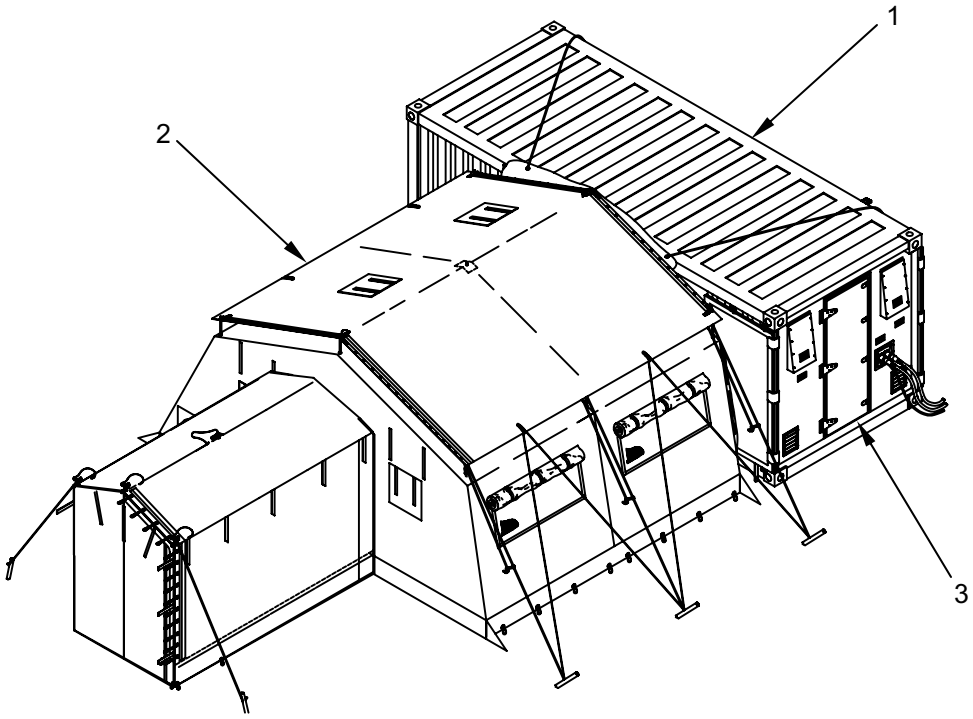


Figure 1. CBL.

THEORY OF OPERATION-CONTINUED

Source Water System

The CBL receives freshwater service from an outside water source or 3,000-gallon fabric water bag **(Figure 2, Item 1)** set up outside the CBL. Fresh water enters the CBL through QDC fittings on the water service panel. Water is fed to the water inlet pump P-1**(Figure 2, Item 2)** and distributed to the cold water inlet **(Figure 2, Item 3)** on both washers as well as the cold water inlet on the water boiler **(Figure 3, Item 4)**. Heated water from the boiler is then fed to the hot water inlets **(Figure 2, Item 5)** on the washers and to the Automatic Soap Dispenser **(Figure 3, Item 6)**.

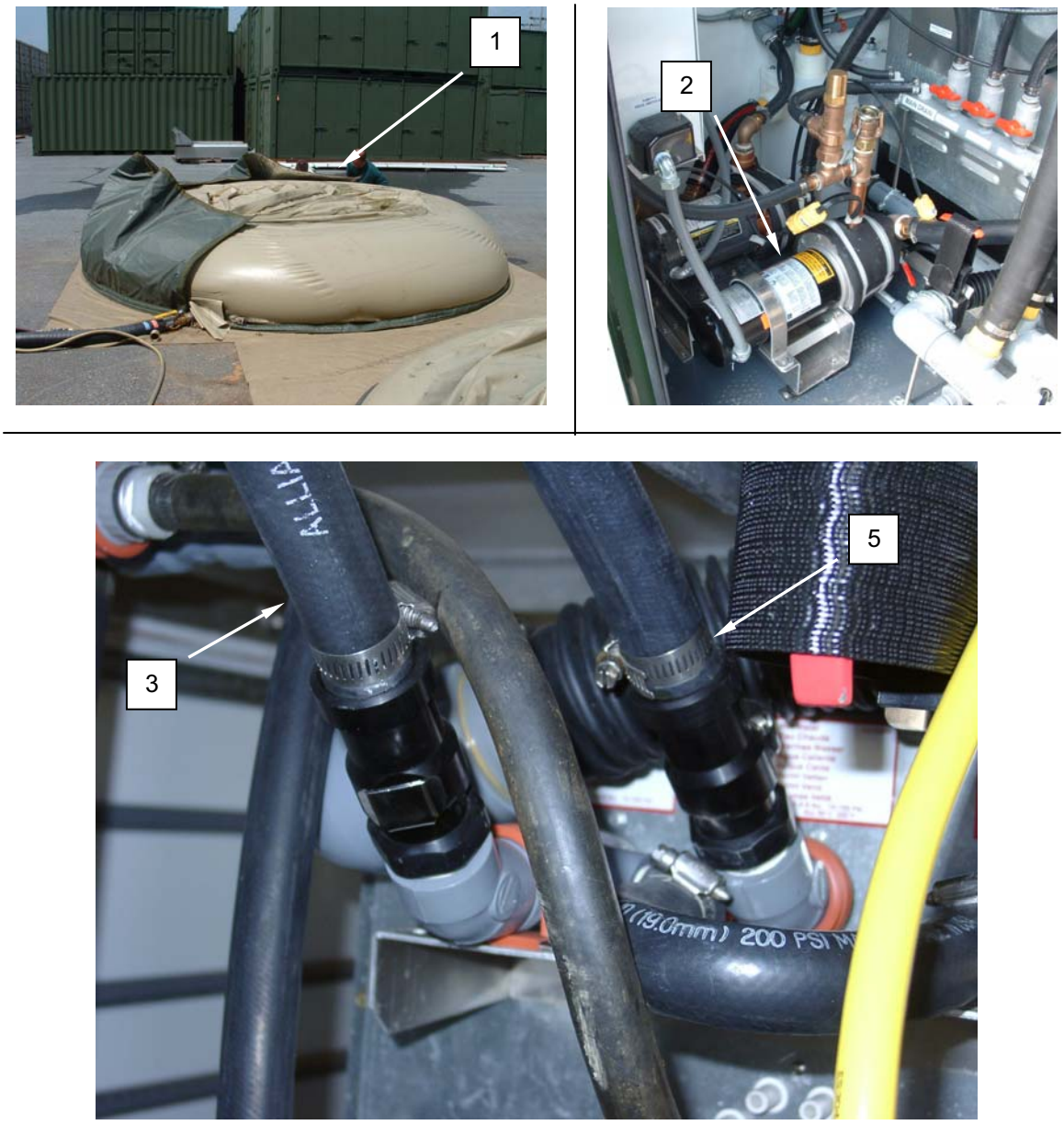
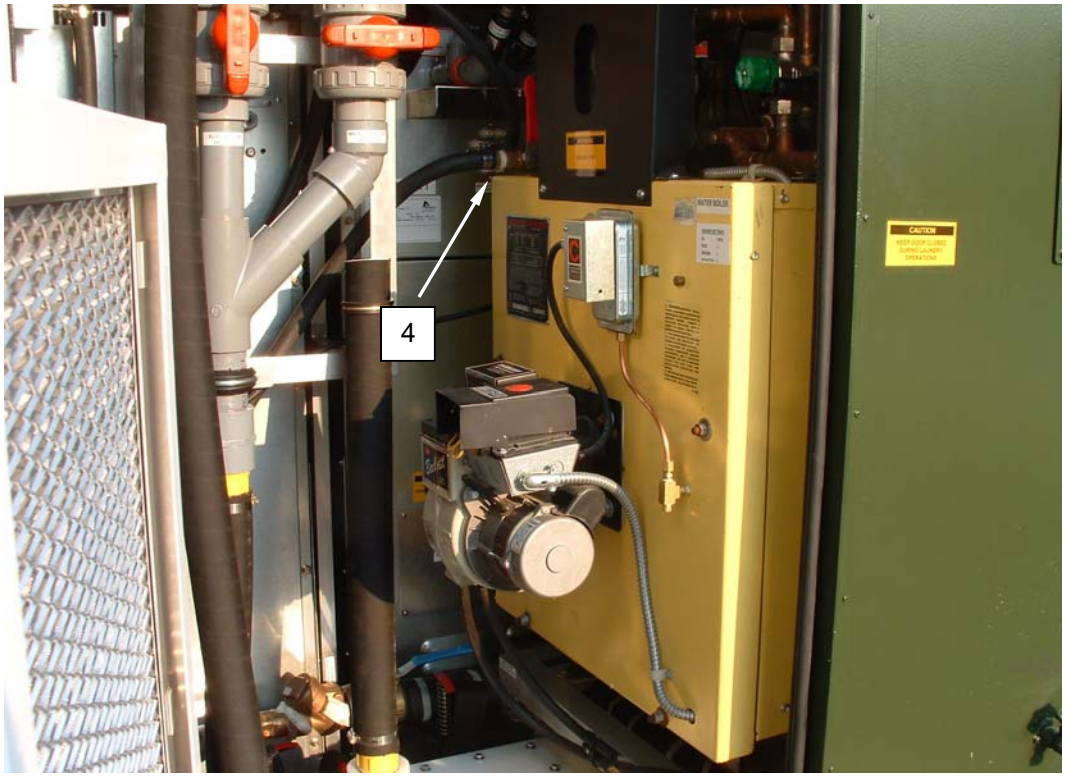


Figure 2. Source Water System.

THEORY OF OPERATION-CONTINUED



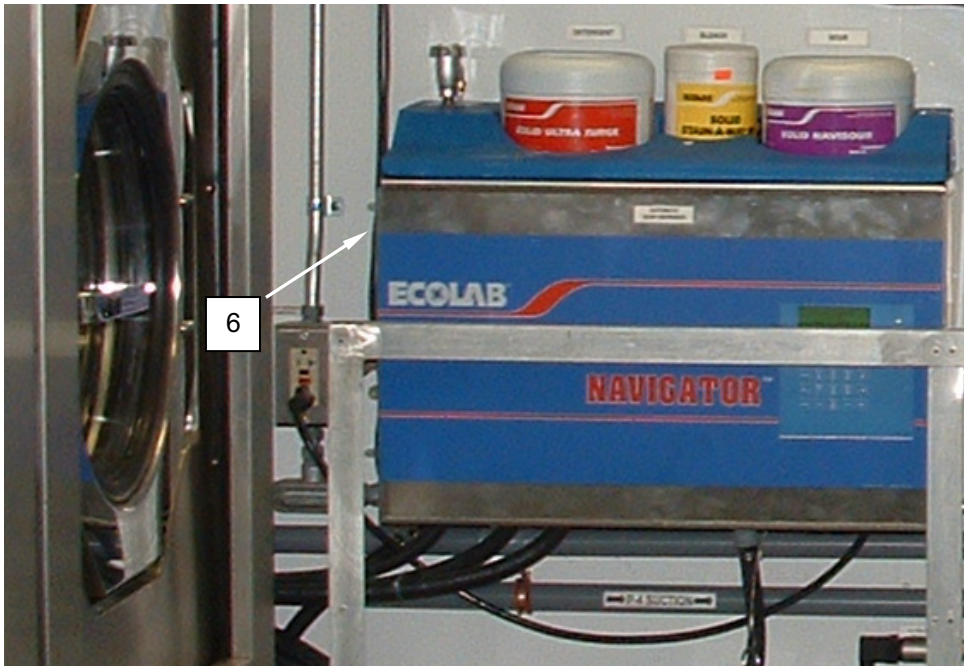


Figure 3. Source Water System.

THEORY OF OPERATION-CONTINUED

Water Reuse System
The CBL utilizes a water reuse system that filters wash water from the washers and stores it in a reuse tank for use in subsequent wash loads. Wash water from the washer is discharged from a reuse drain into the Water Treatment System (WTS) transfer tank **(Figure 4, Item 1)** located behind the washers. When the WTS transfer tank is full, the untreated wash water is pumped up to a WTS holding tank **(Figure 4, Item 2)** located over the washers. Pump P3 **(Figure 5, Item 3)** takes water from the WTS hold tank and sends it through the F-1 **(Figure 5, Item 4)** and F-2 **(Figure 5, Item 5)** filters to remove gross impurities. Water is then routed to the nanofiltration feed tank **(Figure 5, Item 6)** for collection. Water from the nanofilter feed tank is fed into Pump P-4 **(Figure 5, Item 7)** and through a series of three nanofiltration vessels **(Figure 5, Item 8)** that remove all remaining impurities and bacteriological products. Water then passes through carbon filter F-3 **(Figure 5, Item 9)** and is stored in the reuse tank **(Figure 5, Item 10)** for later use.

Two additional modes of operation are available:

Minimum Reuse
In Minimum Reuse mode, wash water from the washers is diverted directly to the reuse tank, bypassing the filtration system. Minimum reuse requires the operation of valves V-15 and V-16 in order to be employed.

The minimum reuse mode is not recommended unless the filtration system is inoperable and water conservation is critical.

No Reuse
The water reuse system may be bypassed entirely by simply selecting the appropriate cycles on the washers. All water is then discharged directly to the waste tank and pumped out as graywater. No reuse is recommended if the filtration system is inoperable.

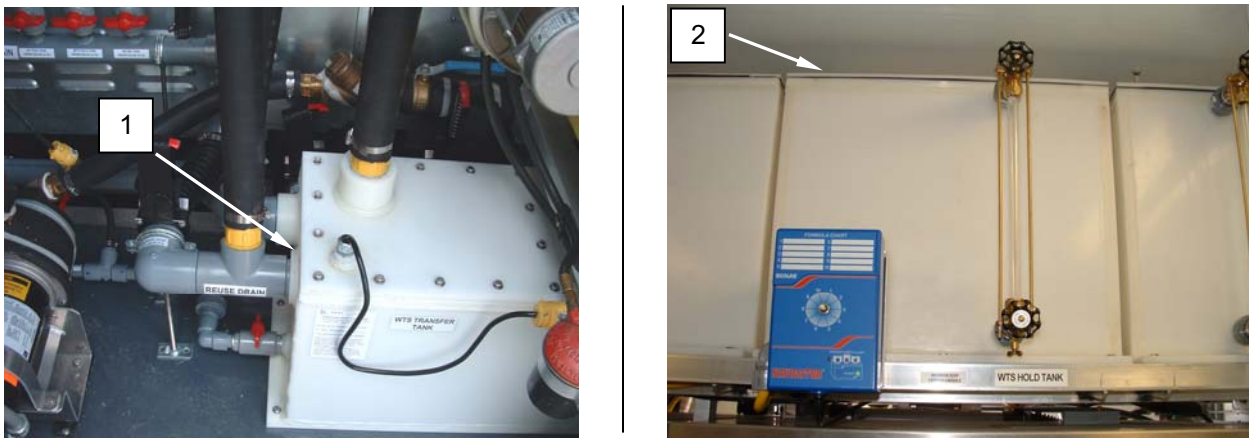


Figure 4. Water Reuse System.

THEORY OF OPERATION-CONTINUED

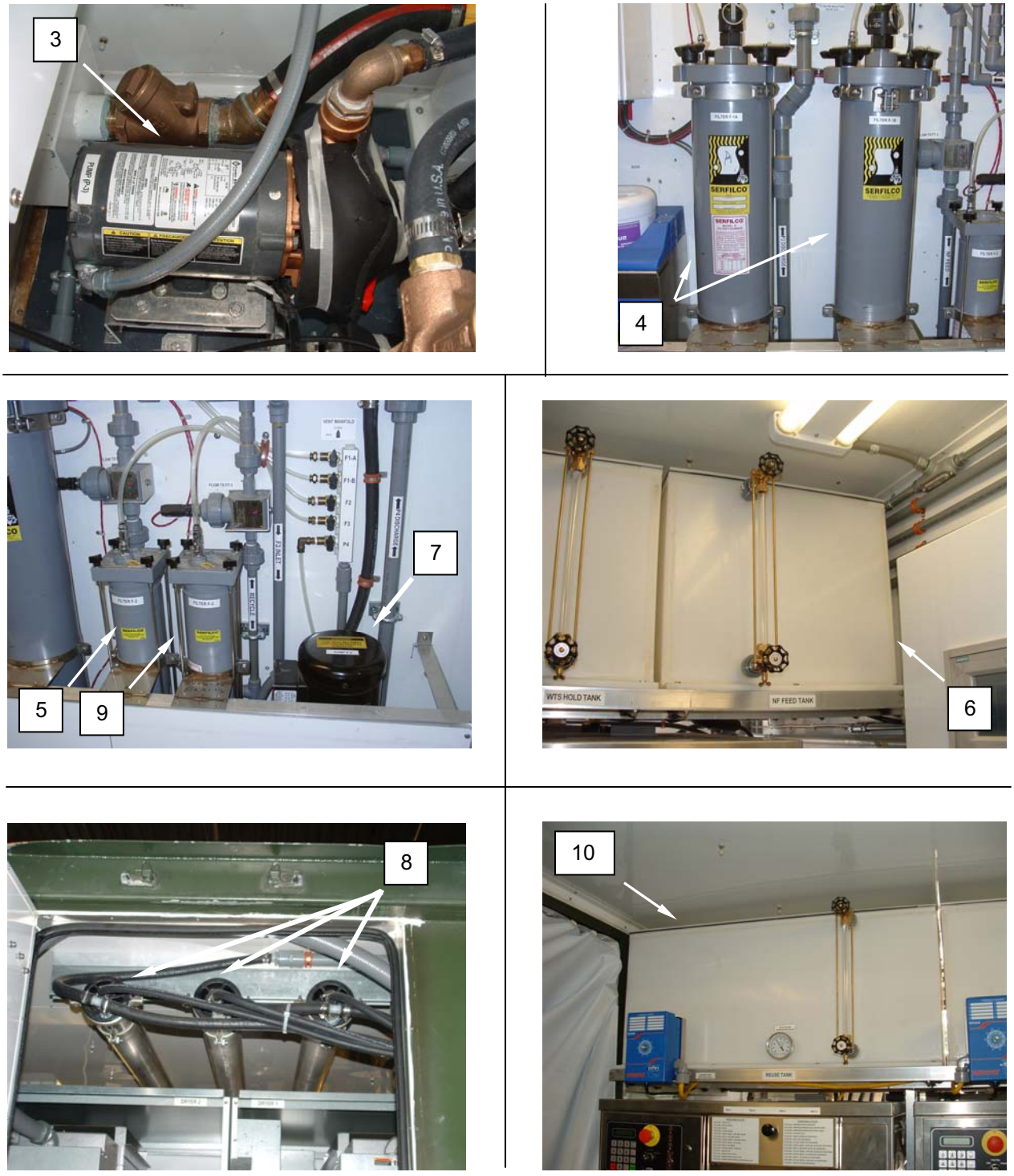


Figure 5. Water Reuse System.

THEORY OF OPERATION-CONTINUED

Graywater System

Overflow from the WTS holding tank, nanofilter tank, and recycle tank is discharged through PVC piping to the waste tank **(Figure 6, Item 1)** located beside washer No. 1. A sump pump in the waste tank pumps the graywater into a 3,000-gallon fabric water bag set up outside the CBL or an approved waste water system.

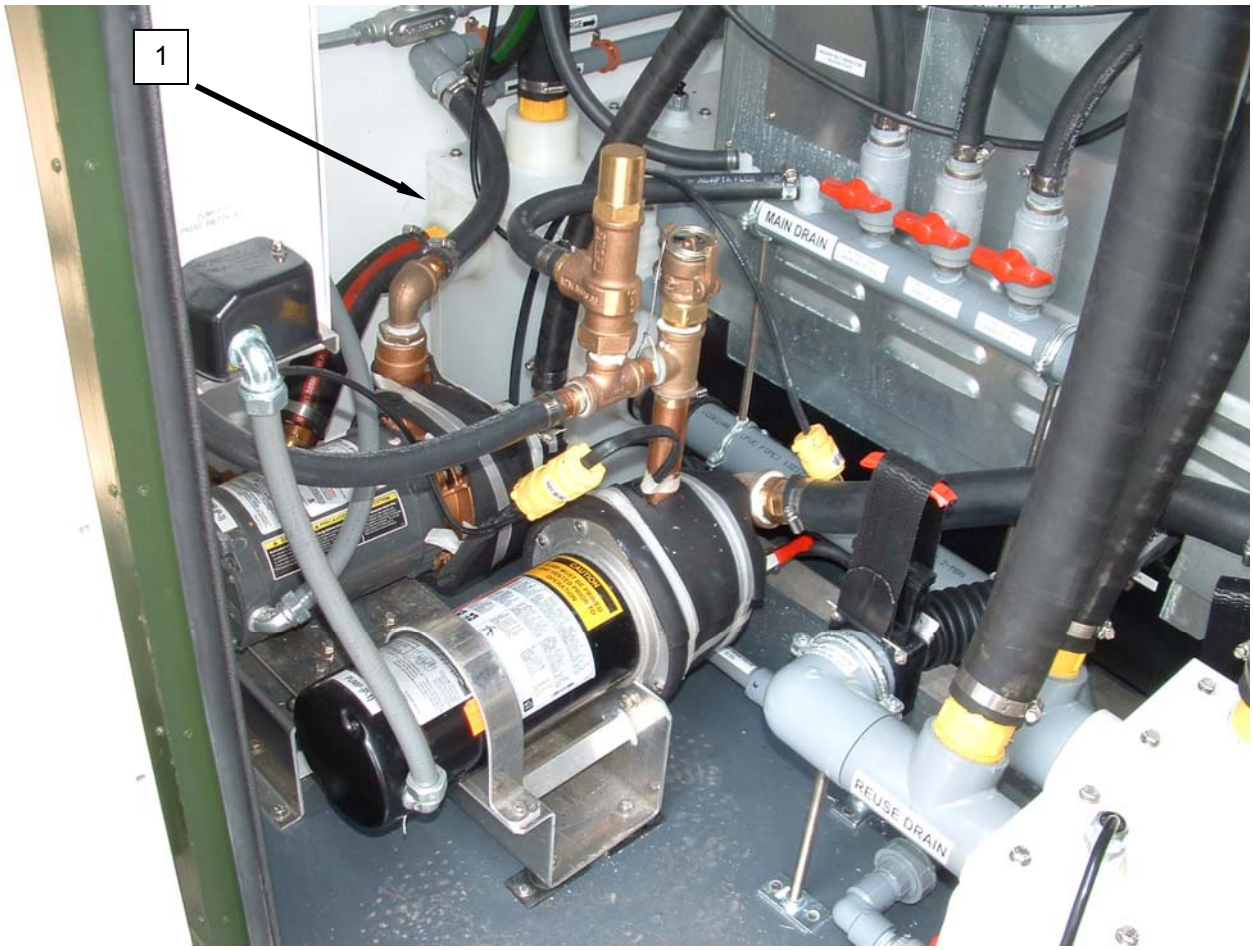


Figure 6. Graywater System.

THEORY OF OPERATION-CONTINUED

Electrical System – Washer Side

The CBL receives 208 VAC power from a 100kW generator or approved municipal power source through three 100A cables. One cable feeds the power service panel at the washer end **(Figure 7, Item 1)** of the container. The power service panel **(Figure 7, Item 2)** at the washer end of the container distributes power to the main circuit breaker panel **(Figure 7, Item 3)**. Power is then distributed through circuit breakers to the washers, exhaust fans, CBL lighting, and filtration system pumps. Service outlet receptacles **(Figure 7, Item 4)** that are GFCI protected are located at each end of the container and at the center for powering work lights and other external components. A 60A outlet **(Figure 7, Item 5)** is provided for powering the FDECU or ASH. All outlet receptacles are controlled and protected by the main circuit breaker panel.

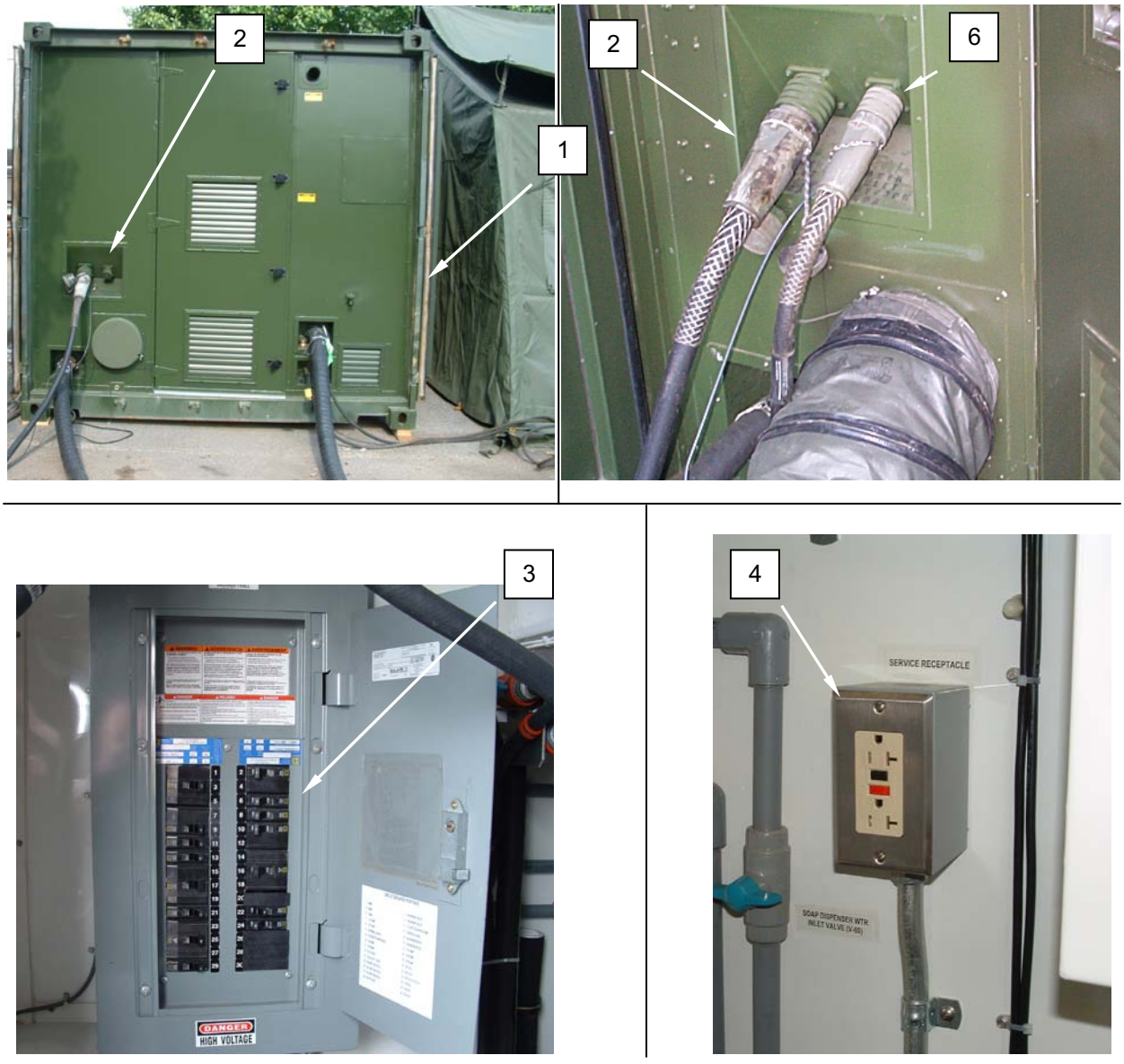


Figure 7. Electrical System.

THEORY OF OPERATION-CONTINUED

Electrical System – Dryer Side

Two cables feed the dryer power service panel located on the service panel at the dryer end **(Figure 8, Item 1)** of the container. The dryer power service panel **(Figure 8, Item 2)** distributes power from the two 100A cables to the dryer breaker panel **(Figure 8, Item 3)**. Power is then distributed to each dryer through circuit breakers.

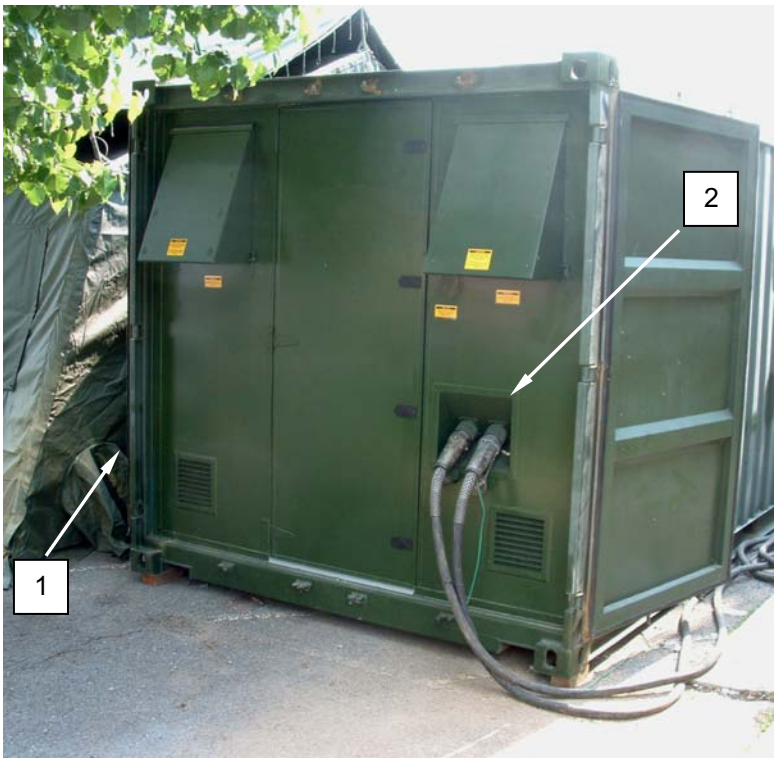


Figure 8. Electrical System.

THEORY OF OPERATION-CONTINUED

Programmable Logic Control (PLC)

The Programmable Logic Control (PLC) **(Figure 9, Item 1)** is used to centralize control of most CBL components. A touchscreen-equipped Human Machine Interface (HMI) **(Figure 9, Item 2)** is used to allow operator control and monitoring of CBL systems and components. An emergency stop **(Figure 9, Item 3)** is also provided to allow for quick shutdown of CBL systems under unusual circumstances.

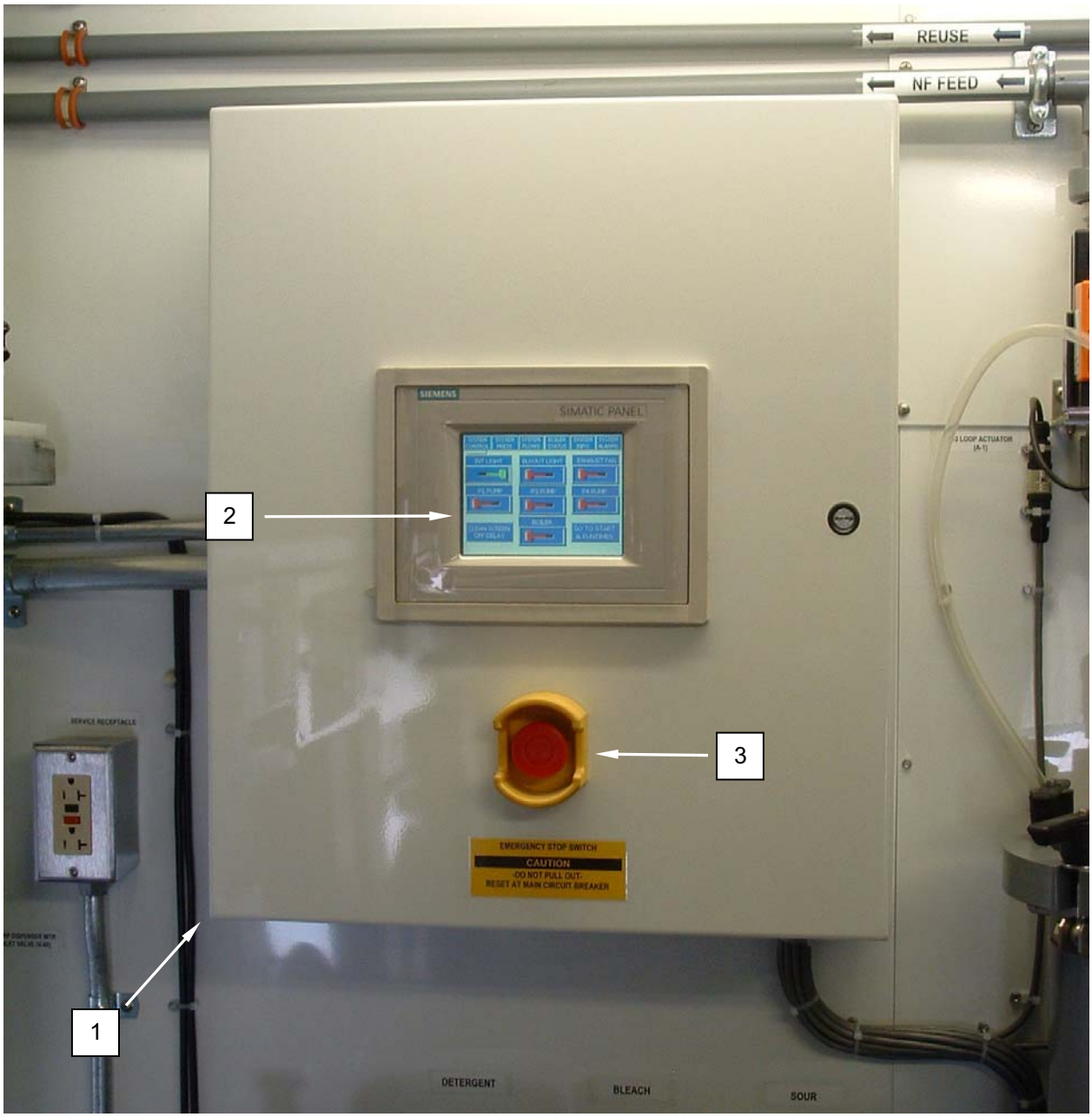


Figure 9. Programmable Logic Control.

THEORY OF OPERATION-CONTINUED

Additional components contained within the PLC enclosure include:

Contactors for the boiler **(Figure 10, Item 4)**, P-1 Pump **(Figure 10, Item 5)**, P-3 pump **(Figure 10, Item 6)**, and P-4 pump **(Figure 10, Item 7)**;
Overload Relays for the P-1 Pump **(Figure 10, Item 8)**, P-3 pump **(Figure 10, Item 9)**, and P-4 pump **(Figure 10, Item 10)**;
Relays for the dryer exhaust fans **(Figure 10, Item 11)**, blackout lights **(Figure 10, Item 12)**, burner power alarm **(Figure 10, Item 13)**, low water level alarm **(Figure 10, Item 14)**, interior lights **(Figure 10, Item 15)**, burner status alarm **(Figure 10, Item 16)**, high temp alarm **(Figure 10, Item 17)**, and the burner lockout alarm **(Figure 10, Item 18)**;
Surge Arrestor **(Figure 10, Item 19)**;
DC power supply **(Figure 10, Item 20)**;
the Programmable Logic Controller module **(Figure 10, Item 21)**;
Analog Input/Output (I/O) board modules 1 **(Figure 10, Item 22)**, 2 **(Figure 10, Item 23)**, and 3 **(Figure 10, Item 24)**, and analog output board module 4 **(Figure 10, Item 25)**.

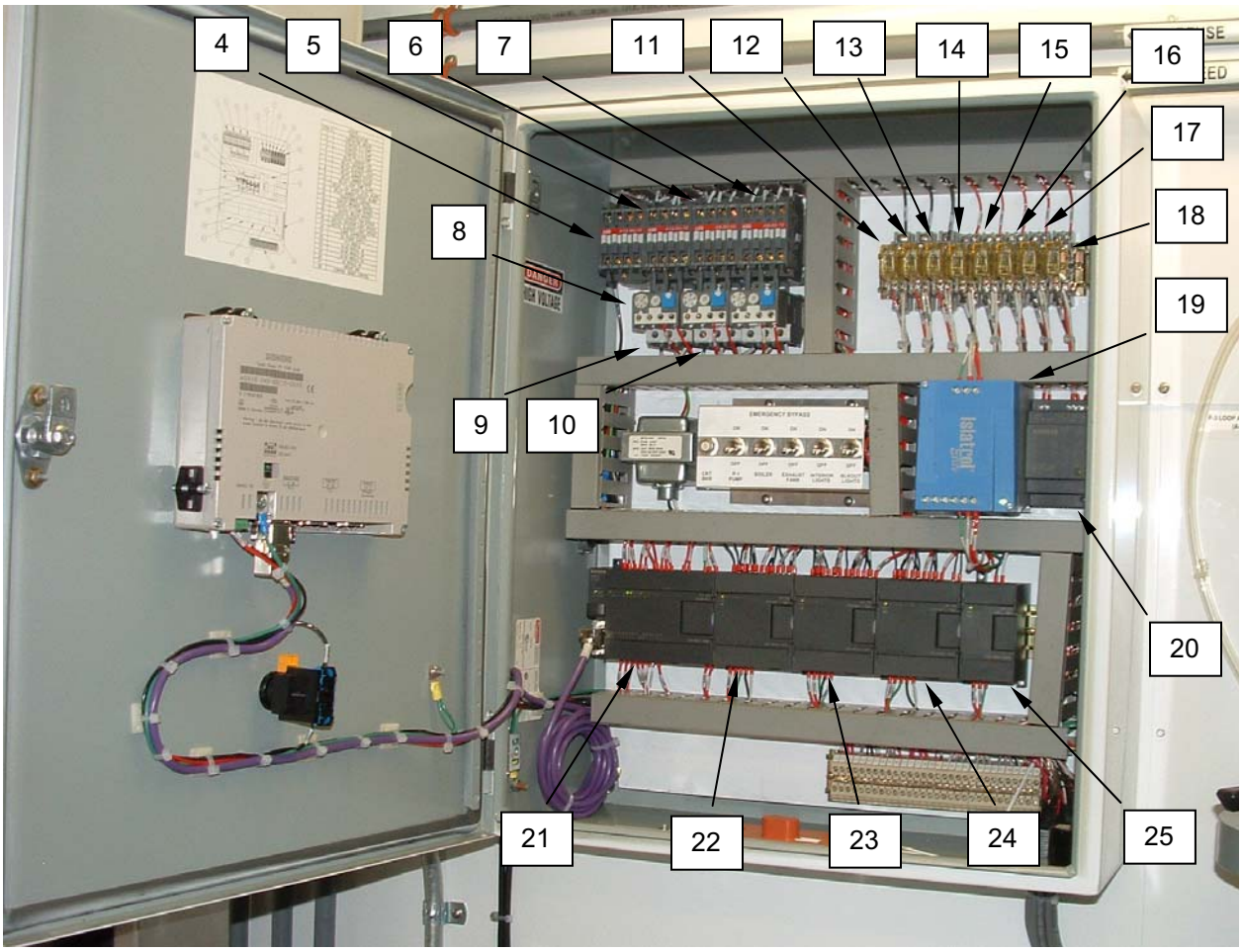


Figure 10. Programmable Logic Control.

THEORY OF OPERATION-CONTINUED

Automatic Soap Dispenser

An automatic soap dispenser is fitted which dispenses dissolved solid laundry detergent, bleach, and laundry sour in preset amounts on demand to each washer. Hot water from the boiler is fed into the automatic soap dispenser, regulated, and delivered as required by washer-controlled solenoid valves to the appropriate laundry chemical canister. Laundry chemicals in solution are collected in a common sump and fed to a pump, which then delivers the dissolved chemicals to the washers.

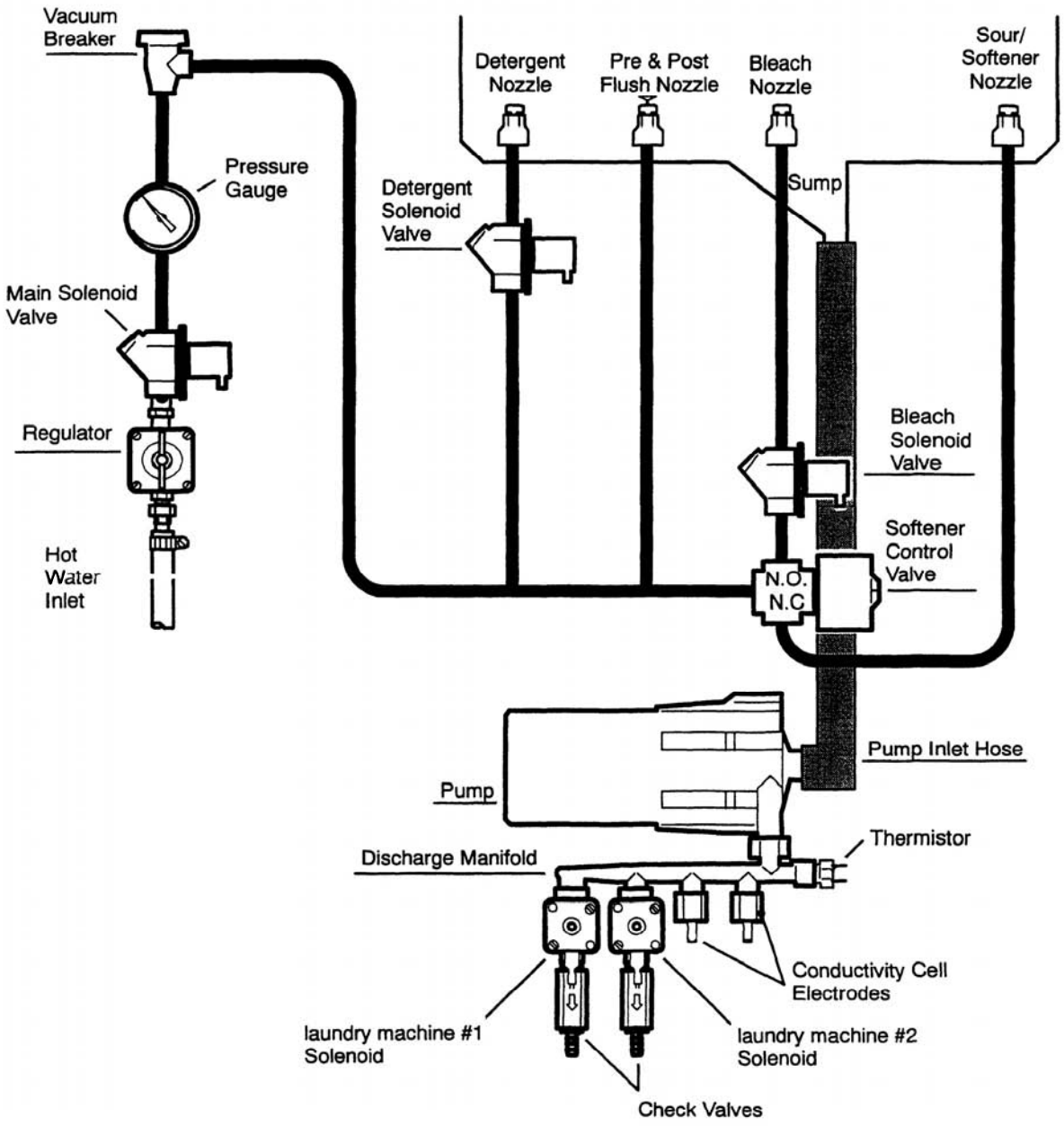


Figure 11. Automatic Soap Dispenser.

THEORY OF OPERATION-CONTINUED

Boiler

An integral boiler is furnished with the CBL. The boiler, through the use of two heat exchangers, heats source water for both of the washers, the automatic soap dispenser, and the water stored in the reuse tank.

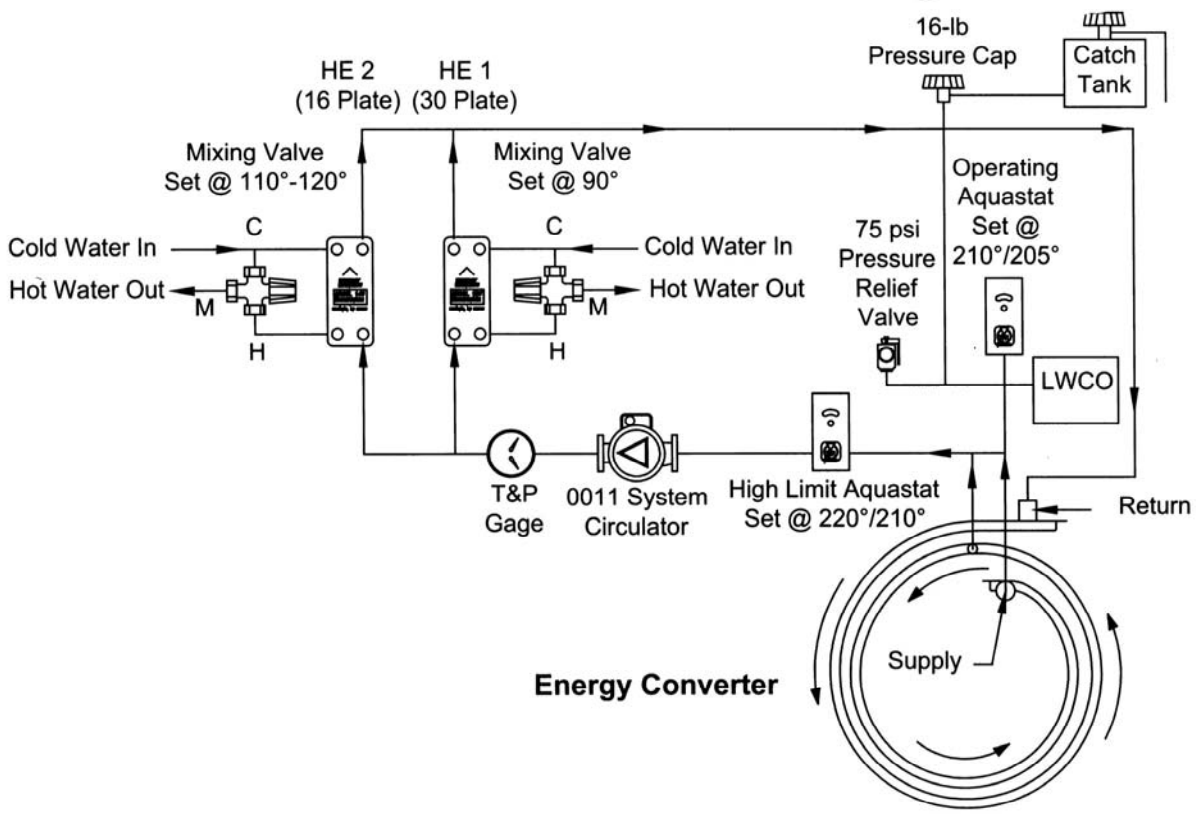


Figure 12. Boiler.

THEORY OF OPERATION-CONTINUED

Ventilation and Climate Control

Dryer exhaust is vented directly to the outside through vents **(Figure 13, Item 1)** installed at the dryer end of the CBL. The vents are connected to the dryers by flexible hose.

Container ventilation is accomplished by the use of two exhaust fans **(Figure 14, Item 2)** mounted to the upper portion of the service panel at the dryer end of the container. The exhaust fans are protected by collapsible rainhoods **(Figure 13, Item 3)**.

Supply air for the boiler is supplied through two filtered vents **(Figure 14, Item 4)** located in the service access door behind the washers. An additional filtered vent **(Figure 14, Item 5)** is located in the lower portion of the service panel and is accessible from under the boiler.

A Field Deployable Environmental Control Unit (FDECU) or Army Space Heater (ASH) is installed outside the TEMPER to provide air conditioning and heat.

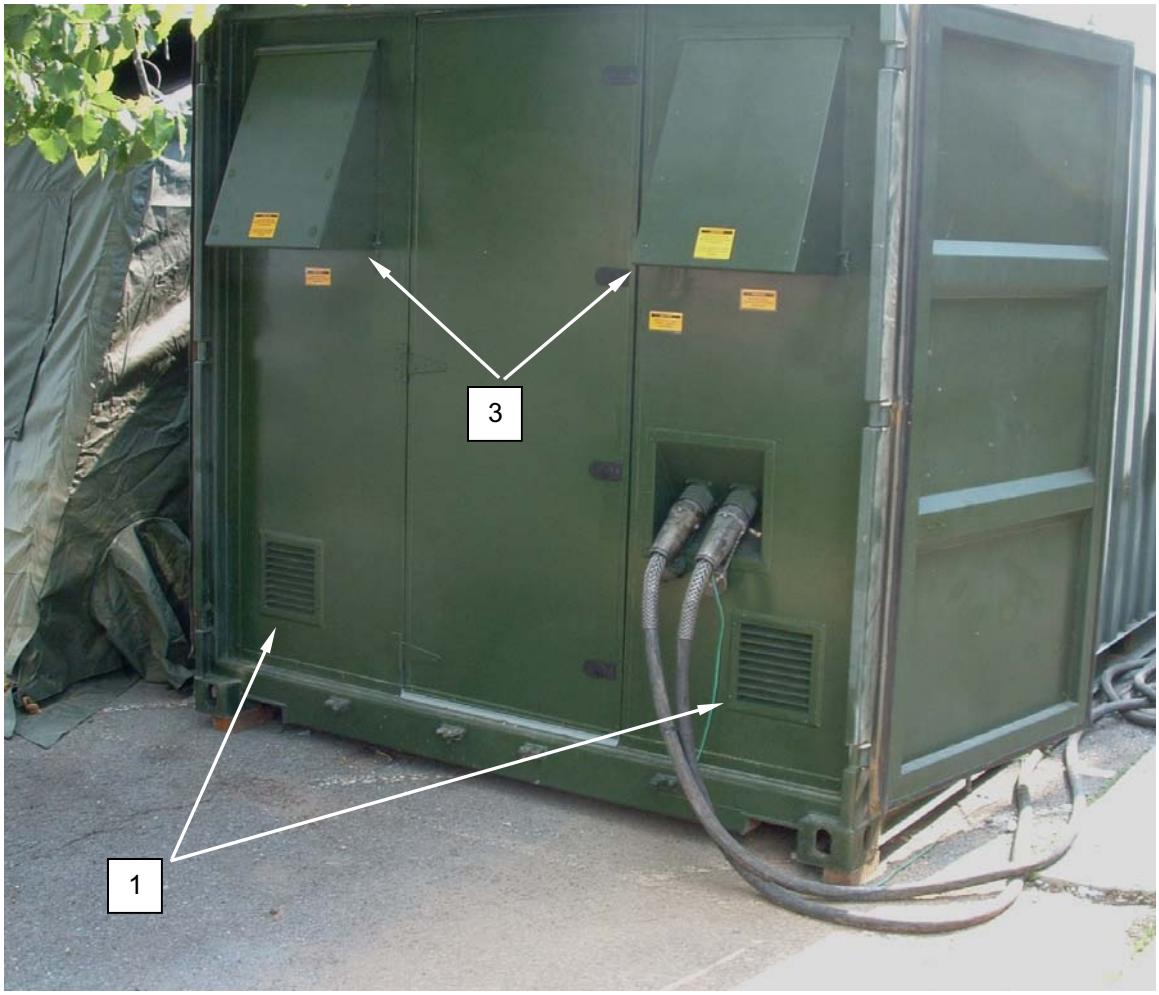


Figure 13. Ventilation and Climate Control.

THEORY OF OPERATION-CONTINUED

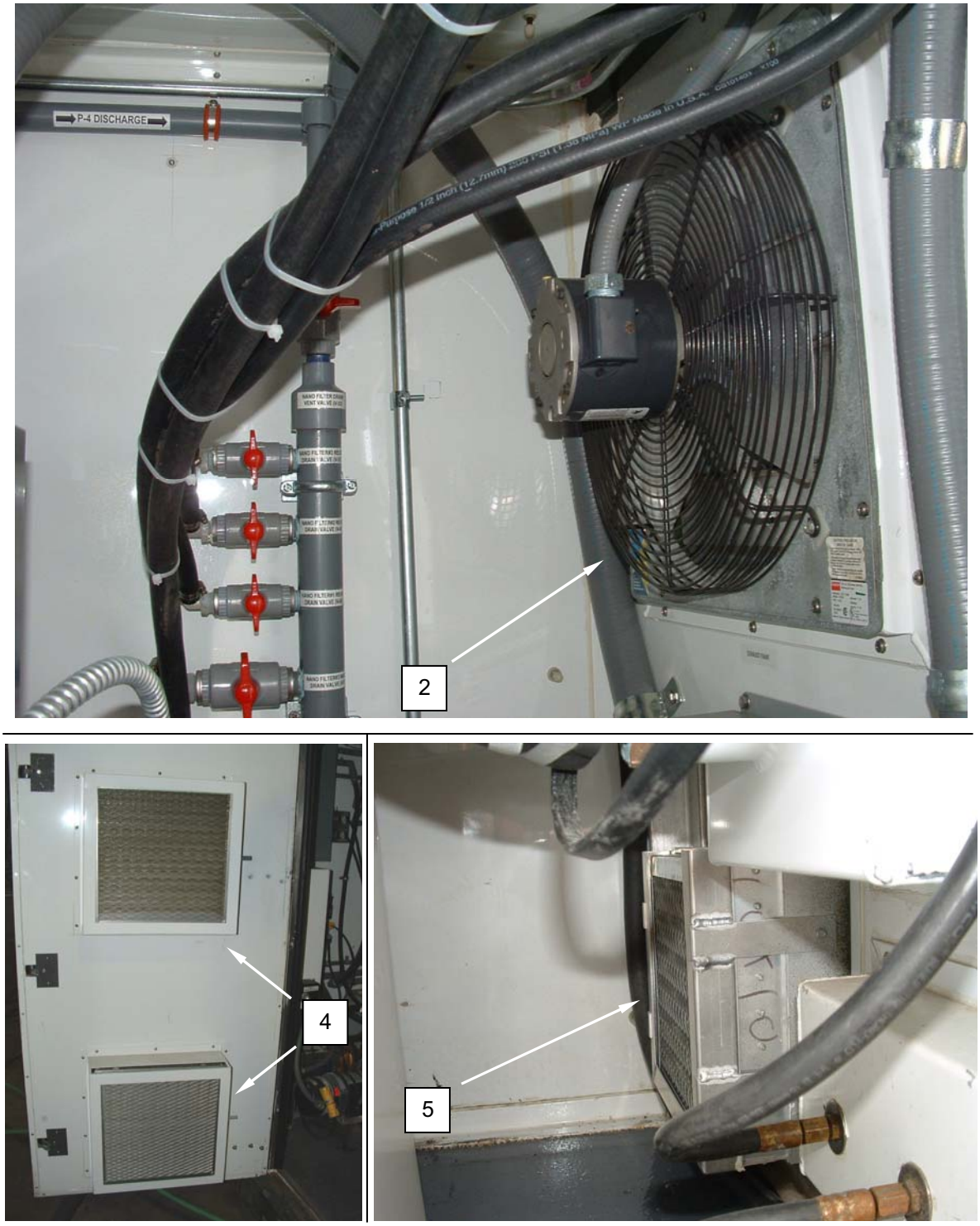


Figure 14. Ventilation and Climate Control.

THEORY OF OPERATION-CONTINUED

Lighting

Two ceiling-mounted fluorescent light fixtures **(Figure 15, Item 1)** provide interior lighting. A blackout lighting fixture **(Figure 15, Item 2)** provides light in blackout conditions or power outage conditions.

Figure 15. Lighting.

THEORY OF OPERATION-CONTINUED

Flow of Laundry

Laundry is brought into the TEMPER and sorted into 50-pound loads according to laundry type (white linens, BDU's, colored linens). When the first full load is ready, it is placed into a dirty laundry cart and taken into the CBL operating area. The first load is placed in a washer, the door is latched, and the washer is set for the appropriate cycle. Another load may then be placed in the remaining washer.

When the first load completes it's wash cycle, the laundry cart cover is placed on top of a clean laundry cart and the wet laundry is emptied onto the cover. The dryer opposite the washer then may be opened, and the wet laundry may be moved with the cart to the dryer door. The dryer door is closed, and the dryer is set for the appropriate drying cycle. Another load may then be placed in the empty washer. The laundry load in the second washer then follows the same process when it's wash cycle has completed. Allowing a 5- to 10 minute stagger of laundry times between each washer and dryer set ensures the maximum operating capacity of the CBL as a system.

When the laundry is dry, it is placed atop the cart cover and taken from the CBL operating area into the TEMPER, where it is folded on the work tables provided. Clean and folded laundry is then taken from the CBL to it's designated storage area.

THEORY OF OPERATION-CONTINUED

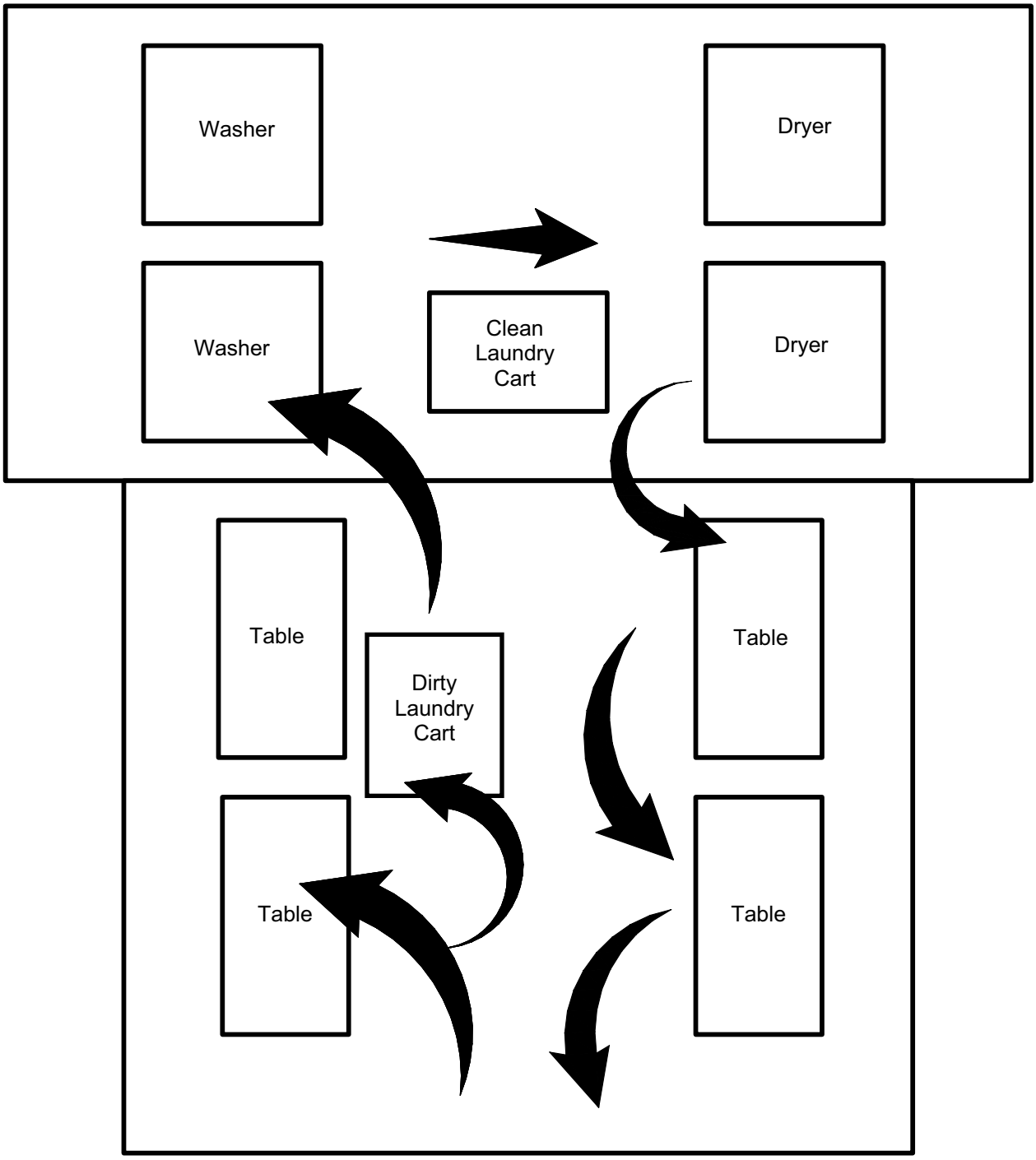


Figure 16. Containerized Batch Laundry (CBL) Laundry Flow.

CHAPTER 2

UNIT MAINTENANCE TROUBLESHOOTING PROCEDURES

CONTAINERIZED BATCH LAUNDRY (CBL)

UNIT MAINTENANCE
CONTAINERIZED BATCH LAUNDRY (CBL)
NSN 3510-01-527-2209
NSN 3510-01-527-2210
TROUBLESHOOTING INDEX

GENERAL

This chapter provides operator maintenance information and includes troubleshooting and general maintenance procedures. Refer to appropriate technical manuals for associated equipment maintenance instructions and item-specific troubleshooting instructions (See Work Package 0084 00 for References). Troubleshooting instructions covered in this section are unique to the Containerized Batch Laundry (CBL).

MALFUNCTION SYMPTOM INDEX

The malfunction symptom index lists common malfunctions that may occur during CBL inspection and operation. Find the malfunction to be eliminated and go to the indicated troubleshooting paragraph that follows. The index cannot list all malfunctions that may occur, all tests or inspections needed to find the fault, nor all actions required to correct the fault. If the existing malfunction is not listed, or cannot be corrected through this troubleshooting index, notify direct support maintenance.

Table 1. Electrical Malfunction Symptom Index.

Symptom	Work Package/Page No.
Electrical	**WP 0005 00**
No electrical power to any equipment.	0005 00-2
No electrical power to washers and PLC.	0005 00-4
No electrical power to dryers.	0005 00-5
Phase Sequencing light not lit.	0005 00-7

MALFUNCTION SYMPTOM INDEX-CONTINUED

Table 2. PLC Malfunction Symptom Index.

Symptom	Work Package/Page No.
PLC and PLC controlled components	**WP 0006 00**
No electrical power to PLC.	0006 00-2
"System Pressure Sensor Failure" on PLC Display.	0006 00-4
"Water Supply High Pressure" on PLC Display.	0006 00-5
"F1 Bag Differential Pressure High" on PLC Display	0006 00-7
"F1 Bag Filter is Clogged – P3 Pump is Stopped" on PLC Display	0006 00-9
"F2 Micron Differential Pressure High" alarm on PLC Display	0006 00-10
"Carbon Filter Outlet Pressure Sensor" alarm on PLC Display	0006 00-12
"F3 Carbon Filter Differential Pressure High" alarm on PLC Display	0006 00-13
"Reuse Loop Flow Sensor Failure" alarm on PLC Display	0006 00-15
"P3 Loop Flow Sensor Failure" alarm	0006 00-16
"P4 Loop Flow Sensor Failure" alarm on PLC Display	0006 00-17
"Waste Loop Flow Sensor Failure" alarm on PLC Display	0006 00-18
"Nano Outlet Pressure Sensor Failure" alarm on PLC Display	0006 00-19
"Nano Inlet Pressure Sensor Failure" alarm on PLC Display	0006 00-20
"Nano Filter Differential Pressure High" alarm on PLC Display	0006 00-21
P3 Pump alarm at PLC	0006 00-23
P4 Pump alarm at PLC	0006 00-25

Table 3. Plumbing Malfunction Symptom Index.

Symptom	Work Package/Page No.
Plumbing	**WP 0007 00**
No source water to CBL	0007 00-2
WTS hold tank overflows.	0007 00-3
Nanofilter Feed Tank overflows.	0007 00-5
Reuse Feed Tank overflows.	0007 00-7
High water consumption in full reuse mode.	0007 00-8
Pump P-1 short cycles.	0007 00-10

MALFUNCTION SYMPTOM INDEX-CONTINUED

Table 4. Washer Malfunction Symptom Index.

Symptom	Work Package/Page No.
Washers	**WP 0008 00**
No electrical power to washer(s).	0008 00-2
“Didn’t fill within time” Error Message On Washer.	0008 00-4
“Empty” Error Message On Washer	0008 00-5
“Speed Detector” Error On Washer.	0008 00-7
Washer door will not latch.	0008 00-8
Drum rotates slowly or not at all (may come with “Speed Detection” error).	0008 00-9
Washer “squeals” during operation.	0008 00-10
Washer overfills.	0008 00-11
Washer “knocks” or shows noticeable imbalance regardless of load.	0008 00-13

Table 5. Automatic Soap Dispenser Malfunction Symptom Index.

Symptom	Work Package/Page No.
Automatic Soap Dispenser	**WP 0009 00**
Water from overflow tube.	0009 00-2
No temperature display.	0009 00-4
No conductivity display.	0009 00-5
Pump runs but will not move any fluid to the wash machine.	0009 00-6
Product consumption too high.	0009 00-7
No product feed.	0009 00-8

Table 6. Dryer Malfunction Symptom Index.

Symptom	Work Package/Page No.
Dryer	**WP 0010 00**
No electrical power to equipment.	0010 00-2
Increased drying time.	0010 00-4
Drum doesn’t turn.	0010 00-6

MALFUNCTION SYMPTOM INDEX-CONTINUED

Table 7. Boiler Malfunction Symptom Index.

Symptom	Work Package/Page No.
Boiler	**WP 0011 00**
No electrical power to equipment.	0011 00-2
Boiler will not light.	0011 00-3
Excessive fuel consumption/excessive smoke.	0011 00-5
Boiler operating, doesn’t heat washer/soap dispenser water.	0011 00-7
Boiler operating, doesn’t heat reuse water.	0011 00-8
Boiler High Temp Alarm.	0011 00-9
Boiler Low Glycol Alarm.	0011 00-10
Boiler Burner Cutout Alarm.	0011 00-11

UNIT MAINTENANCE
CONTAINERIZED BATCH LAUNDRY (CBL)
NSN 3510-01-527-2209
NSN 3510-01-527-2210
TROUBLESHOOTING PROCEDURES – ELECTRICAL SYSTEM

The troubleshooting procedures contain tables listing the malfunctions, tests or inspections, and corrective action required to return the CBL to normal operation. Perform the steps in the order they appear in the tables. Each procedure is headed by an initial setup. This setup outlines what is needed as well as certain conditions which must be met before starting the task.

DO NOT START THE TASK UNTIL:

- You understand the task.
- You understand what you are to do.
- You understand what is needed to do the work.
- You have the things you need.

Table 1. Electrical Troubleshooting Procedures for Containerized Batch Laundry.

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
1. No electrical power to any equipment	**WARNING** The equipment being tested or corrected operates at high voltages and current that can cause serious injury or death. Step 1. Check all electrical cables **(Figure 1, Item 1)** for proper connection. Ensure power source is operating correctly. Step 2. Check Phase Monitor Relay fuses **(Figure 2, Item 2)** IAW WP 0019 00. Step 3. Check Phase Monitor Relay **(Figure 2, Item 3)** IAW WP 0019 00. Step 4. Check main circuit breaker **(Figure 2, Item 4)** IAW WP 0017 00.	**WARNING** The equipment being tested or corrected operates at high voltages and current that can cause serious injury or death. Reconnect cables. If no power is present, check power source. Replace fuses as necessary. Replace Phase Monitor Relay. Inspect and test breaker IAW procedures in WP 0017 00. Replace if necessary. If further corrective action is required, notify direct support maintenance.

Figure 1. No Electrical Power to any Equipment.

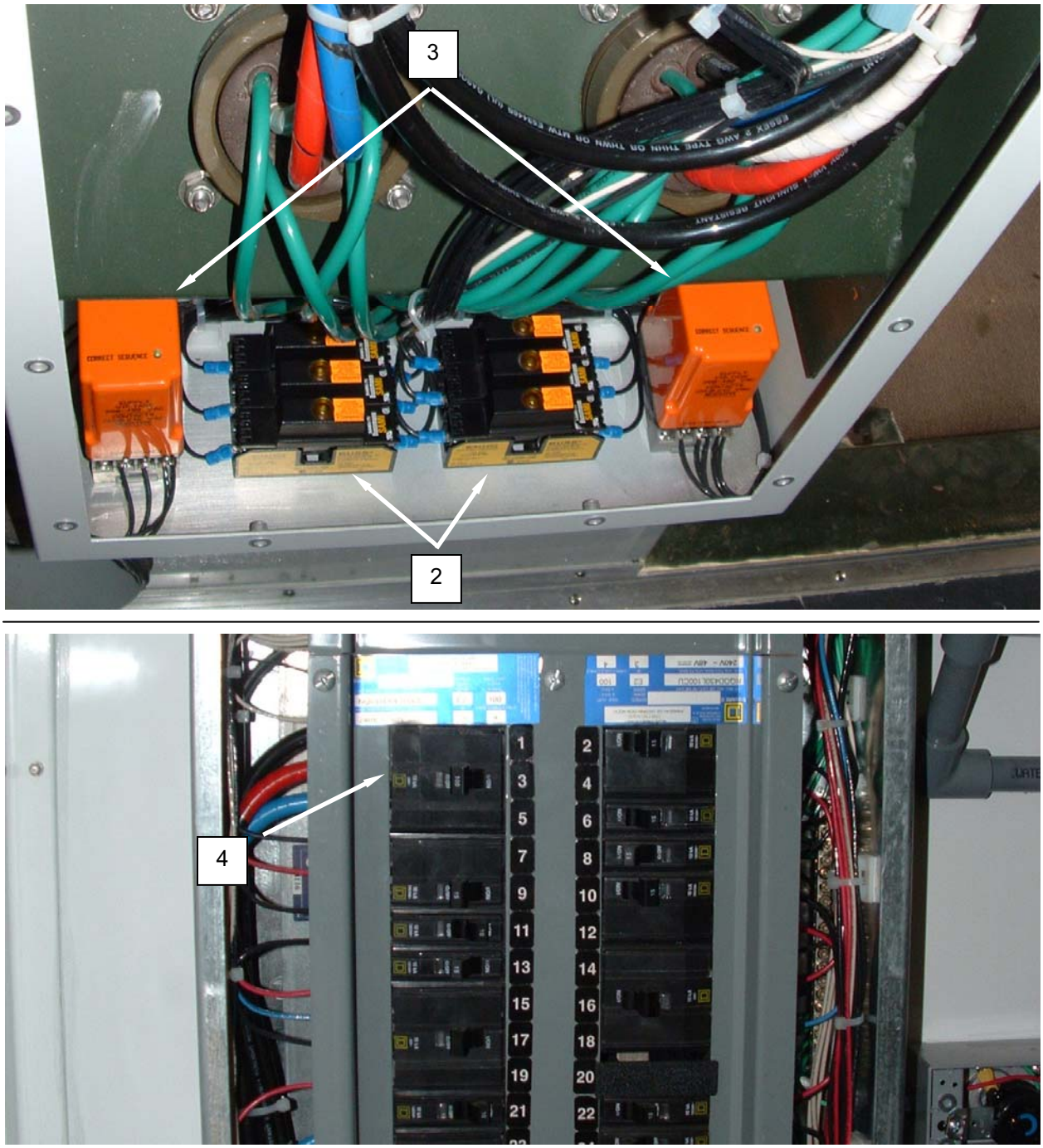


Figure 2. No Electrical Power to any Equipment.

Table 1. Electrical Troubleshooting Procedures for Containerized Batch Laundry - Continued.

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
2. No electrical power to washers and PLC.	 **WARNING** The equipment being tested or corrected operates at high voltages and current that can cause serious injury or death.	 **WARNING** The equipment being tested or corrected operates at high voltages and current that can cause serious injury or death.
	Step 1. Check all electrical cables **(Figure 3, Item 1)** for proper connection. Ensure power source is operating correctly.	Check for power at cable connections. If no power is present, check power source.
	Step 2. Inspect and test power input panel **(Figure 3, Item 2)** IAW WP 0018 00.	Replace damaged power input receptacle.
	Step 3. Check main circuit breaker **(Figure 3, Item 3)**.	Inspect and test breaker IAW procedures in WP 0017 00. Replace if necessary.
		If further corrective action is required, notify direct support maintenance.

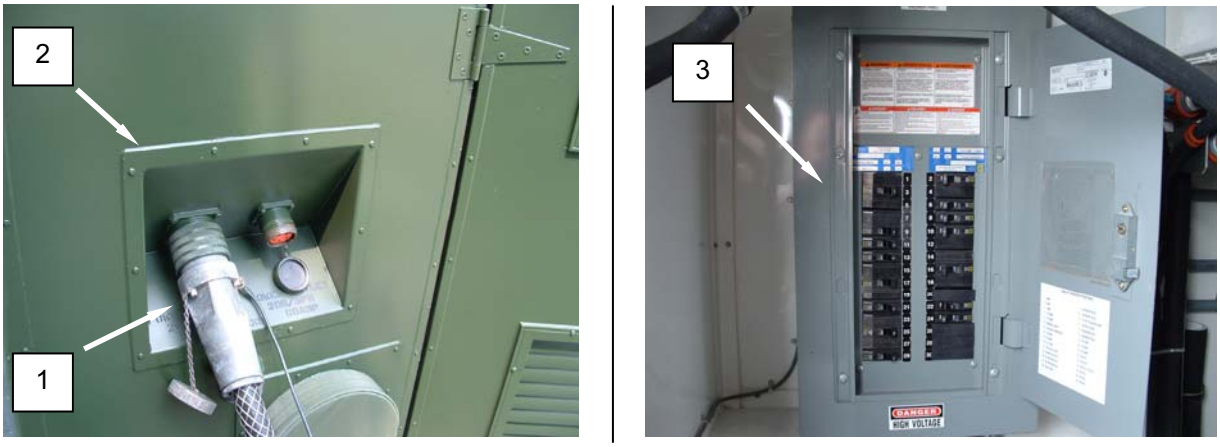


Figure 3. No Electrical Power to Washers and PLC.

Table 1. Electrical Troubleshooting Procedures for Containerized Batch Laundry - Continued.

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
3. No electrical power to dryers.	 **WARNING** The equipment being tested or corrected operates at high voltages and current that can cause serious injury or death. Step 1. If both dryers are not receiving power, check all electrical cables **(Figure 4, Item 1)** for proper connection. Ensure power source is operating correctly. Step 2. If only one dryer is not receiving electrical power, check electrical cable **(Figure 4, Item 1)** for proper connection. Step 3. Inspect and test power input panel **(Figure 4, Item 2)** IAW WP 0018 00. Step 4. Check dryer circuit breaker **(Figure 4, Item 3)**. Step 5. Check Phase Monitor Relay fuses **(Figure 4, Item 4)** IAW WP 0019 00. Step 6. Check Phase Monitor Relay **(Figure 4, Item 5)** IAW WP 0019 00.	 **WARNING** The equipment being tested or corrected operates at high voltages and current that can cause serious injury or death. Reconnect cables. If no power is present, check power source. Reconnect cable. Replace damaged power input receptacle. Reset if necessary. Inspect and test breaker IAW procedures in WP 0017 00. Replace if necessary. Replace fuses as necessary. Replace Phase Monitor Relay. If further corrective action is required, notify direct support maintenance.

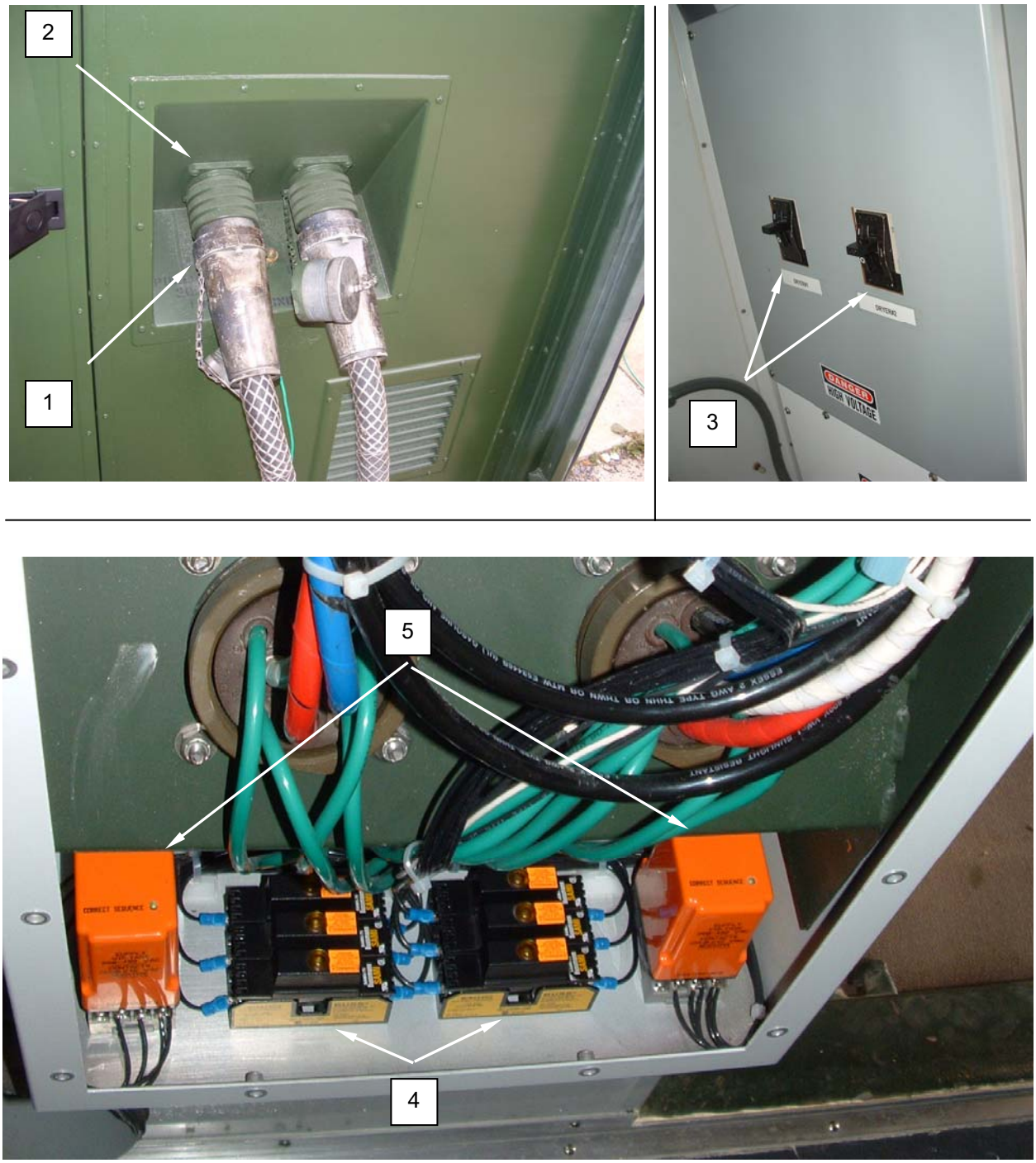
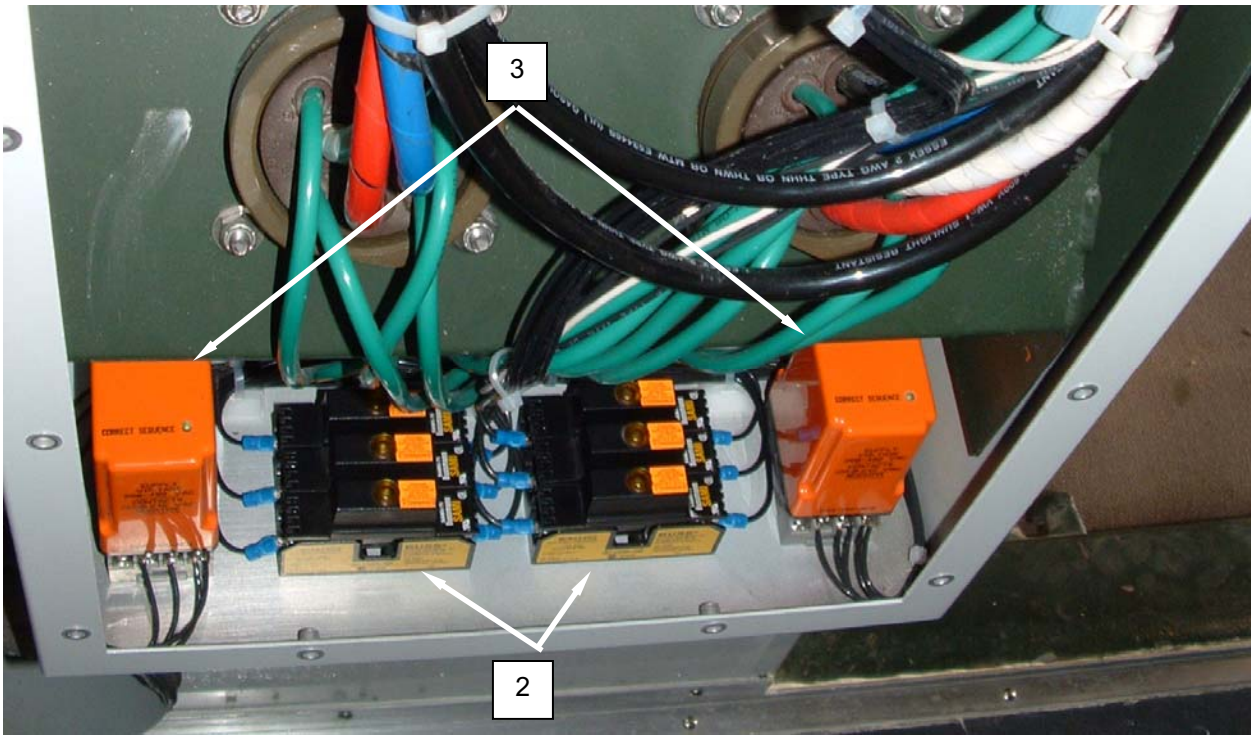


Figure 4. No Electrical Power to Dryers.

Table 1. Electrical Troubleshooting Procedures for Containerized Batch Laundry - Continued.

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
4. Phase Sequencing light not lit.	Step 1. Check for proper phase connection at power source.	Reconnect leads to obtain proper phase sequence.
	Step 2. Inspect cables **(Figure 5, Item 1)** for damage.	Replace damaged cable.
	Step 3. Check Phase Monitor Relay Fuses **(Figure 6, Item 2)** IAW WP 0019 00.	Replace fuses.
	Step 4. Test Phase Monitor Relay **(Figure 6, Item 3)** IAW WP 0019 00.	Replace Phase Monitor Relay
		Replace Phase Indicator Lights if needed.
		If further corrective action is required, notify direct support maintenance.

Figure 5. Phase Sequencing Light not Lit.



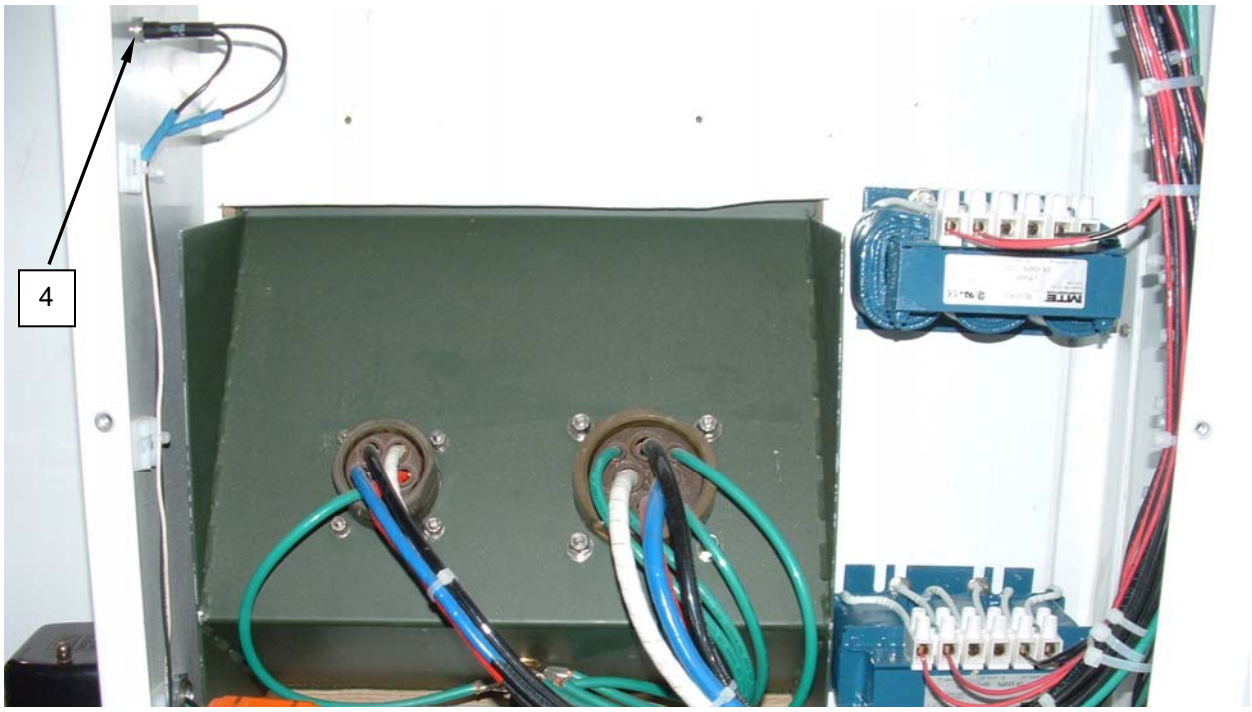


Figure 6. Phase Sequencing Light not Lit.

END OF WORK PACKAGE

UNIT MAINTENANCE
CONTAINERIZED BATCH LAUNDRY (CBL)
NSN 3510-01-527-2209
NSN 3510-01-527-2210
TROUBLESHOOTING PROCEDURES – PROGRAMMABLE LOGIC CONTROL (PLC)

The troubleshooting procedures contain tables listing the malfunctions, tests or inspections, and corrective action required to return the CBL to normal operation. Perform the steps in the order they appear in the tables. Each procedure is headed by an initial setup. This setup outlines what is needed as well as certain conditions which must be met before starting the task.

DO NOT START THE TASK UNTIL:

- You understand the task.
- You understand what you are to do.
- You understand what is needed to do the work.
- You have the things you need.

Table 1. PLC Troubleshooting Procedures for Containerized Batch Laundry.

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
1. No electrical power to PLC	 **WARNING**	 **WARNING**
	The equipment being tested or corrected operates at voltage and current that can cause serious injury or death.	The equipment being tested or corrected operates at voltage and current that can cause serious injury or death.
	Open PLC enclosure and check circuit breaker **(Figure 1, Item 1)**.	Reset circuit breaker. Monitor for condition which may have tripped breaker. Test and replace breaker as necessary IAW WP 0025 00.
	Check PLC circuit breaker No. 8 **(Figure 1, Item 2)** on circuit breaker panel.	Reset if necessary. Test breaker IAW WP 0025 00. Replace breaker if necessary.
	Test PLC transformer **(Figure 1, Item 3)** IAW WP 0025 00.	Replace an inoperative transformer IAW WP 0026 00.
	Test DC power supply **(Figure 1, Item 4)** IAW WP 0025 00.	Replace an inoperative DC power supply IAW WP 0026 00.
		If further corrective action is required, notify direct support maintenance.

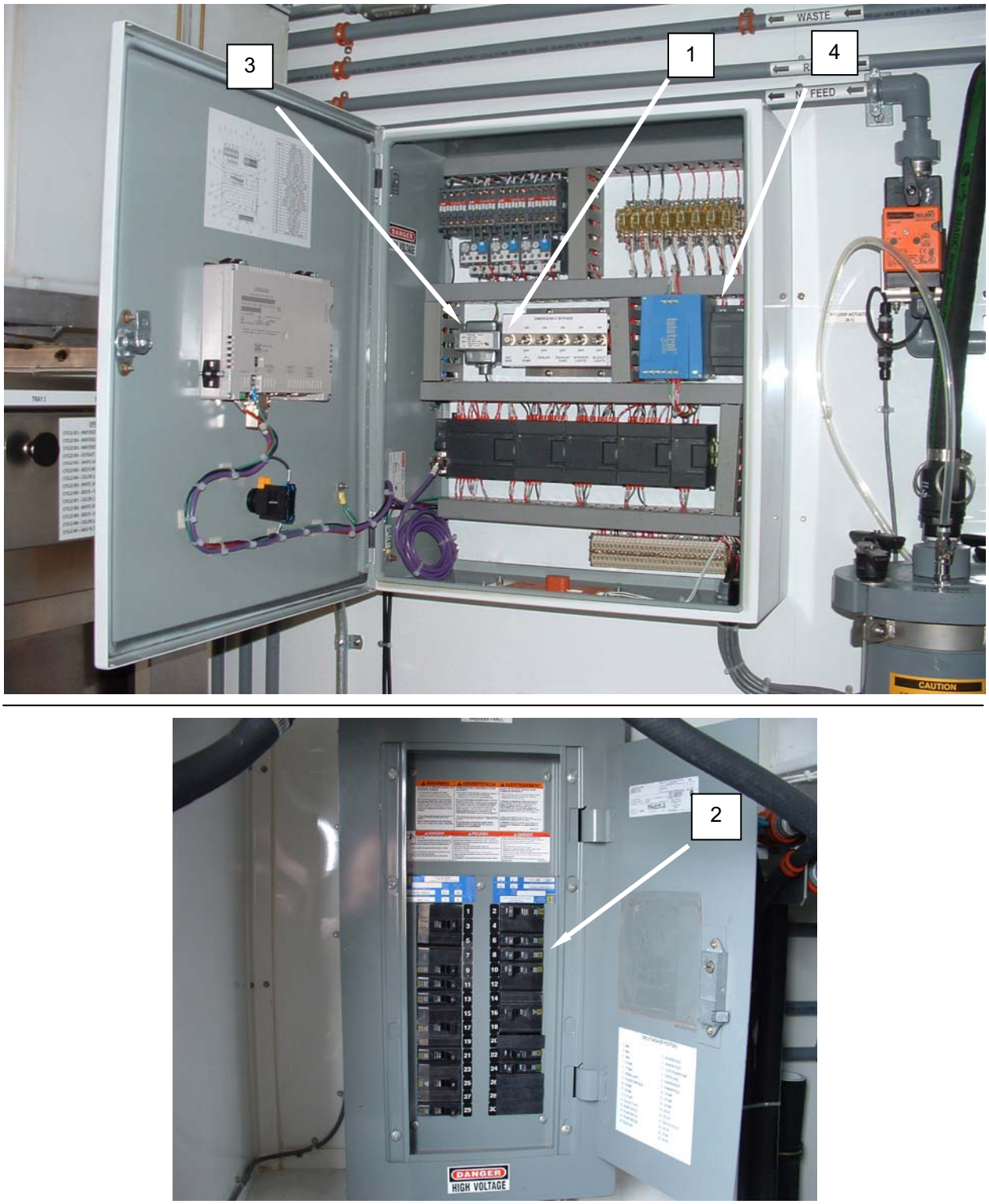


Figure 1. No Electrical Power to PLC.

Table 1. PLC Troubleshooting Procedures for Containerized Batch Laundry - Continued.

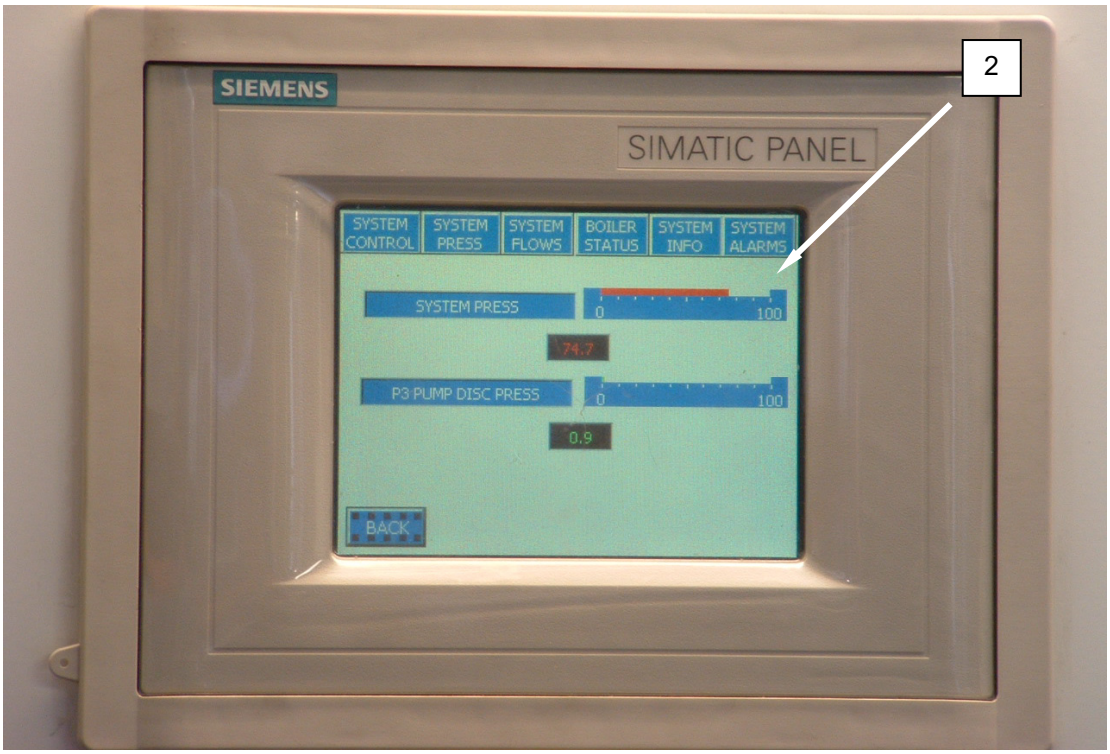
MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
2. “System Pressure Sensor Failure” on PLC Display **(Figure 2, Item 1)**	Inspect sensor connections and reconnect as necessary.	Replace system pressure sensor **(Figure 2, Item 2)** IAW procedures given in WP 0028 00. If alarm persists, notify direct support maintenance.

Figure 2. System Pressure Sensor Failure on PLC Display.

Table 1. PLC Troubleshooting Procedures for Containerized Batch Laundry - Continued.

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
3. “Water Supply High Pressure” on PLC Display **(Figure 3, Item 1)**	Perform troubleshooting steps in TM 10-3510-226-10, WP 0023 00.	
	If connected to municipal water supply, check inlet pressure **(Figure 4, Item 2)**.	Regulate inlet pressure. If municipal water supply is unregulated, throttle the main water shutoff valve **(Figure 4, Item 3)**, or switch to 3000-gallon water tanks for source water.
	Check P-1 pump pressure (inlet pressure) **(Figure 4, Item 2)** and pressure switch adjustment **(Figure 4, Item 4)**.	Adjust pressure switch IAW procedures given in WP 0035 00.
		Replace system pressure sensor IAW procedures given in WP 0028 00.
		If alarm persists, notify direct support maintenance.

Figure 3. Water Supply High Pressure on PLC Display.



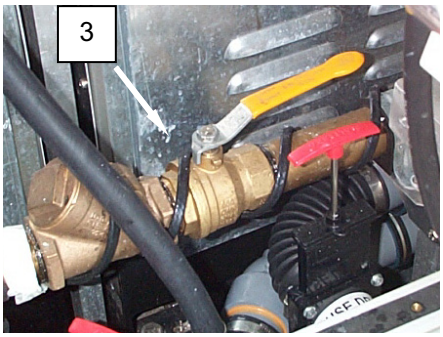


Figure 4. Water Supply High Pressure on PLC Display.

Table 1. PLC Troubleshooting Procedures for Containerized Batch Laundry - Continued.

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
4. “F1 Bag Differential Pressure High” on PLC Display **(Figure 5, Item 1)**	Perform troubleshooting steps in TM 10-3510-226-10, WP 0023 00. Inspect valve V-9 **(Figure 6, Item 2)** for normal operation. Inspect Actuator A-1 **(Figure 6, Item 3)** for normal operation.	 Disassemble and clean valve V-9 as necessary. Disassemble and clean actuator as necessary. Test the actuator IAW procedures given in WP 0029 00. If alarm persists, notify direct support maintenance.

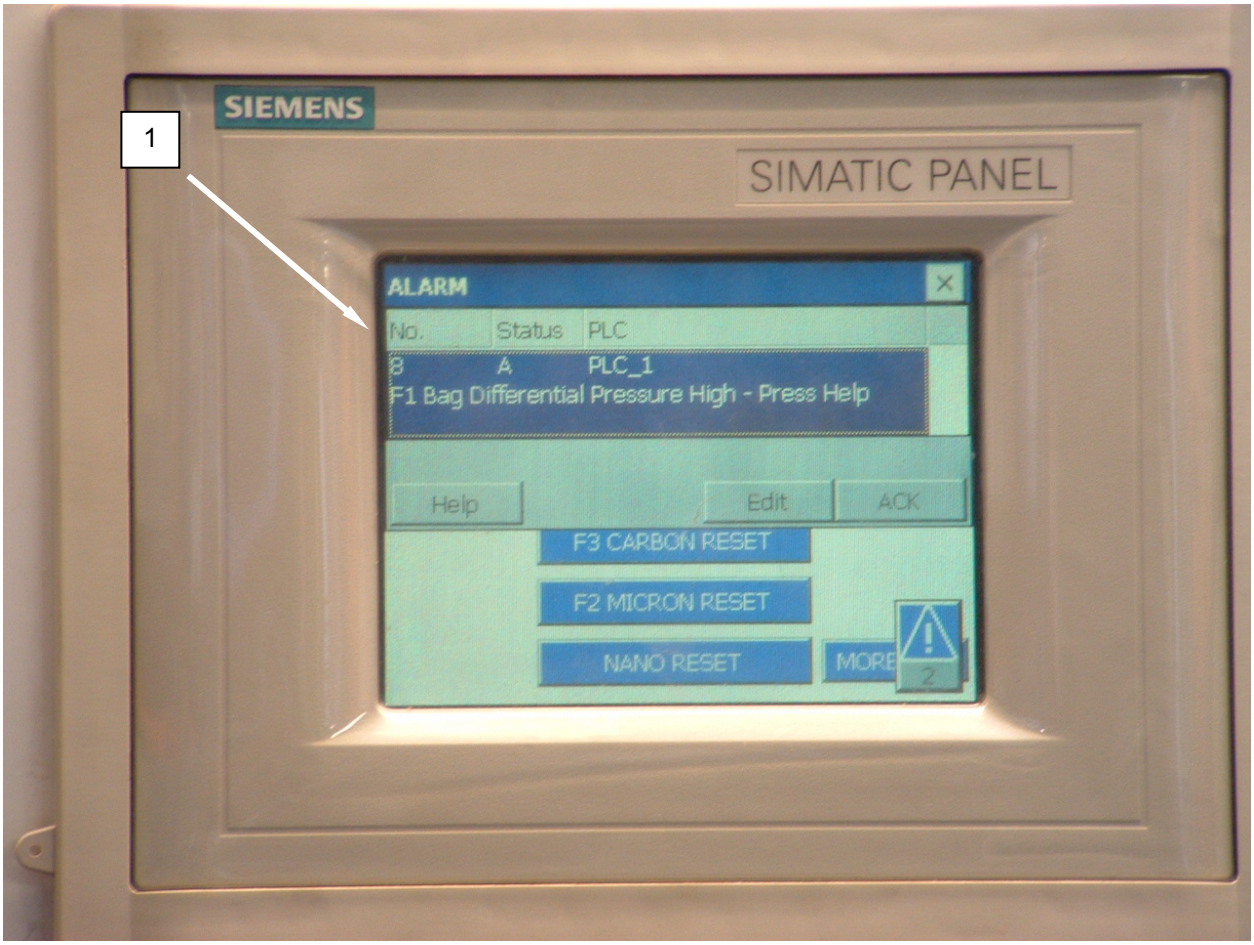


Figure 5. F1 Bag Differential Pressure High on PLC Display.

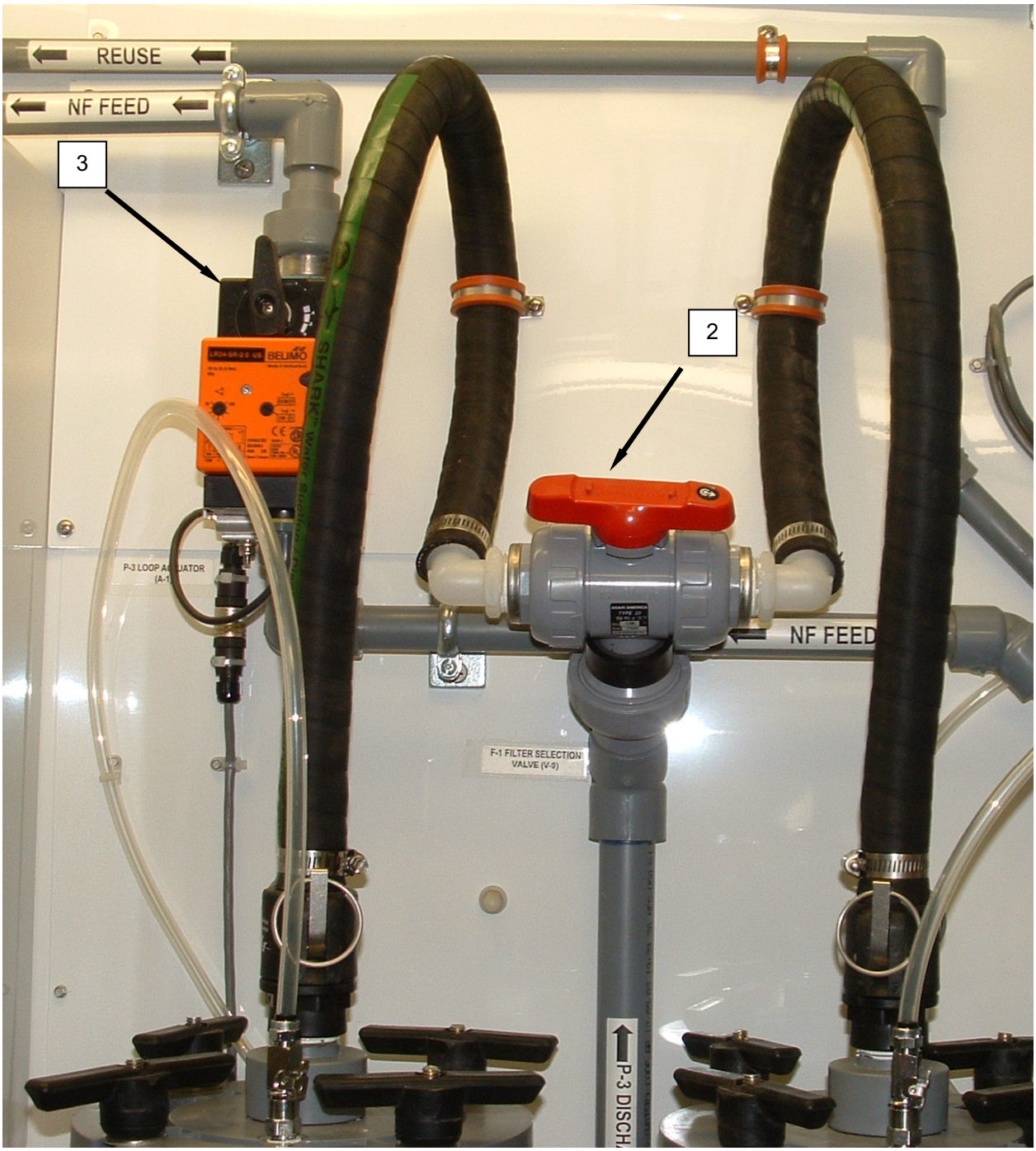


Figure 6. F1 Bag Differential Pressure High on PLC Display.

Table 1. PLC Troubleshooting Procedures for Containerized Batch Laundry - Continued.

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
5. “F2 Micron Differential Pressure High” alarm on PLC Display **(Figure 7, Item 1)**	Perform troubleshooting steps in TM 10-3510-226-10, WP 0023 00. Inspect Actuator A-1 **(Figure 8, Item 2)** for normal operation.	 Disassemble and clean actuator as necessary. Test the actuator IAW procedures given in WP 0029 00. If alarm persists, notify direct support maintenance.

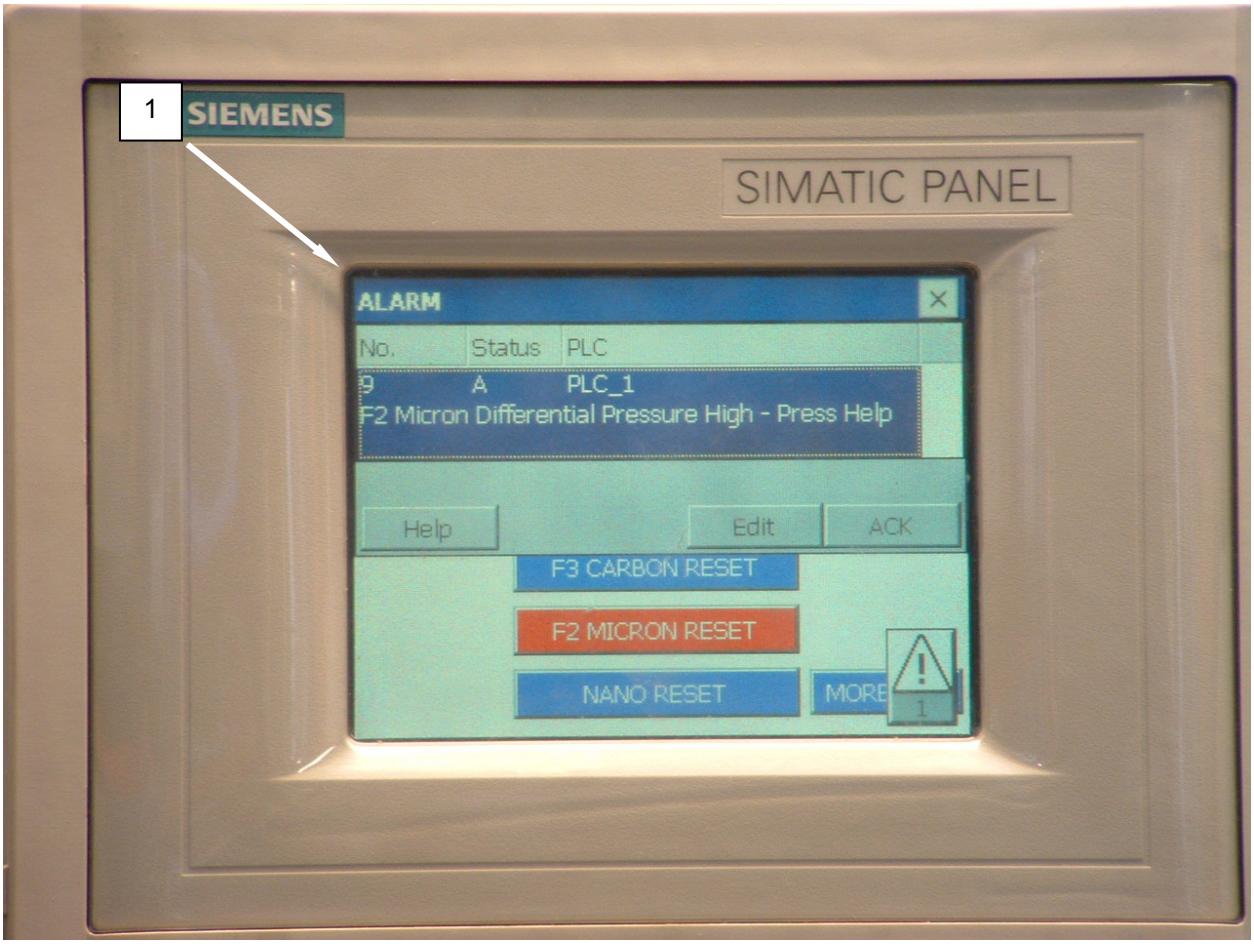


Figure 7. F2 Micron Differential Pressure High Alarm on PLC Display.

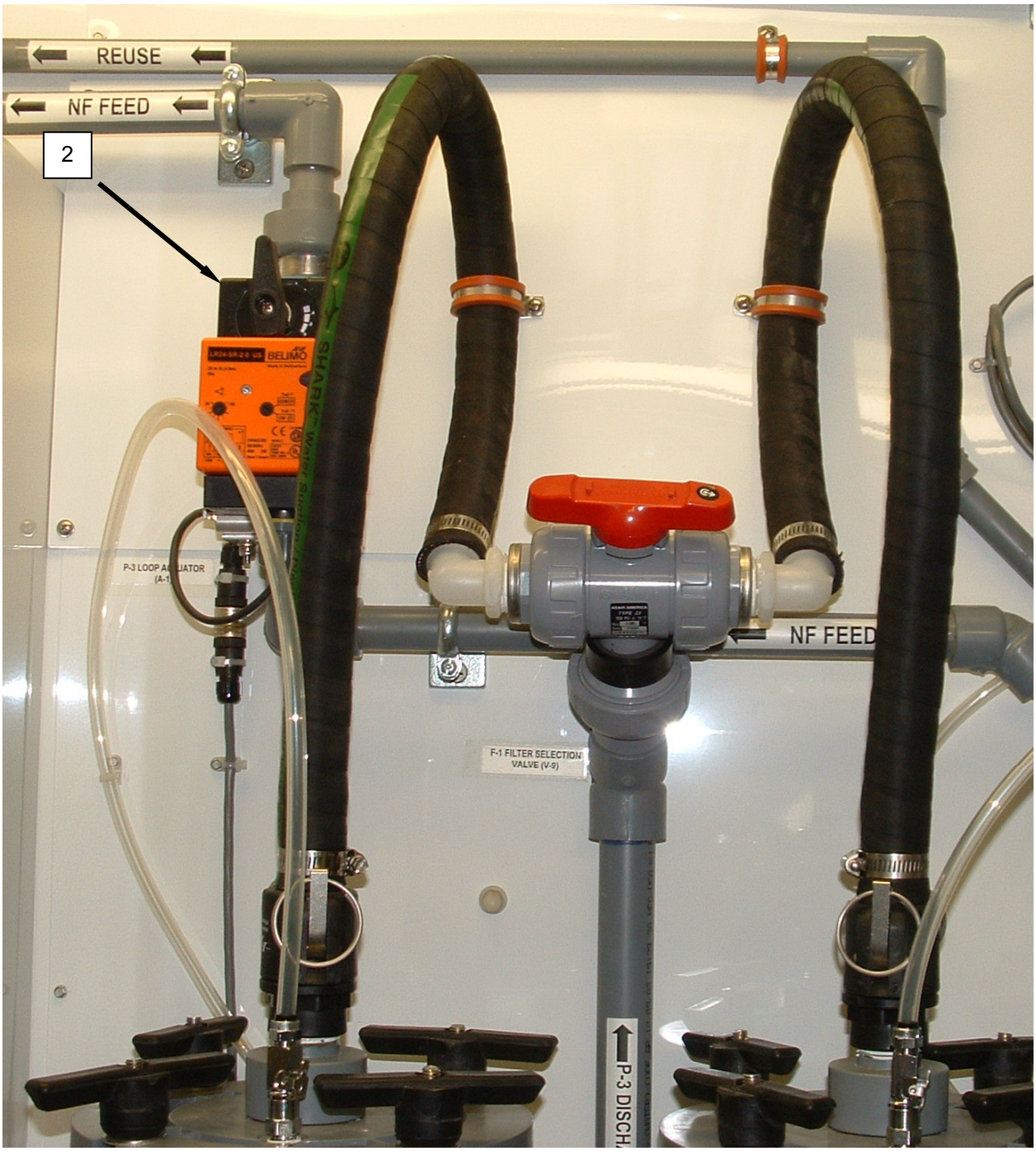


Figure 8. F2 Micron Differential Pressure High Alarm on PLC Display.

Table 1. PLC Troubleshooting Procedures for Containerized Batch Laundry - Continued.

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
6. “Carbon Filter Outlet Pressure Sensor” alarm on PLC Display **(Figure 9, Item 1)**	Inspect sensor connections and reconnect as necessary.	Replace sensor **(Figure 9, Item 2)** IAW procedures given in WP 0028 00. If alarm persists, notify direct support maintenance.

Figure 9. Carbon Filter Outlet Pressure Sensor Alarm on PLC Display.

Table 1. PLC Troubleshooting Procedures for Containerized Batch Laundry - Continued.

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
7. “F3 Carbon Filter Differential Pressure High” alarm on PLC Display **(Figure 10, Item 1)**	Perform troubleshooting steps in TM 10-3510-226-10. Inspect Actuator A-2 **(Figure 11, Item 2)** for normal operation.	 Disassemble and clean actuator as necessary. Test the actuator IAW procedures given in WP 0029 00. Replace sensor IAW procedures given in WP 0028 00. If alarm persists, notify direct support maintenance.

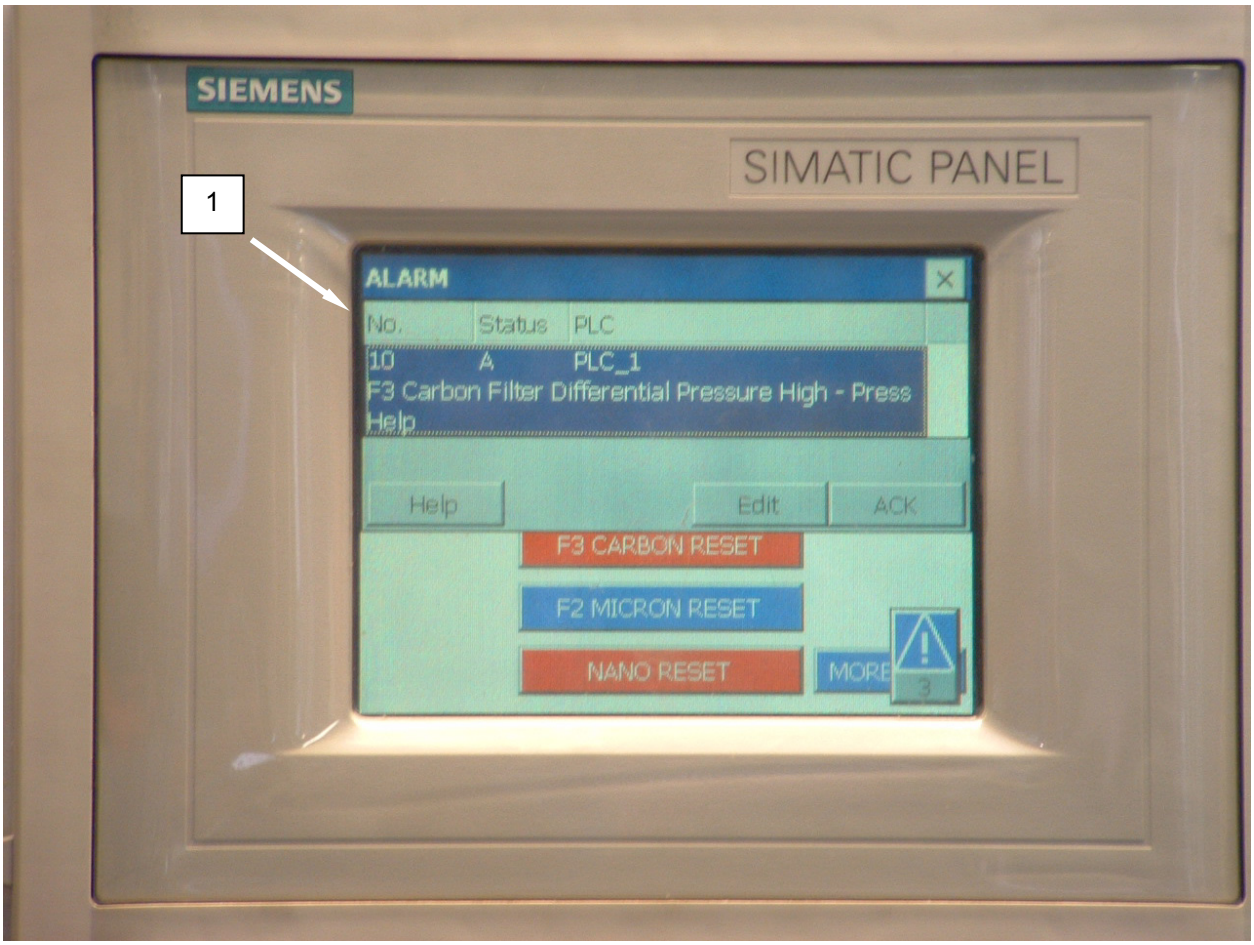


Figure 10. F3 Carbon Filter Differential Pressure High Alarm on PLC Display.

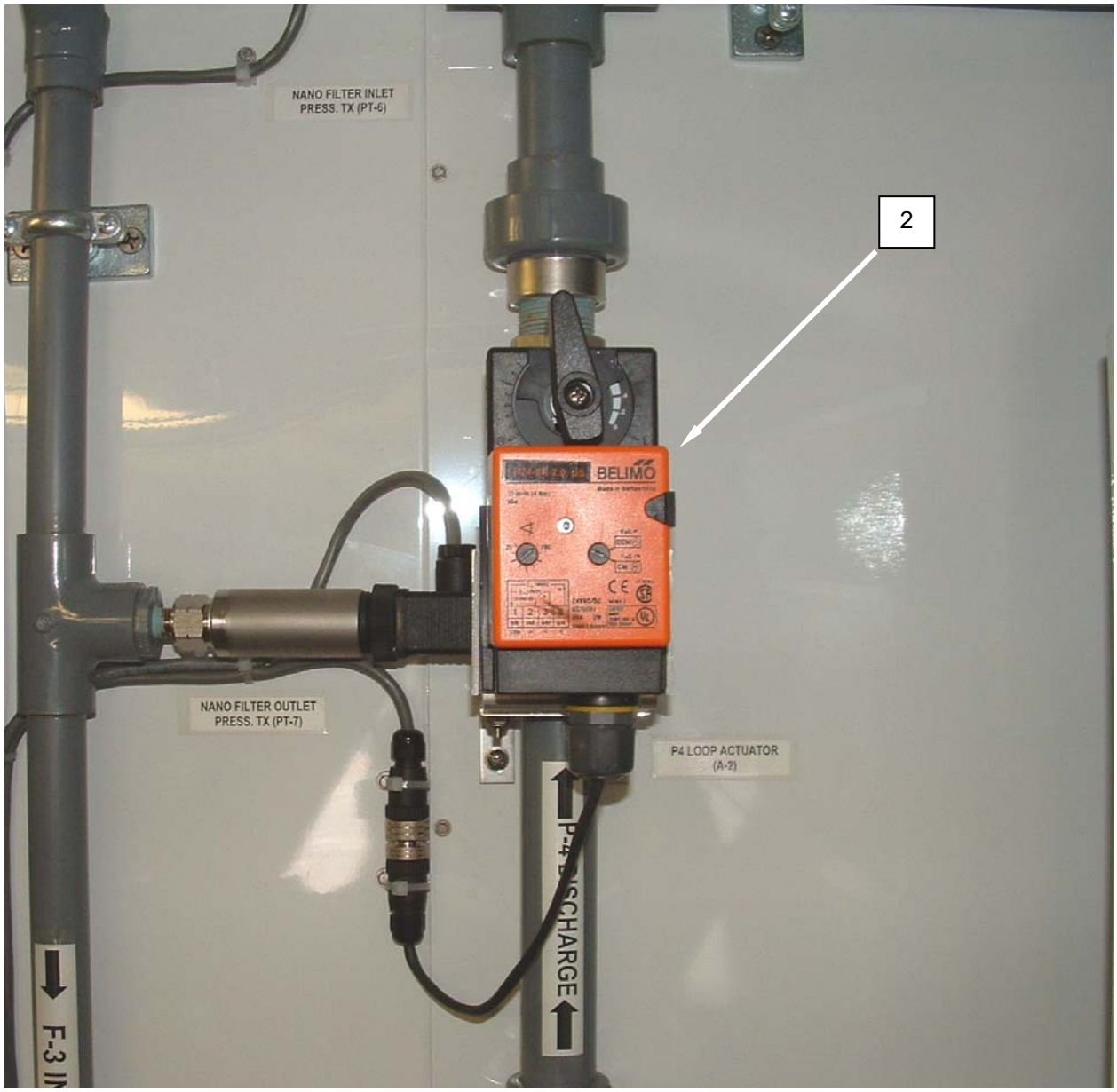


Figure 11. F3 Carbon Filter Differential Pressure High Alarm on PLC Display.

Table 1. PLC Troubleshooting Procedures for Containerized Batch Laundry - Continued.

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
8. “Reuse Loop Flow Sensor Failure” alarm on PLC Display **(Figure 12, Item 1)**	Perform troubleshooting steps in TM 10-3510-226-10. Inspect sensor connections and reconnect as necessary.	Replace sensor **(Figure 12, Item 2)** IAW procedures given in WP 0027 00. If alarm persists, notify direct support maintenance.

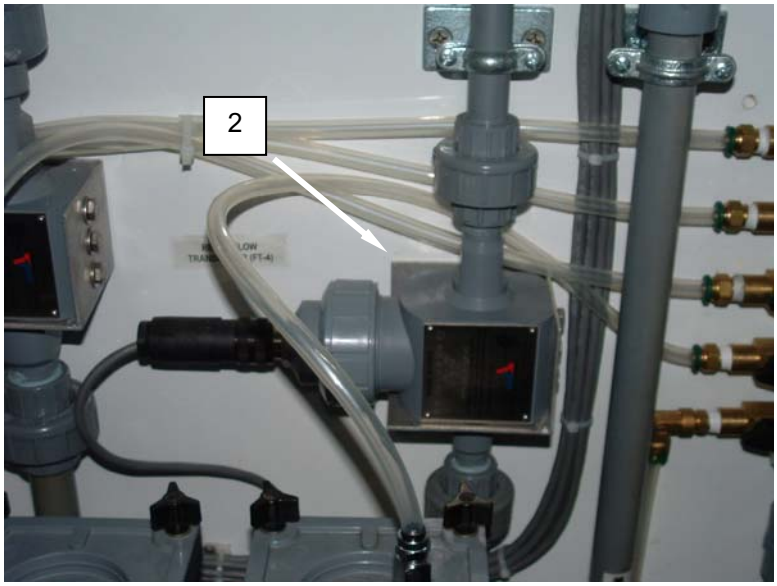


Figure 12. Reuse Loop Flow Sensor Failure Alarm on PLC Display.

Table 1. PLC Troubleshooting Procedures for Containerized Batch Laundry - Continued.

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
9. “P3 Loop Flow Sensor Failure” alarm **(Figure 13, Item 1)**	Inspect sensor connections and reconnect as necessary.	Replace sensor **(Figure 13, Item 2)** IAW procedures given in WP 0027 00. If alarm persists, notify direct support maintenance.

Figure 13. P3 Loop Flow Sensor Failure Alarm on PLC Display.

Table 1. PLC Troubleshooting Procedures for Containerized Batch Laundry - Continued.

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
10. “P4 Loop Flow Sensor Failure” alarm on PLC Display **(Figure 14, Item 1)**	Inspect sensor connections and reconnect as necessary.	Replace sensor **(Figure 14, Item 2)** IAW procedures given in WP 0027 00. If alarm persists, notify direct support maintenance.

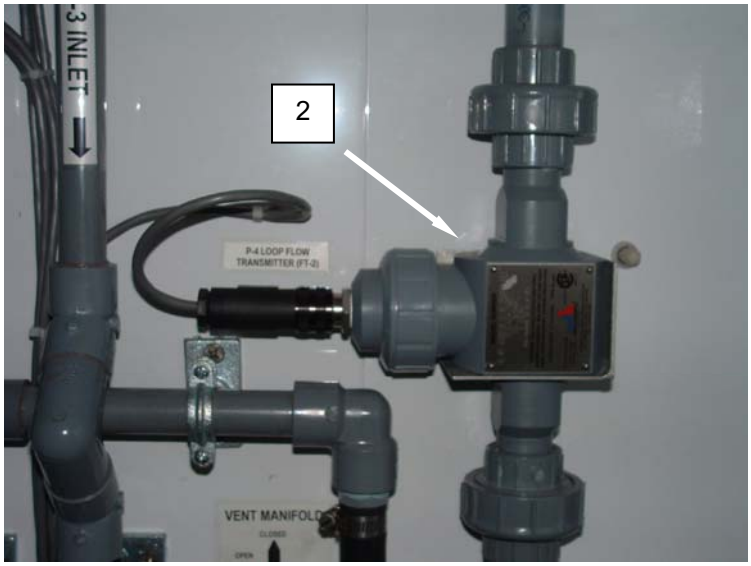


Figure 14. P4 Loop Flow Sensor Failure Alarm on PLC Display.

Table 1. PLC Troubleshooting Procedures for Containerized Batch Laundry - Continued.

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
11. “Waste Loop Flow Sensor Failure” alarm on PLC Display **(Figure 15, Item 1)**	Inspect sensor connections and reconnect as necessary.	Replace sensor **(Figure 15, Item 2)** IAW procedures given in WP 0027 00. If alarm persists, notify direct support maintenance.

Figure 15. Waste Loop Flow Sensor Failure Alarm on PLC Display.

Table 1. PLC Troubleshooting Procedures for Containerized Batch Laundry - Continued.

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
12. “Nano Outlet Pressure Sensor Failure” alarm on PLC Display **(Figure 16, Item 1)**	Inspect sensor connections and reconnect as necessary.	Replace sensor **(Figure 16, Item 1)** IAW procedures given in WP 0028 00. If alarm persists, notify direct support maintenance.

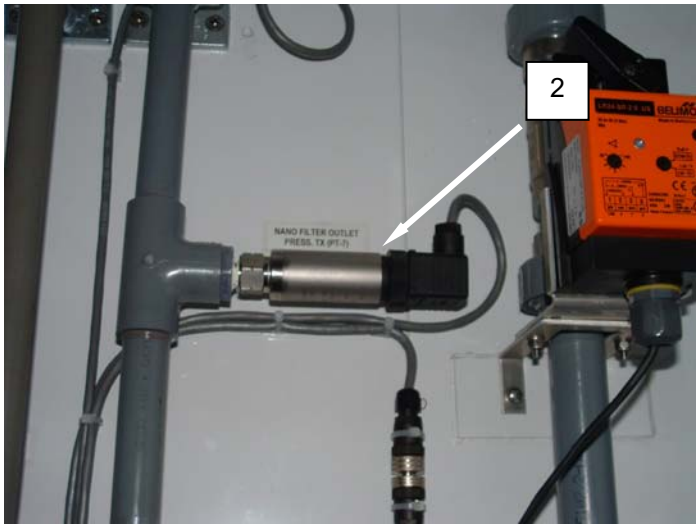


Figure 16. Nano Outlet Pressure Sensor Failure Alarm on PLC Display.

Table 1. PLC Troubleshooting Procedures for Containerized Batch Laundry - Continued.

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
13. “Nano Inlet Pressure Sensor Failure” alarm on PLC Display **(Figure 17, Item 1)**	Inspect sensor connections and reconnect as necessary.	Replace sensor **(Figure 17, Item 2)** IAW procedures given in WP 0028 00. If alarm persists, notify direct support maintenance.

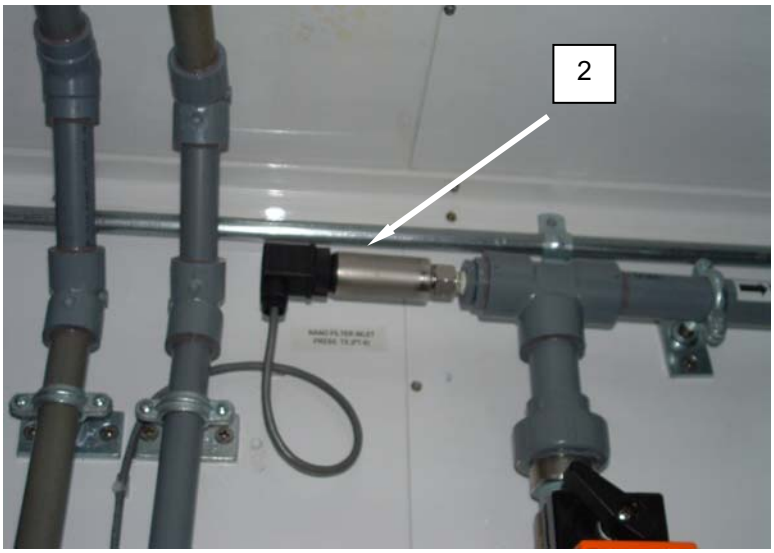


Figure 17. Nano Inlet Pressure Sensor Failure Alarm on PLC Display.

Table 1. PLC Troubleshooting Procedures for Containerized Batch Laundry - Continued.

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
14. “Nano Filter Differential Pressure High” alarm on PLC Display **(Figure 18, Item 1)**	Perform troubleshooting steps in TM 10-3510-226-10, WP 0023 00. Inspect Actuator A-3 **(Figure 19, Item 2)** and Actuator A-4 **(Figure 19, Item 3)** for normal operation. Inspect sensor connections and reconnect as necessary.	 Disassemble and clean actuator as necessary. Test the actuator IAW procedures given in WP 0029 00. Replace sensor IAW procedures given in WP 0028 00. Replace the nanofilters IAW procedures given in WP 0038 00. If alarm persists, notify direct support maintenance.

Figure 18. Nano Filter Differential Pressure High Alarm on PLC Display.

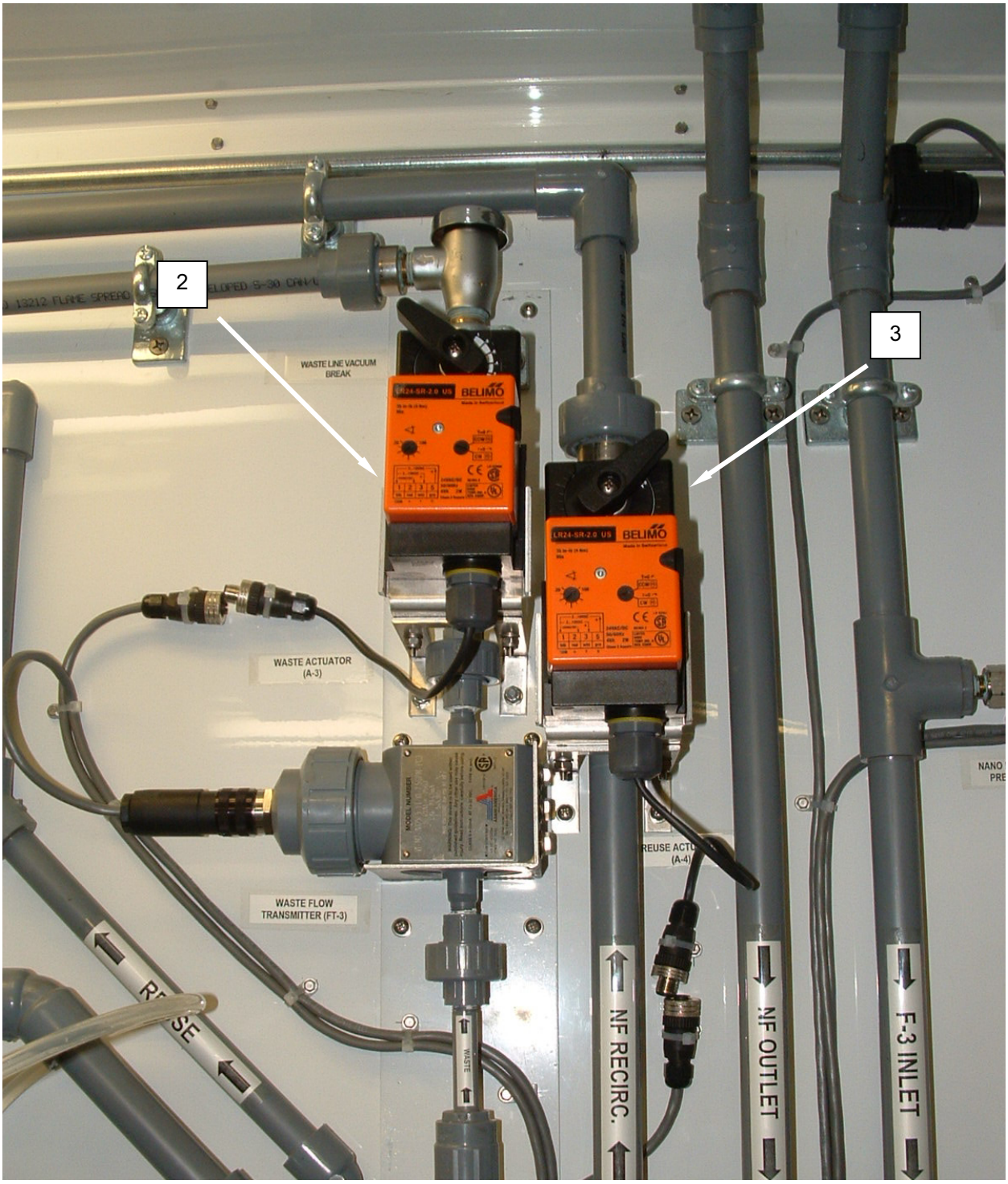
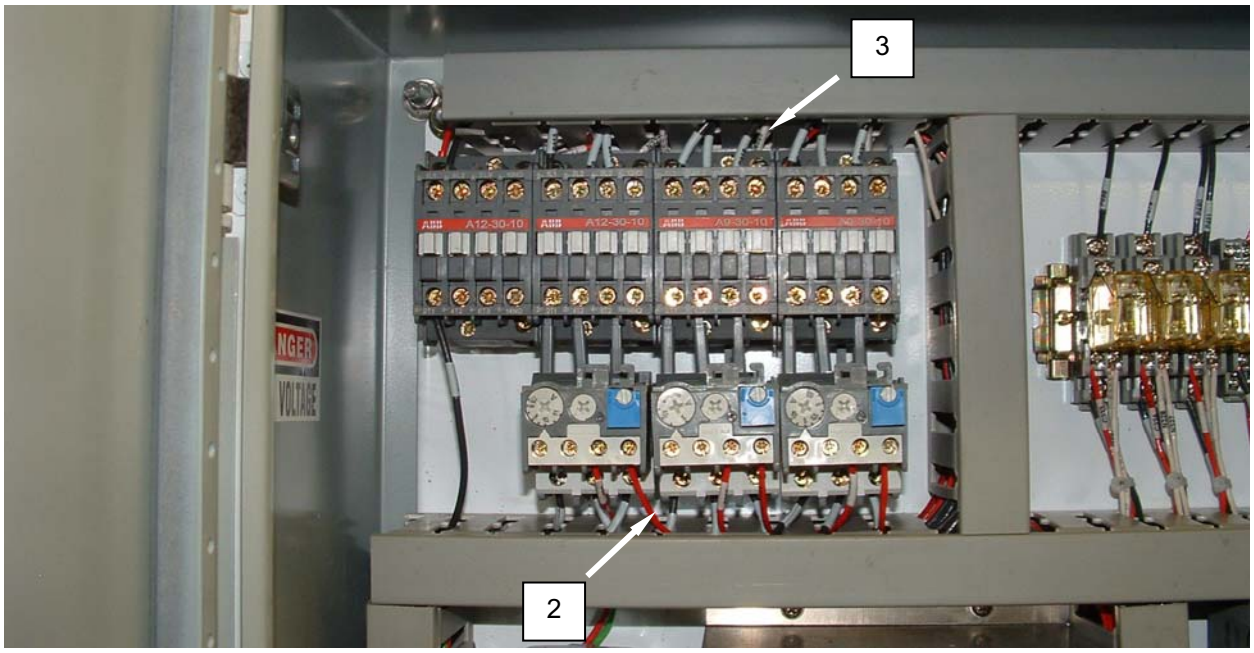


Figure 19. Nano Filter Differential Pressure High Alarm on PLC Display.

Table 1. PLC Troubleshooting Procedures for Containerized Batch Laundry - Continued.

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
15. P3 Pump Failure alarm at PLC **(Figure 20, Item 1)**	Perform troubleshooting steps in TM 10-3510-226-10, WP 0023 00.	
	Test overload relay **(Figure 21, Item 2)** and contactor **(Figure 21, Item 3)** IAW WP 0025 00.	Replace overload relay or contactor as necessary IAW WP 0026.
	Inspect Actuator A-1 **(Figure 21, Item 4)** for normal operation.	Disassemble and clean actuator as necessary. Test the actuator IAW procedures given in WP 0029 00.
	Check flow sensors **(Figure 21, Item 5)** for obstructions or mechanical damage.	Clean or replace flow sensors as necessary, IAW procedures given in WP 0027 00.
	Check P-3 pump for continuity IAW WP 0036 00.	Replace open motor.
		If alarm persists, notify direct support maintenance.

Figure 20. P3 Pump Failure Alarm on PLC Display.



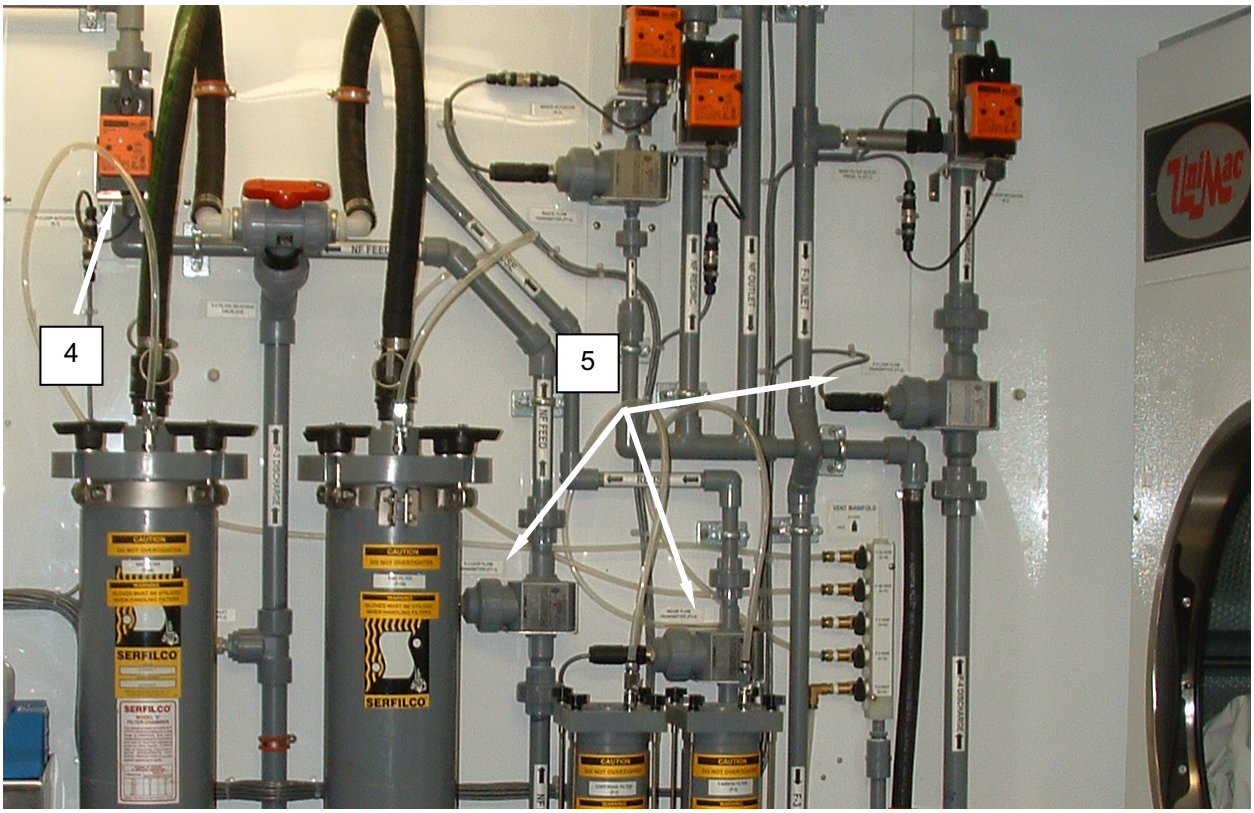
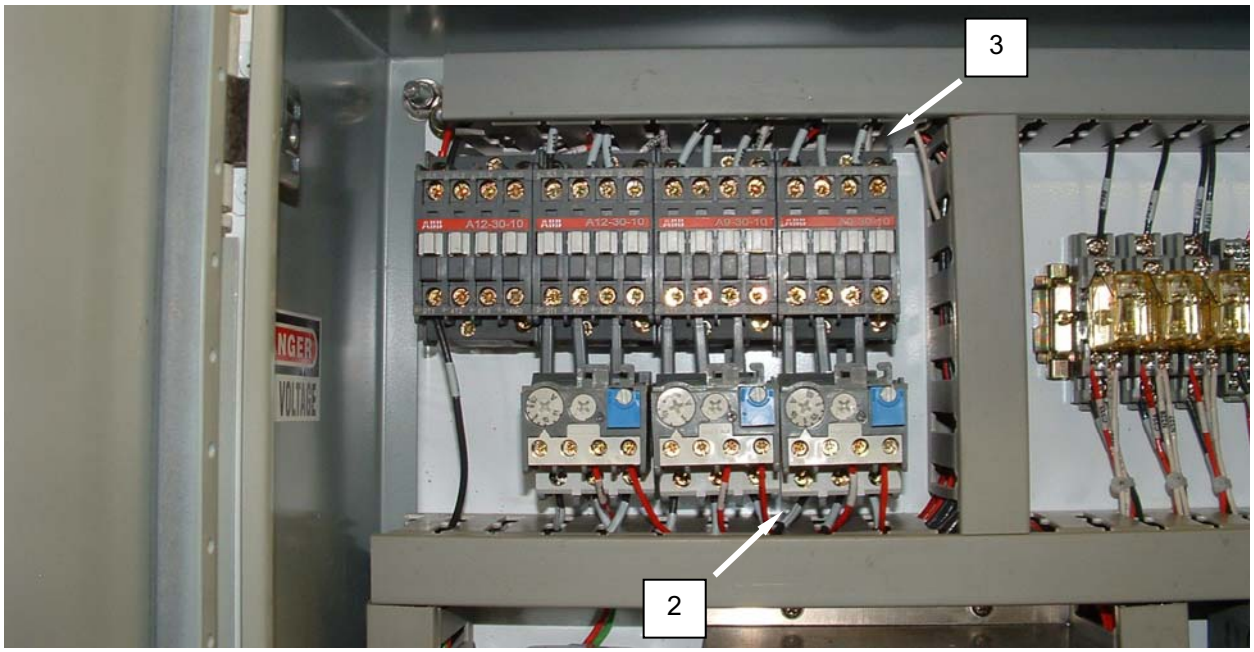


Figure 21. P3 Pump Alarm on PLC Display.

Table 1. PLC Troubleshooting Procedures for Containerized Batch Laundry - Continued.

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
16. P4 Pump alarm at PLC **(Figure 22, Item 1)**	Perform troubleshooting steps in TM 10-3510-226-10, WP 0023 00.	
	Test overload relay **(Figure 23, Item 2)** and contactor **(Figure 23, Item 3)** IAW WP 0025 00.	Replace overload relay or contactor as necessary IAW WP 0026 00.
	Inspect actuators **(Figure 23, Item 4)** for normal operation. Ensure the actuators are not locked in any one position.	Disassemble and clean actuators as necessary. Test the actuator IAW procedures given in WP 0029 00.
	Check flow sensors **(Figure 23, Item 5)** for obstructions or mechanical damage.	Clean or replace flow sensors as necessary, IAW procedures given in WP 0027 00.
	Check P-4 pump motor for continuity IAW WP 0038 00.	Replace open motor. If alarm persists, notify direct support maintenance.

Figure 22. P4 Pump Alarm on PLC Display.



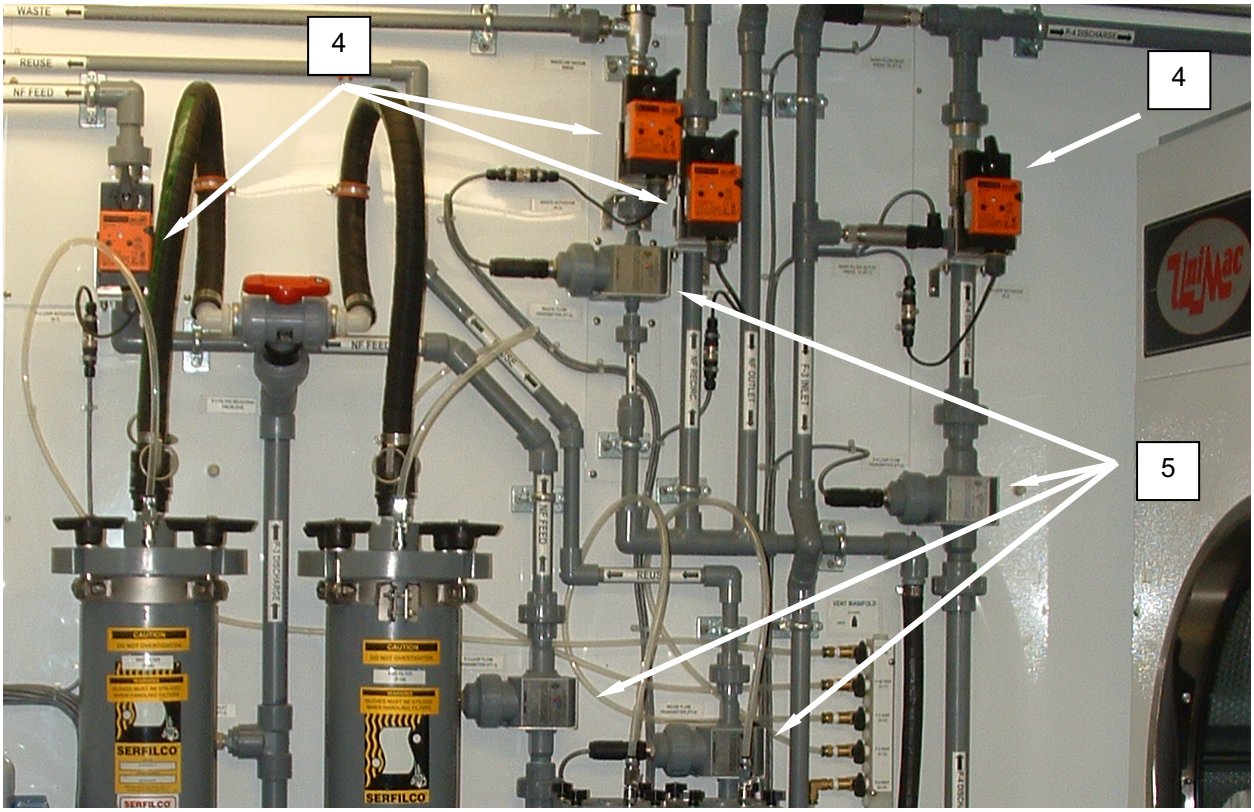


Figure 23. P4 Pump Alarm on PLC Display.

END OF WORK PACKAGE

UNIT MAINTENANCE
CONTAINERIZED BATCH LAUNDRY (CBL)
NSN 3510-01-527-2209
NSN 3510-01-527-2210
TROUBLESHOOTING PROCEDURES – PLUMBING

The troubleshooting procedures contain tables listing the malfunctions, tests or inspections, and corrective action required to return the CBL to normal operation. Perform the steps in the order they appear in the tables. Each procedure is headed by an initial setup. This setup outlines what is needed as well as certain conditions which must be met before starting the task.

DO NOT START THE TASK UNTIL:

- You understand the task.
- You understand what you are to do.
- You understand what is needed to do the work.
- You have the things you need.

Table 1. Plumbing Troubleshooting Procedures for Containerized Batch Laundry.

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
1. No source water to CBL	Ensure water supply **(Figure 1, Item 1)** is sufficient and available.	Replenish water supply. Ensure water supply valves are open. Ensure water supply and water supply hoses are not frozen.
	Check valve setup.	Set valves IAW TM 10-3510-226-10.
	Check Pump P-1 **(Figure 1, Item 2)**.	Ensure P-1 pump is operating. Note that the pump may be cycled off due to sufficient or high system pressure by either the pressure switch or the PLC. Prime pump if necessary IAW TM 10-3510-226-10.
		If further corrective action is required, notify direct support maintenance.

Figure 1. No Source Water to CBL.

Table 1. Plumbing Troubleshooting Procedure for Containerized Batch Laundry – Continued.

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
2. WTS hold tank overflows **WARNING** Always use safety equipment while maintaining graywater handling equipment. Failure to observe safety precautions may result in serious illness or death to personnel.	Check valve setup. Check Pump P-3 **(Figure 3, Item 2)** for normal operation. Check level sensor **(Figure 3, Item 3)**. Remove tank IAW the “Replace” procedure in WP 0040 00 and inspect interior for obstructions.	Ensure CBL is set up IAW TM 10-3510-226-10. Adjust valve V-15 **(Figure 2, Item 1)** to restrict flow. Ensure pump P-3 is ON at the PLC and the circuit breaker panel. Test and maintain Pump P-3 IAW procedures given in WP 0037 00. Clean and maintain level sensor IAW procedures given in WP 0030 00. Clear internal obstructions. If further corrective action is required, notify direct support maintenance.

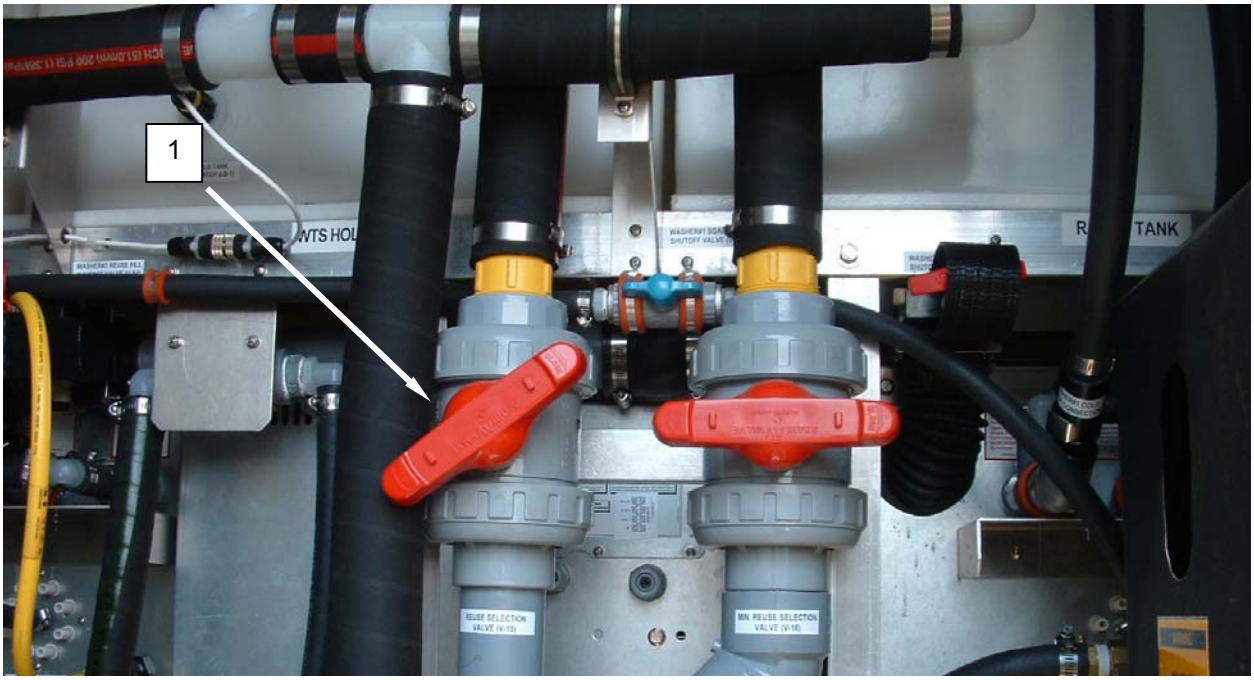


Figure 2. WTS Hold Tank Overflows.

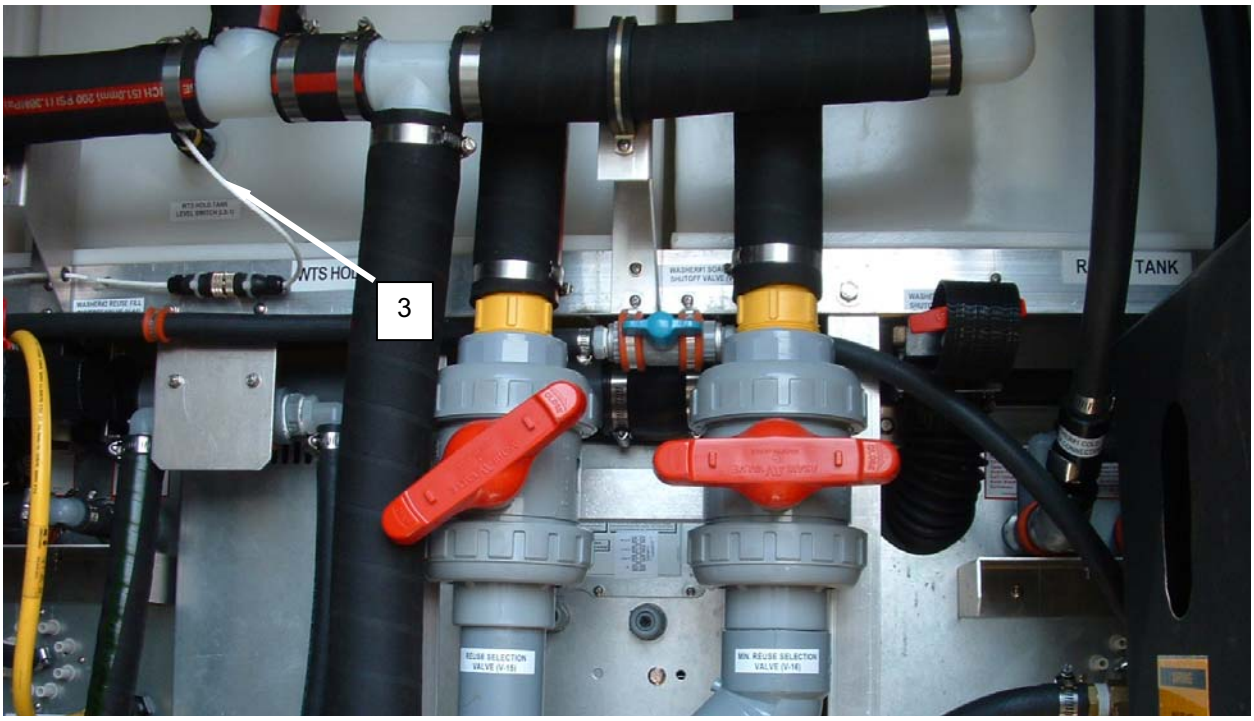
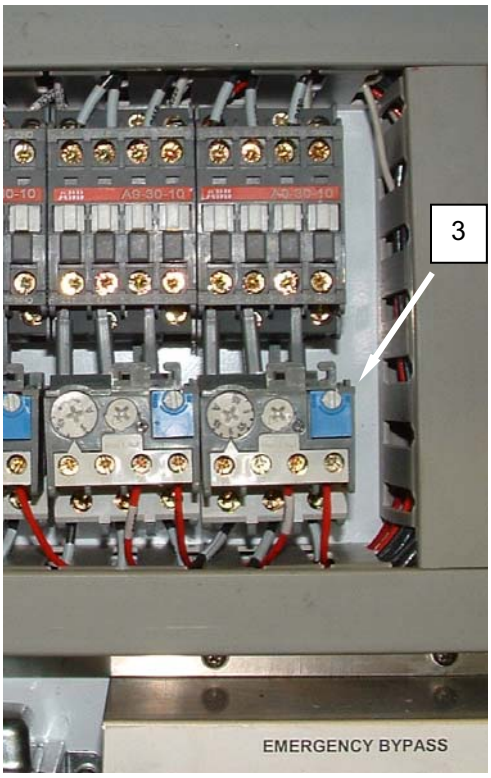


Figure 3. WTS Hold Tank Overflows.

Table 1. Plumbing Troubleshooting Procedure for Containerized Batch Laundry – Continued.

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
3. Nanofilter Feed Tank overflows **WARNING** Always use safety equipment while maintaining graywater handling equipment. Failure to observe safety precautions may result in serious illness or death to personnel.	Check valve setup. Check actuator valve A-1 **(Figure 4, Item 1)**. Check Pump P-4 **(Figure 5, Item 2)** for normal operation. Check level sensor **(Figure 5, Item 4)**. Remove tank and inspect interior for obstructions.	Ensure CBL is set up IAW TM 10-3510-226-10. Ensure actuator valve A-1 is not locked in the open position. Refer to WP 0029 00 for maintenance procedures. Ensure pump P-4 is ON at the PLC and the circuit breaker panel. Reset P-4 overload relay **(Figure 5, Item 3)**. Test and maintain Pump P-4 IAW procedures given in WP 0038 00. Clean and maintain level sensor IAW procedures given in WP 0030 00. Clear internal obstructions. If further corrective action is required, notify direct support maintenance.

Figure 4. Actuator Valve A-1.



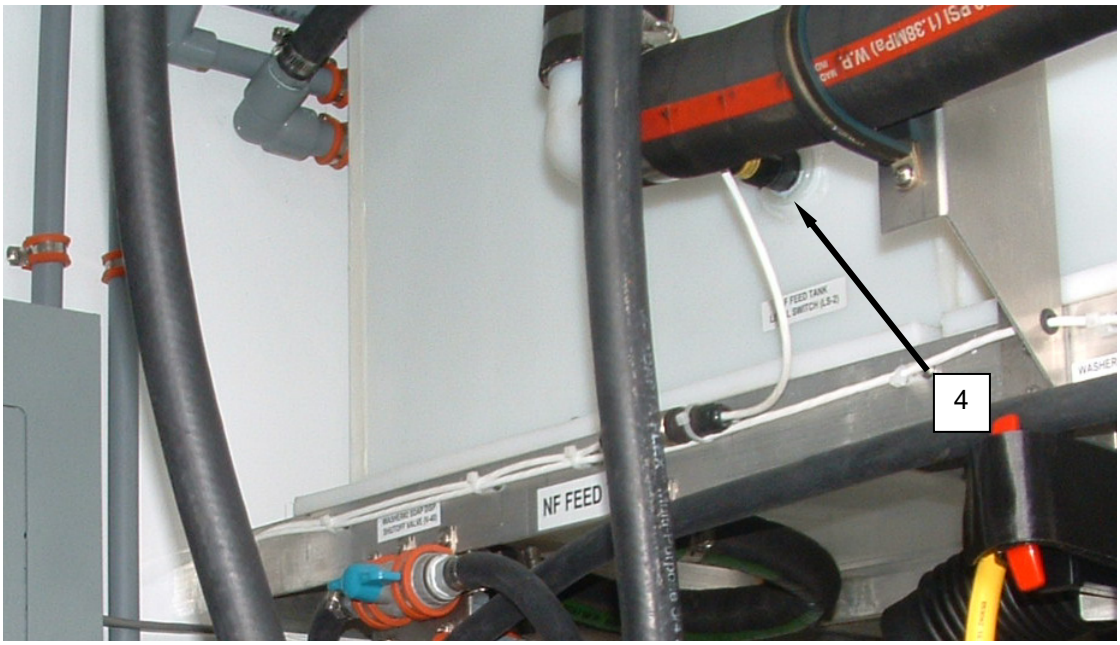


Figure 5. Nanofilter Feed Tank Overflows.

Table 1. Plumbing Troubleshooting Procedure for Containerized Batch Laundry – Continued.

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
4. Reuse Feed Tank overflows **WARNING** Always use safety equipment while maintaining graywater handling equipment. Failure to observe safety precautions may result in serious illness or death to personnel.	Check valve setup. Inspect Actuator A-3 **(Figure 6, Item 1)** and Actuator A-4 **(Figure 6, Item 2)** for normal operation. Remove tank and inspect interior for obstructions.	Ensure CBL is set up IAW TM 10-3510-226-10. If in Minimum Reuse mode, throttle valve V-16. Disassemble and clean actuator as necessary. Test the actuator IAW procedures given in WP 0029 00. Clear internal obstructions. If further corrective action is required, notify direct support maintenance.

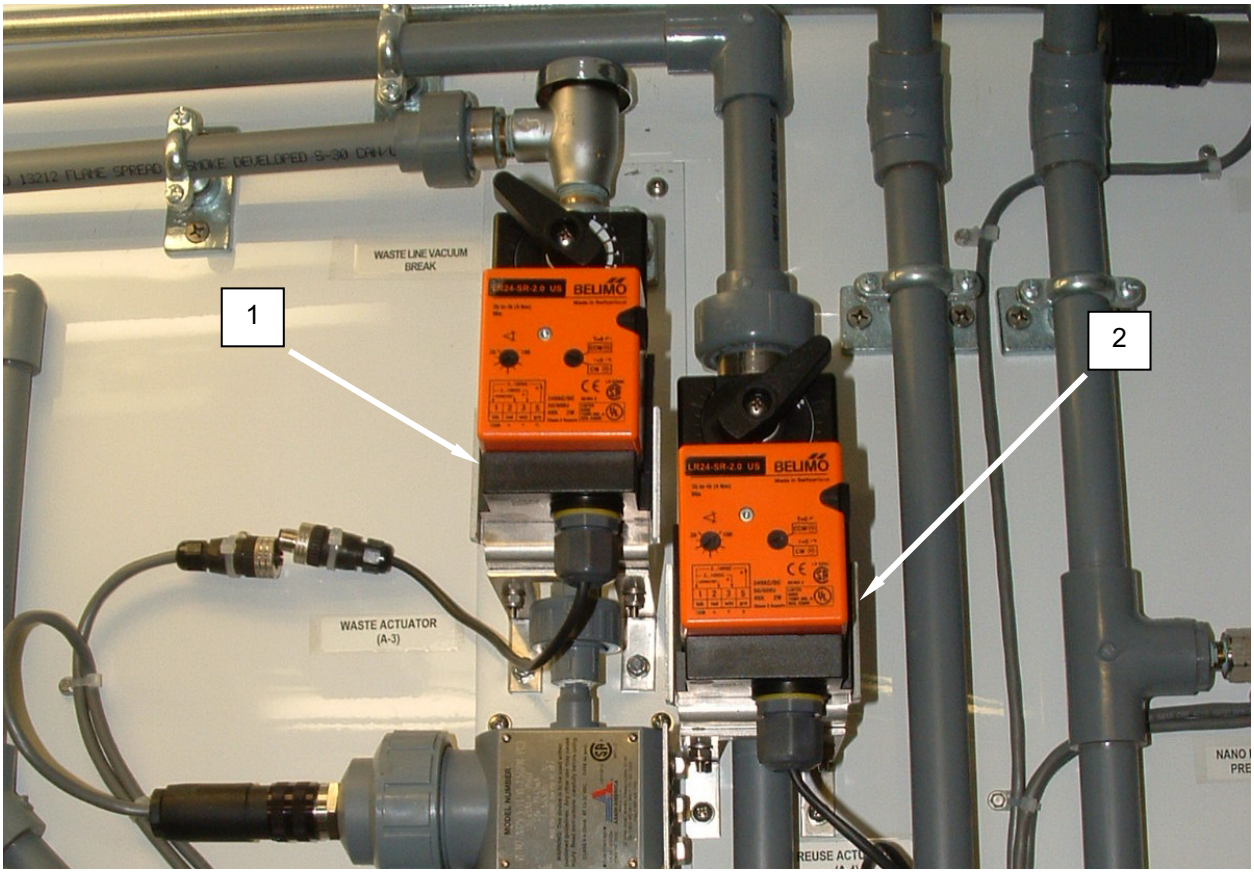


Figure 6. Reuse Feed Tank Overflows.

Table 1. Plumbing Troubleshooting Procedure for Containerized Batch Laundry – Continued.

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
5. High water consumption in full reuse mode	Check valve setup.	Ensure CBL is set up IAW TM 10-3510-226-10.
	Inspect system for leakage.	Repair leaks in hoses, pipes, or Water Treatment System components.
	Inspect Actuator A-3 **(Figure 7, Item 1)** and Actuator A-4 **(Figure 7, Item 2)** for normal operation.	Disassemble and clean actuator as necessary. Test the actuator IAW procedures given in WP 0029 00.
	Check washer main drain valve **(Figure 8, Item 3)**.	Maintain washer main drain valve IAW procedures in WP 0051 00.
		If further corrective action is required, notify direct support maintenance.

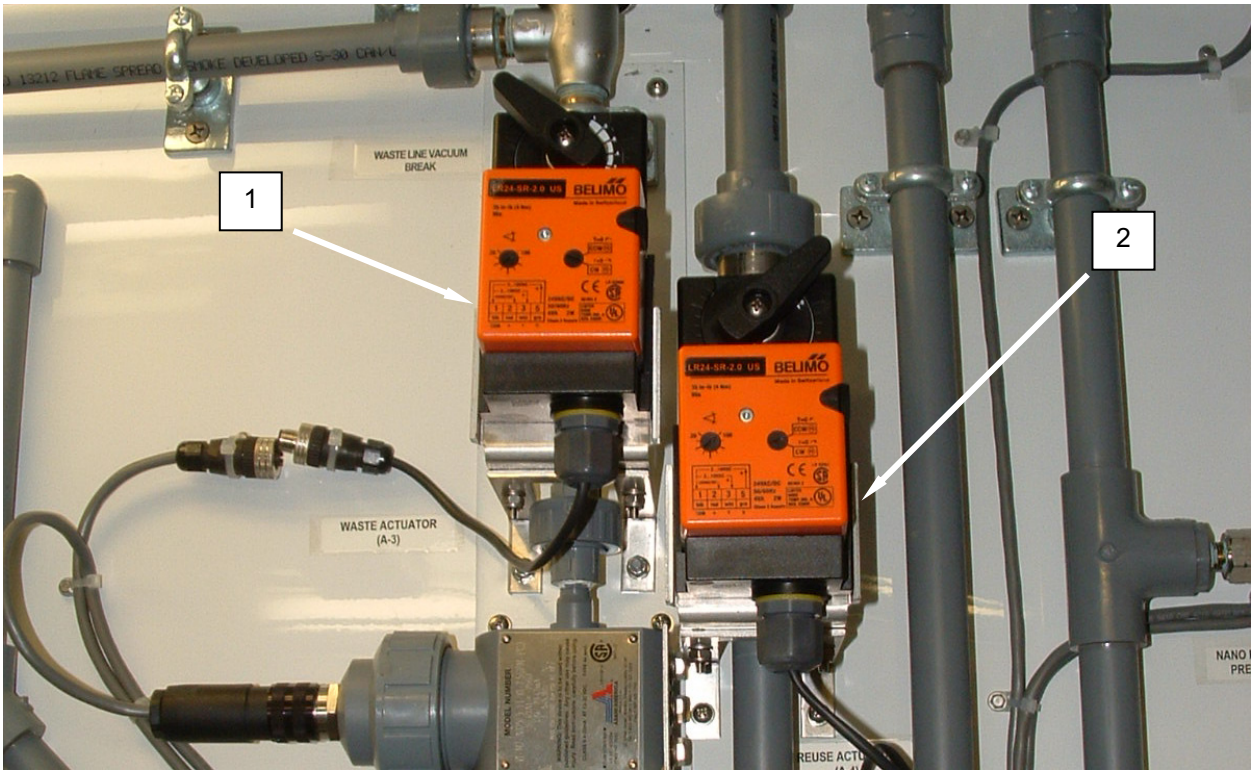


Figure 7. Actuator A-3 and A-4.

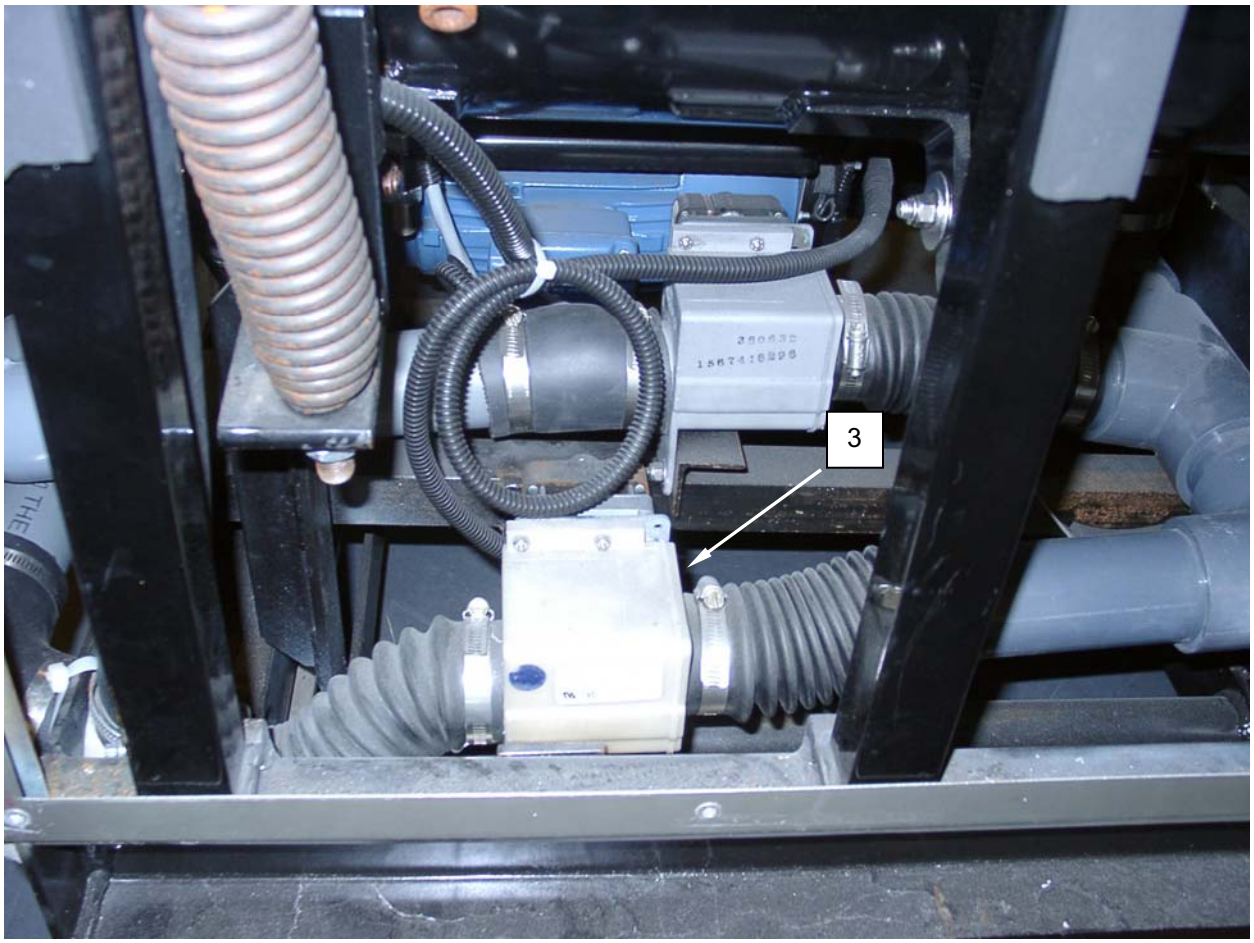


Figure 8. High Water Consumption in Full Reuse Mode.

Table 1. Plumbing Troubleshooting Procedure for Containerized Batch Laundry – Continued.

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
6. Pump P-1 short cycles	Verify water supply and valve setup.	Refill water supply. Ensure CBL is set up IAW TM 10-3510-226-10.
	Inspect system for leakage.	Repair leaks in hoses, pipes, or Water Treatment System components.
	Check pressure switch (**Figure 9, Item 1)** settings. Ensure pump activates at 30 psi and shuts down at 60 psi.	Adjust pressure switch IAW procedures given in WP 0035 00.
	Ensure check valve **(Figure 10, Item 2)** is operable.	Service or replace check valve IAW WP 0031 00.
		If further corrective action is required, notify direct support maintenance.

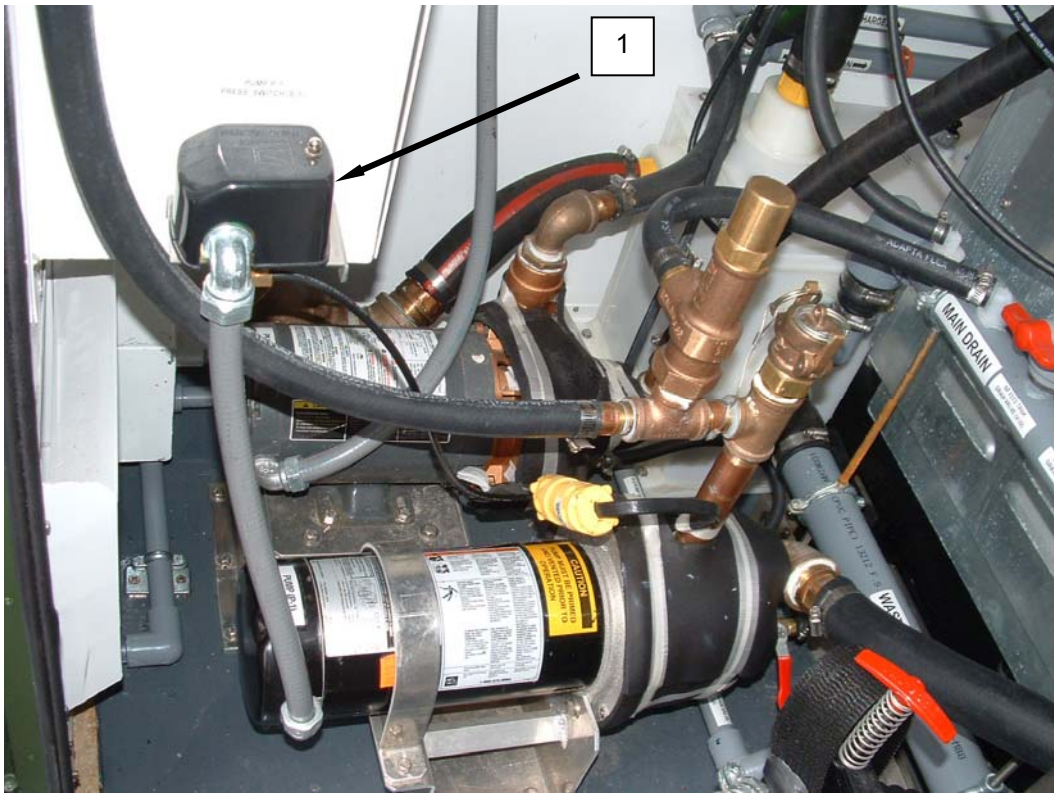


Figure 9. Pump P-1 Short Cycles – Pressure Switch.

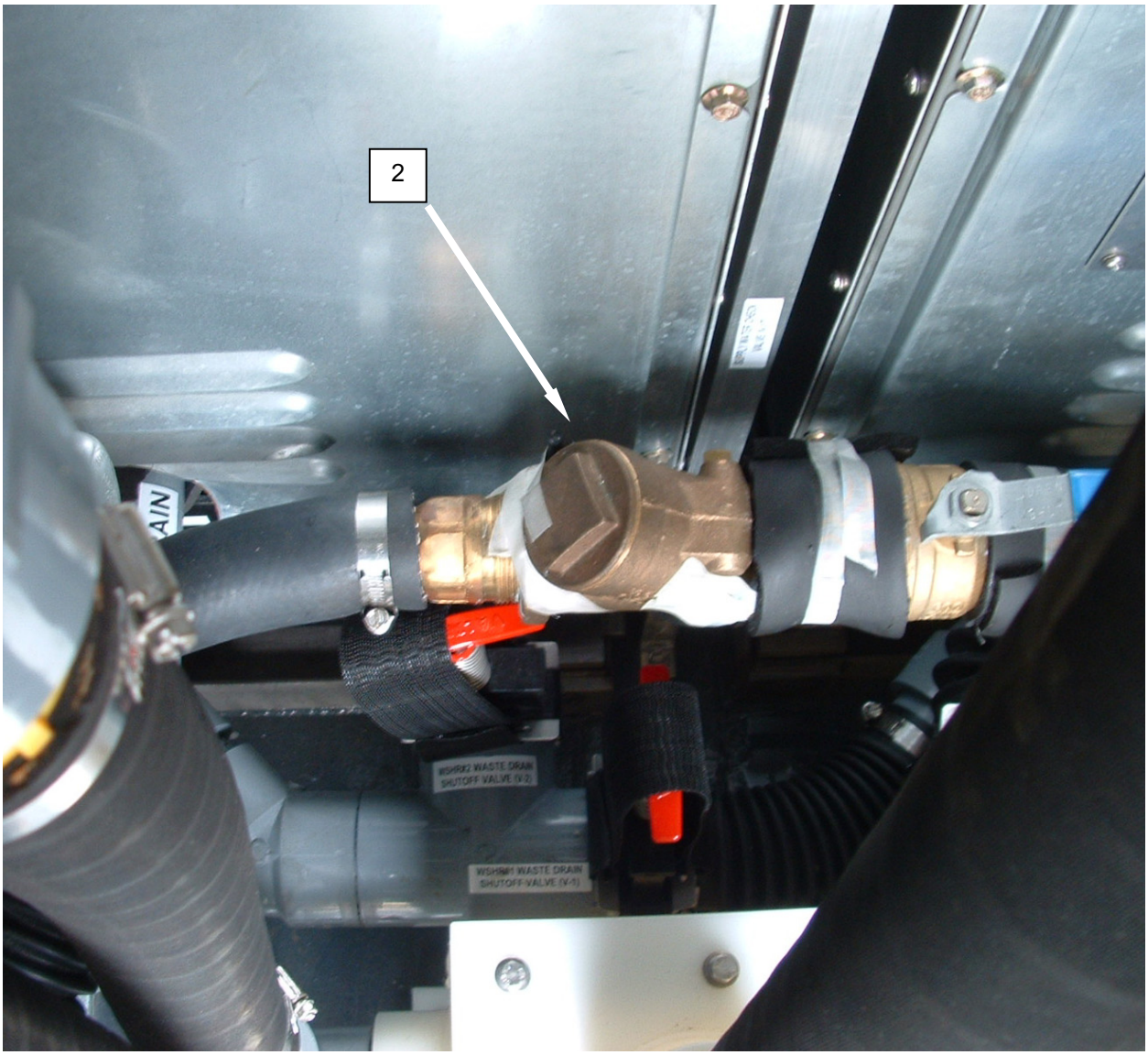


Figure 10. Pump P-1 Short Cycles – Check Valve.

UNIT MAINTENANCE
CONTAINERIZED BATCH LAUNDRY (CBL)
NSN 3510-01-527-2209
NSN 3510-01-527-2210
TROUBLESHOOTING PROCEDURES - WASHER

The troubleshooting procedures contain tables listing the malfunctions, tests or inspections, and corrective action required to return the CBL to normal operation. Perform the steps in the order they appear in the tables. Each procedure is headed by an initial setup. This setup outlines what is needed as well as certain conditions which must be met before starting the task.

DO NOT START THE TASK UNTIL:

- You understand the task.
- You understand what you are to do.
- You understand what is needed to do the work.
- You have the things you need.

Table 1. Washer Troubleshooting Procedures for Containerized Batch Laundry.

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
1. No electrical power to washer(s)	 **WARNING** The equipment being tested or corrected operates at voltage and current that can cause serious injury or death. Check washer plugs and receptacles **(Figure 1, Item 1)** for proper connection and material damage. Check circuit breaker No 2, 4 **(Figure 2, Item 2)** for washer No.1 and 10, 12 **(Figure 2, Item 3)** for washer No. 2. Check washer internal fuses **(Figure 2, Item 4)**. Check power output from washer variable frequency drive **(Figure 2, Item 5)**.	 **WARNING** The equipment being tested or corrected operates at voltage and current that can cause serious injury or death. Reconnect washer plugs. Replace damaged plugs or receptacles IAW WP 0023 00. Reset circuit breaker(s). Test and replace open fuses IAW procedures in WP 0045 00. Replace an inoperative variable frequency drive IAW WP 0053 00. If further corrective action is required, notify direct support maintenance.

Figure 1. Check Washer plugs and Receptacles.

Figure 2. No Electrical Power to Washers.

Table 1. Washer Troubleshooting Procedure for Containerized Batch Laundry – Continued.

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
2. "Didn't fill within time" Error Message On Washer	Ensure washer QD fittings **(Figure 3, Item 1)** are correctly and securely installed.	Refit QD fittings.
	Check fill valves **(Figure 3, Item 2)** in top of washer IAW procedures given in WP 0044 00.	Clean fill valve sediment strainers. Replace inoperative fill valve. Refer to WP 0044 00.
	Check main drain **(Figure 4, Item 3)** and reuse drain valves **(Figure 4, Item 4)** IAW procedures given in WP 0051 00 and 0052 00.	Replace inoperative valves. Refer to WP 0051 00 and 0052 00.
		If further corrective action is required, notify direct support maintenance.

Figure 3. QD Fittings and Fill Valves on Washer.

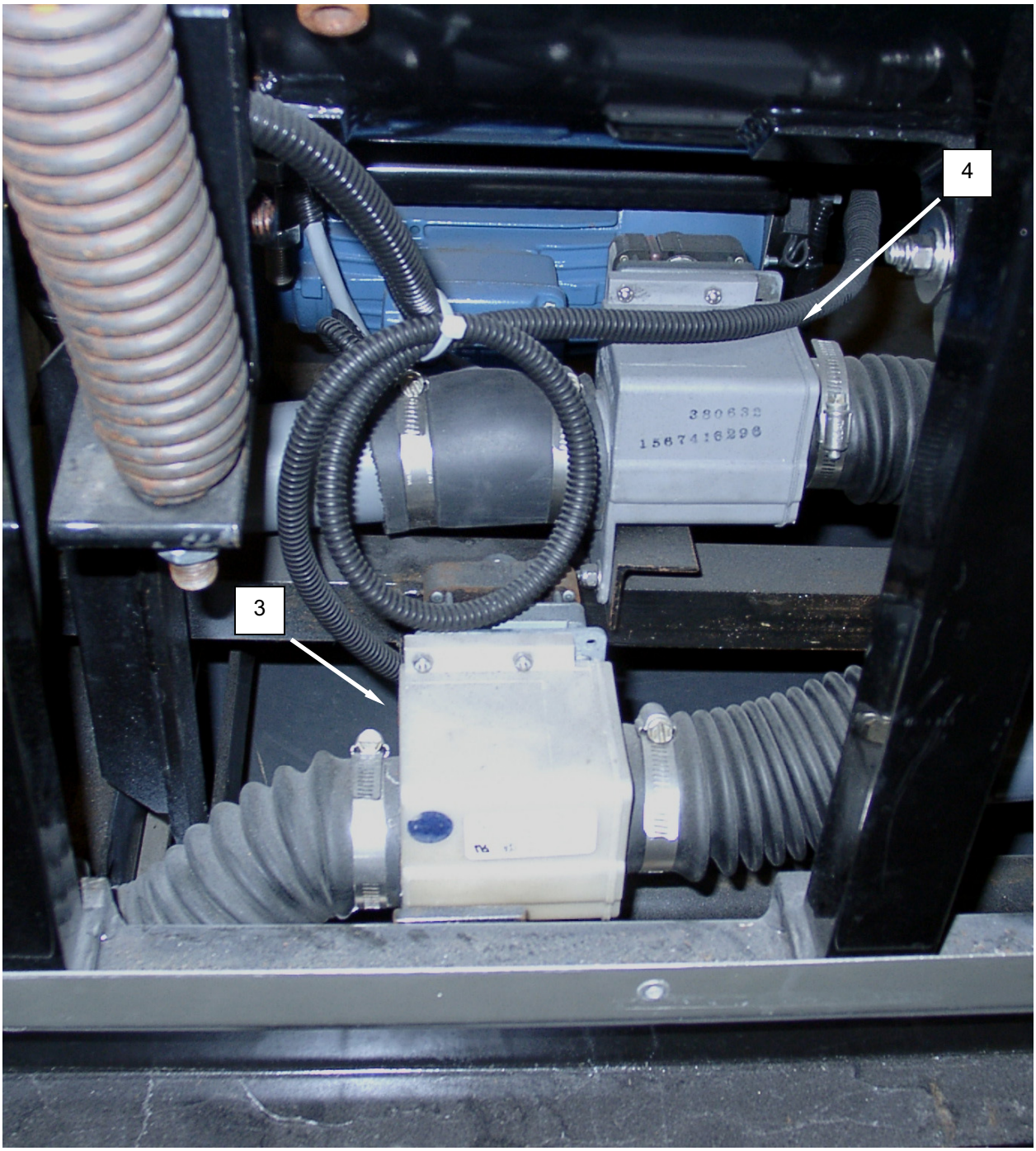


Figure 4. Didn't Fill Within Time Error on Washer.

Table 1. Washer Troubleshooting Procedure for Containerized Batch Laundry – Continued.

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
3. "Empty" Error Message On Washer	Ensure pump is plugged into receptacle **(Figure 5, Item 1)**.	Reconnect pump plug to receptacle.
	Check circuit breaker No. 6 **(Figure 5, Item 2)**.	Ensure WTS transfer tank sump pump circuit breaker is ON, and pump is functioning.
	Check valve setup from WTS transfer tank **(Figure 6, Item 3)**.	Ensure CBL is set up IAW TM 10-3510-226-10.
	Inspect sump pump **(Figure 6, Item 4)** for obstructions.	Remove sump pump and clear sump pump intake of obstructions.
	Test sump pump **(Figure 6, Item 4)** for continuity IAW WP 0034 00.	Replace inoperative sump pump IAW WP 0034 00.
	Check washer main drain valve **(Figure 6, Item 5)**.	Maintain washer main drain valve IAW procedures in WP 0051 00.
		If further corrective action is required, notify direct support maintenance.

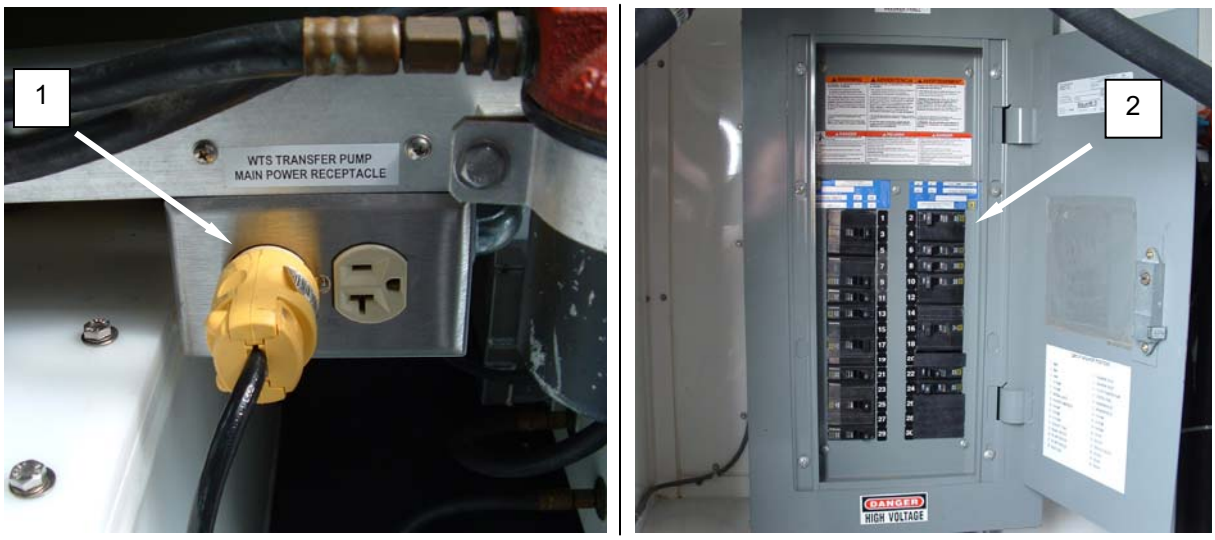


Figure 5. Check Pump and Circuit Breaker.

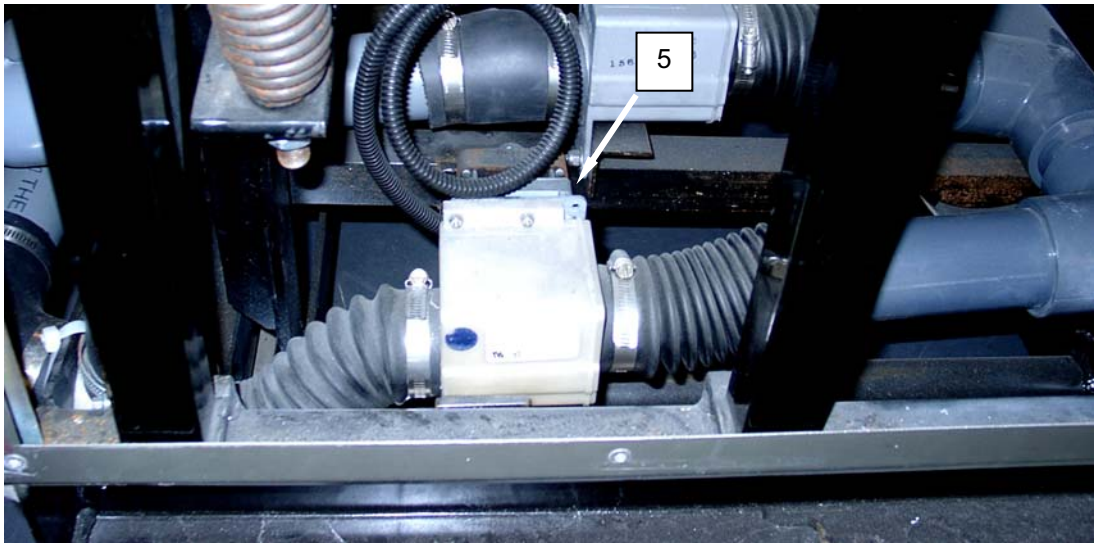


Figure 6. Empty Error on Washer.

Table 1. Washer Troubleshooting Procedure for Containerized Batch Laundry – Continued.

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
4. "Speed Detection" Error On Washer	Verify error message.	Replace inoperative speed detector **(Figure 7, Item 1)**. Refer to WP 0048 00. If further corrective action is required, notify direct support maintenance.

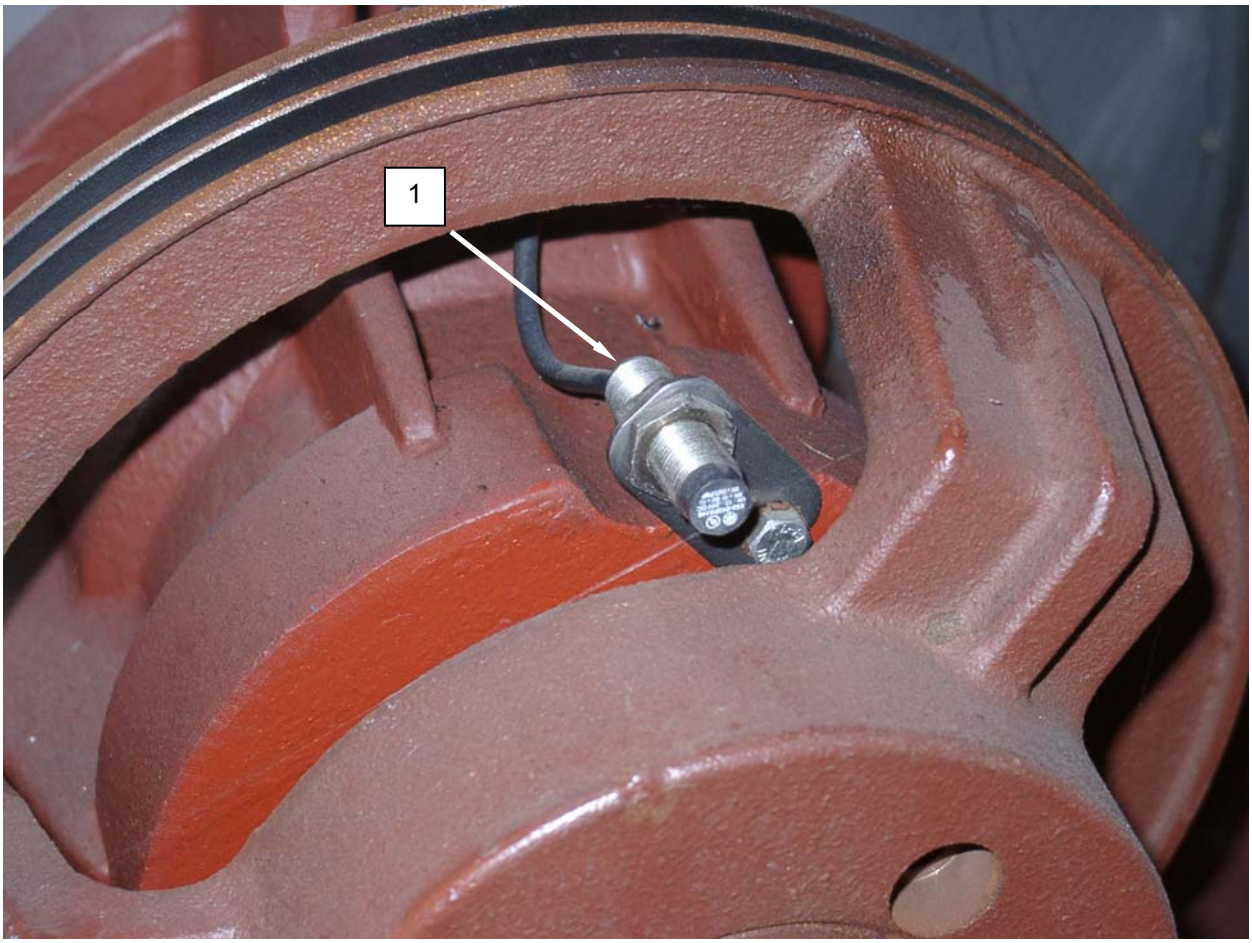


Figure 7. Speed Detection Error on Washer.

Table 1. Washer Troubleshooting Procedure for Containerized Batch Laundry – Continued.

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
5. Washer door will not latch	Check latch assembly **(Figure 8, Item 1)** for loose or missing components and material damage.	Adjust or replace latch components as necessary. Refer to WP 0042 00. If further corrective action is required, notify direct support maintenance.

Figure 8. Washer Door will not Latch.

Table 1. Washer Troubleshooting Procedure for Containerized Batch Laundry – Continued.

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
6. Drum rotates slowly or not at all (may come with "Speed Detection" error)	Inspect belt tension **(Figure 9, Item 1)**. Check output of Variable Frequency Drive **(Figure 9, Item 2)** IAW procedures given in WP 0053 00. Test motor **(Figure 9, Item 3)** IAW procedures given in WP 0056 00.	Adjust or replace belt IAW procedures given in WP 0055 00. Replace Variable Frequency Drive IAW procedures given in WP 0053 00. Replace motor IAW procedures given in WP 0056 00. If further corrective action is required, notify direct support maintenance.

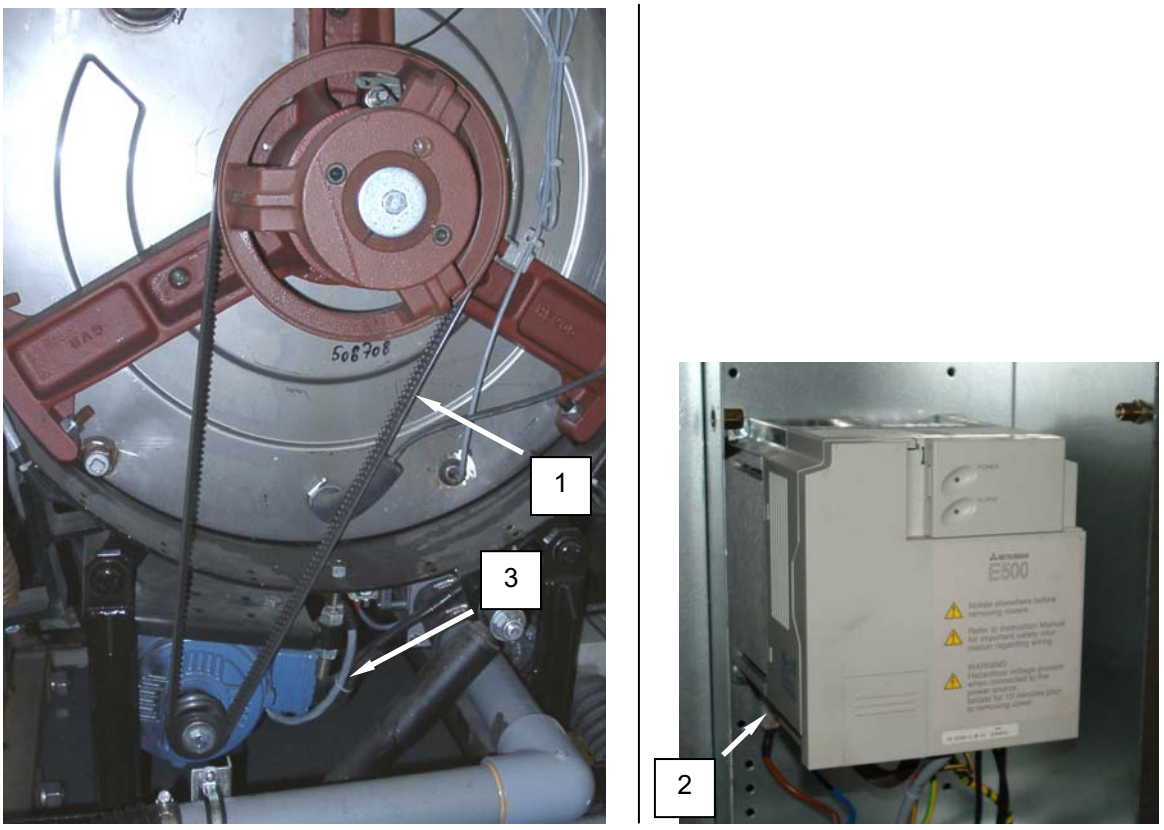


Figure 9. Drum Rotates slowly or not at All.

Table 1. Washer Troubleshooting Procedure for Containerized Batch Laundry – Continued.

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
7. Washer “squeals” during operation	Inspect belt tension **(Figure 10, Item 1)**.	Adjust or replace belt IAW procedures given in WP 0055 00. If further corrective action is required, notify direct support maintenance.

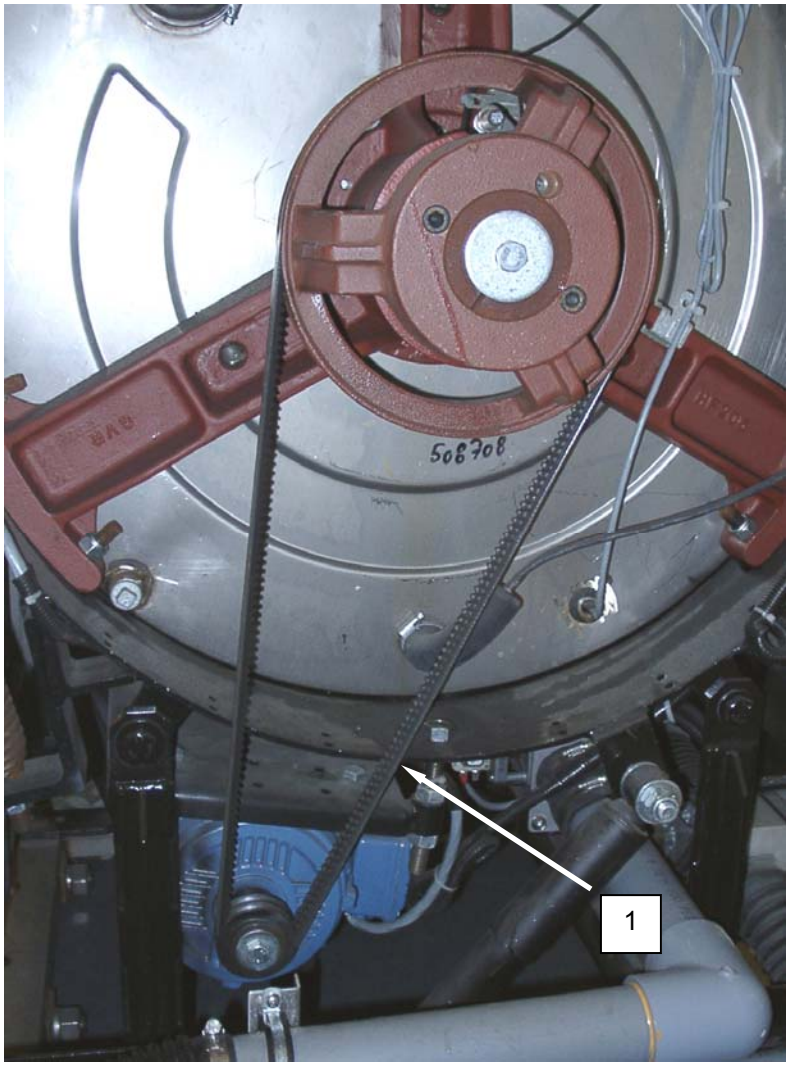


Figure 10. Washer Squeals during Operation.

Table 1. Washer Troubleshooting Procedure for Containerized Batch Laundry – Continued.

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
8. Washer overfills	Ensure level sensor tube **(Figure 11, Item 1)** is connected and clear of obstructions.	Clear level sensor tube and reconnect to level sensor.
	Check for leakage which may indicate level sensor tube **(Figure 11, Item 1)** has disconnected or broken at the drum.	Reconnect or replace level sensor tube IAW procedures given in WP 0046 00.
	Check inlet valves **(Figure 12, Item 2)** for proper closure.	Clear or replace inlet valves as necessary IAW procedures given in WP 0044 00.
		Replace washer control board **(Figure 11, Item 3)** IAW procedures given in WP 0045 00.
		If further corrective action is required, notify direct support maintenance.

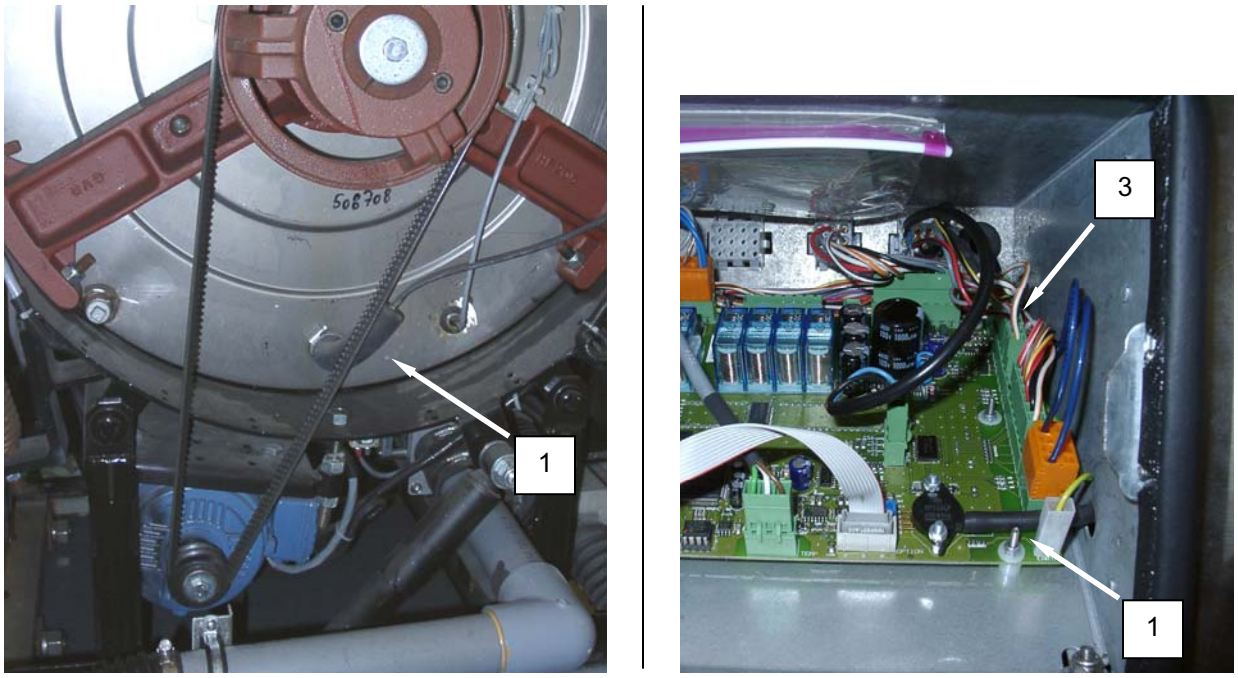


Figure 11. Level Sensor Tube and Washer Control Board.

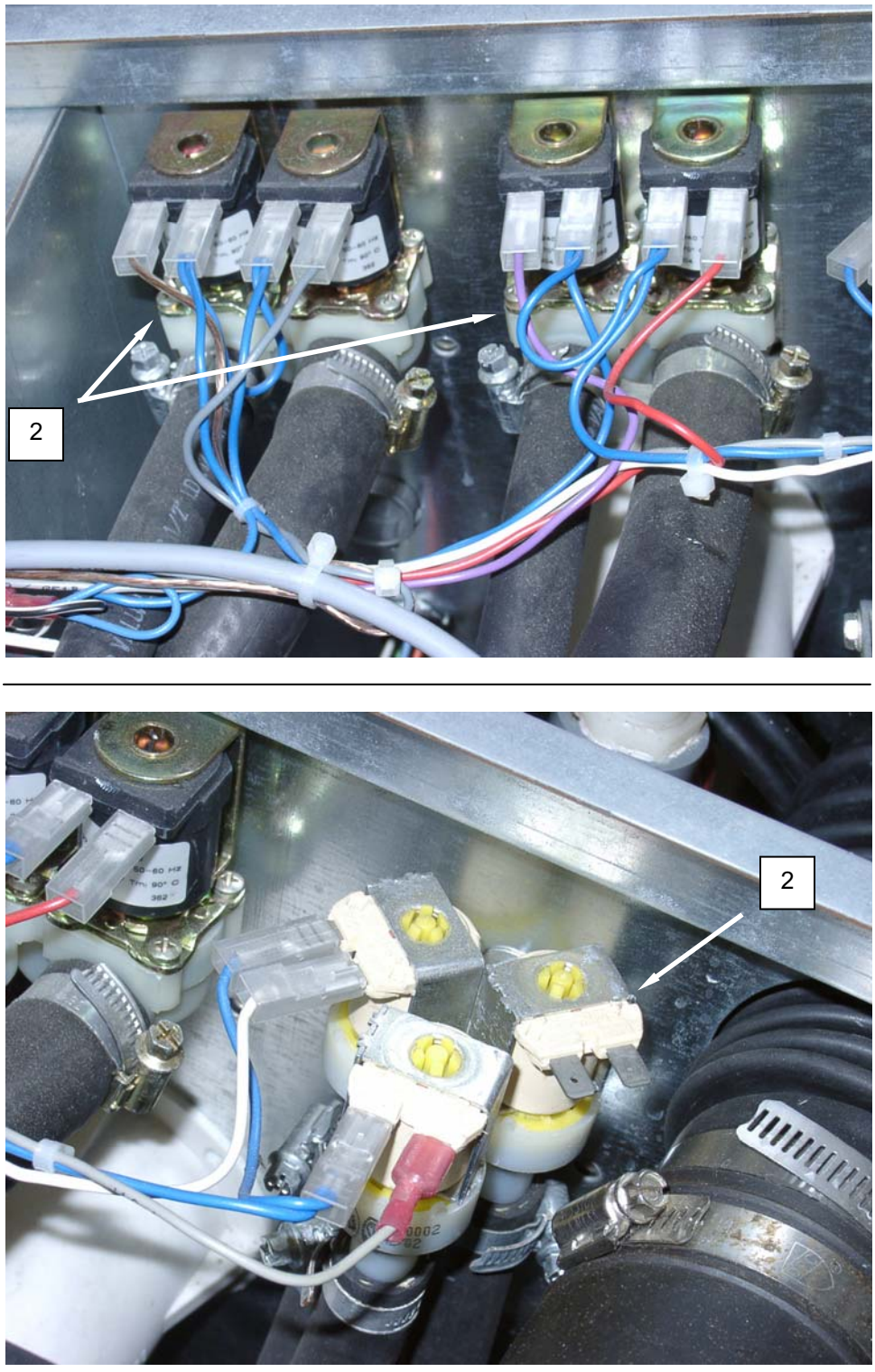


Figure 12. Washer Overfills.

Table 1. Washer Troubleshooting Procedure for Containerized Batch Laundry – Continued.

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
9. Washer "knocks" or shows noticeable imbalance regardless of load	Verify that snubbers and shipping brackets **(Figure 13, Item 1)** have been removed. Run washer without any load. If condition persists, check springs **(Figure 14, Item 2)** or shock absorbers **(Figure 14, Item 3)**.	Remove snubbers and shipping brackets. Reconnect or replace loose or damaged springs and shock absorbers IAW WP 0054 00. If further corrective action is required, notify direct support maintenance.

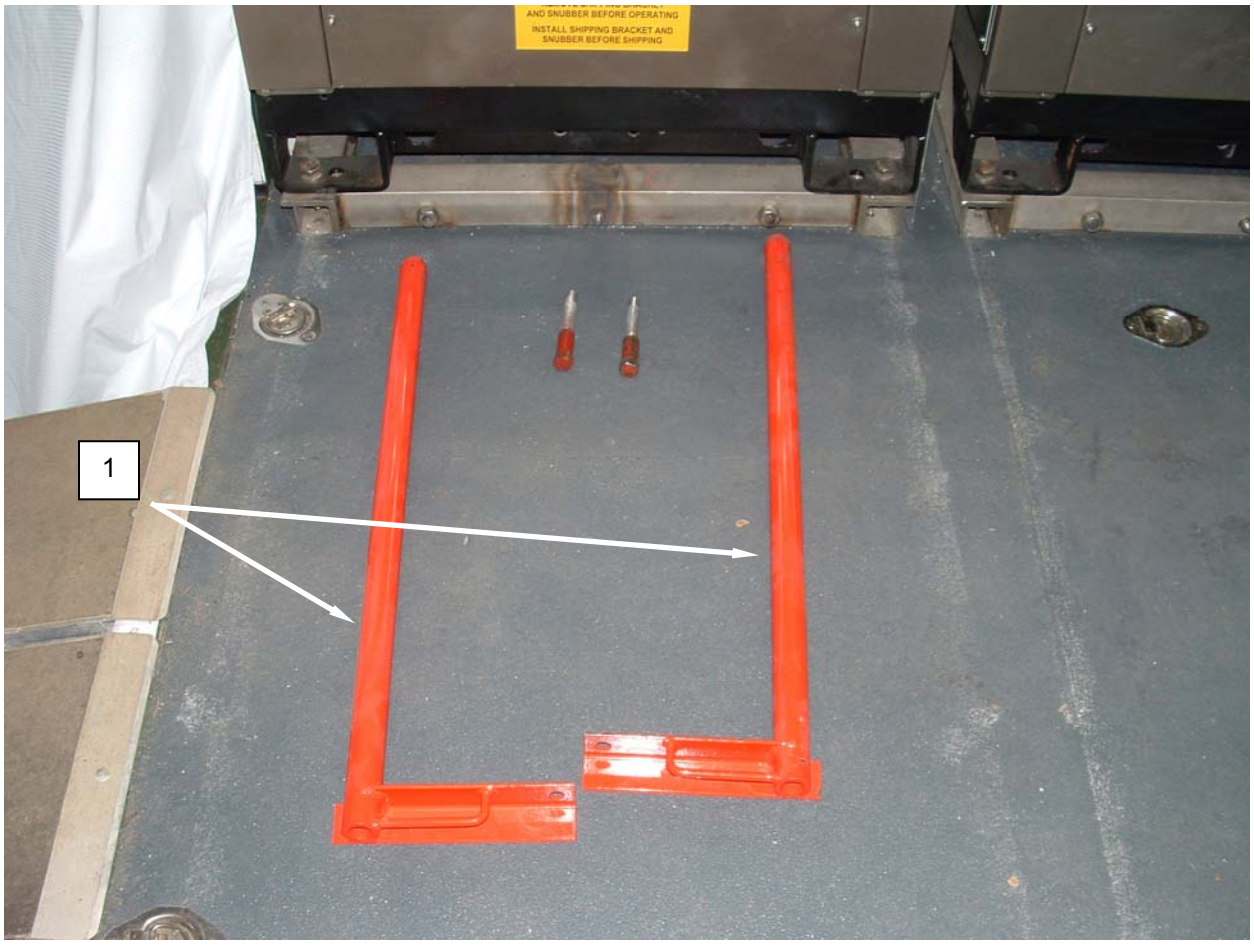
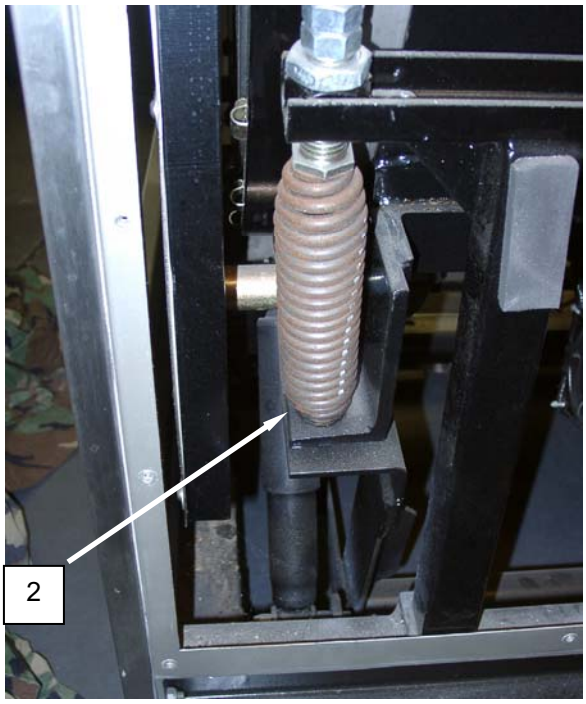


Figure 13. Snubbers and Shipping Brackets.



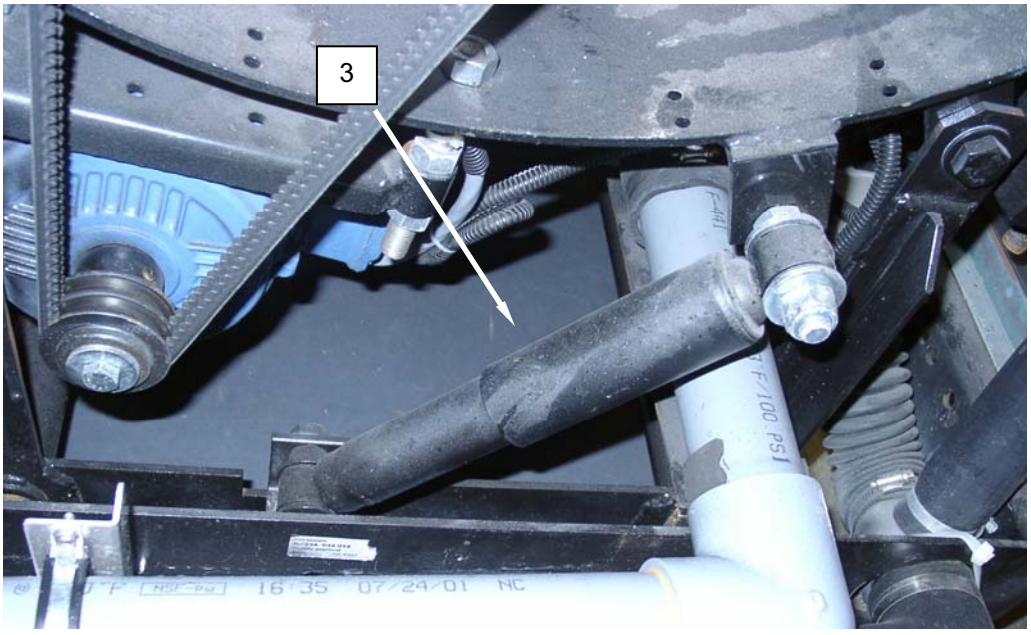


Figure 14. Washer Knocks or shows Noticeable Imbalance Regardless of Load.

END OF WORK PACKAGE

UNIT MAINTENANCE
CONTAINERIZED BATCH LAUNDRY (CBL)
NSN 3510-01-527-2209
NSN 3510-01-527-2210
TROUBLESHOOTING PROCEDURES – AUTOMATIC SOAP DISPENSER

The troubleshooting procedures contain tables listing the malfunctions, tests or inspections, and corrective action required to return the CBL to normal operation. Perform the steps in the order they appear in the tables. Each procedure is headed by an initial setup. This setup outlines what is needed as well as certain conditions which must be met before starting the task.

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- You understand what you are to do.
- You understand what is needed to do the work.
- You have the things you need.

Table 1. Automatic Soap Dispenser Troubleshooting Procedures for Containerized Batch Laundry.

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
1. Water from overflow tube	Check if pressure regulator **(Figure 1, Item 1)** is set too high.	Set the pressure regulator to 18 psi on the pressure gauge.
	Check for blocked check valve **(Figure 1, Item 2)**.	Clear blockage from check valve
	If pump **(Figure 2, Item 3)** is running, turn cabinet power "OFF", and check if solution is flowing to machine.	If water continues to flow, repair/replace the main solenoid. Refer to WP 0058 00.
	If pump **(Figure 2, Item 3)** is not running, turn cabinet power OFF and check all of the pump circuit connections. Turn cabinet power ON and run a washer through a routine cycle.	If pump does not turn on, replace the pump. Refer to WP 0058 00.
	Check for pinched delivery tube **(Figure 2, Item 4)**.	Repair or replace as needed. If further corrective action is required, notify direct support maintenance.

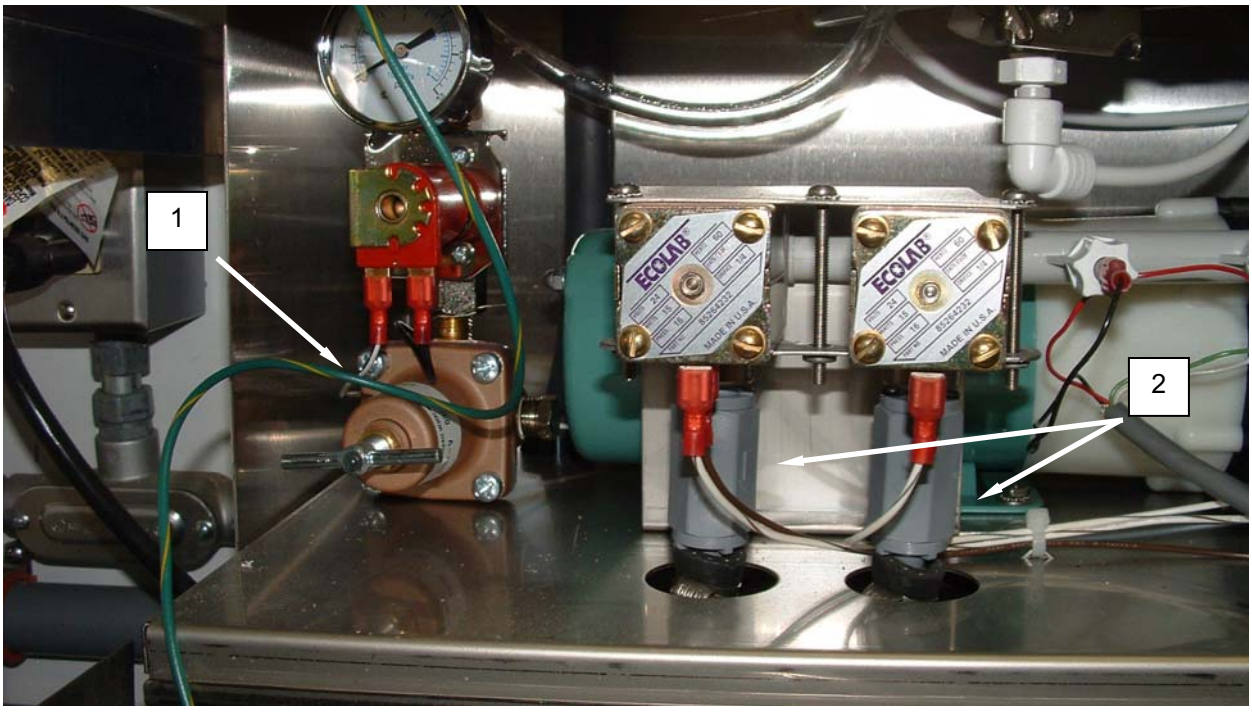


Figure 1. Water from Overflow Tube.

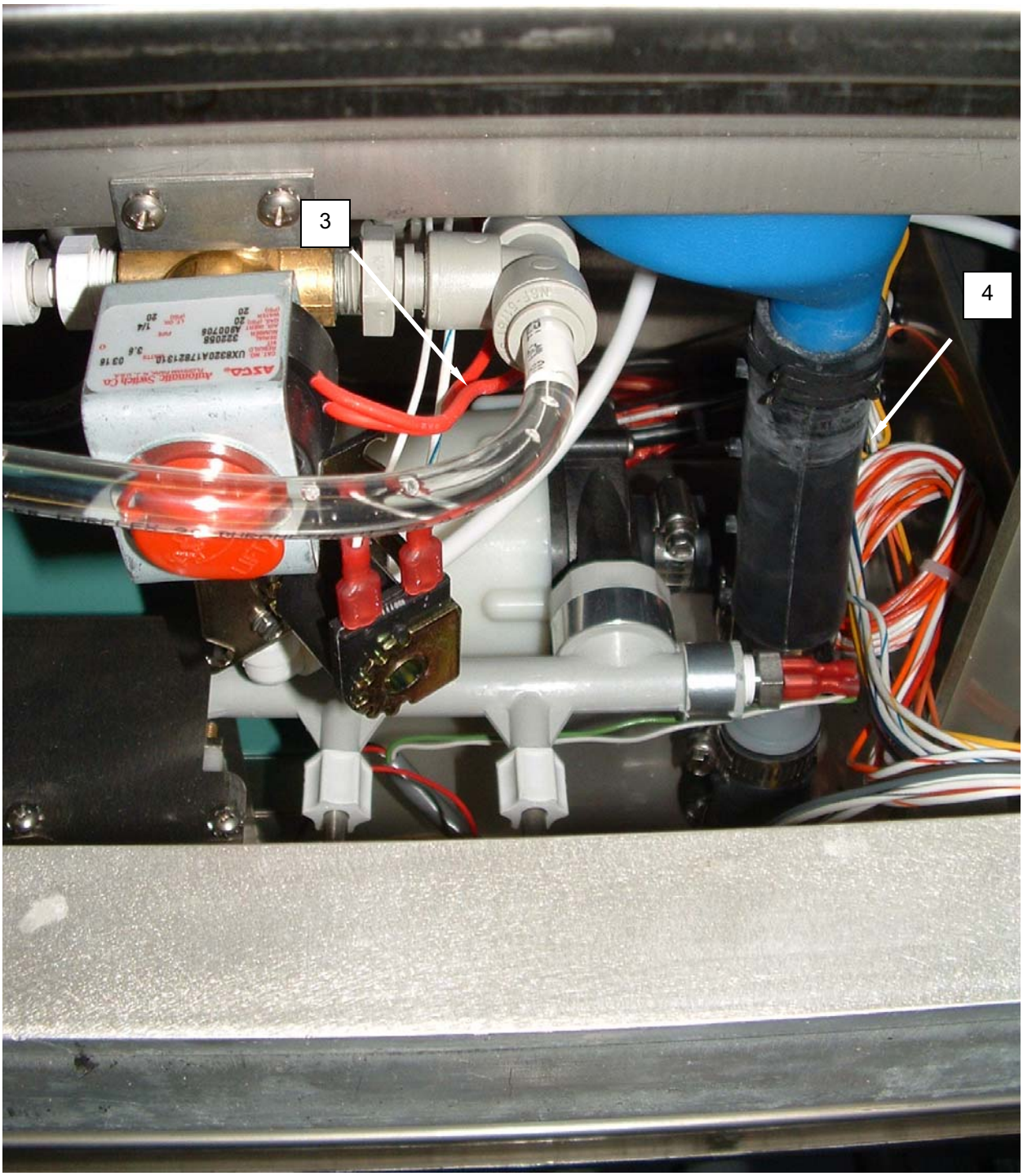
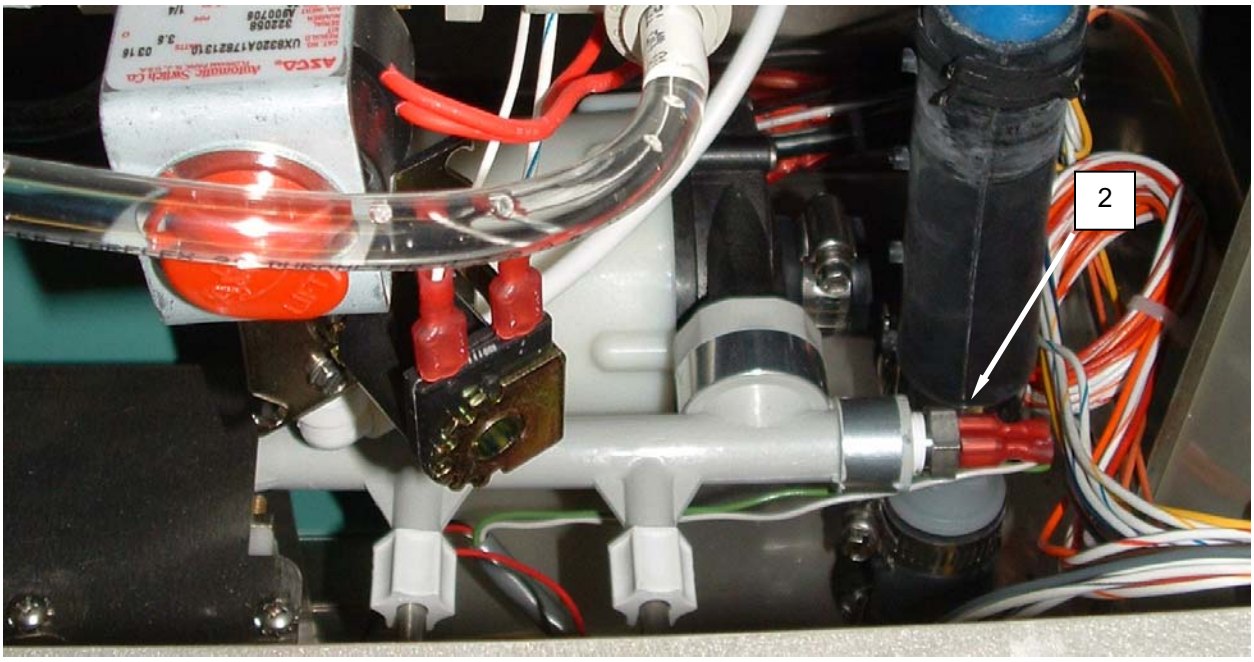


Figure 2. Water from Overflow Tube.

Table 1. Automatic Soap Dispenser Troubleshooting Procedures for Containerized Batch Laundry – Continued.

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
2. No temperature display **(Figure 3, Item 1)**	Check connections at the thermistor **(Figure 4, Item 2)**. Take wires off thermistor **(Figure 4, Item 2)** and connect together with a jumper. Press Key 7 **(Figure 4, Item 3)** on the control panel and watch temperature display **(Figure 3, Item 1)**.	Clean and refit thermistor connectors. If temperature changes, replace thermistor IAW procedures given in WP 0058 00. If temperature remains the same, notify direct support maintenance. If further corrective action is required, notify direct support maintenance.

Figure 3. No Temperature Display.



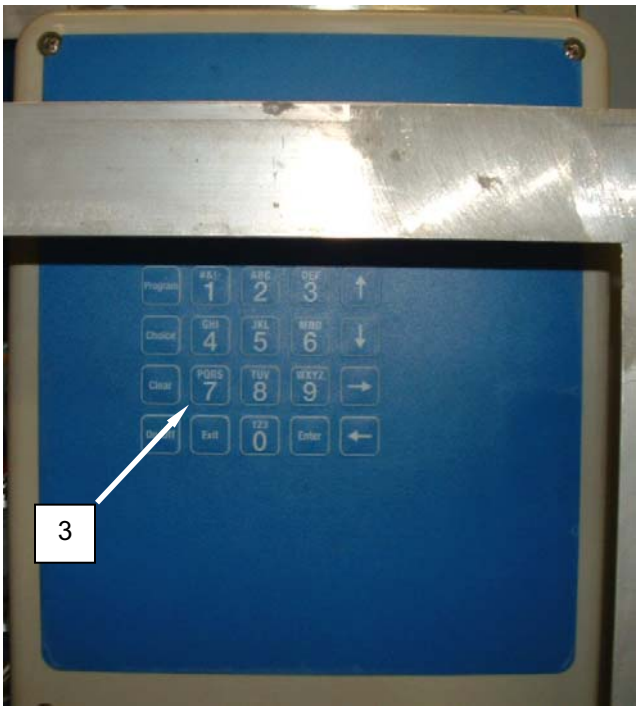
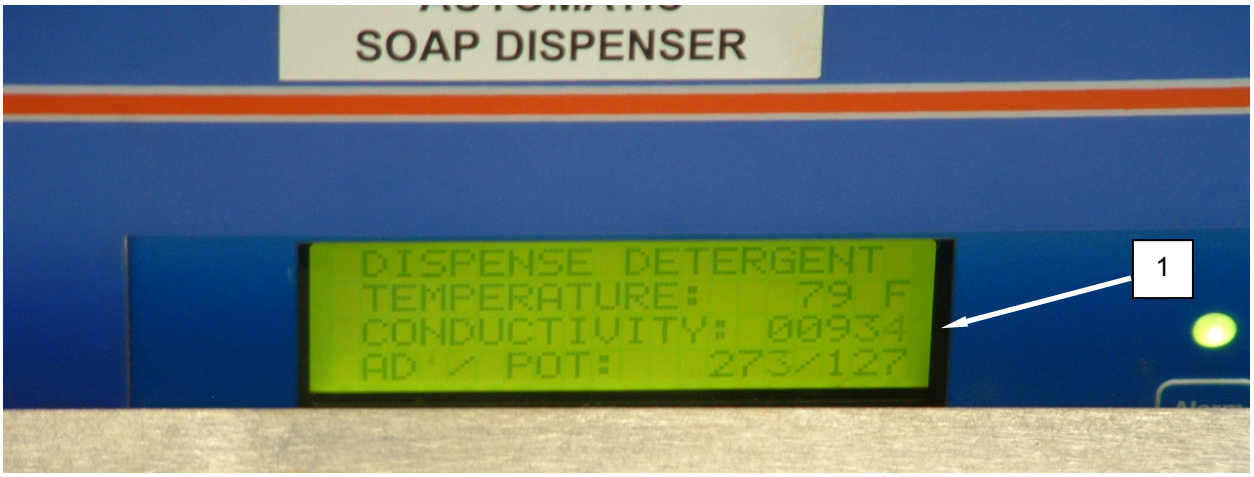


Figure 4. No Temperature Display.

Table 1. Automatic Soap Dispenser Troubleshooting Procedures for Containerized Batch Laundry – Continued.

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
3. No conductivity display **(Figure 5, Item 1)**	Check connections at the conductivity cells **(Figure 5, Item 2)**.	If connections are OK, notify direct support maintenance.



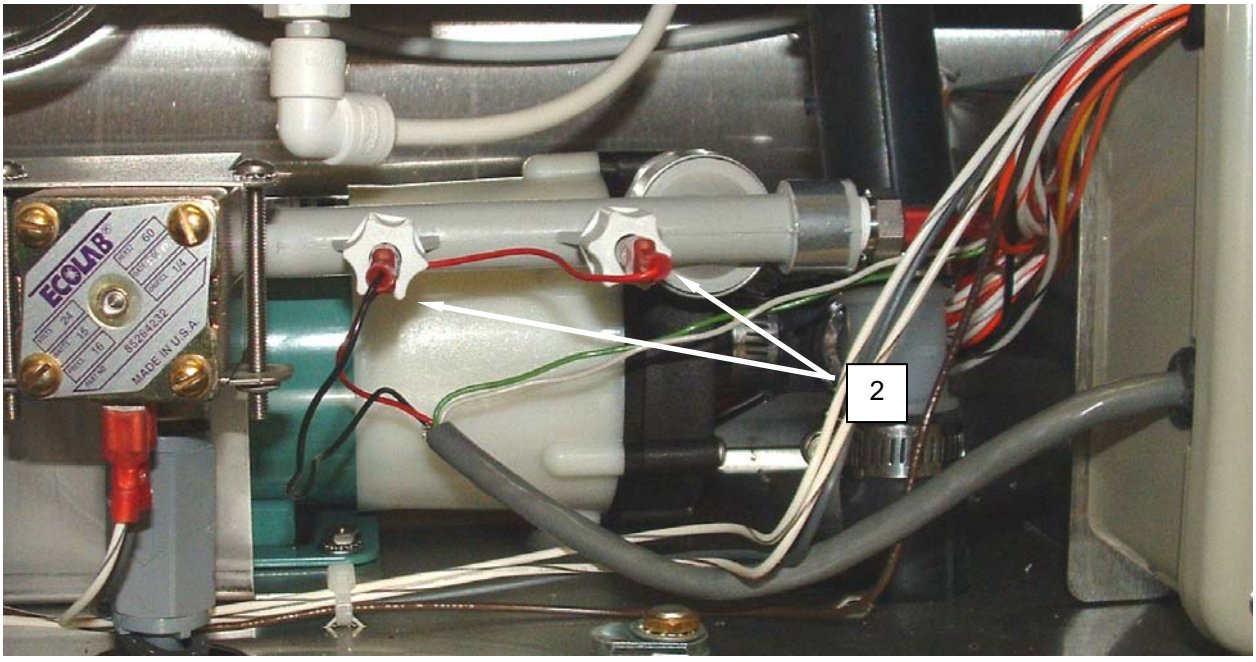


Figure 5. No Conductivity Display.

Table 1. Automatic Soap Dispenser Troubleshooting Procedures for Containerized Batch Laundry – Continued.

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
4. Pump runs but will not move any fluid to the washing machine	Check for check valve **(Figure 6, Item 1)** obstruction. Check solenoid valve **(Figure 6, Item 2)**. Listen for loud audible click. Test solenoid IAW WP 0058 00. **(Figure 6, Item 2)**. Check for pinched delivery tube**.**	Replace check valve. If click is heard and valve still doesn't work, replace the valve Replace an open solenoid IAW WP 0058 00. Replace delivery tube. If further corrective action is required, notify direct support maintenance.

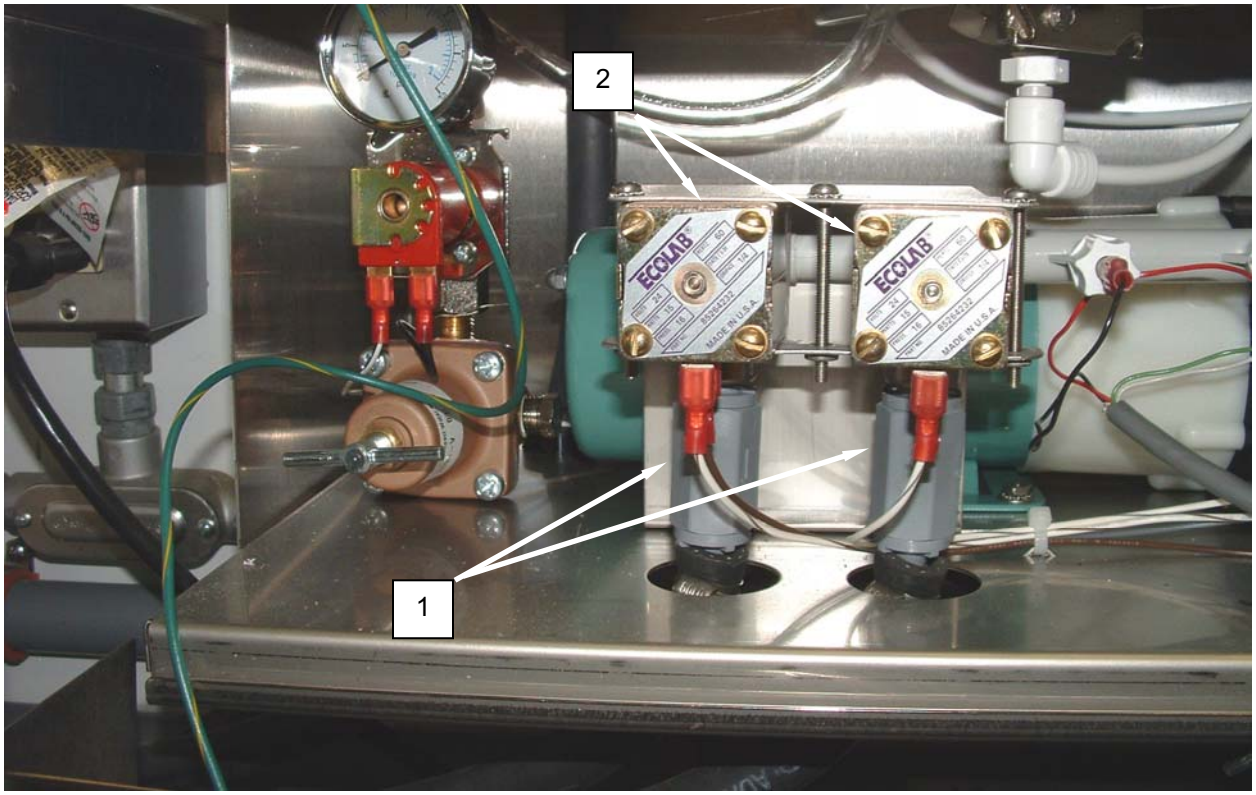


Figure 6. Pump Runs but will not move any Fluid to the Washing Machine.

Table 1. Automatic Soap Dispenser Troubleshooting Procedures for Containerized Batch Laundry – Continued.

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
5. Product consumption too high	Check product solenoid valves **(Figure 7, Item 1)** for proper operation.	If valve does not immediately close when de-energized, the diaphragm is weak and the solenoid valve should be replaced IAW WP 0058 00. If valve fails to close, replace the entire valve IAW WP 0058 00. If further corrective action is required, notify direct support maintenance.

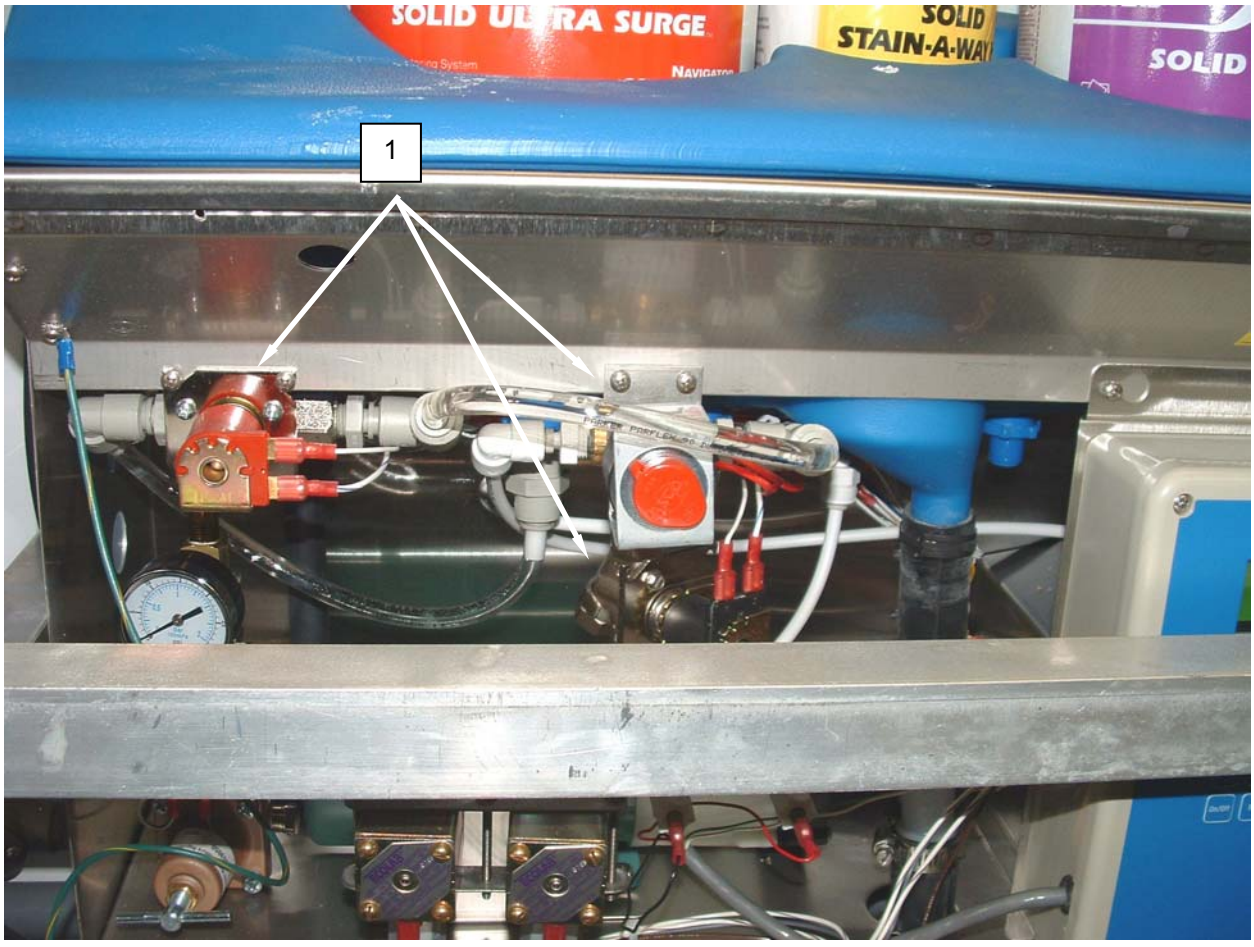
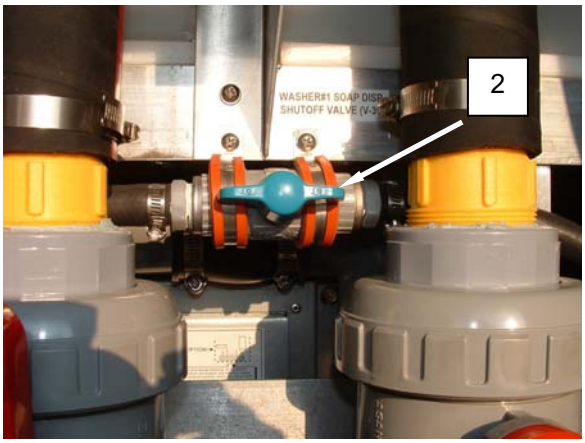


Figure 7. Product Consumption too High.

Table 1. Automatic Soap Dispenser Troubleshooting Procedures for Containerized Batch Laundry – Continued.

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
6. No product feed	Ensure the boiler is operating correctly, and hot water supply valve V-60 **(Figure 8, Item 1)** is open.	Operate CBL IAW TM 10-3510-226-10. Open valve.
	Ensure valves V-39 **(Figure 9, Item 2)** and V-40 **(Figure 9, Item 3)** are open.	Open valves.
	Check nozzles **(Figure 9, Item 4)** for obstructions or damage.	Unscrew nozzles, and clean or replace as necessary.
	Apply a signal to the Automatic Soap dispenser by running a routine cycle. Monitor the LED lights **(Figure 10, Item 5)** on high voltage input board **(Figure 10, Item 6)**.	If no LED, replace control module IAW WP 0058 00.
		If further corrective action is required, notify direct support maintenance.

Figure 8. No Product Feed.



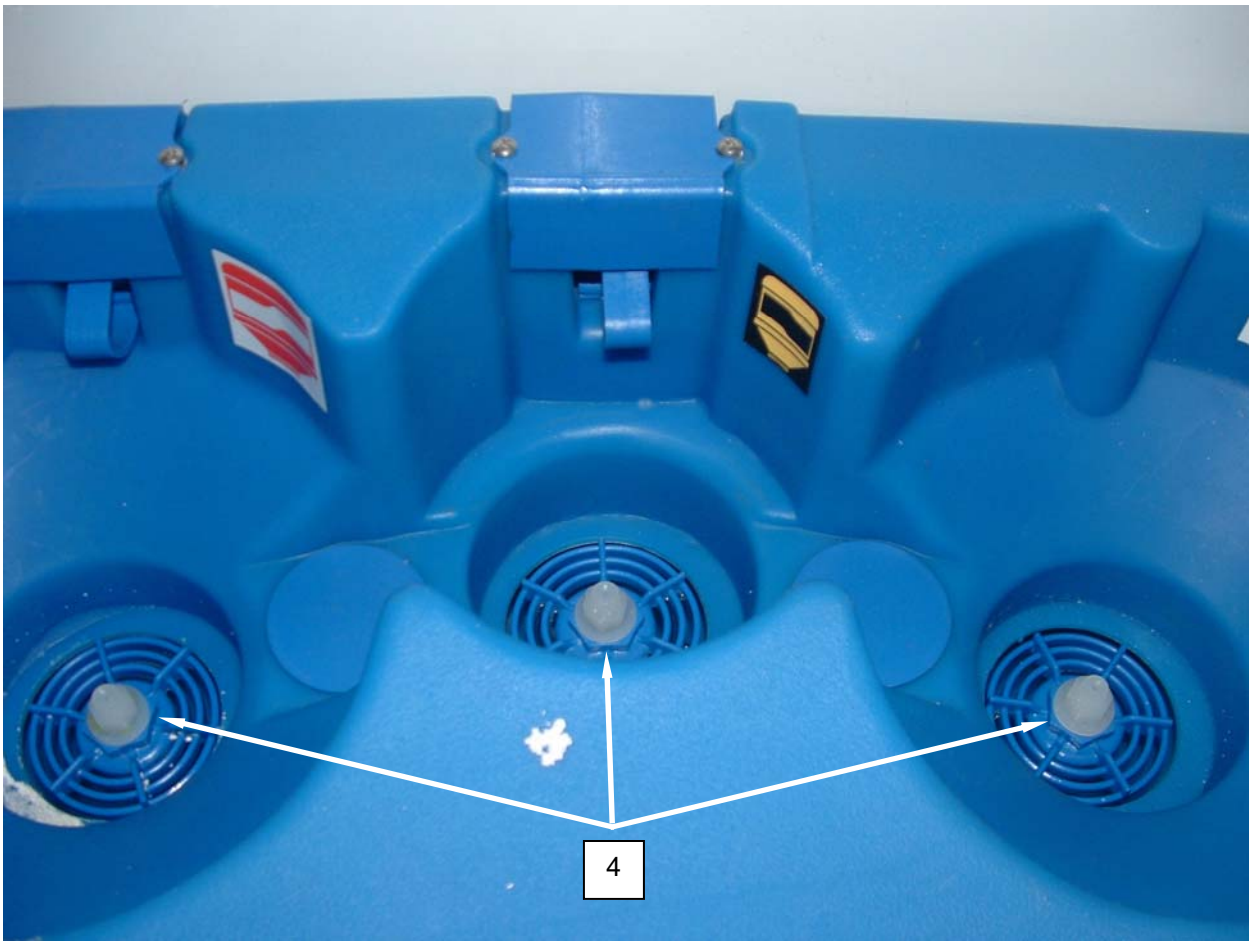


Figure 9. No Product Feed.

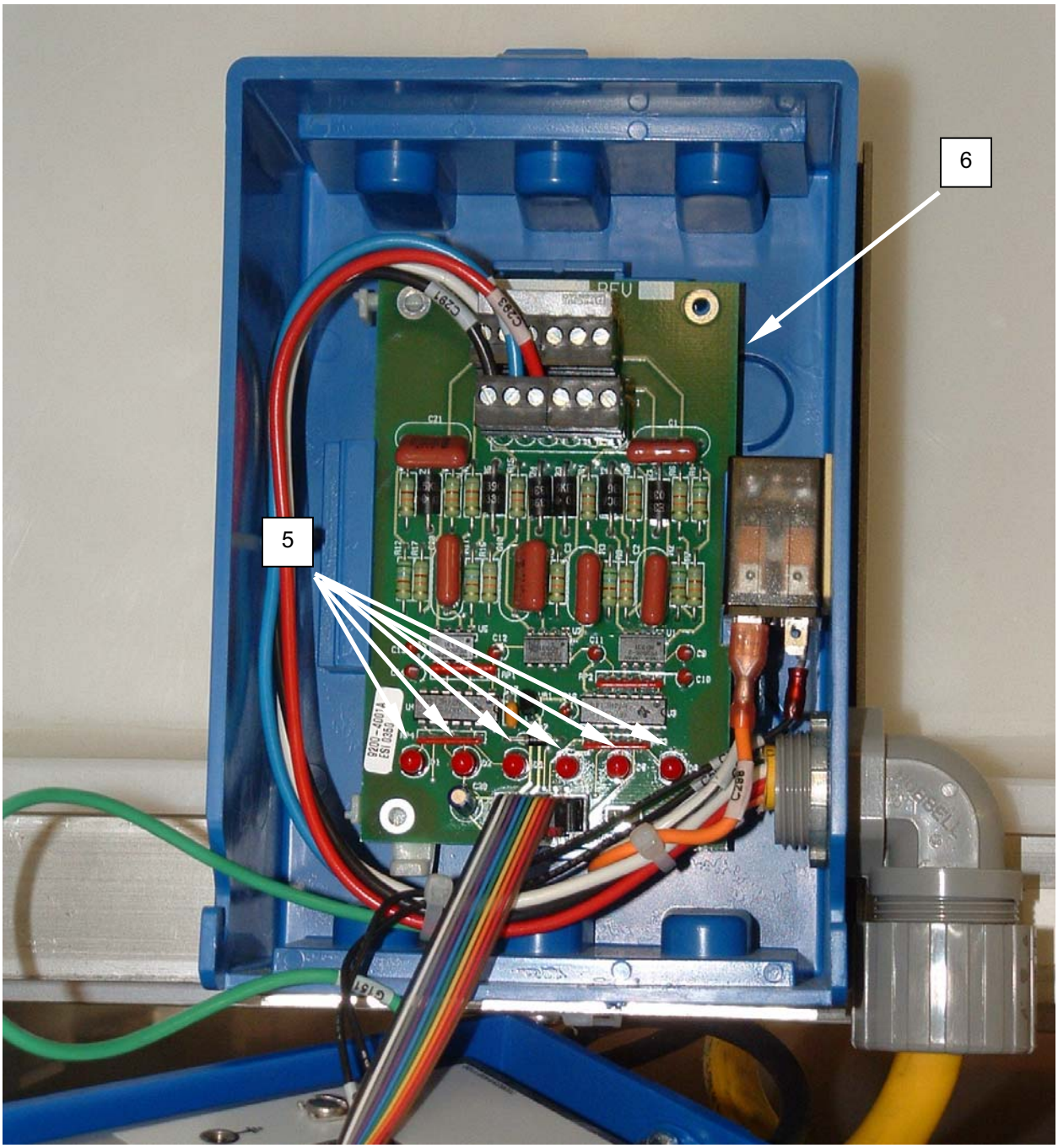


Figure 10. No Product Feed.

END OF WORK PACKAGE

UNIT MAINTENANCE
CONTAINERIZED BATCH LAUNDRY (CBL)
NSN 3510-01-527-2209
NSN 3510-01-527-2210
TROUBLESHOOTING PROCEDURES - DRYER

The troubleshooting procedures contain tables listing the malfunctions, tests or inspections, and corrective action required to return the CBL to normal operation. Perform the steps in the order they appear in the tables. Each procedure is headed by an initial setup. This setup outlines what is needed as well as certain conditions which must be met before starting the task.

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Table 1. Dryer Troubleshooting Procedures for Containerized Batch Laundry.

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
1. No electrical power to equipment	 **WARNING**	 **WARNING**
	The equipment being tested or corrected operates at voltage and current that can cause serious injury or death.	The equipment being tested or corrected operates at voltage and current that can cause serious injury or death.
	Check all electrical cables **(Figure 1, Item 1)** for proper connection.	
	Check for power at cable connections.	If no power is present, check power source.
	Check circuit breakers **(Figure 2, Item 2)**.	Reset breakers. Then, test or replace the breaker, if necessary.
	Check phase monitor relays **(Figure 2, Item 3)**	Test and replace fuses **(Figure 2, Item 4)** as necessary IAW WP 0019 00. Test and replace relay as necessary IAW WP 0019 00.
		If further corrective action is required, notify direct support maintenance.

Figure 1. No Electrical Power to Equipment.

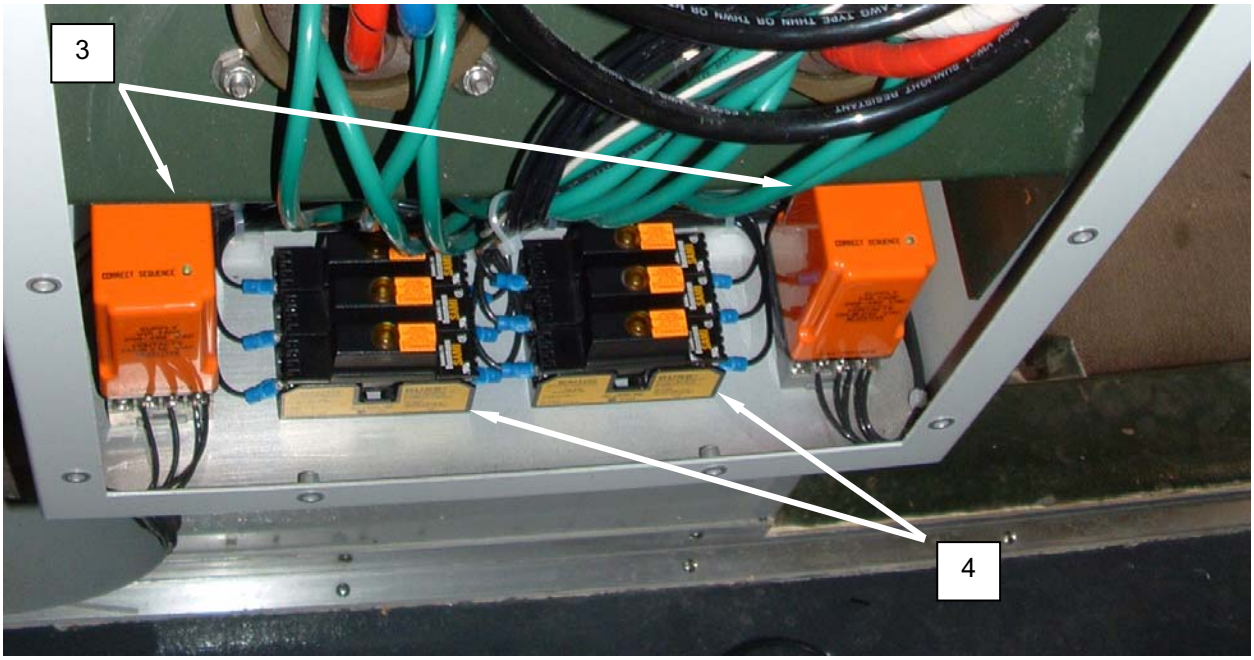


Figure 2. No Electrical Power to Equipment.

Table 1. Dryer Troubleshooting Procedures for Containerized Batch Laundry – Continued.

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
2. Increased drying time	Ensure clothes have been completely spun out by washer.	Troubleshoot washer.
	Verify correct voltage supplied to CBL.	Adjust or replace electrical power supply or components as necessary.
	Test thermostats **(Figure 3, Item 1)** IAW WP 0063 00.	Replace open thermostats.
	Test heat contactors **(Figure 4, Item 2)** IAW WP 0061 00.	Replace inoperative heat contactors.
	Test heater elements **(Figure 3, Item 3)** IAW WP 0065 00.	Replace open heater elements.
		If condition persists, notify direct support maintenance.

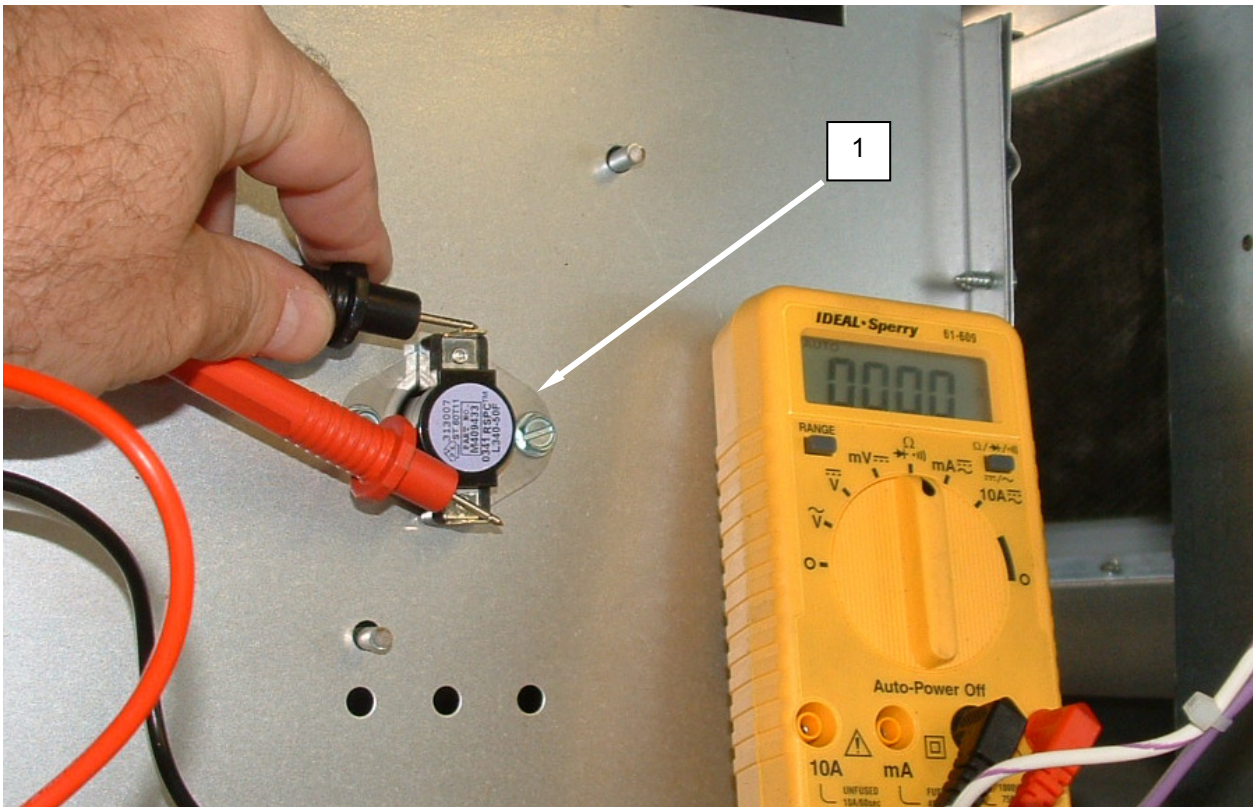
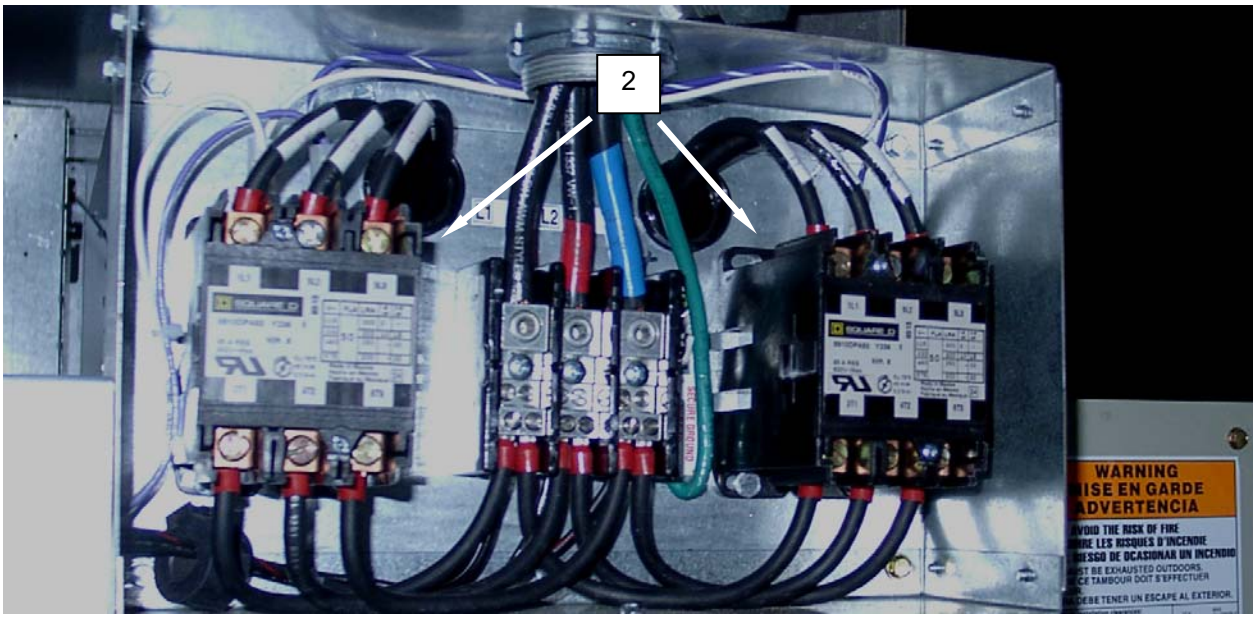


Figure 3. Increased Drying Time.



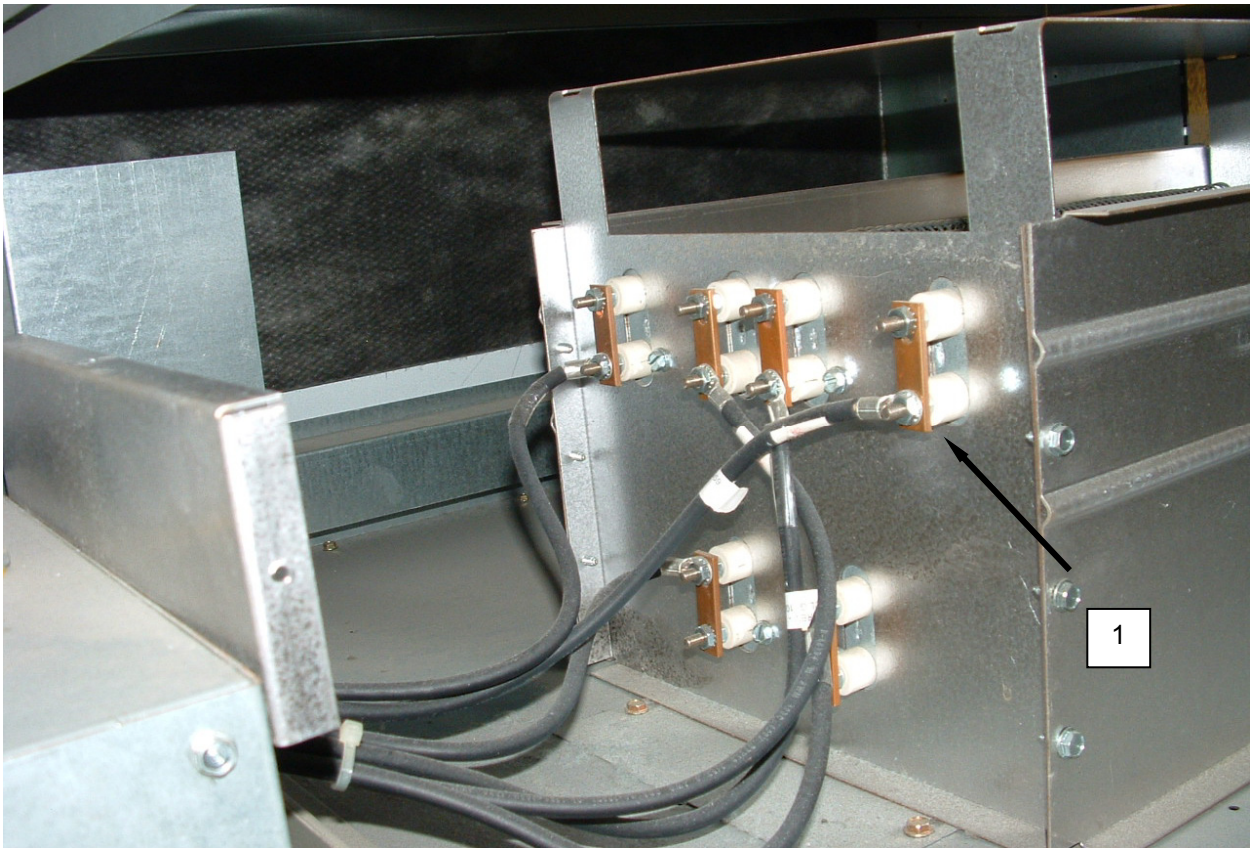


Figure 4. Increased Drying Time.

Table 1. Dryer Troubleshooting Procedures for Containerized Batch Laundry – Continued.

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
3. Drum doesn't turn	Ensure door **(Figure 5, Item 1)** is securely latched and securely mounted.	Adjust door latch IAW WP 0060 00.
	Ensure lint compartment panel is fitted and safety switch **(Figure 5, Item 2)** is depressed and operating correctly.	Refit panel and attempt restart. Test and replace open lint compartment safety switch IAW WP 0063 00.
	Inspect drive belts **(Figure 6, Item 3)** IAW WP 0066 00.	Replace a broken drive belt IAW WP 0066 00.
	Test drive motor **(Figure 6, Item 4)** IAW WP 0067 00.	Replace open drive motor IAW WP 0067 00.
	Check drive motor contactor **(Figure 5, Item 5)** IAW WP 0061 00.	Replace drive motor contactor IAW WP 0061 00.
	Check for 24 VDC control voltage at contactor **(Figure 5, Item 5)**.	Replace controller IAW WP 0063 00.
		If condition persists, notify direct support maintenance.

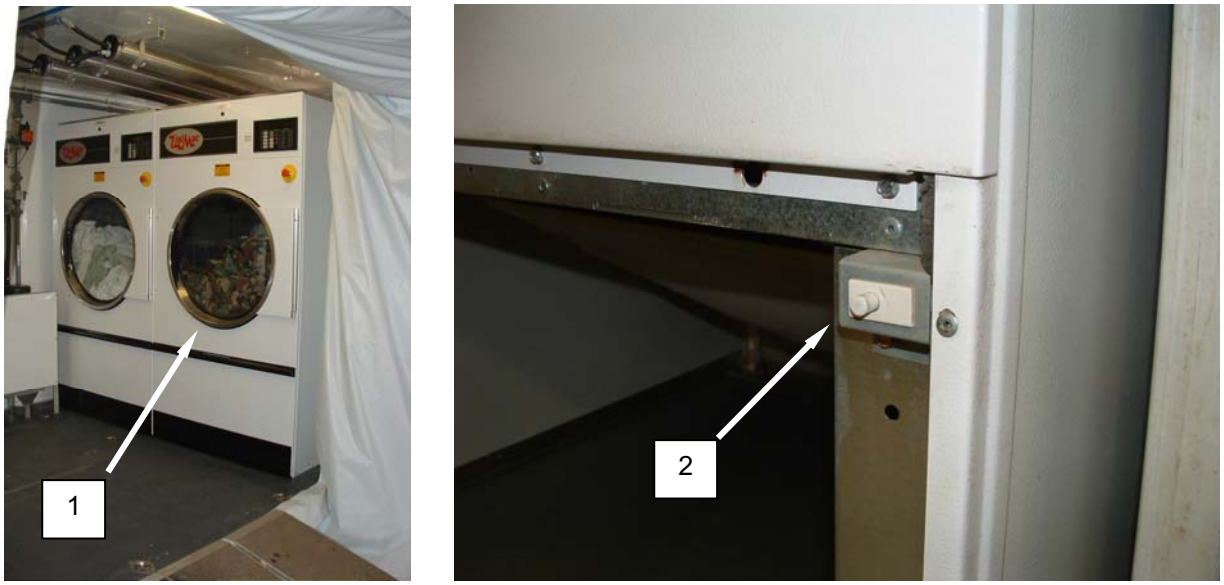
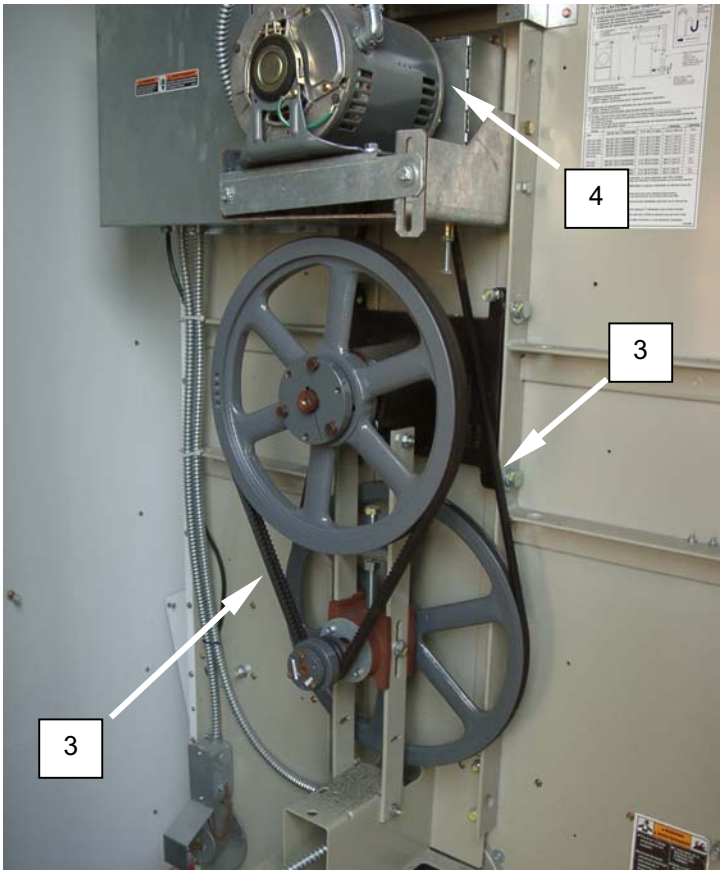


Figure 5. Drum doesn't Turn.



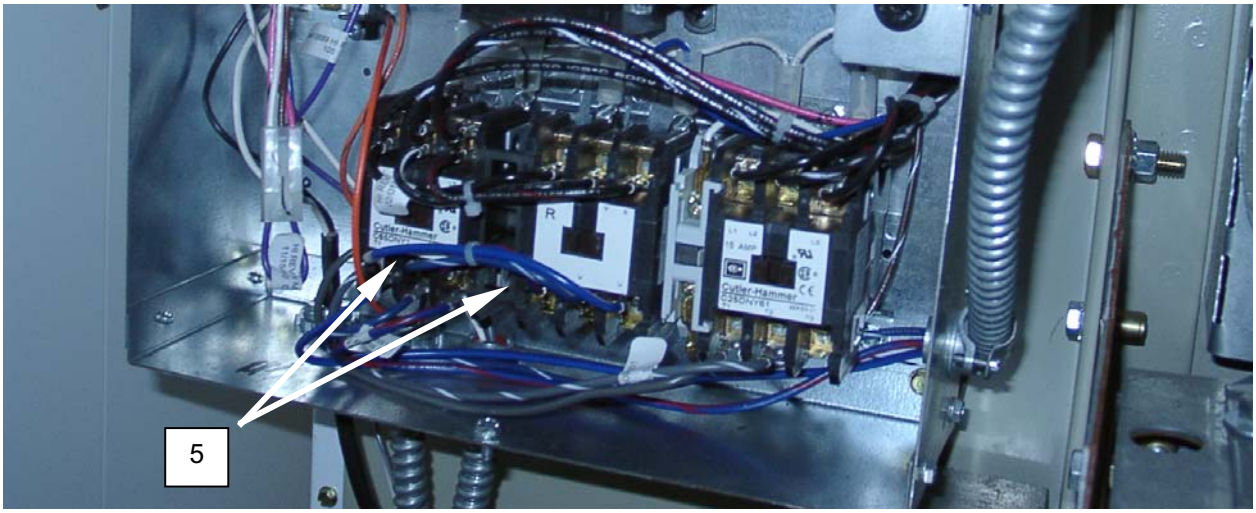


Figure 6. Drum doesn't Turn.

END OF WORK PACKAGE

UNIT MAINTENANCE
CONTAINERIZED BATCH LAUNDRY (CBL)
NSN 3510-01-527-2209
NSN 3510-01-527-2210
TROUBLESHOOTING PROCEDURES - BOILER

The troubleshooting procedures contain tables listing the malfunctions, tests or inspections, and corrective action required to return the CBL to normal operation. Perform the steps in the order they appear in the tables. Each procedure is headed by an initial setup. This setup outlines what is needed as well as certain conditions that must be met before starting the task.

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BOILER TROUBLESHOOTING PROCEDURES

Table 1. Boiler Troubleshooting Procedures for Containerized Batch Laundry.

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
1. No electrical power to equipment	 **WARNING** The equipment being tested or corrected operates at high voltages and current that can cause serious injury or death. Test circuit breaker No. 22 IAW WP 0017 00. **(Figure 1, Item 1)**.	 **WARNING** The equipment being tested or corrected operates at high voltages and current that can cause serious injury or death. Replace inoperative circuit breaker IAW WP 0017 00. If further corrective action is required, notify direct support maintenance.

Figure 1. No Electrical Power to Equipment.

BOILER TROUBLESHOOTING PROCEDURES-CONTINUED

Table 1. Boiler Troubleshooting Procedures for Containerized Batch Laundry – Continued.

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
2. Boiler will not light **NOTE** Normally a burner cutout alarm should sound, however; if the burner is operating while the PLC is bypassed, proceed.	Ensure fuel supply **(Figure 2, Item 1)** is of sufficient quality and quantity, and fuel system has been bled.  **WARNING** Antifreeze used in the following procedure is highly toxic. Wear appropriate protective clothing when handling antifreeze/glycol. If antifreeze contacts eyes or skin, flush the affected area immediately with clean water and seek medical attention. **CAUTION** Do not make substitutions for the antifreeze. The use of antifreeze other than the type identified in the Expendable and Durable List may decrease performance. Failure to comply may shorten the life span of the equipment.	Provide sufficient fuel of the correct type (JP-8, DF-1 or DF-2). Bleed fuel system IAW WP 0068 00. If fuel system will not bleed, inspect and replace fuel filter as necessary.
	Check glycol level **(Figure 2, Item 2)**, and ensure burner has not tripped on low water cutout.	Check for signs of glycol leakage, replenish the ethylene glycol, and monitor operation IAW TM 10-3510-226-10.
	Ensure burner has not tripped on high temperature cutout.	Check for signs of glycol leakage, replenish the ethylene glycol, and monitor operation IAW TM 10-3510-226-10.
	Test transformer **(Figure 2, Item 3)** IAW WP 0068 00.	Replace an open transformer IAW WP 0069 00.
	Inspect igniters for damage **(Figure 2, Item 4)**.	Adjust or replace igniters IAW WP 0068 00 and WP 0069 00.
	Inspect nozzle for damage **(Figure 2, Item 5)**.	Replace nozzle IAW WP 0069 00. If further corrective action is required, notify direct support maintenance.

BOILER TROUBLESHOOTING PROCEDURES-CONTINUED

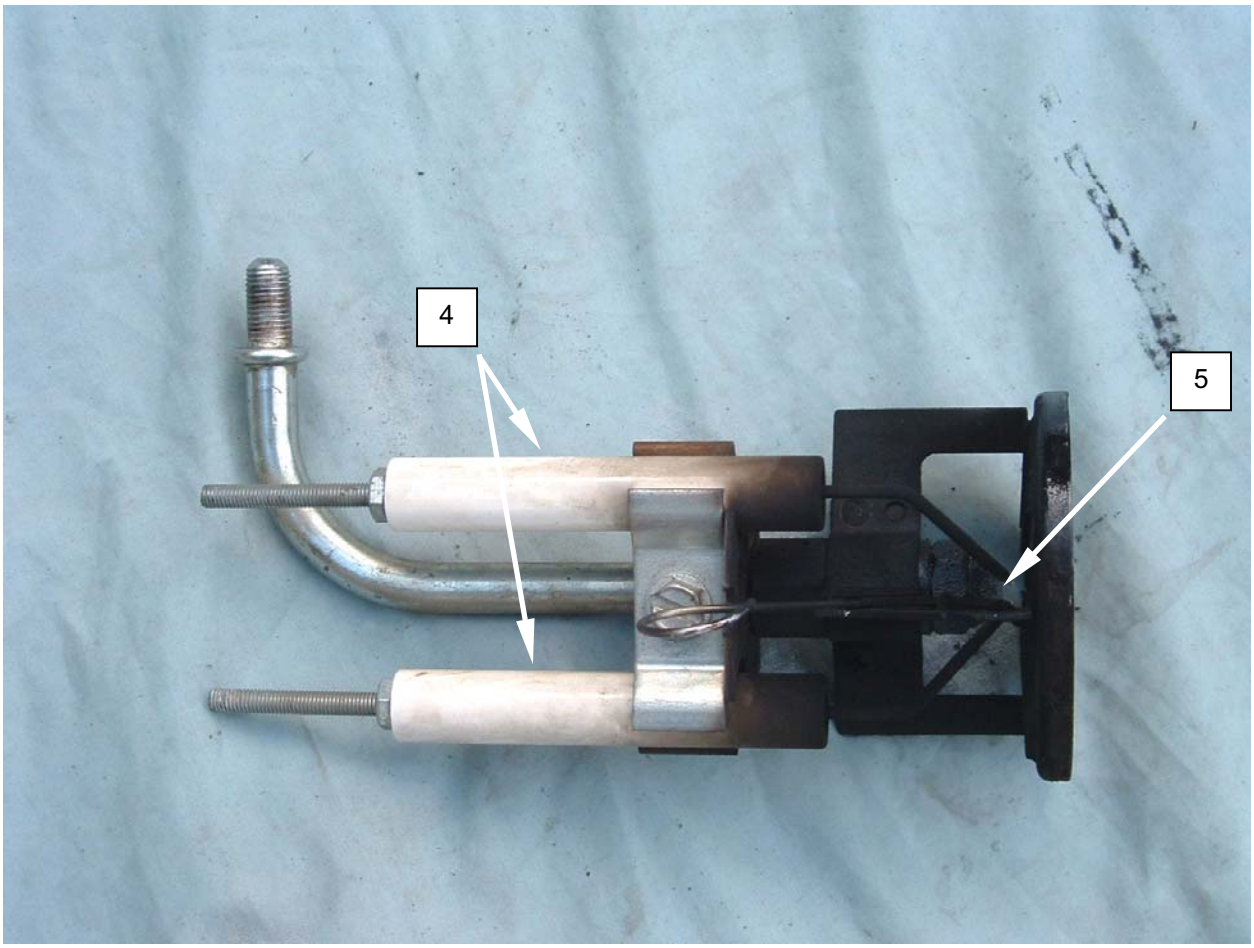


Figure 2. Boiler will not Light.

BOILER TROUBLESHOOTING PROCEDURES-CONTINUED

Table 1. Boiler Troubleshooting Procedures for Containerized Batch Laundry – Continued.

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
3. Excessive fuel consumption/excessive smoke **NOTE** Fuel consumption will increase if operating without reuse.	Ensure fuel supply **(Figure 3, Item 1)** is of sufficient quality and quantity, and fuel system has been bled.	Provide sufficient fuel of the correct type (JP-8, DF-1 or DF-2). Bleed fuel system IAW WP 0068 00. If fuel system will not bleed, inspect and replace fuel filter IAW 10-3510-226-10 as necessary.
	Check for fuel leakage. Ensure hoses are connected correctly to the fuel adapter.	Shut down CBL operation immediately and remedy source of leak.
	Check temperature settings on the operating thermostat **(Figure 3, Item 2)**.	Use a screwdriver in the adjustment hole **(Figure 3, Item 3)** to reset thermostat settings to 205 ^{o}F – 210 ^{o}F in the temperature dial window **(Figure 3, Item 4)**.
	Verify operation of draft inducer fan **(Figure 3, Item 5)** IAW WP 0071 00.	Replace inoperative draft inducer fan IAW WP 0071 00.
	Check burner air intake **(Figure 3, Item 6)**.	Clear burner air intake of dirt and lint. Ensure damper adjustment is tight. Check setting.
	Inspect fuel nozzle **(Figure 3, Item 7)**.	Tighten or replace fuel nozzle IAW WP 0069 00.
	Check exhaust gas sensor (air switch) **(Figure 3, Item 8)**.	Replace inoperative exhaust gas sensor IAW WP 0070 00. If further corrective action is required, notify direct support maintenance.

BOILER TROUBLESHOOTING PROCEDURES-CONTINUED

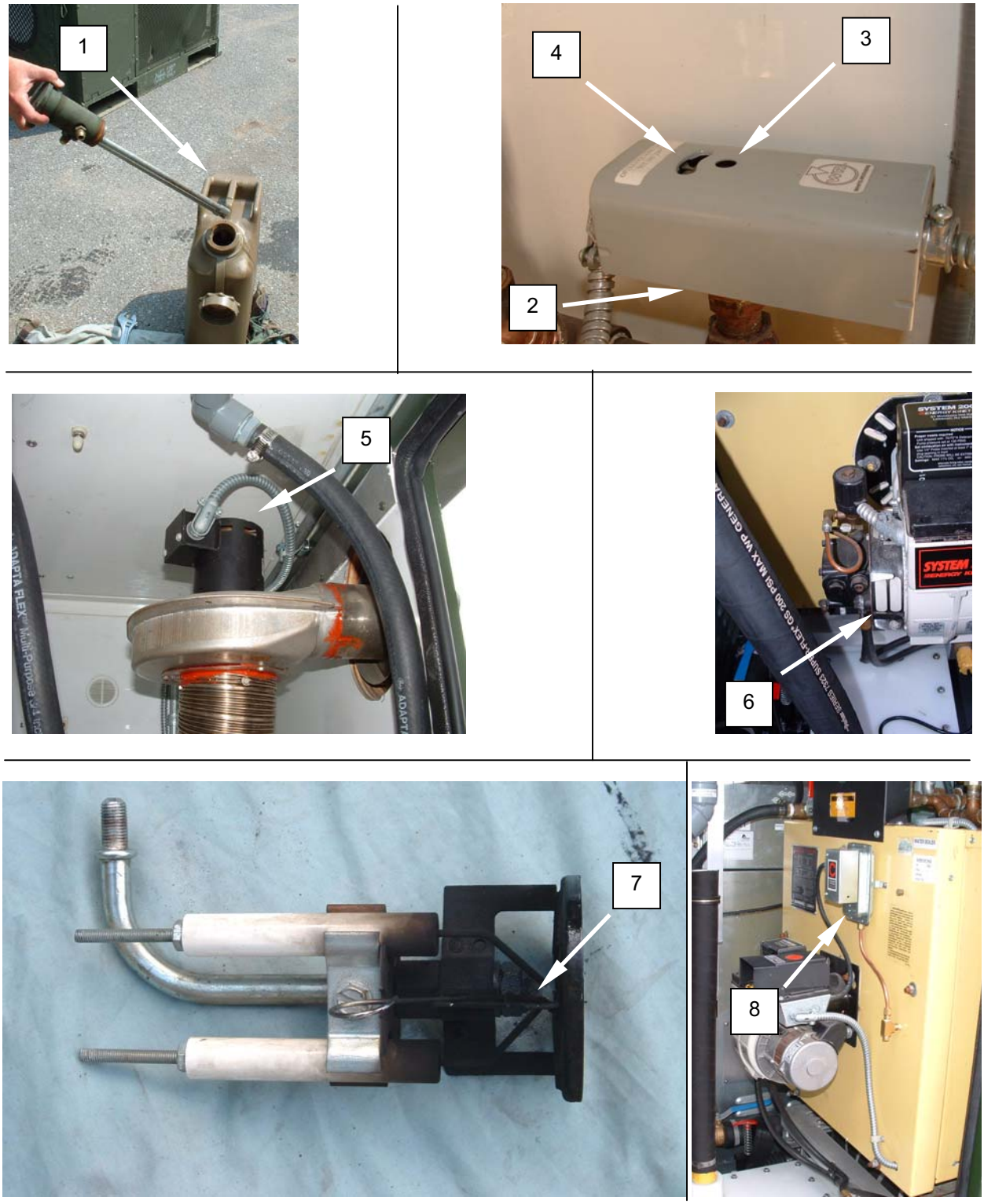


Figure 3. Excessive Fuel Consumption/Excessive Smoke.

BOILER TROUBLESHOOTING PROCEDURES-CONTINUED

Table 1. Boiler Troubleshooting Procedures for Containerized Batch Laundry – Continued.

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
4. Boiler operating, doesn't heat washer/soap dispenser water	Check mixing valve **(Figure 4, Item 1)** setting. Test circulating pump **(Figure 4, Item 2)** IAW procedures given in WP 0074 00. Check mixing valve **(Figure 4, Item 1)** for obstructions and malfunctions. Check heat exchanger **(Figure 4, Item 3)** for obstructions.	Adjust mixing valve IAW TM 10-3510-226-10, WP 0008 00. Replace circulating pump IAW WP 0074 00. Replace mixing valve IAW WP 0075 00. If there are obstructions, notify direct support maintenance. If further corrective action is required, notify direct support maintenance.

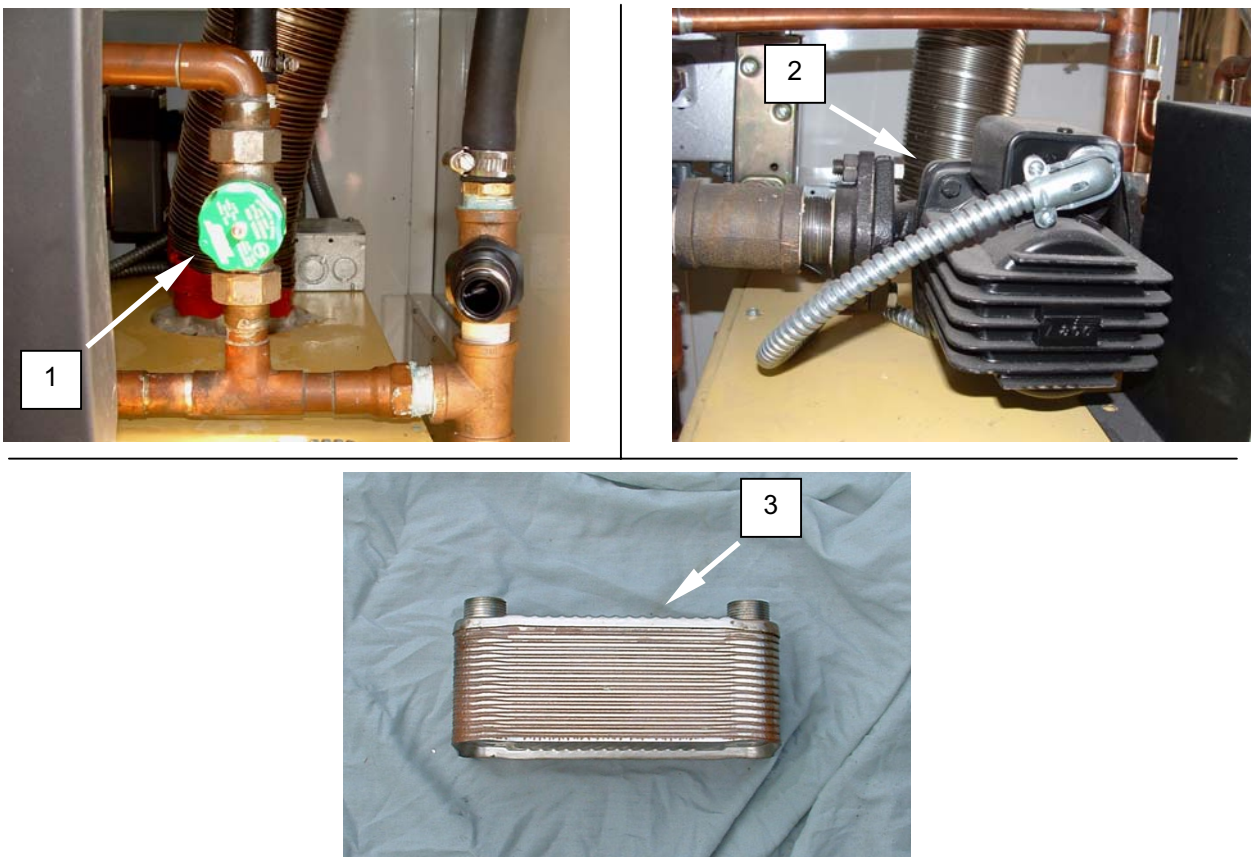


Figure 4. Boiler Operating, doesn't Heat Washer/Soap Dispenser Water.

BOILER TROUBLESHOOTING PROCEDURES-CONTINUED

Table 1. Boiler Troubleshooting Procedures for Containerized Batch Laundry – Continued.

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
5. Boiler operating, doesn't heat reuse water	Check mixing valve **(Figure 5, Item 1)** setting. Check mixing valve **(Figure 5, Item 1)** for obstructions and malfunctions. Check heat exchanger **(Figure 5, Item 2)** for obstructions.	Adjust mixing valve IAW TM 10-3510-226-10, WP 0008 00. Replace mixing valve IAW WP 0075 00. If there are obstructions, notify direct support maintenance. If further corrective action is required, notify direct support maintenance.

Figure 5. Boiler Operating, doesn't Heat Reuse Water.

BOILER TROUBLESHOOTING PROCEDURES-CONTINUED

Table 1. Boiler Troubleshooting Procedures for Containerized Batch Laundry – Continued.

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
6. Boiler High Temp Alarm	Shut down boiler immediately, and inspect for material damage.	
	 **WARNING**	 **WARNING**
	Antifreeze used in the following procedure is highly toxic. Wear appropriate protective clothing when handling antifreeze/glycol. If antifreeze contacts eyes or skin, flush the affected area immediately with clean water and seek medical attention.	Always allow the boiler to cool for at least 30 minutes before attempting any maintenance. Failure to observe safety precautions may result in serious burns or death to personnel.
	CAUTION	
	Do not make substitutions for the antifreeze. The use of antifreeze other than the type identified in the Expendable and Durable List may decrease performance. Failure to comply may shorten the life span of the equipment.	
		Allow boiler to cool for at least 30 minutes.
	Verify glycol level in reservoir **(Figure 6, Item 1)**.	Refill coolant reservoir with ethylene glycol IAW TM 10-3510-226-10. Inspect boiler for leakage.
	Verify operation of circulating pump **(Figure 6, Item 2)**. Refer to WP 0074 00 as necessary.	Replace an inoperative circulating pump. Refer to WP 0074 00 as necessary.
	Check high limit thermostat (**Figure 6, Item 3)** setting and operation.	Reset high limit thermostat. Test and replace high limit thermostat as necessary IAW WP 0063 00.
		If further corrective action is required, notify direct support maintenance.

BOILER TROUBLESHOOTING PROCEDURES-CONTINUED

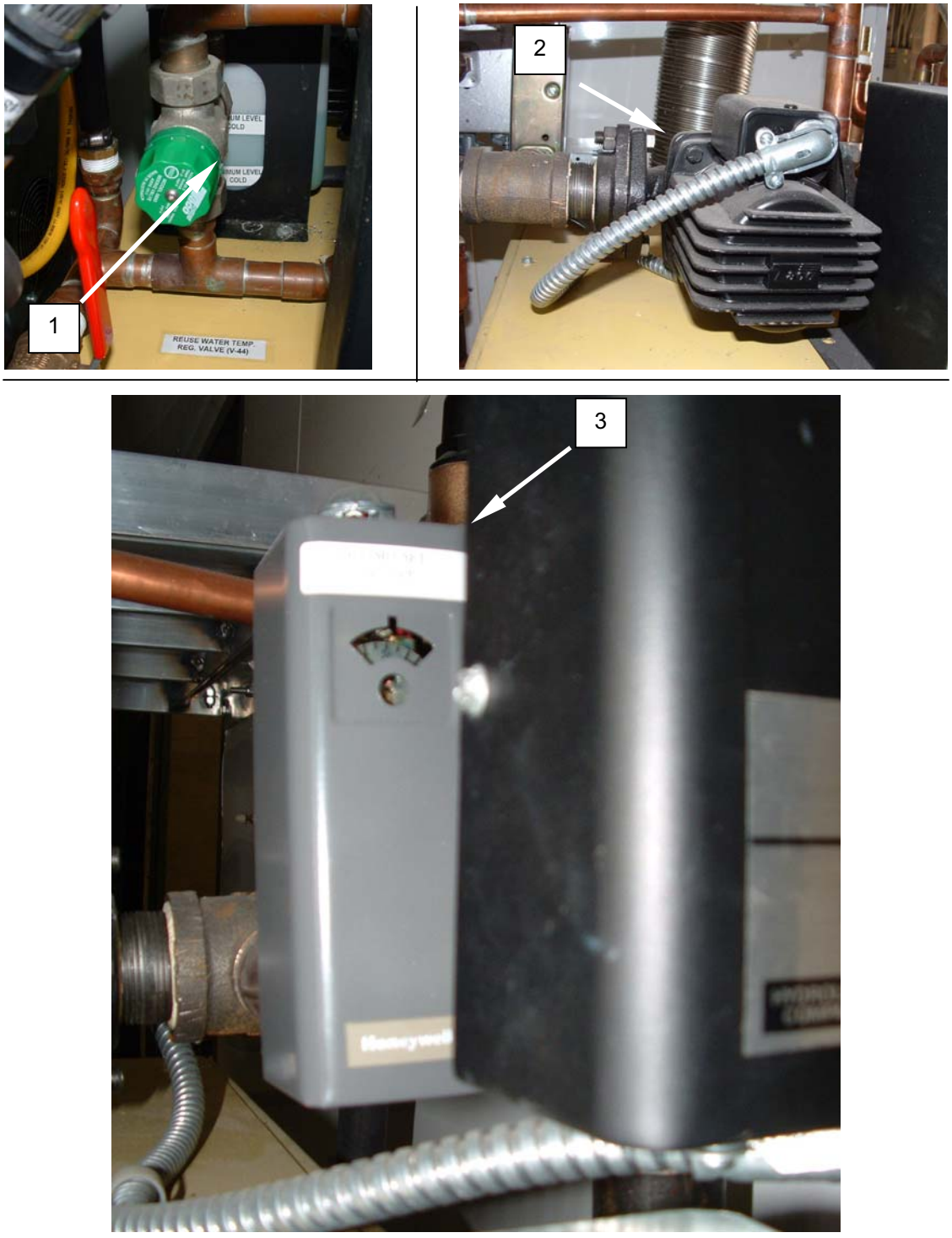


Figure 6. Boiler High Temp Alarm.

BOILER TROUBLESHOOTING PROCEDURES-CONTINUED

Table 1. Boiler Troubleshooting Procedures for Containerized Batch Laundry – Continued.

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
7. Boiler Low Glycol Alarm	 **WARNING** Antifreeze used in the following procedure is highly toxic. Wear appropriate protective clothing when handling antifreeze/glycol. If antifreeze contacts eyes or skin, flush the affected area immediately with clean water and seek medical attention. **CAUTION** Do not make substitutions for the antifreeze. The use of antifreeze other than the type identified in the Expendable and Durable List may decrease performance. Failure to comply may shorten the life span of the equipment. Shut boiler down immediately, and inspect coolant reservoir **(Figure 7, Item 1)**.	Refill coolant reservoir with ethylene glycol solution IAW TM 10-3510-226-10, and inspect for leaks. If further corrective action is required, notify direct support maintenance.

Figure 7. Boiler Low Water Alarm.

BOILER TROUBLESHOOTING PROCEDURES-CONTINUED

Table 1. Boiler Troubleshooting Procedures for Containerized Batch Laundry – Continued.

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
8. Boiler Burner Cutout Alarm	Check fuel source **(Figure 8, Item 1)** and supply; check hoses; if using 55 gallon drum, ensure pickup extension is connected.	Provide sufficient fuel of the correct type (JP-8, DF-1 or DF-2).
	Bleed burner fuel pump IAW WP 0068 00 **(Figure 8, Item 2)** in order to verify fuel delivery to burner.	If fuel stream is solid, with no air spitting, go to remove nozzle assembly under the Test or Inspection column on this page.
	Inspect burner fuel pump strainer **(Figure 8, Item 3)**. Refer to WP 0068 00 as necessary.	Clean strainer. Refer to WP 0068 00 as necessary.
	Ensure fuel filter **(Figure 8, Item 4)** is not clogged. Refer to WP 0069 00 as necessary.	Replace fuel filter element. Replace nozzle. Refer to WP 0069 00 as necessary.
	Remove nozzle assembly and inspect electrodes **(Figure 8, Item 5)**. Refer to WP 0068 00 as necessary.	Adjust or replace electrodes as necessary. Refer to WP 0068 00 and WP 0069 00.
	Check CAD cell **(Figure 8, Item 6)** for soot on lens.	Clean or replace CAD cell IAW procedures given in WP 0068 00 and WP 0069 00 as necessary.
	Test transformer **(Figure 8, Item 7)** IAW procedures given in WP 0068 00.	Replace inoperative transformer. If transformer is good, replace controller. Refer to WP 0069 00 as necessary.
	Check exhaust gas sensor (air switch) **(Figure 8, Item 8)** IAW WP 0070 00.	Replace an inoperative exhaust gas sensor (air switch) IAW WP 0070 00.
	Check draft inducer fan **(Figure 8, Item 9)** IAW WP 0071 00.	Replace inoperative draft inducer fan IAW WP 0071 00.
		If further corrective action is required, notify direct support maintenance.

BOILER TROUBLESHOOTING PROCEDURES-CONTINUED

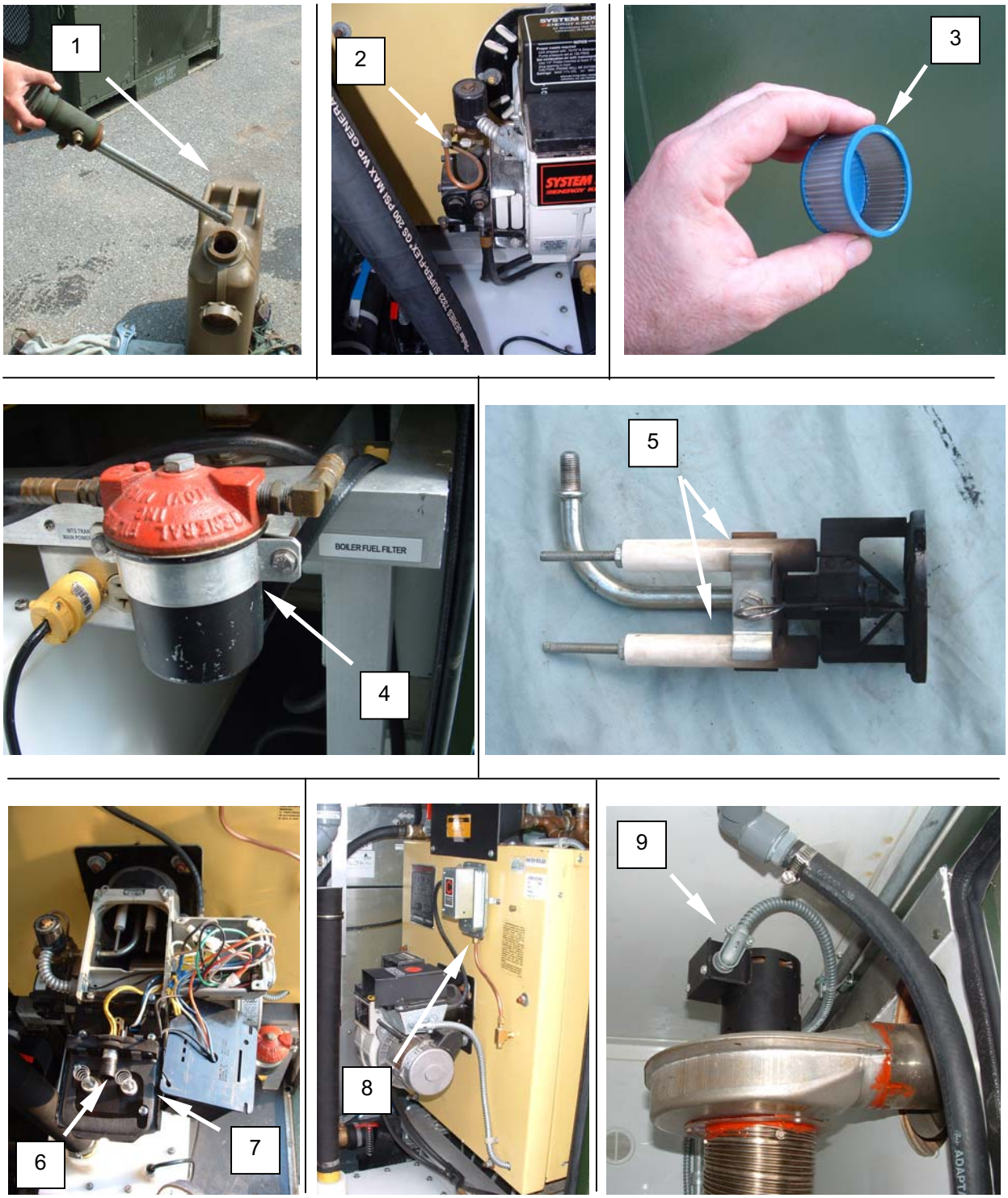


Figure 8. Boiler Burner Cutout Alarm.

END OF WORK PACKAGE

CHAPTER 3

UNIT MAINTENANCE INSTRUCTIONS

CONTAINERIZED BATCH LAUNDRY (CBL)

UNIT MAINTENANCE
CONTAINERIZED BATCH LAUNDRY (CBL)
NSN 3510-01-527-2209
NSN 3510-01-527-2210
SERVICE UPON RECEIPT

SERVICE UPON RECEIPT

Introduction

NOTE

Maintenance programs must be followed in the applicable technical manuals. It is very important to adhere to maintenance procedures in order to prolong the service life of these items.

This TM contains Unit Maintenance procedures applicable to the CBL as authorized by the Maintenance Allocation Chart (MAC) in Work Package 0086 00 of this manual. Refer to associated equipment technical manuals for item-specific maintenance instructions (refer to Work Package 0084 00 for technical manual information). All maintenance instructions covered in this Work Package are unique to the CBL. All maintenance procedures in this Work Package can be performed by one person unless otherwise indicated. Read all **WARNINGS**, **CAUTIONS**, and **NOTES** carefully before attempting any procedures. This includes the warnings at the front of this manual.

Unit Maintenance Work Packages begin with a header specifying the applicable equipment, the item being maintained, and what the maintenance action entails. This is followed by a chart specifying the initial setup of the equipment before starting maintenance, the tools required to perform the maintenance, any materials or parts required, and the number of MOS specific personnel required. Maintenance items which do not list an MOS for the task are non-MOS specific Maintenance items.

Unit Maintenance tasks may be performed by Unit Maintenance, Direct Support, General Support, or Depot personnel.

UNIT SERVICE UPON RECEIPT

Unpacking from Shipment and Inspection

1. Inspect equipment for damage incurred during shipment. If the equipment has been damaged, report the damage on DD Form 6, Packaging Improvement Report.

2. Check equipment against the packing slip to verify the shipment is complete. Report all discrepancies in accordance with the instructions of DA PAM 738-751.

3. Check to see whether the equipment has been modified.

4. After equipment has been positioned in the recommended operational floor plan, check all items requiring service and perform Preventive Maintenance Checks and Services (Refer to WP 0014 00).

SERVICE UPON RECEIPT-CONTINUED

Preparation for Use Upon Receipt

1. Install filters F-1A, F-1B, F-2, and F-3 in filter vessels. Refer to TM 10-3510-226-10 for replacement procedures. If filters are already installed, clean or discard them as applicable.

2. Boiler fuel system must be bled of air IAW procedures in WP 0068 00.

END OF WORK PACKAGE

UNIT MAINTENANCE
CONTAINERIZED BATCH LAUNDRY (CBL)
NSN 3510-01-527-2209
NSN 3510-01-527-2210
PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS), INTRODUCTION

INTRODUCTION

Preventive Maintenance Checks and Services (PMCS) are performed to keep the Containerized Batch Laundry in good operating condition. The checks are used to find, correct, or report problems. Unit personnel are to do the PMCS jobs as shown in the PMCS table. PMCS are done every day the laundry is operated, using the PMCS table. Pay attention to **WARNING** and **CAUTION** statements. A **WARNING** means someone could be hurt. A **CAUTION** means equipment could be damaged.

- Before you begin using the laundry, do **Before** PMCS.
- During use of the laundry, do **During** PMCS.
- After using the laundry, do **After** PMCS.
- Once a week, do **Weekly** PMCS if the laundry has been in use.
- Do **Monthly** PMCS once a month if the laundry has been in use.
- Do **Annual** PMCS once a year.

If you find something wrong when performing PMCS, fix it using troubleshooting and/or maintenance procedures.

The right-hand column of the PMCS table lists conditions that make the laundry not fully mission capable. Write up the faults not fixed on DA Form 2404 for direct support maintenance. For further information on how to use this form, see DA PAM 750-8, The Army Maintenance Management System (TAMMS) Users Manual, dated 25 February 2005.

If tools required to perform PMCS are not listed in procedures, notify your supervisor.

INSPECTION AND COMMON CHECKS

Look for signs of trouble. Senses help here. You can feel, smell, hear, or see many problems that can be eliminated before they get worse. Inspect to see if items are in good condition. Are components correctly installed and secured? Is any damage to the fabric or frame components visible? Correct any faults or notify unit or direct support maintenance.

WARNING

Do not attempt to perform ANY on-site service, however minor, without shutting down the equipment to be serviced. Tightening a hose clamp might not appear to demand shutting down the CBL, but the potential electrocution of the operator as well as electrical and fire damage caused by a split water hose is well worth shutting down the CBL systems.

Always keep the equipment clean
Remove dirt, sand, and debris from all water and electrical panel entries and connections.

INSPECTION AND COMMON CHECKS-CONTINUED

Bolts, nuts, and screws
Check them for obvious looseness, missing, bent, or broken condition on equipment. If you find a bolt, nut, or screw you think is loose, tighten it or report it to your supervisor.

Hoses
Look for wear, damage, and leaks. Ensure clamps are tight. Wet spots indicate leaks, but a stain around a fitting or connector can also mean a leak. If a leak comes from a loose fitting or coupling, shut down the equipment and tighten it. If something is broken or worn out, report it to your supervisor.

Leakage Definition for Unit PMCS

CAUTION

Equipment operation is allowable with Class I and II leaks. Consideration must be given to fluid capacity in the system. When in doubt, check with your supervisor. When operating with Class I or II leaks, frequently check leak intensity. Report Class III leaks to your supervisor.

Class I - Leakage of fluid (as indicated by wetness or discoloration) not great enough to form drops.

Class II - Leakage of fluid great enough to form drops but not enough to cause drops to drip from item being checked or inspected.

Class III - Leakage of fluid great enough to form drops that fall from items being checked or inspected.

It is necessary for you to know how fluid leakage affects the status of the equipment. The caution above lists the types/classes of leakage an operator needs to know to determine the status of the water system. If you spot a leak and are unsure what class the leak is, notify your supervisor or unit maintenance.

UNIT MAINTENANCE
CONTAINERIZED BATCH LAUNDRY (CBL)
NSN 3510-01-527-2209
NSN 3510-01-527-2210
PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS), INCLUDING LUBRICATION INSTRUCTIONS

Table 1. Preventive Maintenance Checks and Services (PMCS).

ITEM NO.	INTERVALS	MAN-HOURS	ITEM TO BE CHECKED OR SERVICED	PROCEDURES	EQUIPMENT NOT READY/AVAILABLE IF:
				TEMPER Components – refer to TM 10-8340-224-13	
				FDECU Components (if used) – refer to TM 10-4120-411-14	
				ASH Components (if used) – refer to TM 9-4520-258-14	
				3000-Gallon Water Tank components (if used) – refer to TM 10-5430-237-12&P	
1	Weekly		Interior Lighting	Inspect ballast **(Figure 1, Item 1)** for burning or leakage.	Ballast is damaged or inoperative, or has a smoky residue.

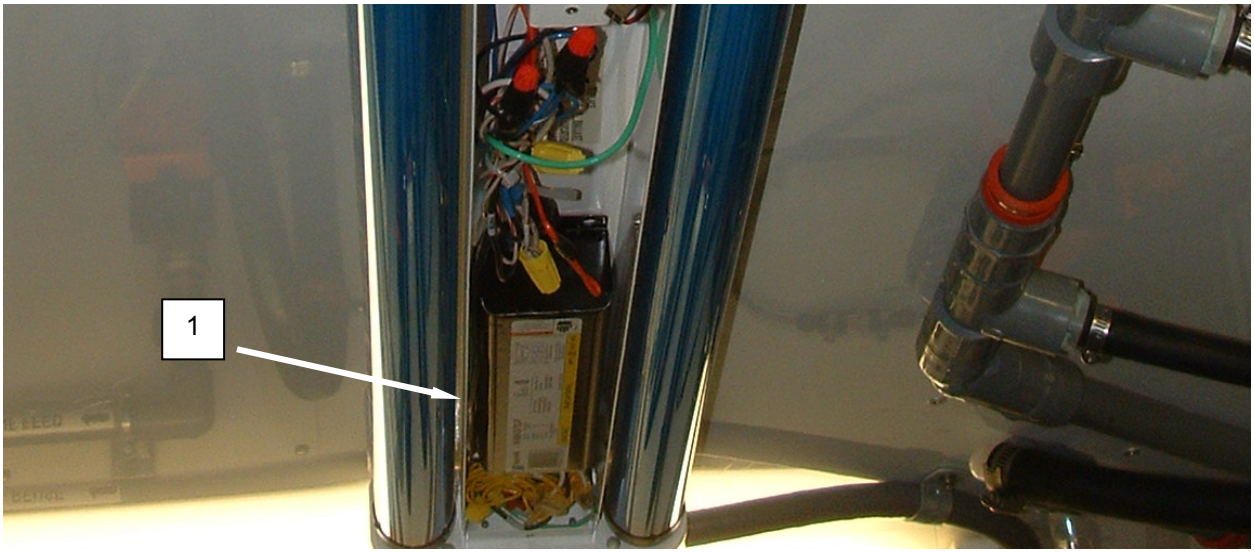


Figure 1. Weekly PMCS.

Table 1. Preventive Maintenance Checks and Services (PMCS) – Continued.

ITEM NO.	INTERVALS	MAN-HOURS	ITEM TO BE CHECKED OR SERVICED	PROCEDURES	EQUIPMENT NOT READY/AVAILABLE IF:
2	Monthly		Water Panels	Clean corrosion from fittings **(Figure 2, Item 2)**.	Fitting is corroded or dirty.

Figure 2. Monthly PMCS – Water Panels.

Table 1. Preventive Maintenance Checks and Services (PMCS) – Continued.

ITEM NO.	INTERVALS	MAN-HOURS	ITEM TO BE CHECKED OR SERVICED	PROCEDURES	EQUIPMENT NOT READY/AVAILABLE IF:
3	Monthly		Washer Drive Belts	Inspect through inspection access plate **(Figure 3, Item 2)** and adjust as required. Refer to WP 0055 00 for adjustment procedures.	Belt **(Figure 3, Item 3)** loose or damaged.

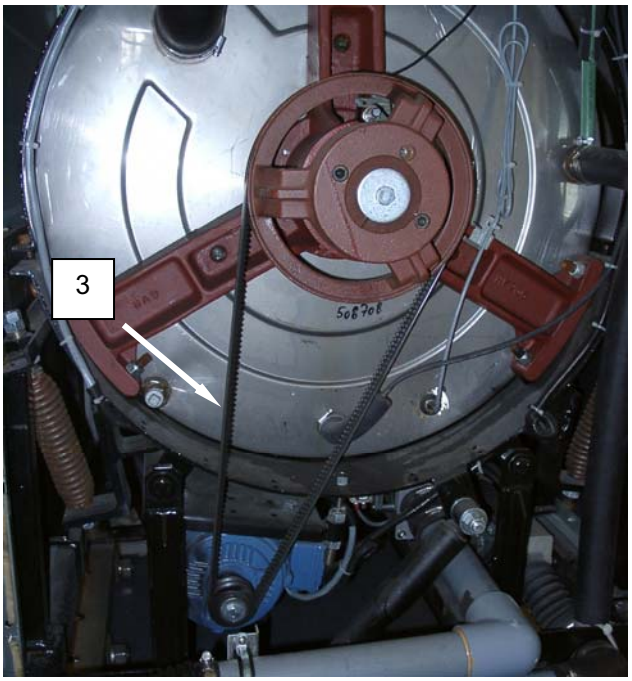


Figure 3. Monthly PMCS – Washer Drive Belts.

Table 1. Preventive Maintenance Checks and Services (PMCS) – Continued.

ITEM NO.	INTERVALS	MAN-HOURS	ITEM TO BE CHECKED OR SERVICED	PROCEDURES	EQUIPMENT NOT READY/AVAILABLE IF:
4	Monthly		Dryer Belts **(Figure 4, Item 4)**	Inspect and adjust dryer belts IAW WP 0066 00.	Dryer belts loose, damaged, or worn.

Figure 4. Monthly PMCS – Dryer Belts.

Table 1. Preventive Maintenance Checks and Services (PMCS) – Continued.

ITEM NO.	INTERVALS	MAN-HOURS	ITEM TO BE CHECKED OR SERVICED	PROCEDURES	EQUIPMENT NOT READY/AVAILABLE IF:
5	Monthly		Burner	Clean fuel pump strainer **(Figure 5, Item 5)** of sediment IAW procedures given in WP 0068 00.	Strainer missing or dirty.

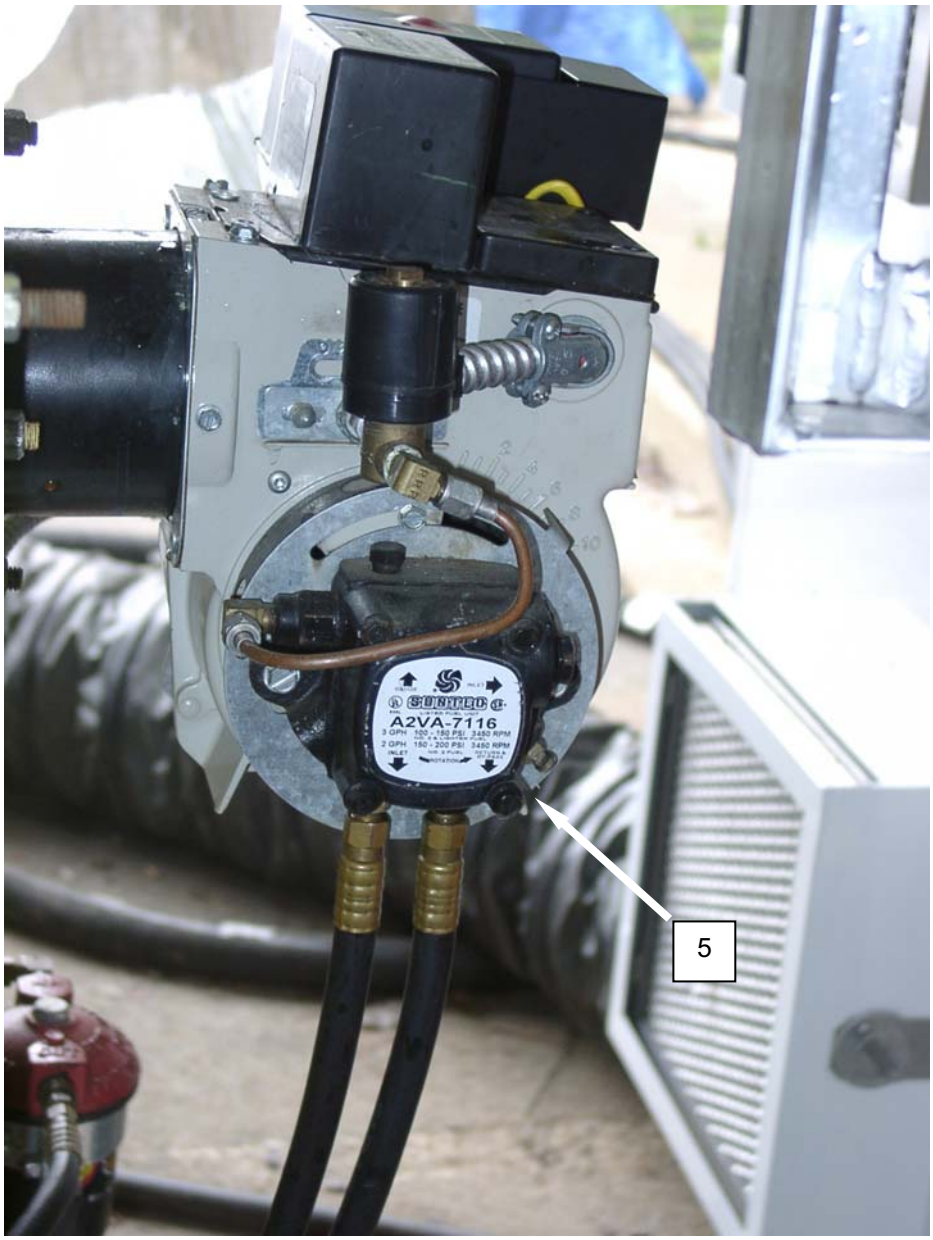


Figure 5. Monthly PMCS - Burner.

Table 1. Preventive Maintenance Checks and Services (PMCS) – Continued.

ITEM NO.	INTERVALS	MAN-HOURS	ITEM TO BE CHECKED OR SERVICED	PROCEDURES	EQUIPMENT NOT READY/AVAILABLE IF:
6	Annual		Interior Lighting	Replace blackout lighting battery **(Figure 6, Item 6)** IAW WP 0016 00.	Battery inoperative.

Figure 6. Annual PMCS – Interior Lighting.

Table 1. Preventive Maintenance Checks and Services (PMCS) – Continued.

ITEM NO.	INTERVALS	MAN-HOURS	ITEM TO BE CHECKED OR SERVICED	PROCEDURES	EQUIPMENT NOT READY/AVAILABLE IF:
7	Annual		Washer source water inlet valves	Clean strainers **(Figure 7, Item 7)** of sediment IAW procedures given in WP 0043 00 and WP 0044 00.	Strainer missing or clogged.

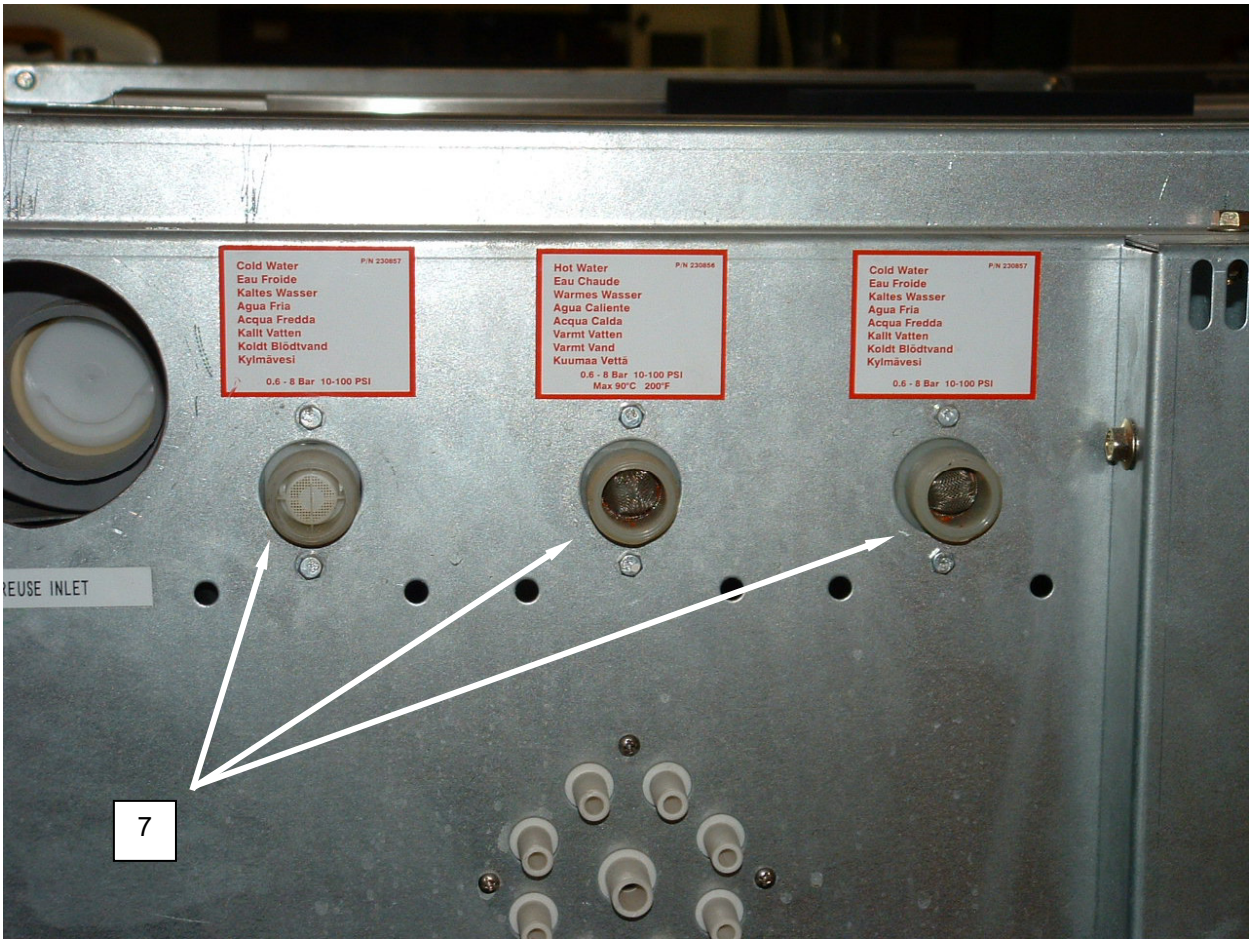


Figure 7. Annual PMCS – Washer Inlet Valves.

END OF WORK PACKAGE

UNIT MAINTENANCE
CONTAINERIZED BATCH LAUNDRY
NSN 3510-01-527-2209
NSN 3510-01-527-2210
CONTAINER
ADJUST, REPLACE

INITIAL SETUP

Tools	**Personnel Required**
Tool Kit, General Mechanics: Automotive (WP 0086 00, Table 2, Item 6)	Quartermaster and Chemical Equipment Repairer 63J (1)
Materials/Parts	**Equipment Condition**
Sealant, RTV (WP 0087 00, Item 46)	CBL shut down.

ADJUST

Adjust the Service Access Door Latch

Adjust the latching screws **(Figure 1, Item 1)** in or out until the door latches securely.

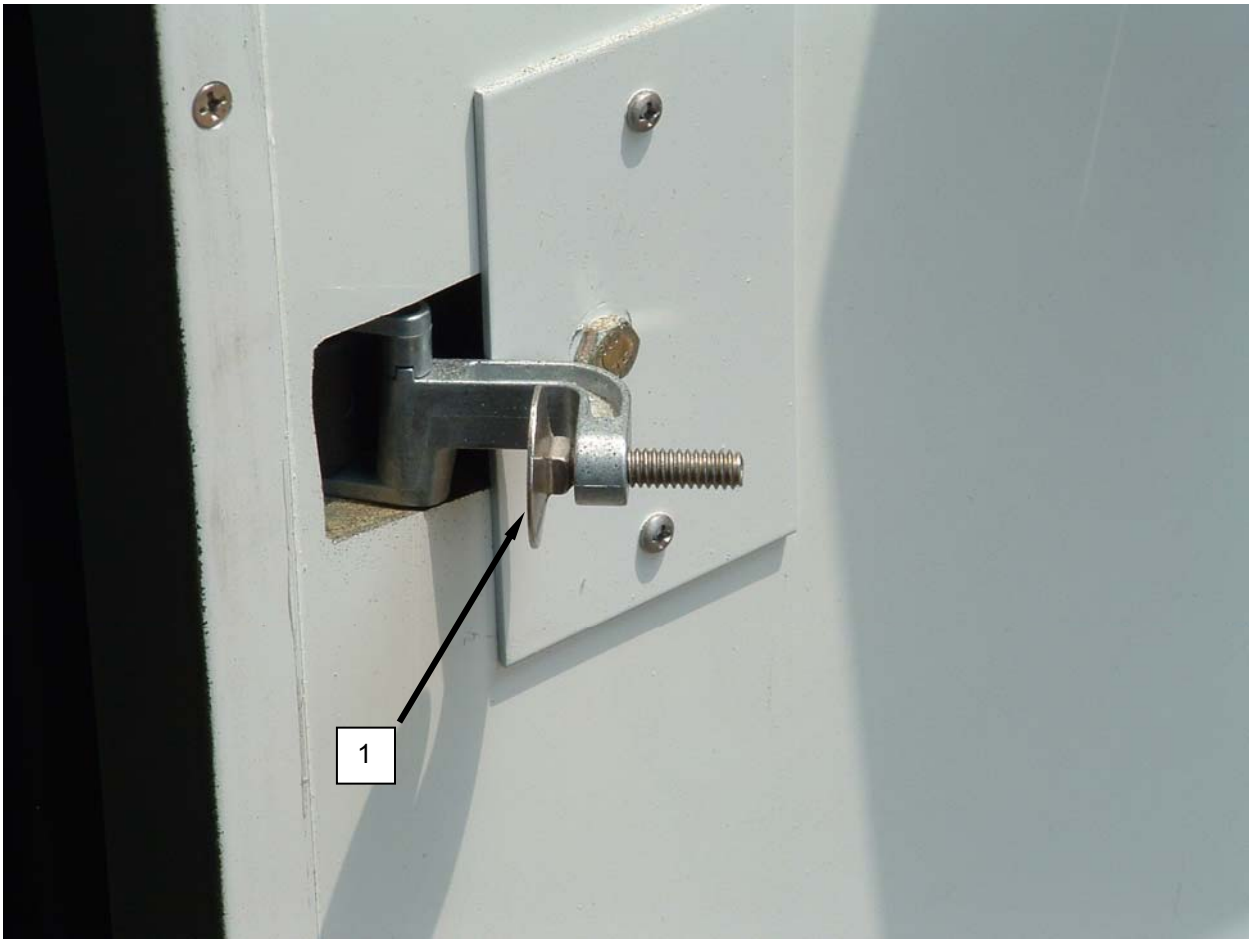


Figure 1. Adjust Service Access Door Latch.

REPLACE

Replace a Level Indicator

CAUTION

Do not attempt to install the replacement level indicator anywhere but in exactly the same holes as the old level indicator. If damage or available replacement does not allow for direct installation, refer replacement to direct support.

1. Remove screws retaining level indicator **(Figure 2, Item 2)** and remove level indicator.

2. Install replacement level indicator **(Figure 2, Item 2)** and retain with screws.

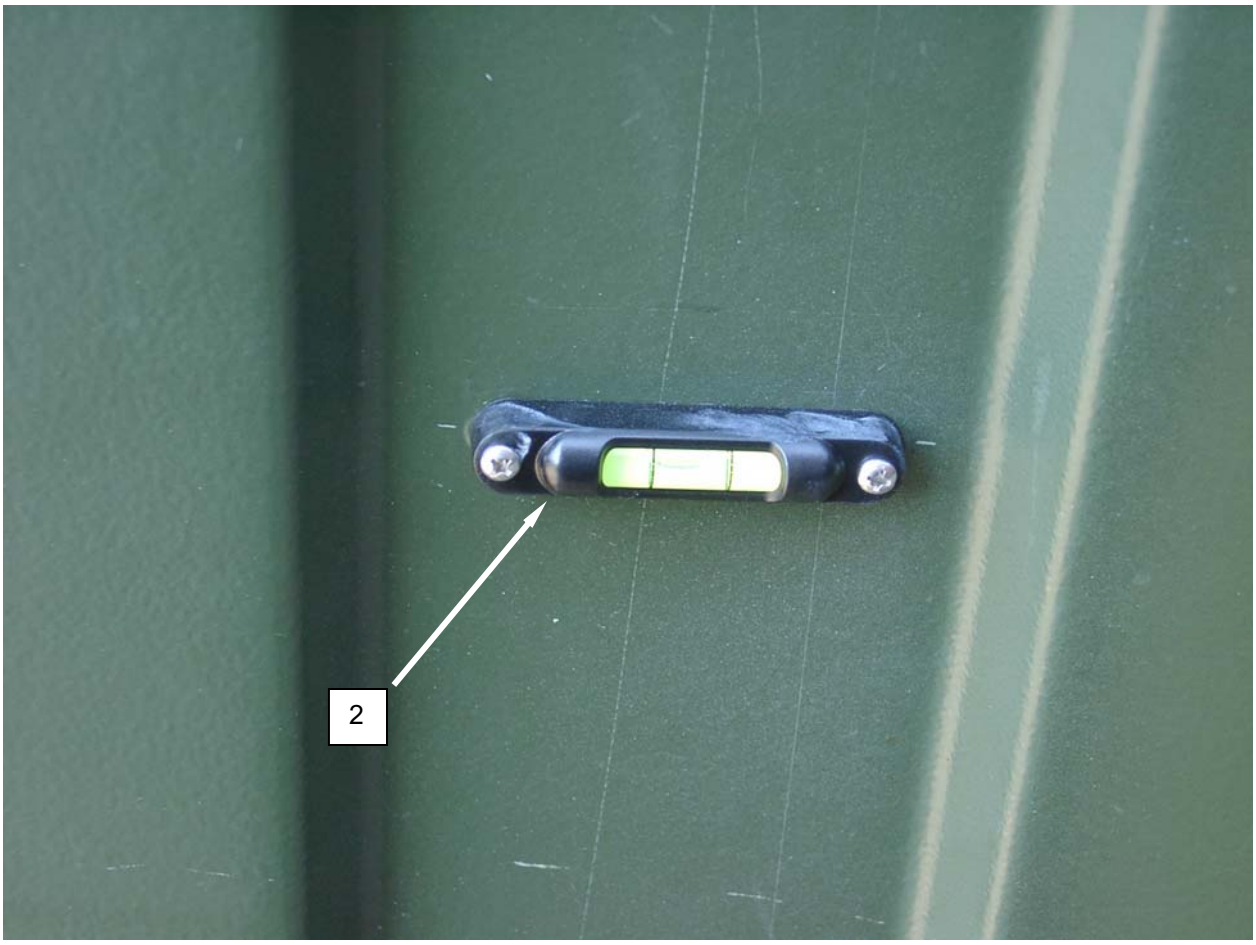


Figure 2. Replace a Level Indicator.

REPLACE-CONTINUED

Replace a Personnel Door

WARNING

Use caution when removing a door. The door must be supported when removing the screws fastening the door to the hinges. Failure to observe safety precautions may result in serious injury to personnel.

NOTE

The following procedure applies only to the light personnel doors fitted to the false walls behind the washers and dryers.

1. Remove screws retaining door **(Figure 3, Item 3)** to door hinge **(Figure 3, Item 4)** and remove door.
2. Remove screws retaining hinges **(Figure 3, Item4)** and remove hinges.
3. Install replacement hinges **(Figure 3, Item 4)** and retain with screws.
4. Install door **(Figure 3, Item 3)** and retain to door hinge **(Figure 3, Item 4)** with screws.

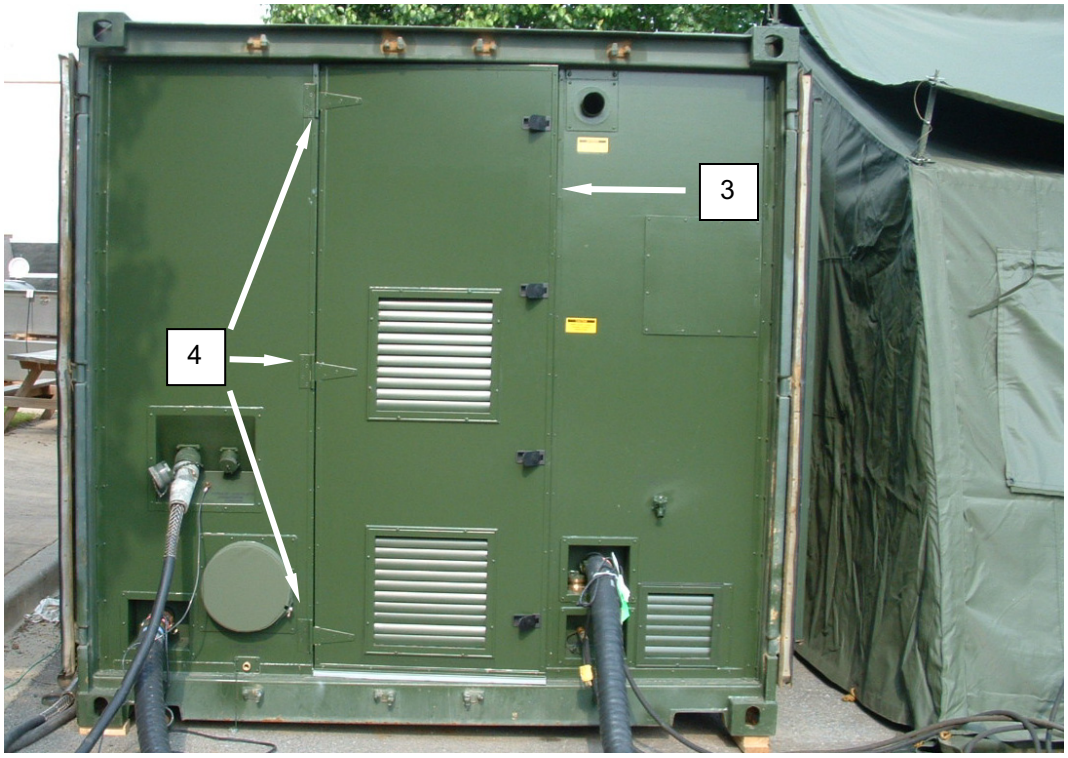
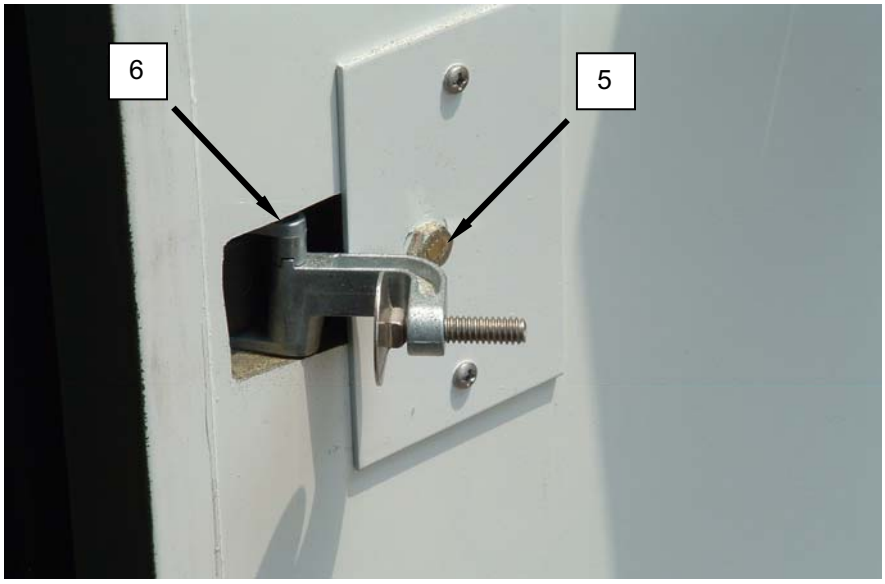


Figure 3. Replace a Personnel Door.

REPLACE-CONTINUED

Replace a Personnel Door Latch

1. Remove the screw **(Figure 4, Item 5)** retaining the latch **(Figure 4, Item 6)**, and remove the latch.
2. Install the replacement latch **(Figure 4, Item 6)**, and retain with screw **(Figure 4, Item 5)**.
3. Check for fit, and adjust as necessary.



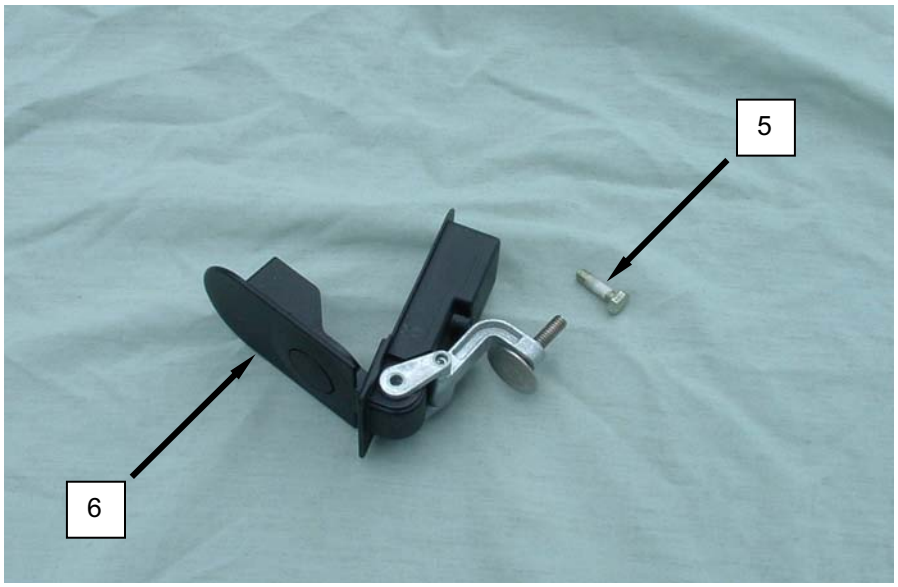


Figure 4. Replace a Personnel Door Latch.

REPLACE-CONTINUED

Replace a Personnel Door Filter Assembly

1. Remove the screws **(Figure 5, Item 7)** retaining the filter assembly **(Figure 5, Item 8)** to the door and remove the filter assembly.

2. Apply sealant to the replacement filter assembly flange **(Figure 5, Item 8)** and install the replacement filter assembly. Retain with screws **(Figure 5, Item 7)**.

3. Wipe excess sealant from replacement filter assembly **(Figure 5, Item 8)** flange.

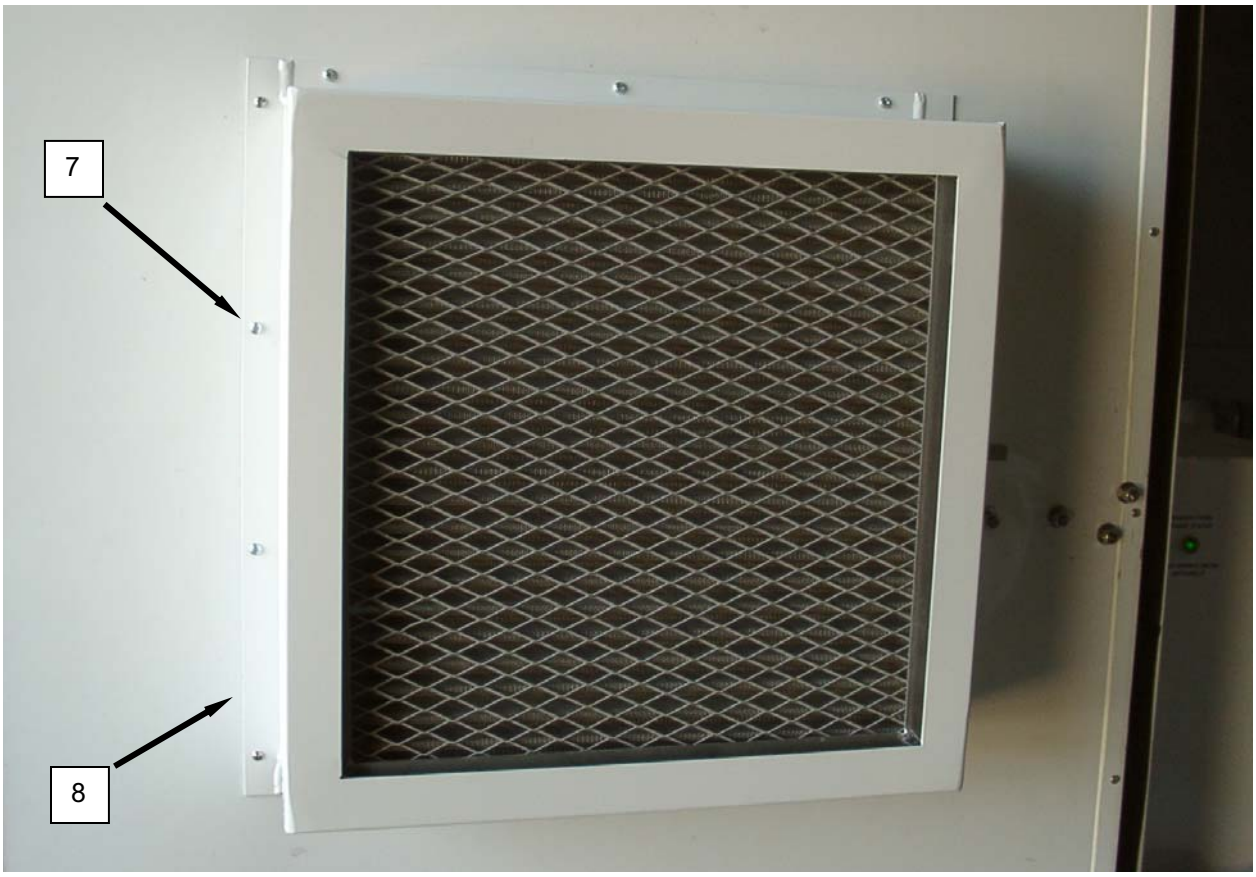


Figure 5. Replace a Personnel Door Filter Assembly.

REPLACE-CONTINUED

Replace Tiedown Provisions

1. Remove screws retaining tiedown provision **(Figure 6, Item 9)** and remove tiedown provision.
2. Install replacement tiedown provision **(Figure 6, Item 9)** and retain with screws.

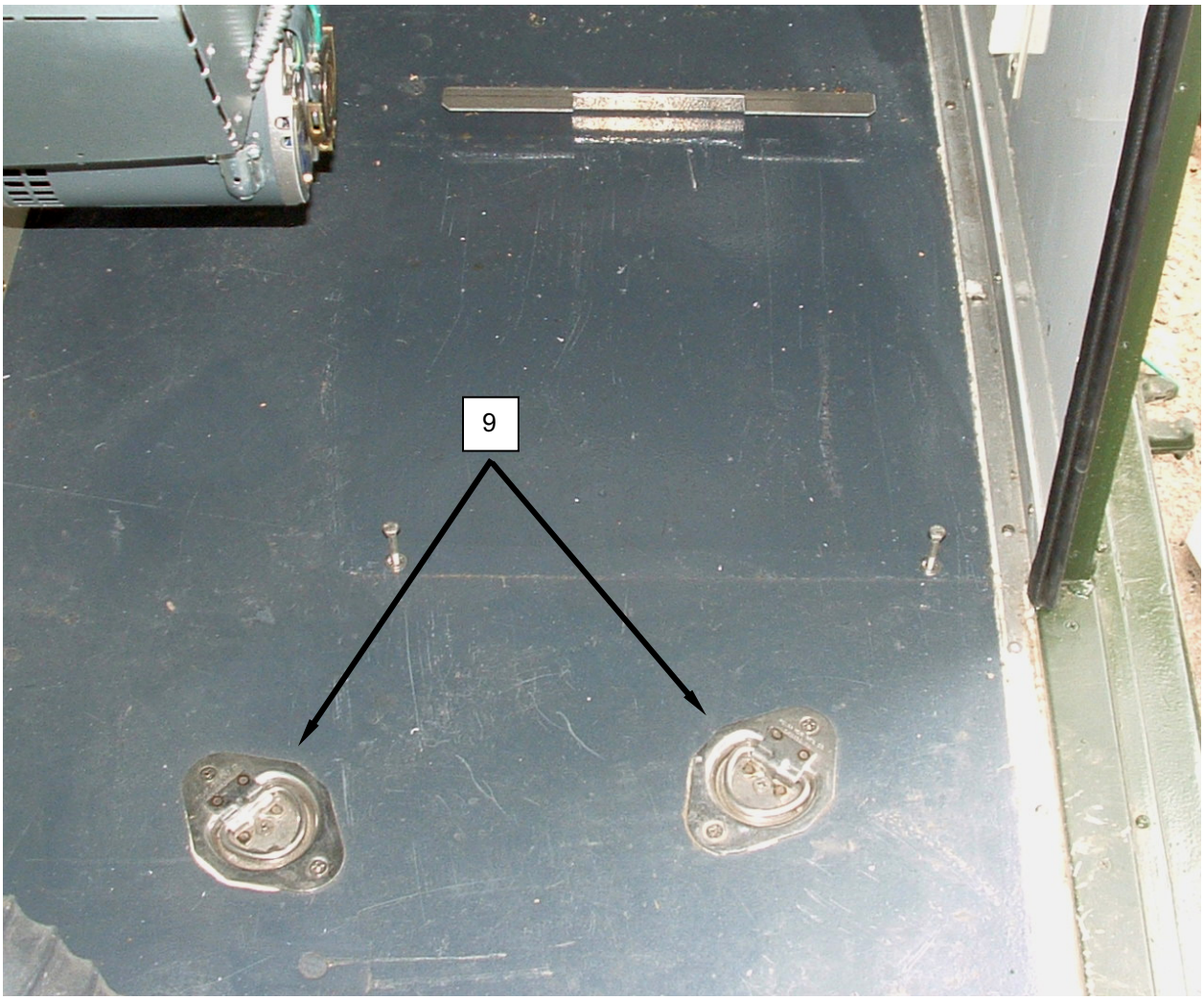


Figure 6. Replace Tiedown Provisions.

END OF WORK PACKAGE

UNIT MAINTENANCE
CONTAINERIZED BATCH LAUNDRY
NSN 3510-01-527-2209
NSN 3510-01-527-2210
LIGHTING, INTERIOR
REPLACE

INITIAL SETUP

Tools
Tool Kit, General Mechanics: Automotive (WP 0086 00, Table 2, Item 7)

Materials/Parts
Connector, Butt, #14-16 – Blue (WP 0087, Item 14)
Tape, Electrical Insulation (WP 0087 00, Item 52)
Wire Markers (WP 0087 00, Item 58)

Personnel Required
Quartermaster and Chemical Equipment Repairer 63J (1)

Equipment Condition
CBL set up

References
TM 10-3510-226-10

REPLACE

Replace Ballast

WARNING

Always secure and tag circuit breakers and switches OFF before attempting any electrical repairs. Remember that the CBL is a wet environment, and capable of posing a shock hazard even when personnel are not in direct contact with metal parts. Failure to comply may result in injury to personnel.

WARNING

Leaking ballast may impose an environmental hazard. Ensure discarded ballast is disposed of IAW unit SOP. Failure to comply may result in injury to personnel.

1. Disconnect power by switching circuit breaker No. 11 to OFF.
2. Remove ballast cover plate.
3. Tag and disconnect wiring from ballast **(Figure 1, Item 1)**. Some wiring may need to be cut in order to be disconnected.
4. Remove two nuts retaining ballast **(Figure 1, Item 1)** and remove ballast.
5. Install replacement ballast **(Figure 1, Item 1)** and retain with two nuts.
6. Wire ballast **(Figure 1, Item 1)** as tagged.
7. Install ballast cover plate.
8. Switch circuit breaker NO. 11 to ON. Operate IAW procedures given in TM 10-3510-226-10, and monitor for normal operation.

REPLACE-CONTINUED

Figure 1. Replace the Ballast.

REPLACE-CONTINUED

Replace the Battery (Blackout Lighting only)

WARNING

Always secure and tag circuit breakers and switches OFF before attempting any electrical repairs. Remember that the CBL is a wet environment, and capable of posing a shock hazard even when personnel are not in direct contact with metal parts. Failure to comply may result in injury to personnel.

WARNING

A leaking battery may impose an environmental hazard. Ensure discarded battery is disposed of IAW unit SOP. Failure to comply may result in injury to personnel.

1. Disconnect power by switching circuit breaker OFF.
2. Remove ballast cover plate.
3. Tag and disconnect wiring from battery **(Figure 2, Item 2)**.
4. Remove the screws retaining the battery **(Figure 2, Item 2)** and remove the battery.
5. Install the replacement battery **(Figure 2, Item 2)** and retain with screws.
6. Connect wiring to battery **(Figure 2, Item 2)** as tagged.
7. Install ballast cover plate.
8. Switch circuit breaker ON.
9. Operate IAW procedures given in TM 10-3510-226-10, and monitor for normal operation.

REPLACE-CONTINUED

Figure 2. Replace the Battery.

END OF WORK PACKAGE

UNIT MAINTENANCE
CONTAINERIZED BATCH LAUNDRY
NSN 3510-01-527-2209
NSN 3510-01-527-2210
CIRCUIT BREAKER
TEST, REPLACE

INITIAL SETUP

Tools
Tool Kit, General Mechanics: Automotive (WP 0086 00, Table 2, Item 6)

Personnel Required
Quartermaster and Chemical Equipment Repairer 63J (1)

Materials/Parts
Tape, Electrical Insulation (WP 0087 00, Item 52)
Wire Markers (WP 0087 00, Item 58)

Equipment Condition
CBL set up

TEST

Test Circuit Breakers

WARNING

This equipment operates at high voltages. Use extreme caution, observe all warnings, and follow all safety procedures. Failure to observe safety precautions may result in injury or death to personnel.

NOTE

Figures 1 and 3 illustrate the procedures on the main circuit breaker panel. Figure 2 and 4 illustrate the procedures on the dryer circuit breaker panel.

1. Switch all circuit breakers **(Figures 1, 2, 3, 4, Item 1)** to OFF.
2. Disconnect all power cables to the CBL.
3. Remove screws retaining the circuit breaker box cover **(Figures 1, 2, Item 2)** (Main Circuit Breaker Panel only).
4. Remove the circuit breaker box cover **(Figures 1, 2, Item 2)** (Main Circuit Breaker Panel only).
5. Remove screws retaining the circuit breaker panel cover **(Figure 1, Item 3)**.
6. Remove the circuit breaker panel cover **(Figure 1, Item 3)**.

TEST-CONTINUED

Figure 1. Test Circuit Breakers – Main Panel.

TEST-CONTINUED

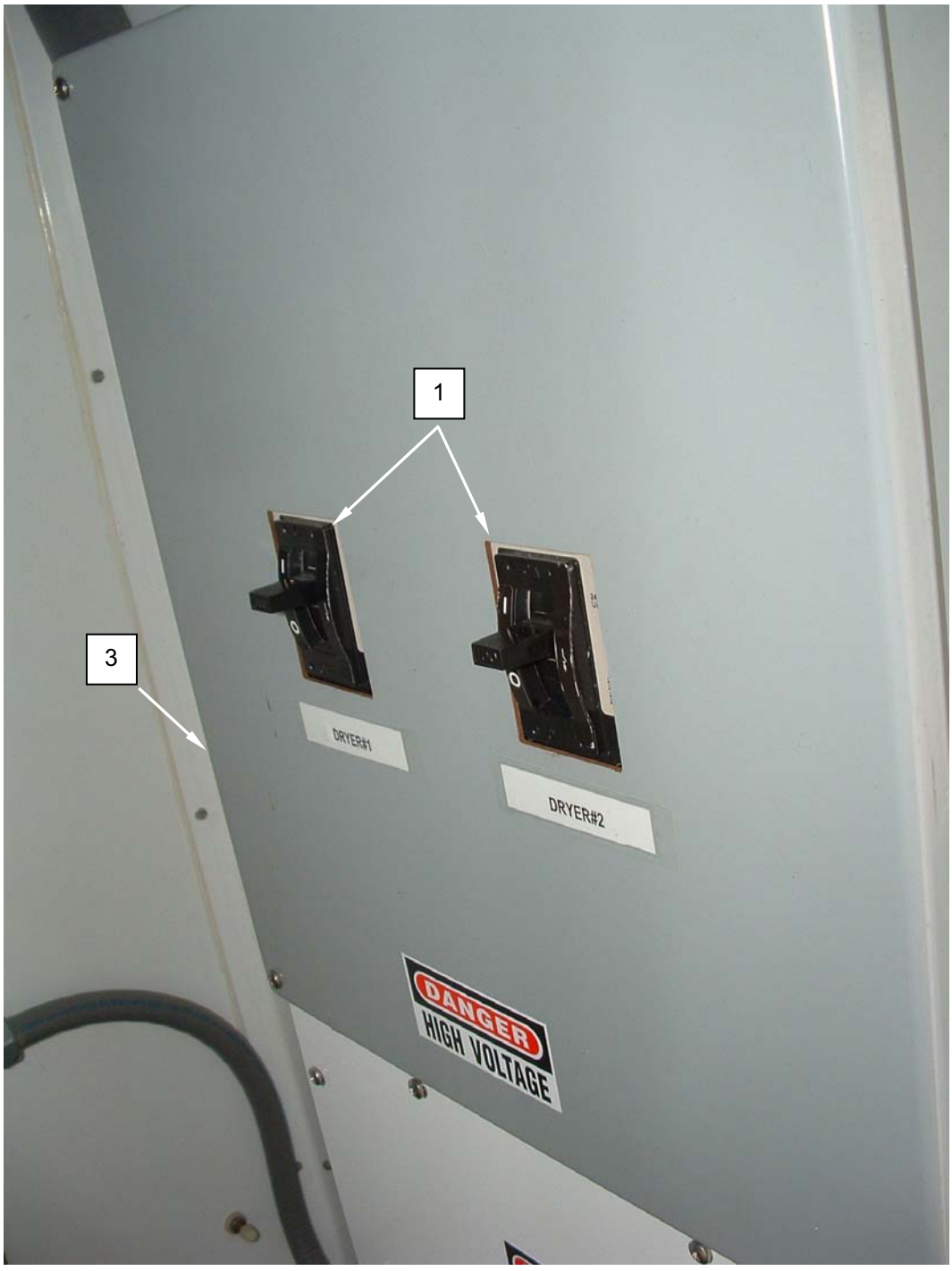


Figure 2. Test Circuit Breakers – Dryer Panel.

TEST-CONTINUED

7. Disconnect wires from each side of breaker **(Figures 1, 2, 3, 4, Item 1)**. Leaving wires connected to circuit breaker could give resistance indication when placed in the ON position.

8. In turn, use a multi-meter set to read resistance (Ohms) to check for continuity at circuit breakers **(Figures 1, 2, 3, 4, Item 1)**. Do this by placing a test lead at opposite terminals of each breaker tested. Three phase breakers require each leg to be tested separately.

9. If continuity is present with circuit breaker in OFF position, replace circuit breaker **(Figures 1, 2, 3, 4, Item 1)**.

10. Switch circuit breaker **(Figures 1, 2, 3, 4, Item 1)** to ON.

11. Test for continuity as described in Step 7. If no continuity is present, replace circuit breaker **(Figures 1, 2, 3, 4, Item 1)**.

12. Reinstall circuit breaker panel cover **(Figures 1, 2, 3, 4, Item 3)** and circuit breaker box cover **(Figures 1, 3, Item 2)**.

13. Reconnect power and monitor for normal operation.

TEST-CONTINUED

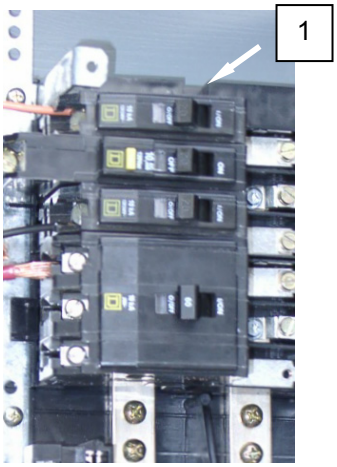


Figure 3. Test Circuit Breakers – Main Panel.

TEST-CONTINUED

Figure 4. Test Circuit Breakers – Dryer Panel.

REPLACE

Replace Circuit Breaker

WARNING

This equipment operates at high voltages. Use extreme caution, observe all warnings, and follow all safety procedures. Failure to observe safety precautions may result in injury or death to personnel.

NOTE

Figures 5 and 7 illustrate the procedures on the main circuit breaker panel. Figures 6 and 8 illustrate the procedures on the dryer circuit breaker panel.

1. Switch all circuit breakers **(Figures 5, 6, 7, 8, Item 1)** to OFF.
2. Disconnect all power cables to the CBL.
3. Remove screws retaining the circuit breaker box cover **(Figures 5, 7, Item 2)** (Main Circuit Breaker Panel only), and remove the circuit breaker box cover.
4. Remove the screws retaining the circuit breaker panel cover **(Figures 5, 6, 7, 8, Item 3)** and lift the circuit breaker panel cover from circuit breaker box.
5. Tag and disconnect wires from the circuit breaker **(Figures 5, 6, 7, 8, Item 1)** to be replaced.
6. Remove circuit breaker **(Figures 5, 6, 7, 8, Item 1)**.

CAUTION

Replace damaged or malfunctioning circuit breakers with new ones of equal amperage only. Installing a circuit breaker of higher amperage poses a severe risk of fire in the CBL.

7. Install circuit breaker **(Figures 5, 6, 7, 8, Item 1)**.
8. Connect wires to circuit breaker **(Figures 5, 6, 7, 8, Item 1)** as tagged.
9. Install circuit breaker panel cover **(Figures 5, 6, 7, 8, Item 3)** and retain with screws.
10. Install circuit breaker box cover **(Figures 5, 7, Item 2)** (main circuit breaker panel only) and retain with screws.
11. Reconnect power and monitor for normal operation.

REPLACE-CONTINUED

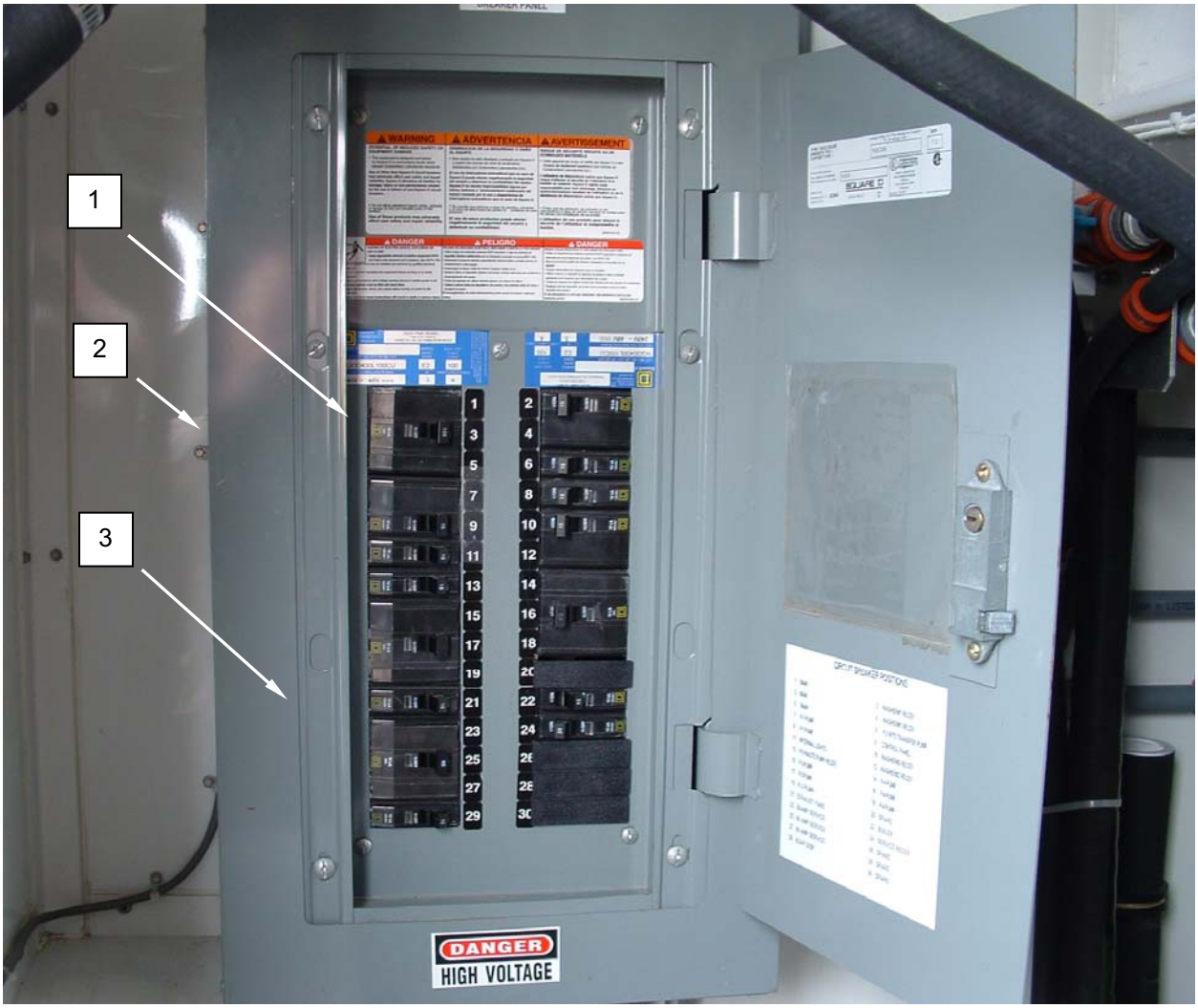


Figure 5. Replace Circuit Breakers – Main Panel.

REPLACE-CONTINUED

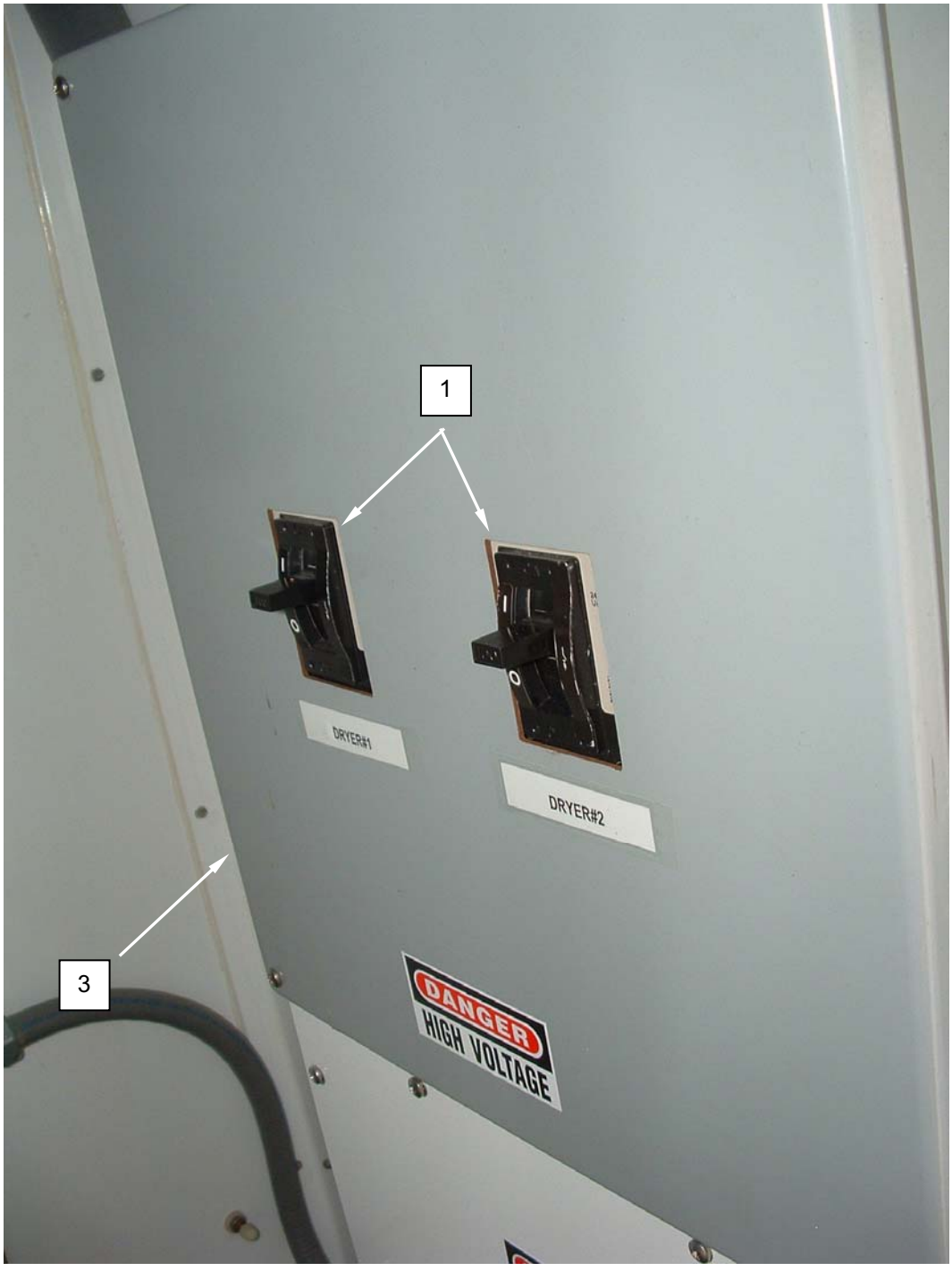


Figure 6. Replace Circuit Breakers – Dryer Panel.

REPLACE-CONTINUED

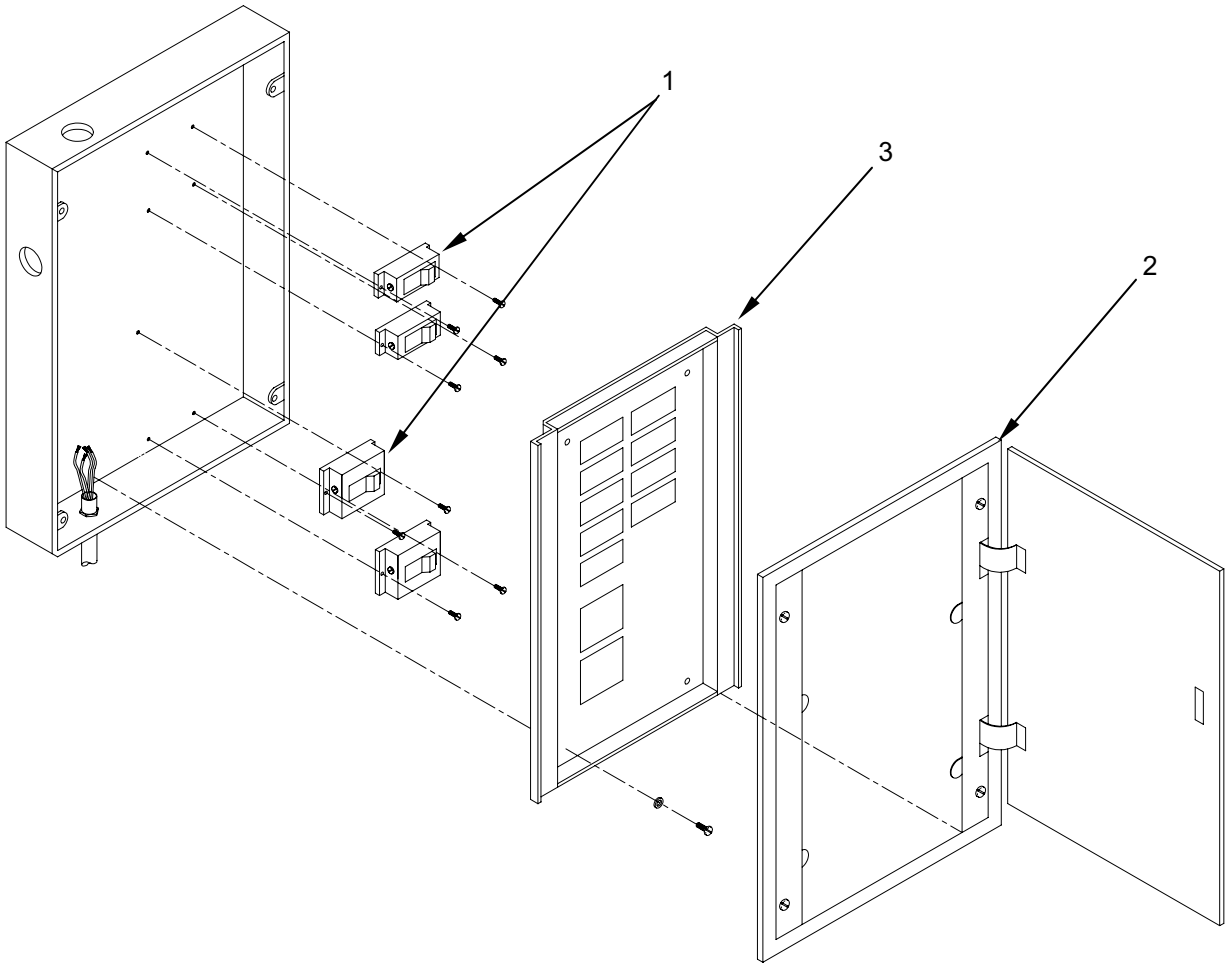


Figure 7. Replace Circuit Breakers – Main Panel.

REPLACE-CONTINUED

Figure 8. Replace Circuit Breakers – Dryer Panel.

END OF WORK PACKAGE

UNIT MAINTENANCE
CONTAINERIZED BATCH LAUNDRY
NSN 3510-01-527-2209
NSN 3510-01-527-2210
POWER INPUT RECEPTACLES
TEST, REPLACE

INITIAL SETUP

Tools	**Personnel Required**
Shop Equipment, Automotive Maintenance and Repair: Organizational Maintenance, Common No.1 (WP 0086 00, Table 2, Item 5)	Quartermaster and Chemical Equipment Repairer 63J (1)
Materials/Parts	**Equipment Condition**
Tape, Electrical Insulation (WP 0087 00, Item 52) Wire Markers (WP 0087 00, Item 58)	CBL set up Circuit Breakers set to off

TEST

Test the Power Input Receptacle

WARNING

This equipment operates at high voltages. Use extreme caution, observe all warnings, and follow all safety procedures. Failure to observe safety precautions may result in injury or death to personnel.

NOTE

The procedure is identical for both the main power input receptacle and the dryer power input receptacles.

1. Disconnect power input cable **(Figure 1, Item 1)** from the receptacle **(Figure 1, Item 2)** on the CBL power panel **(Figure 1, Item 3)**.

2. Remove the CBL panel cover **(Figure 1, Item 4)**.

3. At the rear of the power panel **(Figure 2, Item 3)**, unscrew the retainer **(Figure 2, Item 5)** and pull the receptacle **(Figure 2, Item 2)** out of the sleeve **(Figure 2, Item 6)**.

4. Remove screws retaining the circuit breaker box cover **(Figure 2, Item 7)** (main circuit breaker panel only).

5. Remove the circuit breaker box cover **(Figure 2, Item 7)** (main circuit breaker panel only).

6. Remove screws retaining the circuit breaker panel cover **(Figure 2, Item 8)**.

7. Remove the circuit breaker panel cover **(Figure 2, Item 8)**.

TEST-CONTINUED

8. Use an ohmmeter to check for zero resistance between each prong **(Figure 2, Item 9)** and the corresponding wire connection **(Figure 2, Item 10)** on the dryer circuit breaker **(Figure 2, Item 11)** if testing a dryer power input receptacle, or the main circuit breaker **(Figure 2, Item 12)** if testing the main power input receptacle.

9. Check for secure connection and condition of wiring **(Figure 1, Item 10)** with an open connection between the prong **(Figure 2, Item 9)** on the receptacle **(Figure 1, Item 2)** and the main circuit breaker **(Figure 2, Items 11 or 12)**.

10. Replace a receptacle **(Figure 2, Item 2)** or wiring **(Figure 2, Item 10)** with an open connection.

11. If continuity is determined between each prong and the corresponding circuit breaker connection, re-install the receptacle **(Figure 2, Item 2)**, and secure with retainer **(Figure 2, Item 5)**.

12. Install the panel cover **(Figure 1, Item 4)**.

13. Reinstall circuit breaker panel cover **(Figure 2, Item 7)** and circuit breaker box cover **(Figure 2, Item 8)**.

14. Connect the power input cable **(Figure 1, Item 1)**.

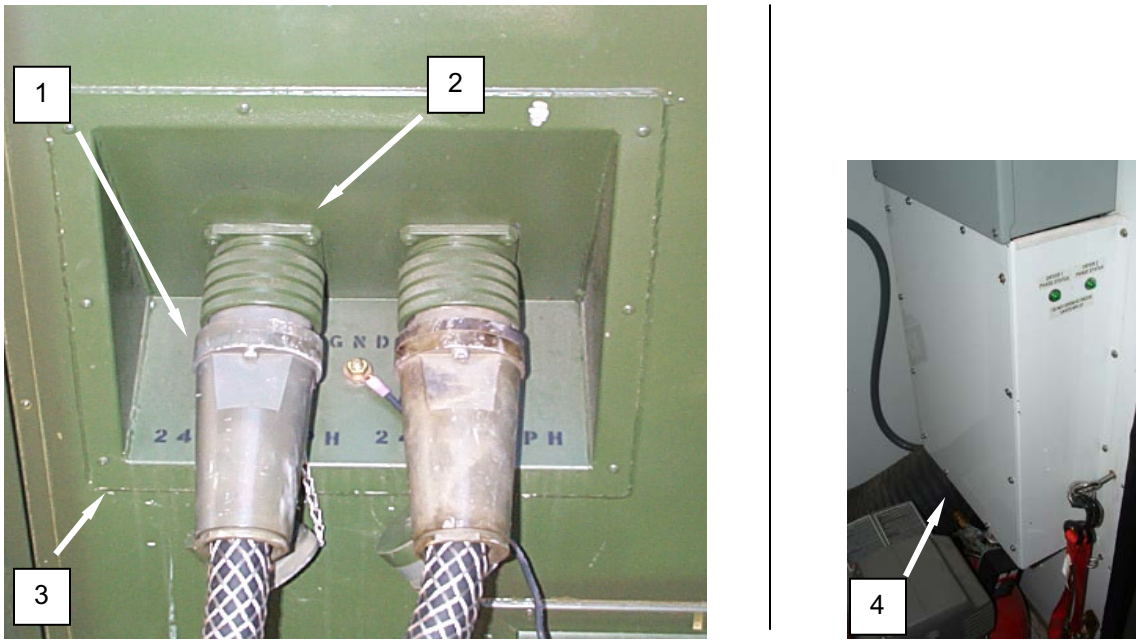
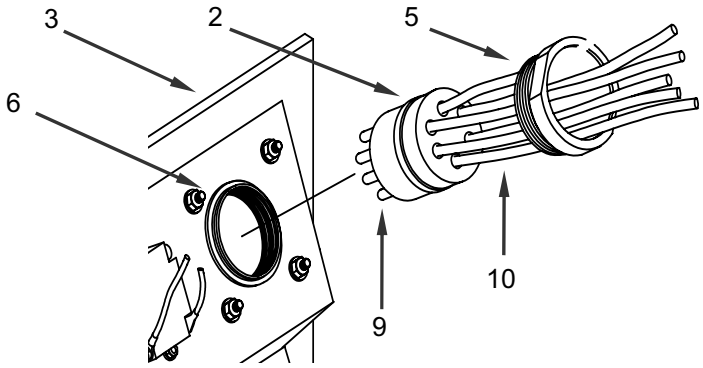


Figure 1. Test the Power Input Receptacle.

TEST-CONTINUED



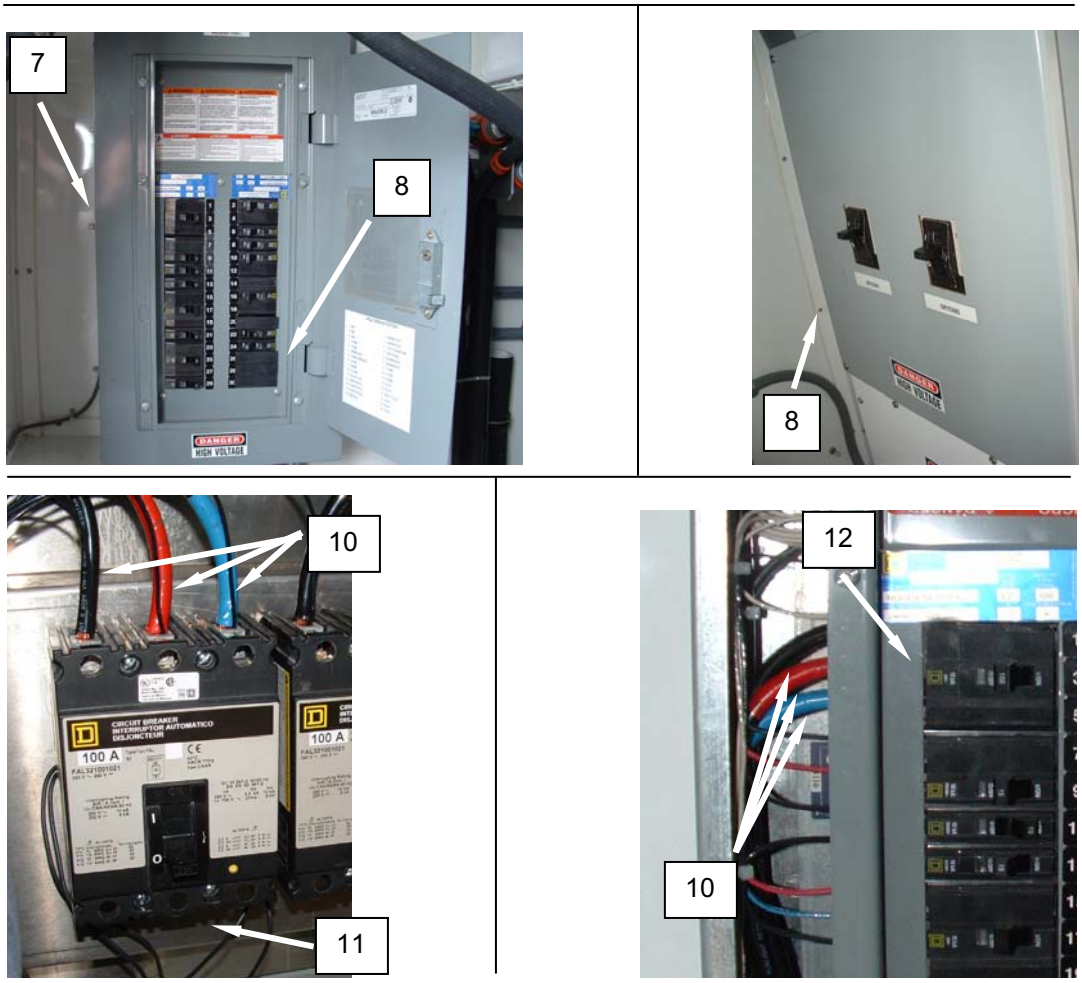


Figure 2. Test the Power Input Receptacle.

REPLACE

Replace the Power Input Receptacle

1. Disconnect the input power cable **(Figure 3, Item 1)** from the receptacle **(Figure 3, Item 2)** on the CBL power panel **(Figure 3, Item 3)**.

2. Remove the panel cover **(Figure 3, Item 4)**.

3. At the rear of the power panel **(Figure 3, Item 3)**, unscrew the retainer **(Figure 3, Item 5)** and pull the receptacle **(Figure 3, Item 2)** out of the sleeve **(Figure 3, Item 6)**.

4. Remove screws retaining the circuit breaker box cover **(Figure 3, Item 7)**, and remove the circuit breaker box cover (Main Circuit Breaker Panel only).

5. Remove screws retaining the circuit breaker panel cover **(Figure 3, Item 8)**, and remove the circuit breaker panel cover.

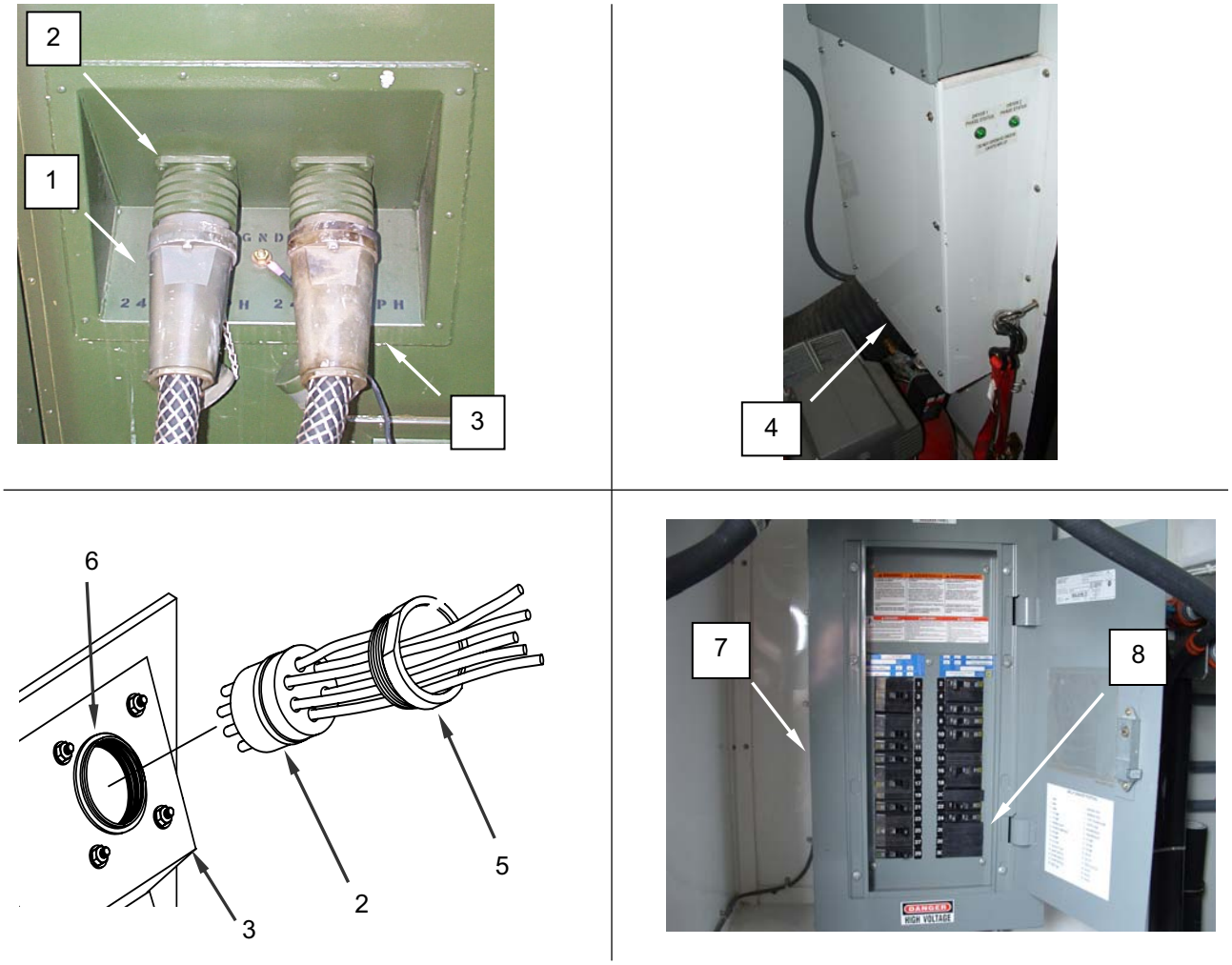


Figure 3. Replace the Power Input Receptacle.

REPLACE-CONTINUED

6. Remove screws, washers and nuts securing the connector sleeve **(Figure 4, Item 6)**, gasket **(Figure 4, Item 13)** and dust cover **(Figure 4, Item 14)** to the power panel **(Figure 4, Item 3)**.

7. Tag and disconnect the wires **(Figure 4, Item 10)** from the main circuit breaker **(Figure 4, Item 12)**, if replacing the main power input connector, or from the dryer circuit breaker if replacing one of the dryer circuit breakers.

8. Install the replacement connector sleeve **(Figure 4, Item 6)**, gasket **(Figure 4, Item 13)** and dust cover **(Figure 4, Item 14)** to the power panel **(Figure 4, Item 3)**

9. From the rear of the power panel **(Figure 4, Item 3)**, push the replacement receptacle **(Figure 4, Item 2)** into the sleeve **(Figure 4, Item 6)** and secure with the retainer **(Figure 4, Item 5).**

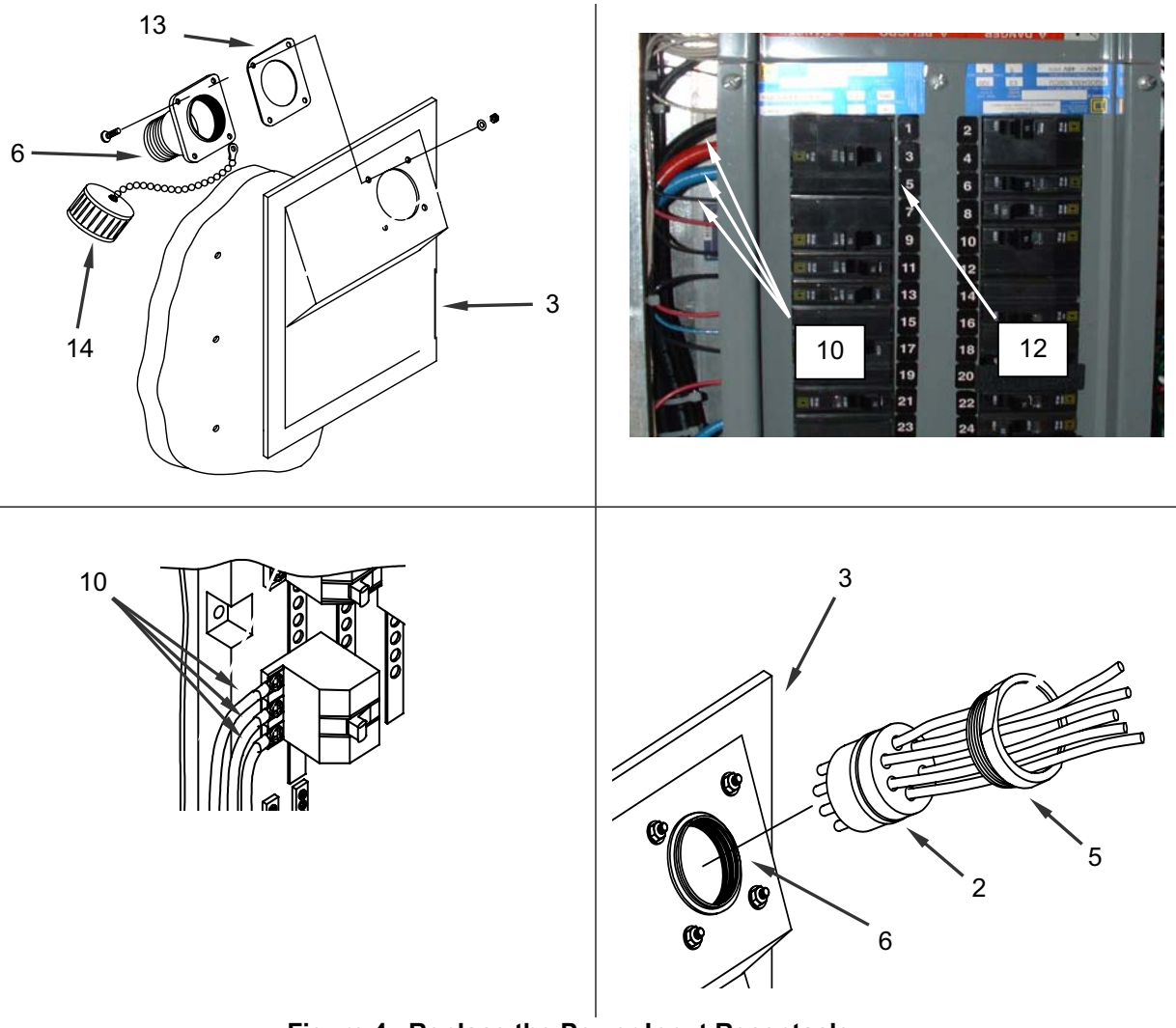


Figure 4. Replace the Power Input Receptacle.

REPLACE-CONTINUED

10. Connect the wires **(Figure 5, Item 10)** as tagged to the main circuit breaker **(Figure 5, Item 12)**, if replacing the main power input connector, or to the dryer circuit breaker if replacing one of the dryer circuit breakers.

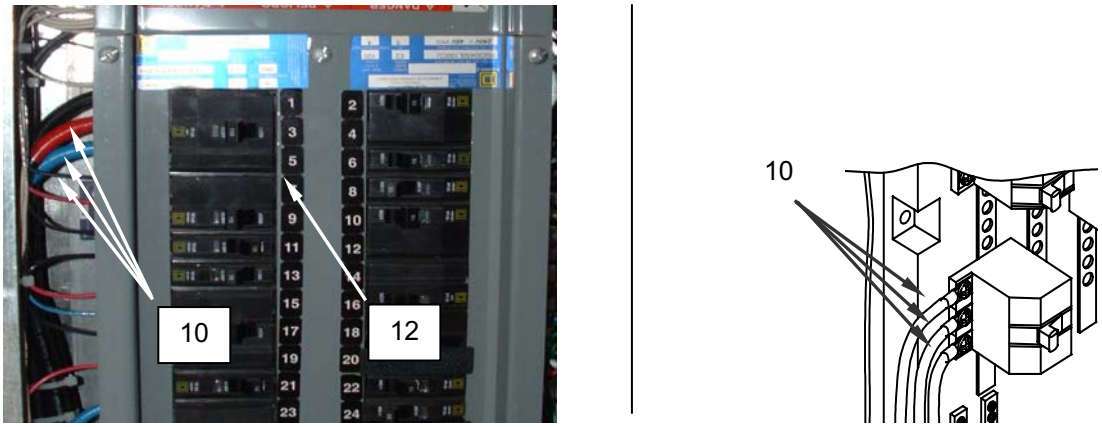


Figure 5. Replace the Power Input Receptacle.

11. Install the panel cover **(Figure 3, Item 4)**.

12. Reinstall circuit breaker panel cover **(Figure 3, Item 7)** and circuit breaker box cover **(Figure 3, Item 8)**.

13. Re-connect power cable **(Figure 1, Item 1)**.

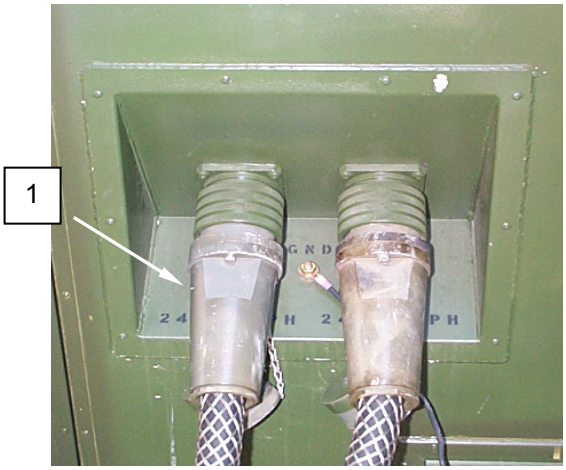


Figure 6. Replace the Power Input Receptacle.

END OF WORK PACKAGE

UNIT MAINTENANCE
CONTAINERIZED BATCH LAUNDRY
NSN 3510-01-527-2209
NSN 3510-01-527-2210
PHASE MONITOR RELAY
INSPECT, TEST, REPLACE

INITIAL SETUP

Tools	**Personnel Required**
Tool Kit, General Mechanics: Automotive (WP 0086 00, Table 2, Item 6)	Quartermaster and Chemical Equipment Repairer 63J (1)
Materials/Parts	**Equipment Condition**
None Required	CBL set up

INSPECT

Inspect the Phase Monitor Relay

WARNING

This equipment operates at high voltages. Use extreme caution, observe all warnings, and follow all safety procedures. Failure to observe safety precautions may result in injury or death to personnel.

1. Disconnect power.
2. Remove screws retaining power input panel interior cover and remove cover.
3. Inspect the phase monitor relay(s) **(Figure 1, Item 1)** for visible damage.
4. Install the power input panel interior cover, and retain with screws.
5. Connect power and monitor for normal operation.

INSPECT-CONTINUED

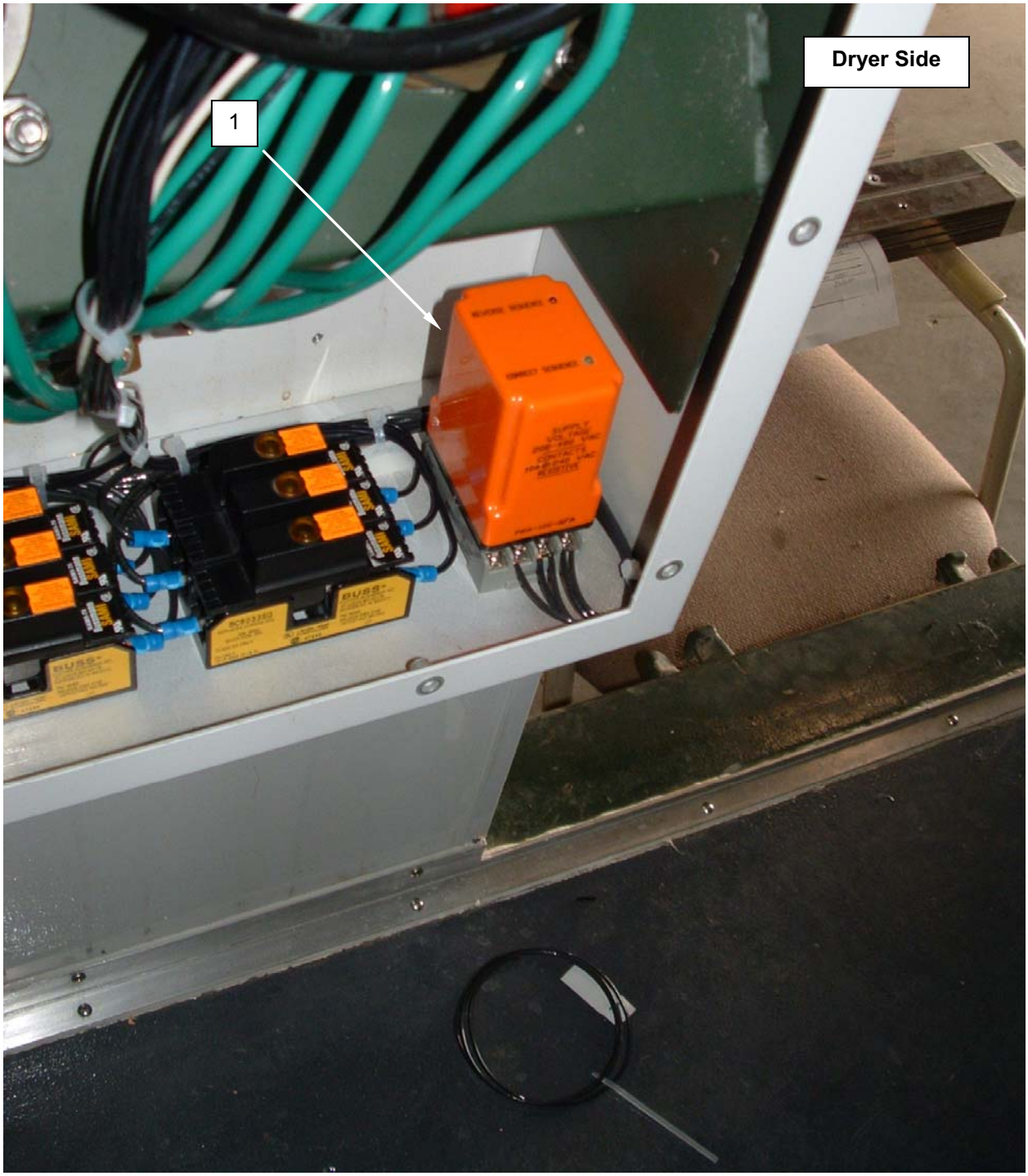


Figure 1. Inspect the Phase Monitor Relay.

INSPECT-CONTINUED

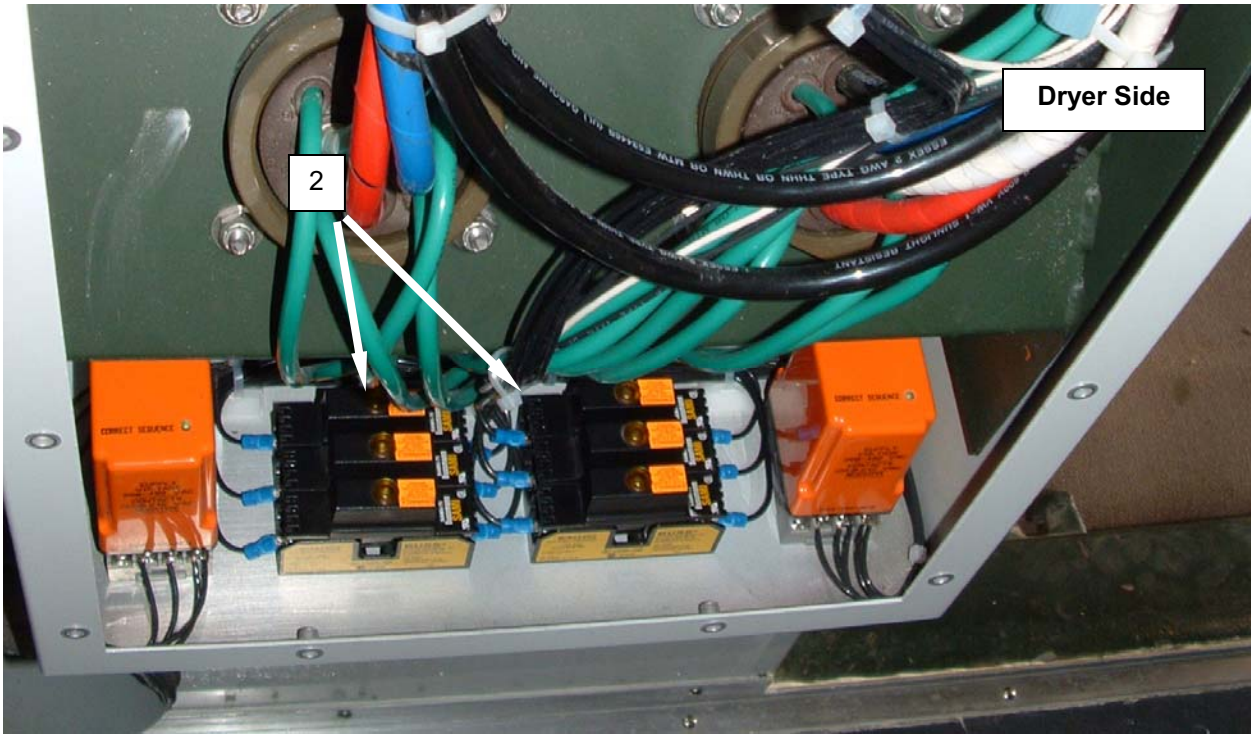
Inspect the Phase Monitor Relay Fuses

WARNING

This equipment operates at high voltages. Use extreme caution, observe all warnings, and follow all safety procedures. Failure to observe safety precautions may result in injury or death to personnel.

1. Disconnect power.
2. Remove screws retaining power input panel interior cover and remove cover.
3. Remove fuse covers **(Figure 2, Item 2)** from fuses **(Figure 2, Item 3)**.
4. Inspect the phase monitor relay fuses **(Figure 2, Item 3)** for visible damage.
5. Test and replace open fuses **(Figure 2, Item 3)** as necessary.
6. Install the fuse covers **(Figure 2, Item 2)**.
7. Install the power input panel interior cover and retain with screws.
8. Connect power and monitor for normal operation.

INSPECT-CONTINUED



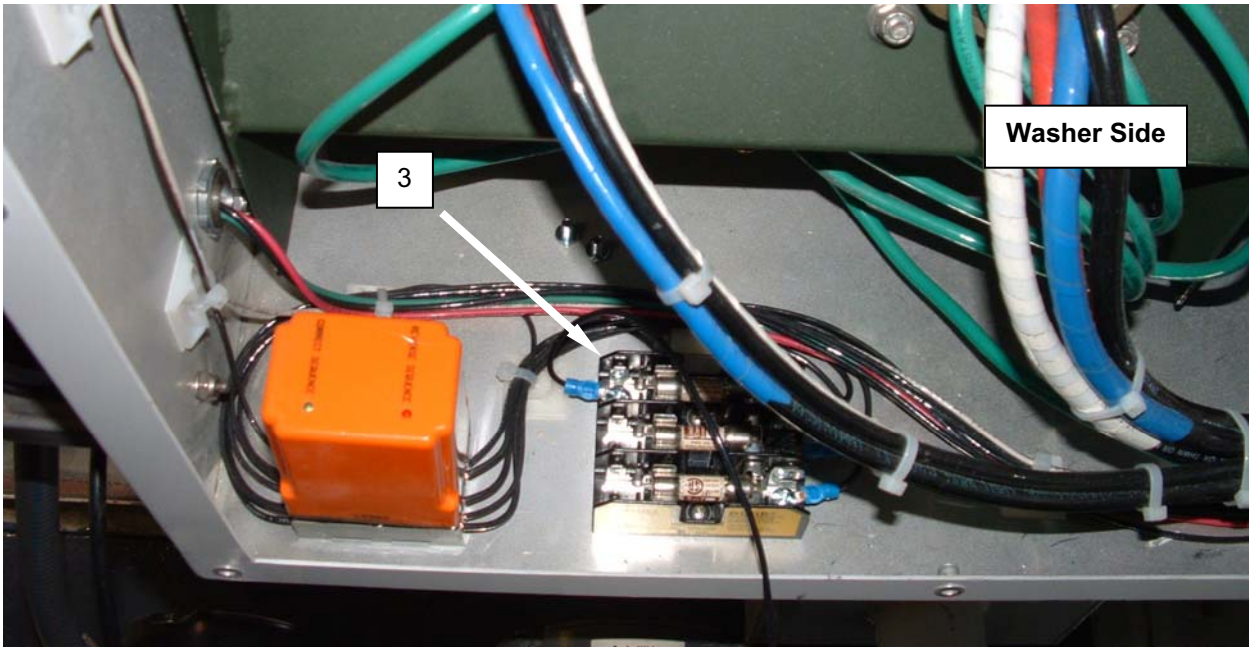


Figure 2. Inspect the Phase Monitor Relay Fuses

TEST

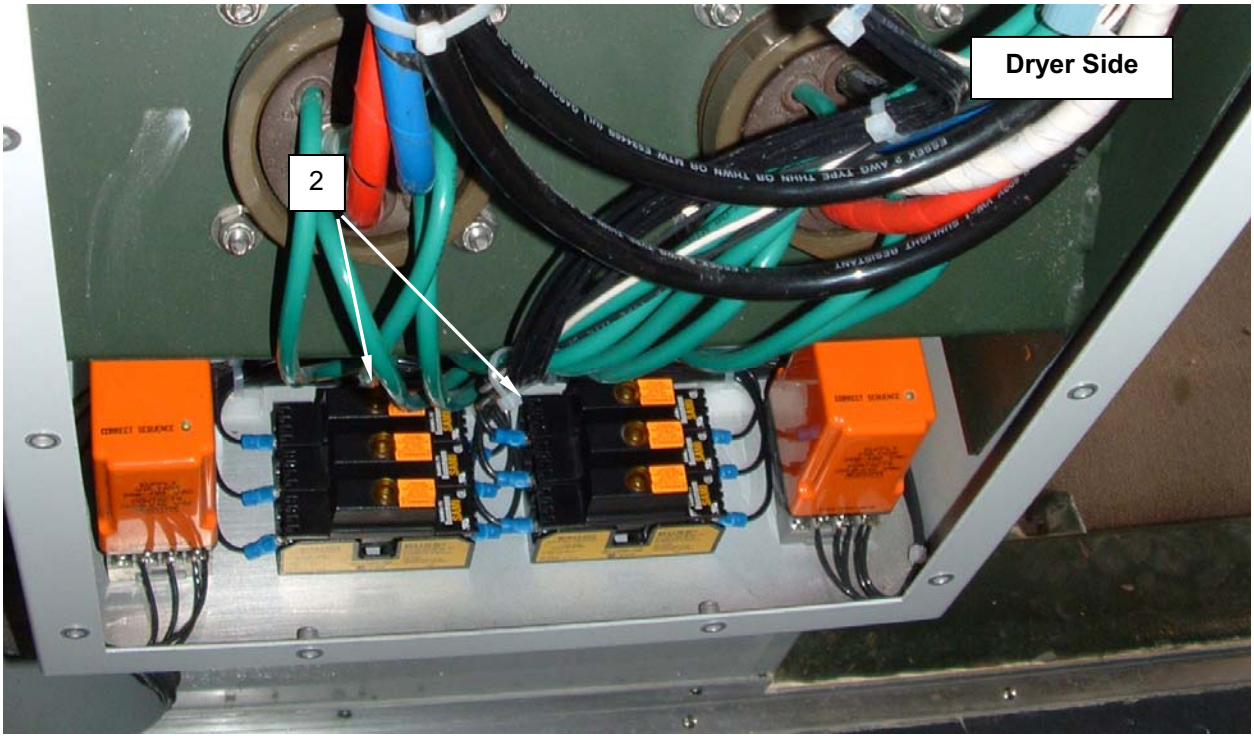
Test the Phase Monitor Relay Fuse

WARNING

This equipment operates at high voltages. Use extreme caution, observe all warnings, and follow all safety procedures. Failure to observe safety precautions may result in injury or death to personnel.

1. Disconnect the power.
2. Remove screws retaining power input panel interior cover, and remove cover.
3. Remove fuse cover **(Figure 3, Item 2)** from fuse **(Figure 3, Item 3)**.
4. Remove fuse **(Figure 3, Item 3)** from fuse holder **(Figure 3, Item 4)**.
5. Use an ohmmeter to test fuse **(Figure 3, Item 3)** for continuity.
6. Replace an open fuse **(Figure 3, Item 3)**.
7. Install fuse **(Figure 3, Item 3)** into fuse holder **(Figure 3, Item 4)**.
8. Install fuse cover **(Figure 3, Item 2)** onto fuse **(Figure 3, Item 3)**.
9. Install the power input panel interior cover and retain with screws.
10. Connect power and monitor for normal operation.

TEST-CONTINUED



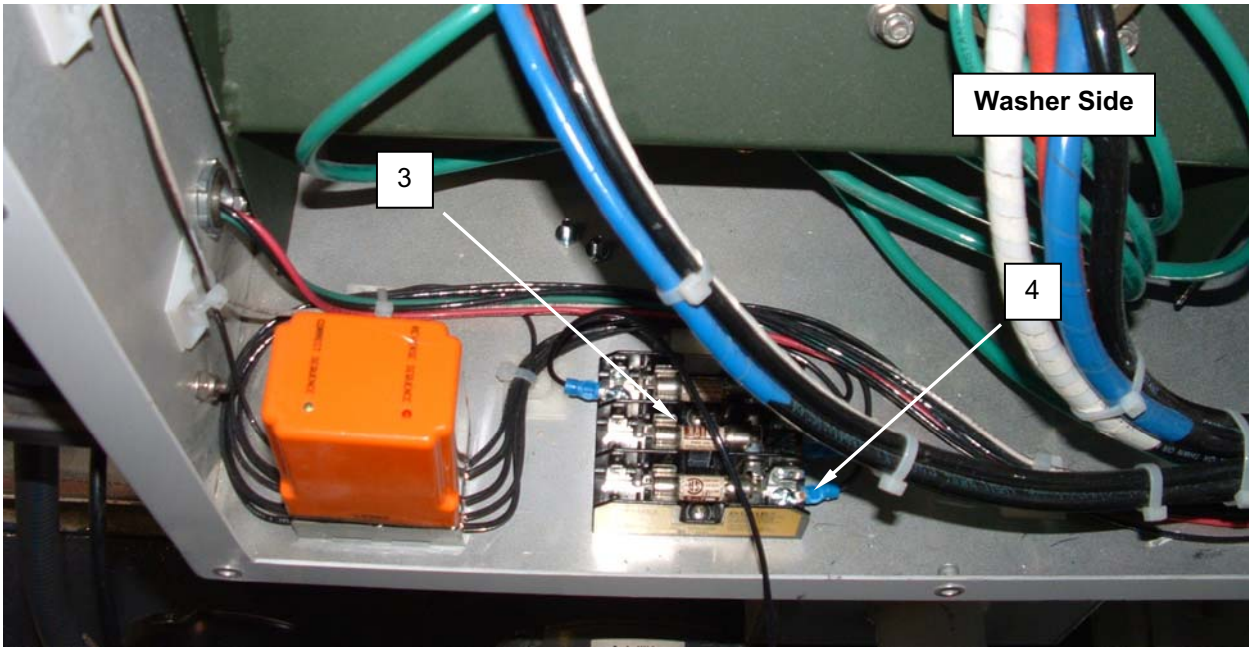


Figure 3. Test the Phase Monitor Relay Fuses.

REPLACE

Replace the Phase Monitor Relay

WARNING

This equipment operates at high voltages. Use extreme caution, observe all warnings, and follow all safety procedures. Failure to observe safety precautions may result in injury or death to personnel.

1. Disconnect power.
2. Remove screws retaining power input panel interior cover and remove cover.
3. Remove the phase monitor relay(s) **(Figure 4, Item 1)** and install replacement relay(s).
4. Install the power input panel interior cover and retain with screws.
5. Connect power and monitor for normal operation.

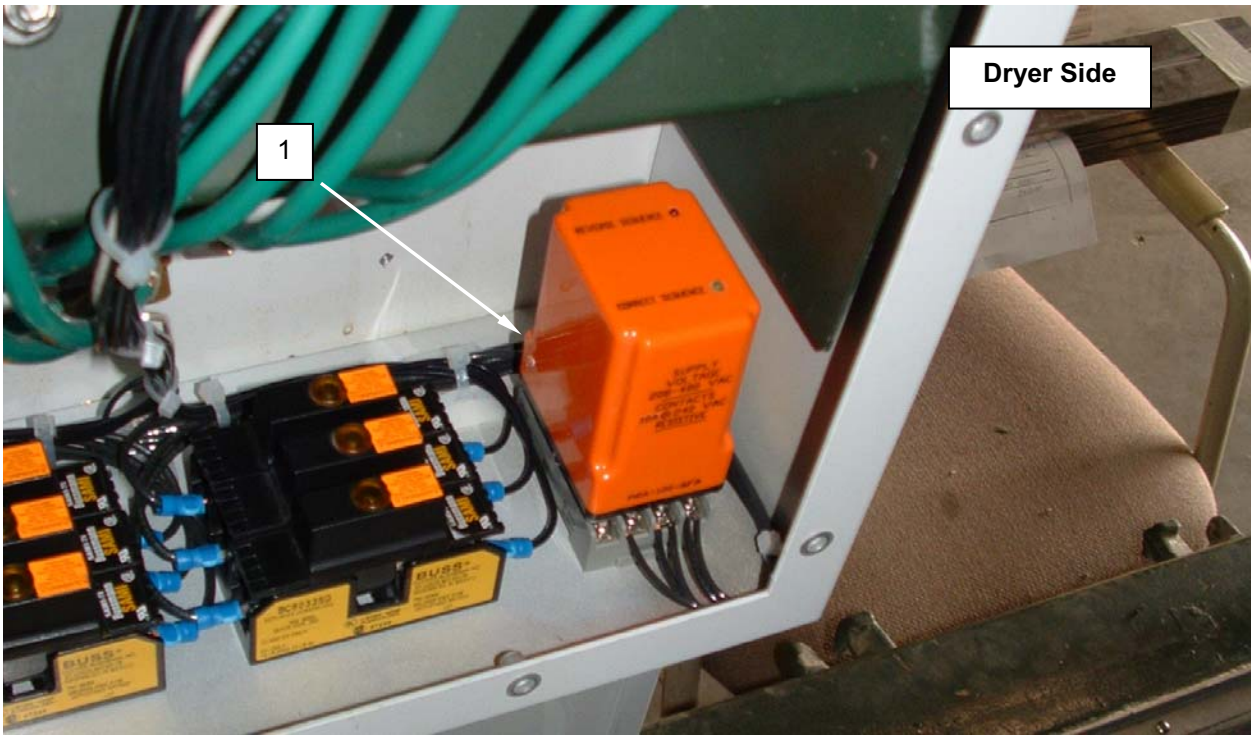


Figure 4. Replace the Phase Monitor Relay.

REPLACE-CONTINUED

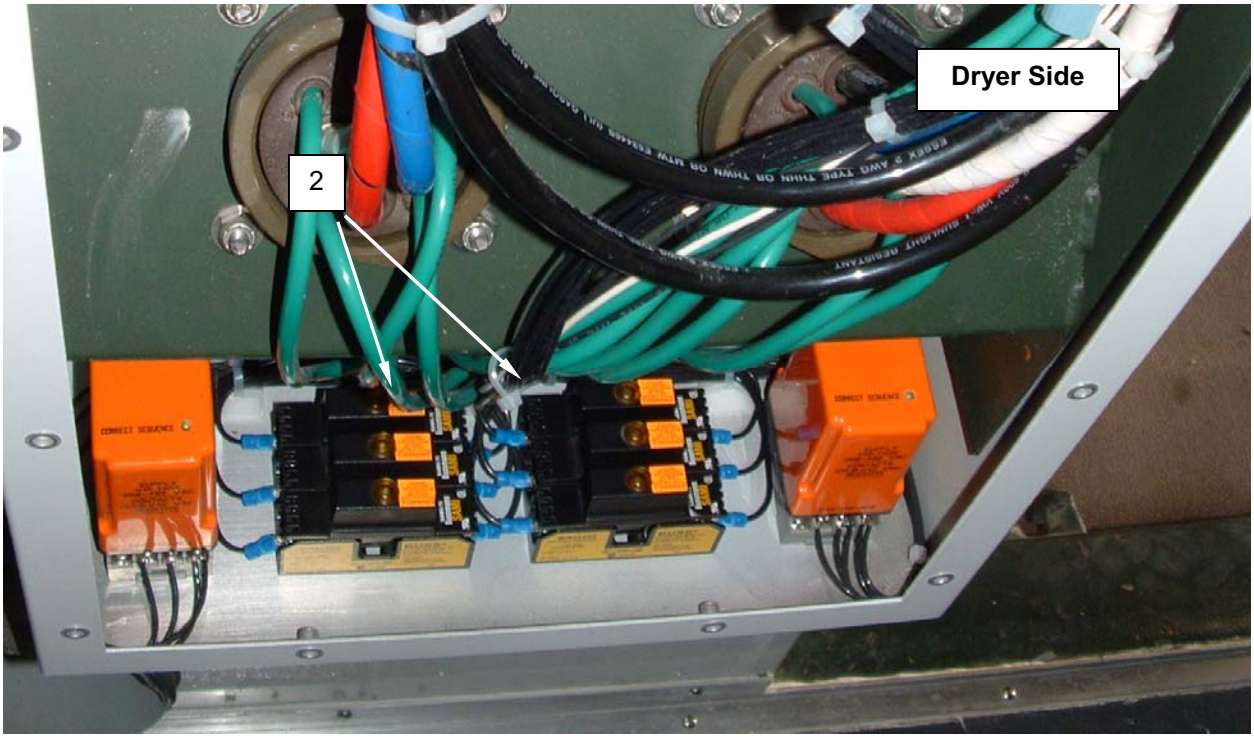
Replace the Phase Monitor Relay Fuse

WARNING

This equipment operates at high voltages. Use extreme caution, observe all warnings, and follow all safety procedures. Failure to observe safety precautions may result in injury or death to personnel.

1. Disconnect power.
2. Remove screws retaining power input panel interior cover, and remove cover.
3. Remove fuse cover **(Figure 5, Item 2)** from fuse **(Figure 5, Item 3)**.
4. Remove fuse **(Figure 5, Item 3)** from fuse holder **(Figure 5, Item 4)**.
5. Install replacement fuse **(Figure 5, Item 3)** into fuse holder **(Figure 5, Item 4)**.
6. Install fuse cover **(Figure 5, Item 2)** onto replacement fuse **(Figure 5, Item 3)**.
7. Install the power input panel interior cover and retain with screws.
8. Connect power and monitor for normal operation.

REPLACE-CONTINUED



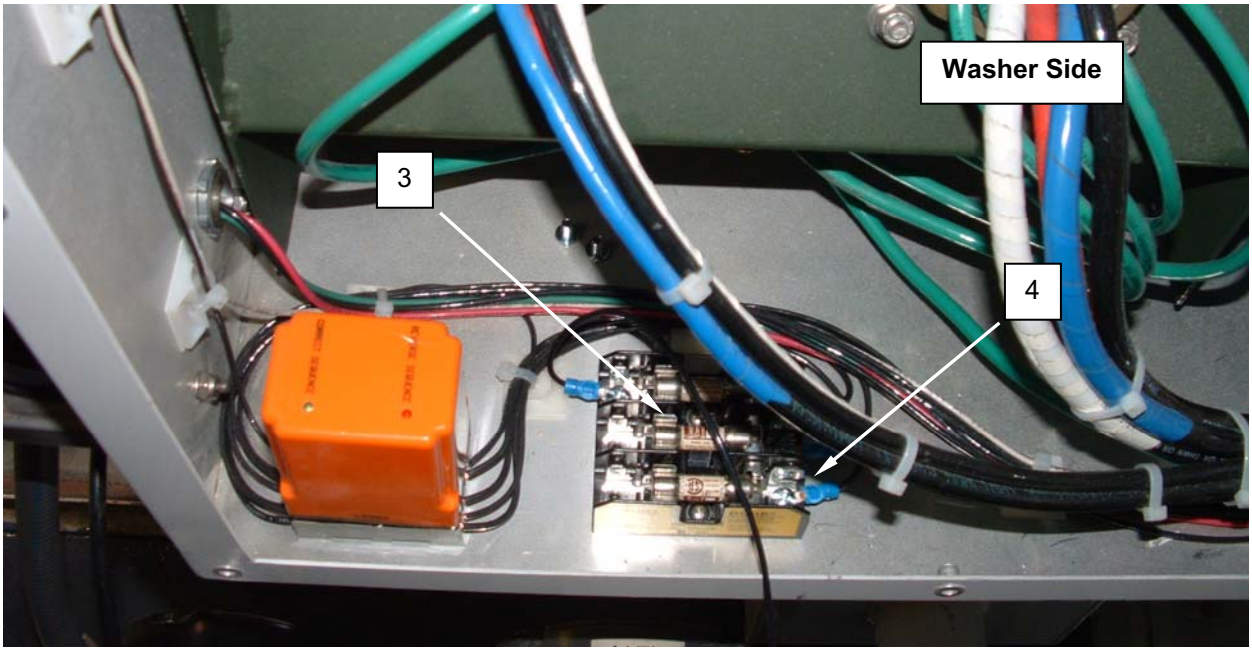


Figure 5. Replace the Phase Monitor Relay Fuses.

END OF WORK PACKAGE

UNIT MAINTENANCE
CONTAINERIZED BATCH LAUNDRY
NSN 3510-01-527-2209
NSN 3510-01-527-2210
PHASE INDICATORS
REPLACE

INITIAL SETUP

Tools	**Personnel Required**
Tool Kit, General Mechanics: Automotive (WP 0086 00, Table 2, Item 6)	Quartermaster and Chemical Equipment Repairer 63J (1)
Materials/Parts	**Equipment Condition**
Connector, Butt, #14-16 – Blue (WP 0087 00, Item 14)	CBL set up

REPLACE

Replace the Phase Indicator Lights

1. Disconnect power.
2. Remove screws retaining power input panel interior cover, and remove cover.
3. Tag and cut wiring from indicator light **(Figure 1, Item 1)**.
4. Unscrew light assembly **(Figure 1, Item 1)** hex nut.
5. Remove failed light assembly **(Figure 1, Item 1)**.
6. Install replacement light assembly **(Figure 1, Item 1)**.
7. Secure with hex nut.
8. Connect wiring to indicator light terminals as tagged **(Figure 1, Item 1)**.
9. Install the power input panel interior cover and retain with screws.
10. Connect power and monitor for normal operation.

REPLACE-CONTINUED

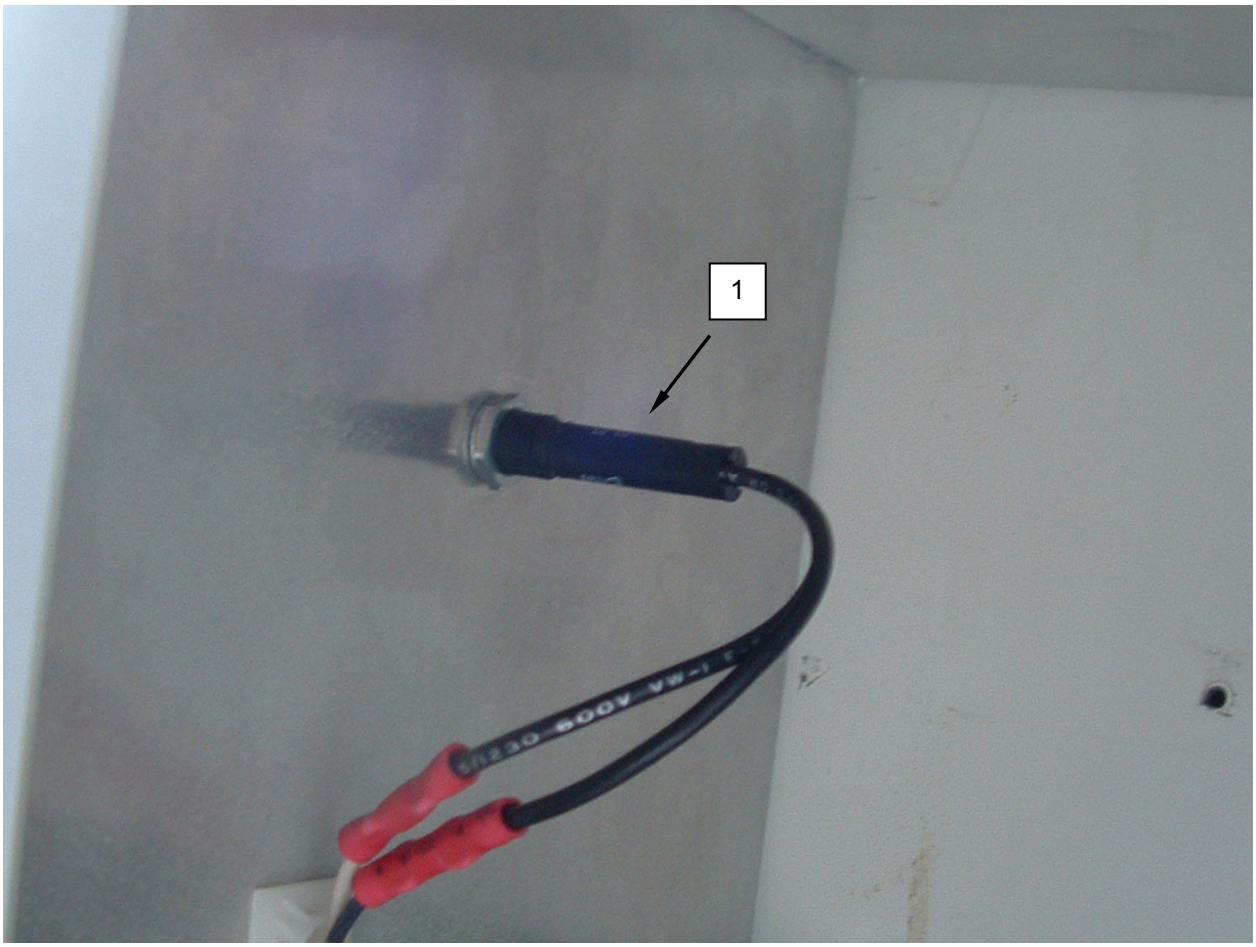


Figure 1. Replace the Phase Indicator Lights.

END OF WORK PACKAGE

UNIT MAINTENANCE
CONTAINERIZED BATCH LAUNDRY
NSN 3510-01-527-2209
NSN 3510-01-527-2210
LINE REACTOR
INSPECT, TEST, REPLACE

INITIAL SETUP

Tools
Tool Kit, General Mechanics: Automotive (WP 0086 00, Table 2, Item 6)

Personnel Required
Quartermaster and Chemical Equipment Repairer 63J (1)

Materials/Parts
Tape, Electrical Insulation (WP 0087 00, Item 50)
Wire Markers (WP 0087 00, Item 56)

Equipment Condition
CBL set up

INSPECT

Inspect the Line Reactor

WARNING

This equipment operates at high voltages. Use extreme caution, observe all warnings, and follow all safety procedures. Failure to observe safety precautions may result in injury or death to personnel.

1. Disconnect power.
2. Remove screws retaining power input panel interior cover and remove power input panel interior cover.
3. Inspect line reactor **(Figure 1, Item 1)** for loose connections, signs of burning, or material damage.
4. Install power input panel interior cover and retain with screws.
5. Connect power and monitor for normal operation.

INSPECT-CONTINUED

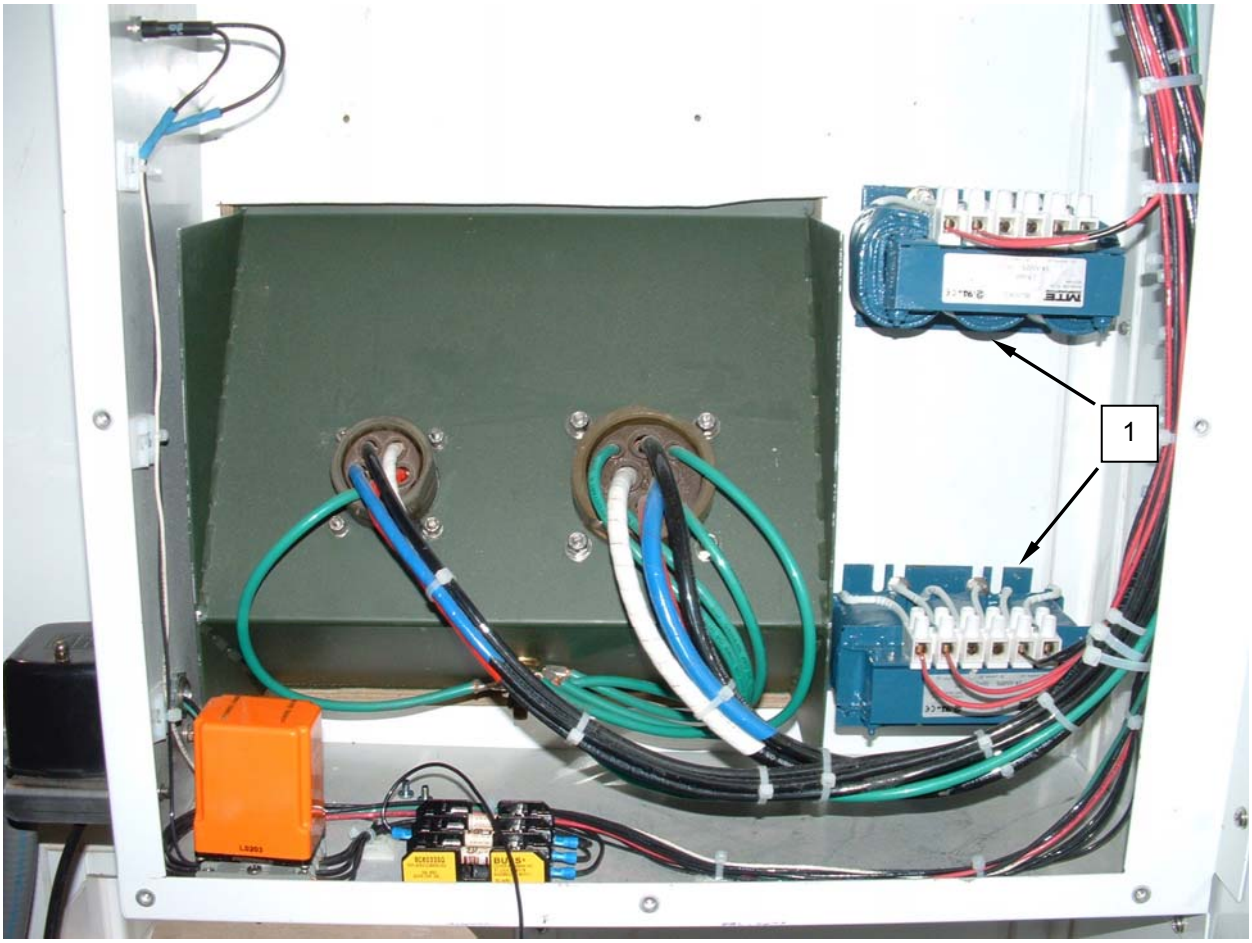


Figure 1. Inspect the Line Reactors.

TEST

Test the Line Reactor

WARNING

This equipment operates at high voltages. Use extreme caution, observe all warnings, and follow all safety procedures. Failure to observe safety precautions may result in injury or death to personnel.

1. Disconnect power.
2. Remove screws retaining power input panel interior cover and remove power input panel interior cover.

WARNING

Connecting power at this time will expose live wiring and components. Use extreme caution, observe all warnings, and follow all safety procedures. Failure to observe safety precautions may result in injury or death to personnel.

3. Connect power and switch the main breaker, breaker No. 8 (washer #1), and breaker No. 10 (washer # 2) to ON.
4. Use a voltmeter to test for 208 VAC at reactor output terminals **(Figure 2, Item 2)**.
5. Use a voltmeter to check for 208 VAC at reactor input terminals **(Figure 2, Item 3)**.
6. Replace an open or shorted reactor **(Figure 1, Item 1)**.
7. Disconnect power.
8. Use an ohmmeter to test for a short to ground from both the reactor output terminals **(Figure 2, Item 2)** and the reactor input terminals **(Figure 2, Item 3)**.
9. Install power input panel interior cover and retain with screws.
10. Connect power and monitor for normal operation.

TEST-CONTINUED

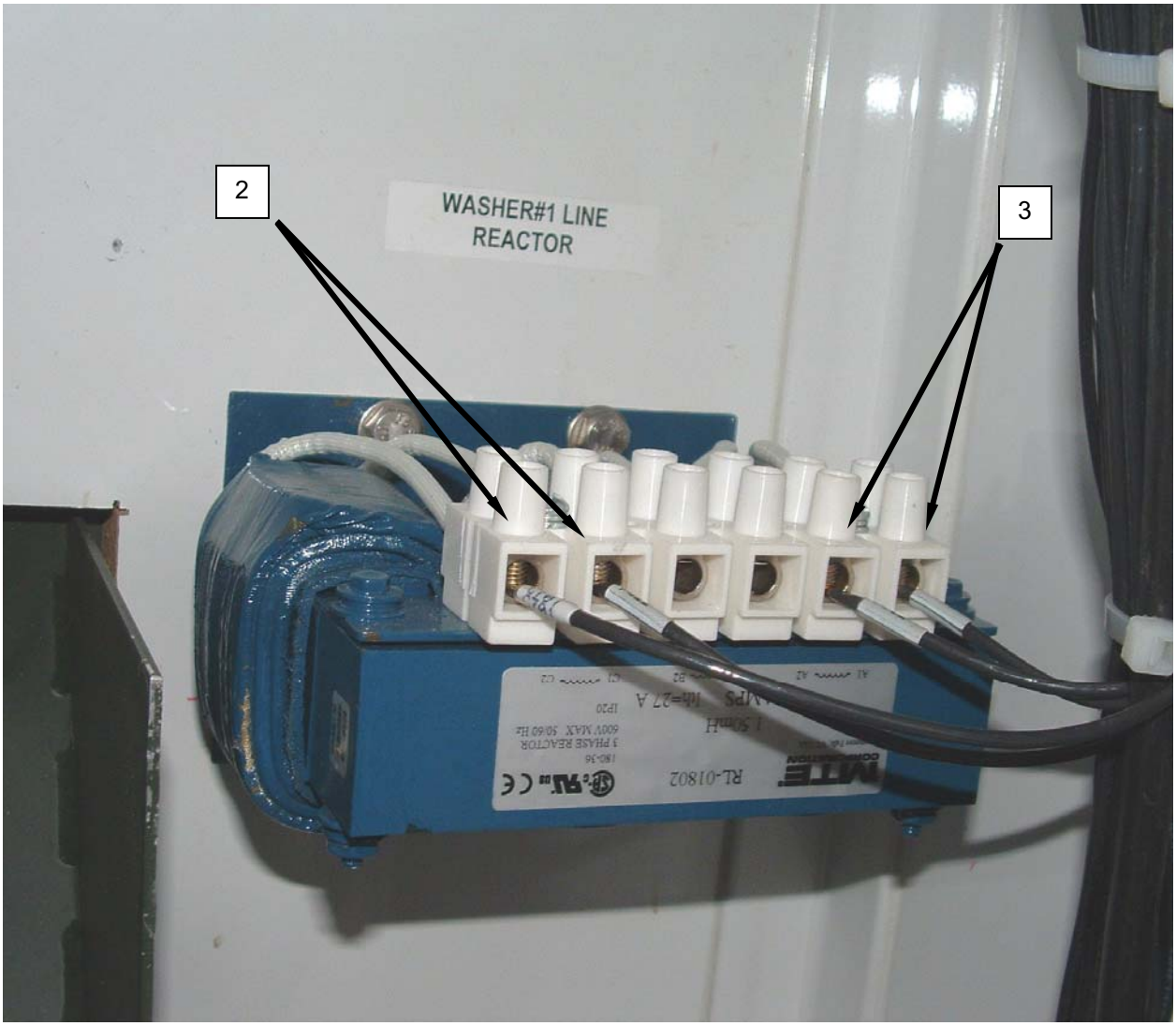


Figure 2. Test the Line Reactors.

REPLACE

Replace the Line Reactor

WARNING

This equipment operates at high voltages. Use extreme caution, observe all warnings, and follow all safety procedures. Failure to observe safety precautions may result in injury or death to personnel.

1. Disconnect power.
2. Remove screws retaining power input panel interior cover and remove power input panel interior cover.
3. Tag and disconnect wiring from the line reactor **(Figure 3, Item 1)**.

CAUTION

Support the line reactor when removing the mounting hardware to prevent this component from falling and damaging other components within the panel.

4. Remove screws and washers retaining the line reactor **(Figure 3, Item 1)** and remove the line reactor.
5. Install the replacement line reactor **(Figure 3, Item 1)** and retain with screws and washers.
6. Connect wiring to the replacement line reactor **(Figure 3, Item 1)** as tagged.
7. Install power input panel interior cover and retain with screws.
8. Connect power and monitor for normal operation.

REPLACE-CONTINUED

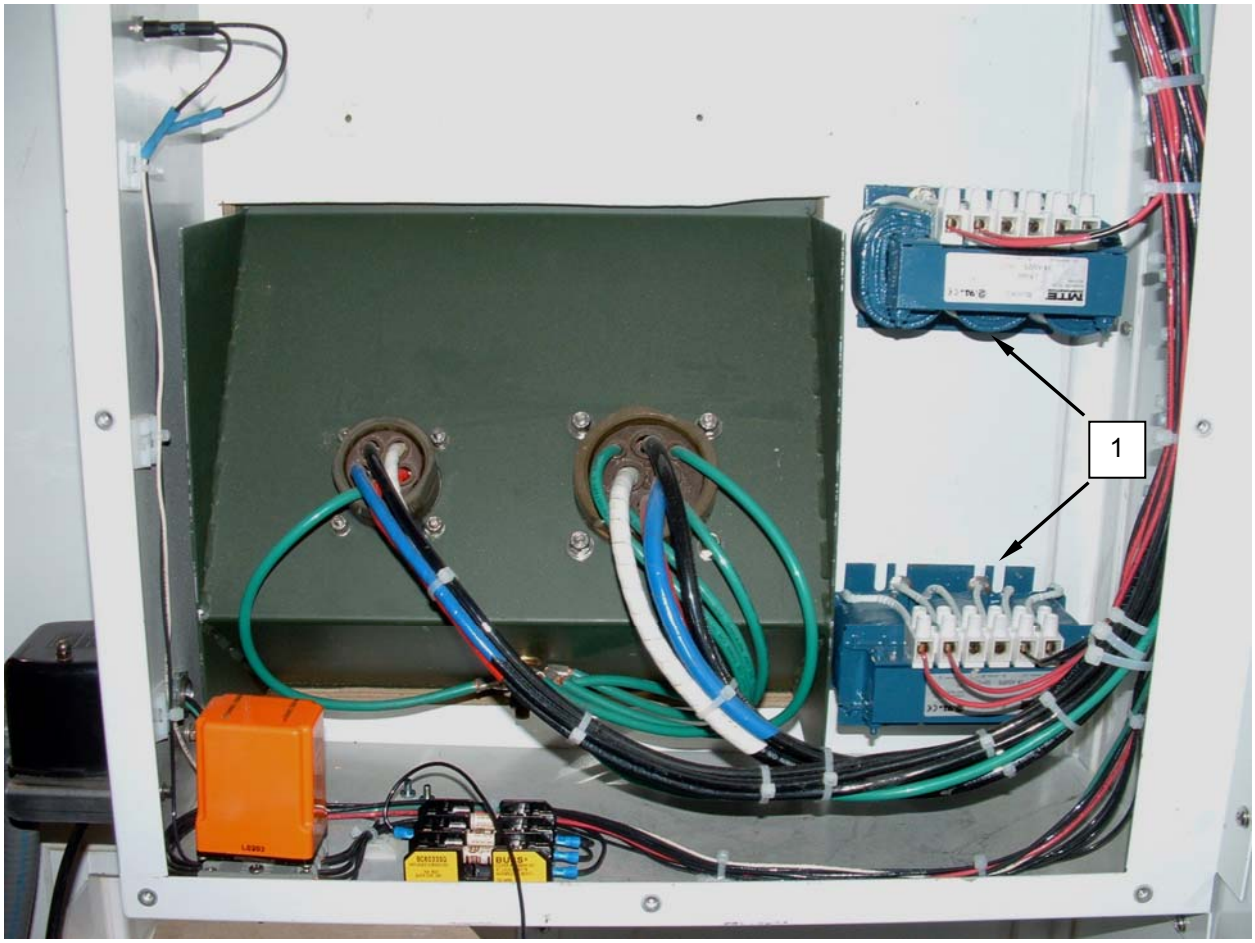


Figure 3. Replace the Line Reactors.

END OF WORK PACKAGE

UNIT MAINTENANCE
CONTAINERIZED BATCH LAUNDRY
NSN 3510-01-527-2209
NSN 3510-01-527-2210
POWER OUTPUT RECEPTACLE
TEST, REPLACE

INITIAL SETUP

Tools	**Personnel Required**
Shop Equipment, Automotive Maintenance and Repair: Organizational Maintenance, Common No.1 (WP 0086 00, Table 2, Item 5)	Quartermaster and Chemical Equipment Repairer 63J (1)
Materials/Parts	**Equipment Condition**
Tape, Electrical Insulation (WP 0087 00, Item 52) Wire Markers (WP 0087 00, Item 58)	CBL set up Main Breaker OFF

TEST

Test the Power Output Receptacle

WARNING

This equipment operates at high voltages. Use extreme caution, observe all warnings, and follow all safety procedures. Failure to observe safety precautions may result in injury or death to personnel.

1. Disconnect power output cable **(Figure 1, Item 1)** from the receptacle **(Figure 1, Item 2)** on the CBL power panel **(Figure 1, Item 3)**.

2. Remove screws retaining the main circuit breaker box cover **(Figure 2, Item 4)** and remove the circuit breaker box cover.

3. Remove screws retaining the circuit breaker panel cover **(Figure 2, Item 5)** and remove the circuit breaker panel cover.

4. At the rear of the power panel **(Figure 1, Item 3)**, remove the panel cover and then unscrew the retainer **(Figure 1, Item 6)** and pull the receptacle **(Figure 1, Item 2)** out of the sleeve **(Figure 1, Item 7)**.

5. Use an ohmmeter to check for zero resistance between each prong **(Figure 1, Item 8)** and the corresponding wire connection **(Figure 1, Item 9)** on the output circuit breaker (#23, 25, 27) **(Figure 1, Item 10)**.

6. Check for secure connection and condition of wiring with an open connection between the prong **(Figure 1, Item 8)** on the receptacle **(Figure 1, Item 2)** and the output circuit breaker (#23, 25, 27) **(Figure 1, Item 10)**.

7. Replace a receptacle **(Figure 1, Item 2)** and/or wiring with an open connection as described under REPLACE.

8. If continuity is determined between each prong and the corresponding circuit breaker connection, re-install the receptacle **(Figure 1, Item 2)**, secure with retainer **(Figure 1, Item 6)**, and install the panel cover.

TEST-CONTINUED

9. Reinstall circuit breaker panel cover **(Figure 2, Item 5)** and circuit breaker box cover **(Figure 2, Item 4)**.

10. Re-connect power cable **(Figure 1, Item 1)**.

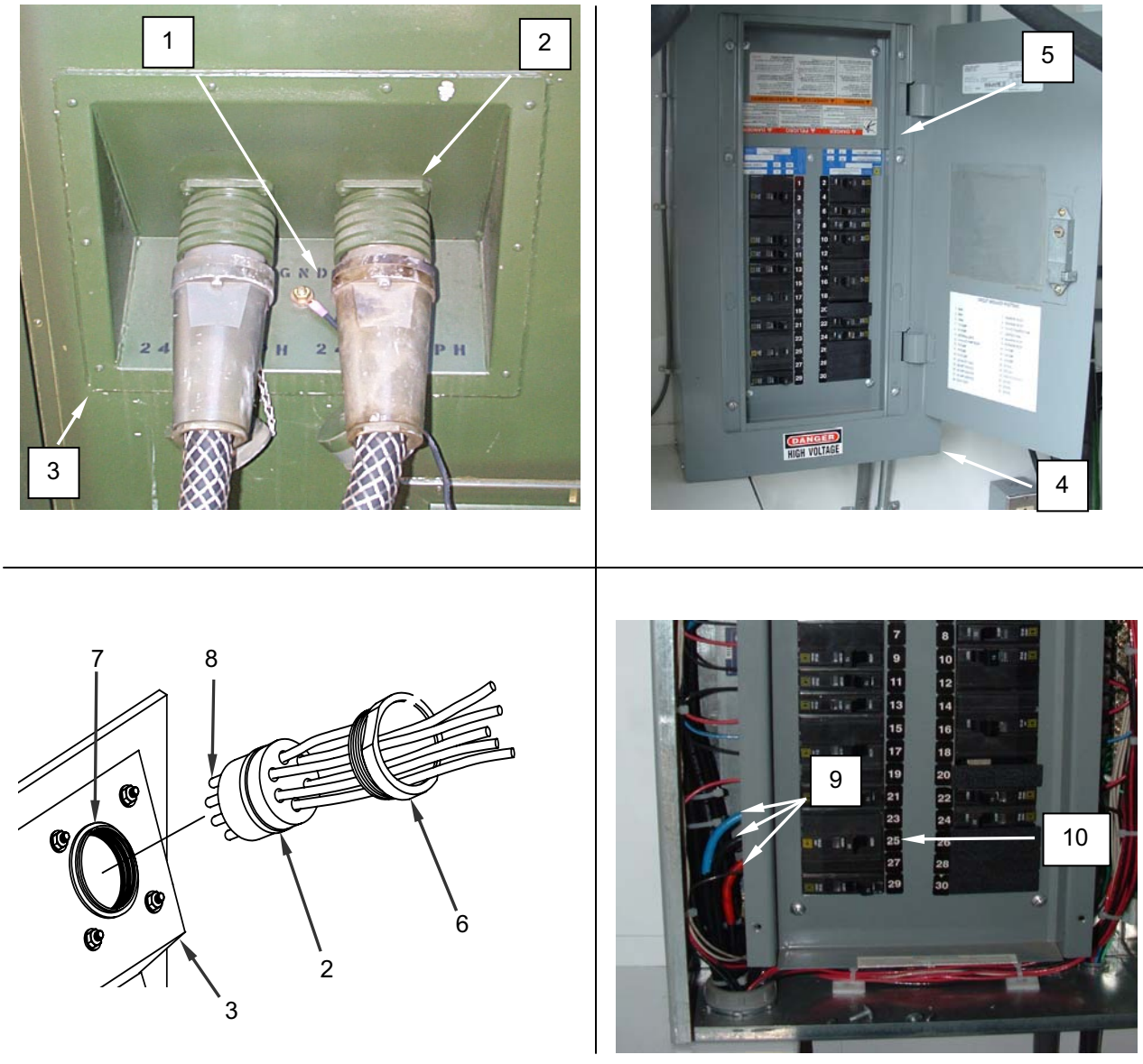


Figure 1. Test the Power Output Receptacle.

REPLACE

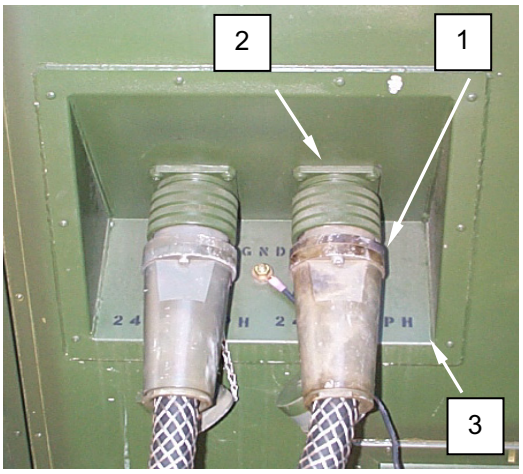
Replace the Power Output Receptacle

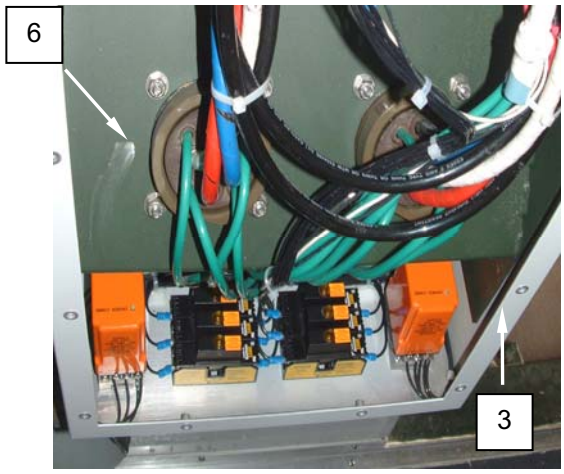
WARNING

This equipment operates at high voltages. Use extreme caution, observe all warnings, and follow all safety procedures. Failure to observe safety precautions may result in injury or death to personnel.

1. Disconnect the output power cable **(Figure 2, Item 1)** from the receptacle **(Figure 2, Item 2)** on the CBL power panel **(Figure 2, Item 3)**

2. At the rear of the power panel **(Figure 2, Item 3)**, remove the panel cover and then unscrew the retainer **(Figure 2, Item 6)** and pull the receptacle **(Figure 2, Item 2)** out of the sleeve **(Figure 2, Item 7)**.





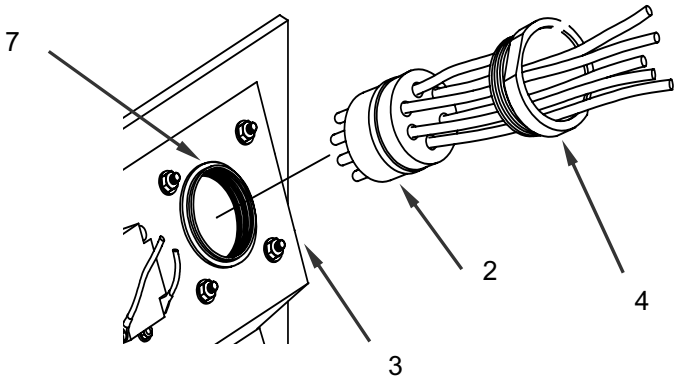


Figure 2. Replace the Power Output Receptacle.

REPLACE-CONTINUED

3. Remove screws retaining the main circuit breaker box cover **(Figure 3, Item 4)** and remove the circuit breaker box cover.

4. Remove screws retaining the circuit breaker panel cover **(Figure 3, Item 5)** and remove the circuit breaker panel cover.

5. Tag and disconnect the wiring **(Figure 3, Item 9)** from the output circuit breaker (#23, 25, 27) **(Figure 3, Item 10)**.

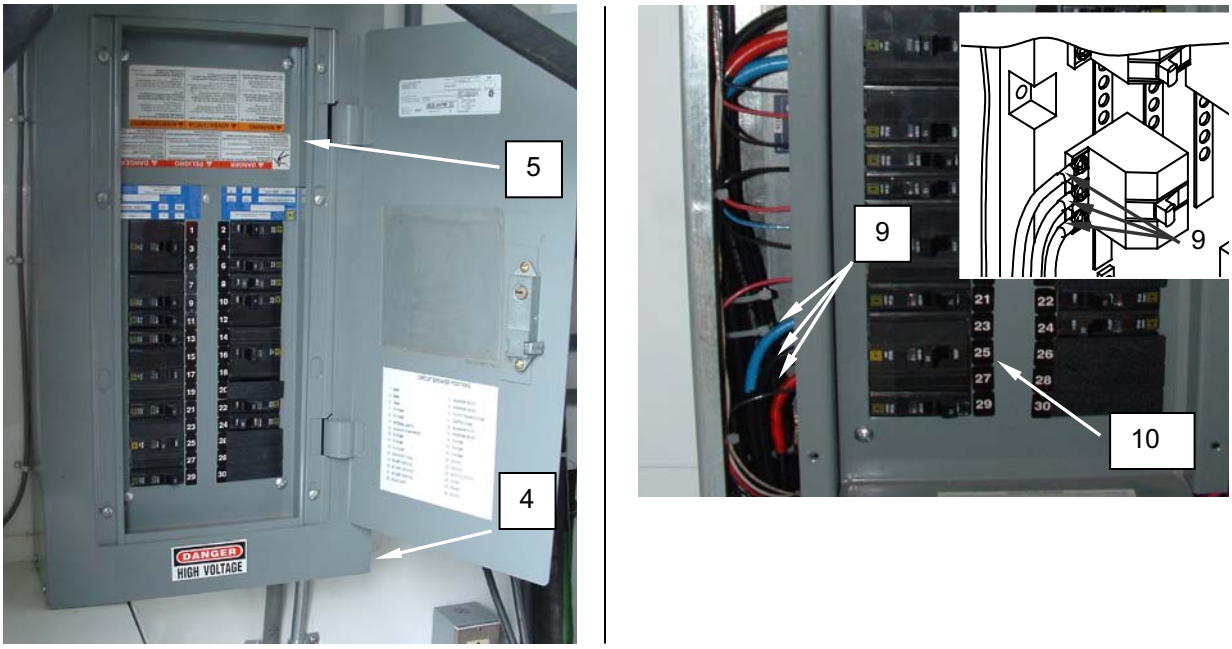


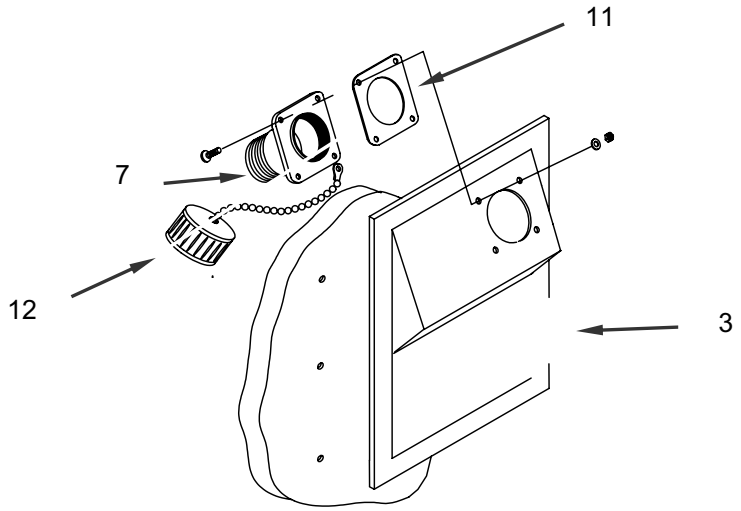
Figure 3. Replace the Power Output Receptacle.

REPLACE-CONTINUED

6. Remove screws, washers and nuts securing the connector sleeve **(Figure 4, Item 7)**, gasket **(Figure 4, Item 11)** and dust cover **(Figure 4, Item 12)** to the power panel **(Figure 4, Item 3)**. Retain the hardware.

7. Obtain new power input receptacle **(Figure 4, Item 2)** and install connector sleeve **(Figure 4, Item 7)**, gasket **(Figure 4, Item 11)** and dust cover **(Figure 4, Item 12)** with retained hardware.

8. From the rear of the power panel **(Figure 4, Item 3)**, push the receptacle **(Figure 4, Item 2)** into the sleeve **(Figure 4, Item 7)** and secure with the retainer **(Figure 4, Item 6).**



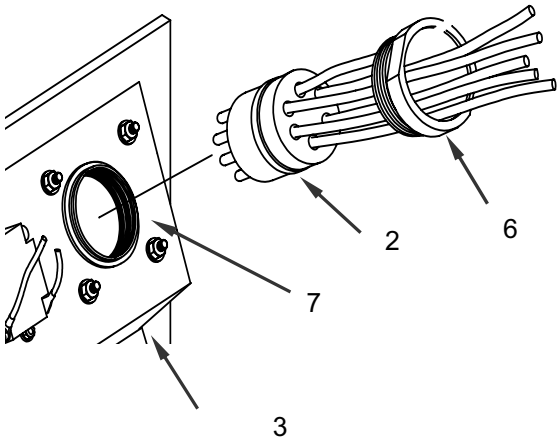


Figure 4. Replace the Power Output Receptacle.

REPLACE-CONTINUED

9. Connect the wiring **(Figure 5, Item 9)** to the circuit breaker **(Figure 5, Item 10)** as tagged.

10. Reinstall circuit breaker panel cover **(Figure 5, Item 5)** and circuit breaker box cover **(Figure 5, Item 4)**.

11. Reconnect the power output cable **(Figure 5, Item 1)** to the receptacle **(Figure 5, Item 2)** on the CBL power panel **(Figure 5, Item 3)**.

12. Place main circuit breaker **(Figure 5, Item 13)** and output circuit breaker (#23, 25, 27) **(Figure 5, Item 10)** to ON and monitor for normal operation.

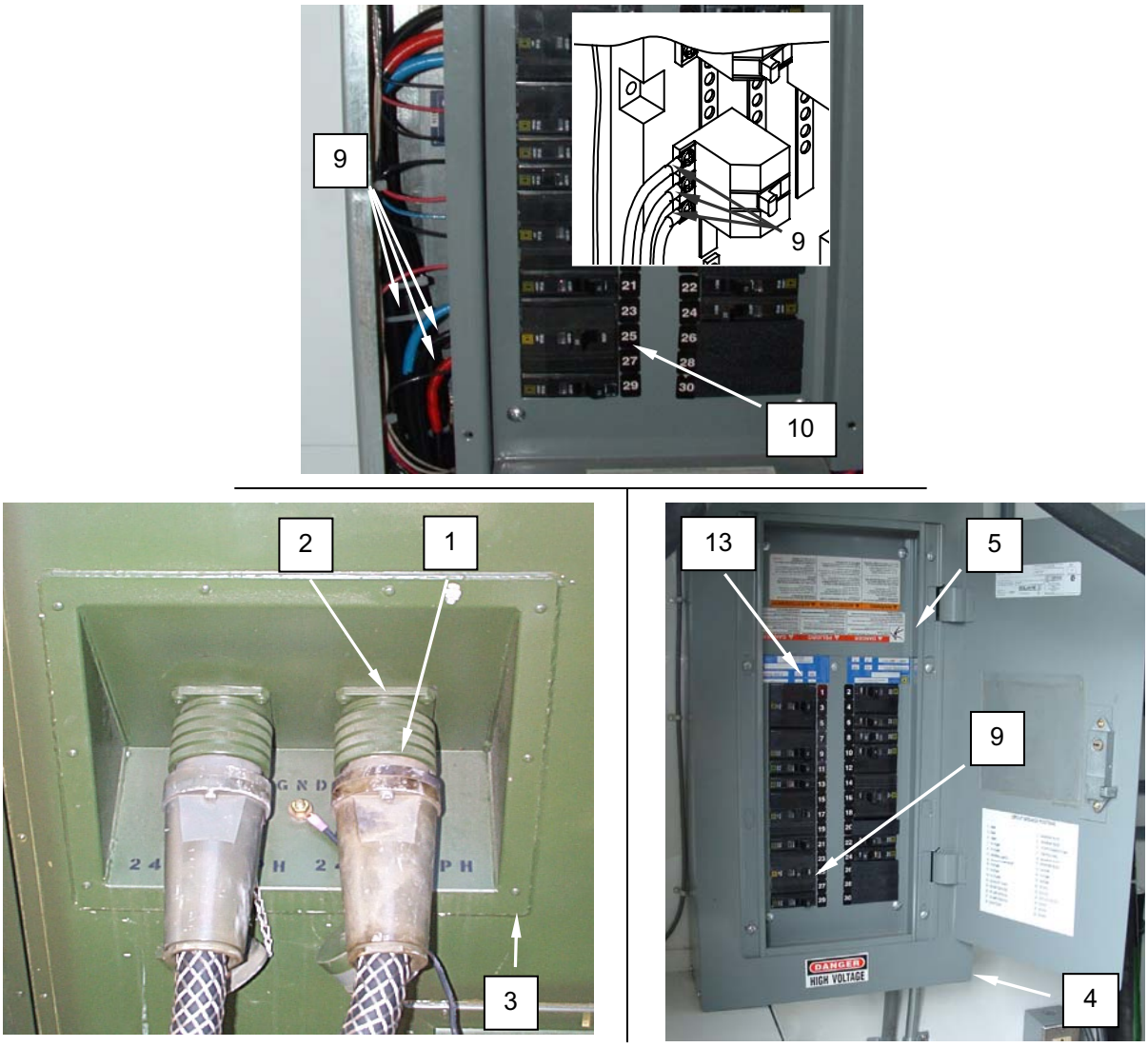


Figure 5. Replace the Power Output Receptacle.

END OF WORK PACKAGE

UNIT MAINTENANCE
CONTAINERIZED BATCH LAUNDRY
NSN 3510-01-527-2209
NSN 3510-01-527-2210
GFCI RECEPTACLES
PUMP RECEPTACLES
WASHER RECEPTACLES
TEST, REPLACE

INITIAL SETUP

Tools
Tool Kit, General Mechanics: Automotive (WP 0086 00, Table 2, Item 6)

Personnel Required
Quartermaster and Chemical Equipment Repairer 63J (1)

Materials/Parts
Tape, Electrical Insulation (WP 0087 00, Item 52)
Wire Markers (WP 0087 00, Item 58)

Equipment Condition
CBL shut down

TEST

Test Receptacles

WARNING

This equipment operates at high voltages. Use extreme caution, observe all warnings, and follow all safety procedures. Failure to observe safety precautions may result in injury or death to personnel.

NOTE

While different receptacles are used for the washers, pumps, and other outlets, the testing procedure is the same.

1. Disconnect plug or plugs from receptacle **(Figure 1, Item 1)**. Ensure power is connected and the appropriate circuit breaker is on. Refer to Table 1 if necessary.

Table 1. Circuit Breakers for Receptacles.

Receptacle	Circuit Breaker(s)
Washer No. 1	No. 2 and No. 4
P-2 WTS Transfer Pump	No. 6
Washer No. 2	No. 10 and No. 12
Waste Pump P-5	No. 13
Service Receptacles	No. 24
Automatic Soap Dispenser	No. 29

NOTE

If testing a GFCI receptacle, make sure the GFCI has been reset before proceeding.

2. If testing the washer receptacles, use a voltmeter set to read at least 250 VAC to check for 208 VAC power at the receptacle inlets **(Figure 1, Item 2)**. All other receptacles must be tested for 120 VAC.

3. If there is power at the receptacle **(Figure 1, Item 1)**, no further test is required. If there is no power at the receptacle, switch the circuit breaker to off and tag out.

TEST-CONTINUED

4. Remove screws retaining receptacle cover **(Figure 1, Item 3)** and remove cover.
5. Remove screws retaining receptacle **(Figure 1, Item 1)** to box **(Figure 1, Item 4)** and remove receptacle.
6. Tag and disconnect wiring from receptacle **(Figure 1, Item 1)**.
7. Use an ohmmeter to test for zero resistance between receptacle inlet **(Figure 1, Item 2)** and corresponding terminal.
8. Use an ohmmeter to test for infinite resistance between each power inlet **(Figure 1, Item 2)**.
9. Use an ohmmeter to test for infinite resistance between each power inlet **(Figure 1, Item 2)** and ground.
10. Connect wiring to receptacle **(Figure 1, Item 1)** as tagged.
11. Install receptacle **(Figure 1, Item 1)** into box **(Figure 1, Item 4)** and retain with screws.
12. Install receptacle cover **(Figure 1, Item 3)** and retain with screws.
13. Switch circuit breaker ON and monitor for normal operation.

TEST-CONTINUED

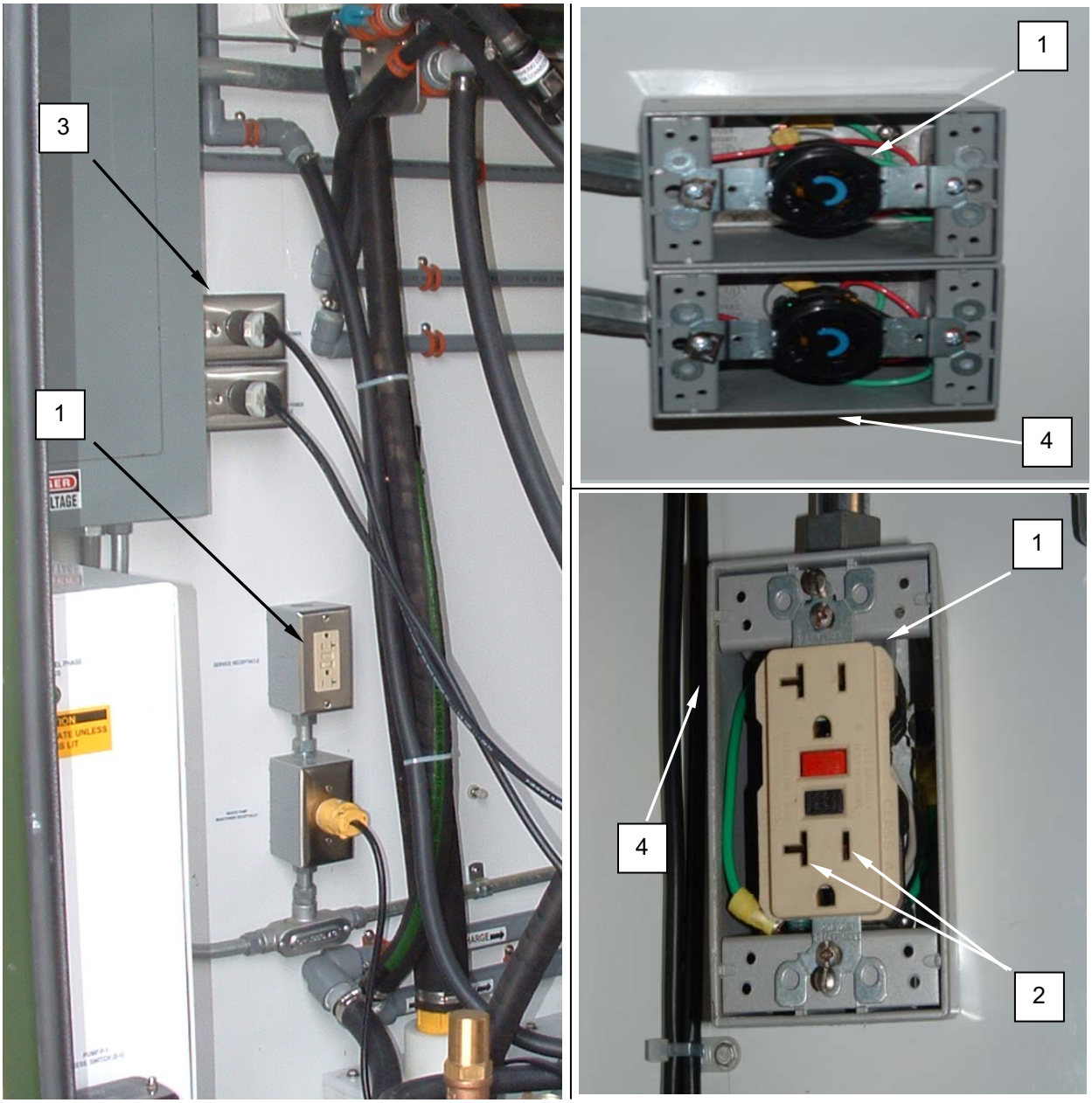


Figure 1. Test a Receptacle.

REPLACE

Replace Receptacles

WARNING

This equipment operates at high voltages. Use extreme caution, observe all warnings, and follow all safety procedures. Failure to observe safety precautions may result in injury or death to personnel.

1. Switch appropriate circuit breaker to OFF, and disconnect plug from the receptacle **(Figure 2, Item 1)**. Refer to Table 2 as necessary.

Table 2. Circuit Breakers for Receptacles.

Receptacle	Circuit Breaker(s)
Washer No. 1	No. 2 and No. 4
P-2 WTS Transfer Pump	No. 6
Washer No. 2	No. 10 and No. 12
Waste Pump P-5	No. 13
Service Receptacles	No. 24
Automatic Soap Dispenser	No. 29

2. Remove screws retaining receptacle cover **(Figure 2, Item 3)** and remove cover.
3. Remove screws retaining receptacle **(Figure 2, Item 1)** to box **(Figure 2, Item 4)** and remove receptacle.
4. Tag and disconnect wiring from receptacle **(Figure 2, Item 1)**.
5. Connect wiring to replacement receptacle **(Figure 2, Item 1)** as tagged.
6. Install receptacle **(Figure 2, Item 1)** into box **(Figure 2, Item 4)** and retain with screws.
7. Install cover **(Figure 2, Item 3)**, and retain with screws.
8. Switch main breaker ON and monitor for normal operation.

REPLACE-CONTINUED

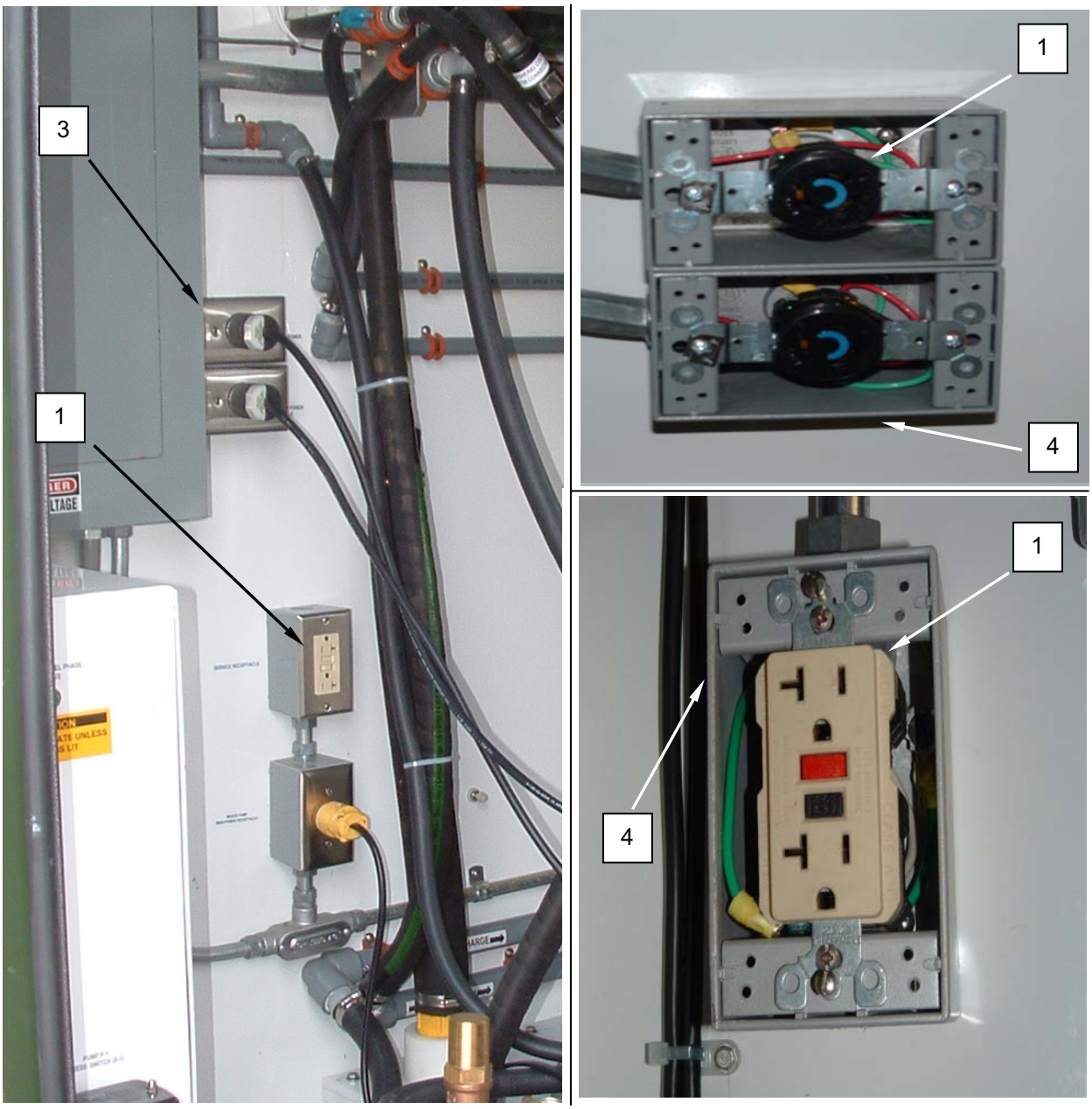


Figure 2. Replace a Receptacle.

END OF WORK PACKAGE

UNIT MAINTENANCE
CONTAINERIZED BATCH LAUNDRY
NSN 3510-01-527-2209
NSN 3510-01-527-2210
EXHAUST FANS
TEST, SERVICE, REPLACE

INITIAL SETUP

Tools
Tool Kit, General Mechanics: Automotive (WP 0086 00, Table 2, Item 6)

Materials/Parts
Connector, Butt, #14-16 – Blue (WP 0087 00, Item 14)
Tape, Electrical Insulation (WP 0087 00, Item 52)
Wire Markers (WP 0087 00, Item 58)

Personnel Required
Quartermaster and Chemical Equipment Repairer 63J (1)

Equipment Condition
CBL set up

TEST

Test the Exhaust Fans

WARNING

This equipment operates at high voltages. Use extreme caution, observe all warnings, and follow all safety procedures. Failure to observe safety precautions may result in injury or death to personnel.

1. Switch circuit breaker No. 21 to OFF.
2. Remove screws retaining junction box cover **(Figure 1, Item 1)** and remove cover.
3. Tag and disconnect wiring **(Figure 1, Item 2)** from fan motor. The wiring may need to be cut.
4. Use an ohmmeter to test for 0 - 10 ohms resistance between motor leads **(Figure 1, Item 2)**.
5. Use an ohmmeter to test for infinite resistance between each motor lead **(Figure 1, Item 2)** and ground.
6. Replace a fan assembly that fails either test.
7. If tests are satisfactory, re-connect wiring to fan motor **(Figure 1, Item 3)** as tagged.
8. Place junction box cover **(Figure 1, Item 1)** into position, and retain with screws.
9. Switch circuit breaker No. 21 to ON and monitor for normal operation.

TEST-CONTINUED

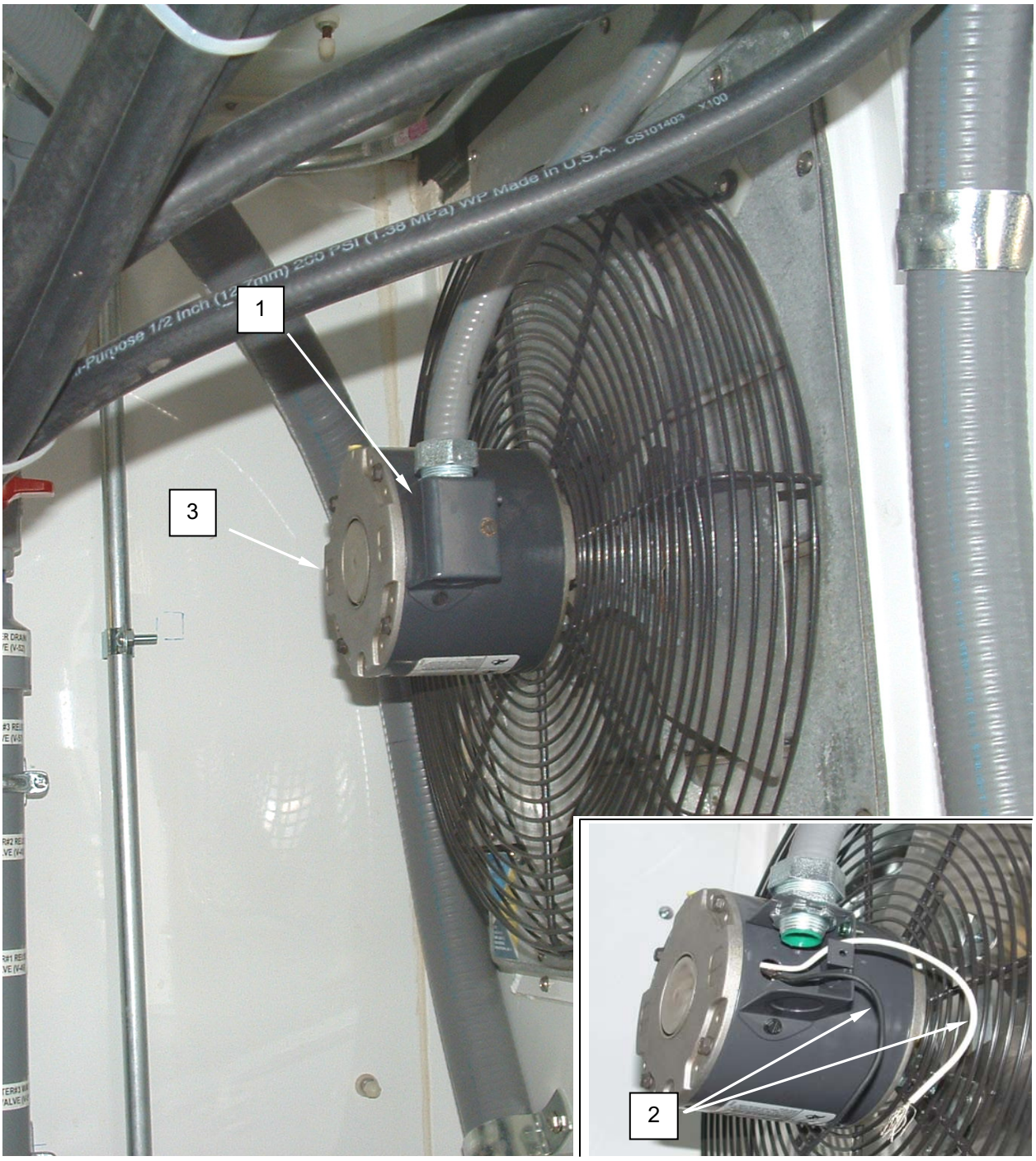


Figure 1. Test the Exhaust Fan.

SERVICE

Clean the Exhaust Fans

WARNING

Ensure power is disconnected before attempting this procedure. Wear heavy work gloves while handling the fan. Serious injury to personnel may result if safety precautions are not observed.

1. Switch circuit breaker No. 21 to OFF.
2. Remove screws securing fan **(Figure 2, Item 4)** to louver assembly **(Figure 2, Item 5)** and remove fan from louver assembly.
3. Clean fan blades **(Figure 2, Item 6)** with rag or soft brush.
4. Position cleaned fan **(Figure 2, Item 4)** onto louver assembly **(Figure 2, Item 5)** and secure with screws.
5. Switch circuit breaker No. 21 to ON and monitor for normal operation.

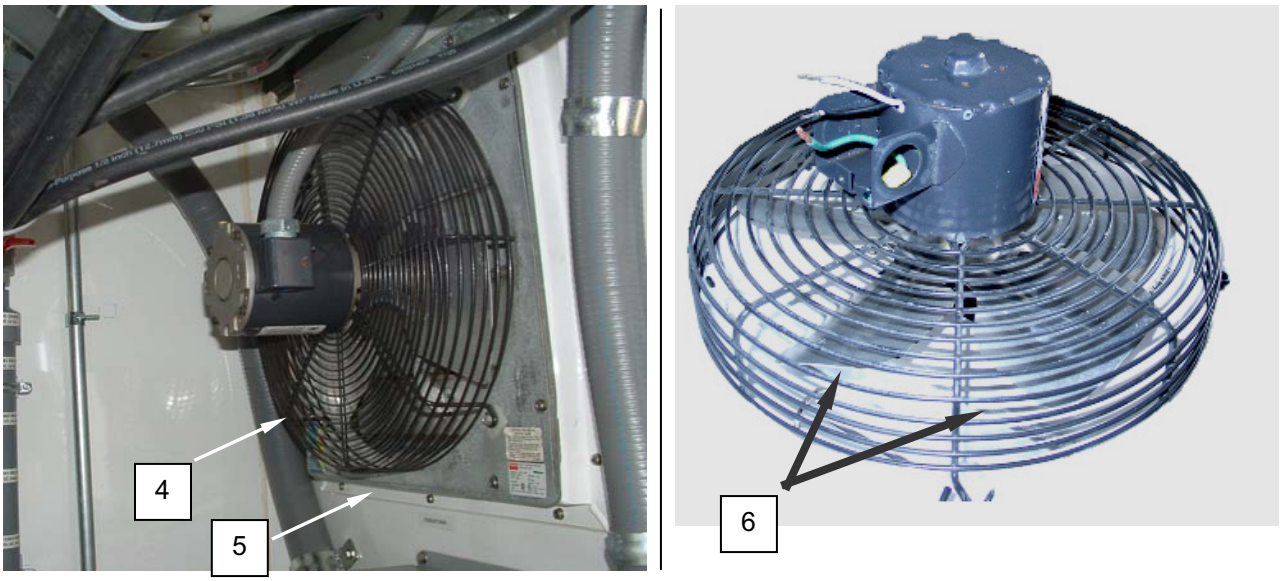


Figure 2. Clean the Exhaust Fan.

REPLACE

Replace Exhaust Fan

WARNING

This equipment operates at high voltages. Use extreme caution, observe all warnings, and follow all safety procedures. Failure to observe safety precautions may result in injury or death to personnel.

1. Switch circuit breaker No. 21 to OFF.
2. Remove screws retaining junction box cover **(Figure 3, Item 1)** and remove cover.
3. Tag and disconnect wiring from fan **(Figure 3, Item 4)**. The wiring may need to be cut.
4. Remove conduit locknut **(Figure 3, Item 7)** and remove conduit from junction box **(Figure 3, Item 8)**.
5. Remove screws retaining louver assembly with fan **(Figure 4, Item 9)** to bulkhead, and remove louver assembly with fan.
6. Install new louver assembly with fan **(Figure 4, Item 9)** and secure with screws to bulkhead.
7. Remove screws retaining junction box cover **(Figure 3, Item 1)** from replacement fan **(Figure 3, Item 4)** and remove cover. If necessary, punch out the junction box penetration on the replacement fan.
8. Install conduit into junction box **(Figure 4, Item 8)** and retain with locknut **(Figure 4, Item 7)**.
9. Connect wiring to fan **(Figure 4, Item 4)** as tagged.
10. Install junction box cover **(Figure 4, Item 1)** and retain with screws.
11. Switch circuit breaker No. 21 ON and monitor for normal operation.

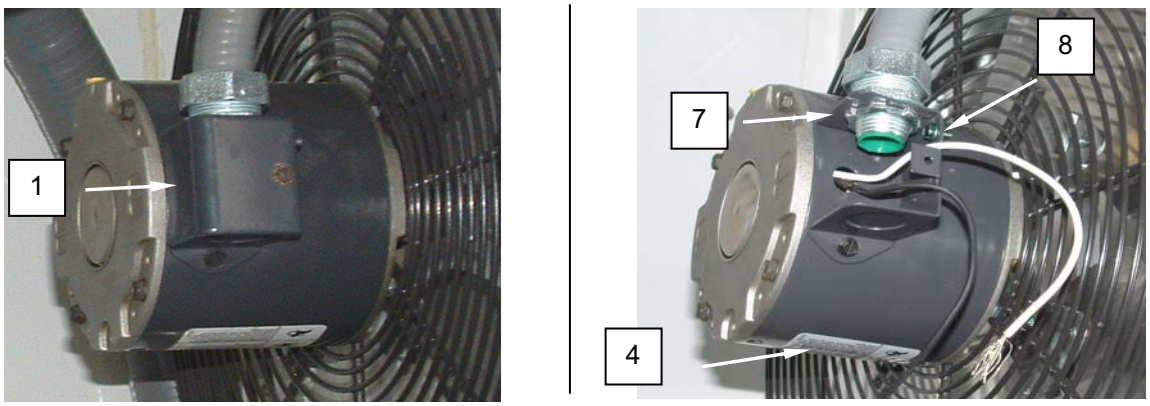


Figure 3. Replace the Exhaust Fan.

REPLACE-CONTINUED

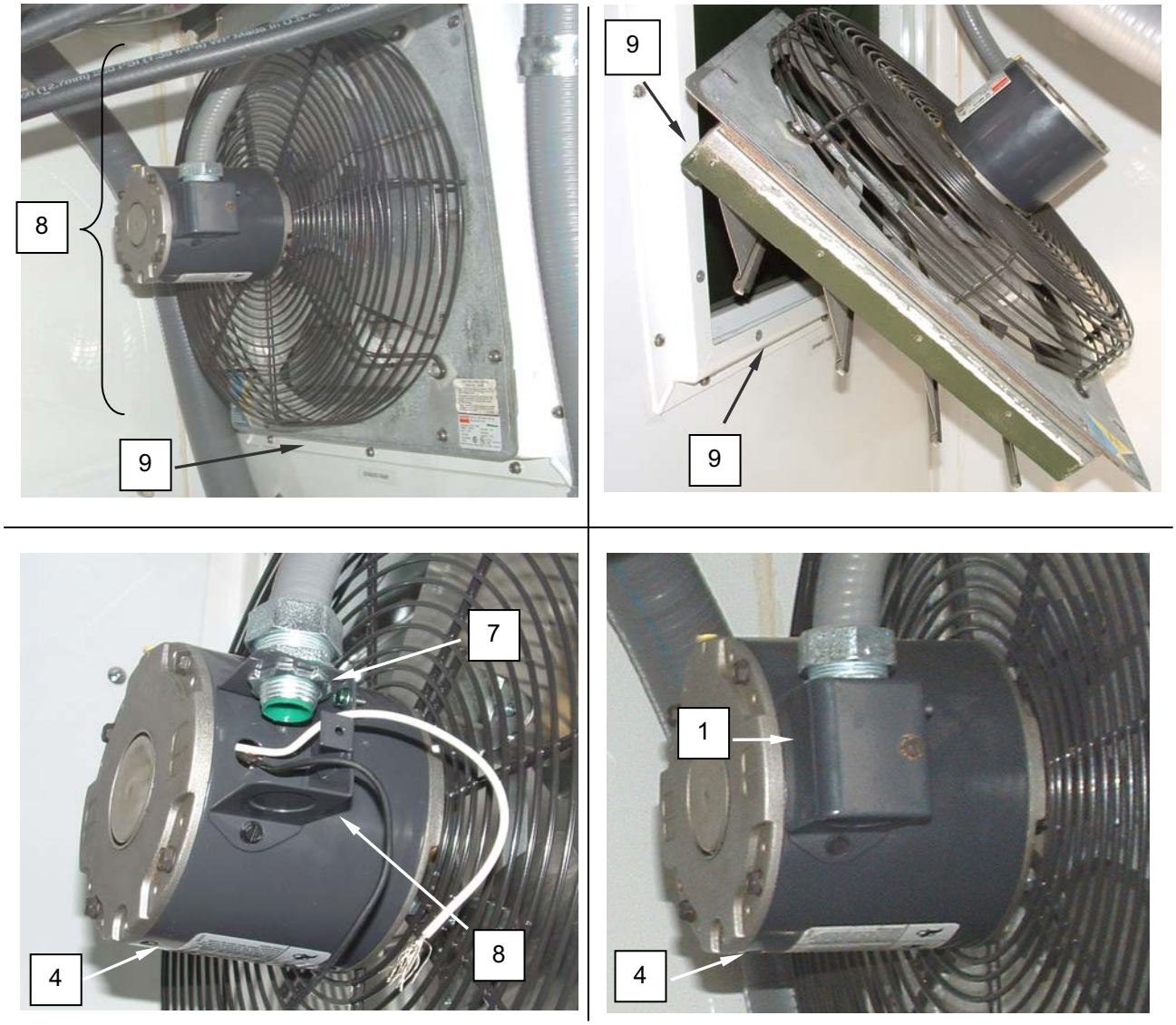


Figure 4. Replace the Exhaust Fan.

END OF WORK PACKAGE

UNIT MAINTENANCE
CONTAINERIZED BATCH LAUNDRY
NSN 3510-01-527-2209
NSN 3510-01-527-2210
PROGRAMMABLE LOGIC CONTROL (PLC)
TEST

INITIAL SETUP

Tools
Tool Kit, General Mechanics: Automotive (WP 0086 00, Table 2, Item 6)

Materials/Parts
Wire Markers (WP0087 00, Item 58)

Personnel Required
Quartermaster and Chemical Equipment Repairer 63J (1)

Equipment Condition
CBL operating

References
TM 10-3510-226-10
WP 0027 00
WP 0028 00

TEST

Selecting the System Info Display

CAUTION

Use extreme caution when accessing system information functions. Unauthorized or careless use of these functions could render the PLC inoperative. In the event this happens the CBL may still be operated manually.

CAUTION

Unless instructed otherwise in this manual, use a bare or gloved finger to operate the PLC touch screen. Use of writing instruments, screws, nails, or metal tools may damage the touch screen, rendering the PLC inoperative.

NOTE

When operating the touch screens on the PLC, use light finger pressure to operate switches and menus.

NOTE

Many system information screens are password protected. These screens access setup functions for the PLC, and should not be accessed by the maintainer. Only those screens accessible to the maintainer are addressed here.

The PLC is programmed to control and monitor the operation of the CBL. The functions are selected through separate displays presented on the PLC screen. The displays may be selected by touching the tab at the top of the screen.

1. When the PLC is powered up, the SYSTEM CONTROL display **(Figure 1, Item 1)** is presented. If a SYSTEM INFO function is desired, touch the SYSTEM INFO tab **(Figure 1, Item 2)** to access the screen. An indicator bar or highlight will indicate that the SYSTEM INFO screen is presented.

TEST-CONTINUED

2. The PLC will show the display in Figure 1. Each button provides access to a menu function.

3. Press SYSTEM CONTROL **(Figure 1, Item 1)** to return to the SYSTEM CONTROL menu. For information on additional PLC screens and controls, refer to TM 10-3510-226-10.

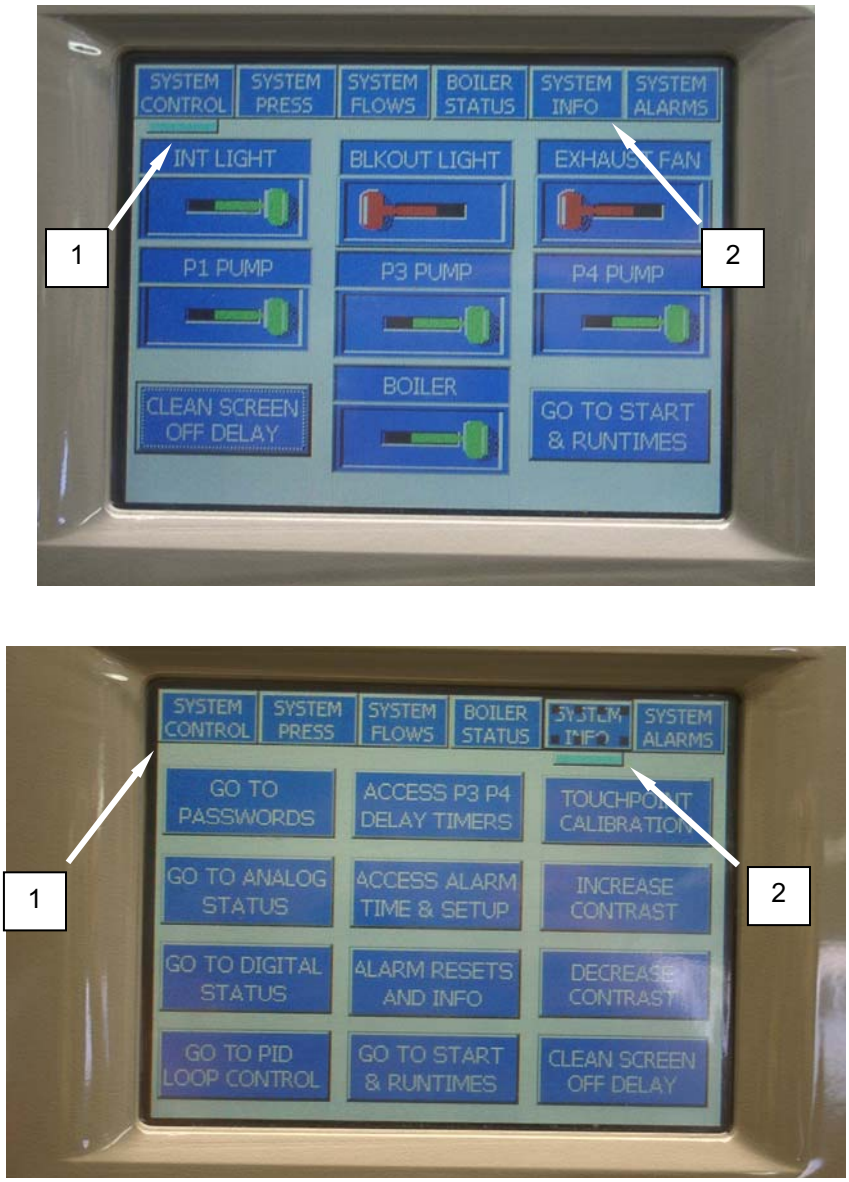


Figure 1. System Info Display.

TEST-CONTINUED

Analog Status

CAUTION

Use extreme caution when accessing SYSTEM INFO functions. Unauthorized or careless use of these functions could render the automatic operation of the CBL inoperative.

CAUTION

Unless instructed otherwise in this manual, use a bare or gloved finger to operate the PLC touch screen. Use of writing instruments, screws, nails, or metal tools may damage the touch screen, rendering the PLC inoperative.

NOTE

When operating the touch screens on the PLC, use light finger pressure to operate switches and menus.

Press the GO TO ANALOG STATUS button **(Figure 2, Item 3)** to view all of the information from the flow and pressure transmitters. The PLC will show the display in Figure 23.

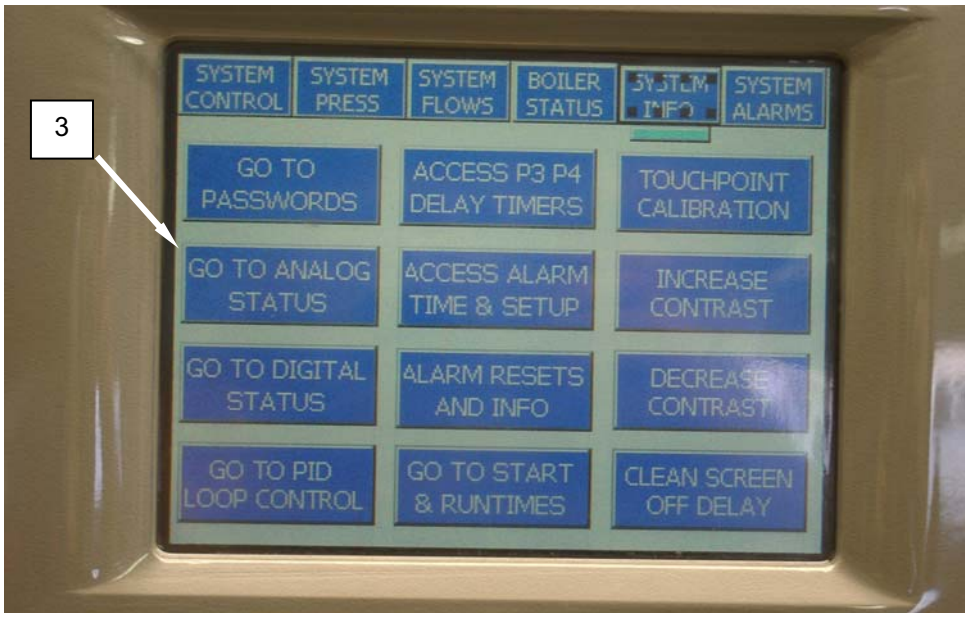


Figure 2. Analog Status.

TEST-CONTINUED

NOTE

The AIW number corresponds to the software address location and is used by the manufacturer. The information displayed consists of the readings from each pressure and flow transmitter. The flow and pressure information needed by the operator can be found in the SYSTEM FLOWS and SYSTEM PRESS screens. This screen will aid in determining if an individual transmitter is functioning properly.

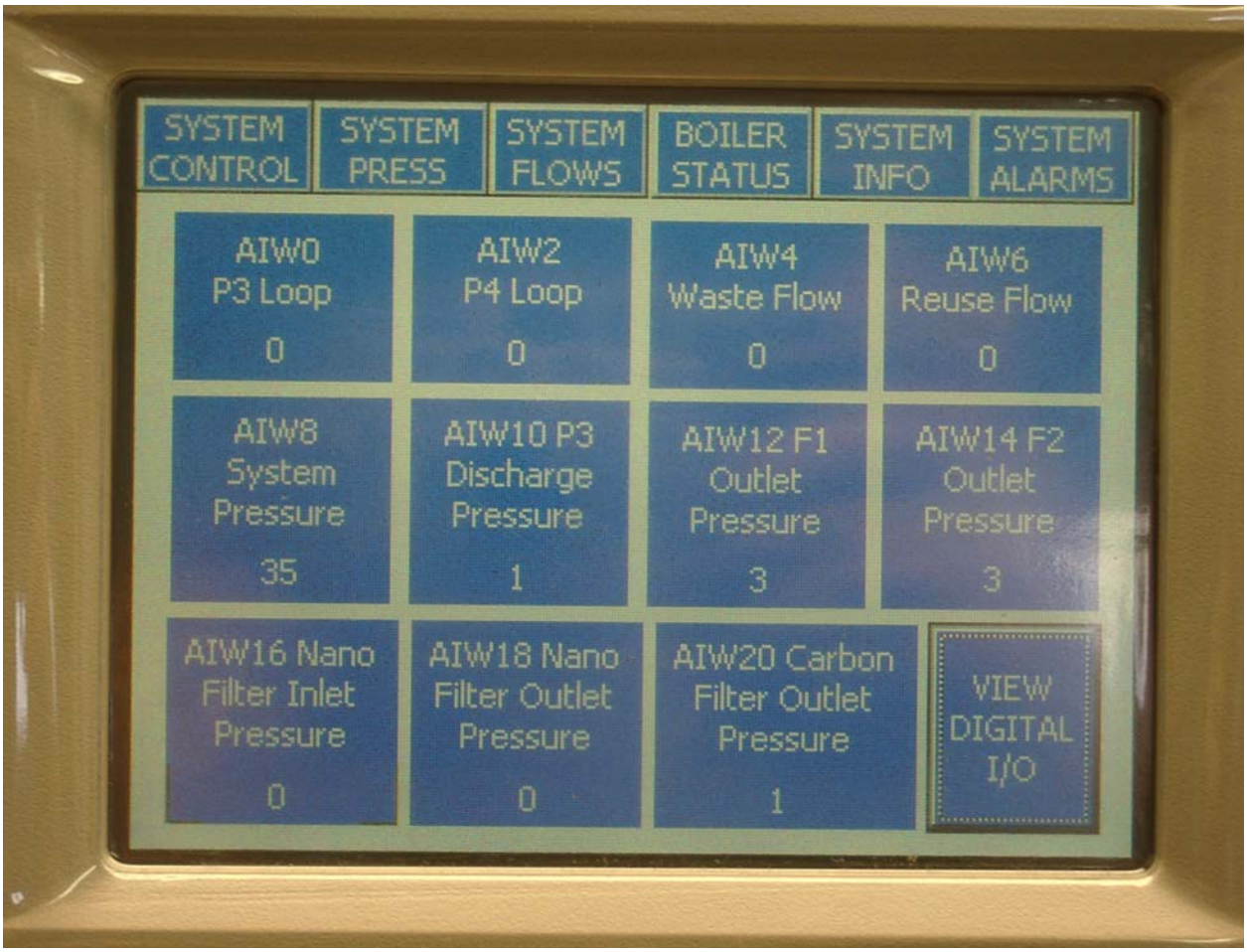


Figure 3. Analog Status Screen.

TEST-CONTINUED

Digital Status

CAUTION

Use extreme caution when accessing SYSTEM INFO functions. Unauthorized or careless use of these functions could render the automatic operation of the CBL inoperative. This section on Digital Status screens is informational only – there are no operator level functions or data presented on these screens.

CAUTION

Unless instructed otherwise in this manual, use a bare or gloved finger to operate the PLC touch screen. Use of writing instruments, screws, nails, or metal tools may damage the touch screen, rendering the PLC inoperative.

NOTE

When operating the touch screens on the PLC, use light finger pressure to operate switches and menus.

Press the GO TO DIGITAL STATUS button **(Figure 4, Item 4)** to view all of the information from the boiler, level sensor, and PLC relay outputs. The PLC will show the display in Figure 5. The PLC displays the status of the PLC relay outputs for each controlled device. The indicators will show a light green background when ON and a dark green background when OFF. If the GO TO PLC VIEW button is pressed, the screen in Figure 6 will be displayed.

The PLC displays the status of the boiler inputs, WTS holding tank, level sensor, and nano feed tank level sensor.

The maintainer should utilize the BOILER STATUS screen to obtain information for boiler operation. The PLC will use the information from the tank level sensors to determine operation of the P-3 and P-4 water filtration loops.

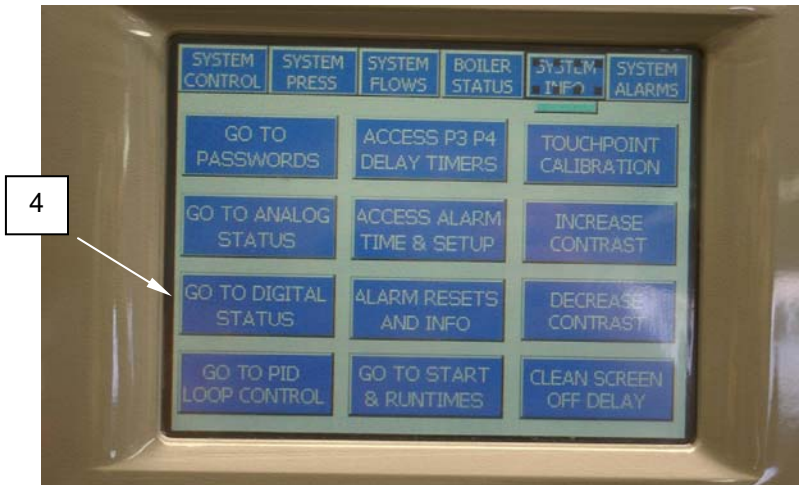


Figure 4. Digital Status.

TEST-CONTINUED

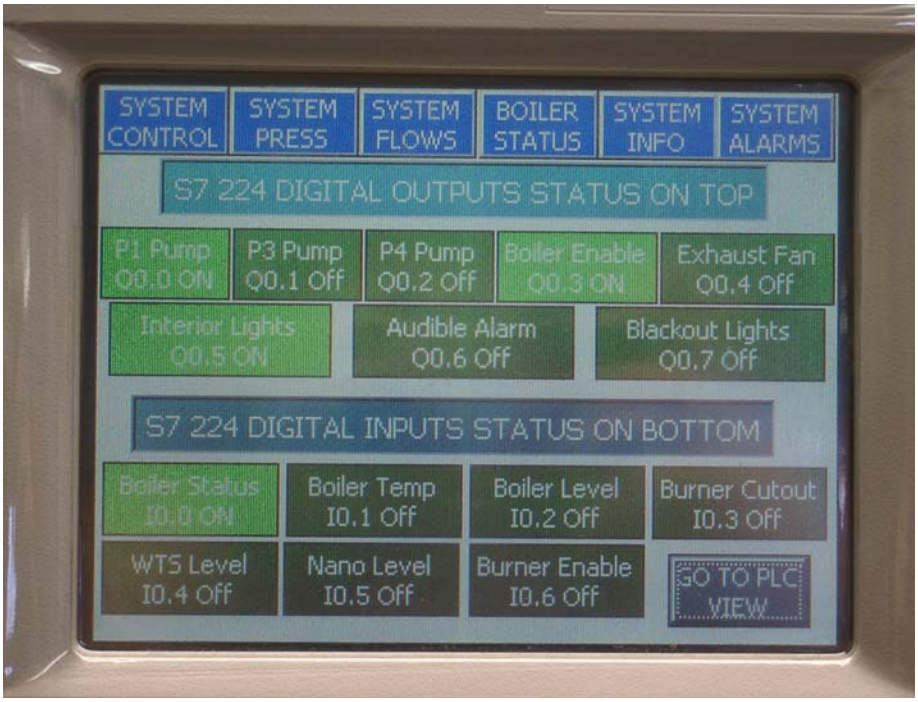


Figure 5. Digital Status Screen.

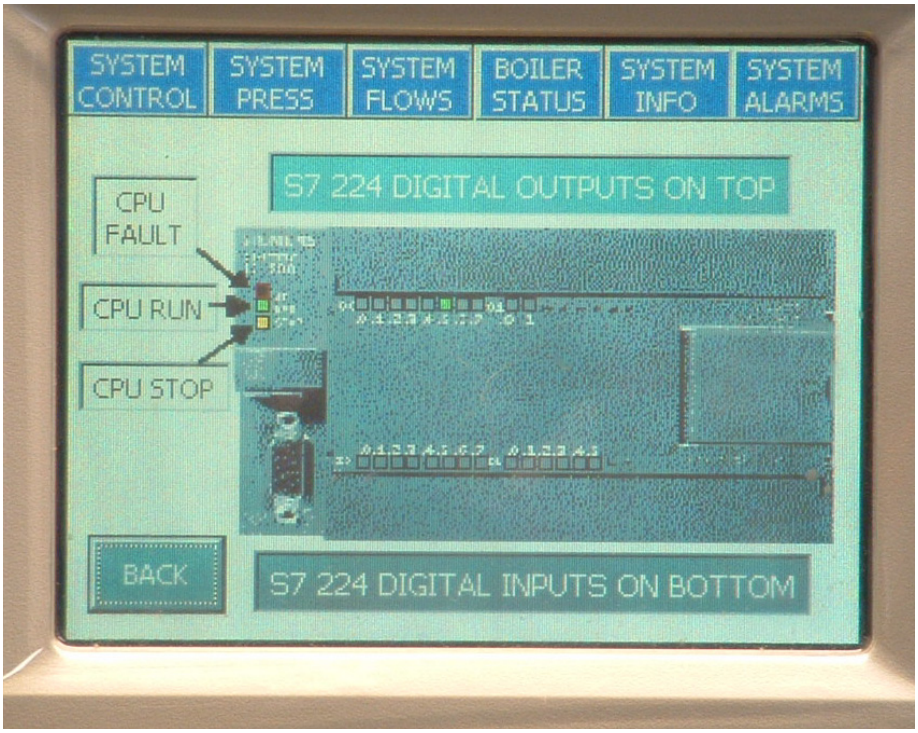


Figure 6. PLC View Screen.

TEST-CONTINUED

Test the Audible Alarm

1. Disconnect power at the main circuit breaker.
2. Open PLC enclosure.
3. Strip the heat shrink insulation **(Figure 7, Item 5)** from the wiring connections.
4. Tag and disconnect wiring from audible alarm **(Figure 7, Item 6)**.
5. Use an ohmmeter to test for continuity.
6. Connect wiring as tagged, and insulate wiring connections with electrical tape.
7. Close enclosure, connect power, and operate PLC. Monitor for normal operation.

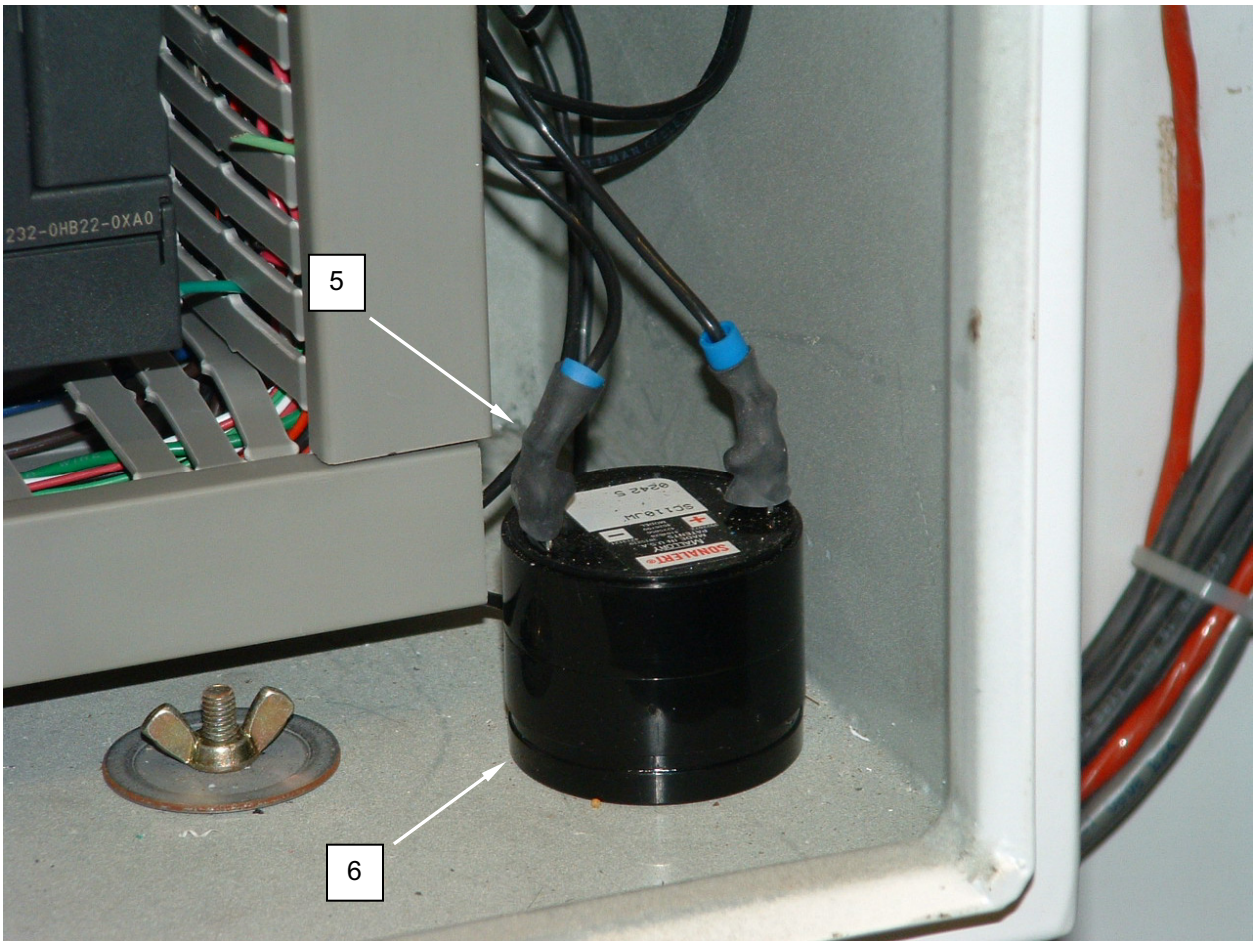


Figure 7. Test Audible Alarm.

TEST-CONTINUED

Test the Analog Output Module

WARNING

This equipment operates at high voltages. Use extreme caution, observe all warnings, and follow all safety procedures. Failure to observe safety precautions may result in injury or death to personnel.

1. Open PLC enclosure.

2. Ensure PLC is ON, and check the power indicator LED **(Figure 8, Item 7)** on the Analog Output Module.

3. If the power indicator light is off, check the power indicator light **(Figure 8, Item 8)** on the Analog Input/Output module adjacent. If the power indicator light on the adjacent module is ON, replace the Analog Output module.

4. If the power indicator LED **(Figure 8, Item 7)** in ON, check for power at the Actuator Valve No. 1 **(Figure 9, Item 9)**. This can be confirmed by manually setting the actuator either fully open or fully closed and operating the Water Treatment System. A correctly functioning Analog Output Module will automatically correct the flow setting at the valve.

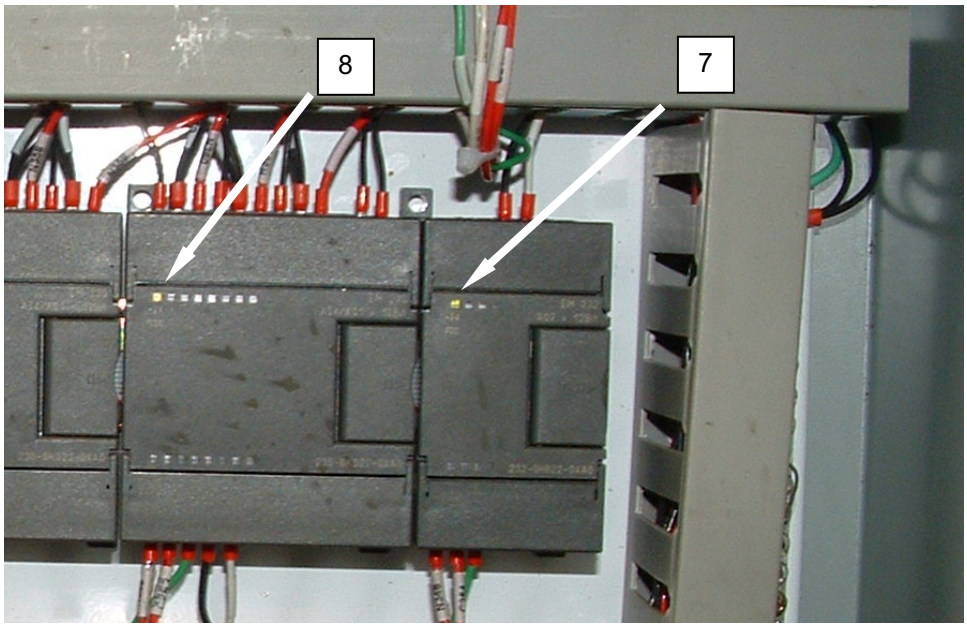


Figure 8. Test Analog Output Module.

TEST-CONTINUED

Figure 9. Test Analog Output Module.

TEST-CONTINUED

Test the Analog Input/Output Modules

WARNING

This equipment operates at high voltages. Use extreme caution, observe all warnings, and follow all safety procedures. Failure to observe safety precautions may result in injury or death to personnel.

1. Open PLC enclosure.

2. Ensure PLC is ON, and check the power indicator LED **(Figure 10, Item 7)** on the Analog Output Module. If the power indicator light is off, check the power indicator light on the Analog Input/Output module adjacent. If the power indicator light on the adjacent module is ON, replace the Analog Output module.

NOTE

If single sensors fail, test and replace the sensor as necessary IAW procedures given in WP 0027 00 and WP 0028 00.

3. If the power indicator LED **(Figure 10, Item 7)** in ON, check for the following sensor failures:

If you see these sensor failures **together**:	Replace this Analog Input/Output Module
P-3 Flow Transmitter	Module No. 1 **(Figure 10, Item 10)**
P-4 Flow Transmitter	
Waste Flow Transmitter	
Reuse Flow Transmitter	
P-1 Discharge Pressure	Module No. 2 **(Figure 10, Item 11)**
P-3 Discharge Pressure	
F-1 Filter Outlet Pressure	
F-2 Filter Outlet Pressure	
Nanofilter Inlet Pressure	Module No. 3 **(Figure 10, Item 12)**
Nanofilter Outlet Pressure	
Carbon Filter Outlet Pressure	

TEST-CONTINUED

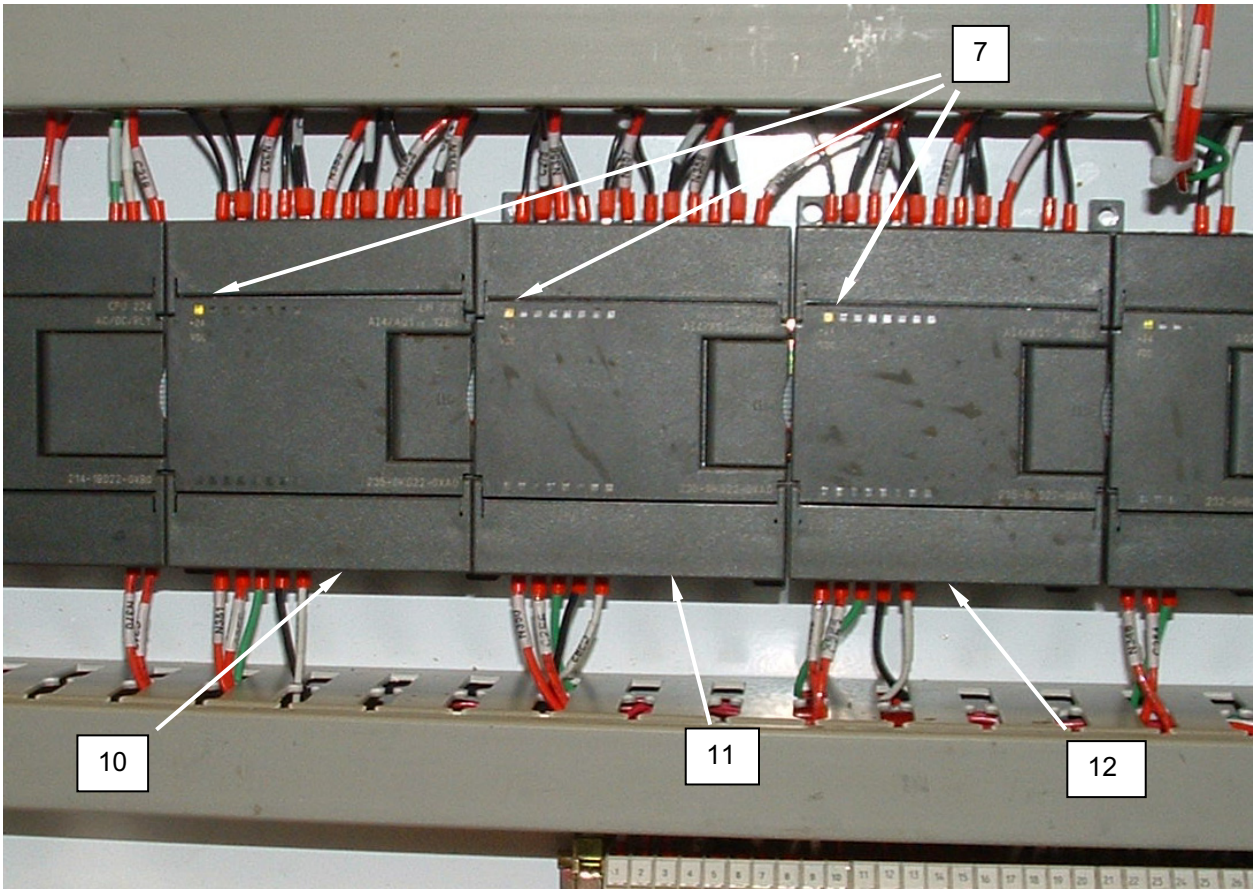


Figure 10. Test Analog Input/Output Module.

TEST-CONTINUED

Test the PLC Controller

WARNING

This equipment operates at high voltages. Use extreme caution, observe all warnings, and follow all safety procedures. Failure to observe safety precautions may result in injury or death to personnel.

1. Open PLC enclosure.
2. Check SF LED **(Figure 11, Item 13)**. Replace a PLC controller displaying a CPU fault (SF) LED.
3. Ensure the RUN LED **(Figure 11, Item 14)** is lit. If not, ensure the DIP switch **(Figure 12, Item 15)** is set to RUN.

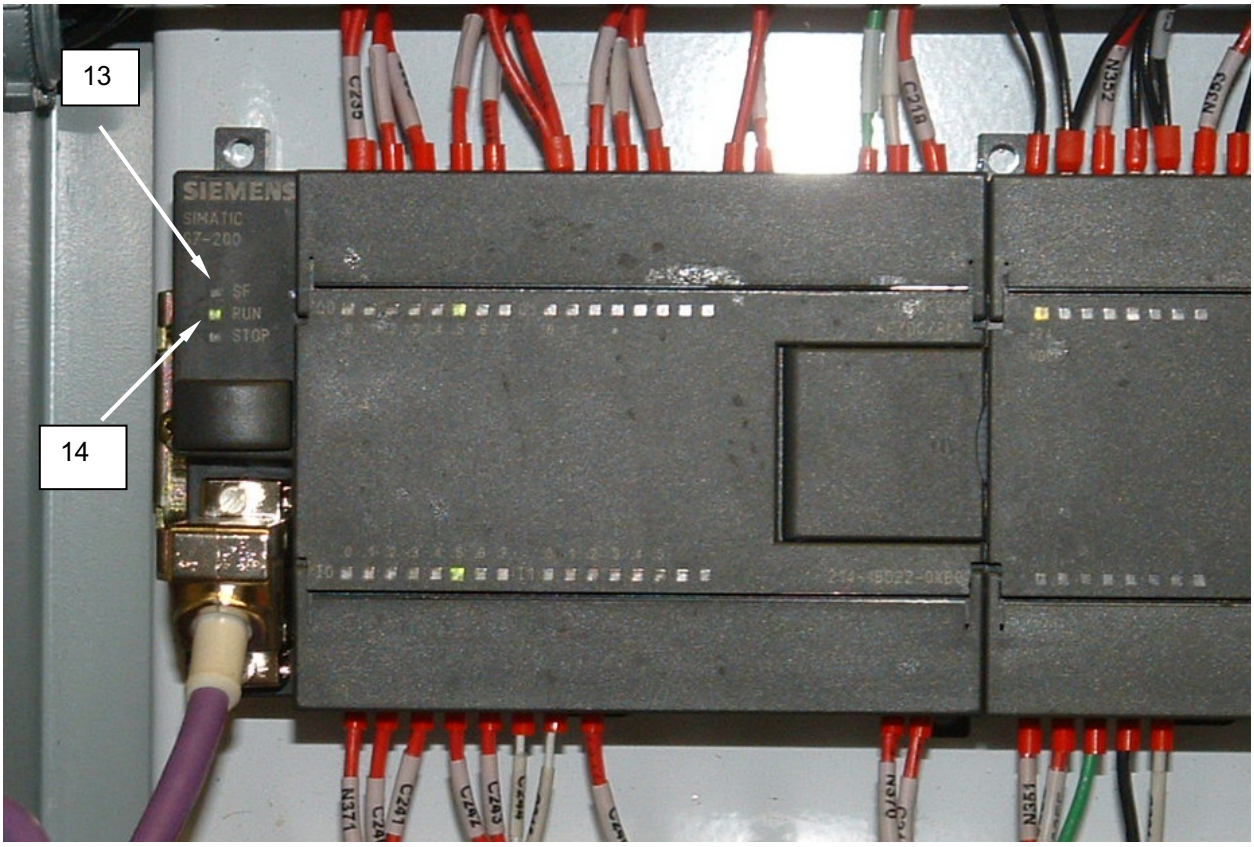


Figure 11. Test PLC Controller.

TEST-CONTINUED

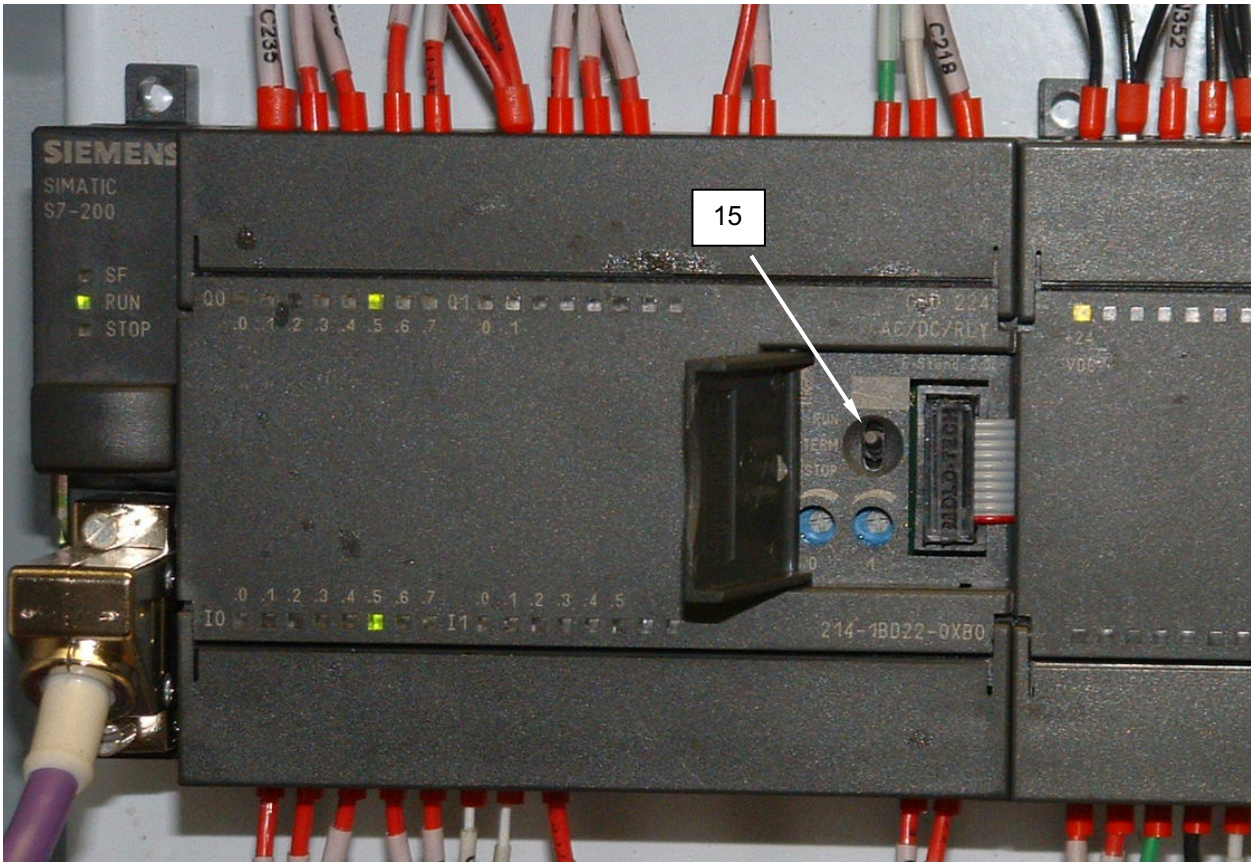


Figure 12. Test PLC Controller.

4. Access the DIGITAL INPUT/OUTPUT STATUS screen by first touching the SYSTEM INFO tab **(Figure 13, Item 2)**, and then the GO TO DIGITAL STATUS button **(Figure 13, Item 4)**.

5. On the PLC display, bring up the PLC view by touching the GO TO PLC VIEW button **(Figure 13, Item 16)** on the DIGITAL INPUT/OUTPUT STATUS screen.

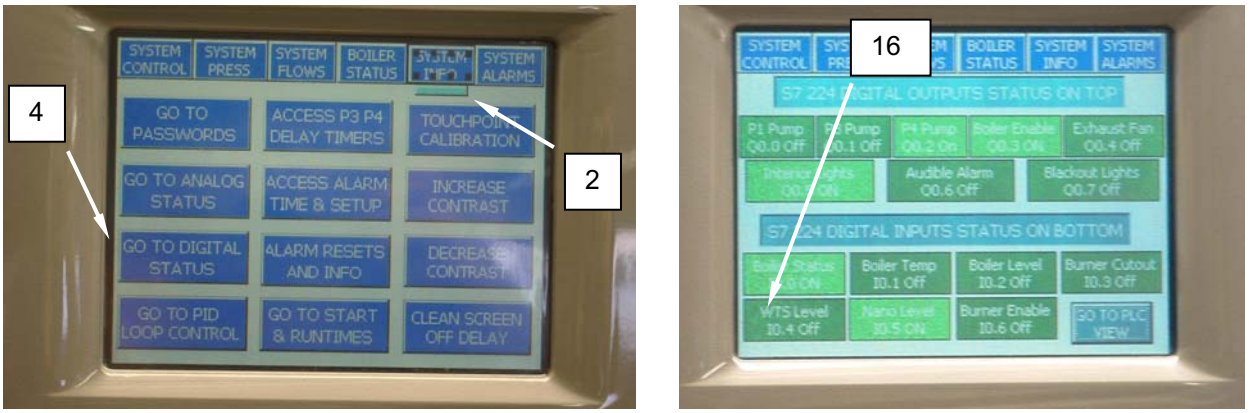
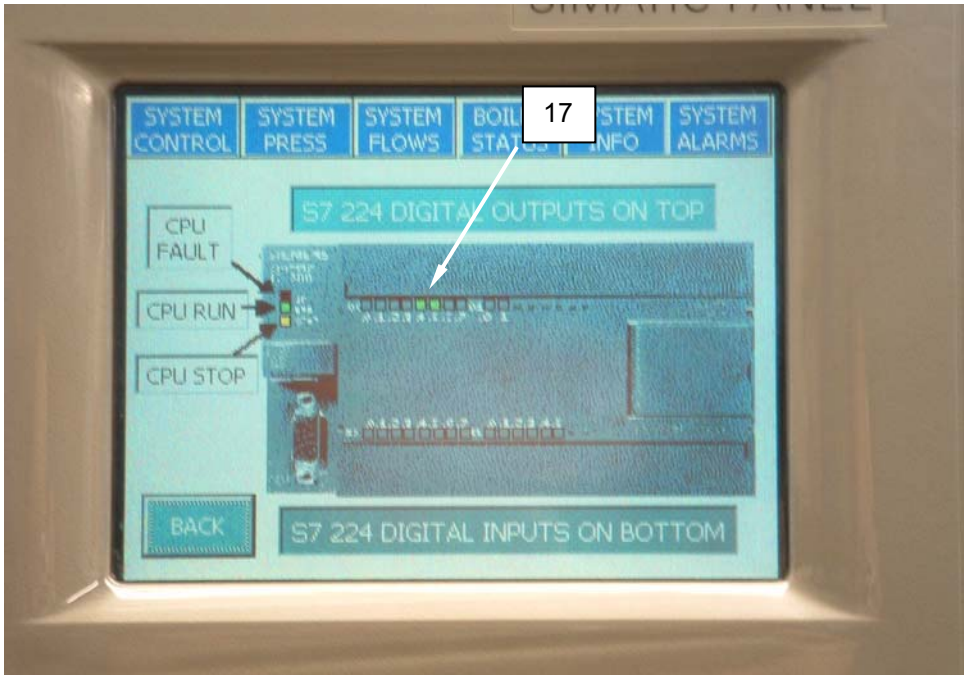


Figure 13. Test PLC Controller.

TEST-CONTINUED

6. Monitor the lights **(Figure 14, Item 17)** displayed on the PLC represented on the PLC VIEW screen, and compare the lights with the LED's **(Figure 14, Item 7)** on the actual PLC controller. The two should match; as an LED lights on the PLC controller, it should be displayed in the PLC view.



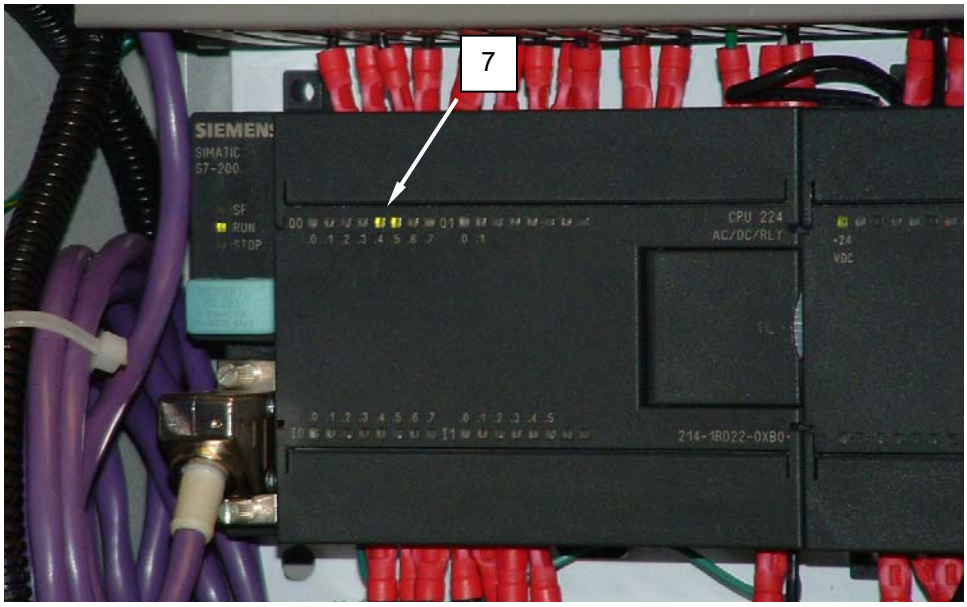


Figure 14. Test PLC Controller.

TEST-CONTINUED

Test the DC Power Supply

WARNING

This equipment operates at high voltages. Use extreme caution, observe all warnings, and follow all safety procedures. Failure to observe safety precautions may result in injury or death to personnel.

1. Ensure power is supplied to the PLC.
2. Open PLC enclosure.
3. Ensure the 24 VDC indicator LED **(Figure 15, Item 18)** is lit.
4. Use a voltmeter to test for 24 VDC output **(Figure 15, Item 19)** between the + and – terminals on the power supply **(Figure 15, Item 20)**.
5. If there is no 24 VDC output **(Figure 15, Item 19)** and the LED **(Figure 15, Item 18)** is not lit, use a voltmeter to test for 120 VAC input **(Figure 15, Item 21)** to power supply **(Figure 15, Item 20)**. If no voltage is supplied to power supply, test surge arrestor **(Figure 15, Item 22)** IAW procedures given in this WP.
6. Replace an inoperative power supply **(Figure 15, Item 20)**.
7. Close PLC enclosure and monitor for normal operation.

TEST-CONTINUED

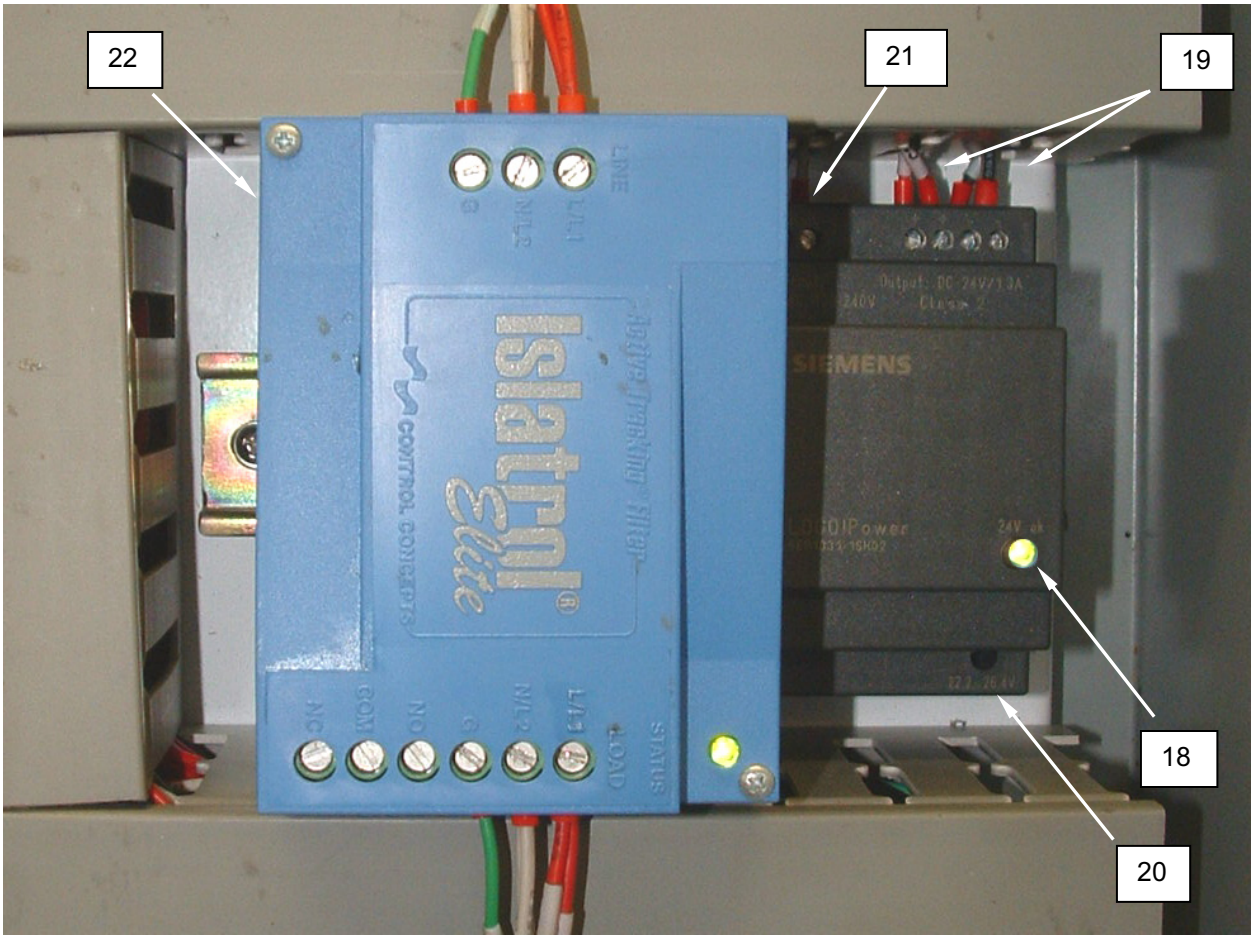


Figure 15. Test DC Power Supply.

TEST-CONTINUED

Test the Surge Arrestor

WARNING

This equipment operates at high voltages. Use extreme caution, observe all warnings, and follow all safety procedures. Failure to observe safety precautions may result in injury or death to personnel.

NOTE

If the surge arrestor is inoperative, there will be no power to the PLC.

1. Ensure circuit breaker No. 8 is switched ON.
2. Open PLC enclosure.
3. Ensure the indicator LED **(Figure 16, Item 7)** is lit.
4. Use a voltmeter to test for 120 VAC between L1 **(Figure 16, Item 23)** and L2 **(Figure 16, Item 24)** on the LOAD side of the surge arrestor **(Figure 16, Item 25)**.
5. Use a voltmeter to test for 120 VAC between L1 **(Figure 16, Item 23)** and G **(Figure 16, Item 26)** on the LOAD side of the surge arrestor **(Figure 16, Item 25)**.
6. Use a voltmeter to test for 120 VAC between L1 **(Figure 16, Item 27)** and L2 **(Figure 16, Item 28)** on the LINE side of the surge arrestor **(Figure 16, Item 4)**.
7. Use a voltmeter to test for 120 VAC between L1 **(Figure 16, Item 27)** and G **(Figure 16, Item 30)** on the LINE side of the surge arrestor **(Figure 16, Item 29)**.
8. Replace a surge arrestor **(Figure 16, Item 22)** which has the correct input voltage and incorrect output voltage.
9. Close PLC enclosure and monitor for normal operation.

TEST-CONTINUED

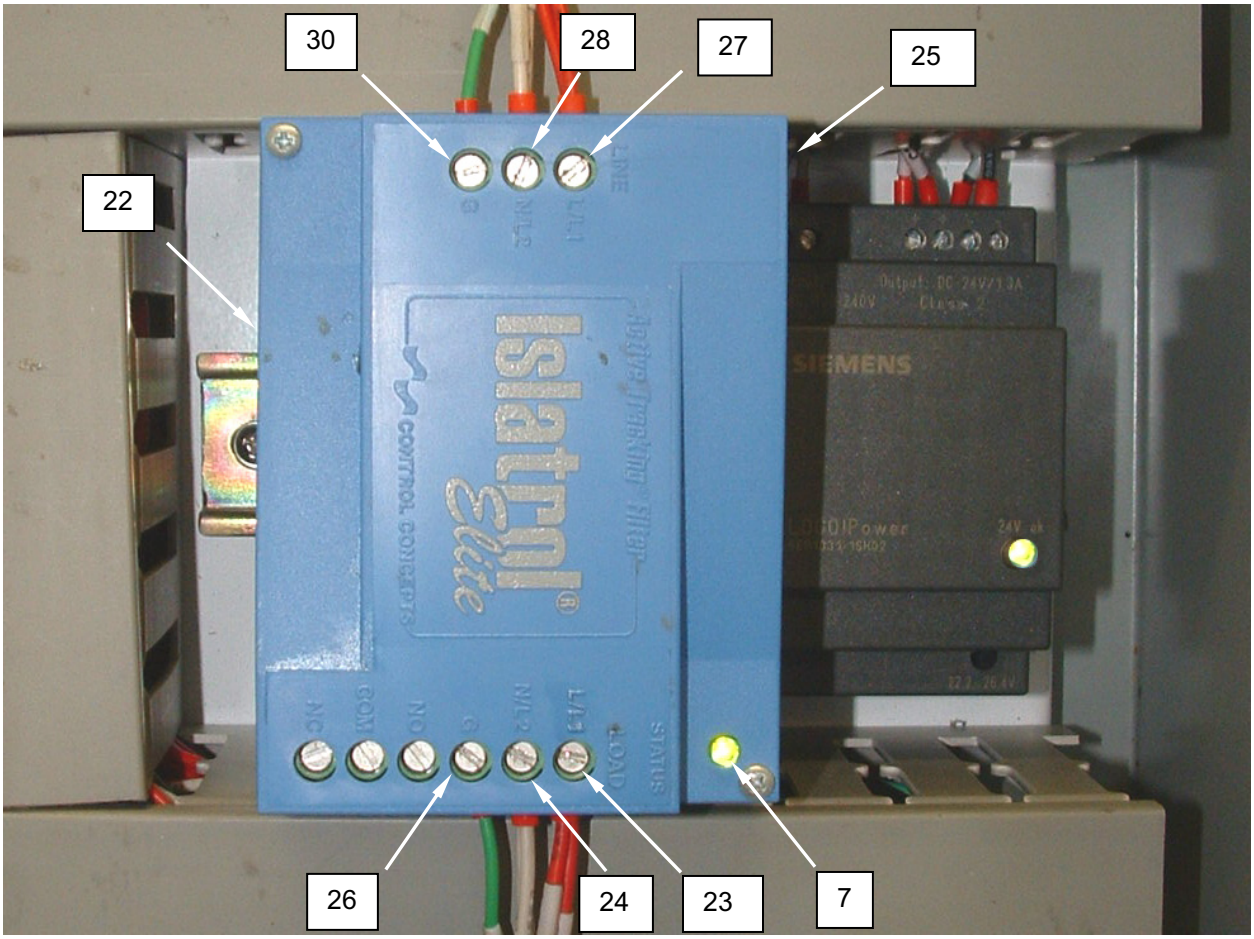


Figure 16. Test Surge Arrestor.

TEST-CONTINUED

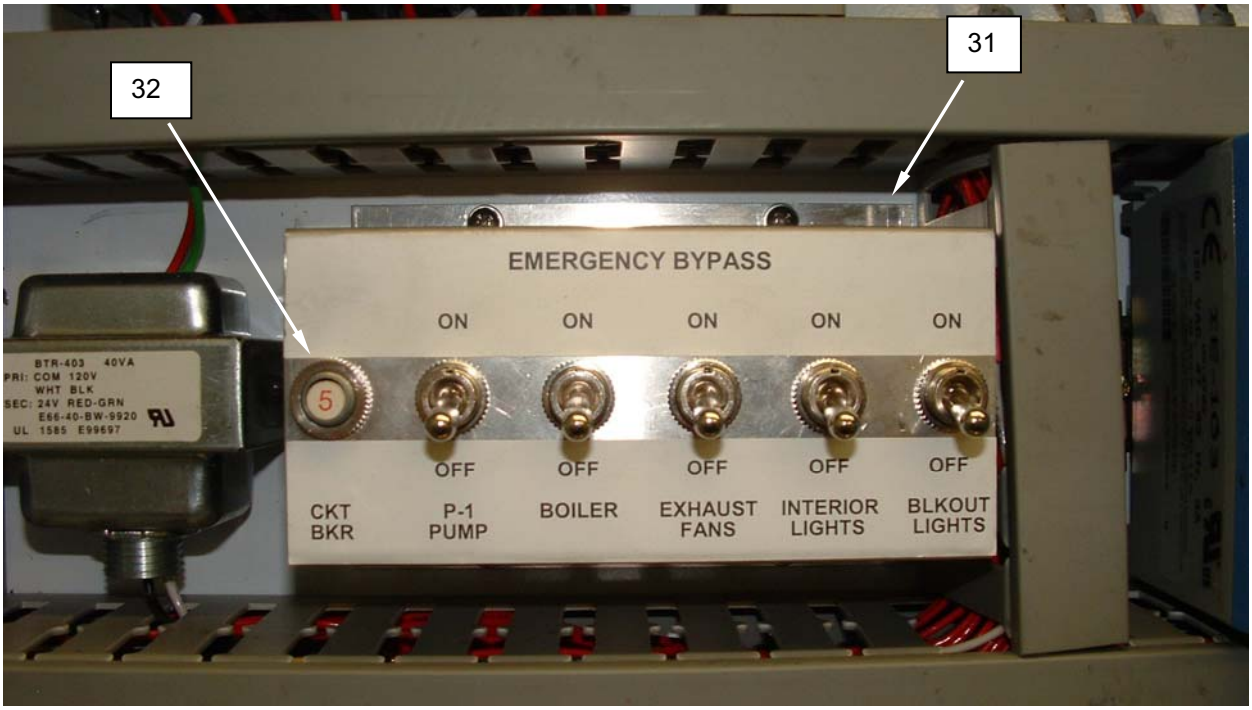
Test the Control Circuit Breaker

WARNING

This equipment operates at high voltages. Use extreme caution, observe all warnings, and follow all safety procedures. Failure to observe safety precautions may result in injury or death to personnel.

1. Disconnect power at the main circuit breaker.
2. Open PLC enclosure.
3. Remove the screws retaining the bypass switch assembly **(Figure 17, Item 31)** and pull the bypass switch assembly from the enclosure.
4. Tag and disconnect the wiring from the circuit breaker **(Figure 17, Item 32)**.
5. Ensure the breaker **(Figure 17, Item 32)** is closed, and use an ohmmeter to test for continuity. There should be 0 ohms resistance.
6. Use an ohmmeter to test for continuity between each terminal and the assembly mount **(Figure 17, Item 31)**. There should be infinite resistance.
7. Replace a circuit breaker **(Figure 17, Item 32)** that fails any of these tests.
8. Connect the wiring to the circuit breaker **(Figure 17, Item 32)** as tagged.
9. Install the bypass switch assembly **(Figure 17, Item 31)** into the PLC enclosure and retain with screws.
10. Close the PLC enclosure, connect power, and monitor for normal operation.

TEST-CONTINUED



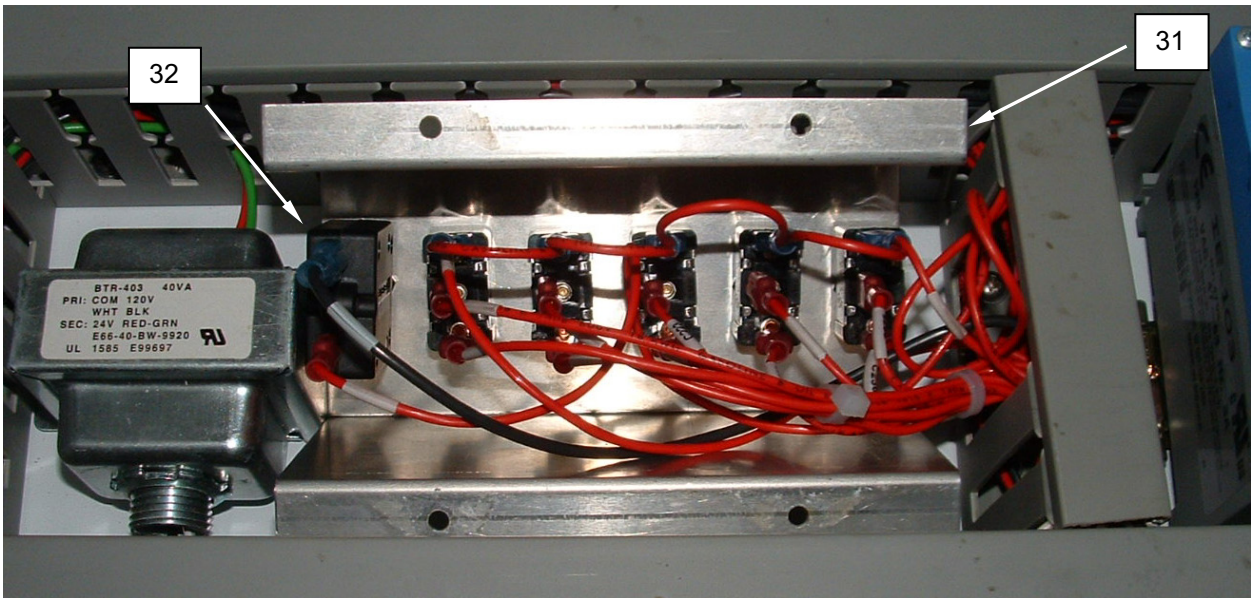


Figure 17. Test Control Circuit Breaker.

TEST-CONTINUED

Test the Control Transformer

WARNING

This equipment operates at high voltages. Use extreme caution, observe all warnings, and follow all safety procedures. Failure to observe safety precautions may result in injury or death to personnel.

1. Open PLC enclosure.
2. Locate terminals 1**(Figure 18, Item 33)** and 4 **(Figure 18, Item 34)** on the terminal block **(Figure 18, Item 35)**.
3. Use a voltmeter to test for 24 VAC between terminals 1**(Figure 18, Item 33)** and 4 **(Figure 18, Item 34)** on the terminal block **(Figure 18, Item 35)**.
4. If no voltage is present, check the surge arrestor IAW procedures given in this WP.
5. Replace an open transformer **(Figure 19, Item 36)**.
6. Close PLC enclosure and monitor for normal operation.

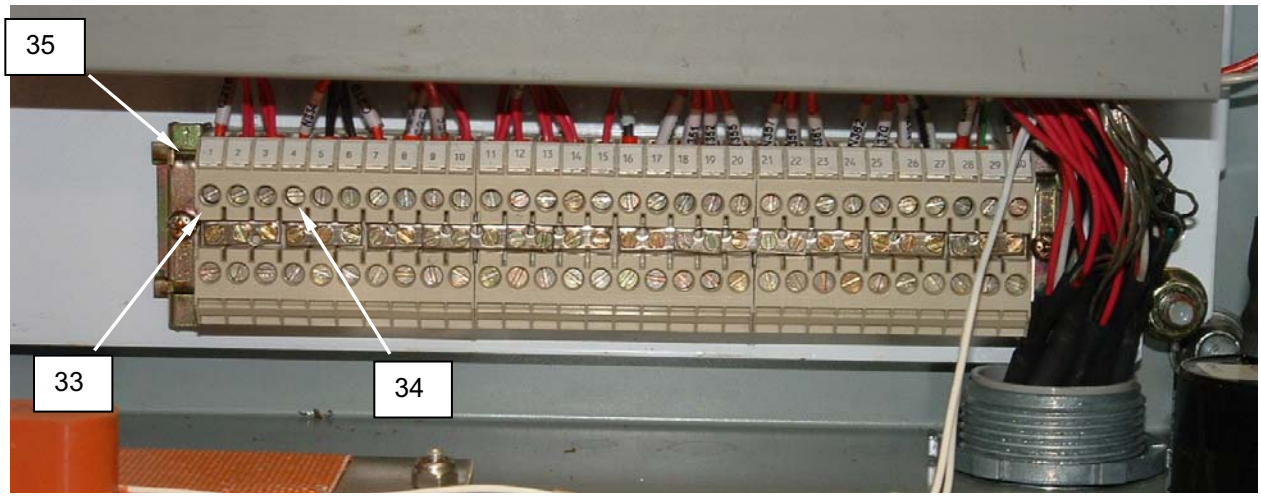


Figure 18. Test the Control Transformer.

TEST-CONTINUED

Figure 19. Test the Control Transformer.

TEST-CONTINUED

Test a Contactor

WARNING

This equipment operates at high voltages. Use extreme caution, observe all warnings, and follow all safety procedures. Failure to observe safety precautions may result in injury or death to personnel.

NOTE

A properly operating contactor will audibly engage when activated. If a loud “clunk” sound is heard when activating a component, the contactor mechanism is operating correctly. The contactor should still be checked for voltage even if it appears to be operating correctly.

NOTE

Ensure there is water in the water treatment system. If any of the sight glasses on the Reuse, WTS, or Nano Feed tanks is full, drain the tank to a level approximately four inches from the top of the sight glass tube before proceeding.

1. Ensure the boiler, P-1 pump, P-3 pump, or P-4 pump, as applicable, has been switched on at the PLC and is in a position to be operating.

2. Open the PLC enclosure and locate the contactor **(Figure 20, Item 37)** to be tested.

3. Visually verify that the gray contactor bar **(Figure 20, Item 38)** is recessed within the contactor **(Figure 20, Item 37)** when activated.

4. If the gray contactor bar **(Figure 20, Item 38)** is not recessed, check for 120 VAC between coil terminals **(Figure 20, Item 39)** and ground.

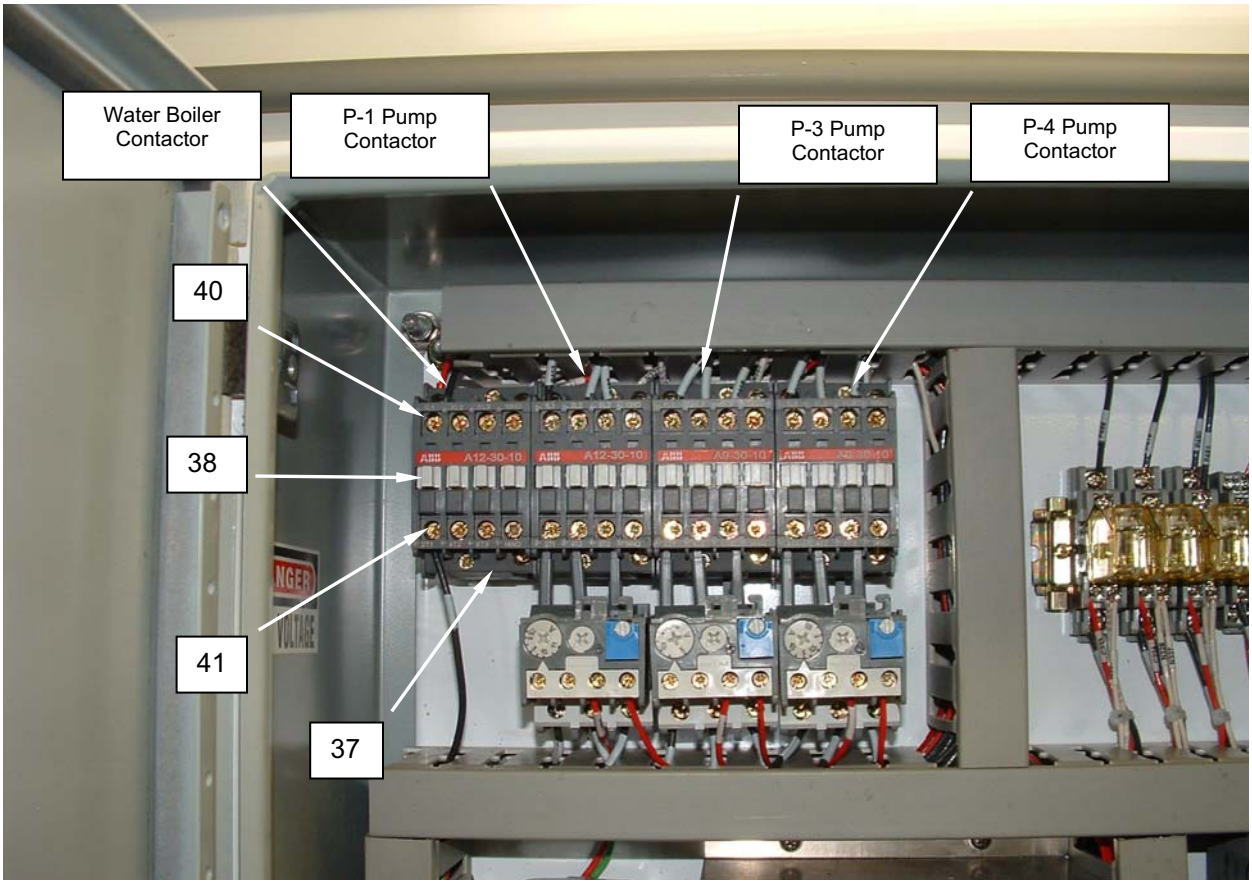
5. Use a voltmeter to test for potential between terminals L1 **(Figure 20, Item 40)** and T1 **(Figure 20, Item 41)**. There should be no voltage reading between these two points.

6. Repeat Step 5 for terminals L2 and T2, and L3 and T3.

7. Replace an inoperative contactor **(Figure 20, Item 37)**.

8. Close the PLC enclosure and monitor for normal operation.

TEST-CONTINUED



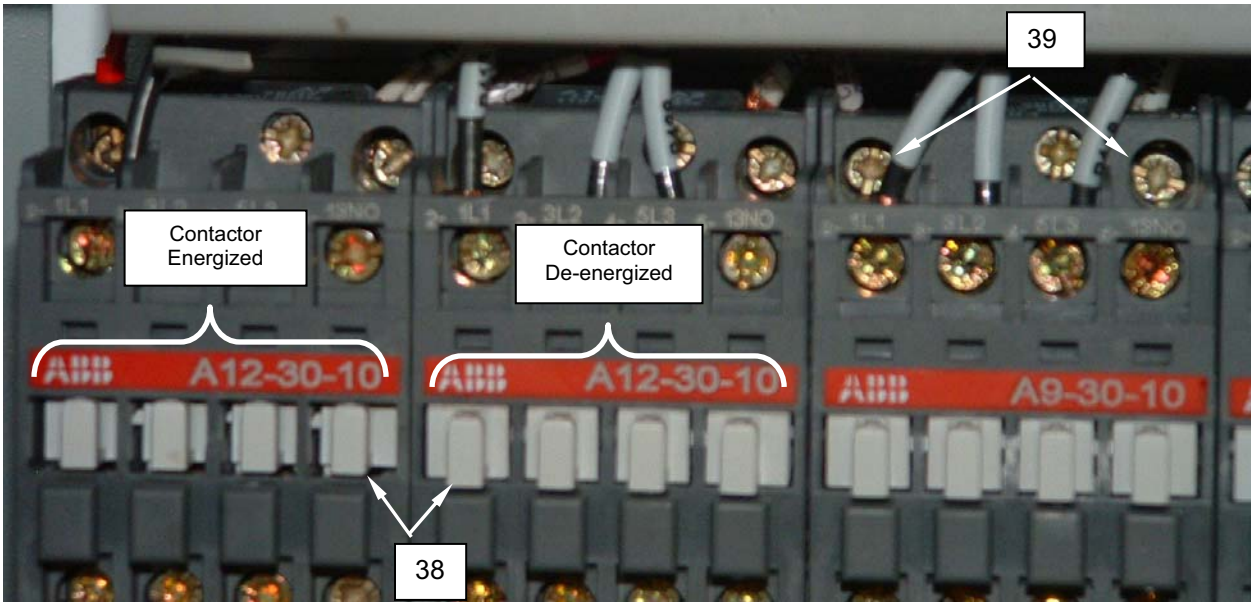


Figure 20. Test a Contactor.

TEST-CONTINUED

Test an Overload Relay

WARNING

This equipment operates at high voltages. Use extreme caution, observe all warnings, and follow all safety procedures. Failure to observe safety precautions may result in injury or death to personnel.

NOTE

The overload relays are wired to the contactor output terminals. Verify that the contactors are operating correctly before testing the overload relays.

1. Ensure the P-1 pump, P-3 pump, or P-4 pump, as applicable, has been switched on at the PLC and is in a position to be operating.

2. Open the PLC enclosure and locate the overload relay **(Figure 21, Item 42)** to be tested.

3. Press the overload reset button **(Figure 21, Item 43)**. If resetting the overload corrects the malfunction, determine the cause of the overload.

4. Use a voltmeter to test for voltage between the two control terminals **(Figure 21, Item 44)** on the relay. There should be 0 VAC between these two points. Test between each control terminal and ground. There should be 120 VAC between each terminal and ground.

5. Use a voltmeter to test for voltage between the T-1 terminal **(Figure 21, Item 45)** on the contactor **(Figure 21, Item 37)** and the L1 terminal **(Figure 21, Item 46)** on the relay **(Figure 21, Item 42)**. There should be 0 VAC between these two points.

6. Replace an inoperative overload relay.

7. Close the PLC enclosure and monitor for normal operation.

TEST-CONTINUED

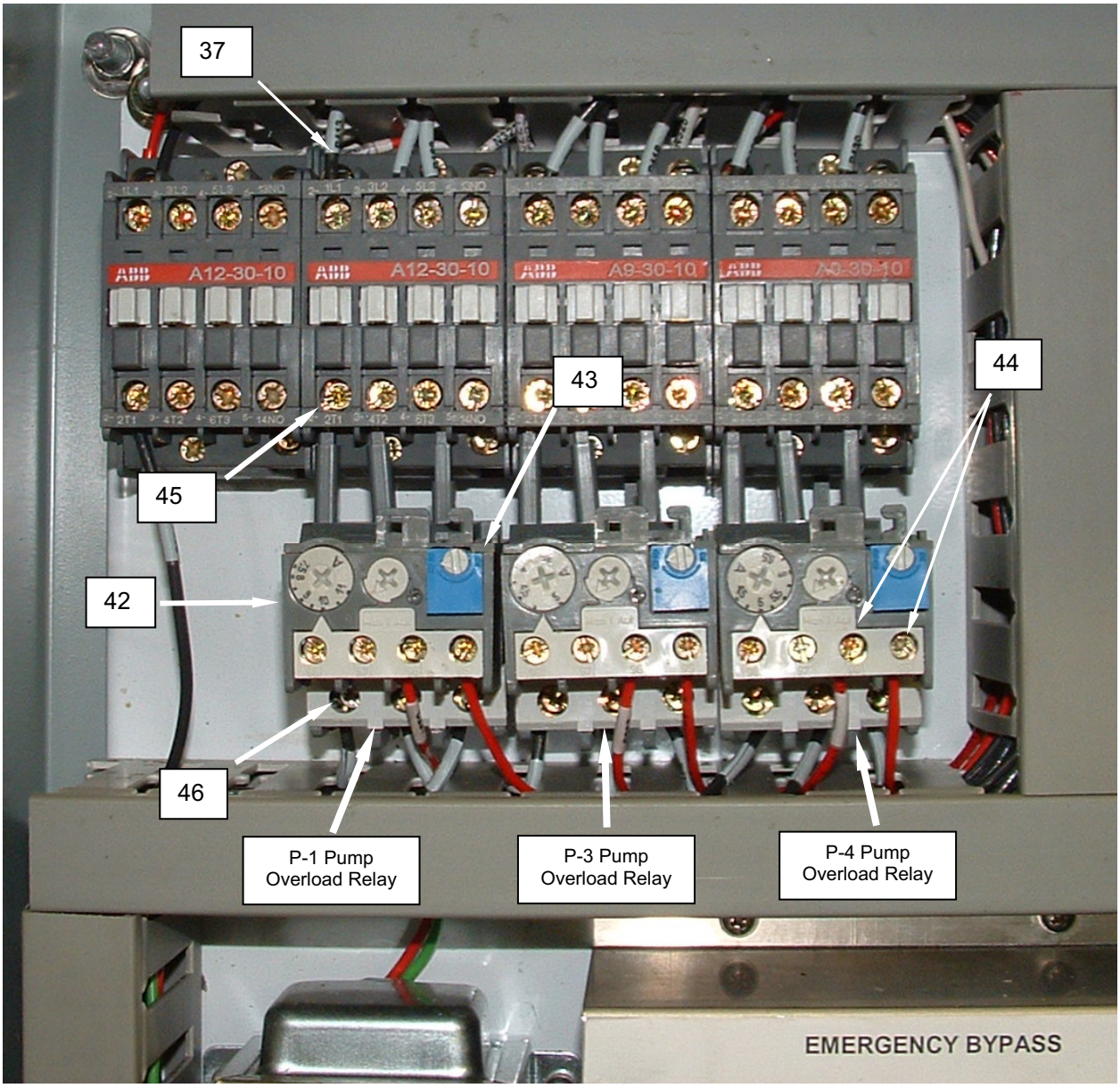


Figure 21. Test an Overload Relay.

TEST-CONTINUED

Test a Control Relay

WARNING

This equipment operates at high voltages. Use extreme caution, observe all warnings, and follow all safety procedures. Failure to observe safety precautions may result in injury or death to personnel.

1. Disconnect power at the main circuit breaker.
2. Open PLC enclosure.

NOTE

The dryer exhaust fan relay, interior lights relay, and blackout lights relay are interchangeable, and may be used when testing a suspected bad relay among the three. The burner status relay, burner power relay, high temp alarm relay, low water alarm relay, and burn lockout alarm relay may be interchanged as well for testing.

3. Locate and remove suspected malfunctioning control relay **(Figure 22, Item 47)** and replace with a known good relay.
4. Close enclosure, connect power, and operate PLC.
5. Monitor for normal operation.

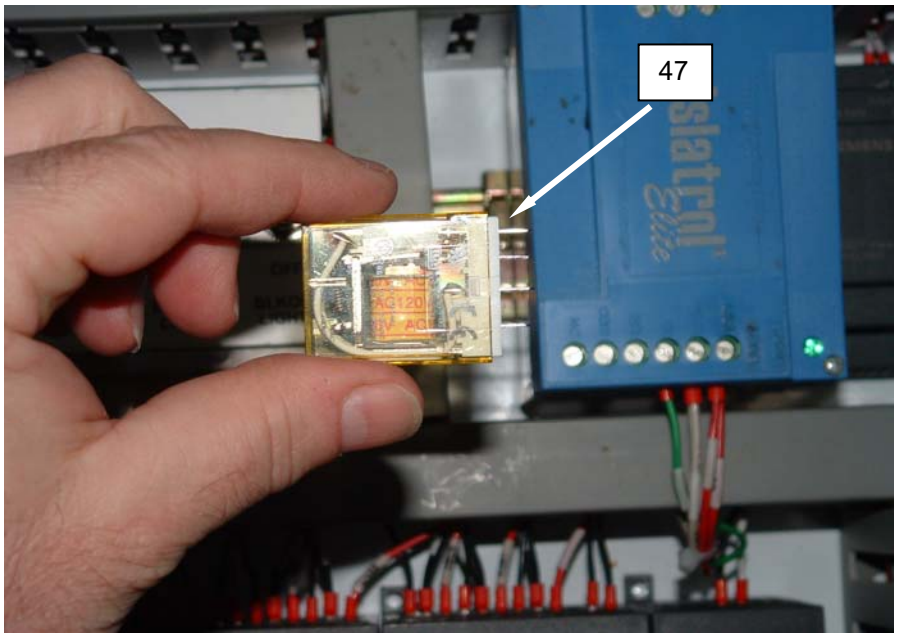


Figure 22. Test a Control Relay.

TEST-CONTINUED

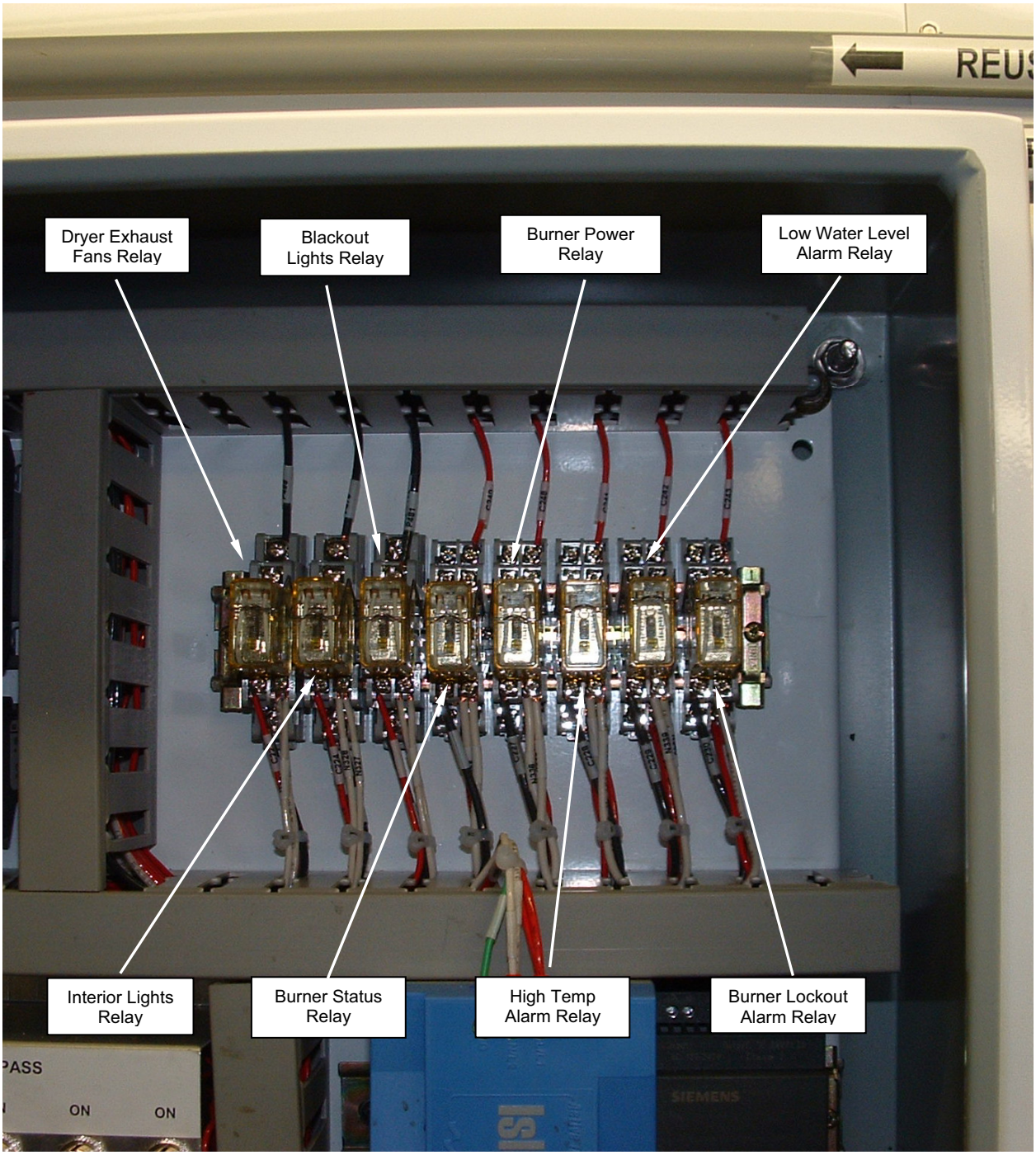


Figure 23. Test a Control Relay.

TEST-CONTINUED

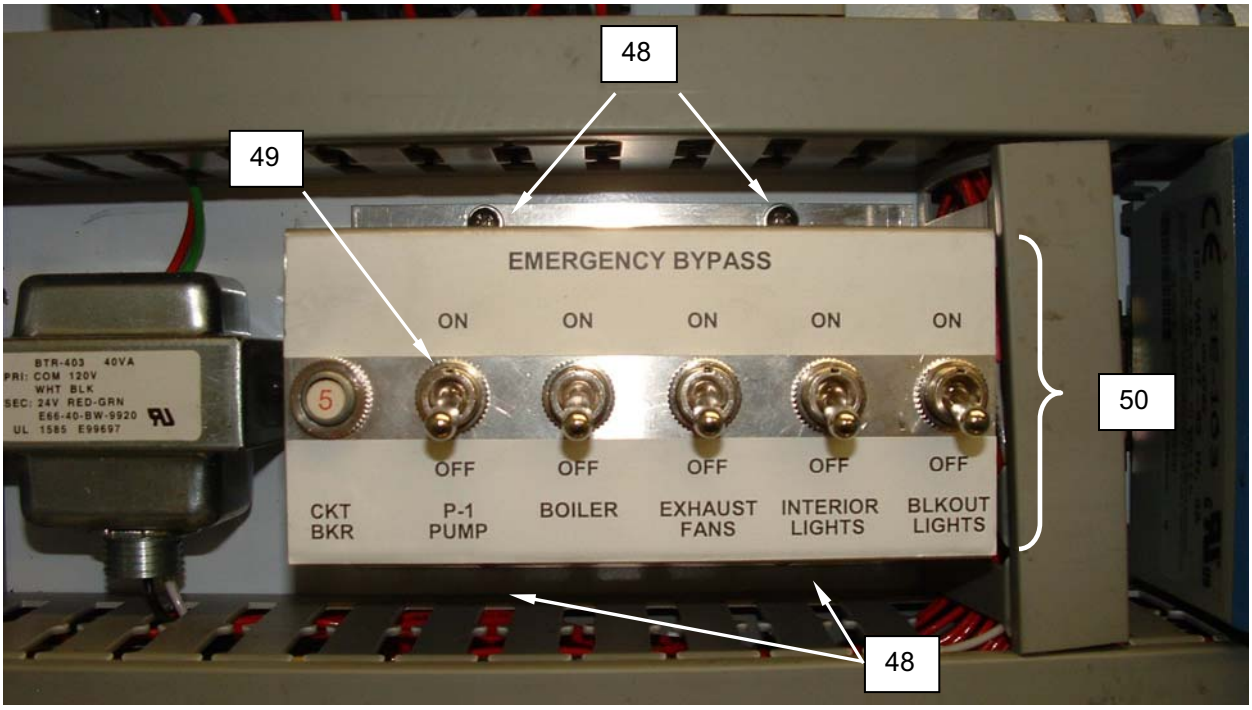
Test the Bypass Switches

WARNING

This equipment operates at high voltages. Use extreme caution, observe all warnings, and follow all safety procedures. Failure to observe safety precautions may result in injury or death to personnel.

1. Disconnect power at the main circuit breaker and open PLC enclosure.
2. Remove the screws **(Figure 24, Item 48)** retaining the bypass switch assembly (on both top and bottom) **(Figure 24, Item 31)**, and pull the bypass switch assembly from the enclosure.
3. Tag and disconnect the wiring from the switch **(Figure 24, Item 49)** being tested.
4. Place the switch **(Figure 24, Item 49)** in the on position, and use an ohmmeter to test for continuity. There should be 0 ohms resistance.
5. Place the switch **(Figure 24, Item 49)** in the off position and use an ohmmeter to test for continuity. There should be infinite resistance.
6. Use an ohmmeter to test for continuity between each terminal and the assembly mount **(Figure 24, Item 50)**. There should be infinite resistance. Replace a switch **(Figure 24, Item 49)** that fails any of these tests.
7. Connect the wiring to the switch **(Figure 24, Item 49)** as tagged.
8. Install the bypass switch assembly **(Figure 24, Item 31)** into the PLC enclosure, and retain with screws **(Figure 24, Item 48)**.
9. Close the PLC enclosure, connect power, and monitor for normal operation.

TEST-CONTINUED



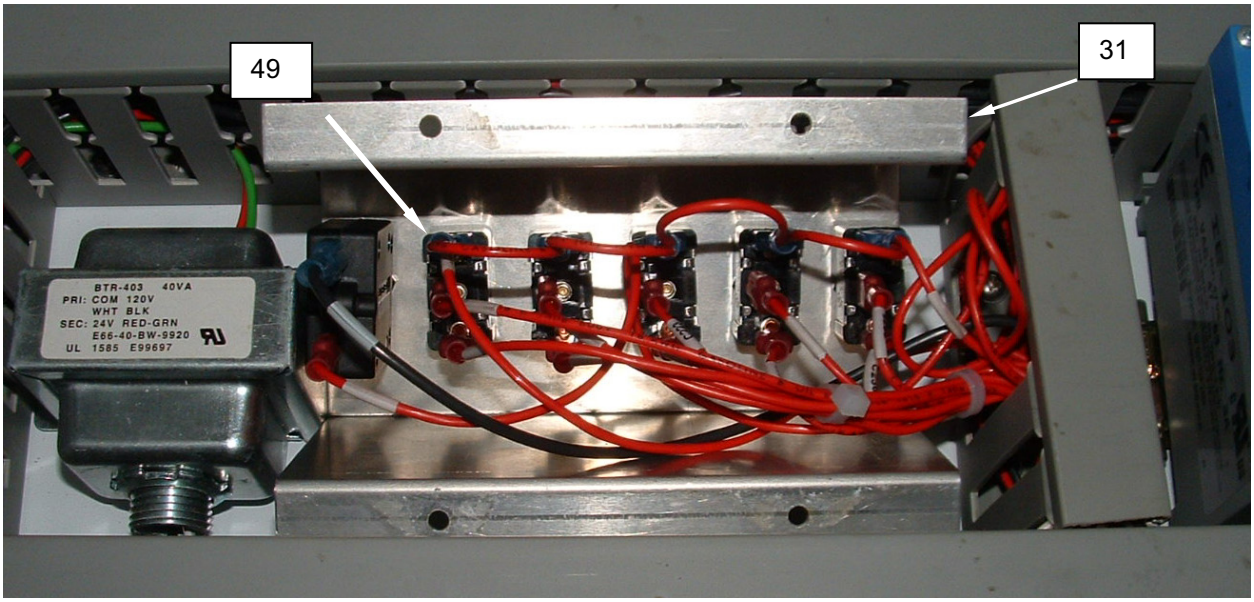


Figure 24. Test the Bypass Switches.

TEST-CONTINUED

Test the Emergency Stop

WARNING

This equipment operates at high voltages. Use extreme caution, observe all warnings, and follow all safety procedures. Failure to observe safety precautions may result in injury or death to personnel.

1. Disconnect power at the main circuit breaker and open PLC enclosure.
2. Tag and disconnect wiring from the two switch terminals **(Figure 25, Item 51)**.
3. Use an ohmmeter to test for continuity across the two switch terminals **(Figure 25, Item 51)**.
4. Connect wiring to the two switch terminals **(Figure 25, Item 51)** as tagged.
5. Close PLC enclosure and monitor for normal operation.

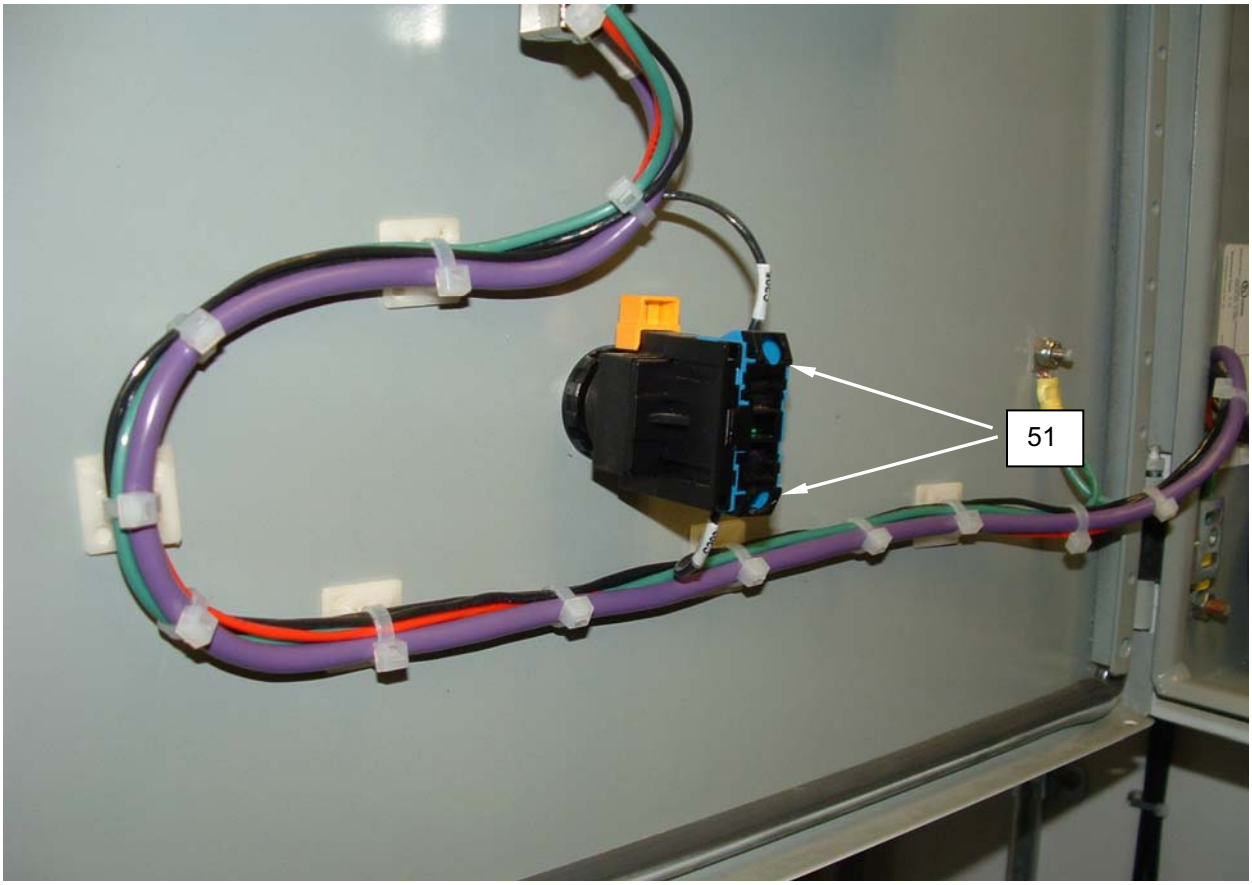


Figure 25. Test the Emergency Stop.

TEST-CONTINUED

Test the Electric Box Heater

WARNING

This equipment operates at high voltages. Use extreme caution, observe all warnings, and follow all safety procedures. Failure to observe safety precautions may result in injury or death to personnel.

WARNING

Do not attempt to verify operation of the heater by touch. Failure to observe safety precautions may result in burn injuries to personnel.

NOTE

The electric box heater is thermostatically controlled, and will not come on until cooled below 40°F. Indications that the heater may be inoperative include the presence of condensation within the PLC enclosure.

1. Disconnect power at the main circuit breaker.
2. Open PLC enclosure.
3. Tag and disconnect wiring from heater **(Figure 26, Item 52)**. It may be necessary to cut and strip the heater wiring to test the heater.

NOTE

The electric box heater is thermostatically controlled, and will not come on until cooled below 40°F. It may be necessary to remove the heater and test it in a refrigerated environment.

4. Use an ohmmeter to test for 140 to 150 ohms resistance.
5. Connect wiring to heater **(Figure 26, Item 52)** as tagged.
6. Close PLC enclosure, then connect power and operate the PLC.
7. Monitor for normal operation.

TEST-CONTINUED

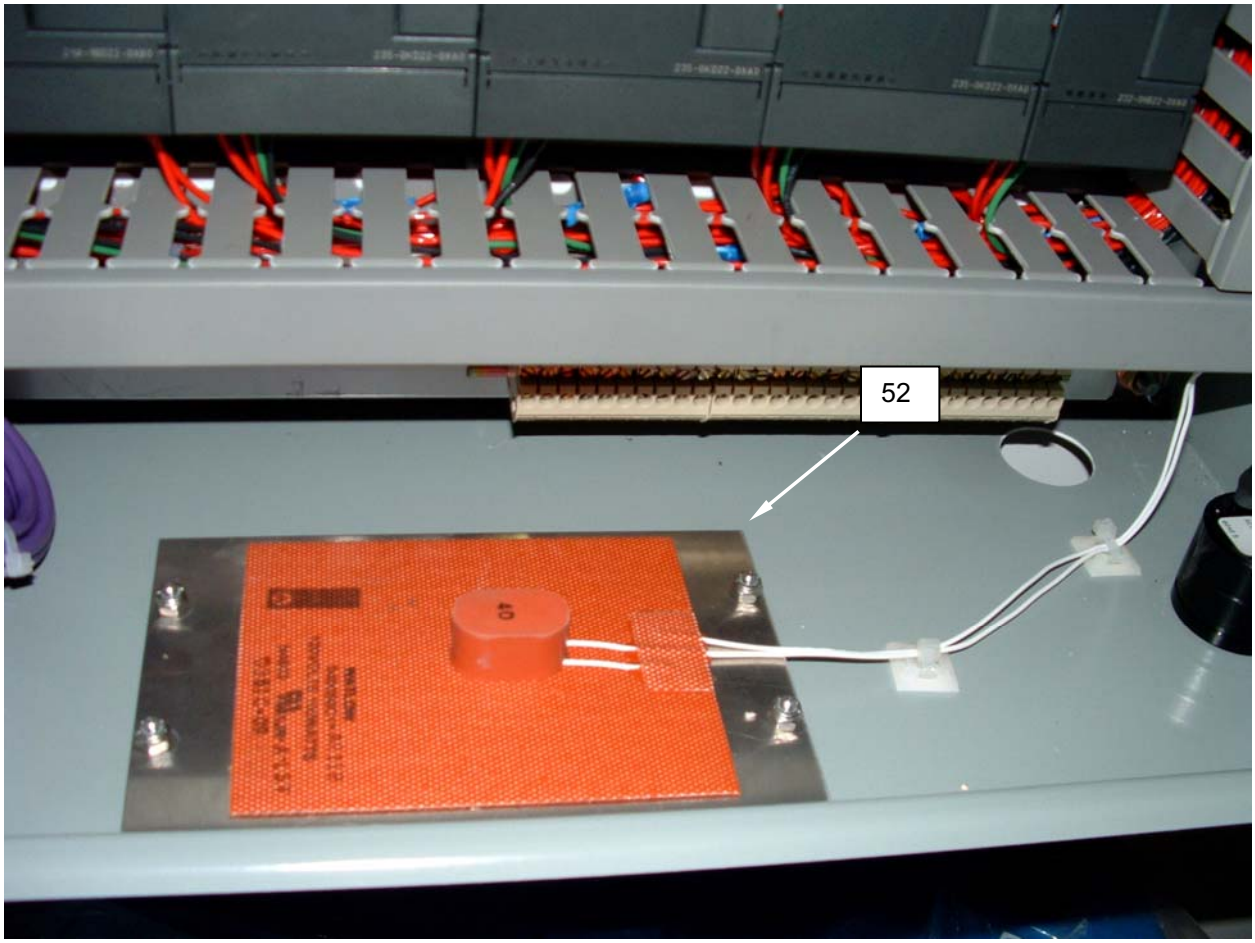


Figure 26. Test the Electric Box Heater.

TEST-CONTINUED

Test the Human Machine Interface (HMI)

WARNING

This equipment operates at high voltages. Use extreme caution, observe all warnings, and follow all safety procedures. Failure to observe safety precautions may result in injury or death to personnel.

1. Ensure power is supplied to the PLC.
2. Ensure the DIP switches **(Figure 27, Item 53)** are set on the DP/MPI setting.
3. If the HMI is unresponsive, or displays a “Cannot write to PLC” error, check all wiring connections. If wiring connections are satisfactory, replace the HMI **(Figure 27, Item 54)**.
4. If there is no display, test the 24 VDC power supply IAW procedures given in this WP. If the 24 VDC power supply is operating correctly, replace the HMI.

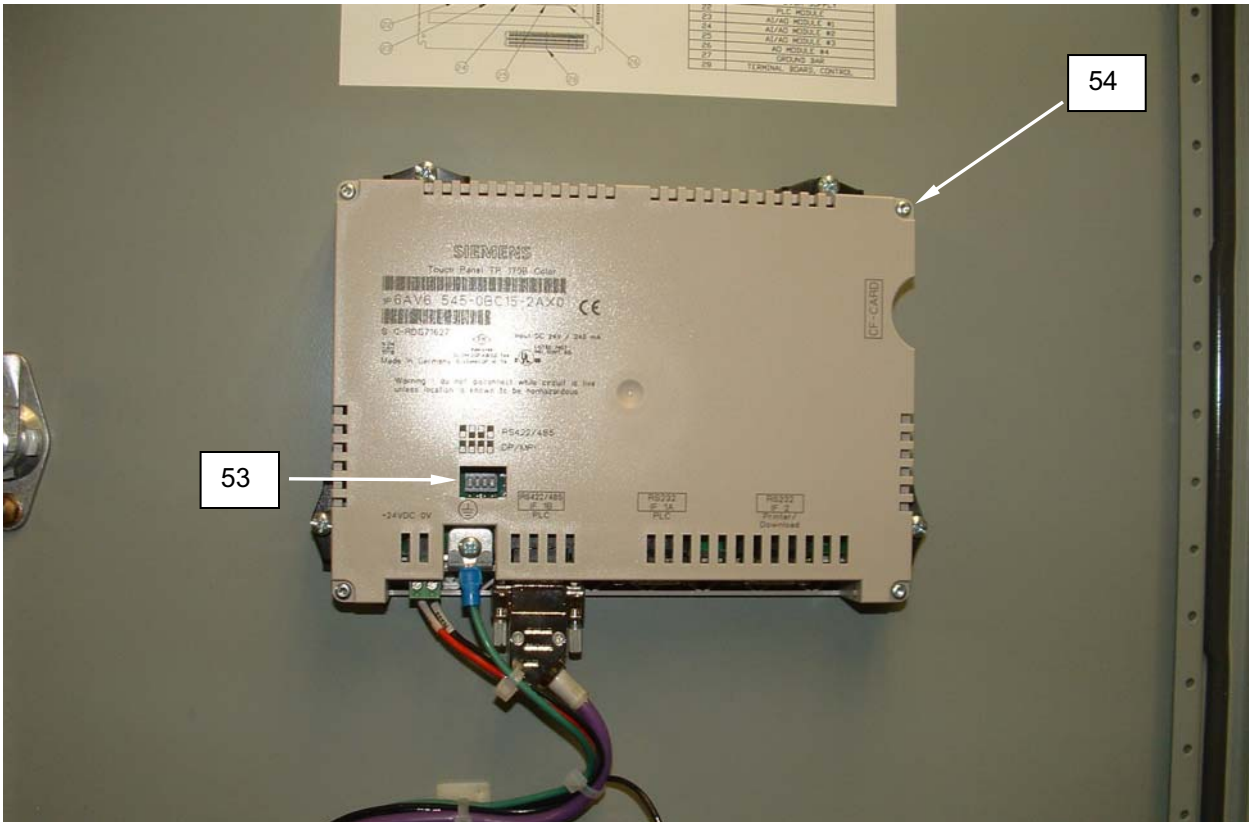


Figure 27. Test the Human Machine Interface (HMI).

END OF WORK PACKAGE

UNIT MAINTENANCE
CONTAINERIZED BATCH LAUNDRY
NSN 3510-01-527-2209
NSN 3510-01-527-2210
PROGRAMMABLE LOGIC CONTROL (PLC)
REPLACE

INITIAL SETUP

Tools
Tool Kit, General Mechanics: Automotive (WP 0086 00, Table 2, Item 6)

Personnel Required
Quartermaster and Chemical Equipment Repairer 63J (1)

Materials/Parts
Tape, Electrical Insulation (WP 0087 00, Item 52)
Wire Markers (WP 0087 00, Item 58)

Equipment Condition
CBL shutdown and drained

REPLACE

Replace Audible Alarm

WARNING

This equipment operates at high voltages. Use extreme caution, observe all warnings, and follow all safety procedures. Failure to observe safety precautions may result in injury or death to personnel.

1. Disconnect power by switching circuit breaker No. 8 to OFF.
2. Open PLC enclosure.
3. Strip the heat shrink insulation **(Figure 1, Item 1)** from the wiring connections.
4. Tag and disconnect wiring from audible alarm **(Figure 1, Item 2)**.
5. Unscrew audible alarm **(Figure 1, Item 2)**, and remove audible alarm.
6. Install replacement audible alarm **(Figure 1, Item 2)**.
7. Connect wiring as tagged, and insulate wiring connections with electrical tape.
8. Close enclosure, connect power, and operate PLC.
9. Monitor for normal operation.

REPLACE-CONTINUED

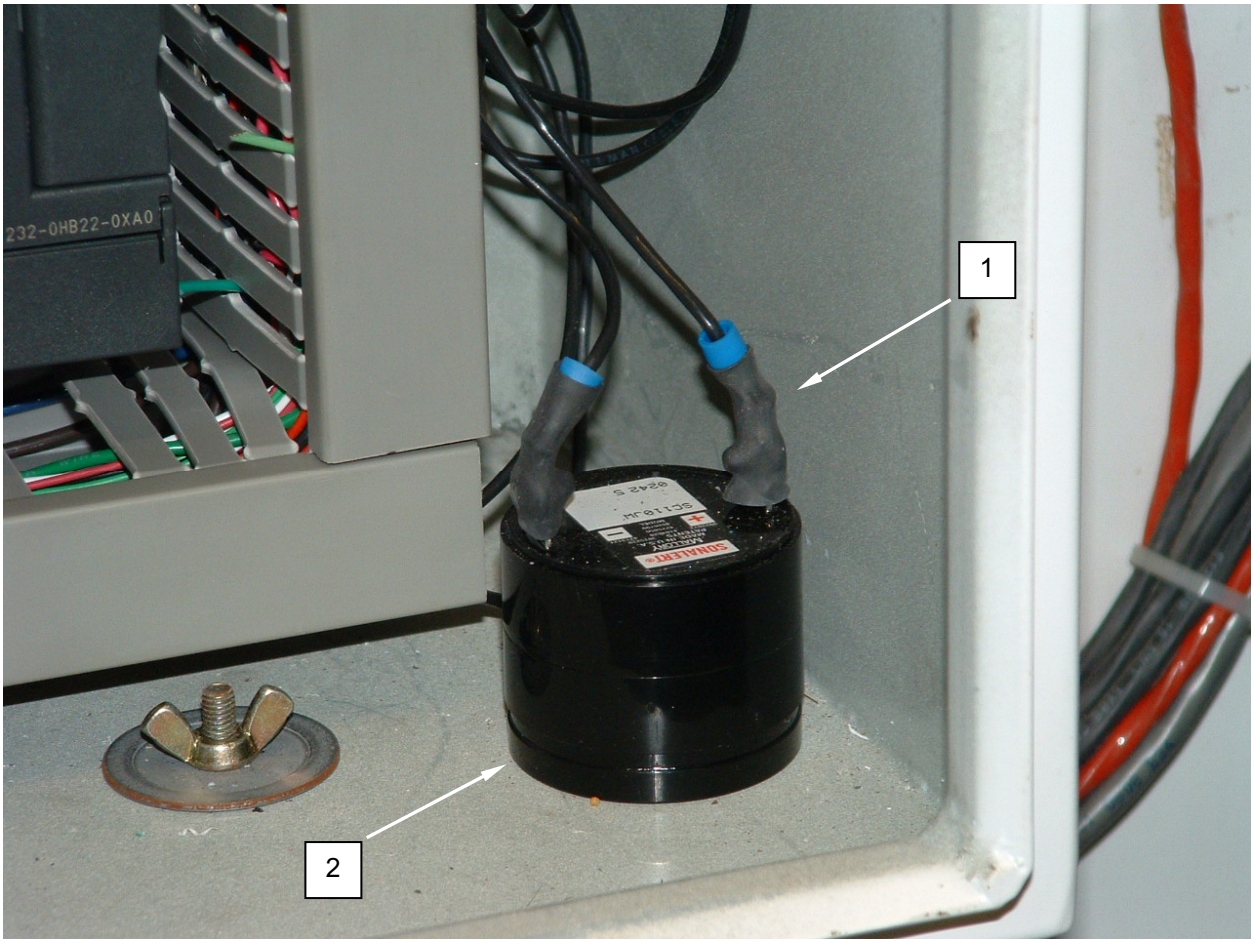


Figure 1. Replace Audible Alarm.

REPLACE-CONTINUED

Replace Analog Output Module

WARNING

This equipment operates at high voltages. Use extreme caution, observe all warnings, and follow all safety procedures. Failure to observe safety precautions may result in injury or death to personnel.

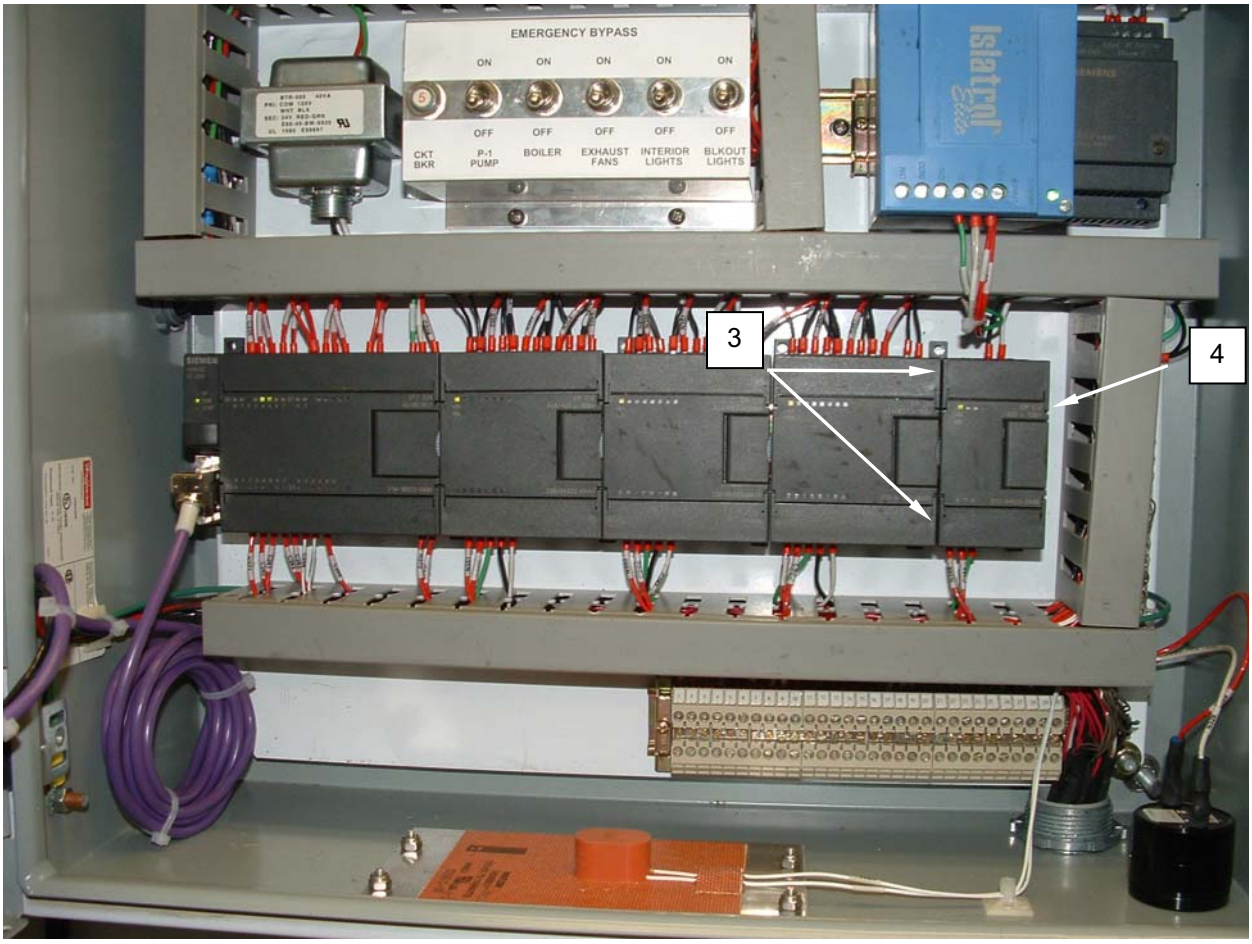
1. Disconnect power by switching circuit breaker No. 8 to OFF.
2. Open PLC enclosure.
3. Release the connection cover flaps **(Figure 2, Item 3)** on both the existing module **(Figure 2, Item 4)** and the replacement module.

CAUTION

Ensure that the wire connections had been documented fully and accurately before disconnect any wiring from the module. An improperly wired module may render the Water Treatment System inoperative.

4. Tag and disconnect wiring from analog output module **(Figure 2, Item 4)**.
5. Remove analog output module **(Figure 2, Item 4)**.
6. Install replacement module **(Figure 2, Item 4)**.
7. Connect wiring to replacement module **(Figure 2, Item 4)** as tagged.
8. Close the connection cover flaps **(Figure 2, Item 3)**.
9. Close PLC enclosure.
10. Connect power and monitor for normal operation.

REPLACE-CONTINUED



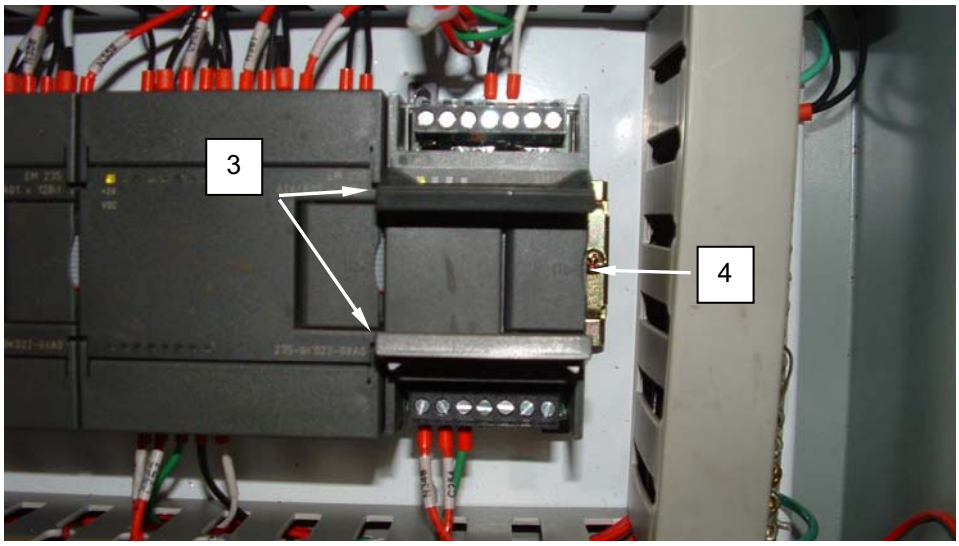


Figure 2. Replace Analog Output Module.

REPLACE-CONTINUED

Replace Analog Input/Output Module

WARNING

This equipment operates at high voltages. Use extreme caution, observe all warnings, and follow all safety procedures. Failure to observe safety precautions may result in injury or death to personnel.

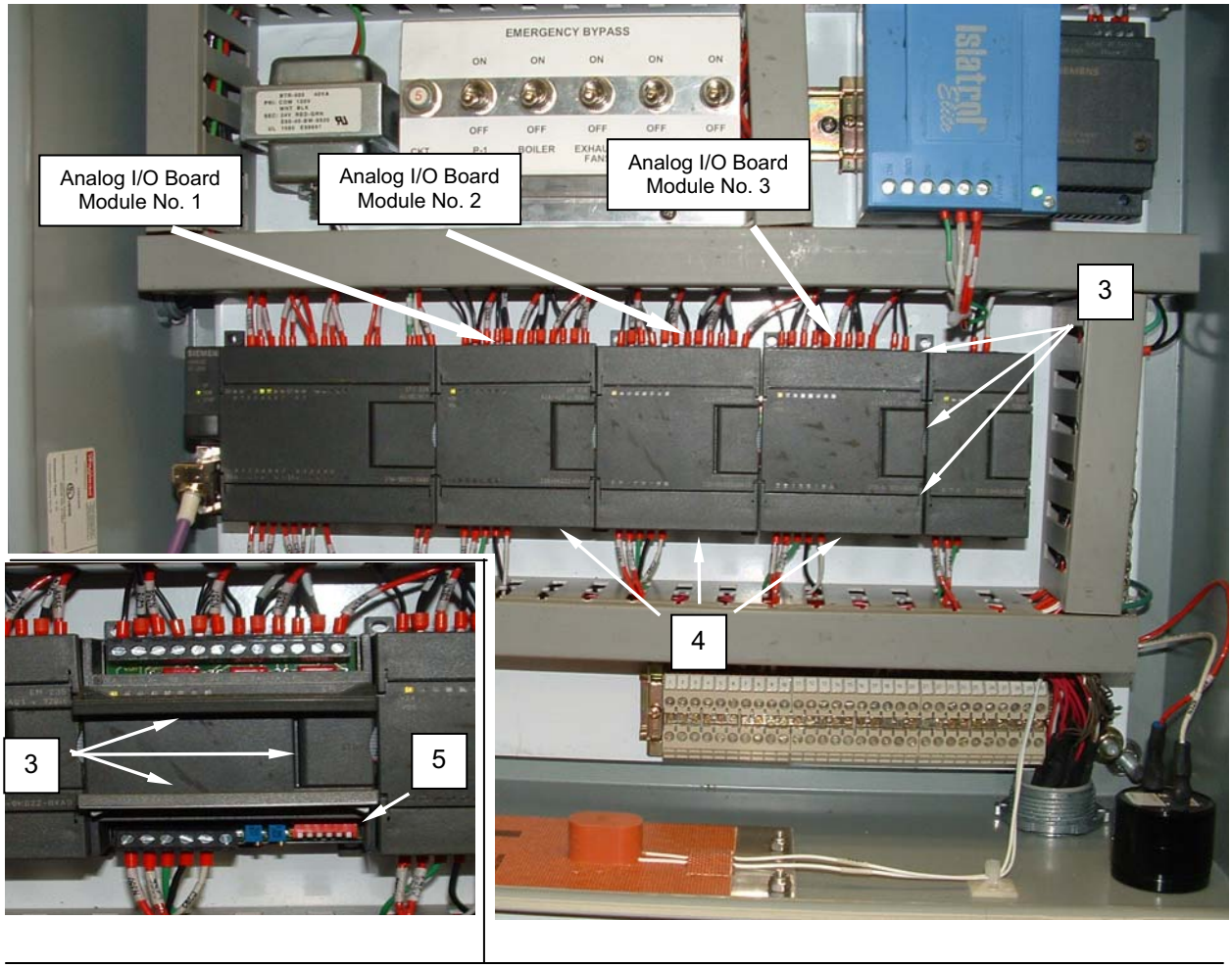
1. Disconnect power by switching circuit breaker No. 8 to OFF.
2. Open PLC enclosure.
3. Release the connection cover flaps **(Figure 3, Item 3)** on both the existing module **(Figure 3, Item 4)** and the replacement module.

CAUTION

Ensure that the wire connections had been documented fully and accurately before disconnect any wiring from the module. An improperly wired module may render the Water Treatment System inoperative.

4. Tag and disconnect wiring from module **(Figure 3, Item 4)**.
5. Remove analog input/output module **(Figure 3, Item 4)**.
6. Install replacement module **(Figure 3, Item 4)**.
7. Connect wiring to replacement module **(Figure 3, Item 4)** as tagged.
8. Set the DIP switches **(Figure 3, Item 5)** with the two outside switches **(Figure 3, Item 6)** OUT, and the four inside switches **(Figure 3, Item 7)** IN as shown in Figure 3.
9. Close the connection cover flaps **(Figure 2, Item 3)**.
10. Close PLC enclosure.
11. Connect power and monitor for normal operation.

REPLACE-CONTINUED



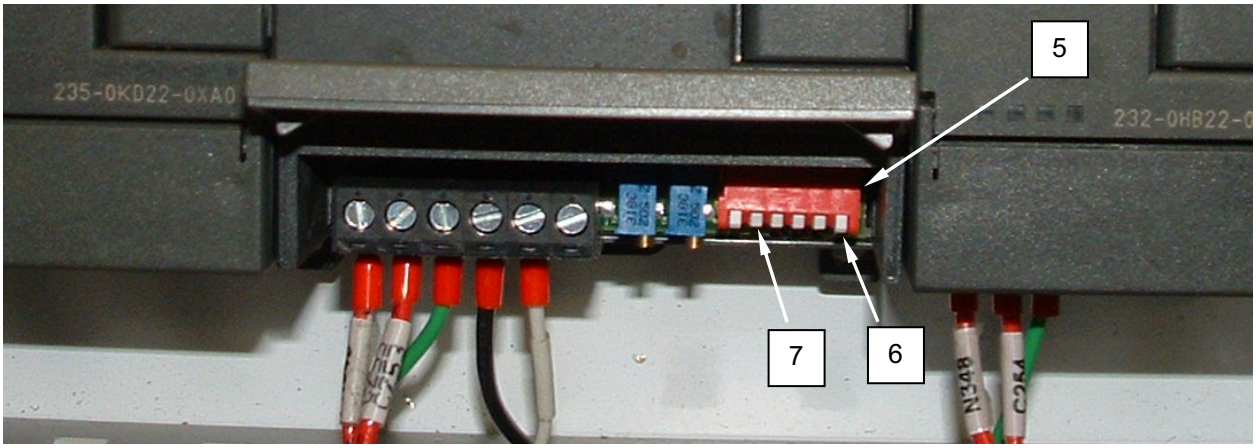


Figure 3. Replace Analog Input/Output Module.

REPLACE-CONTINUED

Replace PLC Controller

WARNING

This equipment operates at high voltages. Use extreme caution, observe all warnings, and follow all safety procedures. Failure to observe safety precautions may result in injury or death to personnel.

1. Disconnect power by switching circuit breaker No. 8 to OFF.
2. Open PLC enclosure.
3. Release the connection cover flaps **(Figure 4, Item 3)** on both the existing module **(Figure 4, Item 4)** and the replacement module.

CAUTION

Ensure that the wire connections had been documented fully and accurately before disconnect any wiring from the module. An improperly wired module may render the Water Treatment System inoperative.

4. Tag and disconnect wiring from PLC controller **(Figure 4, Item 8)**.
5. Remove PLC controller **(Figure 4, Item 8)**.
6. Install replacement PLC controller **(Figure 4, Item 8)**.
7. Connect wiring to replacement PLC controller **(Figure 4, Item 8)** as tagged.
8. Set the DIP switch **(Figure 4, Item 5)** to RUN.
9. Close the connection cover flaps **(Figure 4, Item 3)**.
10. Close PLC enclosure.
11. Connect power and monitor for normal operation.

REPLACE-CONTINUED

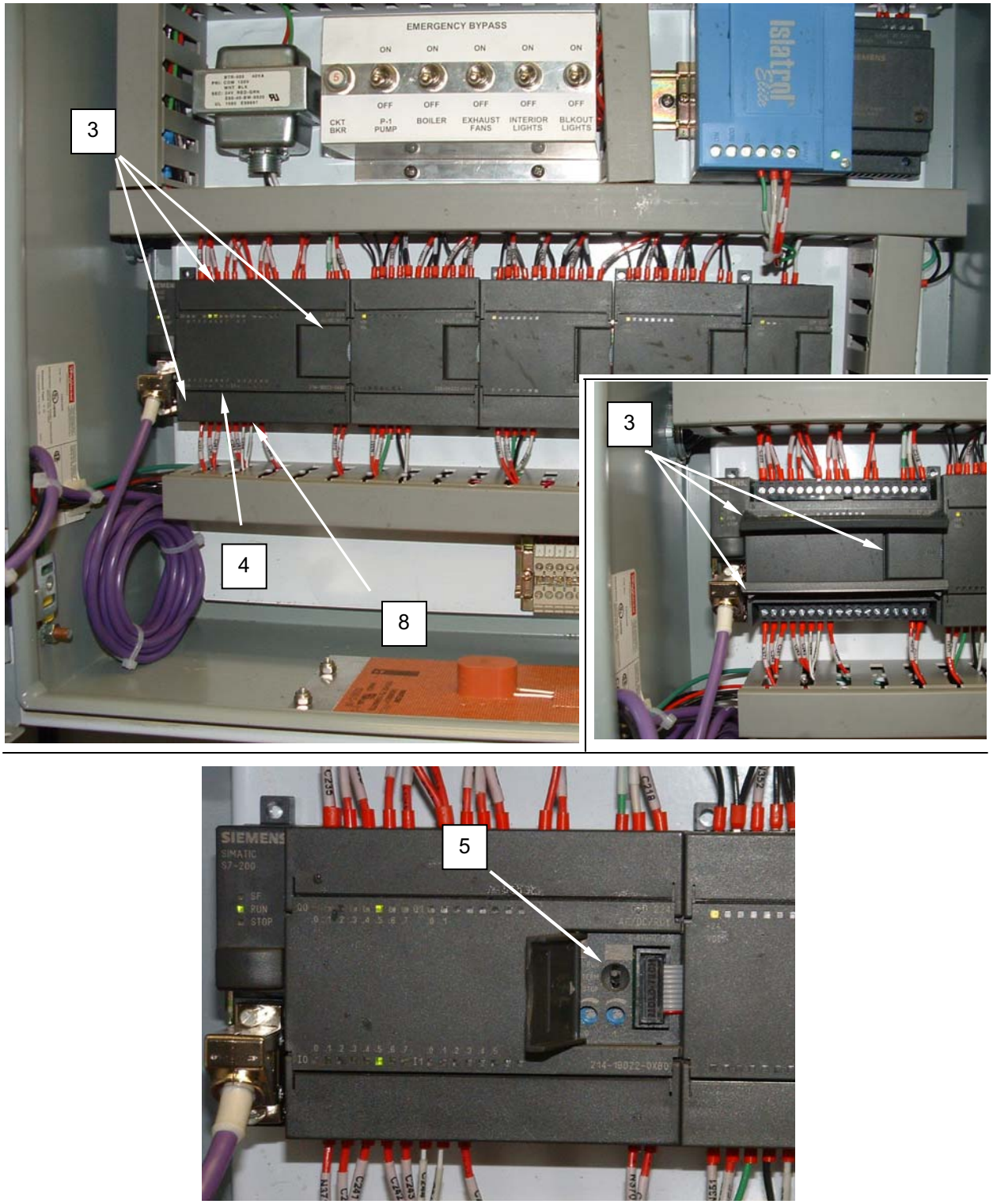


Figure 4. Replace PLC Controller.

REPLACE-CONTINUED

Replace DC Power Supply

WARNING

This equipment operates at high voltages. Use extreme caution, observe all warnings, and follow all safety procedures. Failure to observe safety precautions may result in injury or death to personnel.

1. Disconnect power by switching circuit breaker No. 8 to OFF.
2. Open PLC enclosure.
3. Loosen the screw retaining the clip **(Figure 5, Item 9)** and remove the clip.
4. Tag and disconnect wiring at terminals **(Figure 5, Item 10)** from DC power supply **(Figure 5, Item 11)**.
5. Remove DC power supply **(Figure 5, Item 11)** by grasping the power supply and pulling the top of the power supply out while pushing the lower part of the power supply in with the heel of your hand.
6. Install replacement DC power supply **(Figure 5, Item 11)** by engaging the lower part of the power supply first, and then applying pressure to the top with your hand.
7. Install the clip **(Figure 5, Item 9)** and retain with screw.
8. Connect wiring to replacement DC power supply **(Figure 5, Item 11)** as tagged.
9. Close PLC enclosure.
10. Connect power and monitor for normal operation.

REPLACE-CONTINUED

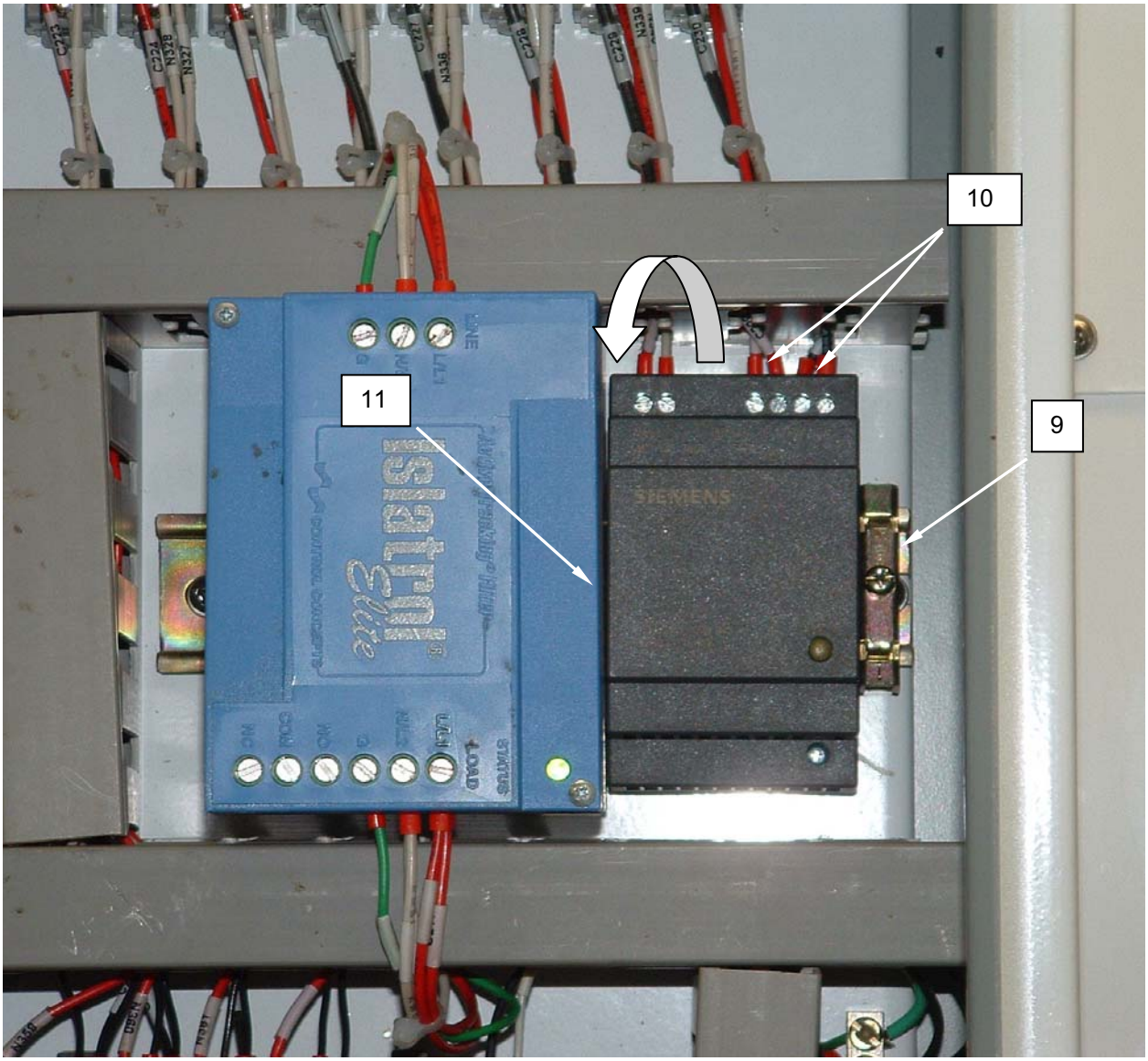


Figure 5. Replace DC Power Supply.

REPLACE-CONTINUED

Replace Surge Arrestor

WARNING

This equipment operates at high voltages. Use extreme caution, observe all warnings, and follow all safety procedures. Failure to observe safety precautions may result in injury or death to personnel.

1. Disconnect power by switching circuit breaker No. 8 to OFF.
2. Open PLC enclosure.
3. Loosen the screw retaining the clip **(Figure 6, Item 9)** and remove the clip.
4. Tag and disconnect wiring from surge arrestor **(Figure 6, Item 12)**.
5. Remove surge arrestor **(Figure 6, Item 12)** by grasping the surge arrestor and pulling the top of the surge arrestor out while pushing the lower part of the surge arrestor in with the heel of your hand.
6. Install replacement surge arrestor **(Figure 6, Item 12)** by engaging the lower part of the surge arrestor first, and then applying pressure to the top with your hand.
7. Connect wiring to replacement surge arrestor **(Figure 6, Item 12)** as tagged.
8. Install the clip **(Figure 6, Item 9)** and retain with screw.
9. Close PLC enclosure.
10. Connect power and monitor for normal operation.

REPLACE-CONTINUED

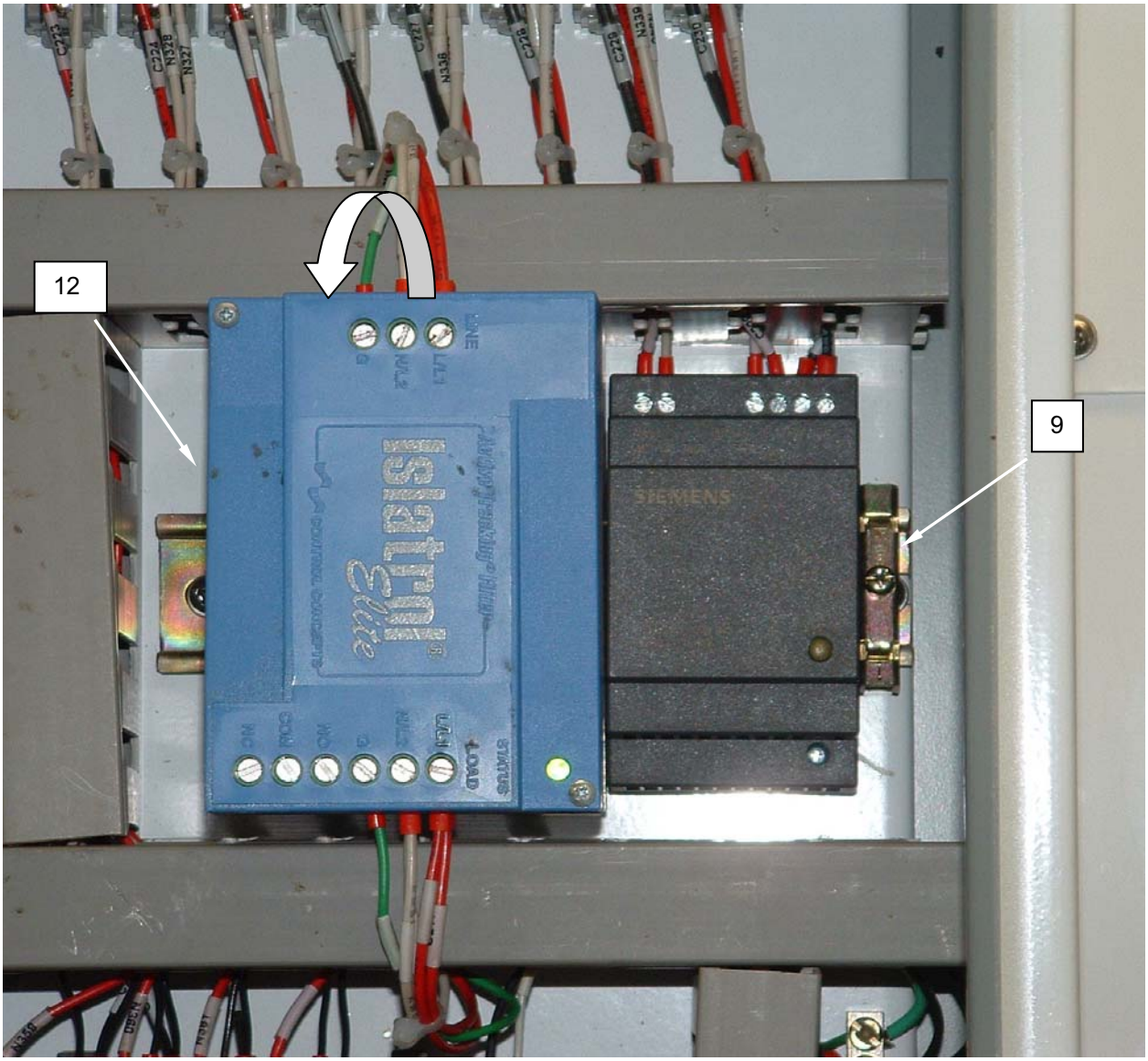


Figure 6. Replace Surge Arrestor.

REPLACE-CONTINUED

Replace Human Machine Interface (HMI)

WARNING

This equipment operates at high voltages. Use extreme caution, observe all warnings, and follow all safety procedures. Failure to observe safety precautions may result in injury or death to personnel.

1. Disconnect power by switching circuit breaker No. 8 to OFF.
2. Open PLC enclosure.
3. Tag and disconnect wiring from HMI **(Figure 7, Item 13)**.
4. Remove screws retaining HMI **(Figure 7, Item 13)** and remove HMI.
5. Install replacement HMI **(Figure 7, Item 13)** and retain with screws.
6. Set DIP switches **(Figure 7, Item 5)** on DP/MPI setting.
7. Connect wiring as tagged.
8. Close PLC enclosure, then connect power and monitor for normal operation.

Figure 7. Replace Human Machine Interface (HMI).

REPLACE-CONTINUED

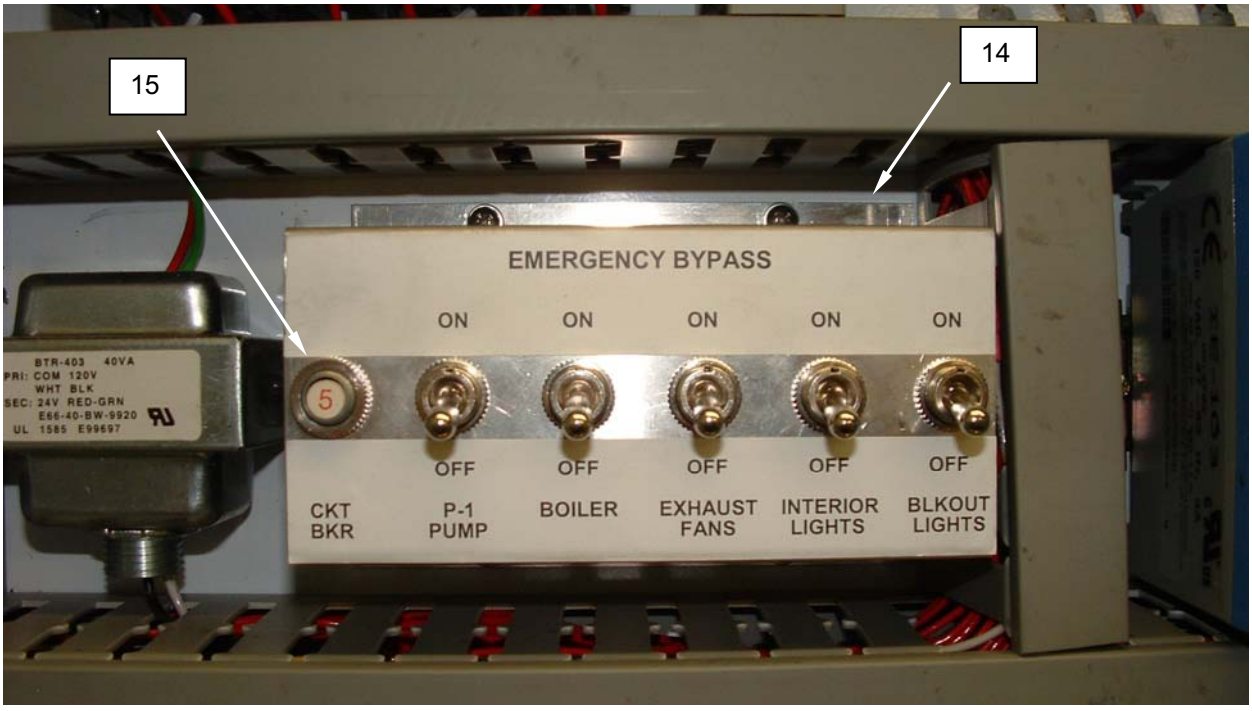
Replace Control Circuit Breaker

WARNING

This equipment operates at high voltages. Use extreme caution, observe all warnings, and follow all safety procedures. Failure to observe safety precautions may result in injury or death to personnel.

1. Disconnect power by switching circuit breaker No. 8 to OFF.
2. Open PLC enclosure.
3. Remove the screws retaining the bypass switch assembly **(Figure 8, Item 14)** and pull the bypass switch assembly from the enclosure.
4. Tag and disconnect the wiring from the circuit breaker **(Figure 8, Item 15)**.
5. Remove the locknut retaining the circuit breaker **(Figure 8, Item 15)** to the bypass switch assembly **(Figure 8, Item 1)** and remove the circuit breaker.
6. Install the replacement circuit breaker **(Figure 8, Item 15)** into the bypass switch assembly **(Figure 8, Item 14)** and retain with locknut.
7. Connect the wiring to the replacement circuit breaker **(Figure 8, Item 15)** as tagged.
8. Install the bypass switch assembly **(Figure 8, Item 14)** into the PLC enclosure and retain with screws.
9. Close the PLC enclosure, connect power, and monitor for normal operation.

REPLACE-CONTINUED



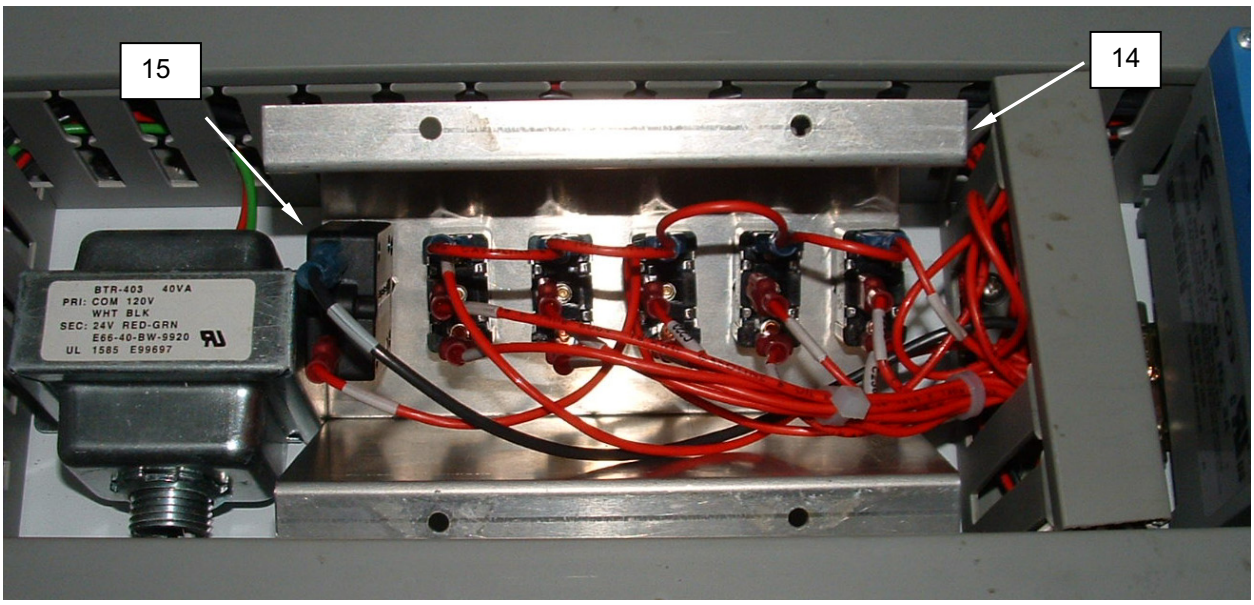


Figure 8. Replace Control Circuit Breaker.

REPLACE-CONTINUED

Replace the Control Transformer

WARNING

This equipment operates at high voltages. Use extreme caution, observe all warnings, and follow all safety procedures. Failure to observe safety precautions may result in injury or death to personnel.

1. Disconnect power by switching circuit breaker No. 8 to OFF.
2. Open the PLC enclosure.
3. Remove the fasteners retaining the transformer **(Figure 9, Item 16)** to the PLC enclosure, and remove the transformer.

NOTE

It may be easier to cut the wiring from the transformer and splice the wiring from the replacement transformer.

4. Locate the termination of the wiring from the transformer **(Figure 9, Item 16)**, and tag and disconnect the wiring from the transformer.
5. Connect the replacement transformer **(Figure 9, Item 16)** wiring as tagged.
6. Install the replacement transformer **(Figure 9, Item 16)**, and retain in place with fasteners in the PLC enclosure.
7. Close the PLC enclosure, connect power, and monitor for normal operation.

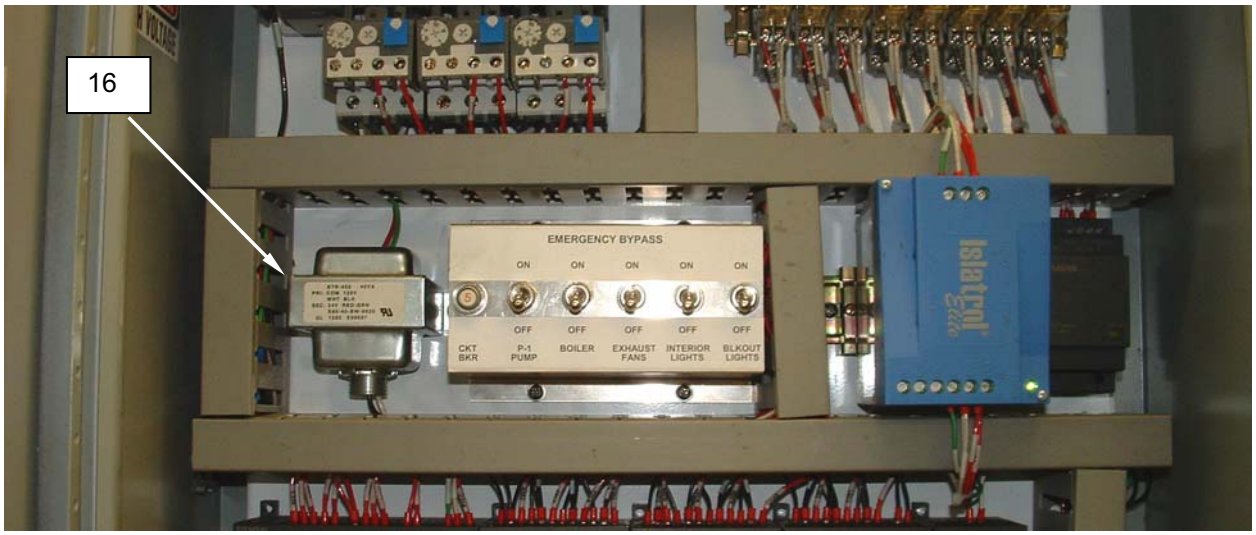


Figure 9. Replace the Control Transformer.

REPLACE-CONTINUED

Replace the Contactors

WARNING

This equipment operates at high voltages. Use extreme caution, observe all warnings, and follow all safety procedures. Failure to observe safety precautions may result in injury or death to personnel.

1. Disconnect power by switching the main circuit breaker to OFF.
2. Open the PLC enclosure.
3. Tag and disconnect wiring from the contactor **(Figure 10, Item 17)**.
4. Remove the screws retaining the contactor **(Figure 10, Item 17)** to the PLC enclosure, and remove the contactor.
5. Install the replacement contactor **(Figure 10, Item 17)** and retain with screws.
6. Connect wiring as tagged.
7. Close the PLC enclosure, connect power, and monitor for normal operation.

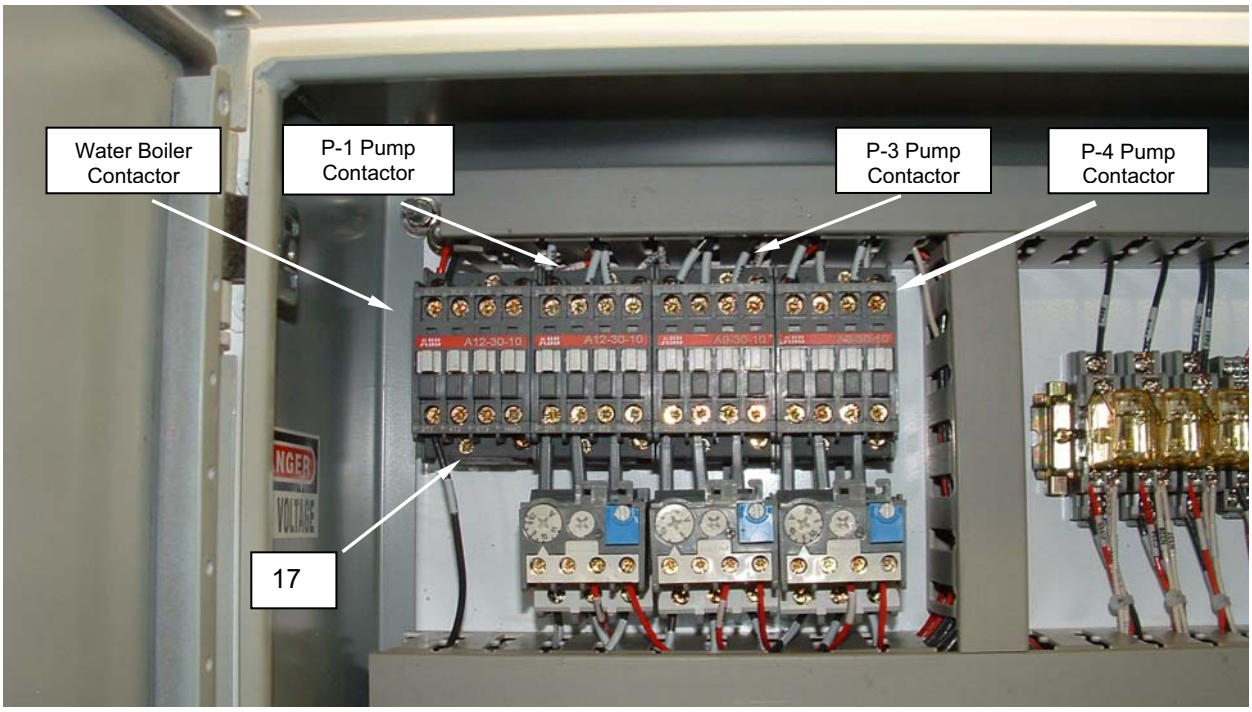


Figure 10. Replace a Contactor.

REPLACE-CONTINUED

Replace an Overload Relay

WARNING

This equipment operates at high voltages. Use extreme caution, observe all warnings, and follow all safety procedures. Failure to observe safety precautions may result in injury or death to personnel.

1. Disconnect power by switching the main circuit breaker to OFF.
2. Open the PLC enclosure.
3. Tag and disconnect wiring from the overload relay **(Figure 11, Item 18)**.
4. Remove the screws retaining the overload relay **(Figure 11, Item 18)** to the PLC enclosure, and remove the overload relay.
5. Install the replacement overload relay **(Figure 11, Item 18)** and retain with screws.
6. Connect wiring as tagged.

NOTE

The replacement overload relay **(Figure 11, Item 18)** must be set for the correct value. The overload relay for the P-1 pump should be set at 9.8 A at the adjustment dial **(Figure 11, Item 19)**. The overload relay for the P-3 pump should be set at 4.8 A, and the overload relay for the P-1 pump should be set at 5.0 A.

7. Close the PLC enclosure, connect power, and monitor for normal operation.

REPLACE-CONTINUED

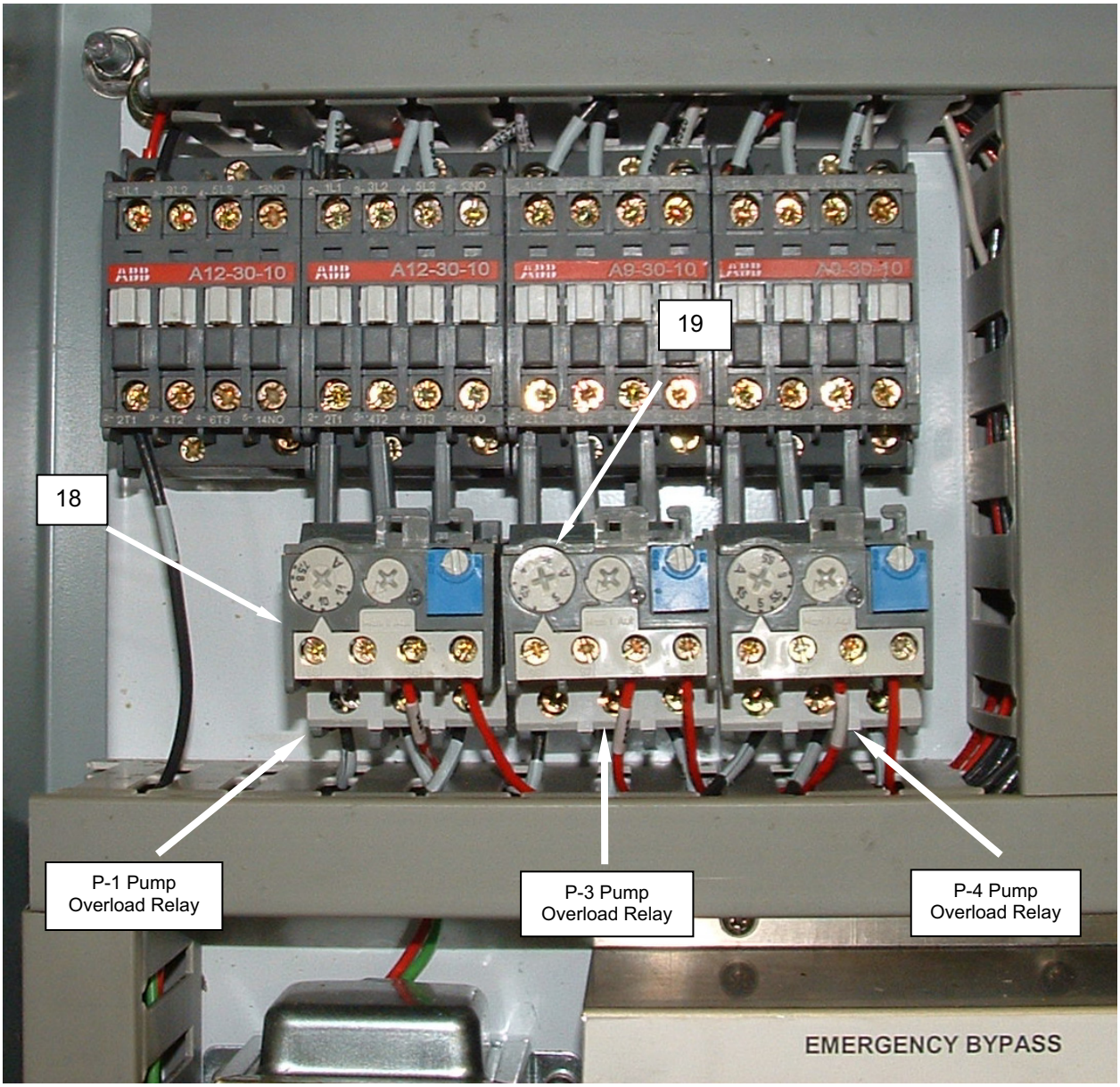


Figure 11. Replace an Overload Relay.

REPLACE-CONTINUED

Replace Control Relay

WARNING

This equipment operates at high voltages. Use extreme caution, observe all warnings, and follow all safety procedures. Failure to observe safety precautions may result in injury or death to personnel.

1. Disconnect power by switching the main circuit breaker to OFF.
2. Open PLC enclosure.
3. Locate and remove control relay **(Figure 12, Item 20)**.

CAUTION

While the control relays all look identical, they are not all interchangeable. The exhaust fan relay, interior lights relay, and blackout lights relay are identical, and the same replacement relay may be used for all three. The remaining relays are interchangeable, as well.

4. Install replacement control relay **(Figure 12, Item 20)**. Ensure the replacement relay is firmly seated and securely retained in place by the clamp.
5. Close enclosure, connect power, and operate PLC.
6. Monitor for normal operation.

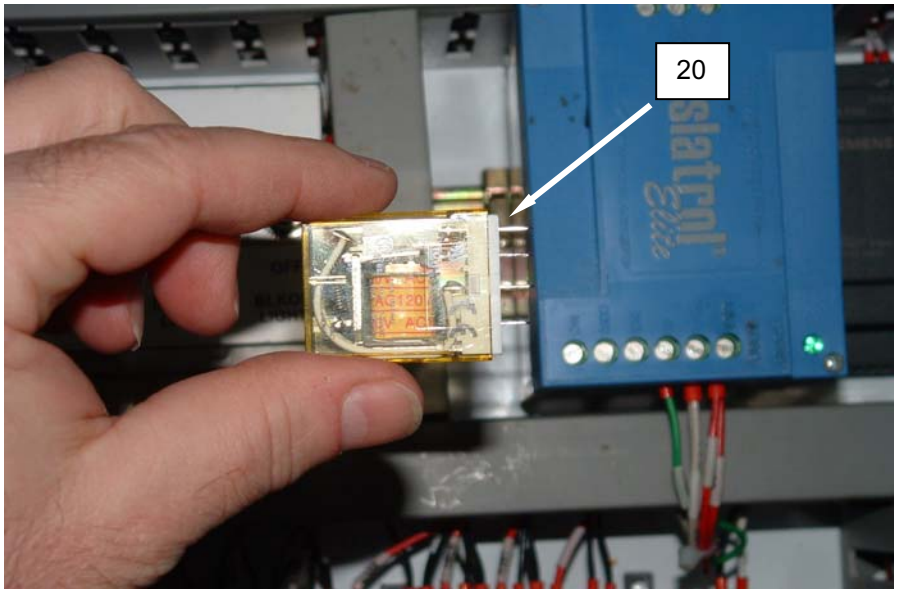


Figure 12. Replace a Control Relay.

REPLACE-CONTINUED

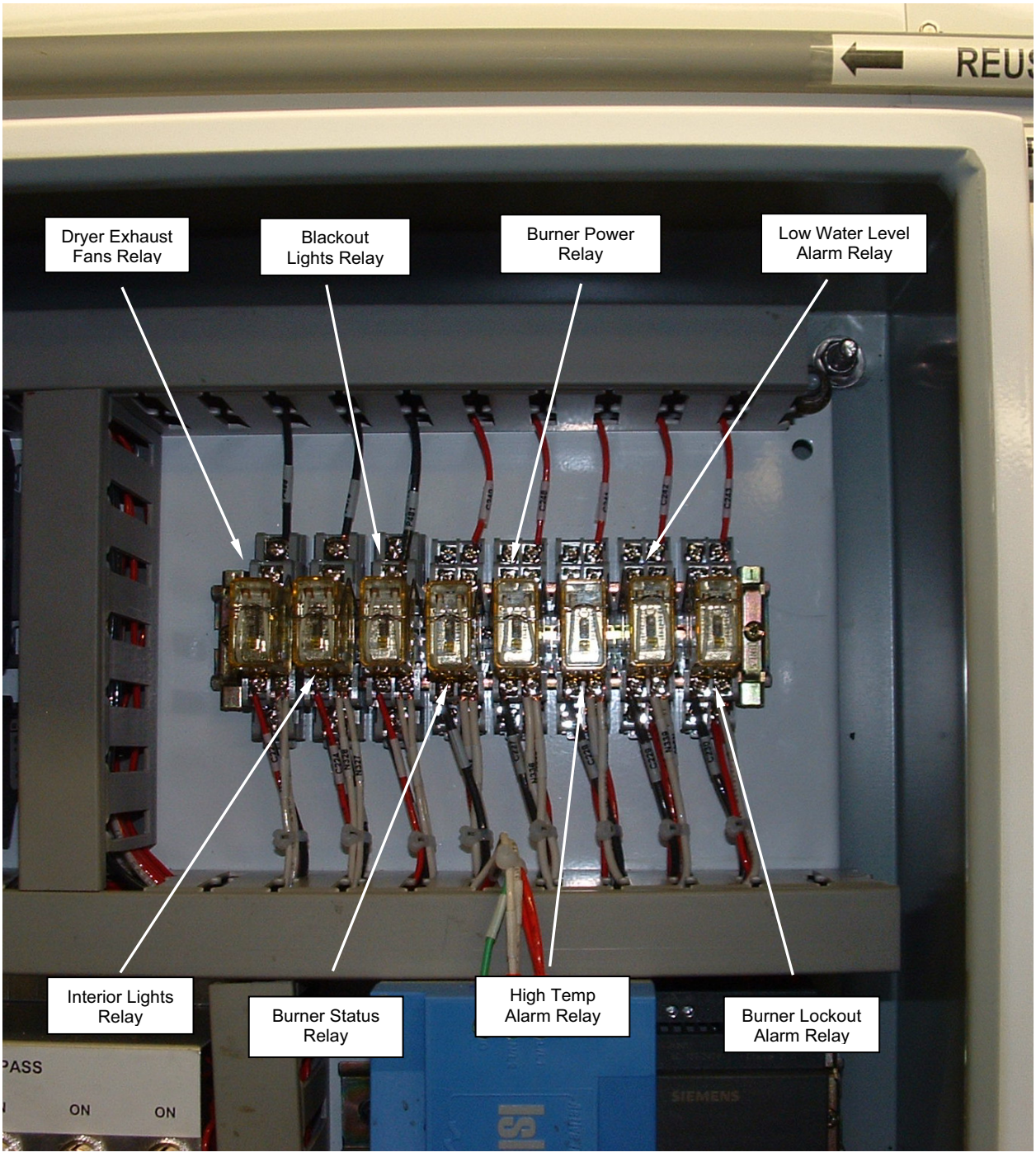


Figure 13. Replace a Control Relay.

REPLACE-CONTINUED

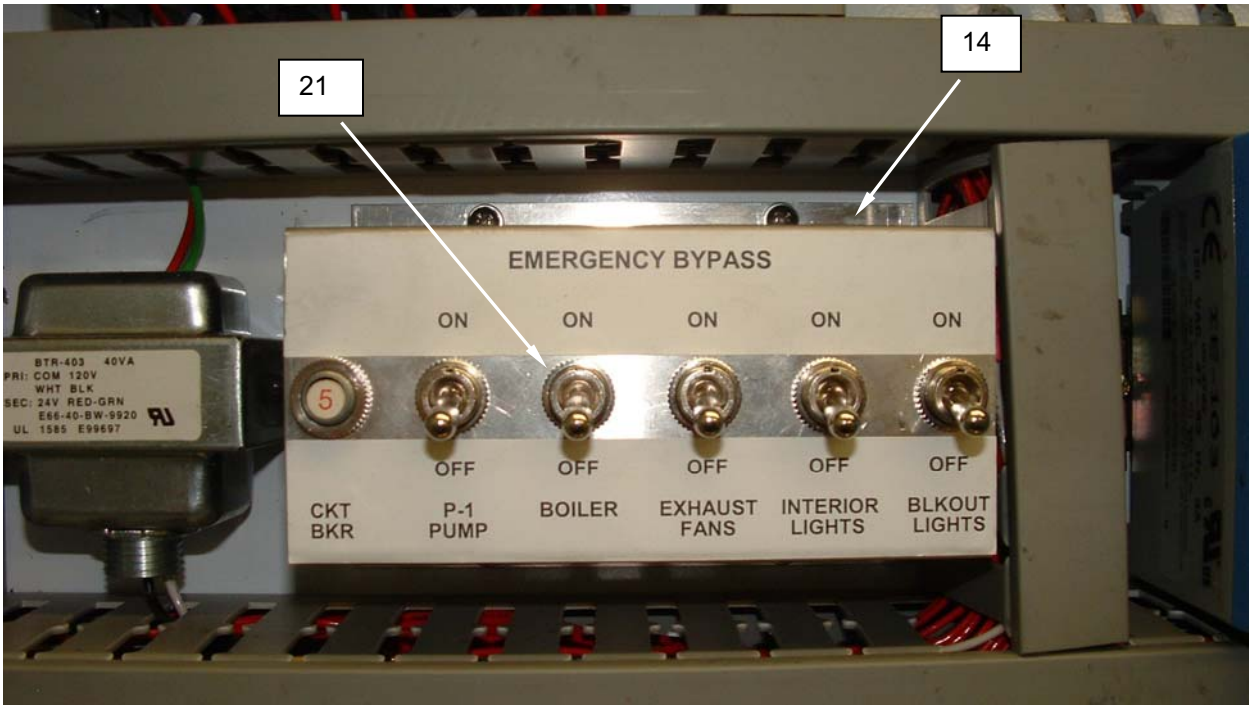
Replace the Bypass Switches

WARNING

This equipment operates at high voltages. Use extreme caution, observe all warnings, and follow all safety procedures. Failure to observe safety precautions may result in injury or death to personnel.

1. Disconnect power by switching circuit breaker No. 8 to OFF.
2. Open PLC enclosure.
3. Remove the screws retaining the bypass switch assembly **(Figure 14, Item 14)** and pull the bypass switch assembly from the enclosure.
4. Tag and disconnect the wiring from the switch **(Figure 14, Item 21)** being replaced.
5. Remove the locknut retaining the switch **(Figure 14, Item 21)** to the bypass switch assembly **(Figure 14, Item 14)** and remove the switch.
6. Install the replacement switch **(Figure 14, Item 21)** into the bypass switch assembly **(Figure 14, Item 14)** and retain with locknut.
7. Connect the wiring to the replacement switch **(Figure 14, Item 21)** as tagged.
8. Install the bypass switch assembly **(Figure 14, Item 14)** into the PLC enclosure and retain with screws.
9. Close the PLC enclosure, connect power, and monitor for normal operation.

REPLACE-CONTINUED



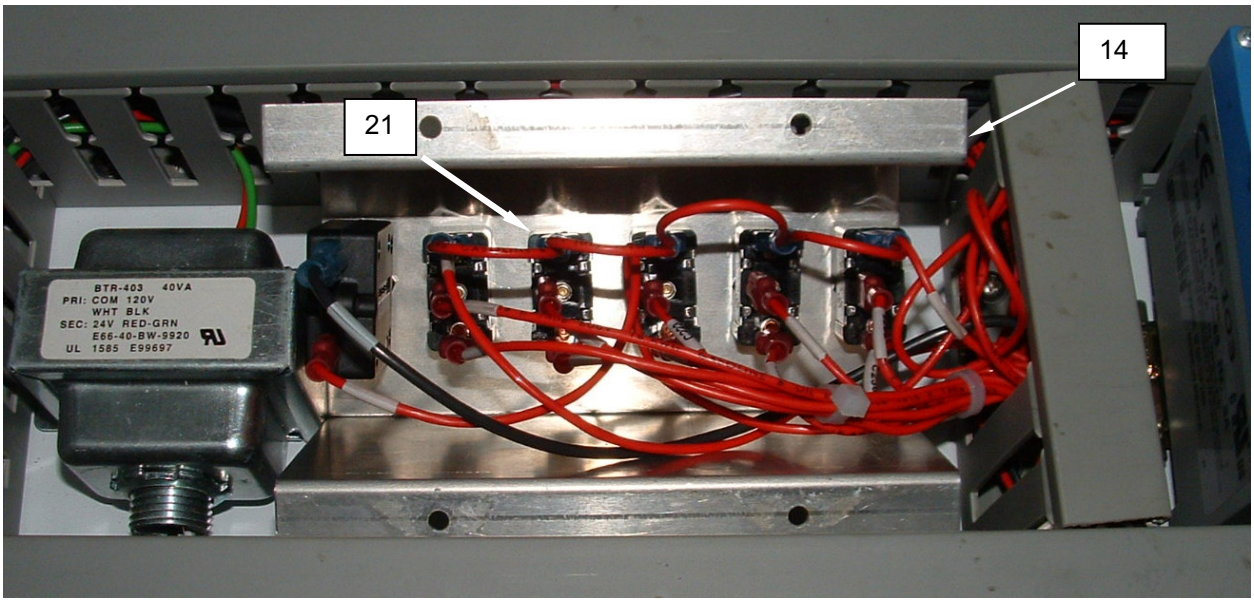


Figure 14. Replace the Bypass Switches.

REPLACE-CONTINUED

Replace the Emergency Stop

WARNING

This equipment operates at high voltages. Use extreme caution, observe all warnings, and follow all safety procedures. Failure to observe safety precautions may result in injury or death to personnel.

1. Disconnect power by switching the main circuit breaker to OFF.
2. Open PLC enclosure.
3. Tag and disconnect wiring from switch **(Figure 15, Item 21)**.
4. Rotate switch retainer **(Figure 15, Item 22)** to the left and remove switch **(Figure 15, Item 21)**.
5. Install replacement switch **(Figure 15, Item 21)**, and secure with retainer by sliding it slightly to the right **(Figure 15, Item 22)**.
6. Connect wiring as tagged.
7. Close PLC enclosure, then connect power and monitor for normal operation.

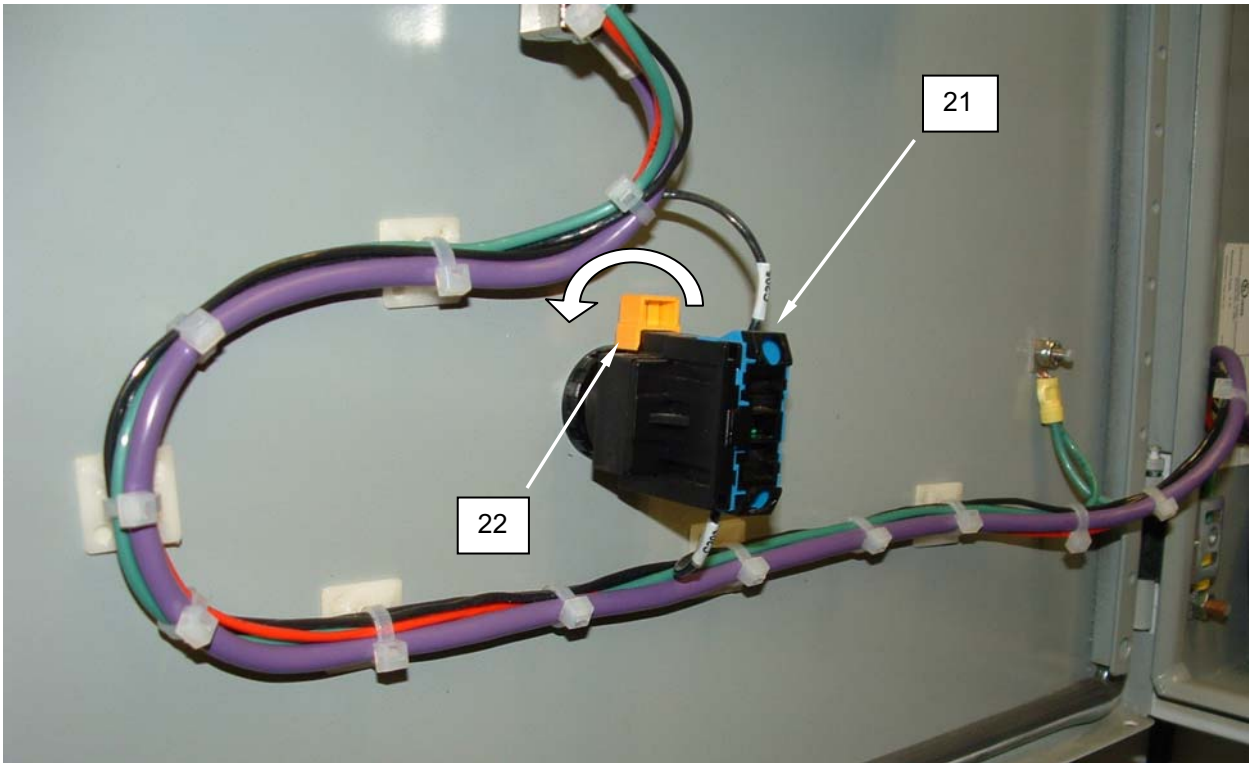


Figure 15. Replace the Emergency Stop.

REPLACE-CONTINUED

Replace the Electric Box Heater

WARNING

This equipment operates at high voltages. Use extreme caution, observe all warnings, and follow all safety procedures. Failure to observe safety precautions may result in injury or death to personnel.

1. Disconnect power by switching circuit breaker No. 8 to OFF.
2. Open PLC enclosure.

NOTE

The heater wiring may be cut and spliced.

3. Tag and disconnect wiring from heater **(Figure 16, Item 23)**.
4. Remove fasteners retaining heater **(Figure 16, Item 23)**, and remove heater.
5. Install replacement heater **(Figure 16, Item 23)** and retain with fasteners.
6. Connect wiring to replacement heater **(Figure 16, Item 23)** as tagged.
7. Close enclosure, connect power, and operate PLC.
8. Monitor for normal operation.

REPLACE-CONTINUED

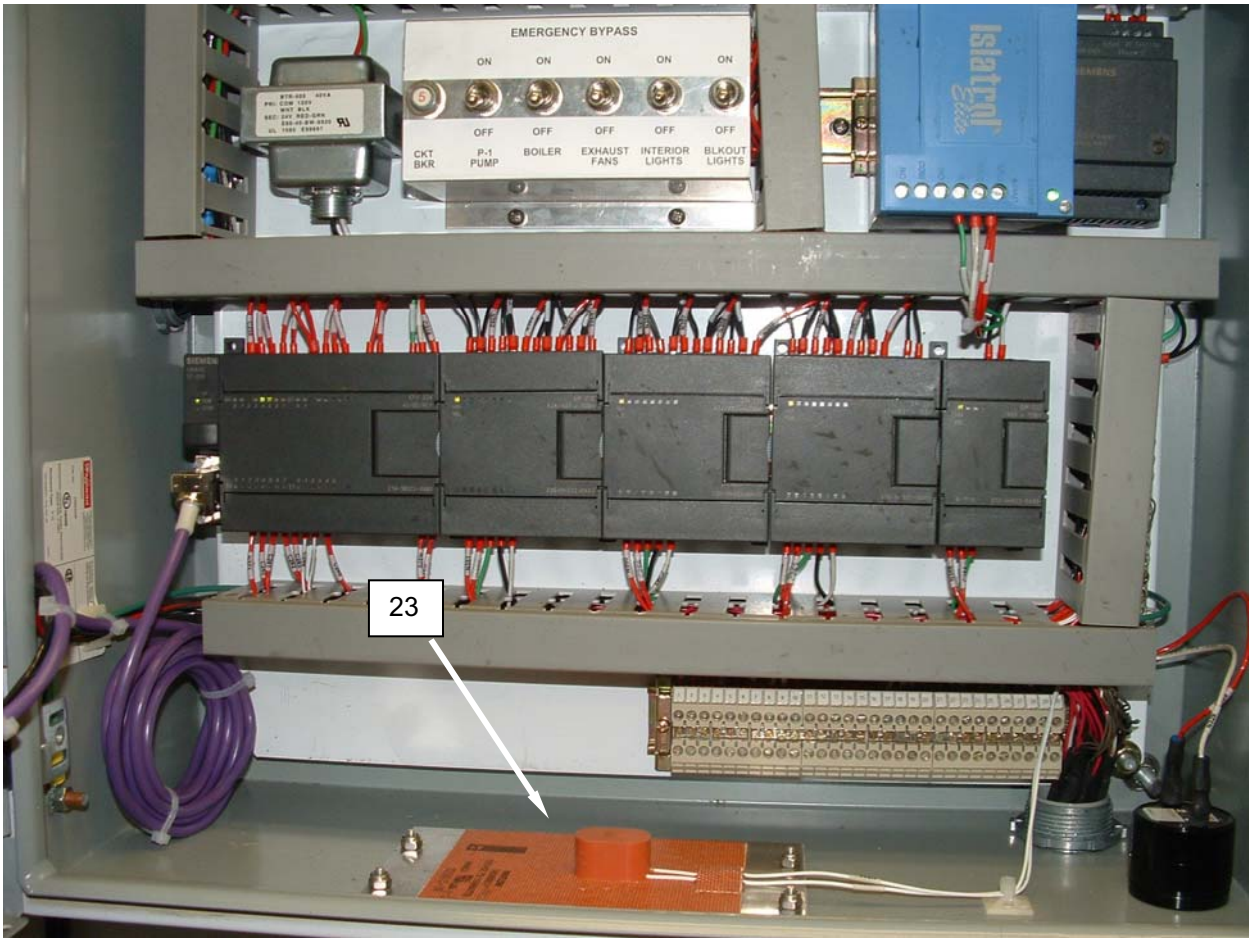


Figure 16. Replace the Electric Box Heater.

END OF WORK PACKAGE

UNIT MAINTENANCE
CONTAINERIZED BATCH LAUNDRY
NSN 3510-01-527-2209
NSN 3510-01-527-2210
FLOW TRANSMITTER
REPLACE

INITIAL SETUP

Tools	**Personnel Required**
Tool Kit, General Mechanics: Automotive (WP 0086 00, Table 2, Item 6)	Quartermaster and Chemical Equipment Repairer 63J (1)
Materials/Parts	**Equipment Condition**
Compound, Sealer Pipe (WP 0087 00, Item 12)	CBL Water Treatment system isolated.

REPLACE

Replace Flow Transmitters

NOTE

The CBL may be operated in minimum reuse or no reuse mode if necessary when performing this maintenance task.

NOTE

The flow transmitter is monitored by the PLC. A failure of this component will be signaled by an alarm and a message at the PLC.

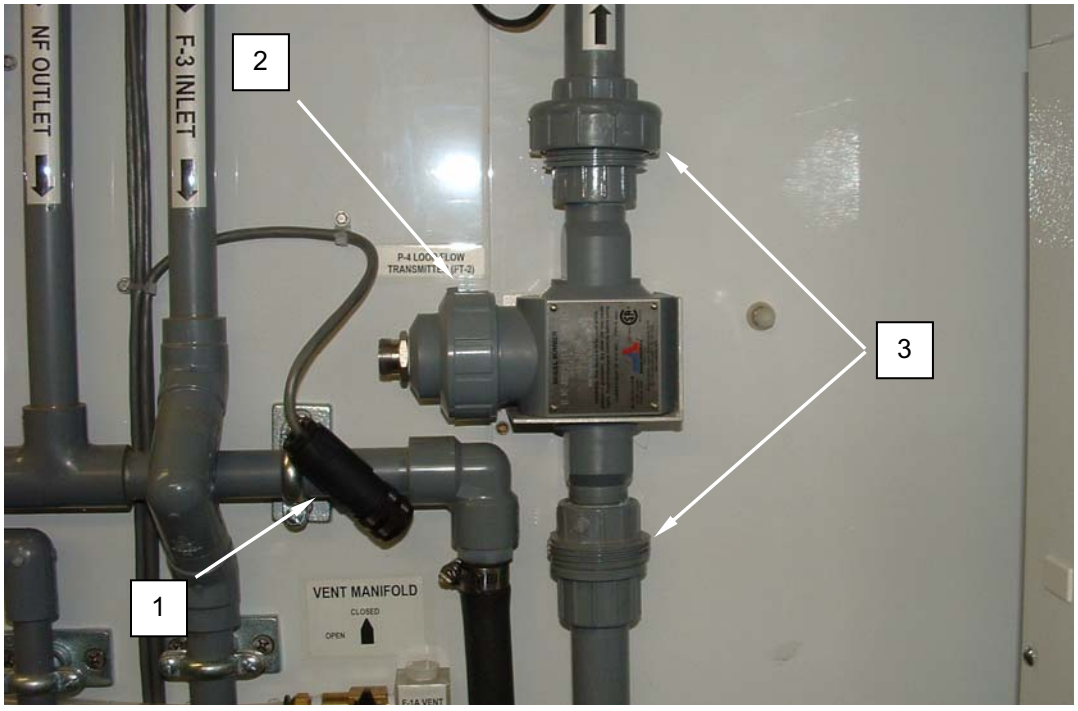
1. Disconnect power by switching circuit breaker No. 8 to OFF.
2. Drain system.
3. Unscrew and disconnect the electrical quick disconnect **(Figure 1, Item 1)** from the flow transmitter **(Figure 1, Item 2)**.

NOTE

It may be necessary to loosen associated plumbing components to allow sufficient free play to remove the transmitter.

4. Make note of the direction of flow, unscrew the unions **(Figure 1, Item 3)**, and remove the transmitter **(Figure 1, Item 2)**.
5. Unscrew the union halves **(Figure 1, Item 3)** from the transmitter **(Figure 1, Item 2)**.
6. Apply pipe sealer compound to the male threads of the transmitter **(Figure 1, Item 2)**, and screw the union halves **(Figure 1, Item 3)** onto the transmitter **(Figure 1, Item 2)**.
7. Install the transmitter **(Figure 1, Item 2)** into the mount, and connect unions **(Figure 1, Item 3)**. Ensure unions are tight, but do not overtighten.
8. Connect electrical quick disconnect **(Figure 1, Item 1)**.
9. Connect power, and monitor for normal operation.

REPLACE-CONTINUED



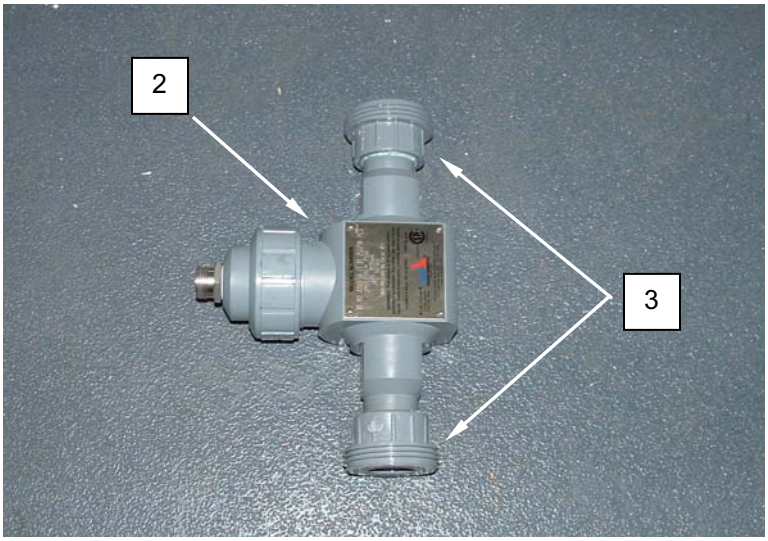


Figure 1. Replace a Flow Transmitter.

END OF WORK PACKAGE

UNIT MAINTENANCE
CONTAINERIZED BATCH LAUNDRY
NSN 3510-01-527-2209
NSN 3510-01-527-2210
PRESSURE TRANSMITTER
REPLACE

INITIAL SETUP

Tools	**Personnel Required**
Tool Kit, General Mechanics: Automotive (WP 0086 00, Table 2, Item 6)	Quartermaster and Chemical Equipment Repairer 63J (1)
Materials/Parts	**Equipment Condition**
Tape, Antiseize, ½-in wide X 260-in. long (WP 0087 00, Item 51)	CBL shutdown

REPLACE

Replace Pressure Transmitter

NOTE

The CBL may be operated in minimum reuse or no reuse mode if necessary when performing this maintenance task.

NOTE

The seven pressure transmitters are monitored by the PLC. A failure of this component will be signaled by an alarm and a message at the PLC.

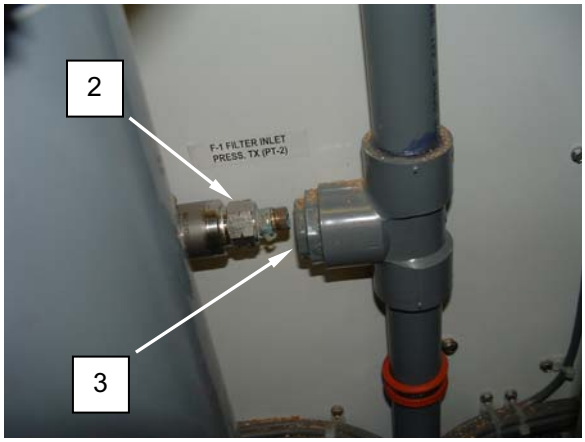
1. Drain system.
2. Disconnect power.

NOTE

Some transmitters may require removal of pipe clamps to provide clearance.

3. Loosen retaining screw and remove the electrical plug **(Figure 1, Item 1)** from the pressure transmitter **(Figure 1, Item 2)**.
4. Unscrew pressure transmitter **(Figure 1, Item 2)** from PVC bushing **(Figure 1, Item 3)**.
5. Apply antisieze tape to threads of replacement transmitter **(Figure 1, Item 2)**.
6. Screw replacement transmitter **(Figure 1, Item 2)** into PVC bushing **(Figure 1, Item 3)**.
7. Connect electrical plug **(Figure 1, Item 1)** and retain with screw.
8. Connect power, and monitor for normal operation.

REPLACE-CONTINUED



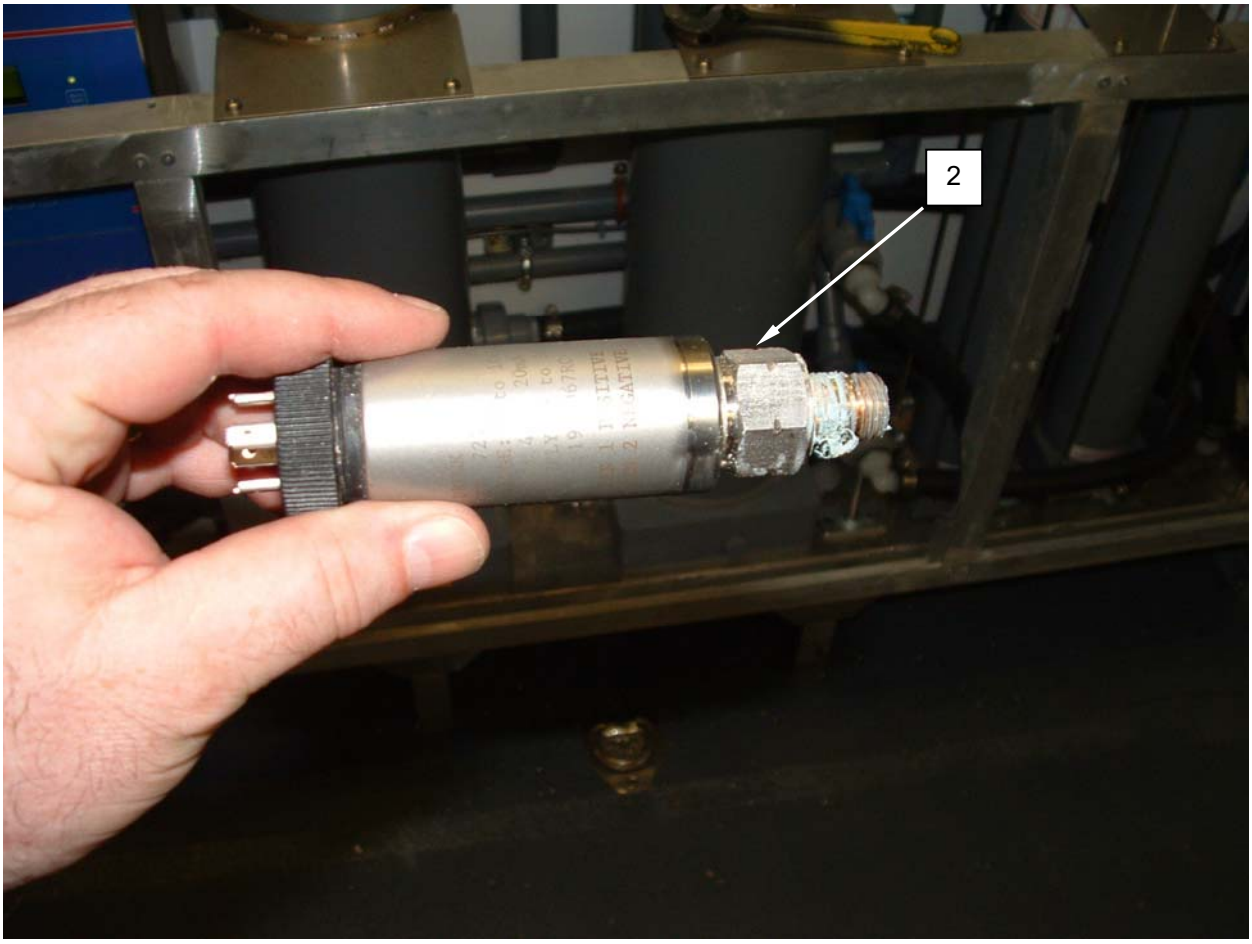


Figure 1. Replace a Pressure Transmitter.

END OF WORK PACKAGE

UNIT MAINTENANCE
CONTAINERIZED BATCH LAUNDRY
NSN 3510-01-527-2209
NSN 3510-01-527-2210
WATER REUSE ACTUATOR VALVES
TEST, REPLACE

INITIAL SETUP

Tools
Tool Kit, General Mechanics: Automotive (WP 0086 00, Table 2, Item 6)

Materials/Parts
Compound, Sealer Pipe (WP 0087 00, Item 12)
Tape, Anti-seize, 1/2 in. Wide X 260 in. Long (WP 0087 00, Item 51)

Personnel Required
Quartermaster and Chemical Equipment Repairer 63J (1)

Equipment Condition
CBL set up

References
TM 10-3510-226-10
WP 0025 00, WP 0004 00

TEST

Test Actuator

WARNING

Ensure that all electrical power is shut off and disconnected before proceeding. The circuit breaker box or individual circuit breaker should be locked and tagged out by personnel following this procedure. Remember that the CBL is a wet environment. Serious injury or death to personnel can result from electrocution if proper safety precautions are not observed.

1. Depress the release button **(Figure 1, Item 1)**, and manually set the suspected actuator **(Figure 1, Item 2)** to the fully closed or fully open position as indicator by the position indicator/handle **(Figure 1, Item 3)**. If unsure, all actuators may be set.

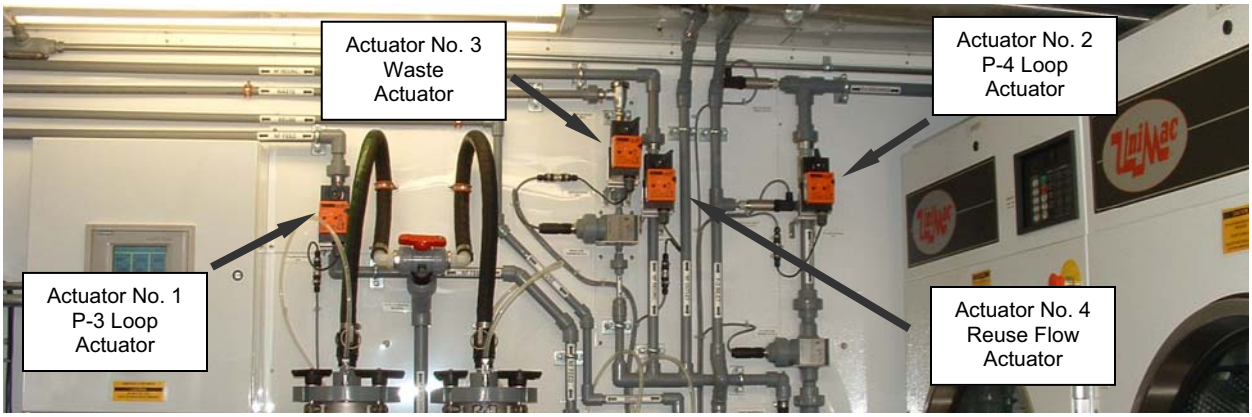
2. Operate the Water Treatment System in full reuse mode IAW procedures given in TM 10-3510-226-10, and monitor the operation of the actuators. If an actuator fails to automatically adjust to an operating position (approximately midrange on the position indicator/handle), refer to Table 1 and determine if controlling components may be inoperative IAW WP 0025 00.

Table 1. Controlling Components.

Actuator	Check
Actuator No. 1 (P-3 Loop Actuator)	Analog Output Module No. 4
Actuator No. 2 (P-4 Loop Actuator)	Analog Input/Output Module No. 3
Actuator No. 3 (Waste Actuator)	Analog Input/Output Module No. 2
Actuator No. 4 (Reuse Flow Actuator)	Analog Input/Output Module No. 1

3. If the controlling components test as being operative, replace the actuator.

TEST-CONTINUED



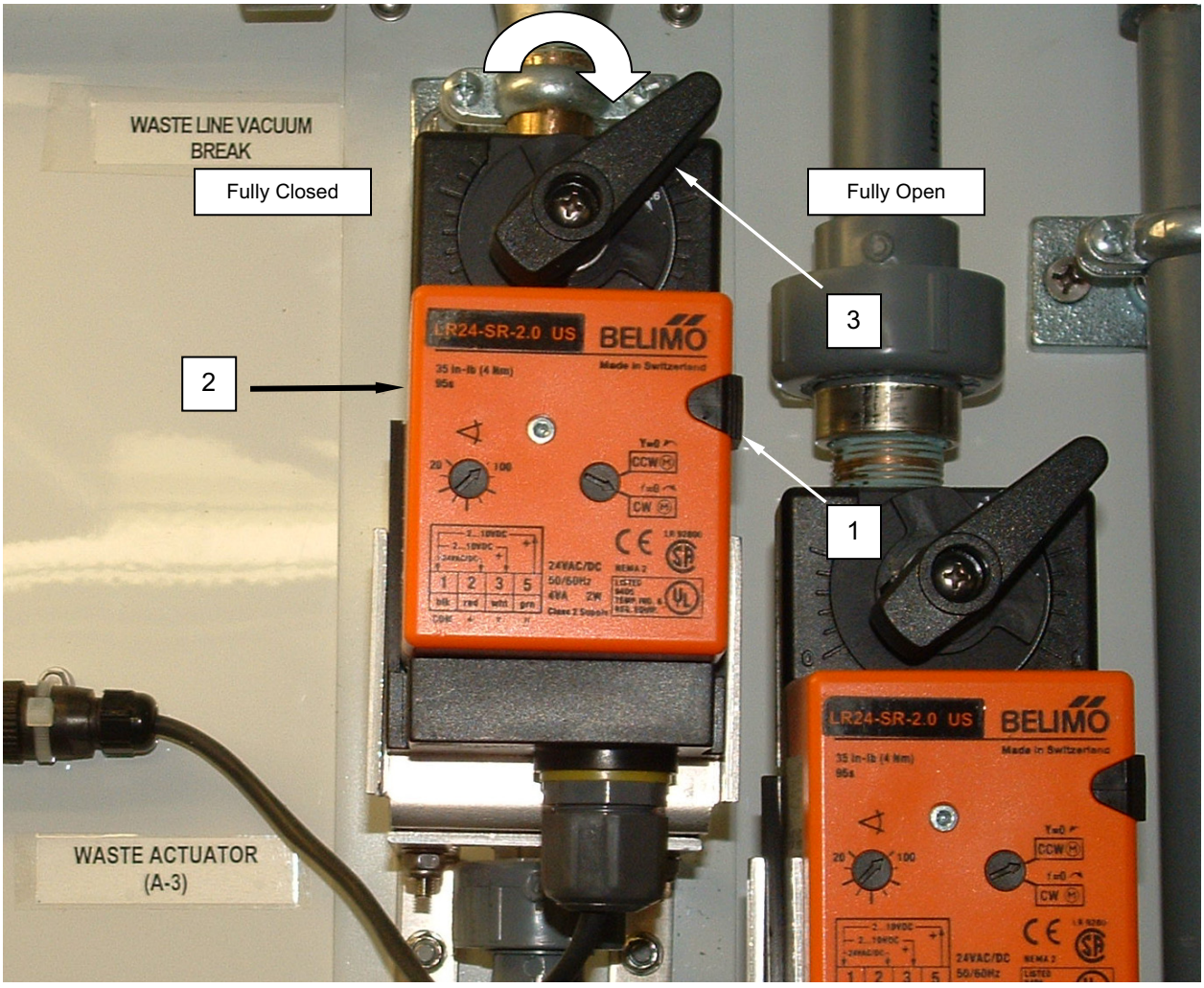


Figure 1. Test Actuator.

REPLACE

Replace Actuator Valve Assembly

WARNING

Ensure that all electrical power is shut off and disconnected before proceeding. The circuit breaker box or individual circuit breaker should be locked and tagged out by personnel following this procedure. Remember that the CBL is a wet environment. Serious injury or death to personnel can result from electrocution if proper safety precautions are not observed.

NOTE

Ensure you have the correct replacement actuator valve. While the actuator valves all look very similar, they are not interchangeable.

1. Disconnect power by switching the P-3 and P-4 circuit breakers to off.

2. Isolate the actuator valve to be replaced, and drain the system. Refer to Table 2 for information on valve settings.

NOTE

Refer to TM 10-3510-226-10 for illustrated settings of Table 2.

Table 2. Valve Settings to Isolate and Drain Actuator Valve Assemblies.

For Actuator Valve Assembly A-1	**Close Valve:**	
	V-41	
	V-42	
	Open Valve:	
	V-28	
For Actuator Valve Assembly A-2, A-3, A-4	**Close Valve:**	
	V-43	
	Open Valve:	
	V-25	V-47
	V-30	V-48
	V-31	V-50
	V-32	V-51
	V-46	V-52

3. Twist and disconnect the electrical quick disconnect **(Figure 2, Item 4)**.

4. Remove the screw retaining the position indicator/handle **(Figure 2, Item 3)**. Do not remove the position indicator/handle.

5. Remove the screws retaining the actuator bracket **(Figure 2, Item 5)** to the wall mount, and remove actuator **(Figure 2, Item 2)** and bracket as an assembly.

6. Remove the bracket **(Figure 2, Item 5)** from the actuator **(Figure 2, Item 2)** by separating the bracket from the slot in the actuator body.

REPLACE-CONTINUED

7. Unscrew the CPVC unions **(Figure 2, Item 6)** and any attached pipe from the actuator valve **(Figure 2, Item 7)**.

8. Remove the actuator identification tag **(Figure 2, Item 8)** and place it on the replacement actuator valve **(Figure 2, Item 7)**.

9. Apply anti-seize tape or pipe sealant to threads of CPVC union halves **(Figure 2, Item 6)** and screw union halves into replacement actuator valve **(Figure 2, Item 7)**.

10. Install bracket **(Figure 2, Item 5)** to replacement actuator **(Figure 2, Item 2)**.

11. Install replacement actuator **(Figure 2, Item 2)** with bracket **(Figure 2, Item 5)** as an assembly onto the wall mount, and retain in place with screws. Do not tighten.

12. Connect CPVC unions **(Figure 2, Item 6)** ensuring O-rings **(Figure 2, Item 9)** are in place. Then, tighten mounting screws.

13. Install the position indicator/handle **(Figure 2, Item 3)** screw.

14. Connect the electrical quick disconnect **(Figure 2, Item 4)**. Secure the electrical quick disconnect in place with wire ties.

15. Prepare the system for operation by setting valve IAW Table 3.

16. Operate the system IAW procedures given in TM 10-3510-226-10, and monitor for normal operation.

Table 3. Valve Settings to Isolate and Drain Actuator Valve Assemblies.

For Actuator Valve Assembly A-1	**Open Valve:**	
	V-41	
	V-42	
	Close Valve:	
	V-28	
For Actuator Valve Assembly A-2, A-3, A-4	**Open Valve:**	
	V-43	
	Close Valve:	
	V-25	V-47
	V-30	V-48
	V-31	V-50
	V-32	V-51
	V-46	V-52

REPLACE-CONTINUED

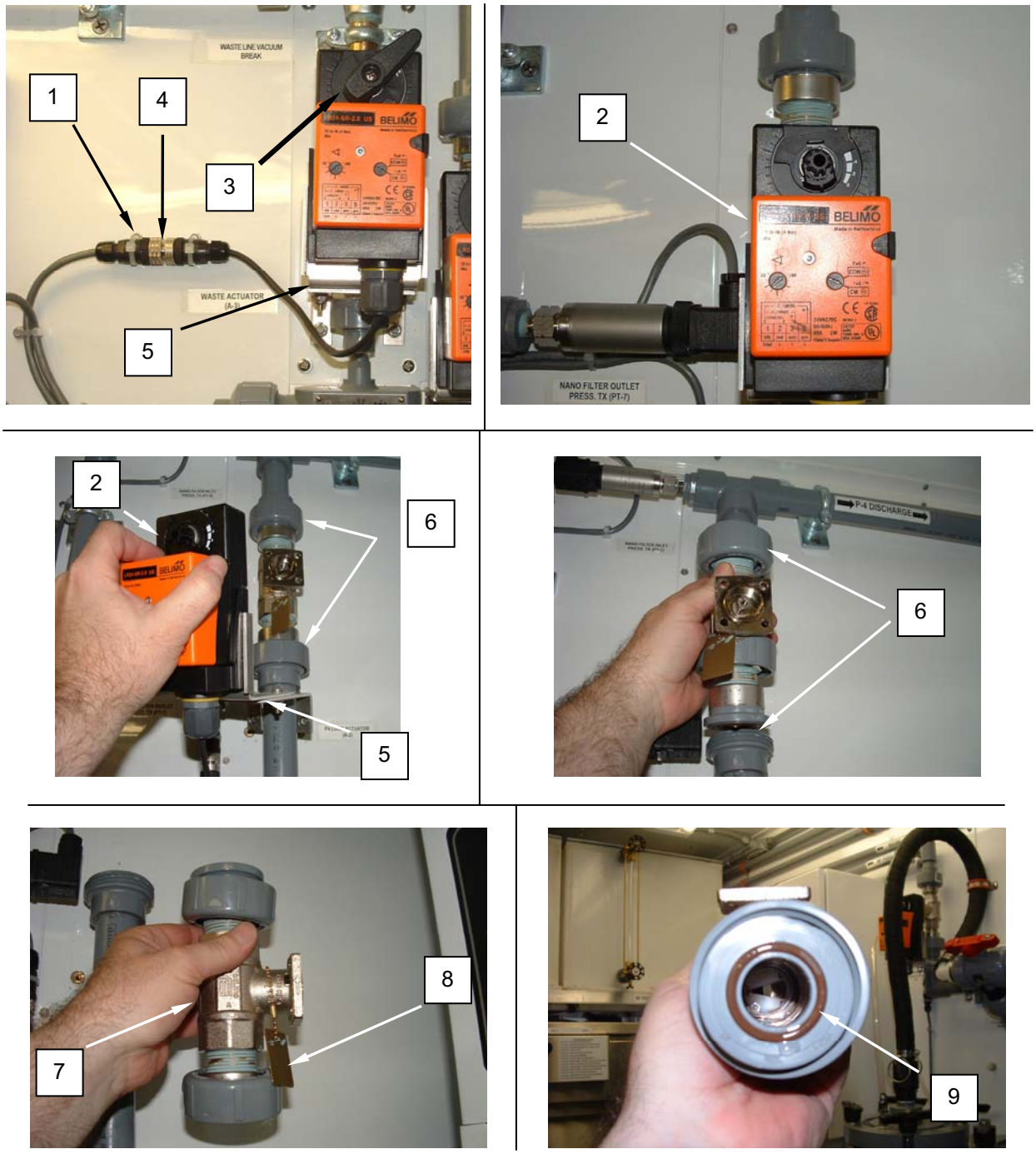


Figure 2. Replace the Actuator Valve Assembly.

END OF WORK PACKAGE

UNIT MAINTENANCE
CONTAINERIZED BATCH LAUNDRY
NSN 3510-01-527-2209
NSN 3510-01-527-2210
LEVEL SENSOR
TEST, REPLACE

INITIAL SETUP

Tools
Tool Kit, General Mechanics: Automotive (WP 0086 00, Table 2, Item 6)

Materials/Parts
Compound, Sealer Pipe (WP 0087 00, Item 12)

Personnel Required
Quartermaster and Chemical Equipment Repairer 63J (1)

Equipment Condition
CBL shutdown

References
TM 10-3510-226-10

TEST

Test the Level Sensors

1. Enter the system status menu on the PLC, and then go to digital status.

2. Locate the WTS and Nano level readings **(Figure 1, Item 1)** - there should be an ON or OFF value after "IO".

3. Run the Water Treatment System (WTS) through an initial fill (#1) or top off cycle (#30), and monitor the values for the WTS Level and Nano Level. No value change after the tank fills, or an overflow condition, indicates a failure of the level sensor. Refer to TM 10-3510-226-10 for information on performing an initial fill or top off.

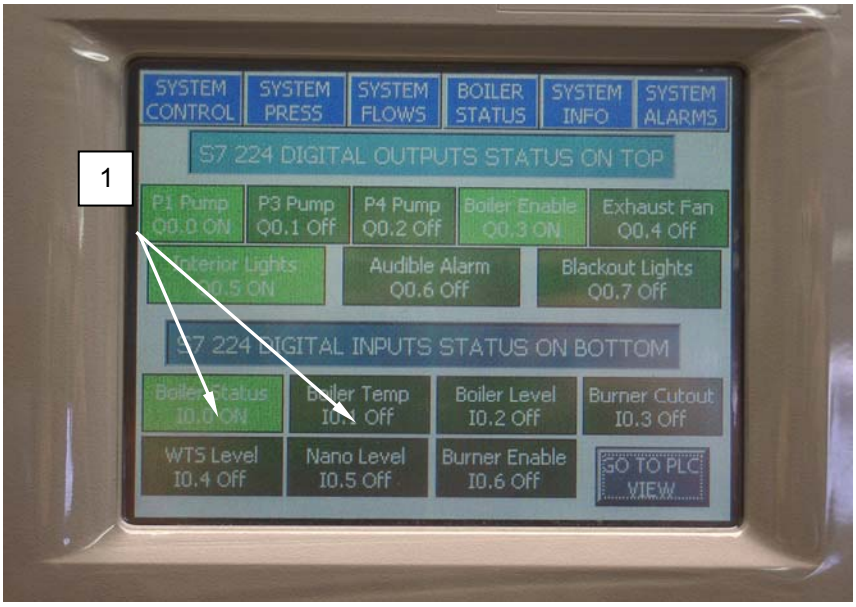


Figure 1. Test the Level Sensors.

REPLACE

Replace the Level Sensors

1. Disconnect power and drain tank.
2. Disconnect electrical quick disconnect **(Figure 2, Item 2)** from level sensor **(Figure 3, Item 3)**.
3. Remove level sensor **(Figure 3, Item 3)** from tank.
4. Disassemble electrical quick disconnect **(Figure 2, Item 3)**, and transfer wiring from the replacement level sensor **(Figure 3, Item 3)**.
5. Apply pipe sealing compound to threads of replacement level sensor **(Figure 3, Item 3)**.
6. Connect electrical quick disconnect **(Figure 2, Item 1)** to replacement level sensor **(Figure 3, Item 3)**.
7. Connect power and monitor for normal operation.

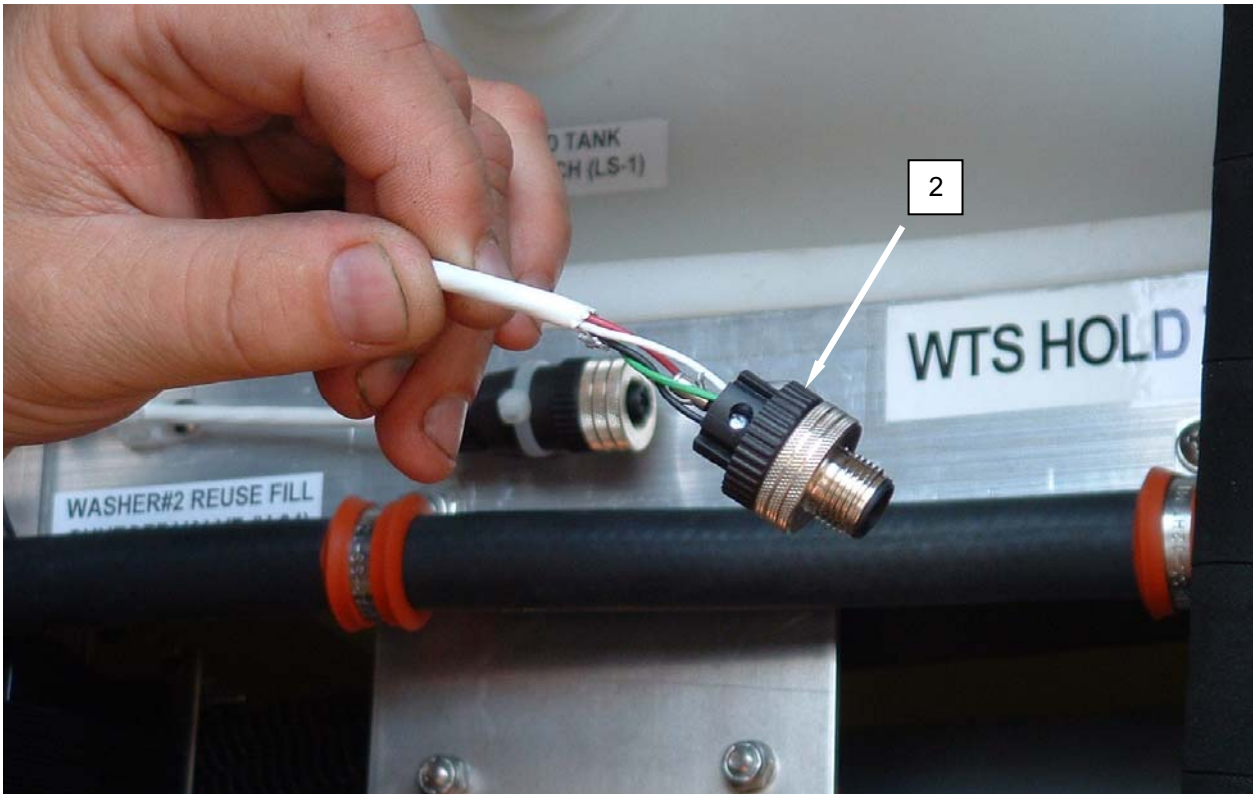
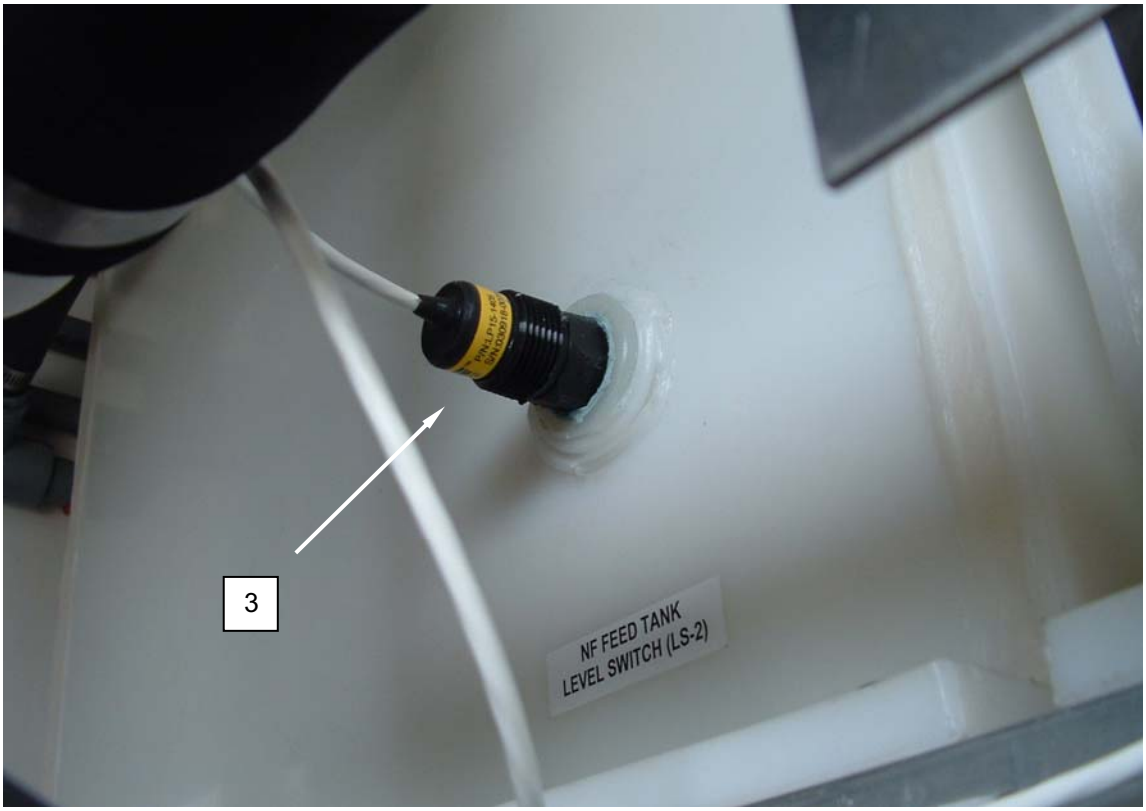


Figure 2. Replace the Level Sensors.

REPLACE-CONTINUED



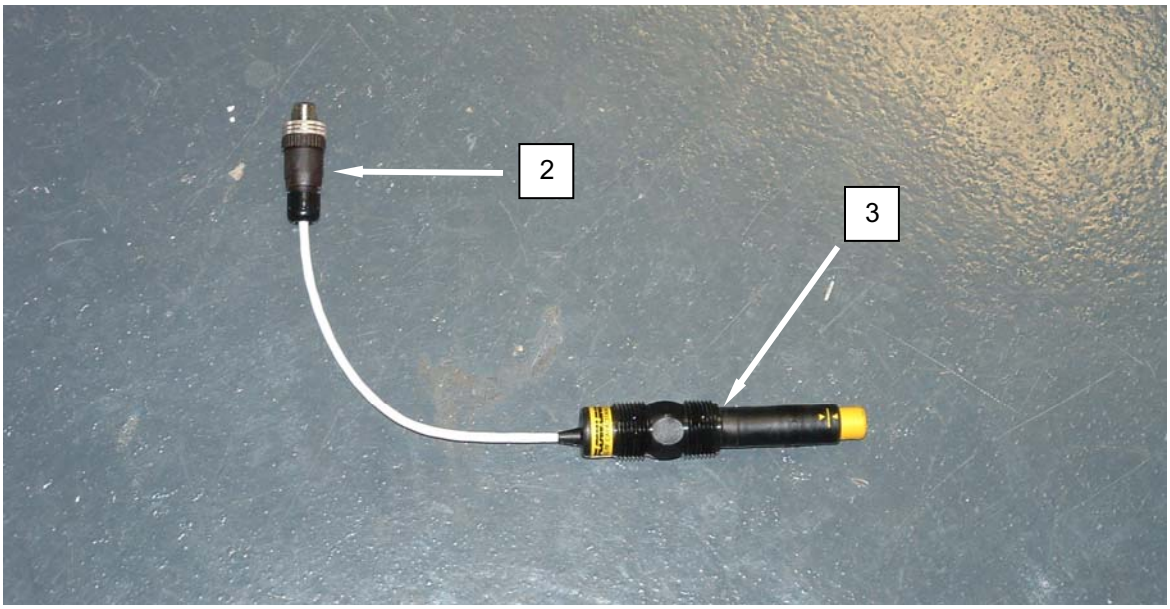


Figure 3. Replace the Level Sensors.

END OF WORK PACKAGE

UNIT MAINTENANCE
CONTAINERIZED BATCH LAUNDRY
NSN 3510-01-527-2209
NSN 3510-01-527-2210
SYSTEM, WATER
SERVICE, REPAIR, REPLACE

INITIAL SETUP

Tools
Shop Equipment, Automotive Maintenance and Repair: Organizational Maintenance, Common No.1 (WP 0086 00, Table 2, Item 5)

Materials/Parts
Adhesive (WP 0087 00, Item 2)
Bleach, Laundry, Sodium Hypochlorite, 1 Gal (WP 0087 00, Item 8)
Brush, Acid Swabbing (WP 0087 00, Item 9)
Cleaner, Solvent (WP 0087 00, Item 11)
Compound, Sealer Pipe (WP 0087 00, Item 12)
Primer, Adhesive (WP 0087 00, Item 44)
Wrench, Strap Large Size 6 3/8 in. (WP 0086 00, Item 8)

Personnel Required
Quartermaster and Chemical Equipment Repairer 63J (1)

Equipment Condition
CBL operating

References
TB MED 577
TM 10-3510-226-10 (WP 0011 00)
WP 0036 00, WP 0040 00

SERVICE

Clean CPVC Check Valves V-20 and V-55

WARNING

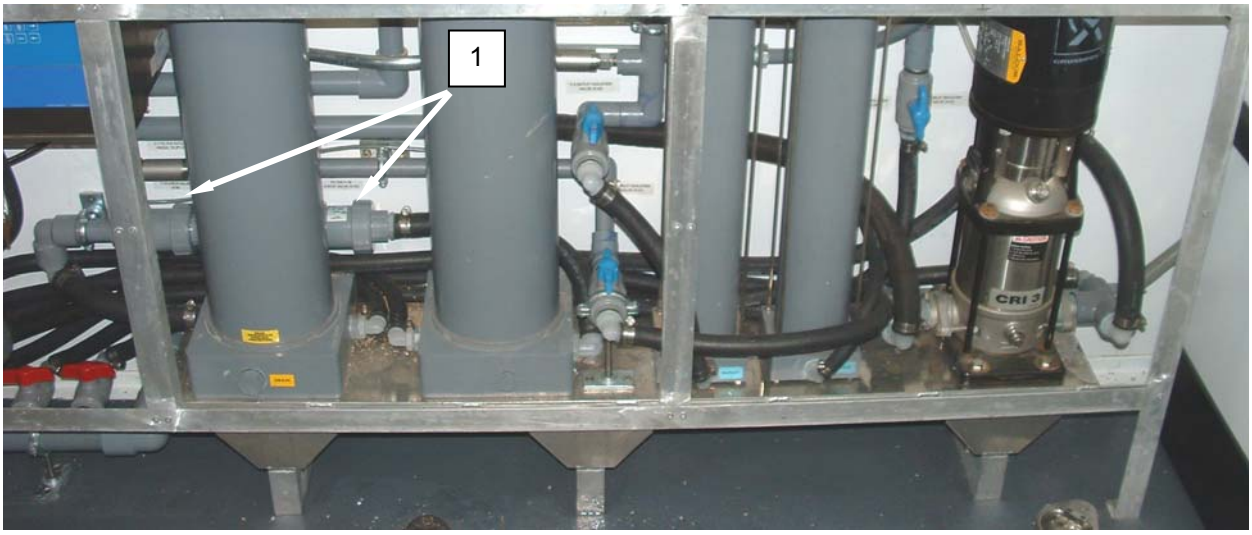
Ensure graywater pipes have been sanitized IAW procedures contained in TB MED 577 before attempting any repairs. Failure to observe safety precautions may result in serious illness or death from biohazards.

NOTE

Many repairs on the Water Treatment System plumbing may be accomplished if the CBL is operating with no water reuse. However, repairs should be performed with the CBL secured from routine laundry operations if at all possible. Refer to TM 10-3510-226-10 for instructions on operating the CBL with no water reuse.

1. Flush and drain Water Treatment System IAW procedures given in TM 10-3510-226-10.
2. Place CBL out of service and disconnect power.
3. Make a note of the direction of flow and position of the check valve **(Figure 1, Item 1)**.
4. Use a strap wrench to loosen the check valve unions **(Figure 1, Item 2)** and remove the check valve **(Figure 1, Item 1)**.
5. Clean any debris from the check valve interior.
6. Install the check valve **(Figure 1, Item 1)** in the correct flow position.
7. Hand-tighten the check valve unions **(Figure 1, Item 2)**.
8. Operate CBL IAW procedures given in TM 10-3510-226-10 and monitor for leakage and normal operation.

SERVICE-CONTINUED



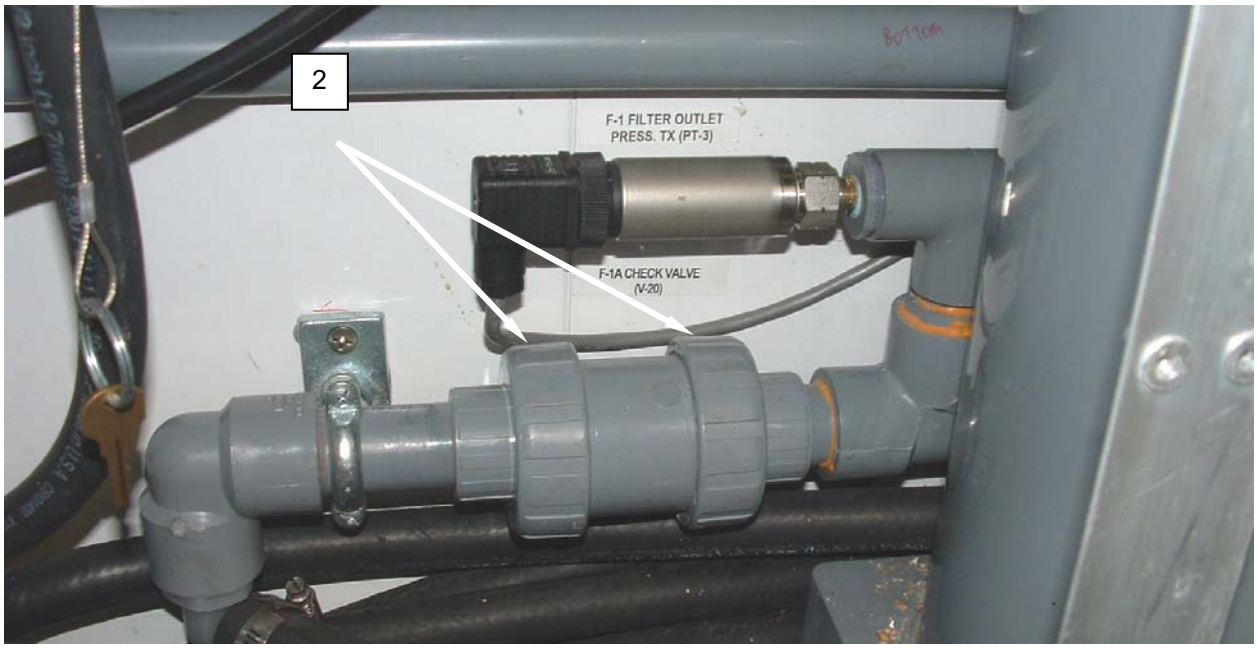


Figure 1. Clean CPVC Check Valves.

SERVICE-CONTINUED

Clean Brass Check Valves V-17 and V-19

WARNING

Ensure graywater pipes have been sanitized IAW procedures contained in TB MED 577 before attempting any repairs. Failure to observe safety precautions may result in serious illness or death from biohazards.

1. Flush and drain Water Treatment System IAW procedures given in TM 10-3510-226-10.
2. Place CBL out of service and disconnect power.
3. Use a pipe wrench to steady the check valve **(Figure 2, Item 3)** and remove the check valve cap **(Figure 2, Item 4)**.
4. Clean any debris from the check valve interior.
5. Use a pipe wrench to steady the check valve **(Figure 2, Item 3)**, and install the check valve cap **(Figure 2, Item 4)**.
6. Operate CBL IAW procedures given in TM 10-3510-226-10 and monitor for leakage and normal operation.

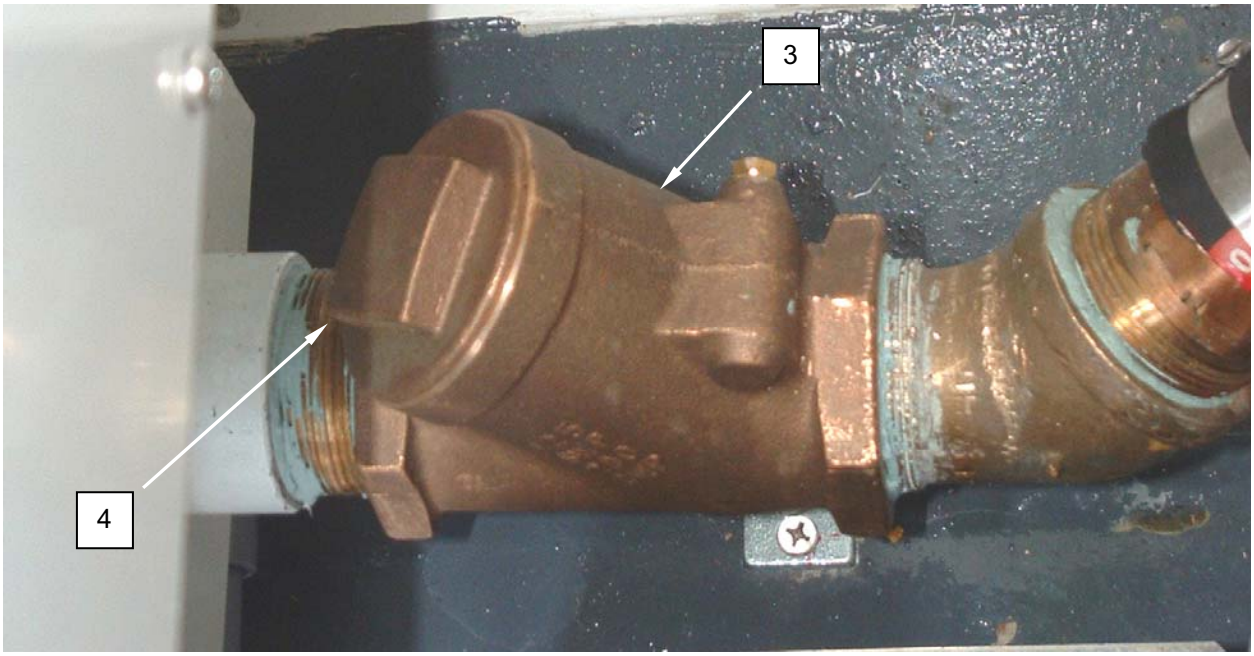


Figure 2. Clean Brass Check Valves.

REPAIR

Repair the PVC Plumbing

WARNING

Ensure graywater pipes have been sanitized IAW procedures contained in TB MED 577 before attempting any repairs. Failure to observe safety precautions may result in serious illness or death from biohazards.

NOTE

Many repairs on the Water Treatment System plumbing may be accomplished if the CBL is operating with no water reuse. However, repairs should be performed with the CBL secured from routine laundry operations if at all possible. Refer to TM 10-3510-226-10 for instructions on operating the CBL with no water reuse.

1. Flush and drain Water Treatment System IAW procedures given in TM 10-3510-226-10.
2. Place CBL out of service and disconnect power.
3. Cut out damaged CPVC pipe section **(Figure 3, Item 5)** or fitting.
4. Clean cut and prime cut ends.
5. Cut replacement pipe section **(Figure 3, Item 6)** as necessary to fit.
6. Install pipe section **(Figure 3, Item 6)**, fittings, and couplings **(Figure 3, Item 7)** as necessary, and cement in place.
7. Operate CBL IAW procedures given in TM 10-3510-226-10 and monitor for leakage and normal operation.

REPAIR-CONTINUED

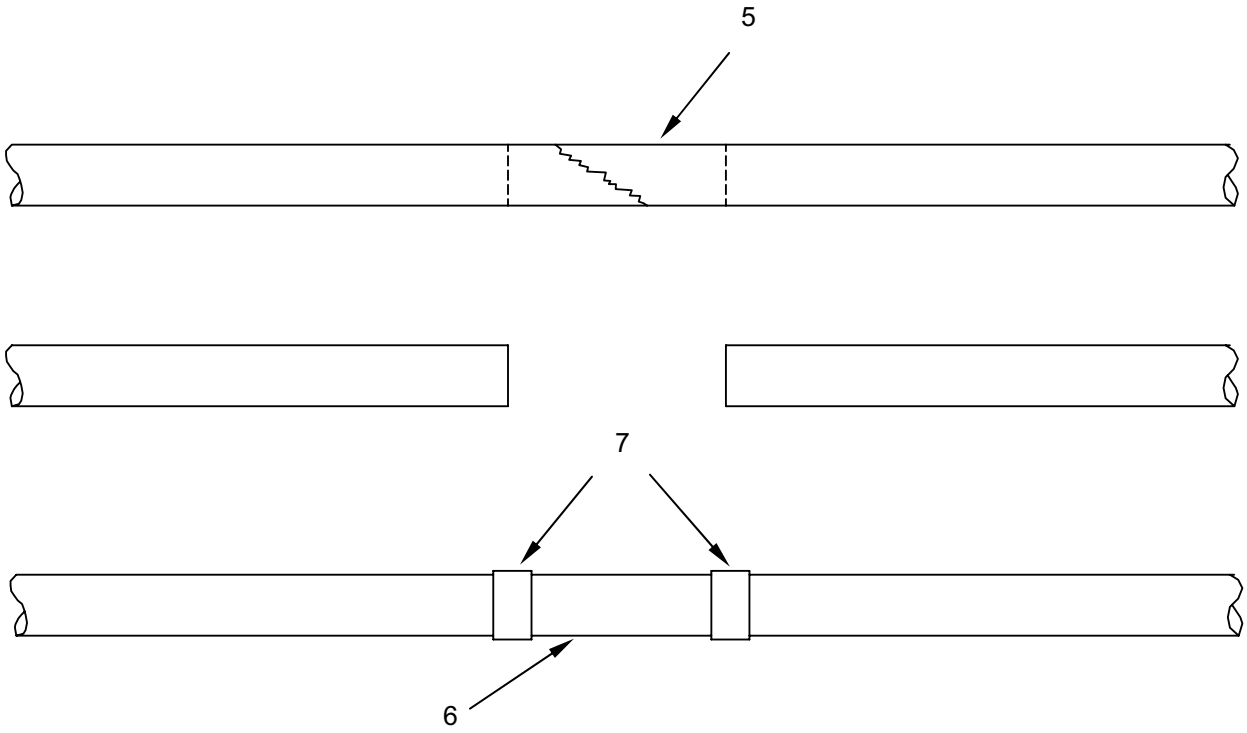


Figure 3. Repair the PVC Plumbing.

REPLACE

Replace PVC Hand Operated Ball Valves and Check Valves

WARNING

Ensure graywater pipes have been sanitized IAW procedures contained in TB MED 577 before attempting any repairs. Failure to observe safety precautions may result in serious illness or death from biohazards.

NOTE

If the unions of the valve are serviceable, the replacement valve may be installed using the existing unions. Retain the unused unions as repair parts.

NOTE

Many repairs on the Water Treatment System plumbing may be accomplished if the CBL is operating with no water reuse. However, repairs should be performed with the CBL secured from routine laundry operations if at all possible. Refer to TM 10-3510-226-10 for instructions on operating the CBL with no water reuse.

1. Flush and drain Water Treatment System IAW procedures given in TM 10-3510-226-10.
2. Place CBL out of service and disconnect power.
3. Unscrew or cut out damaged CPVC valve **(Figure 4, Item 8)** as required.

NOTE

Valves V-52 **(Figure 4, Item 9)** and V-60 **(Figure 4, Item 10)** may require the installation of a coupling and an additional 2-inch section of PVC pipe for installation.

4. Clean cut and prime cut ends.
5. Install replacement CPVC valve **(Figure 4, Item 8)** and fittings as necessary, and cement in place.
6. Operate CBL IAW procedures given in TM 10-3510-226-10 and monitor for leakage and normal operation.

REPLACE-CONTINUED

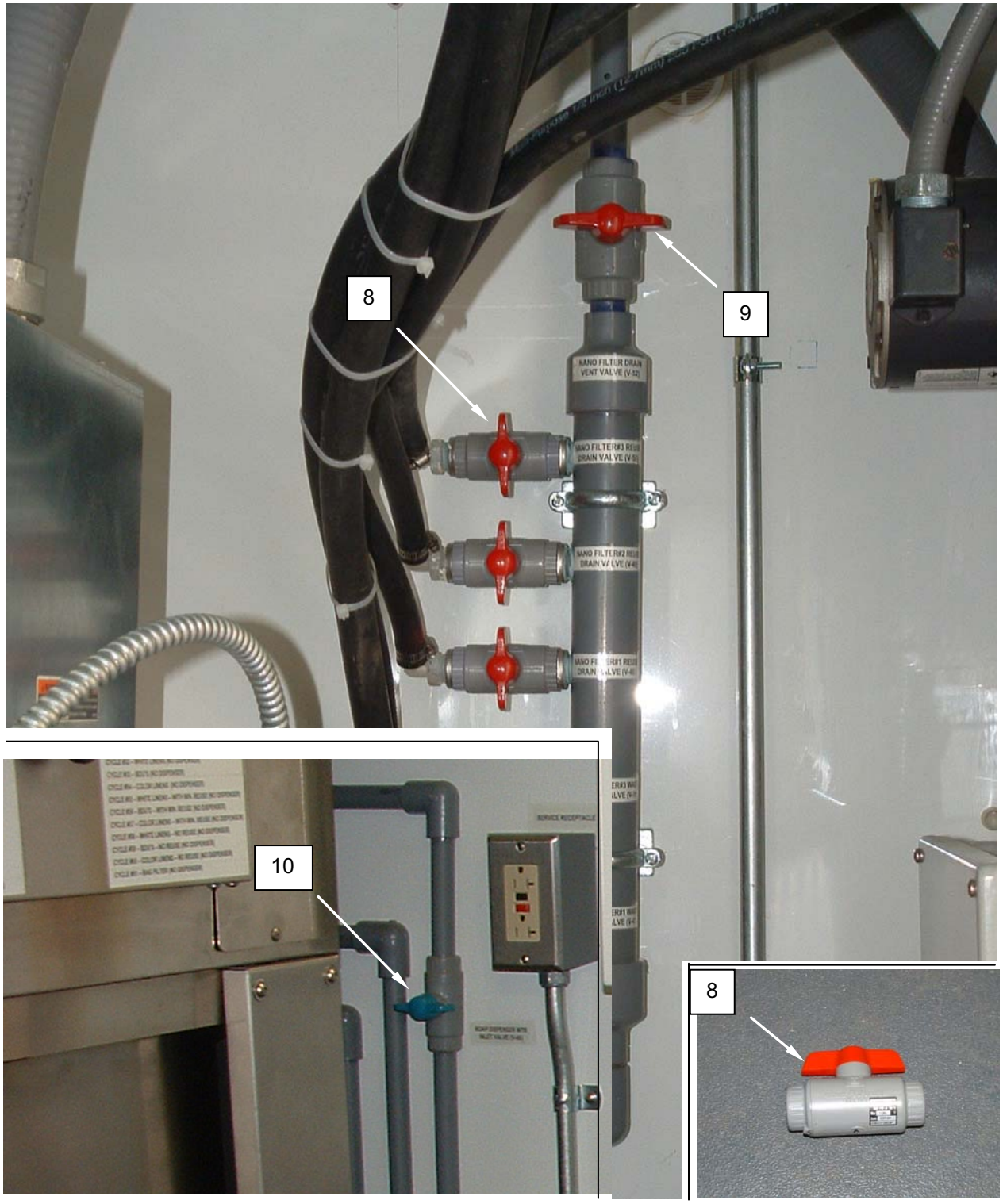


Figure 4. Replace PVC Hand Operated Valves and Check Valves.

REPLACE-CONTINUED

Replace PVC Hand Operated Gate Valves

WARNING

Ensure graywater pipes have been sanitized IAW procedures contained in TB MED 577 before attempting any repairs. Failure to observe safety precautions may result in serious illness or death from biohazards.

NOTE

It is not necessary to replace the valve body unless it is damaged. Replacing the valve core and gaskets is sufficient.

NOTE

Many repairs on the Water Treatment System plumbing may be accomplished if the CBL is operating with no water reuse. However, repairs should be performed with the CBL secured from routine laundry operations if at all possible. Refer to TM 10-3510-226-10 for instructions on operating the CBL with no water reuse.

1. Flush and drain Water Treatment System IAW procedures given in TM 10-3510-226-10.
2. Place CBL out of service and disconnect power.
3. Remove screws, nuts and washers retaining CPVC gate valve core **(Figure 5, Item 11)** to valve body.
4. Ensure new gaskets are in place, and install replacement CPVC valve core **(Figure 5, Item 11)** to valve body.
5. Operate CBL IAW procedures given in TM 10-3510-226-10 and monitor for leakage and normal operation.

REPLACE-CONTINUED

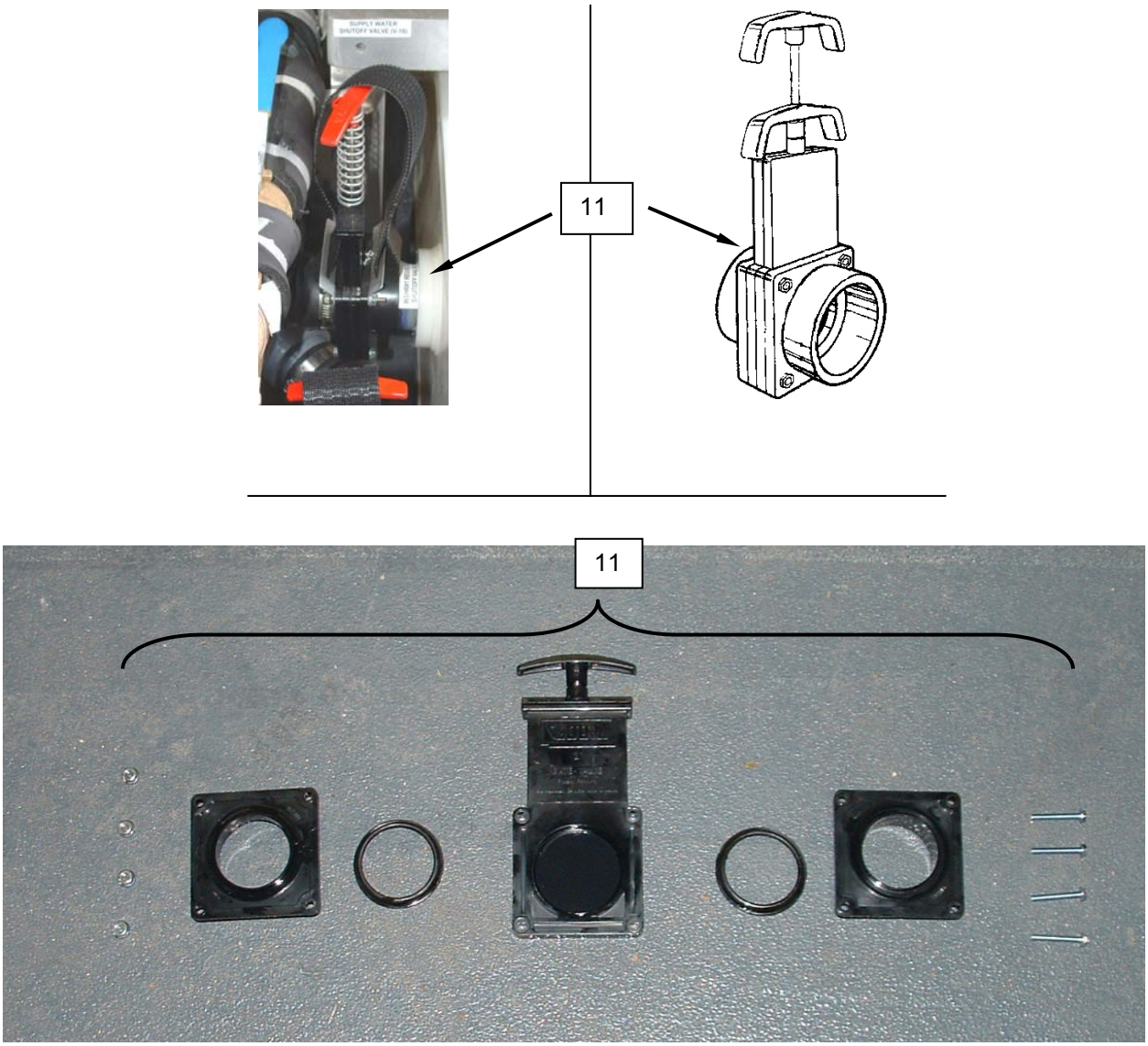


Figure 5. Replace PVC Hand Operated Gate Valves.

REPLACE-CONTINUED

Replace Copper/Brass Pipe Fittings

WARNING

Ensure graywater pipes have been sanitized IAW procedures contained in TB MED 577 before attempting any repairs. Failure to observe safety precautions may result in serious illness or death from biohazards.

NOTE

The following procedure applies only to threaded pipe nipples and fittings.

1. Flush and drain Water Treatment System IAW procedures given in TM 10-3510-226-10.
2. Place CBL out of service and disconnect power.
3. Use a pipe wrench to steady attached plumbing, and unscrew nipple **(Figure 6, Item 12)** or fitting **(Figure 6, Item 13)** to be replaced.
4. Apply pipe sealing compound to threads of replacement nipple **(Figure 6, Item 12)** or fitting **(Figure 6, Item 13)**.
5. Use a pipe wrench to steady attached plumbing, and install replacement nipple **(Figure 6, Item 12)** or fitting **(Figure 6, Item 13)**.
6. Ensure replacement nipple or fitting is tight.
7. Operate CBL IAW procedures given in TM 10-3510-226-10 and monitor for leakage and normal operation.

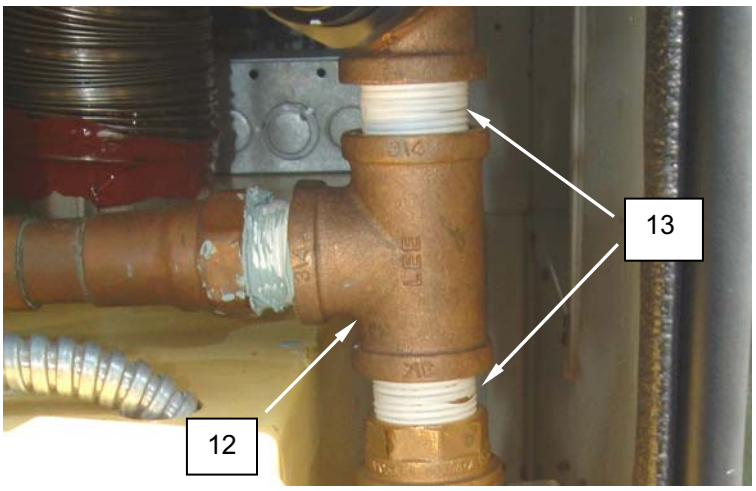


Figure 6. Replace Copper/Brass Pipe Fittings.

REPLACE-CONTINUED

Replace Brass Hand Operated Valves

WARNING

Ensure graywater pipes have been sanitized IAW procedures contained in TB MED 577 before attempting any repairs. Failure to observe safety precautions may result in serious illness or death from biohazards.

1. Flush and drain Water Treatment System IAW procedures given in TM 10-3510-226-10.
2. Place CBL out of service and disconnect power.
3. Note position of valve **(Figure 7, Item 14)** and valve operating handle **(Figure 7, Item 15)**.
4. Remove the nut retaining the operating handle **(Figure 7, Item 15)**, and remove the operating handle.
5. Use a pipe wrench to steady attached plumbing, and unscrew valve **(Figure 7, Item 14)** to be replaced.
6. Remove the nut retaining the operating handle **(Figure 7, Item 15)** on the replacement valve, and remove the operating handle.
7. Apply pipe sealing compound to threads of replacement valve **(Figure 7, Item 14)** or attaching nipple **(Figure 7, Item 16)**.
8. Use a pipe wrench to steady attached plumbing, and install replacement valve **(Figure 7, Item 14)**.
9. Ensure replacement valve **(Figure 7, Item 14)** is tight and correctly aligned to ease of operation.
10. Operate CBL IAW procedures given in TM 10-3510-226-10 and monitor for leakage and normal operation.

REPLACE-CONTINUED

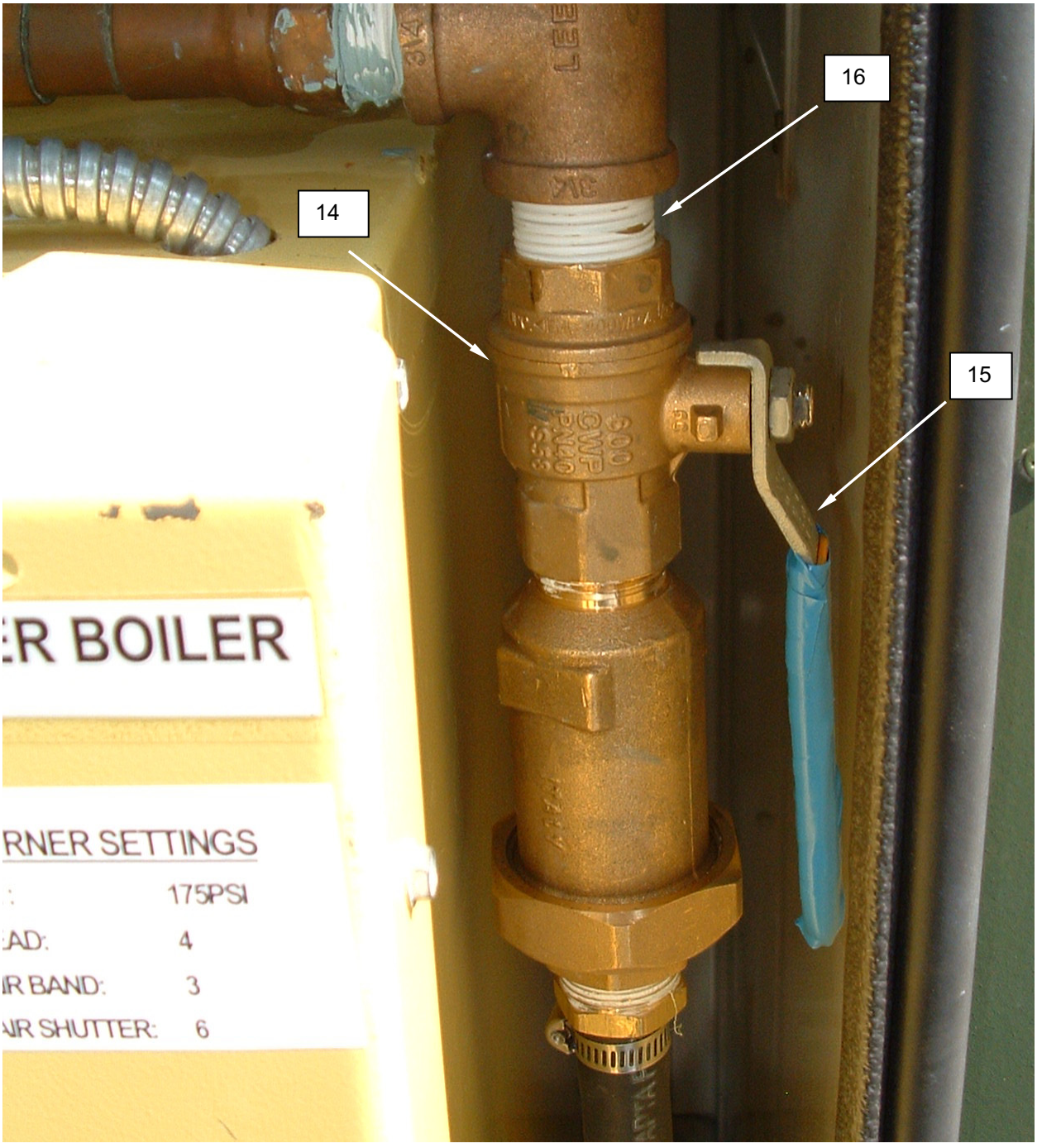


Figure 7. Replace Brass Hand Operated Valves.

REPLACE-CONTINUED

Replace Brass Check Valves

WARNING

Ensure graywater pipes have been sanitized IAW procedures contained in TB MED 577 before attempting any repairs. Failure to observe safety precautions may result in serious illness or death from biohazards.

NOTE

Valve V-17 requires removal of Washer No.1 at least 2 inches IAW procedures given in WP 0040 00. Valve V-19 requires removal of the P-3 pump IAW procedures given in WP 0036 00 in order to provide clearance for replacement.

1. Flush and drain Water Treatment System IAW procedures given in TM 10-3510-226-10.
2. Place CBL out of service and disconnect power.
3. Locate the nearest union or hose fitting and disconnect.
4. Make a note of the direction of flow and position of the check valve **(Figure 8, Item 3)**.
5. Use a pipe wrench to steady the attached pipe and remove the check valve **(Figure 8, Item 3)**.
6. Use a pipe wrench to steady the check valve **(Figure 8, Item 3)** and remove any remaining attached pipe or fittings **(Figure 8, Item 13)** as an assembly.
7. Apply pipe sealing compound to the check valve **(Figure 8, Item 3)** or attached male pipe fittings **(Figure 8, Item 13)**.
8. Use a pipe wrench to steady attaching pipe.
9. Install the check valve **(Figure 8, Item 3)**, ensuring that the correct direction of flow and valve position has been retained.
10. Use a pipe wrench to steady the replacement check valve **(Figure 8, Item 3)**.
11. Install any remaining attached pipe and fittings **(Figure 8, Item 13)** as an assembly onto the replacement check valve **(Figure 8, Item 3)**.
12. Connect and tighten any remaining disconnected unions or hose fittings.
13. Operate CBL IAW procedures given in TM 10-3510-226-10 and monitor for leakage and normal operation.

REPLACE-CONTINUED

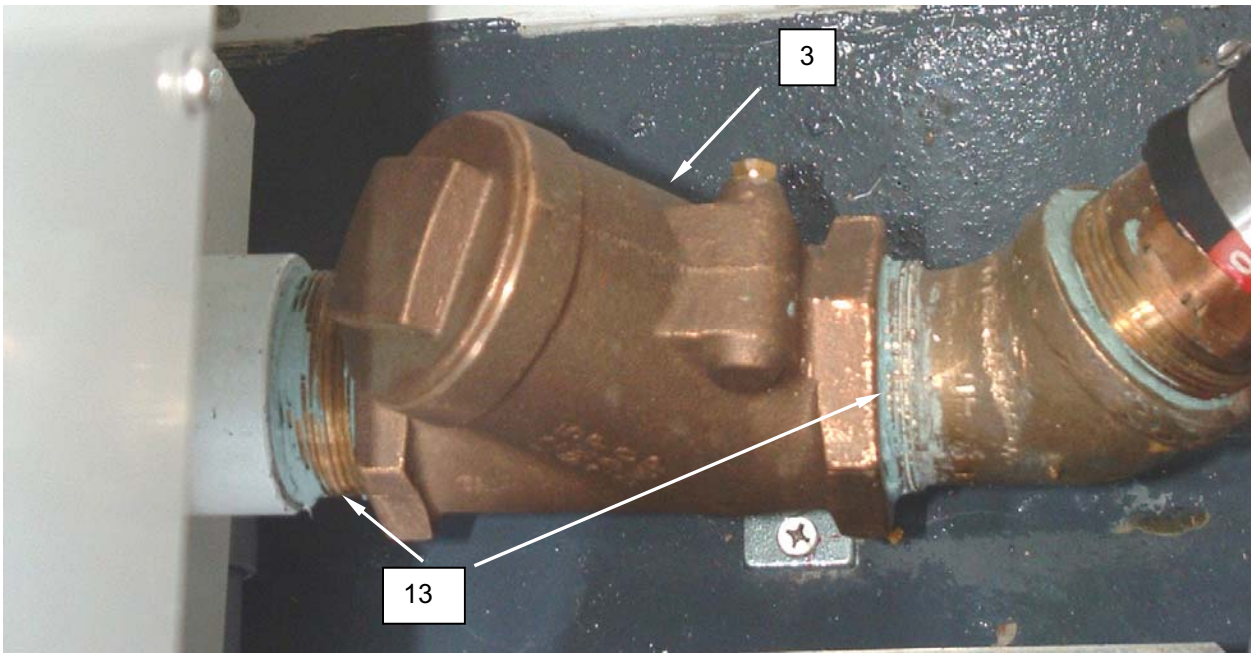


Figure 8. Replace Brass Check Valves.

REPLACE-CONTINUED

Replace Internal Hoses

WARNING

Ensure graywater pipes have been sanitized IAW procedures contained in TB MED 577 before attempting any repairs. Failure to observe safety precautions may result in serious illness or death from biohazards.

1. Flush and drain Water Treatment System IAW procedures given in TM 10-3510-226-10.
2. Place CBL out of service and disconnect power.
3. Loosen and remove hose clamps **(Figure 9, Item 17)** retaining damaged hose **(Figure 9, Item 18)**.
4. Remove hose **(Figure 9, Item 18)**.
5. Cut replacement hose **(Figure 9, Item 18)** to same length as damaged hose.
6. Install replacement hose **(Figure 9, Item 18)**, and retain with hose clamps **(Figure 9, Item 17)**.
7. Operate CBL IAW procedures given in TM 10-3510-226-10 and monitor for leakage and normal operation.

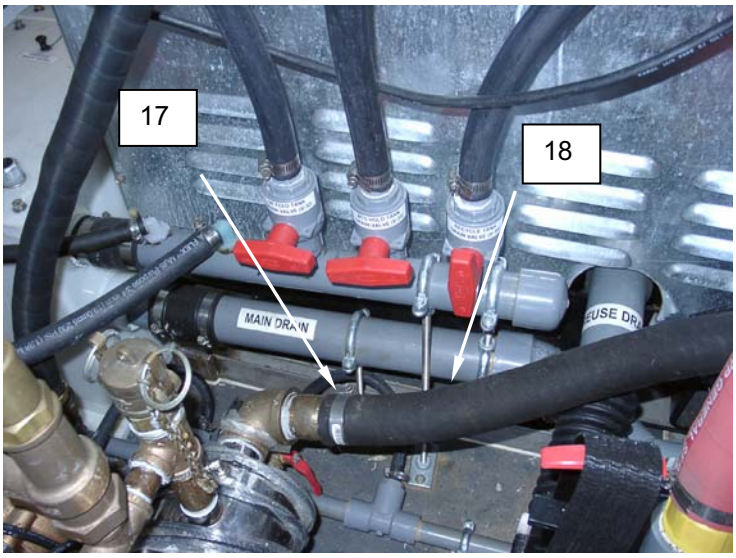


Figure 9. Replace Internal Hoses.

END OF WORK PACKAGE

UNIT MAINTENANCE
CONTAINERIZED BATCH LAUNDRY
NSN 3510-01-527-2209
NSN 3510-01-527-2210
WATER PANELS
SERVICE

INITIAL SETUP

Tools
Shop Equipment, Automotive Maintenance and Repair: Organizational Maintenance, Common No.1 (WP 0086 00, Table 2, Item 5)

Personnel Required
Quartermaster and Chemical Equipment Repairer 63J (1)

Materials/Parts
None Required

Equipment Condition
CBL shut down and drained

SERVICE

Clean the Water Panel Fittings

1. Disconnect hoses from the water panels **(Figure 1, Item 1)**.
2. Clean corrosion from fitting **(Figure 1, Item 2)**.
3. Reconnect hoses.

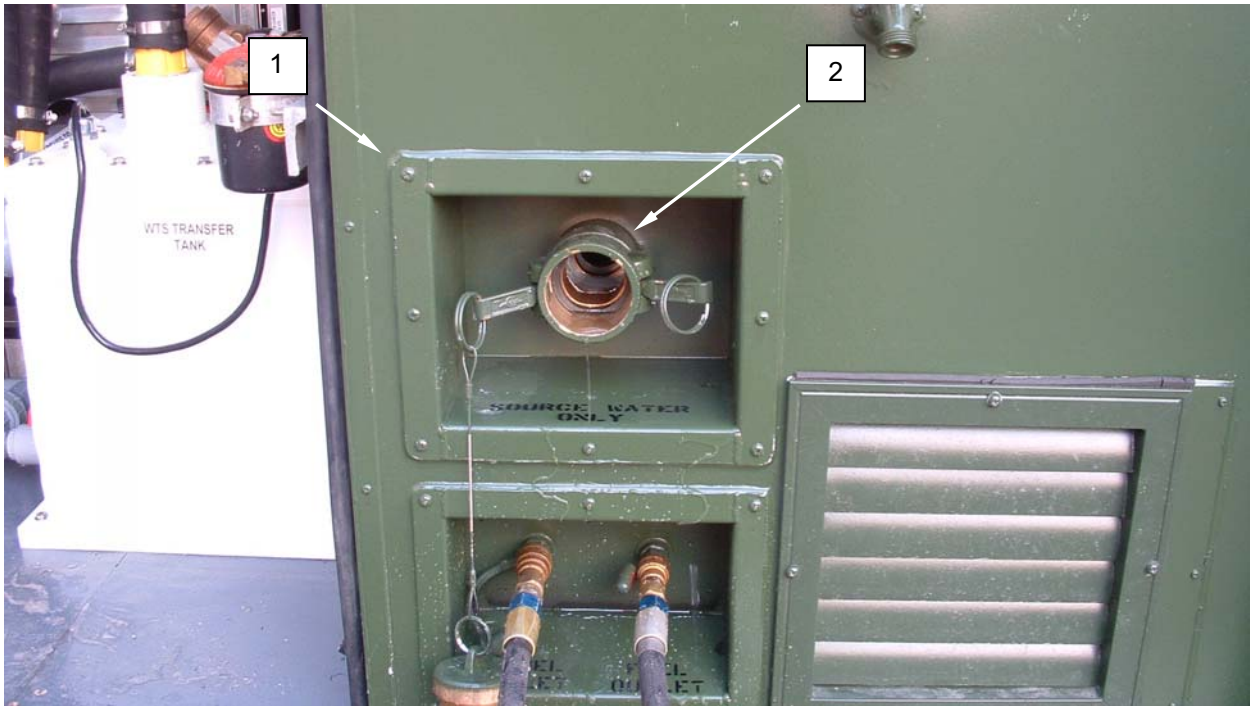


Figure 1. Clean the Water Inlet Panel Fitting.

END OF WORK PACKAGE

UNIT MAINTENANCE
CONTAINERIZED BATCH LAUNDRY
NSN 3510-01-527-2209
NSN 3510-01-527-2210
DRAINAGE TANKS
REPAIR, REPLACE

INITIAL SETUP

Tools
Shop Equipment, Automotive Maintenance and Repair: Organizational Maintenance, Common No.1 (WP 0086 00, Table 2, Item 5)

Materials/Parts
Baled Rag, General (WP 0087 00, Item 5)
Bleach, Laundry, Sodium Hypochlorite, 1 Gal (WP 0087 00, Item 8)
Cleaner, Solvent (WP 0087 00, Item 11)
Compound, Sealer Pipe (WP 0087 00, Item 12)
Paper, Gasket (WP 0087 00, Item 41)
Plastic Sheet (WP 0087 00, Item 43)

Personnel Required
Quartermaster and Chemical Equipment Repairer 63J (1)

Equipment Condition
CBL set up.

References
TB MED 577
WP 0041 00

REPAIR

Repair the Drainage Tanks

WARNING

Always secure and tag circuit breakers and switches OFF before attempting any electrical repairs. Remember that the CBL is a wet environment, and capable of posing a shock hazard even when personnel are not in direct contact with metal parts.

WARNING

Ensure graywater pipes have been sanitized IAW procedures contained in TB MED 577 before attempting any repairs. Always use provided safety equipment, including hand and eye protection, when performing maintenance on graywater handling components. Failure to observe safety precautions may result in serious illness or death from biohazards.

1. Place CBL out of service and disconnect power.
2. Drain tank **(Figure 1, Item 1)**.
3. Remove manual lift knob **(Figure 1, Item 2)** from waste tank pump P-5 (waste tank only).
4. Remove top of drainage tank **(Figure 1, Item 1)**.
5. Clean and disinfect IAW TB MED 577.
6. Locate source of leak.

REPAIR-CONTINUED

NOTE

If a crack is located, always drill the ends to stop the crack. Failure to do so may result in continued damage after repairs are complete.

7. If tank is cracked, drill ends of crack **(Figure 1, Item 3)** and clean crack of any residue.
8. Allow tank **(Figure 1, Item 1)** to dry completely.
9. If crack is narrow enough, the damaged area may be heated with a propane torch and rewelded.
10. If the damage is more substantial, cut a patch **(Figure 1, Item 4)** of plastic or metal large enough to cover the damaged area with approximately 1½-inch (4 cm) overlap.
11. Cut a rubber or paper gasket **(Figure 1, Item 5)** to match the patch, with approximately ½-inch (1 cm) overlap.
12. Drill ¼-inch holes at 1 inch intervals around the perimeter of the patch **(Figure 1, Item 4)**.
13. Place the drilled patch **(Figure 1, Item 4)** in location over the damaged area of the tank **(Figure 1, Item 1)**, mark the holes, and drill corresponding holes into the tank.
14. Place the patch **(Figure 1, Item 4)** over the gasket **(Figure 1, Item 5)**, mark the holes, and cut corresponding holes in the gasket.
15. Assemble the patch **(Figure 1, Item 4)** and gasket **(Figure 1, Item 5)** together with stainless steel 1/4 - 20 x 1 machine screws **(Figure 1, Item 6)**.
16. Install the assembled patch **(Figure 1, Item 4)** onto the tank **(Figure 1, Item 1)**, and fasten each machine screw **(Figure 1, Item 6)** with a stainless steel 1/4 - 20 locknut **(Figure 1, Item 7)**.
17. Install the tank top and retain with screws.
18. Install manual lift knob **(Figure 1, Item 2)** onto waste tank pump P-5 (waste tank only).
19. Connect power, place CBL back in service, and monitor tank repair for leakage.

REPAIR-CONTINUED

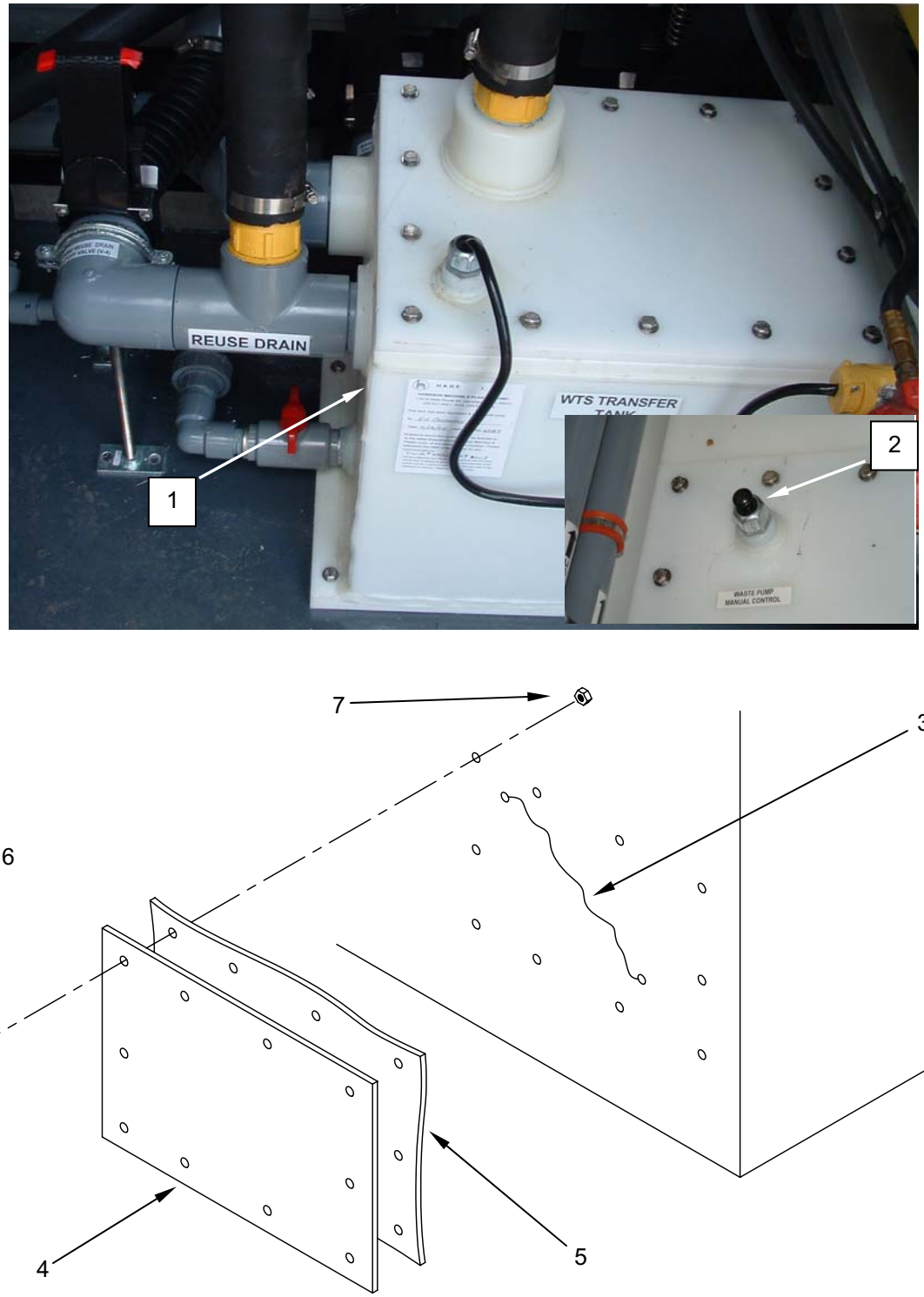


Figure 1. Repair a Drainage Tank.

REPLACE

Replace a Drainage Tank

WARNING

Always secure and tag circuit breakers and switches OFF before attempting any electrical repairs. Remember that the CBL is a wet environment, and capable of posing a shock hazard even when personnel are not in direct contact with metal parts.

WARNING

Ensure graywater pipes have been sanitized IAW procedures contained in TB MED 577 before attempting any repairs. Always use provided safety equipment, including hand and eye protection, when performing maintenance on graywater handling components. Failure to observe safety precautions may result in serious illness or death from biohazards.

NOTE

Remove washer No 1 to replace WTS transfer tank IAW procedures contained in WP 0041 00; washer no. 2 to replace Waste tank. It may be necessary to remove the pump receptacle box under the boiler to remove the WTS transfer tank. Remove the boiler vent to access mounting screws on WTS transfer tank.

1. Drain tank.
2. Remove manual lift knob **(Figure 2, Item 2)** from waste tank pump P-5, (waste tank only).
3. Remove top **(Figure 2, Item 8)** of drainage tank **(Figure 2, Item 1)**.
4. Clean and disinfect IAW TB MED 577.
5. Tag and disconnect all hose connections **(Figure 2, Item 9)** to tank.
6. Disconnect union connecting tank drain valve to tank.
7. Disconnect pump cord plug **(Figure 2, Item 10)** from receptacle.
8. Disassemble pump cord plug **(Figure 2, Item 10)**.
9. Loosen watertight tank penetration **(Figure 2, Item 11)** and pull pump wiring through.
10. Loosen hose clamps, and remove discharge hose from pump **(Figure 2, Item 12)**.
11. Remove fasteners retaining pump **(Figure 2, Item 12)** to tank **(Figure 2, Item 1)**, and remove pump.
12. Remove bolts retaining tank **(Figure 2, Item 1)** to CBL deck, and remove tank.
13. Remove watertight tank penetration **(Figure 2, Item 11)** from tank **(Figure 2, Item 1)**.

REPLACE-CONTINUED

NOTE

It may be necessary to strip the drainage tank of fittings to install on the replacement tank.

14. Install replacement tank **(Figure 2, Item 1)** and secure in place with bolts.
15. Install pump **(Figure 2, Item 12)** and retain in place with fasteners.
16. Connect discharge hose to pump **(Figure 2, Item 12)** and secure with hose clamp.
17. Install watertight tank penetration **(Figure 2, Item 11)** into replacement tank **(Figure 2, Item 1)**, if necessary.
18. Route pump cord through watertight tank penetration **(Figure 2, Item 11)** and tighten.
19. Reinstall pump cord plug **(Figure 2, Item 10)** onto pump cord.
20. Connect hoses **(Figure 2, Item 9)** to tank **(Figure 2, Item 1)** and secure with clamps.
21. Install top **(Figure 2, Item 8)** of drainage tank.
22. Install manual lift knob **(Figure 2, Item 2)** onto waste tank pump P-5 (waste tank only).
23. Connect pump cord plug **(Figure 2, Item 10)** to pump receptacle, and monitor for normal operation.

REPLACE-CONTINUED

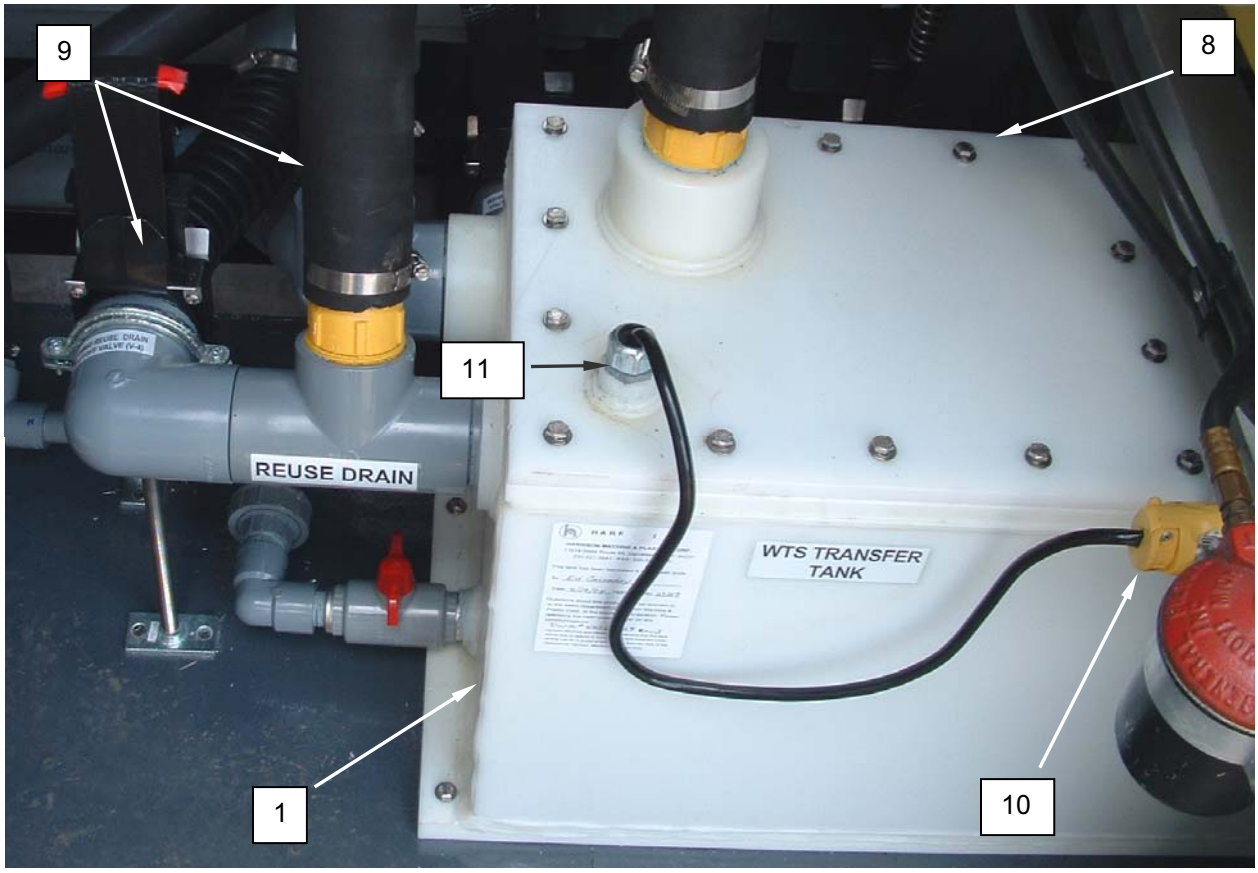


Figure 2. Replace a Drainage Tank.

END OF WORK PACKAGE

UNIT MAINTENANCE
CONTAINERIZED BATCH LAUNDRY
NSN 3510-01-527-2209
NSN 3510-01-527-2210
PUMPS, DRAINAGE, WTS/P-2 AND WASTE/P-5
TEST, REPLACE

INITIAL SETUP

Tools
Tool Kit, General Mechanics: Automotive (WP 0086 00, Table 2, Item 6)

Materials/Parts
Bleach, Laundry, Sodium Hypochlorite, 1 Gal (WP 0087 00, Item 8)
Cleaner, Solvent (WP 0087 00, Item 11)
Compound, Sealer Pipe (WP 0087 00, Item 12)

Personnel Required
Quartermaster and Chemical Equipment Repairer 63J (1)

Equipment Condition
CBL set up

References
TB MED 577
WP 0041 00

TEST

Test the Drainage Tank Pump Float

WARNING

This equipment operates at high voltage. Use extreme caution, observe all warnings, and follow all safety procedures. Failure to observe safety precautions may result in injury or death to personnel.

WARNING

Ensure graywater pipes have been sanitized IAW procedures contained in TB MED 577 before attempting any repairs. Always use provided safety equipment, including hand and eye protection, when performing maintenance on graywater handling components. Failure to observe safety precautions may result in serious illness or death from biohazards.

1. Place CBL out of service and disconnect power.
2. Remove manual lift knob **(Figure 1, Item 1)** (Waste Tank only).
3. Remove top **(Figure 1, Item 2)** of drainage tank.
4. Clean and disinfect tank IAW TB MED 577.
5. Disconnect float guide rod **(Figure 1, Item 3)** and remove float **(Figure 1, Item 4)** from rod.
6. Place float **(Figure 1, Item 4)** in container of water and check for sinking.
7. Replace an inoperative float **(Figure 1, Item 4)**.
8. Install float **(Figure 1, Item 4)** onto guide rod **(Figure 1, Item 3)**, and reconnect guide rod.
9. Install top **(Figure 1, Item 2)** of drainage tank.
10. Install manual lift knob **(Figure 1, Item 1)** (Waste Tank only).

11. Connect power, and monitor for normal operation.

Figure 1. Test the Drainage Tank Pump Float.

Test the Drainage Tank Pump Float Switch and Motor

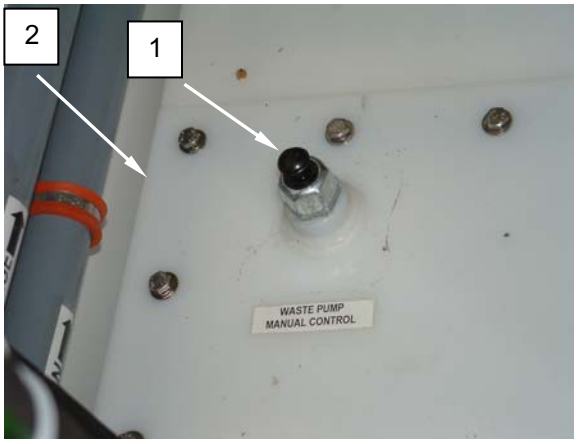
WARNING

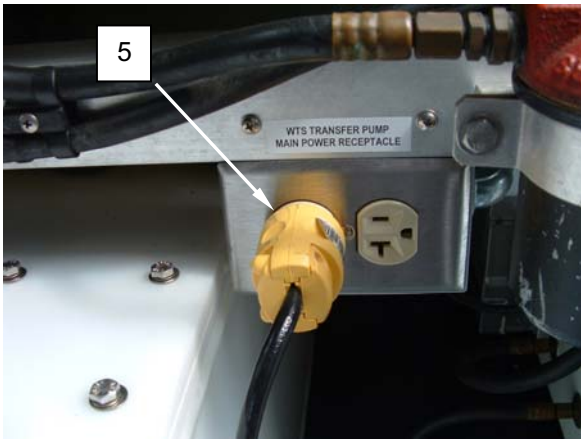
This equipment operates at high voltage. Use extreme caution, observe all warnings, and follow all safety procedures. Failure to observe safety precautions may result in injury or death to personnel.

WARNING

Ensure graywater pipes have been sanitized IAW procedures contained in TB MED 577 before attempting any repairs. Always use provided safety equipment, including hand and eye protection, when performing maintenance on graywater handling components. Failure to observe safety precautions may result in serious illness or death from biohazards.

1. Place CBL out of service and disconnect power.
2. Remove manual lift knob **(Figure 2, Item 1)** (Waste Tank only).
3. Remove top **(Figure 2, Item 2)** of drainage tank.
4. Clean and disinfect tank IAW TB MED 577.
5. Unplug pump power cord plug **(Figure 2, Item 5)** from receptacle.
6. Ensure the float **(Figure 2, Item 4)** is in its lowest position, and use an ohmmeter to check for infinite resistance between the two flat prongs on the plug **(Figure 2, Item 5)**.
7. Manually raise the float **(Figure 2, Item 4)** is in its highest position, and use an ohmmeter to check for zero resistance between the two flat prongs on the plug **(Figure 2, Item 5)**.
8. Use an ohmmeter to check for infinite resistance between each flat prong on the plug **(Figure 2, Item 5)** and ground.
9. Replace a pump **(Figure 2, Item 6)** assembly which fails any test.
10. Install top **(Figure 2, Item 2)** of drainage tank.
11. Install manual lift knob **(Figure 2, Item 1)** (Waste Tank only).
12. Connect power and monitor for normal operation.





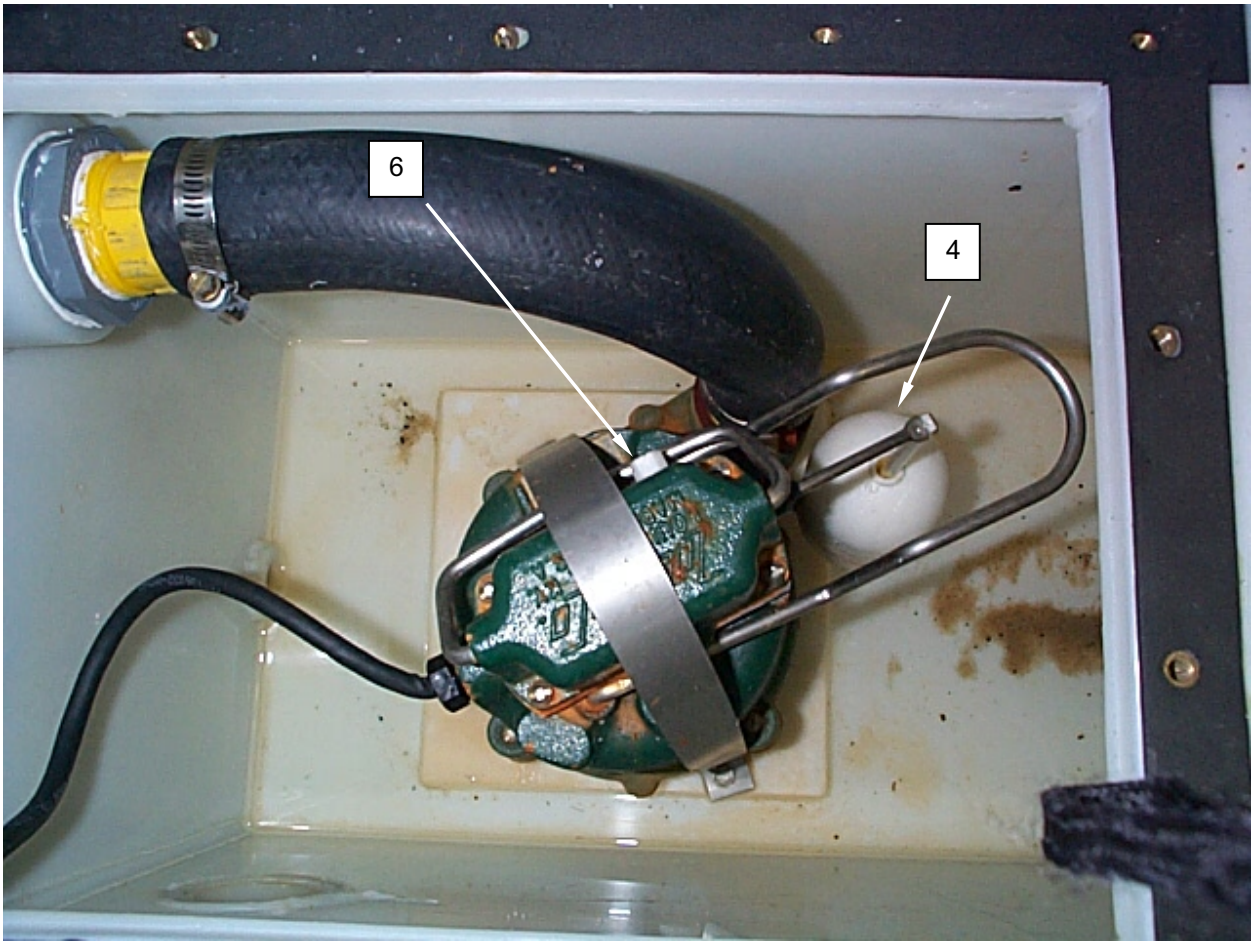


Figure 2. Test the Drainage Tank Pump Float Switch and Motor.

REPLACE

Replace the Drainage Tank Pump Float

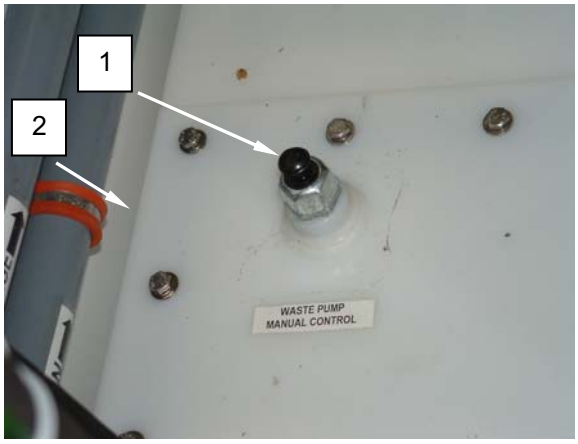
WARNING

This equipment operates at high voltage. Use extreme caution, observe all warnings, and follow all safety procedures. Failure to observe safety precautions may result in injury or death to personnel.

WARNING

Ensure graywater pipes have been sanitized IAW procedures contained in TB MED 577 before attempting any repairs. Always use provided safety equipment, including hand and eye protection, when performing maintenance on graywater handling components. Failure to observe safety precautions may result in serious illness or death from biohazards.

1. Place CBL out of service and disconnect power.
2. Remove manual lift knob **(Figure 3, Item 1)** (Waste Tank only) and push operating rod **(Figure 3, Item 7)** down through fitting.
3. Remove top **(Figure 3, Item 2)** of drainage tank.
4. Clean and disinfect tank IAW TB MED 577.
5. Disconnect float guide rod **(Figure 3, Item 3)** and remove float **(Figure 3, Item 4)** from rod.
6. Install replacement float **(Figure 3, Item 4)** onto guide rod **(Figure 3, Item 3)** and reconnect guide rod.
7. Install manual lift operating rod **(Figure 3, Item 7)** into fitting (Waste Tank only).
8. Install top **(Figure 3, Item 2)** of drainage tank.
9. Install manual lift knob **(Figure 3, Item 1)** (Waste Tank only).
10. Connect power and monitor for normal operation.



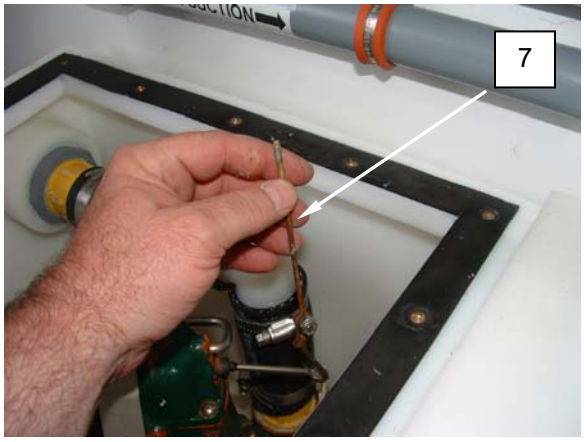


Figure 3. Replace the Drainage Tank Pump Float.

Replace a Drainage Tank Pump

WARNING

This equipment operates at high voltage. Use extreme caution, observe all warnings, and follow all safety procedures. Failure to observe safety precautions may result in injury or death to personnel.

WARNING

Ensure graywater pipes have been sanitized IAW procedures contained in TB MED 577 before attempting any repairs. Always use provided safety equipment, including hand and eye protection, when performing maintenance on graywater handling components. Failure to observe safety precautions may result in serious illness or death from biohazards.

NOTE

To replace waste tank pump, washer No. 2 must be removed IAW procedures given in WP 0041 00.

1. Place CBL out of service and disconnect power.
2. Remove manual lift knob **(Figure 4, Item 1)** (Waste Tank only).
3. Remove top **(Figure 4, Item 2)** of drainage tank.
4. Clean and disinfect tank IAW TB MED 577.
5. Remove screws retaining mounting strap **(Figure 5, Item 8)** and remove strap.
6. Loosen hose clamp retaining discharge hose **(Figure 5, Item 9)** to pump **(Figure 5, Item 6)**.
7. Remove discharge hose **(Figure 5, Item 9)** from pump **(Figure 5, Item 6)** and remove pump from drainage tank.
8. Disassemble power cord plug **(Figure 4, Item 5)** and retain for installment on replacement pump power cord.
9. Loosen watertight strain relief **(Figure 4, Item 10)** in drainage tank top **(Figure 4, Item 2)**.
10. Pull power cord plug **(Figure 4, Item 5)** through strain relief **(Figure 4, Item 10)**.
11. Install replacement pump assembly **(Figure 5, Item 6)** into drainage tank.
12. Connect discharge hose **(Figure 5, Item 9)** to pump discharge and retain with hose clamp.
13. Install mounting strap **(Figure 5, Item 8)** and retain with screws.
14. Cut plug from end of replacement pump power cord.
15. Feed power cord through drain tank top strain relief **(Figure 4, Item 10)**.

16. Strip insulation from end of power cord, and install plug **(Figure 4, Item 5)** onto replacement pump power cord.

17. Install top **(Figure 4, Item 2)** of drainage tank.

18. Install manual lift knob **(Figure 4, Item 1)** (Waste Tank only).

19. Connect power, and monitor for normal operation.

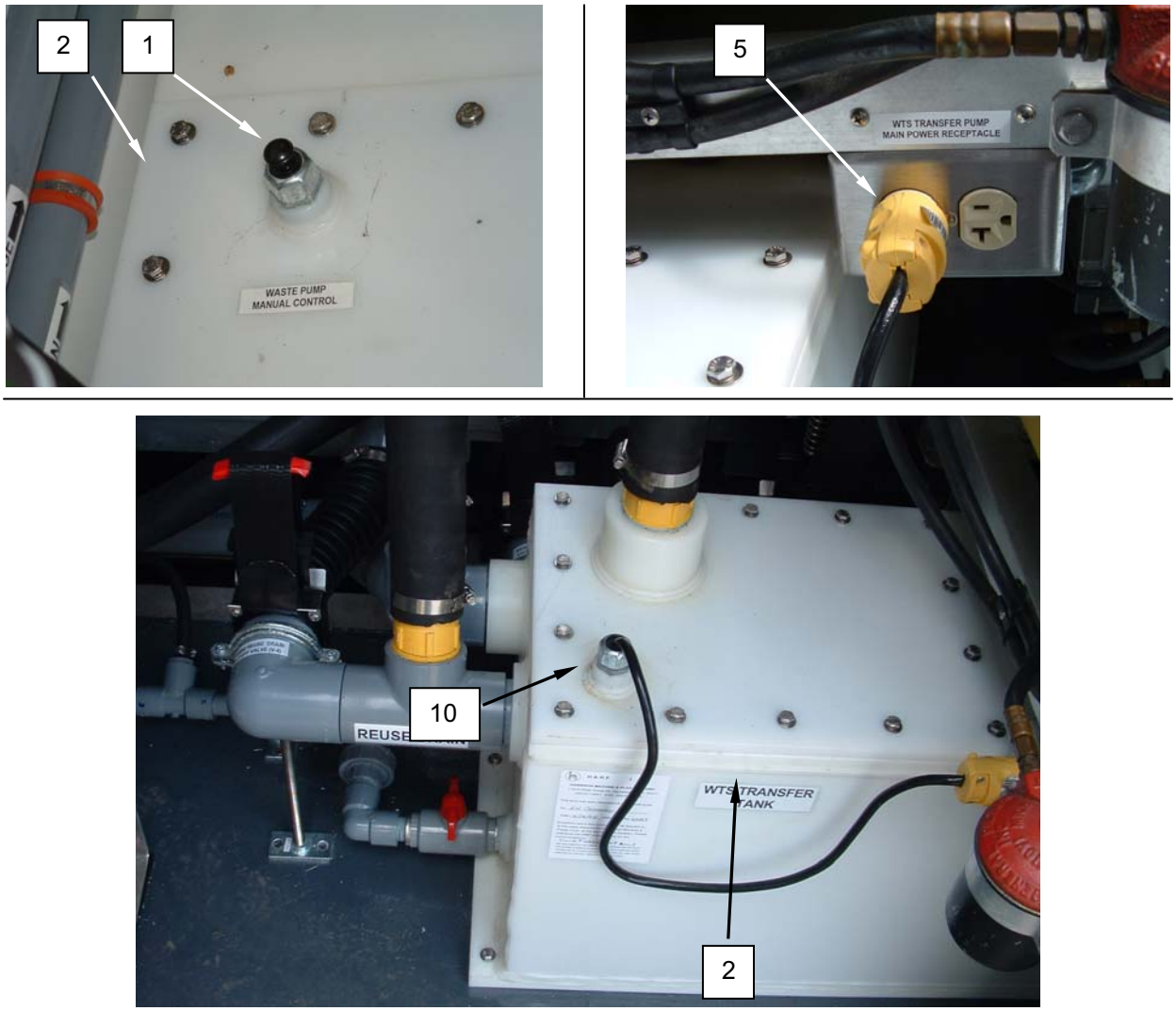


Figure 4. Replace the Drainage Tank Pump.

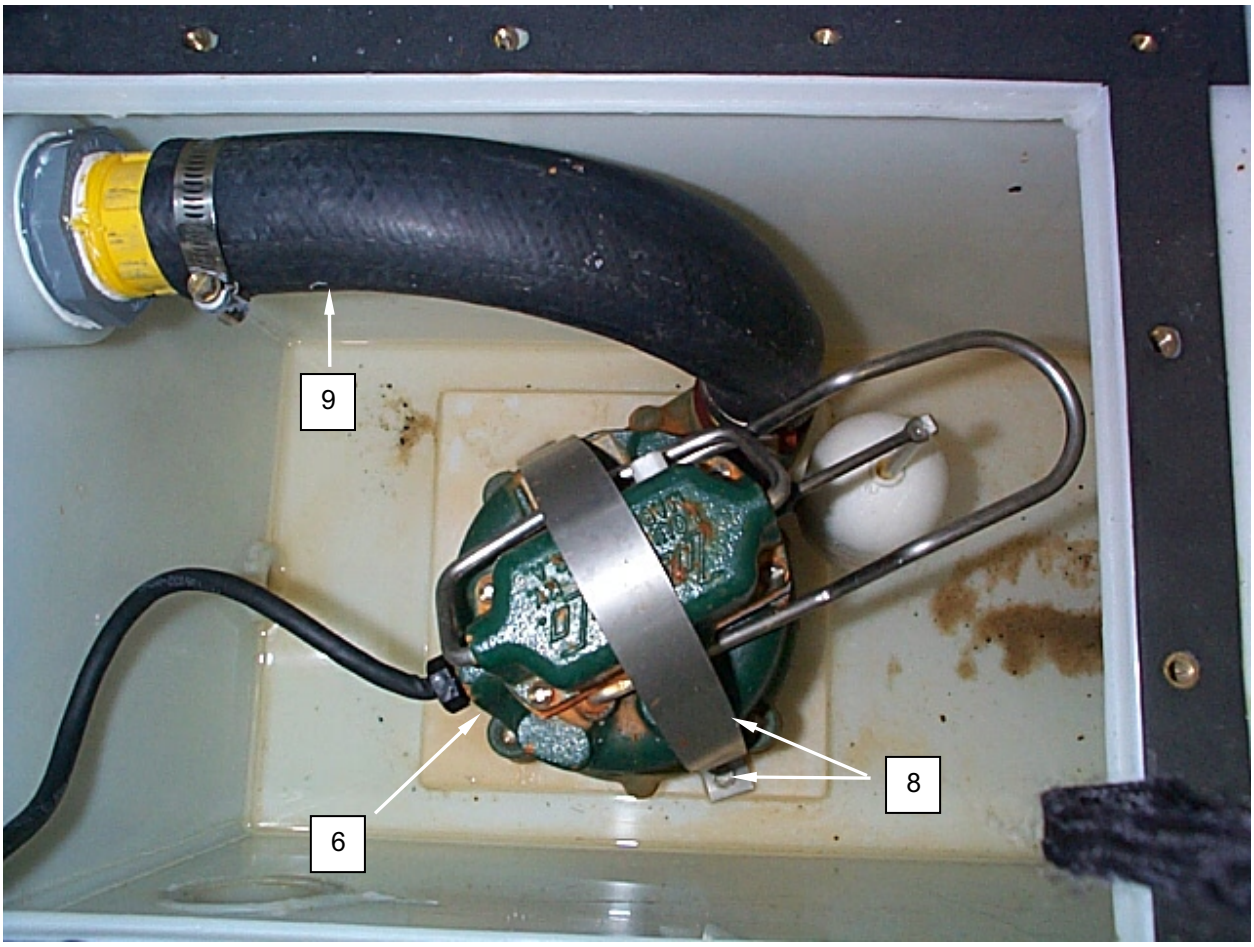


Figure 5. Replace the Drainage Tank Pump.

END OF WORK PACKAGE

UNIT MAINTENANCE
CONTAINERIZED BATCH LAUNDRY
NSN 3510-01-527-2209
NSN 3510-01-527-2210
PUMP/P1, WATER SOURCE
TEST, ADJUST

INITIAL SETUP

Tools
Shop Equipment, Automotive Maintenance and Repair: Organizational Maintenance, Common No.1 (WP 0086 00, Table 2, Item 5)

Materials/Parts
None Required

Personnel Required
Quartermaster and Chemical Equipment Repairer 63J (2)

Equipment Condition
CBL set up.

References
TB MED 577
TM 10-3510-226-10

TEST

Test the Pressure Switch and Pump

WARNING

Ensure that all electrical power is shut off and disconnected before proceeding. The circuit breaker box or individual circuit breaker should be locked and tagged out by personnel following this procedure. Remember that the CBL is a wet environment. Serious injury or death to personnel can result from electrocution if proper safety precautions are not observed.

1. Switch the P-1 Pump circuit breaker (No. 7 and 9) to OFF.
2. Loosen nut retaining pressure switch cover **(Figure 1, Item 1)** and remove cover.
3. Tag and disconnect motor wiring from pressure switch **(Figure 1, Item 2)**.
4. Use an ohmmeter to check for continuity across each leg of pressure switch **(Figure 1, Item 2)**. There should be 0 ohms resistance.
5. Depress switch actuator **(Figure 1, Item 3)** and check for continuity. There should be infinite resistance. Replace a pressure switch **(Figure 1, Item 2)** that fails either test.
6. Use an ohmmeter to check for 1.5 – 2.0 ohms resistance between motor leads.
7. Use an ohmmeter to test of infinite resistance between each motor lead and ground. Replace a motor **(Figure 1, Item 4)** that fails either test.
8. Reconnect motor wiring to switch **(Figure 1, Item 2)** as tagged.
9. Install pressure switch cover **(Figure 1, Item 1)** and retain with nut.
10. Reconnect power and monitor for normal operation.

TEST-CONTINUED

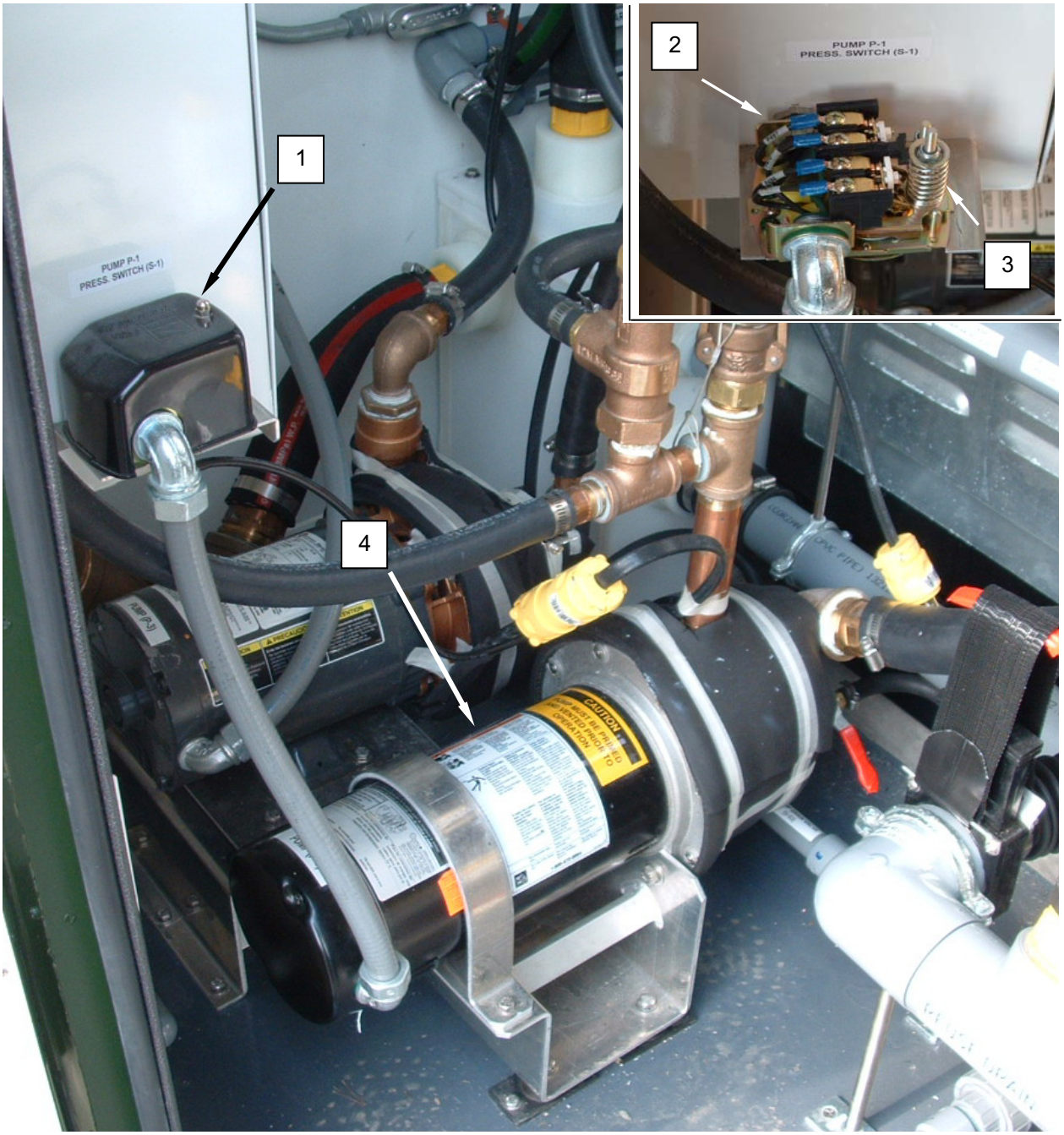


Figure 1. Test the Pressure Switch and Pump.

TEST-CONTINUED

Test the Pressure Relief Valve

WARNING

Ensure that all electrical power is shut off and disconnected before proceeding. The circuit breaker box or individual circuit breaker should be locked and tagged out by personnel following this procedure. Remember that the CBL is a wet environment. Serious injury or death to personnel can result from electrocution if proper safety precautions are not observed.

WARNING

Ensure graywater pipes have been sanitized IAW procedures contained in TB MED 577 before attempting any repairs. Failure to observe safety precautions may result in serious illness or death from biohazards.

1. Disconnect power from P-1 pump **(Figure 2, Item 5)**.
2. Loosen hose clamp retaining the pressure relief valve hose **(Figure 2, Item 6)** to the drain manifold **(Figure 2, Item 7)**, and disconnect pressure relief valve hose from drain manifold.
3. Place hose end **(Figure 2, Item 6)** in bucket.
4. Ensure water supply is on, connect power to P-1 pump **(Figure 2, Item 5)** and switch pump on.
5. Monitor hose discharge into bucket.
6. Adjust the valve **(Figure 2, Item 8)** that discharges water at operating pressures (30 to 60 psig).
7. Switch P-1 pump **(Figure 2, Item 5)** off and disconnect power.
8. Install pressure relief valve hose **(Figure 2, Item 6)** onto drain manifold **(Figure 2, Item 7)** and retain with hose clamp.
9. Operate CBL IAW procedures given in TM 10-3510-226-10 and monitor for leakage and normal operation.

TEST-CONTINUED

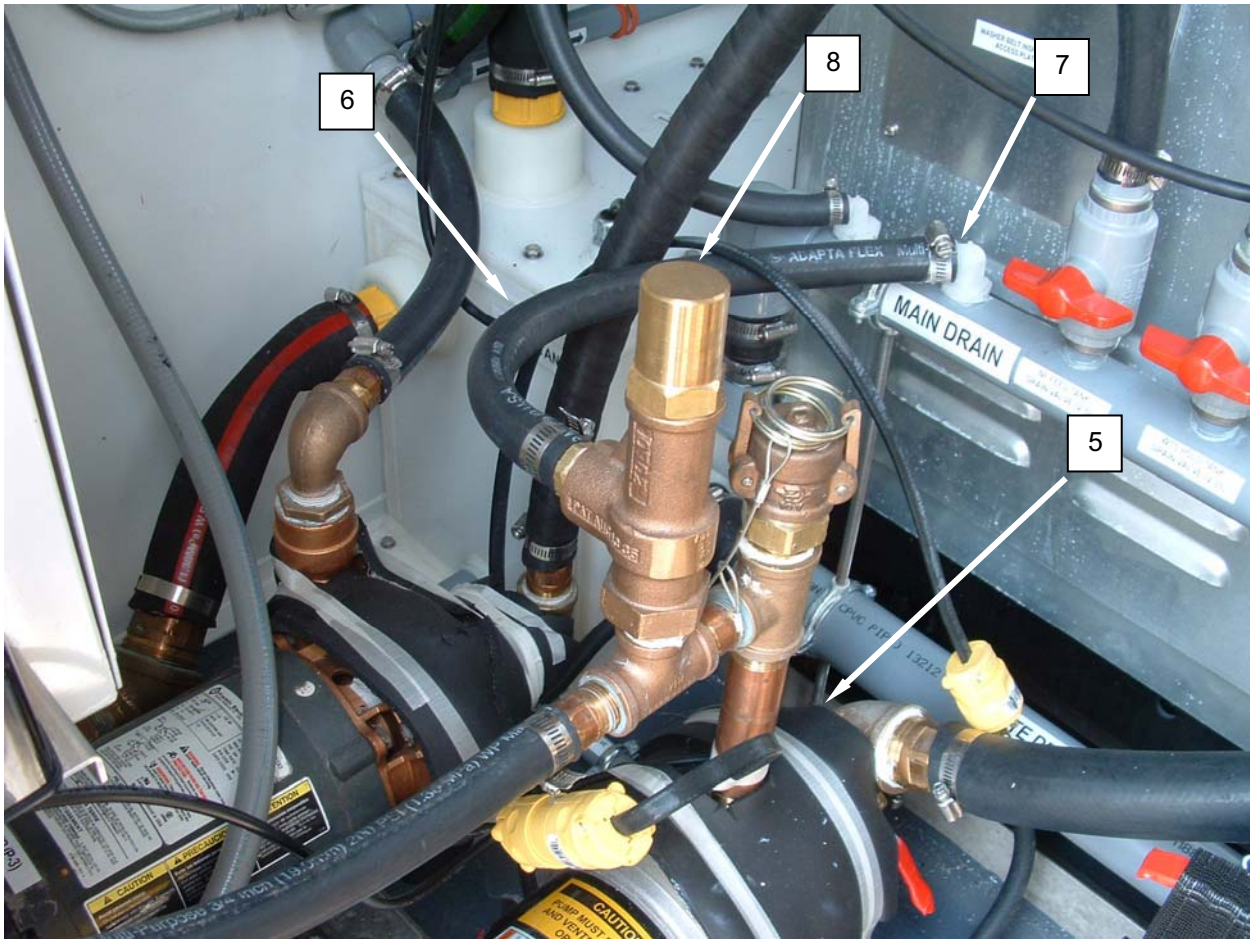


Figure 2. Test the Pressure Relief Valve.

ADJUST

Adjust the Pressure Switch

WARNING

This equipment operates at high voltages. Use extreme caution, observe all warnings, and follow all safety procedures. Failure to observe safety precautions may result in injury or death to personnel.

1. Loosen nut retaining pressure switch cover and remove cover.
2. Adjust the switch cut-in **(Figure 3, Item 9)** to 30 psi and cut-out **(Figure 3, Item 10)** to 60 psi. Have an assistant monitor system pressure at the PLC.
3. Install cover and retain with nut.
4. Monitor for normal operation.

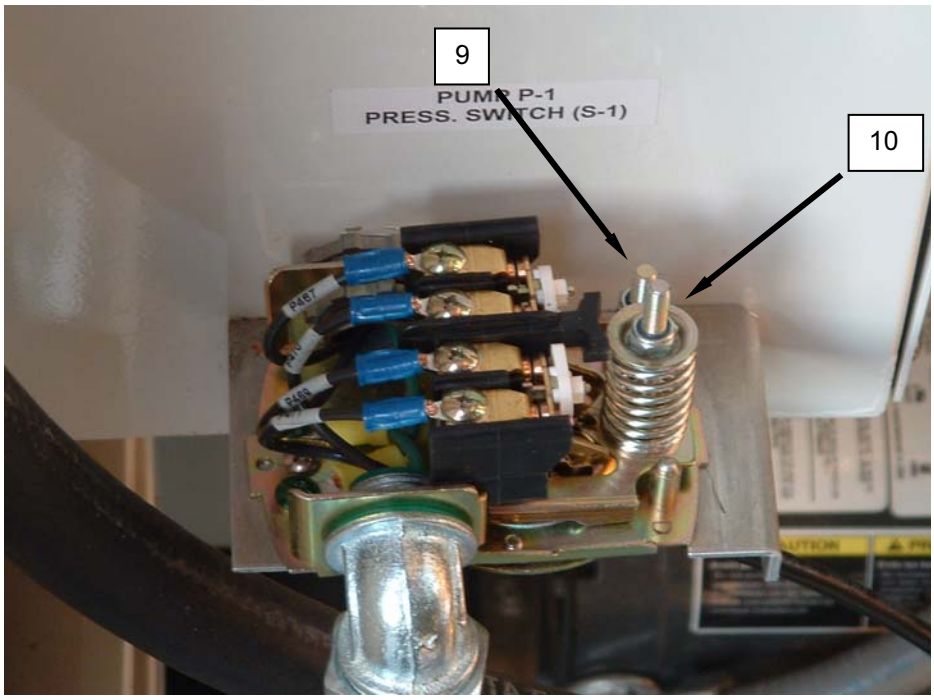


Figure 3. Adjust the Pressure Switch.

ADJUST-CONTINUED

Adjust the Pressure Relief Valve

NOTE

The system pressure may be monitored at the PLC.

1. Remove the cap **(Figure 4, Item 11)** from the pressure relief valve **(Figure 4, Item 8)**.
2. Loosen the locknut **(Figure 4, Item 12)**.
3. Turn the adjustment screw **(Figure 4, Item 13)** clockwise to increase relief pressure or counter-clockwise to decrease relief pressure.
4. Tighten the locknut **(Figure 4, Item 12)**, and install the pressure relief valve cap **(Figure 4, Item 11)**.

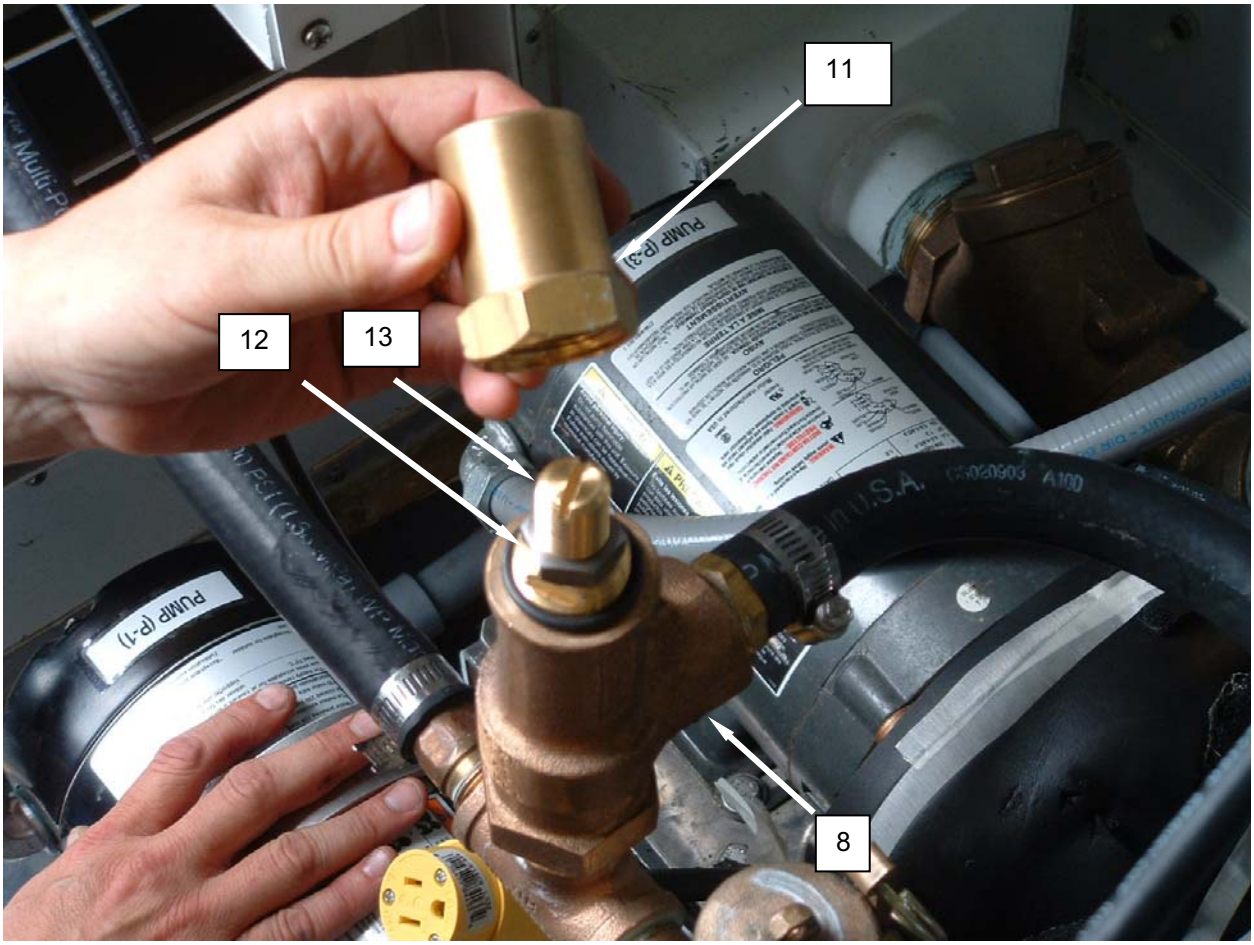
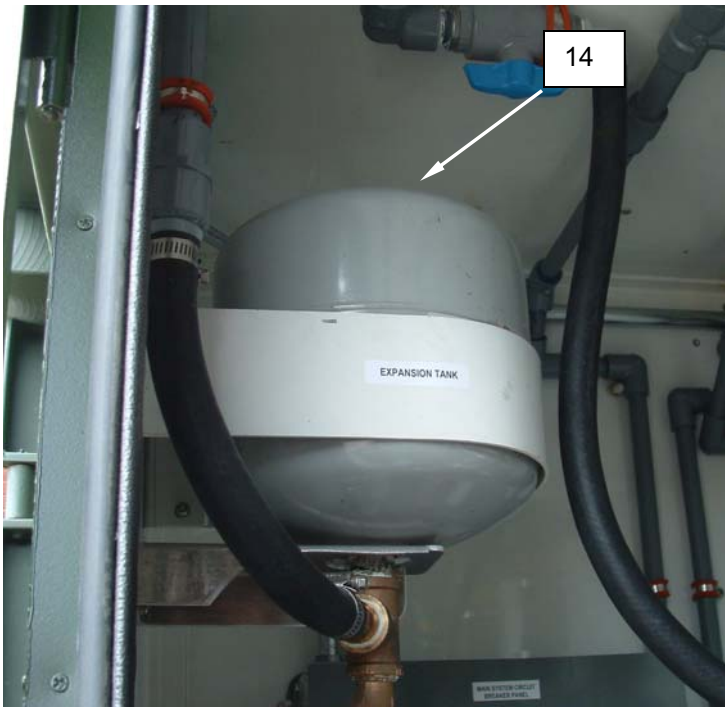


Figure 4. Adjust the Pressure Relief Valve.

ADJUST-CONTINUED

Adjust the Expansion Tank Head Pressure

Apply or release air pressure to the tank **(Figure 5, Item 14)** at the valve **(Figure 5, Item 8)** until a pressure of 25 - 30 psig is attained.



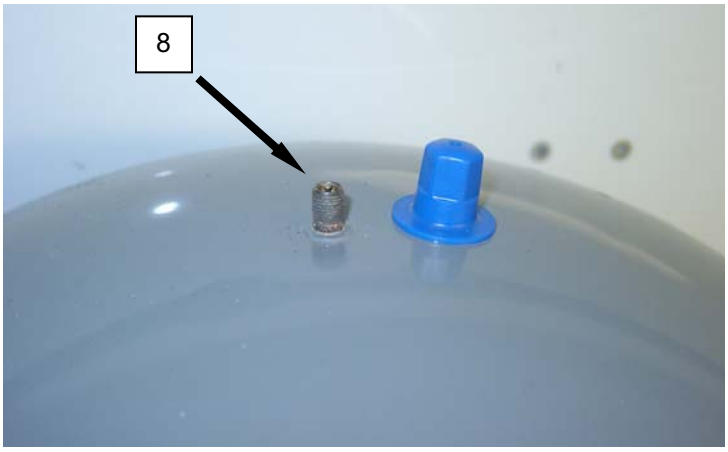


Figure 5. Adjust the Expansion Tank Head Pressure.

END OF WORK PACKAGE

UNIT MAINTENANCE
CONTAINERIZED BATCH LAUNDRY
NSN 3510-01-527-2209
NSN 3510-01-527-2210
PUMP/P1, WATER SOURCE
REPLACE

INITIAL SETUP

Tools
Shop Equipment, Automotive Maintenance and Repair: Organizational Maintenance, Common No.1 (WP 0086 00, Table 2, Item 5)

Materials/Parts
Compound, Sealer Pipe (WP 0087 00, Item 12)
Tape, Electrical Insulation (WP 0087 00, Item 52)
Wire Markers (WP 0087 00, Item 58)

Personnel Required
Quartermaster and Chemical Equipment Repairer 63J (2)

Equipment Condition
CBL set up.

References
TB MED 577
TM 10-3510-226-10

REPLACE

Replace the Pressure Switch

WARNING

Ensure that all electrical power is shut off and disconnected before proceeding. The circuit breaker box or individual circuit breaker should be locked and tagged out by personnel following this procedure. Remember that the CBL is a wet environment. Serious injury or death to personnel can result from electrocution if proper safety precautions are not observed.

1. Switch P-1 pump circuit breaker No. 7 and 9 to OFF.
2. Loosen nut retaining pressure switch cover **(Figure 1, Item 1)** and remove cover.

NOTE

It will be necessary to remove insulation from the pump to access the pressure line connection.

3. Remove pressure line connection **(Figure 1, Item 2)** from pump.
4. Tag and disconnect wiring from pressure switch **(Figure 1, Item 3)**.
5. Loosen and remove both conduit locknuts from switch **(Figure 1, Item 3)**.
6. Remove switch **(Figure 1, Item 3)** from conduits.
7. Install replacement switch **(Figure 1, Item 3)** onto conduits and retain with locknuts.
8. Connect wiring to replacement switch **(Figure 1, Item 3)** as tagged.

REPLACE-CONTINUED

CAUTION

Do not cross thread or overtighten pressure line connection on pump.

9. Connect replacement switch pressure line connection **(Figure 1, Item 2)** to pump.
10. Install cover **(Figure 1, Item 1)** and retain with nut.
11. Switch P-1 pump circuit breaker No. 7 and 9 to ON.
12. Operate IAW procedures given in TM 10-3510-226-10 and monitor for normal operation.
13. Adjust cut-in and cut-out as necessary.

REPLACE-CONTINUED

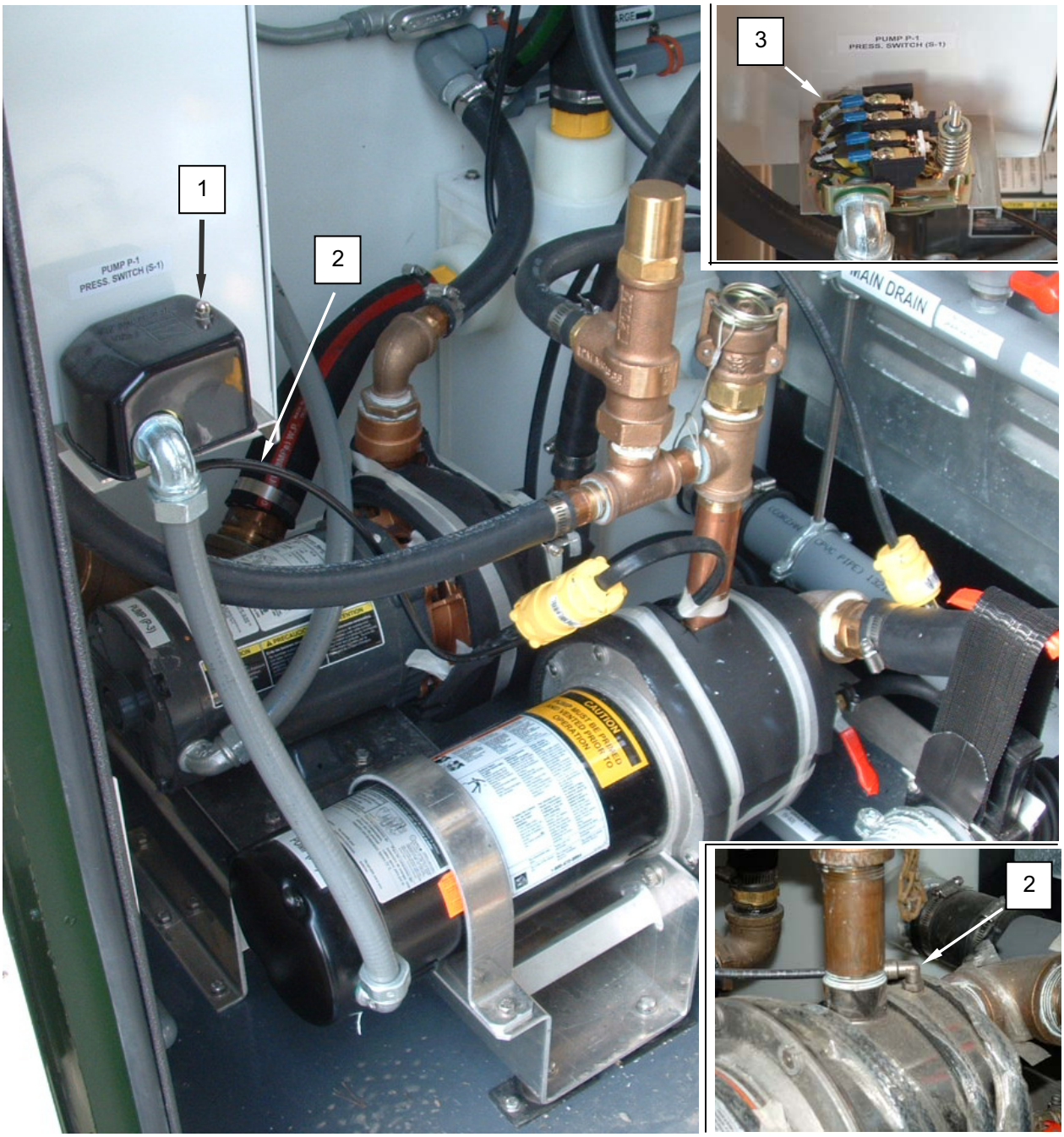


Figure 1. Replace the Pressure Switch.

REPLACE-CONTINUED

Replace the Pressure Relief Valve

WARNING

This component operates close to electrical equipment. Remember that the CBL is a wet environment. Use extreme caution, observe all warnings, and follow all safety procedures. Failure to observe safety precautions may result in injury or death to personnel.

WARNING

Ensure graywater pipes have been sanitized IAW procedures contained in TB MED 577 before attempting any repairs. Failure to observe safety precautions may result in serious illness or death from biohazards.

1. Switch P-1 pump circuit breaker No. 7 and 9 to OFF.
2. Relieve pressure from system, and open pump drain **(Figure 2, Item 4)**.
3. Loosen hose clamp retaining the pressure relief valve hose **(Figure 2, Item 5)** to the pressure relief valve **(Figure 2, Item 6)**.
4. Disconnect pressure relief valve hose **(Figure 2, Item 5)** from the pressure relief valve **(Figure 2, Item 6)**.
5. Make a note of the position of the pressure relief valve **(Figure 2, Item 6)**, use a pipe wrench to steady the attached pipe fittings, and remove the pressure relief valve.
6. Apply pipe sealer compound to the male threads of the replacement pressure relief valve **(Figure 2, Item 6)** or the attaching male pipe fittings or nipple.
7. Install the replacement pressure relief valve **(Figure 2, Item 6)**, ensuring the replacement valve is both tight and correctly aligned.
8. Install pressure relief valve hose **(Figure 2, Item 5)** onto pressure relief valve **(Figure 2, Item 6)** and retain with hose clamp.
9. Close pump drain **(Figure 2, Item 4)**.
10. Switch circuit breaker No. 7 and 9 to ON. Operate IAW procedures given in TM 10-3510-226-10 and monitor for normal operation.
11. Adjust pressure relief valve as necessary.

REPLACE-CONTINUED

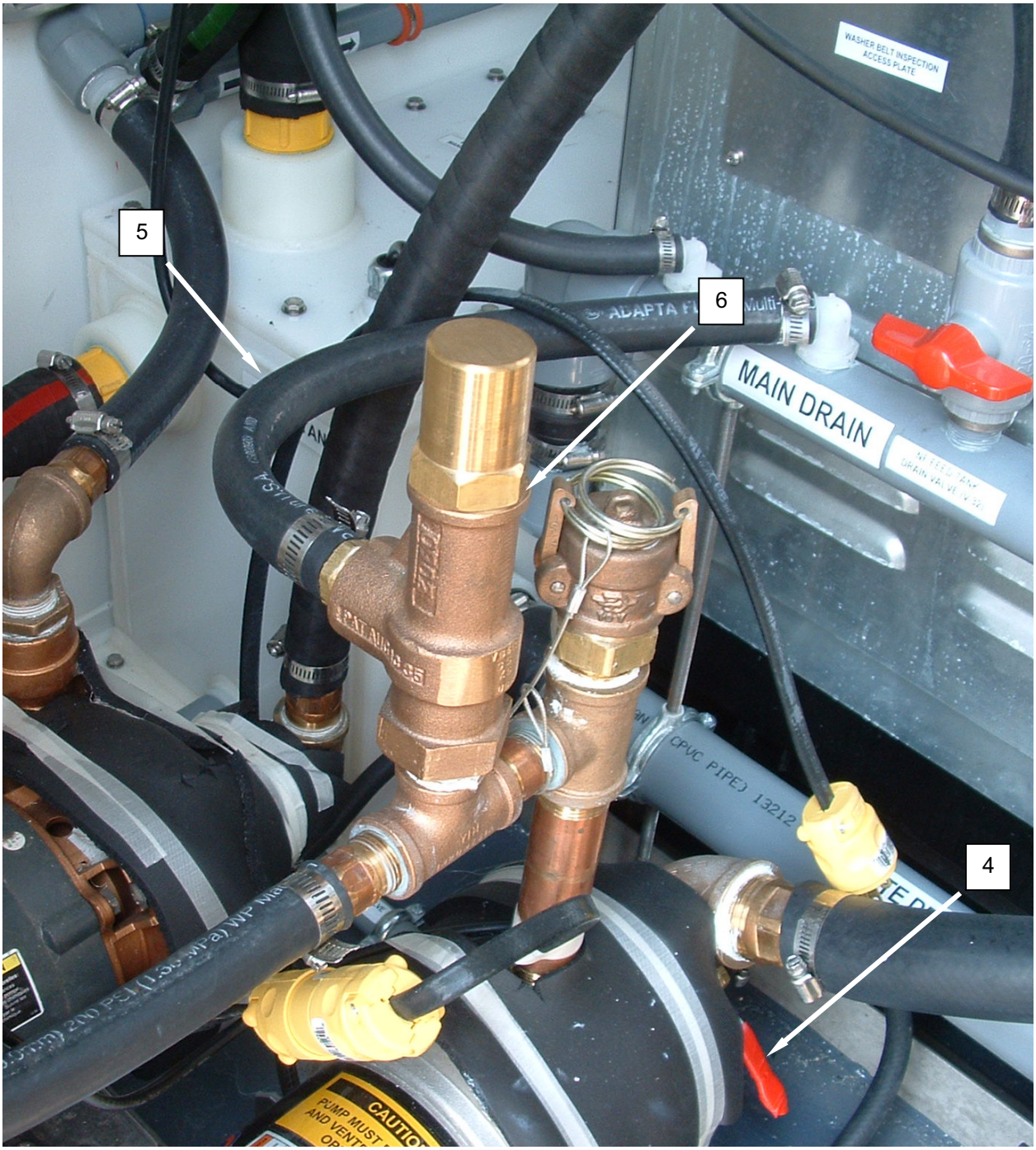


Figure 2. Replace the Pressure Relief Valve.

REPLACE-CONTINUED

Replace the Expansion Tank

WARNING

This component operates close to electrical equipment. Remember that the CBL is a wet environment. Use extreme caution, observe all warnings, and follow all safety procedures. Failure to observe safety precautions may result in injury or death to personnel.

CAUTION

Do not step on pump P-1 or P-3 when performing this maintenance task.

NOTE

A step aid may be necessary to perform this task.

1. Switch P-1 pump circuit breaker No. 7 and 9 to OFF.
2. Relieve pressure from system.
3. Tag and disconnect hoses **(Figure 3, Item 7)** from tank **(Figure 3, Item 8)**.
4. Remove screws retaining the tank mounting strap **(Figure 3, Item 9)** and the lower bracket **(Figure 3, Item 10)**.
5. Secure the tee fitting **(Figure 3, Item 11)** with a pipe wrench, and unscrew the tank **(Figure 3, Item 8)** from the tee fitting.
6. Apply pipe sealer compound to the threads on the replacement tank **(Figure 3, Item 8)** and screw the replacement tank into the tee fitting **(Figure 3, Item 11)**.
7. Ensure the tank **(Figure 3, Item 8)** is aligned so that the data decals are accessible.
8. Install the tank mounting strap **(Figure 3, Item 9)** and the lower bracket **(Figure 3, Item 10)**, and retain with screws.
9. Connect hoses **(Figure 3, Item 7)** to tank **(Figure 3, Item 8)** as tagged.
10. Fill system, connect power to the P1 pump, and monitor for normal operation.

REPLACE-CONTINUED

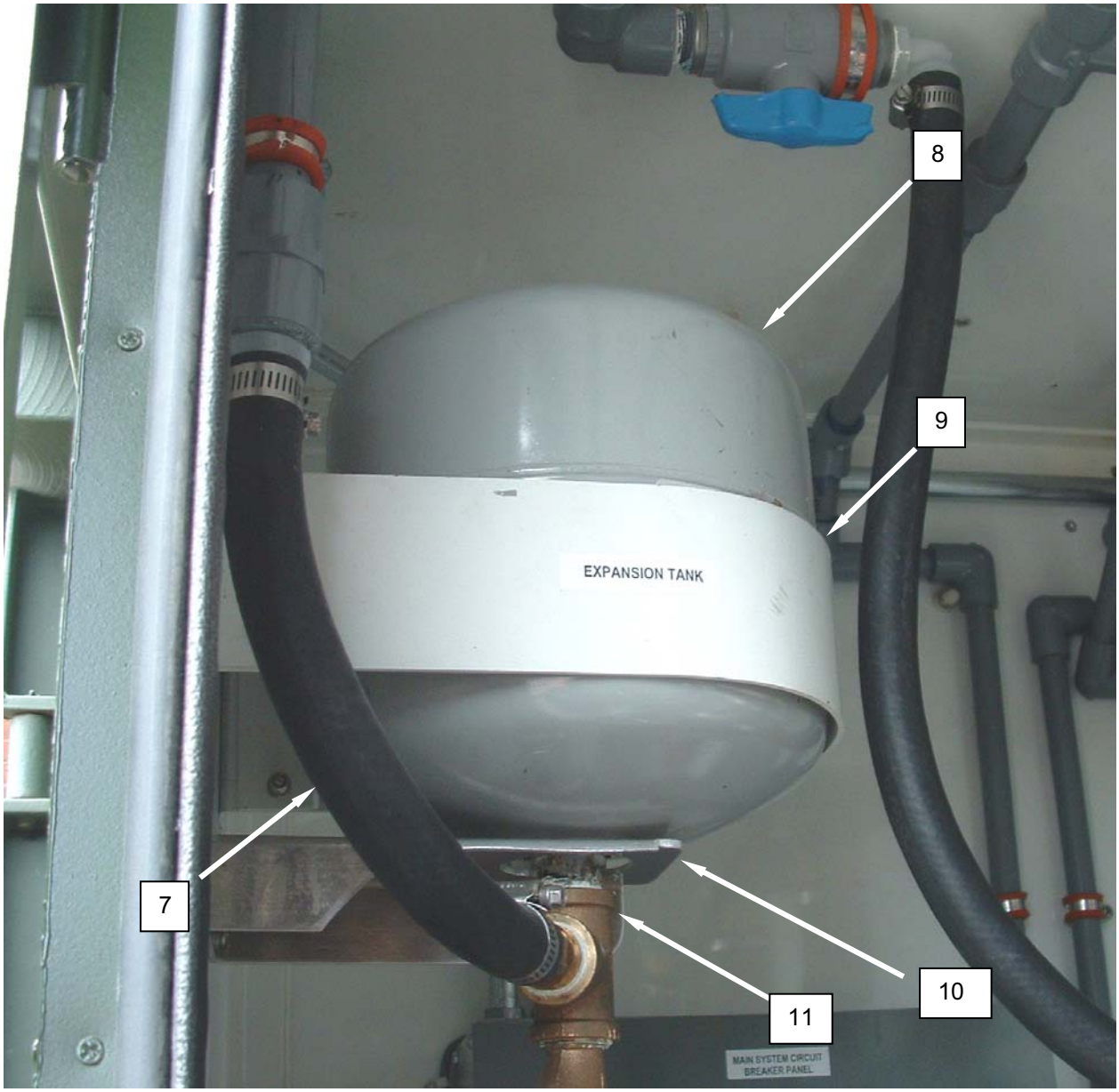


Figure 3. Replace the Expansion Tank.

REPLACE-CONTINUED

Replace the Pump Seal

WARNING

Ensure that all electrical power is shut off and disconnected before proceeding. The circuit breaker box or individual circuit breaker should be locked and tagged out by personnel following this procedure. Remember that the CBL is a wet environment. Serious injury or death to personnel can result from electrocution if proper safety precautions are not observed.

1. Switch P-1 pump circuit breaker No. 7 and 9 to OFF.
2. Open P-1 pump drain valve **(Figure 4, Item 12)** and allow pump to drain
3. Remove all insulation from pump, and remove heat trace.
4. Loosen hose clamp retaining discharge hose **(Figure 4, Item 13)** and remove hose.
5. Loosen hose clamp retaining pressure relief valve hose **(Figure 4, Item 5)**, and remove hose.
6. Loosen hose clamp retaining drain hose **(Figure 4, Item 14)** and remove hose.
7. Loosen hose clamp retaining pump suction hose **(Figure 4, Item 15)** and remove hose.
8. Loosen compression nut retaining pressure switch tubing **(Figure 4, Item 16)** to pump casing **(Figure 4, Item 17)**, and remove tubing.
9. Remove the screws retaining the pump end cover **(Figure 4, Item 18)**, and remove the pump end cover.

REPLACE-CONTINUED

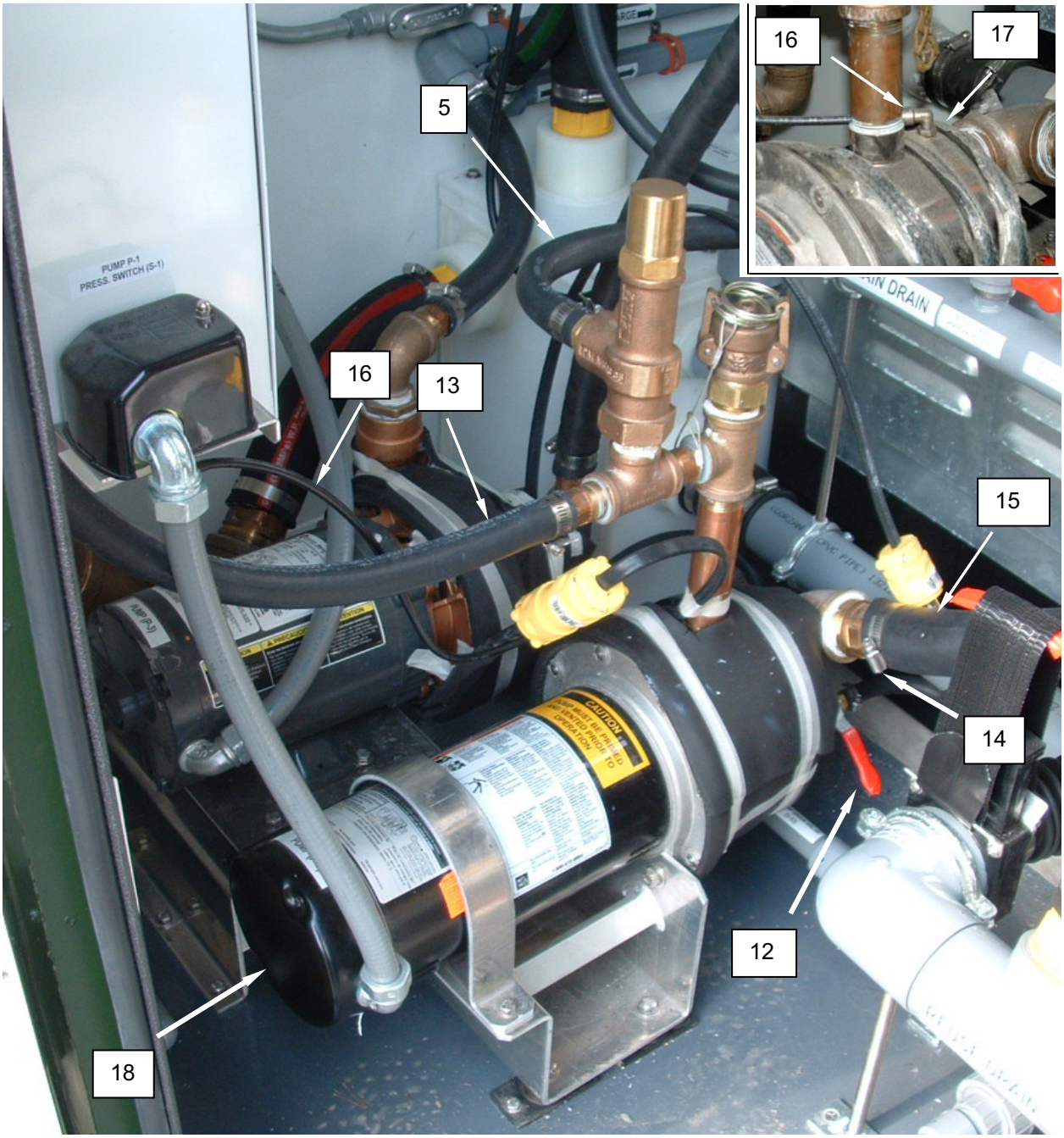


Figure 4. Replace the Pump Seal.

REPLACE-CONTINUED

WARNING

Always discharge the pump motor capacitor before attempting any maintenance procedures. Serious injury or death to personnel can result from electrocution if proper safety precautions are not observed.

NOTE

It may be necessary to dismount the pump motor capacitor in order to access the shaft.

10. Place a wrench on the flats of the shaft **(Figure 5, Item 19)**.

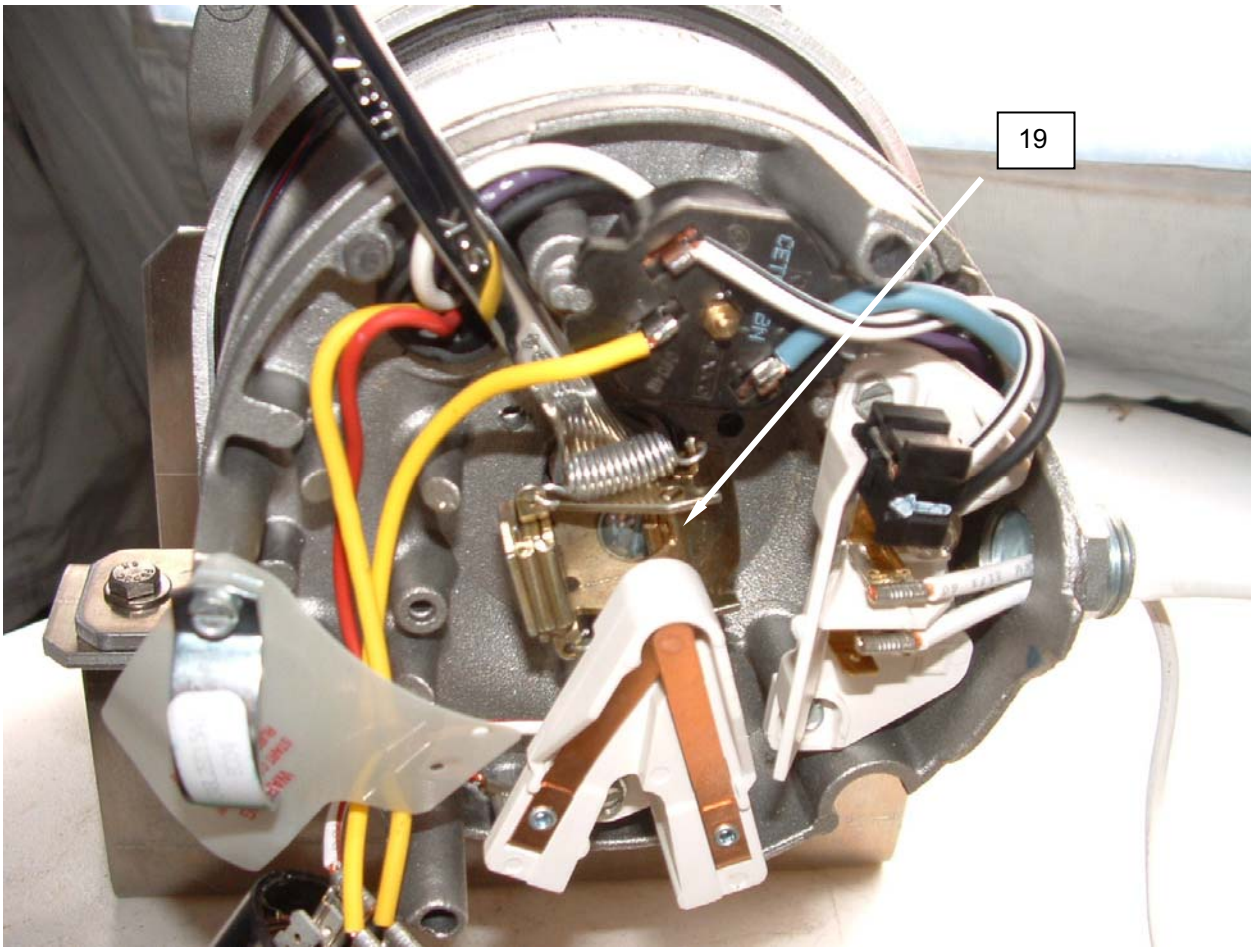


Figure 5. Replace the Pump Seal.

REPLACE-CONTINUED

11. Use a wrench to remove the screws retaining the pump casing **(Figure 6, Item 17)**, and remove the pump casing.
12. Remove the impellor **(Figure 6, Item 20)** by unscrewing the impellor from the shaft **(Figure 6, Item 19)**.
13. Remove the seal face **(Figure 6, Item 21)** from the shaft **(Figure 6, Item 19)**.
14. Remove the stationary seal face **(Figure 6, Item 22)** from the seal plate **(Figure 6, Item 23)**.
15. Install the replacement stationary seal face **(Figure 6, Item 22)** into the seal plate **(Figure 6, Item 23)**.
16. Install the replacement seal face **(Figure 6, Item 21)** onto the shaft **(Figure 6, Item 19)**.
17. Install the impellor **(Figure 6, Item 20)**.
18. Install the pump casing **(Figure 6, Item 17)** and retain with screws.

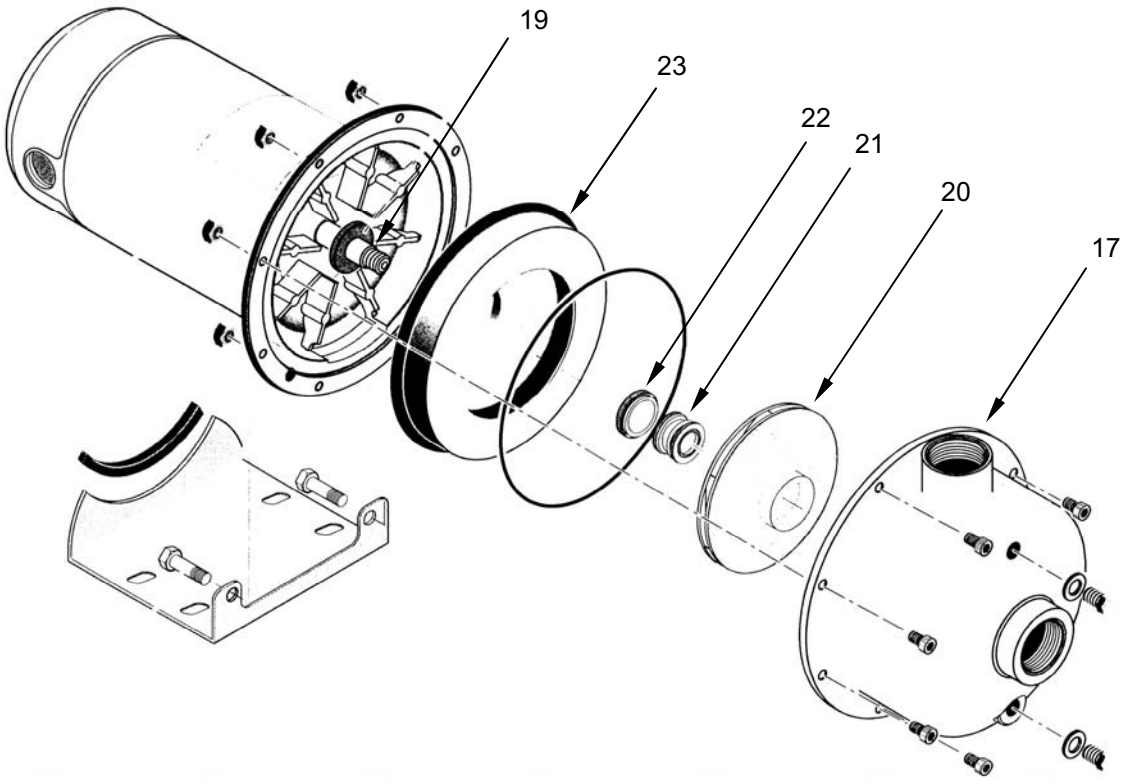


Figure 6. Replace the Pump Seal.

REPLACE-CONTINUED

CAUTION

Do not over tighten the pressure switch tubing compression nut. Over tightening the pressure switch will strip it. Failure to comply may result in damage to component.

19. Install the pressure switch tubing **(Figure 7, Item 16)** onto the pump casing **(Figure 7, Item 17)** and retain with compression nut.

20. Install the drain hose **(Figure 7, Item 14)** onto the pump casing **(Figure 7, Item 17)** and retain with hose clamp.

21. Install the pump suction hose **(Figure 7, Item 15)** onto the hose barb and retain with hose clamp.

22. Install the pressure relief valve hose **(Figure 7, Item 5)** and retain with hose clamp.

23. Install the discharge hose **(Figure 7, Item 13)** and retain with hose clamp.

24. Install heat trace, and recover pump with insulation.

25. Close pump drain valve **(Figure 7, Item 24)**. Operate IAW procedures given in TM 10-3510-226-10 and monitor for normal operation.

REPLACE-CONTINUED

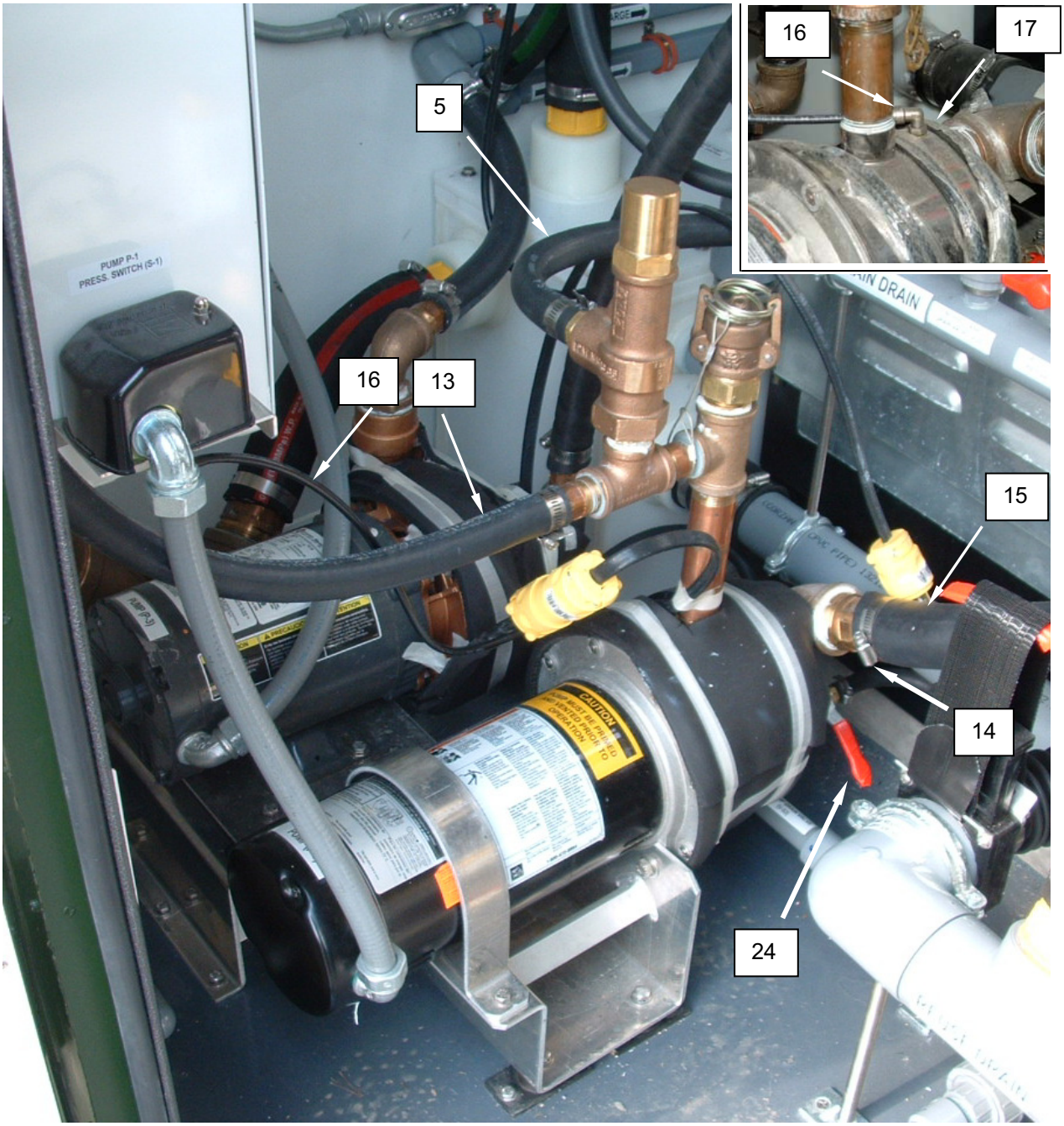


Figure 7. Replace the Pump Seal.

REPLACE-CONTINUED

Replace the Pump Impellor

WARNING

Ensure that all electrical power is shut off and disconnected before proceeding. The circuit breaker box or individual circuit breaker should be locked and tagged out by personnel following this procedure. Remember that the CBL is a wet environment. Serious injury or death to personnel can result from electrocution if proper safety precautions are not observed.

NOTE

The impellor may also be accessed by removing the pump motor from the pump casing.

1. Switch P-1 pump circuit breaker No. 7 and 9 to OFF.
2. Open P-1 pump drain valve **(Figure 8, Item 24)** and allow pump to drain
3. Remove all insulation from pump, and remove heat trace.
4. Loosen hose clamp retaining discharge hose **(Figure 8, Item 13)**, and remove hose.
5. Loosen hose clamp retaining pressure relief valve hose **(Figure 8, Item 5)**, and remove hose.
6. Loosen hose clamp retaining drain hose **(Figure 8, Item 14)**, and remove hose.
7. Loosen hose clamp retaining pump suction hose **(Figure 8, Item 15)**, and remove hose.
8. Loosen compression nut retaining pressure switch tubing **(Figure 8, Item 16)** to pump casing **(Figure 8, Item 17)**, and remove tubing.
9. Remove the screws retaining the pump end cover **(Figure 8, Item 18)**, and remove the pump end cover.

REPLACE-CONTINUED

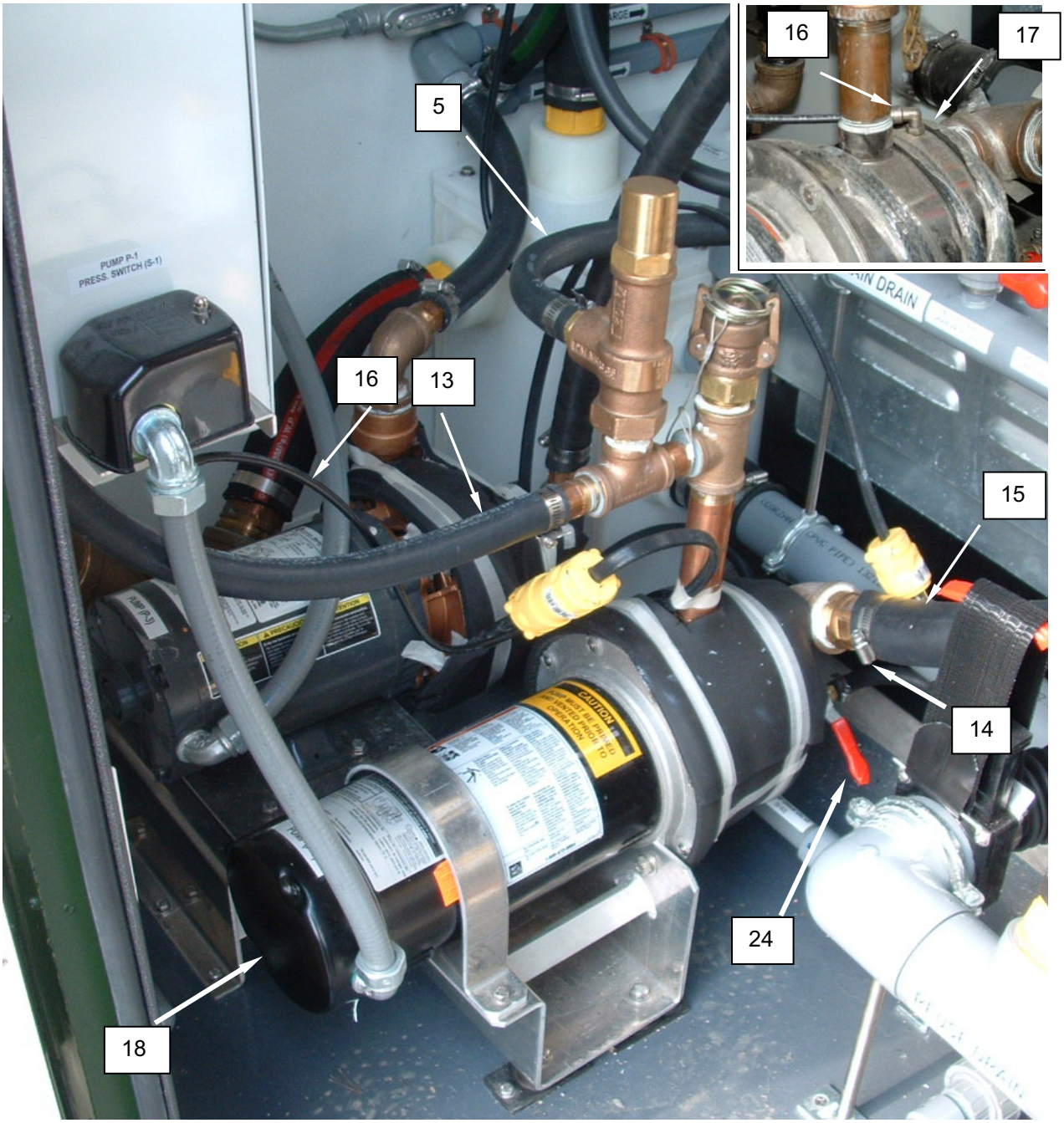


Figure 8. Replace the Pump Impellor.

REPLACE-CONTINUED

WARNING

Always discharge the pump motor capacitor before attempting any maintenance procedures. Serious injury or death to personnel can result from electrocution if proper safety precautions are not observed.

NOTE

It may be necessary to dismount the pump motor capacitor in order to access the shaft.

10. Place a wrench on the flats of the shaft **(Figure 9, Item 19)**.

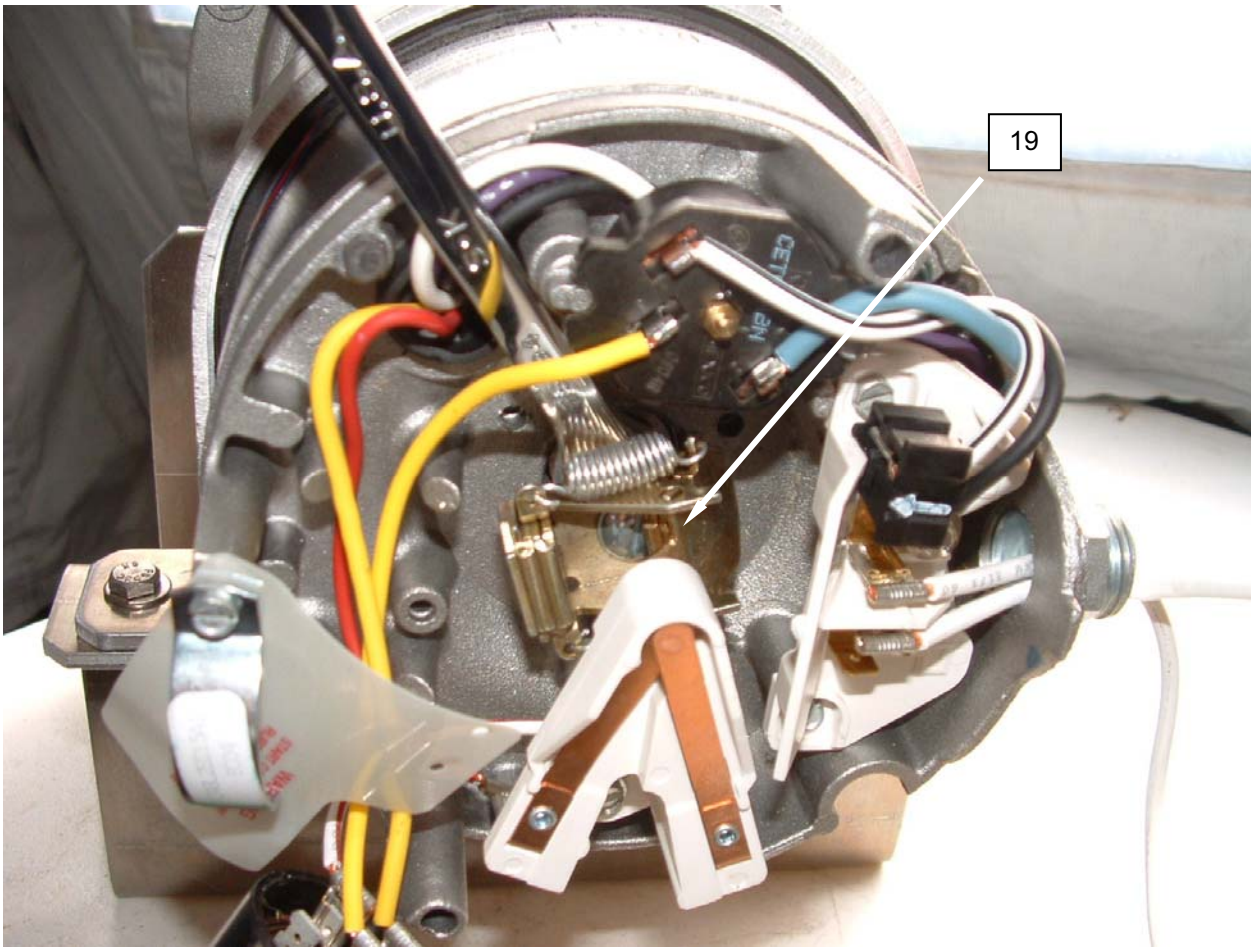


Figure 9. Replace the Pump Impellor.

REPLACE-CONTINUED

11. Use a wrench to remove the screws retaining the pump casing **(Figure 10, Item 17)**, and remove the pump casing.

12. Remove the impellor **(Figure 10, Item 20)** by unscrewing the impellor from the shaft **(Figure 10, Item 19)**.

13. Install the replacement impellor **(Figure 10, Item 20)** and retain with screw.

14. Install the pump casing **(Figure 10, Item 17)** and retain with screws.

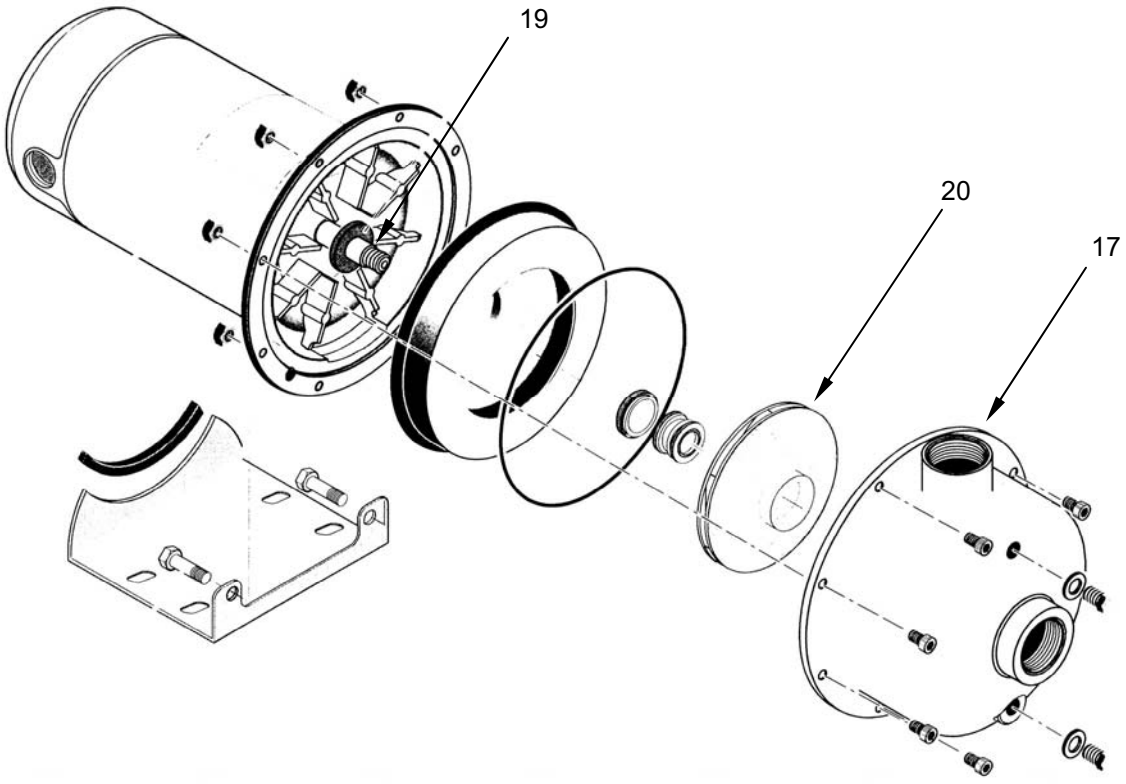


Figure 10. Replace the Pump Impellor.

REPLACE-CONTINUED

CAUTION

Do not over tighten the pressure switch tubing compression nut. Over tightening the pressure switch will strip it. Failure to comply may result in damage to component.

15. Install the pressure switch tubing **(Figure 11, Item 16)** onto the pump casing **(Figure 11, Item 17)** and retain with compression nut.
16. Install the drain hose **(Figure 11, Item 14)** onto the pump casing **(Figure 11, Item 17)** and retain with hose clamp.
17. Install the pump suction hose **(Figure 11, Item 15)** onto the hose barb and retain with hose clamp.
18. Install the pressure relief valve hose **(Figure 11, Item 5)** and retain with hose clamp.
19. Install the discharge hose **(Figure 11, Item 13)** and retain with hose clamp.
20. Install heat trace, and recover pump with insulation.
21. Close pump drain valve **(Figure 11, Item 24)**. Operate IAW procedures given in TM 10-3510-226-10 and monitor for normal operation.

REPLACE-CONTINUED

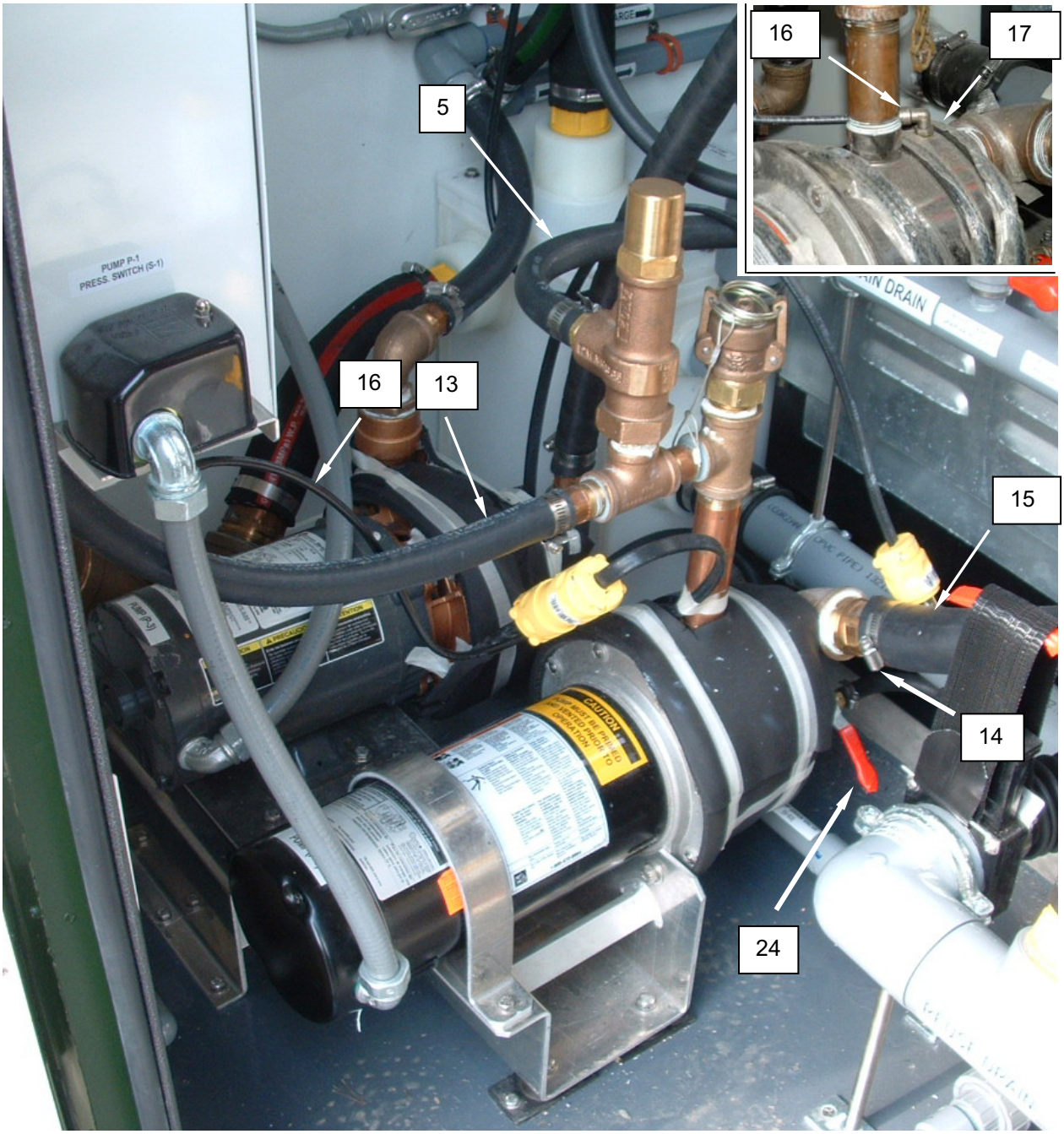


Figure 11. Replace the Pump Impellor.

REPLACE-CONTINUED

Replace the Pump Motor

WARNING

Ensure that all electrical power is shut off and disconnected before proceeding. The circuit breaker box or individual circuit breaker should be locked and tagged out by personnel following this procedure. Remember that the CBL is a wet environment. Serious injury or death to personnel can result from electrocution if proper safety precautions are not observed.

1. Switch P-1 pump circuit breaker No. 7 and 9 to OFF.
2. Open P-1 pump drain valve **(Figure 12, Item 24)** and allow pump to drain
3. Remove all insulation from pump, and remove heat trace.
4. Loosen hose clamp retaining discharge hose **(Figure 12, Item 13)**, and remove hose.
5. Loosen hose clamp retaining pressure relief valve hose **(Figure 12, Item 5)**, and remove hose.
6. Loosen hose clamp retaining drain hose **(Figure 12, Item 14)**, and remove hose.
7. Loosen hose clamp retaining pump suction hose **(Figure 12, Item 15)**, and remove hose.
8. Loosen compression nut retaining pressure switch tubing **(Figure 12, Item 16)** to pump casing **(Figure 12, Item 17)**, and remove tubing.
9. Remove the screws retaining the pump end cover **(Figure 12, Item 18)**, and remove the pump end cover.

REPLACE-CONTINUED

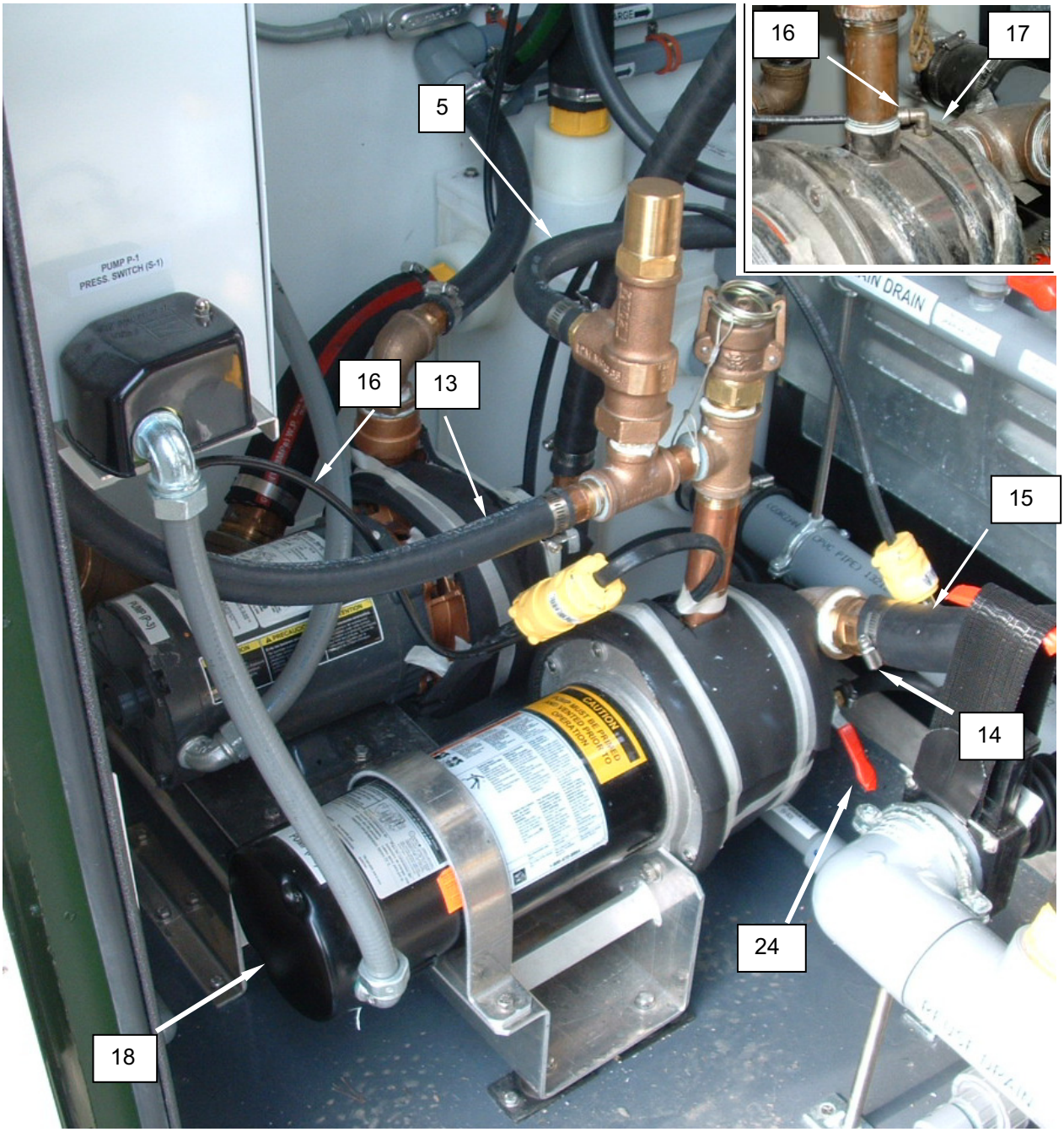


Figure 12. Replace the Pump Motor.

REPLACE-CONTINUED

WARNING

Always discharge the pump motor capacitor before attempting any maintenance procedures. Serious injury or death to personnel can result from electrocution if proper safety precautions are not observed.

NOTE

It may be necessary to dismount the pump motor capacitor in order to access the shaft.

10. Tag and disconnect wiring from pump motor **(Figure 13, Item 25)**, and remove conduit elbow **(Figure 13, Item 26)**.

11. Install conduit elbow **(Figure 13, Item 26)** onto replacement pump motor **(Figure 13, Item 25)**, and connect wiring to motor as tagged.

12. Place a wrench on the flats of the shaft **(Figure 13, Item 19)** of inoperative motor.

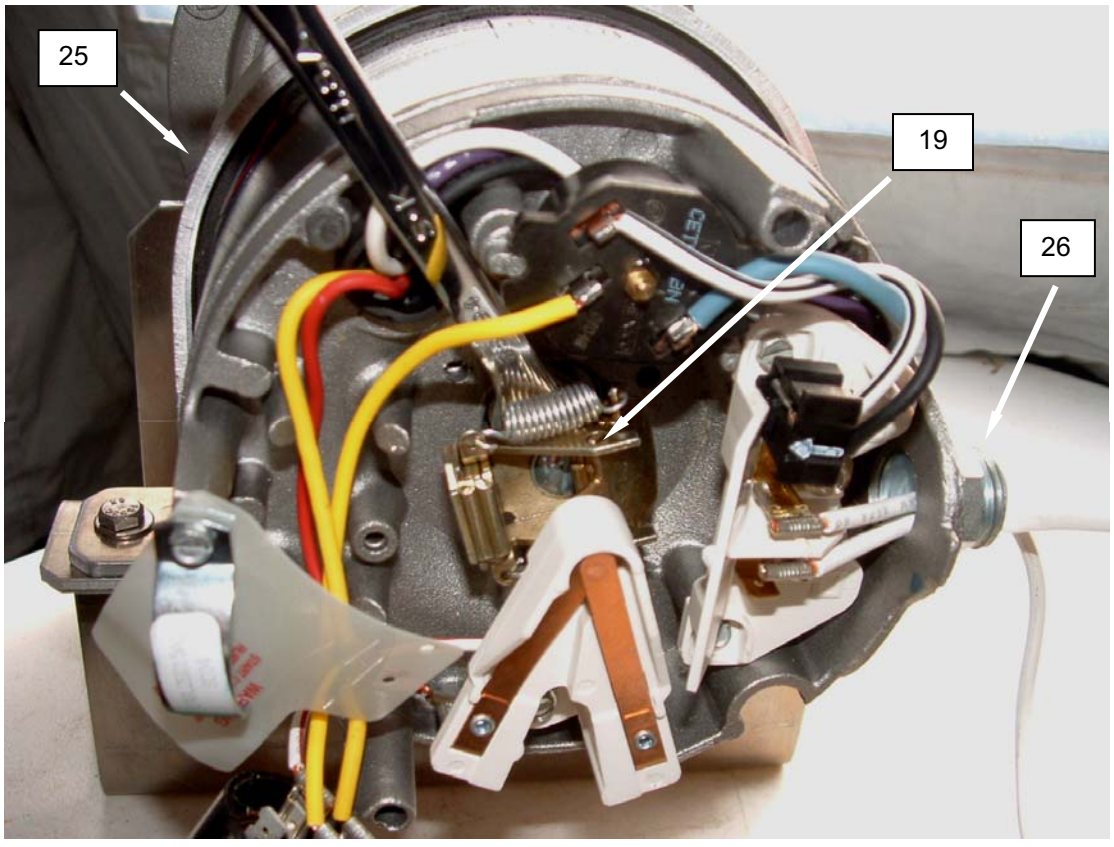


Figure 13. Replace the Pump Motor.

REPLACE-CONTINUED

13. Use a wrench to remove the screws retaining the pump casing **(Figure 14, Item 17)**, and remove the pump casing.

14. Remove the impellor **(Figure 14, Item 20)** by unscrewing the impellor from the shaft **(Figure 14, Item 19)**.

15. Remove the spring and seal face **(Figure 14, Item 21)** from the shaft **(Figure 14, Item 19)**.

16. Remove machine screws retaining motor **(Figure 14, Item 25)** to seal plate **(Figure 14, Item 23)**, and remove motor.

17. Install replacement motor **(Figure 14, Item 25)** onto seal plate **(Figure 14, Item 23)**, and retain with machine screws.

18. Install the replacement impellor **(Figure 14, Item 20)** and retain with screw.

19. Install the pump casing **(Figure 14, Item 17)** and retain with screws.

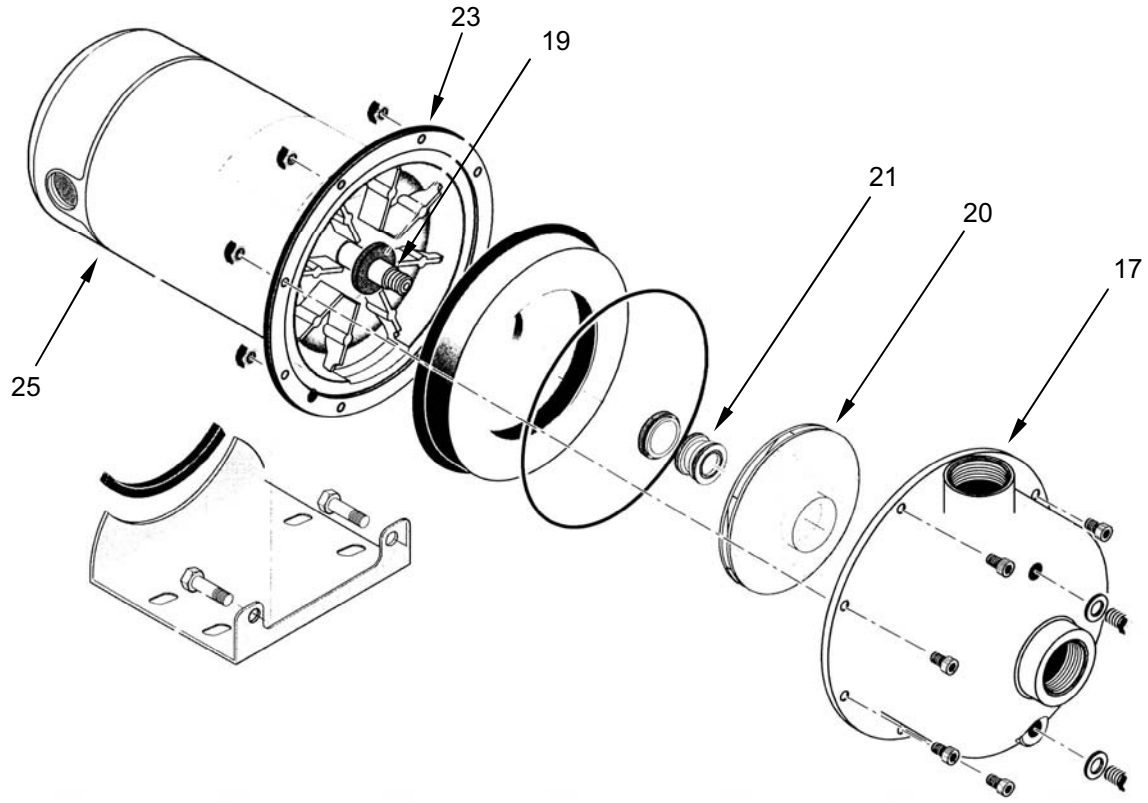


Figure 14. Replace the Pump Motor.

REPLACE-CONTINUED

20. Install the pressure switch tubing **(Figure 15, Item 16)** onto the pump casing **(Figure 15, Item 17)** and retain with compression nut.
21. Install the pump suction hose **(Figure 15, Item 15)** onto the hose barb and retain with hose clamp.
22. Install the pressure relief valve hose **(Figure 15, Item 5)** and retain with hose clamp.
23. Install the discharge hose **(Figure 15, Item 13)** and retain with hose clamp.
24. Install the motor mounting strap **(Figure 15, Item 27)** and retain with screw and nuts.
25. Install heat trace, and recover pump with insulation.
26. Close pump drain valve **(Figure 15, Item 24)**. Operate IAW procedures given in TM 10-3510-226-10 and monitor for normal operation.

REPLACE-CONTINUED

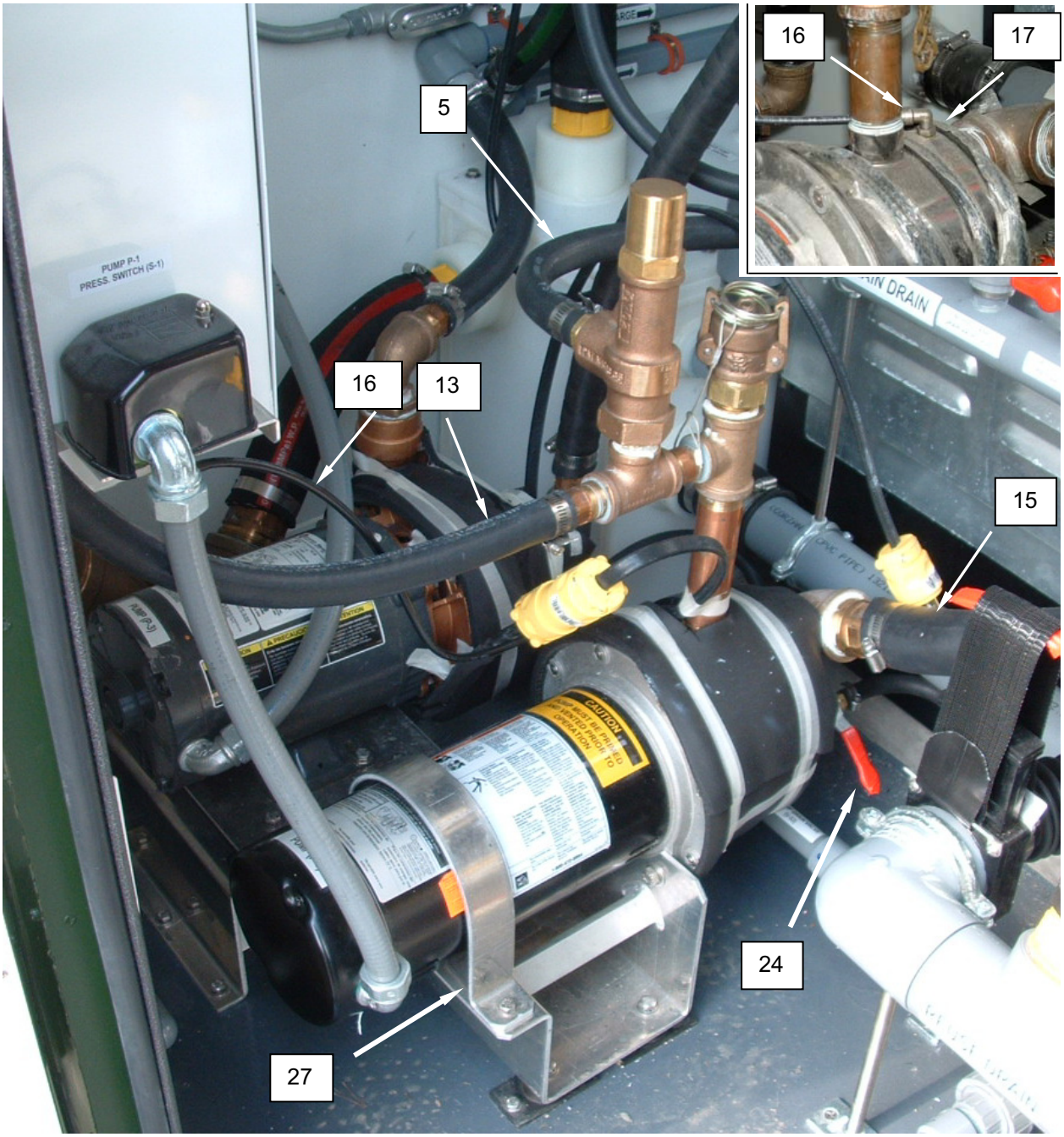


Figure 15. Replace the Pump Motor.

REPLACE-CONTINUED

Replace the P-1 Pump Assembly

WARNING

Ensure that all electrical power is shut off and disconnected before proceeding. The circuit breaker box or individual circuit breaker should be locked and tagged out by personnel following this procedure. Remember that the CBL is a wet environment. Serious injury or death to personnel can result from electrocution if proper safety precautions are not observed.

1. Switch P-1 pump circuit breaker No. 7 and 9 to OFF.
2. Remove insulation and heat tape.
3. Remove screws retaining pump end cover **(Figure 16, Item 18)** and remove end cover.
4. Tag and disconnect pump wiring.
5. Remove conduit locknut, and remove conduit **(Figure 16, Item 28)** from pump.
6. Loosen hose clamp retaining discharge hose **(Figure 16, Item 13)** and remove hose.
7. Loosen hose clamp retaining pressure relief valve hose **(Figure 16, Item 5)**, and remove hose.
8. Loosen hose clamp retaining drain hose **(Figure 16, Item 14)** and remove hose.
9. Loosen hose clamp retaining pump suction hose **(Figure 16, Item 16)** and remove hose.
10. Loosen compression nut retaining pressure switch tubing **(Figure 16, Item 16)** to pump casing **(Figure 16, Item 17)** and remove tubing.
11. Mark alignment of discharge fittings, including pressure relief valve **(Figure 16, Item 6)**, and use a pipe wrench to unscrew fittings as an assembly.
12. Mark alignment of pump drain fittings **(Figure 16, Item 29)** and use a pipe wrench to unscrew fittings from pump housing as an assembly.
13. Mark alignment of pump suction fittings **(Figure 16, Item 30)** and use a pipe wrench to unscrew fittings from pump housing as an assembly.
14. Remove nuts and bolts retaining motor mounting strap **(Figure 16, Item 27)** and remove strap.
15. Remove machine screws **(Figure 16, Item 31)** retaining pump assembly **(Figure 16, Item 32)** to mount.
16. Remove pump assembly **(Figure 16, Item 32)**.
17. Install replacement pump assembly **(Figure 16, Item 32)**.
18. Remove any plugs as necessary to install fittings.
19. Install machine screws **(Figure 16, Item 31)** to retain pump assembly **(Figure 16, Item 32)** to mount.

REPLACE-CONTINUED

20. Install mounting strap **(Figure 16, Item 27)** and retain with nuts and bolts.

21. Apply pipe sealant to threads of suction fittings **(Figure 16, Item 30)** and install as an assembly. Ensure fittings are aligned correctly.

22. Apply pipe sealant to threads of pump drain fittings **(Figure 16, Item 29)** and install as an assembly. Ensure fittings are aligned correctly.

23. Apply pipe sealant to threads of discharge fittings, including pressure relief valve **(Figure 16, Item 6)**, and install as an assembly. Ensure fittings are aligned correctly.

24. Install pressure switch tubing **(Figure 16, Item 16)** and retain with compression nut.

25. Install suction hose **(Figure 16, Item 15)** and retain with hose clamp.

26. Install pump drain hose **(Figure 16, Item 14)** and retain with hose clamp.

27. Install pump pressure relief valve hose **(Figure 16, Item 5)** and retain with hose clamp.

28. Install pump discharge hose **(Figure 16, Item 13)** and retain with hose clamp.

29. Remove pump end cover **(Figure 16, Item 18)** from replacement motor.

30. Install pump motor conduit **(Figure 16, Item 28)** onto replacement motor and retain with locknut.

31. Connect pump motor wiring as tagged.

32. Install pump end cover **(Figure 16, Item 18)** and retain with screws.

33. Install insulation and heat trace.

34. Operate IAW procedures given in TM 10-3510-226-10 and monitor for normal operation.

REPLACE-CONTINUED

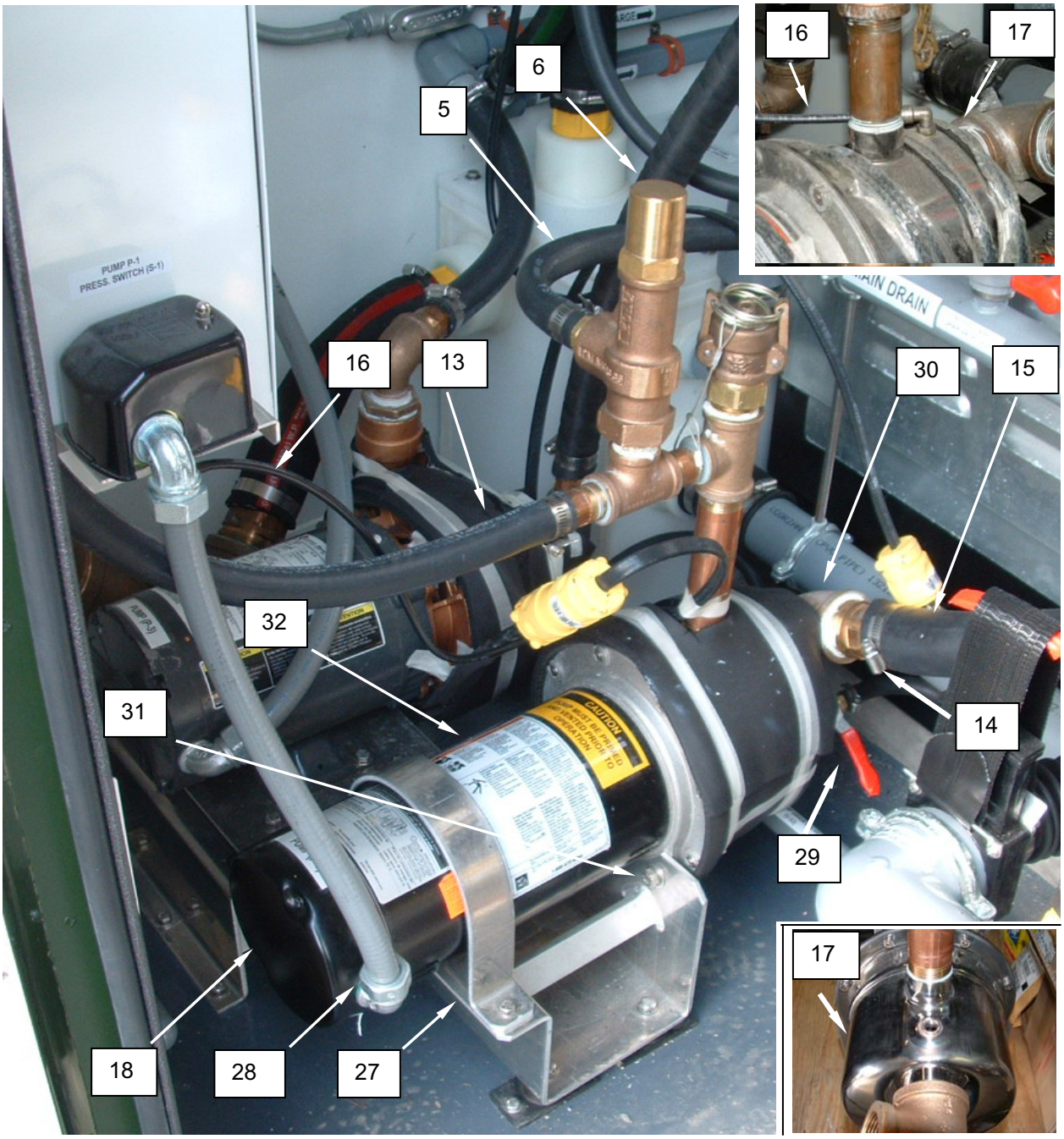


Figure 16. Replace the P-1 Pump Assembly.

END OF WORK PACKAGE

UNIT MAINTENANCE
CONTAINERIZED BATCH LAUNDRY
NSN 3510-01-527-2209
NSN 3510-01-527-2210
PUMP/P-3, FILTRATION LOOP 1
TEST, REPLACE

INITIAL SETUP

Tools
Shop Equipment, Automotive Maintenance and Repair: Organizational Maintenance, Common No.1 (WP 0086 00, Table 2, Item 5)

Materials/Parts
Compound, Sealer Pipe (WP 0087 00, Item 12)
Tape, Electrical Insulation (WP 0087 00, Item 52)
Wire Markers (WP 0087 00, Item 58)

Personnel Required
Quartermaster and Chemical Equipment Repairer 63J (1)

Equipment Condition
CBL set up

References
TM 10-3510-226-10
TB MED 577
WP 0041 00

TEST

Test Pump P-3

WARNING

Ensure that electrical power to the P-3 pump is shut off and disconnected before proceeding. The circuit breaker box or individual circuit breaker should be locked and tagged out by personnel following this procedure. Remember that the CBL is a wet environment. Serious injury or death to personnel can result from electrocution if proper safety precautions are not observed.

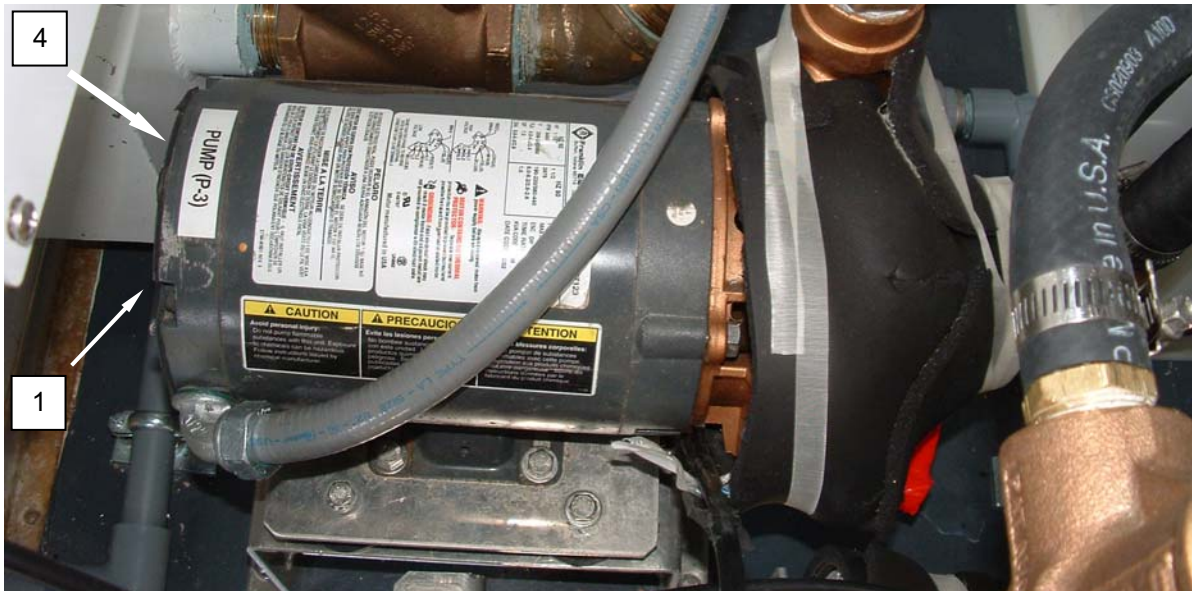
1. Disconnect power by switching circuit breaker No. 14, 16, and 18 to off, and drain pump.
2. Remove screws retaining pump end cover **(Figure 1, Item 1)**, and remove pump end cover.

NOTE

Removing the pump may make testing easier.

3. Tag and disconnect motor leads.
4. Use an ohmmeter to test for 2 - 4 ohms resistance between motor leads L1, L2, and L3 **(Figure 1, Item 2)**.
5. Use an ohmmeter to test for infinite resistance between each motor lead **(Figure 1, Item 2)** and ground **(Figure 1, Item 3)**.
6. Replace a pump motor **(Figure 1, Item 4)** that has open or shorted windings.
7. Reconnect wiring as tagged.
8. Install pump end cover **(Figure 1, Item 1)** and retain with screws.
9. Operate pump IAW procedures given in TM 10-3510-226-10, and monitor for normal operation.

TEST-CONTINUED



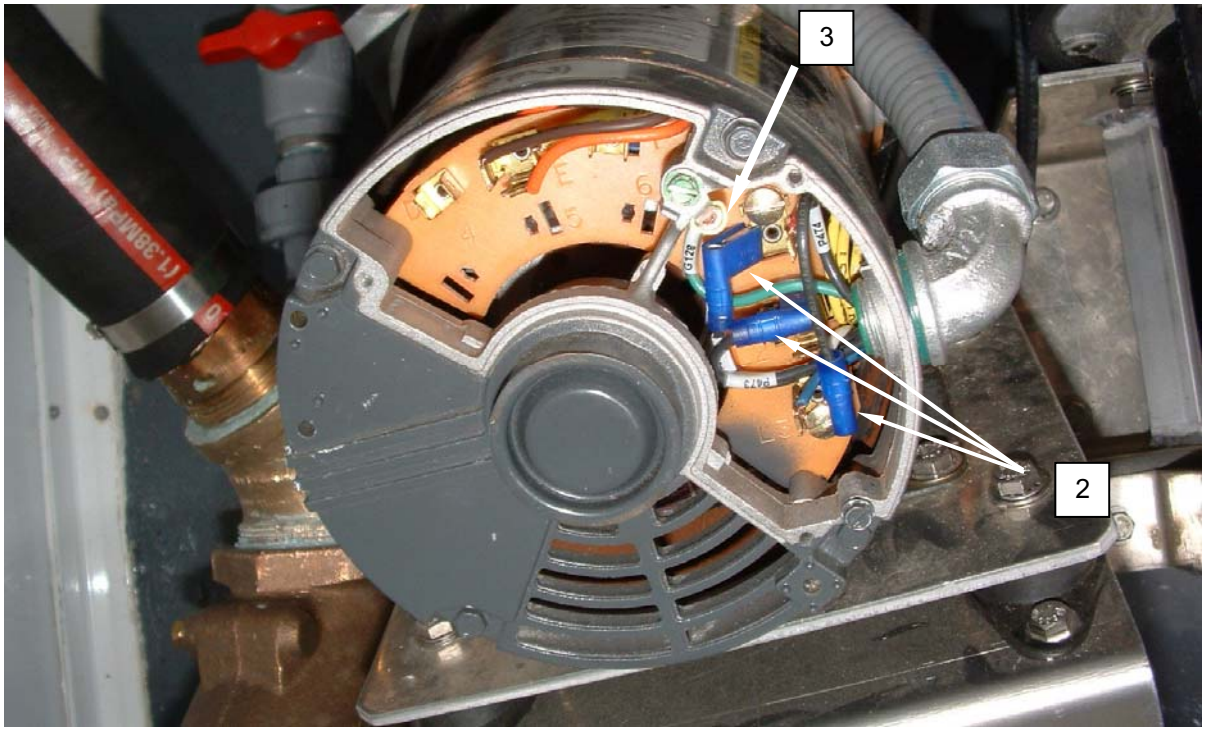


Figure 1. Test Pump P-3.

REPLACE

Replace Pump Seal

WARNING

Ensure that all electrical power is shut off and disconnected before proceeding. The circuit breaker box or individual circuit breaker should be locked and tagged out by personnel following this procedure. Remember that the CBL is a wet environment. Serious injury or death to personnel can result from electrocution if proper safety precautions are not observed.

1. Disconnect power by switching circuit breaker No. 15, 17, and 19 to OFF, and drain pump.
2. Remove insulation and heat trace.
3. Remove bolts, washers and nuts retaining pump motor **(Figure 2, Item 4)** to pump mount **(Figure 2, Item 5)**.
4. Remove bolts retaining pump adapter **(Figure 2, Item 6)** to casing **(Figure 2, Item 7)**, and pull pump rearward to expose impellor **(Figure 2, Item 8)**.
5. Remove the dust cap **(Figure 2, Item 9)** from the motor.

NOTE

Depending on the individual pump, the pump shaft may be secured in place by either sticking a large flat blade screwdriver in a slot in the shaft at the motor end, or by placing an open-end wrench on flats formed onto the shaft. Inspect your pump carefully to determine which method may apply.

6. Secure the pump shaft **(Figure 2, Item 10)**, and remove the acorn nut retaining the impellor **(Figure 2, Item 8)**.
7. Unscrew the impellor **(Figure 2, Item 8)** from the pump shaft **(Figure 2, Item 10)**.
8. Remove the spring and shaft seal **(Figure 2, Item 11)** from the pump shaft **(Figure 2, Item 10)**.
9. Remove the stationary seal **(Figure 2, Item 12)** from the pump adapter **(Figure 2, Item 6)**.
10. Install the replacement stationary seal **(Figure 2, Item 12)** into the pump adapter **(Figure 2, Item 6)**.
11. Install the shaft seal **(Figure 2, Item 11)** and spring onto the pump shaft **(Figure 2, Item 10)**.
12. Install the impellor **(Figure 2, Item 8)**, and retain with acorn nut.
13. Seat the pump adapter **(Figure 2, Item 6)** to the pump casing **(Figure 2, Item 7)** and retain in place with bolts.
14. Install the dust cap **(Figure 2, Item 9)** onto the motor.
15. Secure the pump motor **(Figure 2, Item 4)** to the pump mount **(Figure 2, Item 5)** with bolts, washers, and nuts.

REPLACE-CONTINUED

16. Install insulation and heat trace.

17. Operate pump IAW procedures given in TM 10-3510-226-10, and monitor for normal operation.

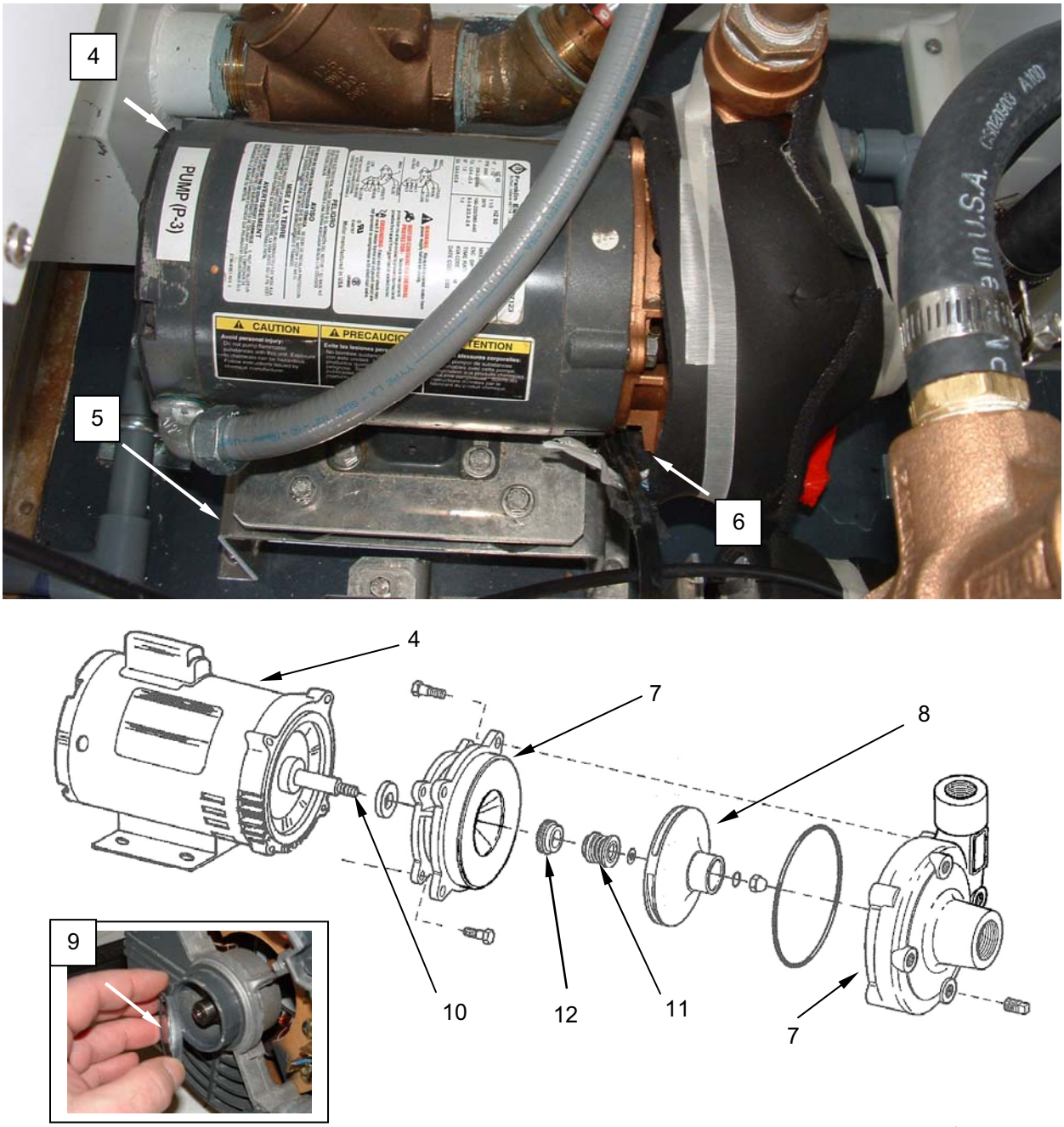


Figure 2. Replace Pump Seal.

REPLACE-CONTINUED

Replace Pump Impellor

WARNING

Ensure that all electrical power is shut off and disconnected before proceeding. The circuit breaker box or individual circuit breaker should be locked and tagged out by personnel following this procedure. Remember that the CBL is a wet environment. Serious injury or death to personnel can result from electrocution if proper safety precautions are not observed.

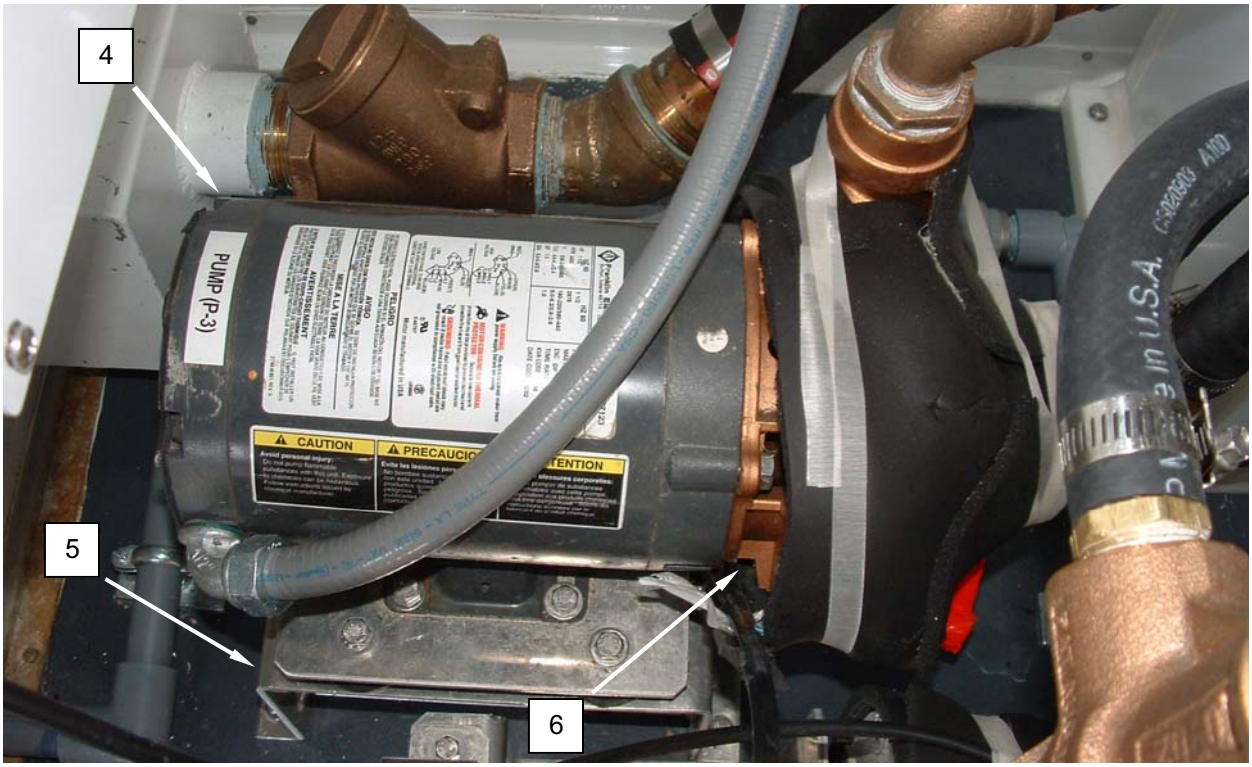
1. Disconnect power by switching circuit breaker No. 15, 17, and 19 to OFF, and drain pump.
2. Remove insulation and heat trace.
3. Remove bolts, washers and nuts retaining pump motor **(Figure 3, Item 4)** to pump mount **(Figure 3, Item 5)**.
4. Remove bolts retaining pump adapter **(Figure 3, Item 6)** to casing **(Figure 3, Item 7)**, and pull pump rearward to expose impellor **(Figure 3, Item 8)**.
5. Remove the dust cap **(Figure 3, Item 9)** from the motor.

NOTE

Depending on the individual pump, the pump shaft may be secured in place by either sticking a large flat blade screwdriver in a slot in the shaft at the motor end, or by placing an open-end wrench on flats formed onto the shaft. Inspect your pump carefully to determine which method may apply.

6. Secure the pump shaft **(Figure 3, Item 10)**, and remove the acorn nut retaining the impellor.
7. Unscrew the impellor **(Figure 3, Item 8)** from the pump shaft **(Figure 3, Item 10)**.
8. Install the replacement impellor **(Figure 3, Item 8)**, and retain with acorn nut.
9. Seat the pump adapter **(Figure 3, Item 6)** to the pump casing **(Figure 3, Item 7)** and retain in place with bolts.
10. Install the dust cap **(Figure 3, Item 9)** onto the motor.
11. Secure the pump motor **(Figure 3, Item 4)** to the pump mount **(Figure 3, Item 5)** with bolts, washers, and nuts.
12. Install insulation and heat trace.
13. Operate pump IAW procedures given in TM 10-3510-226-10, and monitor for normal operation.

REPLACE-CONTINUED



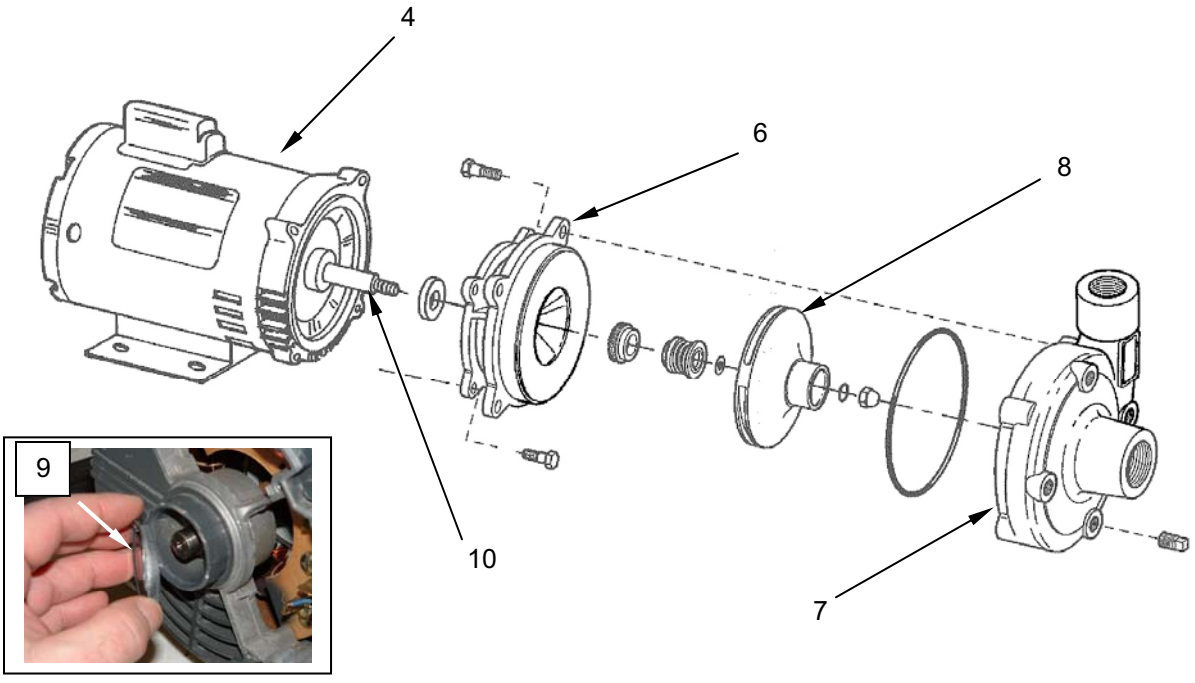


Figure 3. Replace Pump Impellor.

REPLACE-CONTINUED

Replace the Pump Motor

WARNING

Ensure that all electrical power is shut off and disconnected before proceeding. The circuit breaker box or individual circuit breaker should be locked and tagged out by personnel following this procedure. Remember that the CBL is a wet environment. Serious injury or death to personnel can result from electrocution if proper safety precautions are not observed.

1. Disconnect power by switching circuit breaker No. 15, 17, and 19 to OFF, and drain pump.
2. Remove screws retaining pump end cover **(Figure 4, Item 1)**, and remove pump end cover.
3. Tag and disconnect motor leads.
4. Remove locknut retaining conduit **(Figure 4, Item 13)** to motor **(Figure 4, Item 4)**, and remove conduit.
5. Remove bolts, washers, and nuts retaining pump motor **(Figure 4, Item 4)** to pump mount **(Figure 4, Item 5)**.
6. Remove bolts retaining pump adapter **(Figure 4, Item 6)** to casing **(Figure 4, Item 7)**, and pull pump rearward to expose impellor **(Figure 4, Item 8)**.
7. Remove the dust cap **(Figure 4, Item 9)** from the motor.

NOTE

Depending on the individual pump, the pump shaft may be secured in place by either sticking a large flat blade screwdriver in a slot in the shaft at the motor end, or by placing an open-end wrench on flats formed onto the shaft. Inspect you pump carefully to determine which method may apply.

8. Secure the pump shaft **(Figure 4, Item 10)**, and remove the acorn nut retaining the impellor **(Figure 4, Item 8)**.
9. Remove the impellor **(Figure 4, Item 8)** from the pump shaft **(Figure 4, Item 10)**.
10. Remove the spring and shaft seal **(Figure 4, Item 11)** from the pump shaft **(Figure 4, Item 10)**.
11. Remove the pump motor **(Figure 4, Item 4)** from the pump adapter **(Figure 4, Item 6)**.
12. Install the replacement pump motor **(Figure 4, Item 4)** into the pump adapter **(Figure 4, Item 6)**.
13. Install the shaft seal **(Figure 4, Item 11)** and spring onto the pump shaft.
14. Install the impellor **(Figure 4, Item 8)**, and retain with acorn nut.

REPLACE-CONTINUED

15. Seat the pump adapter **(Figure 4, Item 7)** to the pump casing **(Figure 4, Item 8)** and retain in place with bolts.

16. Install the dust cap **(Figure 3, Item 9)** onto the motor.

17. Secure the pump motor **(Figure 4, Item 2)** to the pump mount **(Figure 4, Item 6)** with bolts, washers, and nuts.

18. Remove screws retaining end cover **(Figure 4, Item 1)** on replacement pump motor **(Figure 4, Item 2)**, and remove end cover.

19. Knock out conduit plug if necessary.

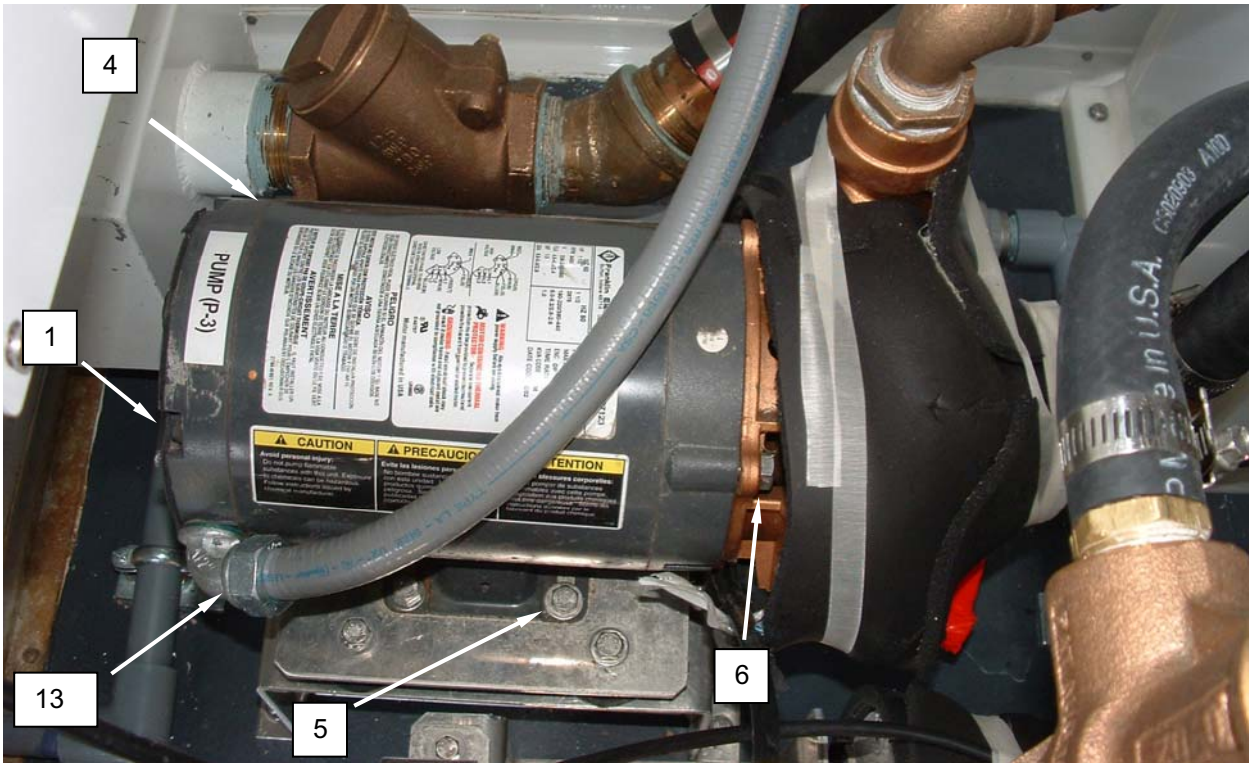
20. Install conduit **(Figure 4, Item 14)** to motor, and retain with locknut.

21. Connect conduit wiring to motor leads as tagged.

22. Install pump end cover **(Figure 4, Item 1)**, and retain with screws.

23. Operate pump IAW procedures given in TM 10-3510-226-10, and monitor for normal operation.

REPLACE-CONTINUED



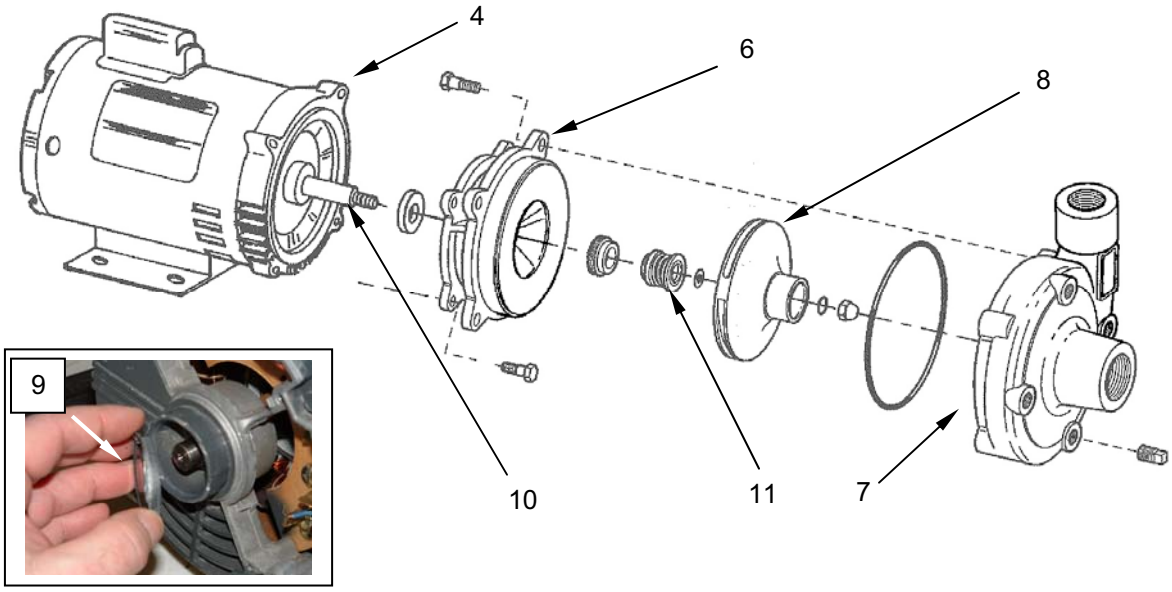


Figure 4. Replace the Pump Motor.

REPLACE-CONTINUED

Replace P-3 Pump Assembly

WARNING

Ensure that all electrical power at the p-4 Pump is shut off and disconnected before proceeding. The circuit breaker box or individual circuit breaker should be locked and tagged out by personnel following this procedure. Remember that the CBL is a wet environment. Serious injury or death to personnel can result from electrocution if proper safety precautions are not observed.

WARNING

Ensure graywater pipes have been sanitized IAW procedures contained in TB MED 577 before attempting any repairs. Failure to observe safety precautions may result in serious illness or death from biohazards.

NOTE

Removal of the P-3 Pump Assembly may be easier if Washer No. 2 has been removed IAW WP 0041.

1. Disconnect power by switching circuit breaker No. 15, 17, and 19 to OFF, and drain pump.
2. Remove insulation **(Figure 5, Item 14)** and heat trace from pump, and drain all water from system.
3. Loosen hose clamp retaining pump discharge hose **(Figure 5, Item 15)**, and remove pump discharge hose.
4. Loosen hose clamp retaining pump suction hose **(Figure 5, Item 16)** and remove pump suction hose.
5. Note alignment of pump discharge fittings **(Figure 5, Item 17)** and unscrew fittings as an assembly from the pump housing.
6. Note alignment of pump suction fittings **(Figure 6, Item 18)** and unscrew fittings as an assembly from the pump housing.
7. Remove screws, washers, rubber isolation washers, and nuts retaining pump upper mount **(Figure 5, Item 19)** to pump lower mount **(Figure 5, Item 20)** and remove pump assembly **(Figure 5, Item 21)**.
8. Remove screws retaining pump end cover **(Figure 5, Item 1)** and remove pump end cover.
9. Tag and disconnect motor leads **(Figure 5, Item 2)**.
10. Remove locknut retaining conduit **(Figure 5, Item 13)** to motor **(Figure 5, Item 14)** and remove conduit.
11. Remove screws, washers, and nuts retaining pump motor **(Figure 5, Item 4)** to pump upper mount **(Figure 5, Item 19)**.

REPLACE-CONTINUED

12. Install replacement pump assembly **(Figure 5, Item 21)** to pump upper mount, and retain with screws, washers, and nuts.

13. Remove screws retaining end cover **(Figure 5, Item 1)** on replacement pump motor **(Figure 5, Item 4)**, and remove end cover.

14. Knock out conduit plug if necessary.

15. Install conduit **(Figure 5, Item 13)** to motor **(Figure 5, Item 14)**, and retain with locknut.

16. Connect conduit wiring to motor leads **(Figure 5, Item 2)** as tagged.

17. Install pump end cover **(Figure 5, Item 1)**, and retain with screws.

18. Install pump **(Figure 5, Item 21)** with upper mount **(Figure 5, Item 19)** as an assembly to pump lower mount **(Figure 5, Item 20)** and retain with screws, washers, rubber isolation washers, and nuts.

19. Install pump suction fittings **(Figure 6, Item 18)** as an assembly, and ensure alignment is correct.

20. Install pump discharge fittings **(Figure 5, Item 17)** as an assembly, and ensure alignment is correct.

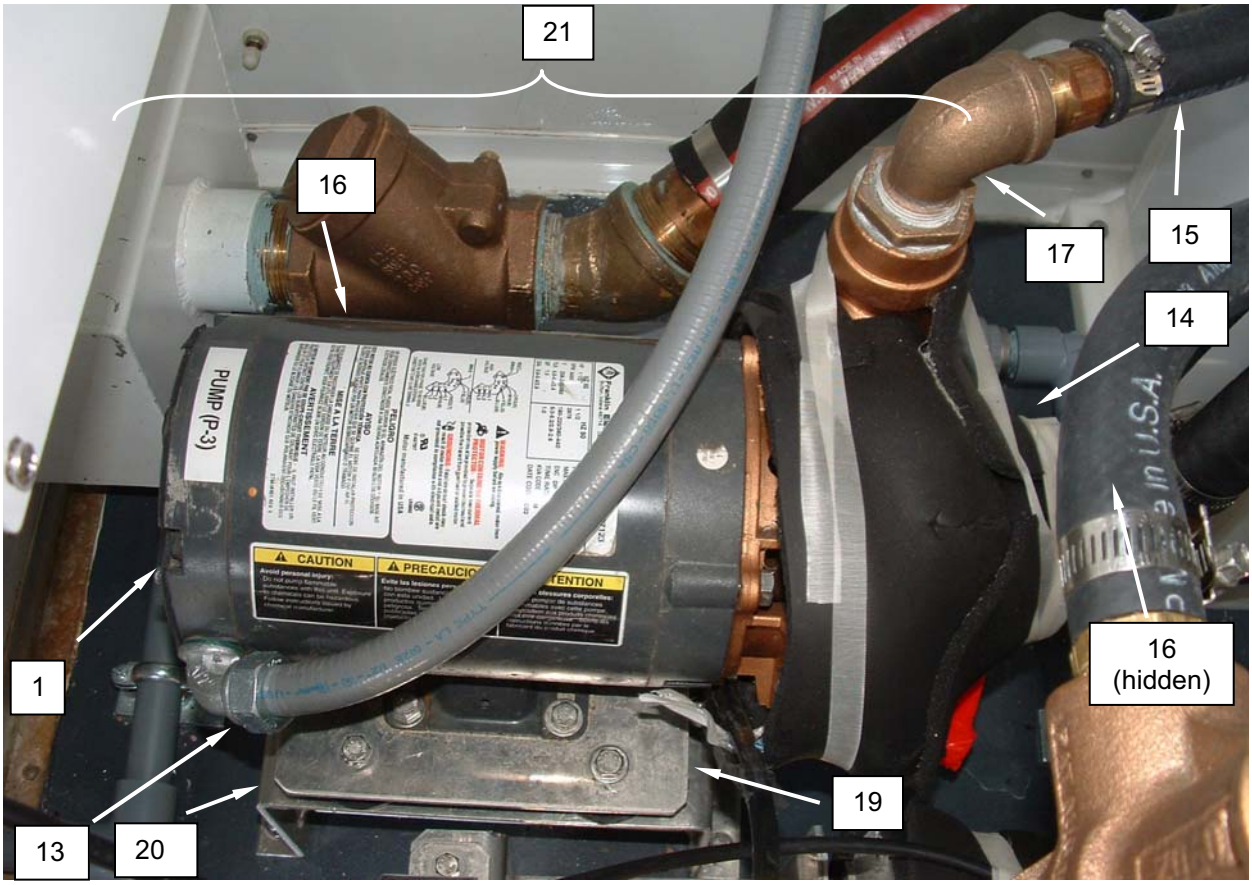
21. Install pump suction hose **(Figure 5, Item 16)**, and retain with clamp.

22. Install pump discharge hose **(Figure 5, Item 15)**, and retain with clamp.

23. Reinstall heat trace and pump insulation **(Figure 5, Item 14)**.

24. Operate pump IAW procedures given in TM 10-3510-226-10, and monitor for normal operation.

REPLACE-CONTINUED



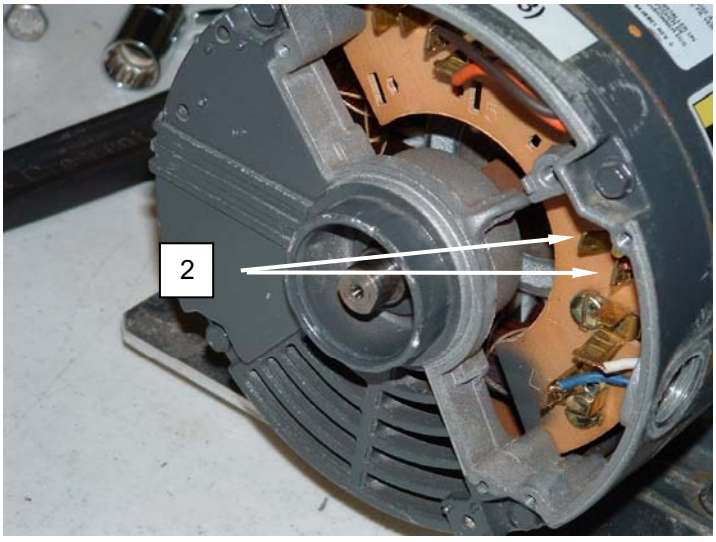


Figure 5. Replace the P-3 Pump Assembly.

REPLACE-CONTINUED

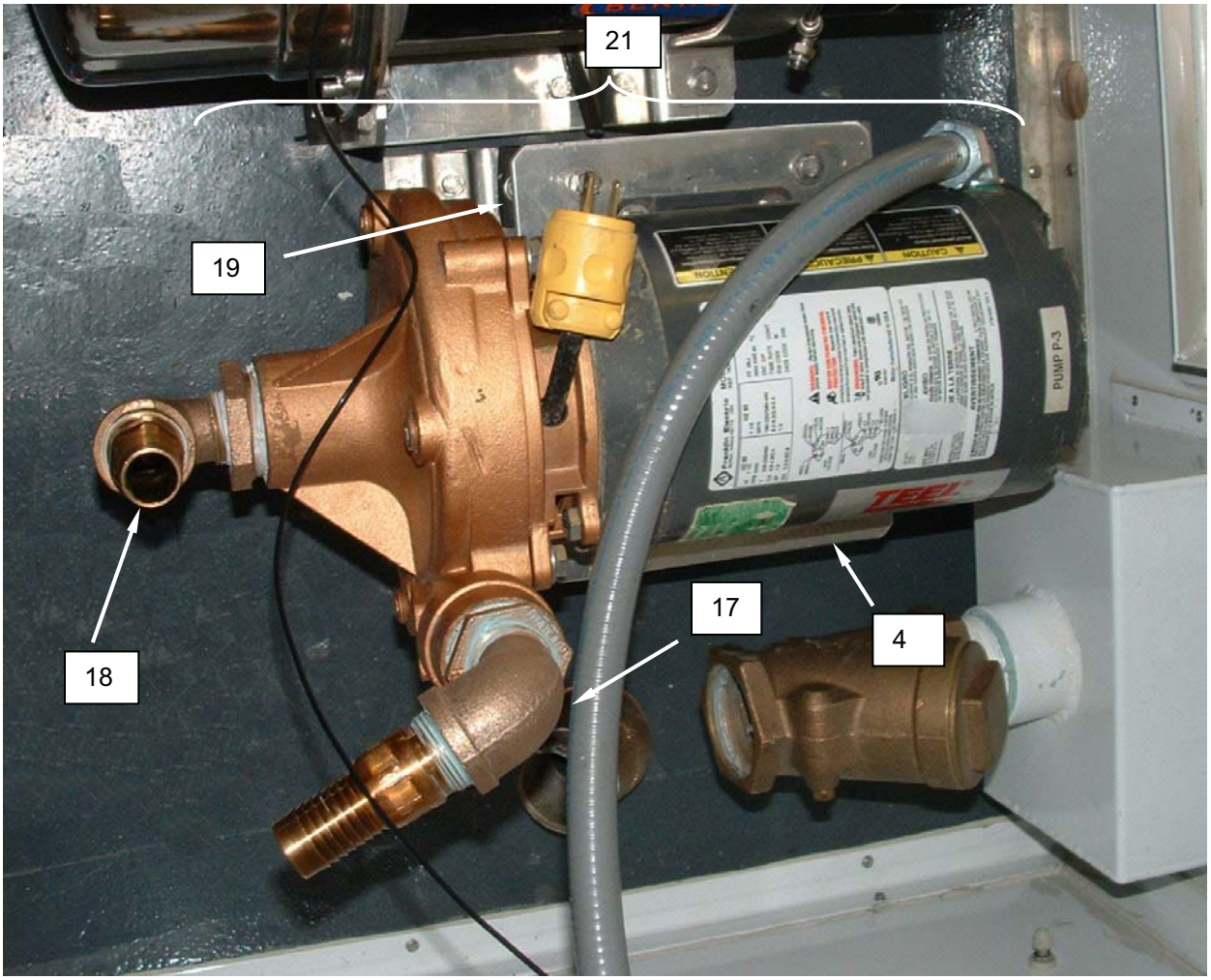


Figure 6. Replace the P-3 Pump Assembly.

END OF WORK PACKAGE

UNIT MAINTENANCE
CONTAINERIZED BATCH LAUNDRY
NSN 3510-01-527-2209
NSN 3510-01-527-2210
PUMP/P-4, FILTRATION LOOP 2
TEST, REPLACE

INITIAL SETUP

Tools
Shop Equipment, Automotive Maintenance and Repair: Organizational Maintenance, Common No.1 (WP 0086 00, Table 2, Item 5)

Personnel Required
Quartermaster and Chemical Equipment Repairer 63J (2)

Materials/Parts
Compound, Sealer, Pipe (WP 0087 00, Item 12)
Sealant, RTV (WP 0087 00, Item 46)
Tape, Electrical Insulation (WP 0087 00, Item 52)
Wire Markers (WP 0087 00, Item 58)
O-ring Kit (WP 0088 00, Item 1)

Equipment Condition
CBL set up

References
TM 103510-226-10
TB MED 577

TEST

Test Pump P-4

WARNING

Ensure that all electrical power is shut off and disconnected before proceeding. The circuit breaker box or individual circuit breaker should be locked and tagged out by personnel following this procedure. Remember that the CBL is a wet environment. Serious injury or death to personnel can result from electrocution if proper safety precautions are not observed.

1. Disconnect power by switching circuit breaker 14, 16, 18 to OFF and ensure the panel covering P-4 pump has been removed.
2. Remove screws retaining cover to pump junction box **(Figure 1, Item 1)** and remove cover.
3. Tag and disconnect motor leads.
4. Use an ohmmeter to test for 2.5 to 3.5 ohms resistance between motor leads No. 1 and 7, No. 3 and 9, and No. 2 and 8 with wire leads 4, 5, and 6 jumpered.
5. Use an ohmmeter to test for infinite resistance between each motor lead and ground.
6. Replace a pump motor **(Figure 1, Item 2)** that has open or shorted windings.
7. Reconnect wiring as tagged.
8. Install cover to pump junction box **(Figure 1, Item 1)**, and retain with screws.
9. Operate pump IAW procedures given in TM 10-3510-226-10 and monitor for normal operation.
10. Install guard panel.

TEST-CONTINUED

Figure 1. Test Pump P-4.

REPLACE

Replace the Pump Seal

WARNING

Ensure that all electrical power is shut off and disconnected before proceeding. The circuit breaker box or individual circuit breaker should be locked and tagged out by personnel following this procedure. Remember that the CBL is a wet environment. Serious injury or death to personnel can result from electrocution if proper safety precautions are not observed.

1. Disconnect power, drain water system, and remove guard panel to expose pump.
2. Remove the screws retaining the coupling guard **(Figure 2, Item 3)** and remove the coupling guard.
3. Remove the bolts securing the coupling halves and remove the coupling **(Figure 2, Item 4)**.
4. Remove the coupling pin from the pump shaft **(Figure 2, Item 5)**.
5. Tag and disconnect motor leads.
6. Remove the bolts retaining the motor **(Figure 2, Item 2)** to the motor stool **(Figure 2, Item 6)** and remove the motor.
7. Loosen the three screws securing the cartridge seal **(Figure 2, Item 7)** and unscrew the cartridge seal from the motor stool **(Figure 2, Item 6)**.
8. Install a new O-ring onto the cartridge seal **(Figure 2, Item 7)** and install the cartridge seal. Do not tighten the setscrews.
9. Install the motor **(Figure 2, Item 2)** onto the motor stool **(Figure 2, Item 6)** and retain with bolts.
10. Install locknut retaining conduit **(Figure 3, Item 8)** and install conduit.
11. Connect motor leads.
12. Install the coupling pin into the pump shaft **(Figure 2, Item 5)**.
13. Install the coupling halves **(Figure 2, Item 4)** and secure in place with bolts. Align motor shaft keyway **(Figure 2, Item 4)**.
14. Tighten the cartridge seal **(Figure 3, Item 7)** securing setscrews.
15. Install the coupling guard **(Figure 2, Item 3)** and retain with screws.
16. Operate pump IAW procedures given in TM 10-3510-226-10, and monitor for normal operation.
17. Install guard panel.

REPLACE-CONTINUED

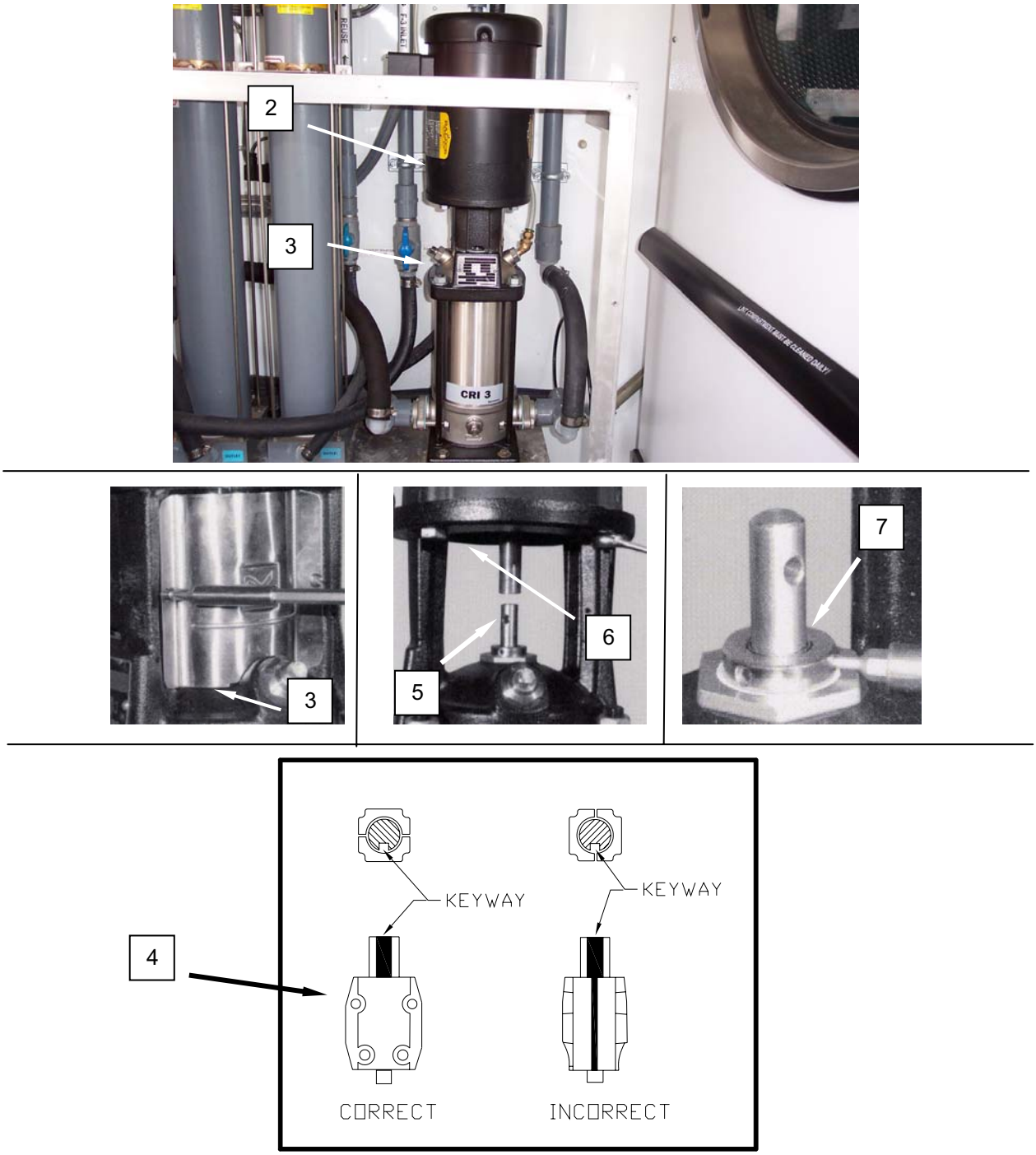


Figure 2. Replace the Pump Seal.

REPLACE-CONTINUED

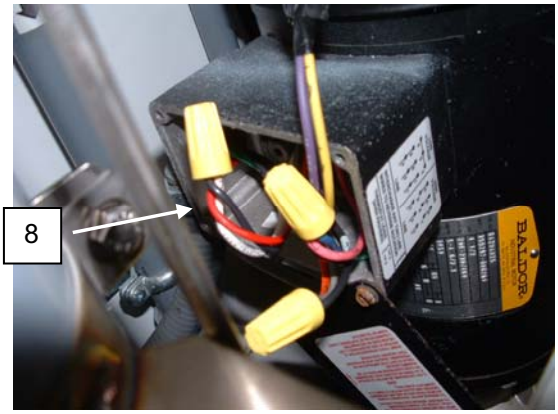


Figure 3. Replace the Pump Seal.

REPLACE-CONTINUED

Replace the Pump Impellor Stack

WARNING

Ensure that all electrical power is shut off and disconnected before proceeding. The circuit breaker box or individual circuit breaker should be locked and tagged out by personnel following this procedure. Remember that the CBL is a wet environment. Serious injury or death to personnel can result from electrocution if proper safety precautions are not observed.

WARNING

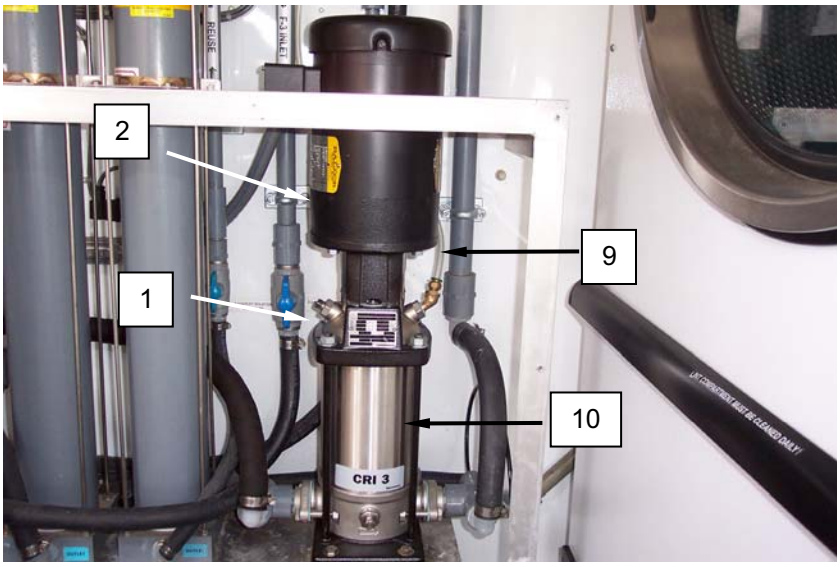
Ensure graywater pipes have been sanitized IAW procedures contained in TB MED 577 before attempting any repairs. Failure to observe safety precautions may result in serious illness or death from biohazards.

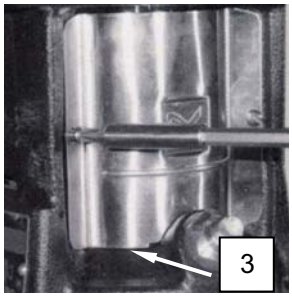
NOTE

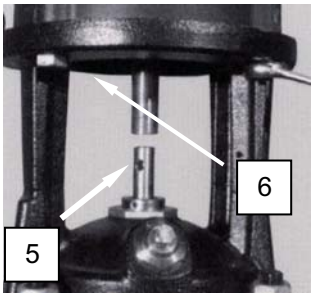
The P-4 pump is a multistage centrifugal pump, which has individual impellers and impellor casings assembled as a stack. While the individual impellor components within the impellor stack may be replaced, it is recommended that the entire stack assembly be replaced in the event of damage or wear to these components.

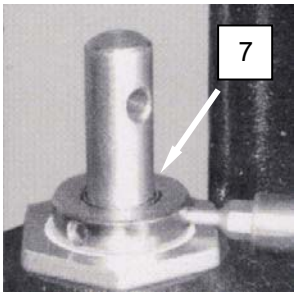
1. Disconnect power and drain WTS IAW procedures given in TM 10-3510-226-10.
2. Remove guard panel.
3. Remove the screws retaining the coupling guard **(Figure 4, Item 3)**, and remove the coupling guard.
4. Remove the bolts securing the coupling halves and remove the coupling **(Figure 4, Item 4)**.
5. Remove the coupling pin from the pump shaft **(Figure 4, Item 5)**.
6. Tag and disconnect motor leads.
7. Remove locknut retaining conduit **(Figure 5, Item 8)** and remove conduit.
8. Remove the bolts retaining the motor **(Figure 4, Item 2)** to the motor stool **(Figure 4, Item 6)** and remove the motor.
9. Loosen the three screws securing the cartridge seal **(Figure 4, Item 7)** and unscrew the cartridge seal from the motor stool **(Figure 4, Item 6)**.
10. Disconnect the vent hose **(Figure 4, Item 9)** from the pump head.
11. Remove the nuts retaining the motor stool and pump head **(Figure 4, Item 6)** to the pump outer sleeve **(Figure 4, Item 10)**, and remove the motor stool.

REPLACE-CONTINUED









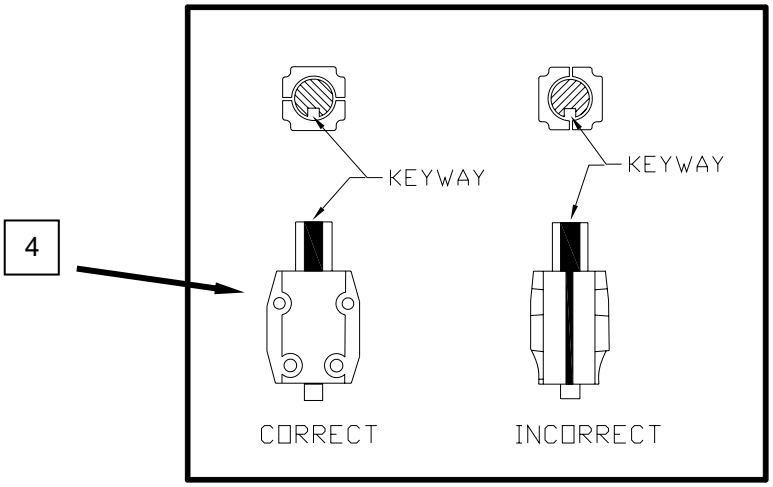


Figure 4. Replace the Pump Impellor.

REPLACE-CONTINUED

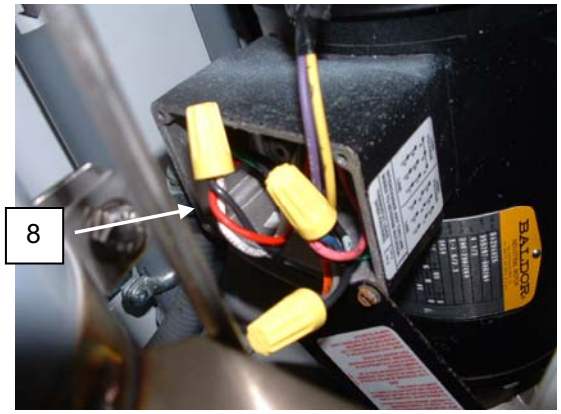


Figure 5. Conduit for P-4 Pump.

NOTE

When withdrawing the impellor stack, support the stack from the bottom as soon as the stack is clear of the pump. While the pump shaft may be expected to be tight, there is also a chance that the shaft **(Figure 5, Item 3)** may be loose and the impellor stack may fall off the stack.

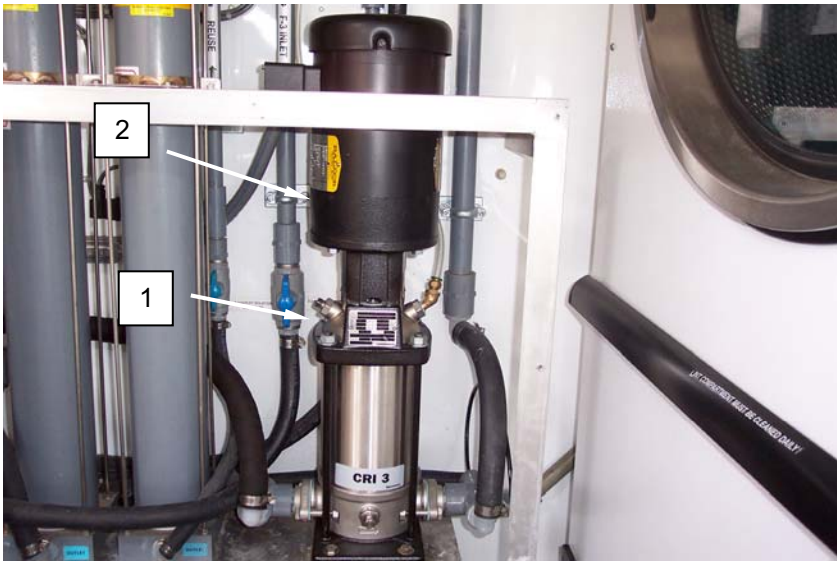
12. Remove impellor stack **(Figure 6, Item 11)** from pump.

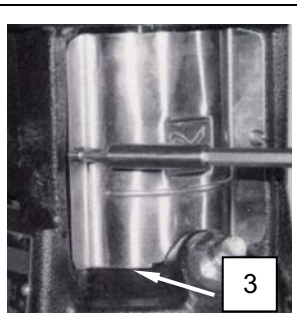
13. Install impellor stack **(Figure 6, Item 11)** into pump.

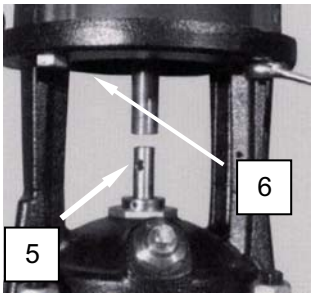
Figure 6. Replace the Pump Impellor.

REPLACE-CONTINUED

14. Install the pump head and motor stool **(Figure 7, Item 6)** and retain with nuts.
15. Install a new O-ring onto the cartridge seal **(Figure 7, Item 7)**, and install the cartridge seal. Do not tighten the setscrews.
16. Install the motor **(Figure 7, Item 2)** onto the motor stool **(Figure 7, Item 6)** and retain with bolts.
17. Install conduit and retain with locknut. Reconnect motor leads.
18. Install coupling pin to pump shaft **(Figure 7, Item 5)**.
19. Install the coupling halves **(Figure 8, Item 4)** and secure in place with bolts. Align motor shaft keyway **(Figure 8, Item 4)**.
20. Tighten the cartridge seal **(Figure 7, Item 7)** securing setscrews.
21. Install the coupling guard **(Figure 7, Item 3)** and retain with screws.
22. Operate pump IAW procedures given in TM 10-3510-226-10, and monitor for normal operation.
23. Install guard panel.







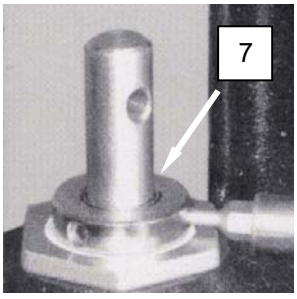


Figure 7. Replace the Pump Impellor.

REPLACE-CONTINUED

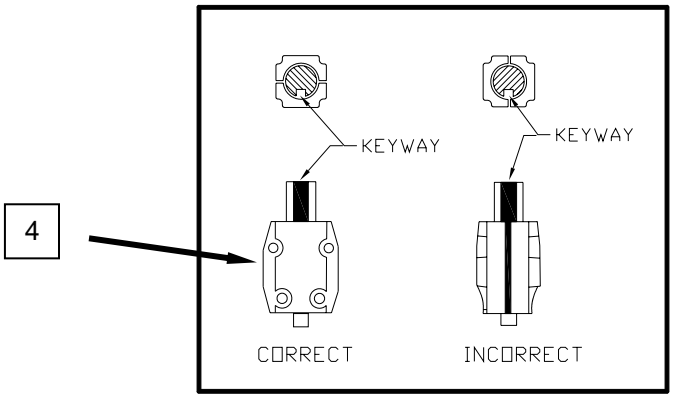


Figure 8. Aligning the Coupling Keyway.

Replace the Pump Motor

WARNING

Ensure that all electrical power is shut off and disconnected before proceeding. The circuit breaker box or individual circuit breaker should be locked and tagged out by personnel following this procedure. Remember that the CBL is a wet environment. Serious injury or death to personnel can result from electrocution if proper safety precautions are not observed.

1. Disconnect power at circuit breaker 14, 16, 18 and drain WTS IAW procedures given in TM 10-3510-226-10.
2. Remove guard panel.
3. Remove screws retaining cover to pump junction box **(Figure 9, Item 1)** and remove cover.
4. Tag and disconnect motor leads.
5. Remove locknut retaining conduit **(Figure 9, Item 8)** and remove conduit.
6. Remove the screws retaining the coupling guard **(Figure 9, Item 3)** and remove the coupling guard.
7. Remove the bolts securing the coupling halves and remove the coupling **(Figure 10, Item 4)**.
8. Remove the bolts retaining the motor **(Figure 9, Item 2)** to the motor stool **(Figure 9, Item 6)** and remove the motor.
9. Install the replacement motor **(Figure 9, Item 2)** onto the motor stool **(Figure 9, Item 6)** and retain with bolts.
10. Install the coupling halves **(Figure 10, Item 4)** and secure in place with bolts. Align motor shaft keyway **(Figure 10, Item 4)**.
11. Install the coupling guard **(Figure 9, Item 1)** and retain with screws.

REPLACE-CONTINUED

12. Remove screws retaining junction box cover **(Figure 9, Item 1)** on replacement motor **(Figure 9, Item 2)** and remove junction box cover.

13. Install conduit **(Figure 9, Item 8)** onto replacement pump motor **(Figure 9, Item 2)** and retain with locknut.

14. Connect wiring as tagged.

15. Install junction box cover **(Figure 9, Item 1)** and retain with screws.

16. Operate pump IAW procedures given in TM 10-3510-226-10, and monitor for normal operation.

17. Install guard panel.

REPLACE-CONTINUED

Figure 9. Replace the Pump Seal.

REPLACE-CONTINUED

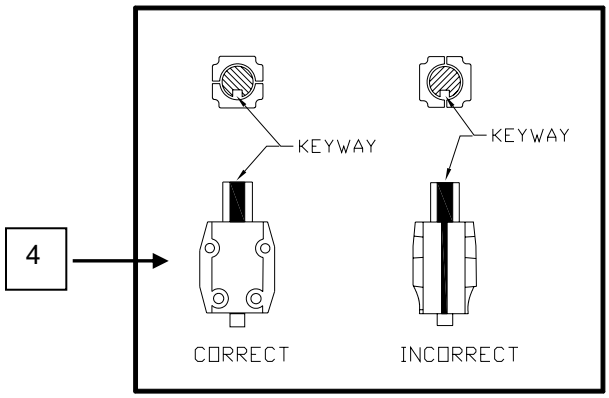


Figure 10. Aligning Keyway.

Replace P-4 Pump Assembly

WARNING

Ensure that all electrical power at the P-4 Pump is shut off and disconnected before proceeding. The circuit breaker box or individual circuit breaker should be locked and tagged out by personnel following this procedure. Remember that the CBL is a wet environment. Serious injury or death to personnel can result from electrocution if proper safety precautions are not observed.

1. Disconnect power at circuit breaker 14, 16, 18 and drain WTS IAW procedures given in TM 10-3510-226-10.
2. Remove guard panel.
3. Remove screws retaining cover to pump junction box **(Figure 11, Item 1)** and remove cover.
4. Tag and disconnect wiring from pump motor **(Figure 11, Item 2)**.
5. Remove locknut retaining conduit **(Figure 11, Item 8)** and remove conduit.
6. Remove bolts, washers, and nuts retaining pump inlet and outlet flanges **(Figure 11, Item 12)**, and separate flanges from pump.
7. Remove vent hose **(Figure 11, Item 9)**.

REPLACE-CONTINUED

WARNING

The pump assembly is a two-man lift. Serious injury to personnel can result if proper safety precautions are not observed. Failure to comply may cause serious injury to personnel.

8. Remove bolts, washers, and nuts **(Figure 11, Item 13)** securing pump to pump mount, and remove pump.
9. Install replacement pump **(Figure 11, Item 2)** and retain with bolts, washers, and nuts.
10. Install new gaskets on inlet and outlet flanges **(Figure 11, Item 12)**.
11. Attach inlet and outlet flanges **(Figure 11, Item 12)** to replacement pump **(Figure 11, Item 2)** and retain with bolts, washers, and nuts.
12. Install vent hose **(Figure 11, Item 9)**.
13. Remove screws retaining cover to pump junction box **(Figure 11, Item 1)** and remove cover.
14. Knock out conduit penetration if necessary.
15. Install conduit **(Figure 11, Item 8)** onto replacement pump motor **(Figure 11, Item 2)** and retain with locknut.
16. Connect wiring to pump as tagged.
17. Install cover to pump junction box **(Figure 11, Item 1)** and retain with screws.

18. Operate pump IAW procedures given in TM 10-3510-226-10, and monitor for normal operation.

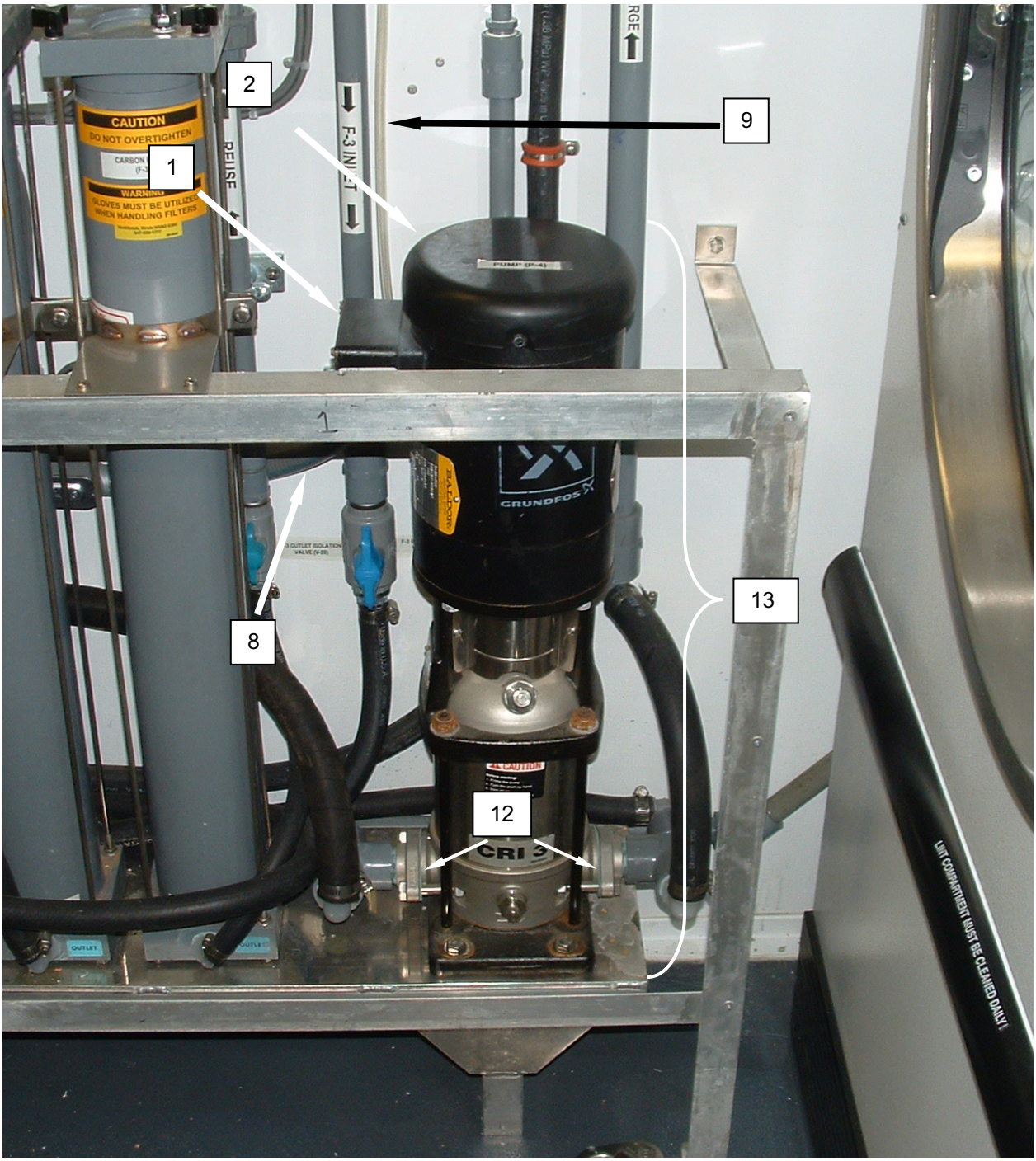


Figure 11. Replace P-4 Pump Assembly.

END OF WORK PACKAGE

UNIT MAINTENANCE
CONTAINERIZED BATCH LAUNDRY
NSN 3510-01-527-2209
NSN 3510-01-527-2210
NANOFILTERS
REPLACE

INITIAL SETUP

Tools	**Personnel Required**
Tool Kit, General Mechanics: Automotive (WP 0086 00, Table 2, Item 6)	Quartermaster and Chemical Equipment Repairer 63J (1)
Materials/Parts	**Equipment Condition**
None Required	CBL set up and operating in no reuse mode only. Pump P-4 OFF at PLC.

REPLACE

WARNING

Avoid eye, skin, and clothing contact with graywater and equipment that handles graywater. Graywater is to be considered hazardous at all times. Full protection in the form of rubber gloves, apron, face shield, and safety glasses should be used when performing any type of maintenance that involves graywater. Remove any contaminated clothing. If graywater contacts eyes or skin, flush with clean water and seek immediate medical attention. Failure to wear proper protective clothing and equipment may result in serious illness.

NOTE

Spent cartridge filters need to be disposed in accordance with local, state, and federal requirements. Contact your local authorities (i.e. Facility Environmental Office) to ensure that you are following proper disposal procedures before proceeding with nanofilter replacement.

NOTE

Replace nanofilter cartridges as a set.

Replace Nanofilter Cartridges

1. Open nanofilter drain valves **(Figure 1, Item 1)** and allow to drain approximately 15 minutes.

REPLACE-CONTINUED

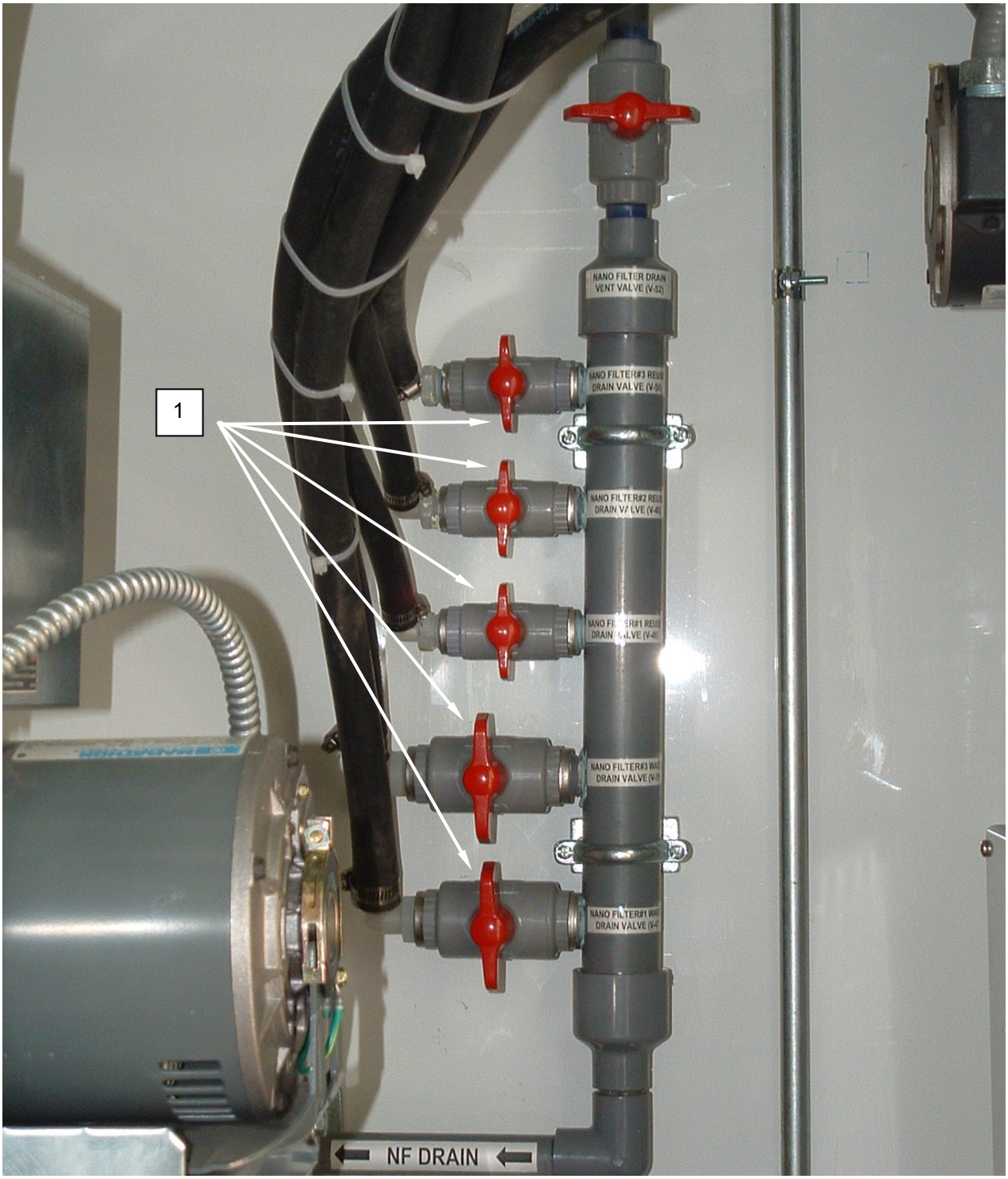


Figure 1. Replace Nanofilter Cartridges.

REPLACE-CONTINUED

NOTE

A step aid may be required.

2. Remove bolt, washer, and nut retaining nanofilter end cap clamp **(Figure 2, Item 2)** and remove clamp.

NOTE

Have a bucket or container available to catch remaining water in filter canister.

3. Remove the end cap **(Figure 2, Item 3)**.
4. Repeat Steps 2 and 3 for the opposite end of the nanofilter canister.
5. Use the broom handle to carefully push the cartridges **(Figure 2, Item 4)** out from the canister.

NOTE

Spent cartridge filters need to be disposed in accordance with local, state, and federal requirements. Contact your local authorities (i.e. Facility Environmental Office) to ensure that you are following proper disposal procedures

6. Remove nanofilter cartridges **(Figure 2, Item 4)** and disassemble.

NOTE

Nanofilters have gaskets fitted to one end. Refer to Figure 3 for gasket placement.

7. Connect nanofilter cartridges **(Figure 2, Item 4)** together with interface adapter **(Figure 2, Item 5)**.
8. Install replacement nanofilter cartridges **(Figure 2, Item 4)**.
9. Install the end cap **(Figure 2, Item 3)**.
10. Install end cap clamp **(Figure 2, Item 2)** and retain with bolt, washer and nut.
11. Repeat steps 2 through 8 for remaining nanofilter cartridges.
12. Switch P-4 pump on.
13. Close drain valves **(Figure 3, Item 1)** and monitor system operation.

REPLACE-CONTINUED

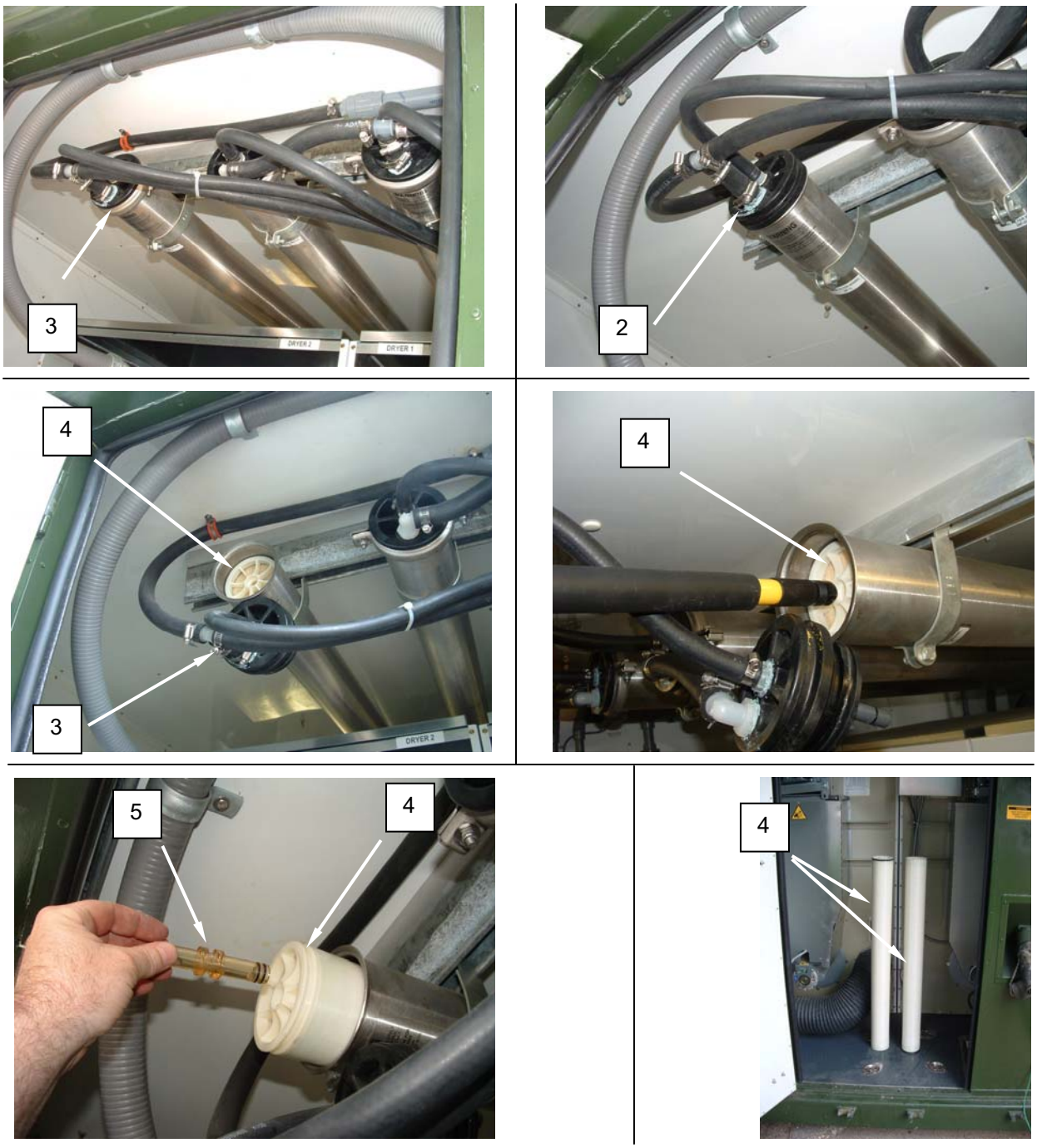


Figure 2. Replace Nanofilter Cartridges.

REPLACE-CONTINUED

Figure 3. Close Drain Valves.

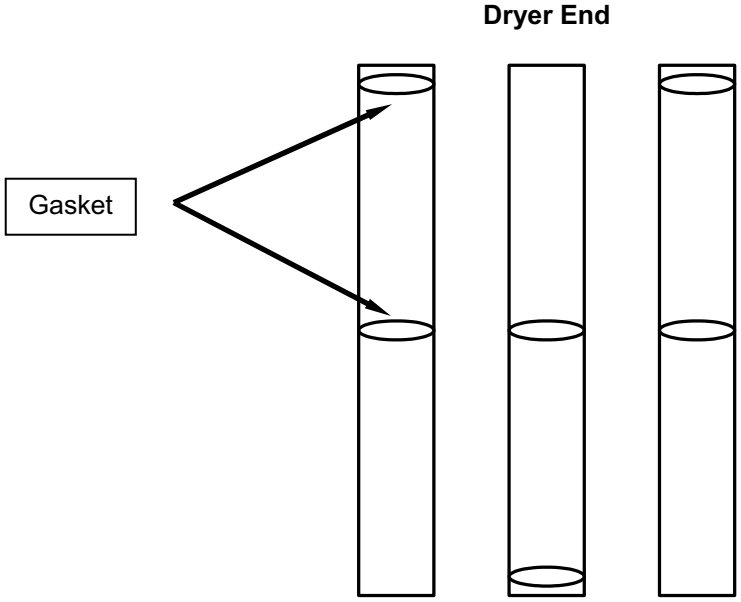


Figure 4. Replace Nanofilter Cartridges.

END OF WORK PACKAGE

UNIT MAINTENANCE
CONTAINERIZED BATCH LAUNDRY
NSN 3510-01-527-2209
NSN 3510-01-527-2210
TANKS, WATER REUSE HOLDING
SERVICE, REPAIR, REPLACE

INITIAL SETUP

Tools
Shop Equipment, Automotive Maintenance and Repair: Organizational Maintenance, Common No.1 (WP 0086 00, Table 2, Item 5)

Materials/Parts
Baled Rag, General (WP 0087 00, Item 5)
Bleach, Laundry, Sodium Hypochlorite, 1 Gal (WP 0087 00, Item 8)
Cleaner, Solvent (WP 0087 00, Item 11)
Compound, Sealer Pipe (WP 0087 00, Item 12)
Paper, Gasket (WP 0087 00, Item 41)
Plastic Sheet (WP 0087 00, Item 43)

Personnel Required
Quartermaster and Chemical Equipment Repairer 63J (1)

Equipment Condition
CBL set up

References
TB MED 577
WP 0041 00

SERVICE

Clean the Water Reuse Holding Tank Sight Glass

CAUTION

Use caution when handling and tightening the sight glass tube. Overtightening will break the tube.

1. Close valves **(Figure 1, Item 1)** on sight glass assembly.
2. Drain tank if possible.
3. Loosen sight glass nuts **(Figure 1, Item 2)**.
4. Remove sight glass **(Figure 1, Item 3)**.

CAUTION

Do not use a bronze or stainless steel brush to clean the sight glass.

5. Use a rag to clean residue from sight glass **(Figure 1, Item 3)** interior.
6. Inspect gaskets, and replace if necessary.
7. Install sight glass **(Figure 1, Item 3)**, and retain in place with nuts **(Figure 1, Item 2)**. Do not overtighten.
8. Open valves **(Figure 1, Item 1)**, and monitor for normal operation.

SERVICE-CONTINUED

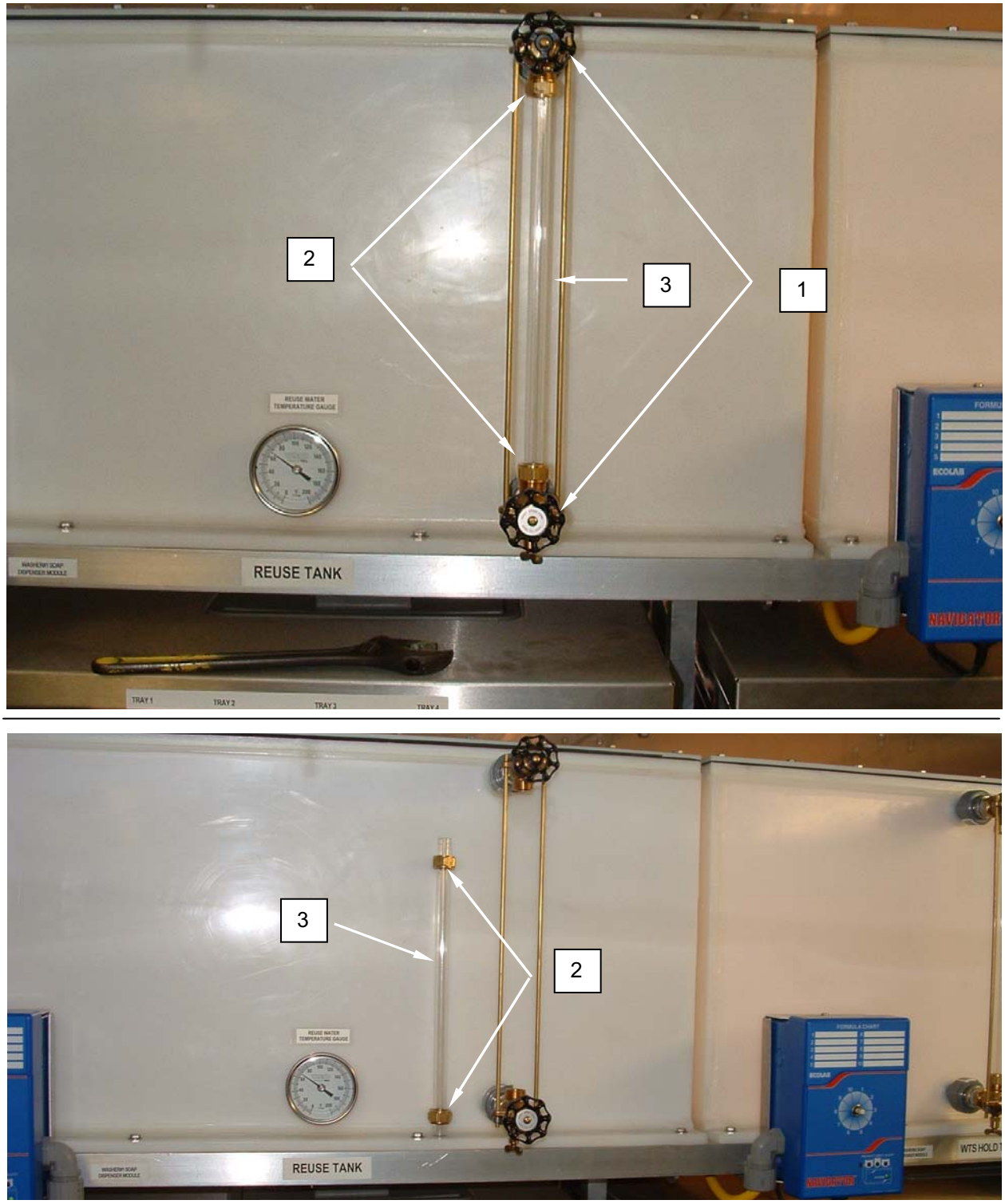


Figure 1. Clean the Water Reuse Holding Tank Sight Glass.

REPAIR

Repair the Water Reuse Holding Tanks

WARNING

Always secure and tag circuit breakers and switches OFF before attempting any electrical repairs. Remember that the CBL is a wet environment, and capable of posing a shock hazard even when personnel are not in direct contact with metal parts.

WARNING

Ensure graywater pipes have been sanitized IAW procedures contained in TB MED 577 before attempting any repairs. Failure to observe safety precautions may result in serious illness or death from biohazards.

NOTE

Prior to tank removal for repairs, remove both washers IAW procedures given in WP 0041 00.

NOTE

To remove the Nano Tank, the WTS hold tank must be removed first.

1. Disconnect power to the CBL by disconnecting all power cables.
2. Drain tank **(Figure 2, Item 4)** completely.
3. Tag and remove all hose connections, electrical connections, and fittings from the damaged tank **(Figure 2, Item 4)**. Ensure the sight glass assemblies have been removed as well.
4. Remove the soap dispenser control modules **(Figure 2, Item 5)** from their mounts and place out of the way.
5. Remove the sight glass **(Figure 2, Item 3)**.
6. Remove mounting hardware retaining the tank **(Figure 2, Item 4)** to the tank rack **(Figure 2, Item 6)**.
7. Remove tank **(Figure 2, Item 4)**.
8. Remove screws, washers, and nuts retaining top of tank **(Figure 2, Item 4)**, and remove top.
9. Locate source of leak.

NOTE

If a crack is located, always drill the ends to stop the crack. Failure to do so may result in continued damage after repairs are complete.

10. If tank is cracked, drill ends of crack **(Figure 2, Item 7)** and clean crack of any residue.

REPAIR-CONTINUED

11. Allow tank **(Figure 2, Item 4)** to dry completely.

12. If crack is narrow enough, the damaged area may be heated with a propane torch and rewelded.

13. If the damage is more substantial, cut a patch **(Figure 2, Item 8)** of plastic or metal large enough to cover the damaged area with approximately 1 ½ -inch (4 cm) overlap.

14. Cut a rubber or paper gasket **(Figure 2, Item 9)** to match the patch, with approximately ½ -inch (1 cm) overlap.

15. Drill ¼-inch holes at 1-inch intervals around the perimeter of the patch **(Figure 2, Item 8)**.

16. Place the drilled patch **(Figure 2, Item 8)** in location over the damaged area of the tank, mark the holes, and drill corresponding holes into the tank **(Figure 2, Item 4)**.

17. Place the patch **(Figure 2, Item 8)** over the gasket **(Figure 2, Item 9)**, mark the holes, and cut corresponding holes in the gasket.

18. Assemble the patch **(Figure 2, Item 8)** and gasket **(Figure 2, Item 9)** together with stainless steel 1/4 - 20 x 1 machine screws **(Figure 2, Item 10)**.

19. Install the assembled patch **(Figure 2, Item 8)** onto the tank **(Figure 2, Item 4)**, and fasten each machine screw with a stainless steel 1/4 - 20 nut **(Figure 2, Item 11)**.

20. Plug all openings in the tank and fill the tank with water to check for leaks. Correct all leakage and drain the tank.

21. Install the tank top and retain with screws.

22. Install the assembled tank **(Figure 2, Item 4)** in place and retain with original hardware.

23. Install hose connections, electrical connections, and fittings, including the sight glass assembly, onto the tank **(Figure 2, Item 4)** as tagged.

24. Remount the soap dispenser control modules **(Figure 2, Item 5)**.

25. Monitor tank repair for leakage.

REPAIR-CONTINUED

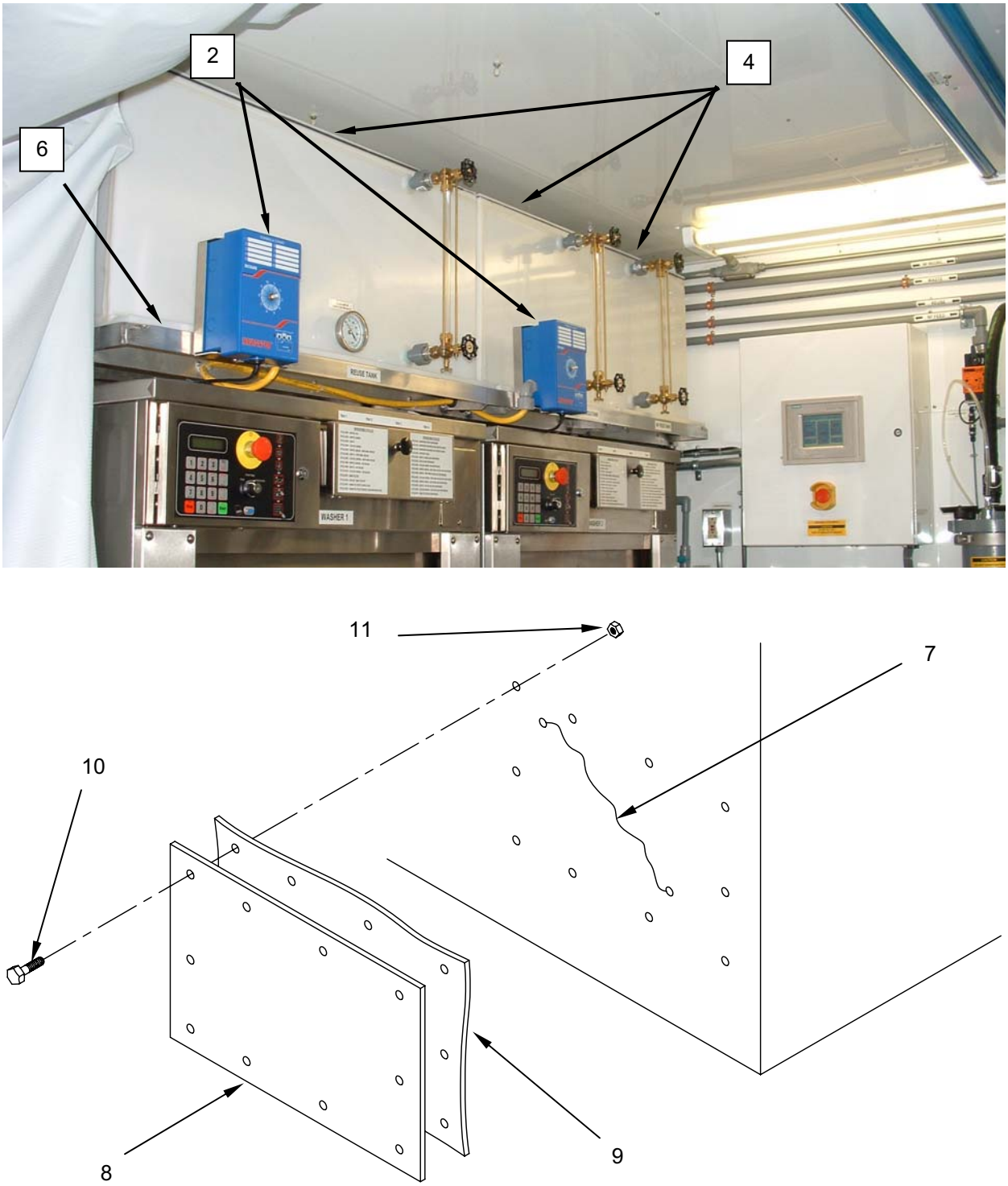


Figure 2. Repair the Water Reuse Holding Tanks.

REPLACE

Replace the Water Reuse Holding Tank Sight Glass

CAUTION

Use caution when handling and tightening the sight glass tube. Overtightening will break the glass.

1. Close valves **(Figure 3, Item 1)** on sight glass assembly.
2. Drain tank if possible.
3. Loosen sight glass nuts **(Figure 3, Item 2)**.
4. Remove sight glass **(Figure 3, Item 3)**.
5. Remove nuts **(Figure 3, Item 2)** and gaskets from sight glass **(Figure 3, Item 3)**.
6. Inspect gaskets, and replace if necessary.
7. Install gaskets and nuts **(Figure 3, Item 2)** on replacement sight glass **(Figure 3, Item 3)**.
8. Install replacement sight glass **(Figure 3, Item 3)** and retain in place with nuts **(Figure 3, Item 2)**. Do not overtighten.
9. Open valves **(Figure 3, Item 1)** and monitor for normal operation.

REPLACE-CONTINUED

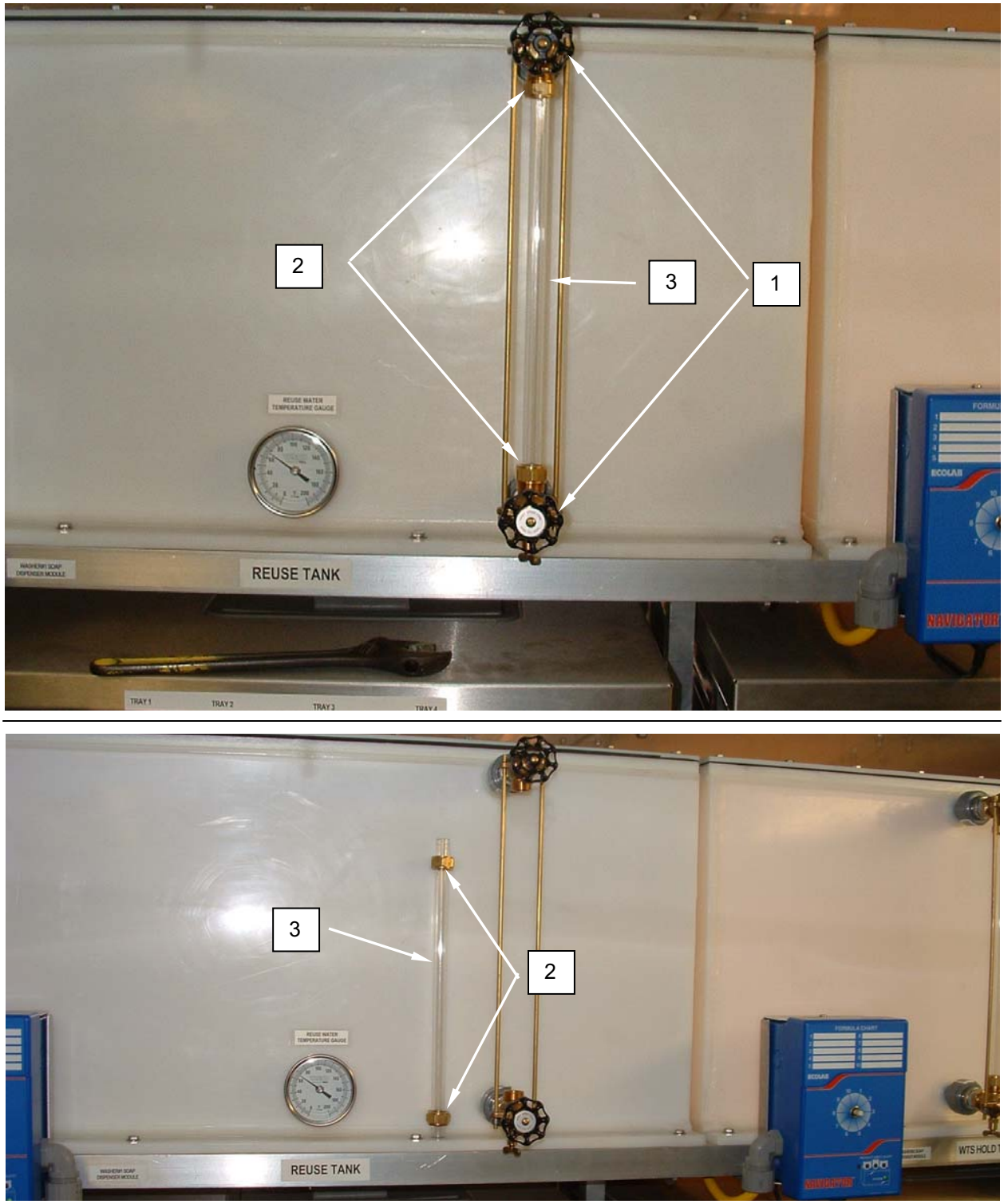


Figure 3. Replace the Water Reuse Holding Tank Sight Glass.

REPLACE-CONTINUED

Replace the Reuse Water Temperature Gauge

1. Drain tank.
2. Unscrew gauge **(Figure 4, Item 12)** from tank.
3. Apply pipe sealant or antisieze tape to threads of replacement gauge **(Figure 4, Item 12)**.
4. Install replacement gauge **(Figure 4, Item 12)**, ensuring the gauge is both tight and correctly oriented.
5. Monitor for leaks and normal operation.

Figure 4. Replace the Reuse Water Temperature Gauge.

REPLACE-CONTINUED

Replace the Water Reuse Holding Tanks

WARNING

Ensure that all electrical power is shut off and disconnected before proceeding. The circuit breaker box or individual circuit breaker should be locked and tagged out by personnel following this procedure. Remember that the CBL is a wet environment. Serious injury or death to personnel can result from electrocution if proper safety precautions are not observed.

NOTE

Prior to tank removal for repairs, remove both washers IAW procedures given in WP 0041 00.

NOTE

To remove the Nano Tank, the WTS Hold Tank must be removed first.

1. Disconnect power to the CBL by disconnecting all power cables.
2. Drain tank **(Figure 5, Item 4)** completely.
3. Tag and remove all hose connections, electrical connections, and fittings from the damaged tank **(Figure 5, Item 4)**. Ensure that the level sensor and sight glass assembly is removed.
4. Remove the soap dispenser control modules **(Figure 5, Item 5)** from their mounts and place out of the way.
5. Remove mounting hardware retaining the tank **(Figure 5, Item 4)** to the tank rack **(Figure 5, Item 6)**.
6. Remove tank **(Figure 5, Item 4)**.
7. Remove screws, washers, and nuts retaining top of tank **(Figure 5, Item 4)**, and remove top.
8. Install the tank top and retain with fasteners.
9. Install the assembled tank **(Figure 5, Item 4)** in place and retain with original hardware.
10. Remount the soap dispenser control modules **(Figure 5, Item 5)**.
11. Install hose connections, electrical connections, and fittings, including the level sensor and sight glass assembly, onto the tank **(Figure 5, Item 4)** as tagged.
12. Monitor tanks for leakage.

REPLACE-CONTINUED

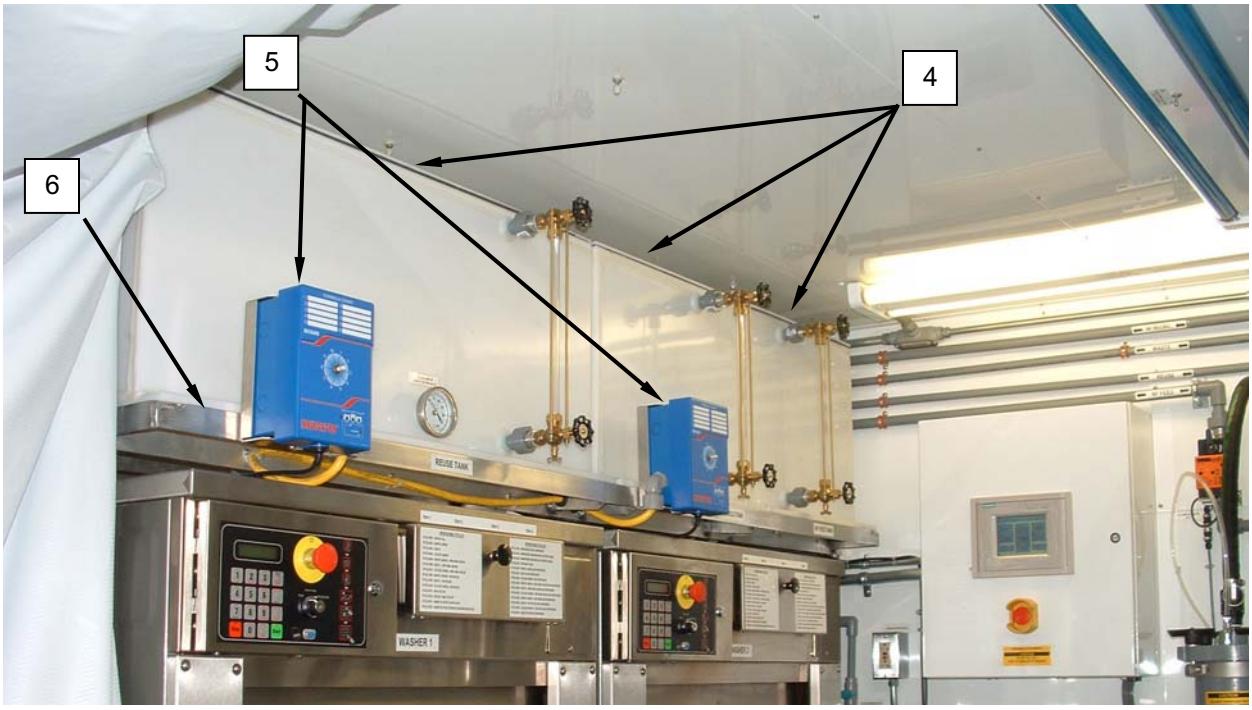


Figure 5. Replace the Water Reuse Holding Tanks.

END OF WORK PACKAGE

UNIT MAINTENANCE
CONTAINERIZED BATCH LAUNDRY
NSN 3510-01-527-2209
NSN 3510-01-527-2210
WASHER
REMOVE/ INSTALL

INITIAL SETUP

Tools	**Personnel Required**
Tool Kit, General Mechanics: Automotive (WP 0086 00, Table 2, Item 6)	Quartermaster and Chemical Equipment Repairer 63J (2)
Materials/Parts	**Equipment Condition**
None Required	CBL set up

REMOVE

Remove the Washer

WARNING

Ensure that all electrical power for the washer is shut off and disconnected before proceeding. The circuit breaker box should be locked by personnel following this procedure. Serious injury or death can result from electrocution if proper safety precautions are not observed.

WARNING

The washer is extremely heavy. Use caution when lifting and blocking the washer, and do not allow unnecessary personnel in the immediate area while it is being moved. Serious injury or death may result if safety precautions are not observed.

CAUTION

The washer is a large, heavy piece of machinery being moved out of a confined space. Before removal and installation, remove or protect any equipment which might be damaged by the washer on its way in or out.

1. Disconnect washer power cord **(Figure 1, Item 1)**. Secure the cord to the washer to ensure it will not snap or be damaged when the washer is moved.

2. Disconnect washer soap dispenser tubing **(Figure 1, Item 2)** and soap dispenser control cable **(Figure 1, Item 3)**.

3. Close off hot and cold water supply valves **(Figure 1, Item 4)** to washer **(Figure 1, Item 5)**.

4. Disconnect hot and cold water supply hoses **(Figure 1, Item 6)** to washer **(Figure 1, Item 5)**.

REMOVE-CONTINUED

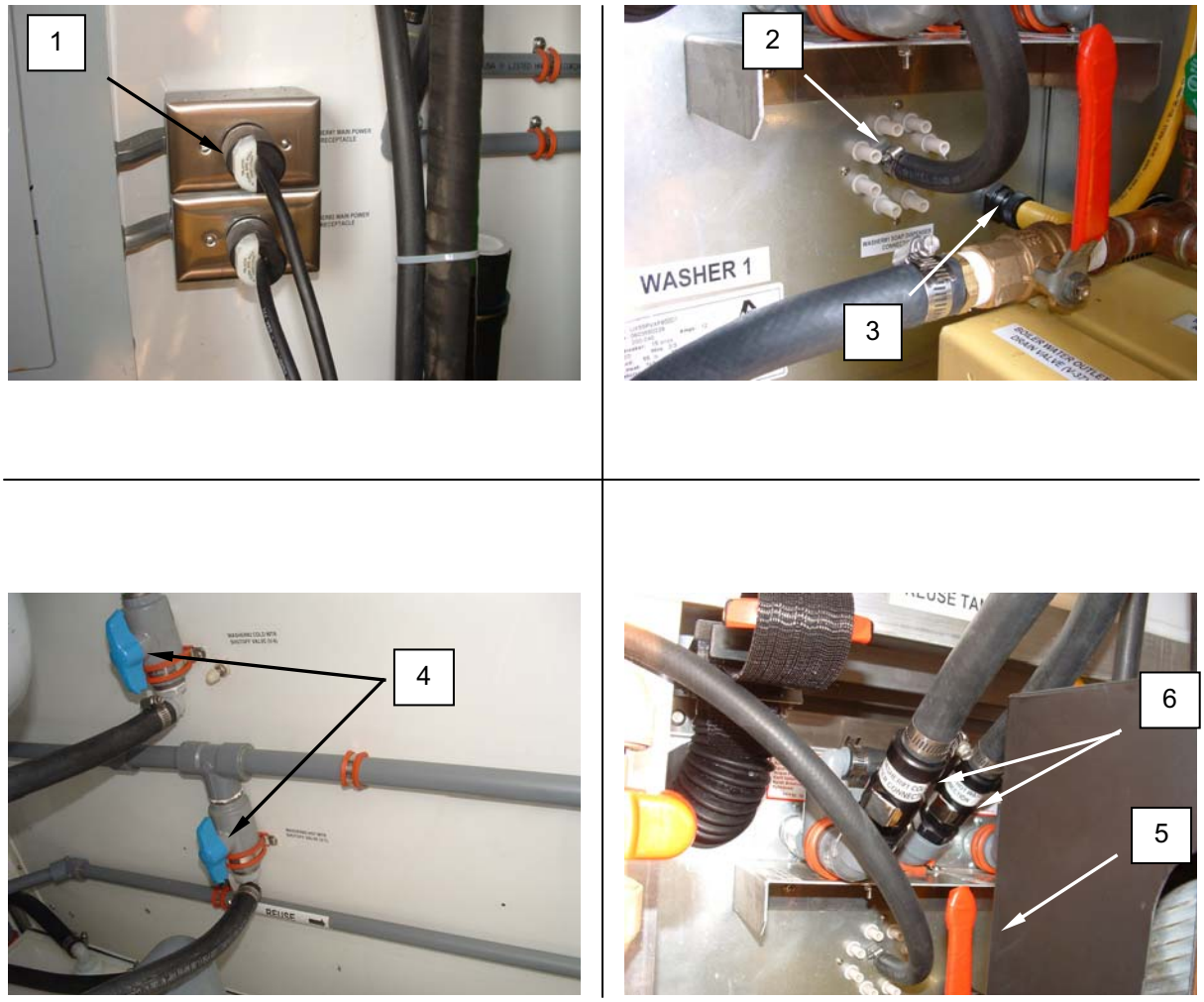


Figure 1. Remove the Washer.

REMOVE-CONTINUED

5. Close reuse fill shutoff valve V-63 **(Figure 2, Item 7)**, waste drain shutoff valve V-1 **(Figure 2, Item 8)**, and reuse drain shutoff valve V-3 **(Figure 2, Item 9)** for washer No. 1. Close V-64, V-2, and V-4 for washer No. 2.

6. Loosen clamps and remove the reuse fill line **(Figure 2, Item 10)**, main drain line **(Figure 2, Item 11)** and reuse drain line **(Figure 2, Item 12)**.

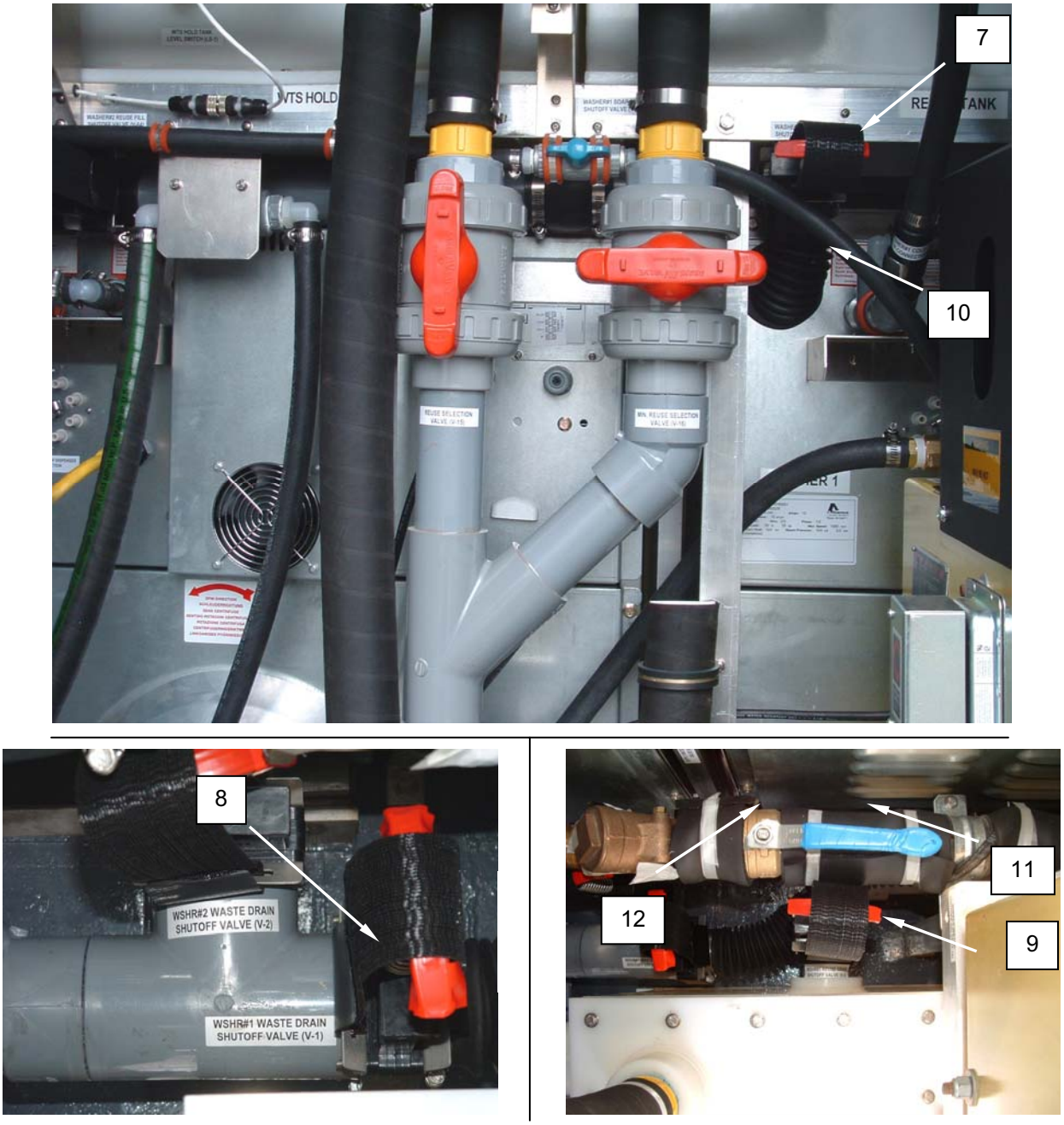


Figure 2. Closing Valves to Remove the Washer.

REMOVE-CONTINUED

7. Remove the screws retaining the washer kick panel **(Figure 3, Item 13)**, and remove the kick panel.
8. Remove the bolts **(Figure 3, Item 14)** retaining washer casters **(Figure 3, Item 15)**, and pull the washer **(Figure 3, Item 5)** out into laundry operator work space.
9. Remove the two bolts retaining the washer top panel **(Figure 3, Item 16)**.
10. Remove bolts retaining back panel **(Figure 3, Item 17)**, and remove back panel.
11. Remove the bolts retaining the washer side panels **(Figure 3, Item 18)**, and remove the side panels.

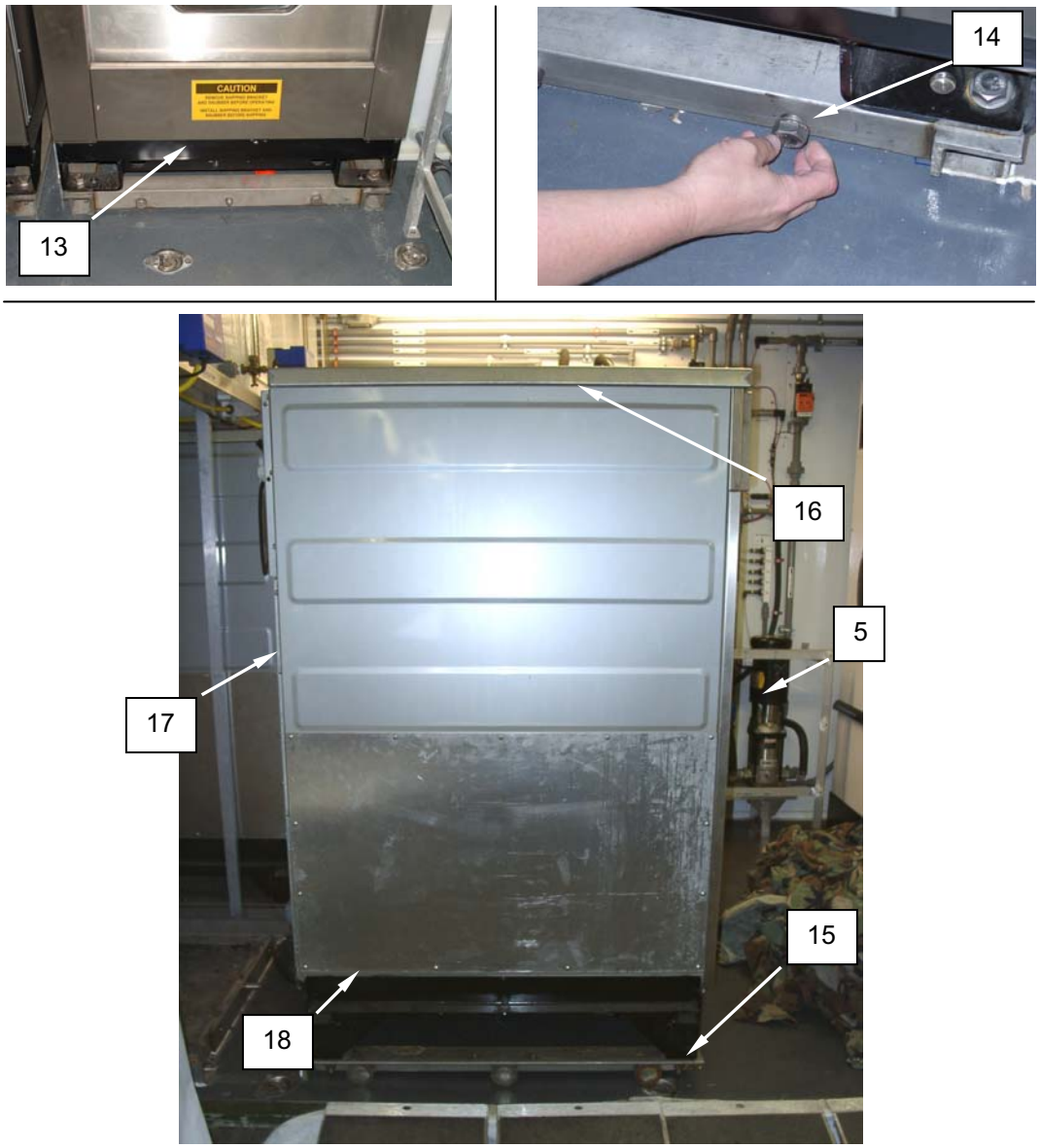


Figure 3. Remove the Washer.

INSTALL

Install the Washer

WARNING

Ensure that all electrical power is shut off and disconnected before proceeding. The Circuit Breaker box should be locked by personnel following this procedure. Serious injury or death can result from electrocution if proper safety precautions are not observed.

WARNING

The washer is extremely heavy. Use caution when lifting and blocking the washer, and do not allow unnecessary personnel in the immediate area while it is being moved. Serious injury or death may result if safety precautions are not observed.

CAUTION

The washer is a large, heavy piece of machinery being moved out of a confined space. Before removal and installation, remove or protect any equipment which might be damaged by the washer on its way in or out.

1. Install washer side panels **(Figure 4, Item 18)** and retain with bolts.
2. Install washer back panel **(Figure 4, Item 17)** and retain with bolts.
3. Install washer top panel **(Figure 4, Item 16)** and retain with bolts.

NOTE

Ensure the snubbers are out of the way before pushing the washer back. If the washer will not travel all the way back into its operating position, the snubber may be preventing further movement.

4. Push washer **(Figure 4, Item 5)** back into position and secure in place with bolts **(Figure 4, Item 14)**.
5. Install the kick panel **(Figure 4, Item 13)** and retain with screws.

INSTALL-CONTINUED

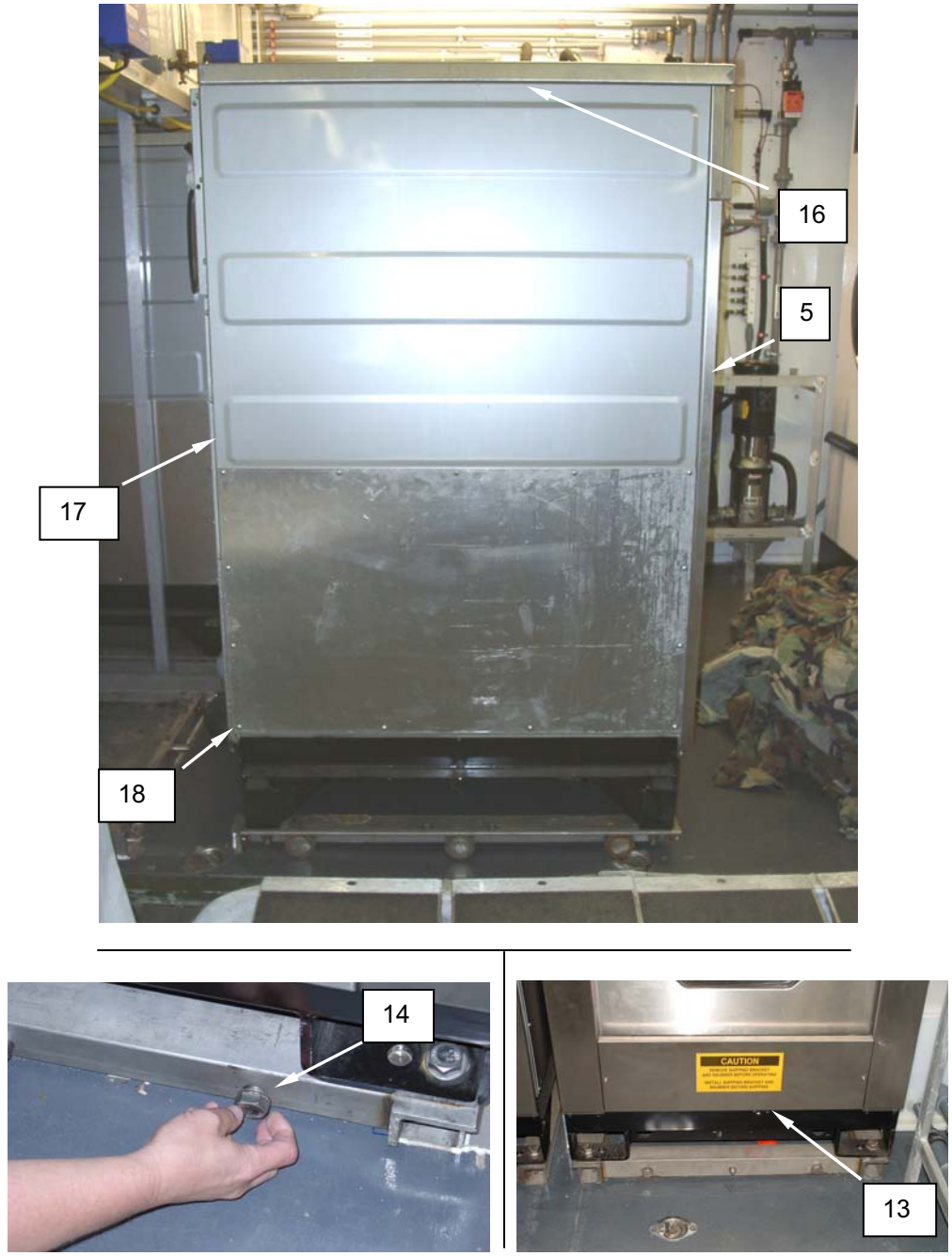


Figure 4. Install the Washer.

INSTALL-CONTINUED

6. Connect the reuse fill line **(Figure 5, Item 10)**, main drain line **(Figure 5, Item 11)**, and reuse drain lines **(Figure 5, Item 12)**, and retain with clamps.

7. Open the reuse fill shutoff valve V-63 **(Figure 5, Item 7)**, waste drain shutoff valve V-1 **(Figure 5, Item 8)**, and reuse drain shutoff valve V-3 **(Figure 5, Item 9)**. Open V-64, V-2, and V-4 for washer No. 2.

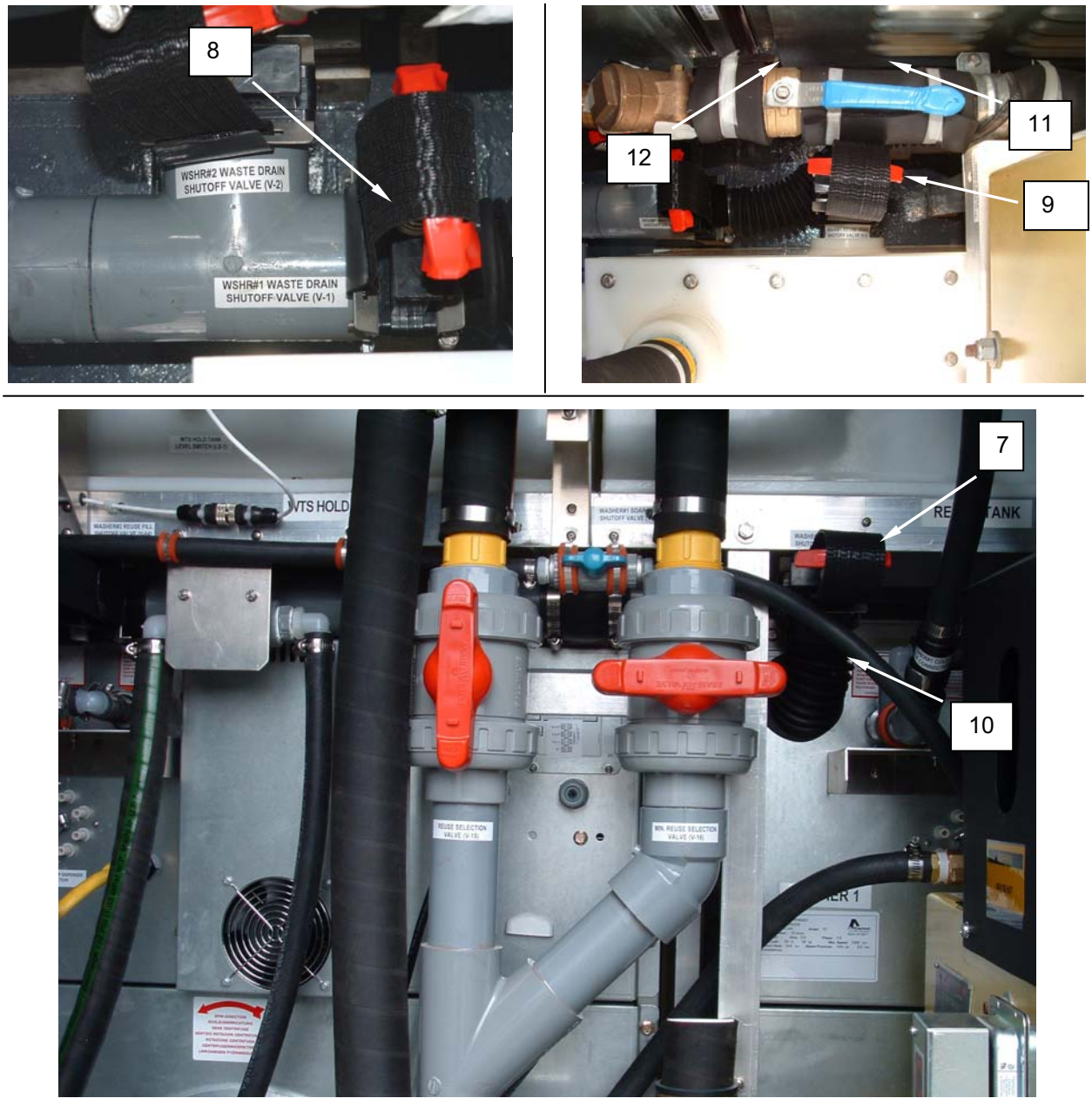


Figure 5. Install the Washer.

INSTALL-CONTINUED

8. Connect the hot and cold water supply hoses **(Figure 6, Item 6)**.
9. Connect the washer soap dispenser tubing **(Figure 6, Item 2)**.
10. Connect washer power cord **(Figure 6, Item 1)** and soap dispenser control cable **(Figure 6, Item 3)**.
11. Open washer cold and hot water supply valves **(Figure 6, Item 4)**.
12. Monitor for normal operation.

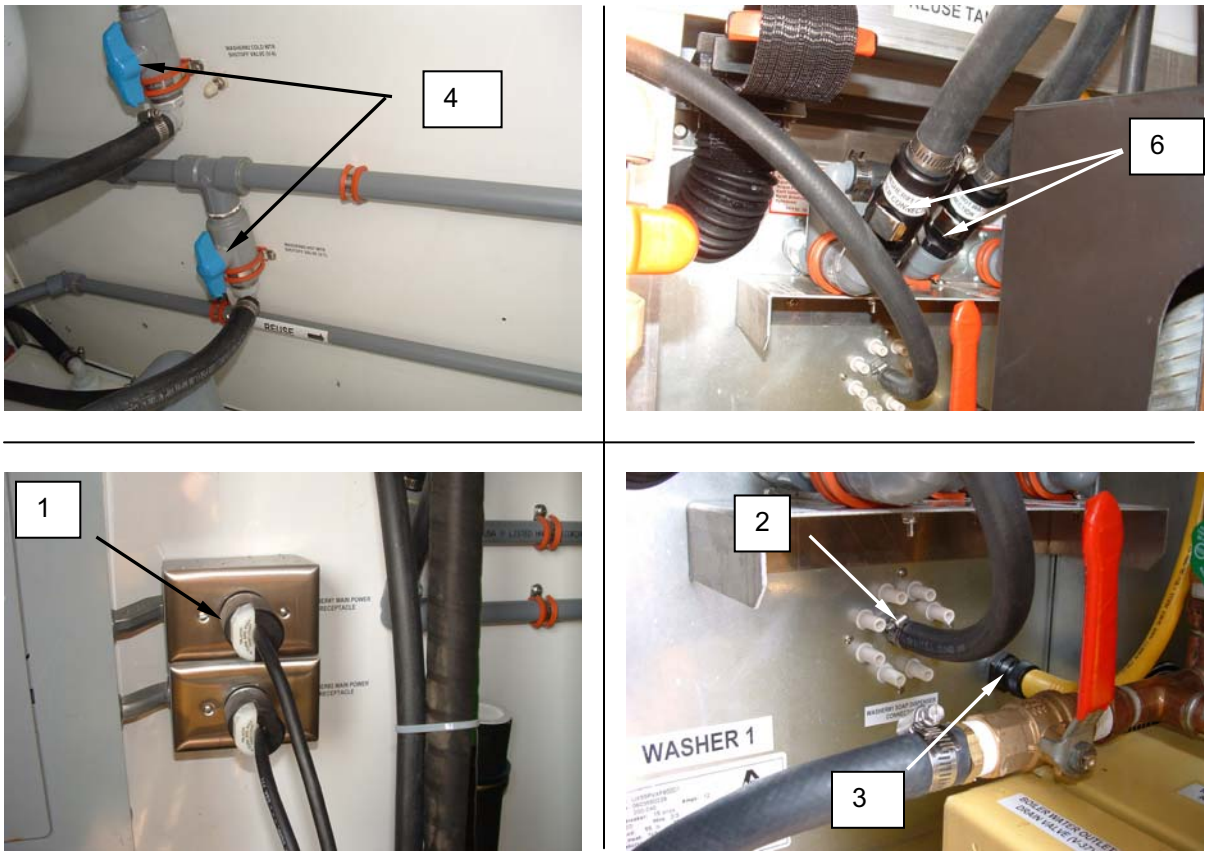


Figure 6. Install the Washer.

END OF WORK PACKAGE

UNIT MAINTENANCE
CONTAINERIZED BATCH LAUNDRY
NSN 3510-01-527-2209
NSN 3510-01-527-2210
ASSEMBLY, DOOR LOCK
TEST, REPLACE

INITIAL SETUP

Tools
Tool Kit, General Mechanics: Automotive (WP 0086 00, Table 2, Item 6)

Materials/Parts
Tie, Wire, 6.3-in (WP 0087 00, Item 55)

Personnel Required
Quartermaster and Chemical Equipment Repairer 63J (2)

Equipment Condition
CBL set up

References
TM 10-3510-226-10
WP 0041 00

TEST

Test the Door Unlocked Switch

WARNING

Ensure that all electrical power is shut off and disconnected before proceeding. The circuit breaker box should be locked by personnel following this procedure. Serious injury or death can result from electrocution if proper safety precautions are not observed.

NOTE

This switch is normally open (NO).

1. Remove washer IAW procedures given in WP 0041 00.
2. Cut the wire ties **(Figure 1, Item 1)** retaining switch wiring to the washer frame. There may be one or two wire ties.
3. Open washer door.
4. Remove screws retaining door strike assembly **(Figure 1, Item 2)**, and remove door strike assembly.
5. Tag and disconnect wiring from unlock switch **(Figure 1, Item 3)**.
6. Use an ohmmeter to check for 0 resistance when the switch **(Figure 1, Item 3)** is closed.
7. Use an ohmmeter to check for infinite resistance when the switch **(Figure 1, Item 3)** is open. Replace a switch **(Figure 1, Item 3)** which fails either test.
8. Connect wiring to switch **(Figure 1, Item 3)** as tagged.
9. Install door strike assembly **(Figure 1, Item 2)**, and retain with screws.
10. Retain wiring with wire tie **(Figure 1, Item 1)**.
11. Install washer IAW procedures given in WP 0041 00.

TEST-CONTINUED

12. Close washer door, and operate IAW procedures given in TM 10-3510-226-10.

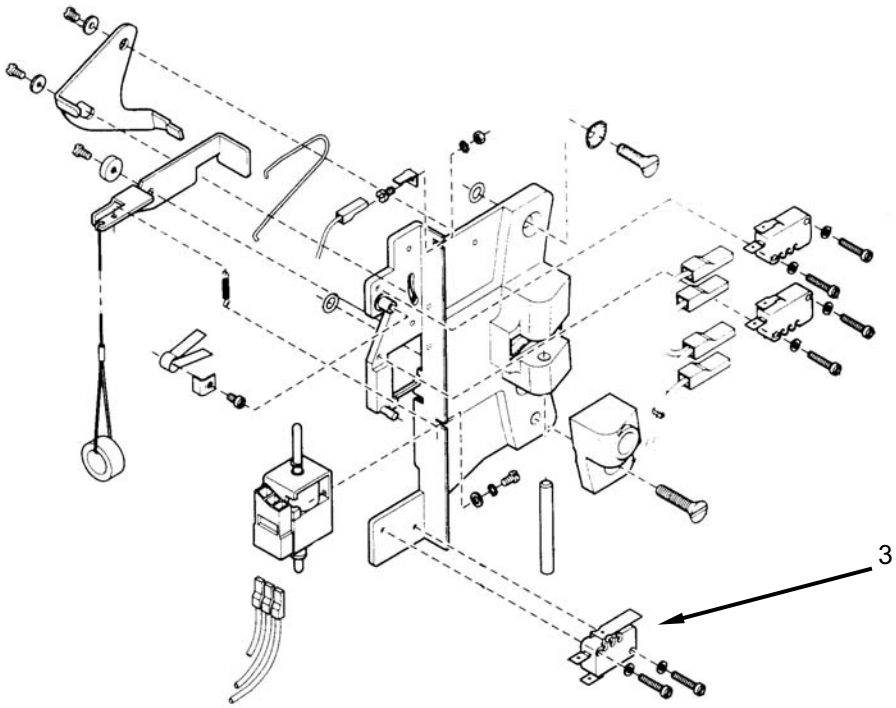


Figure 1. Test the Door Unlocked Switch.

TEST-CONTINUED

Test the Door Latched Switch

WARNING

Ensure that all electrical power is shut off and disconnected before proceeding. The circuit breaker box should be locked by personnel following this procedure. Serious injury or death can result from electrocution if proper safety precautions are not observed.

NOTE

This switch is normally open (NO).

1. Remove washer IAW procedures given in WP 0041 00.
2. Cut the wire ties **(Figure 2, Item 1)** retaining switch wiring to the washer frame. There may be one or two wire ties.
3. Open washer door.
4. Remove screws retaining door strike assembly **(Figure 2, Item 2)** and remove door strike assembly.
5. Tag and disconnect wiring from latched switch **(Figure 2, Item 4)**.
6. Use an ohmmeter to check for 0 resistance when the switch **(Figure 2, Item 4)** is closed.
7. Use an ohmmeter to check for infinite resistance when the switch **(Figure 2, Item 4)** is open.
8. Replace a switch **(Figure 2, Item 4)** that fails either test.
9. Connect wiring to switch **(Figure 2, Item 4)** as tagged.
10. Install door strike assembly **(Figure 2, Item 2)** and retain with screws.
11. Retain wiring with wire tie **(Figure 2, Item 1)**.
12. Install washer IAW procedures given in WP 0041 00.
13. Close washer door, and operate IAW procedures given in TM 10-3510-226-10.

TEST-CONTINUED

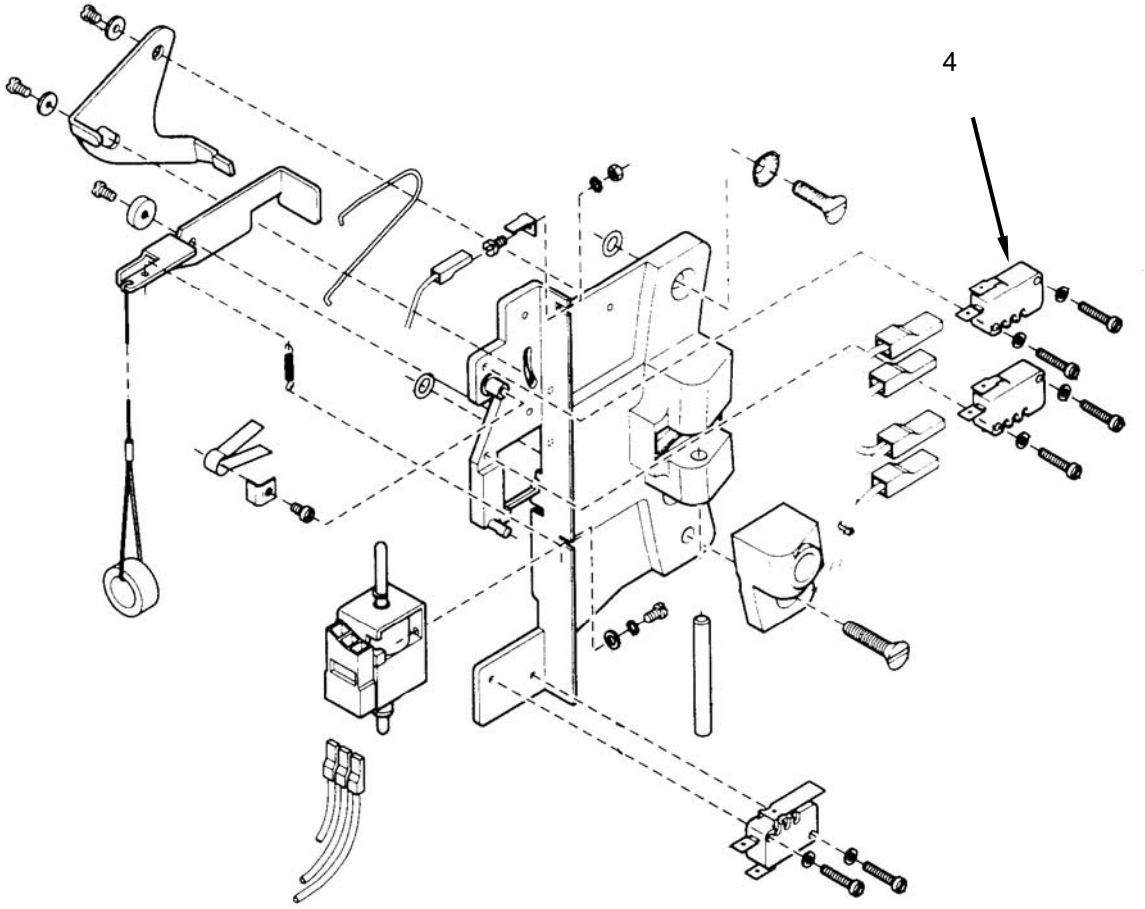


Figure 2. Test the Door Latched Switch.

TEST-CONTINUED

Test the Door Locked Switch

WARNING

Ensure that all electrical power is shut off and disconnected before proceeding. The circuit breaker box should be locked by personnel following this procedure. Serious injury or death can result from electrocution if proper safety precautions are not observed.

NOTE

This switch is normally open (NO).

1. Remove washer IAW procedures given in WP 0041 00.
2. Cut the wire ties **(Figure 3, Item 1)** retaining switch wiring to the washer frame. There may be one or two wire ties.
3. Open washer door.
4. Remove screws retaining door strike assembly **(Figure 3, Item 2)**, and remove door strike assembly.
5. Tag and disconnect wiring from lock switch **(Figure 3, Item 5)**.
6. Use an ohmmeter to check for 0 resistance when the switch **(Figure 3, Item 5)** is closed.
7. Use an ohmmeter to check for infinite resistance when the switch **(Figure 3, Item 5)** is open.
8. Replace a switch **(Figure 3, Item 5)** which fails either test.
9. Connect wiring to switch **(Figure 3, Item 5)** as tagged.
10. Install door strike assembly **(Figure 3, Item 2)** and retain with screws.
11. Install washer IAW procedures given in WP 0041 00.
12. Close washer door, and operate IAW procedures given in TM 10-3510-226-10.

TEST-CONTINUED

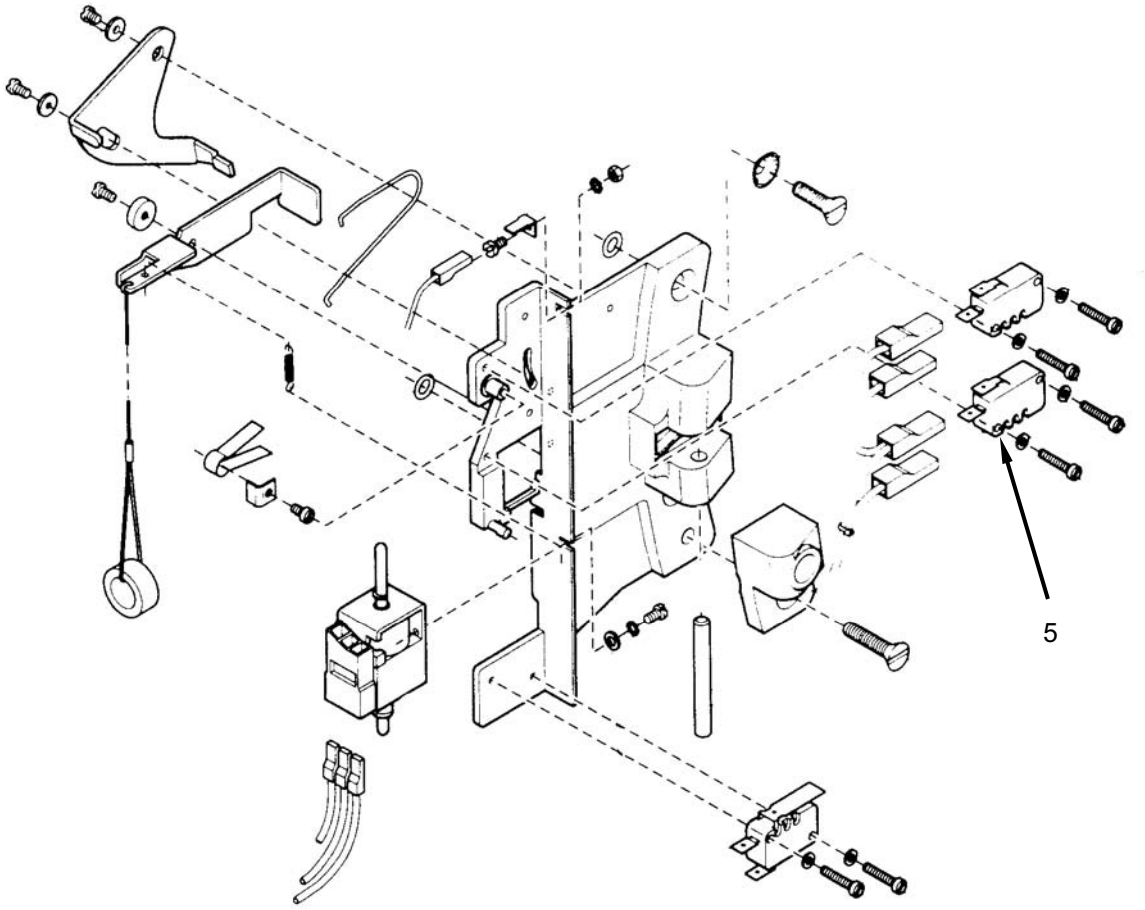


Figure 3. Test the Door Locked Switch.

TEST-CONTINUED

Test the Door Lock Solenoid

WARNING

Ensure that all electrical power is shut off and disconnected before proceeding. The circuit breaker box should be locked by personnel following this procedure. Serious injury or death can result from electrocution if proper safety precautions are not observed.

NOTE

This switch is normally open (NO).

1. Remove washer IAW procedures given in WP 0041 00.
2. Cut the wire ties **(Figure 4, Item 1)** retaining switch wiring to the washer frame. There may be one or two wire ties.
3. Pull down on release **(Figure 4, Item 6)** and then open washer door.
4. Remove screws retaining door strike assembly **(Figure 4, Item 2)** and remove door strike assembly.
5. Tag and disconnect wiring from solenoid **(Figure 4, Item 7)**.
6. Use an ohmmeter to check for resistance. Refer to Table 1 for approximate values.

Table 1. Resistance Values for the Door Lock Solenoid.

Wire Terminals	Value in ohms
Black and White	30 ohms
Black and Red	25 ohms
Red and White	55 ohms

7. Replace an open solenoid **(Figure 4, Item 7)**.
8. Connect wiring to solenoid **(Figure 4, Item 7)** as tagged.
9. Install door strike assembly **(Figure 4, Item 2)** and retain with screws.
10. Install washer IAW procedures given in WP 0041 00.
11. Close washer door, and operate IAW procedures given in TM 10-3510-226-10.

TEST-CONTINUED

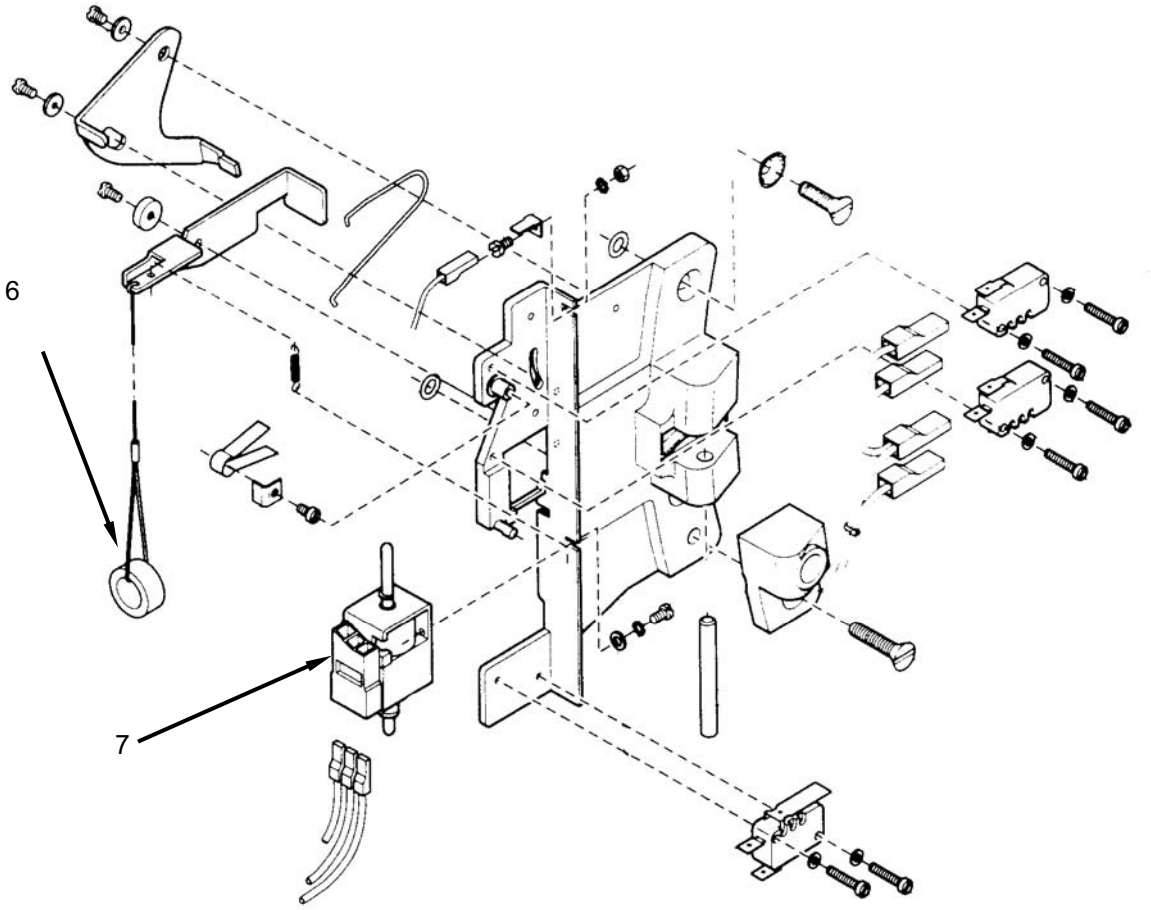


Figure 4. Test the Door Lock Solenoid.

REPLACE

Replace the Door Handle Assembly

WARNING

Ensure that all electrical power is shut off and disconnected before proceeding. The circuit breaker box should be locked by personnel following this procedure. Serious injury or death can result from electrocution if proper safety precautions are not observed.

1. Ensure washer has completed its full wash cycle and has drained.
2. Switch washer circuit breaker to OFF.

NOTE

If door will not open, this indicates a problem with the door lock solenoid.

3. Open washer door.
4. Remove the screws retaining the door handle assembly **(Figure 5, Item 8)** and remove the door handle assembly.
5. Install the replacement door handle assembly **(Figure 5, Item 8)** and retain with screws.
6. Close washer door, and operate IAW procedures given in TM 10-3510-226-10.

Figure 5. Replace the Door Handle Assembly.

REPLACE-CONTINUED

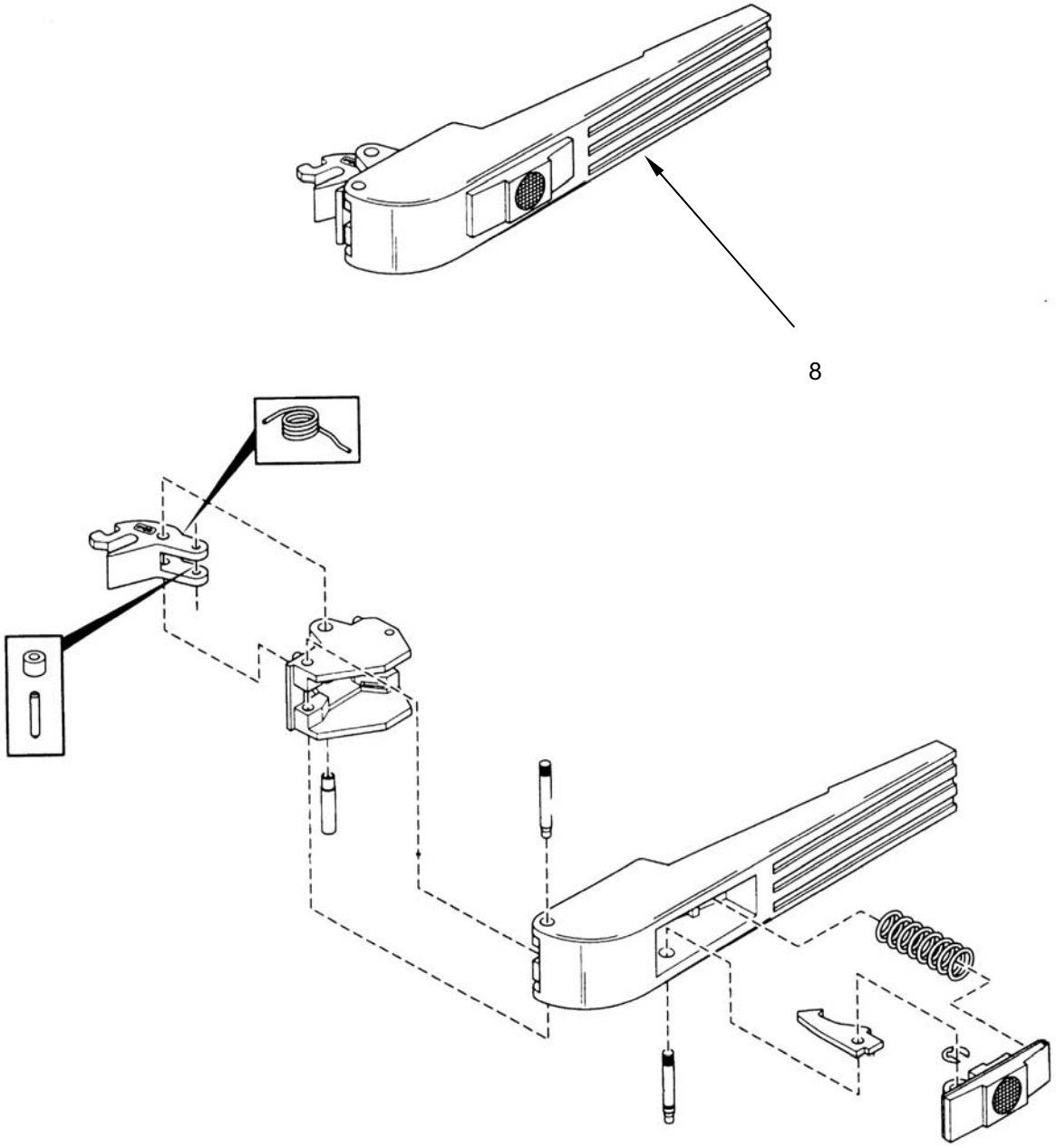


Figure 6. Replace the Door Handle Assembly.

REPLACE-CONTINUED

Replace the Door Unlocked Switch

WARNING

Ensure that all electrical power is shut off and disconnected before proceeding. The circuit breaker box should be locked by personnel following this procedure. Serious injury or death can result from electrocution if proper safety precautions are not observed.

NOTE

This switch is normally open (NO).

1. Remove washer IAW procedures given in WP 0041 00.
2. Cut the wire ties **(Figure 7, Item 1)** retaining switch wiring to the washer frame. There may be one or two wire ties.
3. Open washer door.
4. Remove screws retaining door strike assembly **(Figure 7, Item 2)** and remove door strike assembly.
5. Tag and disconnect wiring from unlock switch **(Figure 7, Item 3)**.
6. Remove screws retaining switch **(Figure 7, Item 3)** to door strike assembly **(Figure 7, Item 2)** and remove switch.
7. Install replacement switch **(Figure 7, Item 3)** onto door strike assembly **(Figure 7, Item 2)** and retain with screws.
8. Connect wiring to replacement switch **(Figure 7, Item 3)** as tagged.
9. Install door strike assembly **(Figure 7, Item 2)** and retain with screws.
10. Retain wiring with wire tie **(Figure 7, Item 1)**.
11. Install washer IAW procedures given in WP 0041 00.
12. Close washer door, and operate IAW procedures given in TM 10-3510-226-10.

REPLACE-CONTINUED

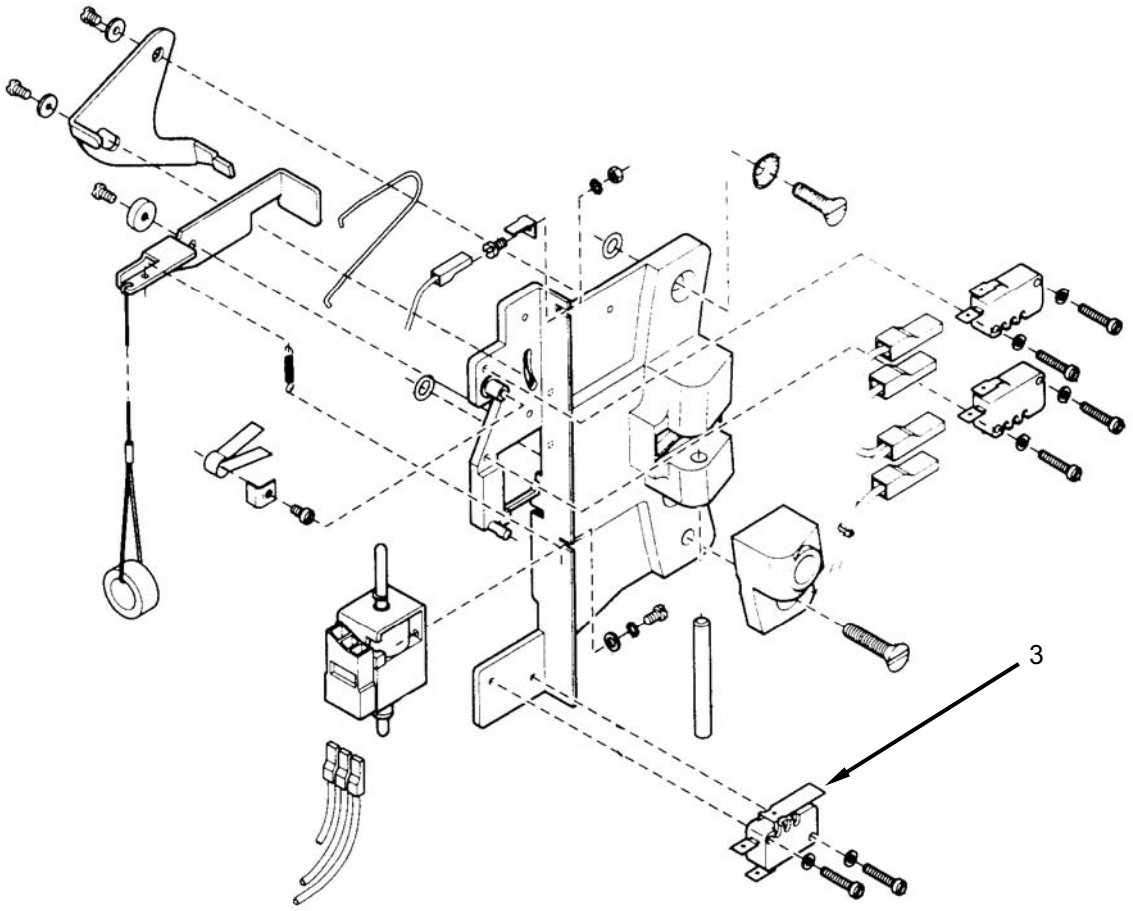


Figure 7. Replace the Door Unlocked Switch.

REPLACE-CONTINUED

Replace the Door Latched Switch

WARNING

Ensure that all electrical power is shut off and disconnected before proceeding. The circuit breaker box should be locked by personnel following this procedure. Serious injury or death can result from electrocution if proper safety precautions are not observed.

NOTE

This switch is normally open (NO).

1. Remove washer IAW procedures given in WP 0041 00.
2. Cut the wire ties **(Figure 8, Item 1)** retaining switch wiring to the washer frame. There may be one or two wire ties.
3. Open washer door.
4. Remove screws retaining door strike assembly **(Figure 8, Item 2)** and remove door strike assembly.
5. Tag and disconnect wiring from latched switch **(Figure 8, Item 4)**.
6. Remove screws retaining switch **(Figure 8, Item 4)** to door strike assembly **(Figure 8, Item 4)** and remove switch.
7. Install replacement switch **(Figure 8, Item 4)** onto door strike assembly **(Figure 8, Item 2)** and retain with screws.
8. Connect wiring to replacement switch **(Figure 8, Item 4)** as tagged.
9. Install door strike assembly **(Figure 8, Item 2)** and retain with screws.
10. Retain wiring with wire tie **(Figure 8, Item 1)**.
11. Install washer IAW procedures given in WP 0041 00.
12. Close washer door, and operate IAW procedures given in TM 10-3510-226-10.

REPLACE-CONTINUED

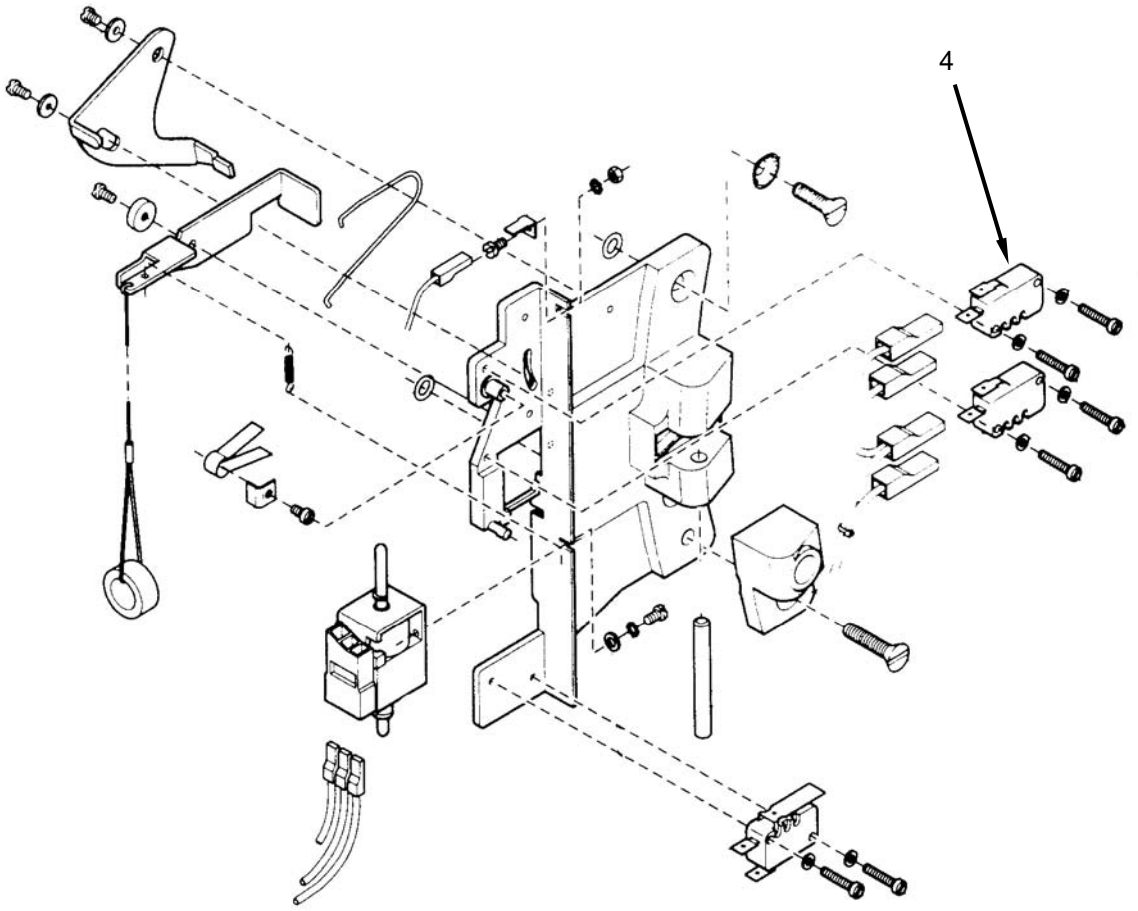


Figure 8. Replace the Door Latched Switch.

REPLACE-CONTINUED

Replace the Door Locked Switch

WARNING

Ensure that all electrical power is shut off and disconnected before proceeding. The circuit breaker box should be locked by personnel following this procedure. Serious injury or death can result from electrocution if proper safety precautions are not observed.

NOTE

This switch is normally open (NO).

1. Remove washer IAW procedures given in WP 0041 00.
2. Cut the wire ties **(Figure 9, Item 1)** retaining switch wiring to the washer frame. There may be one or two wire ties.
3. Open washer door.
4. Remove screws retaining door strike assembly **(Figure 9, Item 2)** and remove door strike assembly.
5. Tag and disconnect wiring from lock switch **(Figure 9, Item 5)**.
6. Remove screws retaining switch **(Figure 9, Item 5)** to door strike assembly **(Figure 9, Item 1)** and remove switch.
7. Install replacement switch **(Figure 9, Item 5)** onto door strike assembly **(Figure 9, Item 2)** and retain with screws.
8. Connect wiring to replacement switch **(Figure 9, Item 5)** as tagged.
9. Install door strike assembly **(Figure 9, Item 2)** and retain with screws.
10. Retain wiring with wire tie **(Figure 9, Item 1)**.
11. Install washer IAW procedures given in WP 0041 00.
12. Close washer door, and operate IAW procedures given in TM 10-3510-226-10.

REPLACE-CONTINUED

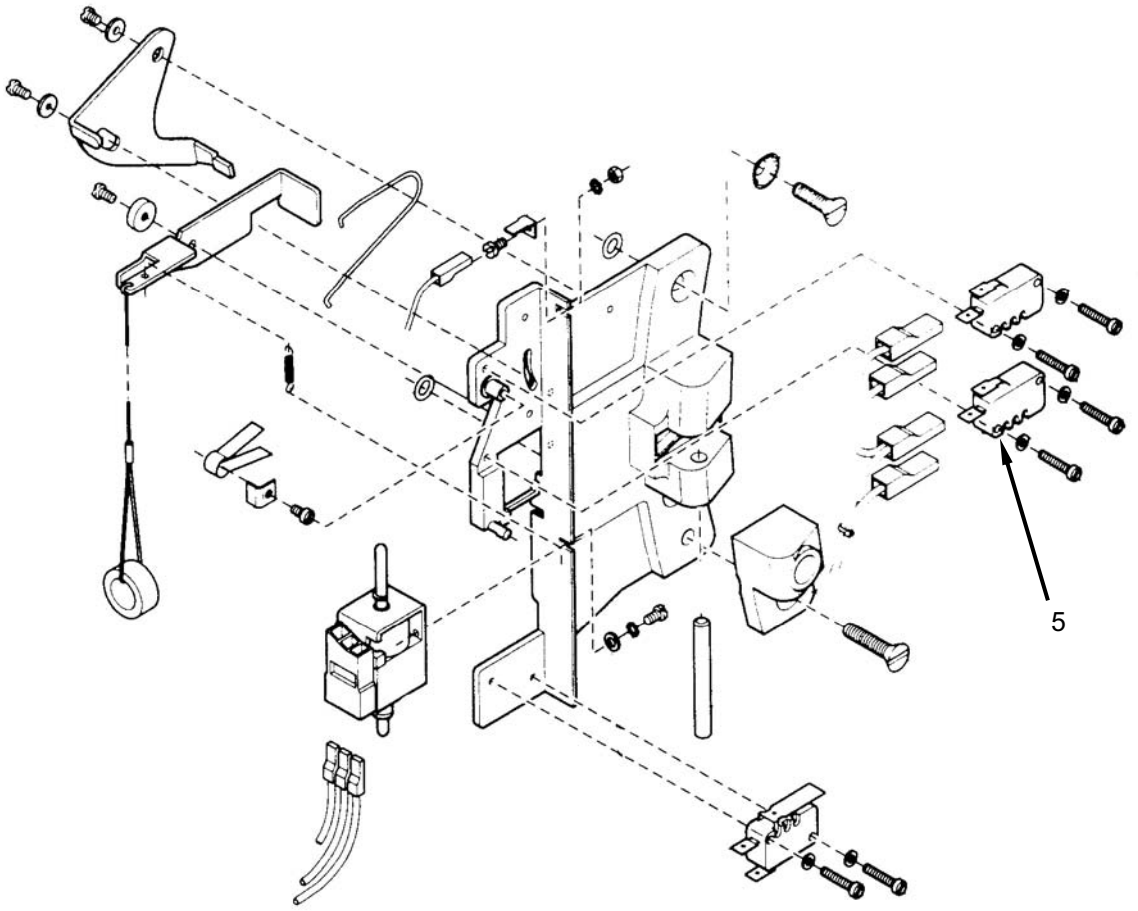


Figure 9. Replace the Door Locked Switch.

REPLACE-CONTINUED

Replace the Door Lock Solenoid

WARNING

Ensure that all electrical power is shut off and disconnected before proceeding. The circuit breaker box should be locked by personnel following this procedure. Serious injury or death can result from electrocution if proper safety precautions are not observed.

NOTE

This switch is normally open (NO).

1. Remove washer IAW procedures given in WP 0041 00.
2. Cut the wire ties **(Figure 10, Item 1)** retaining switch wiring to the washer frame. There may be one or two wire ties.
3. Pull down on release **(Figure 10, Item 6)** and then open washer door.
4. Remove screws retaining door strike assembly **(Figure 10, Item 2)** and remove door strike assembly.
5. Tag and disconnect wiring from solenoid **(Figure 10, Item 7)**.
6. Remove screws retaining solenoid **(Figure 10, Item 7)** to door strike assembly **(Figure 10, Item 2)** and remove solenoid.
7. Install replacement solenoid **(Figure 10, Item 7)** onto door strike assembly **(Figure 10, Item 2)** and retain with screws.
8. Connect wiring to replacement solenoid **(Figure 10, Item 7)** as tagged.
9. Install door strike assembly **(Figure 10, Item 2)** and retain with screws.
10. Retain wiring with wire tie **(Figure 10, Item 1)**.
11. Install washer IAW procedures given in WP 0041 00.
12. Close washer door, and operate IAW procedures given in TM 10-3510-226-10.

REPLACE-CONTINUED

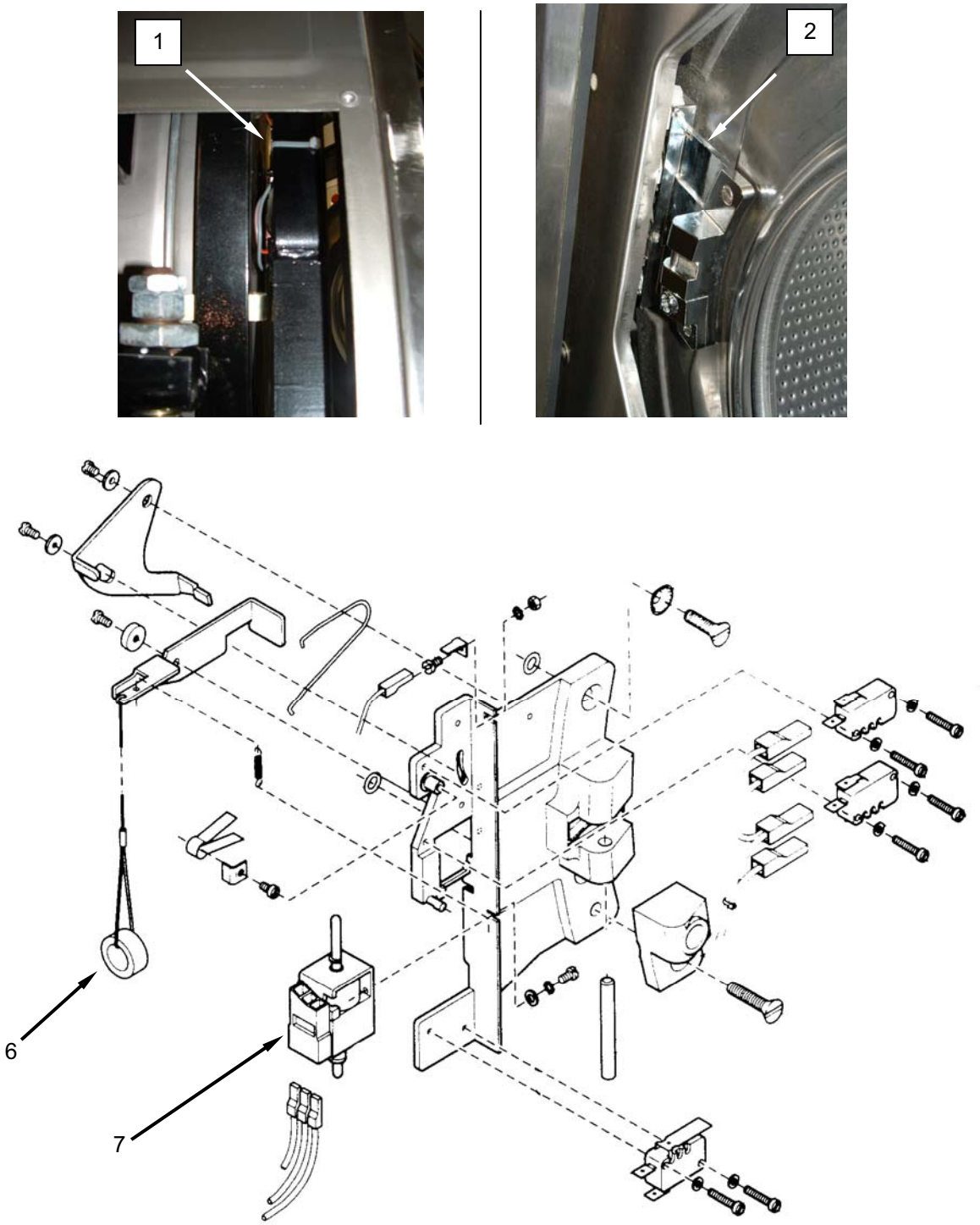


Figure 10. Replace the Door Lock Solenoid.

END OF WORK PACKAGE

UNIT MAINTENANCE
CONTAINERIZED BATCH LAUNDRY
NSN 3510-01-527-2209
NSN 3510-01-527-2210
VALVE, REUSE PUMP DUMP
TEST, REPLACE

INITIAL SETUP

Tools
Tool Kit, General Mechanics: Automotive (WP 0086 00, Table 2, Item 6)

Materials/Parts
Wire Markers (WP 0087 00, Item 58)

Personnel Required
Quartermaster and Chemical Equipment Repairer 63J (2)

Equipment Condition
CBL set up

References
WP 0041 00

TEST

Test the Washer Reuse Tank Dump Valve

WARNING

Ensure that the washer electrical power is shut off and disconnected before proceeding. The circuit breaker box should be locked by personnel following this procedure. Serious injury or death can result from electrocution if proper safety precautions are not observed.

WARNING

The washer is extremely heavy. Use caution when lifting and blocking the washer, and do not allow unnecessary personnel in the immediate area while it is being moved. Serious injury or death may result if safety precautions are not observed.

CAUTION

The washer is a large, heavy piece of machinery being moved out of a confined space. Before removal and installation, remove or protect any equipment that might be damaged by the washer on its way in or out.

1. Remove washer IAW procedures given in WP 0041 00.
2. Tag and disconnect wiring from dump valve **(Figure 1, Item 1)**.
3. Use an ohmmeter to test for 110 to 120 ohms resistance.
4. Replace a dump valve with an open solenoid **(Figure 1, Item 1)**.
5. Reconnect wiring as tagged.
6. Install washer IAW procedures given in WP 0041 00.

TEST-CONTINUED

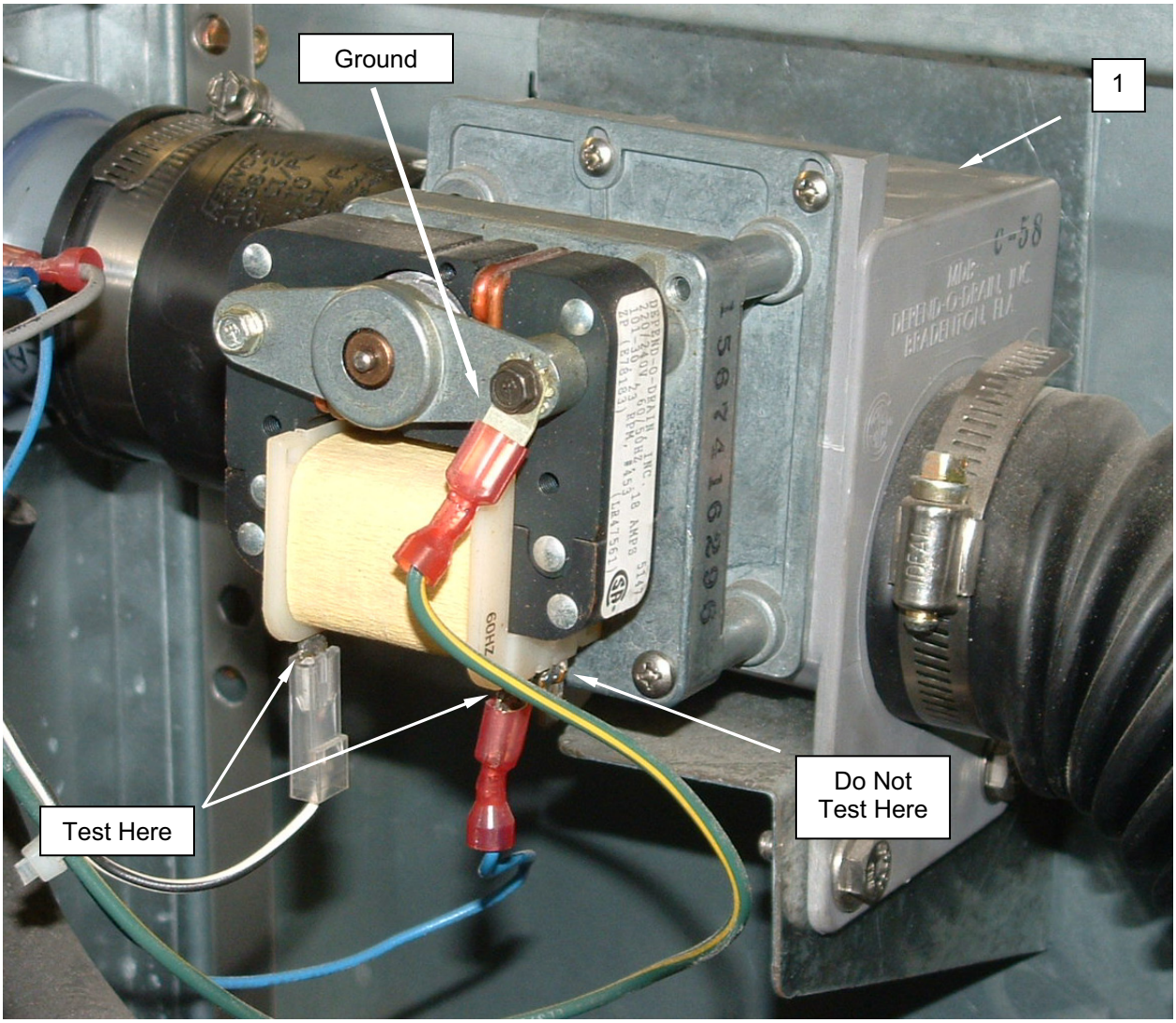


Figure 1. Test the Washer Reuse Tank Dump Valve.

REPLACE

Replace the Washer Reuse Tank Dump Valve

WARNING

Ensure that the washer electrical power is shut off and disconnected before proceeding. The circuit breaker box should be locked by personnel following this procedure. Serious injury or death can result from electrocution if proper safety precautions are not observed.

WARNING

The washer is extremely heavy. Use caution when lifting and blocking the washer, and do not allow unnecessary personnel in the immediate area while it is being moved. Serious injury or death may result if safety precautions are not observed.

CAUTION

The washer is a large, heavy piece of machinery being moved out of a confined space. Before removal and installation, remove or protect any equipment which might be damaged by the washer on its way in or out.

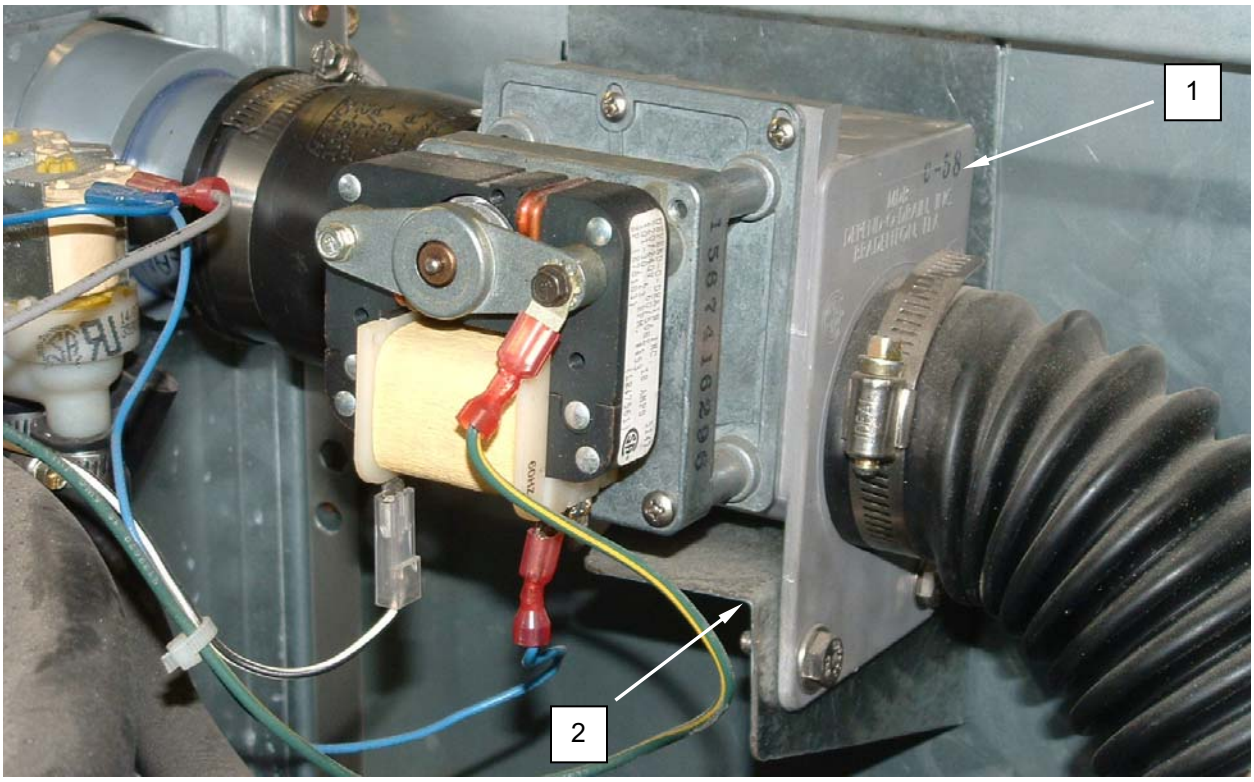
1. Remove washer IAW procedures given in WP 0041 00.
2. Tag and disconnect wiring from dump valve **(Figure 2, Item 1)**.
3. Tag and disconnect hoses from dump valve **(Figure 2, Item 1)**.
4. Remove screws, nuts, and washers retaining dump valve **(Figure 2, Item 1)** to mounting bracket **(Figure 2, Item 2)**, and remove dump valve.
5. Install replacement dump valve **(Figure 2, Item 1)**, and retain with screws, washers, and nuts.
6. Connect hoses to dump valve **(Figure 2, Item 1)** as tagged.

CAUTION

Ensure the wire connections are placed on the 60 Hz terminals as marked on the valve motor. Connection to the 50 Hz terminals will impair performance and reduce the operating life of the valve motor.

7. Reconnect wiring to dump valve **(Figure 2, Item 1)** as tagged.
8. Install washer IAW procedures given in WP 0041 00.

REPLACE-CONTINUED



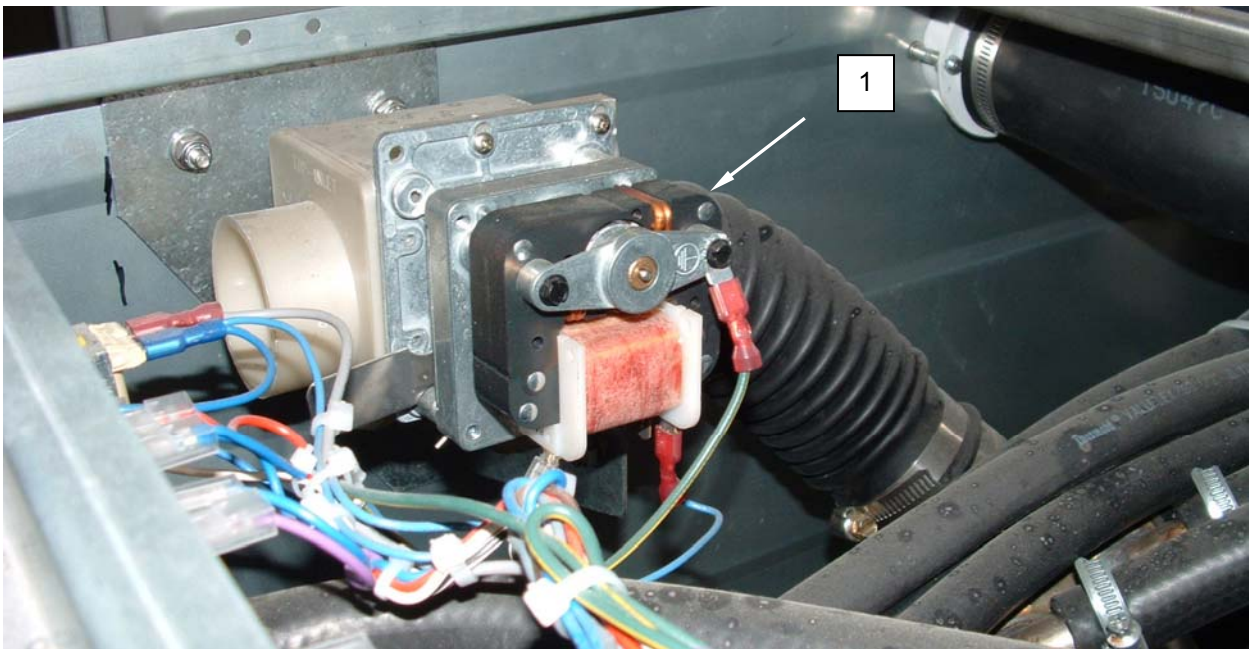


Figure 2. Replace the Washer Reuse Tank Dump Valve.

END OF WORK PACKAGE

UNIT MAINTENANCE
CONTAINERIZED BATCH LAUNDRY
NSN 3510-01-527-2209
NSN 3510-01-527-2210
VALVES, SOURCE WATER INLET
WASHER 3-WAY VALVE
TEST, SERVICE, REPLACE

INITIAL SETUP

Tools
Tool Kit, General Mechanics: Automotive (WP 0086 00, Table 2, Item 6)

Materials/Parts
Wire Markers (WP 0087 00, Item 58)

Personnel Required
Quartermaster and Chemical Equipment Repairer 63J (2)

Equipment Condition
CBL set up

References
WP 0041 00

TEST

Test the Washer Water Inlet Valve (2-Way Valve)

WARNING

Ensure that all electrical power is shut off and disconnected before proceeding. The circuit breaker box should be locked by personnel following this procedure. Serious injury or death can result from electrocution if proper safety precautions are not observed.

WARNING

The washer is extremely heavy. Use caution when lifting and blocking the washer, and do not allow unnecessary personnel in the immediate area while it is being moved. Serious injury or death may result if safety precautions are not observed.

CAUTION

The washer is a large, heavy piece of machinery being moved out of a confined space. Before removal and installation, remove or protect any equipment that might be damaged by the washer on its way in or out.

1. Remove washer IAW procedures given in WP 0041 00.

NOTE

Each valve has two solenoids that must be tested separately.

2. Tag and disconnect wiring from valve **(Figure 1, Item 1)**.
3. Use an ohmmeter to test for approximately 2500 ohms resistance.
4. Replace a valve **(Figure 1, Item 1)** with an open solenoid.

TEST-CONTINUED

5. Reconnect wiring as tagged.

6. Install washer IAW procedures given in WP 0041 00.

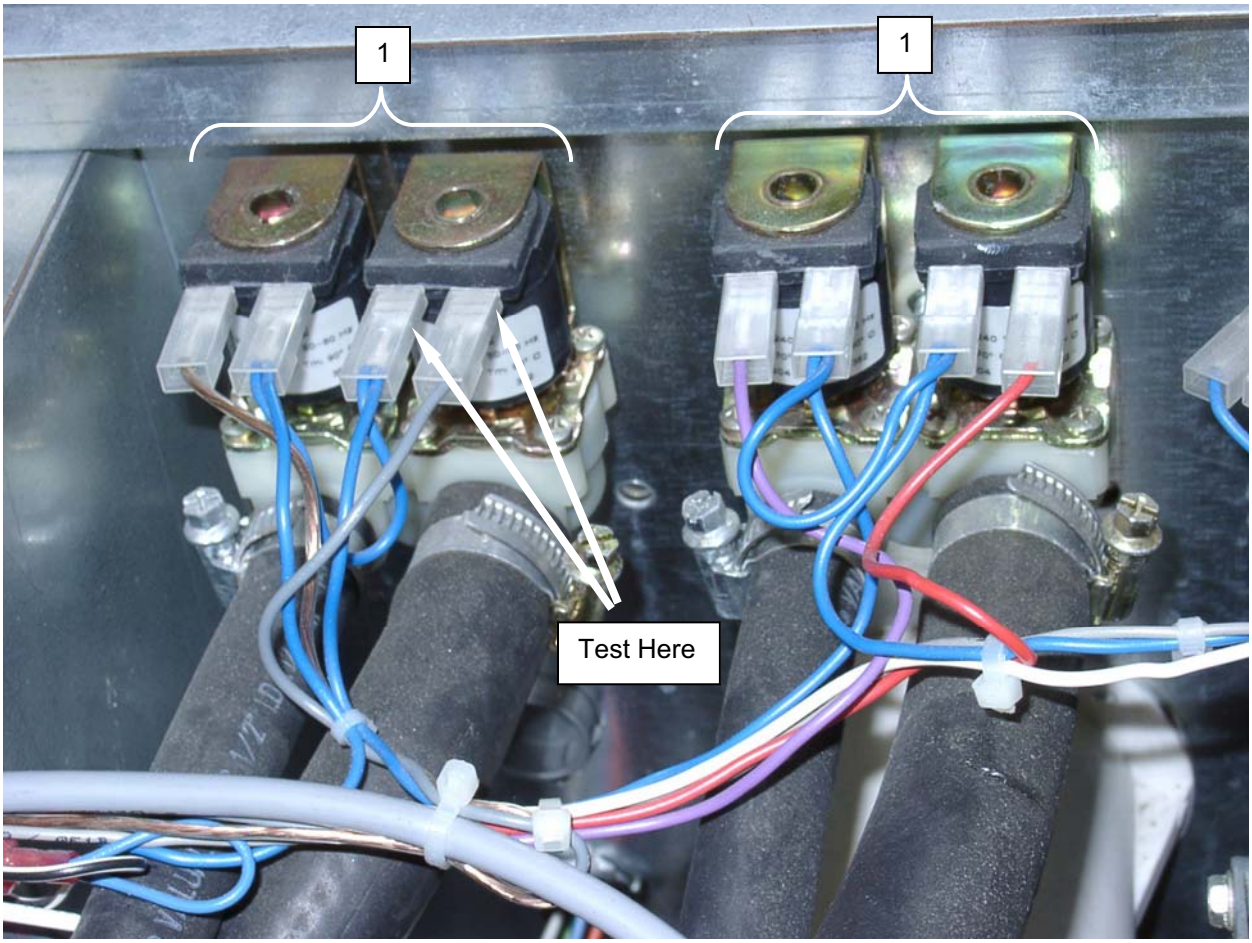


Figure 1. Test the Washer Water Inlet Valve (2-Way Valve).

TEST-CONTINUED

Test the Washer 3-Way Valve

WARNING

Ensure that all electrical power is shut off and disconnected before proceeding. The circuit breaker box should be locked by personnel following this procedure. Serious injury or death can result from electrocution if proper safety precautions are not observed.

WARNING

The washer is extremely heavy. Use caution when moving and blocking the washer, and do not allow unnecessary personnel in the immediate area while it is being moved. Serious injury or death may result if safety precautions are not observed.

CAUTION

The washer is a large, heavy piece of machinery being moved out of a confined space. Before removal and installation, remove or protect any equipment that might be damaged by the washer on its way in or out.

1. Remove washer IAW procedures given in WP 0041 00.

NOTE

The valve has three solenoids that must be tested separately. However, only two solenoids are connected and used in the washer.

2. Tag and disconnect wiring from valve **(Figure 2, Item 1)**.
3. Use an ohmmeter to test for approximately 4000 ohms resistance.
4. Replace a valve **(Figure 2, Item 1)** with an open solenoid.
5. Reconnect wiring as tagged.
6. Install washer IAW procedures given in WP 0041 00.

TEST-CONTINUED

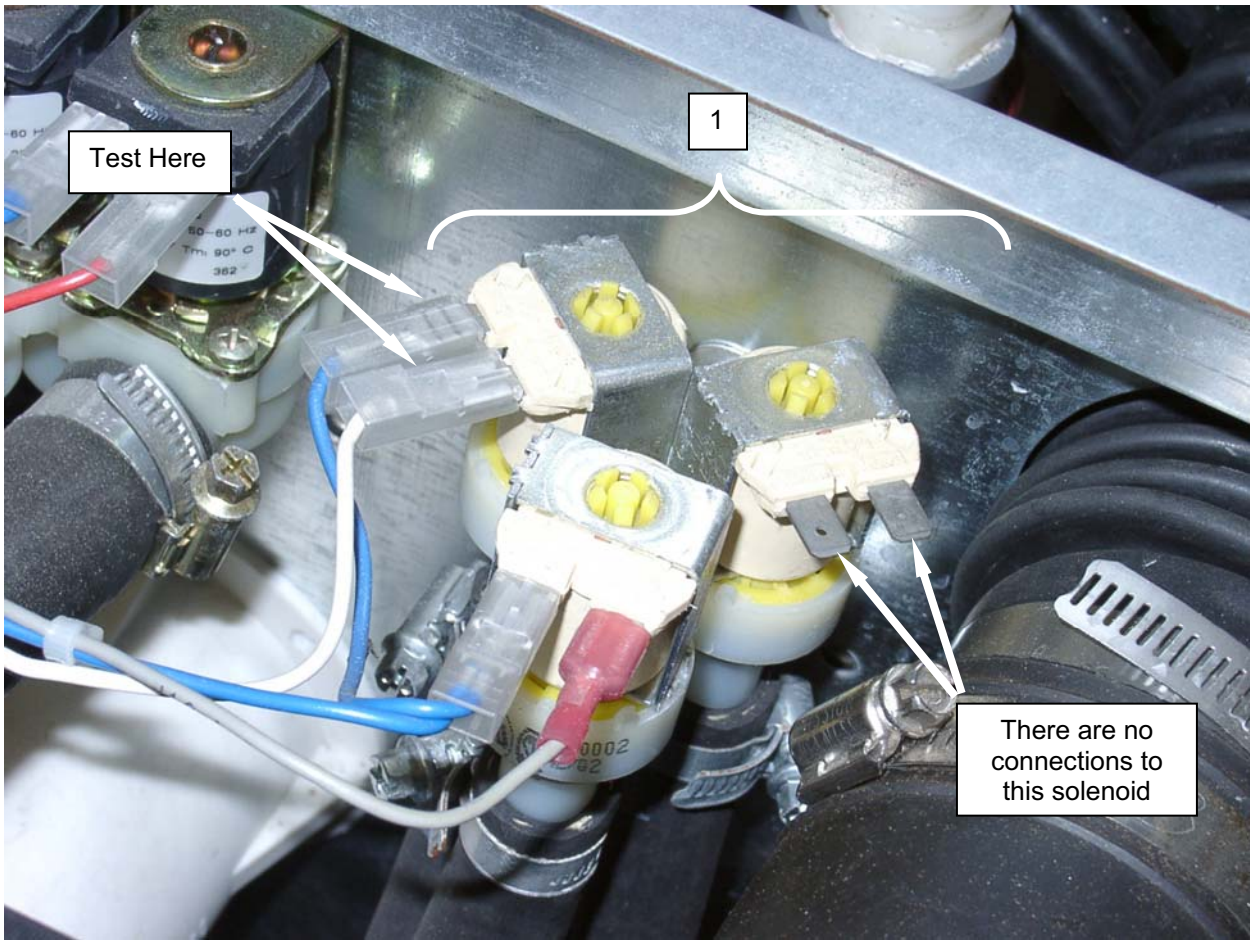


Figure 2. Test the Washer 3-Way Valve.

SERVICE

Service the Washer Water Inlet Valve (2-Way Valve) and Washer 3-Way Valve

WARNING

Ensure that all electrical power is shut off and disconnected before proceeding. The circuit breaker box should be locked by personnel following this procedure. Serious injury or death can result from electrocution if proper safety precautions are not observed.

WARNING

The washer is extremely heavy. Use caution when lifting and blocking the washer, and do not allow unnecessary personnel in the immediate area while it is being moved. Serious injury or death may result if safety precautions are not observed.

CAUTION

The washer is a large, heavy piece of machinery being moved out of a confined space. Before removal and installation, remove or protect any equipment that might be damaged by the washer on its way in or out.

1. Remove washer IAW procedures given in WP 0041 00.

2. Remove the clamps **(Figure 3, Item 2)** retaining the fittings **(Figure 3, Item 3)** to the mounting bracket **(Figure 3, Item 4)**.

3. Remove the mounting bracket **(Figure 3, Item 4)**.

CAUTION

It may be necessary to cut the hose from the fittings. Do not put unnecessary stress onto the CPVC fittings, and if the hose needs to be cut, ensure that the fittings are not damaged.

4. Loosen hose clamps **(Figure 4, Item 5)** and remove the connecting hose **(Figure 4, Item 6)** from the fittings **(Figure 3, Item 3)**.

5. Note the alignment of the fittings **(Figure 4, Item 3)**, and unscrew fittings from the valves.

6. Note position of inlet strainers **(Figure 4, Item 7)**, and remove inlet strainers.

SERVICE-CONTINUED

7. Clean inlet strainers **(Figure 4, Item 7)**.

WARNING

A flow restrictor **(Figure 4, Item 8)** must be installed with the inlet strainer **(Figure 4, Item 7)** on the 3-way valve. Omission of this component may allow chemicals to spray out of the soap trays, causing serious chemical burns to eyes and skin of operating personnel.

CAUTION

The inlet strainers must be installed with the strainer mesh facing out in order to allow sediment to accumulate on the sides of the strainer. Installing the strainer with the strainer mesh facing in will result in premature clogging of the strainer.

NOTE

Ensure rubber gaskets are secure and centered on all inlet valves.

8. Reinstall inlet strainers **(Figure 4, Item 7)**.

NOTE

Ensure the retaining clamps are in place before connecting the fittings to the valves.

9. Connect fittings **(Figure 4, Item 3)** to the valves. Ensure the fittings are all correctly aligned.
10. Install the connecting hose **(Figure 4, Item 6)** and retain with hose clamps **(Figure 4, Item 5)**.
11. Install the mounting bracket **(Figure 3, Item 4)**.
12. Connect the clamps **(Figure 3, Item 2)** to the mounting bracket.
13. Install washer IAW procedures given in WP 0041 00.

SERVICE-CONTINUED

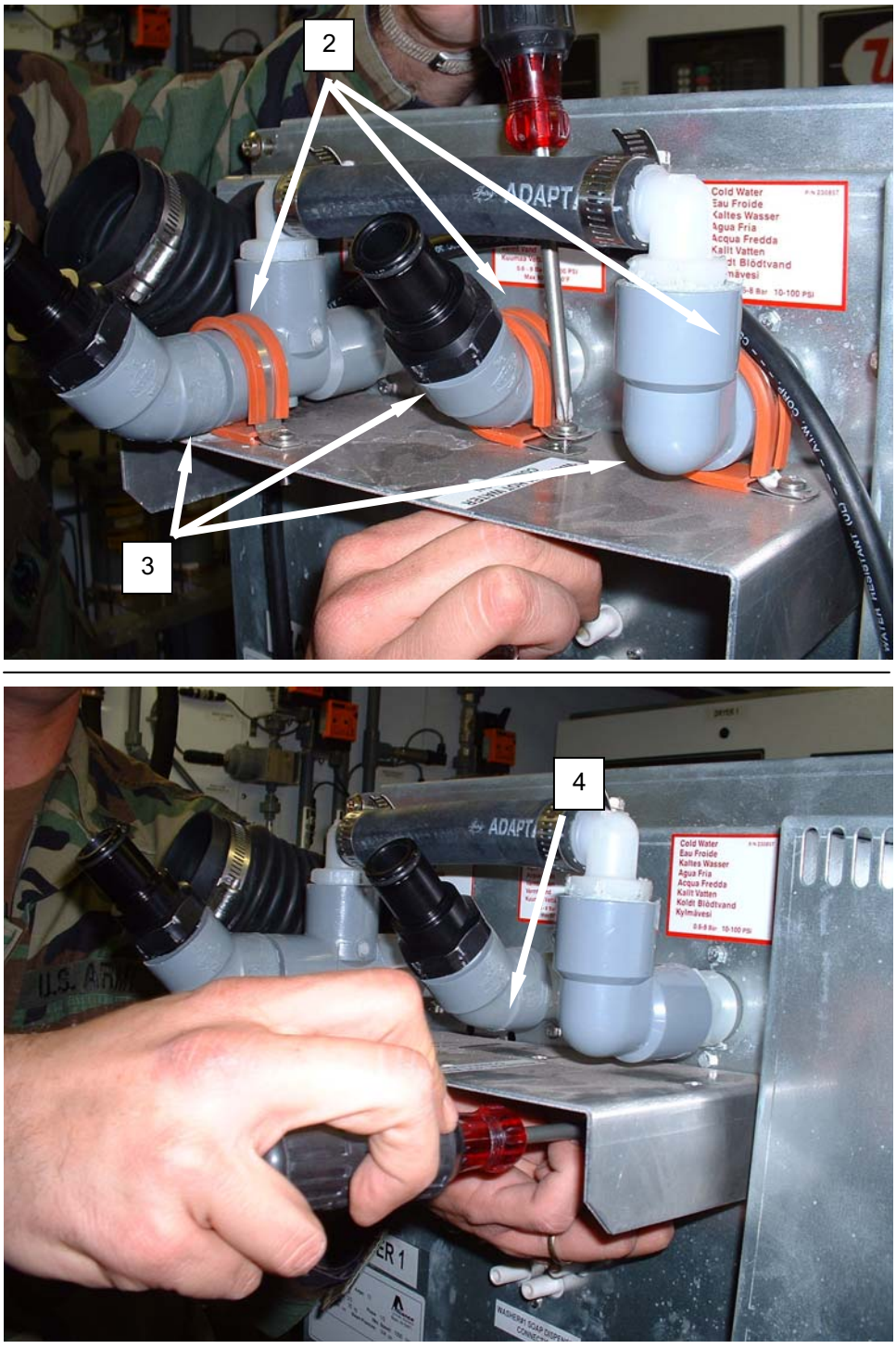


Figure 3. Service the Strainers.

SERVICE-CONTINUED

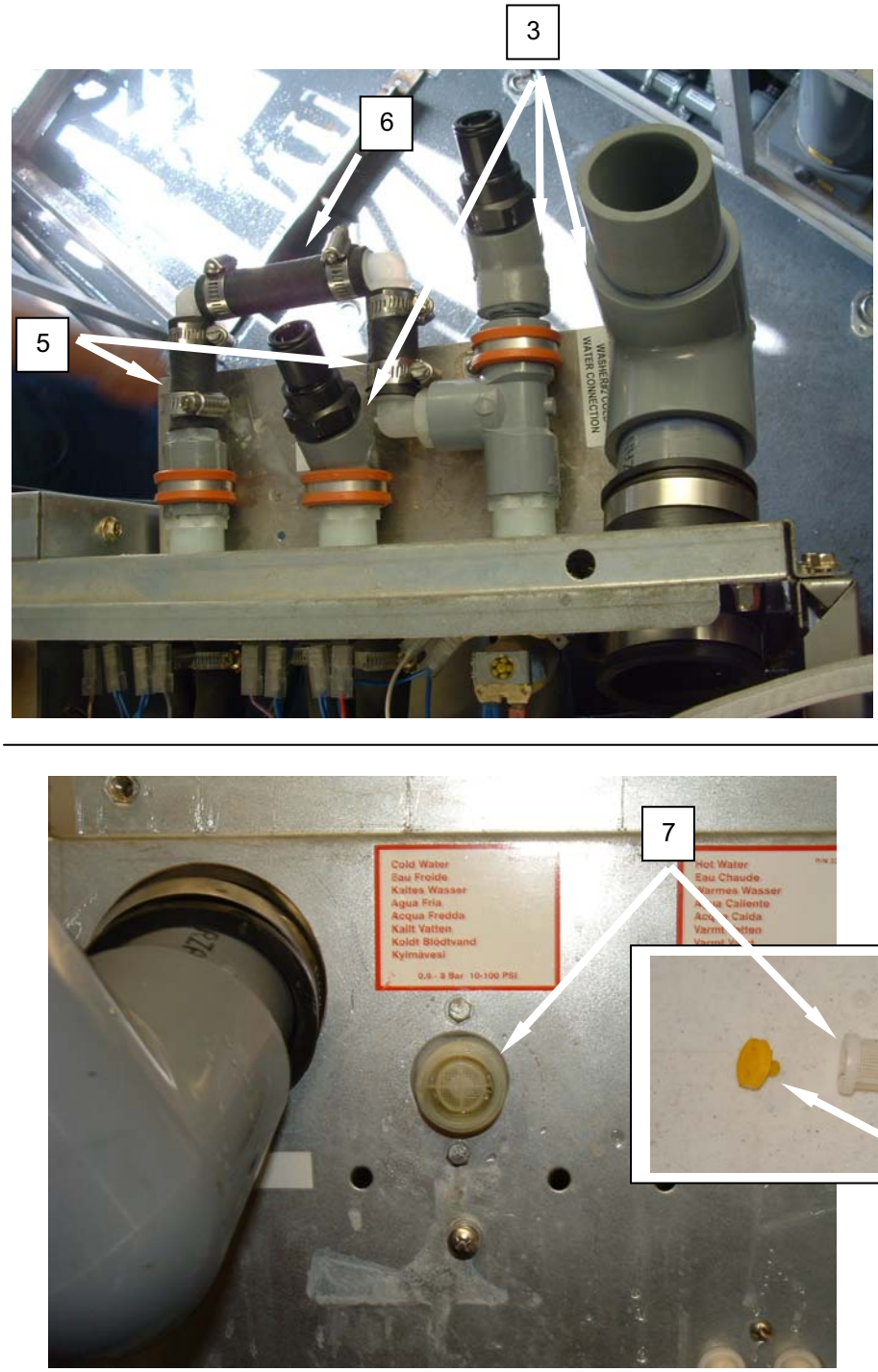


Figure 4. Service the Washer Water Inlet Valve (2-Way Valve).

REPLACE

Replace the Washer Water Inlet Valve (2-Way Valve)

WARNING

Ensure that all electrical power is shut off and disconnected before proceeding. The circuit breaker box should be locked by personnel following this procedure. Serious injury or death can result from electrocution if proper safety precautions are not observed.

WARNING

The washer is extremely heavy. Use caution when lifting and blocking the washer, and do not allow unnecessary personnel in the immediate area while it is being moved. Serious injury or death may result if safety precautions are not observed.

CAUTION

The washer is a large, heavy piece of machinery being moved out of a confined space. Before removal and installation, remove or protect any equipment which might be damaged by the washer on its way in or out.

1. Remove washer IAW procedures given in WP 0041 00.
2. Tag and disconnect wiring and internal hoses from valve **(Figure 5, Item 1)**.
3. Remove the clamps **(Figure 6, Item 2)** retaining the fittings **(Figure 6, Item 3)** to the mounting bracket **(Figure 6, Item 4)**.
4. Remove the mounting bracket **(Figure 6, Item 4)**.

CAUTION

It may be necessary to cut the hose from the fittings. Do not put unnecessary stress onto the CPVC fittings, and if the hose needs to be cut, ensure that the fittings are not damaged.

5. Loosen hose clamps **(Figure 6, Item 5)** and remove the connecting hose **(Figure 6, Item 6)** from the fittings **(Figure 6, Item 3)**.
6. Note the alignment of the fittings **(Figure 6, Item 3)**, and unscrew fittings from the valves **(Figure 5, Item 1)**.
7. Remove screws, washers, and nuts retaining valve **(Figure 5, Item 1)** and remove valve.

NOTE

Ensure rubber gaskets have been fitted to all inlet valves.

8. Install replacement valve **(Figure 5, Item 1)**, and retain with screws, washers, and nuts.

REPLACE-CONTINUED

NOTE

Ensure the retaining clamps are in place before connecting the fittings to the valves.

9. Connect fittings **(Figure 6, Item 3)** to the valves. Ensure the fittings are all correctly aligned.
10. Install the connecting hose **(Figure 6, Item 6)** and retain with hose clamps **(Figure 6, Item 5)**.
11. Install the mounting bracket **(Figure 6, Item 4)**.
12. Connect the clamps **(Figure 6, Item 2)** to the mounting bracket.
13. Connect wiring and internal hoses to valve **(Figure 5, Item 1)** as tagged
14. Install washer IAW procedures given in WP 0041 00.

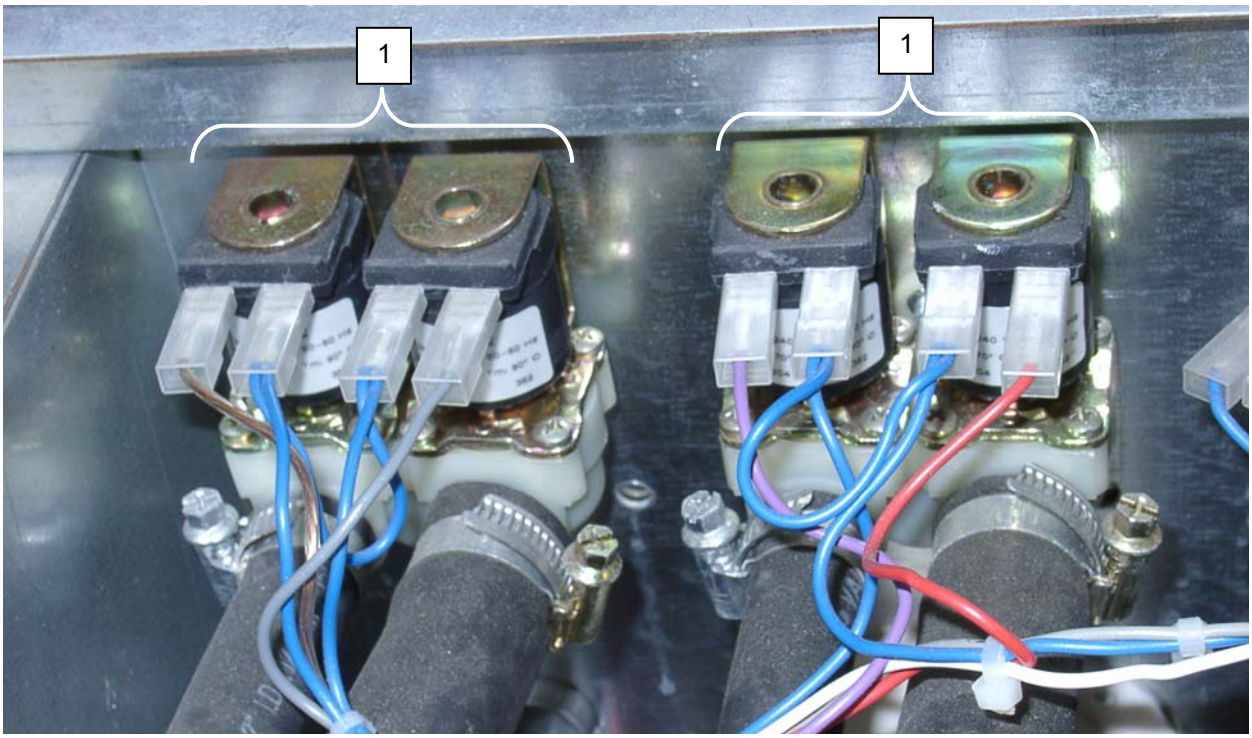
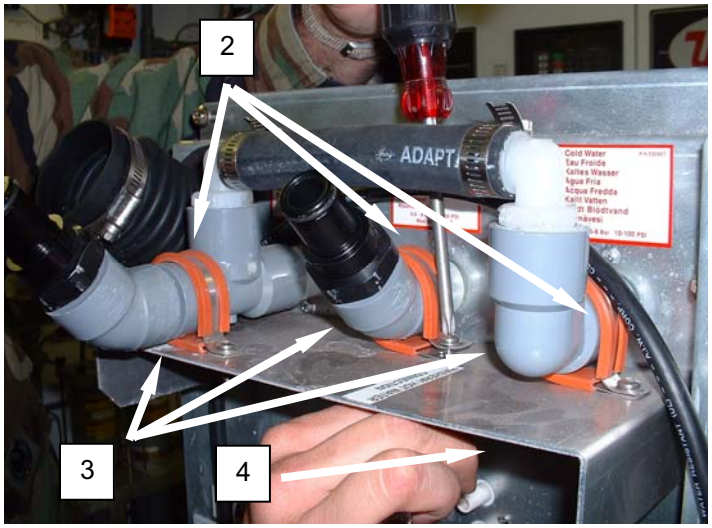


Figure 5. Replace the Washer Water Inlet Valve (2-Way Valve).

REPLACE-CONTINUED



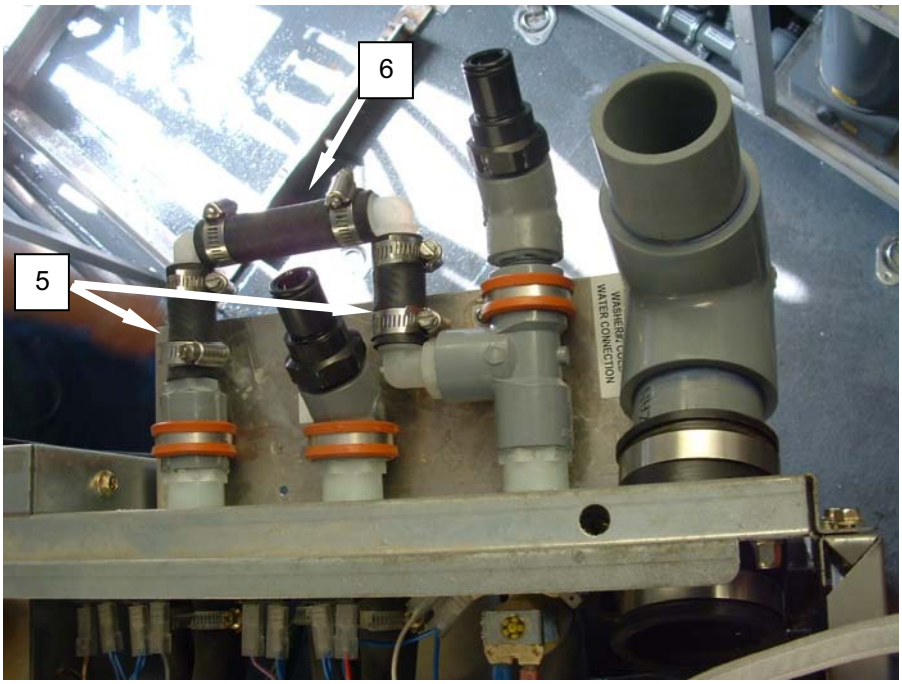


Figure 6. Replace the Washer Water Inlet Valve (2-Way Valve).

REPLACE-CONTINUED

Replace the Washer 3-Way Valve

WARNING

Ensure that all electrical power is shut off and disconnected before proceeding. The circuit breaker box should be locked by personnel following this procedure. Serious injury or death can result from electrocution if proper safety precautions are not observed.

WARNING

The washer is extremely heavy. Use caution when moving and blocking the washer, and do not allow unnecessary personnel in the immediate area while it is being moved. Serious injury or death may result if safety precautions are not observed.

CAUTION

The washer is a large, heavy piece of machinery being moved out of a confined space. Before removal and installation, remove or protect any equipment that might be damaged by the washer on its way in or out.

1. Remove washer IAW procedures given in WP 0041 00.
2. Tag and disconnect wiring and internal hoses from valve **(Figure 7, Item 1)**.
3. Remove the clamps **(Figure 7, Item 2)** retaining the fittings **(Figure 7, Item 3)** to the mounting bracket **(Figure 7, Item 4)**.
4. Remove the mounting bracket **(Figure 7, Item 4)**.

CAUTION

It may be necessary to cut the hose from the fittings. Do not put unnecessary stress onto the CPVC fittings, and if the hose needs to be cut, ensure that the fittings are not damaged.

5. Loosen hose clamps **(Figure 8, Item 5)** and remove the connecting hose **(Figure 8, Item 6)** from the fittings **(Figure 7, Item 3)**.
6. Note the alignment of the fittings **(Figure 7, Item 3)**, and unscrew fittings from the valves **(Figure 7, Item 1)**.
7. Remove screws, washers, and nuts retaining valve **(Figure 7, Item 1)** and remove valve.

REPLACE-CONTINUED

WARNING

A flow restrictor **(Figure 8, Item 7)** must be installed with the inlet strainer **(Figure 8, Item 8)** on the 3-way valve. Omission of this component may allow chemicals to spray out of the soap trays, causing serious chemical burns to eyes and skin of operating personnel.

NOTE

Ensure rubber gaskets have been fitted to all inlet valves.

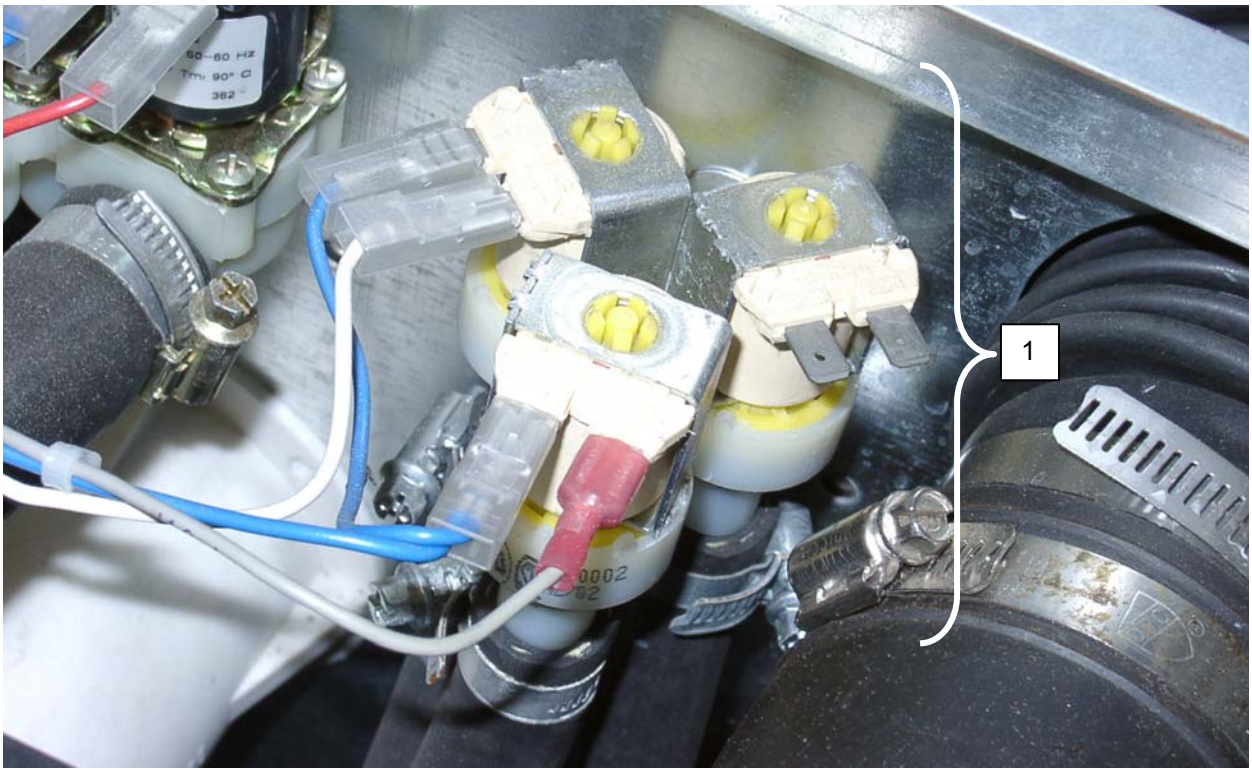
8. Install replacement valve **(Figure 7, Item 1)**, and retain with screws, washers, and nuts.

NOTE

Ensure the retaining clamps are in place before connecting the fittings to the valves.

9. Connect fittings **(Figure 7, Item 3)** to the valves. Ensure the fittings are all correctly aligned.
10. Install the connecting hose **(Figure 8, Item 6)** and retain with hose clamps **(Figure 8, Item 5)**.
11. Install the mounting bracket **(Figure 7, Item 4)**.
12. Connect the clamps **(Figure 7, Item 2)** to the mounting bracket.
13. Connect wiring and internal hoses to valve **(Figure 7, Item 1)** as tagged
14. Install washer IAW procedures given in WP 0041 00.

REPLACE-CONTINUED



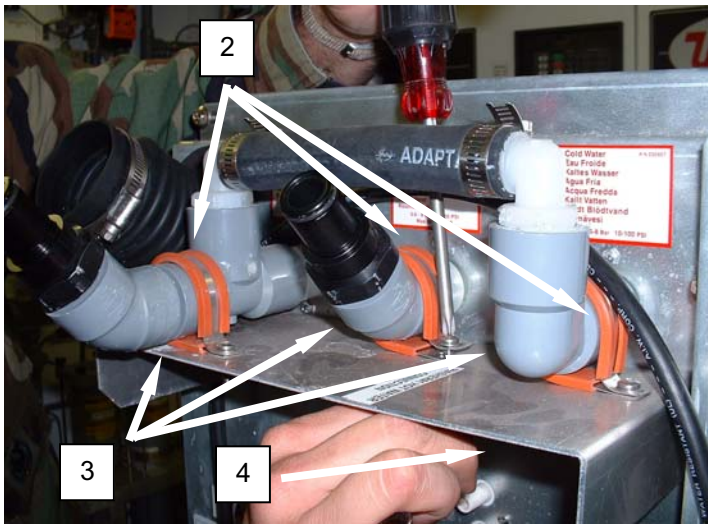
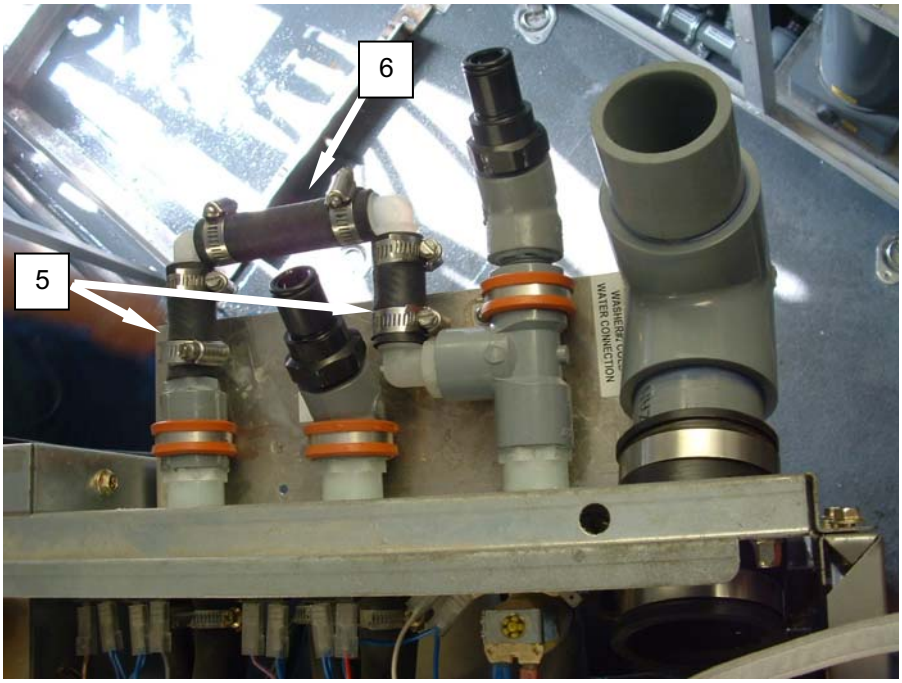


Figure 7. Replace the Washer 3-Way Valve.

REPLACE-CONTINUED



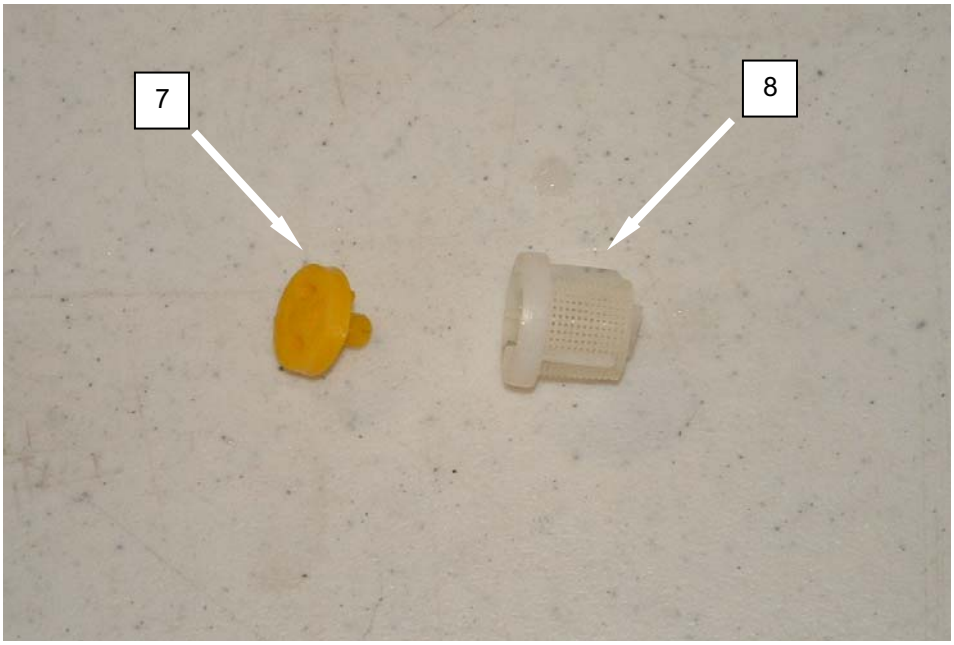


Figure 8. Replace the Washer 3-Way Valve.

END OF WORK PACKAGE

UNIT MAINTENANCE
CONTAINERIZED BATCH LAUNDRY
NSN 3510-01-527-2209
NSN 3510-01-527-2210
CONTROLS, WASHER
TEST, REPLACE

INITIAL SETUP

Tools	**Personnel Required**
Tool Kit, General Mechanics: Automotive (WP 0086 00, Table 2, Item 6)	Quartermaster and Chemical Equipment Repairer 63J (2)
Materials/Parts	**Equipment Condition**
Wire Markers (WP 0087 00, Item 58)	CBL set up

TEST

Test the Microprocessor Board Fuse

WARNING

Ensure that all electrical power to the washer is shut off and disconnected before proceeding. The circuit breaker box should be locked by personnel following this procedure. Serious injury or death can result from electrocution if proper safety precautions are not observed.

CAUTION

Use caution when handling electronic components such as printed circuit boards. Do not remove the board from the anti-static packaging until you are ready to install it, and always make sure you are grounded to the washer when handling the board. Failure to observe adequate precautions may result in failure of the replacement board.

1. Disconnect washer power cord.
2. Use washer key to open control panel.
3. Remove the fuse **(Figure 1, Item 1)**.

NOTE

Visual inspection of the fuse may reveal an obviously open fuse element, but a fuse that may look good might be open as well. Always remove the fuse from the holder and test for continuity.

4. Use an ohmmeter to test the fuse for continuity. Replace an open fuse.
5. Install the fuse **(Figure 1, Item 1)**.
6. Close and lock control panel.
7. Connect washer power cord and monitor for normal operation.

TEST-CONTINUED

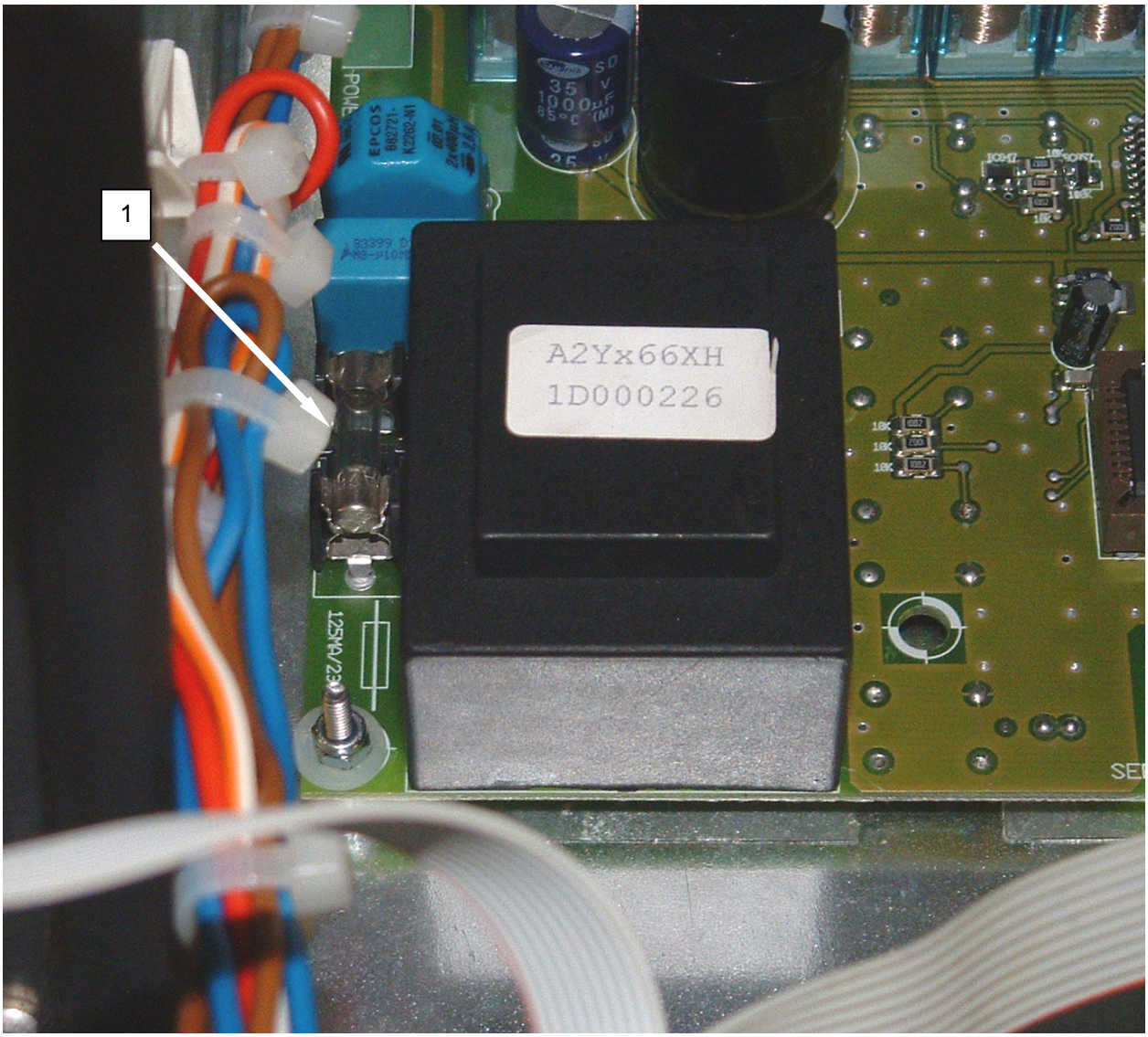


Figure 1. Test the Microprocessor Board Fuse.

TEST-CONTINUED

Test the Soap Dispenser Printed Circuit Board Fuse

WARNING

Ensure that all electrical power to the washer is shut off and disconnected before proceeding. The circuit breaker box should be locked by personnel following this procedure. Serious injury or death can result from electrocution if proper safety precautions are not observed.

CAUTION

Use caution when handling electronic components such as printed circuit boards. Do not remove the board from the anti-static packaging until you are ready to install it, and always make sure you are grounded to the washer when handling the board. Failure to observe adequate precautions may result in failure of the replacement board.

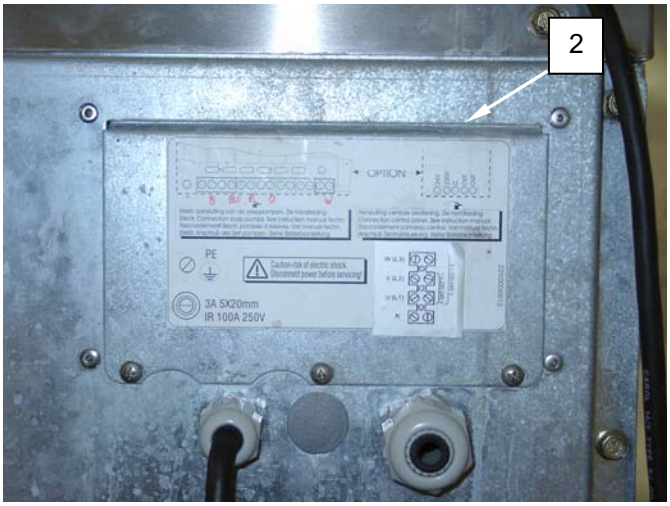
1. Disconnect washer power cord.
2. Remove screws and washers retaining the electrical connection plate **(Figure 2, Item 2)** and remove the electrical connection plate.
3. Use a flat-blade screwdriver to remove the fuse holder cap **(Figure 2, Item 3)** from the soap dispenser PC board **(Figure 2, Item 4)**, and remove the fuse from the cap.

NOTE

Visual inspection of the fuse may reveal an obviously open fuse element, but a fuse that may look good might be open as well. Always remove the fuse from the holder and test for continuity.

4. Use an ohmmeter to test the fuse for continuity. Replace an open fuse.
5. Install the fuse into the fuse holder cap **(Figure 2, Item 3)** and install the fuse holder cap into the soap dispenser PC board **(Figure 2, Item 4)**.
6. Install electrical connection plate **(Figure 2, Item 2)** and retain with screws and washers.
7. Connect washer power cord and monitor for normal operation.

TEST-CONTINUED



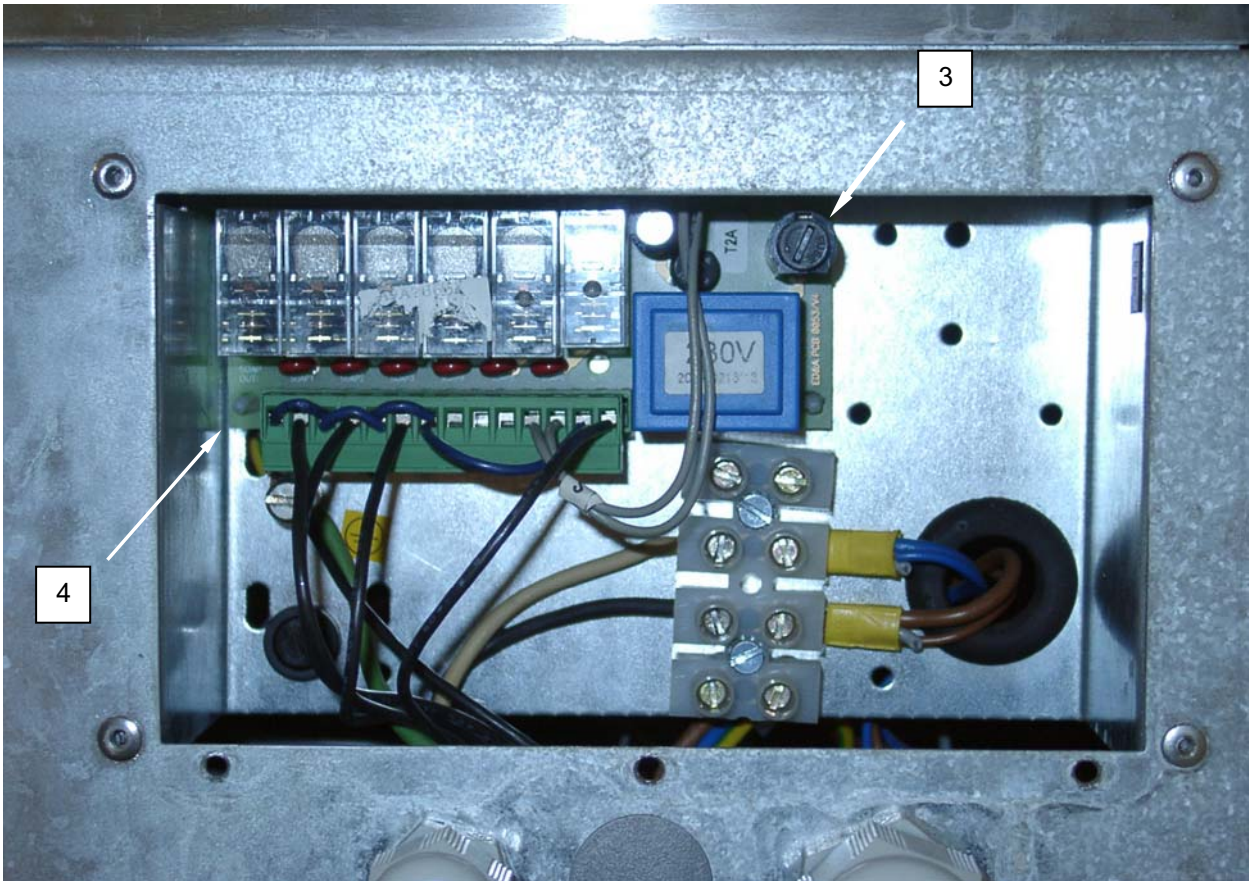


Figure 2. Test the Soap Dispenser Printed Circuit Board.

REPLACE

Replace the Microprocessor Display

WARNING

Ensure that all electrical power to the washer is shut off and disconnected before proceeding. The circuit breaker box should be locked by personnel following this procedure. Serious injury or death can result from electrocution if proper safety precautions are not observed.

CAUTION

Use caution when handling electronic components such as printed circuit boards. Do not remove the board from the anti-static packaging until you are ready to install it, and always make sure you are grounded to the washer when handling the board. Failure to observe adequate precautions may result in failure of the replacement board.

1. Disconnect washer power cord.
2. Use washer key to open control panel.
3. Tag and disconnect wiring from display **(Figure 3, Item 5)**.
4. Remove screws retaining display **(Figure 3, Item 5)** and remove display.
5. Install replacement display **(Figure 3, Item 5)** and retain with screws.
6. Connect display wiring as tagged.
7. Close and lock control panel.
8. Connect washer power cord and monitor for normal operation.

REPLACE-CONTINUED

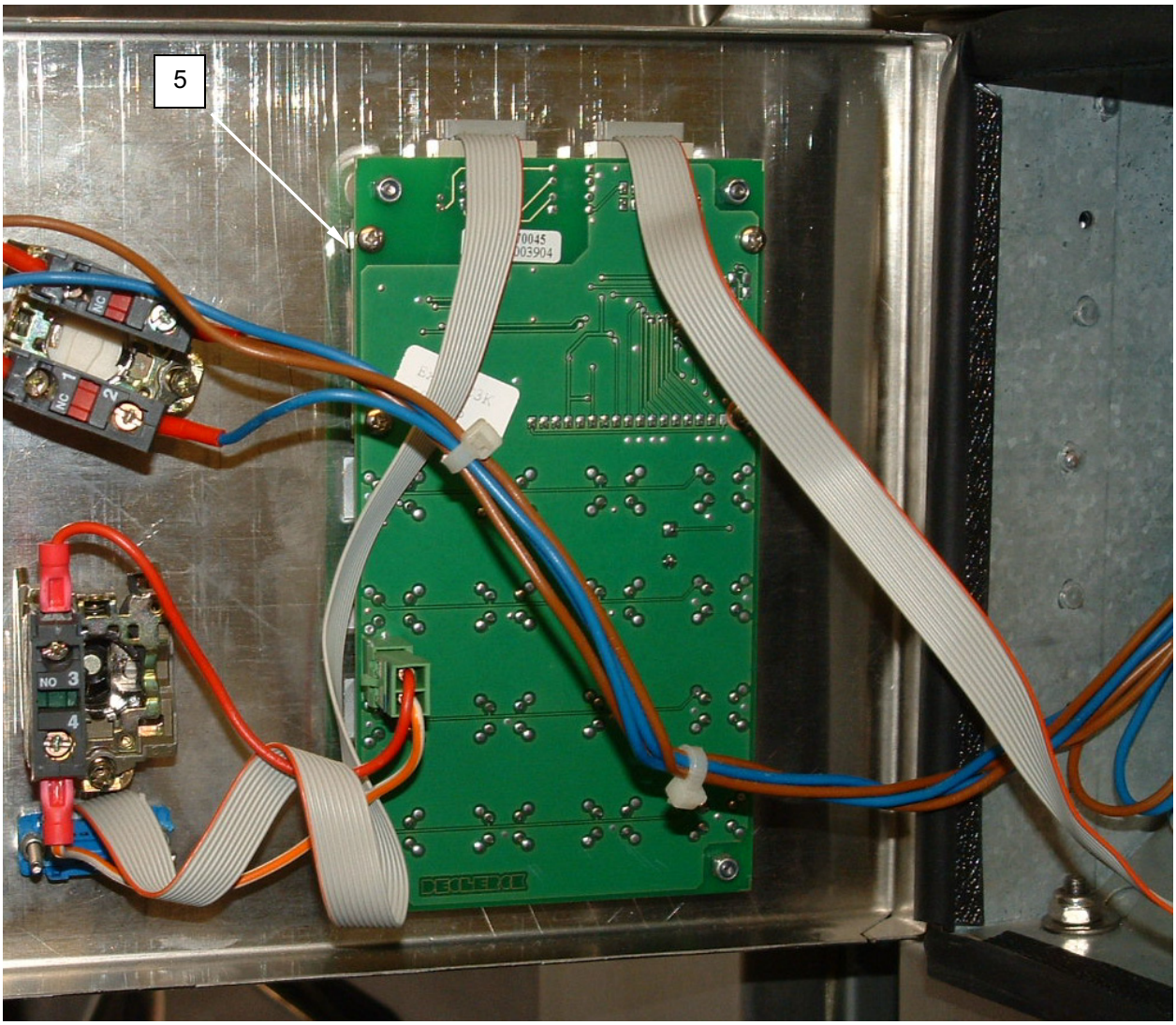


Figure 3. Replace the Microprocessor Display.

REPLACE-CONTINUED

Replace the Microprocessor Display Overlay

WARNING

Ensure that all electrical power to the washer is shut off and disconnected before proceeding. The circuit breaker box should be locked by personnel following this procedure. Serious injury or death can result from electrocution if proper safety precautions are not observed.

1. Disconnect washer power cord.
2. Use washer key to open control panel **(Figure 4, Item 6)**.
3. Loosen the screw **(Figure 4, Item 7)** securing the retaining catch **(Figure 4, Item 8)** on the emergency stop switch **(Figure 4, Item 9)**.
4. Use a screwdriver to lift the retaining catch **(Figure 4, Item 7)** on the emergency stop switch **(Figure 4, Item 8)**, separate the switch halves, and remove the switch.
5. Loosen the screw **(Figure 4, Item 10)** securing the retaining catch **(Figure 4, Item 11)** on the key switch **(Figure 4, Item 12)**.
6. Use a screwdriver to lift the retaining catch **(Figure 11, Item 11)** on the key switch **(Figure 4, Item 12)**, separate the switch halves, and remove the switch.
7. Carefully peel damaged overlay **(Figure 4, Item 13)** from washer display.
8. Ensure display area is clean, and no adhesive residue or fragments of the old overlay are present.
9. Install replacement overlay **(Figure 4, Item 13)**.

NOTE

The switch halves are marked for alignment to ease reassembly.

NOTE

When installed, the switch may be free to rotate within the limits imposed by the wiring.

10. Install the halves of the key switch **(Figure 4, Item 12)**, into the control panel **(Figure 4, Item 6),** and lock halves together.
11. Tighten the screw **(Figure 4, Item 10)** securing the retaining catch **(Figure 4, Item 11)** on the key switch **(Figure 4, Item 12)**.

REPLACE-CONTINUED

NOTE

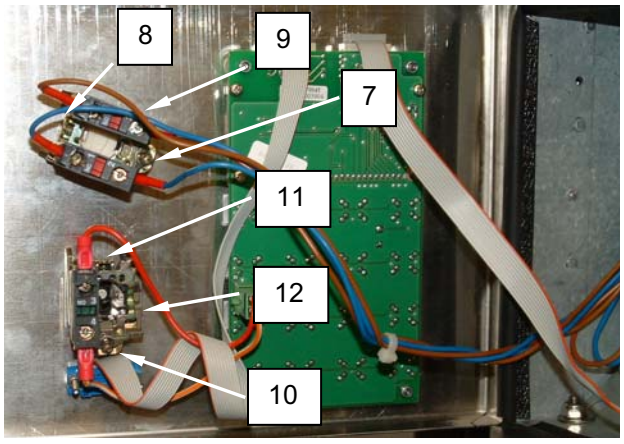
The switch halves are marked for alignment to ease reassembly.

NOTE

When installed, the switch may be free to rotate within the limits imposed by the wiring.

12. Install the halves of the emergency stop switch **(Figure 4, Item 9)** into the control panel **(Figure 4, Item 6)** and lock halves together.
13. Tighten the screw **(Figure 4, Item 7)** securing the retaining catch **(Figure 4, Item 8)** of the emergency stop switch **(Figure 4, Item 9)**.
14. Close the control panel **(Figure 4, Item 6)**.
15. Connect washer power cord and monitor for normal operation.

REPLACE-CONTINUED



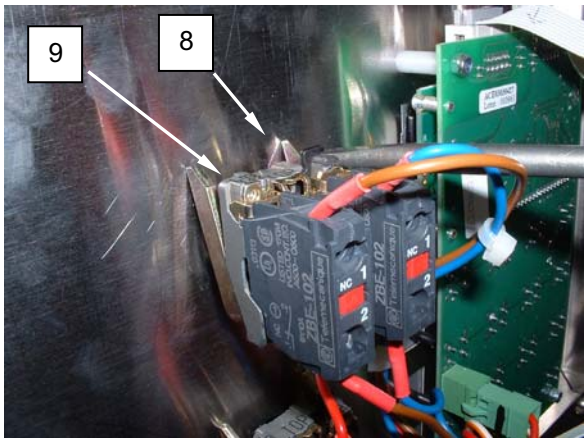


Figure 4. Replace the Microprocessor Display Overlay.

REPLACE-CONTINUED

Replace the Microprocessor Board

WARNING

Ensure that all electrical power to the washer is shut off and disconnected before proceeding. The circuit breaker box should be locked by personnel following this procedure. Serious injury or death can result from electrocution if proper safety precautions are not observed.

CAUTION

Use caution when handling electronic components such as printed circuit boards. Do not remove the board from the anti-static packaging until you are ready to install it, and always make sure you are grounded to the washer when handling the board. Failure to observe adequate precautions may result in failure of the replacement board.

1. Disconnect washer power cord.
2. Open control panel with washer key.
3. Tag and disconnect wiring from board **(Figure 5, Item 14)**.
4. Remove screws retaining the board **(Figure 5, Item 14)**, and remove the board.
5. Disconnect level sensing tube **(Figure 5, Item 15)** from the level sensor **(Figure 5, Item 16)**.
6. Connect level sensing tube **(Figure 5, Item 15)** to the level sensor **(Figure 5, Item 16)** on the replacement board.
7. Install replacement board **(Figure 5, Item 14)**, and retain with screws.
8. Connect wiring as tagged.
9. Close and lock control panel.
10. Connect washer power cord and monitor for normal operation.

REPLACE-CONTINUED

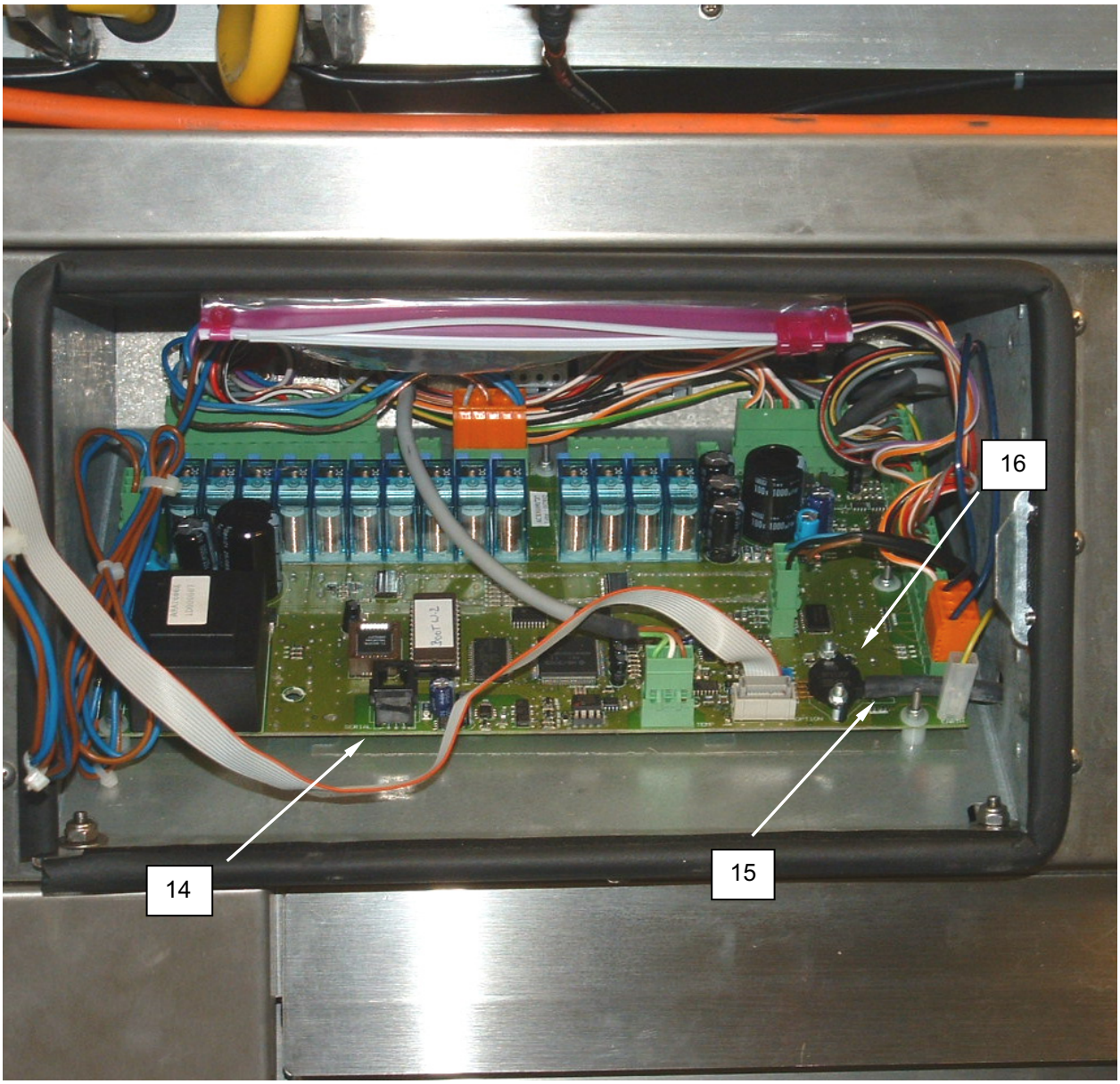


Figure 5. Replace the Microprocessor Board.

REPLACE-CONTINUED

Replace the Microprocessor Board Fuse

WARNING

Ensure that all electrical power to the washer is shut off and disconnected before proceeding. The circuit breaker box should be locked by personnel following this procedure. Serious injury or death can result from electrocution if proper safety precautions are not observed.

CAUTION

Use caution when handling electronic components such as printed circuit boards. Do not remove the board from the anti-static packaging until you are ready to install it, and always make sure you are grounded to the washer when handling the board. Failure to observe adequate precautions may result in failure of the replacement board.

1. Disconnect washer power cord.
2. Open control panel.
3. Remove fuse **(Figure 6, Item 1)**.
4. Install replacement fuse **(Figure 6, Item 1)**.
5. Close and lock control panel.
6. Connect washer power cord and monitor for normal operation.

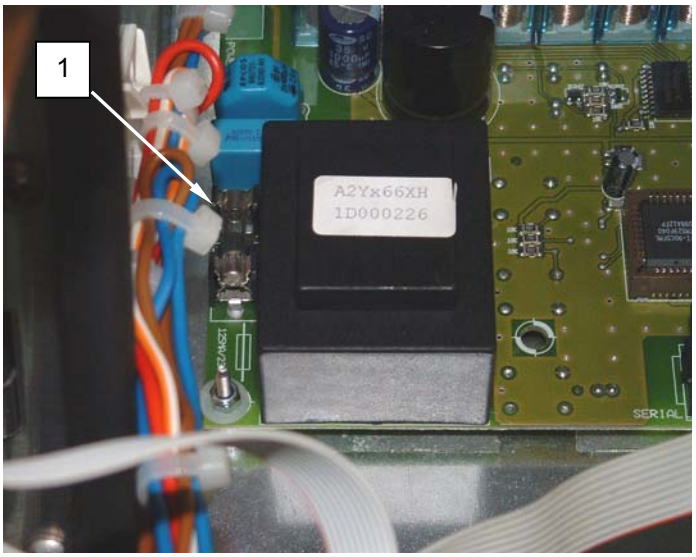


Figure 6. Replace the Microprocessor Board Fuse.

REPLACE-CONTINUED

Replace the Soap Dispenser Printed Circuit Board

WARNING

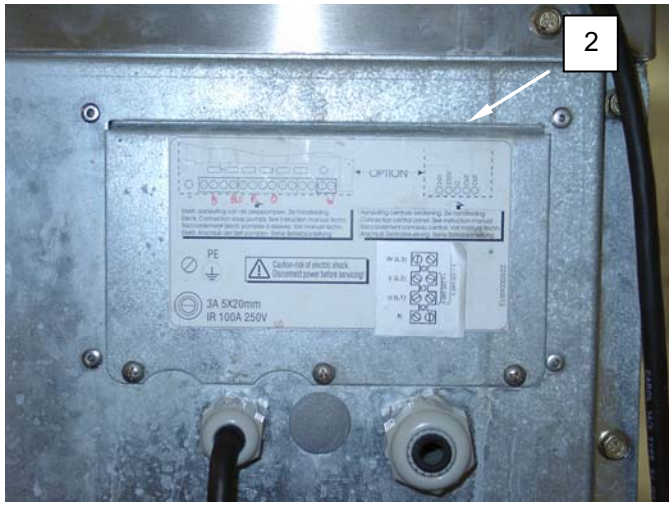
Ensure that all electrical power to the washer is shut off and disconnected before proceeding. The circuit breaker box should be locked by personnel following this procedure. Serious injury or death can result from electrocution if proper safety precautions are not observed.

CAUTION

Use caution when handling electronic components such as printed circuit boards. Do not remove the board from the anti-static packaging until you are ready to install it, and always make sure you are grounded to the washer when handling the board. Failure to observe adequate precautions may result in failure of the replacement board.

1. Disconnect washer power cord.
2. Remove screws retaining the electrical connection plate **(Figure 7, Item 2)**, and remove the electrical connection plate.
3. Tag and disconnect wiring from the soap dispenser PC board **(Figure 7, Item 4)**.
4. Remove the PC board **(Figure 7, Item 4)** from the standoffs **(Figure 7, Item 17)** and remove PC board.
5. Install the replacement board **(Figure 7, Item 4)** onto the standoffs **(Figure 7, Item 17)**.
6. Connect wiring to the replacement PC board **(Figure 7, Item 14)** as tagged.
7. Install electrical connection plate **(Figure 7, Item 2)** and retain with screws.
8. Connect washer power cord and monitor for normal operation.

REPLACE-CONTINUED



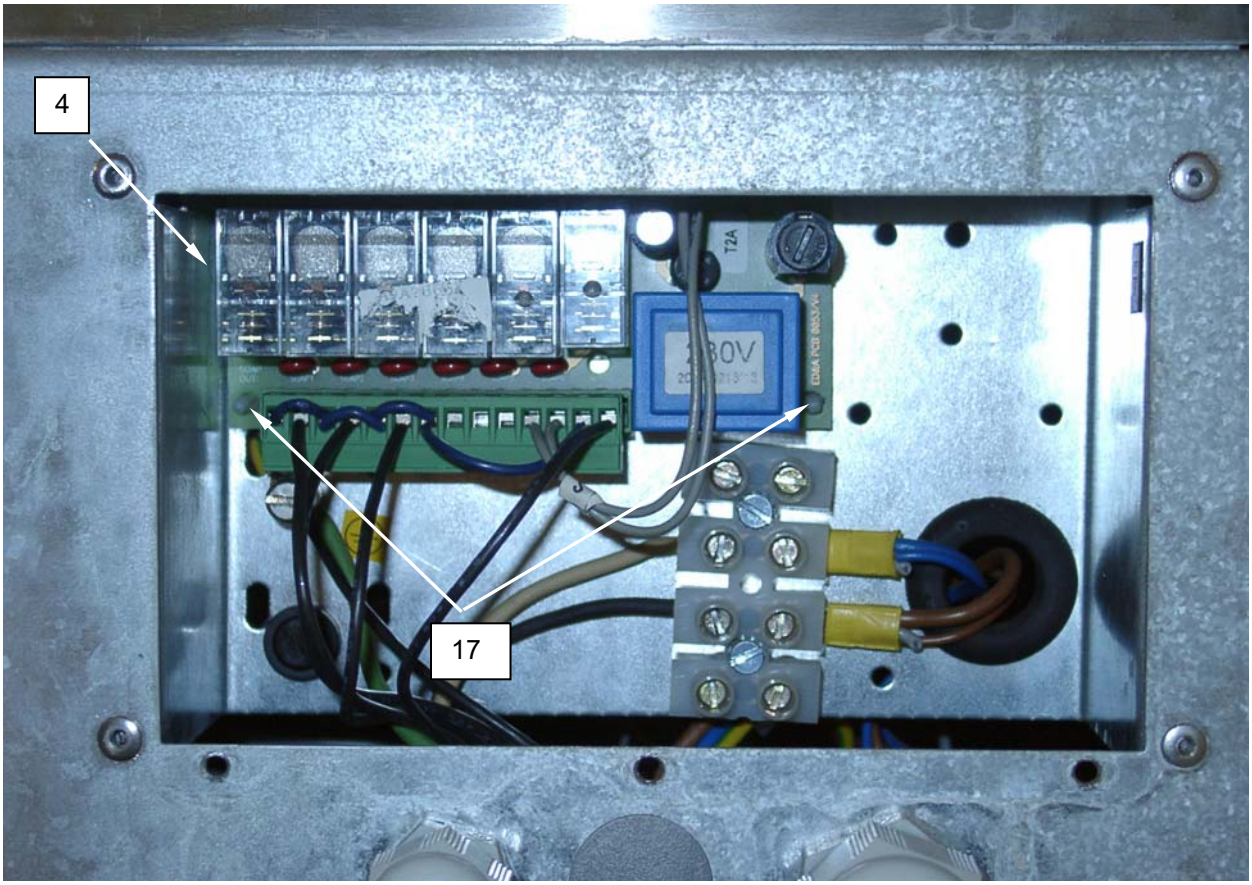


Figure 7. Replace the Soap Dispenser Printed Circuit Board.

REPLACE-CONTINUED

Replace the Soap Dispenser Printed Circuit Board Fuse

WARNING

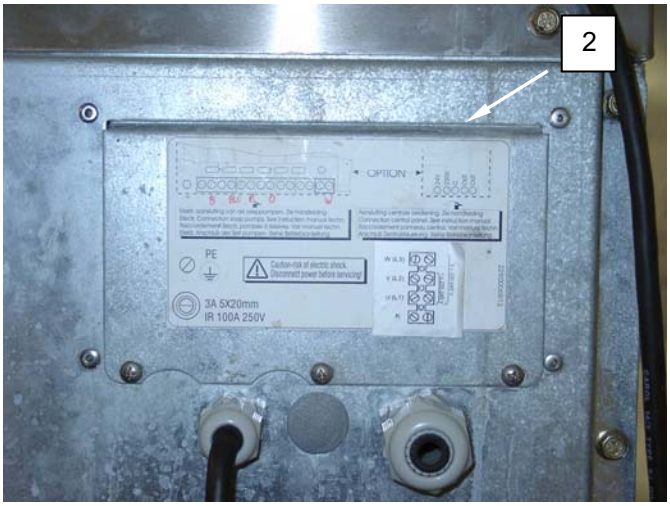
Ensure that all electrical power to the washer is shut off and disconnected before proceeding. The circuit breaker box should be locked by personnel following this procedure. Serious injury or death can result from electrocution if proper safety precautions are not observed.

CAUTION

Use caution when handling electronic components such as printed circuit boards. Do not remove the board from the anti-static packaging until you are ready to install it, and always make sure you are grounded to the washer when handling the board. Failure to observe adequate precautions may result in failure of the replacement board.

1. Disconnect washer power cord.
2. Remove screws retaining the electrical connection plate **(Figure 8, Item 2)**, and remove the electrical connection plate.
3. Use a flat-blade screwdriver to remove the fuse holder cap **(Figure 8, Item 3)** from the soap dispenser PC board **(Figure 8, Item 4)** and remove the fuse.
4. Install a replacement fuse into the fuse holder cap **(Figure 8, Item 3)** and install the fuse holder cap into the soap dispenser PC board **(Figure 8, Item 4)**.
5. Install electrical connection plate **(Figure 8, Item 2)** and retain with screws.
6. Connect washer power cord and monitor for normal operation.

REPLACE-CONTINUED



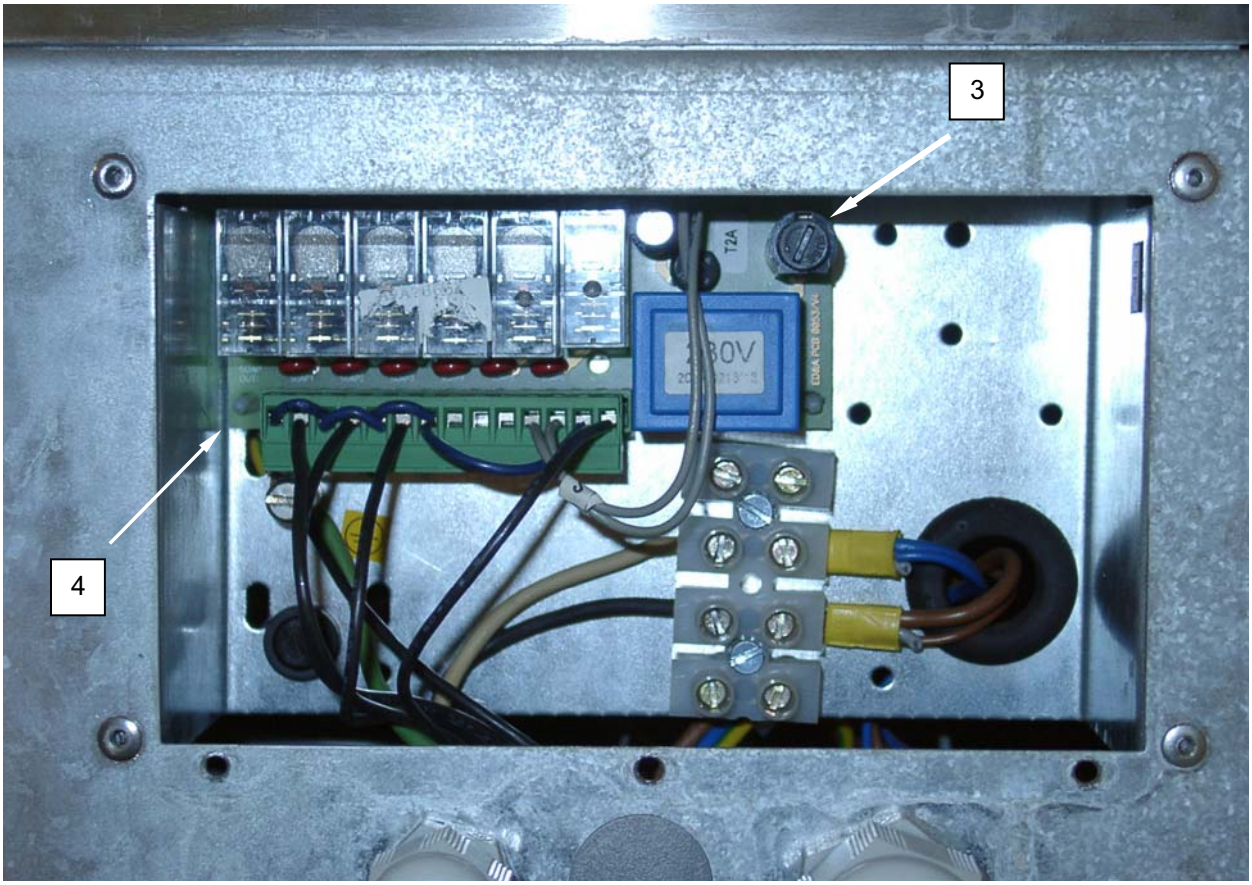


Figure 8. Replace the Soap Dispenser Printed Circuit Board.

END OF WORK PACKAGE

UNIT MAINTENANCE
CONTAINERIZED BATCH LAUNDRY
NSN 3510-01-527-2209
NSN 3510-01-527-2210
TUBE, LEVEL SENSING
INSPECT, SERVICE, REPLACE

INITIAL SETUP

Tools
Shop Equipment, Automotive Maintenance and Repair: Organizational Maintenance, Common No.1 (WP 0086 00, Table 2, Item 5)

Materials/Parts
Tie, Wire, 6.3 in (WP 0087 00, Item 55)

Personnel Required
Quartermaster and Chemical Equipment Repairer 63J (2)

Equipment Condition
CBL set up

References
WP 0041 00

INSPECT

Inspect the Level Sensing Tube

WARNING

Ensure that all electrical power is shut off and disconnected before proceeding. The Circuit Breaker box should be locked by personnel following this procedure. Serious injury or death can result from electrocution if proper safety precautions are not observed.

WARNING

The washer is extremely heavy. Use caution when lifting and blocking the washer, and do not allow unnecessary personnel in the immediate area while it is being moved. Serious injury or death may result if safety precautions are not observed.

CAUTION

The washer is a large, heavy piece of machinery being moved out of a confined space. Before removal and installation, remove or protect any equipment which might be damaged by the washer on its way in or out.

1. Remove washer IAW procedures given in WP 0041 00.
2. Inspect the level sensing tube **(Figure 1, Item 1)** for material damage, wear, pinching, and proper connection.
3. Install washer IAW procedures given in WP 0041 00.

INSPECT-CONTINUED

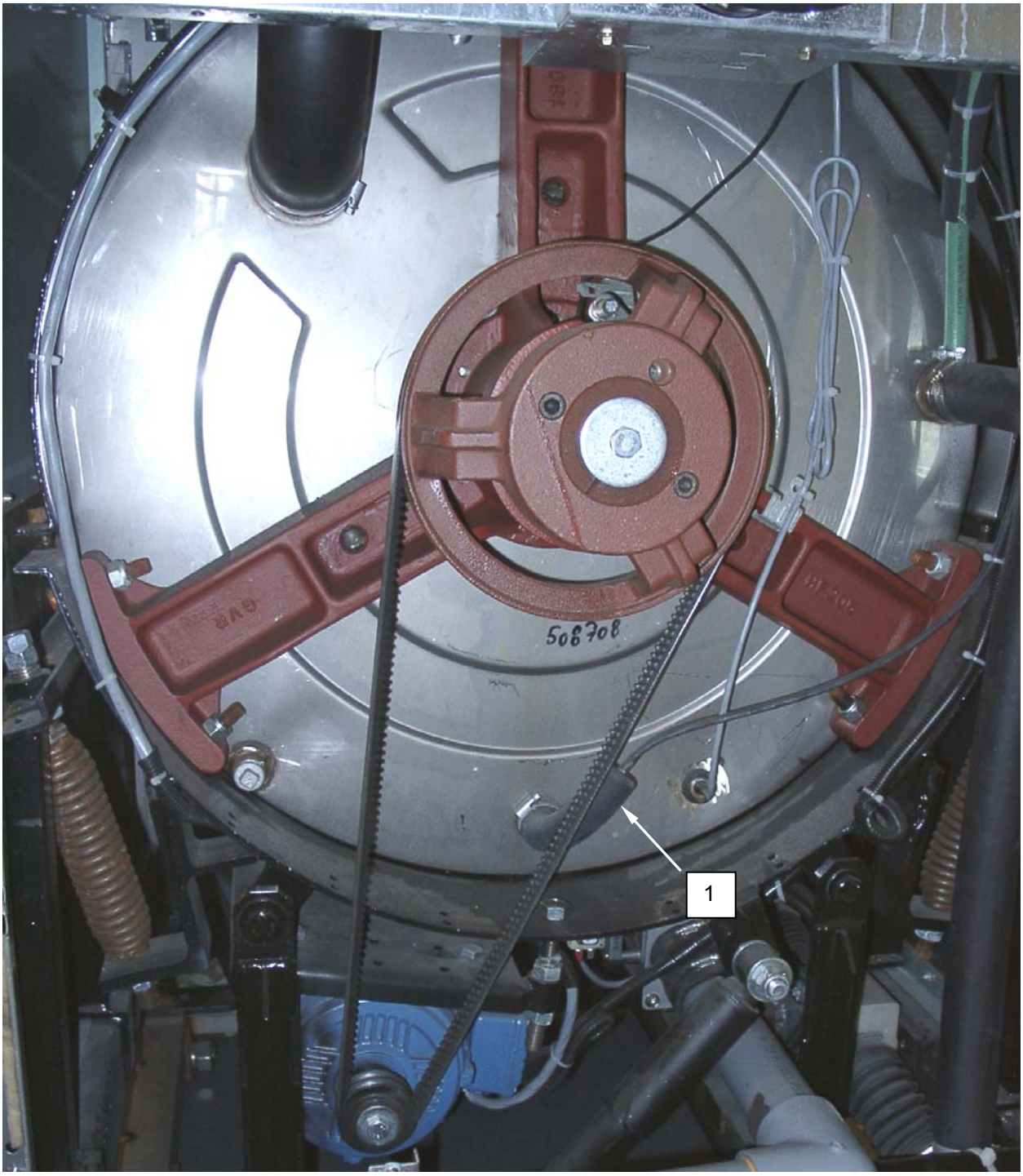


Figure 1. Inspect the Level Sensing Tube.

SERVICE

Clean the Level Sensing Tube

1. Disconnect washer power cord.
2. Use washer key to open washer control panel.
3. Disconnect level sensing tube **(Figure 2, Item 1)** from level sensor **(Figure 2, Item 2)**.
4. Use compressed air to clear level sensing tube **(Figure 2, Item 1)**.
5. Reconnect level sensing tube **(Figure 2, Item 1)** to level sensor **(Figure 2, Item 2)**.
6. Close and latch washer control panel.
7. Connect power, and monitor for normal operation.

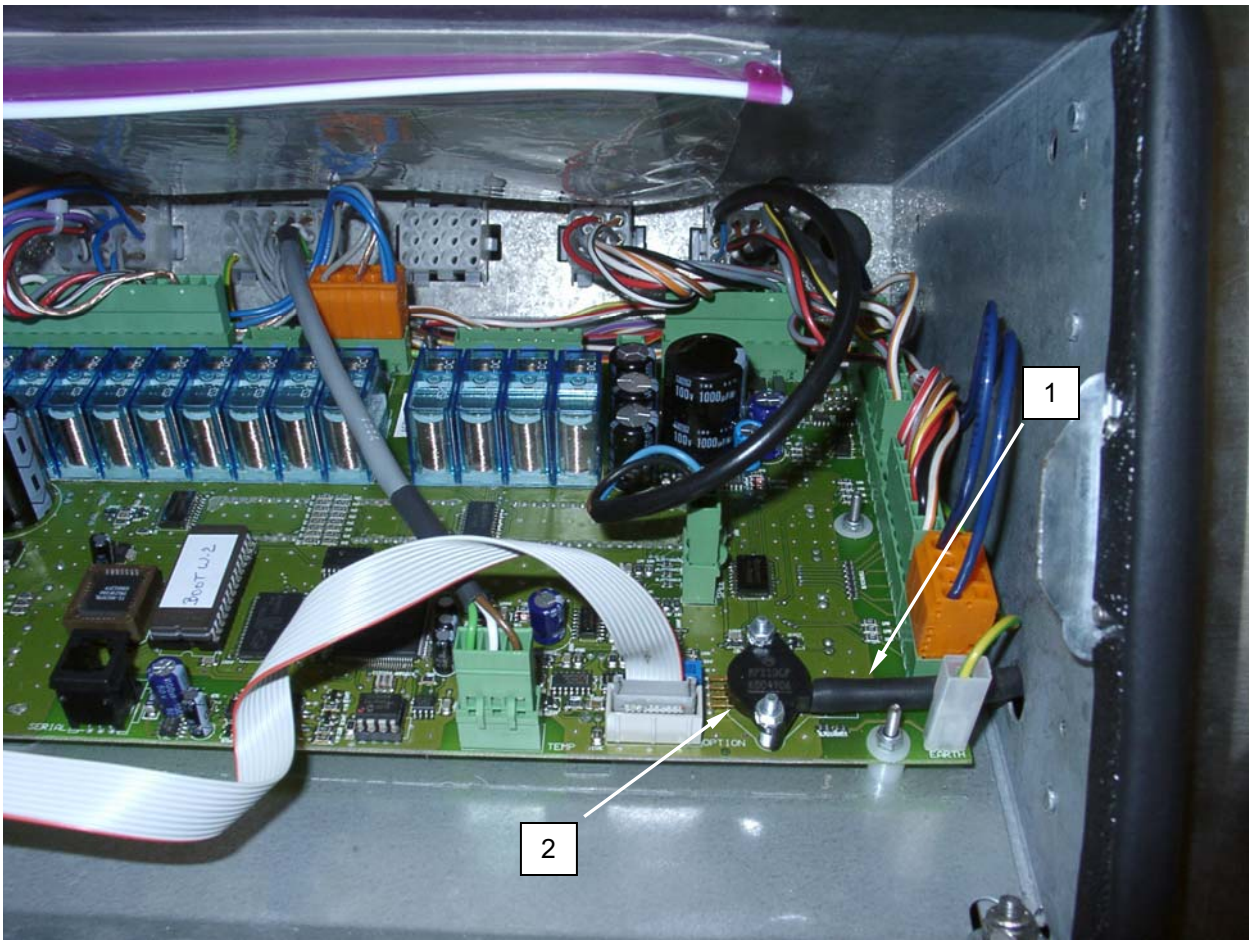


Figure 2. Clean the Level Sensing Tube.

REPLACE

Replace the Level Sensing Tube

WARNING

Ensure that all electrical power is shut off and disconnected before proceeding. The Circuit Breaker box should be locked by personnel following this procedure. Serious injury or death can result from electrocution if proper safety precautions are not observed.

WARNING

The washer is extremely heavy. Use caution when lifting and blocking the washer, and do not allow unnecessary personnel in the immediate area while it is being moved. Serious injury or death may result if safety precautions are not observed.

CAUTION

The washer is a large, heavy piece of machinery being moved out of a confined space. Before removal and installation, remove or protect any equipment which might be damaged by the washer on its way in or out.

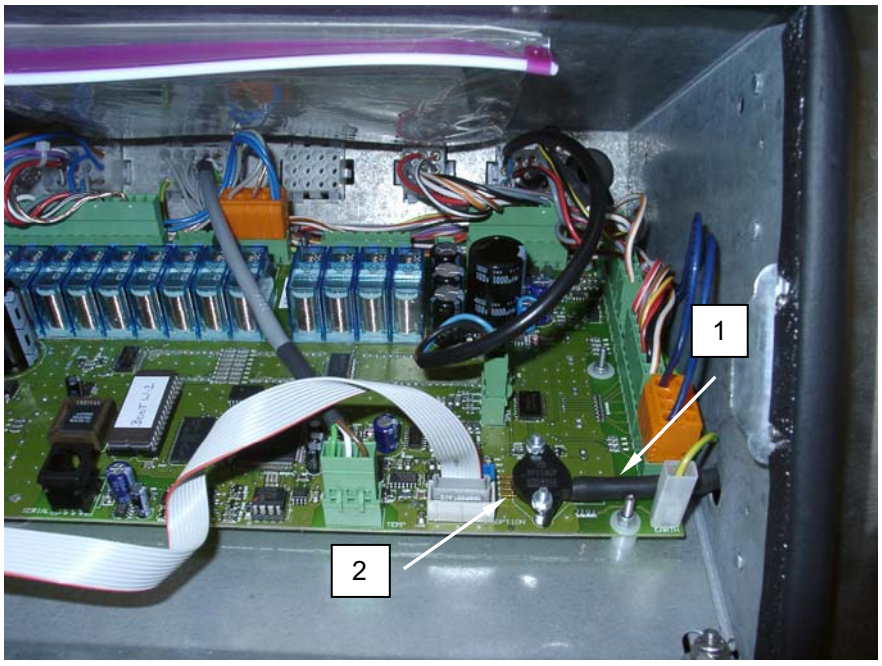
1. Remove washer IAW procedures given in WP 0041 00.
2. Use the washer key to open the control panel, and disconnect the washer level sensing tube **(Figure 3, Item 1)** from the level sensor **(Figure 3, Item 2)**.
3. Disconnect washer level sensing tube **(Figure 3, Item 1)** from washer drum, and remove level sensing tube. Make note of any retaining looms, guides, or wire ties used to route the tube.
4. Install washer level sensing tube **(Figure 3, Item 1)** onto drum.

CAUTION

Ensure the tube is mounted away from any locations where the tube might pinch, stretch, or chafe. Use wire ties as necessary to ensure the tube is properly routed.

5. Route washer level sensing tube **(Figure 3, Item 1)** close to wiring harness and up into control box. Ensure replacement tube is routed through existing looms and guides.
6. Connect washer level sensing tube **(Figure 3, Item 1)** to level sensor **(Figure 3, Item 2)** in control box.
7. Install wire ties as necessary to secure level sensing tube **(Figure 3, Item 1)**.
8. Close the control panel and install washer IAW procedures given in WP 0041 00.
9. Operate washer IAW TM 10-3510-226-10 and monitor for normal operation.

REPLACE-CONTINUED



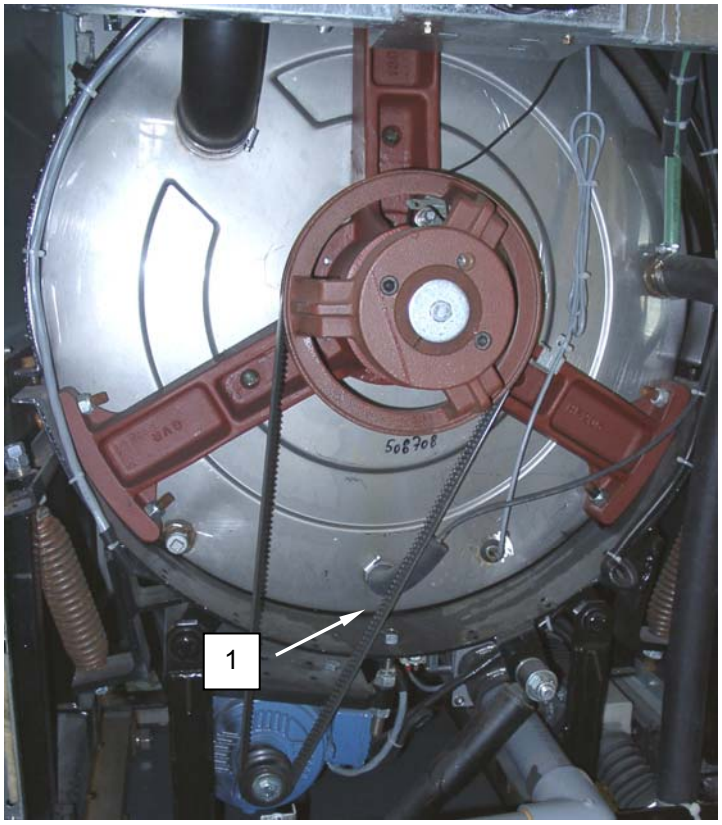


Figure 3. Replace the Level Sensing Tube.

END OF WORK PACKAGE

UNIT MAINTENANCE
CONTAINERIZED BATCH LAUNDRY
NSN 3510-01-527-2209
NSN 3510-01-527-2210
SENSOR, TEMPERATURE
REPLACE

INITIAL SETUP

Tools
Tool Kit, General Mechanics: Automotive (WP 0086 00, Table 2, Item 6)

Materials/Parts
Tie, Wire, 6.3 in (WP 0087 00, Item 55)

Personnel Required
Quartermaster and Chemical Equipment Repairer 63J (2)

Equipment Condition
CBL set up

References
TM 10-3510-226-10
WP 0041 00

REPLACE

Replace the Temperature Sensor

WARNING

Ensure that all electrical power is shut off and disconnected before proceeding. The Circuit Breaker box should be locked by personnel following this procedure. Serious injury or death can result from electrocution if proper safety precautions are not observed.

WARNING

The washer is extremely heavy. Use caution when lifting and blocking the washer, and do not allow unnecessary personnel in the immediate area while it is being moved. Serious injury or death may result if safety precautions are not observed.

CAUTION

The washer is a large, heavy piece of machinery being moved out of a confined space. Before removal and installation, remove or protect any equipment that might be damaged by the washer on its way in or out.

1. Remove washer IAW procedures given in WP 0041 00.
2. Remove temperature sensor **(Figure 1, Item 1)** from grommet seal.
3. Use washer key to open control panel.
4. Disconnect temperature sensor **(Figure 1, Item 1)** from the microprocessor board **(Figure 1, Item 2)**.
5. Remove temperature sensor **(Figure 1, Item 1)** with connected wiring **(Figure 1, Item 3)** from washer. Make note of wire placement in wire guides, and points where wire ties may require cutting.
6. Route temperature sensor wiring **(Figure 1, Item 3)** close to wiring harness and up into control box. Ensure replacement sensor wiring is routed through existing looms and guides.

REPLACE-CONTINUED

7. Install replacement temperature sensor **(Figure 1, Item 1)** in grommet seal.
8. Connect replacement temperature sensor wiring **(Figure 1, Item 3)** to microprocessor board **(Figure 1, Item 2)**.
9. Install wire ties as necessary to secure temperature sensor wiring **(Figure 1, Item 1)**.
10. Close control panel, and install washer IAW procedures given in WP 0041 00.
11. Operate washer IAW TM 10-3510-226-10 and monitor for normal operation.

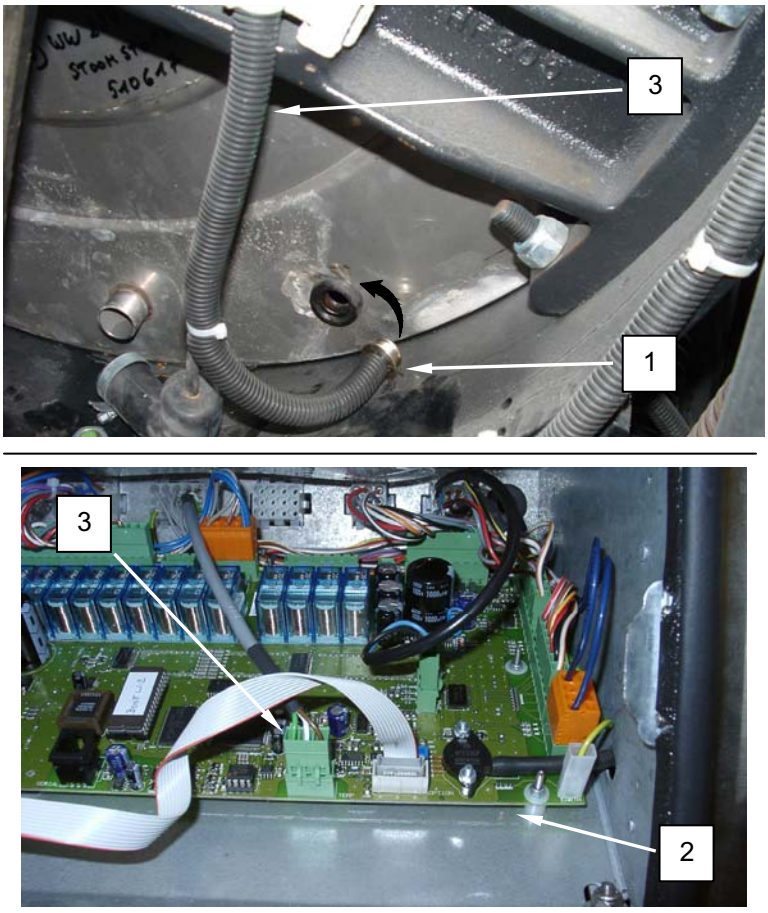


Figure 1. Replace the Temperature Sensor.

END OF WORK PACKAGE

UNIT MAINTENANCE
CONTAINERIZED BATCH LAUNDRY
NSN 3510-01-527-2209
NSN 3510-01-527-2210
DETECTOR, SPEED
REPLACE

INITIAL SETUP

Tools
Tool Kit, General Mechanics: Automotive (WP 0086 00, Table 2, Item 6)

Materials/Parts
Tie, Wire, 6.3 in (WP 0087 00, Item 55)

Personnel Required
Quartermaster and Chemical Equipment Repairer 63J (2)

Equipment Condition
CBL set up

References
TM 10-3510-226-10
WP 0041 00

REPLACE

Replace the Washer Speed Detector

WARNING

Ensure that all electrical power is shut off and disconnected before proceeding. The Circuit Breaker box should be locked by personnel following this procedure. Serious injury or death can result from electrocution if proper safety precautions are not observed.

WARNING

The washer is extremely heavy. Use caution when lifting and blocking the washer, and do not allow unnecessary personnel in the immediate area while it is being moved. Serious injury or death may result if safety precautions are not observed.

CAUTION

The washer is a large, heavy piece of machinery being moved out of a confined space. Before removal and installation, remove or protect any equipment that might be damaged by the washer on its way in or out.

1. Remove washer IAW procedures given in WP 0041 00.
2. Remove locknuts retaining detector **(Figure 1, Item 1)** to bracket, and remove detector.
3. Use washer key to open control panel.
4. Disconnect speed detector **(Figure 1, Item 1)** from the microprocessor board **(Figure 1, Item 2)**.
5. Remove speed detector **(Figure 1, Item 1)** with connected wiring **(Figure 1, Item 3)** from washer. Make note of wire placement in wire guides, and points where wire ties may require cutting.
6. Route speed detector wiring **(Figure 1, Item 3)** close to wiring harness and up into control box. Ensure replacement speed detector wiring is routed through existing looms and guides.

REPLACE-CONTINUED

CAUTION

Ensure that there is at least $^{1}/_{16}$ -inch clearance between the speed detector and the washer drum pulley. After installing the replacement speed detector, slowly swing the washer drum puller at least two rotations to ensure that there is no contact between the speed detector and the pulley.

7. Install replacement detector **(Figure 1, Item 1)**, and retain with locknuts.
8. Connect replacement speed detector wiring **(Figure 1, Item 3)** to microprocessor board **(Figure 1, Item 2)**.
9. Install wire ties as necessary to secure speed detector wiring **(Figure 1, Item 1)**.
10. Close control panel, and install washer IAW procedures given in WP 0041 00.
11. Operate washer IAW TM 10-3510-226-10 and monitor for normal operation.

REPLACE-CONTINUED

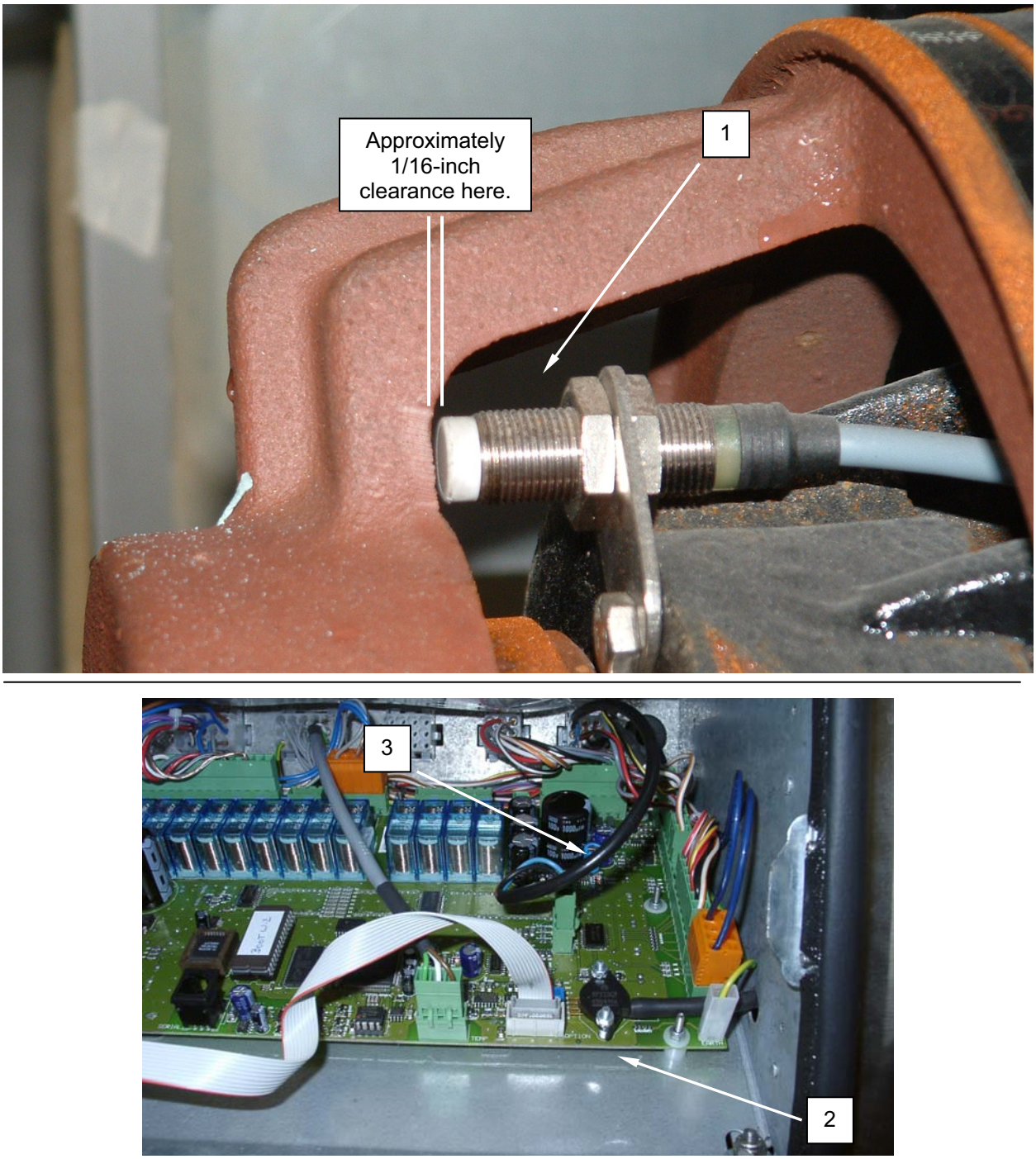


Figure 1. Replace the Washer Speed Detector.

END OF WORK PACKAGE

UNIT MAINTENANCE
CONTAINERIZED BATCH LAUNDRY
NSN 3510-01-527-2209
NSN 3510-01-527-2210
WASHER BALANCE SWITCH
TEST, ADJUST, REPLACE

INITIAL SETUP

Tools
Tool Kit, General Mechanics: Automotive (WP 0086 00, Table 2, Item 6)

Materials/Parts
Wire Markers (WP 0087 00, Item 58)

Personnel Required
Quartermaster and Chemical Equipment Repairer 63J (2)

Equipment Condition
CBL set up

References
TM 10-3510-226-10
WP 0041 00

TEST

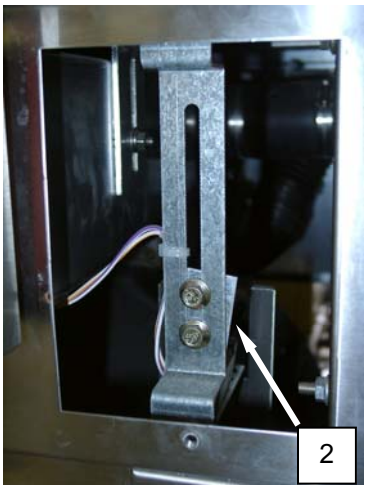
Test the Washer Balance Switch

WARNING

Ensure that all electrical power is shut off and disconnected before proceeding. The Circuit Breaker box should be locked by personnel following this procedure. Serious injury or death can result from electrocution if proper safety precautions are not observed.

1. Disconnect power.
2. Remove the screw retaining the washer right front panel **(Figure 1, Item 1)**, and remove the right front panel.
3. Open the control panel.
4. Tag and disconnect wiring from balance switch **(Figure 1, Item 2)** on the microprocessor board **(Figure 1, Item 3)**.
5. Ensure that switch trigger spring **(Figure 2, Item 4)** is not disturbed, and use an ohmmeter to test for 0 ohms resistance.
6. Deflect switch trigger spring **(Figure 2, Item 4)**, and use an ohmmeter to test for an open circuit.
7. Replace the balance switch **(Figure 1, Item 2)** that fails either test.
8. Reconnect wiring to the microprocessor board **(Figure 1, Item 3)** as tagged.
9. Install the washer right front panel **(Figure 2, Item 1)** and retain with screw.
10. Close and lock control panel.
11. Connect power and operate IAW procedures given in TM 10-3510-226-10.

TEST-CONTINUED



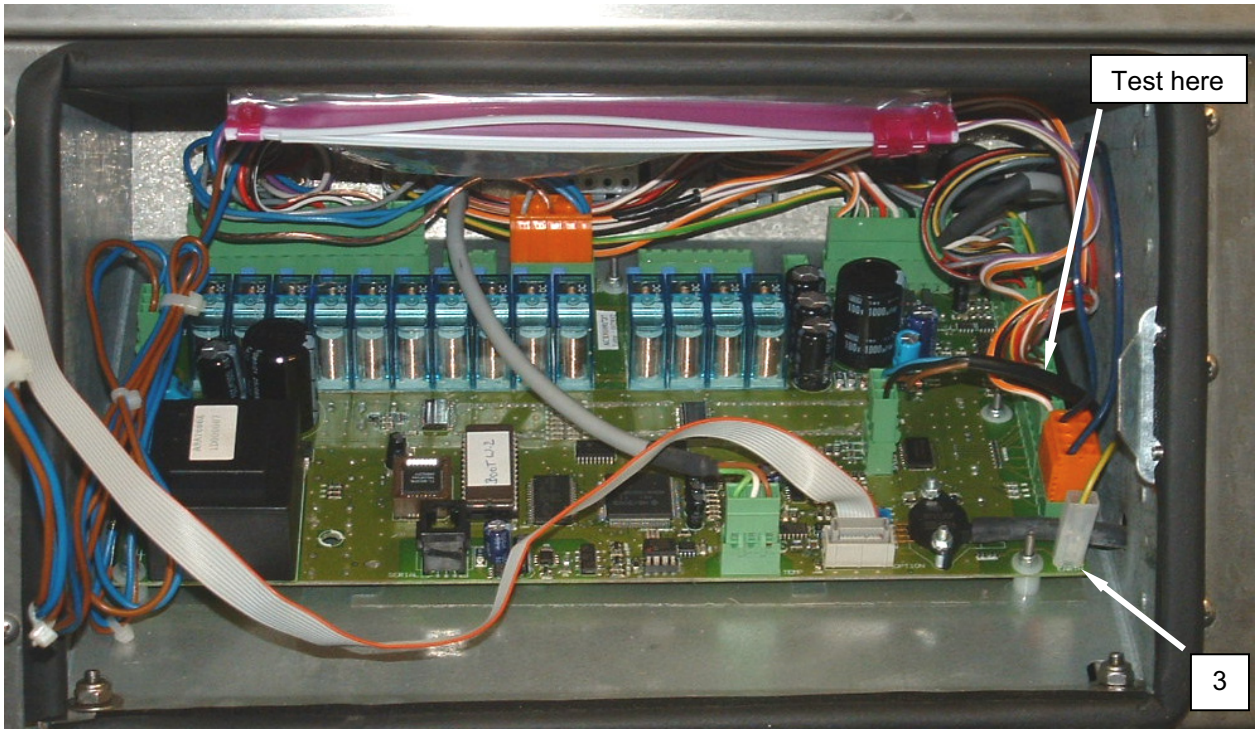


Figure 1. Test the Washer Balance Switch.

TEST-CONTINUED

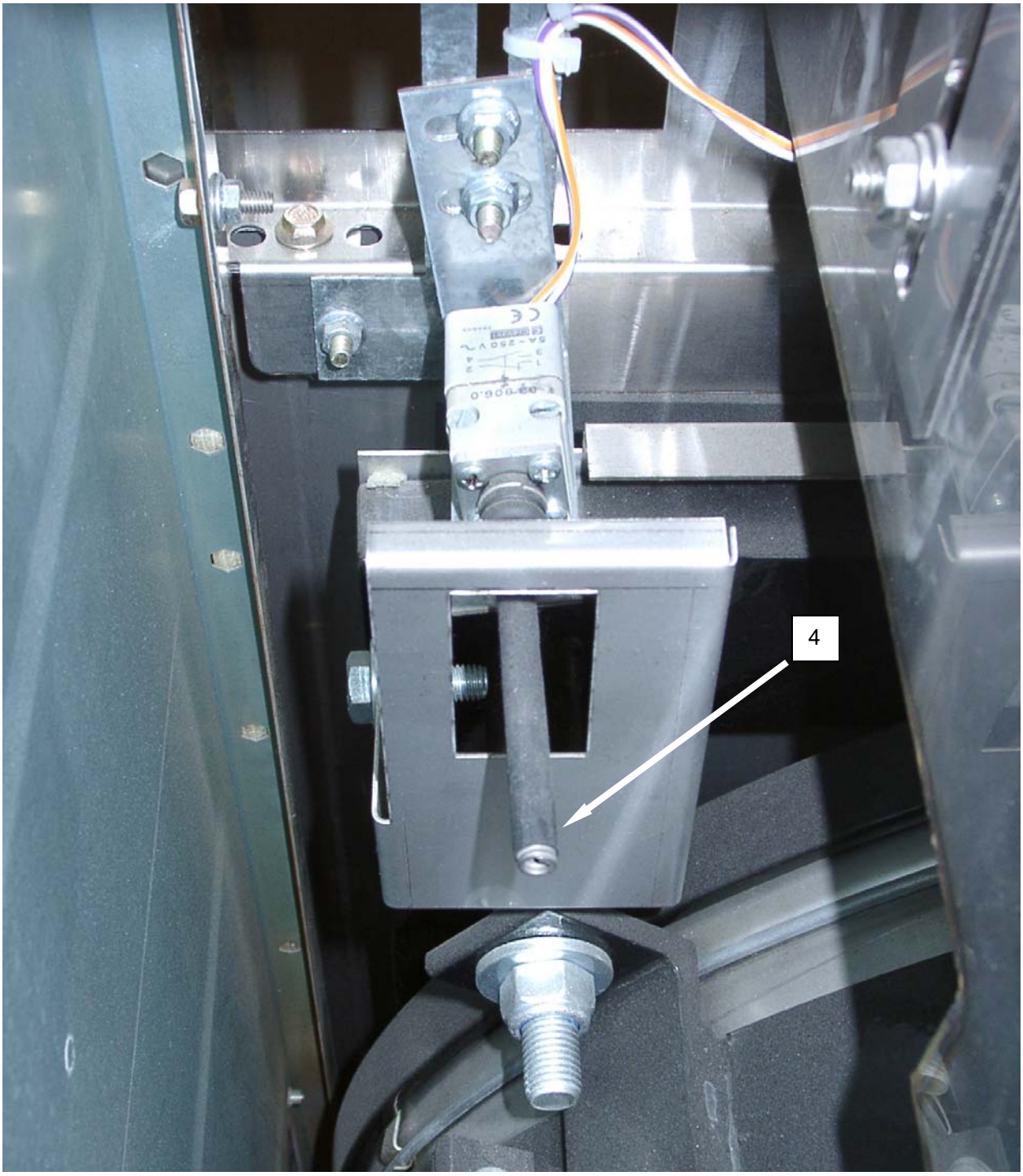


Figure 2. Test the Washer Balance Switch.

ADJUST

Adjust the Balance Switch

1. Disconnect washer power cord.

2. Remove the screw retaining the washer right front panel **(Figure 3, Item 1)**, and remove the right front panel.

NOTE

Loosen balance switch screws – do not remove them. If the screws or the balance switch fall into the washer, the washer must be removed and disassembled to retrieve the parts.

3. Loosen the screws **(Figure 3, Item 5)** retaining the balance switch, and adjust the balance switch to locate the trigger spring **(Figure 4, Item 4)** in the horizontal center of the trigger spring window **(Figure 4, Item 6)**, and approximately 1/3 the distance from the bottom of the trigger spring window.

4. Tighten the balance switch retaining screws **(Figure 3, Item 5)**.

5. Install the washer right front panel **(Figure 3, Item 1)** and retain with screw.

6. Connect washer power cord and monitor for normal operation.

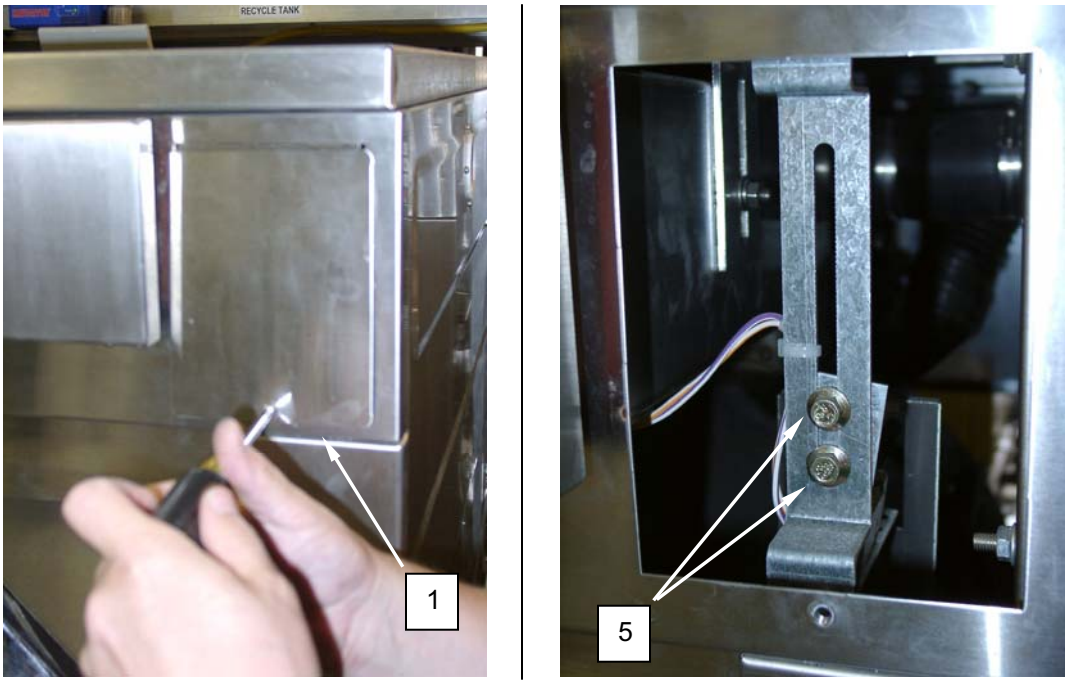


Figure 3. Adjust the Balance Switch.

ADJUST-CONTINUED

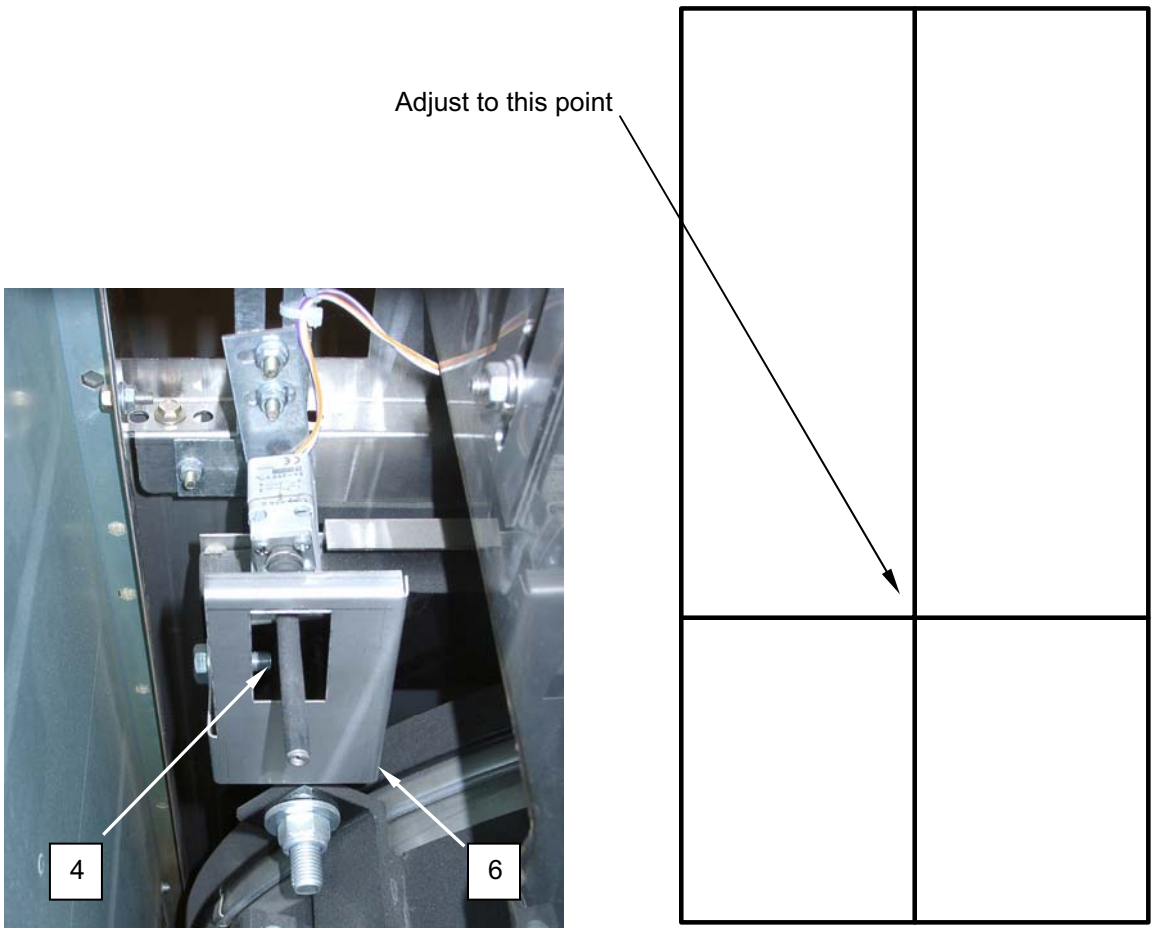


Figure 4. Adjust the Balance Switch.

REPLACE

Replace the Washer Balance Switch

WARNING

Ensure that all electrical power is shut off and disconnected before proceeding. The Circuit Breaker box should be locked by personnel following this procedure. Serious injury or death can result from electrocution if proper safety precautions are not observed.

WARNING

The washer is extremely heavy. Use caution when lifting and blocking the washer, and do not allow unnecessary personnel in the immediate area while it is being moved. Serious injury or death may result if safety precautions are not observed.

CAUTION

The washer is a large, heavy piece of machinery being moved out of a confined space. Before removal and installation, remove or protect any equipment that might be damaged by the washer on its way in or out.

1. Remove washer IAW procedures given in WP 0041 00.

NOTE

Wiring may be cut and spliced, or may be disconnected at the microprocessor board.

2. Tag and disconnect wiring from balance switch **(Figure 5, Item 2)**.
3. Remove screws retaining balance switch **(Figure 5, Item 2)**, and remove balance switch.
4. Install replacement balance switch **(Figure 5, Item 2)**, and retain with screws.
5. Adjust replacement balance switch **(Figure 5, Item 2)** IAW procedures described in this WP.
6. Reconnect wiring as tagged.
7. Install washer IAW procedures given in WP 0041 00.

REPLACE-CONTINUED

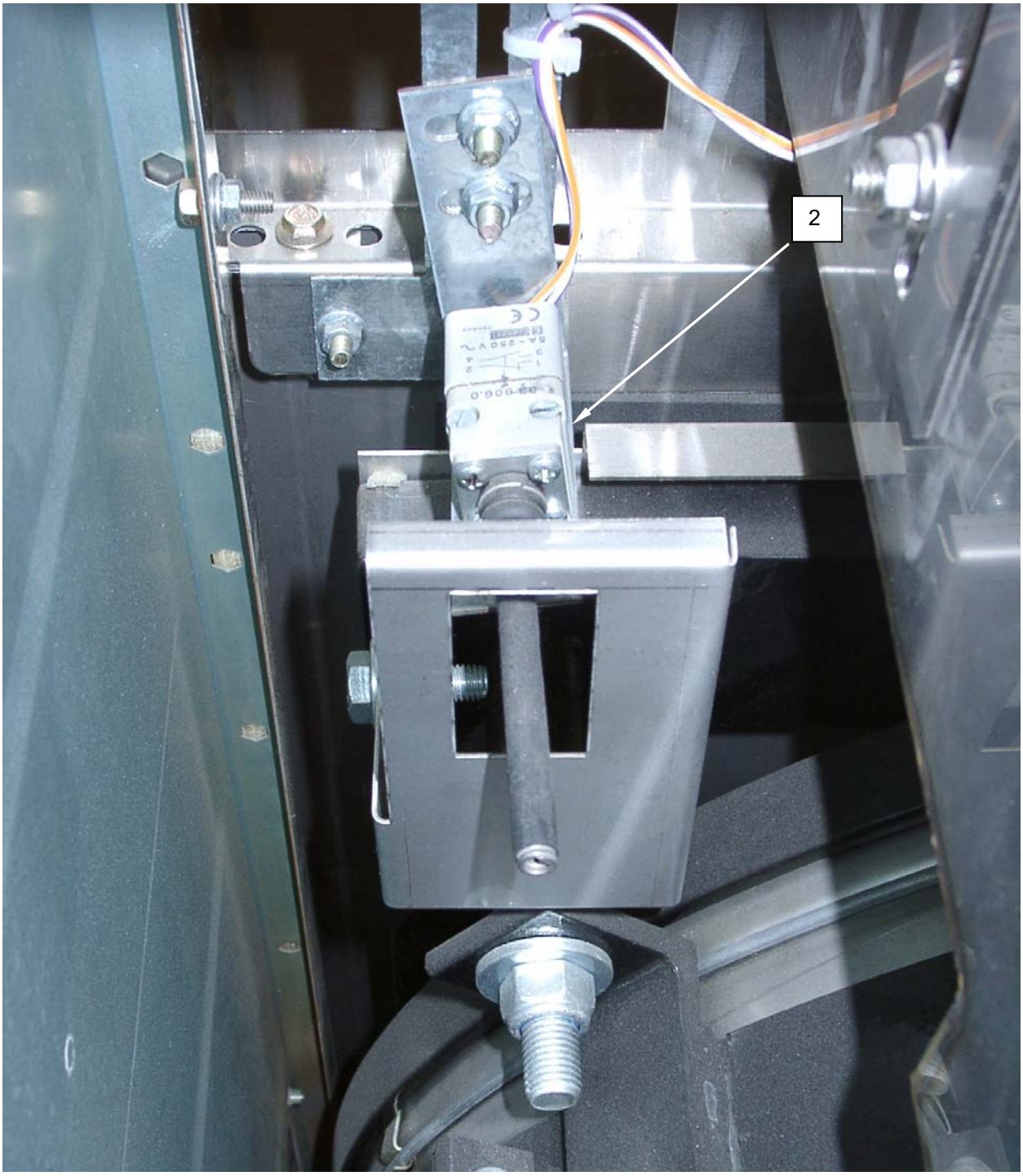


Figure 5. Replace the Washer Balance Switch.

END OF WORK PACKAGE

UNIT MAINTENANCE
CONTAINERIZED BATCH LAUNDRY
NSN 3510-01-527-2209
NSN 3510-01-527-2210
SWITCH, EMERGENCY STOP
TEST, REPLACE

INITIAL SETUP

Tools	**Personnel Required**
Tool Kit, General Mechanics: Automotive (WP 0086 00, Table 2, Item 6)	Quartermaster and Chemical Equipment Repairer 63J (1)
Materials/Parts	**Equipment Condition**
Wire Markers (WP 0087 00, Item 58)	CBL set up

TEST

Test the Washer Emergency Stop Switch

WARNING

Ensure that all electrical power is shut off and disconnected before proceeding. The Circuit Breaker box should be locked by personnel following this procedure. Serious injury or death can result from electrocution if proper safety precautions are not observed.

1. Switch the washer circuit breaker to OFF.
2. Unlock and open control panel **(Figure 1, Item 1)**.
3. Tag and disconnect wiring from switch **(Figure 1, Item 2)**.

NOTE

The emergency stop switch is a double pole – double throw (DPDT) switch controlling two separate circuits. Both legs of the switch must be tested separately.

4. Depress switch **(Figure 1, Item 2)** to open circuit, and use an ohmmeter to test for infinite resistance.
5. Reset switch **(Figure 1, Item 2)**, and use an ohmmeter to test for 0 ohms resistance.
6. Replace a switch **(Figure 1, Item 2)** that fails either test.
7. Reconnect wiring as tagged.
8. Close and lock control panel **(Figure 1, Item 1)**.
9. Reconnect power and monitor for normal operation.

TEST-CONTINUED

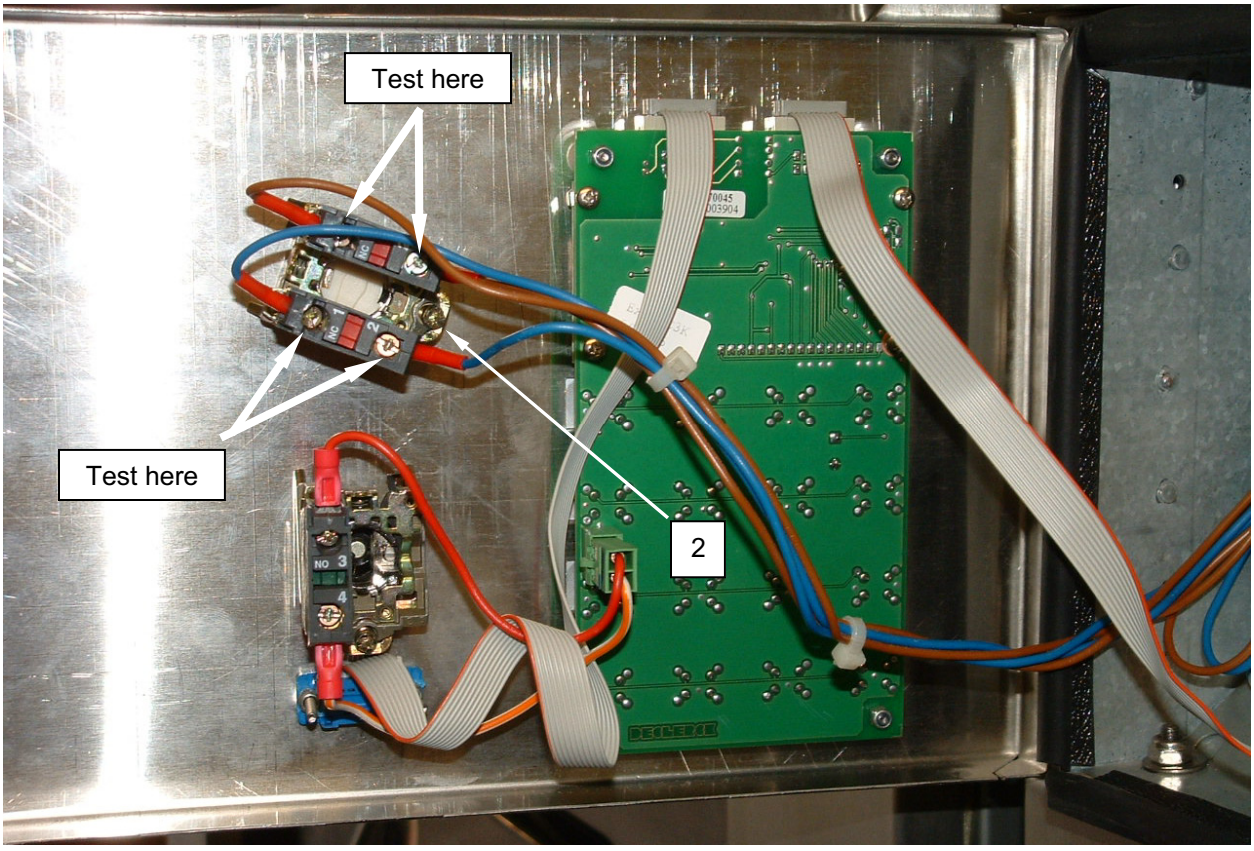


Figure 1. Test the Washer Emergency Stop Switch.

REPLACE

Replace the Washer Emergency Stop Switch

WARNING

Ensure that all electrical power is shut off and disconnected before proceeding. The Circuit Breaker box should be locked by personnel following this procedure. Serious injury or death can result from electrocution if proper safety precautions are not observed.

1. Switch the washer circuit breaker to OFF.
2. Unlock and open control panel **(Figure 2, Item 1)**.
3. Tag and disconnect wiring from switch **(Figure 2, Item 2)**.
4. Loosen the screw **(Figure 2, Item 3)** securing the retaining catch **(Figure 3, Item 4)**.
5. Use a screwdriver to lift the retaining catch **(Figure 3, Item 4)** on the switch **(Figure 3, Item 2)**, separate the switch halves, and remove the switch.

NOTE

The switch halves are marked for alignment to ease reassembly.

NOTE

When installed, the switch may be free to rotate within the limits imposed by the wiring.

6. Install the halves of the replacement switch **(Figure 3, Item 2)**, into the control panel **(Figure 2, Item 1),** and lock halves together.
7. Tighten the screw **(Figure 2, Item 3)** securing the retaining catch **(Figure 3, Item 4)**.
8. Reconnect wiring as tagged.
9. Close and lock control panel **(Figure 2, Item 1)**.
10. Reconnect power and monitor for normal operation.

REPLACE-CONTINUED

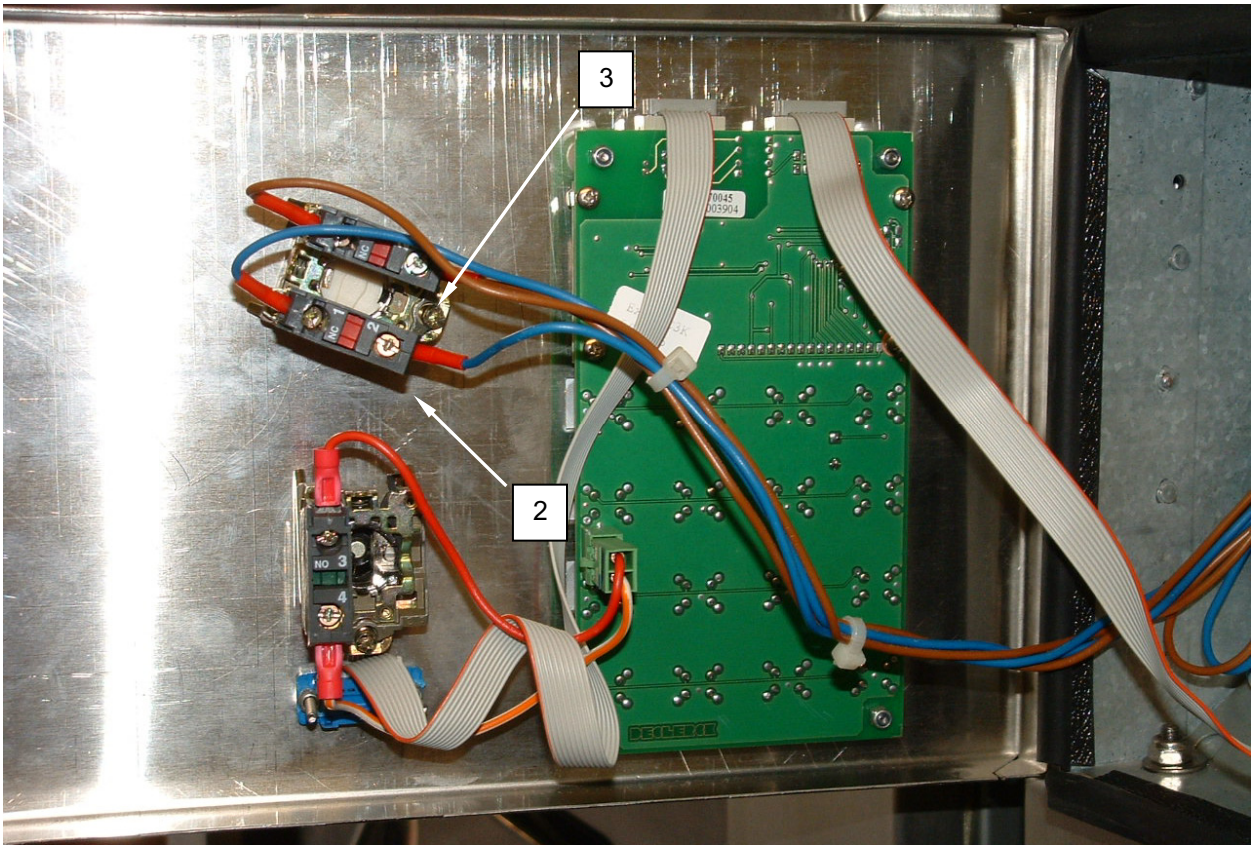
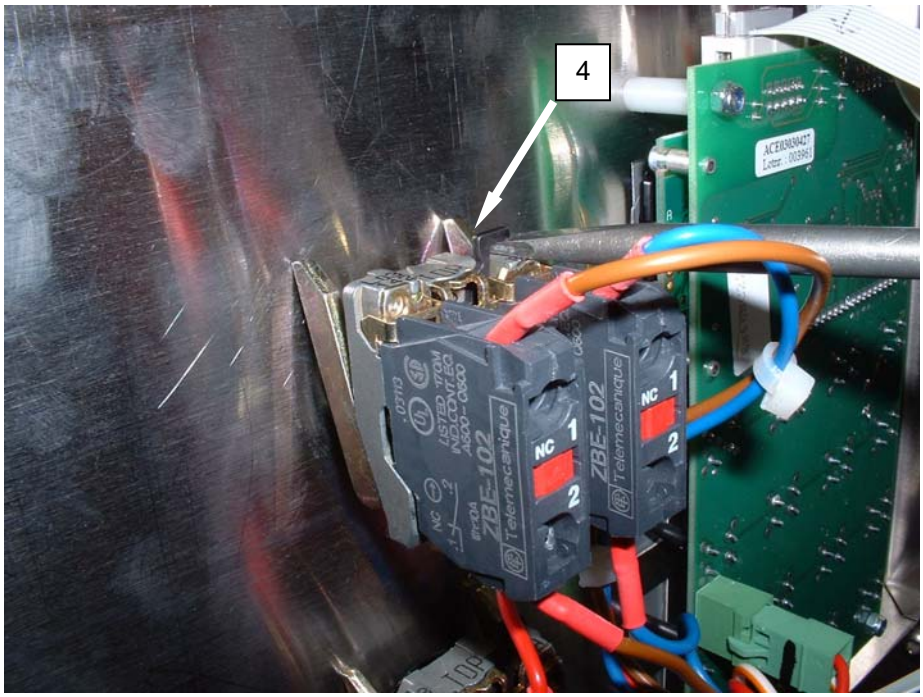


Figure 2. Replace the Washer Emergency Stop Switch.

REPLACE-CONTINUED



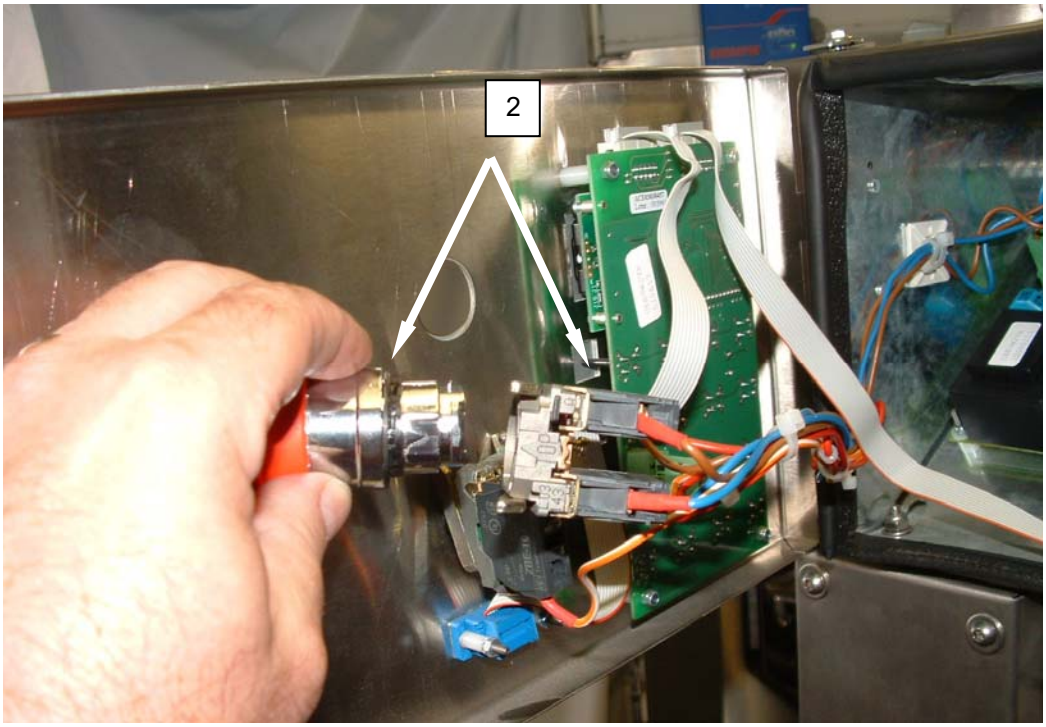


Figure 3. Replace the Washer Emergency Stop Switch.

END OF WORK PACKAGE

UNIT MAINTENANCE
CONTAINERIZED BATCH LAUNDRY
NSN 3510-01-527-2209
NSN 3510-01-527-2210
VALVE, MAIN DRAIN
TEST, REPLACE

INITIAL SETUP

Tools
Tool Kit, General Mechanics: Automotive (WP 0086 00, Table 2, Item 6)

Materials/Parts
Wire Markers (WP 0087 00, Item 58)

Personnel Required
Quartermaster and Chemical Equipment Repairer 63J (2)

Equipment Condition
CBL set up

References
WP 0041 00

TEST

Test the Washer Main Drain Valve

WARNING

Ensure that all electrical power is shut off and disconnected before proceeding. The circuit breaker box should be locked by personnel following this procedure. Serious injury or death can result from electrocution if proper safety precautions are not observed.

WARNING

The washer is extremely heavy. Use caution when lifting and blocking the washer, and do not allow unnecessary personnel in the immediate area while it is being moved. Serious injury or death may result if safety precautions are not observed.

CAUTION

The washer is a large, heavy piece of machinery being moved out of a confined space. Before removal and installation, remove or protect any equipment that might be damaged by the washer on its way in or out.

1. Remove washer IAW procedures given in WP 0041 00.
2. Tag and disconnect wiring from valve motor **(Figure 1, Item 1)**.
3. Use an ohmmeter to check for 135 to 145 ohms resistance between motor leads **(Figure 1, Item 2)**.
4. Use an ohmmeter to check for infinite resistance between each motor lead **(Figure 1, Item 2)** and ground.
5. Replace an open motor **(Figure 1, Item 1)** or a motor which has shorted to ground.
6. Loosen and remove the clamps retaining the hoses **(Figure 1, Item 3)** to the valve **(Figure 1, Item 1)** and remove the hoses.

TEST-CONTINUED

7. Ensure the valve **(Figure 1, Item 1)** opens and closes completely and is free of obstructions.
8. Ensure there is no damage to the valve butterfly or valve bore.
9. Install hoses **(Figure 1, Item 3)** onto valve **(Figure 1, Item 1)** and retain with clamps.
10. Reconnect wiring as tagged.
11. Install washer IAW procedures given in WP 0041 00.

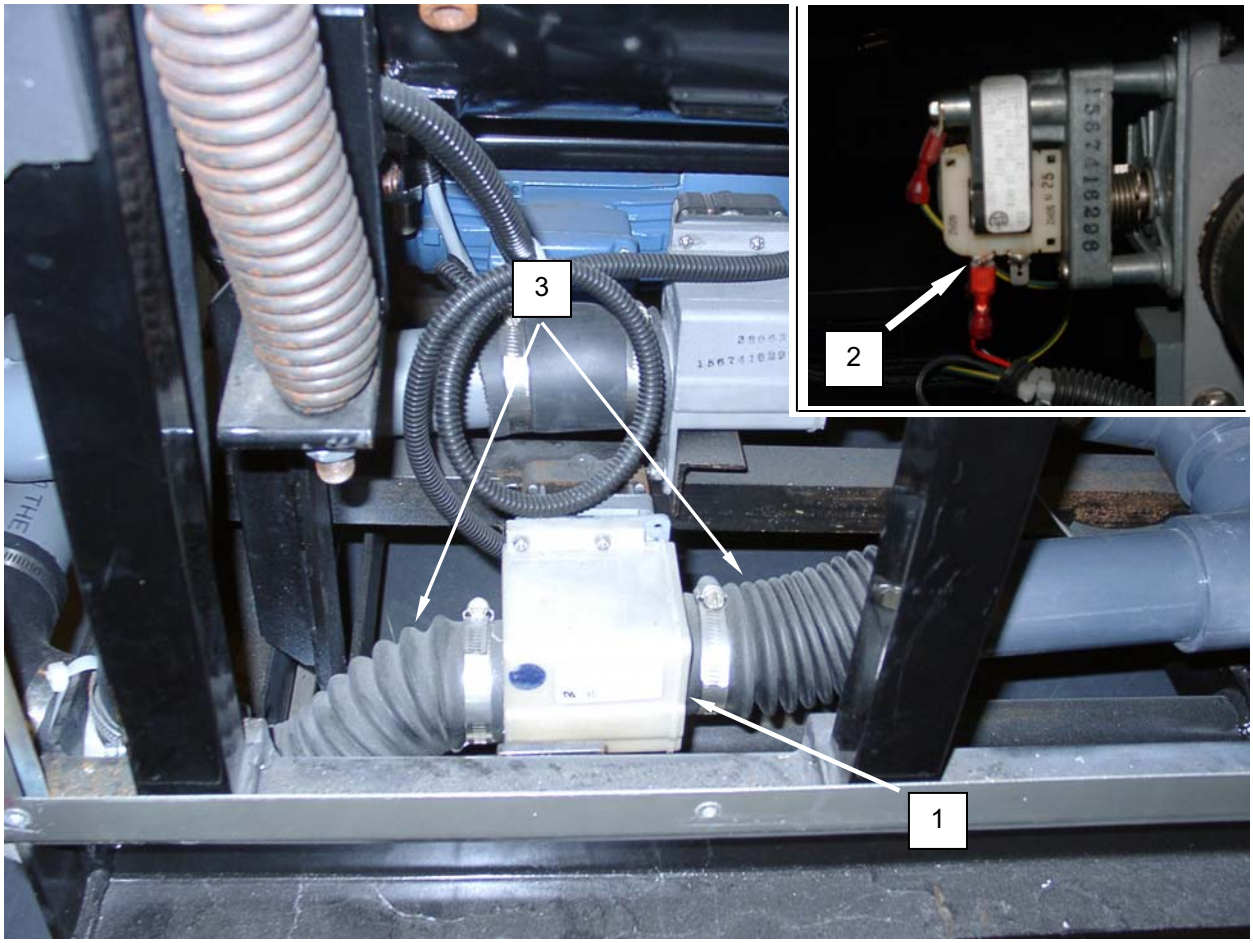


Figure 1. Test the Washer Main Drain Valve.

REPLACE

Replace the Washer Main Drain Valve

WARNING

Ensure that all electrical power is shut off and disconnected before proceeding. The circuit breaker box should be locked by personnel following this procedure. Serious injury or death can result from electrocution if proper safety precautions are not observed.

WARNING

The washer is extremely heavy. Use caution when lifting and blocking the washer, and do not allow unnecessary personnel in the immediate area while it is being moved. Serious injury or death may result if safety precautions are not observed.

CAUTION

The washer is a large, heavy piece of machinery being moved out of a confined space. Before removal and installation, remove or protect any equipment that might be damaged by the washer on its way in or out.

1. Remove washer IAW procedures given in WP 0041 00.
2. Tag and disconnect wiring from valve motor **(Figure 2, Item 1)**.
3. Loosen and remove the clamps retaining the hoses **(Figure 2, Item 3)** to the valve **(Figure 2, Item 1)** and remove the hoses.
4. Remove the screws retaining the valve **(Figure 2, Item 1)** to the valve bracket and remove the valve.
5. Install the replacement valve **(Figure 2, Item 1)** and retain with screws.
6. Install hoses **(Figure 2, Item 3)** onto valve **(Figure 2, Item 1)** and retain with clamps.

CAUTION

Ensure the wire connections are placed on the 60Hz terminals as marked on the valve motor. Connection to the 50Hz terminals will impair performance and reduce the operating life of the valve motor.

7. Reconnect wiring as tagged.
8. Install washer IAW procedures given in WP 0041 00.

REPLACE-CONTINUED

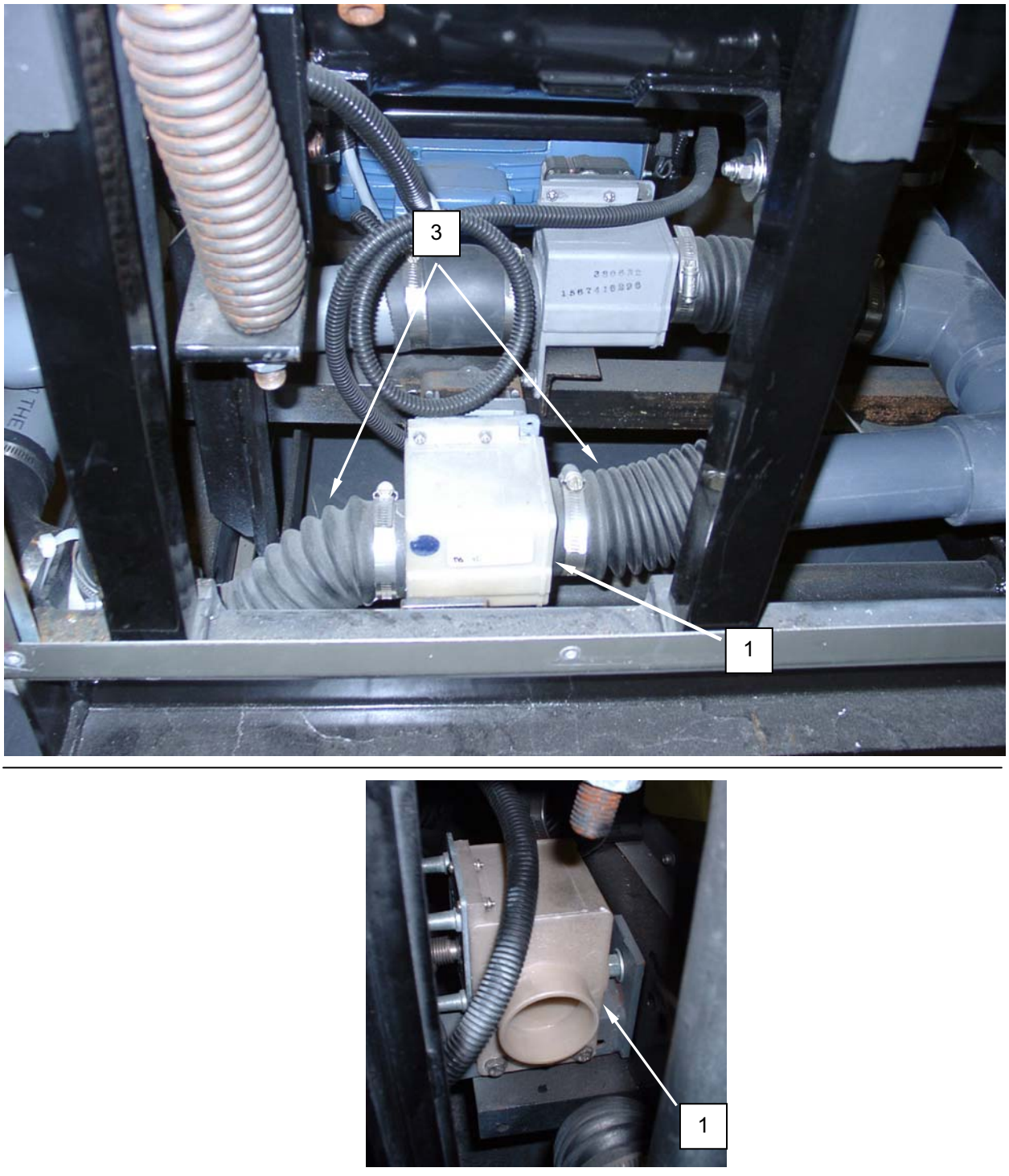


Figure 2. Replace the Washer Main Drain Valve.

END OF WORK PACKAGE

UNIT MAINTENANCE
CONTAINERIZED BATCH LAUNDRY
NSN 3510-01-527-2209
NSN 3510-01-527-2210
VALVE, REUSE DRAIN
TEST, REPLACE

INITIAL SETUP

Tools
Tool Kit, General Mechanics: Automotive (WP 0086 00, Table 2, Item 6)

Materials/Parts
Wire Markers (WP 0087 00, Item 58)

Personnel Required
Quartermaster and Chemical Equipment Repairer 63J (2)

Equipment Condition
CBL set up

References
WP 0041 00

TEST

Test the Washer Reuse Drain Valve

WARNING

Ensure that all electrical power is shut off and disconnected before proceeding. The circuit breaker box should be locked by personnel following this procedure. Serious injury or death can result from electrocution if proper safety precautions are not observed.

WARNING

The washer is extremely heavy. Use caution when lifting and blocking the washer, and do not allow unnecessary personnel in the immediate area while it is being moved. Serious injury or death may result if safety precautions are not observed.

CAUTION

The washer is a large, heavy piece of machinery being moved out of a confined space. Before removal and installation, remove or protect any equipment that might be damaged by the washer on its way in or out.

1. Remove washer IAW procedures given in WP 0041 00.
2. Tag and disconnect wiring from valve motor **(Figure 1, Item 1)**.
3. Use an ohmmeter to check for 100 to 120 ohms resistance between motor leads **(Figure 1, Item 2)**.
4. Use an ohmmeter to check for infinite resistance between each motor lead **(Figure 1, Item 2)** and ground.
5. Replace an open motor **(Figure 1, Item 1)** or a motor which has shorted to ground.
6. Loosen and remove the clamps retaining the hoses **(Figure 1, Item 3)** to the valve **(Figure 1, Item 1)** and remove the hoses.

TEST-CONTINUED

7. Ensure the valve **(Figure 1, Item 1)** opens and closes completely and is free of obstructions.
8. Ensure there is no damage to the valve butterfly or valve bore.
9. Install hoses **(Figure 1, Item 3)** onto valve **(Figure 1, Item 1)** and retain with clamps.
10. Reconnect wiring as tagged.
11. Install washer IAW procedures given in WP 0041 00.

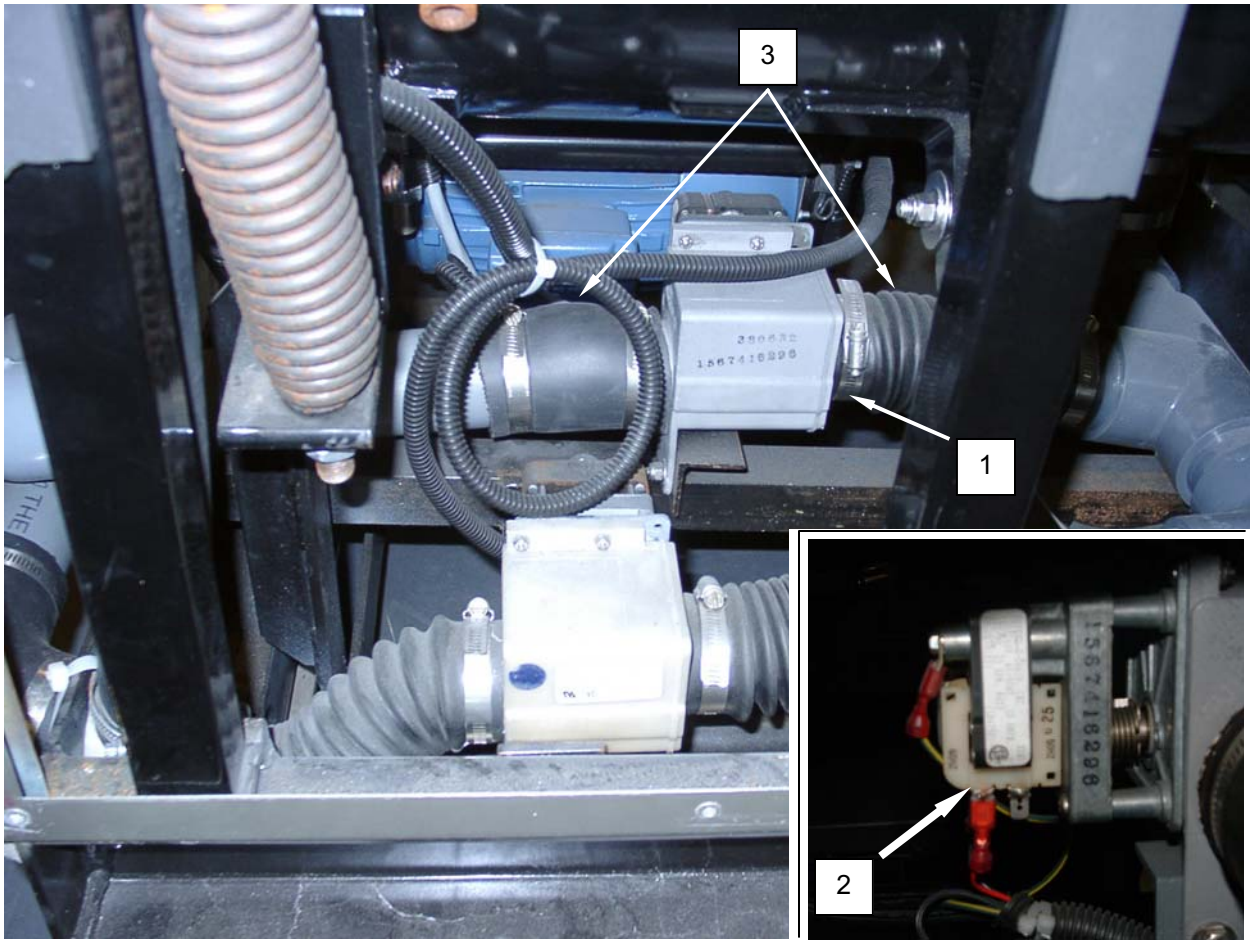


Figure 1. Test the Washer Reuse Drain Valve.

REPLACE

Replace the Washer Reuse Drain Valve

WARNING

Ensure that all electrical power is shut off and disconnected before proceeding. The circuit breaker box should be locked by personnel following this procedure. Serious injury or death can result from electrocution if proper safety precautions are not observed.

WARNING

The washer is extremely heavy. Use caution when lifting and blocking the washer, and do not allow unnecessary personnel in the immediate area while it is being moved. Serious injury or death may result if safety precautions are not observed.

CAUTION

The washer is a large, heavy piece of machinery being moved out of a confined space. Before removal and installation, remove or protect any equipment that might be damaged by the washer on its way in or out.

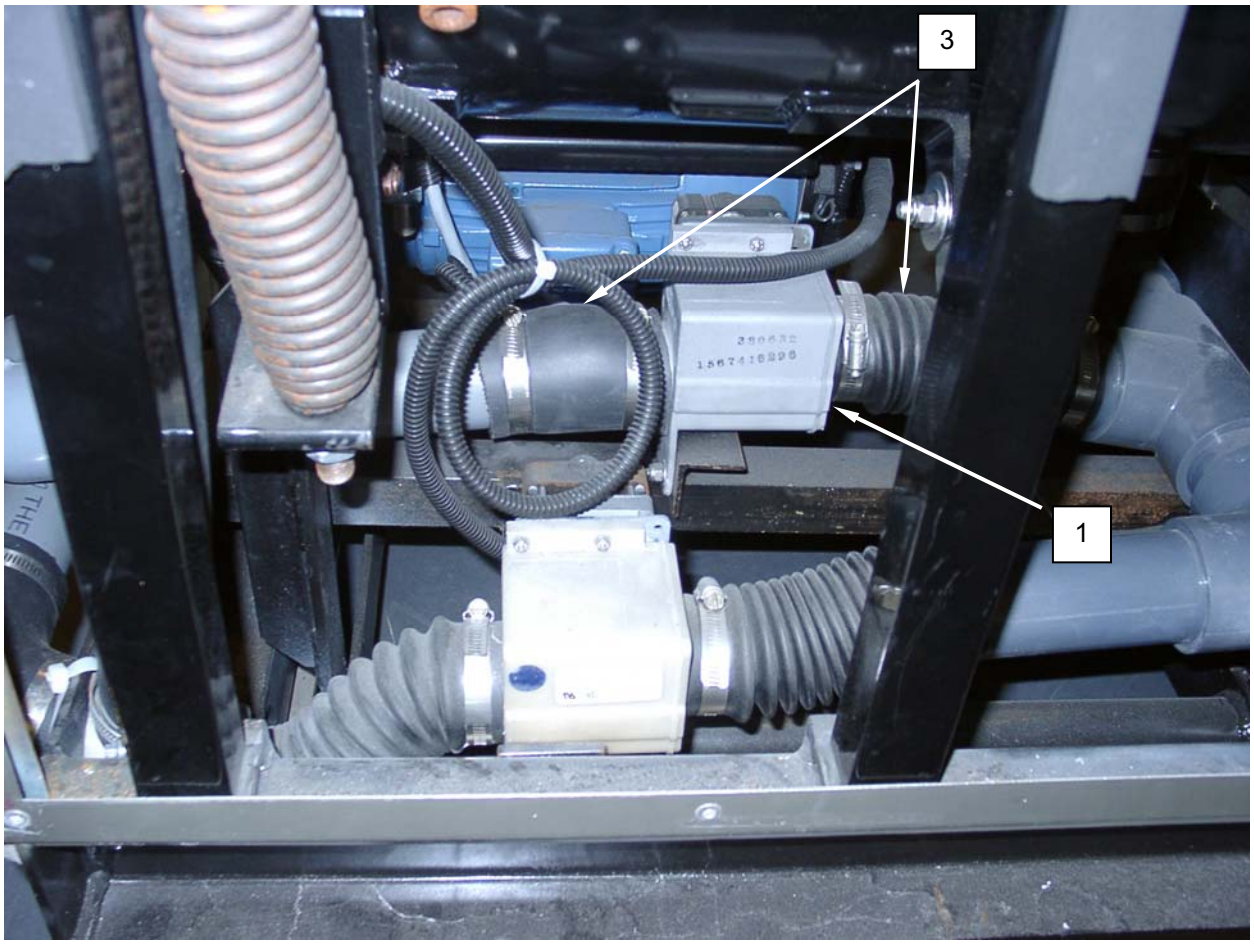
1. Remove washer IAW procedures given in WP 0041 00.
2. Tag and disconnect wiring from valve motor **(Figure 2, Item 1)**.
3. Loosen and remove the clamps retaining the hoses **(Figure 2, Item 3)** to the valve **(Figure 2, Item 1)** and remove the hoses.
4. Remove the screws retaining the valve **(Figure 2, Item 1)** to the valve bracket and remove the valve.
5. Install the replacement valve **(Figure 2, Item 1)** and retain with screws.
6. Install hoses **(Figure 2, Item 3)** onto valve **(Figure 2, Item 1)** and retain with clamps.

CAUTION

Ensure the wire connections are placed on the 60Hz terminals as marked on the valve motor. Connection to the 50Hz terminals will impair performance and reduce the operating life of the valve motor.

7. Reconnect wiring as tagged.
8. Install washer IAW procedures given in WP 0041 00.

REPLACE-CONTINUED



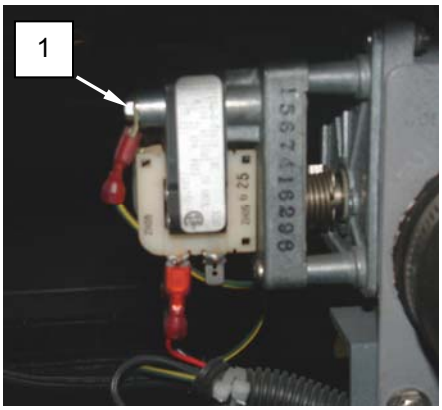


Figure 2. Replace the Washer Reuse Drain Valve.

END OF WORK PACKAGE

UNIT MAINTENANCE
CONTAINERIZED BATCH LAUNDRY
NSN 3510-01-527-2209
NSN 3510-01-527-2210
DRIVE, VARIABLE FREQUENCY
TEST, REPLACE

INITIAL SETUP

Tools
Tool Kit, General Mechanics: Automotive (WP 0086 00, Table 2, Item 6)

Materials/Parts
Wire Markers (WP 0087 00, Item 58)

Personnel Required
Quartermaster and Chemical Equipment Repairer 63J (2)

Equipment Condition
CBL set up

References
TM 10-3510-226-10
WP 0041 00

TEST

Test the Variable Frequency Drive

The variable frequency drive may be tested by running an extract cycle (cycle 36) to fully load the motor. A faulty variable frequency drive will deliver an error. Refer to TM 10-3510-226-10 for washer operating instructions.

Figure 1. Test the Variable Frequency Drive.

TEST-CONTINUED

Test the Washer Variable Frequency Drive Cooling Fan

WARNING

Ensure that all electrical power is shut off and disconnected before proceeding. The circuit breaker box should be locked by personnel following this procedure. Serious injury or death can result from electrocution if proper safety precautions are not observed.

WARNING

The washer is extremely heavy. Use caution when lifting and blocking the washer, and do not allow unnecessary personnel in the immediate area while it is being moved. Serious injury or death may result if safety precautions are not observed.

CAUTION

The washer is a large, heavy piece of machinery being moved out of a confined space. Before removal and installation, remove or protect any equipment that might be damaged by the washer on its way in or out.

NOTE

For Washer No. 2, steps 1 and 9 may be omitted. There is also no need to remove the back, side, or top panels to perform this maintenance task.

1. Remove washer IAW procedures given in WP 0041 00.
2. Remove screws retaining inverter box cover **(Figure 2, Item 1)** and remove cover.
3. Tag and disconnect wiring from fan **(Figure 2, Item 2)**.
4. Use an ohmmeter to check for 750 ohms resistance between motor leads **(Figure 2, Item 3)**.
5. Use an ohmmeter to check for infinite resistance between each motor lead **(Figure 2, Item 3)** and ground.
6. Replace a fan with an open motor or a motor which has shorted to ground.
7. Reconnect wiring as tagged.
8. Install inverter box cover **(Figure 2, Item 1)** and retain with screws.
9. Install washer IAW procedures given in WP 0041 00.

TEST-CONTINUED

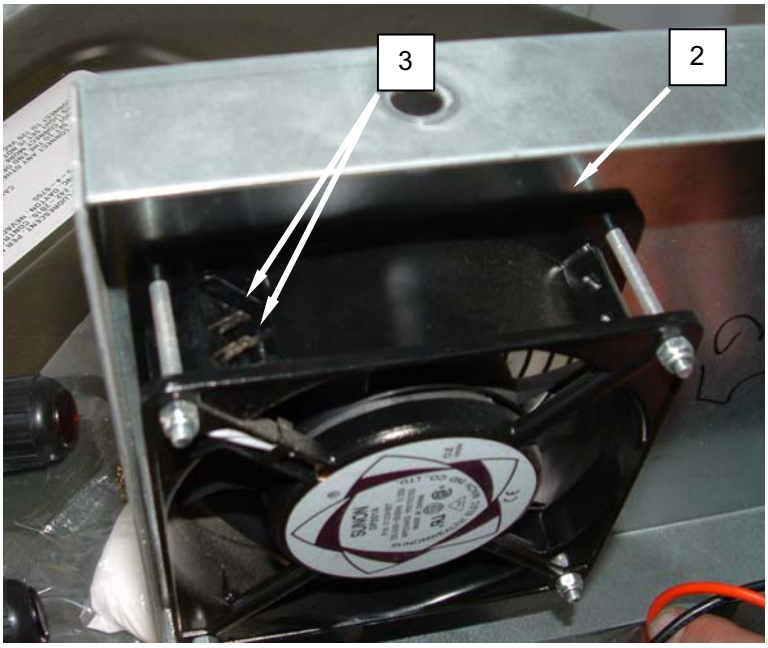


Figure 2. Test the Washer Variable Frequency Drive Cooling Fan.

REPLACE

Replace the Variable Frequency Drive

WARNING

Ensure that all electrical power is shut off and disconnected before proceeding. The circuit breaker box should be locked by personnel following this procedure. Serious injury or death can result from electrocution if proper safety precautions are not observed.

WARNING

The washer is extremely heavy. Use caution when lifting and blocking the washer, and do not allow unnecessary personnel in the immediate area while it is being moved. Serious injury or death may result if safety precautions are not observed.

CAUTION

The washer is a large, heavy piece of machinery being moved out of a confined space. Before removal and installation, remove or protect any equipment that might be damaged by the washer on its way in or out.

NOTE

For Washer No. 2, steps 1 and 13 may be omitted. There is also no need to remove the back, side, or top panels to perform this maintenance task.

1. Remove washer IAW procedures given in WP 0041 00.
2. Remove screws retaining inverter box cover **(Figure 3, Item 1)**, and remove cover.
3. Tag and disconnect wiring from fan **(Figure 3, Item 2)**.
4. Wait at least 10 minutes before proceeding.
5. Release tabs retaining inverter cover **(Figure 3, Item 4)**, and remove cover.
6. Tag and disconnect wiring from inverter **(Figure 4, Item 5)**.
7. Remove nuts retaining inverter **(Figure 4, Item 5)**, and remove inverter.
8. Install replacement inverter **(Figure 4, Item 5)** and retain with nuts.
9. Release tabs retaining inverter cover **(Figure 3, Item 4)**, and remove cover.
10. Connect wiring as tagged, and install inverter cover.
11. Connect wiring to fan **(Figure 3, Item 2)**.

REPLACE-CONTINUED

12. Install inverter box cover **(Figure 3, Item 1)** and retain with screws.

13. Install washer IAW procedures given in WP 0041 00.

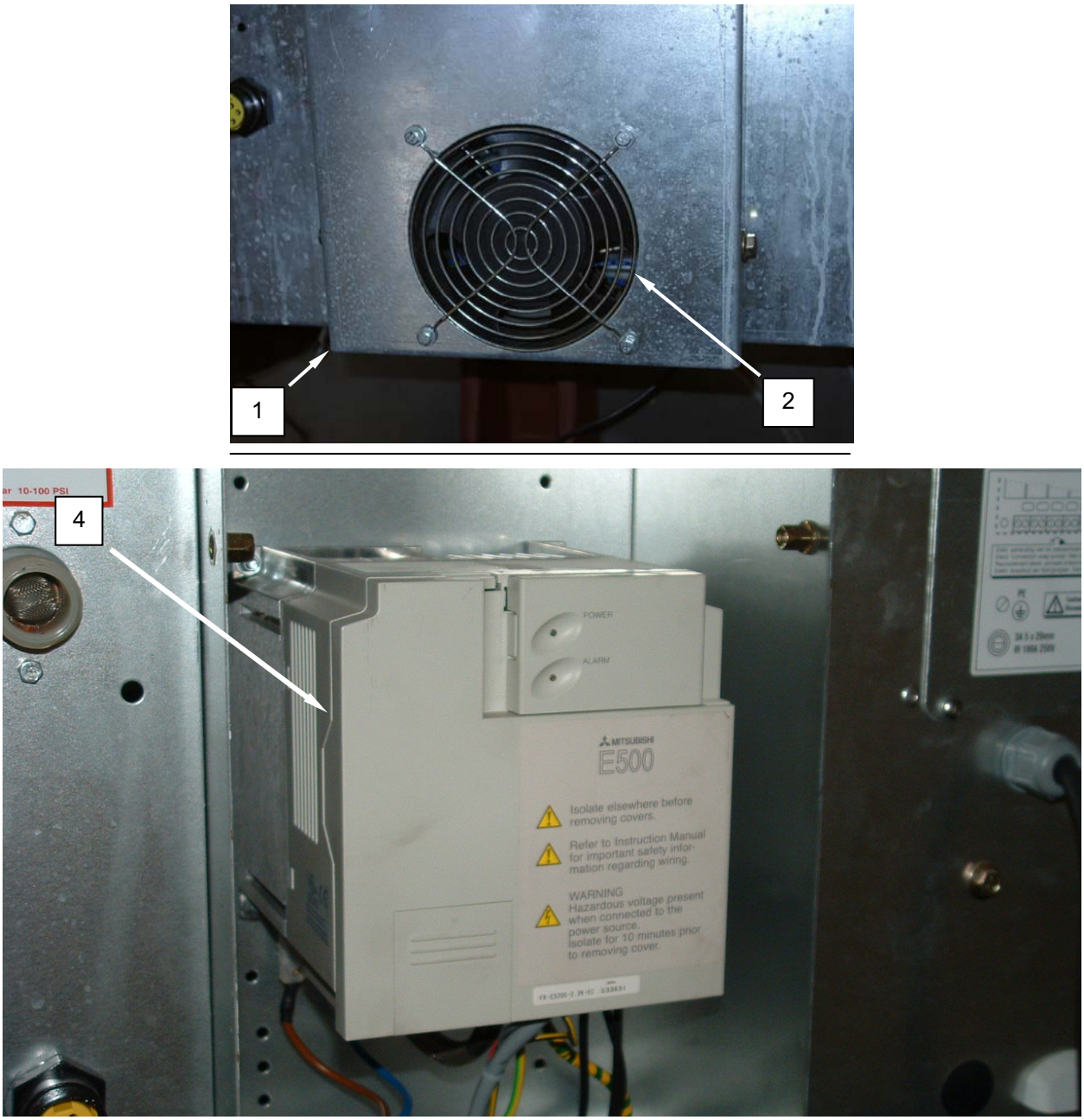


Figure 3. Replace the Washer Variable Frequency Drive.

REPLACE-CONTINUED

Figure 4. Replace the Washer Variable Frequency Drive.

REPLACE-CONTINUED

Replace the Washer Variable Frequency Drive Cooling Fan

WARNING

Ensure that all electrical power is shut off and disconnected before proceeding. The Circuit Breaker box should be locked by personnel following this procedure. Serious injury or death can result from electrocution if proper safety precautions are not observed.

WARNING

The washer is extremely heavy. Use caution when lifting and blocking the washer, and do not allow unnecessary personnel in the immediate area while it is being moved. Serious injury or death may result if safety precautions are not observed.

CAUTION

The washer is a large, heavy piece of machinery being moved out of a confined space. Before removal and installation, remove or protect any equipment that might be damaged by the washer on its way in or out.

NOTE

For Washer No. 2, steps 1 and 8 may be omitted. There is also no need to remove the back, side, or top panels to perform this maintenance task.

1. Remove washer IAW procedures given in WP 0041 00.
2. Remove screws retaining inverter box cover **(Figure 5, Item 1)** and remove cover.
3. Tag and disconnect wiring from fan **(Figure 5, Item 2)**.
4. Remove bolts, washers and nuts retaining fan **(Figure 5, Item 2)** to cover **(Figure 5, Item 1)**, and remove fan.
5. Install replacement fan **(Figure 5, Item 2)**, and retain with bolts, washers, and nuts.
6. Connect wiring to fan **(Figure 5, Item 2)**.
7. Install inverter box cover **(Figure 5, Item 1)**, and retain with screws.
8. Install washer IAW procedures given in WP 0041 00.

REPLACE-CONTINUED

Figure 5. Replace the Washer Variable Frequency Drive Cooling Fan.

END OF WORK PACKAGE

UNIT MAINTENANCE
CONTAINERIZED BATCH LAUNDRY
NSN 3510-01-527-2209
NSN 3510-01-527-2210
SHOCK ABSORBERS
SPRINGS
INSPECT, REPLACE

INITIAL SETUP

Tools
Shop Equipment, Automotive Maintenance and Repair: Organizational Maintenance, Common No.1 (WP 0086 00, Table 2, Item 5)

Materials/Parts
Cleaner, Lubricant, and Preservative (WP 0087, Item 10)

Personnel Required
Quartermaster and Chemical Equipment Repairer 63J (2)

Equipment Condition
CBL set up

References
TM 10-3510-226-10
WP 0041 00

INSPECT

Inspect the Washer Shock Absorbers

WARNING

Ensure that all electrical power is shut off and disconnected before proceeding. The Circuit Breaker box should be locked by personnel following this procedure. Serious injury or death can result from electrocution if proper safety precautions are not observed.

WARNING

The washer is extremely heavy. Use caution when lifting and blocking the washer, and do not allow unnecessary personnel in the immediate area while it is being moved. Serious injury or death may result if safety precautions are not observed.

CAUTION

The washer is a large, heavy piece of machinery being moved out of a confined space. Before removal and installation, remove or protect any equipment that might be damaged by the washer on its way in or out.

NOTE

The washer is equipped with three shock absorbers.

1. Remove washer IAW procedures given in WP 0041 00.
2. Inspect shock absorbers **(Figure 1, Item 1)** for physical damage, fluid leakage, or loose bolts.
3. Install washer IAW procedures given in WP 0041 00.

INSPECT-CONTINUED

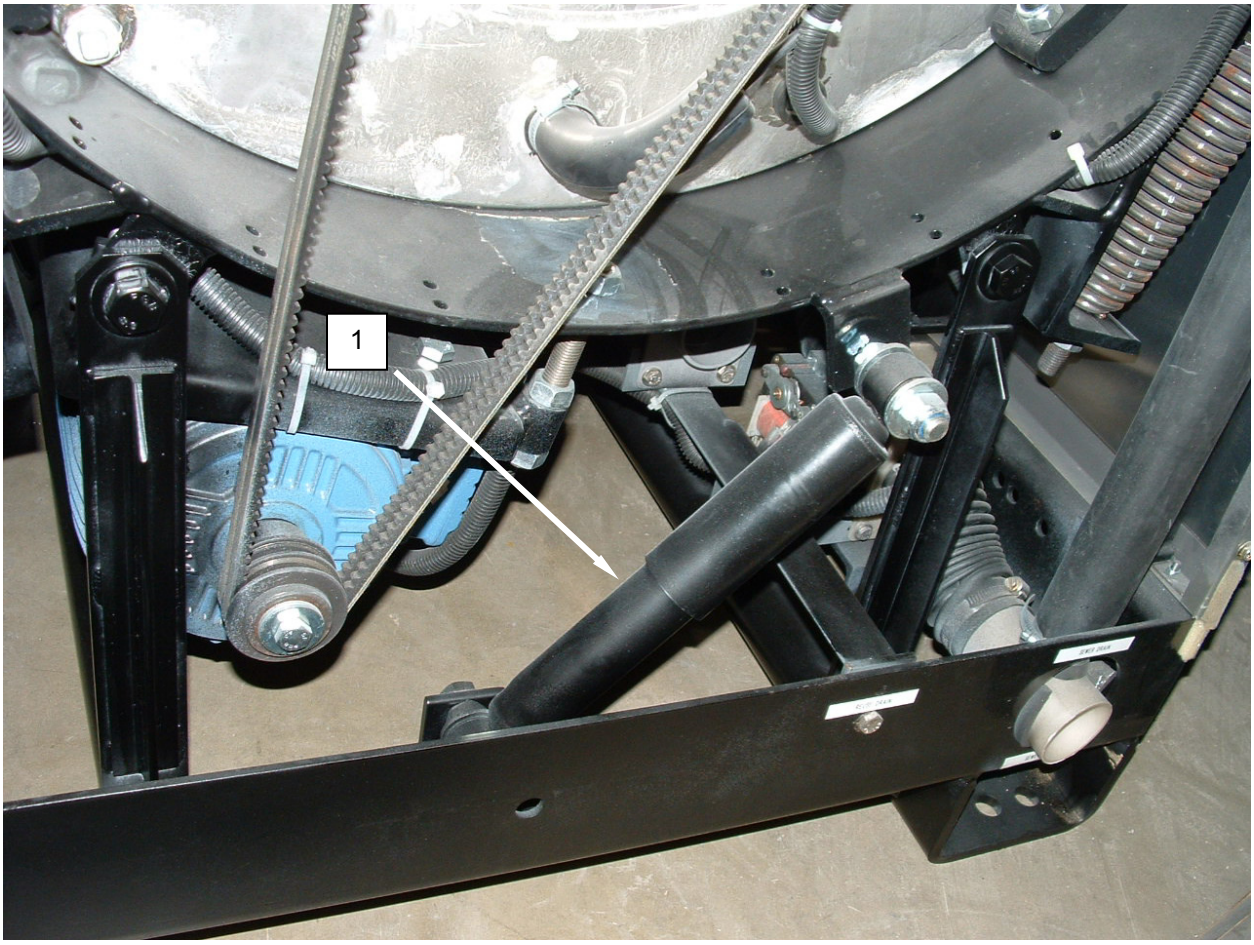


Figure 1. Inspect the Washer Shock Absorbers.

INSPECT-CONTINUED

Inspect the Washer Springs

WARNING

Ensure that all electrical power is shut off and disconnected before proceeding. The Circuit Breaker box should be locked by personnel following this procedure. Serious injury or death can result from electrocution if proper safety precautions are not observed.

WARNING

The washer is extremely heavy. Use caution when lifting and blocking the washer, and do not allow unnecessary personnel in the immediate area while it is being moved. Serious injury or death may result if safety precautions are not observed.

CAUTION

The washer is a large, heavy piece of machinery being moved out of a confined space. Before removal and installation, remove or protect any equipment that might be damaged by the washer on its way in or out.

NOTE

The washer is equipped with four springs.

1. Remove washer IAW procedures given in WP 0041 00.
2. Inspect springs **(Figure 2, Item 2)** for physical damage, corrosion, or loose mounting bolts.
3. Install washer IAW procedures given in WP 0041 00.

INSPECT-CONTINUED

Figure 2. Inspect the Washer Springs.

REPLACE

Replace the Washer Shock Absorbers

WARNING

Ensure that all electrical power is shut off and disconnected before proceeding. The Circuit Breaker box should be locked by personnel following this procedure. Serious injury or death can result from electrocution if proper safety precautions are not observed.

WARNING

The washer is extremely heavy. Use caution when lifting and blocking the washer, and do not allow unnecessary personnel in the immediate area while it is being moved. Serious injury or death may result if safety precautions are not observed.

CAUTION

The washer is a large, heavy piece of machinery being moved out of a confined space. Before removal and installation, remove or protect any equipment that might be damaged by the washer on its way in or out.

NOTE

The washer is equipped with three shock absorbers. Replace shock absorbers as a set only.

1. Remove the bolts retaining the left front panel **(Figure 3, Item 3)** and the right front panel **(Figure 3, Item 4)**, and remove both panels.

2. Remove washer IAW procedures given in WP 0041 00.

WARNING

Do not proceed with this task unless the drum is fully supported by the shipping brackets. Failure to support the drum may result in serious injury to personnel.

3. Support washer drum **(Figure 3, Item 5)** with shipping brackets. Refer to TM 10-3510-226-10 as necessary for information on installing the shipping brackets.

REPLACE-CONTINUED

CAUTION

The shock absorber mounting bolts may be installed by power tools at the manufacturer. Always use the correct tools to loosen the mounting hardware – an open end wrench and a box wrench or socket. If the mounting hardware cannot be removed, refer the procedure to the next higher maintenance level.

4. Apply penetrating oil to bolts retaining shock absorber **(Figure 3, Item 6)**. Allow the penetrating oil to soak for about 15 minutes

5. Remove bolts retaining shock absorber **(Figure 3, Item 6)**, and remove shock absorber.

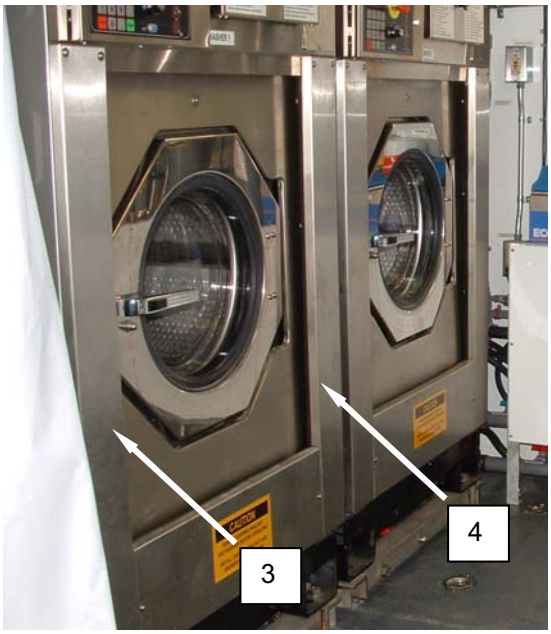
6. Install replacement shock absorbers **(Figure 3, Item 6)** and retain with bolts.

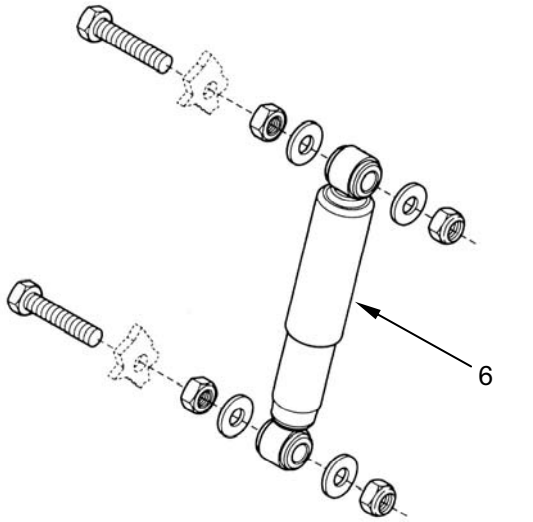
7. Remove shipping brackets. Refer to TM 10-3510-226-10 as necessary for information on installing the shipping brackets.

8. Install washer IAW procedures given in WP 0041 00.

9. Install the left front panel **(Figure 3, Item 3)** and the right front panel **(Figure 3, Item 4)**, and retain with bolts.

REPLACE-CONTINUED





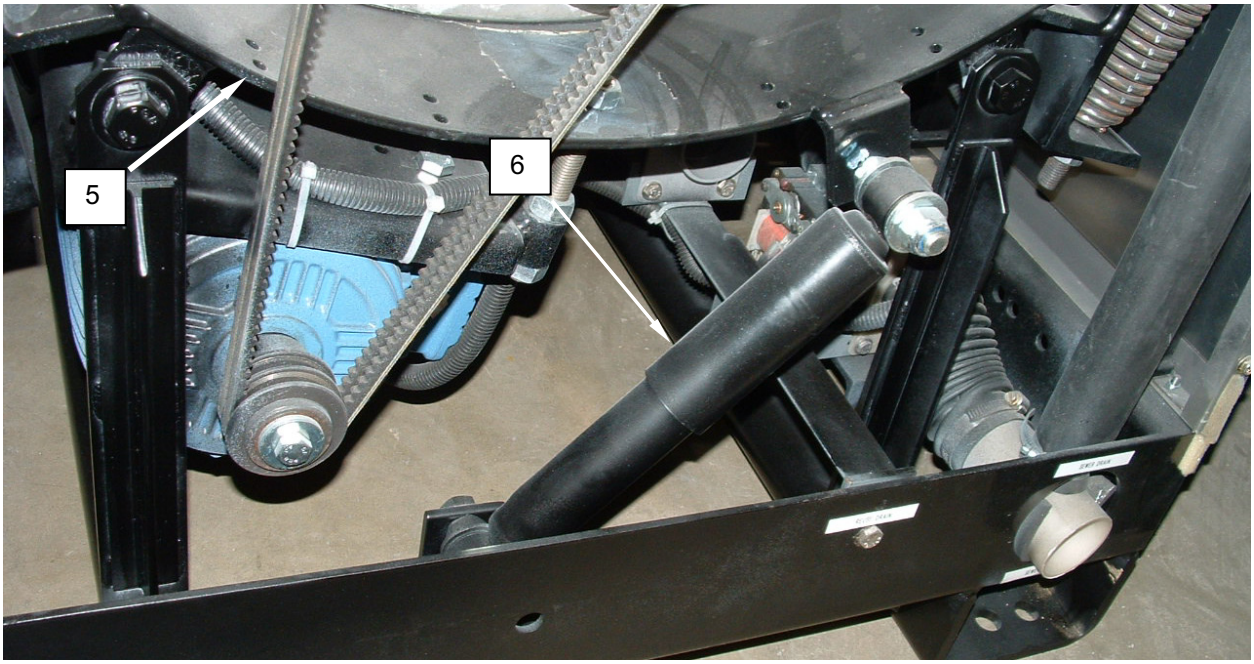


Figure 3. Replace the Washer Shock Absorbers.

REPLACE-CONTINUED

Replace the Washer Springs

WARNING

Ensure that all electrical power is shut off and disconnected before proceeding. The Circuit Breaker box should be locked by personnel following this procedure. Serious injury or death can result from electrocution if proper safety precautions are not observed.

WARNING

The washer is extremely heavy. Use caution when lifting and blocking the washer, and do not allow unnecessary personnel in the immediate area while it is being moved. Serious injury or death may result if safety precautions are not observed.

CAUTION

The washer is a large, heavy piece of machinery being moved out of a confined space. Before removal and installation, remove or protect any equipment that might be damaged by the washer on its way in or out.

CAUTION

Replace the springs one at a time; that is, do not remove any more than one spring at any given time. Removal of more than one spring may allow the washer drum to drop, damaging components. If a spring has broken, replace the broken spring first before replacing any others.

NOTE

The washer is equipped with four springs. Replace springs as a set only.

NOTE

The front and rear springs are set up differently.

1. Remove washer IAW procedures given in WP 0041 00.
2. Support washer drum **(Figure 4, 5, Item 5)** with one shipping bracket installed on the side opposite the spring **(Figure 4, 5, Item 2)** being replaced. Refer to TM 10-3510-226-10 as necessary for information on installing the shipping brackets.
3. Remove locknuts **(Figure 4, 5, Item 7)** retaining spring **(Figure 4, 5, Item 2)**, and unscrew spring.
4. Install replacement spring **(Figure 4, 5, Item 2)**.
5. Remove shipping bracket, and adjust springs to approximately 9 $^{3}/_{8}$-inches length.
6. Install washer IAW procedures given in WP 0041 00.

REPLACE-CONTINUED

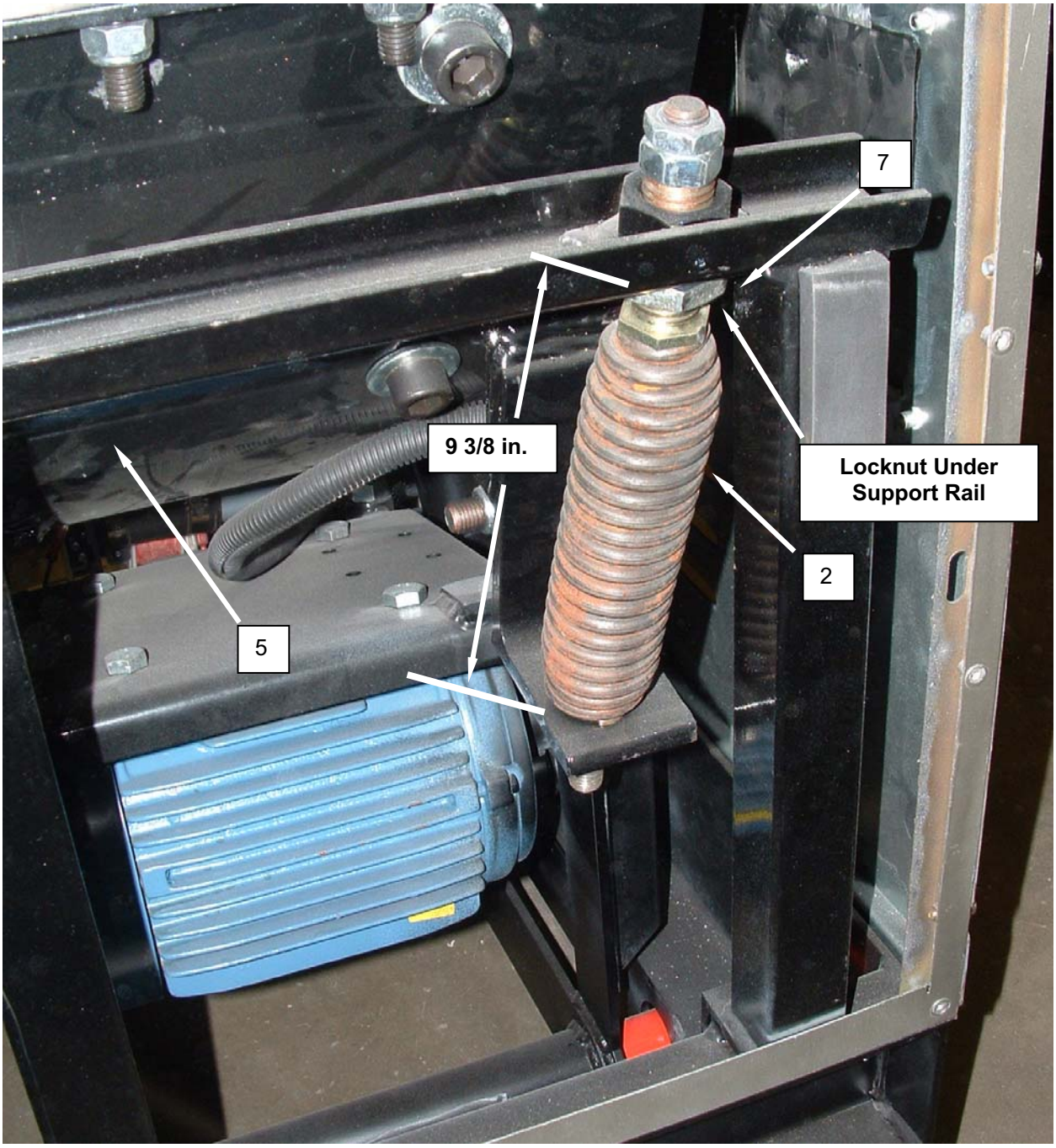


Figure 4. Replace the Washer Front Springs.

REPLACE-CONTINUED

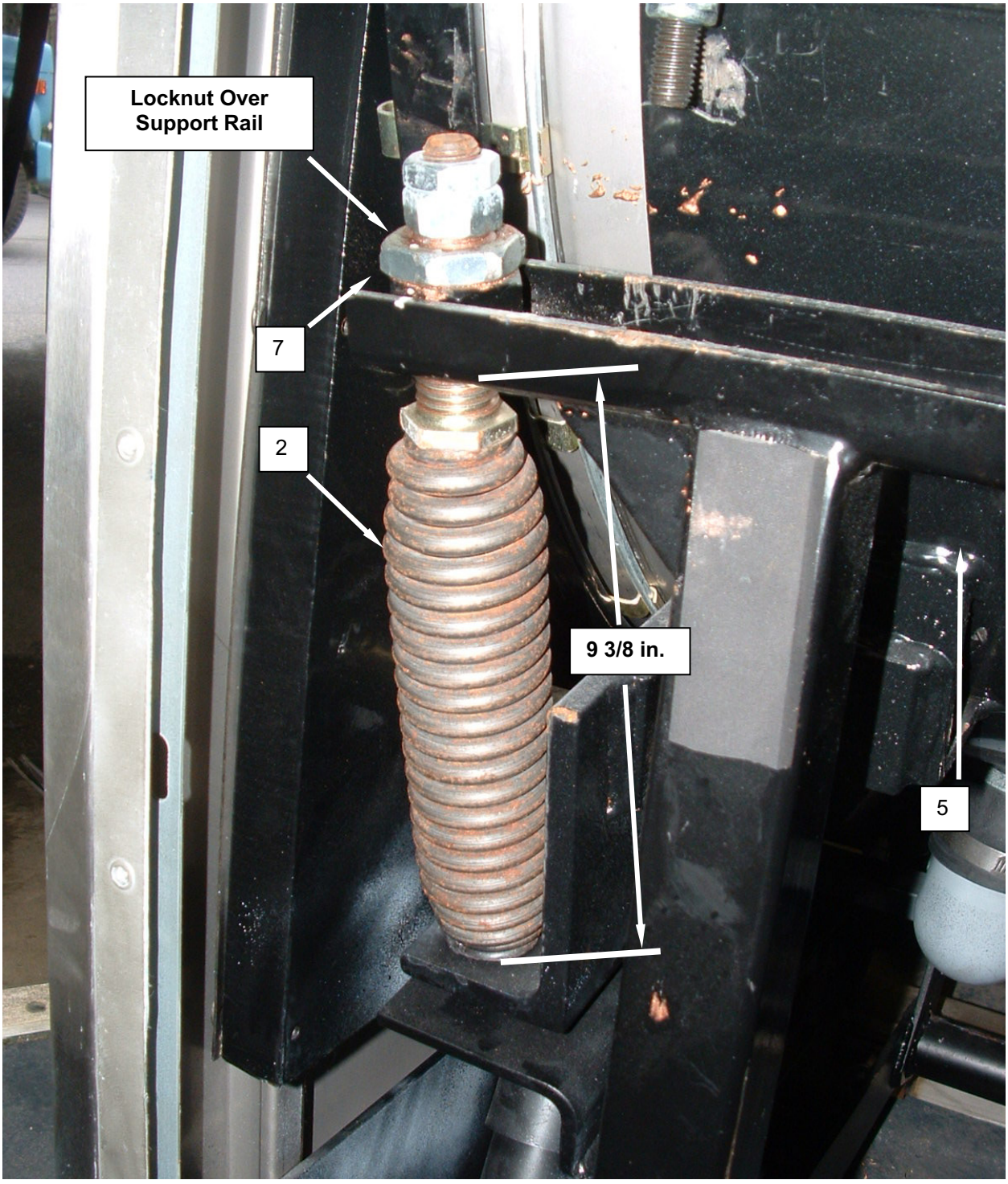


Figure 5. Replace the Washer Rear Springs.

END OF WORK PACKAGE

UNIT MAINTENANCE
CONTAINERIZED BATCH LAUNDRY
NSN 3510-01-527-2209
NSN 3510-01-527-2210
WASHER DRIVE BELTS
INSPECT, ADJUST, REPLACE

INITIAL SETUP

Tools
Tool Kit, General Mechanics: Automotive (WP 0086 00, Table 2, Item 6)

Materials/Parts
None Required

Personnel Required
Quartermaster and Chemical Equipment Repairer 63J (2)

Equipment Condition
CBL set up

References
WP 0041 00

INSPECT

Inspect the Washer Drive Belts

WARNING

Ensure that washer electrical power is shut off and disconnected before proceeding. The Circuit Breaker box should be locked by personne following this procedure. Serious injury or death can result from electrocution if proper safety precautions are not observed.

WARNING

The washer is extremely heavy. Use caution when lifting and blocking the washer, and do not allow unnecessary personnel in the immediate area while it is being moved. Serious injury or death may result if safety precautions are not observed.

CAUTION

The washer is a large, heavy piece of machinery being moved out of a confined space. Before removal and installation, remove or protect any equipment which might be damaged by the washer on its way in or out.

1. Remove washer IAW procedures given in WP 0041 00.
2. Inspect belt **(Figure 1, Item 1)** for physical damage such as fraying and wear.
3. Ensure belt deflection is approximately ½ inch.
4. Install washer IAW procedures given in WP 0041 00.

INSPECT-CONTINUED

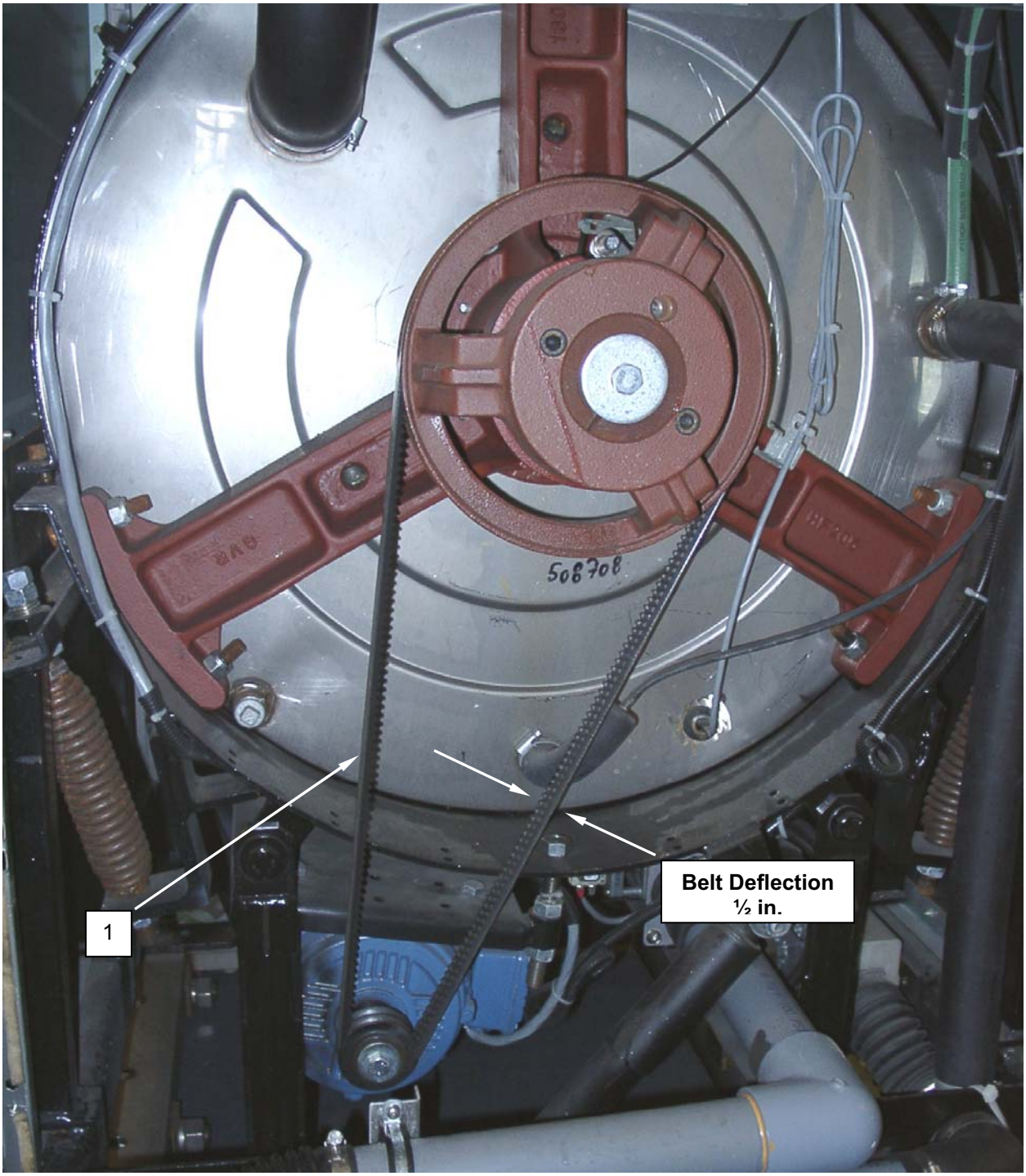


Figure 1. Inspect the Washer Drive Belts.

ADJUST

Adjust the Washer Drive Belts

WARNING

Ensure that all electrical power is shut off and disconnected before proceeding. The Circuit Breaker box should be locked by personnel following this procedure. Serious injury or death can result from electrocution if proper safety precautions are not observed.

WARNING

The washer is extremely heavy. Use caution when lifting and blocking the washer, and do not allow unnecessary personnel in the immediate area while it is being moved. Serious injury or death may result if safety precautions are not observed.

CAUTION

The washer is a large, heavy piece of machinery being moved out of a confined space. Before removal and installation, remove or protect any equipment that might be damaged by the washer on its way in or out.

1. Remove washer IAW procedures given in WP 0041 00.
2. Adjust and tighten locknuts on adjustment bolt **(Figure 2, Item 2)** as necessary.
3. Ensure belt deflection is approximately ½ inch.
4. Install washer IAW procedures given in WP 0041 00.

ADJUST-CONTINUED

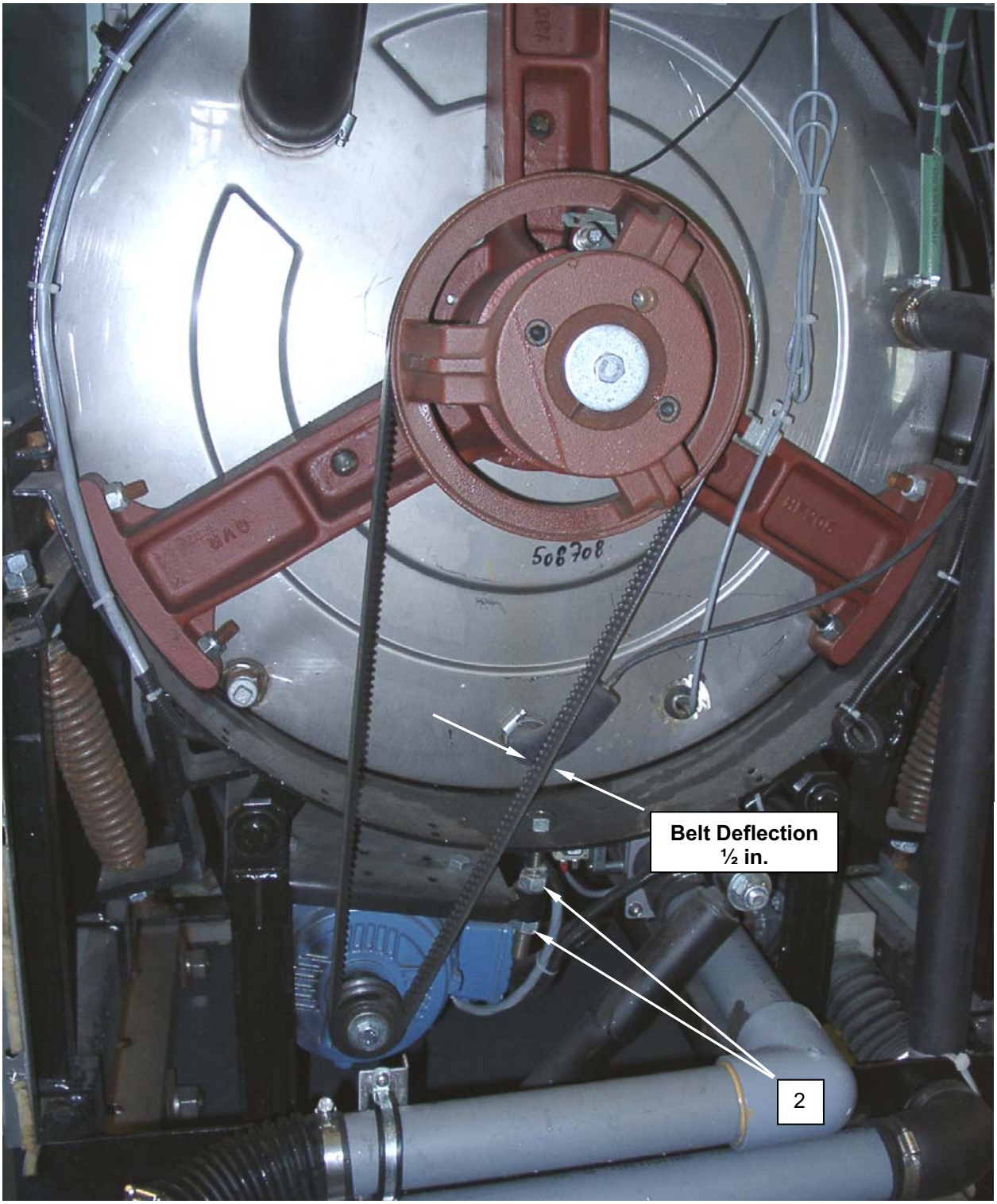


Figure 2. Adjust the Washer Drive Belts.

REPLACE

Replace the Washer Drive Belts

WARNING

Ensure that all electrical power is shut off and disconnected before proceeding. The Circuit Breaker box should be locked by personnel following this procedure. Serious injury or death can result from electrocution if proper safety precautions are not observed.

WARNING

The washer is extremely heavy. Use caution when lifting and blocking the washer, and do not allow unnecessary personnel in the immediate area while it is being moved. Serious injury or death may result if safety precautions are not observed.

CAUTION

The washer is a large, heavy piece of machinery being moved out of a confined space. Before removal and installation, remove or protect any equipment that might be damaged by the washer on its way in or out.

NOTE

Both belts must be replaced as a set.

1. Remove washer IAW procedures given in WP 0041 00.
2. Adjust and tighten locknuts **(Figure 3, Item 3)** on adjustment bolt as necessary to relieve tension on belts **(Figure 3, Item 1)**.
3. Remove belts **(Figure 3, Item 1)** from pulleys **(Figure 3, Item 4)**.
4. Install replacement belts **(Figure 3, Item 1)** onto pulleys **(Figure 3, Item 4)**.
5. Adjust and tighten locknuts **(Figure 3, Item 3)** on adjustment bolt as necessary to ensure belt deflection is approximately ½ inch.
6. Install washer IAW procedures given in WP 0041 00.

REPLACE-CONTINUED

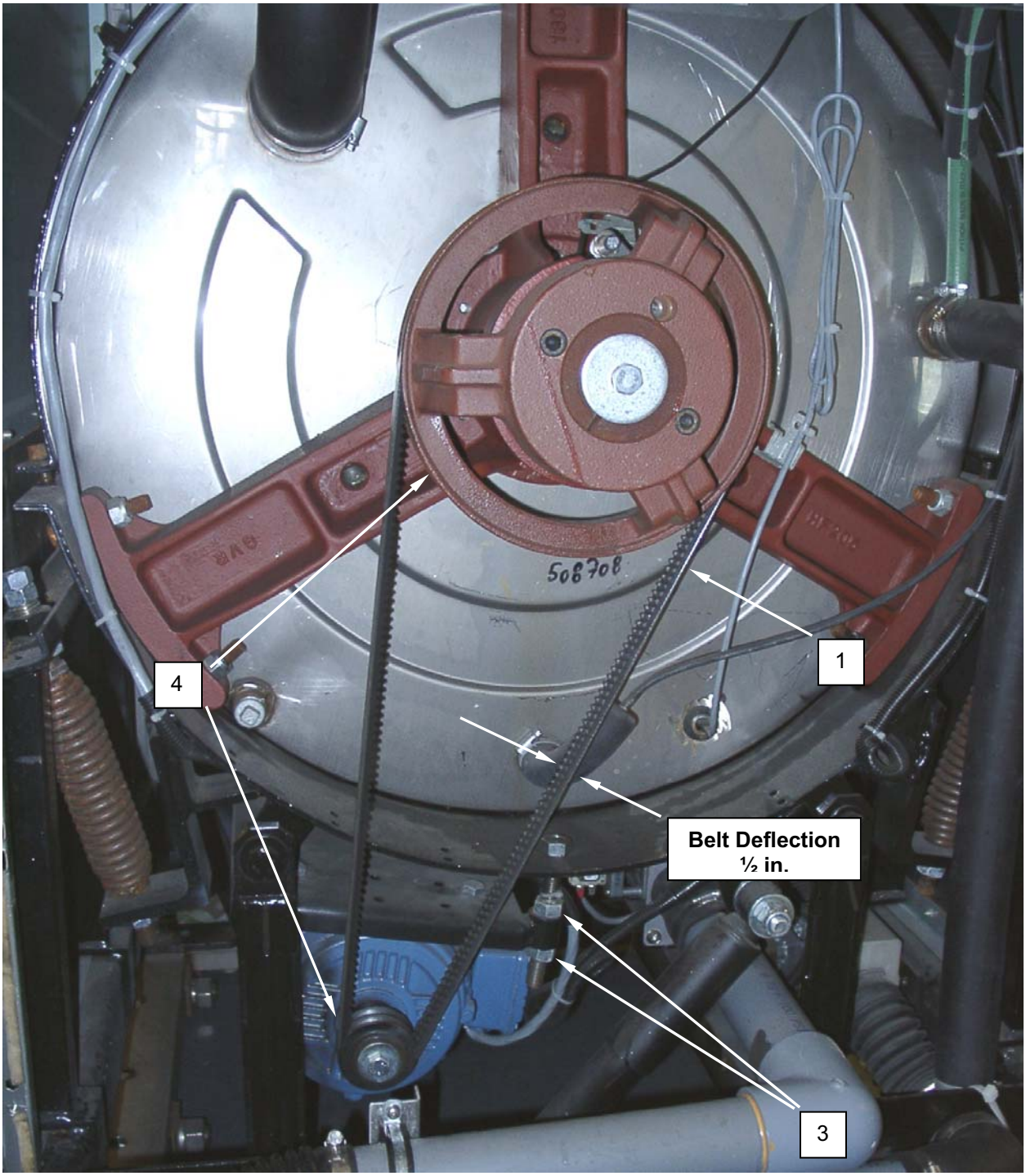


Figure 3. Replace the Washer Drive Belts.

END OF WORK PACKAGE

UNIT MAINTENANCE
CONTAINERIZED BATCH LAUNDRY
NSN 3510-01-527-2209
NSN 3510-01-527-2210
MOTOR
TEST, REPLACE

INITIAL SETUP

Tools
Shop Equipment, Automotive Maintenance and Repair: Organizational Maintenance, Common No.1 (WP 0086 00, Table 2, Item 5)
Straps

Materials/Parts
Wire Markers (WP 0087 00, Item 58)

Personnel Required
Quartermaster and Chemical Equipment Repairer 63J (2)

Equipment Condition
CBL set up

References
WP 0041 00

TEST

Test the Washer Motor

WARNING

Ensure that all electrical power is shut off and disconnected before proceeding. The Circuit Breaker box should be locked by personnel following this procedure. Serious injury or death can result from electrocution if proper safety precautions are not observed.

WARNING

The washer is extremely heavy. Use caution when lifting and blocking the washer, and do not allow unnecessary personnel in the immediate area while it is being moved. Serious injury or death may result if safety precautions are not observed.

CAUTION

The washer is a large, heavy piece of machinery being moved out of a confined space. Before removal and installation, remove or protect any equipment that might be damaged by the washer on its way in or out.

1. Remove the cover from the variable frequency drive **(Figure 1, Item 1)** IAW procedures given in WP 0041 00.

2. Tag and disconnect the wiring from the 1, 2, and 3 terminals **(Figure 1, Item 2)** on the variable frequency drive.

3. Use an ohmmeter to test for 1 to 3 ohms resistance between each wire.

4. Reconnect wiring as tagged.

5. Install all removed components IAW procedures given in WP 0041 00.

TEST-CONTINUED

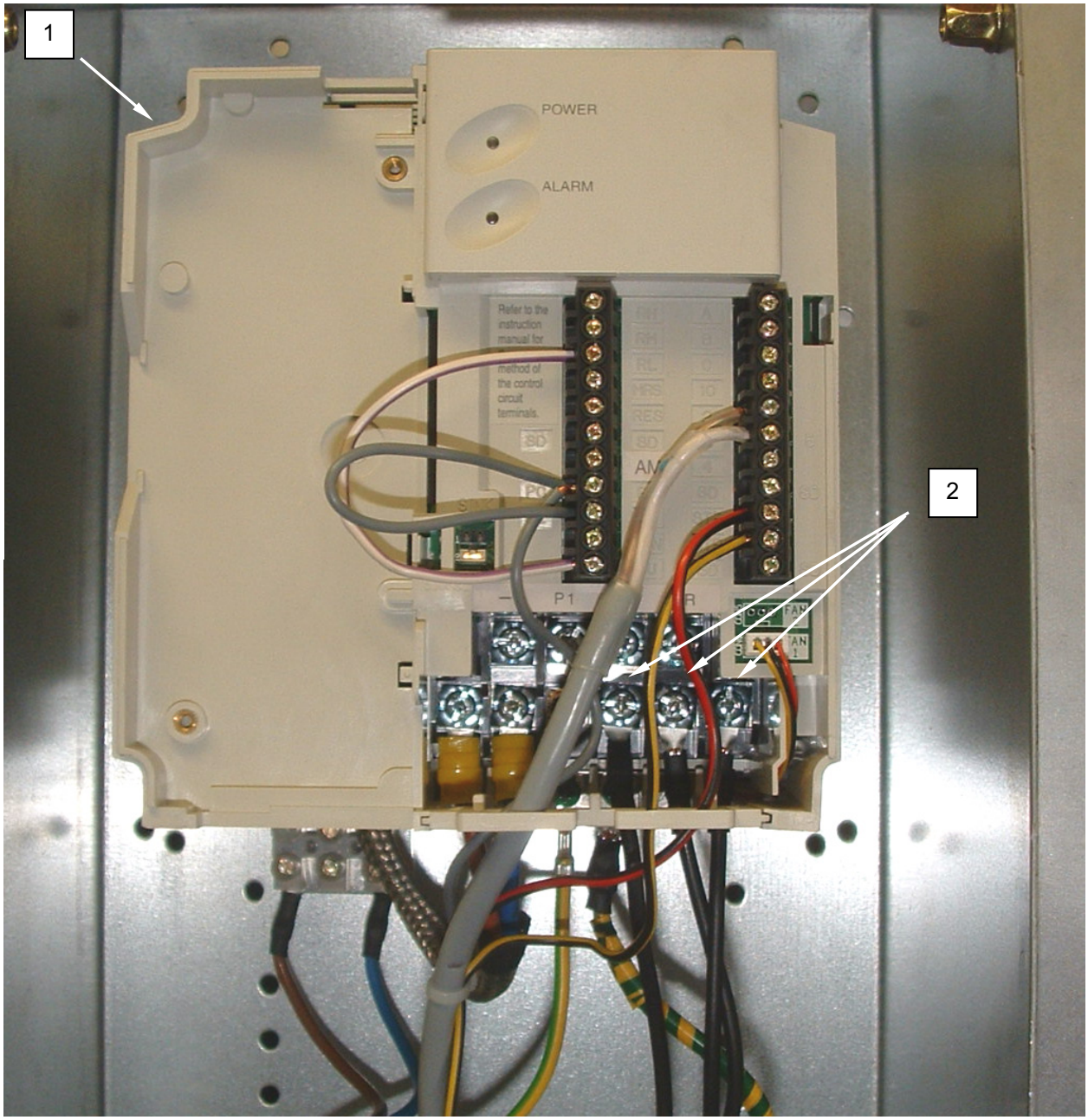


Figure 1. Test the Washer Motor.

REPLACE

Replace the Washer Motor

WARNING

Ensure that all electrical power is shut off and disconnected before proceeding. The Circuit Breaker box should be locked by personnel following this procedure. Serious injury or death can result from electrocution if proper safety precautions are not observed.

WARNING

The washer is extremely heavy. Use caution when lifting and blocking the washer, and do not allow unnecessary personnel in the immediate area while it is being moved. Serious injury or death may result if safety precautions are not observed.

CAUTION

The washer is a large, heavy piece of machinery being moved out of a confined space. Before removal and installation, remove or protect any equipment that might be damaged by the washer on its way in or out.

1. Remove washer IAW procedures given in WP 0041 00.
2. Adjust and tighten locknuts **(Figure 2, Item 3)** on adjustment bolt as necessary to relieve tension on belt.
3. Remove belt **(Figure 2, Item 4)** from pulley **(Figure 2, Item 5)**.
4. Remove the reuse drain line **(Figure 2, Item 6)** from the reuse drain valve.
5. Disconnect motor fan **(Figure 2, Item 7)** leads.

REPLACE-CONTINUED

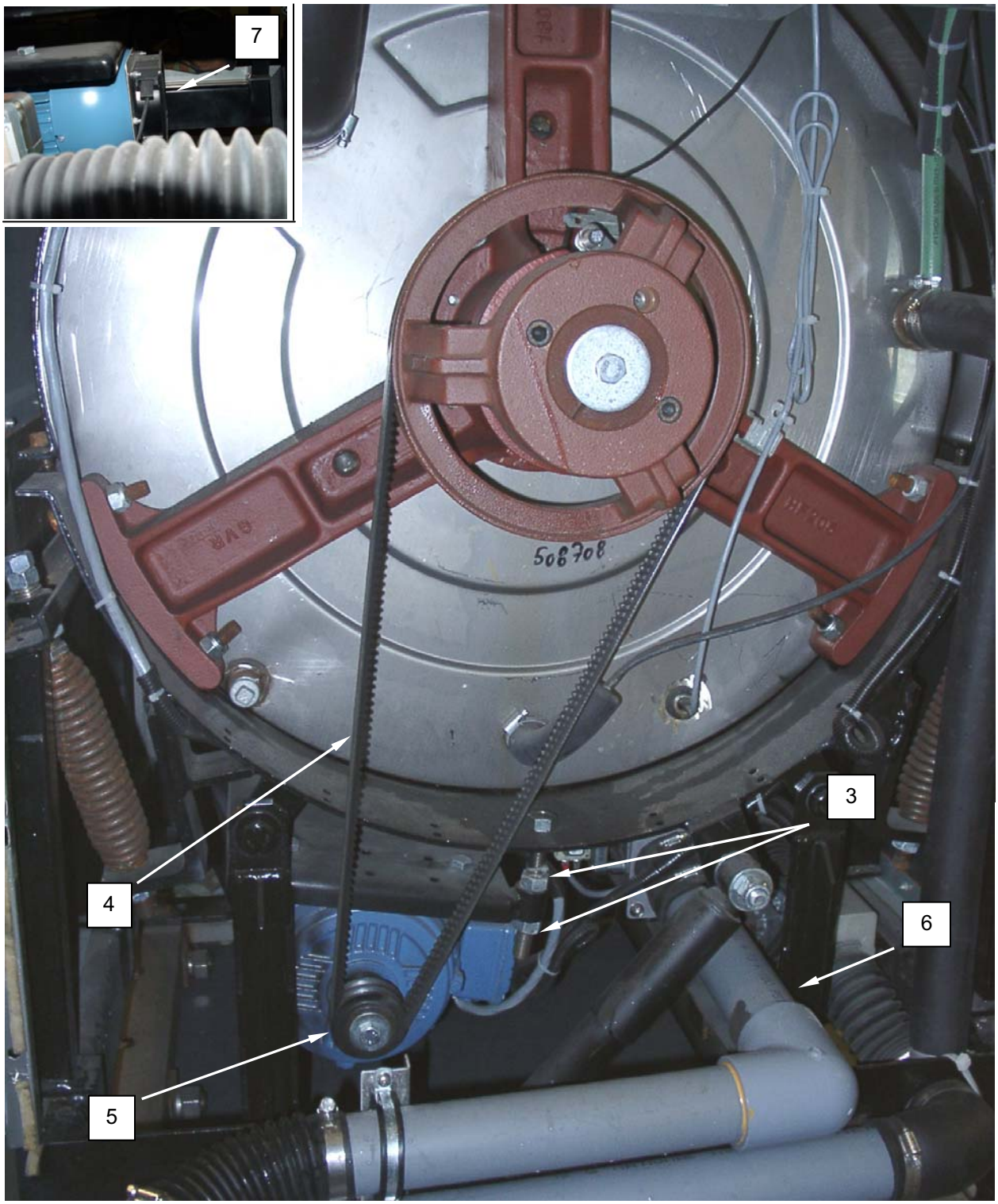


Figure 2. Replace the Washer Motor.

REPLACE-CONTINUED

6. Remove the four screws retaining the junction box **(Figure 3, Item 8)** cover and remove cover.
7. Tag and disconnect motor leads and ground wire.
8. Remove locknut retaining conduit **(Figure 3, Item 9)** to the junction box, and remove the conduit.

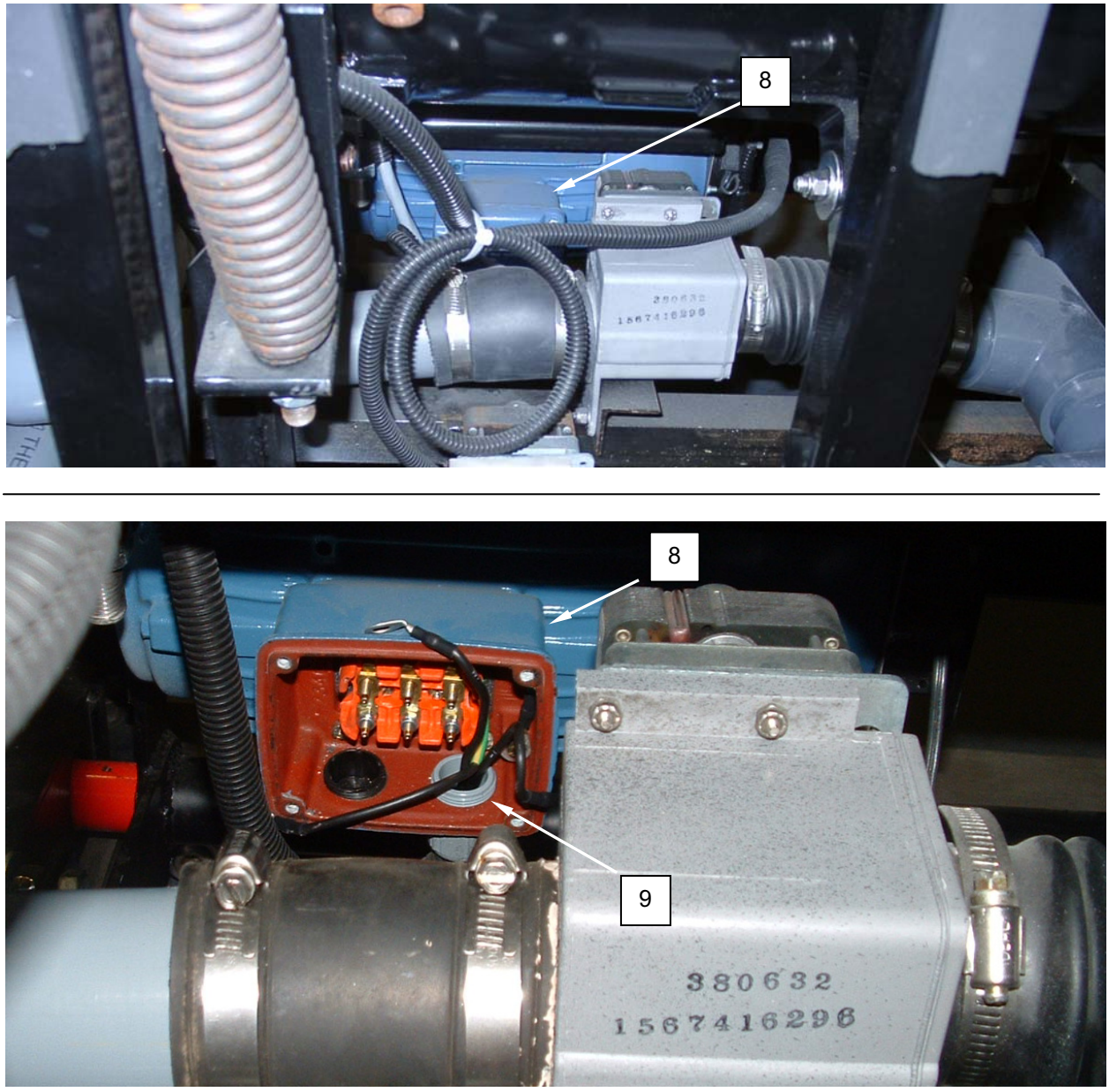


Figure 3. Replace the Washer Motor.

REPLACE-CONTINUED

WARNING

The washer motor is heavy – approximately 70 lbs - and located in a very confined space. Use caution when lifting the motor. Two persons are required to lift and remove the motor from the washer. Serious injury may result if safety precautions are not observed.

9. Fasten two 1-inch straps **(Figure 4, Item 10)** to both drum support rails, looping under the motor **(Figure 4, Item 11)**. Space the straps evenly and tighten straps.

10. Remove bolts, washers, and nuts securing motor **(Figure 4, Item 11)** to motor mount **(Figure 4, Item 12)**, and slowly release the strap **(Figure 4, Item 10)** to remove motor. Leave the strap(s) in place.

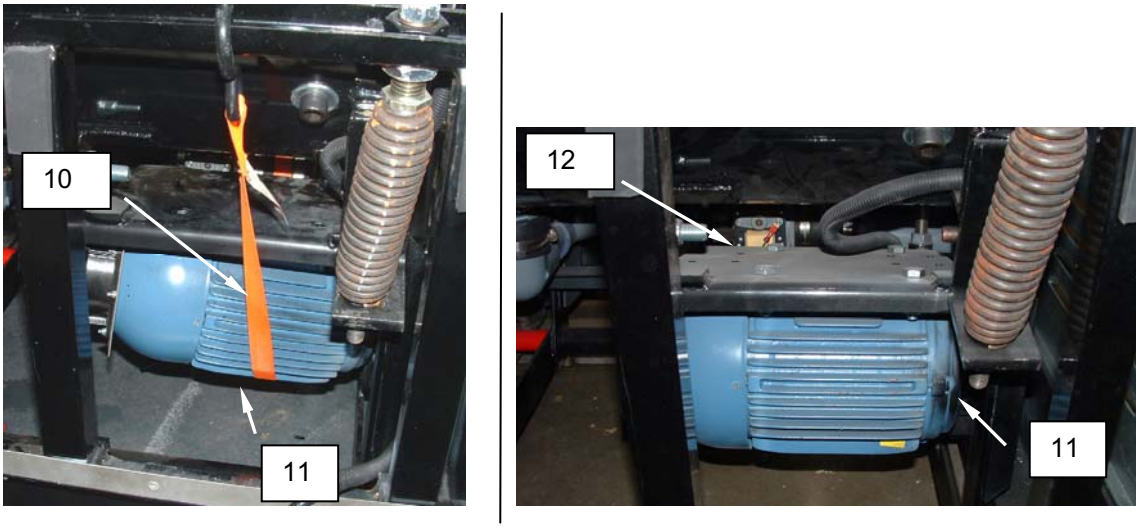


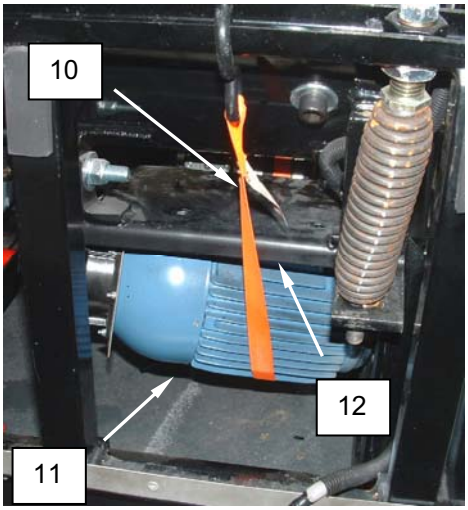
Figure 4. Replace the Washer Motor.

11. Remove pulley **(Figure 5, Item 5)** from motor **(Figure 5, Item 11)** and install the pulley on the replacement motor.

12. Lay the replacement motor **(Figure 5, Item 11)** onto the strap(s) **(Figure 5, Item 10)** and tighten the strap(s) to lift the motor into place.

13. Install replacement motor **(Figure 5, Item 11)** onto motor mount **(Figure 5, Item 12)** and retain with bolts, washers, and nuts.

REPLACE-CONTINUED



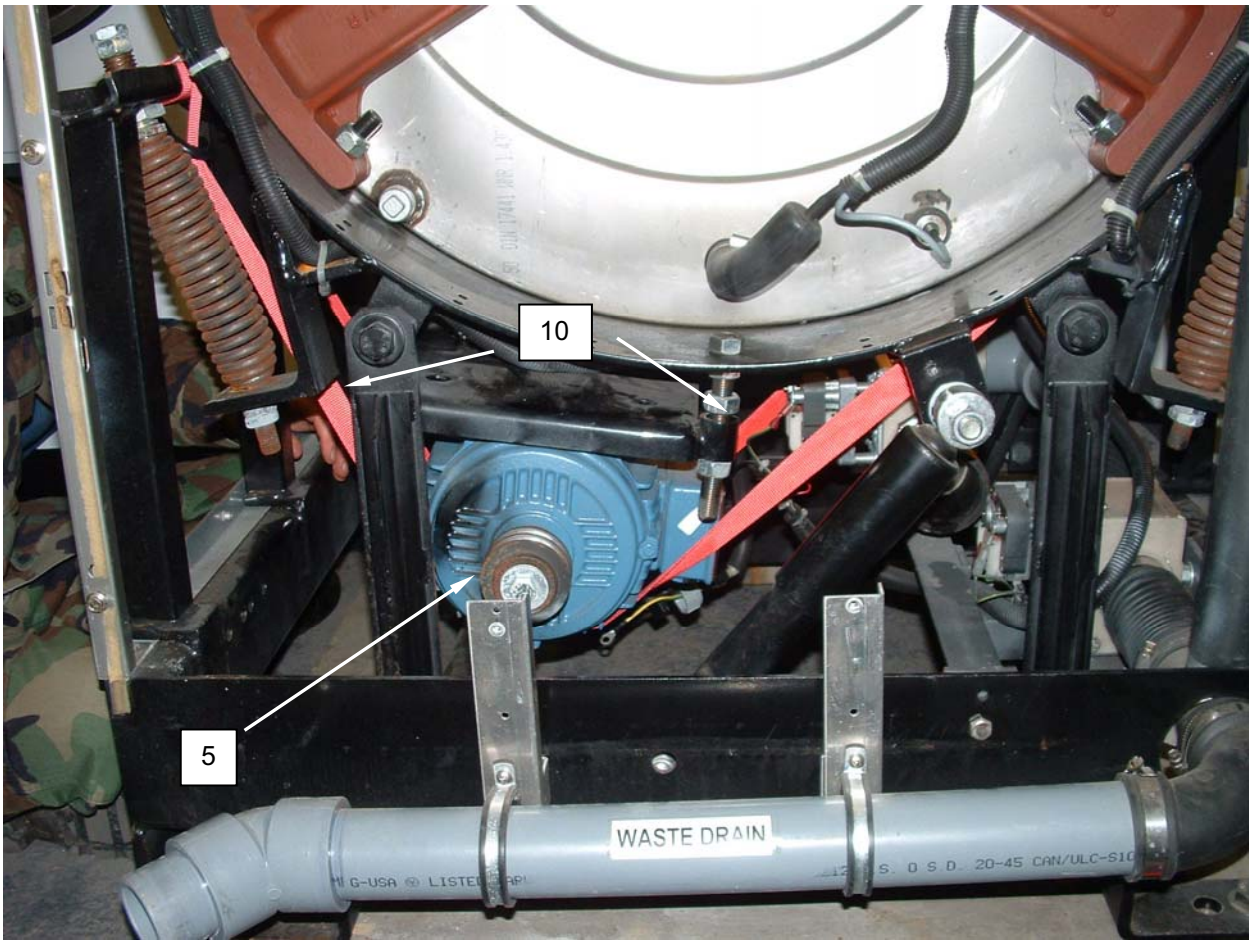


Figure 5. Replace the Washer Motor.

REPLACE-CONTINUED

14. Remove screws retaining junction box **(Figure 6, Item 8)** cover to replacement motor **(Figure 6, Item 11)** and remove cover.

15. If necessary, knock out plug from conduit penetration on replacement motor **(Figure 6, Item 11)**.

16. Install conduit **(Figure 6, Item 9)** into junction box **(Figure 6, Item 8)** on replacement motor **(Figure 6, Item 11)**, and retain with locknut.

17. Connect wiring to motor **(Figure 6, Item 11)** and to the motor fan **(Figure 6, Item 7)** as tagged.

18. Install motor junction box **(Figure 6, Item 8)** cover and retain with screws.

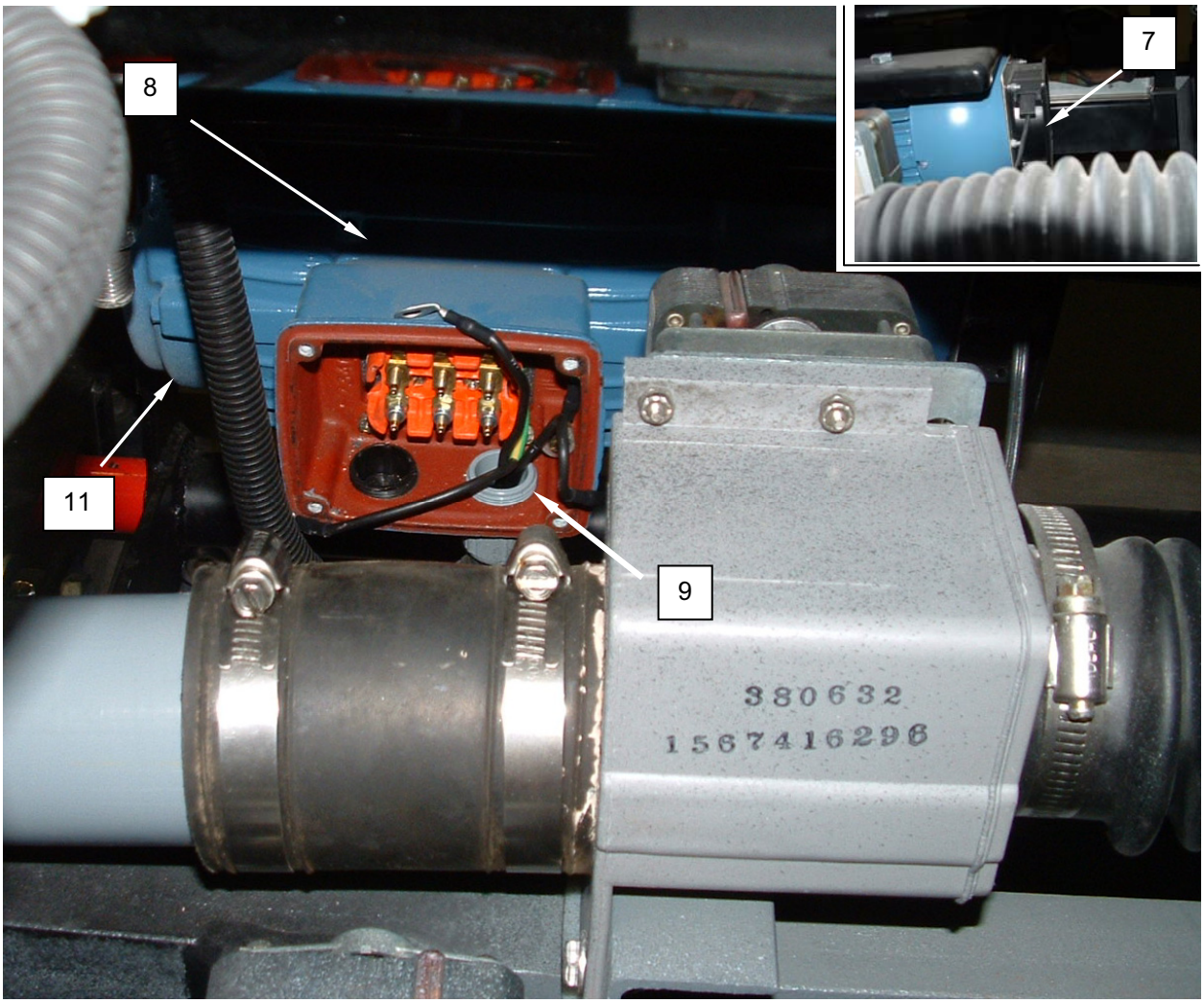


Figure 6. Replace the Washer Motor.

REPLACE-CONTINUED

19. Install belt **(Figure 7, Item 4)** onto pulley **(Figure 7, Item 5)**.

20. Install reuse drain line **(Figure 7, Item 6)** onto reuse drain valve. Ensure connecting hose is tightly clamped.

21. Adjust and tighten locknuts **(Figure 7, Item 3)** on adjustment bolt as necessary to ensure belt deflection is approximately 1/2 inch.

22. Install washer IAW procedures given in WP 0041 00.

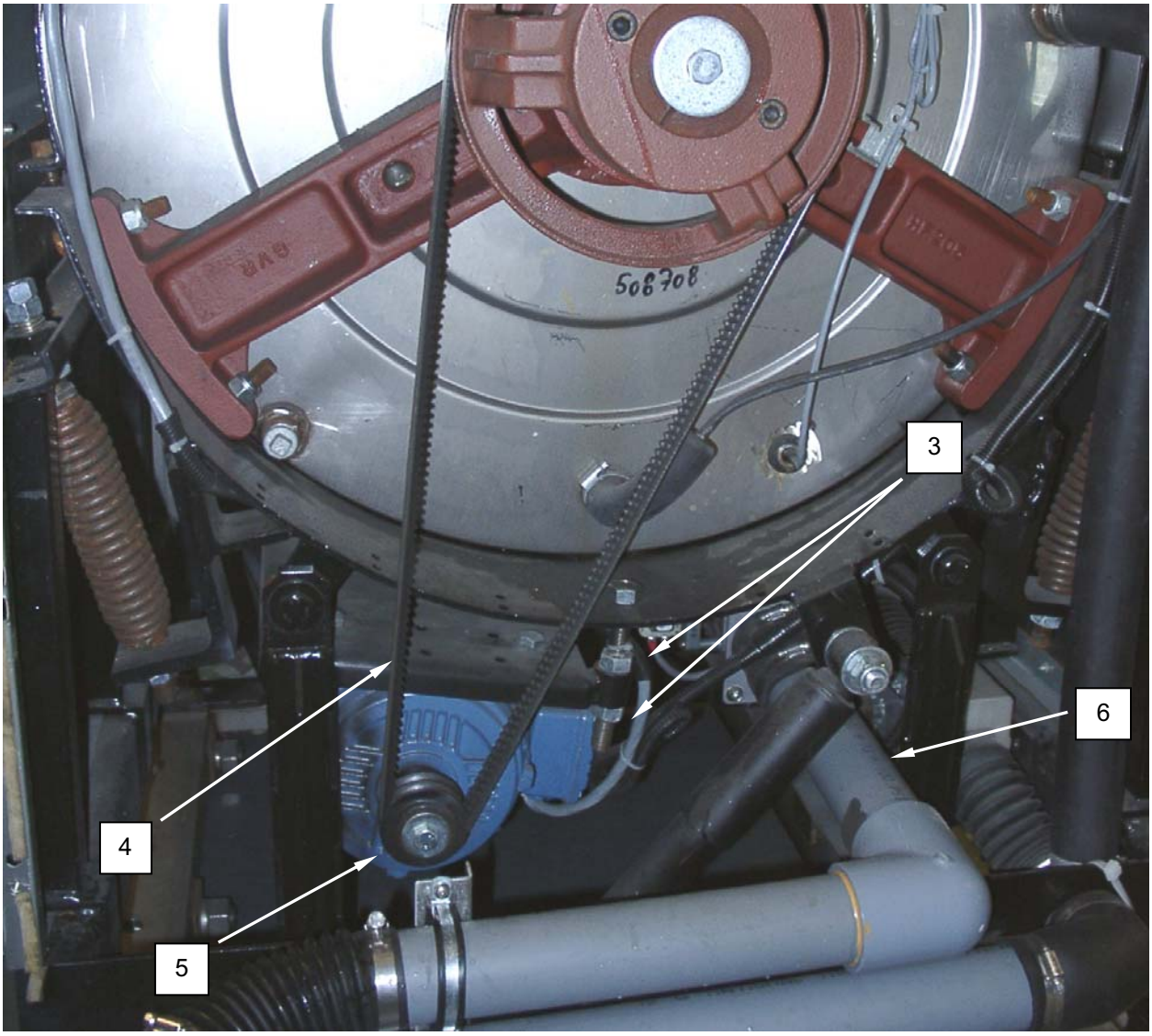


Figure 7. Replace the Washer Motor.

END OF WORK PACKAGE

UNIT MAINTENANCE
CONTAINERIZED BATCH LAUNDRY
NSN 3510-01-527-2209
NSN 3510-01-527-2210
FITTINGS, WASHER QD
REPLACE

INITIAL SETUP

Tools	**Personnel Required**
Tool Kit, General Mechanics: Automotive (WP 0086 00, Table 2, Item 6)	Quartermaster and Chemical Equipment Repairer 63J (2)
Materials/Parts	**Equipment Condition**
None Required	CBL set up

REPLACE

Replace the Washer QD Fittings

1. Disconnect washer power cord and water service to CBL.

2. Relieve water pressure from system by switching the P-1 pump off at circuit breaker No. 7 and 9, closing water supply valve V-57, and opening the water spigot.

3. Disconnect QD fitting **(Figure 1, Item 1)**.

4. Secure the attached piping with one pipe wrench, and use a second pipe wrench to remove the male half of the QD fitting **(Figure 1, Item 1)** from the washer.

5. Secure the attached piping with one pipe wrench, and use a second pipe wrench to install the replacement male half of the QD fitting **(Figure 1, Item 1)** onto the washer.

6. Loosen the hose clamp on the female half of the QD fitting **(Figure 1, Item 1)**, and remove the female half of the QD fitting from the hose.

7. Install the replacement female half of the QD fitting **(Figure 1, Item 1)** onto the hose, and tighten the hose clamp to secure. Connect QD fitting.

8. Restore water service to CBL and check for leakage.

9. Connect washer power cord and monitor for normal operation.

REPLACE-CONTINUED

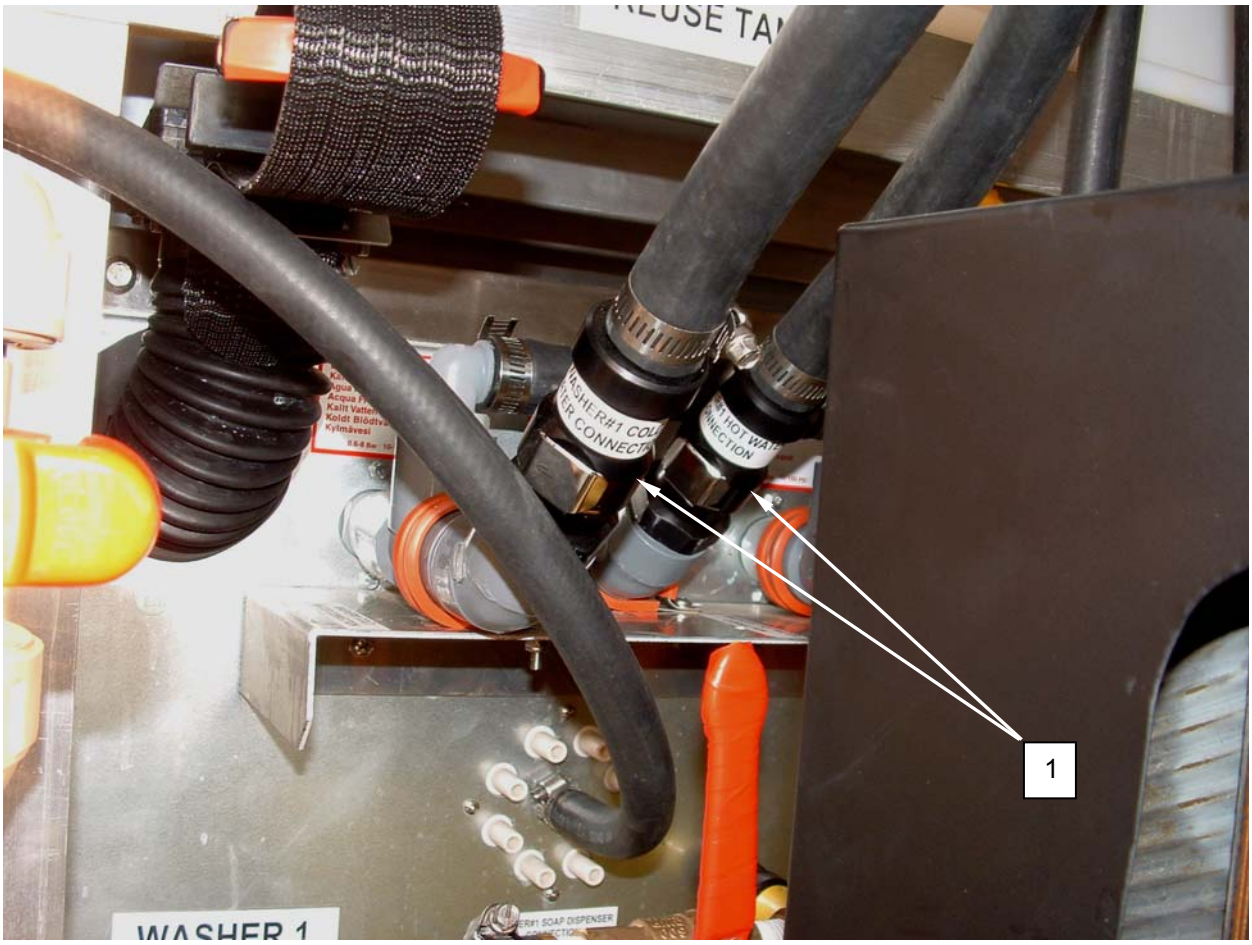


Figure 1. Replace the Washer QD Fittings.

END OF WORK PACKAGE

UNIT MAINTENANCE
CONTAINERIZED BATCH LAUNDRY
NSN 3510-01-527-2209
NSN 3510-01-527-2210
DISPENSER, AUTOMATIC SOAP
TEST, REPLACE

INITIAL SETUP

Tools
Tool Kit, General Mechanics: Automotive (WP 0086 00, Table 2, Item 6)

Materials/Parts
Tie, Wire, Medium – 6 in (WP 0087 00, Item 57)
Wire Markers (WP 0087 00, Item 58)

Personnel Required
Quartermaster and Chemical Equipment Repairer 63J (2)

Equipment Condition
CBL set up.
Soap Dispenser Water Inlet Valve V-60 closed

References
TM 10-3510-226-10

TEST

Test the Solenoids

WARNING

Ensure that all electrical power to the automatic soap dispenser is shut off and disconnected before proceeding. The circuit breaker box should be locked by personnel following this procedure. Serious injury or death can result from electrocution if proper safety precautions are not observed.

1. Disconnect power from the automatic soap dispenser by either unplugging the power cord **(Figure 1, Item 1)** or switching circuit breaker No. 29 to OFF.
2. Unlatch key lock and remove cover **(Figure 1, Item 2)**.
3. Tag and disconnect wiring from solenoid **(Figure 1, Item 3)** to be tested.
4. Use an ohmmeter to test solenoid **(Figure 1, Item 3)** for continuity.
5. Replace an open solenoid **(Figure 1, Item 3)**.
6. Reconnect wiring as tagged.
7. Repeat steps 3 through 6 for remaining solenoids.
8. Install cover **(Figure 1, Item 2)**, connect power and monitor for normal operation.

TEST-CONTINUED

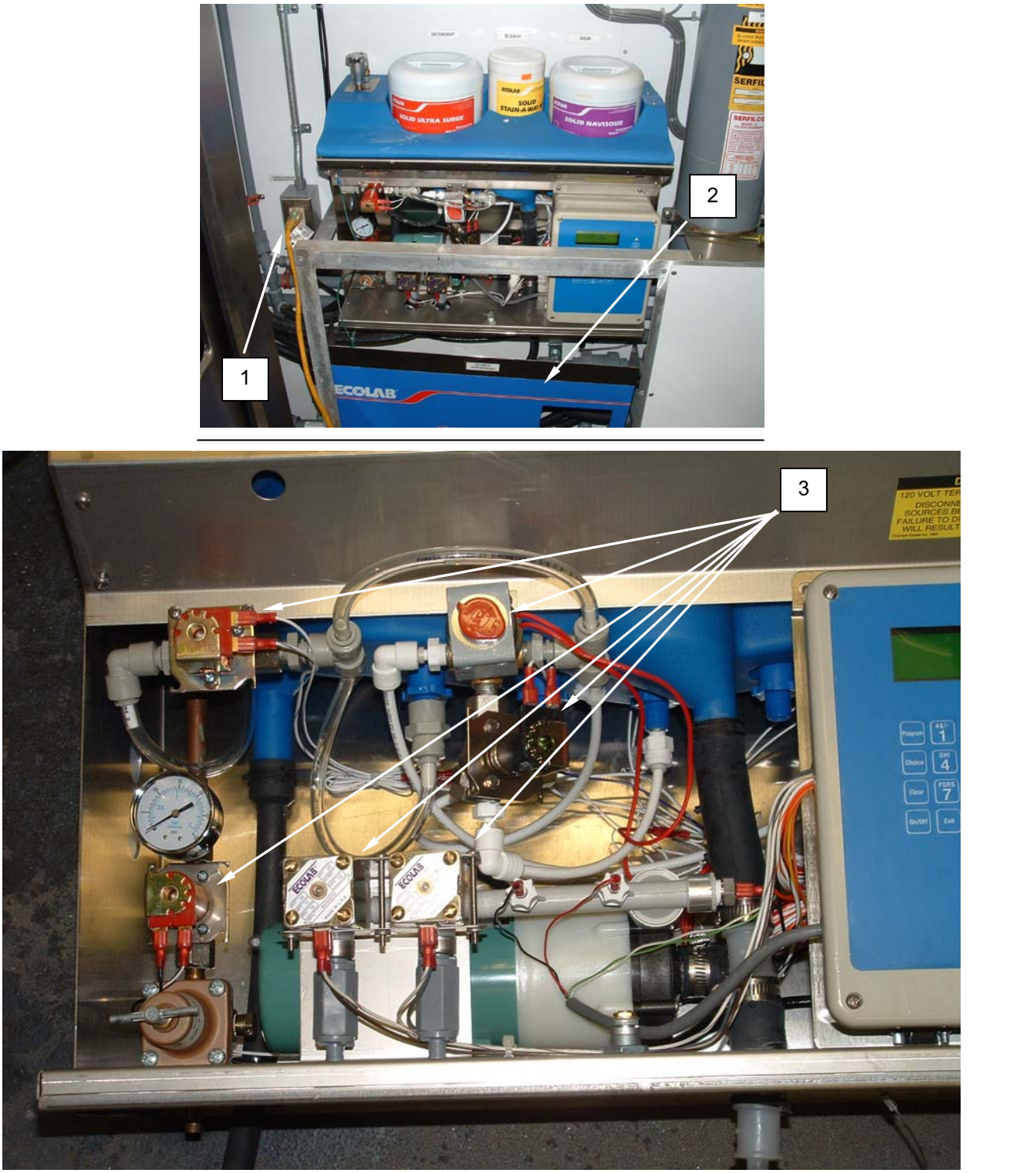


Figure 1. Test the Solenoids.

TEST-CONTINUED

Test the Pump Motor

WARNING

Ensure that all electrical power to the automatic soap dispenser is shut off and disconnected before proceeding. The circuit breaker box should be locked by personnel following this procedure. Serious injury or death can result from electrocution if proper safety precautions are not observed.

NOTE

Many maintenance procedures on the Automatic Soap Dispenser are easier to carry out if the unit is removed from the CBL wall. Refer to the procedure on replacement of the entire unit for details on removal and installation of the Automatic Soap Dispenser.

1. Disconnect power from the automatic soap dispenser.
2. Unlatch key lock and remove cover **(Figure 2, Item 2)**.
3. Tag and disconnect the wiring from the pump **(Figure 2, Item 4)**.
4. Use an ohmmeter to test for 25 ohms resistance between the motor leads **(Figure 2, Item 5)**.
5. Use an ohmmeter to test for infinite resistance between each motor lead **(Figure 2, Item 3)** and ground.
6. Replace a pump **(Figure 2, Item 4)** with an open motor, or a motor that has shorted to ground.
7. Connect the wiring to the pump **(Figure 2, Item 4)** as tagged.
8. Install cover **(Figure 2, Item 2)** and latch.
9. Connect power, and monitor for normal operation.

TEST-CONTINUED

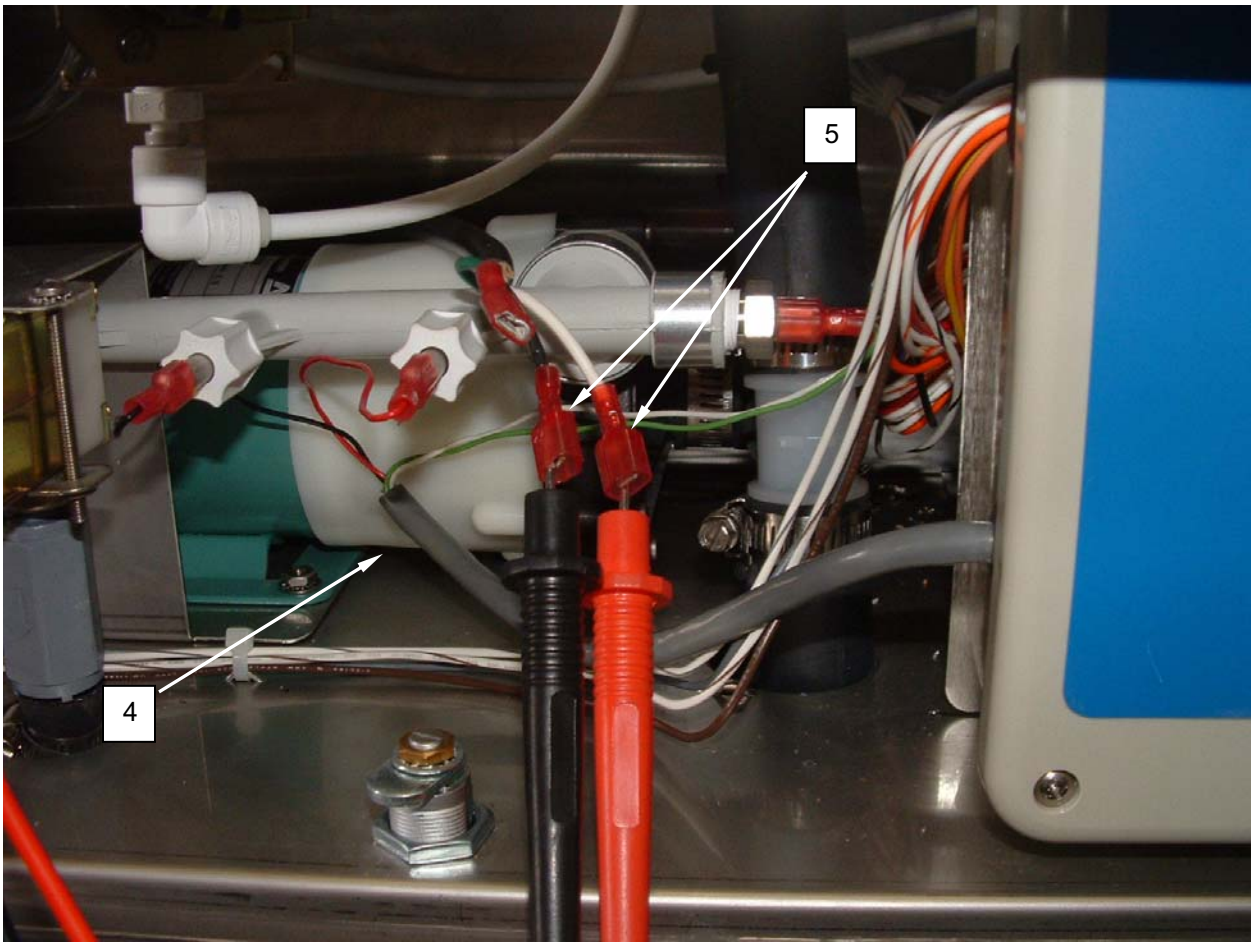


Figure 2. Test the Pump Motor.

REPLACE

Replace the Thermistor

WARNING

Ensure that all electrical power to the automatic soap dispenser is shut off and disconnected before proceeding. The circuit breaker box should be locked by personnel following this procedure. Serious injury or death can result from electrocution if proper safety precautions are not observed.

WARNING

Use caution when handling laundry chemicals. Chemicals can cause injuries due to chemical burns, poisoning, and hazardous vapors. Failure to observe safety and handling precautions may cause injury or death to personnel

1. Disconnect power from the automatic soap dispenser.
2. Unlatch key lock and remove cover **(Figure 3, Item 2)**.
3. Tag and disconnect wiring from the thermistor **(Figure 4, Item 6)**.
4. Unscrew the thermistor **(Figure 4, Item 6)**.
5. Install the replacement thermistor **(Figure 4, Item 6)**.
6. Connect wiring to the replacement thermistor **(Figure 4, Item 6)** as tagged.
7. Install cover **(Figure 3, Item 2)** and latch.
8. Connect power, and monitor for normal operation.

Figure 3. Replace the Thermistor.

REPLACE-CONTINUED

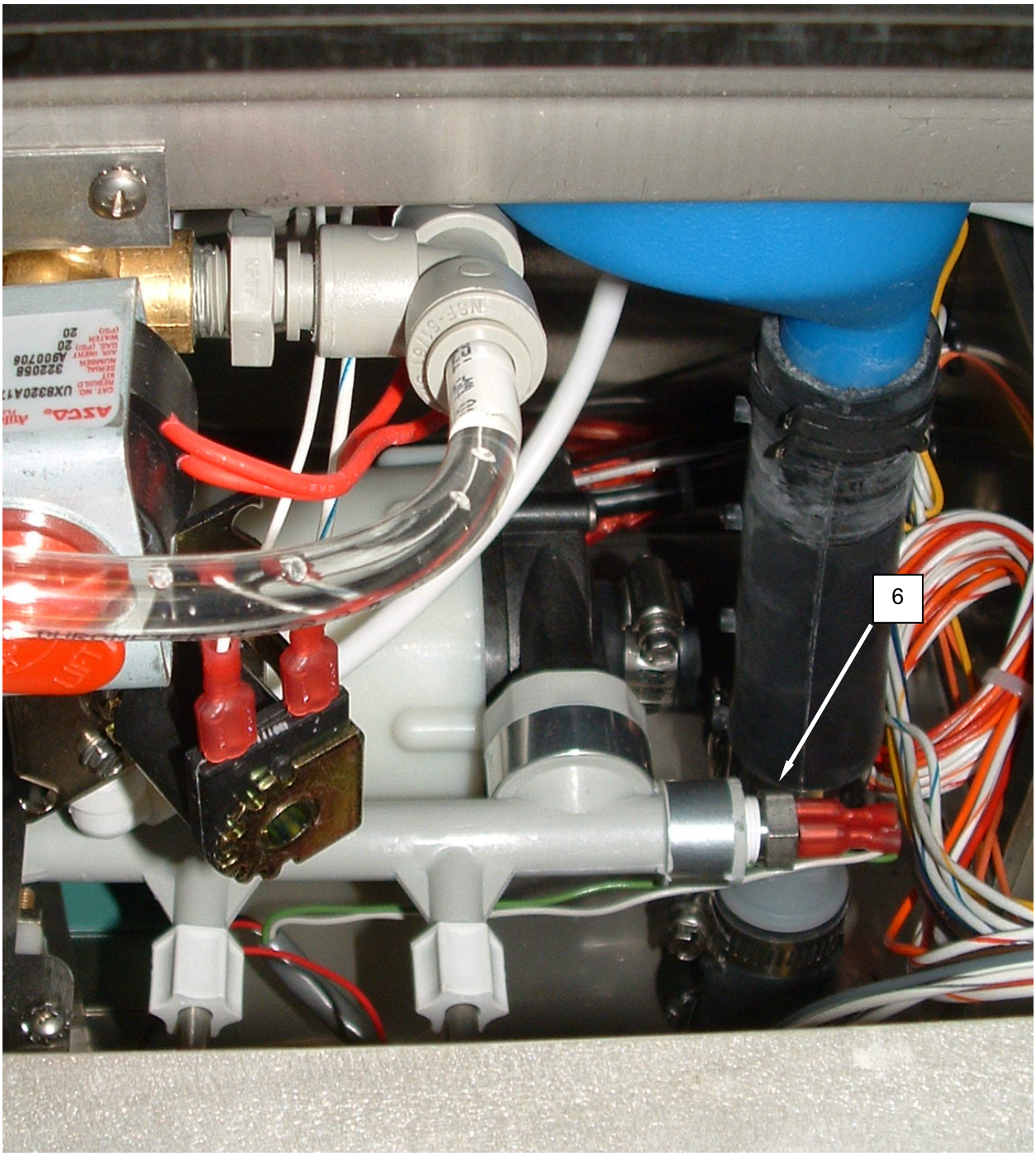


Figure 4. Replace the Thermistor.

REPLACE-CONTINUED

Replace a Solenoid

WARNING

Ensure that all electrical power to the automatic soap dispenser is shut off and disconnected before proceeding. The circuit breaker box should be locked by personnel following this procedure. Serious injury or death can result from electrocution if proper safety precautions are not observed.

WARNING

Use caution when handling laundry chemicals. Chemicals can cause injuries due to chemical burns, poisoning, and hazardous vapors. Failure to observe safety and handling precautions may cause injury or death to personnel

1. Disconnect power from the automatic soap dispenser.
2. Unlatch key lock and remove cover **(Figure 5, Item 2)**.
3. Tag and disconnect the wiring from the solenoid **(Figure 5, Item 3)**, and remove the solenoid.
4. Tag and disconnect the solenoid **(Figure 5, Item 3)** water connections.
5. Remove the screws retaining the solenoid **(Figure 5, Item 3)**, and withdraw the solenoid from the automatic soap dispenser housing.
6. Install the solenoid **(Figure 5, Item 3)** into the automatic soap dispenser housing.
7. Connect the solenoid **(Figure 5, Item 3)** water connections as tagged.
8. Connect the wiring to the replacement solenoid **(Figure 5, Item 3)** as tagged.
9. Secure the solenoid **(Figure 5, Item 3)** to the automatic soap dispenser housing with screws.
10. Install cover and latch. Connect power, and monitor for normal operation.

REPLACE-CONTINUED

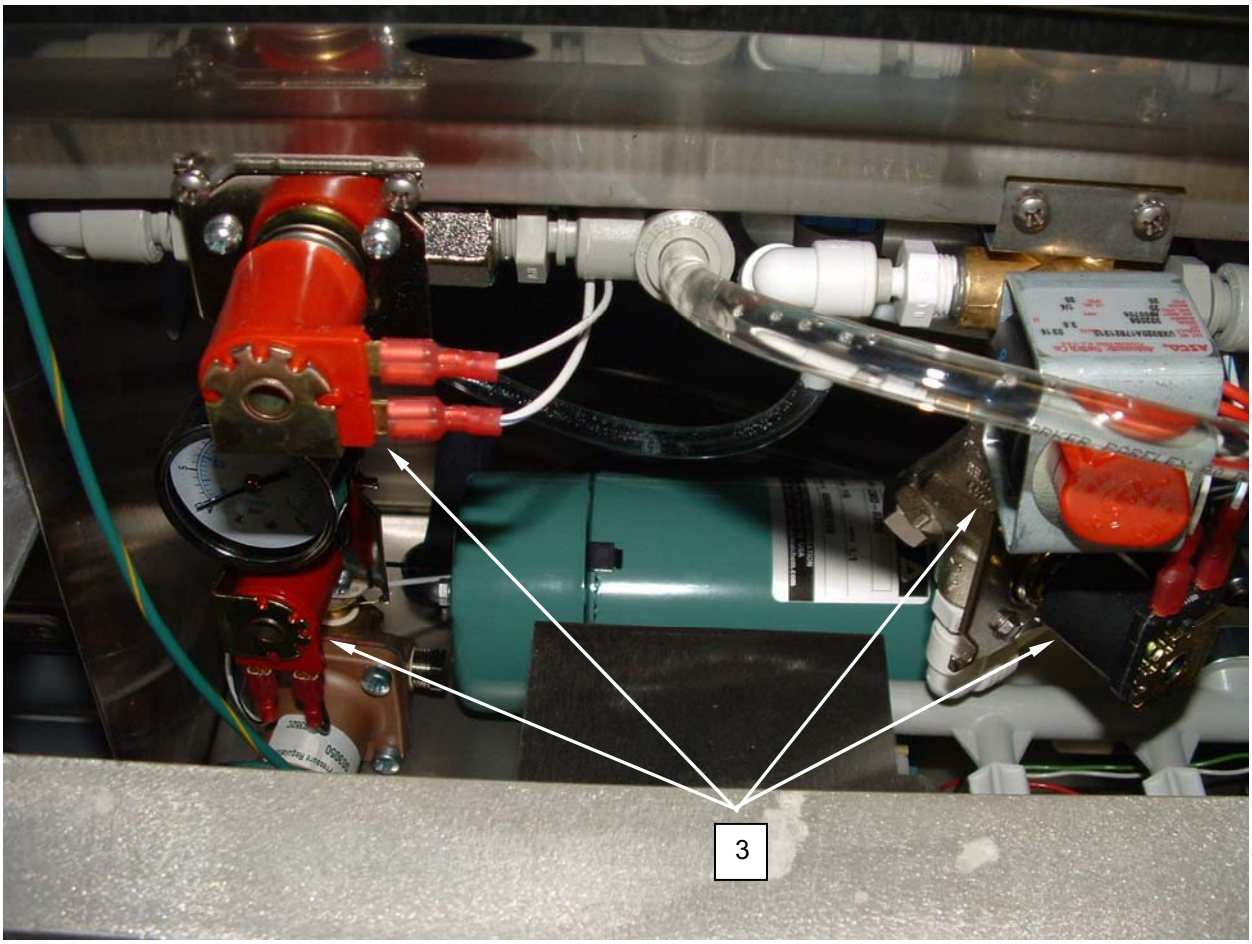


Figure 5. Replace the Solenoids.

REPLACE-CONTINUED

Replace the Pump

WARNING

Ensure that all electrical power to the automatic soap dispenser is shut off and disconnected before proceeding. The circuit breaker box should be locked by personnel following this procedure. Serious injury or death can result from electrocution if proper safety precautions are not observed.

WARNING

Use caution when handling laundry chemicals. Chemicals can cause injuries due to chemical burns, poisoning, and hazardous vapors. Failure to observe safety and handling precautions may cause injury or death to personnel.

1. Disconnect power from the automatic soap dispenser.
2. Unlatch key lock, and remove cover **(Figure 6, Item 2)**.
3. Tag and disconnect the pump **(Figure 6, Item 7)** water connections.
4. Remove the screws and nuts retaining the pump **(Figure 6, Item 7)** and withdraw the pump from the automatic soap dispenser housing.
5. Tag and disconnect the wiring from the pump **(Figure 6, Item 7)** and remove the pump.
6. Connect the wiring to the replacement pump **(Figure 6, Item 7)** as tagged.
7. Install the pump **(Figure 6, Item 7)** into the automatic soap dispenser housing.
8. Connect the pump **(Figure 6, Item 7)** water connections as tagged.
9. Secure the pump **(Figure 6, Item 7)** to the automatic soap dispenser housing with screws and nuts.
10. Install cover **(Figure 6, Item 2)** and latch.
11. Connect power, and monitor for normal operation.

REPLACE-CONTINUED

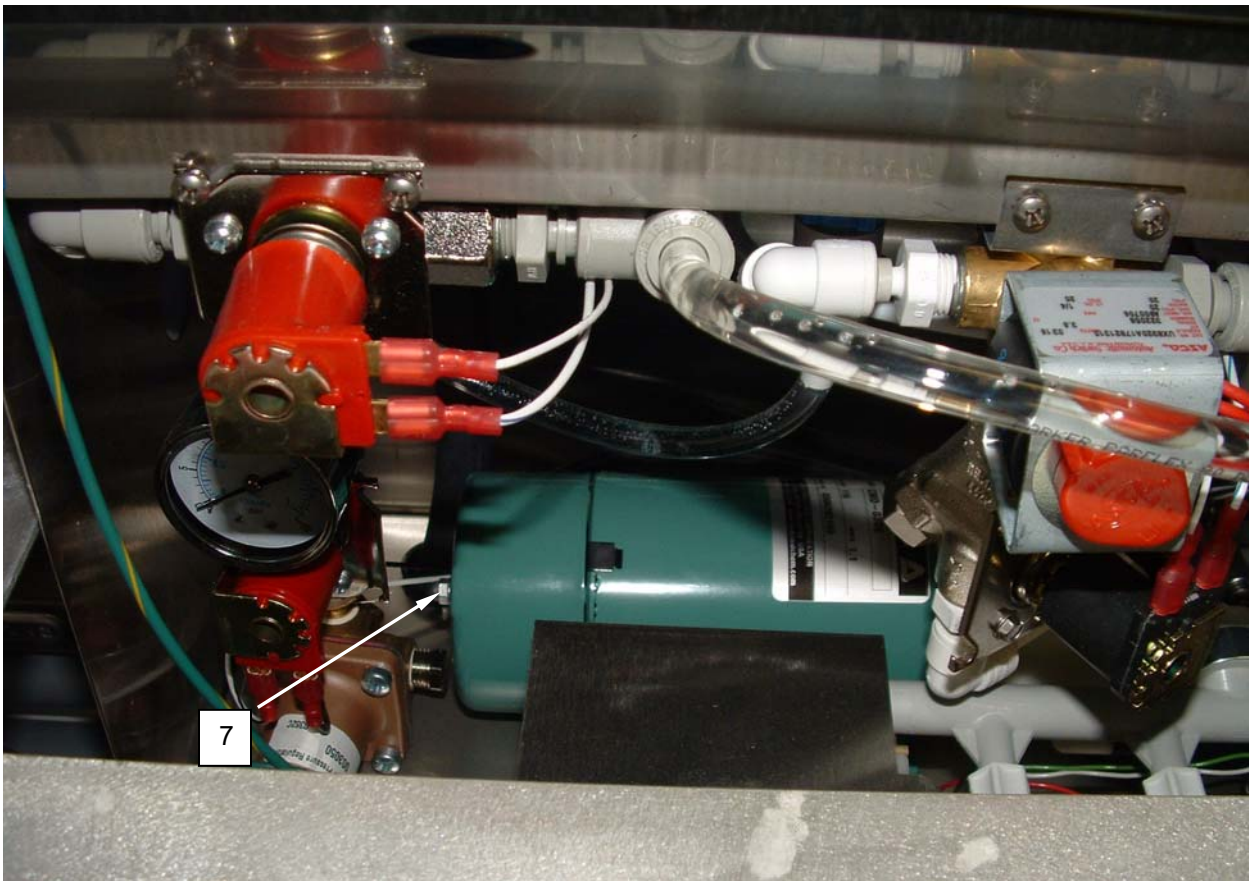


Figure 6. Replace the Pump.

REPLACE-CONTINUED

Replace the Automatic Soap Dispenser Control Module

WARNING

Ensure that all electrical power to the automatic soap dispenser is shut off and disconnected before proceeding. The circuit breaker box should be locked by personnel following this procedure. Serious injury or death can result from electrocution if proper safety precautions are not observed.

1. Disconnect power to automatic soap dispenser.
2. Open control module box **(Figure 7, Item 8)**.
3. Tag and disconnect wiring from control module **(Figure 7, Item 8)**.
4. Remove chart stop relay **(Figure 7, Item 9)** and retain for installation in replacement control module.
5. Remove conduit locknut, and remove conduit **(Figure 7, Item 10)** from box.
6. Remove fasteners retaining box to mount and remove control module **(Figure 7, Item 8)**.
7. Open replacement control module **(Figure 7, Item 8)**.
8. Install chart stop relay **(Figure 7, Item 9)** in replacement control module **(Figure 7, Item 8)**.
9. Install replacement control module **(Figure 7, Item 8)** and retain with fasteners.
10. Install conduit **(Figure 7, Item 10)** and retain with locknut.
11. Connect wiring as tagged.

NOTE

The replacement control module will be equipped with an adjustment knob. This should be removed and discarded before placing the CBL back in normal operation.

12. Close control module **(Figure 7, Item 8)**, connect power, and monitor for normal operation.

REPLACE-CONTINUED

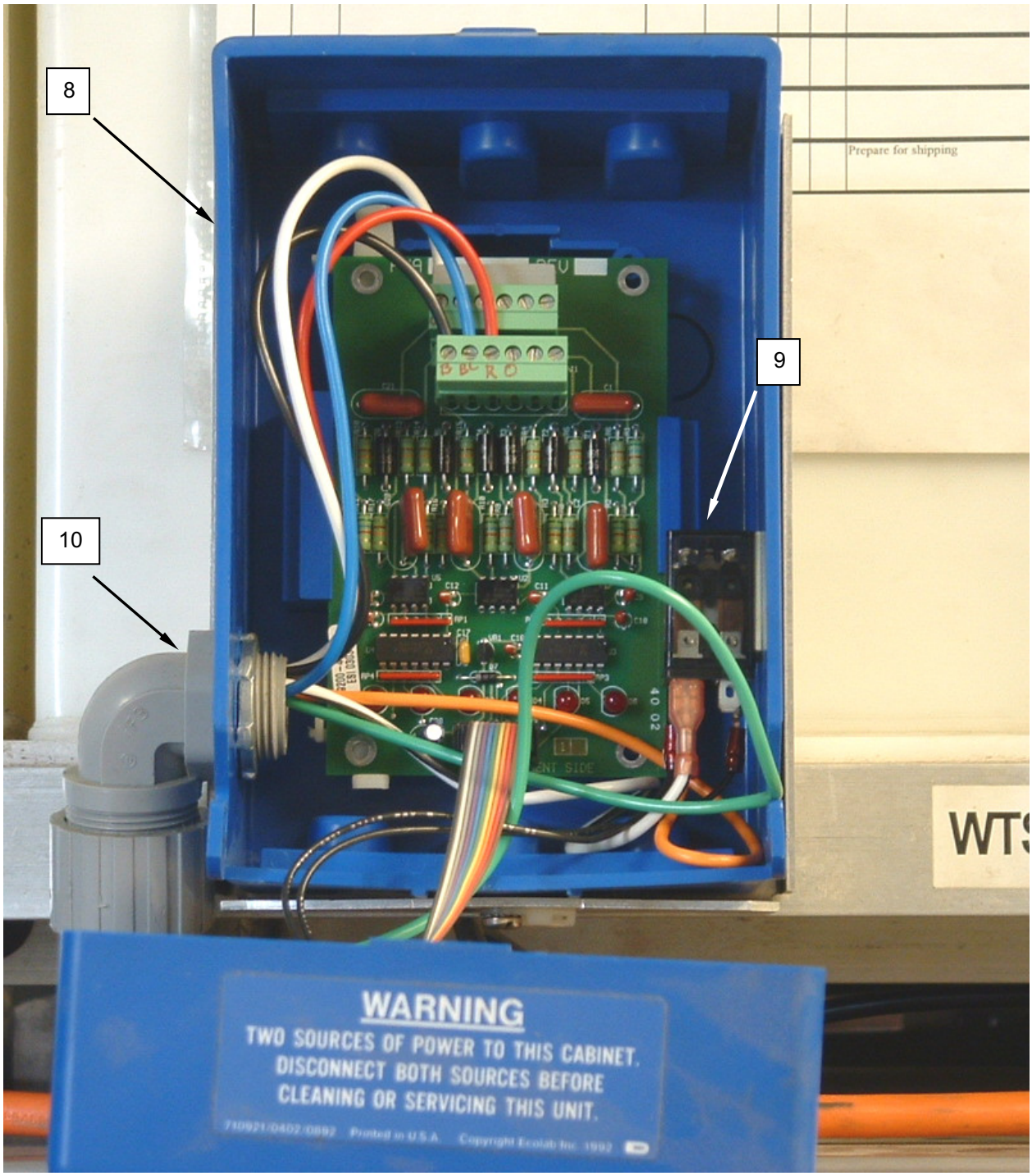


Figure 7. Replace the Automatic Soap Dispenser Control Module.

REPLACE-CONTINUED

Replace the Automatic Soap Dispenser

WARNING

Ensure that all electrical power to the automatic soap dispenser is shut off and disconnected before proceeding. The circuit breaker box should be locked by personnel following this procedure. Serious injury or death can result from electrocution if proper safety precautions are not observed.

WARNING

Use caution when handling laundry chemicals. Chemicals can cause injuries due to chemical burns, poisoning, and hazardous vapors. Failure to observe safety and handling precautions may cause injury or death to personnel

1. Disconnect power from the automatic soap dispenser **(Figure 8, Item 11)**.
2. Remove chemical canisters **(Figure 8, Item 12)** from automatic soap dispenser.
3. Unlatch key lock and remove cover **(Figure 8, Item 2)**. Disconnect the ground wire from the cover.
4. Close the soap dispenser internal drain valve V-24.
5. Tag and disconnect external hoses from automatic soap dispenser **(Figure 8, Item 11)**. Cut and remove wire ties as necessary.
6. Remove the control panel **(Figure 8, Item 13)**.

Figure 8. Replace the Automatic Soap Dispenser.

REPLACE-CONTINUED

7. Remove the retaining nuts **(Figure 9, Item 14)** securing the washer control cables **(Figure 9, Item 15)**, and disconnect the washer control cables.

8. Reinstall the control panel **(Figure 9, Item 13)** loosely.

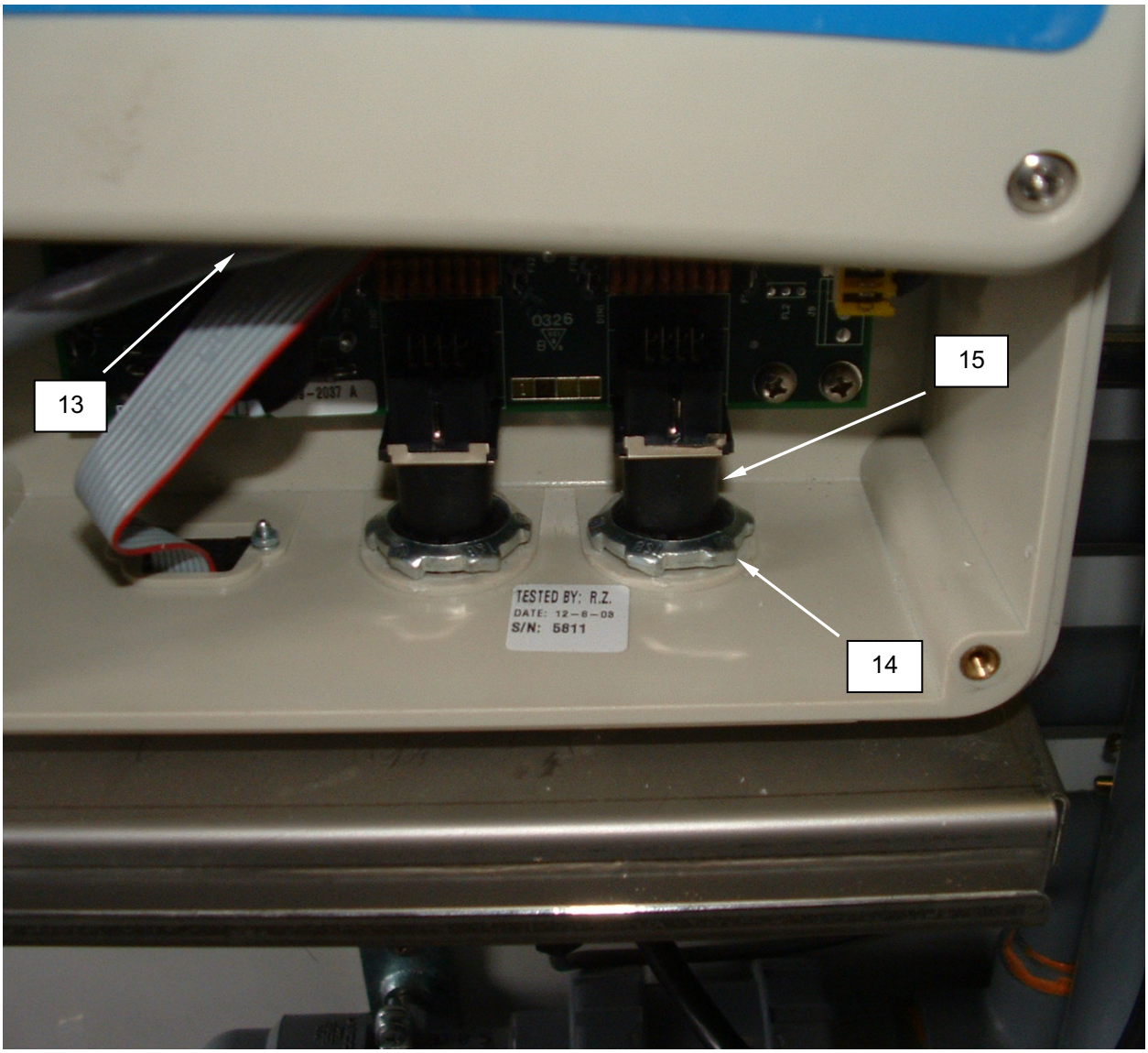


Figure 9. Replace the Automatic Soap Dispenser.

REPLACE-CONTINUED

9. Remove center screw from bottom lip of soap dispenser **(Figure 10, Item 11)**.

10. Withdraw automatic soap dispenser **(Figure 10, Item 11)** from CBL bulkhead.

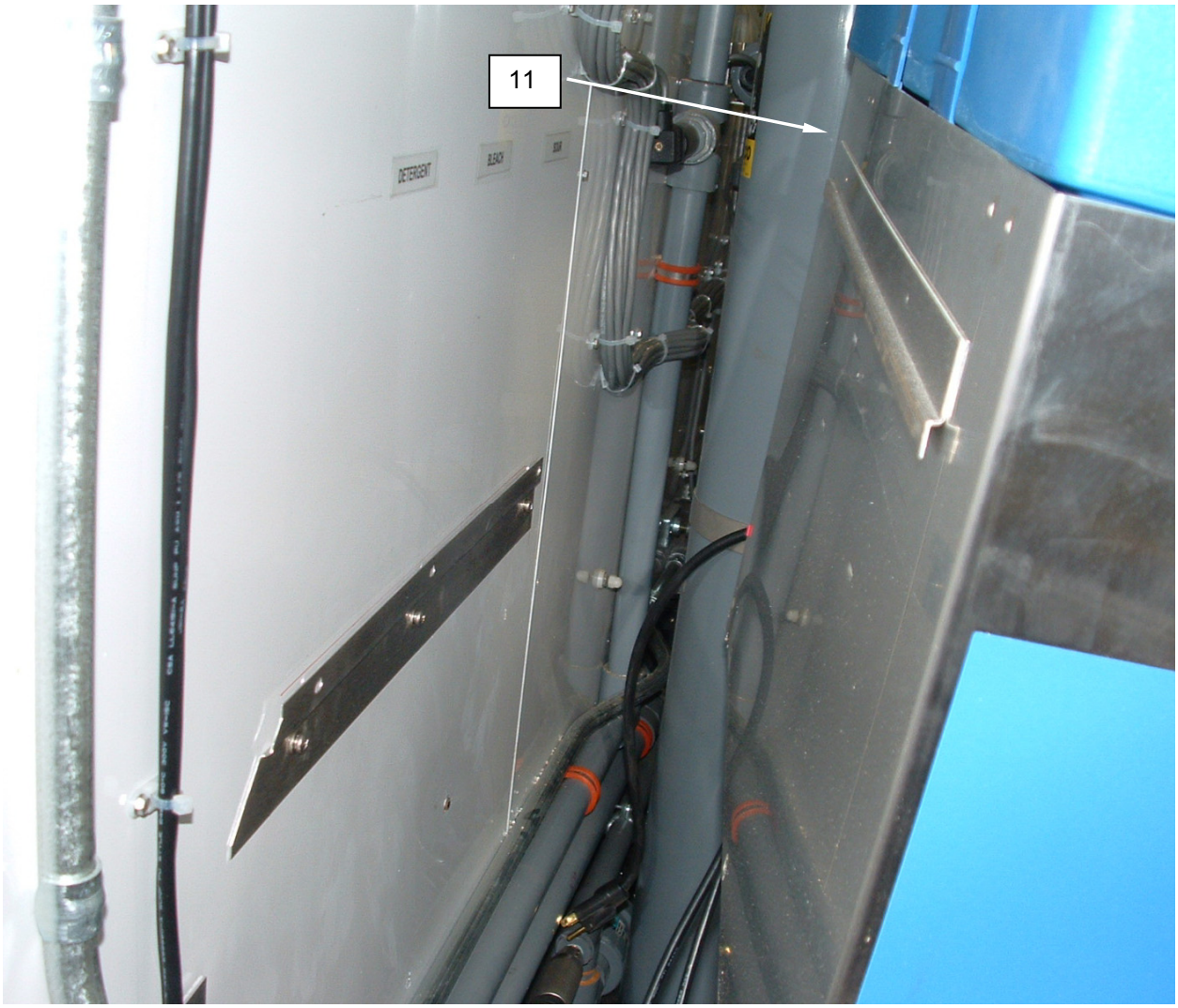


Figure 10. Replace the Automatic Soap Dispenser.

REPLACE-CONTINUED

11. Unlatch key lock and remove cover **(Figure 11, Item 3)** from replacement automatic soap dispenser.

12. Install replacement automatic soap dispenser **(Figure 11, Item 11)**, and retain with fasteners.

13. Connect hoses and cables as tagged to replacement automatic soap dispenser **(Figure 11, Item 11)**. Retain with wire ties as necessary.

14. Install cover **(Figure 11, Item 2)** and latch key lock.

15. Connect power, and operate IAW procedures given in TM 10-3510-226-10. Monitor for normal operation.

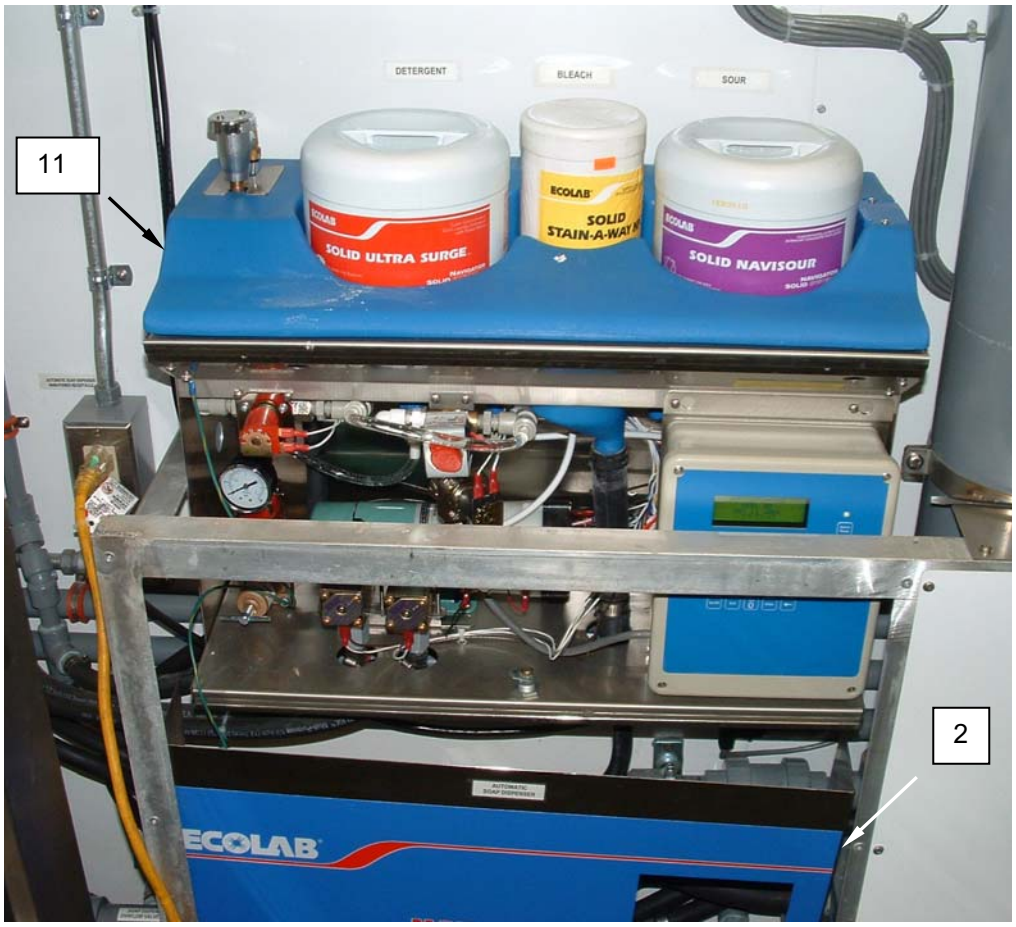


Figure 11. Replace the Automatic Soap Dispenser.

END OF WORK PACKAGE

UNIT MAINTENANCE
CONTAINERIZED BATCH LAUNDRY
NSN 3510-01-527-2209
NSN 3510-01-527-2210
DRYER SWITCH, AIRFLOW
TEST, ADJUST, REPAIR

INITIAL SETUP

Tools
Tool Kit, General Mechanics: Automotive (WP 0086 00, Table 2, Item 6)

Personnel Required
Quartermaster and Chemical Equipment Repairer 63J (2)

Materials/Parts
Baled Rag, General (WP 0087 00, Item 5)
Wire Markers (WP 0087, Item 58)

Equipment Condition
CBL set up

TEST

Test the Dryer Airflow Switch

WARNING

Ensure that all electrical power is shut off and disconnected before proceeding. The Circuit Breaker box should be locked by personnel following this procedure. Serious injury or death can result from electrocution if proper safety precautions are not observed.

1. Switch dryer circuit breaker to OFF.
2. Remove the switch guard retaining screws and remove switch guard **(Figure 1, Item 1)**.
3. Tag and disconnect wiring from switch **(Figure 1, Item 2)**.
4. Use an ohmmeter to check for 0 ohms resistance across switch terminals when switch lever is raised.
5. Use an ohmmeter to check for infinite ohms resistance across switch terminals when switch lever is depressed.
6. Replace a switch **(Figure 1, Item 2)** that fails either test.
7. Reconnect wiring as tagged.
8. Install switch guard **(Figure 1, Item 1)**, and retain with screws.
9. Monitor for normal operation.

TEST-CONTINUED

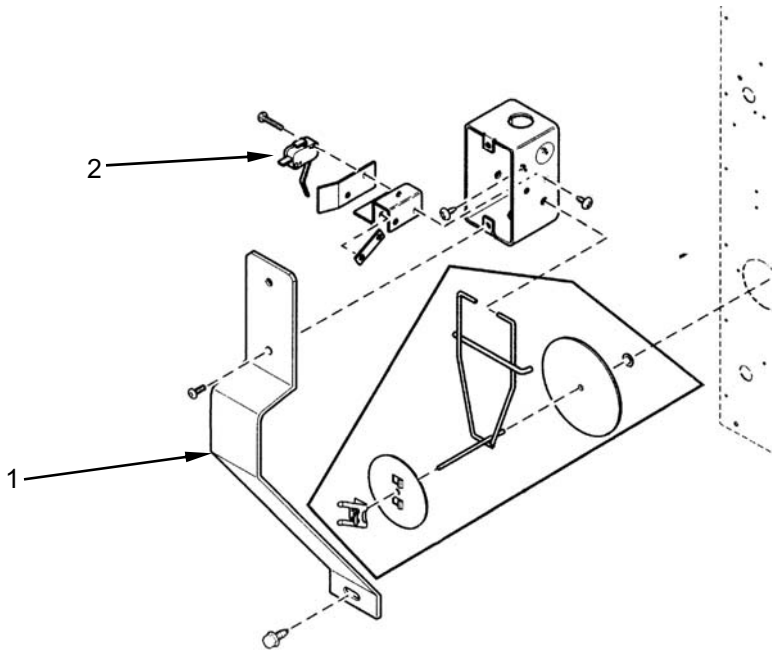


Figure 1. Test the Dryer Airflow Switch.

ADJUST

Adjust the Dryer Airflow Switch

WARNING

Use caution when performing this procedure. Dryer exhaust can be very hot. Failure to observe safety precautions may result in serious burns to personnel.

1. Block dryer exhaust.
2. Start dryer, and note position of counterweight **(Figure 2, Item 3)**.
3. Release counterweight clip **(Figure 2, Item 4)**, and adjust counterweight to a point where the switch will be activated.
4. Clear dryer exhaust.
5. Monitor for normal operation.

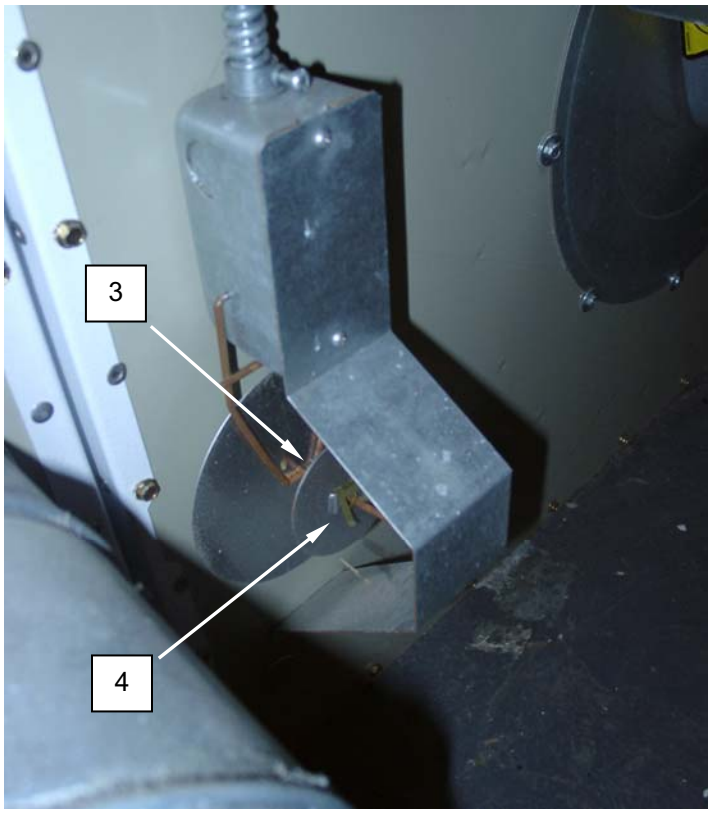


Figure 2. Adjust the Dryer Airflow Switch.

REPAIR

Repair the Dryer Airflow Switch

WARNING

Ensure that all electrical power is shut off and disconnected before proceeding. The Circuit Breaker box should be locked by personnel following this procedure. Serious injury or death can result from electrocution if proper safety precautions are not observed.

1. Disconnect power.
2. Remove switch guard retaining screws, and remove switch guard **(Figure 3, Item 1)**.
3. Tag and disconnect wiring from switch **(Figure 3, Item 2)**.
4. Remove vane lever **(Figure 3, Item 5)** with vane **(Figure 3, Item 6)** and counterweight **(Figure 3, Item 3)** as an assembly from the airflow switch box.
5. Remove screws retaining switch **(Figure 3, Item 2)** to airflow switch box and remove switch.
6. Release clip retaining counterweight **(Figure 3, Item 3)**, and remove counterweight.
7. Remove clip retaining vane **(Figure 3, Item 6)** and remove vane.
8. Replace any damaged, corroded, or otherwise unserviceable components.
9. Install switch **(Figure 3, Item 2)**, and retain with screws.
10. Install vane **(Figure 3, Item 6)** onto vane lever **(Figure 3, Item 5)** and retain with clip.
11. Install counterweight **(Figure 3, Item 3)** onto vane lever **(Figure 3, Item 5)** and retain with clip.
12. Install assembled vane lever **(Figure 3, Item 5)** with vane **(Figure 3, Item 6)** and counterweight **(Figure 3, Item 3)** as an assembly onto the airflow switch box.
13. Connect wiring to switch **(Figure 3, Item 2)** as tagged.
14. Install switch guard **(Figure 3, Item 1)** and retain with screws.
15. Connect power, and monitor for normal operation.

REPAIR-CONTINUED

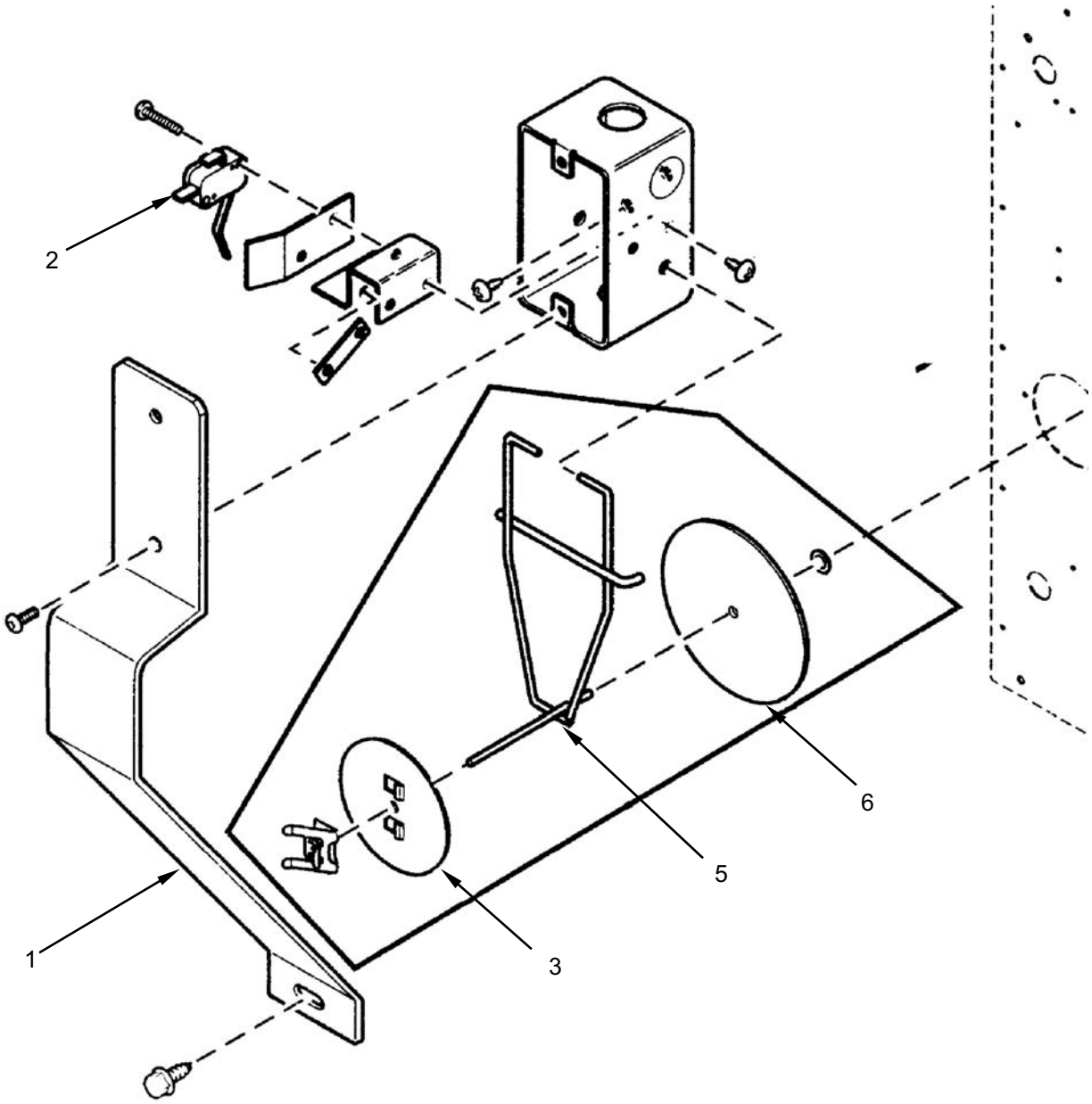


Figure 3. Repair the Dryer Airflow Switch.

END OF WORK PACKAGE

UNIT MAINTENANCE
CONTAINERIZED BATCH LAUNDRY
NSN 3510-01-527-2209
NSN 3510-01-527-2210
ASSEMBLY, LOADING DOOR CATCH
ADJUST, REPLACE

INITIAL SETUP

Tools	**Personnel Required**
Shop Equipment, Automotive Maintenance and Repair: Organizational Maintenance, Common No.1 (WP 0086 00, Table 2, Item 5)	Quartermaster and Chemical Equipment Repairer 63J (2)
Materials/Parts	**Equipment Condition**
None Required	CBL set up

ADJUST

Adjust the Dryer Loading Door Catch Assembly

1. Open door.
2. Loosen acorn nut.
3. Adjust door strike screw **(Figure 1, Item 1)** in or out as required.
4. Tighten acorn nut.
5. Monitor for normal operation.

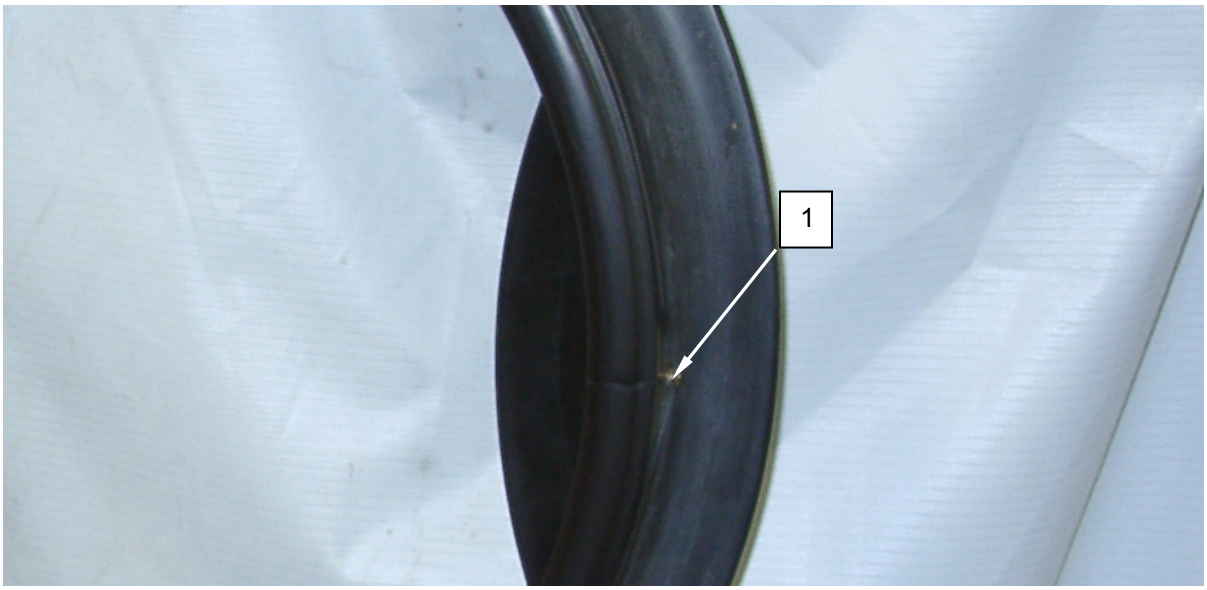


Figure 1. Adjust the Dryer Loading Door Catch Assembly.

REPLACE

Replace the Dryer Loading Door Catch Assembly

NOTE

If tools or repair components are not available, the dryer door may be installed to open on the opposite side. The dryer front must be dropped and the door switch and harness must be relocated to accomplish this.

1. Open door.
2. Drill out rivets **(Figure 2, Item 2)** and remove strike **(Figure 2, Item 3)**.
3. Install replacement strike **(Figure 2, Item 3)**, and retain with rivets **(Figure 2, Item 2)**.

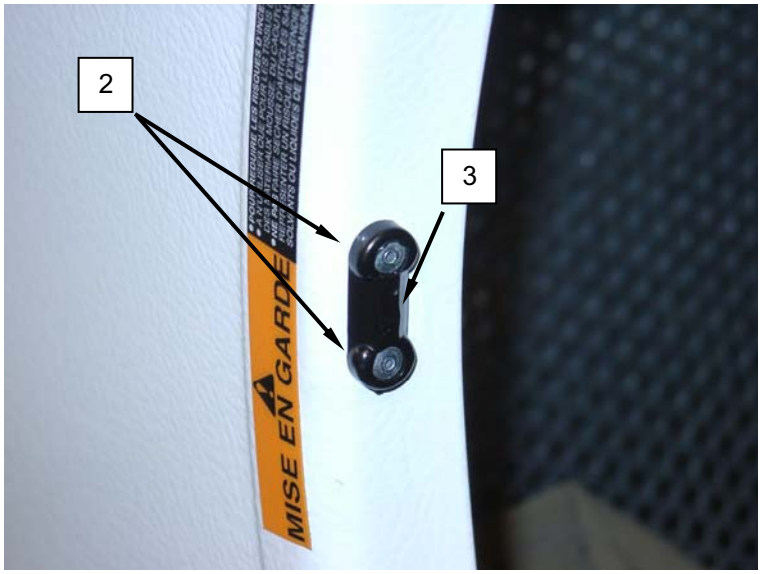


Figure 2. Replace the Dryer Loading Door Catch Assembly.

END OF WORK PACKAGE

UNIT MAINTENANCE
CONTAINERIZED BATCH LAUNDRY
NSN 3510-01-527-2209
NSN 3510-01-527-2210
DRYER CONTACTORS
TEST, REPLACE

INITIAL SETUP

Tools
Tool Kit, General Mechanics: Automotive (WP 0086 00, Table 2, Item 6)

Materials/Parts
Wire Markers (WP 0087 00, Item 58)

Personnel Required
Quartermaster and Chemical Equipment Repairer 63J (1)

Equipment Condition
CBL set up

References
TM 10-3510-226-10

TEST

Test the Fan Contactor

WARNING

Ensure that all electrical power to the dryer is shut off and disconnected before proceeding. The circuit breaker box should be locked by personnel following this procedure. Serious injury or death can result from electrocution if proper safety precautions are not observed.

1. Disconnect power.
2. Remove screws retaining contactor box cover, and remove cover.
3. Locate the fan contactor **(Figure 1, Item 1)**.

WARNING

Use extreme caution when testing live electrical components. Serious injury or death can result from electrocution if proper safety precautions are not observed.

4. Connect power and operate dryer.
5. Check for 210 VAC across primary terminals L1, L2, and L3 **(Figure 1, Item 2)**. If no voltage is present, refer to WP 0010 for dryer troubleshooting procedures.
6. Use a voltmeter to check for 210 VAC across secondary terminals T1 and T2 **(Figure 1, Item 3)**.
7. Disconnect power to dryer at the circuit breaker.
8. Disconnect the white and red wires **(Figure 1, Item 4)** from the contactor control circuit, and use an ohmmeter to test for 3 to 5 ohms across the two terminals. Replace an open contactor.
9. Reconnect the white and red wires **(Figure 1, Item 4)** to the contactor control circuit terminals.
10. Install contactor box cover and retain with screws.

TEST-CONTINUED

11. Connect power, operate IAW procedures given in TM 10-3510-226-10, and monitor for normal operation.

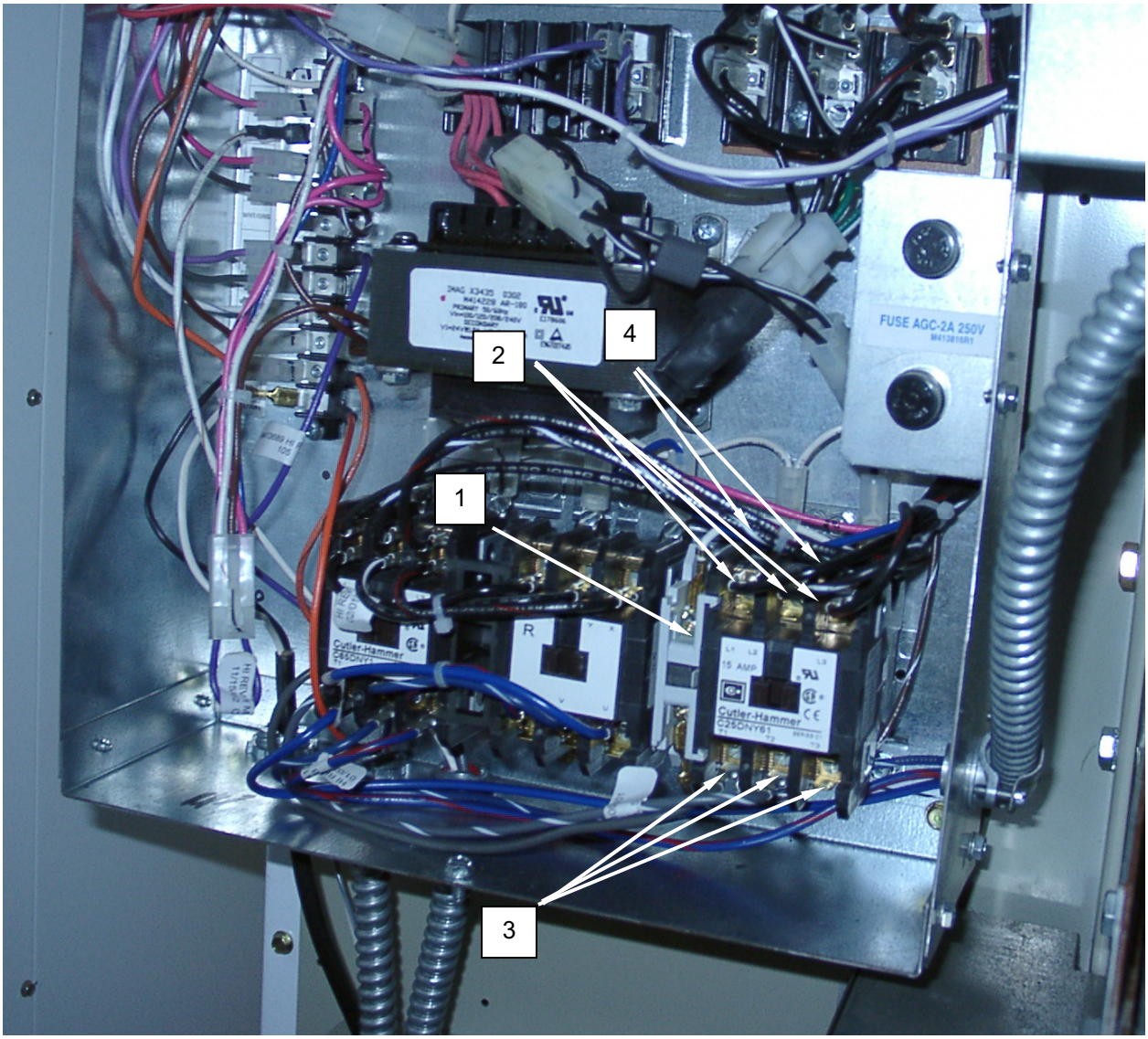


Figure 1. Test the Fan Contactor.

TEST-CONTINUED

Test the Reversing Contactor

WARNING

Ensure that all electrical power to the dryer is shut off and disconnected before proceeding. The circuit breaker box should be locked by personnel following this procedure. Serious injury or death can result from electrocution if proper safety precautions are not observed.

NOTE

The reversing contactor is made up of two separate contactors that must be tested separately.

1. Disconnect power.
2. Remove screws retaining contactor box cover, and remove cover.
3. Locate the forward **(Figure 2, Item 5)** and reverse contactor **(Figure 2, Item 6)** on the reversing contactor **(Figure 2, Item 7)**.

WARNING

Use extreme caution when testing live electrical components. Serious injury or death can result from electrocution if proper safety precautions are not observed.

NOTE

Ensure the dryer is operating in reversing mode. Refer to TM 10-3510-226-10 for operating instructions.

4. Connect power and operate dryer.

NOTE

The contactors will switch on and off during operation. If no load voltage is found on one contactor, check the other.

5. Check for 210 VAC across primary terminals L1, L2, and L3 **(Figure 2, Item 2)** on either the forward or reverse contactor. If no voltage is present, refer to WP 0010 for dryer Troubleshooting procedures.
6. Use a voltmeter to check for 210 VAC across secondary terminals T1, T2, and T3 **(Figure 2, Item 3)** on either the forward or reverse contactor.
7. Perform steps 5 and 6 on the remaining contactor.
8. Disconnect power at the dryer circuit breaker.

TEST-CONTINUED

9. Disconnect the white and red wires **(Figure 2, Item 4)** from the contactor control circuit, and use an ohmmeter to test for 3 to 5 ohms across the two terminals. Replace an open contactor.

10. Reconnect the white and red wires **(Figure 2, Item 4)** to the contactor control circuit terminals.

11. Perform steps 9 and 10 on the remaining contactor.

12. Install contactor box cover, and retain with screws.

13. Connect power, operate IAW procedures given in TM 10-3510-226-10, and monitor for normal operation.

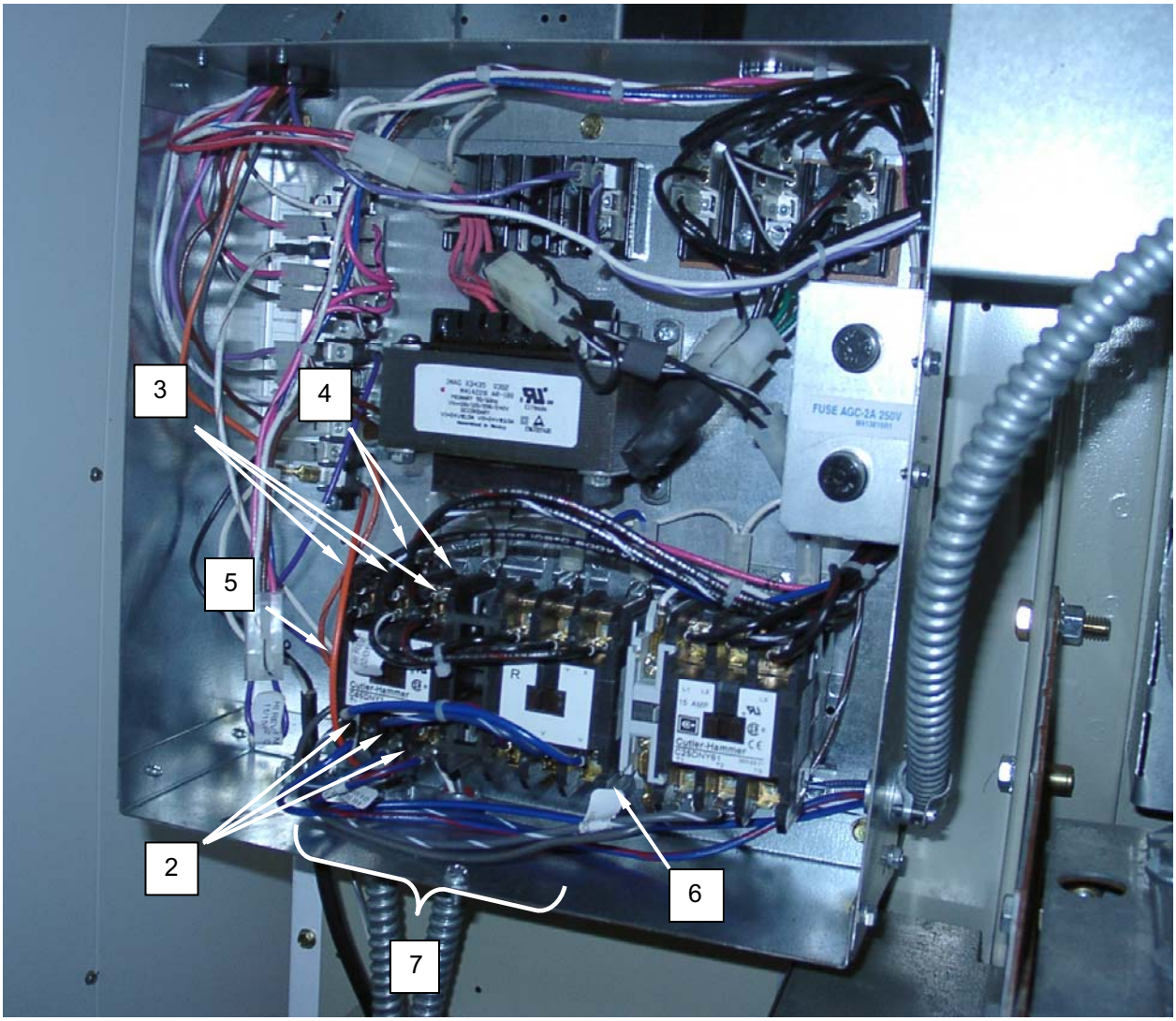


Figure 2. Test the Reversing Contactor.

TEST-CONTINUED

Test the Heat Contactors

WARNING

Ensure that all electrical power to the dryer is shut off and disconnected before proceeding. The circuit breaker box should be locked by personnel following this procedure. Serious injury or death can result from electrocution if proper safety precautions are not observed.

1. Disconnect power.
2. Remove screws retaining the accessory box cover, and remove cover.
3. Locate the two heat contactors **(Figure 3, Item 7)**.

WARNING

Use extreme caution when testing live electrical components. Serious injury or death can result from electrocution if proper safety precautions are not observed.

4. Connect power and operate dryer.
5. Check for 210 VAC across primary terminals L1, L2, and L3 **(Figure 3, Item 2)**. If no voltage is present, refer to WP 0010 for dryer troubleshooting procedures.

NOTE

Allow the dryer to operate at high heat for at least 1 minute before testing.

6. Use a voltmeter to check for 210 VAC across secondary terminals T1, T2, and T3 **(Figure 3, Item 3)**.
7. Repeat steps 4 and 5 for the remaining contactor.
8. Disconnect power.
9. Disconnect the white and red wires **(Figure 3, Item 4)** from the contactor control circuit, and use an ohmmeter to test for 0 to 2 ohms across the two terminals. Replace an open contactor.
10. Reconnect the white and purple-and-white striped wires **(Figure 3, Item 4)** to the contactor control circuit terminals.
11. Repeat steps 8 and 9 for the remaining contactor.

TEST-CONTINUED

12. Install accessory box cover, and retain with screws.

13. Connect power, operate IAW procedures given in TM 10-3510-226-10, and monitor for normal operation.

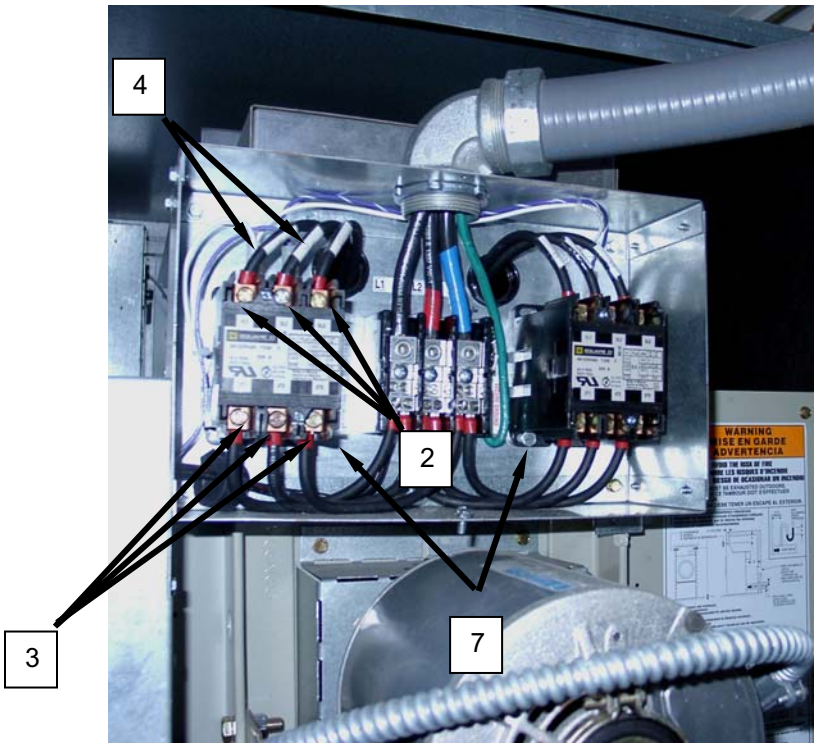


Figure 3. Test the Heat Contactors.

REPLACE

Replace the Fan Contactor

WARNING

Ensure that all electrical power to the dryer is shut off and disconnected before proceeding. The circuit breaker box should be locked by personnel following this procedure. Serious injury or death can result from electrocution if proper safety precautions are not observed.

1. Disconnect power.
2. Remove screws retaining contactor box cover, and remove cover.

NOTE

Wiring may also be replaced one for one from the contactor to the replacement contactor.

3. Tag and disconnect wiring from contactor **(Figure 4, Item 1)**.
4. Remove screws retaining contactor **(Figure 4, Item 1)**, and remove contactor.
5. Install replacement contactor **(Figure 4, Item 1)**, and retain with screws.
6. Connect wiring to replacement contactor **(Figure 4, Item 1)** as tagged.
7. Install contactor box cover, and retain with screws.
8. Connect power, operate IAW procedures given in TM 10-3510-226-10, and monitor for normal operation.

REPLACE-CONTINUED

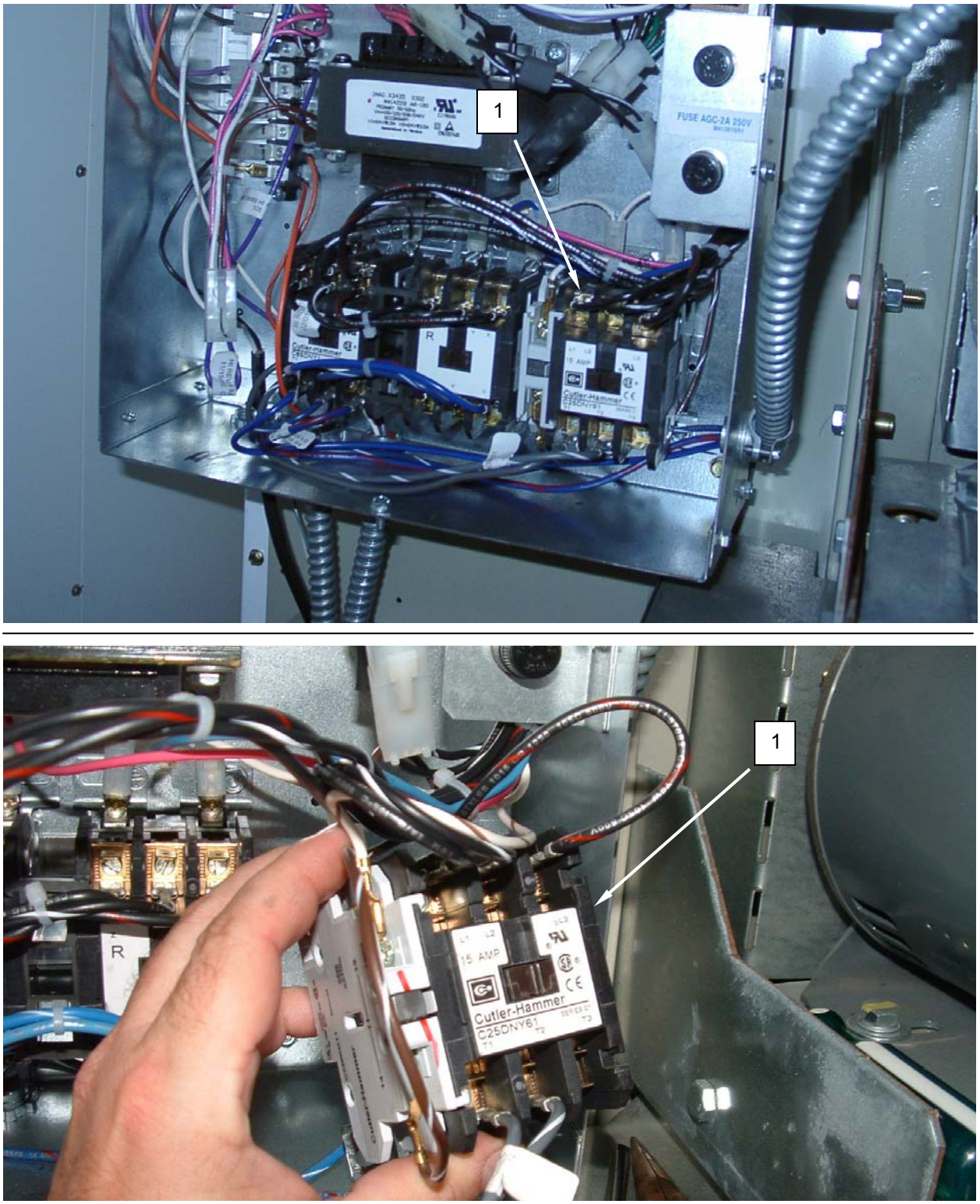


Figure 4. Replace the Fan Contactor.

REPLACE-CONTINUED

Replace the Reversing Contactor

WARNING

Ensure that all electrical power to the dryer is shut off and disconnected before proceeding. The circuit breaker box should be locked by personnel following this procedure. Serious injury or death can result from electrocution if proper safety precautions are not observed.

1. Disconnect power.
2. Remove screws retaining contactor box cover and remove cover.

NOTE

Wiring may also be replaced one for one from the contactors to the replacement contactors.

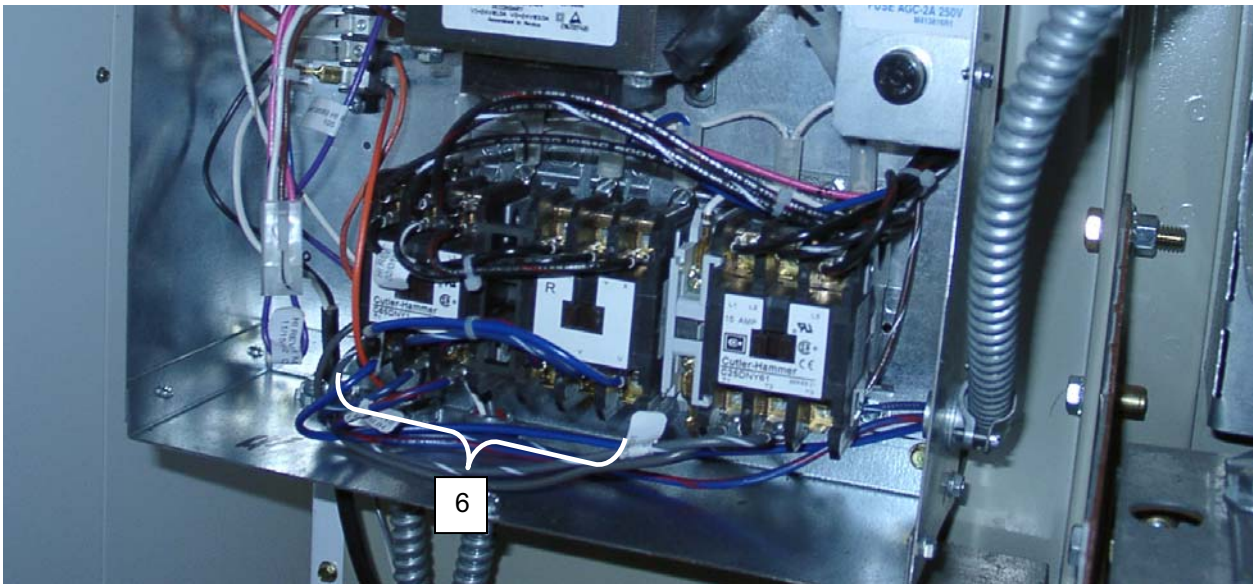
3. Tag and disconnect wiring from contactors **(Figure 5, Item 6)**.

NOTE

The reversing contactor, though comprised of two separate contactors, is replaced as an assembly.

4. Remove screws retaining contactors **(Figure 5, Item 6)** and remove contactors as an assembly.
5. Install replacement contactors **(Figure 5, Item 6)** and retain with screws.
6. Connect wiring to replacement contactors **(Figure 5, Item 6)** as tagged.
7. Install contactor box cover, and retain with screws.
8. Connect power, operate IAW procedures given in TM 10-3510-226-10, and monitor for normal operation.

REPLACE-CONTINUED



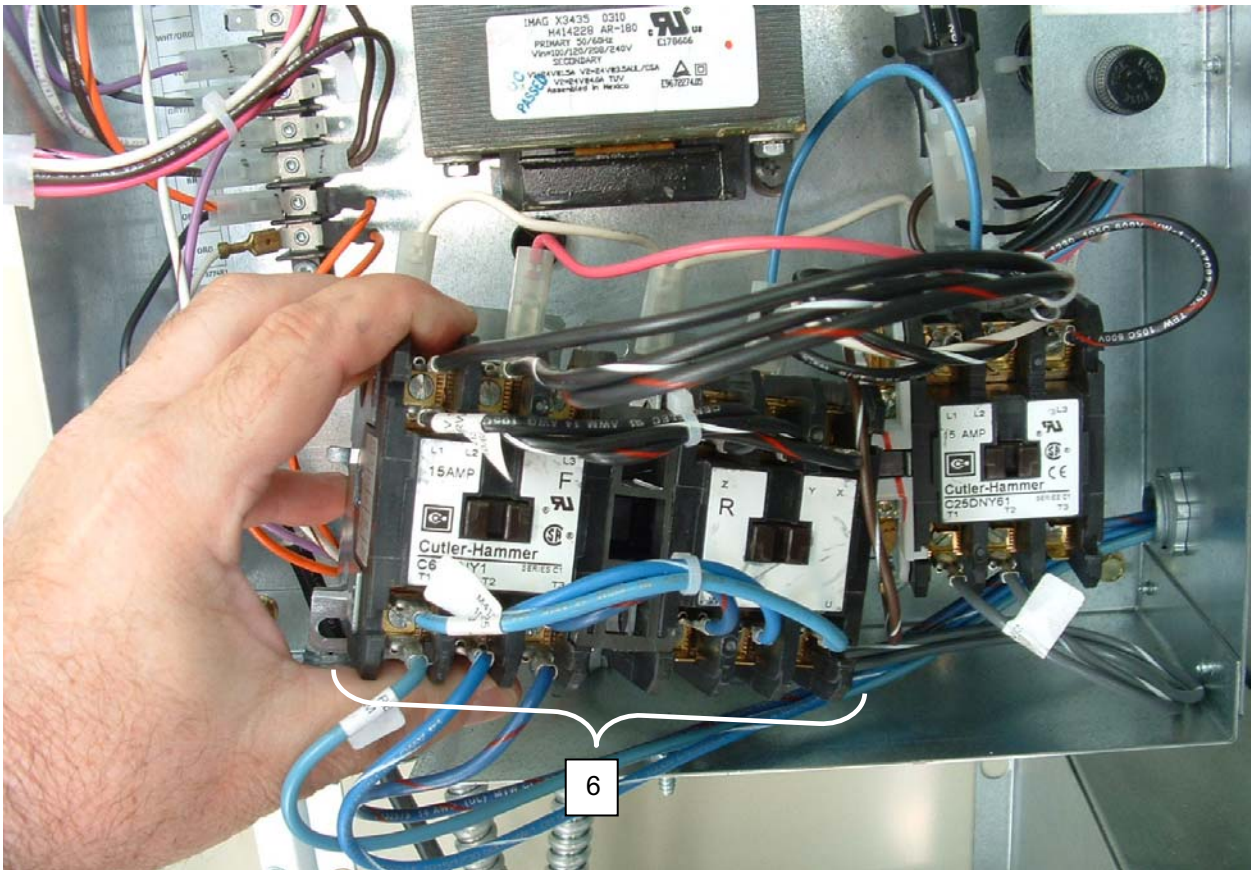


Figure 5. Replace the Reversing Contactor.

REPLACE-CONTINUED

Replace a Heat Contactor

WARNING

Ensure that all electrical power to the dryer is shut off and disconnected before proceeding. The circuit breaker box should be locked by personnel following this procedure. Serious injury or death can result from electrocution if proper safety precautions are not observed.

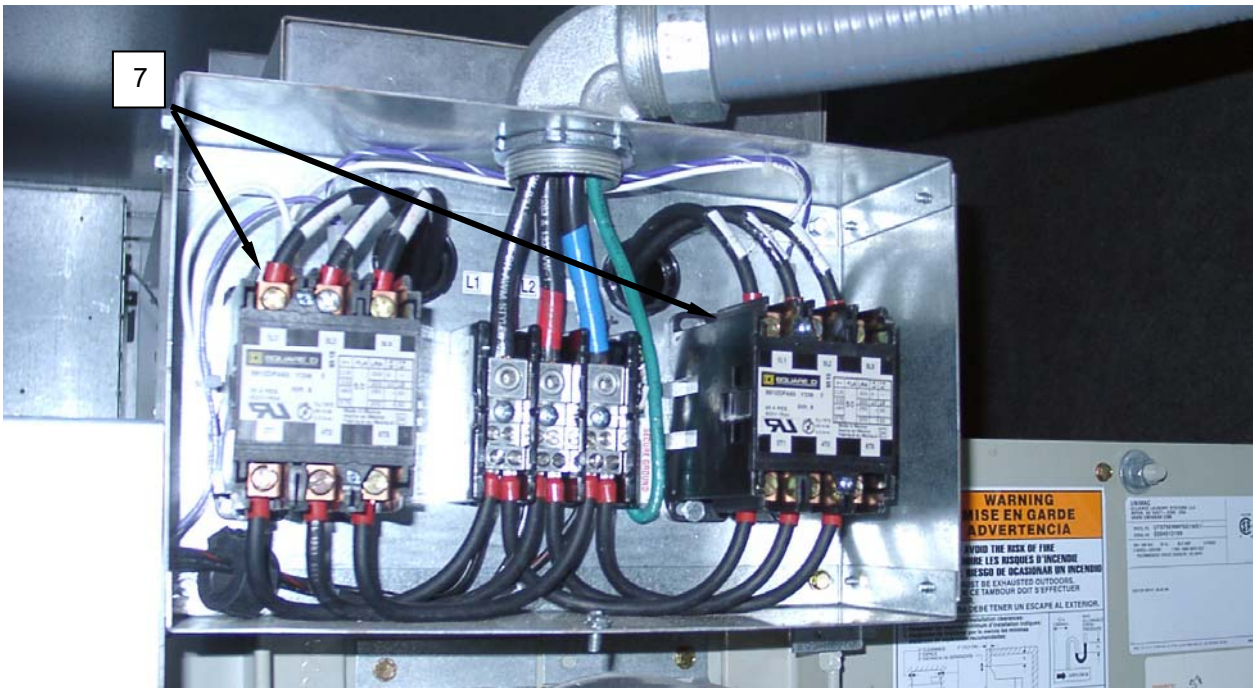
1. Disconnect power.
2. Remove screws retaining accessory box cover, and remove cover.

NOTE

Wiring may also be replaced one for one from the contactor to the replacement contactor.

3. Tag and disconnect wiring from contactor **(Figure 6, Item 7)**.
4. Remove screws retaining contactor **(Figure 6, Item 7)** and remove contactor.
5. Install replacement contactor **(Figure 6, Item 7)** and retain with screws.
6. Connect wiring to replacement contactor **(Figure 6, Item 7)** as tagged.
7. Install accessory box cover, and retain with screws.
8. Connect power, operate IAW procedures given in TM 10-3510-226-10, and monitor for normal operation.

REPLACE-CONTINUED



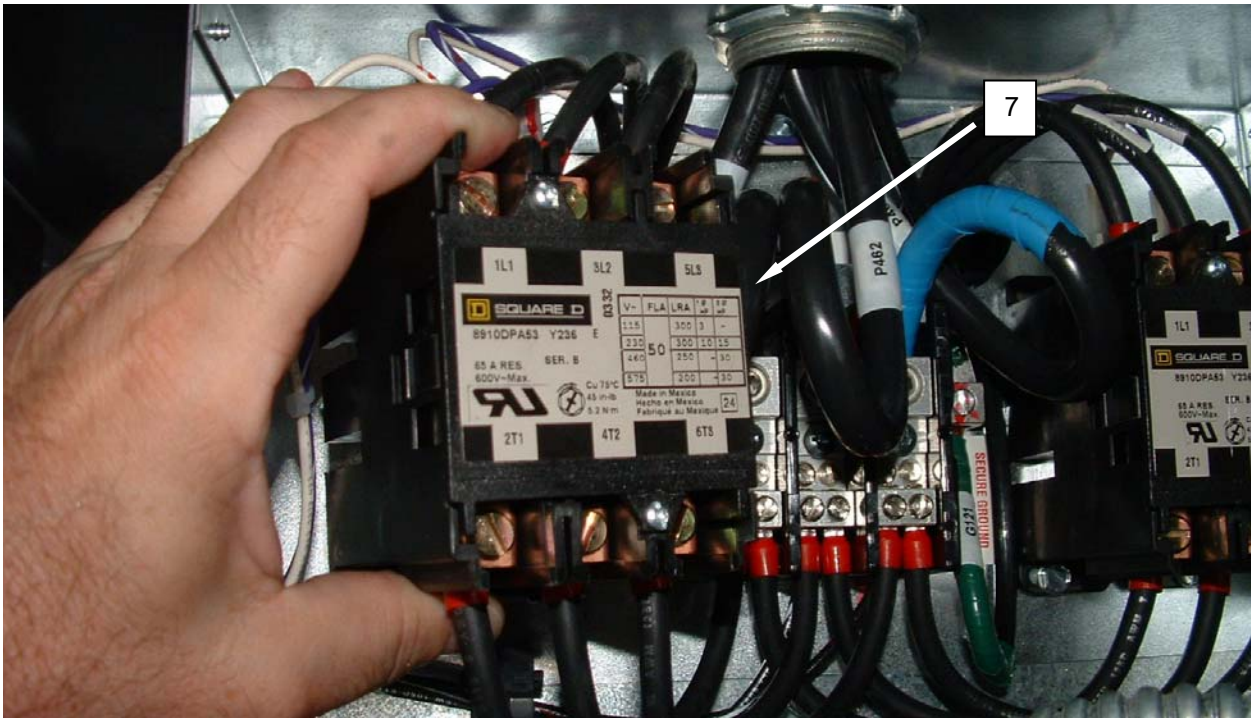


Figure 6. Replace the Heat Contactors.

END OF WORK PACKAGE

UNIT MAINTENANCE
CONTAINERIZED BATCH LAUNDRY
NSN 3510-01-527-2209
NSN 3510-01-527-2210
DRYER TRANSFORMER
TEST, REPLACE

INITIAL SETUP

Tools
Tool Kit, General Mechanics: Automotive (WP 0086 00, Table 2, Item 6)

Materials/Parts
Wire Markers (WP 0087 00, Item 58)

Personnel Required
Quartermaster and Chemical Equipment Repairer 63J (1)

Equipment Condition
CBL set up

References
TM 10-3510-226-10

TEST

Test the Dryer Transformer Fuses

WARNING

Ensure that all electrical power is shut off and disconnected before proceeding. The Circuit Breaker box should be locked by personnel following this procedure. Serious injury or death can result from electrocution if proper safety precautions are not observed.

NOTE

Always test both transformer fuses at the same time. A fuse may not have visible signs of having opened.

1. Disconnect power by switching the circuit breakers to OFF.
2. Remove screws retaining contactor box cover and remove cover.
3. Locate primary fuse **(Figure 1, Item 1)**.
4. Unscrew fuse holder cap **(Figure 1, Item 1)**.
5. Remove fuse from cap **(Figure 1, Item 1)**.
6. Use an ohmmeter to test the fuse **(Figure 1, Item 1)** for continuity.
7. Replace an open fuse **(Figure 1, Item 1)**.
8. Install fuse into cap **(Figure 1, Item 1)**.
9. Install cap **(Figure 1, Item 1)** with fuse into fuse holder.
10. Repeat Steps 4 through 9 for the secondary fuse **(Figure 1, Item 2)**.
11. Install cover and retain with screws.
12. Connect power, operate IAW procedures given in TM 10-3510-226-10, and monitor for normal operation.

TEST-CONTINUED

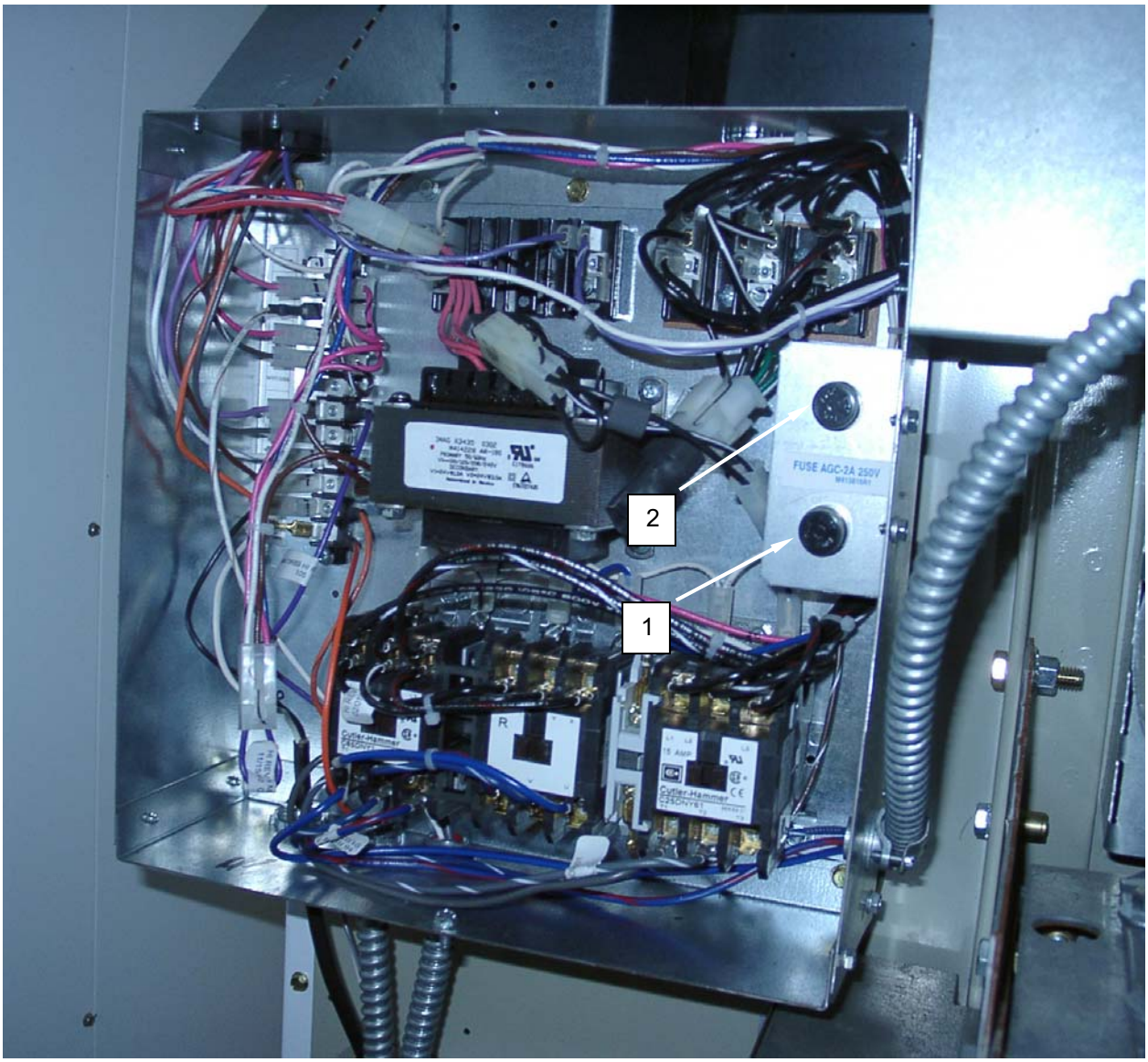


Figure 1. Test the Dryer Transformer Fuses.

TEST-CONTINUED

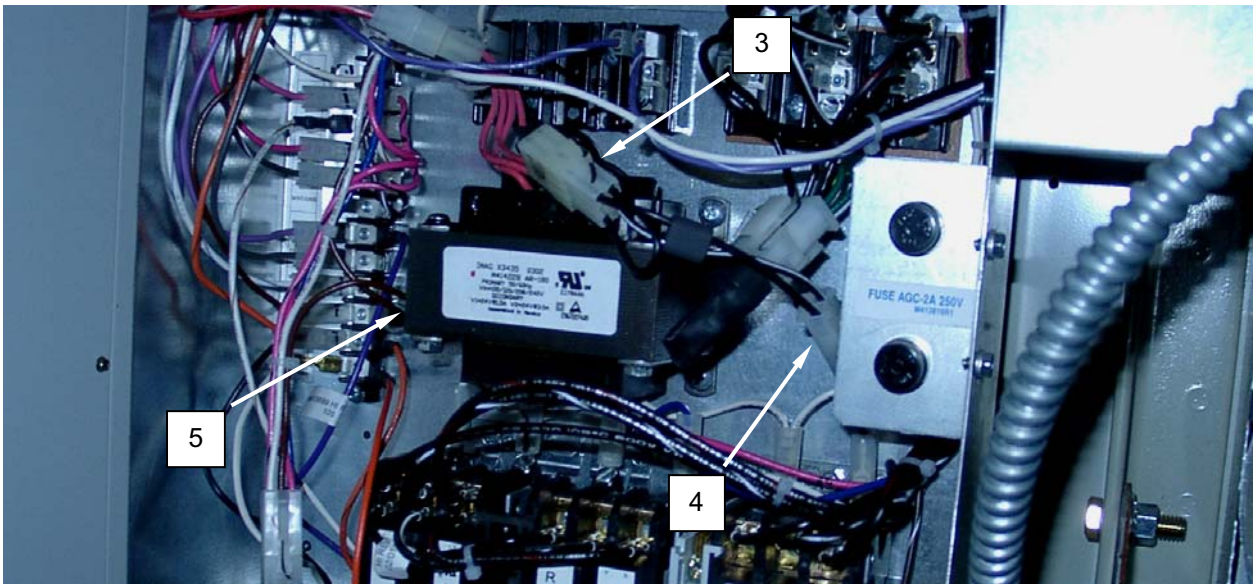
Test the Transformer

WARNING

Ensure that all electrical power is shut off and disconnected before proceeding. The Circuit Breaker box should be locked by personnel following this procedure. Serious injury or death can result from electrocution if proper safety precautions are not observed.

1. Disconnect power by switching the circuit breakers to OFF.
2. Remove screws retaining contactor box cover and remove cover.
3. Tag and disconnect the electrical quick disconnects **(Figure 2, Items 3 and 4)** from transformer **(Figure 2, Item 5)**.
4. Use an ohmmeter to test for 0.2 ohms resistance across the terminals 1 and 4 on the four-pin electrical quick disconnect **(Figure 2, Item 3)**.
5. Use an ohmmeter to test for 0.2 ohms resistance across the terminals 2 and 3 on the four-pin electrical quick disconnect **(Figure 2, Item 3)**.
6. Use an ohmmeter to test for 6.5 ohms resistance across the terminals on the tow-pin electrical quick disconnect **(Figure 2, Item 4)**.
7. Replace an open or shorted transformer **(Figure 2, Item 5)**.
8. Connect wiring to replacement transformer **(Figure 2, Item 5)** as tagged.
9. Install contactor box cover and retain with screws.
10. Connect power, operate IAW procedures given in TM 10-3510-226-10, and monitor for normal operation.

TEST-CONTINUED



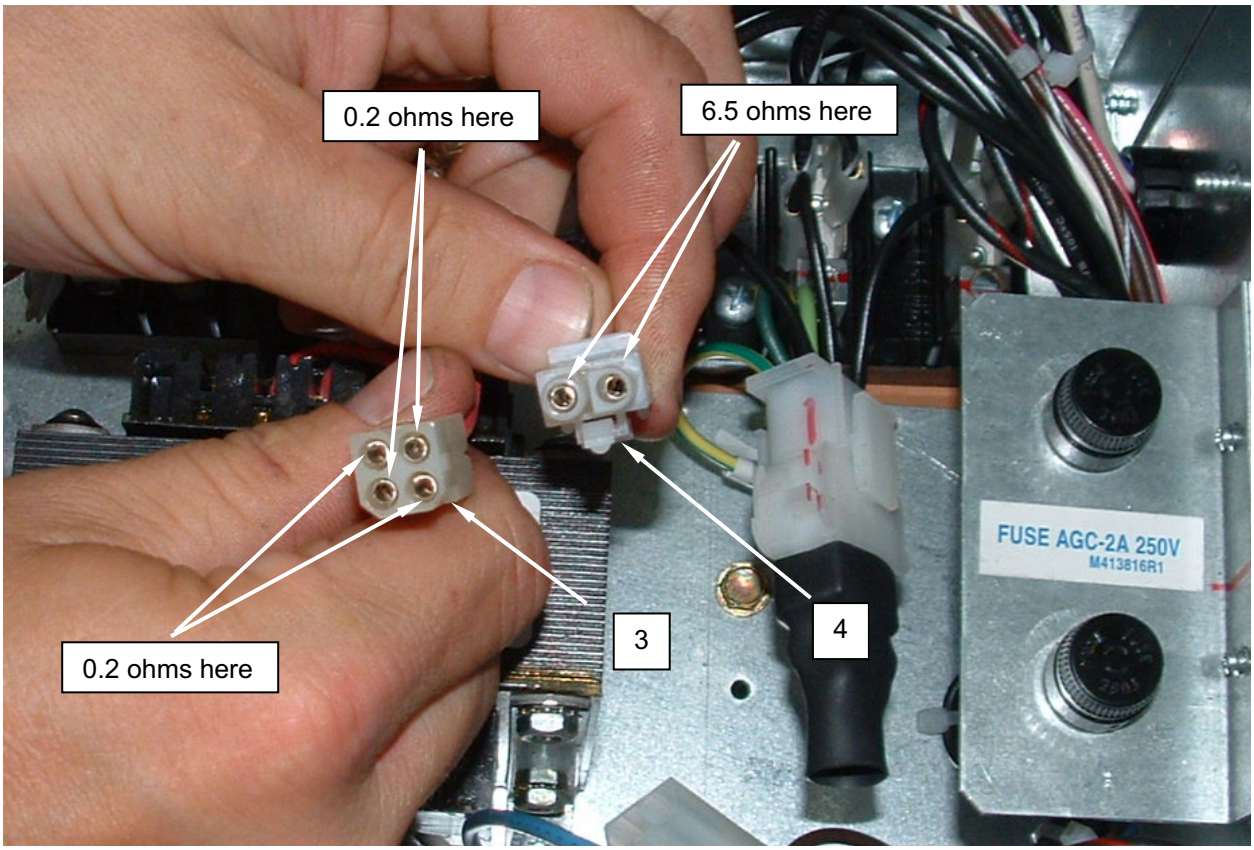


Figure 2. Test the Dryer Transformer.

REPLACE

Replace the Dryer Transformer Fuses

WARNING

Ensure that all electrical power is shut off and disconnected before proceeding. The Circuit Breaker box should be locked by personnel following this procedure. Serious injury or death can result from electrocution if proper safety precautions are not observed.

1. Disconnect power by switching the circuit breakers to OFF.
2. Remove screws retaining contactor box cover and remove cover.
3. Unscrew fuse holder cap **(Figure 3, Item 1)**.
4. Remove fuse from cap **(Figure 3, Item 1)**.
5. Install replacement fuse into cap **(Figure 3, Item 1)**.
6. Install cap **(Figure 3, Item 1)** with replacement fuse into fuse holder.
7. Install cover, and retain with screws.
8. Connect power, operate IAW procedures given in TM 10-3510-226-10, and monitor for normal operation.

REPLACE-CONTINUED

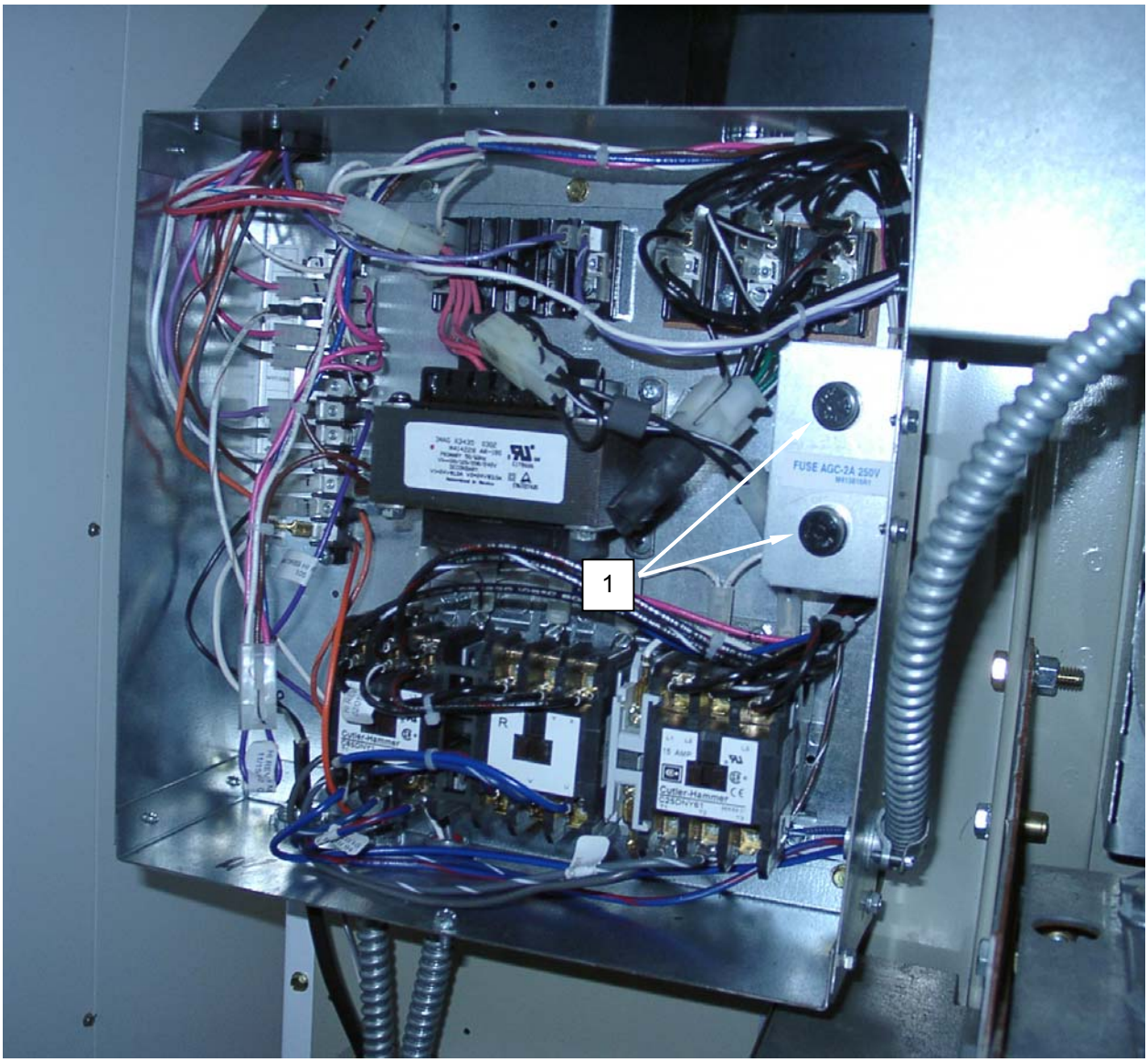


Figure 3. Replace the Dryer Transformer Fuses.

REPLACE-CONTINUED

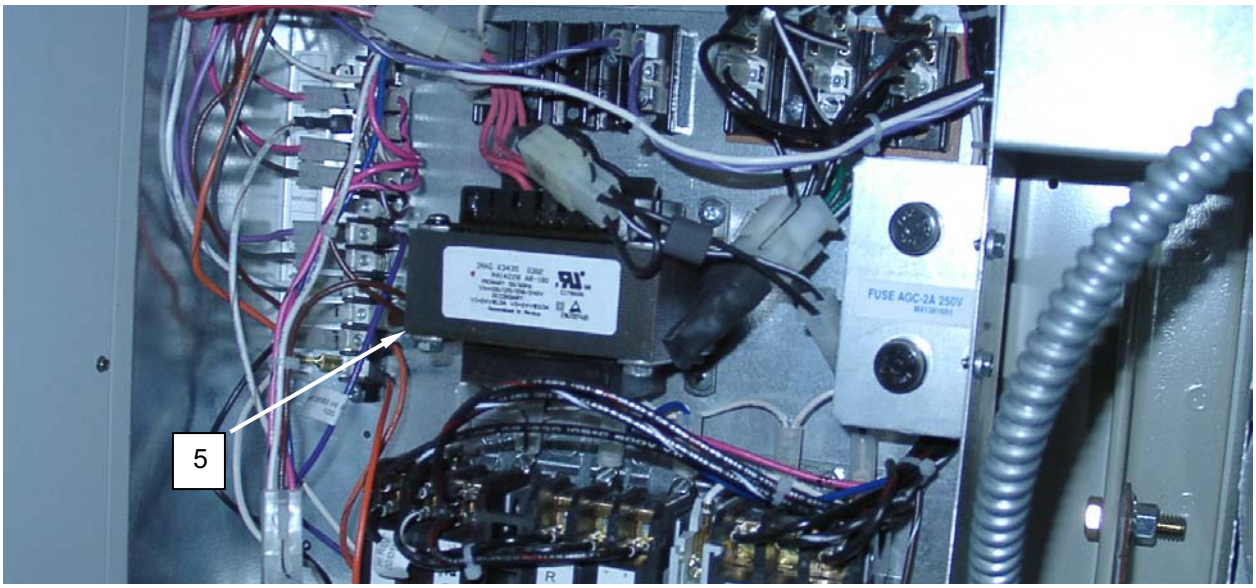
Replace the Dryer Transformer

WARNING

Ensure that all electrical power is shut off and disconnected before proceeding. The Circuit Breaker box should be locked by personnel following this procedure. Serious injury or death can result from electrocution if proper safety precautions are not observed.

1. Disconnect power by switching the circuit breakers to OFF.
2. Remove screws retaining contactor box cover and remove cover.
3. Tag and disconnect wiring from transformer **(Figure 4, Item 5)**.
4. Remove screws retaining transformer **(Figure 4, Item 5)**, and remove transformer.
5. Install replacement transformer **(Figure 4, Item 5)**, and retain with screws.
6. Connect wiring to replacement transformer **(Figure 4, Item 5)** as tagged.
7. Install contactor box cover and retain with screws.
8. Connect power, operate IAW procedures given in TM 10-3510-226-10, and monitor for normal operation.

REPLACE-CONTINUED



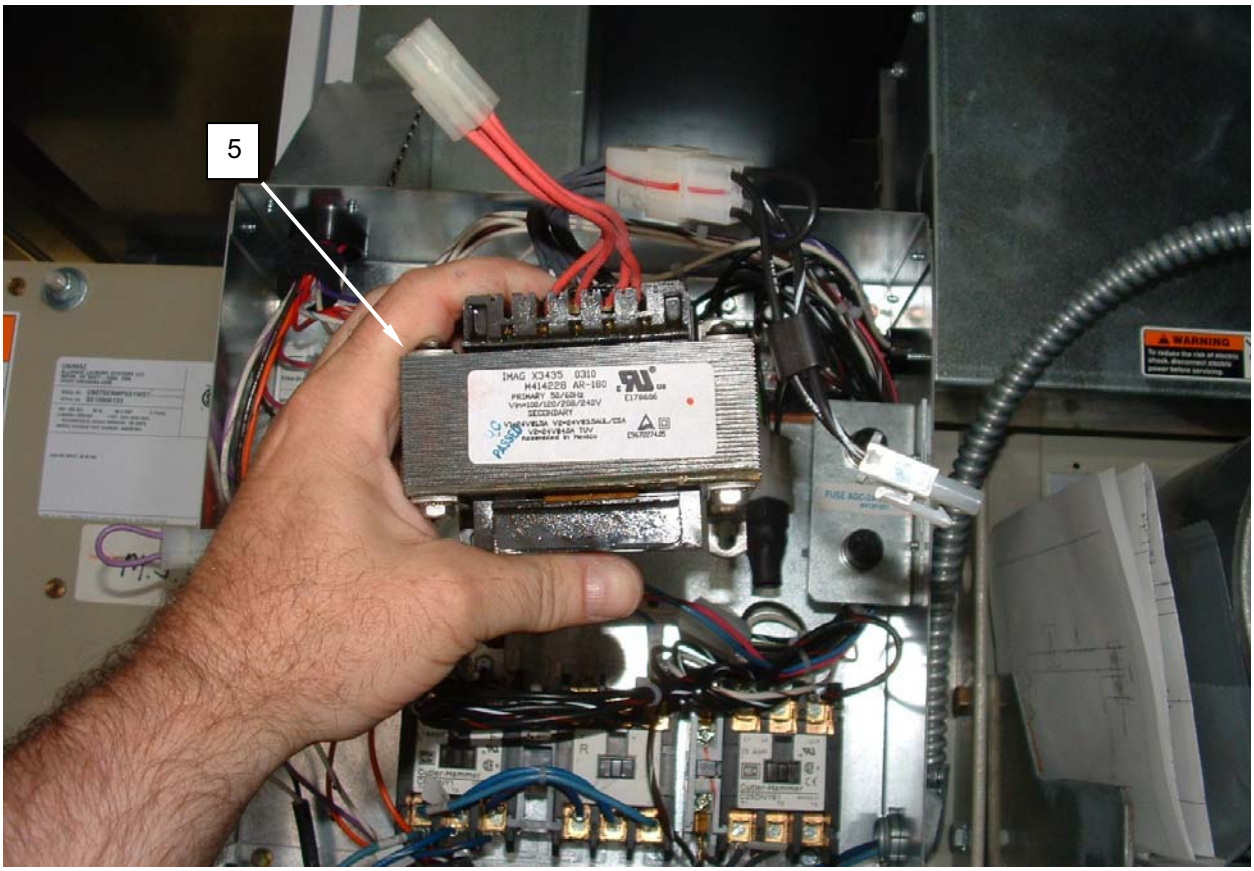


Figure 4. Replace the Dryer Transformer.

END OF WORK PACKAGE

UNIT MAINTENANCE
CONTAINERIZED BATCH LAUNDRY
NSN 3510-01-527-2209
NSN 3510-01-527-2210
CONTROLS, DRYER
TEST, REPLACE

INITIAL SETUP

Tools
Tool Kit, General Mechanics: Automotive (WP 0086 00, Table 2, Item 6)

Personnel Required
Quartermaster and Chemical Equipment Repairer 63J (1)

Materials/Parts
Tape, Electrical Insulation, ¾-inch Width (WP 0087 00, Item 52)
Wire Markers (WP 0087, Item 58)

Equipment Condition
CBL set up

TEST

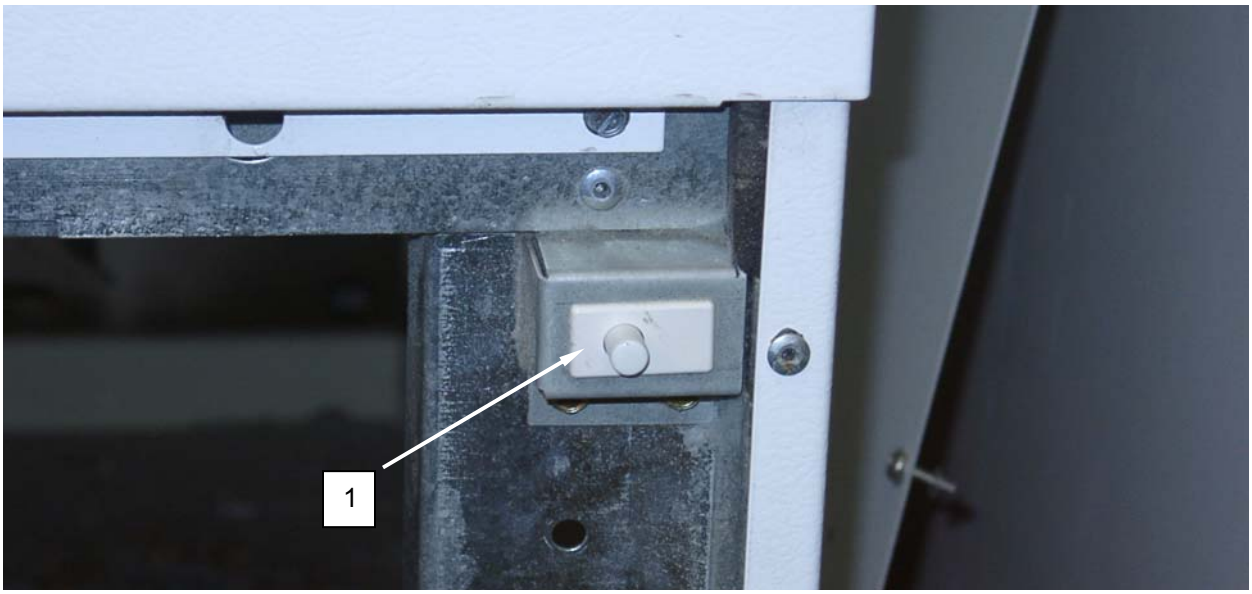
Test the Dryer Lint Panel Switch

WARNING

Ensure that all dryer electrical power is shut off and disconnected before proceeding. The circuit breaker box should be locked by personnel following this procedure. Serious injury or death can result from electrocution if proper safety precautions are not observed.

1. Disconnect power by switching the dryer circuit breaker to OFF.
2. Remove lint panel.
3. Tag and disconnect wiring from switch **(Figure 1, Item 1)**.
4. Use an ohmmeter to check for 0 ohms resistance when switch **(Figure 1, Item 1)** is closed.
5. Use an ohmmeter to check for infinite ohms resistance when switch **(Figure 1, Item 1)** is open.
6. Replace a malfunctioning switch **(Figure 1, Item 1)**.
7. Reconnect wiring to switch **(Figure 1, Item 1)** as tagged.
8. Install lint panel.
9. Switch the circuit breaker to ON and monitor for normal operation.

TEST-CONTINUED



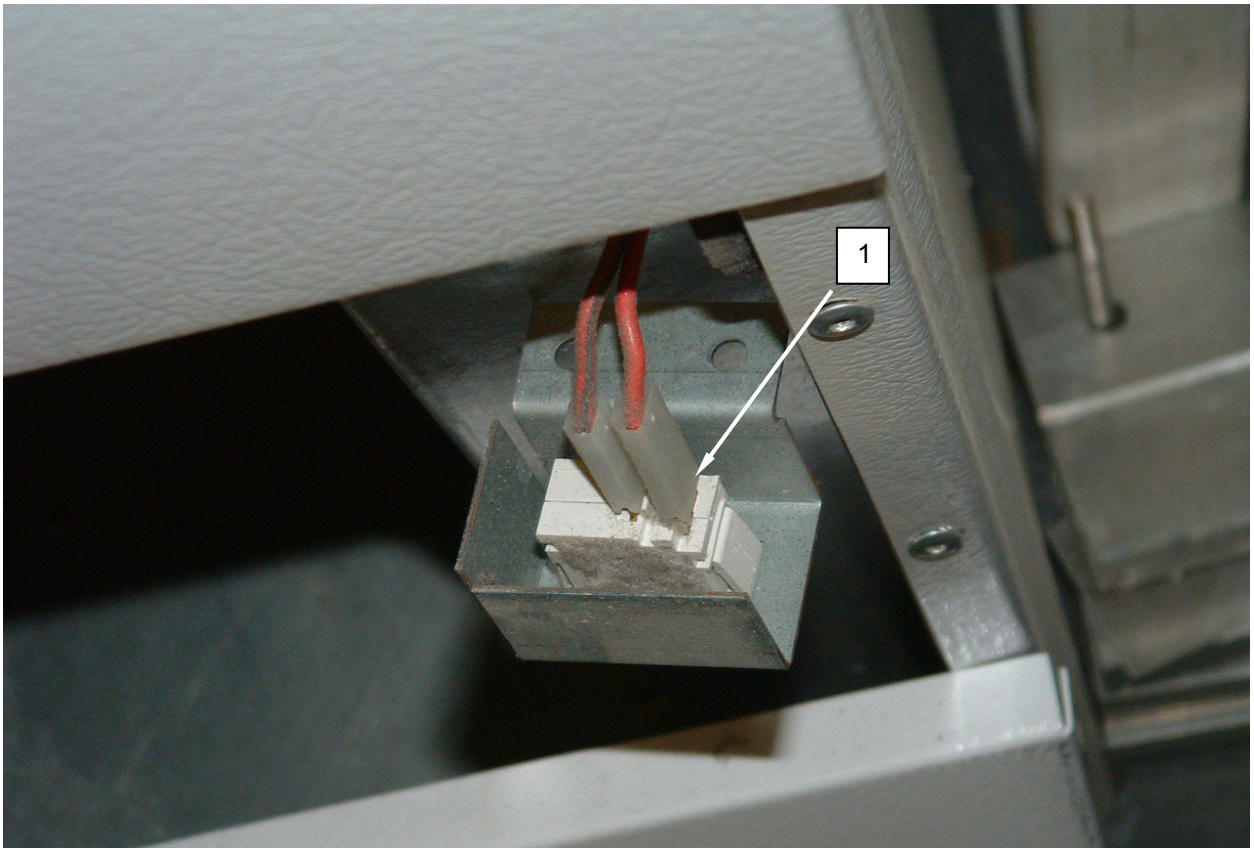


Figure 1. Test the Dryer Lint Panel Switch.

TEST-CONTINUED

Test the Lint Compartment Thermistor

WARNING

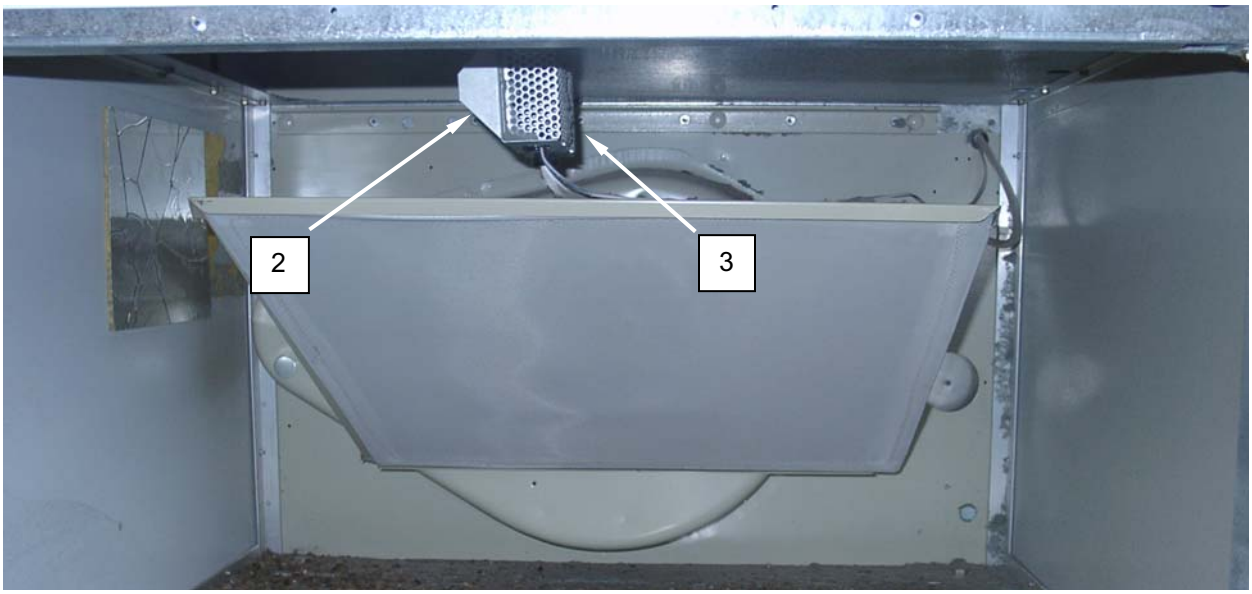
Ensure that all dryer electrical power is shut off and disconnected before proceeding. The circuit breaker box should be locked by personnel following this procedure. Serious injury or death can result from electrocution if proper safety precautions are not observed.

NOTE

If the thermistor shorts or if the dryer internal temperature exceeds 200 ^{o}F, an alarm will sound on the dryer and SH will be shown on the dryer display. If this occurs, press STOP/RESET twice within 3 seconds, and then press ON/SELECT. If SH still shows on the display, replace the thermistor.

1. Disconnect power by switching the dryer circuit breaker to OFF.
2. Remove lint panel.
3. Remove screws retaining thermistor bracket **(Figure 2, Item 2)** and remove thermistor and bracket as an assembly.
4. Remove screws retaining thermistor guard **(Figure 2, Item 3)** and remove guard.
5. Tag and disconnect wiring from thermistor **(Figure 2, Item 4)**.
6. Use an ohmmeter to check for 41,000 ohms resistance at room temperature.
7. Replace a shorted thermistor **(Figure 2, Item 4)**.
8. Reconnect wiring to thermistor **(Figure 2, Item 4)** as tagged.
9. Install thermistor guard **(Figure 2, Item 3)** and retain with screws.
10. Install thermistor **(Figure 2, Item 4)** and bracket **(Figure 2, Item 2)** as an assembly and retain with screws.
11. Install lint panel.
12. Switch the circuit breaker to ON and monitor for normal operation.

TEST-CONTINUED



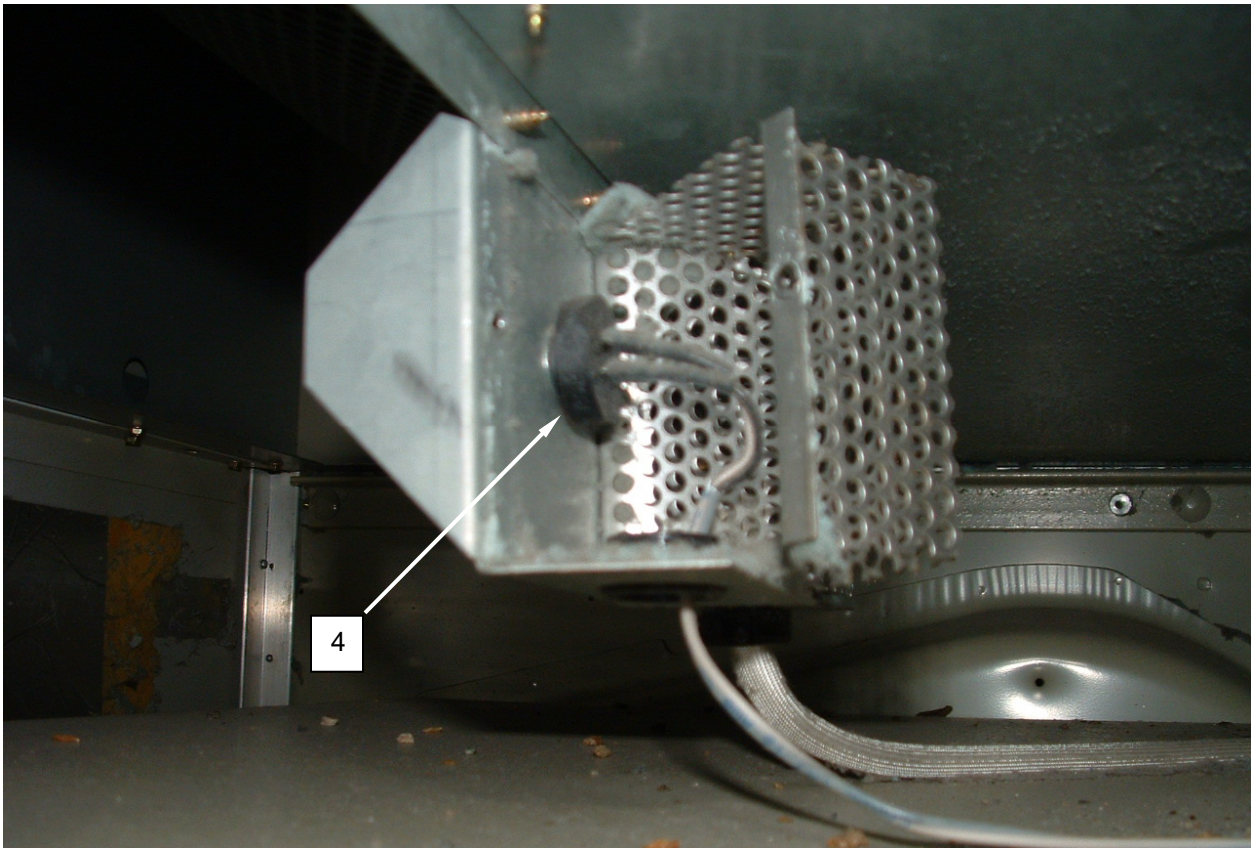


Figure 2. Test the Lint Compartment Thermistor.

TEST-CONTINUED

Test the High Limit Thermostat

WARNING

Ensure that all dryer electrical power is shut off and disconnected before proceeding. The circuit breaker box should be locked by personnel following this procedure. Serious injury or death can result from electrocution if proper safety precautions are not observed.

NOTE

Ensure dryer has completely cooled before testing.

1. Disconnect power by switching the dryer circuit breaker to OFF.
2. Remove the top front panel of the dryer using the dryer key.
3. Tag and disconnect wiring from thermostat **(Figure 3, Item 5)**.
4. Use an ohmmeter to check for 0 ohms resistance.
5. Replace a malfunctioning thermostat **(Figure 3, Item 5)**.
6. Reconnect wiring to thermostat **(Figure 3, Item 5)** as tagged.
7. Install top front panel.
8. Switch the circuit breaker to ON and monitor for normal operation.

TEST-CONTINUED

Figure 3. Test the High Limit Thermostat.

TEST-CONTINUED

Test the Thermostat

WARNING

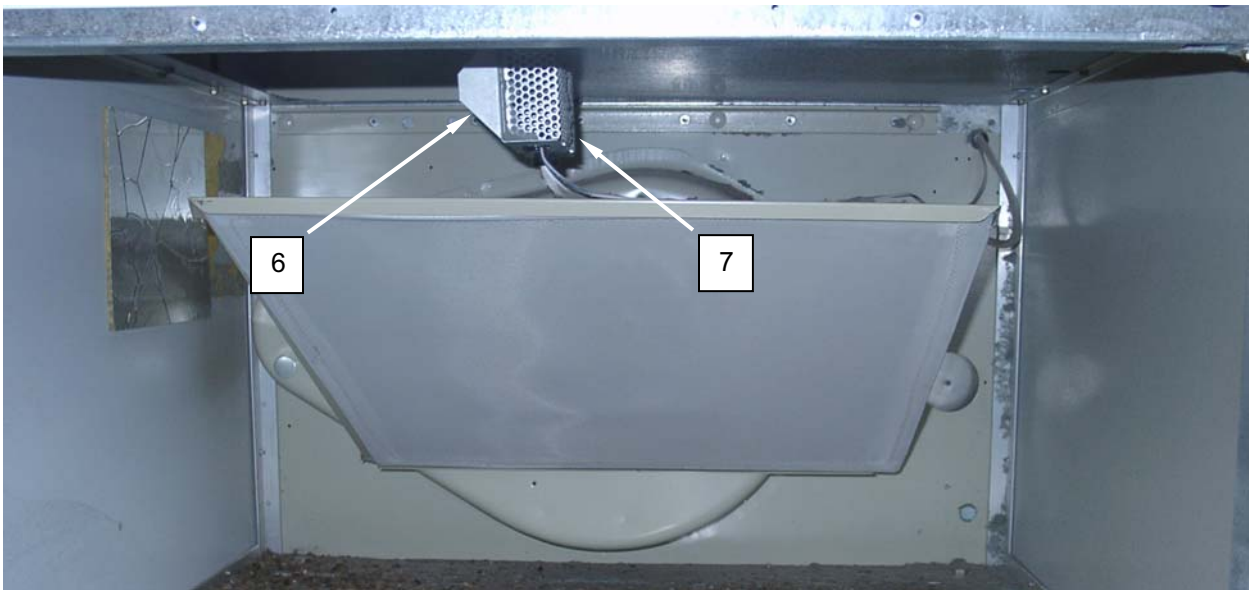
Ensure that all dryer electrical power is shut off and disconnected before proceeding. The circuit breaker box should be locked by personnel following this procedure. Serious injury or death can result from electrocution if proper safety precautions are not observed.

NOTE

Ensure dryer has completely cooled before testing.

1. Disconnect power by switching the dryer circuit breaker to OFF.
2. Remove lint panel.
3. Remove screws retaining thermostat bracket assembly **(Figure 4, Item 6)** and remove thermostat and bracket as an assembly.
4. Remove screws retaining thermostat guard **(Figure 4, Item 7)** and remove guard.
5. Tag and disconnect wiring from thermostat **(Figure 4, Item 5)**.
6. Use an ohmmeter to check for 0 ohms resistance.
7. Replace a malfunctioning thermostat **(Figure 4, Item 5)**.
8. Connect wiring to thermostat **(Figure 4, Item 5)** as tagged.
9. Install thermostat guard **(Figure 4, Item 7)** and retain with screws.
10. Install thermostat **(Figure 4, Item 5)** and bracket **(Figure 4, Item 6)** as an assembly and retain with screws.
11. Install lint panel.
12. Switch the circuit breaker to ON and monitor for normal operation.

TEST-CONTINUED



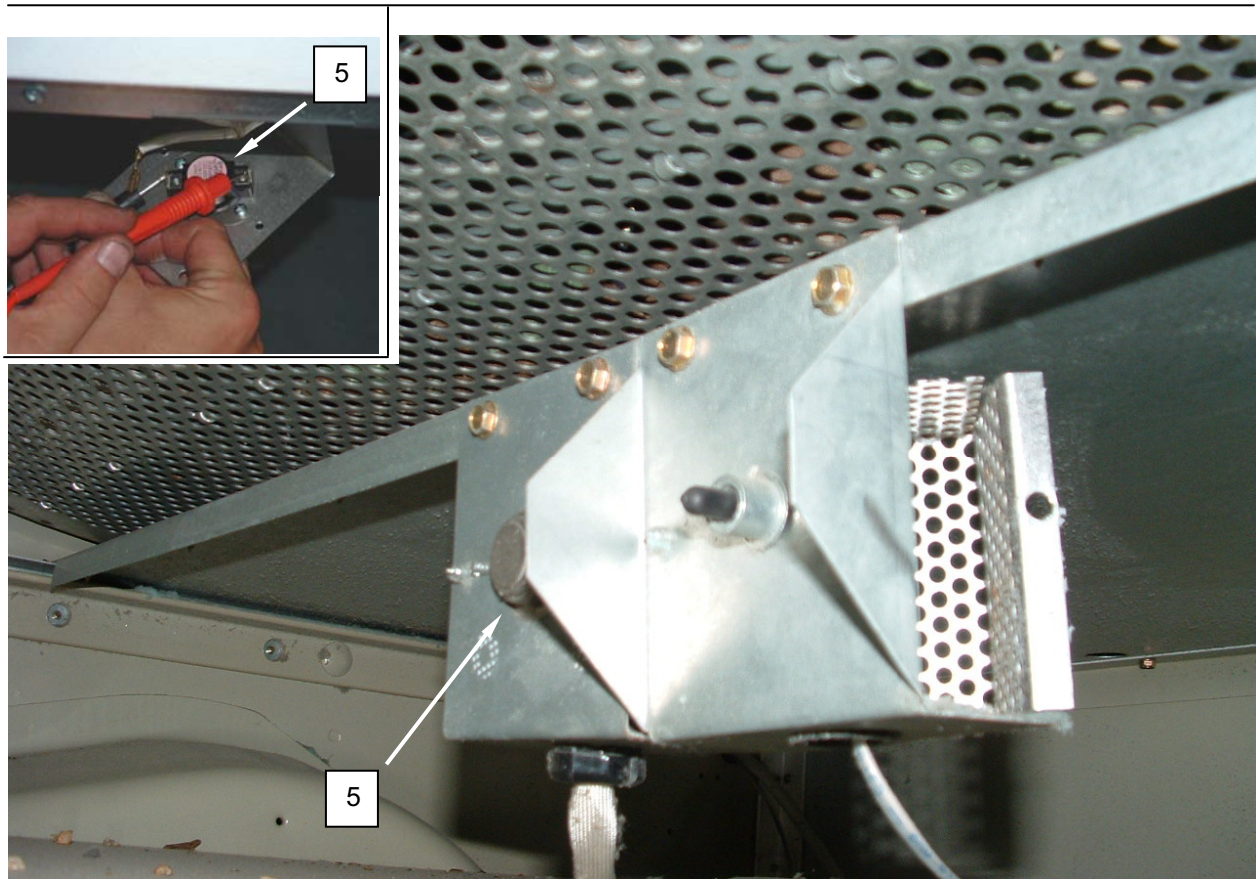


Figure 4. Test the Thermostat.

TEST-CONTINUED

Test the Dryer Door Switch

WARNING

Ensure that all dryer electrical power is shut off and disconnected before proceeding. The circuit breaker box should be locked by personnel following this procedure. Serious injury or death can result from electrocution if proper safety precautions are not observed.

1. Disconnect power by switching the dryer circuit breaker to OFF.
2. Open dryer door.
3. Remove switch **(Figure 5, Item 8)** by prying it gently with a small screwdriver.

NOTE

Do not allow wiring to fall back through switch opening. Wrap tape or a wire tie around the switch wiring if necessary to keep the wiring from falling back into the dryer.

4. Tag and disconnect wiring from switch **(Figure 5, Item 8)**.
5. Use an ohmmeter to check for 0 ohms resistance in the closed position.
6. Use an ohmmeter to check for infinite resistance in the open position.
7. Replace a switch **(Figure 5, Item 8)** that fails either test.
8. Connect wiring to switch **(Figure 5, Item 8)** as tagged.
9. Install switch **(Figure 5, Item 8)**.
10. Close dryer door.
11. Switch the circuit breaker to ON and monitor for normal operation.

TEST-CONTINUED

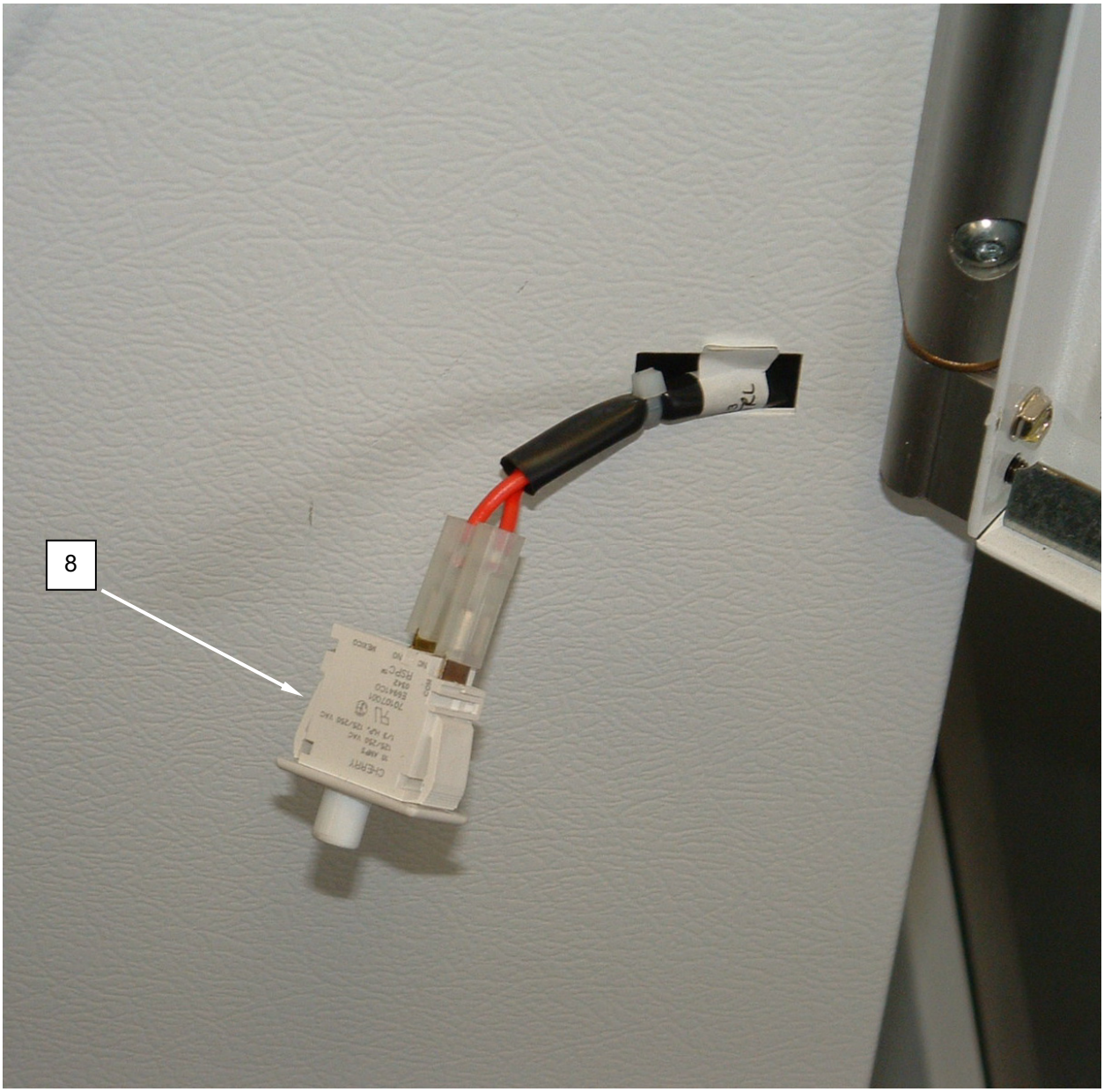


Figure 5. Test the Dryer Door Switch.

TEST-CONTINUED

Test the Control Panel

1. Run system diagnostic test on control panel by holding START **(Figure 6, Item 9)** and pressing SAVE CUSTOM **(Figure 6, Item 10)**. All LED's will then light as shown in Figure 6. Replace a control panel with inoperative LED's.

2. Hold START **(Figure 6, Item 9)** and pressing SAVE CUSTOM **(Figure 6, Item 10)** to exit the diagnostic test.

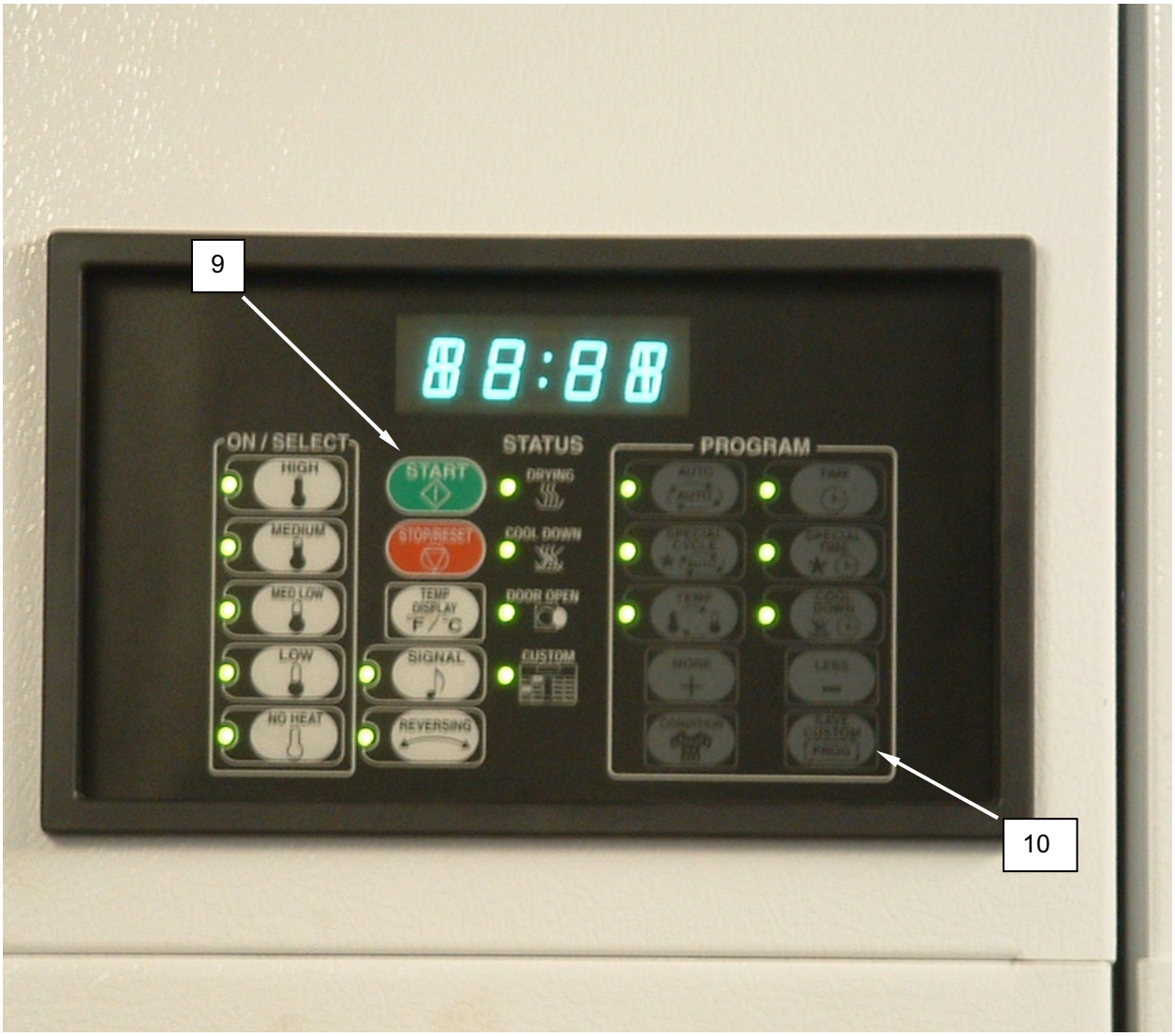


Figure 6. Test the Control Panel.

TEST-CONTINUED

Test the Control Panel Fuses

WARNING

Ensure that all dryer electrical power is shut off and disconnected before proceeding. The circuit breaker box should be locked by personnel following this procedure. Serious injury or death can result from electrocution if proper safety precautions are not observed.

1. Disconnect power by switching the dryer circuit breaker to OFF.
2. Remove the top front panel of the dryer using the dryer key.
3. Remove screws retaining control panel door, and open door.
4. Remove the secondary fuse from fuse holder **(Figure 7, Item 11)**.
5. Use an ohmmeter to test the fuse **(Figure 7, Item 11)** for continuity. Replace an open fuse.
6. Remove the primary fuse **(Figure 7, Item 12)** from the printed circuit board.
7. Use an ohmmeter to test the fuse **(Figure 7, Item 11)** for continuity. Replace an open fuse.
8. Install fuses **(Figure 7, Items 11 and 12)**.
9. Close control panel door, and secure in place with screws.
10. Install top front panel.

Figure 7. Test the Control Panel Fuses.

REPLACE

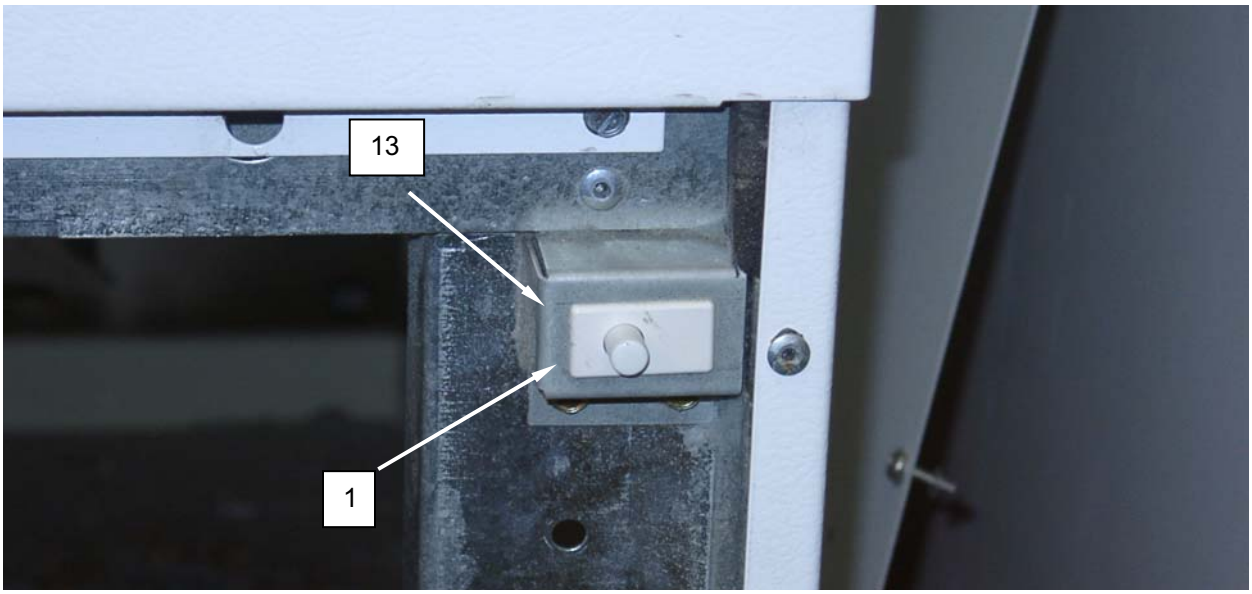
Replace the Dryer Lint Panel Switch

WARNING

Ensure that all dryer electrical power is shut off and disconnected before proceeding. The circuit breaker box should be locked by personnel following this procedure. Serious injury or death can result from electrocution if proper safety precautions are not observed.

1. Disconnect power by switching the dryer circuit breaker to OFF.
2. Remove lint panel.
3. Remove screws retaining switch bracket **(Figure 8, Item 13)**, and remove bracket from dryer.
4. Tag and disconnect wiring from switch **(Figure 8, Item 1)**.
5. Remove switch **(Figure 8, Item 2)** from bracket **(Figure 8, Item 13)** by gently prying switch from retaining clips.
6. Install replacement switch **(Figure 8, Item 1)** into bracket retaining clips.
7. Connect wiring to replacement switch **(Figure 8, Item 1)** as tagged.
8. Install bracket **(Figure 8, Item 13)** onto dryer and retain with screws.
9. Install lint panel.
10. Switch the circuit breaker to ON and monitor for normal operation.

REPLACE-CONTINUED



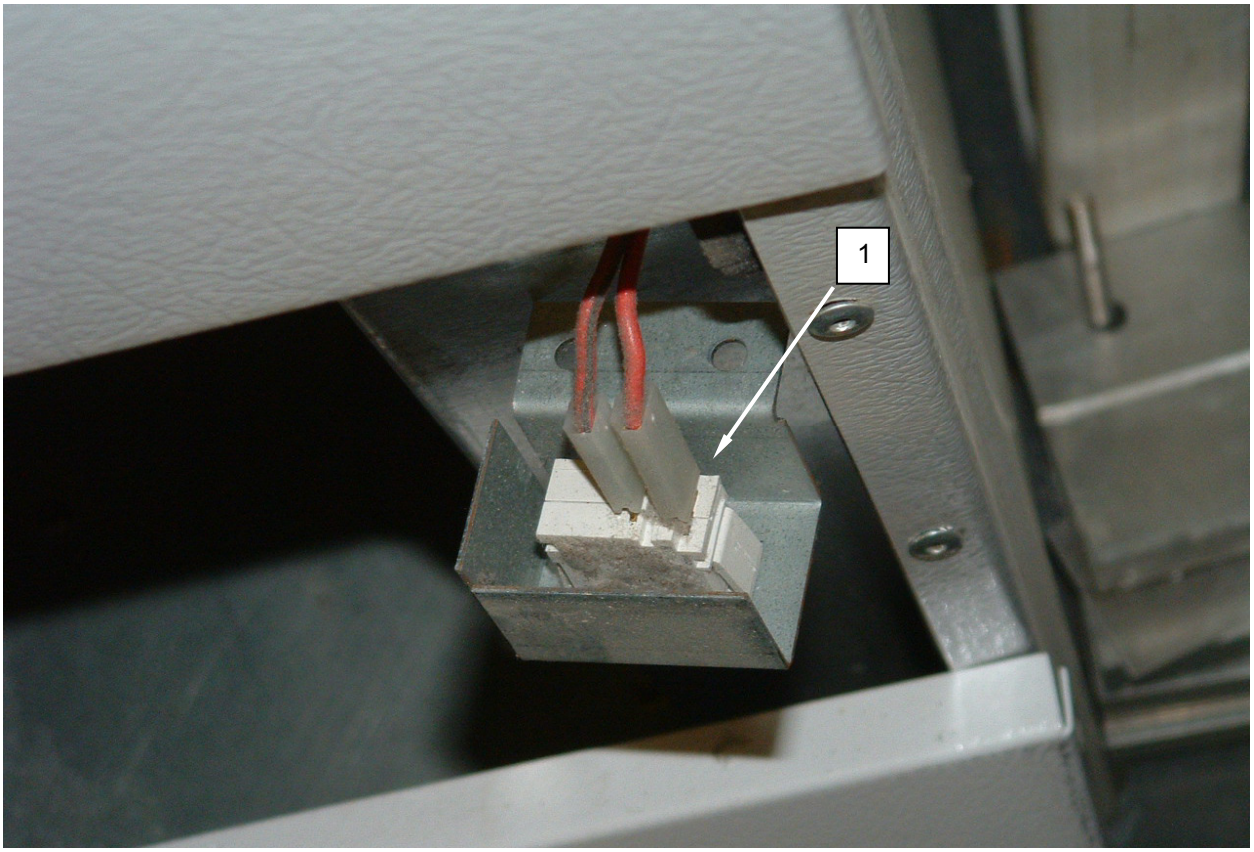


Figure 8. Replace the Dryer Lint Panel Switch.

REPLACE-CONTINUED

Replace the Lint Compartment Thermistor

WARNING

Ensure that all dryer electrical power is shut off and disconnected before proceeding. The circuit breaker box should be locked by personnel following this procedure. Serious injury or death can result from electrocution if proper safety precautions are not observed.

1. Disconnect power by switching the dryer circuit breaker to OFF.
2. Remove lint panel.
3. Remove screws retaining thermistor bracket **(Figure 9, Item 2)** and remove thermistor and bracket as an assembly.
4. Remove screws retaining thermistor guard **(Figure 9, Item 3)**, and remove guard.
5. Tag and disconnect wiring from thermistor **(Figure 9, Item 4)**.
6. Remove thermistor **(Figure 9, Item 4)** by unscrewing the thermistor from the bracket.
7. Install replacement thermistor **(Figure 9, Item 4)**.
8. Reconnect wiring to thermistor **(Figure 9, Item 4)** as tagged.
9. Install thermistor guard **(Figure 9, Item 3)** and retain with screws.
10. Install thermistor **(Figure 9, Item 4)** and bracket **(Figure 9, Item 2)** as an assembly and retain with screws.
11. Install lint panel.
12. Switch the circuit breaker to ON and monitor for normal operation.

REPLACE-CONTINUED

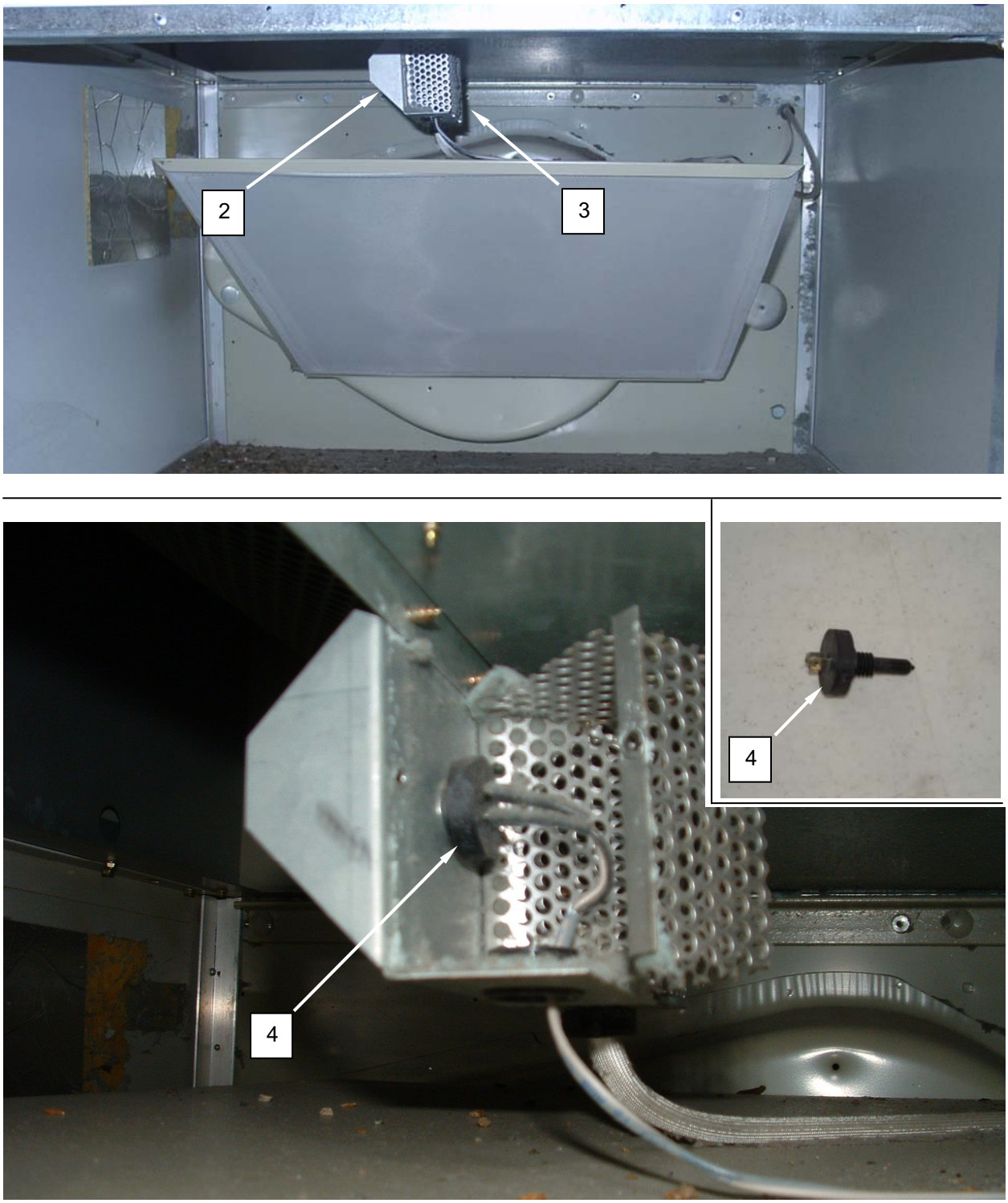


Figure 9. Replace the Lint Compartment Thermistor.

REPLACE-CONTINUED

Replace the High Limit Thermostat

WARNING

Ensure that all dryer electrical power is shut off and disconnected before proceeding. The circuit breaker box should be locked by personnel following this procedure. Serious injury or death can result from electrocution if proper safety precautions are not observed.

1. Disconnect power by switching the dryer circuit breaker to OFF.
2. Remove the top front panel of the dryer using the dryer key.
3. Tag and disconnect wiring from thermostat **(Figure 10, Item 5)**.
4. Remove the screws retaining the thermostat **(Figure 10, Item 5)** and remove the thermostat.
5. Install the replacement thermostat **(Figure 10, Item 5)** and retain with screws.
6. Connect wiring to thermostat **(Figure 10, Item 5)** as tagged.
7. Install top front panel.
8. Switch the circuit breaker to ON and monitor for normal operation.

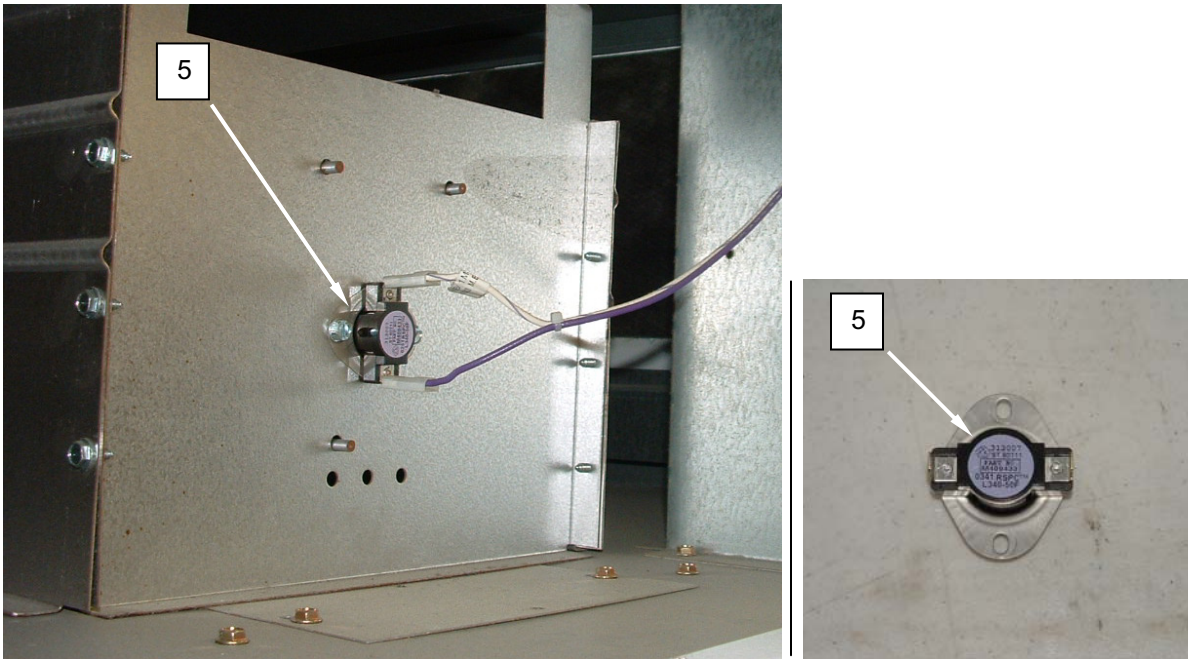


Figure 10. Replace the High Limit Thermostat.

REPLACE-CONTINUED

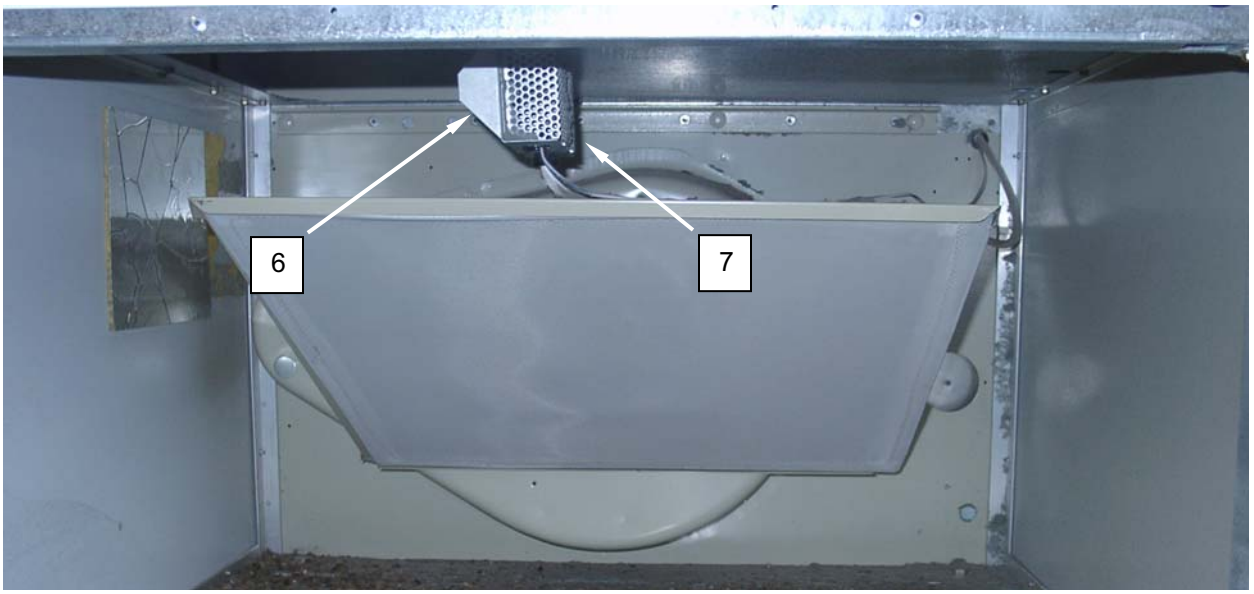
Replace the Thermostat

WARNING

Ensure that all dryer electrical power is shut off and disconnected before proceeding. The circuit breaker box should be locked by personnel following this procedure. Serious injury or death can result from electrocution if proper safety precautions are not observed.

1. Disconnect power by switching the dryer circuit breaker to OFF.
2. Remove lint panel.
3. Remove screws retaining thermostat bracket **(Figure 11, Item 6)** assembly and remove thermostat and bracket as an assembly.
4. Remove screws retaining thermostat guard **(Figure 11, Item 7)** and remove guard.
5. Tag and disconnect wiring from thermostat **(Figure 11, Item 5)**.
6. Remove screws retaining thermostat **(Figure 11, Item 5)** to bracket **(Figure 11, Item 6)** and remove thermostat.
7. Install replacement thermostat **(Figure 11, Item 5)** onto bracket **(Figure 11, Item 6)** and retain with screws.
8. Connect wiring to thermostat **(Figure 11, Item 5)** as tagged.
9. Install thermostat guard **(Figure 11, Item 7)** and retain with screws.
10. Install thermostat **(Figure 11, Item 5)** and bracket **(Figure 11, Item 6)** as an assembly and retain with screws.
11. Install lint panel.
12. Switch the circuit breaker to ON and monitor for normal operation.

REPLACE-CONTINUED



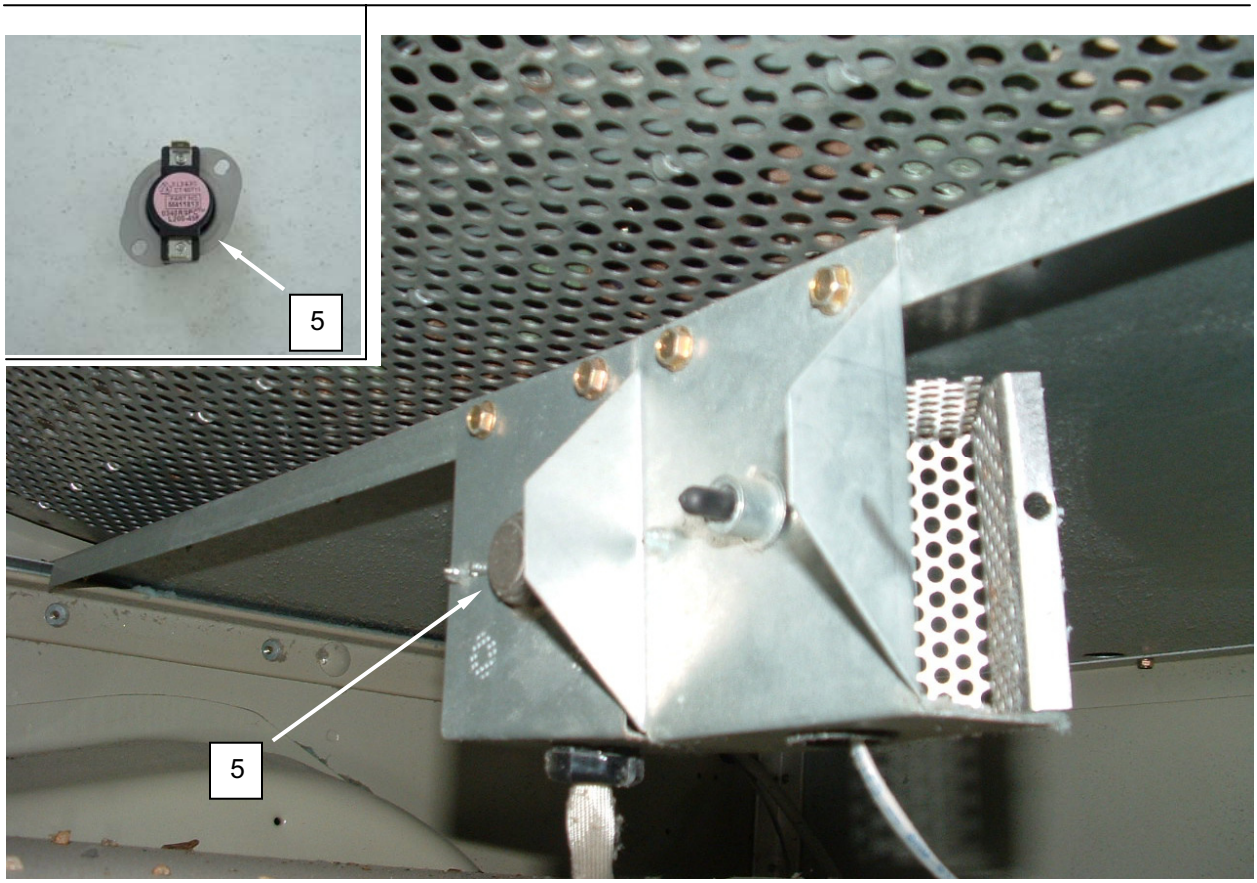


Figure 11. Replace the Thermostat.

REPLACE-CONTINUED

Replace the Dryer Door Switch

WARNING

Ensure that all dryer electrical power is shut off and disconnected before proceeding. The circuit breaker box should be locked by personnel following this procedure. Serious injury or death can result from electrocution if proper safety precautions are not observed.

1. Disconnect power by switching the dryer circuit breaker to OFF.
2. Open dryer door.
3. Remove the switch **(Figure 12, Item 8)** by prying gently with a small screwdriver.

NOTE

Do not allow wiring to fall back through switch opening. Wrap tape or a wire tie around the switch wiring if necessary to keep the wiring from falling back into the dryer.

4. Tag and disconnect wiring from switch **(Figure 12, Item 8)**.
5. Connect wiring to replacement switch **(Figure 12, Item 8)** as tagged.
6. Install switch **(Figure 12, Item 8)**.
7. Close dryer door.
8. Switch the circuit breaker to ON and monitor for normal operation.

REPLACE-CONTINUED

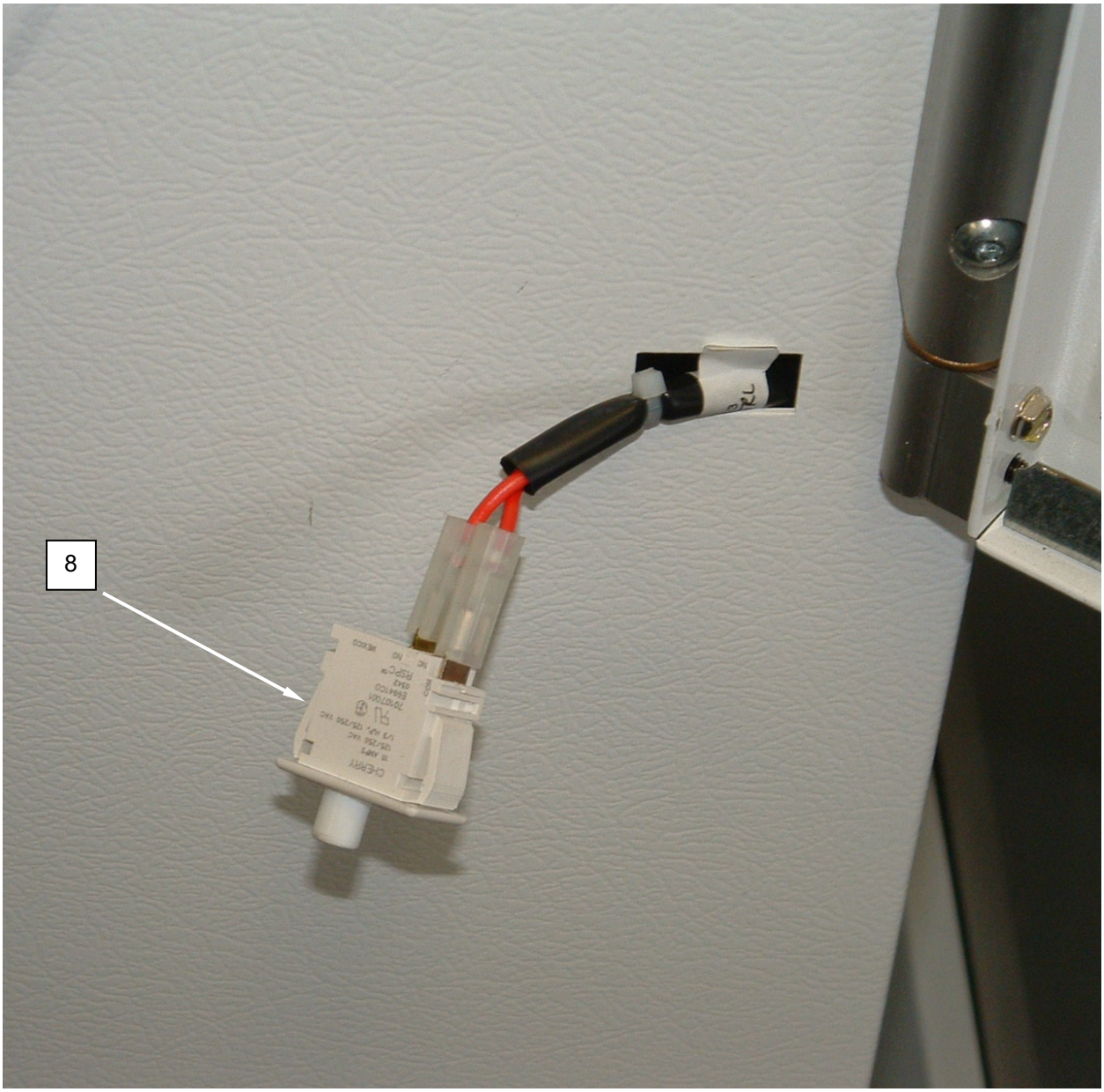


Figure 12. Replace the Dryer Door Switch.

REPLACE-CONTINUED

Replace the Control Panel

WARNING

Ensure that all dryer electrical power is shut off and disconnected before proceeding. The circuit breaker box should be locked by personnel following this procedure. Serious injury or death can result from electrocution if proper safety precautions are not observed.

1. Disconnect power by switching the dryer circuit breaker to OFF.
2. Remove the top front panel of the dryer using the dryer key.
3. Remove screws retaining control panel door, and open door.
4. Tag and disconnect wiring from control panel printed circuit board **(Figure 13, Item 14)**.
5. Remove nuts **(Figure 13, Item 15)** retaining control panel **(Figure 13, Item 16)** and remove control panel.
6. Install replacement control panel and retain with nuts **(Figure 13, Item 15)**.
7. Connect wiring to replacement control panel printed circuit board **(Figure 13, Item 14)** as tagged.
8. Close control panel door, and secure in place with screws.
9. Install top front panel.
10. Connect power and monitor for normal operation.

REPLACE-CONTINUED

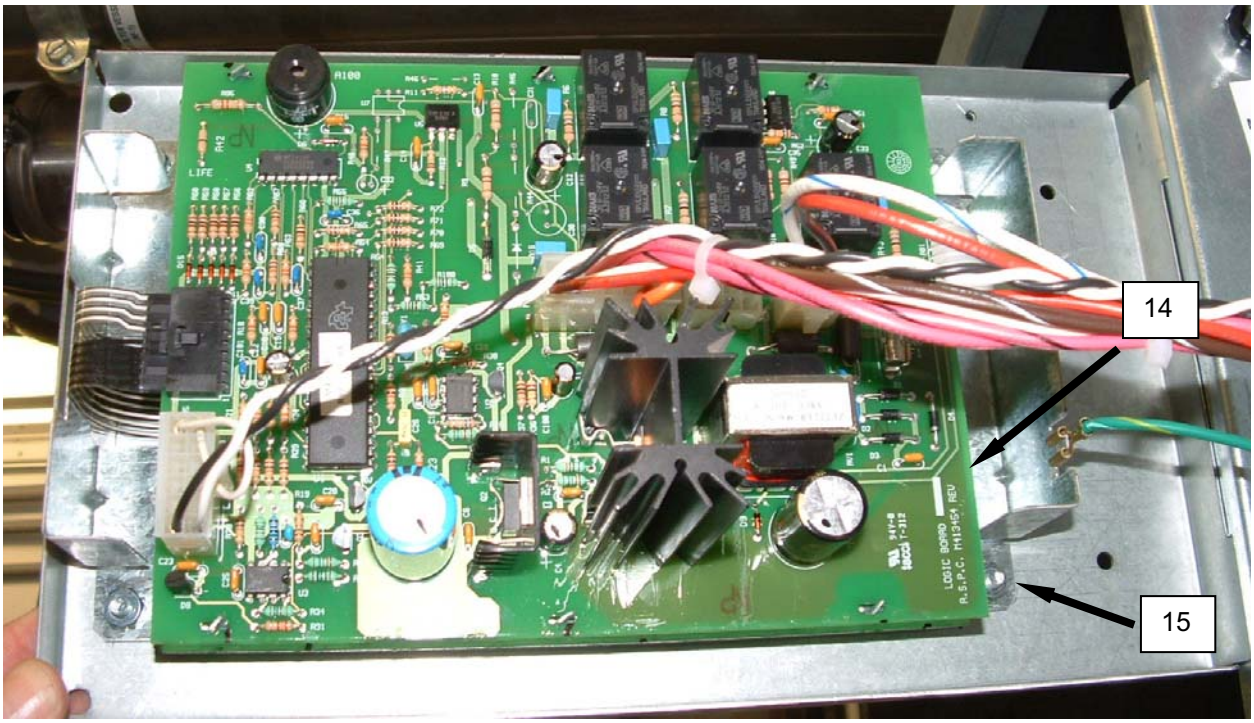


Figure 13. Replace the Control Panel Display.

REPLACE-CONTINUED

Replace the Control Panel Display Overlay

1. Disconnect power by switching the dryer circuit breaker to OFF.
2. Remove the top front panel of the dryer using the dryer key.
3. Remove overlay **(Figure 14, Item 17)** from display. Ensure all traces of the old overlay and adhesive are removed.
4. Install replacement overlay **(Figure 14, Item 17)**.
5. Connect power and monitor for normal operation.

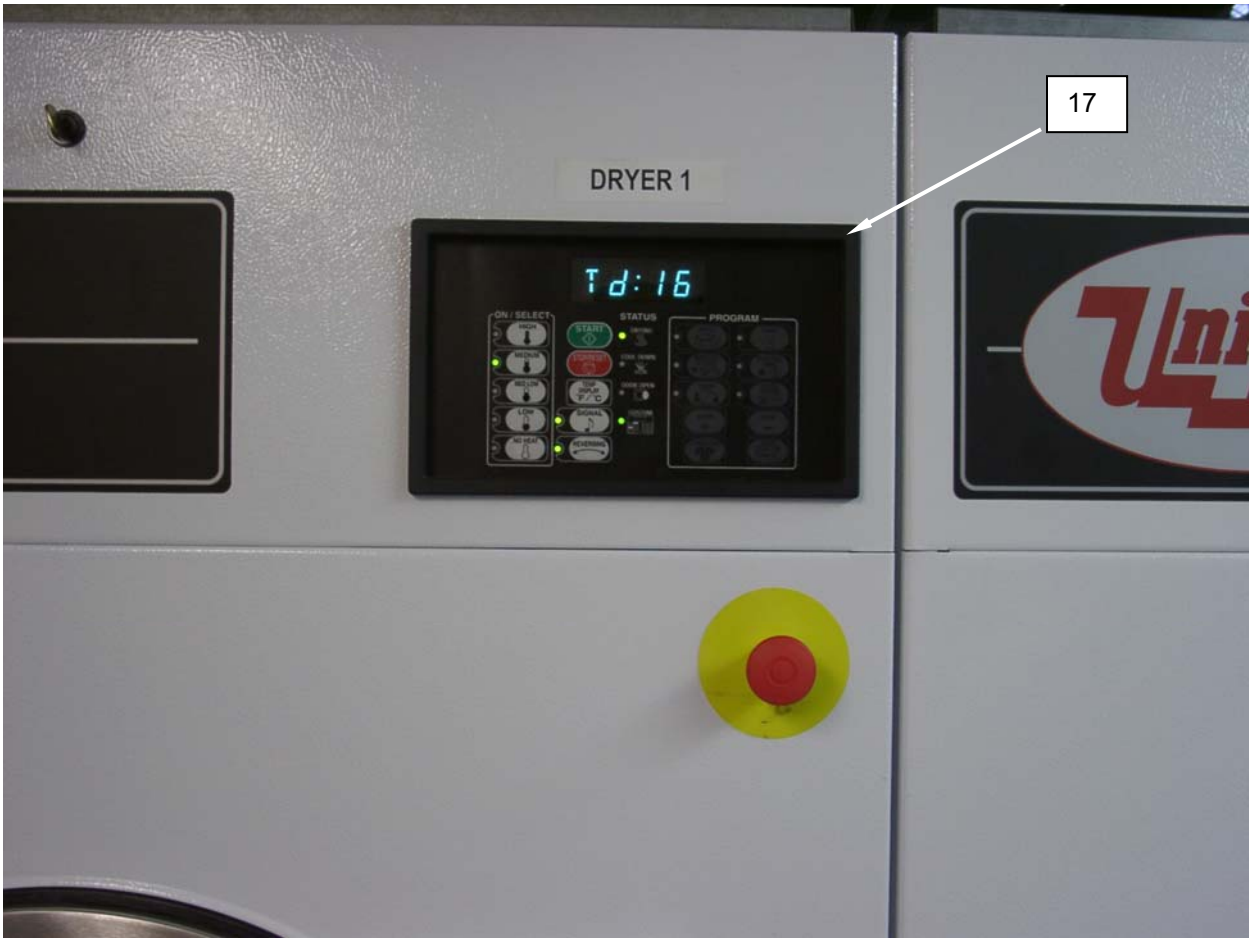


Figure 14. Replace the Control Panel Display Overlay.

REPLACE-CONTINUED

Replace the Control Panel Fuse

WARNING

Ensure that all dryer electrical power is shut off and disconnected before proceeding. The circuit breaker box should be locked by personnel following this procedure. Serious injury or death can result from electrocution if proper safety precautions are not observed.

1. Disconnect power by switching the dryer circuit breaker to OFF.
2. Remove the top front panel of the dryer using the dryer key.
3. Remove screws retaining control panel door, and open door.
4. Remove the secondary fuse from fuse holder **(Figure 15, Item 18)**.
5. Install the replacement secondary fuse into fuse holder **(Figure 15, Item 18)**
6. Remove the primary fuse **(Figure 15, Item 12)** from the printed circuit board.
7. Install the replacement primary fuse **(Figure 15, Item 12)** into the printed circuit board.
8. Close control panel door, and secure in place with screws.
9. Install top front panel.

Figure 15. Replace the Control Panel Fuses.

END OF WORK PACKAGE

UNIT MAINTENANCE
CONTAINERIZED BATCH LAUNDRY
NSN 3510-01-527-2209
NSN 3510-01-527-2210
SWITCH, EMERGENCY STOP
TEST, REPLACE

INITIAL SETUP

Tools
Tool Kit, General Mechanics: Automotive (WP 0086 00, Table 2, Item 6)

Materials/Parts
Wire Markers (WP 0087, Item 56)

Personnel Required
Quartermaster and Chemical Equipment Repairer 63J (2)

Equipment Condition
CBL set up

References
TM 10-3510-226-10

TEST

Test the Dryer Emergency Stop Switch

WARNING

Ensure that all dryer electrical power is shut off and disconnected before proceeding. The Circuit Breaker box should be locked by personnel following this procedure. Serious injury or death can result from electrocution if proper safety precautions are not observed.

1. Switch the dryer circuit breaker to OFF.
2. Remove top front panel **(Figure 1, Item 1)** and the lint compartment panel **(Figure 1, Item 2)**.
3. Open control panel **(Figure 1, Item 3)**.
4. Remove the screws retaining the door **(Figure 1, Item 4)** and remove the door.

NOTE

Remove the bottom screws retaining the dryer front first, then the side screws, and then the top screws.

NOTE

The emergency stop switch and door switch will still be connected to the dryer front.

5. Remove screws retaining dryer front **(Figure 1, Item 5)** and remove dryer front.

TEST-CONTINUED

Figure 1. Test the Dryer Emergency Stop Switch.

TEST-CONTINUED

6. Disconnect wiring from switch **(Figure 2, Item 6)**.
7. Depress switch **(Figure 2, Item 6)** to open circuit, and use an ohmmeter to test for infinite resistance.
8. Reset switch **(Figure 2, Item 6)**, and use an ohmmeter to test for 0 ohms resistance.
9. Replace a switch **(Figure 2, Item 6)** that fails either test.
10. Reconnect wiring as tagged.
11. Install dryer front **(Figure 1, Item 5)**, and retain with screws
12. Close control panel **(Figure 1, Item 3)**
13. Install door **(Figure 1, Item 4)** and retain with screws.
14. Install top front panel **(Figure 1, Item 1)** and lint compartment panel **(Figure 1, Item 2)**.
15. Connect power, operate IAW procedures given in TM 10-3510-226-10, and monitor for normal operation.

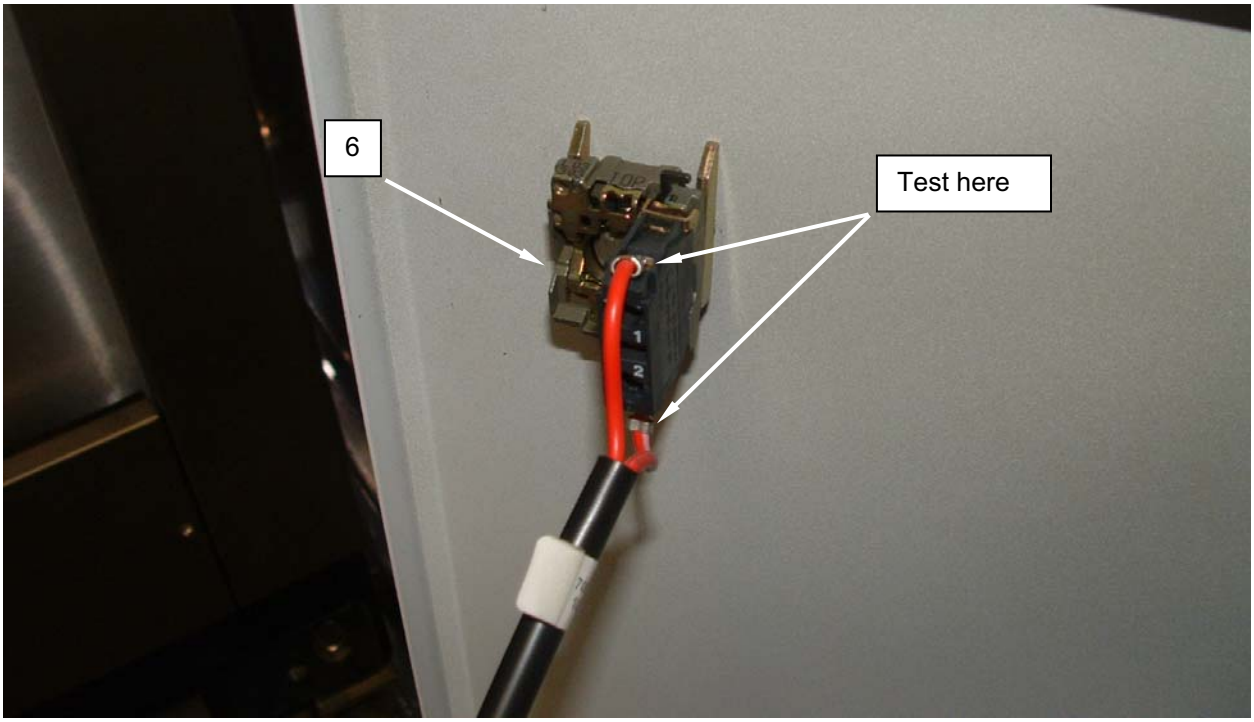


Figure 2. Test the Dryer Emergency Stop Switch.

REPLACE

Replace the Dryer Emergency Stop Switch

WARNING

Ensure that all electrical power is shut off and disconnected before proceeding. The Circuit Breaker box should be locked by personnel following this procedure. Serious injury or death can result from electrocution if proper safety precautions are not observed.

1. Switch the dryer circuit breaker to OFF.
2. Remove top front panel **(Figure 3, Item 1)** and the lint compartment panel **(Figure 3, Item 2)**.
3. Open control panel **(Figure 3, Item 3)**.
4. Remove the screws retaining the door **(Figure 3, Item 4)** and remove the door.

NOTE

Remove the bottom screws retaining the dryer front first, then the side screws, and then the top screws.

NOTE

The emergency stop switch and door switch will still be connected to the dryer front.

5. Remove screws retaining dryer front **(Figure 3, Item 5)** and remove dryer front.
6. Tag and disconnect wiring from switch **(Figure 4, Item 6)**.
7. Remove switch **(Figure 4, Item 6)** by lifting switch release lever **(Figure 4, Item 7)** and separating the two switch halves.
8. Install replacement switch **(Figure 4, Item 6)**.
9. Reconnect wiring as tagged.
10. Install dryer front **(Figure 3, Item 5)** and retain with screws
11. Close control panel **(Figure 3, Item 3)**
12. Install door **(Figure 3, Item 4)** and retain with screws.
13. Install top front panel **(Figure 3, Item 1)** and lint compartment panel **(Figure 3, Item 2)**.
14. Connect power, operate IAW procedures given in TM 10-3510-226-10, and monitor for normal operation.

REPLACE-CONTINUED

Figure 3. Replace the Dryer Emergency Stop Switch.

REPLACE-CONTINUED

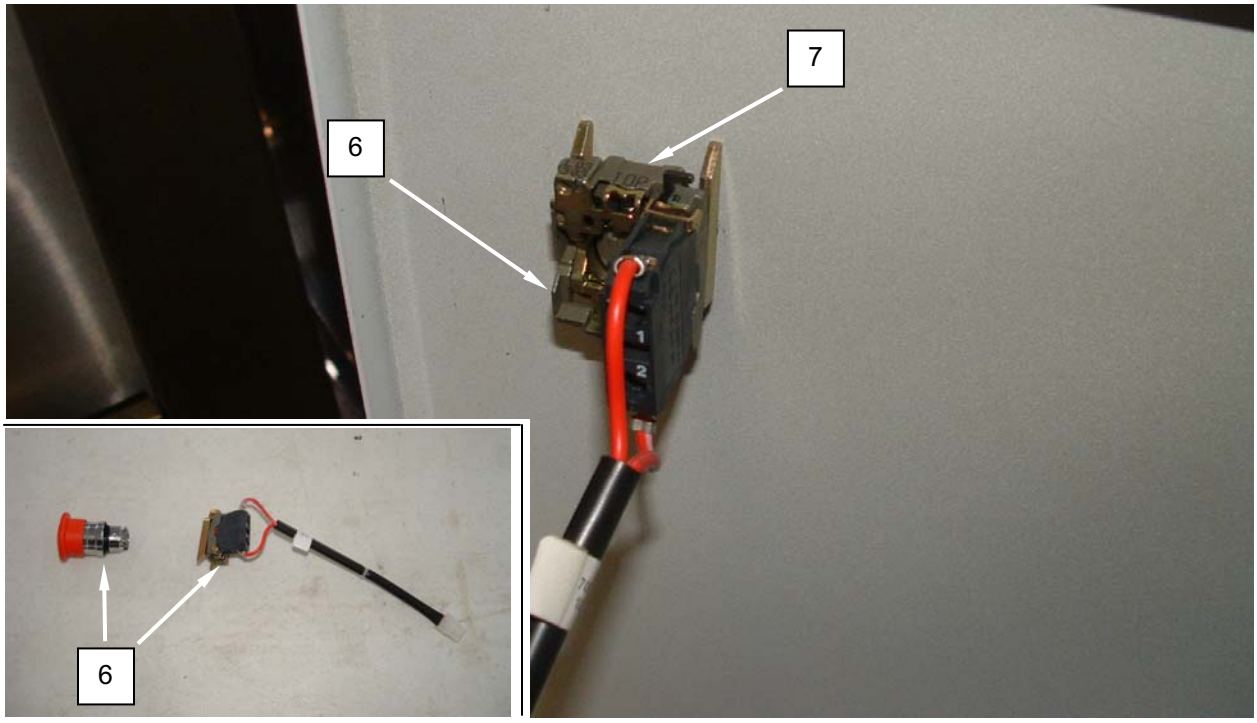


Figure 4. Replace the Dryer Emergency Stop Switch.

END OF WORK PACKAGE

UNIT MAINTENANCE
CONTAINERIZED BATCH LAUNDRY
NSN 3510-01-527-2209
NSN 3510-01-527-2210
ELEMENTS, HEATING
TEST, REPLACE

INITIAL SETUP

Tools
Tool Kit, General Mechanics: Automotive (WP 0086 00, Table 2, Item 6)

Materials/Parts
Wire Markers (WP 0087, Item 58)

Personnel Required
Quartermaster and Chemical Equipment Repairer 63J (1)

Equipment Condition
CBL set up

References
TM 10-3510-226-10

TEST

Test the Dryer Heating Elements

WARNING

Ensure that all dryer electrical power is shut off and disconnected before proceeding. The circuit breaker box or individual circuit breaker should be locked and tagged out by personnel following this procedure. Remember that the CBL is a wet environment. Serious injury or death to personnel can result from electrocution if proper safety precautions are not observed.

1. Disconnect power by switching the dryer circuit breaker to OFF.
2. Remove the screws retaining the perforated element guard, and remove the guard.
3. Tag and disconnect the wiring from the element terminals **(Figure 1, Item 1)**. Reinstall the terminal nuts **(Figure 1, Item 2)** for testing.
4. Use an ohmmeter to check for 4 ohms resistance between element terminals **(Figure 1, Item 1)** as indicated in Figure 1.
5. Use an ohmmeter to test for infinite resistance between each element terminal **(Figure 1, Item 1)** and ground.
6. Replace elements that are open or shorted.
7. Remove terminal nuts **(Figure 1, Item 2)** and reconnect wiring as tagged.
8. Install perforated element guard, and retain with screws.
9. Connect power, operate IAW procedures given in TM 10-3510-226-10, and monitor for normal operation.

TEST-CONTINUED

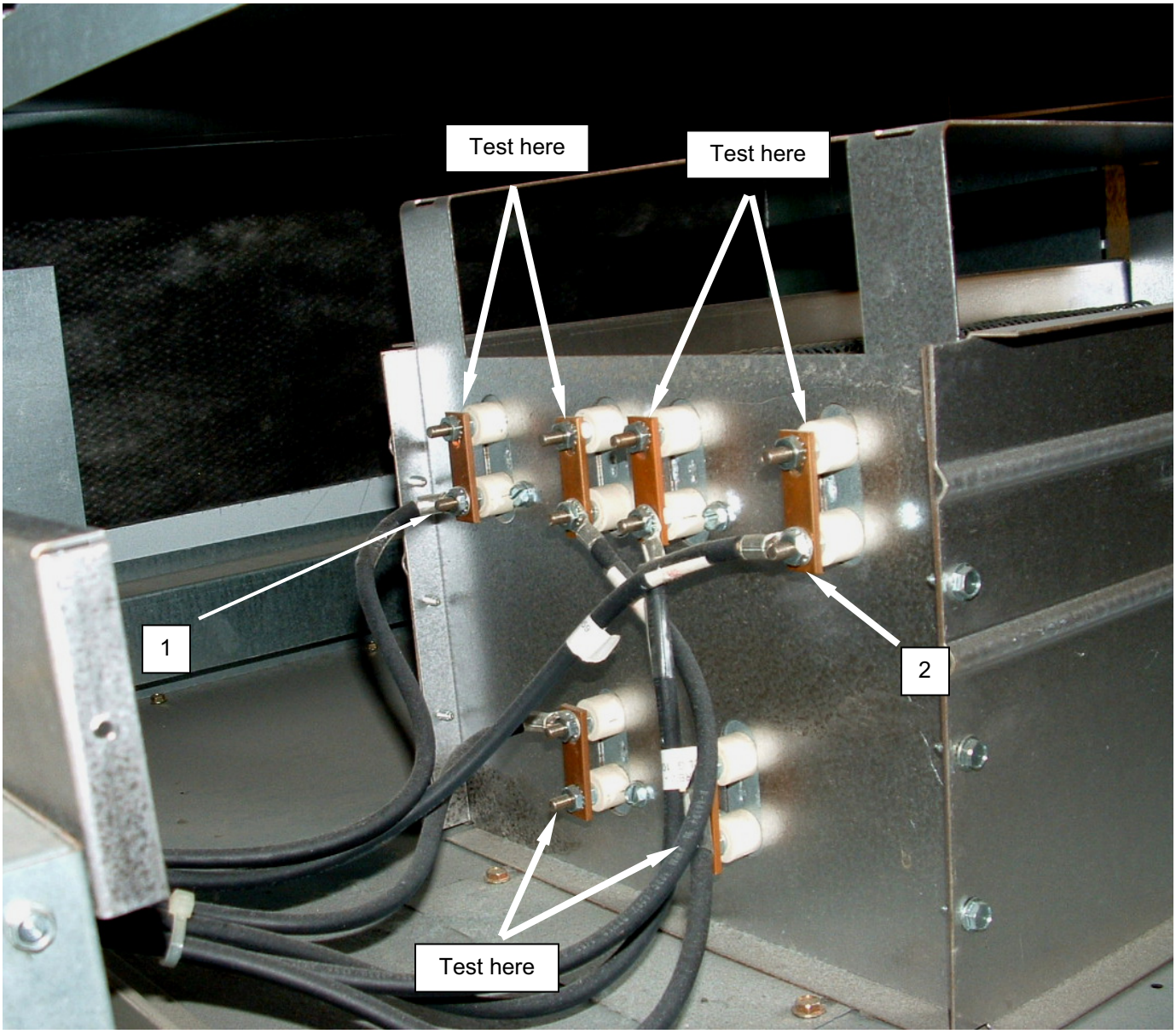


Figure 1. Test the Dryer Heating Elements.

REPLACE

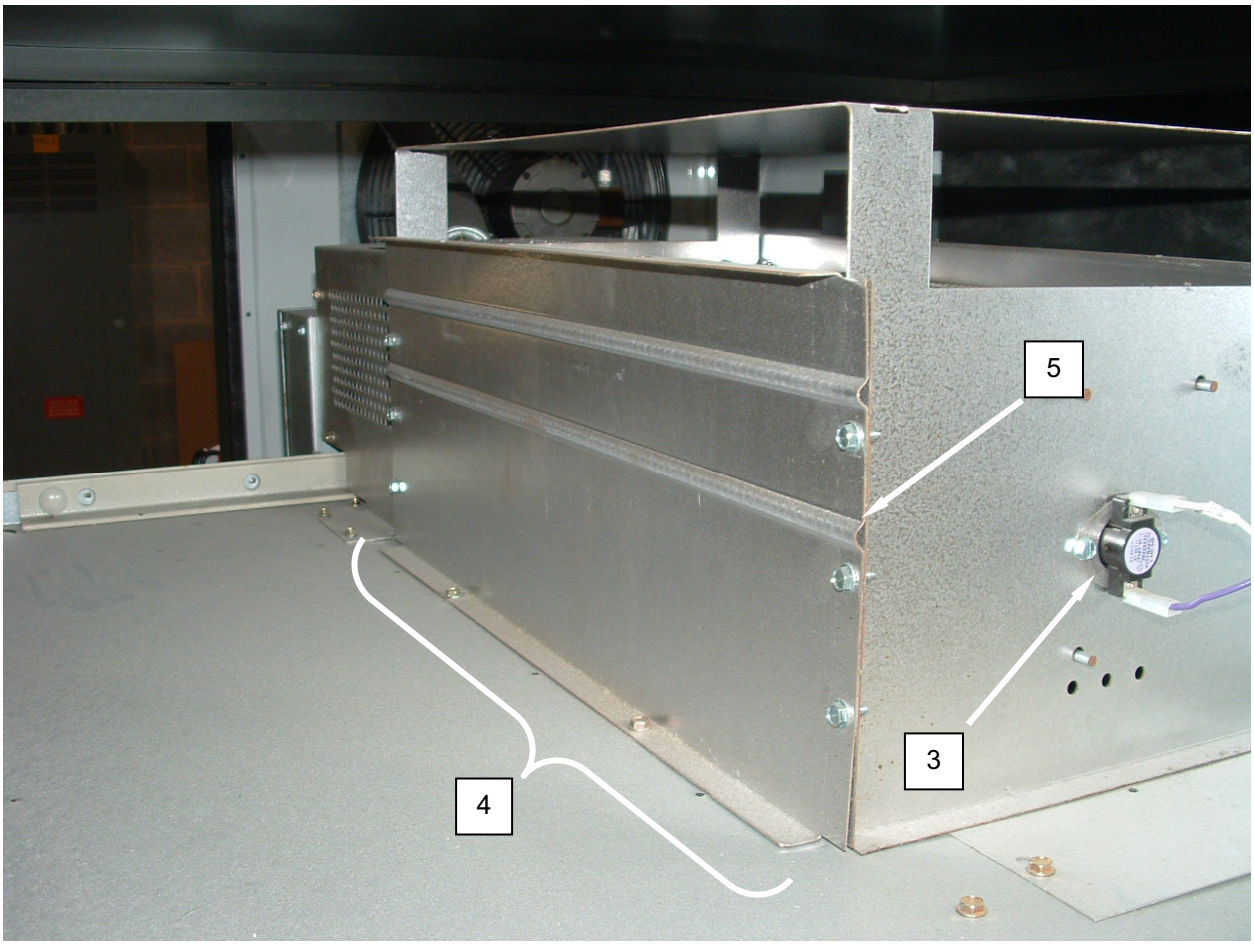
Replace the Dryer Heating Elements

WARNING

Ensure that all dryer electrical power is shut off and disconnected before proceeding. The circuit breaker box or individual circuit breaker should be locked and tagged out by personnel following this procedure. Remember that the CBL is a wet environment. Serious injury or death to personnel can result from electrocution if proper safety precautions are not observed.

1. Disconnect power by switching the dryer circuit breaker to OFF.
2. Remove the top front panel of the dryer using the dryer key.
3. Disconnect the wiring from the high limit thermostat **(Figure 2, Item 3)**.
4. Remove the screws retaining the perforated element guard, and remove the guard.
5. Tag and disconnect the wiring from the elements **(Figure 2, Item 1)**.
6. Remove the screws retaining the element assembly **(Figure 2, 3, Item 4)**, and remove the element assembly.
7. Remove the side covers **(Figure 2, 3, Item 5)** from the element assembly **(Figure 2, 3, Item 4)**.
8. Remove the screws retaining the element **(Figure 3, Item 6)** to be replaced, and remove the element. Retain the copper bus bars **(Figure 2, Item 7)** for installation on the replacement element
9. Install the retained copper bus bars **(Figure 2, Item 7)** on the replacement element, and install the replacement element **(Figure 3, Item 6)** into the element assembly **(Figure 2, 3, Item 4)**, and retain with screws.
10. Install the side covers **(Figure 2, 3, Item 5)** onto the element assembly **(Figure 2, 3, Item 4)**.
11. Install the replacement element assembly **(Figure 2, Item 4)**, and retain with screws.
12. Connect wiring to elements **(Figure 2, Item 1)** as tagged.
13. Reconnect wiring to high limit thermostat, and install the top front panel of the dryer.
14. Install perforated element guard, and retain with screws.
15. Connect power, operate IAW procedures given in TM 10-3510-226-10, and monitor for normal operation.

REPLACE-CONTINUED



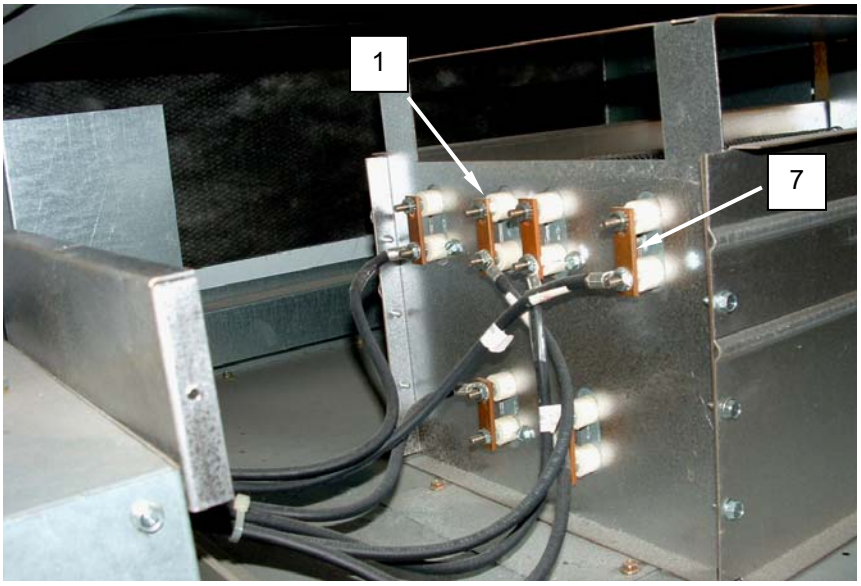
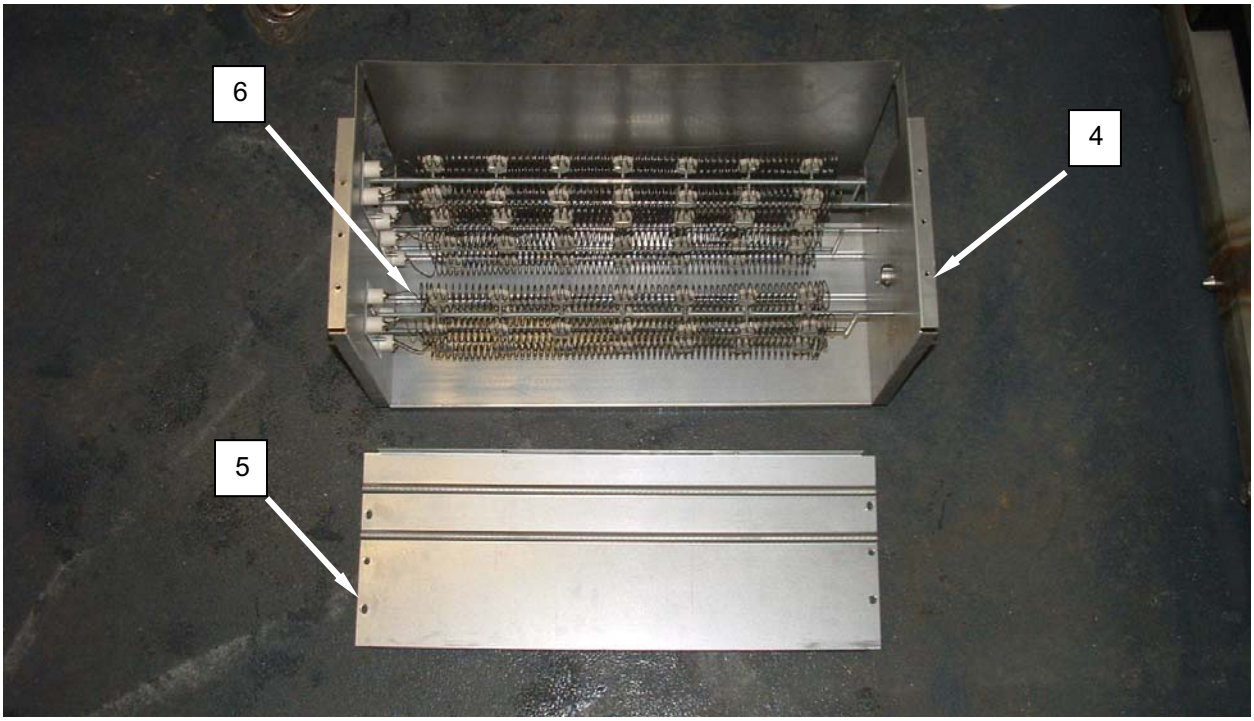


Figure 2. Replace the Dryer Heating Elements.

REPLACE-CONTINUED



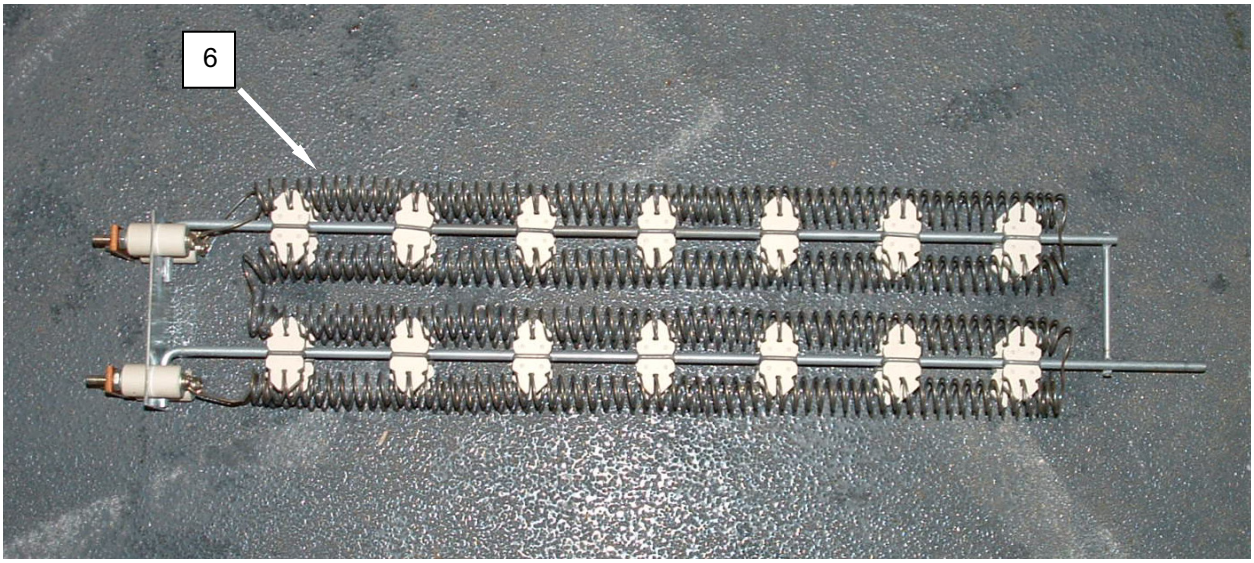


Figure 3. Replace the Dryer Heating Elements.

END OF WORK PACKAGE

UNIT MAINTENANCE
CONTAINERIZED BATCH LAUNDRY
NSN 3510-01-527-2209
NSN 3510-01-527-2210
DRYER BELTS, DRIVE
INSPECT, ADJUST, REPLACE

INITIAL SETUP

Tools
Tool Kit, General Mechanics: Automotive (WP 0086 00, Table 2, Item 6)

Materials/Parts
None Required

Personnel Required
Quartermaster and Chemical Equipment Repairer 63J (1)

Equipment Condition
CBL set up

References
TM 10-3510-226-10

INSPECT

Inspect the Dryer Drive Belts

WARNING

Ensure that all dryer electrical power is shut off and disconnected before proceeding. The circuit breaker box or individual circuit breaker should be locked and tagged out by personnel following this procedure. Remember that the CBL is a wet environment. Serious injury or death to personnel can result from electrocution if proper safety precautions are not observed.

WARNING

Ensure that the dryer power is shut off and disconnected before proceeding. Rotating machinery and belts may snag fingers, hair, or clothing. Failure to observe safety precautions may result in serious injury or death to personnel.

1. Disconnect power by switching the dryer circuit breaker to OFF.
2. Remove screws retaining belt guard and remove belt guard.
3. Inspect each belt **(Figure 1, Item 1)** for approximately ½ -inch deflection.
4. Inspect each belt **(Figure 1, Item 1)** for glazing, cuts, and shredding.
5. Adjust belts **(Figure 1, Item 1)** with improper deflection.
6. Replace belts **(Figure 1, Item 1)** with physical damage or which cannot be adjusted.
7. Install belt guard, and retain with screws.
8. Connect power, operate IAW procedures given in TM 10-3510-226-10, and monitor for normal operation.

INSPECT-CONTINUED

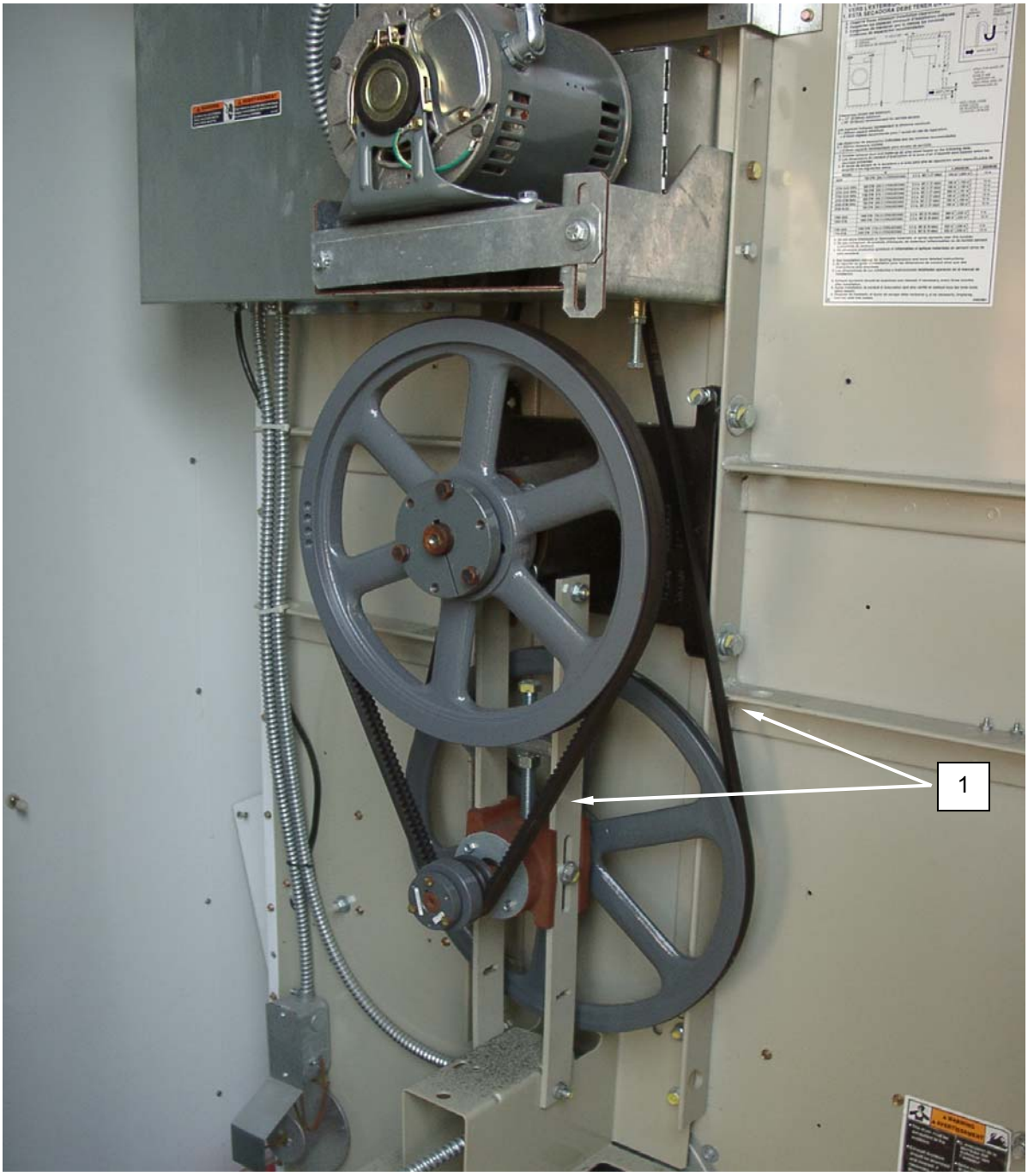


Figure 1. Inspect the Dryer Drive Belts.

ADJUST

Adjust the Dryer Drive Belts

WARNING

Ensure that all dryer electrical power is shut off and disconnected before proceeding. The circuit breaker box or individual circuit breaker should be locked and tagged out by personnel following this procedure. Remember that the CBL is a wet environment. Serious injury or death to personnel can result from electrocution if proper safety precautions are not observed.

WARNING

Ensure that the dryer power is shut off and disconnected before proceeding. Rotating machinery and belts may snag fingers, hair, or clothing. Failure to observe safety precautions may result in serious injury or death to personnel.

1. Disconnect power by switching the dryer circuit breaker to OFF.

2. Remove screws retaining belt guard, and remove belt guard.

3. Adjust outer belt **(Figure 2, Item 2)** first by loosening pulley adjusting screws **(Figure 2, Item 3)**, increasing or easing tension on belt by moving idler housing **(Figure 2, Item 4)** up or down, and locking idler housing in place. A correctly adjusted belt should have approximately ½-inch deflection.

4. Adjust inner belt **(Figure 2, Item 5)** by loosening motor adjustment **(Figure 2, Item 6)**, increasing or easing tension as necessary by moving motor up or down, and locking motor in place. A correctly adjusted belt should have approximately ½-inch deflection.

5. Recheck all belt tensions after completing last adjustment.

6. Install belt guard and retain with screws.

7. Connect power, operate IAW procedures given in TM 10-3510-226-10, and monitor for normal operation.

ADJUST-CONTINUED

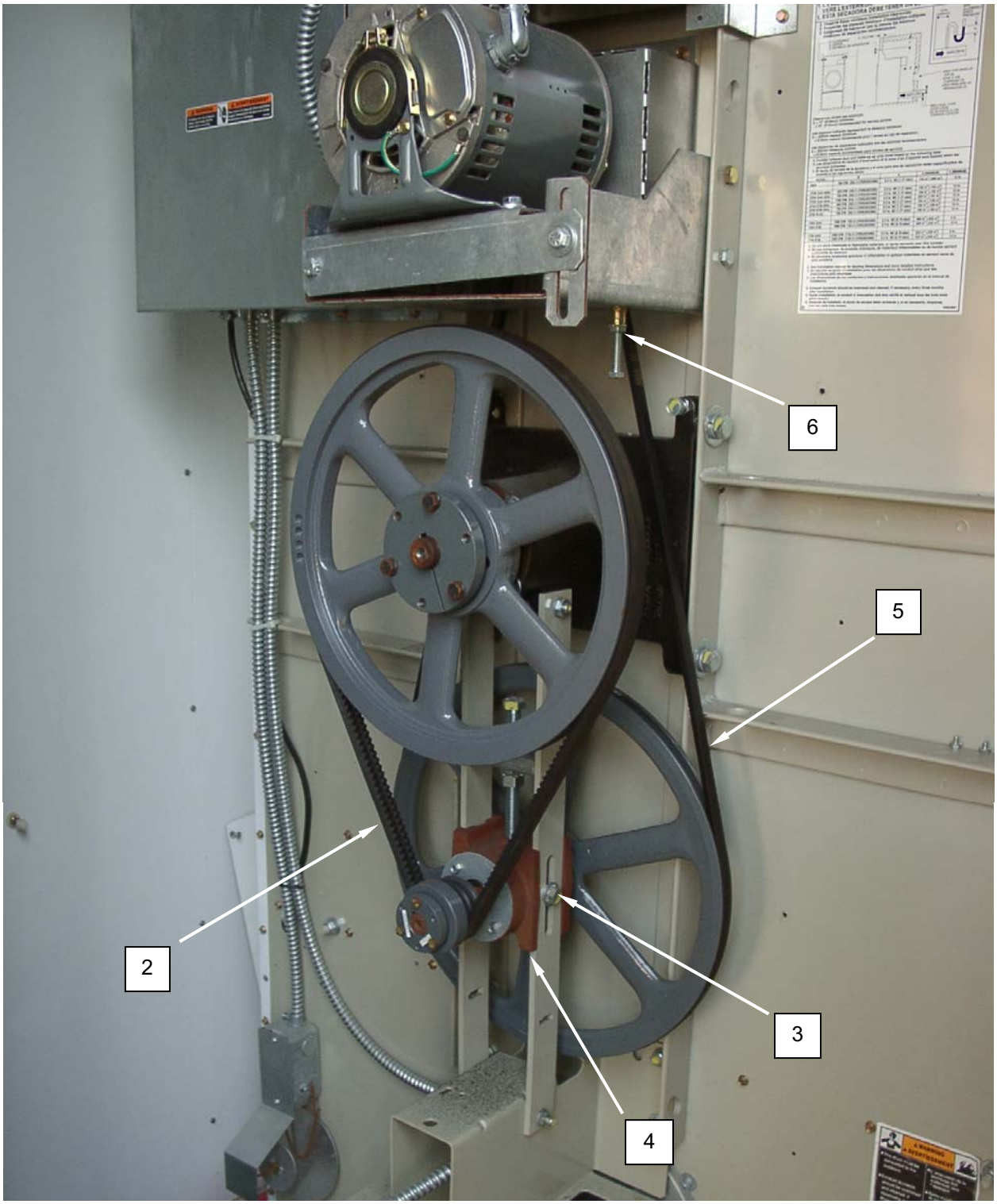


Figure 2. Adjust the Dryer Drive Belts.

REPLACE

Replace the Dryer Drive Belts

WARNING

Ensure that all dryer electrical power is shut off and disconnected before proceeding. The circuit breaker box or individual circuit breaker should be locked and tagged out by personnel following this procedure. Remember that the CBL is a wet environment. Serious injury or death to personnel can result from electrocution if proper safety precautions are not observed.

WARNING

Ensure that the dryer power is shut off and disconnected before proceeding. Rotating machinery and belts may snag fingers, hair, or clothing. Failure to observe safety precautions may result in serious injury or death to personnel.

NOTE

Replace the belts as a set.

1. Disconnect power by switching the dryer circuit breaker to OFF.
2. Remove screws retaining the belt guard and remove belt guard.
3. Loosen screws retaining the idler housing **(Figure 3, Item 4)** and release tension from outer belt **(Figure 3, Item 2)**.
4. Remove outer belts **(Figure 3, Item 2)**.
5. Remove the lower bolt **(Figure 3, Item 7)** from the idler housing **(Figure 3, Item 4)** and allow the idler housing to swing out.
6. Remove inner belt **(Figure 3, Item 5)**.
7. Install replacement inner belt **(Figure 3, Item 5)**.
8. Position the idler housing **(Figure 3, Item 4)** back in place and retain with the lower bolt **(Figure 3, Item 7)**.
9. Install replacement outer belts **(Figure 3, Item 2)**.
10. Adjust belts.
11. Install belt guard and retain with screws.
12. Connect power, operate IAW procedures given in TM 10-3510-226-10, and monitor for normal operation.

REPLACE-CONTINUED

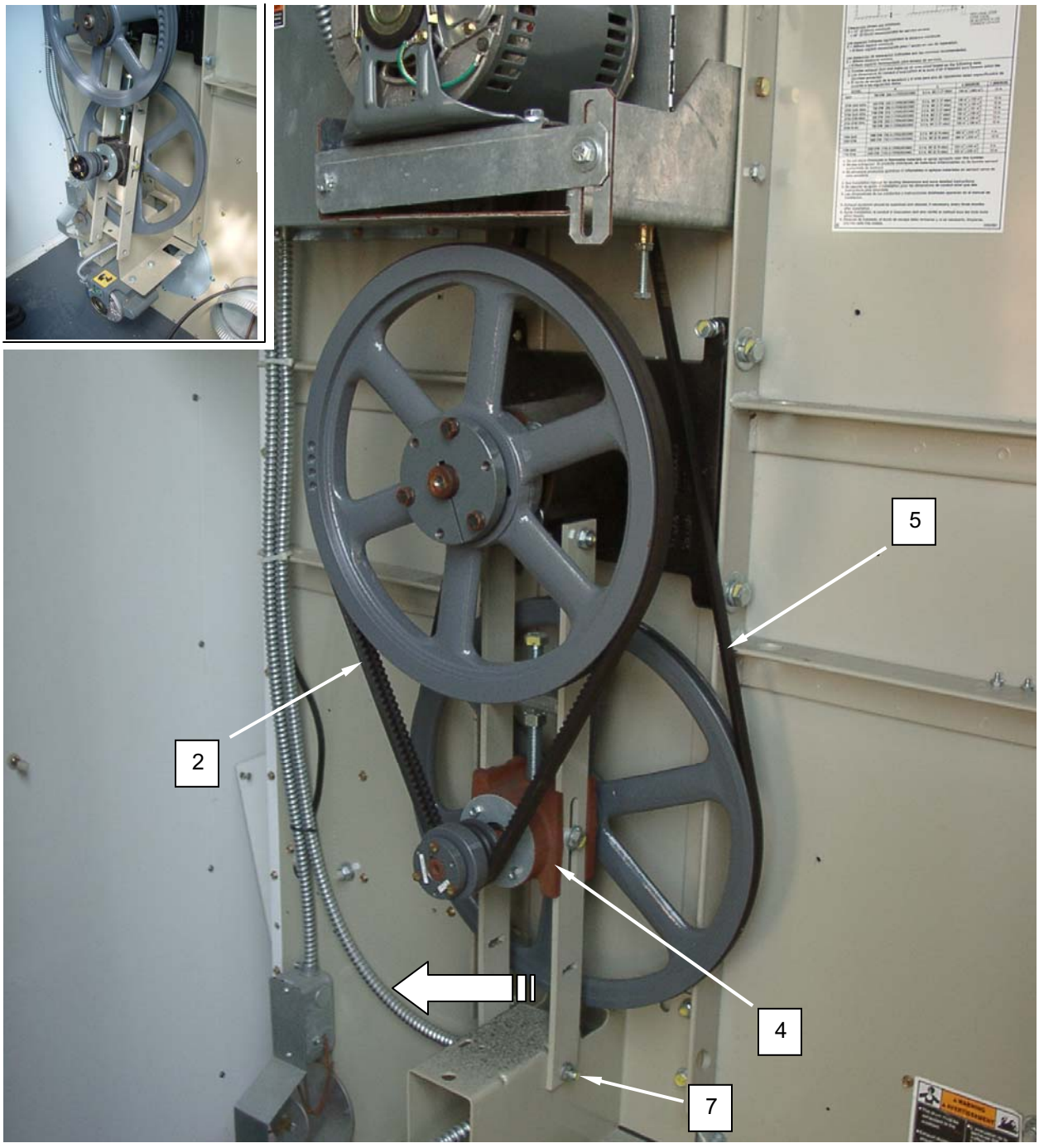


Figure 3. Replace the Dryer Drive Belts.

END OF WORK PACKAGE

UNIT MAINTENANCE
CONTAINERIZED BATCH LAUNDRY
NSN 3510-01-527-2209
NSN 3510-01-527-2210
MOTOR, CYLINDER DRIVE
MOTOR, FAN
TEST, REPLACE

INITIAL SETUP

Tools
Tool Kit, General Mechanics: Automotive (WP 0086 00, Table 2, Item 6)

Materials/Parts
Wire Markers (WP 0087 00, Item 58)

Personnel Required
Quartermaster and Chemical Equipment Repairer 63J (1)

Equipment Condition
CBL set up

References
TM 10-3510-226-10
WP 0066 00

TEST

Test the Cylinder Drive Motor

WARNING

Ensure that all dryer electrical power is shut off and disconnected before proceeding. The circuit breaker box or individual circuit breaker should be locked and tagged out by personnel following this procedure. Remember that the CBL is a wet environment. Serious injury or death to personnel can result from electrocution if proper safety precautions are not observed.

WARNING

Ensure that the dryer power is shut off and disconnected before proceeding. Rotating machinery and belts may snag fingers, hair, or clothing. Failure to observe safety precautions may result in serious injury or death to personnel.

1. Disconnect power by switching the dryer circuit breaker to OFF.
2. Remove screws retaining junction box cover **(Figure 1, Item 1)** and remove junction box cover.
3. Tag and disconnect wiring from motor **(Figure 1, Item 2)**.
4. Use an ohmmeter to check for 10 to 12 ohms resistance between motor terminals.
5. Use an ohmmeter to check for infinite resistance between each motor terminal and ground.
6. Replace an open or shorted motor **(Figure 1, Item 2)**.
7. Reconnect wiring as tagged.
8. Install junction box cover **(Figure 1, Item 1)** and retain with screws.

TEST-CONTINUED

9. Connect power, operate IAW procedures given in TM 10-3510-226-10, and monitor for normal operation.

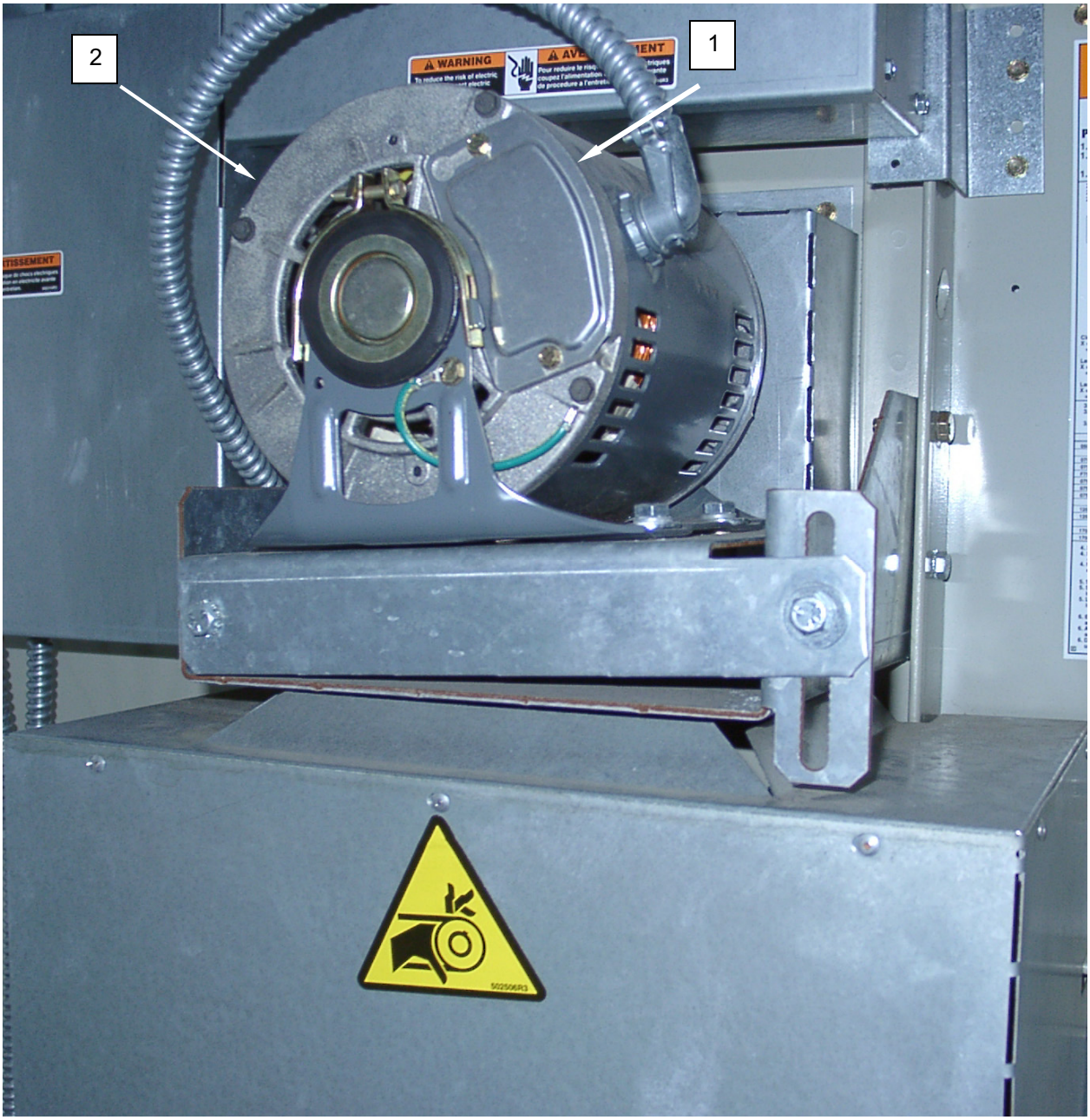


Figure 1. Test the Cylinder Drive Motor.

TEST-CONTINUED

Test the Fan Motor

WARNING

Ensure that all dryer electrical power is shut off and disconnected before proceeding. The circuit breaker box or individual circuit breaker should be locked and tagged out by personnel following this procedure. Remember that the CBL is a wet environment. Serious injury or death to personnel can result from electrocution if proper safety precautions are not observed.

WARNING

Ensure that the dryer power is shut off and disconnected before proceeding. Rotating machinery and belts may snag fingers, hair, or clothing. Failure to observe safety precautions may result in serious injury or death to personnel.

1. Disconnect power.
2. Remove screws retaining contactor box cover and remove cover.
3. Locate the fan contactor **(Figure 1, Item 3)**.
4. Tag and disconnect wires **(Figure 1, Item 4)** from T1 and T2.
5. Use an ohmmeter to test for 4 ohms resistance between disconnected wires **(Figure 1, Item 4)**.
6. Use an ohmmeter to test for infinite resistance between each disconnected wire **(Figure 1, Item 4)** and ground.
7. Replace an open or shorted motor.
8. Connect wiring **(Figure 1, Item 4)** as tagged.
9. Install contactor box cover and retain with screws.
10. Connect power, operate IAW procedures given in TM 10-3510-226-10 and monitor for normal operation.

TEST-CONTINUED

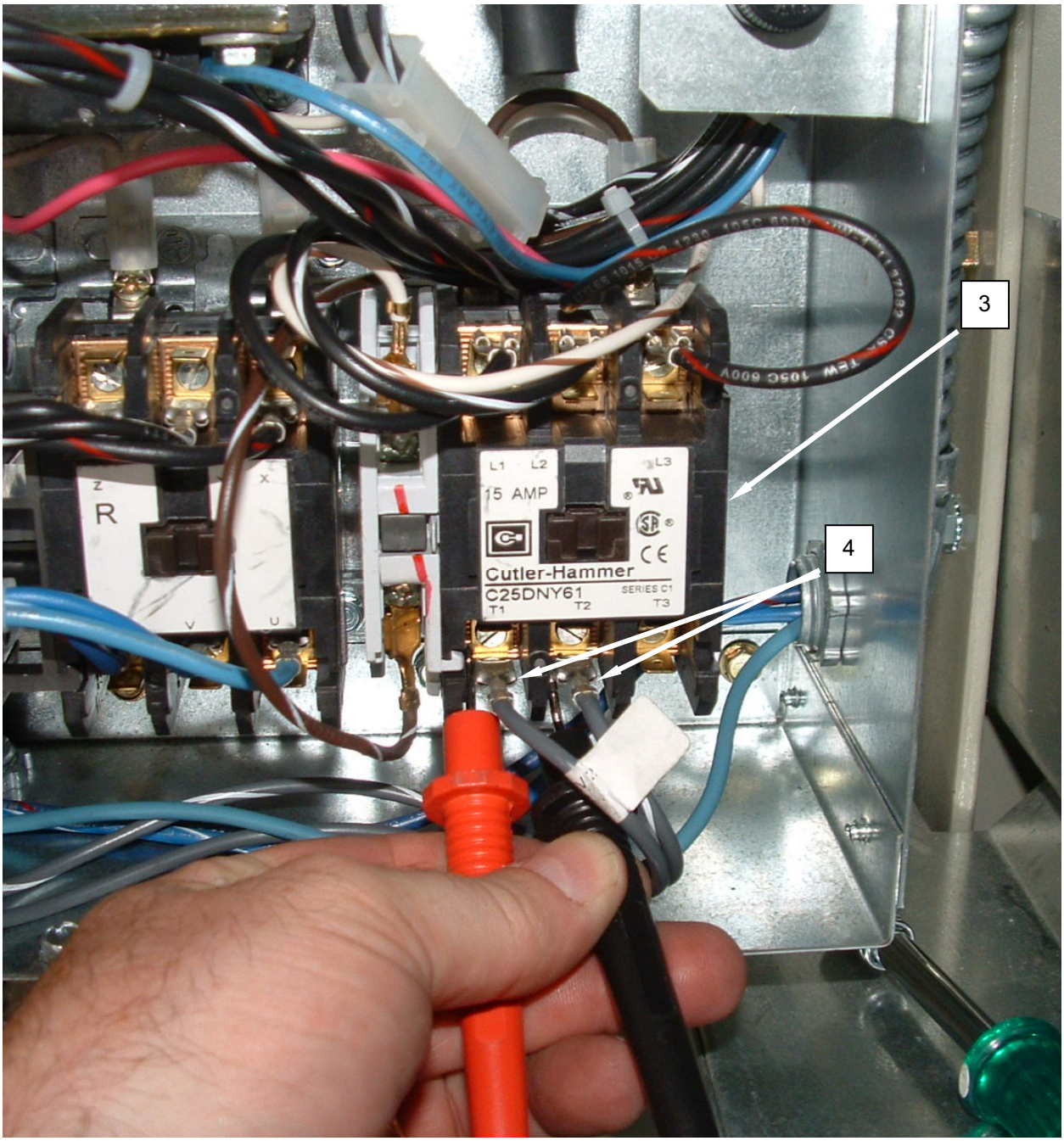


Figure 2. Test the Fan Motor.

REPLACE

Replace the Cylinder Drive Motor

WARNING

Ensure that all dryer electrical power is shut off and disconnected before proceeding. The circuit breaker box or individual circuit breaker should be locked and tagged out by personnel following this procedure. Remember that the CBL is a wet environment. Serious injury or death to personnel can result from electrocution if proper safety precautions are not observed.

WARNING

Ensure that the dryer power is shut off and disconnected before proceeding. Rotating machinery and belts may snag fingers, hair, or clothing. Failure to observe safety precautions may result in serious injury or death to personnel.

1. Disconnect power by switching the dryer circuit breaker to OFF.
2. Remove screws retaining belt guard and remove belt guard.
3. Remove screws retaining junction box cover **(Figure 3, Item 1)** and remove junction box cover.
4. Tag and disconnect wiring from motor **(Figure 3, Item 2)**.
5. Remove conduit locknut, and remove conduit **(Figure 3, Item 5)** from junction box.
6. Adjust motor to relieve tension on belt **(Figure 3, Item 6)**.
7. Remove screws, washers, and nuts retaining motor **(Figure 3, Item 2)** to motor mount and remove motor.
8. Install replacement motor **(Figure 3, Item 2)**, and secure in place with screws, washers, and nuts.
9. Install inner belt **(Figure 3, Item 7)** onto replacement motor **(Figure 3, Item 2)** and adjust to ½-inch deflection.
10. Remove screws retaining junction box cover **(Figure 3, Item 1)** on replacement motor **(Figure 3, Item 2)**, and remove cover.
11. Knock out conduit plug, if necessary.
12. Install conduit **(Figure 3, Item 5)** into junction box, and retain with locknut.
13. Connect wiring to replacement motor **(Figure 3, Item 2)** as tagged.
14. Install junction box cover **(Figure 3, Item 1)** onto replacement motor **(Figure 3, Item 2)**, and retain with screws.
15. Install belt guard and retain with screws.

REPLACE-CONTINUED

16. Connect power, operate IAW procedures given in TM 10-3510-226-10, and monitor for normal operation.

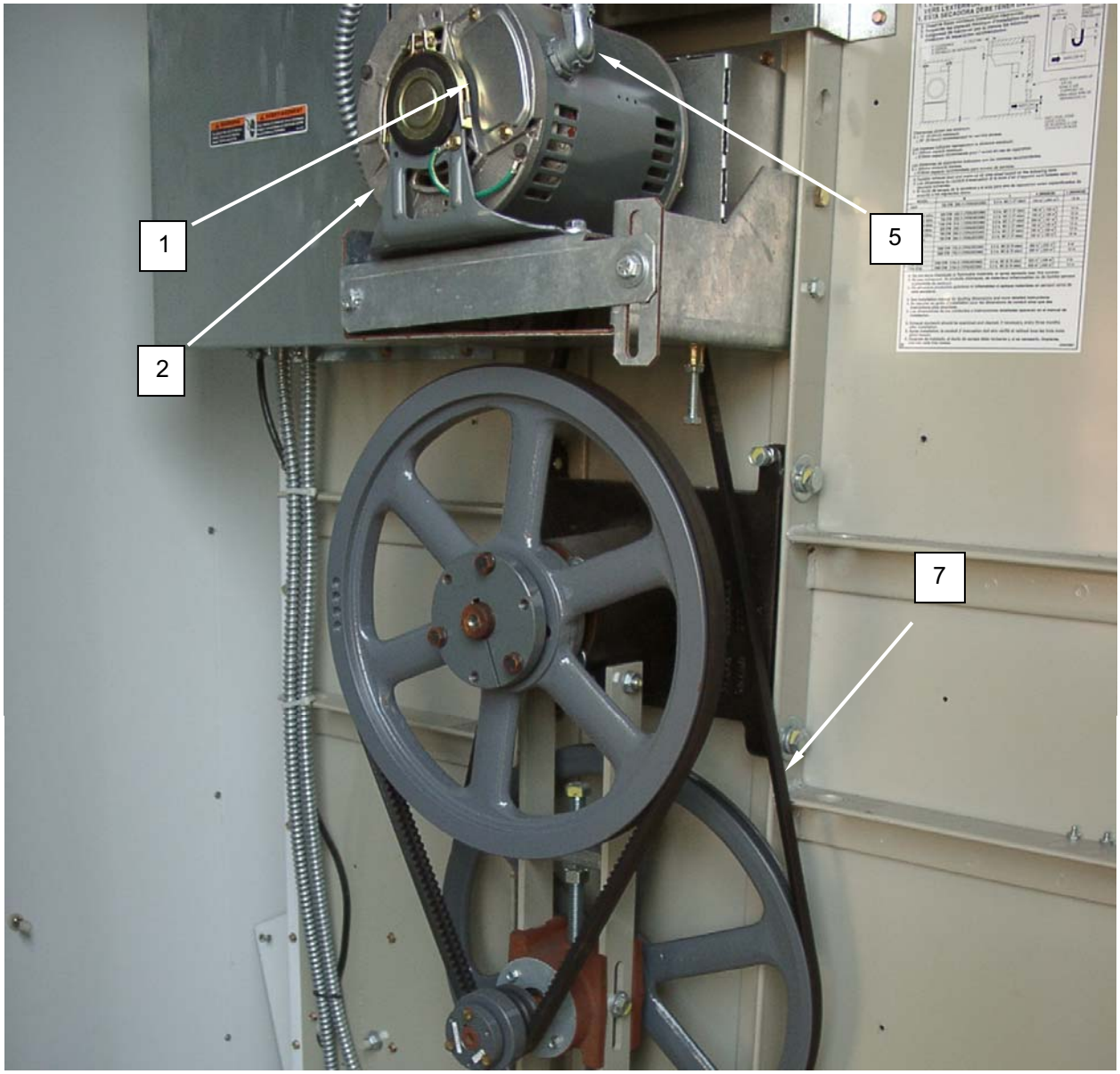


Figure 3. Replace the Cylinder Drive Motor.

REPLACE-CONTINUED

Replace the Fan Motor

WARNING

Ensure that all dryer electrical power is shut off and disconnected before proceeding. The circuit breaker box or individual circuit breaker should be locked and tagged out by personnel following this procedure. Remember that the CBL is a wet environment. Serious injury or death to personnel can result from electrocution if proper safety precautions are not observed.

WARNING

Ensure that the dryer power is shut off and disconnected before proceeding. Rotating machinery and belts may snag fingers, hair, or clothing. Failure to observe safety precautions may result in serious injury or death to personnel.

1. Disconnect power.
2. Remove the belts IAW procedures given in WP 0066 00.
3. Remove screws retaining motor junction box cover **(Figure 4, Item 8)**, and remove cover.
4. Tag and disconnect wiring from motor **(Figure 4, Item 9)**.
5. Remove the conduit **(Figure 4, Item 10)** with wiring from the motor.

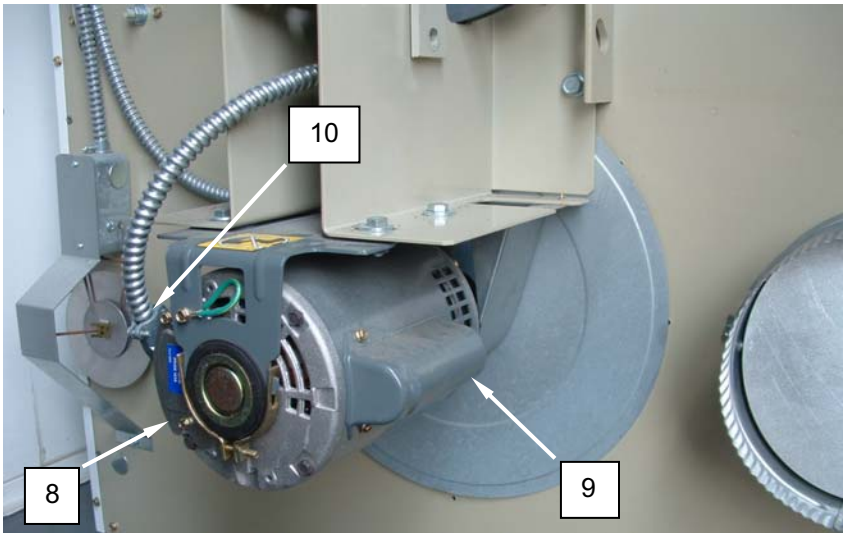


Figure 4. Replace the Fan Motor.

REPLACE-CONTINUED

6. Remove screws retaining fan housing cover **(Figure 5, Item 11)**.
7. Remove bolts securing guard **(Figure 5, Item 12)**, and remove guard.
8. Remove bolts securing motor **(Figure 5, Item 9)** to motor mount, and remove motor, fan **(Figure 5, Item 9, 13)**, and fan housing cover **(Figure 5, Item 11)** as an assembly.
9. Secure the motor shaft and remove the nut retaining the fan **(Figure 5, Item 13)** to the motor shaft **(Figure 5, Item 14)**.
10. Remove the bolts retaining the fan housing cover **(Figure 5, Item 11)** to the motor **(Figure 5, Item 9)**.
11. Remove the fan **(Figure 5, Item 13)** and the fan housing cover **(Figure 5, Item 11)** from the motor shaft **(Figure 5, Item 14)**. Remove the key **(Figure 5, Item 15)** from the motor shaft.
12. Install the key **(Figure 5, Item 15)** on the replacement motor shaft **(Figure 5, Item 14)**.
13. Install the fan housing cover **(Figure 5, Item 11)** onto the motor shaft **(Figure 5, Item 14)**.
14. Install the fan **(Figure 5, Item 13)** onto the motor shaft **(Figure 5, Item 14)** and retain with nut.
15. Secure the fan housing cover **(Figure 5, Item 11)** to the motor **(Figure 5, Item 9)** with bolts.
16. Install the motor **(Figure 5, Item 9)**, fan **(Figure 5, Item 13)**, and fan housing cover **(Figure 5, Item 11)** as an assembly onto the motor mount and retain with bolts.
17. Install the guard **(Figure 5, Item 12)** and retain with bolts.
18. Retain the fan housing cover **(Figure 5, Item 11)** to the dryer with screws.
19. Remove screws retaining motor junction box cover **(Figure 4, Item 8)**, and remove cover.
20. Install the conduit **(Figure 4, Item 10)** with wiring into the motor junction box **(Figure 4, Item 8)**.
21. Connect the wiring to the motor **(Figure 4, Item 9)** as tagged.
22. Install the motor junction box cover **(Figure 4, Item 8)** and retain with screws.
23. Install the belts IAW procedures given in WP 0066 00.
24. Connect power, operate IAW procedures given in TM 10-3510-226-10, and monitor for normal operation.

REPLACE-CONTINUED

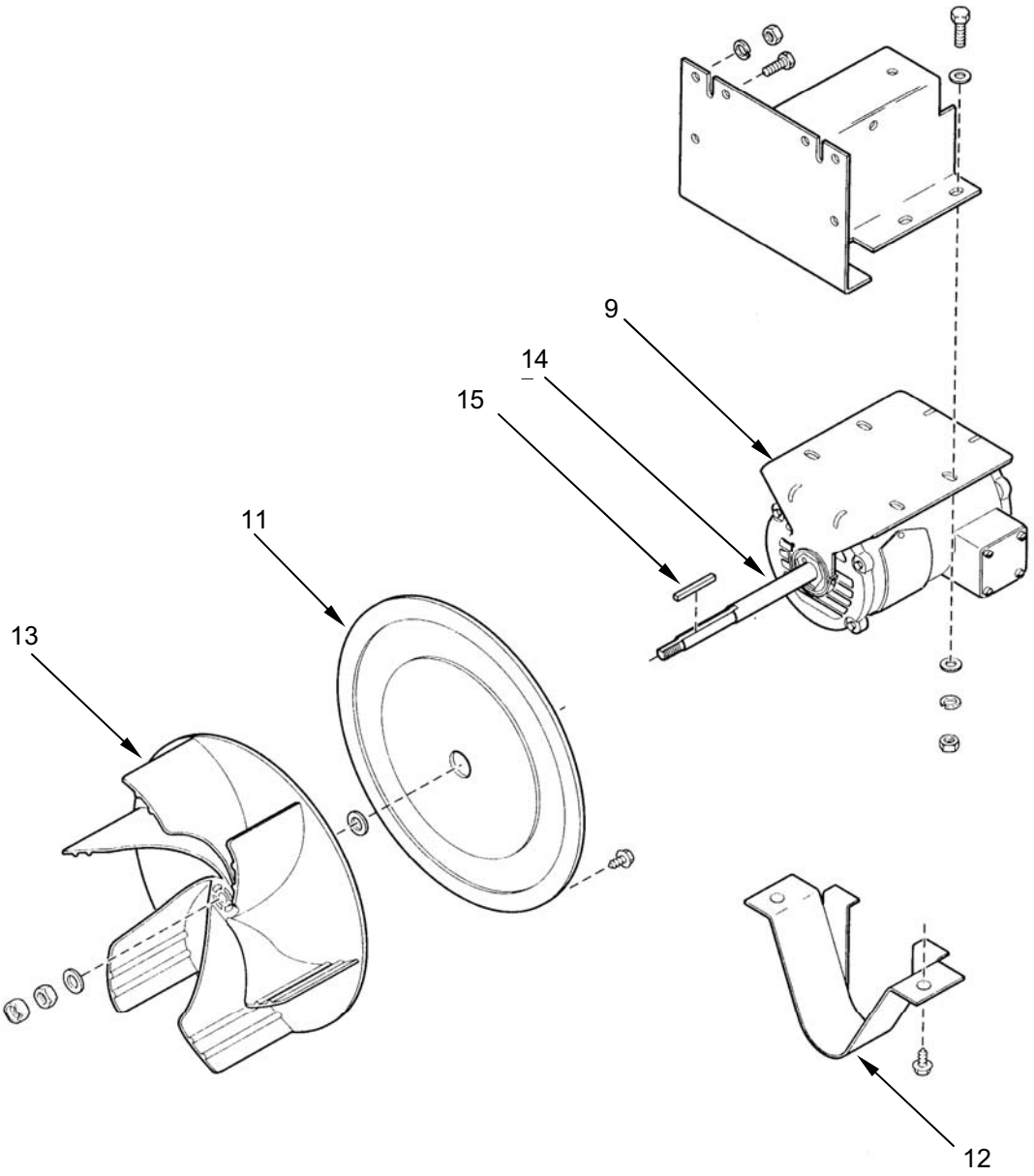


Figure 5. Replace the Fan Motor.

END OF WORK PACKAGE

UNIT MAINTENANCE
CONTAINERIZED BATCH LAUNDRY (CBL)
NSN 3510-01-527-2209
NSN 3510-01-527-2210
CONTROLS, BURNER, AND BURNER
TEST, SERVICE, ADJUST

INITIAL SETUP

Tools
Tool Kit, General Mechanics: Automotive (WP 0086 00, Table 2, Item 6)

Materials/Parts
Absorbent Material, Spill Cleanup (WP 0087 00, Item 1)
Baled Rag, General (WP 0087 00, Item 5)
Connector, Butt, #14-16 – Blue (WP 0087 00, Item 14)
Tape, Electrical Insulation, ¾-inch Width (WP 0087 00, Item 52)
Ethylene Glycol, Solution (WP 0087 00, Item 27)
Wire Markers (WP 0087 00, Item 58)

Personnel Required
Quartermaster and Chemical Equipment Repairer 63J (2)

Equipment Condition
CBL set up

References
TM 10-3510-226-10

TEST

Test the Burner Motor

WARNING

Ensure that all electrical power to the boiler is shut off and disconnected before proceeding. The circuit breaker box or individual circuit breaker should be locked and tagged out by personnel following this procedure. Remember that the CBL is a wet environment. Serious injury or death to personnel can result from electrocution if proper safety precautions are not observed.

WARNING

Allow the boiler and any associated hot water pipe, tubing or fixtures to cool at least 30 minutes before attempting any repairs. Failure to observe safety precautions may result in serious injury or death to personnel.

1. Disconnect power by switching the circuit breaker No. 22 to off.
2. Remove screw retaining burner primary control **(Figure 1, Item 1)**, and remove burner primary control.
3. Tag and disconnect motor wiring at connections **(Figure 1, Item 2)**.
4. Use an ohmmeter to check for 4 to 6 ohms resistance between motor leads at connections **(Figure 1, Item 2)**.
5. Use an ohmmeter to test for infinite resistance between each motor lead and ground.

TEST-CONTINUED

6. Replace a burner with an open or shorted motor IAW WP 0069 00.
7. Connect wiring as tagged.
8. Install burner primary control **(Figure 1, Item 1)**, and retain with screw.
9. Connect power, and operate IAW procedures given in TM 10-3510-226-10.
10. Monitor for normal operation.

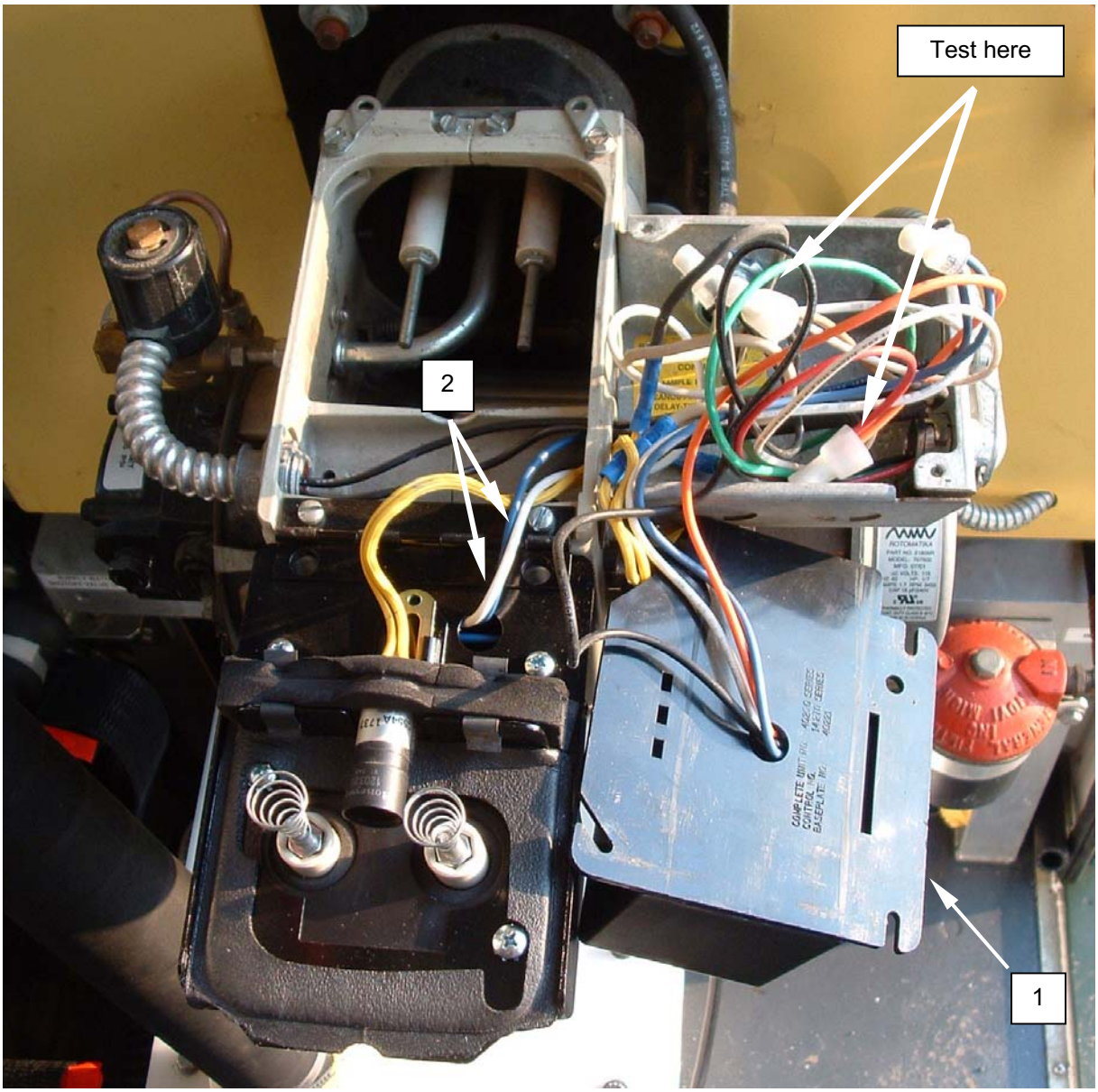


Figure 1. Test the Burner Motor.

TEST-CONTINUED

Test the Burner Transformer

WARNING

Ensure that all electrical power to the boiler is shut off and disconnected before proceeding. The circuit breaker box or individual circuit breaker should be locked and tagged out by personnel following this procedure. Remember that the CBL is a wet environment. Serious injury or death to personnel can result from electrocution if proper safety precautions are not observed.

WARNING

Allow the boiler and any associated hot water pipe, tubing or fixtures to cool at least 30 minutes before attempting any repairs. Failure to observe safety precautions may result in serious injury or death to personnel.

1. Disconnect power by switching the circuit breaker to off.
2. Remove the screws retaining the transformer **(Figure 2, Item 3)**, and flip the transformer back.
3. Remove screw retaining burner primary control **(Figure 2, Item 1)** and remove burner primary control.
4. Tag and disconnect the wiring **(Figure 2, Item 2)**.
5. Use an ohmmeter to test for 90,000 – 100,000 ohms resistance between the two wires **(Figure 2, Item 2)**.
6. Use and ohmmeter to test for 250,000 ohms resistance between the two spring terminals **(Figure 2, Item 4)**.
7. Replace an open or shorted transformer **(Figure 2, Item 3)**.
8. Connect wiring to the transformer as tagged.
9. Install burner primary control **(Figure 2, Item 1)** and retain with screw.
10. Flip the transformer **(Figure 2, Item 3)** back in operating position and retain with screws.
11. Connect power, and operate IAW procedures given in TM 10-3510-226-10.
12. Monitor for normal operation.

TEST-CONTINUED

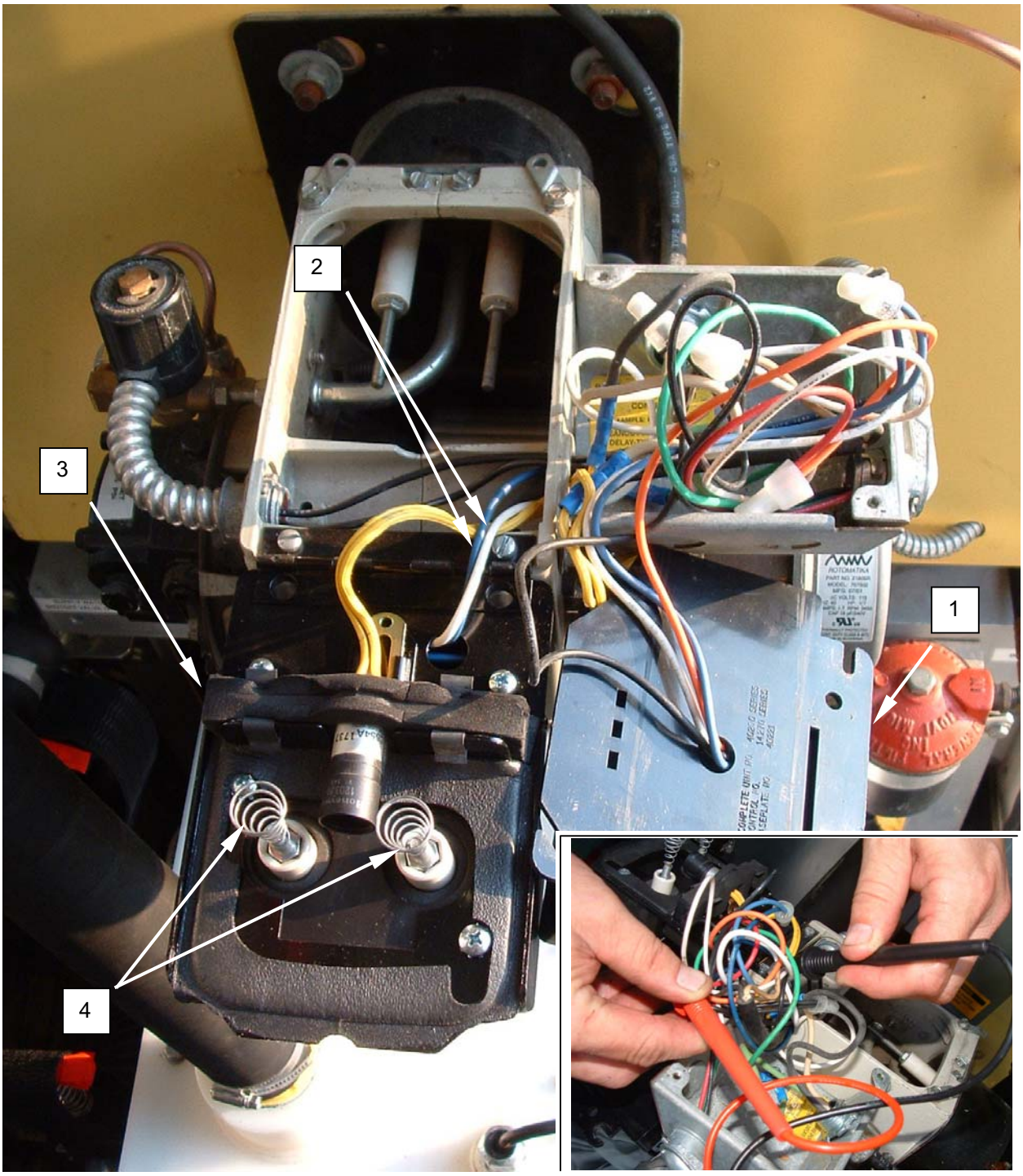


Figure 2. Test the Burner Transformer.

TEST-CONTINUED

Test the Thermostat

WARNING

Ensure that all electrical power to the boiler is shut off and disconnected before proceeding. The circuit breaker box or individual circuit breaker should be locked and tagged out by personnel following this procedure. Remember that the CBL is a wet environment. Serious injury or death to personnel can result from electrocution if proper safety precautions are not observed.

WARNING

Allow the boiler and any associated hot water pipe, tubing or fixtures to cool at least 30 minutes before attempting any repairs. Failure to observe safety precautions may result in serious injury or death to personnel.

1. Switch the boiler off at circuit breaker No. 22, and allow the boiler to cool for at least 30 minutes before proceeding.
2. Slide the thermostat cover **(Figure 3, Item 5)** up and remove the cover.
3. Tag and disconnect the wiring from the thermostat terminals **(Figure 3, Item 6)**.
4. Ensure the dial **(Figure 3, Item 7)** has been set for approximately 205 ^{o}F.
5. Use an ohmmeter to test for continuity between the two terminals **(Figure 3, Item 6)**. There should be continuity between the two terminals.
6. Reconnect the wiring to the terminals **(Figure 3, Item 6)** as tagged.
7. Install the thermostat cover **(Figure 3, Item 5)**.
8. Switch the boiler on at circuit breaker No. 22, and operate the boiler for at least 30 minutes IAW procedures given in TM 10-3510-226-10.
9. Monitor for normal operation.

TEST-CONTINUED

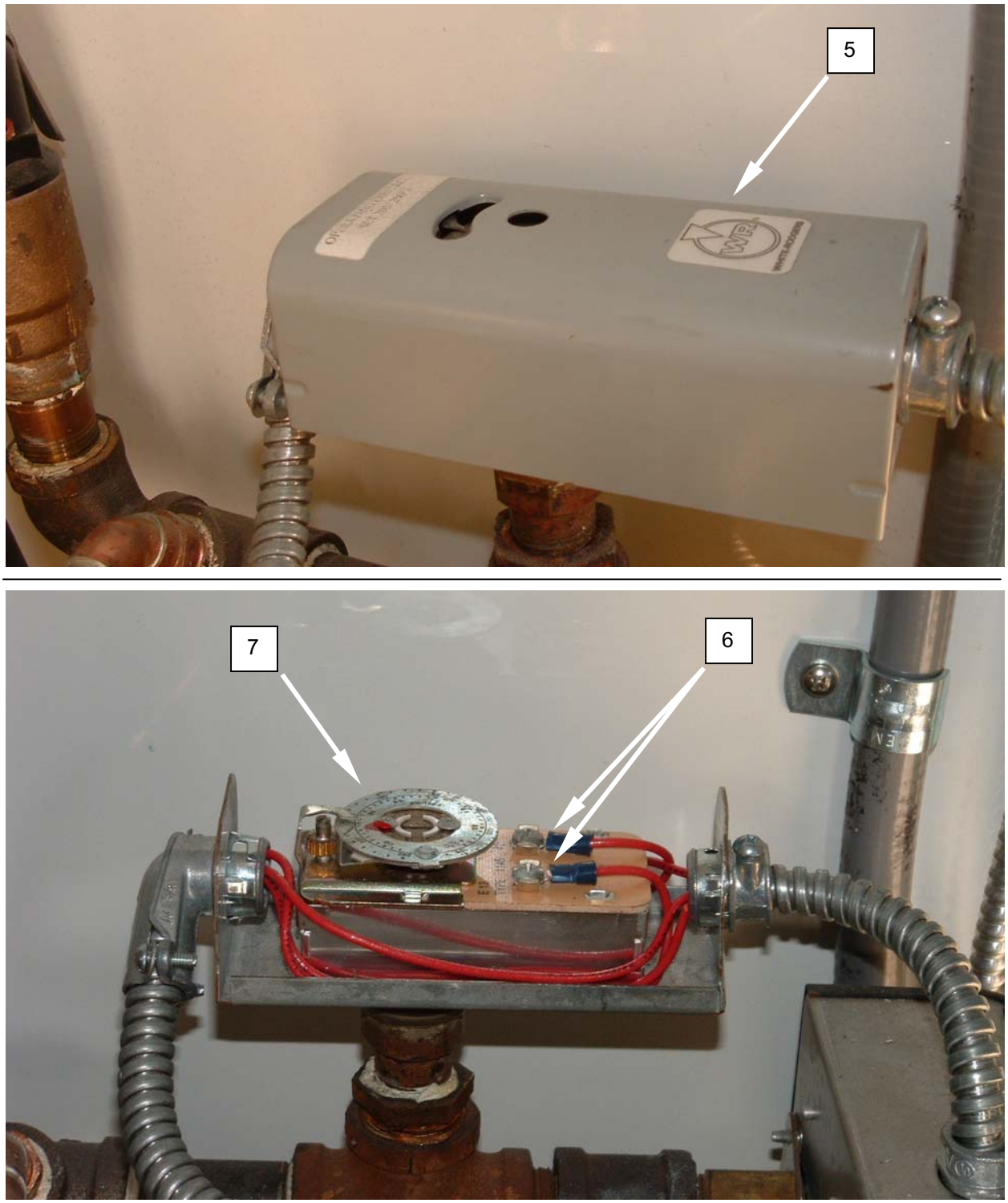


Figure 3. Test the Thermostat.

TEST-CONTINUED

Test the High Temperature Cutout

WARNING

Ensure that all electrical power to the boiler is shut off and disconnected before proceeding. The circuit breaker box or individual circuit breaker should be locked and tagged out by personnel following this procedure. Remember that the CBL is a wet environment. Serious injury or death to personnel can result from electrocution if proper safety precautions are not observed.

WARNING

Allow the boiler and any associated hot water pipe, tubing or fixtures to cool at least 30 minutes before attempting any repairs. Failure to observe safety precautions may result in serious injury or death to personnel.

1. Switch the boiler off at circuit breaker No. 22, and allow the boiler to cool for at least 30 minutes before proceeding.
2. Loosen the screw retaining the high temperature cutout cover **(Figure 4, Item 8)**, and remove the cover.
3. Tag and disconnect the wiring from the thermostat terminals **(Figure 4, Item 9)**.
4. Ensure the dial **(Figure 4, Item 10)** has been set for approximately 210 ^{o}F.
5. Use an ohmmeter to test for continuity between the B terminal **(Figure 4, Item 11)** and R terminal **(Figure 4, Item 12)**. There should be continuity between the two terminals.
6. Use an ohmmeter to test for continuity between the B terminal **(Figure 4, Item 11)** and W terminal **(Figure 4, Item 13)**. There should be infinite resistance between the two terminals.
7. Reconnect the wiring to the terminals **(Figure 4, Items 9)** as tagged.
8. Install the high temperature cutout cover **(Figure 4, Item 8)**, and retain with screw.
9. Switch the boiler on at circuit breaker No. 22, and operate the boiler for at least 30 minutes IAW procedures given in TM 10-3510-226-10.
10. Monitor for normal operation.

TEST-CONTINUED

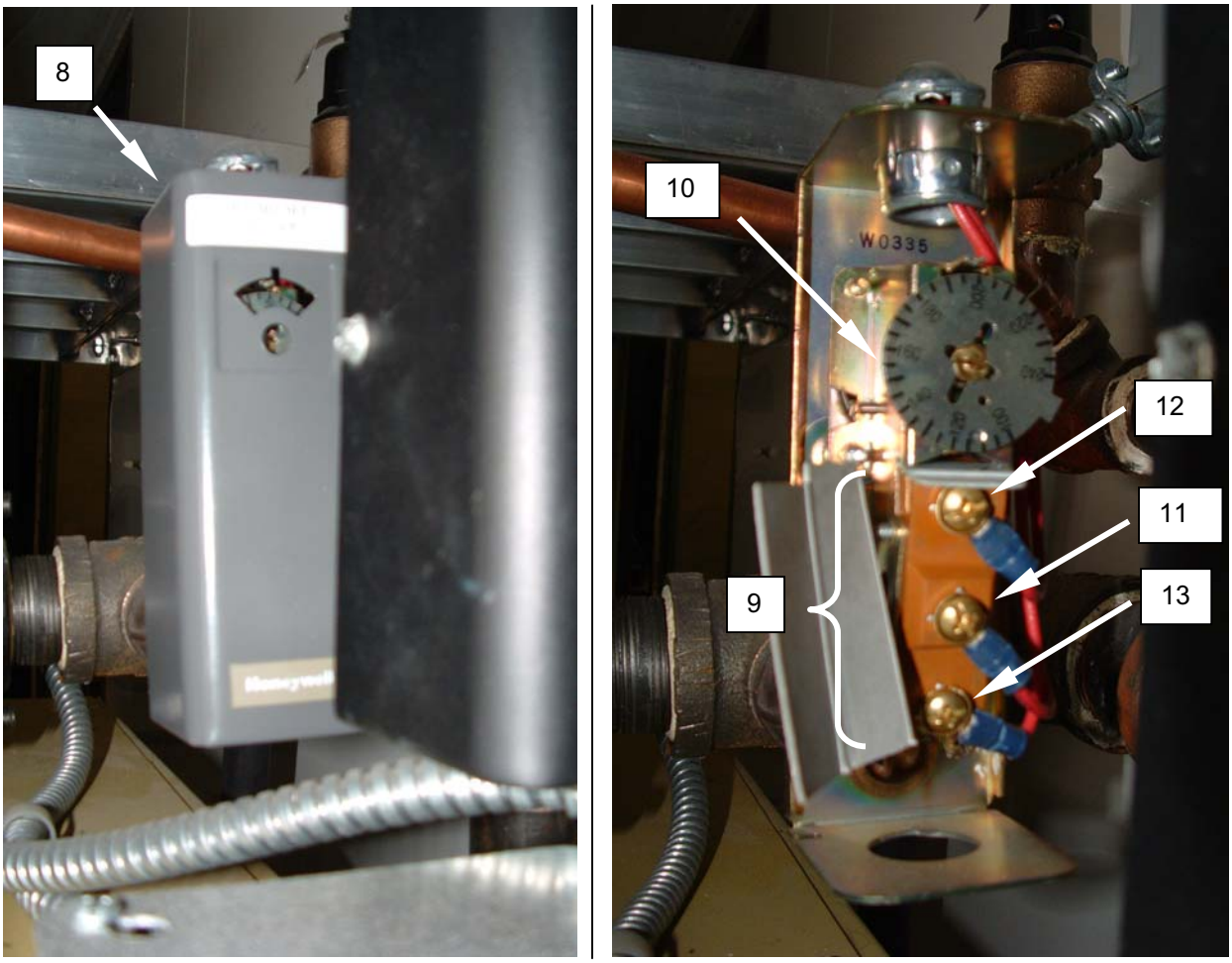


Figure 4. Test the High Temperature Cutout.

TEST-CONTINUED

Test the Low Water Cutoff

WARNING

Allow the boiler and any associated hot water pipe, tubing or fixtures to cool at least 30 minutes before attempting any repairs. Failure to observe safety precautions may result in serious injury or death to personnel.

CAUTION

Testing of the cutoff requires a low-water condition for the cutoff to activate. If the cut off has failed, running the boiler with low coolant may cause irreparable damage to the boiler.

NOTE

The low water cutoff should receive this test any time the coolant must be drained or changed.

1. Switch the boiler off at circuit breaker No. 22 and allow the boiler to cool for at least 1 hour before proceeding.
2. Attach a garden hose to the boiler drain valve **(Figure 5, Item 14)**, and place the free end of the hose in a 5-gallon container.
3. Open the drain valve **(Figure 5, Item 14)** and allow the boiler to drain for at least 15 minutes.
4. Switch the boiler on at circuit breaker No. 22 and have an assistant switch the boiler on at the PLC.

CAUTION

Testing of the cutoff requires a low-water condition for the cutoff to activate. If the cut off has failed, running the boiler with low coolant may cause irreparable damage to the boiler.

5. If the burner starts firing, shut down the boiler immediately. This indicates a failure of the low water cutoff **(Figure 5, Item 15)**.
6. Close the boiler drain valve **(Figure 5, Item 14)**.

TEST-CONTINUED


WARNING

Antifreeze used in the following procedure is highly toxic. Wear appropriate protective clothing when handling antifreeze/glycol. If antifreeze contacts eyes or skin, flush the affected area immediately with clean water and seek medical attention.

CAUTION

Do not make substitutions for the antifreeze. The use of antifreeze other than the type identified in the Expendable and Durable List may decrease performance. Failure to comply may shorten the life span of the equipment.

7. Open the pressure regulating cap **(Figure 5, Item 16)**, and begin refilling the boiler with ethylene glycol IAW TM 10-3510-226-10.
8. Monitor the burner operation. The burner should remain off until the coolant reaches a safe level.
9. Operate the boiler IAW procedures given in TM 10-3510-226-10.

TEST-CONTINUED

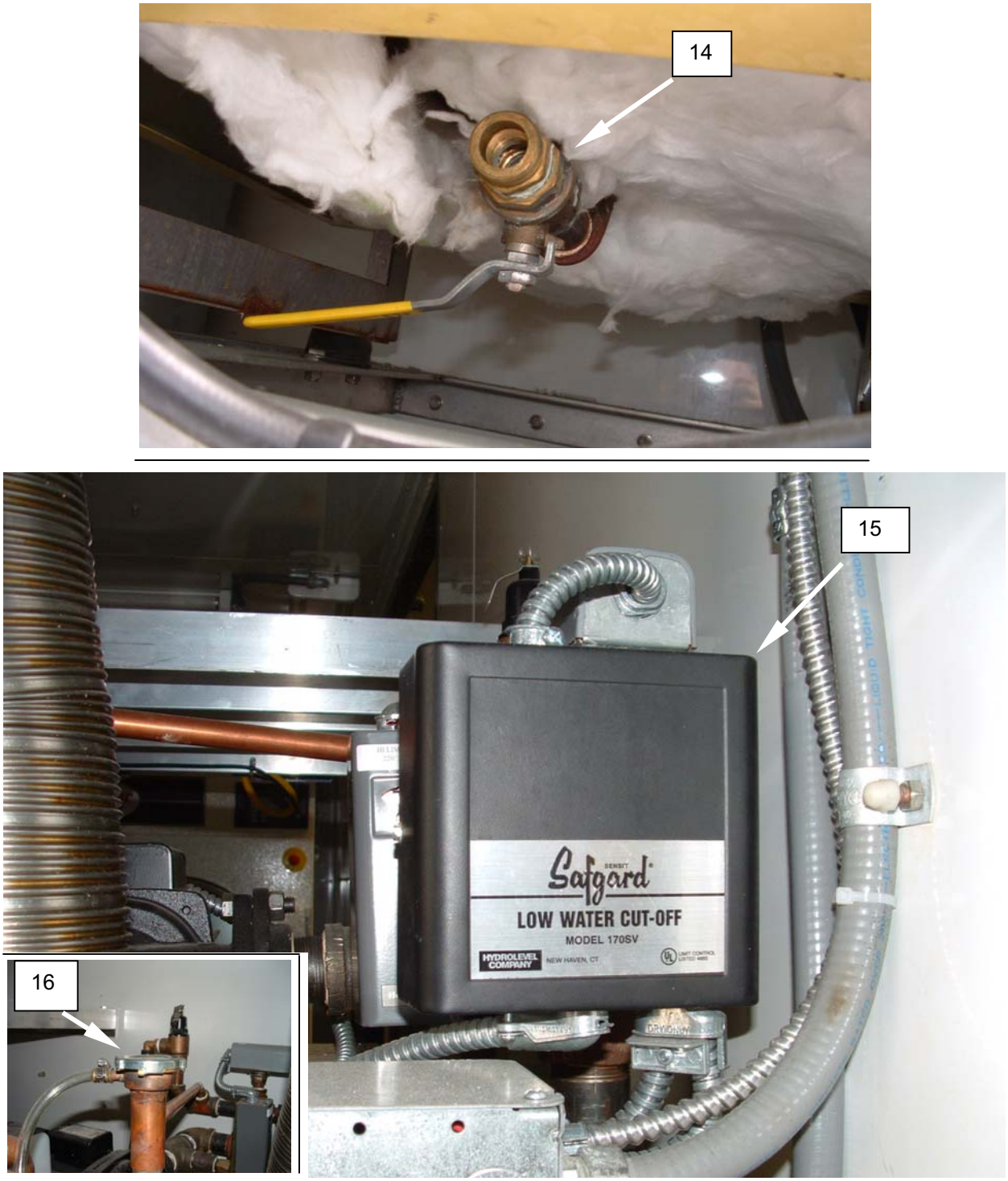


Figure 5. Test the Low Water Cutoff.

SERVICE

Bleed the Burner Fuel System

WARNING

Ensure fuel is contained and not allowed to spill or spray into the CBL. Failure to observe safety precautions may result in a fire, with the possibility of serious injury or death to personnel.

1. Locate bleed fitting **(Figure 6, Item 17)** on fuel pump.
2. Open bleed fitting **(Figure 6, Item 17)** approximately ½ turn.
3. Operate boiler, and allow fuel to discharge from bleed fitting **(Figure 6, Item 17)** into an approved fuel container.
4. When fuel stream is solid with no bubbles or spitting, tighten fuel bleed fitting **(Figure 6, Item 17)**.
5. Monitor for normal operation.

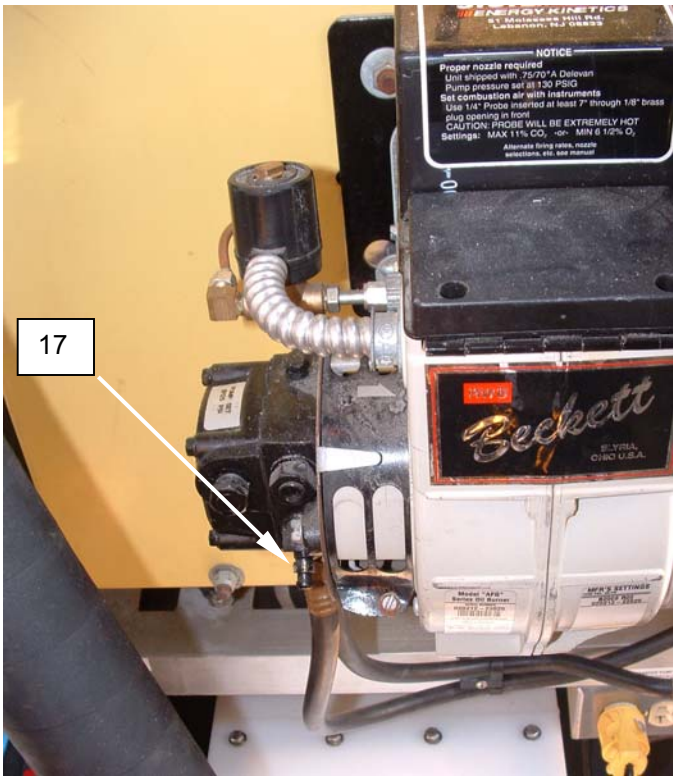


Figure 6. Bleed the Burner Fuel System.

SERVICE-CONTINUED

Clean the Fuel Pump Strainer

WARNING

Ensure fuel is contained and not allowed to spill or spray into the CBL. Failure to observe safety precautions may result in a fire, with the possibility of serious injury or death to personnel.

1. Disconnect power by switching the circuit breaker to off.
2. Loosen the two compression nuts retaining the fuel pipe to the burner and remove the fuel pipe.
3. Remove the screws retaining the pump cover **(Figure 7, Item 18)** and remove the pump cover.
4. Remove the pump strainer **(Figure 7, Item 19)** and rinse in clean fuel.
5. Install strainer **(Figure 7, Item 19)**.
6. Ensure pump cover gasket is in place and install pump cover **(Figure 7, Item 18)**. Retain with screws.
7. Install fuel pipe and tighten compression fittings.
8. Connect power, and operate IAW procedures given in TM 10-3510-226-10.
9. Monitor for normal operation.

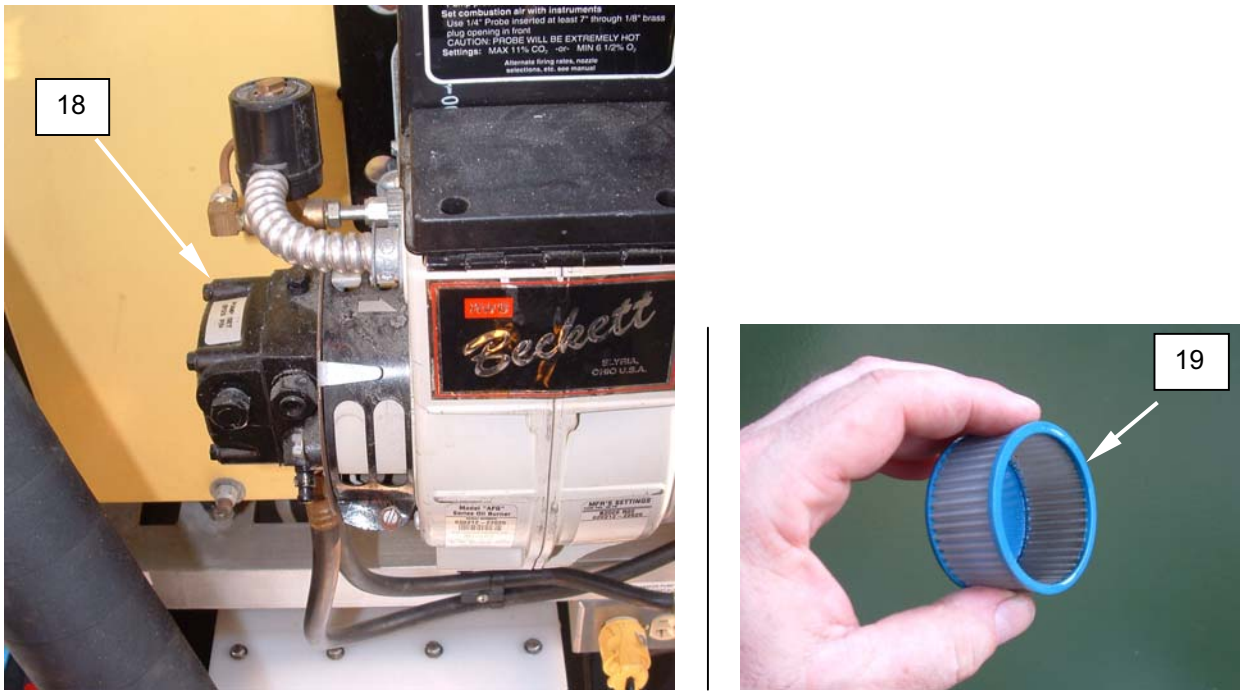


Figure 7. Clean the Fuel Pump Strainer.

SERVICE-CONTINUED

Clean the CAD Cell

WARNING

Ensure that all electrical power to the boiler is shut off and disconnected before proceeding. The circuit breaker box or individual circuit breaker should be locked and tagged out by personnel following this procedure. Remember that the CBL is a wet environment. Serious injury or death to personnel can result from electrocution if proper safety precautions are not observed.

WARNING

Allow the boiler and any associated hot water pipe, tubing or fixtures to cool at least 30 minutes before attempting any repairs. Failure to observe safety precautions may result in serious injury or death to personnel.

1. Disconnect power by switching the circuit breaker to off.
2. Remove the screws retaining the transformer **(Figure 8, Item 3)**, and flip the transformer back.
3. Use a rag to clean the lens of the CAD cell **(Figure 8, Item 20)** of soot.
4. Flip the transformer **(Figure 8, Item 3)** back in operating position, and retain with screws.
5. Connect power, and operate IAW procedures given in TM 10-3510-226-10.
6. Monitor for normal operation.

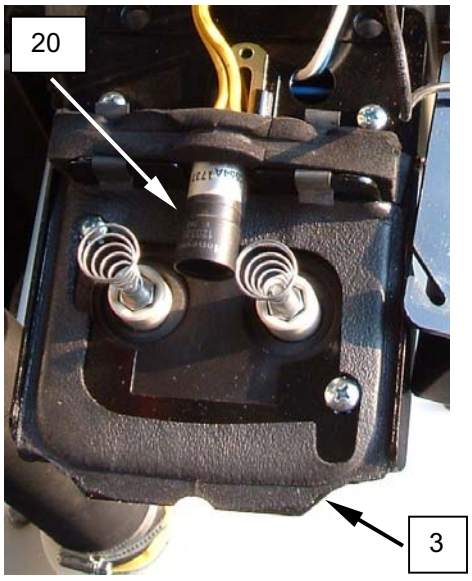


Figure 8. Clean the CAD Cell.

ADJUST

Adjust the Thermostat

WARNING

Ensure that all electrical power to the boiler is shut off and disconnected before proceeding. The circuit breaker box or individual circuit breaker should be locked and tagged out by personnel following this procedure. Remember that the CBL is a wet environment. Serious injury or death to personnel can result from electrocution if proper safety precautions are not observed.

WARNING

Allow the boiler and any associated hot water pipe, tubing or fixtures to cool at least 30 minutes before attempting any repairs. Failure to observe safety precautions may result in serious injury or death to personnel.

NOTE

The thermostat has been designed for adjustment without removal of the cover, but removal of the cover is recommended to ensure adequate visual verification of the setting.

1. Switch the boiler off at circuit breaker No. 22, and allow the boiler to cool for at least 30 minutes before proceeding.
2. Loosen the screw retaining the thermostat cover **(Figure 9, Item 5)**, and remove the cover.
3. Ensure the dial **(Figure 9, Item 7)** has been set for approximately 205 ^{o}F.
4. Install the thermostat cover **(Figure 9, Item 5)**, and retain with screw.
5. Switch the boiler on at circuit breaker No. 22, and operate the boiler for at least 30 minutes IAW procedures given in TM 10-3510-226-10.
6. Monitor for normal operation.

ADJUST-CONTINUED

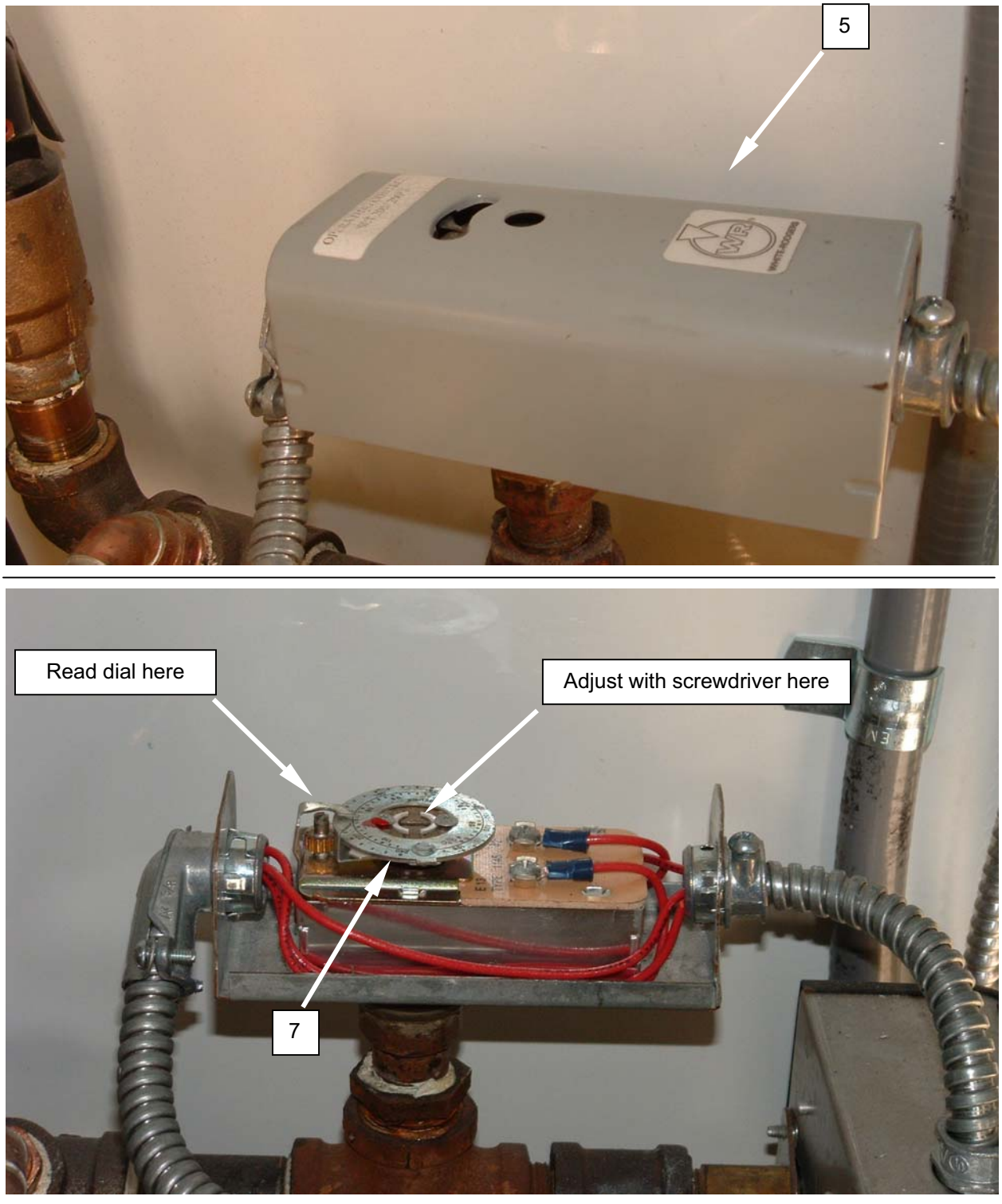


Figure 9. Adjust the Thermostat.

ADJUST-CONTINUED

Adjust the High Temperature Cutout

WARNING

Ensure that all electrical power to the boiler is shut off and disconnected before proceeding. The circuit breaker box or individual circuit breaker should be locked and tagged out by personnel following this procedure. Remember that the CBL is a wet environment. Serious injury or death to personnel can result from electrocution if proper safety precautions are not observed.

WARNING

Allow the boiler and any associated hot water pipe, tubing or fixtures to cool at least 30 minutes before attempting any repairs. Failure to observe safety precautions may result in serious injury or death to personnel.

1. Switch the boiler off at circuit breaker No. 22, and allow the boiler to cool for at least 30 minutes before proceeding.
2. Ensure the dial **(Figure 10, Item 10)** has been set for approximately 210 ^{o}F.
3. Switch the boiler on at circuit breaker No. 22, and operate the boiler for at least 30 minutes IAW procedures given in TM 10-3510-226-10.
4. Monitor for normal operation.

ADJUST-CONTINUED

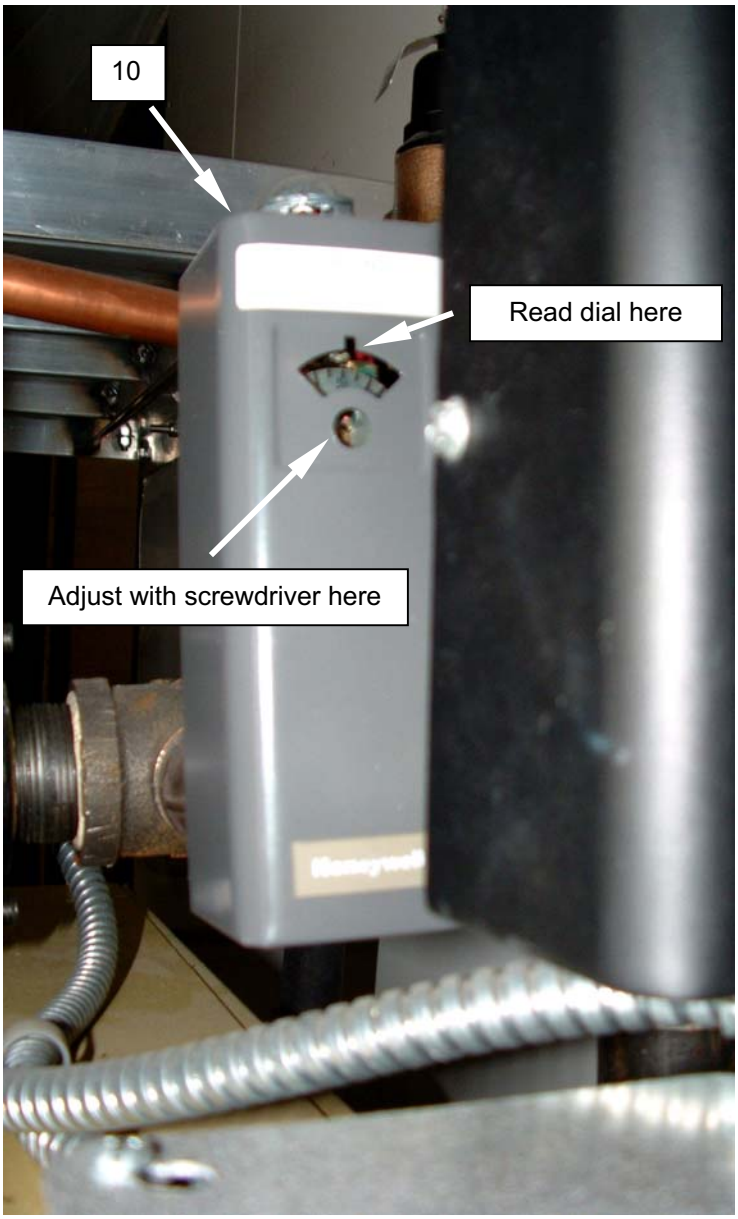


Figure 10. Adjust the High Temperature Cutout.

ADJUST-CONTINUED

Adjust the Burner Electrodes

WARNING

Ensure that all electrical power to the boiler is shut off and disconnected before proceeding. The circuit breaker box or individual circuit breaker should be locked and tagged out by personnel following this procedure. Remember that the CBL is a wet environment. Serious injury or death to personnel can result from electrocution if proper safety precautions are not observed.

WARNING

Ensure fuel is contained and not allowed to spill or spray into the CBL. Failure to observe safety precautions may result in a fire, with the possibility of serious injury or death to personnel.

WARNING

Allow the boiler and any associated hot water pipe, tubing or fixtures to cool at least 30 minutes before attempting any repairs. Failure to observe safety precautions may result in serious injury or death to personnel.

1. Disconnect power by switching the circuit breaker to off.
2. Remove the screws retaining the transformer **(Figure 11, Item 3)** and swing the transformer up and out of the way.
3. Loosen the compression nut retaining the fuel solenoid **(Figure 11, Item 21)** to the nozzle assembly **(Figure 11, Item 22)**.
4. Remove the locknut retaining the nozzle assembly **(Figure 11, Item 22)**, and remove the nozzle assembly.
5. Loosen the screws retaining the electrodes **(Figure 11, Item 23)** to the nozzle assembly **(Figure 11, Item 22)**, and position the electrodes approximately 1/4 inch apart, just above the nozzle **(Figure 11, Item 24)**.
6. Tighten the screws retaining the electrodes **(Figure 11, Item 23)**.
7. Install the nozzle assembly **(Figure 11, Item 22)** into the burner, and retain with locknut.
8. Connect the fuel solenoid **(Figure 11, Item 21)** to the nozzle assembly **(Figure 11, Item 22)**, and tighten compression nut.

ADJUST-CONTINUED

9. Swing transformer **(Figure 11, Item 3)** back into place and retain with screws.

10. Connect power, operate IAW procedures given in TM 10-3510-226-10, and monitor for normal operation.

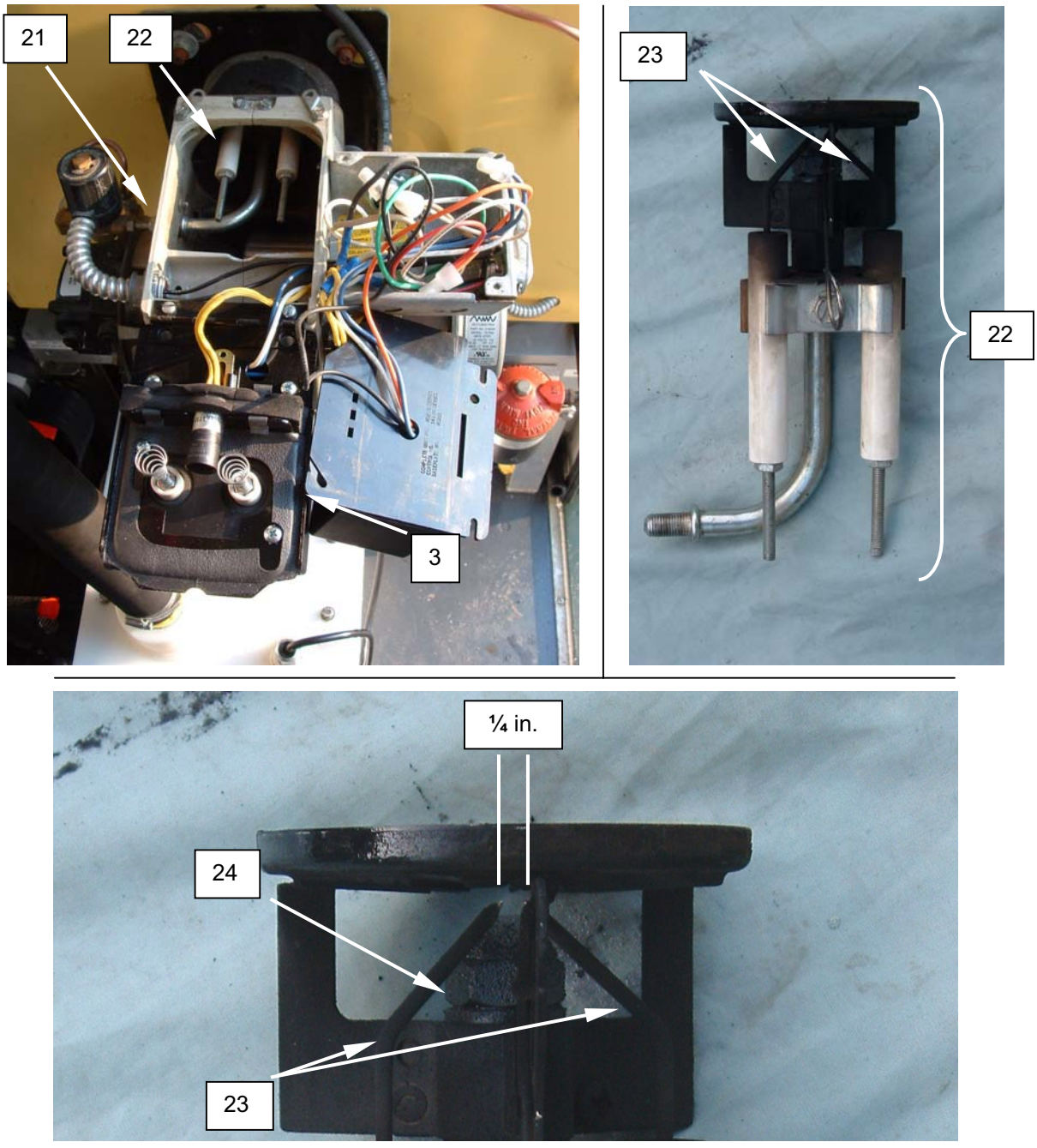


Figure 11. Adjust the Burner Electrodes.

END OF WORK PACKAGE

UNIT MAINTENANCE
CONTAINERIZED BATCH LAUNDRY
NSN 3510-01-527-2209
NSN 3510-01-527-2210
CONTROLS, BURNER, AND BURNER
REPLACE

INITIAL SETUP

Tools
Tool Kit, General Mechanics: Automotive (WP 0086 00, Table 2, Item 6)

Materials/Parts
Absorbent Material, Spill Cleanup (WP 0087 00, Item 1)
Baled Rag, General (WP 0087 00, Item 5)
Connector, Butt, #14-16 – Blue (WP 0087 00, Item 14)
Tape, Electrical Insulation, ¾-inch Width (WP 0087 00, Item 50)
Wire Markers (WP 0087, Item 56)

Personnel Required
Quartermaster and Chemical Equipment Repairer 63J (2)

Equipment Condition
CBL set up

References
TM 10-3510-226-10

REPLACE

Replace the Burner Motor

WARNING

Ensure that all electrical power to the boiler is shut off and disconnected before proceeding. The circuit breaker box or individual circuit breaker should be locked and tagged out by personnel following this procedure. Remember that the CBL is a wet environment. Serious injury or death to personnel can result from electrocution if proper safety precautions are not observed.

WARNING

Ensure fuel is contained and not allowed to spill or spray into the CBL. Failure to observe safety precautions may result in a fire, with the possibility of serious injury or death to personnel.

WARNING

Allow the boiler and any associated hot water pipe, tubing or fixtures to cool at least 30 minutes before attempting any repairs. Failure to observe safety precautions may result in serious injury or death to personnel.

1. Disconnect power by switching circuit breaker No. 22 to OFF.

2. Remove screw retaining burner primary control **(Figure 1, Item 1)**, and remove burner primary control.

3. Tag and disconnect motor wiring at connections **(Figure 1, Item 2)**.

4. Remove the screws retaining the motor **(Figure 2, Item 3)** to the burner **(Figure 2, Item 4)**, and replacement remove the motor.

REPLACE-CONTINUED

5. Remove the fuel pump coupling **(Figure 2, Item 5)** from the motor.
6. Install the fuel pump coupling **(Figure 2, Item 5)** onto the replacement motor.
7. Ensure the fuel pump coupling **(Figure 2, Item 5)** is in place, and install the motor **(Figure 2, Item 3)**. Retain with screws.
8. Connect wiring **(Figure 1, Item 2)** as tagged.
9. Install burner primary control **(Figure 1, Item 1)**, and retain with screw.
10. Connect power, operate IAW procedures given in TM 10-3510-226-10, and monitor for normal operation.

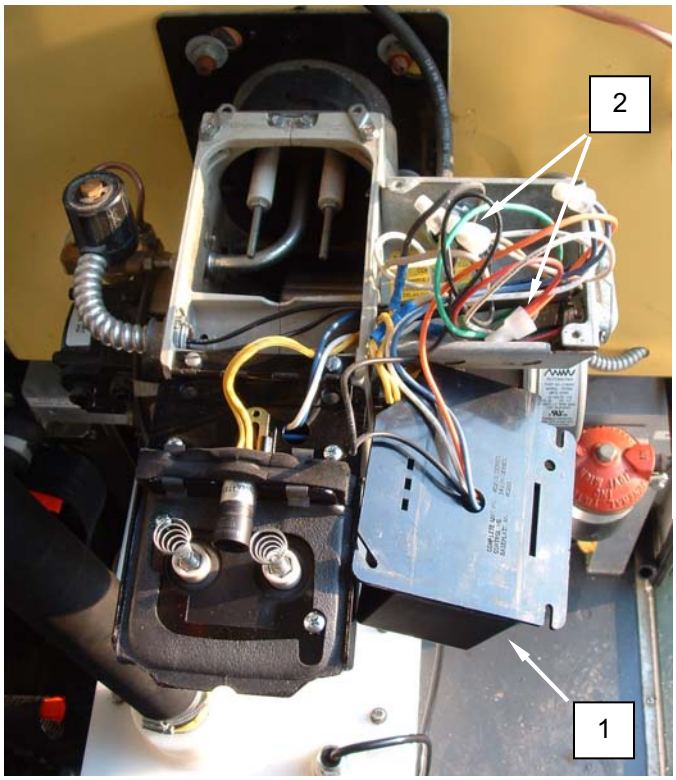


Figure 1. Replace the Motor.

REPLACE-CONTINUED

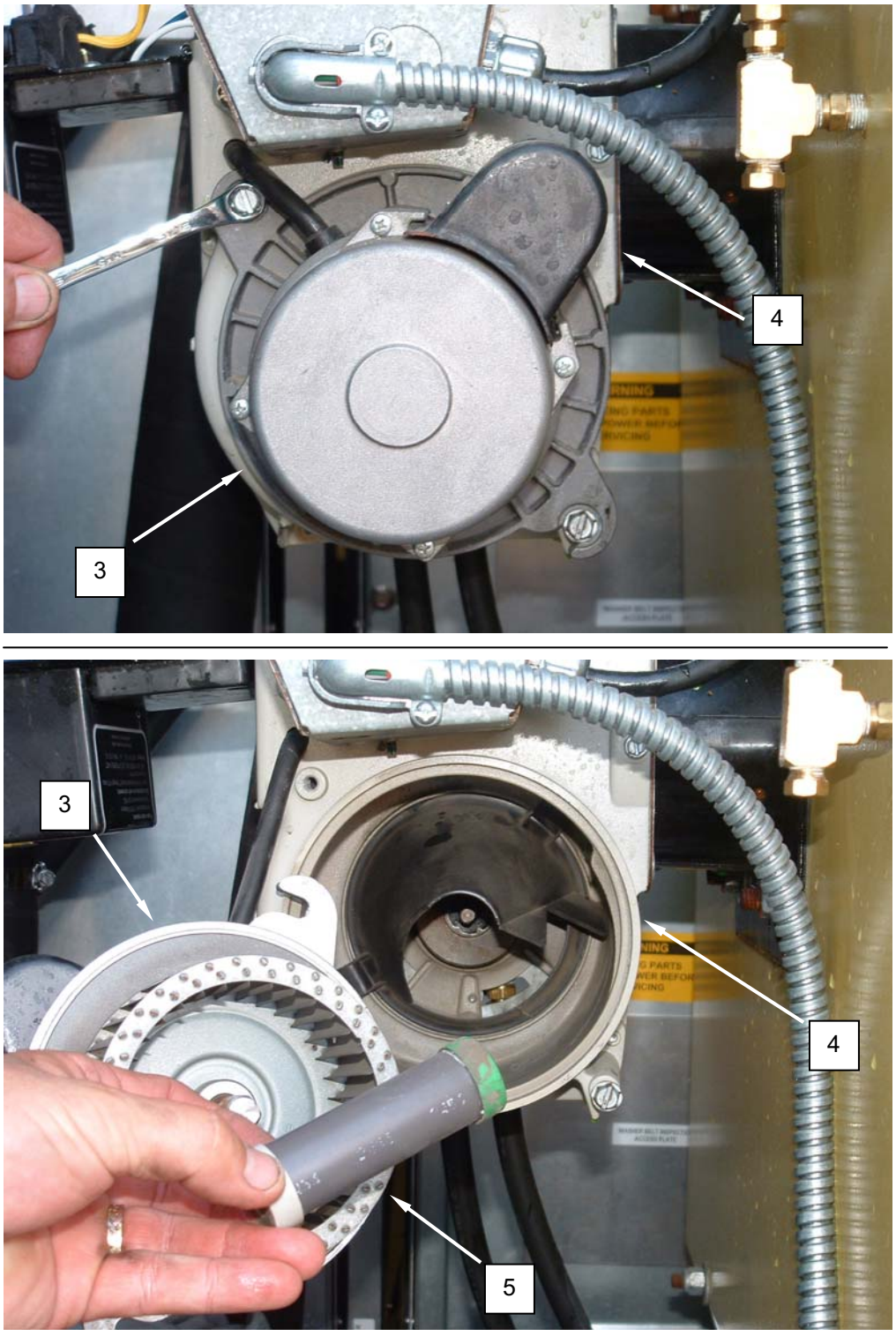


Figure 2. Replace the Motor.

REPLACE-CONTINUED

Replace Burner Nozzle

WARNING

Ensure that all electrical power to the boiler is shut off and disconnected before proceeding. The circuit breaker box or individual circuit breaker should be locked and tagged out by personnel following this procedure. Remember that the CBL is a wet environment. Serious injury or death to personnel can result from electrocution if proper safety precautions are not observed.

WARNING

Ensure fuel is contained and not allowed to spill or spray into the CBL. Failure to observe safety precautions may result in a fire, with the possibility of serious injury or death to personnel.

WARNING

Allow the boiler and any associated hot water pipe, tubing or fixtures to cool at least 30 minutes before attempting any repairs. Failure to observe safety precautions may result in serious injury or death to personnel.

1. Disconnect power by switching circuit breaker No. 22 to OFF.
2. Remove screws retaining transformer **(Figure 3, Item 6)** and swing transformer up and out of the way.
3. Loosen compression nut retaining the fuel solenoid **(Figure 3, Item 7)** to the nozzle assembly **(Figure 3, Item 8)**.
4. Remove the locknut retaining the nozzle assembly **(Figure 3, Item 8)** and remove the nozzle assembly.
5. Unscrew the nozzle **(Figure 3, Item 9)** from the nozzle assembly **(Figure 3, Item 8)**.
6. Install the replacement nozzle **(Figure 3, Item 9)** into the nozzle assembly **(Figure 3, Item 8)**.
7. Install the nozzle assembly **(Figure 3, Item 8)** into the burner and retain with locknut.
8. Connect the fuel solenoid **(Figure 3, Item 7)** to the nozzle assembly **(Figure 3, Item 8)** and tighten compression nut.
9. Swing transformer **(Figure 3, Item 6)** back into place and retain with screws.
10. Connect power, operate IAW procedures given in TM 10-3510-226-10 and monitor for normal operation.

REPLACE-CONTINUED

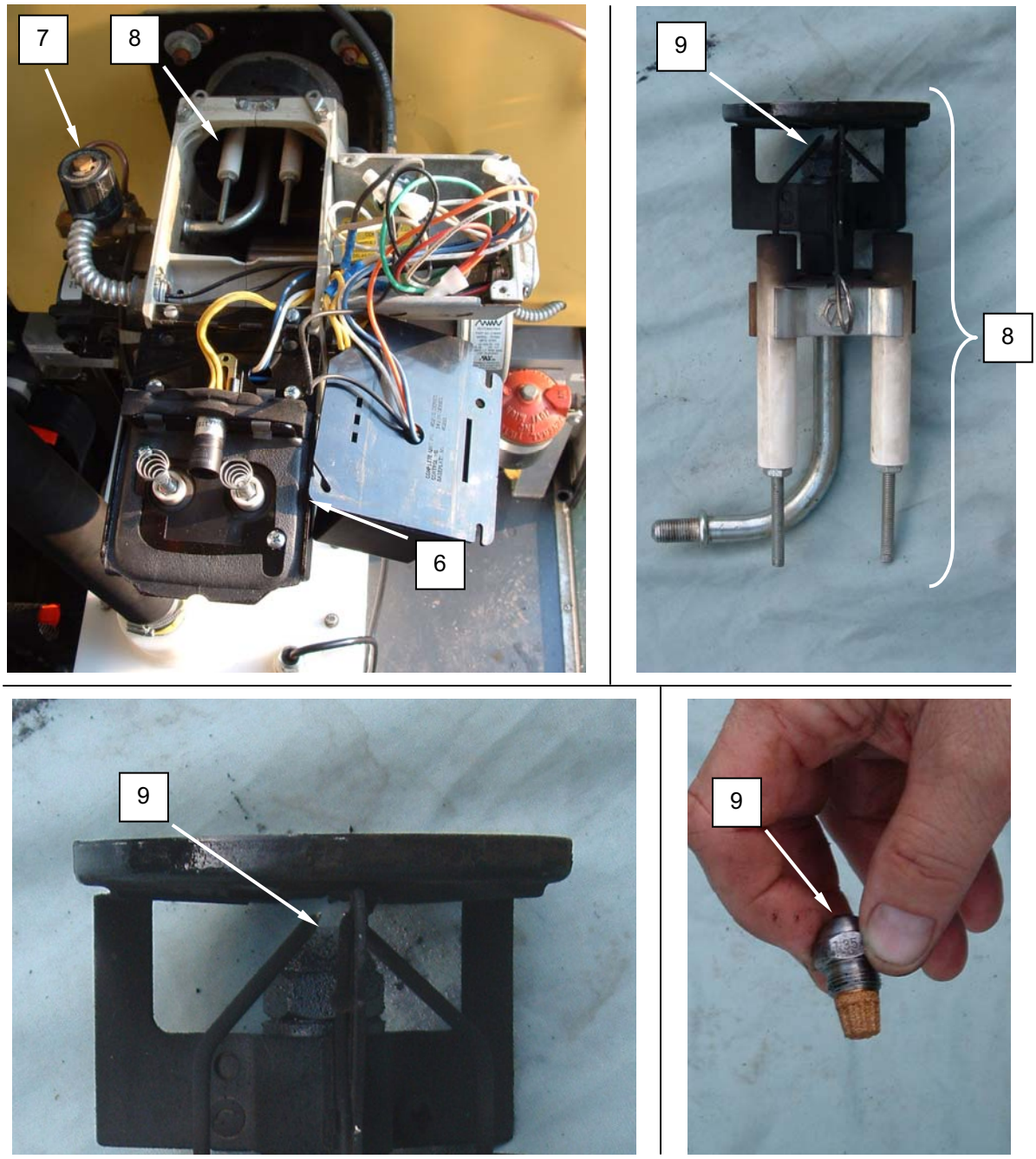


Figure 3. Replace Burner Nozzle.

REPLACE-CONTINUED

Replace the Flame Retention Head

WARNING

Ensure that all electrical power to the boiler is shut off and disconnected before proceeding. The circuit breaker box or individual circuit breaker should be locked and tagged out by personnel following this procedure. Remember that the CBL is a wet environment. Serious injury or death to personnel can result from electrocution if proper safety precautions are not observed.

WARNING

Ensure fuel is contained and not allowed to spill or spray into the CBL. Failure to observe safety precautions may result in a fire, with the possibility of serious injury or death to personnel.

WARNING

Allow the boiler and any associated hot water pipe, tubing or fixtures to cool at least 30 minutes before attempting any repairs. Failure to observe safety precautions may result in serious injury or death to personnel.

1. Disconnect power by switching circuit breaker No. 22 to OFF.
2. Remove screws retaining transformer **(Figure 4, Item 6)**, and swing transformer up and out of the way.
3. Loosen compression nut retaining the fuel solenoid **(Figure 4, Item 7)** to the nozzle assembly **(Figure 4, Item 8)**.
4. Remove the locknut retaining the nozzle assembly **(Figure 4, Item 8)**, and remove the nozzle assembly.
5. Loosen the clamp **(Figure 4, Item 10)** retaining the electrodes
6. Loosen clamp screw on the flame retention head **(Figure 4, Item 11)** and remove the flame retention head.
7. Install the replacement flame retention head **(Figure 4, Item 11)** and tighten the clamp screw.
8. Adjust the electrodes IAW WP 0068 00.
9. Install the nozzle assembly **(Figure 4, Item 8)** into the burner, and retain with locknut.
10. Connect the fuel solenoid **(Figure 4, Item 7)** to the nozzle assembly **(Figure 4, Item 8)**, and tighten compression nut.
11. Swing transformer **(Figure 4, Item 6)** back into place and retain with screws.

REPLACE-CONTINUED

12. Connect power, operate IAW procedures given in TM 10-3510-226-10, and monitor for normal operation.

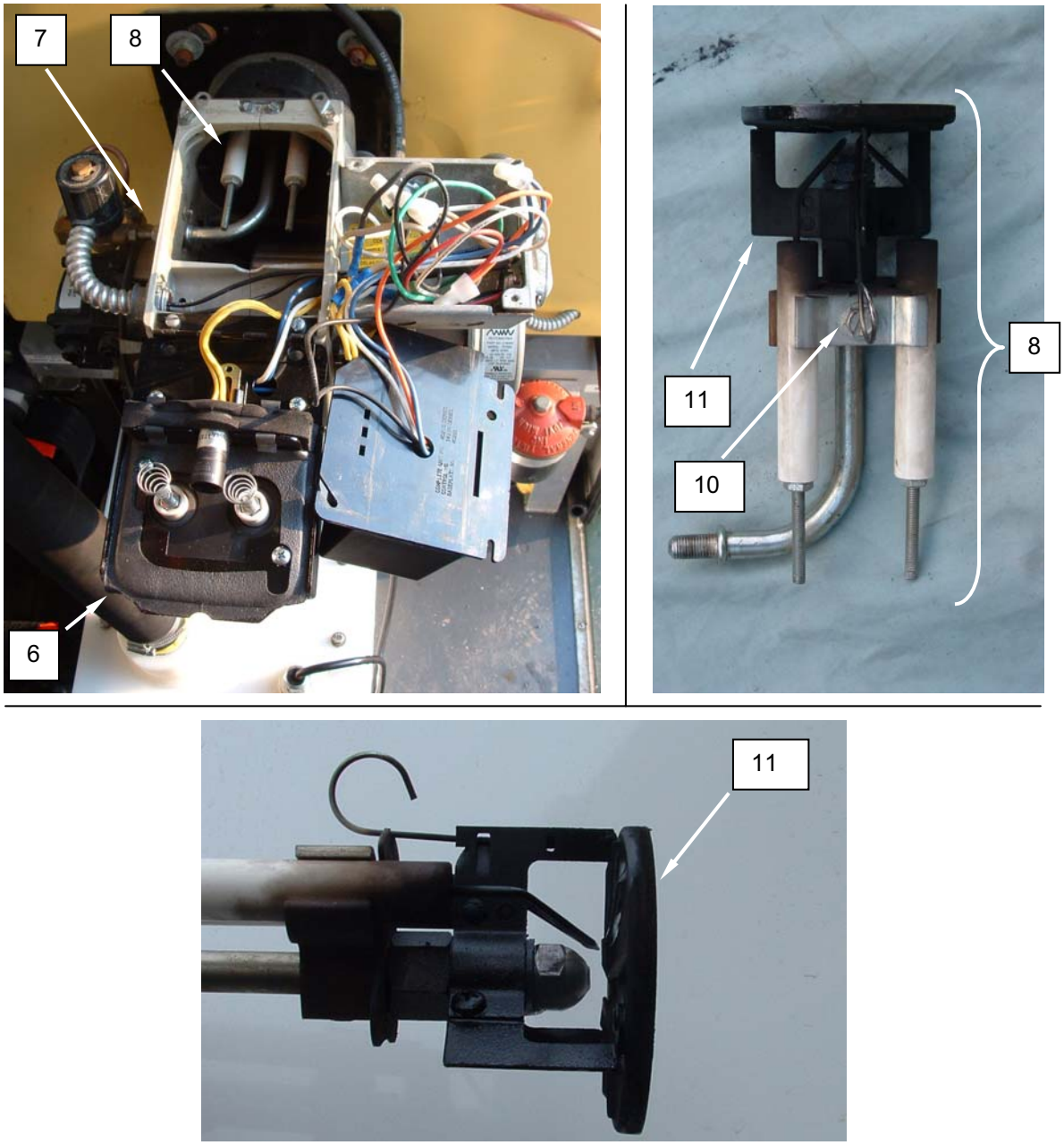


Figure 4. Replace the Flame Retention Head.

REPLACE-CONTINUED

Replace the Fuel Pump Coupling

WARNING

Ensure that all electrical power to the boiler is shut off and disconnected before proceeding. The circuit breaker box or individual circuit breaker should be locked and tagged out by personnel following this procedure. Remember that the CBL is a wet environment. Serious injury or death to personnel can result from electrocution if proper safety precautions are not observed.

WARNING

Ensure fuel is contained and not allowed to spill or spray into the CBL. Failure to observe safety precautions may result in a fire, with the possibility of serious injury or death to personnel.

WARNING

Allow the boiler and any associated hot water pipe, tubing or fixtures to cool at least 30 minutes before attempting any repairs. Failure to observe safety precautions may result in serious injury or death to personnel.

1. Disconnect power by switching circuit breaker No. 22 to OFF.
2. Loosen the screws retaining the motor **(Figure 5, Item 3)** to the burner **(Figure 5, Item 4)**, and remove the motor by twisting counter-clockwise.
3. Remove the fuel pump coupling **(Figure 5, Item 5)**.
4. Install the replacement fuel pump coupling **(Figure 5, Item 5)**.
5. Ensure the fuel pump coupling **(Figure 5, Item 5)** is in place, and install the motor **(Figure 5, Item 3)**.
6. Ensure the motor **(Figure 5, Item 3)** is secure and tighten the screws retaining the motor.
7. Connect power, bleed fuel pump, and monitor for normal operation.

REPLACE-CONTINUED

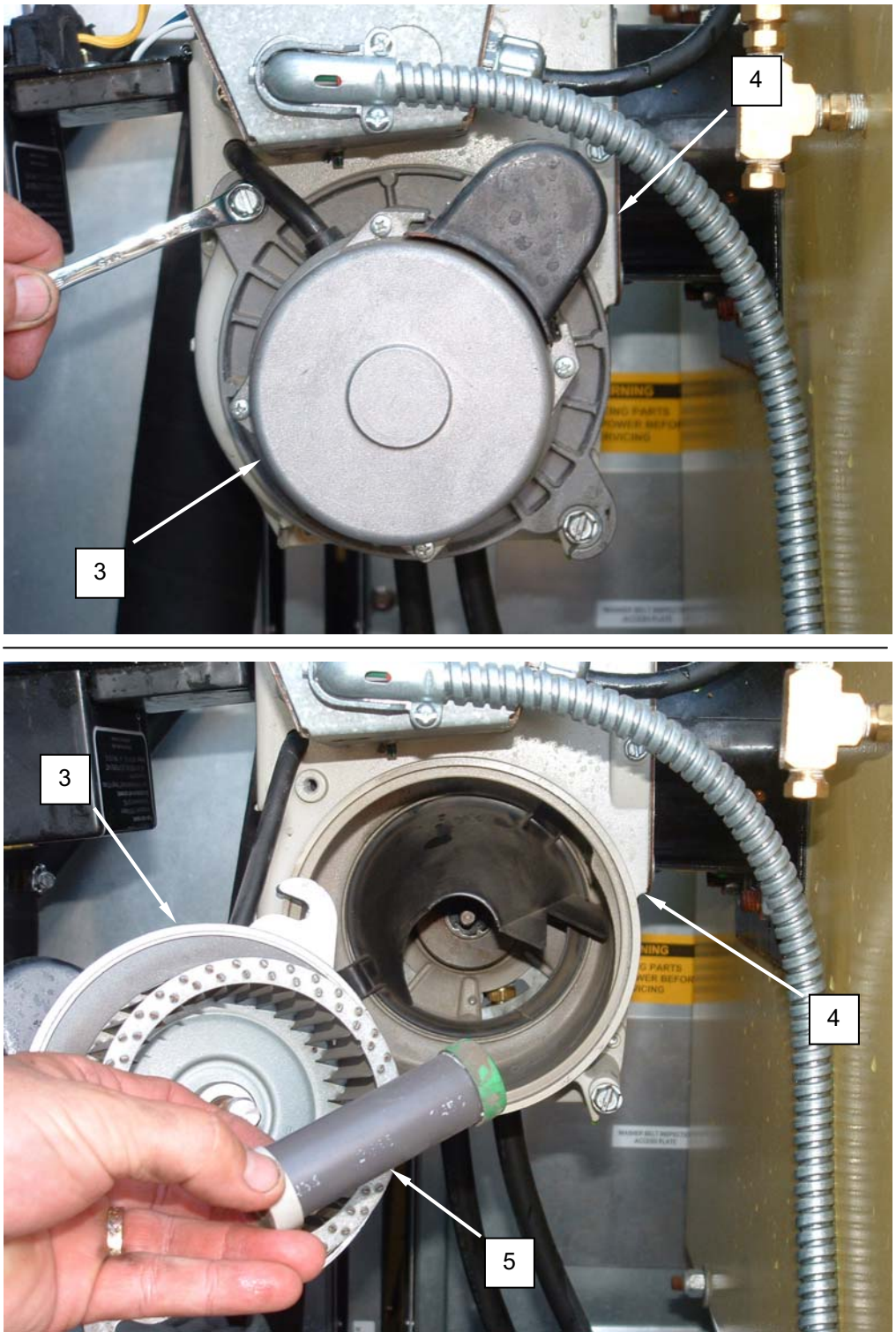


Figure 5. Replace the Fuel Pump Coupling.

REPLACE-CONTINUED

Replace the Fuel Pump

WARNING

Ensure that all electrical power to the boiler is shut off and disconnected before proceeding. The circuit breaker box or individual circuit breaker should be locked and tagged out by personnel following this procedure. Remember that the CBL is a wet environment. Serious injury or death to personnel can result from electrocution if proper safety precautions are not observed.

WARNING

Ensure fuel is contained and not allowed to spill or spray into the CBL. Failure to observe safety precautions may result in a fire, with the possibility of serious injury or death to personnel.

WARNING

Allow the boiler and any associated hot water pipe, tubing or fixtures to cool at least 30 minutes before attempting any repairs. Failure to observe safety precautions may result in serious injury or death to personnel.

1. Disconnect power by switching circuit breaker No. 22 to OFF.
2. Tag and disconnect fuel pump supply and return hoses **(Figure 6, Item 12)**.
3. Loosen the compression nut retaining the copper fuel pipe **(Figure 6, Item 13)** to the fuel pump **(Figure 6, Item 13)**.
4. Remove the screws retaining the fuel pump **(Figure 6, Item 14)** to the burner and remove the fuel pump.
5. Ensure the fuel pump coupling is in place and install the replacement fuel pump **(Figure 6, Item 14)**. Retain with screws.
6. Install the copper fuel pipe **(Figure 6, Item 13)** to the fuel pump **(Figure 6, Item 14)** and tighten compression nuts.
7. Install the fuel supply and return hoses **(Figure 6, Item 12)** as tagged and tighten.
8. Connect power, bleed fuel pump, and monitor for normal operation.

REPLACE-CONTINUED

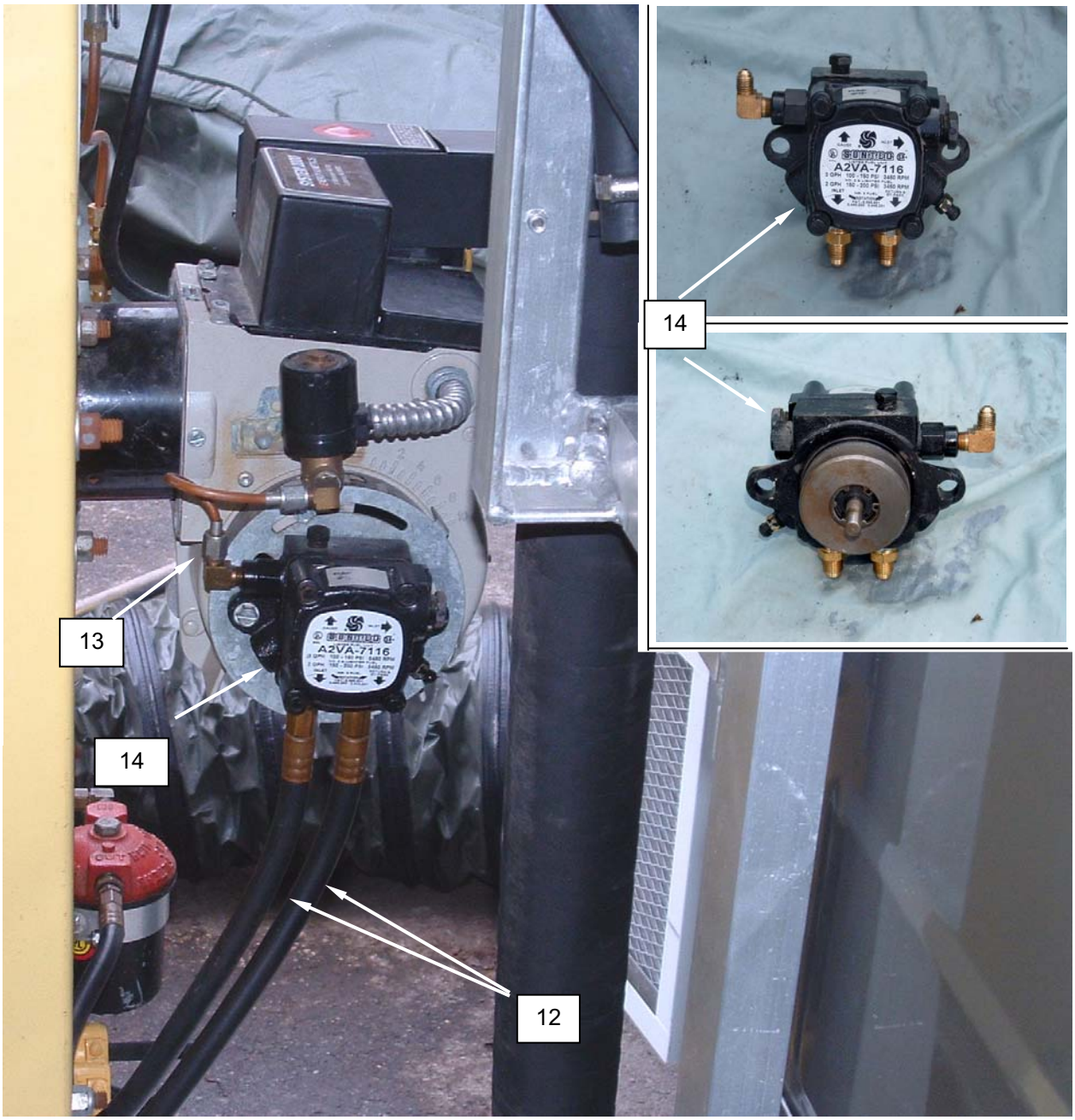


Figure 6. Replace the Fuel Pump.

REPLACE-CONTINUED

Replace the Transformer

WARNING

Ensure that all electrical power to the boiler is shut off and disconnected before proceeding. The circuit breaker box or individual circuit breaker should be locked and tagged out by personnel following this procedure. Remember that the CBL is a wet environment. Serious injury or death to personnel can result from electrocution if proper safety precautions are not observed.

1. Disconnect power by switching circuit breaker No. 22 to OFF.
2. Remove the screws retaining the transformer **(Figure 7, Item 6)** and flip the transformer up and back.
3. Tag and disconnect the wiring.
4. Remove the remaining screws at the hinge retaining the transformer **(Figure 7, Item 6)** and remove the transformer.
5. Install the replacement transformer **(Figure 7, Item 6)** and secure in place with screws at the hinge.
6. Connect wiring as tagged.
7. Place the transformer **(Figure 7, Item 6)** in operating position and retain with screws.
8. Connect power and monitor for normal operation

REPLACE-CONTINUED

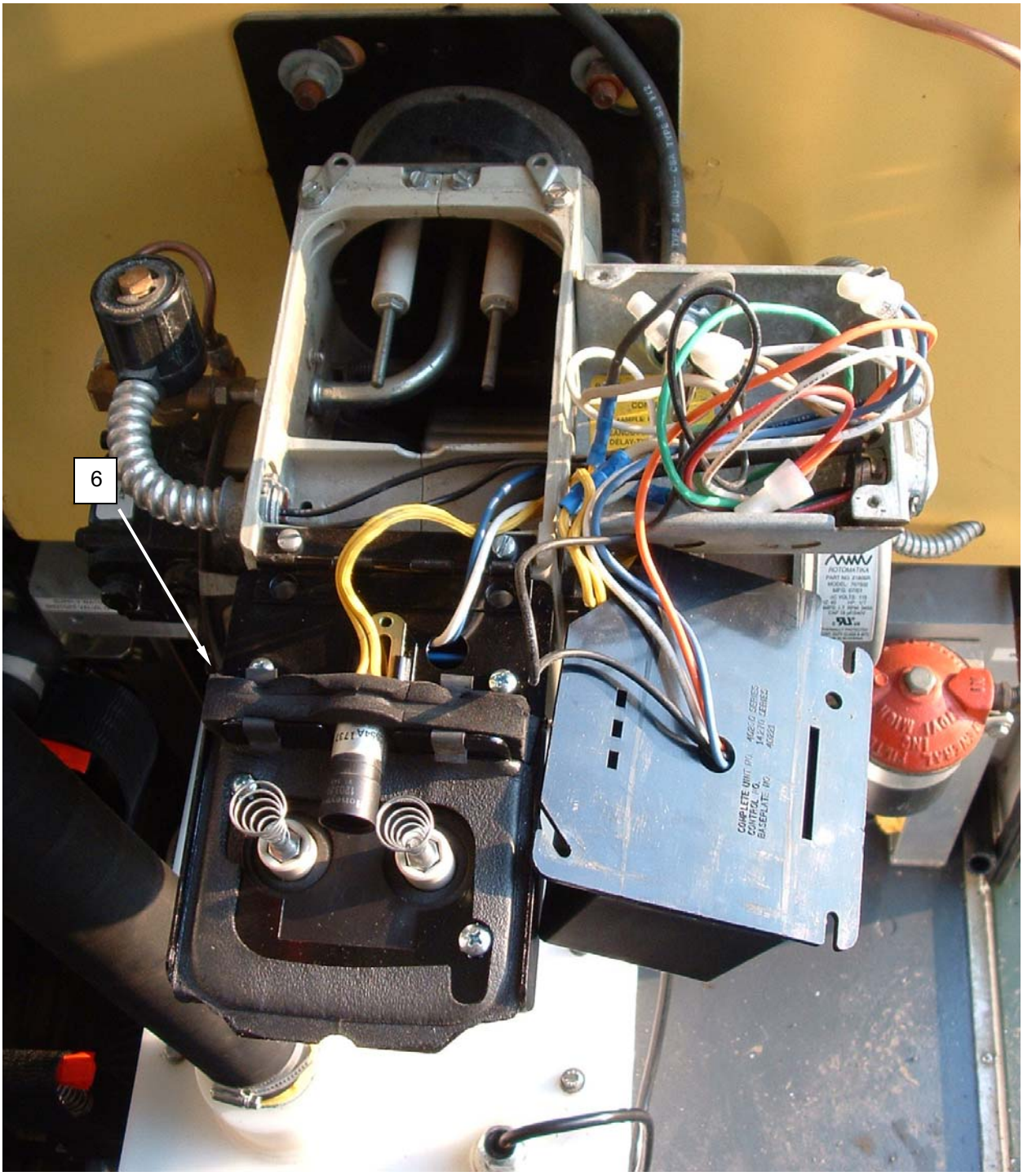


Figure 7. Replace the Burner Transformer.

REPLACE-CONTINUED

Replace the Burner Electrodes

WARNING

Ensure that all electrical power to the boiler is shut off and disconnected before proceeding. The circuit breaker box or individual circuit breaker should be locked and tagged out by personnel following this procedure. Remember that the CBL is a wet environment. Serious injury or death to personnel can result from electrocution if proper safety precautions are not observed.

WARNING

Ensure fuel is contained and not allowed to spill or spray into the CBL. Failure to observe safety precautions may result in a fire, with the possibility of serious injury or death to personnel.

WARNING

Allow the boiler and any associated hot water pipe, tubing or fixtures to cool at least 30 minutes before attempting any repairs. Failure to observe safety precautions may result in serious injury or death to personnel.

1. Disconnect power by switching circuit breaker No. 22 to OFF.
2. Remove screws retaining transformer **(Figure 8, Item 6)**, and swing transformer up and out of the way.
3. Loosen compression nut retaining the fuel solenoid **(Figure 8, Item 7)** to the nozzle assembly **(Figure 8, Item 8)**.
4. Remove the locknut retaining the nozzle assembly **(Figure 8, Item 8)** and remove the nozzle assembly.
5. Loosen the screws retaining the electrodes **(Figure 8, Item 15)** to the nozzle assembly **(Figure 8, Item 8)** and remove the electrodes.
6. Install the replacement electrodes **(Figure 8, Item 15)** onto the nozzle assembly **(Figure 8, Item 8)** and retain in place with screws. Do not tighten.
7. Position the electrodes **(Figure 8, Item 15)** approximately ¼ inch apart, just above the nozzle **(Figure 8, Item 9)**.
8. Tighten the screws retaining the electrodes **(Figure 8, Item 15)**.
9. Install the nozzle assembly **(Figure 8, Item 8)** into the burner, and retain with locknut.
10. Connect the fuel solenoid **(Figure 8, Item 7)** to the nozzle assembly **(Figure 8, Item 8)**, and tighten compression nut.

REPLACE-CONTINUED

11. Swing transformer **(Figure 8, Item 6)** back into place and retain with screws.

12. Connect power, operate IAW procedures given in TM 10-3510-226-10, and monitor for normal operation.

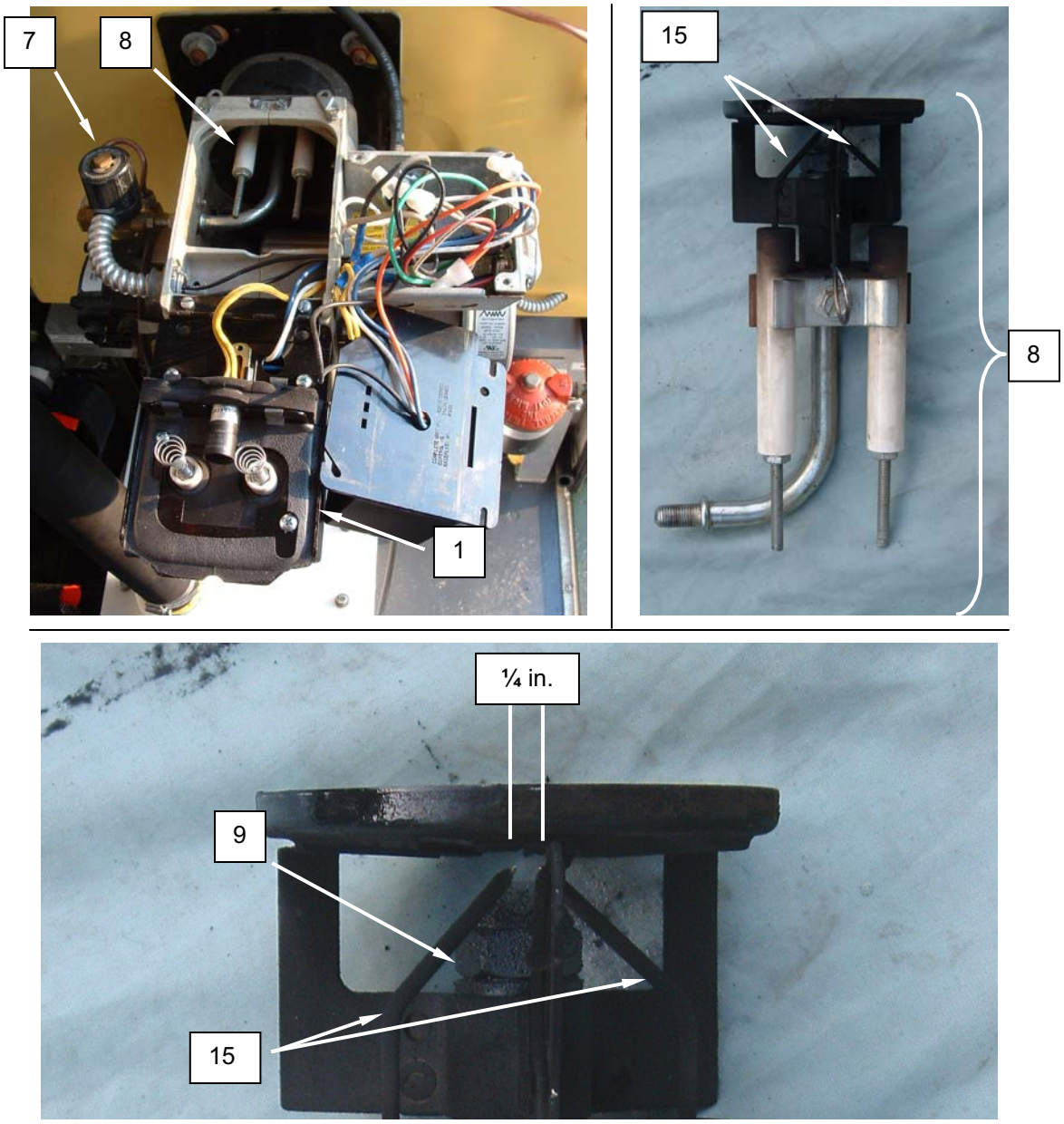


Figure 8. Replace the Burner Electrodes.

REPLACE-CONTINUED

Replace the Burner Controller

WARNING

Ensure that all electrical power to the boiler is shut off and disconnected before proceeding. The circuit breaker box or individual circuit breaker should be locked and tagged out by personnel following this procedure. Remember that the CBL is a wet environment. Serious injury or death to personnel can result from electrocution if proper safety precautions are not observed.

1. Disconnect power by switching circuit breaker No. 22 to OFF.
2. Remove screws retaining controller **(Figure 9, Item 16)** to burner.
3. Remove controller **(Figure 9, Item 16)** with guard as an assembly from burner.
4. Remove guard from controller **(Figure 9, Item 16)**.
5. Tag and disconnect wiring from controller **(Figure 9, Item 16)**.
6. Connect wiring to replacement controller **(Figure 9, Item 16)** as tagged.
7. Install guard onto controller **(Figure 9, Item 16)** and ensure alignment of screw holes is correct.
8. Install controller with guard as an assembly onto burner, and retain with screws.
9. Connect power and monitor for normal operation.

REPLACE-CONTINUED

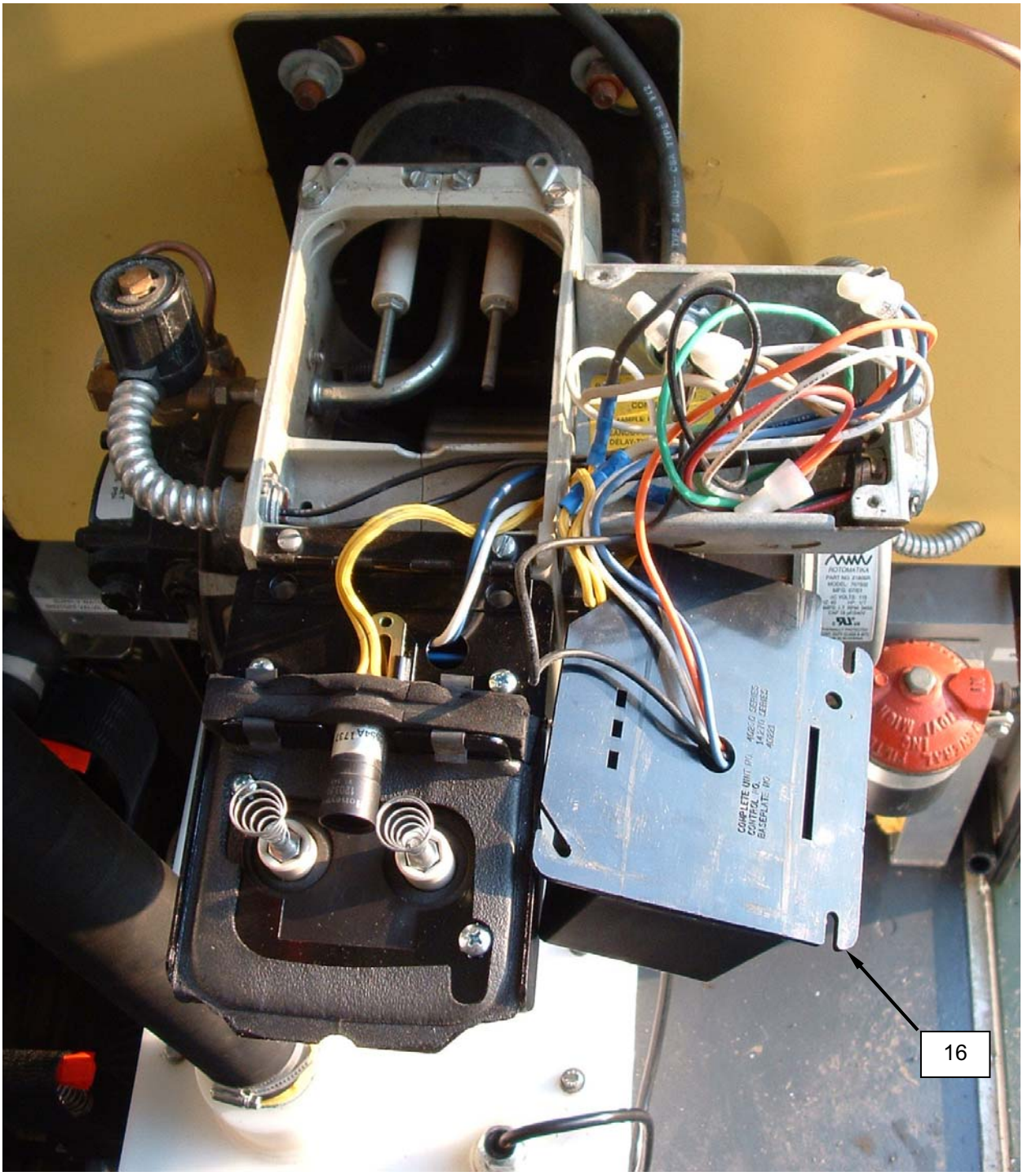


Figure 9. Replace the Burner Controller.

REPLACE-CONTINUED

Replace the CAD Cell

WARNING

Ensure that all electrical power to the boiler is shut off and disconnected before proceeding. The circuit breaker box or individual circuit breaker should be locked and tagged out by personnel following this procedure. Remember that the CBL is a wet environment. Serious injury or death to personnel can result from electrocution if proper safety precautions are not observed.

1. Disconnect power by switching circuit breaker No. 22 to OFF.
2. Remove screws retaining transformer **(Figure 10, Item 6)**, and swing transformer up and out of the way.
3. Remove screws retaining controller **(Figure 10, Item 16)** to burner.
4. Remove controller **(Figure 10, Item 16)** from burner.
5. Tag and disconnect wiring **(Figure 10, Item 23)** from CAD cell **(Figure 10, Item 17)**.
6. Remove CAD cell **(Figure 10, Item 17)** from burner.
7. Insert replacement CAD cell **(Figure 10, Item 17)** into burner.
8. Connect replacement CAD cell wiring **(Figure 10, Item 18)** as tagged.
9. Install controller **(Figure 10, Item 16)** as an assembly onto burner, and retain with screws.
10. Swing transformer **(Figure 10, Item 6)** back into place and retain with screws.
11. Connect power and monitor for normal operation.

REPLACE-CONTINUED

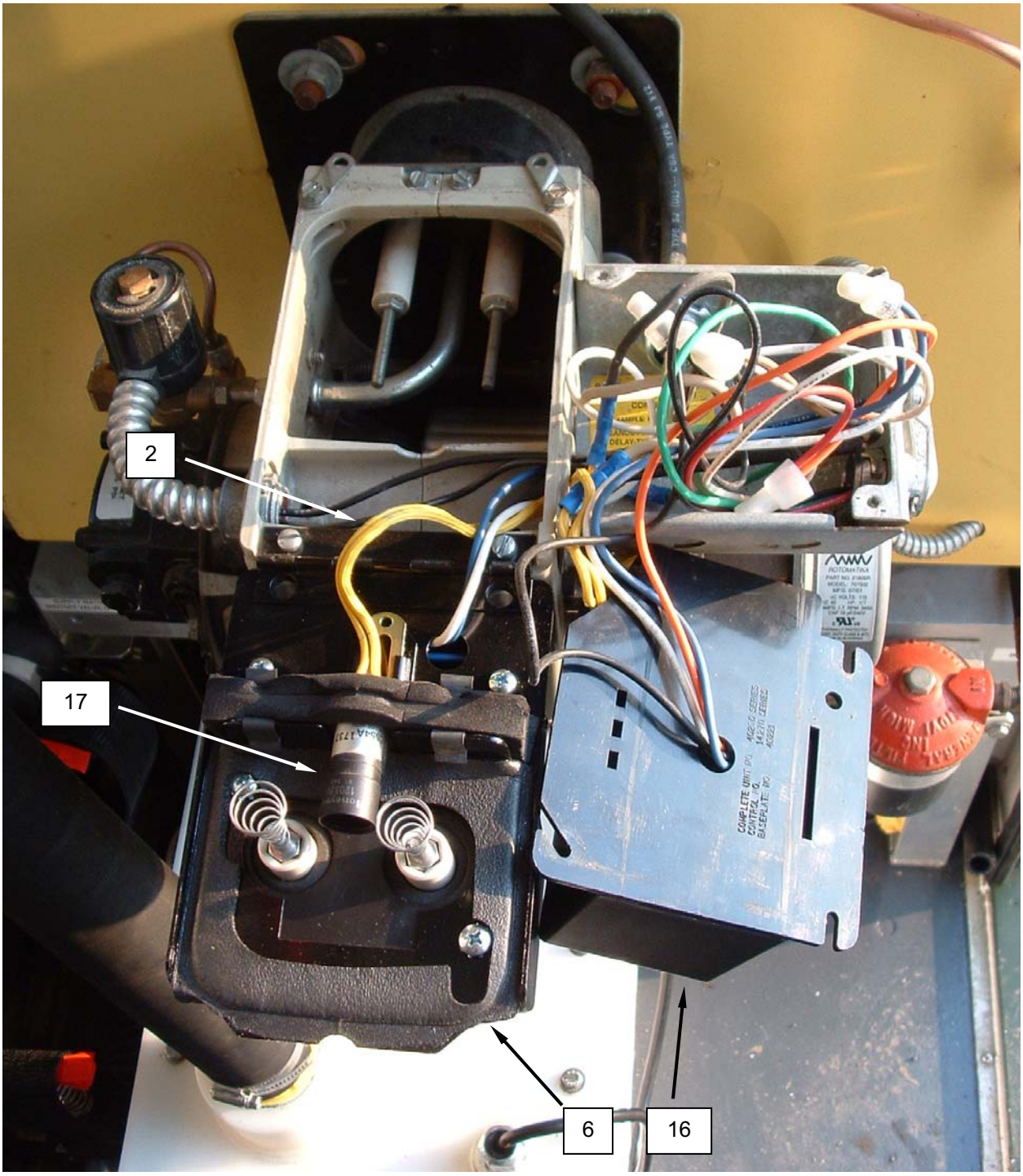


Figure 10. Replace the CAD Cell.

REPLACE-CONTINUED

Replace the Internal Fuel Hoses

WARNING

Ensure fuel is contained and not allowed to spill or spray into the CBL. Failure to observe safety precautions may result in a fire, with the possibility of serious injury or death to personnel.

1. Disconnect power by switching circuit breaker No. 22 to OFF.
2. Tag and disconnect hoses **(Figure 11, Item 19)** from fuel pump and fuel fittings.
3. Install replacement hose set **(Figure 11, Item 19)** as tagged, and tighten fittings.
4. Connect power, bleed fuel pump, and monitor for normal operation.

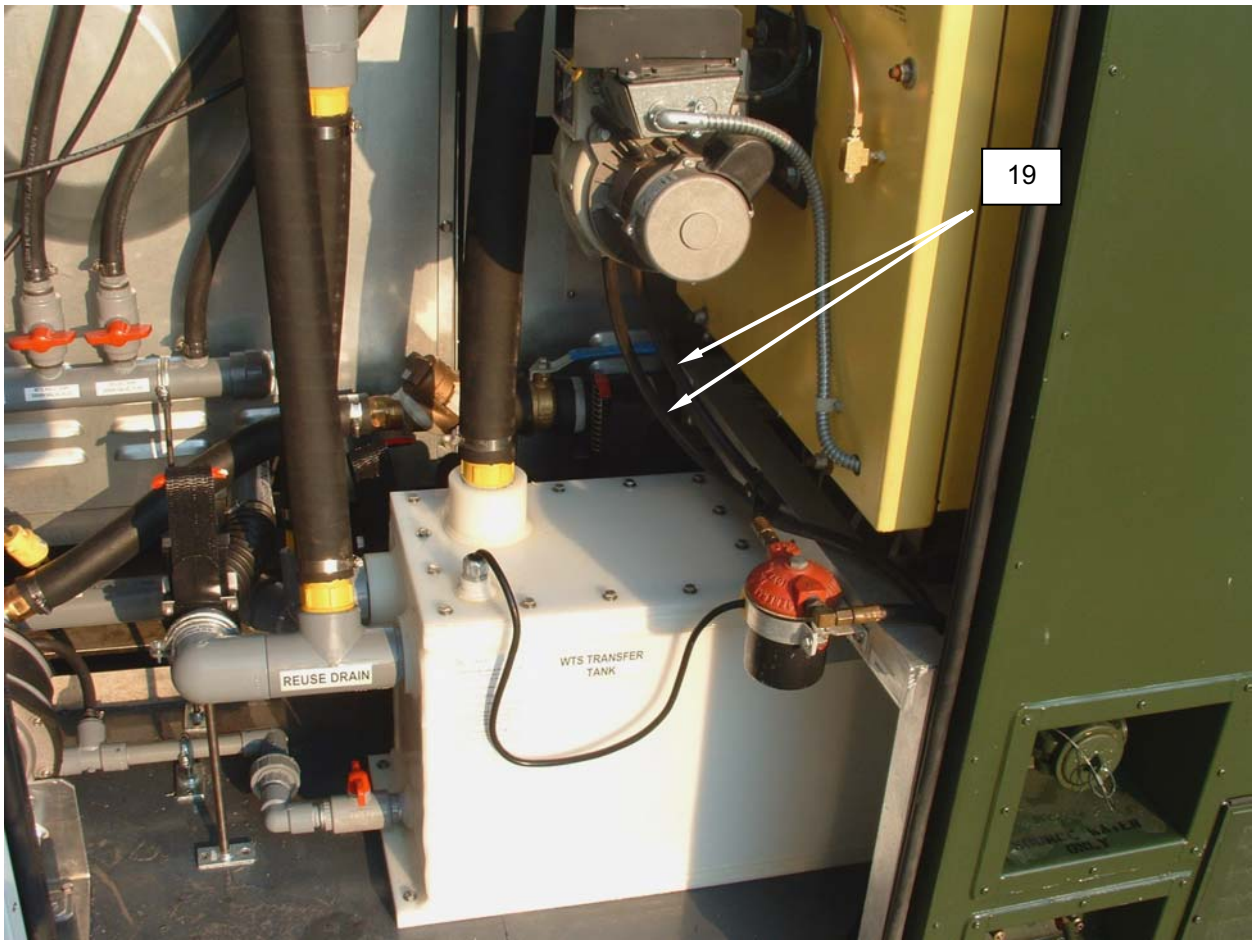


Figure 11. Replace the Fuel Hoses.

REPLACE-CONTINUED

Replace the Fuel Filter

WARNING

Ensure fuel is contained and not allowed to spill or spray into the CBL. Failure to observe safety precautions may result in a fire, with the possibility of serious injury or death to personnel.

1. Disconnect power by switching circuit breaker No. 22 to OFF.
2. Remove bolt **(Figure 12, Item 20)** retaining filter housing **(Figure 12, Item 21)** to filter canister **(Figure 12, Item 22)**, and lift filter housing off of canister.
3. Remove and discard fuel filter **(Figure 12, Item 23)** from filter canister **(Figure 12, Item 22)**. Install replacement filter into filter canister.
4. Ensure gasket is in place, and install filter housing **(Figure 12, Item 21)** onto filter canister **(Figure 12, Item 22)**.
5. Retain with bolt **(Figure 12, Item 20)**, and tighten.
6. Wipe any residual fuel from filter housing **(Figure 12, Item 21)** and filter canister **(Figure 12, Item 22)**.
7. Connect power, bleed fuel pump, and monitor for normal operation.

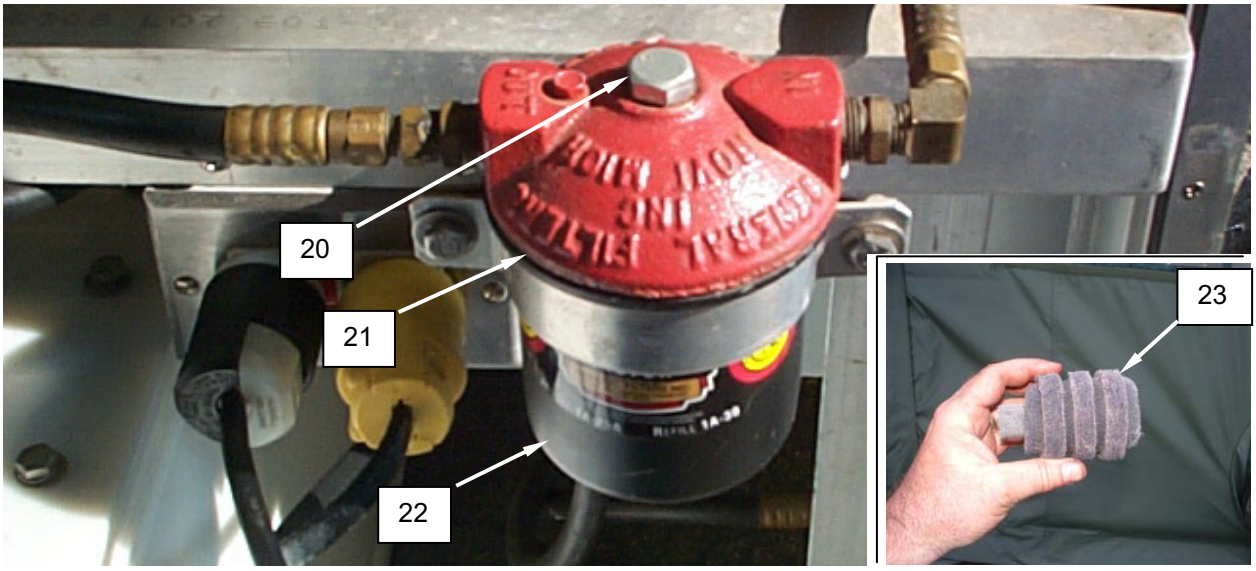


Figure 12. Replace the Fuel Filter.

REPLACE-CONTINUED

Replace the Burner Assembly

WARNING

Ensure that all electrical power to the boiler is shut off and disconnected before proceeding. The circuit breaker box or individual circuit breaker should be locked and tagged out by personnel following this procedure. Remember that the CBL is a wet environment. Serious injury or death to personnel can result from electrocution if proper safety precautions are not observed.

WARNING

Ensure fuel is contained and not allowed to spill or spray into the CBL. Failure to observe safety precautions may result in a fire, with the possibility of serious injury or death to personnel.

WARNING

Allow the boiler and any associated hot water pipe, tubing or fixtures to cool at least 30 minutes before attempting any repairs. Failure to observe safety precautions may result in serious injury or death to personnel.

WARNING

Use eye protection, gloves, and a dust mask when performing this procedure. The burner insulating amulet is fiberglass and can cause eye, skin, and respiratory system injury to personnel if adequate precautions are not observed.

1. Disconnect power by switching circuit breaker No. 22 to OFF.
2. Remove screw retaining the burner primary control **(Figure 13, Item 1)** and remove primary control.
3. Tag and disconnect motor wiring.
4. Remove conduit locknut, and remove conduit **(Figure 13, Item 24)** from junction box.
5. Tag and disconnect fuel supply and return hoses **(Figure 13, Item 12)**.
6. Remove the nuts retaining the burner assembly **(Figure 13, Item 25)** to the boiler **(Figure 13, Item 26)**, and remove the burner assembly.
7. Ensure the insulating amulet **(Figure 14, Item 27)** is in place.
8. Install the replacement burner assembly **(Figure 13, Item 25)**, and secure in place with nuts.
9. Connect the fuel supply and return hoses **(Figure 13, Item 12)** as tagged.

REPLACE-CONTINUED

10. Remove the screw retaining the replacement burner primary control **(Figure 13, Item 1)** and remove primary control.
11. If necessary, knock out the penetration for the conduit in the junction box.
12. Install conduit **(Figure 13, Item 24)** and retain with locknut.
13. Connect wiring as tagged.
14. Install the burner primary control **(Figure 13, Item 1)** and retain with screws.
15. Connect power, bleed fuel pump, and monitor for normal operation.

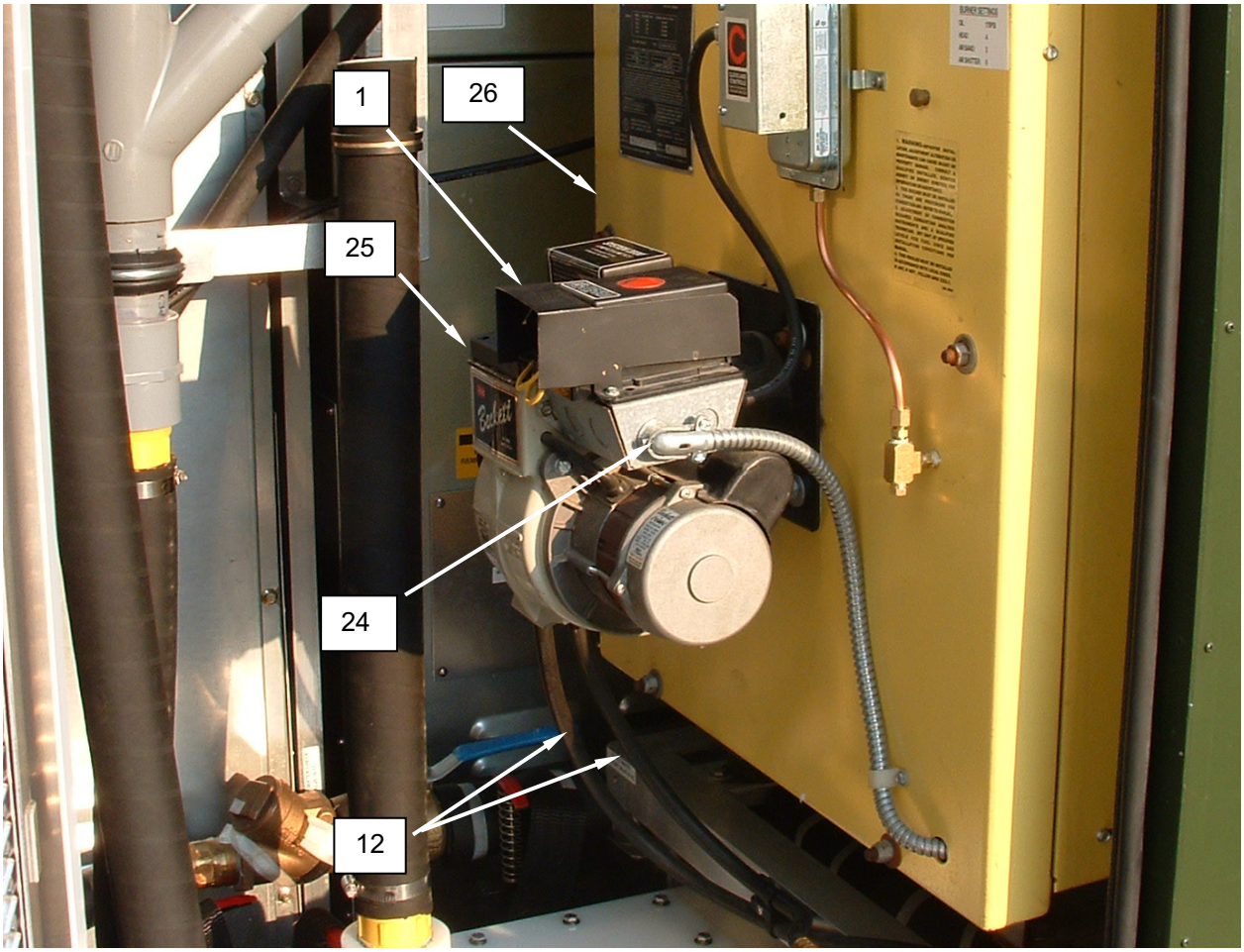


Figure 13. Replace the Burner Assembly.

REPLACE-CONTINUED

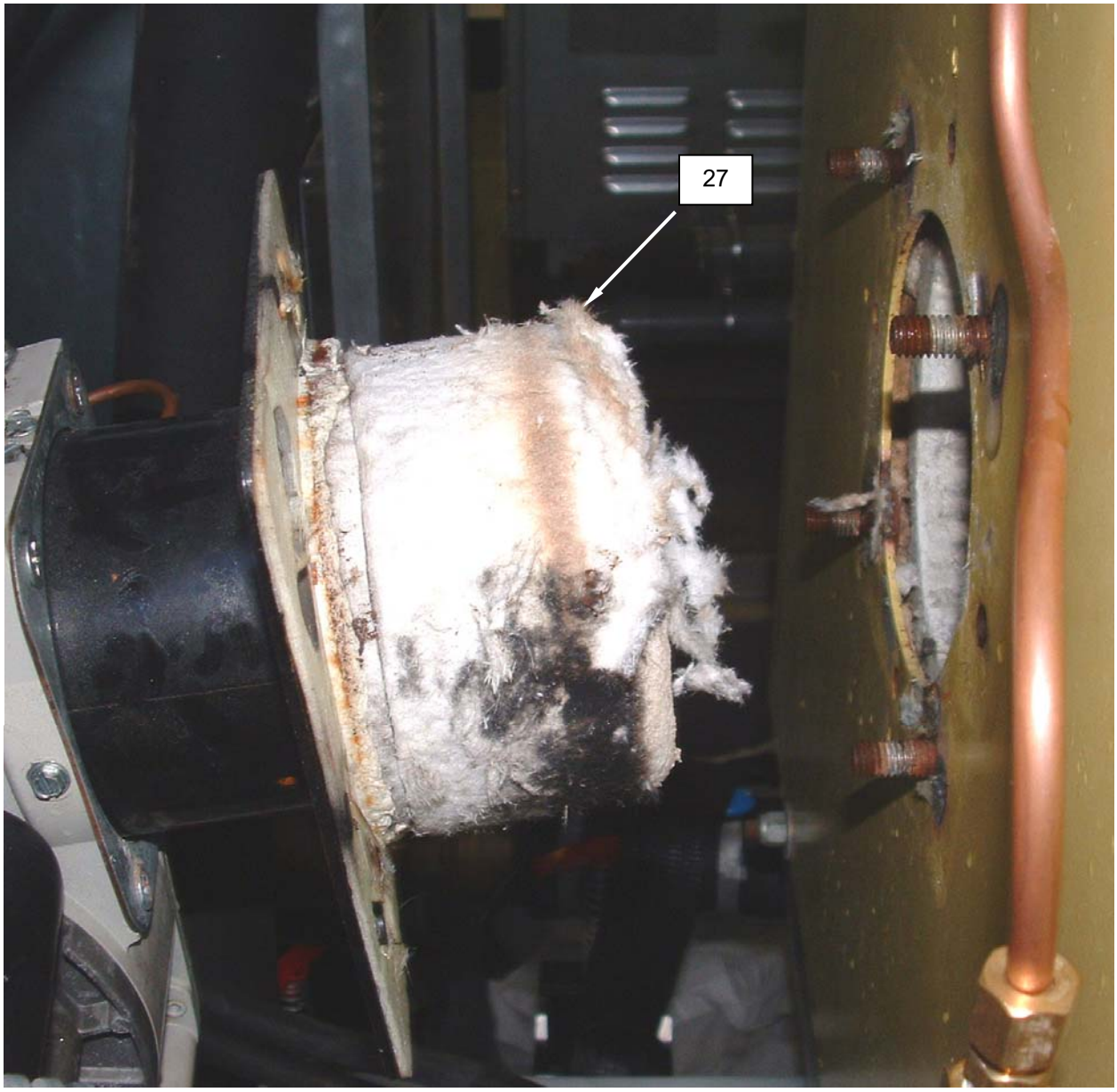


Figure 14. Replace the Burner Assembly.

END OF WORK PACKAGE

UNIT MAINTENANCE
CONTAINERIZED BATCH LAUNDRY
NSN 3510-01-527-2209
NSN 3510-01-527-2210
EXHAUST GAS SENSOR (AIR SWITCH)
TEST, REPLACE

INITIAL SETUP

Tools	**Personnel Required**
Tool Kit, General Mechanics: Automotive (WP 0086 00, Table 2, Item 6)	Quartermaster and Chemical Equipment Repairer 63J (1)
Materials/Parts	**Equipment Condition**
Wire Markers (WP 0087, Item 58)	CBL set up and operating

TEST

Test the Exhaust Gas Sensor

WARNING

Ensure that all electrical power is shut off and disconnected before proceeding. The circuit breaker box or individual circuit breaker should be locked and tagged out by personnel following this procedure. Remember that the CBL is a wet environment. Serious injury or death to personnel can result from electrocution if proper safety precautions are not observed.

WARNING

Allow the boiler and any associated hot water pipe, tubing or fixtures to cool at least 30 minutes before attempting any repairs. Failure to observe safety precautions may result in serious injury or death to personnel.

1. Switch boiler OFF at circuit breaker No. 22 and remove cover from exhaust gas sensor **(Figure 1, Item 1)**.
2. Tag and disconnect wiring at terminals **(Figure 1, Item 2)**.
3. Use a ohmmeter to check for continuity at terminals **(Figure 1, Item 2)**. Replace an open exhaust gas sensor.
4. Install cover on exhaust gas sensor **(Figure 1, Item 1)**.
5. Operate boiler IAW TM 10-3510-226-10. Monitor for normal operation.

TEST-CONTINUED

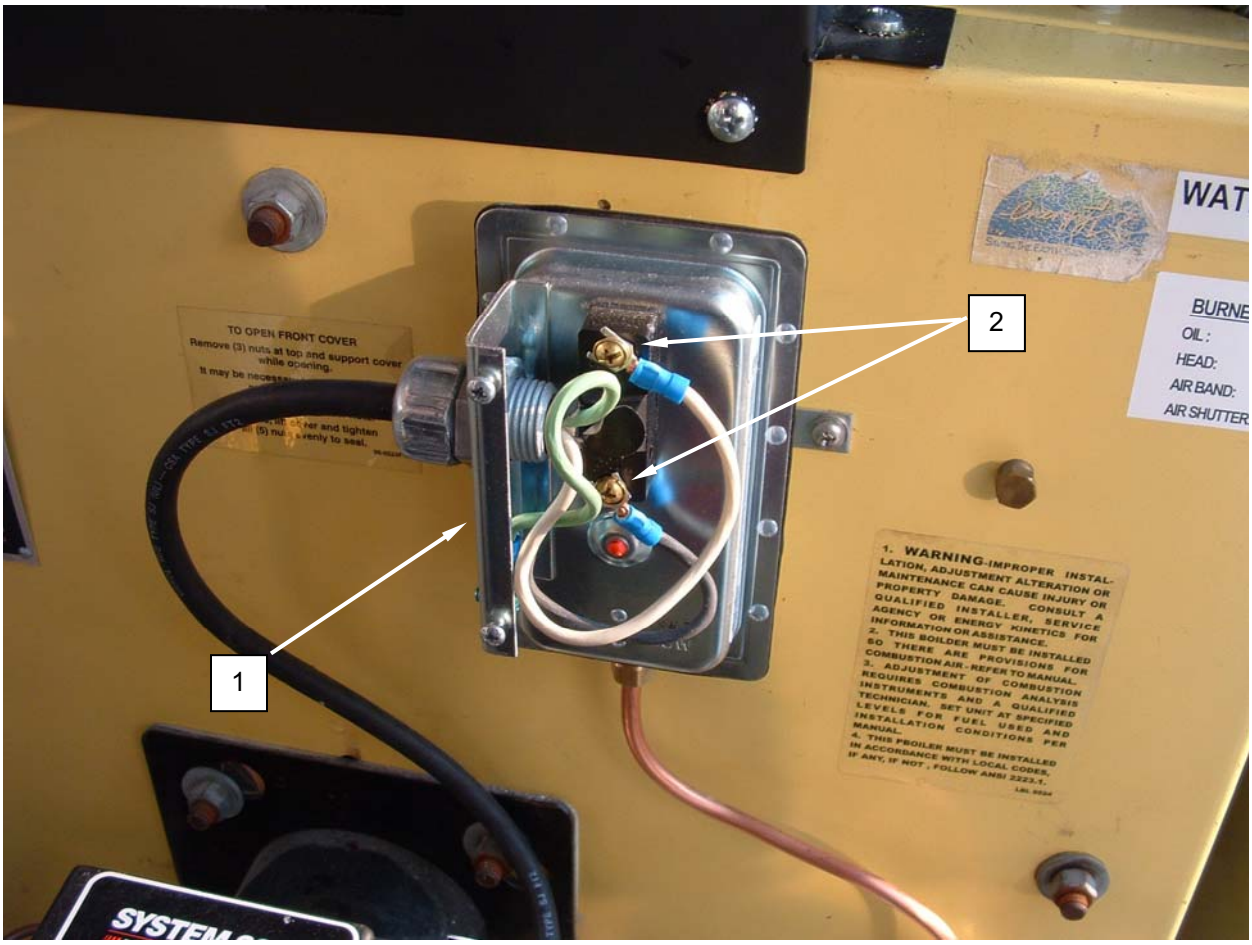


Figure 1. Test the Exhaust Gas Sensor.

REPLACE

Replace the Exhaust Gas Sensor

1. Shut boiler off at circuit breaker No. 22.

WARNING

Ensure that all electrical power is shut off and disconnected before proceeding. The circuit breaker box or individual circuit breaker should be locked and tagged out by personnel following this procedure. Remember that the CBL is a wet environment. Serious injury or death to personnel can result from electrocution if proper safety precautions are not observed.

WARNING

Allow the boiler and any associated hot water pipe, tubing or fixtures to cool at least 30 minutes before attempting any repairs. Failure to observe safety precautions may result in serious injury or death to personnel.

2. Remove cover from exhaust gas sensor **(Figure 2, Item 1)**.
3. Loosen compression nut and disconnect copper tubing **(Figure 2, Item 3)** from exhaust gas sensor **(Figure 2, Item 1)**.
4. Tag and disconnect wiring from exhaust gas sensor **(Figure 2, Item 1)**.
5. Remove conduit **(Figure 2, Item 4)**.
6. Remove screws retaining exhaust gas sensor **(Figure 2, Item 1)** to boiler and remove exhaust gas sensor.
7. Install replacement exhaust gas sensor **(Figure 2, Item 1)**, and retain with screws.
8. Connect copper tubing **(Figure 2, Item 3)** to replacement exhaust gas sensor and secure with compression nut.
9. Remove cover from replacement exhaust gas sensor **(Figure 2, Item 1)**.
10. Install conduit **(Figure 2, Item 4)** onto replacement exhaust gas sensor **(Figure 2, Item 1)**.
11. Connect wiring to replacement exhaust gas sensor **(Figure 2, Item 1)** as tagged.
12. Install cover.
13. Switch circuit breaker No. 22 on, and operate boiler IAW TM 10-3510-226-10. Monitor for normal operation.

REPLACE-CONTINUED

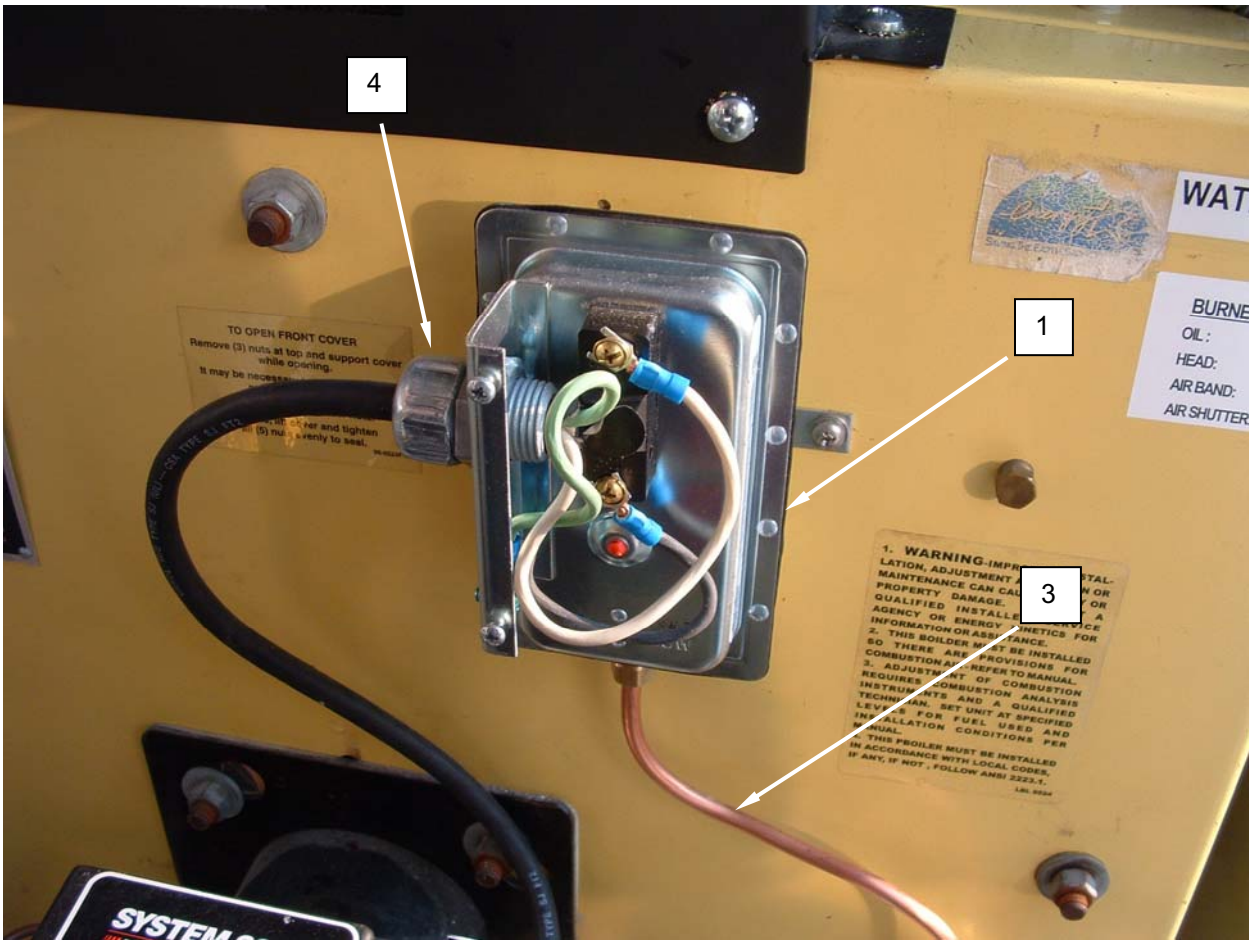


Figure 2. Replace the Exhaust Gas Sensor.

END OF WORK PACKAGE

UNIT MAINTENANCE
CONTAINERIZED BATCH LAUNDRY
NSN 3510-01-527-2209
NSN 3510-01-527-2210
INDUCER, DRAFT
TEST, REPLACE

INITIAL SETUP

Tools
Tool Kit, General Mechanics: Automotive (WP 0086 00, Table 2, Item 6)

Materials/Parts
Connector, Butt, #14-16 – Blue (WP 0087 00, Item 14)
Tape, Electrical Insulation, ¾-inch Width (WP 0087 00, Item 52)
Wire Markers (WP 0087, Item 58)

Personnel Required
Quartermaster and Chemical Equipment Repairer 63J (1)

Equipment Condition
CBL set up

TEST

Test the Draft Inducer Motor

WARNING

Ensure that all electrical power is shut off to the boiler and disconnected before proceeding. The circuit breaker box or individual circuit breaker should be locked and tagged out by personnel following this procedure. Remember that the CBL is a wet environment. Serious injury or death to personnel can result from electrocution if proper safety precautions are not observed.

WARNING

Allow the boiler and any associated hot water pipe, tubing or fixtures to cool at least 30 minutes before attempting any repairs. Failure to observe safety precautions may result in serious injury or death to personnel.

1. Disconnect power by switching the circuit breaker No. 22 to OFF.
2. Remove screws retaining junction box cover **(Figure 1, Item 1)**, and remove cover.
3. Tag and cut wiring **(Figure 1, Item 2)**.
4. Use an ohmmeter to test for 0 - 10 ohms resistance between motor leads **(Figure 1, Item 2)**.
5. Use an ohmmeter to test for infinite resistance between each motor lead **(Figure 1, Item 2)** and ground.
6. Connect wiring **(Figure 1, Item 2)** as tagged.
7. Install junction box cover **(Figure 1, Item 1)**, and retain with screws.
8. Connect power and monitor for normal operation.

TEST-CONTINUED

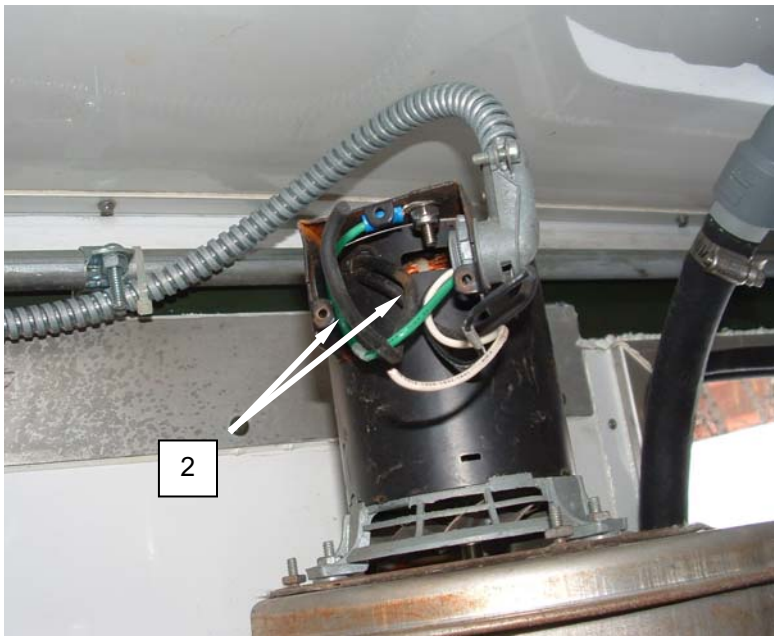


Figure 1. Test the Draft Inducer Motor.

REPLACE

Replace the Draft Inducer

WARNING

Ensure that all electrical power is shut off to the boiler and disconnected before proceeding. The circuit breaker box or individual circuit breaker should be locked and tagged out by personnel following this procedure. Remember that the CBL is a wet environment. Serious injury or death to personnel can result from electrocution if proper safety precautions are not observed.

WARNING

Allow the boiler and any associated hot water pipe, tubing or fixtures to cool at least 30 minutes before attempting any repairs. Failure to observe safety precautions may result in serious injury or death to personnel.

WARNING

Use eye protection, gloves, and a dust mask when performing this procedure. The insulating gasket is fiberglass and can cause eye, skin, and respiratory system injury to personnel if adequate precautions are not observed.

NOTE

The fan volute remains in place for replacement of the fan unless physical damage to the volute demands replacement of the fan as a whole.

1. Disconnect power by switching the circuit breaker to OFF.
2. Remove screws retaining junction box cover **(Figure 2, Item 1)**, and remove cover.
3. Tag and cut wiring.
4. Remove locknut retaining conduit **(Figure 2, Item 3)** to junction box and remove conduit.
5. Remove screws retaining fan **(Figure 3, Item 4)** to fan volute **(Figure 2, Item 5)** and remove fan.
6. Remove screws retaining replacement fan **(Figure 2, Item 4)** to replacement fan volute **(Figure 2, Item 5)** and remove replacement fan.
7. Remove screws retaining junction box cover **(Figure 2, Item 1)** to replacement fan **(Figure 2, Item 4)**, and remove cover.
8. Knock out junction box penetration for conduit, if necessary.
9. Install conduit **(Figure 2, Item 3)** into junction box, and retain with locknut.

REPLACE-CONTINUED

10. Connect wiring as tagged.
11. Install replacement fan **(Figure 2, Item 4)** into fan volute and retain with screws.
12. Install junction box cover **(Figure 2, Item 1)**, and retain with screws.
13. Connect power and monitor for normal operation.

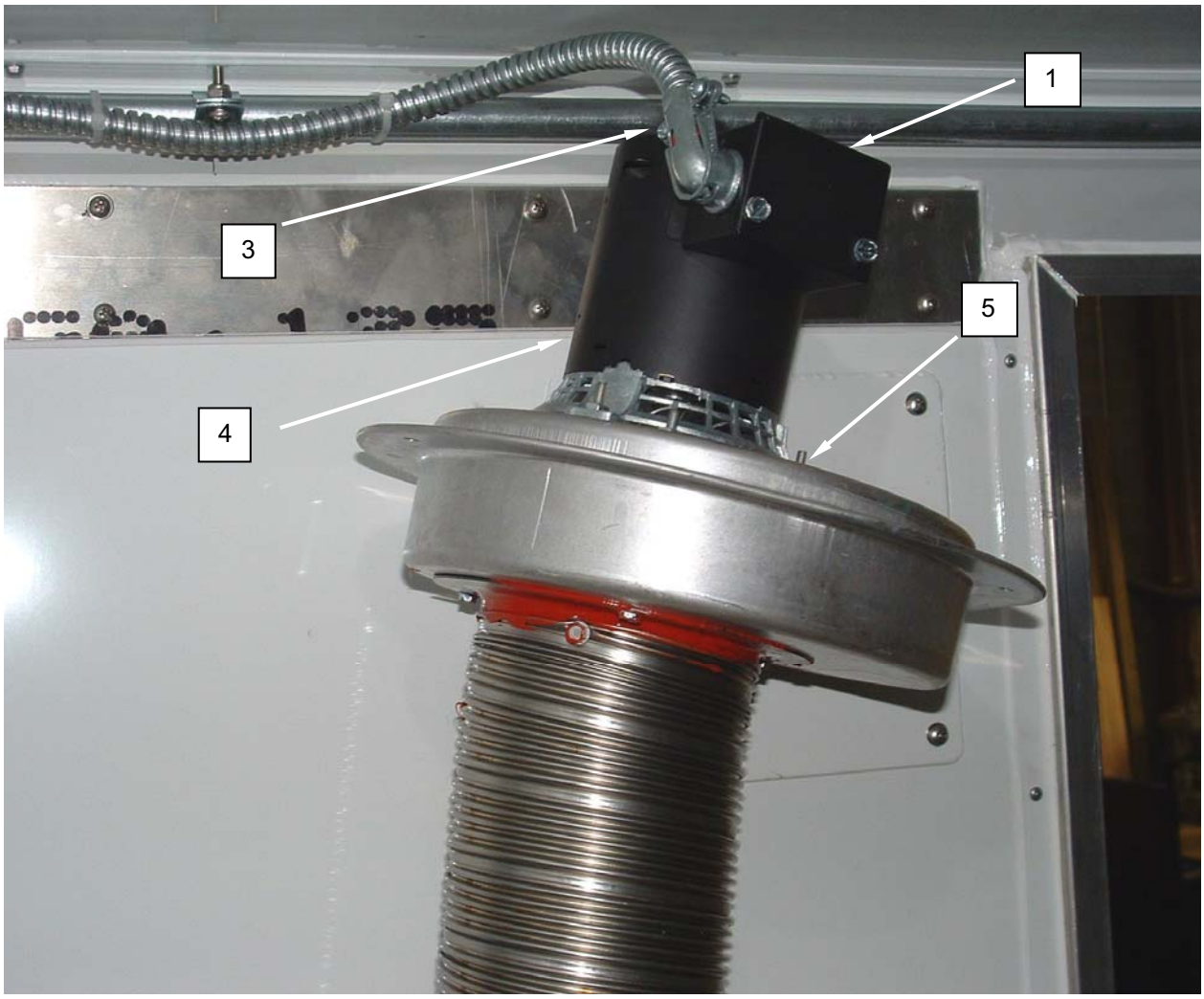


Figure 2. Replace the Draft Inducer.

REPLACE-CONTINUED

Figure 3. Replace the Draft Inducer.

END OF WORK PACKAGE

UNIT MAINTENANCE
CONTAINERIZED BATCH LAUNDRY
NSN 3510-01-527-2209
NSN 3510-01-527-2210
HEAT EXCHANGER
REPLACE

INITIAL SETUP

Tools
Shop Equipment, Automotive Maintenance and Repair: Organizational Maintenance, Common No.1 (WP 0086 00, Table 2, Item 5)

Personnel Required
Quartermaster and Chemical Equipment Repairer 63J (1)

Materials/Parts
Flux, Soldering (WP 0087 00, Item 29)
Solder, Tin Alloy (WP 0087 00, Item 48)

Equipment Condition
CBL set up.

REPLACE

Replace the Heat Exchanger

WARNING

Allow the boiler and any associated hot water pipe, tubing or fixtures to cool at least 30 minutes before attempting any repairs. Failure to observe safety precautions may result in serious injury or death to personnel.

1. Disconnect power by switching circuit breakers to OFF.
2. Drain system.
3. Remove screws retaining guard **(Figure 1, Item 1)** and remove guard.
4. Unscrew unions **(Figure 1, Item 2)** and remove heat exchanger **(Figure 1, Item 3)**.
5. Desolder union halves from heat exchanger **(Figure 1, Item 3)**.
6. Solder union halves to heat exchanger **(Figure 1, Item 3)**.
7. Install heat exchanger **(Figure 1, Item 3)** and secure with unions **(Figure 1, Item 2)**.
8. Install guard **(Figure 1, Item 1)** and retain with screws.
9. Fill system, connect power, and monitor for normal operation.

REPLACE-CONTINUED

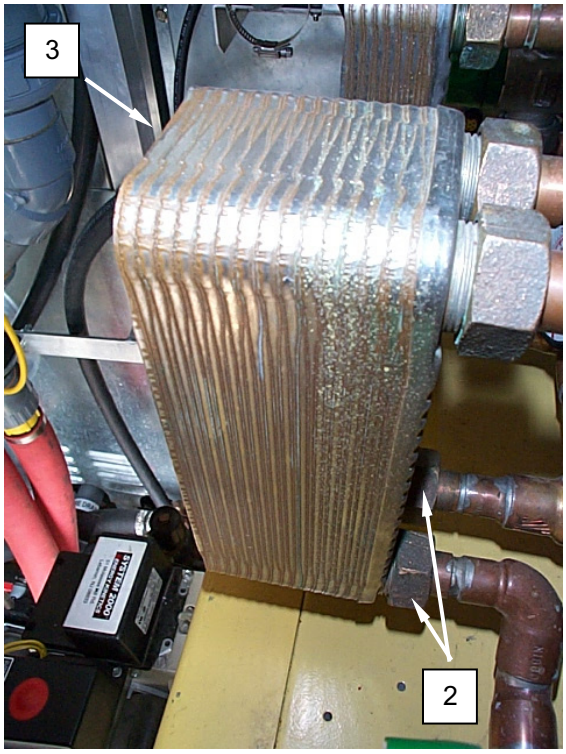


Figure 1. Replace the Heat Exchanger.

END OF WORK PACKAGE

UNIT MAINTENANCE
CONTAINERIZED BATCH LAUNDRY (CBL)
NSN 3510-01-527-2209
NSN 3510-01-527-2210
COOLANT, RESERVOIR
REPLACE

INITIAL SETUP

Tools
Tool Kit, General Mechanics: Automotive (WP 0086 00, Table 2, Item 6)

Personnel Required
Quartermaster and Chemical Equipment Repairer 63J (1)

Materials/Parts
Ethylene Glycol, Solution (WP 0087 00, Item 27)

Equipment Condition
CBL set up

References
TM 10-3510-226-10

REPLACE

Replace the Coolant Reservoir

WARNING

Allow the boiler and any associated hot water pipe, tubing or fixtures to cool at least 30 minutes before attempting any repairs. Failure to observe safety precautions may result in serious injury or death to personnel.

NOTE

Replacement of this component may be easier if washer No. 1 is removed.

1. Disconnect the power.
2. Remove the screws retaining the coolant reservoir mount **(Figure 1, Item 1)** and remove the coolant reservoir mount.
3. Loosen the clamp retaining the hose to the coolant reservoir **(Figure 1, Item 2)** and remove the coolant reservoir.
4. If necessary, drain the coolant reservoir **(Figure 1, Item 2)**.
5. Install the replacement coolant reservoir **(Figure 1, Item 2)** onto the hose and retain with clamp.
6. Install the coolant reservoir **(Figure 1, Item 2)** in place atop the boiler and secure in place with the coolant reservoir mount **(Figure 1, Item 1)**.
7. Retain the coolant reservoir mount **(Figure 1, Item 1)** with screws.

REPLACE-CONTINUED


WARNING

Antifreeze used in the following procedure is highly toxic. Wear appropriate protective clothing when handling antifreeze/glycol. If antifreeze contacts eyes or skin, flush the affected area immediately with clean water and seek medical attention.

CAUTION

Do not make substitutions for the antifreeze. The use of antifreeze other than the type identified in the Expendable and Durable List may decrease performance. Failure to comply may shorten the life span of the equipment.

8. Connect power, and refill with antifreeze (ethylene glycol) IAW TM 10-3510-226-10.
9. Monitor for normal operation.

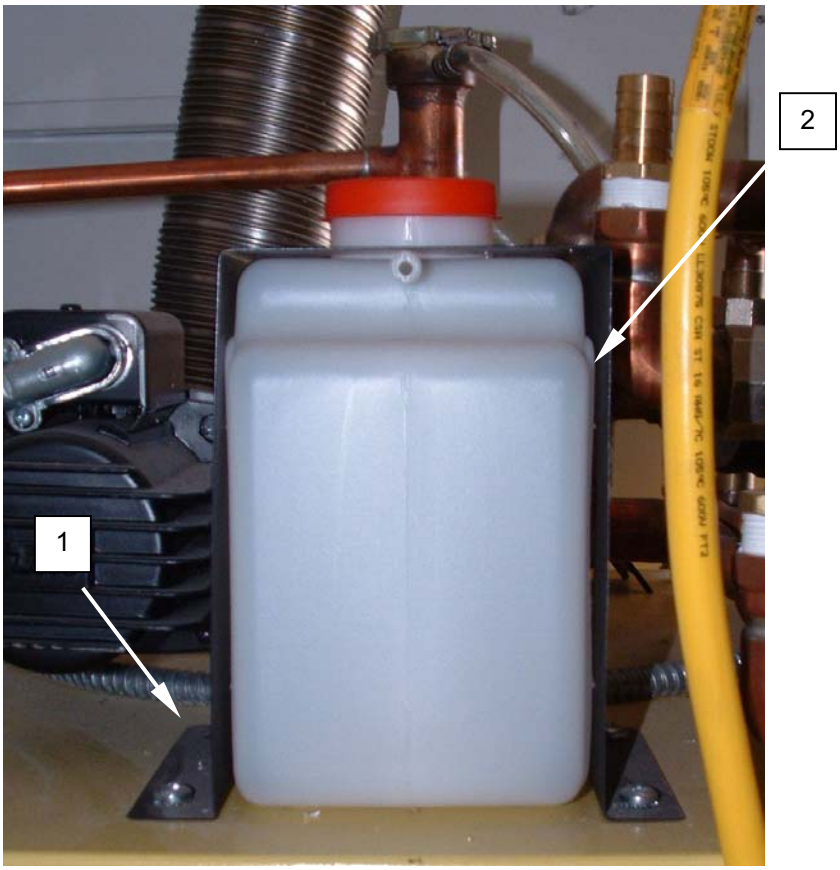


Figure 1. Replace the Coolant Reservoir.

END OF WORK PACKAGE

UNIT MAINTENANCE
CONTAINERIZED BATCH LAUNDRY (CBL)
NSN 3510-01-527-2209
NSN 3510-01-527-2210
PUMP, CIRCULATION
TEST, REPLACE

INITIAL SETUP

Tools
Tool Kit, General Mechanics: Automotive (WP 0086 00, Table 2, Item 6)

Materials/Parts
Baled Rag, General (WP 0087 00, Item 5)
Connector, Butt, #14-16 – Blue (WP 0087 00, Item 14)
Ethylene Glycol, Solution (WP 0087 00, Item 27)
Tape, Electrical Insulation, ¾-inch Width (WP 0087 00, Item 52)
Wire Markers (WP 0087 00, Item 58)

Personnel Required
Quartermaster and Chemical Equipment Repairer 63J (1)

Equipment Condition
CBL set up

References
WP 0073 00
TM 10-3510-226-10

TEST

Test the Circulation Pump Motor

WARNING

Ensure that all electrical power to the boiler is shut off and disconnected before proceeding. The circuit breaker box or individual circuit breaker should be locked and tagged out by personnel following this procedure. Remember that the CBL is a wet environment. Serious injury or death to personnel can result from electrocution if proper safety precautions are not observed.

WARNING

Allow the boiler and any associated hot water pipe, tubing or fixtures to cool at least 30 minutes before attempting any repairs. Failure to observe safety precautions may result in serious injury or death to personnel.

NOTE

Replacement of this component may be easier if washer No. 1 is removed.

1. Disconnect power by switching the circuit breaker No. 22 to off.
2. Remove screws retaining junction box cover **(Figure 1, Item 1)** and remove cover.
3. Tag and disconnect wiring.
4. Use an ohmmeter to test for 10 - 15 ohms resistance between motor leads.
5. Use an ohmmeter to test for infinite resistance between each motor lead and ground.

TEST-CONTINUED

6. Connect wiring as tagged.
7. Install junction box cover **(Figure 1, Item 1)**, and retain with screws.
8. Connect power and monitor for normal operation.

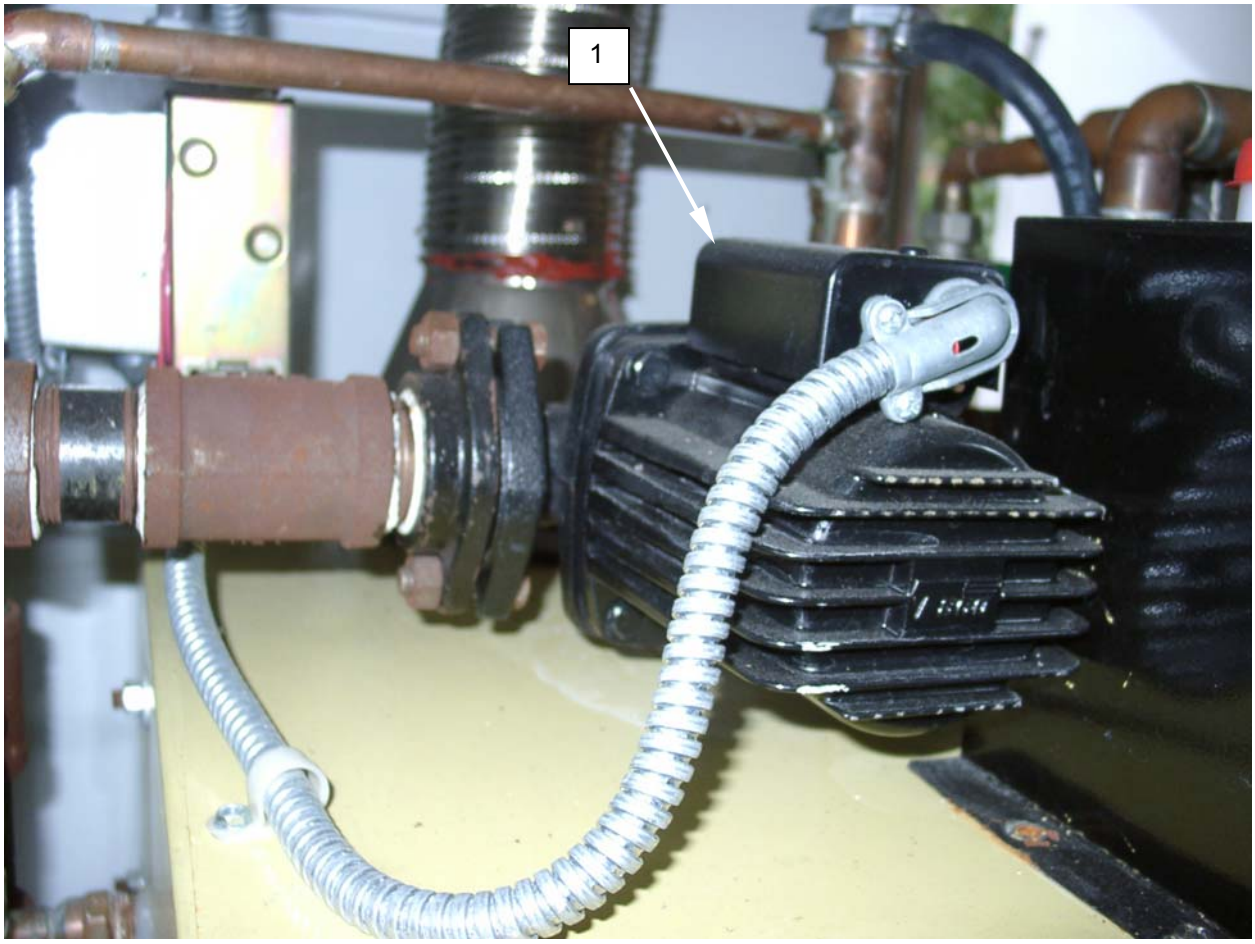


Figure 1. Test the Circulation Pump Motor.

REPLACE

Replace the Circulation Pump

WARNING

Ensure that all electrical power to the boiler is shut off and disconnected before proceeding. The circuit breaker box or individual circuit breaker should be locked and tagged out by personnel following this procedure. Remember that the CBL is a wet environment. Serious injury or death to personnel can result from electrocution if proper safety precautions are not observed.

WARNING

Allow the boiler and any associated hot water pipe, tubing or fixtures to cool at least 30 minutes before attempting any repairs. Failure to observe safety precautions may result in serious injury or death to personnel.

NOTE

Replacement of this component may be easier if washer No. 1 is removed.

1. Disconnect power by switching the circuit breaker No. 22 to off.
2. Remove the coolant reservoir IAW procedures given in WP 0073 00.
3. Drain boiler of glycol. Retain glycol for refill.
4. Remove screws retaining junction box cover **(Figure 2, Item 1)**, and remove cover.
5. Tag and disconnect wiring.
6. Remove locknut retaining conduit **(Figure 2, Item 2)**, and remove conduit.
7. Remove bolts, washers, and nuts retaining pump **(Figure 2, Item 3)** to pump flanges **(Figure 2, Item 4)**, and remove pump.
8. Install new flange gaskets.
9. Install replacement pump **(Figure 2, Item 3)**, and retain with bolts, washers, and nuts.
10. Remove screws retaining junction box cover **(Figure 2, Item 1)** on replacement pump **(Figure 2, Item 3)**, and remove cover.
11. Knock out conduit penetration in junction box **(Figure 2, Item 1)**, if necessary.
12. Install conduit **(Figure 2, Item 2)**, and retain with locknut.
13. Connect wiring as tagged.
14. Install junction box cover **(Figure 2, Item 1)** and retain with screws.

REPLACE-CONTINUED

15. Install the coolant reservoir IAW procedures given in WP 0073 00.

WARNING

Antifreeze used in the following procedure is highly toxic. Wear appropriate protective clothing when handling antifreeze/glycol. If antifreeze contacts eyes or skin, flush the affected area immediately with clean water and seek medical attention.

CAUTION

Do not make substitutions for the antifreeze. The use of antifreeze other than the type identified in the Expendable and Durable List may decrease performance. Failure to comply may shorten the life span of the equipment.

16. Refill system with ethylene glycol, and connect power IAW TM 10-3510-226-10.

17. Monitor for normal operation.

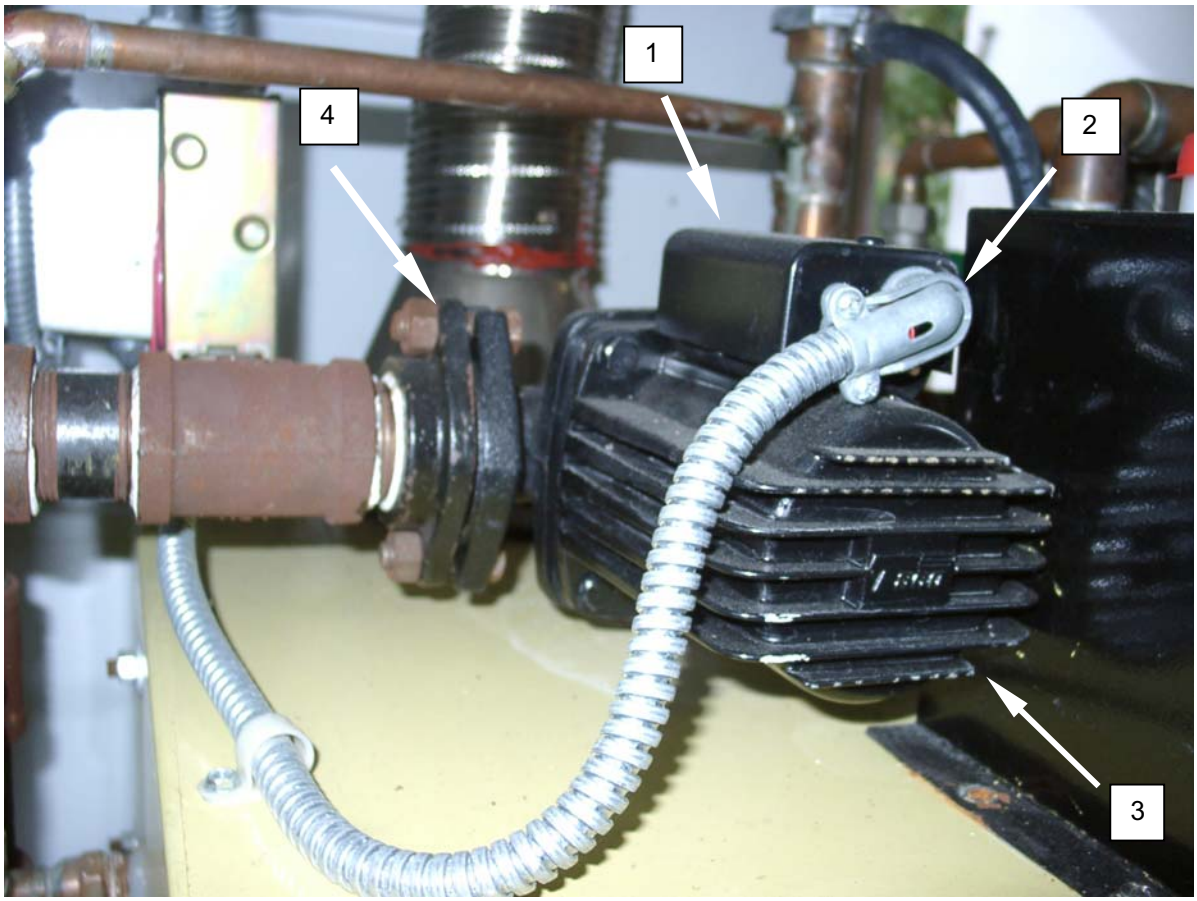


Figure 2. Replace the Circulation Pump.

END OF WORK PACKAGE

UNIT MAINTENANCE
CONTAINERIZED BATCH LAUNDRY
NSN 3510-01-527-2209
NSN 3510-01-527-2210
VALVES, MIXING
REPLACE

INITIAL SETUP

Tools
Shop Equipment, Automotive Maintenance and Repair: Organizational Maintenance, Common No.1 (WP 0086 00, Table 2, Item 5)

Materials/Parts
Absorbent Material, Spill Cleanup (WP 0087 00, Item 1)
Ethylene Glycol, Solution (WP 0087 00, Item 27)

Personnel Required
Quartermaster and Chemical Equipment Repairer 63J (1)

Equipment Condition
CBL set up

References
TM 10-3510-226-10

REPLACE

Replace a Mixing Valve

WARNING

Allow the boiler and any associated hot water pipe, tubing or fixtures to cool at least 30 minutes before attempting any repairs. Failure to observe safety precautions may result in serious injury or death to personnel.

1. Disconnect the power by switching the circuit breakers off.
2. Drain boiler of glycol. Retain glycol in an approved container for refill.
3. Remove the guard.
4. Unscrew unions **(Figure 1, Item 1)** and remove mixing valve **(Figure 1, Item 2)**.
5. Install the replacement mixing valve **(Figure 1, Item 2)** and secure with unions **(Figure 1, Item 1)**.
6. Install the guard.


WARNING

Antifreeze used in the following procedure is highly toxic. Wear appropriate protective clothing when handling antifreeze/glycol. If antifreeze contacts eyes or skin, flush the affected area immediately with clean water and seek medical attention.

CAUTION

Do not make substitutions for the antifreeze. The use of antifreeze other than the type identified in the Expendable and Durable List may decrease performance. Failure to comply may shorten the life span of the equipment.

7. Refill system with ethylene glycol, and connect power IAW TM 10-3510-226-10.

REPLACE-CONTINUED

8. Monitor for normal operation.

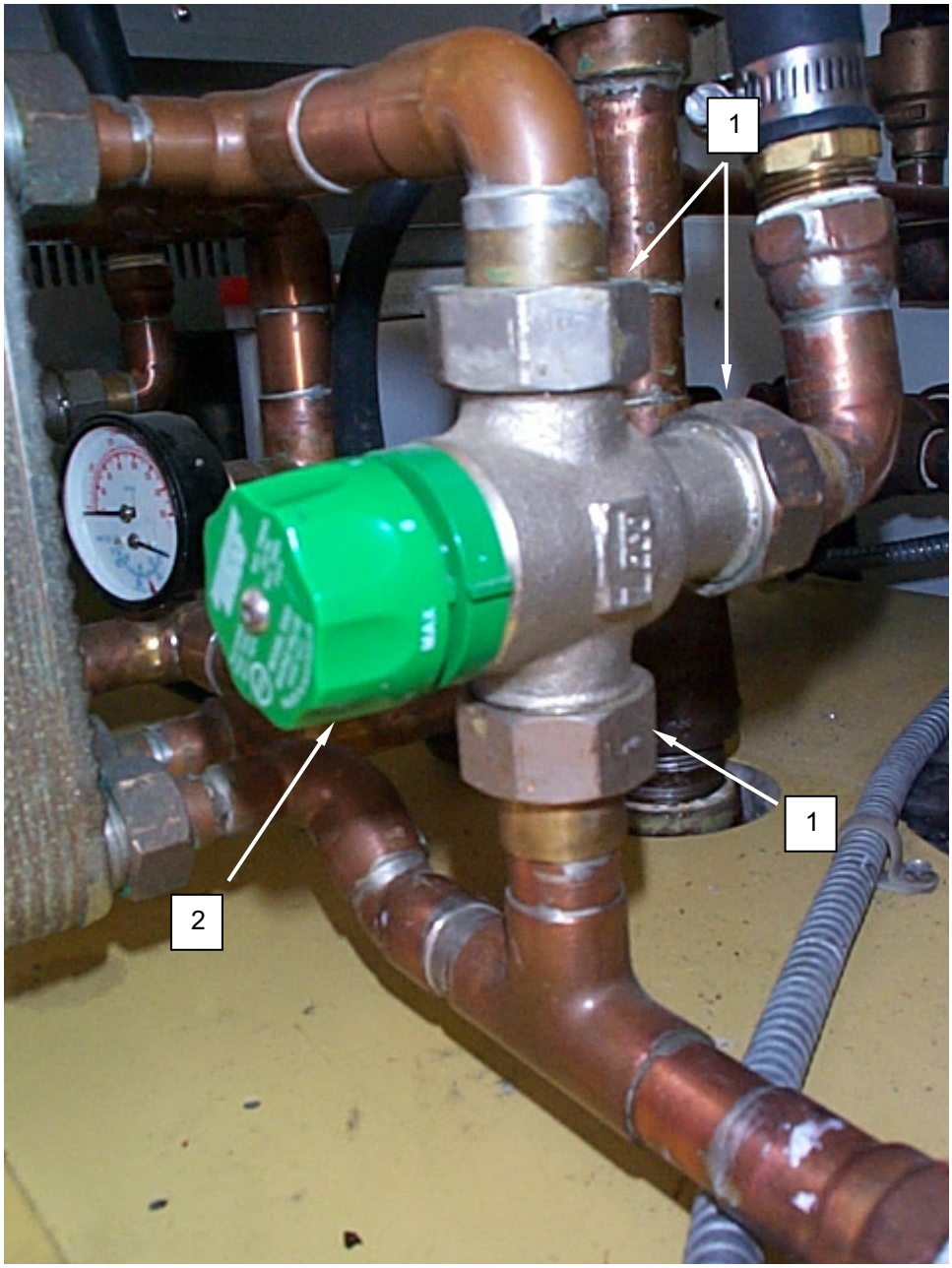


Figure 1. Replace a Mixing Valve.

END OF WORK PACKAGE

UNIT MAINTENANCE
CONTAINERIZED BATCH LAUNDRY
NSN 3510-01-527-2209
NSN 3510-01-527-2210
VALVE, PRESSURE RELIEF
REPLACE

INITIAL SETUP

Tools	**Personnel Required**
Shop Equipment, Automotive Maintenance and Repair: Organizational Maintenance, Common No.1 (WP 0086 00, Table 2, Item 5)	Quartermaster and Chemical Equipment Repairer 63J (1)
Materials/Parts	**Equipment Condition**
Compound, Sealer, Pipe (WP 0087 00, Item 12)	CBL set up

REPLACE

Replace Pressure Relief Valve

WARNING

Allow the boiler and any associated hot water pipe, tubing or fixtures to cool at least 30 minutes before attempting any repairs. Failure to observe safety precautions may result in serious injury or death to personnel.

WARNING

Do not allow the boiler to operate with a faulty pressure relief valve. A stuck valve may cause an explosion. Failure to observe safety precautions may result in serious injury or death to personnel.

NOTE

Replacement of this component may be easier if washer No. 1 is removed. Refer to WP 0040 00 to remove the washer.

1. Disconnect power by switching circuit breaker No. 22 to OFF.
2. Drain system.
3. Note position of valve hose barb fitting **(Figure 1, Item 1)**, and remove hose from valve hose barb fitting.
4. Remove hose barb fitting **(Figure 1, Item 1)** and retain for use with replacement valve **(Figure 1, Item 2)**.
5. Unscrew valve **(Figure 1, Item 2)**.
6. Coat threads of replacement valve **(Figure 1, Item 2)** with pipe sealer compound, and screw valve into place.
7. Install hose barb fitting **(Figure 1, Item 1)**.
8. Ensure valve hose barb fitting **(Figure 1, Item 1)** is positioned correctly, and connect hose.

REPLACE-CONTINUED

9. Fill system, connect power, and monitor for normal operation.

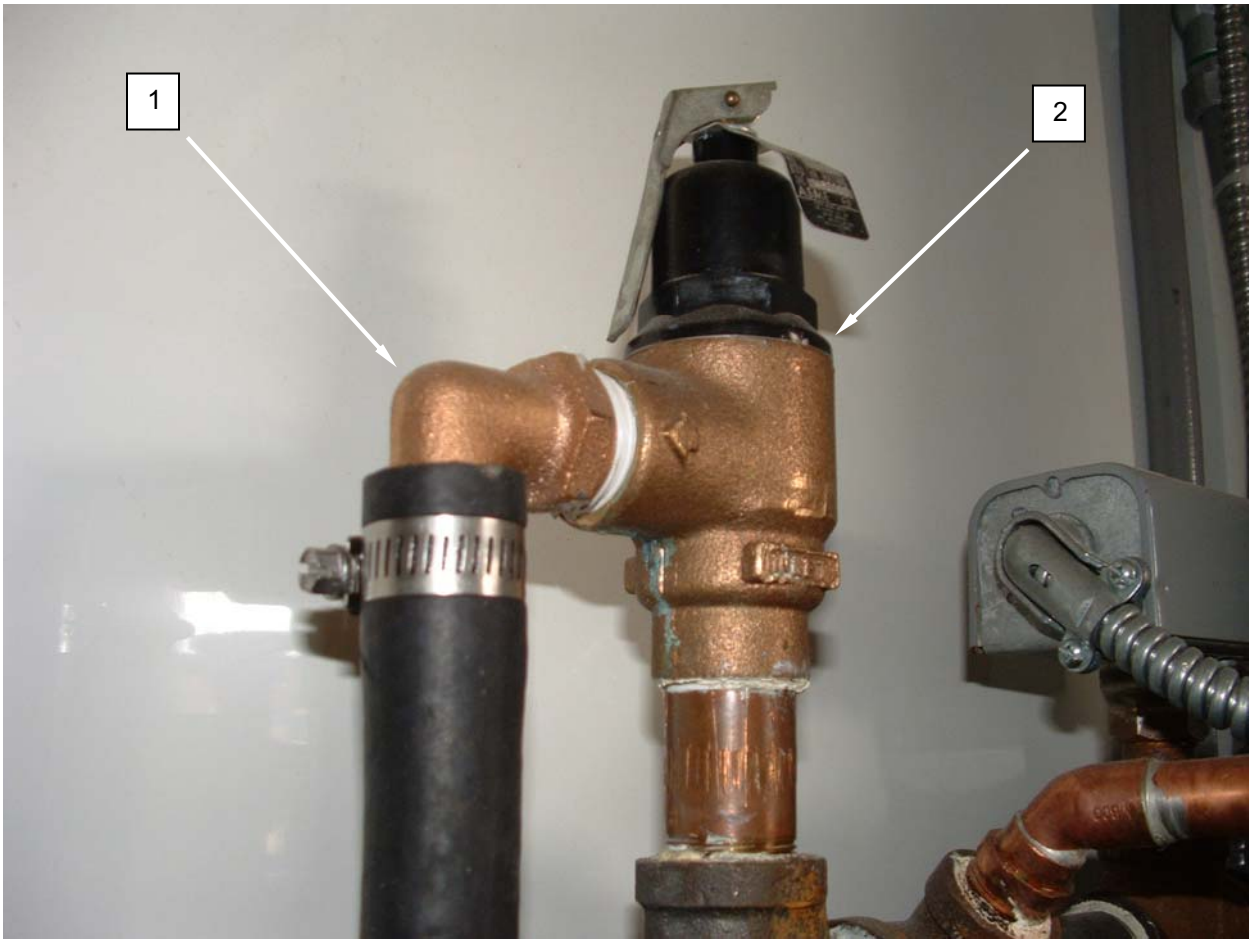


Figure 1. Replace the Pressure Relief Valve.

END OF WORK PACKAGE

UNIT MAINTENANCE
CONTAINERIZED BATCH LAUNDRY (CBL)
NSN 3510-01-527-2209
NSN 3510-01-527-2210
GAUGE, PRESSURE-TEMPERATURE
REPLACE

INITIAL SETUP

Tools
Tool Kit, General Mechanics: Automotive (WP 0086 00, Table 2, Item 6)

Materials/Parts
Tape, Antiseize, ½-in Wide X 260 in Long (WP 0087 00, Item 51)
Ethylene Glycol, Solution (WP 0087 00, Item 27)

Personnel Required
Quartermaster and Chemical Equipment Repairer 63J (1)

Equipment Condition
CBL set up

REPLACE

Replace the Pressure-Temperature Gauge

WARNING

Allow the boiler and any associated hot water pipe, tubing or fixtures to cool at least 30 minutes before attempting any repairs. Failure to observe safety precautions may result in serious injury or death to personnel.

1. Switch the boiler off at circuit breaker No. 22.
2. Drain the antifreeze from the boiler into an approved receptacle.
3. Remove the guard **(Figure 1, Item 1)** from the gauge **(Figure 1, Item 2)**.
4. Unscrew the gauge **(Figure 1, Item 2)** from the boiler.
5. Apply pipe sealant to the threads of the replacement gauge **(Figure 1, Item 2)**, and install replacement gauge.
6. Ensure gauge **(Figure 1, Item 2)** is tight and correctly oriented.
7. Install the guard **(Figure 1, Item 1)**.

REPLACE-CONTINUED


WARNING

Antifreeze used in the following procedure is highly toxic. Wear appropriate protective clothing when handling antifreeze/glycol. If antifreeze contacts eyes or skin, flush the affected area immediately with clean water and seek medical attention.

CAUTION

Do not make substitutions for the antifreeze. The use of antifreeze other than the type identified in the Expendable and Durable List may decrease performance. Failure to comply may shorten the life span of the equipment.

8. Refill boiler with ethylene glycol.
9. Switch boiler on at circuit breaker.
10. Monitor for leaks and normal operation.

Figure 1. Replace the Pressure-Temperature Gauge.

END OF WORK PACKAGE

UNIT MAINTENANCE
CONTAINERIZED BATCH LAUNDRY
NSN 3510-01-527-2209
NSN 3510-01-527-2210
CAP, PRESSURE REGULATING
REPLACE

INITIAL SETUP

Tools	**Personnel Required**
None Required	Quartermaster and Chemical Equipment Repairer 63J (1)
Materials/Parts	**Equipment Condition**
None Required	CBL set up

REPLACE

Replace the Pressure Regulating Cap

WARNING

Allow the boiler and any associated hot water pipe, tubing or fixtures to cool at least 1 hour before attempting any repairs. Failure to observe safety precautions may result in serious injury or death to personnel.

1. Switch boiler off at circuit breaker No. 22.
2. Allow boiler to cool at least one hour before proceeding.
3. Slowly turn cap **(Figure 1, Item 1)** counterclockwise.
4. Remove cap **(Figure 1, Item 1)**.
5. Install replacement cap **(Figure 1, Item 1)** and turn clockwise until cap is locked.
6. Operate boiler and monitor for normal operation.

REPLACE-CONTINUED

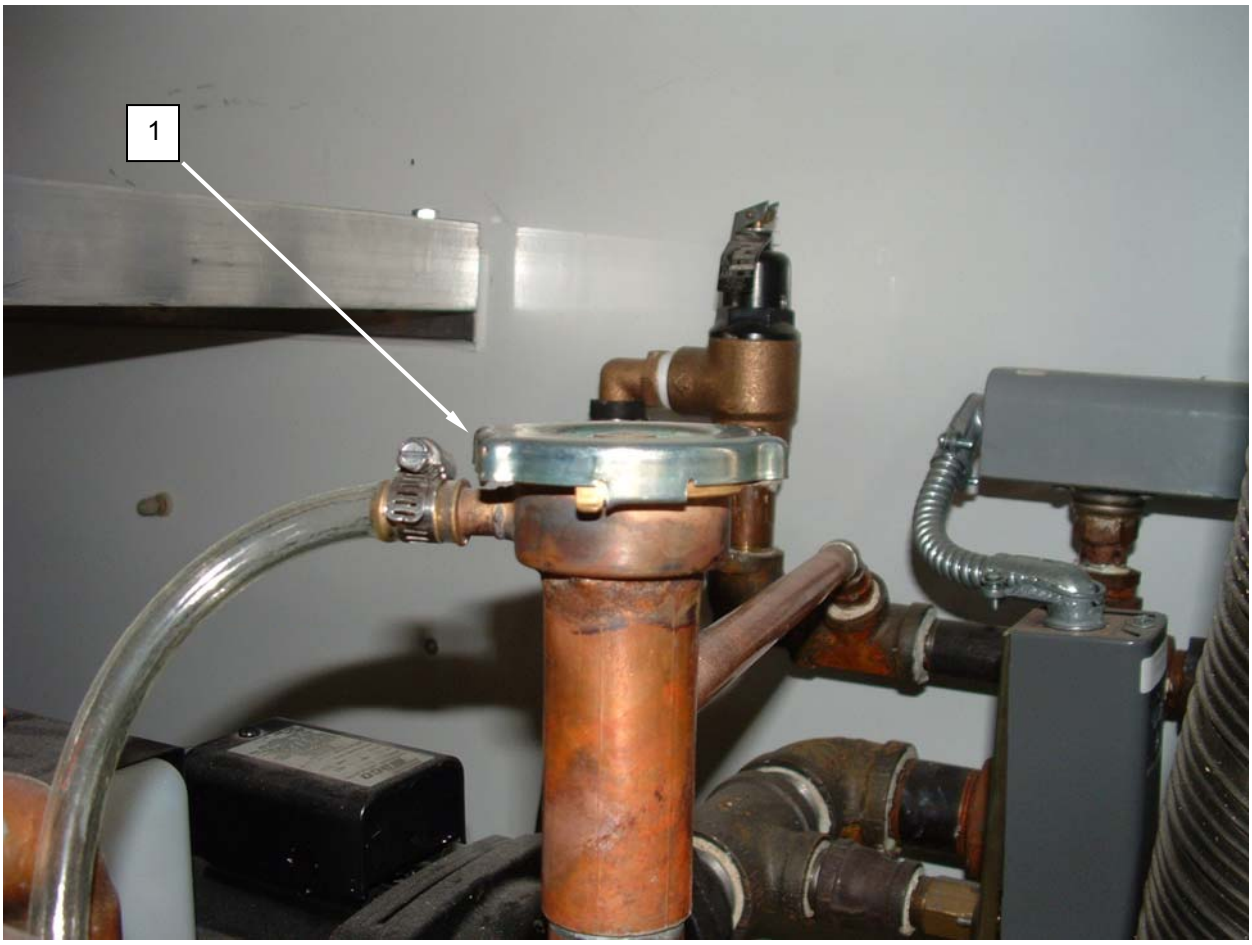


Figure 1. Replace the Pressure Regulating Cap.

END OF WORK PACKAGE

UNIT MAINTENANCE
CONTAINERIZED BATCH LAUNDRY
NSN 3510-01-527-2209
NSN 3510-01-527-2210
EQUIPMENT, COLD WEATHER
TEST, REPLACE

INITIAL SETUP

Tools	**Personnel Required**
Tool Kit, General Mechanics: Automotive (WP 0086 00, Table 2, Item 6)	Quartermaster and Chemical Equipment Repairer 63J (1)
Materials/Parts	**Equipment Condition**
None Required	CBL set up

TEST

Test the Extension Cords

WARNING

Ensure that all electrical power is shut off and disconnected before proceeding. The circuit breaker box or individual circuit breaker should be locked and tagged out by personnel following this procedure. Remember that the CBL is a wet environment. Serious injury or death to personnel can result from electrocution if proper safety precautions are not observed.

1. Disconnect extension cord **(Figure 1, Item 1)**.
2. Place extension cord ends next to each other.
3. Use an ohmmeter to test for continuity between each male prong and each female socket.
4. Each prong should have continuity with one socket.
5. Replace an open or shorted extension cord **(Figure 1, Item 1)**.

Figure 1. Test the Extension Cords.

TEST-CONTINUED

Test the Heat Tapes

WARNING

Ensure that all electrical power is shut off and disconnected before proceeding. The circuit breaker box or individual circuit breaker should be locked and tagged out by personnel following this procedure. Remember that the CBL is a wet environment. Serious injury or death to personnel can result from electrocution if proper safety precautions are not observed.

WARNING

Allow the heat tapes to cool at least 30 minutes before attempting any testing or repair procedures. Failure to observe safety precautions may result in serious injury or death to personnel.

1. Disconnect heat tape **(Figure 2, Item 2)** from receptacle.
2. Use an ohmmeter to check for 750 ohms resistance between the two flat prongs on the plug **(Figure 2, Item 3)**.
3. Replace an open heat tape **(Figure 2, Item 2)**.
4. Use an ohmmeter to check for continuity between each flat prong and the ground prong on the plug **(Figure 2, Item 3)**. There should be infinite resistance.
5. Replace a heat tape that is shorted.
6. Reconnect the heat tape plug **(Figure 2, Item 3)** to the appropriate receptacle and monitor for normal operation.

TEST-CONTINUED

Figure 2. Test the Heat Tapes.

REPLACE

Replace the Heat Tapes

WARNING

Ensure that all electrical power is shut off and disconnected before proceeding. The circuit breaker box or individual circuit breaker should be locked and tagged out by personnel following this procedure. Remember that the CBL is a wet environment. Serious injury or death to personnel can result from electrocution if proper safety precautions are not observed.

WARNING

Allow the heat tapes to cool at least 30 minutes before attempting any testing or repair procedures. Failure to observe safety precautions may result in serious injury or death to personnel.

1. Disconnect heat tape **(Figure 3, Item 2)** from receptacle.
2. Remove insulation **(Figure 3, Item 4)** and retain.
3. Carefully unwind heat tape **(Figure 3, Item 2)** from pump body and remove.
4. Install replacement heat tape **(Figure 3, Item 2)** by wrapping the areas of the pump covered by the old heat tape.
5. Install insulation **(Figure 3, Item 4)**.
6. Connect heat tape plug **(Figure 3, Item 3)** to receptacle, and monitor for normal operation.

REPLACE-CONTINUED

Figure 3. Replace the Heat Tapes.

REPLACE-CONTINUED

Replace the Air Compressor

WARNING

The air compressor assembly weighs approximately 40 pounds (approximately 17 kilograms). Two persons must carry the unit. When lifting the air compressor, lift with your legs, not with your back, to prevent injury. Failure to do so may result in back injury.

WARNING

Always turn the compressor off and bleed the pressure from the hose and tank before performing maintenance or attaching tools and accessories. See TM 10-3510-226-10, WP 0012 00 to bleed the compressor. The compressor can propel dirt, chips, and loose particles at high speed. Failure to comply may result in serious injury to personnel.

1. Remove the screws retaining the air compressor **(Figure 4, Item 5)** to the base plate **(Figure 4, Item 6)** and remove the air compressor.

2. Install the replacement air compressor **(Figure 4, Item 5)** onto the base plate **(Figure 4, Item 6)** and retain with screws.

REPLACE-CONTINUED

Figure 4. Replace the Air Compressor.

END OF WORK PACKAGE

CHAPTER 4

DIRECT SUPPORT MAINTENANCE INSTRUCTIONS

CONTAINERIZED BATCH LAUNDRY (CBL)

DIRECT SUPPORT MAINTENANCE
CONTAINERIZED BATCH LAUNDRY
NSN 3510-01-527-2209
NSN 3510-01-527-2210
RAMP
REPAIR

INITIAL SETUP

Tools	**Personnel Required**
Shop Equipment, Automotive Maintenance and Repair: Organizational Maintenance, Common No.1 (WP 0086 00, Table 2, Item 5)	Quartermaster and Chemical Equipment Repairer 63J (1)
Materials/Parts	**Equipment Condition**
Rod, Welding (WP 0087 00, Item 45)	CBL set up.

REPAIR

Repair the Ramp

NOTE

The ramp is made of aluminum alloy, and must be welded with gas shielded arc welders or with aluminum rods specifically made for conventional arc welders.

1. Remove ramp **(Figure 1, Item 1)** from service.

2. Weld damage to ramp **(Figure 1, Item 1)**. Fabricate patches of $^{1}/_{8}$-inch aluminum sheet as necessary. Use of diamond plate for patches is preferable.

WARNING

Ensure repaired ramp is not warped in any way. Ensure ramp alignment is correct. Failure to observe precautions may produce a tripping hazard, creating a potential for serious injury or death to personnel.

3. Ensure repaired ramp **(Figure 1, Item 1)** fits correctly.

REPAIR-CONTINUED

Figure 1. Repair the Ramp.

END OF WORK PACKAGE

DIRECT SUPPORT MAINTENANCE
CONTAINERIZED BATCH LAUNDRY
NSN 3510-01-527-2209
NSN 3510-01-527-2210
PANELS, WATER
REPLACE

INITIAL SETUP

Tools
Basin Wrench (WP 0086 00, Table 2, Item 1)

Personnel Required
Quartermaster and Chemical Equipment Repairer 63J (1)

Materials/Parts
Compound, Sealer, Pipe (WP 0087 00, Item 12)

Equipment Condition
CBL shut down and drained

REPLACE

Replace the Water Panel Fittings

1. Disconnect hoses from water panel **(Figure 1, Item 1)**.
2. Use a large basin wrench to remove damaged fitting **(Figure 1, Item 2)** from panel **(Figure 1, Item 1)**.
3. Clean threads, and apply pipe sealant to threads.
4. Install replacement fitting **(Figure 1, Item 2)** and tighten.
5. Connect hoses, restore water service, and check for leakage.
6. Monitor for normal operation.

REPLACE-CONTINUED

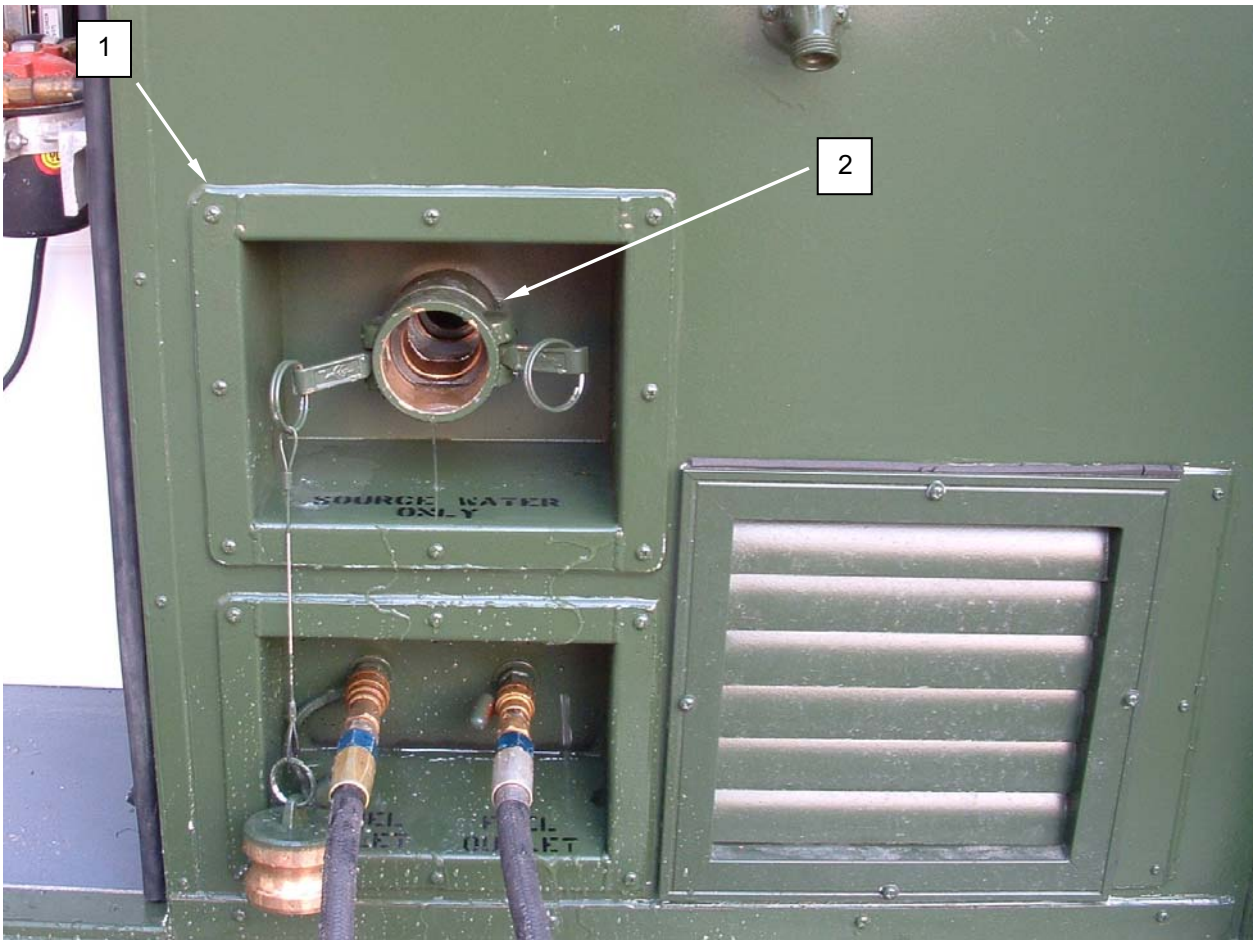


Figure 1. Replace the Water Panel Fittings.

END OF WORK PACKAGE

DIRECT SUPPORT MAINTENANCE
CONTAINERIZED BATCH LAUNDRY
NSN 3510-01-527-2209
NSN 3510-01-527-2210
WASHER
REPLACE

INITIAL SETUP

Tools
Shop Equipment, Automotive Maintenance and Repair: Organizational Maintenance, Common No.1 (WP 0086 00, Table 2, Item 5)
Forklift, 15000-lb capacity (WP 0086 00, Table 2, Item 9)

Personnel Required
(12)

Materials/Parts
None Required

Equipment Condition
CBL set up.

References
TM 10-3510-266-10
WP 0041 00

REPLACE

Replace the Washer

WARNING

Ensure that all electrical power is shut off and disconnected before proceeding. The Circuit Breaker box should be locked by personnel following this procedure. Serious injury or death can result from electrocution if proper safety precautions are not observed.

NOTE

It is not necessary to remove the top, side, back, or kick panels.

1. Remove the washer IAW procedures given in WP 0041 00.
2. Remove all items from TEMPER and strike or move TEMPER IAW procedures given in TM 10-3510-226-10.
3. Remove bolts retaining washer **(Figure 1, Item 1)** to caster **(Figure 1, Item 2)**.
4. Use a forklift or suitable lifting device to lift washer **(Figure 1, Item 1)** from caster **(Figure 1, Item 2)** and remove from CBL.
5. Use a forklift or suitable lifting device to install the replacement washer **(Figure 1, Item 1)** into the washer caster **(Figure 1, Item 2)** and retain with bolts.
6. Raise and refit TEMPER IAW procedures given in TM 10-3510-226-10.
7. Install the washer IAW procedures given in WP 0041 00.

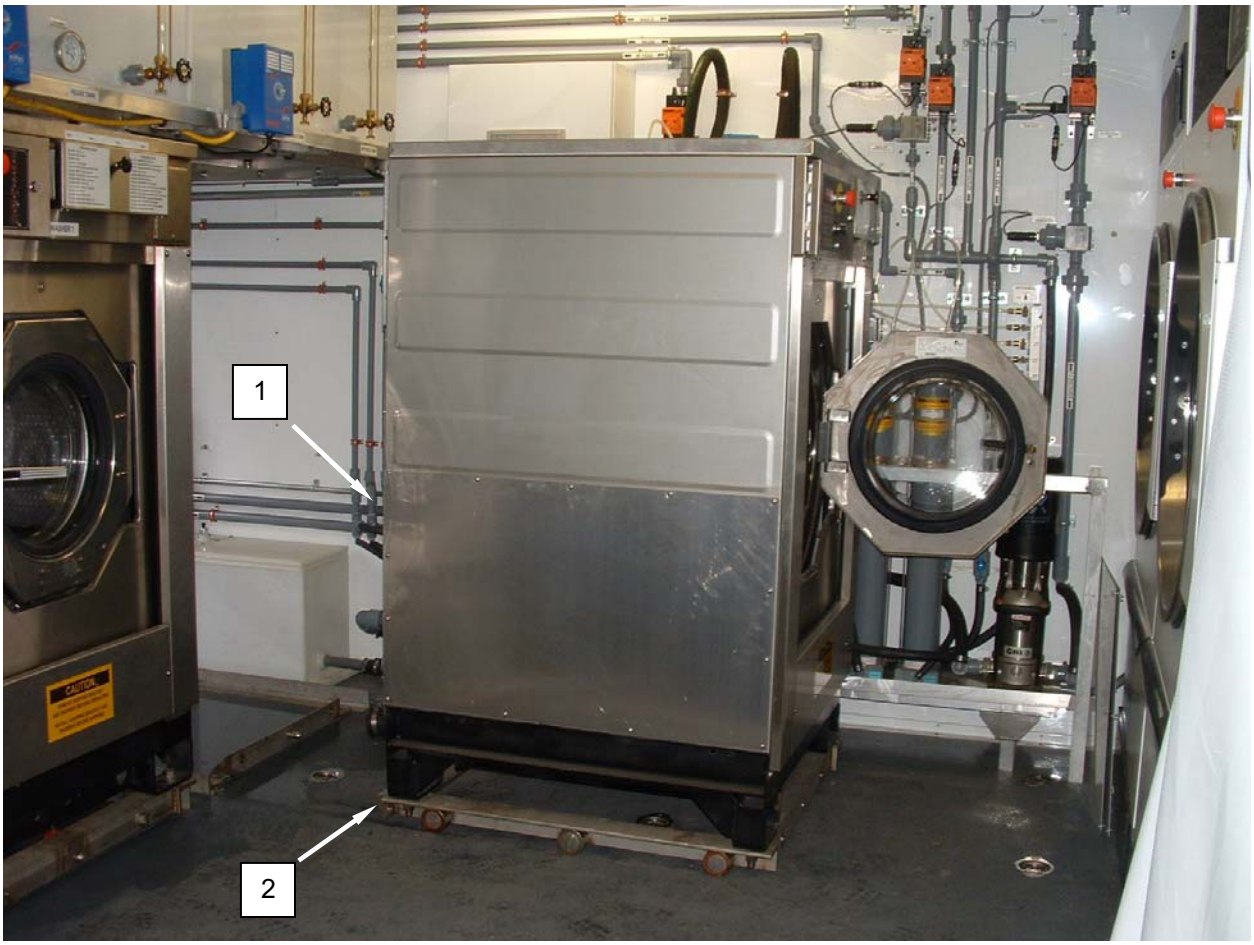


Figure 1. Replace the Washer.

END OF WORK PACKAGE

DIRECT SUPPORT MAINTENANCE
CONTAINERIZED BATCH LAUNDRY
NSN 3510-01-527-2209
NSN 3510-01-527-2210
DRYER
REPLACE

INITIAL SETUP

Tools
Shop Equipment, Automotive Maintenance and Repair: Organizational Maintenance, Common No.1 (WP 0086 00, Table 2, Item 5)
Unspecified lifting equipment, 5000-lb minimum capacity (forklift, hoist) (WP 0086 00, Table 2, Item 9)

Personnel Required
(12)

Materials/Parts
None Required

Equipment Condition
CBL set up.

References
TM 10-3510-226-10

REPLACE

Replace the Dryer

WARNING

Ensure that all electrical power is shut off and disconnected before proceeding. The Circuit Breaker box should be locked by personnel following this procedure. Serious injury or death can result from electrocution if proper safety precautions are not observed.

NOTE

Dryer No. 2 must be removed from the CBL before replacing Dryer No. 1.

1. Disconnect power from CBL.
2. Remove all items from TEMPER and strike or move TEMPER IAW procedures given in TM 10-3510-226-10.
3. Remove screws retaining junction box cover **(Figure 1, Item 1)** and remove junction box cover.
4. Tag and disconnect wiring from dryer.
5. Remove conduit locknut and remove conduit **(Figure 1, Item 2)**.
6. Remove hose clamp retaining duct **(Figure 1, Item 3)** to dryer **(Figure 2, Item 4)** and disconnect duct from dryer.
7. Remove lint compartment panel **(Figure 2, Item 5)**.
8. Remove bolts **(Figure 2, Item 6)** retaining dryer **(Figure 2, Item 4)** to CBL deck.
9. Use a forklift to move dryer **(Figure 2, Item 4)** to center of CBL operating area.
10. Remove dryer **(Figure 2, Item 4)** from CBL.

REPLACE-CONTINUED

11. Install replacement dryer **(Figure 2, Item 4)** into CBL operating area.
12. Remove dryer lint compartment panel **(Figure 2, Item 5)**.
13. Move replacement dryer **(Figure 2, Item 4)** into position and align mounting holes.
14. Install mounting bolts **(Figure 2, Item 6)** and tighten.
15. Remove junction box cover **(Figure 1, Item 1)** on replacement dryer.
16. Knock out conduit access if necessary, install conduit **(Figure 1, Item 2)**, and retain with conduit locknut.
17. Connect wiring to replacement dryer **(Figure 2, Item 4)** as tagged.
18. Install junction box cover **(Figure 1, Item 1)** and retain with screws.
19. Install duct **(Figure 1, Item 3)** onto replacement dryer exhaust and secure with hose clamp.
20. Raise and refit TEMPER IAW procedures given in TM 10-3510-226-10.
21. Connect power and monitor for normal operation.

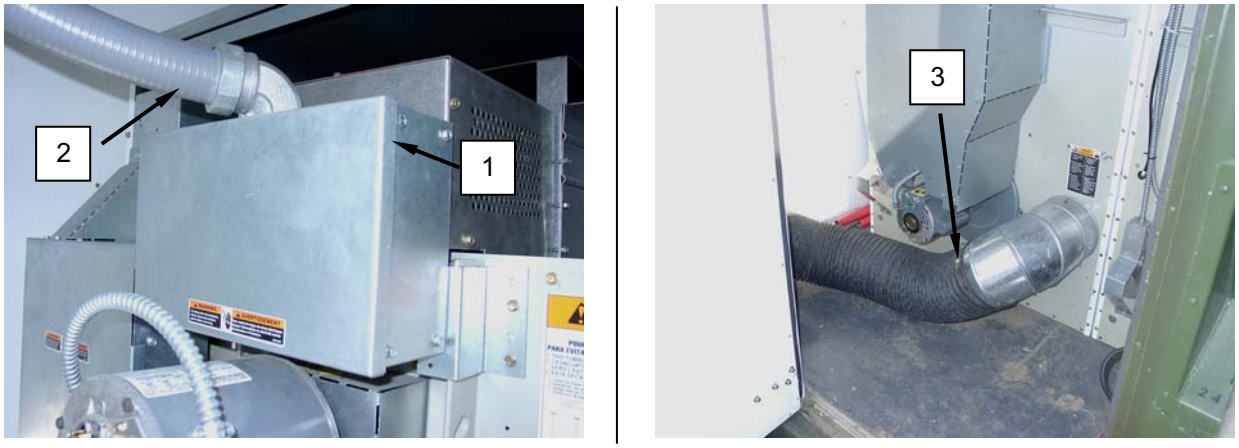
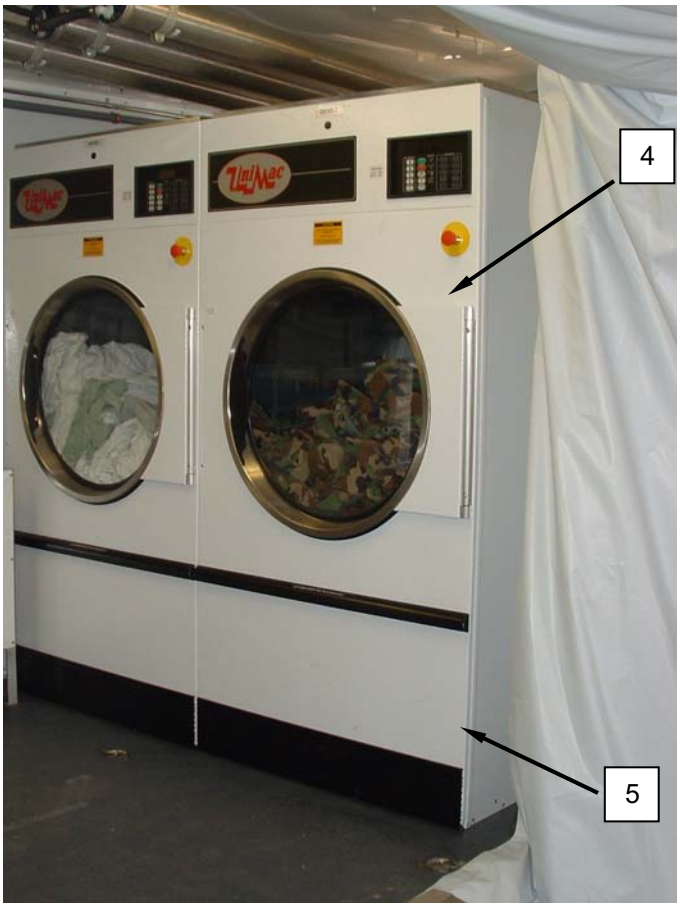


Figure 1. Replace the Dryer.

REPLACE-CONTINUED



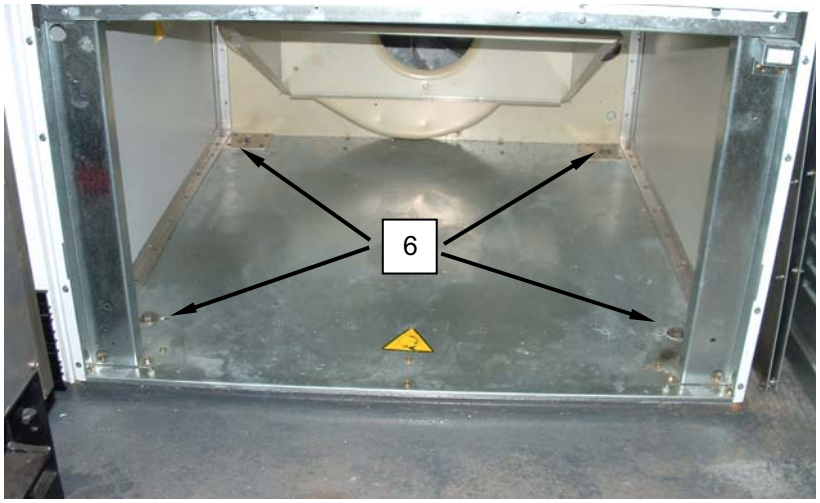


Figure 2. Replace the Dryer.

END OF WORK PACKAGE

UNIT AND DIRECT SUPPORT MAINTENANCE
CONTAINERIZED BATCH LAUNDRY (CBL)
NSN 3510-01-527-2209
NSN 3510-01-527-2210
REFERENCES

SCOPE

This section lists all field manuals, forms, medical bulletins, technical manuals and miscellaneous publications referenced in this manual.

Field Manuals

Chemical and Biological Contamination Avoidance ..... FM 3-3
NBC Decontamination ..... FM 3-5
Packaging of Materials, Packing ..... FM 38-701
Field Hygiene and Sanitation ..... FM 21-10

Forms

Discrepancy in Shipment Report ..... SF 361
Equipment Inspection and Maintenance Worksheet ..... DA Form 2404
Quality Deficiency Report ..... SF 368
Recommended Changes to Equipment Technical Publications ..... DA Form 2028-2
Report of Packaging and Handling Deficiencies ..... SF 362
Report of Discrepancy ..... SF 364

Medical Bulletins

Sanitary Control and Surveillance of Water Supplies at Fixed Installations ..... TB MED 576
Sanitary Control and Surveillance of Field Water Supplies ..... TB MED 577

Technical Manuals

Administrative Storage of Equipment ..... TM 740-90-1
Procedures for Destruction of Equipment to Prevent Enemy Use ..... TM 750-244-3
Distribution Illumination Systems, Electrical (DISE) and Power Distribution Illumination Systems, Electrical (PDISE) consisting of Electric Feeder System M200, M200 A/P (NSN 6150-01-208-9755), (6150-01-3 Electrical Feeder System M100, M100 A/P (6150-01-208-9754), (6150-01-308-5671) Electrical Distribution System M40, M40 A/P (6150-01-208-9753), (6150-01-307-9446) Electrical Distribution M60, M60 A/P (6150-01-208-9752), (6150-01-307-9445) Electrical Assembly M46 (6150-01-208-9751) ..... TM 9-6150-226-13
Operator's Maintenance Manual for Containerized Batch Laundry ..... TM 10-3510-226-10
Repair Parts and Special Tools List (RPSTL) for Containerized Batch Laundry ..... TM 10-3510-226-23
Operator's and Unit Maintenance Manual (including RPSTL) Tank, Fabric, Self-supporting, 3000 Gallon Water ..... TM 10-5430-233-12&P
Preservation, Packaging, and Packing of Military Supplies and Equipment ..... TM 38-230-2
Unit and Direct Support Maintenance Manual (including Repair Parts and Special Tools List), General Cargo Container ..... TM 55-8115-204-23&P
Operator, Unit, and Direct Support Maintenance Manual for Tent Extendable, Modular, Personnel (TEMPER) ..... TM 10-8340-224-13

Pamphlets
The Army Maintenance Management System (TAMMS) Users Manual ..... DA PAM 750-8

Common Table Of Allowance
Army Medical Department Expendable/Durable Items ..... CTA 8-100
Expendable/Durable Items ..... CTA 50-970

UNIT AND DIRECT SUPPORT MAINTENANCE
CONTAINERIZED BATCH LAUNDRY (CBL)
NSN 3510-01-527-2209
NSN 3510-01-527-2210
MAINTENANCE ALLOCATION CHART (MAC) INTRODUCTION

INTRODUCTION

The Army Maintenance System MAC

This introduction provides a general explanation of all maintenance and repair functions authorized at the two maintenance levels under the Two-Level Maintenance System concept.

The MAC (immediately following the introduction) designates overall authority and responsibility for the performance of maintenance functions on the identified end item or component. The application of the maintenance functions to the end item or component shall be consistent with the capacities and capabilities of the designated maintenance levels, which are shown on the MAC in column (4) as:

Field - includes two columns, Unit maintenance and Direct Support maintenance. The Unit maintenance column is divided again into two more subcolumns, C for Operator or Crew and O for Unit maintenance.

Sustainment – includes two subcolumns, General Support (H) and Depot (D)

The tools and test equipment requirements (immediately following the MAC) list the tools and test equipment (both special tools and common tool sets) required for each maintenance function as referenced from the MAC.
The remarks (immediately following the tools and test equipment requirements) contain supplemental instructions and explanatory notes for a particular maintenance function.

Maintenance Functions

Maintenance functions are limited to and defined as follows:

1. Inspect. To determine the serviceability of an item by comparing its physical, mechanical, and/or electrical characteristics with established standards through examination (e.g., by sight, sound, or feel.) This includes scheduled inspection and gagings and evaluation of cannon tubes.

2. Test. To verify serviceability by measuring the mechanical, pneumatic, hydraulic, or electrical characteristics of an item and comparing those characteristics with prescribed standards on a scheduled basis, i.e., load testing of lift devices and hydrostatic testing of pressure hoses.

3. Service. Operations required periodically to keep an item in proper operating condition, e.g. to clean (includes decontaminate, when required), to preserve, to drain, to paint, or to replenish fuel, lubricants, chemical fluids, or gases. This includes scheduled exercising and purging of recoil mechanisms. The following are examples of service functions:

    a. Unpack. To remove from packing box for service or when required for the performance of maintenance operations.

    b. Repack. To return item to packing box after service and other maintenance operations.

    c. Clean. To rid the item of contamination.

d. Touch up. To spot paint scratched or blistered surfaces.

e. Mark. To restore obliterated identification.

4. Adjust. To maintain or regulate, within prescribed limits, by bringing into proper or position, or by setting the operating characteristics to specified parameters.

5. Align. To adjust specified variable elements of an item to bring about optimum or desired performance

6. Calibrate. To determine and cause corrections to be made or to be adjusted on instruments of test, measuring, and diagnostic equipment used in precision measurement. Consists of comparisons of two instruments, one of which is a certified standard of known accuracy, to detect and adjust any discrepancy in the accuracy of the instrument being compared.

7. Remove/install. To remove and install the same item when required to perform service or other maintenance functions. Install may be the act of emplacing, seating, or fixing into position a spare, repair part, or module (component or assembly) in a manner to allow the proper functioning of an equipment or system.

8. Paint. To prepare and spray color coats of paint so that the ammunition can be identified and protected. The color indicating primary use is applied, preferably, to the entire exterior surface as the background color of the item. Other markings are to be repainted as original so as to retain proper ammunition identification.

9. Replace. To remove an unserviceable item and install a serviceable counterpart in its place. “Replace” is authorized by the MAC and assigned maintenance level is shown as the third position code of the Source, Maintenance and Recoverability (SMR) code.

10. Repair. The application of maintenance services, including fault location/troubleshooting, removal/installation, disassembly/assembly procedures and maintenance actions to identify troubles and restore serviceability to an item by correcting specific damage, fault, malfunction, or failure in a part, subassembly, module (component or assembly), end item, or system.

NOTE

The following definitions are applicable to the “repair” maintenance function:

Services. Inspect, test, service, adjust, align, calibrate, and/or replace.

Fault location/troubleshooting. The process of investigating and detecting the cause of equipment malfunctioning; the act of isolating a fault within a system or Unit Under Test (UUT).

Disassembly/assembly. The step by step breakdown (taking apart) of a spare/functional group coded item to the level of its least component, that is assigned an SMR code for the level of maintenance under consideration (i.e. identified as maintenance significant).

Actions. Welding, grinding, riveting, straightening, facing, machining, and/or resurfacing.

11. Overhaul. That maintenance effort (service/action) prescribed to restore an item to a completely serviceable/operational condition as required by maintenance standards in appropriate technical publications. Overhaul is normally the highest degree of maintenance performed by the Army. Overhaul does not normally return an item to like new condition.

12. Rebuild. Consists of those services/actions necessary for the restoration of unserviceable equipment to a like new condition in accordance with original manufacturing standards. Rebuild is the highest degree of material maintenance applied to Army equipment. The rebuild operation includes the act of returning to zero those age measurements (e.g., hours/miles) considered in classifying Army equipment/components.

Explanation of Columns in the MAC

Column (1) Group Number. Column (1) lists Functional Group Code (FGC) numbers, the purpose of which is to identify maintenance significant components, assemblies, subassemblies, and modules with the Next Higher Assembly (NHA).

Column (2) Component/Assembly. Column (2) contains the item names of components, assemblies, subassemblies, and modules for which maintenance is authorized.

Column (3) Maintenance Function. Column (3) lists the functions to be performed on the item listed in column (2). (For a detailed explanation of these functions refer to “Maintenance Functions” outlined above).

Column (4) Maintenance Level. Column (4) specifies each level of maintenance authorized to perform each function listed in column (3), by indicating work time required (expressed as manhours in whole hours or decimals) in the appropriate subcolumn. This work time figure represents the active time required to perform that maintenance function at the indicated level of maintenance. If the number or complexity of the tasks within the listed maintenance function varies at different maintenance levels, appropriate work time figures are to be shown for each level. The work time figure represents the average time required to restore an item (assembly, subassembly, component, module, end item, or system) to a serviceable condition under typical field operating conditions. This time includes preparation time (including any necessary disassembly/assembly time), troubleshooting/fault location time, and quality assurance time in addition to the time required to perform the specific tasks identified for the maintenance functions authorized in the MAC. The symbol designations for the various maintenance levels are as follows:

Field:

C Operator or Crew maintenance
O Unit maintenance
F Direct Support maintenance

Sustainment:

L Specialized Repair Activity
H General Support maintenance
D Depot maintenance

NOTE

The “L” maintenance level is not included in column (4) of the MAC. Functions to this level of maintenance are identified by work time figure in the “H” column of column (4), and an associated reference code is used in the REMARKS column (6). This code is keyed to the remarks and the SRA complete repair application is explained there.

Column (5) Tools and Equipment Reference Code. Column (5) specifies, by code, those common tool sets (not individual tools), common Test, Measurement and Diagnostic Equipment (TMDE), and special tools, special TMDE, and support special equipment required to perform the designated function. Codes are keyed to the entries in the tools and test equipment table.

Column (6) Remarks Code. When applicable, this column contains a letter code, in alphabetic order, which is keyed to the remarks table entries.

Explanation of Columns in the Tools and Test Equipment Requirements

Column (1) – Tool or Test Equipment Reference Code. The tool or test equipment reference code correlates with a code used in column (5) of the MAC.

Column (2) – Maintenance Level. The lowest level of maintenance authorized to use the tool or test equipment.

Column (3) – Nomenclature. Name or identification of the tool or test equipment.

Column (4) – National Stock Number (NSN). The NSN of the tool or test equipment.

Column (5) – Tool Number. The manufacturer's part number.

Explanation of Columns in Remarks

Column (1) – Remarks Code. The code recorded in column (6) of the MAC.

Column (2) – Remarks. This column lists information pertinent to the maintenance function being performed as indicated in the MAC.

UNIT AND DIRECT SUPPORT MAINTENANCE
CONTAINERIZED BATCH LAUNDRY (CBL)
NSN 3510-01-527-2209
NSN 3510-01-527-2210
MAINTENANCE ALLOCATION CHART (MAC)

Table 1. Maintenance Allocation Chart (MAC) for Containerized Batch Laundry.

(1) GROUP NUMBER	(2) COMPONENT/ ASSEMBLY	(3) MAINTENANCE FUNCTION	(4) MAINTENANCE LEVEL					(5) TOOLS AND EQUIPMENT REFERENCE CODE	(6) REMARKS CODE
			FIELD			SUSTAINMENT			
			UNIT		DIRECT SUPPORT	GENERAL SUPPORT	DEPOT		
			C	O	F	H	D		
00	LAUNDRY, CONTAINERIZED BATCH								A
01	CONTAINER, MODIFIED CARGO								B
0101	ENDWALL, WASHER	Inspect	0.1						A
		Adjust		0.3				6	
		Service		0.1					
		Repair		0.7				6	
0102	ENDWALL, DRYER	Inspect	0.1						A
		Adjust		0.3				6	
		Repair		0.7					
0103	RAMP	Inspect	0.1						A
		Repair			0.5			5	
		Replace	0.1						
0104	INDICATORS, LEVEL	Inspect	0.1						A
		Replace		0.2				6	
010105	PROVISIONS, TIEDOWN	Inspect	0.1						A
		Replace		0.2				6	
0106	ENDWALL, MODIFIED TEMPER	Inspect	0.1						A
		Replace	1.0						
02	SYSTEM, ELECTRICAL								C
0201	LIGHTING, INTERIOR	Inspect	0.1	0.1				6	A
		Test	0.1					6	
		Repair		0.5				6	
0202	BREAKERS, CIRCUIT	Test		0.5				6	
		Replace		0.5				6	
0203	RECEPTACLES, POWER INPUT	Inspect	0.1						A
		Test		0.5				6	
		Replace		1.0				6	
0204	RELAY, PHASE MONITOR	Inspect		0.1				6	
		Replace		0.2				6	
0205	FUSE, PHASE MONITOR RELAY	Inspect		0.1				6	
		Test		0.2				6	
		Replace		0.2				6	

Table 1. Maintenance Allocation Chart (MAC) for Containerized Batch Laundry – Continued.

(1) GROUP NUMBER	(2) COMPONENT/ ASSEMBLY	(3) MAINTENANCE FUNCTION	(4) MAINTENANCE LEVEL					(5) TOOLS AND EQUIPMENT REFERENCE CODE	(6) REMARKS CODE
			FIELD			SUSTAINMENT			
			UNIT		DIRECT SUPPORT	GENERAL SUPPORT	DEPOT		
			C	O	F	H	D		
0206	INDICATOR,	Inspect	0.1						A
	PHASE	Replace		0.2				6	
0207	REACTOR, LINE	Inspect		0.1				6	
		Test		0.5				6	
		Replace		1.0				6	
0208	RECEPTACLE,	Inspect	0.1						A
	POWER OUTPUT	Test		0.5				6	
		Replace		1.0				6	
0209	RECEPTACLES,	Inspect	0.1						A
	GFCI	Test	0.1	0.3				6	A
		Replace		0.4				6	
0210	FANS, EXHAUST	Inspect	0.1						A
		Test		0.5				6	
		Service		0.5				6	
		Replace		0.4				6	
0211	RECEPTACLES,	Inspect	0.1						A
	PUMP	Test		0.3				6	
		Replace		0.3				6	
0212	RECEPTACLE,	Inspect	0.1						A
	WASHER	Test		0.3				6	
		Replace		0.3				6	
03	SYSTEM, CONTROL								A
0301	CONTROL,	Inspect	0.1						A
	PROGRAMMABLE	Test		0.3				6	
	LOGIC (PLC)	Service	0.1						A
		Replace	0.1	0.5				6	A
0302	TRANSMITTERS,	Inspect	0.1						A
	FLOW	Replace		0.5				6	
0303	TRANSMITTERS,	Inspect	0.1						A
	PRESSURE	Replace		0.5				6	
0304	VALVES, WATER	Inspect	0.1						A
	REUSE	Test		0.3				6	
	ACTUATOR	Repair		0.4				6	
		Replace		0.5				6	
0305	BREAKER,	Test		0.5				6	
	CONTROL	Replace		0.5				6	
	CIRCUIT								
0306	TRANSFORMER,	Test		0.4				6	
	CONTROL	Replace		0.5				6	
0307	CONTACTOR	Test		0.4				6	
		Replace		0.5				6	
0308	RELAY,	Test		0.4				6	
	OVERLOAD	Replace		0.5				6	

Table 1. Maintenance Allocation Chart (MAC) for Containerized Batch Laundry – Continued.

(1) GROUP NUMBER	(2) COMPONENT/ ASSEMBLY	(3) MAINTENANCE FUNCTION	(4) MAINTENANCE LEVEL					(5) TOOLS AND EQUIPMENT REFERENCE CODE	(6) REMARKS CODE
			FIELD			SUSTAINMENT			
			UNIT		DIRECT SUPPORT	GENERAL SUPPORT	DEPOT		
			C	O	F	H	D		
0309	RELAY,	Test		0.4				6	
	CONTROL	Replace		0.5				6	
0310	SWITCH, BYPASS	Test		0.5				6	
		Replace		0.5				6	
0311	STOP,	Test		0.4				6	
	EMERGENCY	Replace		0.5				6	
0312	HEATER,	Test		0.4				6	
	ELECTRIC BOX	Replace		0.5				6	
0313	SENSOR, LEVEL	Inspect	0.1						A
		Test		0.4				6	
		Replace		0.4				6	
04	SYSTEM, WATER								A, D
0401	PIPES AND	Inspect	0.1						A
	FITTINGS, CPVC	Repair		1.0				5	
0402	VALVES, CPVC	Inspect	0.1						A
	HAND	Service	0.1						A
	OPERATED	Repair		0.6				6	
		Replace		1.0				6	
0403	VALVES, CPVC	Inspect	0.1						A
	CHECK	Service		0.5				6	
		Replace		1.0				6	
0404	PIPES AND	Inspect	0.1						A
	FITTINGS, COPPER/BRASS	Repair		1.0				6	
0405	VALVES,	Inspect	0.1						A
	COPPER/BRASS	Service	0.1						A
	HAND	Repair		0.6				6	
	OPERATED	Replace		1.0				6	
0406	VALVES,	Inspect	0.1						A
	COPPER/BRASS	Service		0.5				6	
	CHECK	Replace		1.0				6	
0407	PANELS, WATER	Inspect	0.1						A
		Service		0.1				6	
		Replace			0.3			1	
0408	HOSES,	Inspect	0.1						A
	INTERNAL	Replace		0.3				6	
0409	HOSES,	Inspect	0.1						A
	EXTERNAL	Replace		0.3				6	
0410	TANKS,	Inspect	0.1						A
	DRAINAGE	Service	0.5						A
		Repair		2.0				5	
		Replace		2.0				5	

Table 1. Maintenance Allocation Chart (MAC) for Containerized Batch Laundry – Continued.

(1) GROUP NUMBER	(2) COMPONENT/ ASSEMBLY	(3) MAINTENANCE FUNCTION	(4) MAINTENANCE LEVEL					(5) TOOLS AND EQUIPMENT REFERENCE CODE	(6) REMARKS CODE
			FIELD			SUSTAINMENT			
			UNIT		DIRECT SUPPORT	GENERAL SUPPORT	DEPOT		
			C	O	F	H	D		
0411	PUMPS,	Test		0.5				6	
	DRAINAGE	Replace		0.5				6	
	WTS/P-2 AND								
	WASTE/P-5								
0412	PUMP/P-1,	Inspect	0.1						A
	WATER SOURCE	Test		0.4				6	
		Adjust		0.5				6	
		Repair		2.0				6	
		Replace		0.8				6	
0413	VALVE,	Inspect	0.1						A
	PRESSURE	Test		0.5				6	
	RELIEF	Adjust		0.5				6	
		Replace		0.5				6	
0414	TANK,	Inspect	0.1						A
	EXPANSION	Replace		0.4				6	
0415	PUMP/P-3,	Inspect	0.1						A
	FILTRATION	Test		0.4				6	
	LOOP 1	Repair		2.0				6	
		Replace		1.0				6	
0416	PUMP/P-4,	Inspect	0.1						A
	FILTRATION	Test		0.4				6	
	LOOP 2	Repair		2.0				6	
		Replace		1.0				6	
0417	FILTERS, F-1A	Inspect	0.1						A
	AND F-1B	Repair	0.2					8	A
		Replace	0.3					8	A
0418	FILTERS, F-2 AND	Inspect	0.1						A
	F-3	Repair	0.2					8	A
		Replace	0.3					8	A
0419	NANOFILTERS	Inspect	0.1						A
		Repair		0.5				7	A
		Replace		0.8				7	A
0420	TANKS, WATER	Inspect	0.1						A
	REUSE HOLDING	Service		0.2				5	A
		Repair		2.0				6	A
		Replace		2.0					
05	WASHER/	Inspect	0.1						A
	EXTRACTOR,	Remove		0.4				6, 9	
	LAUNDRY	Install		0.4					
		Replace			4.0				
0501	ASSEMBLY,	Test	0.1	0.4				6	A
	DOOR LOCK	Repair		0.4				6	
0502	VALVE, REUSE	Test		0.5				6	
	PUMP DUMP	Replace		0.8				6	

Table 1. Maintenance Allocation Chart (MAC) for Containerized Batch Laundry – Continued.

(1) GROUP NUMBER	(2) COMPONENT/ ASSEMBLY	(3) MAINTENANCE FUNCTION	(4) MAINTENANCE LEVEL					(5) TOOLS AND EQUIPMENT REFERENCE CODE	(6) REMARKS CODE
			FIELD			SUSTAINMENT			
			UNIT		DIRECT SUPPORT	GENERAL SUPPORT	DEPOT		
			C	O	F	H	D		
0503	VALVES,	Test		0.5				6	
	SOURCE WATER	Service		0.3				6	
	INLET	Replace		0.8				6	
0504	CONTROLS,	Inspect	0.1						A
	WASHER	Test		0.4				6	
		Repair		0.8				6	
0505	TUBE, LEVEL	Inspect		0.8				6	
	SENSING	Service		0.8				6	
		Replace		0.8				6	
0506	SENSOR,	Test		0.2				6	
	TEMPERATURE	Replace		0.8				6	
0507	DETECTOR,	Test		0.2				6	
	SPEED	Replace		0.8				6	
0508	SWITCH,	Test		0.5				6	
	BALANCE	Adjust		0.8				6	
		Replace		0.8				6	
0509	SWITCH,	Test		0.4				6	
	EMERGENCY STOP	Replace		0.4				6	
0510	VALVE, MAIN	Test		0.8				6	
	DRAIN	Replace		1.5				6	
0511	VALVE, REUSE	Test		0.8				6	
	DRAIN	Replace		1.5				6	
0512	DRIVE, VARIABLE	Test		0.5				6	
	FREQUENCY	Repair		0.8				6	
		Replace		0.8				6	
0513	ABSORBERS,	Inspect		0.8				6	
	SHOCK	Replace		1.5				6	
0514	SPRINGS	Inspect		0.8				6	
		Replace		1.5				6	
0515	BELT, DRIVE	Inspect		0.3				6	
		Adjust		0.8				6	
		Replace		0.8				6	
0516	MOTOR	Test		0.8				6	
		Replace		1.5				6	
0517	FITTINGS,	Inspect	0.1						A
	WASHER QD	Replace		0.4				6	
06	DISPENSER,	Inspect	0.1						A
	AUTOMATIC SOAP	Replace		0.7				6	
0601	MODULE,	Inspect	0.1						A
	CONTROL	Replace		0.5				6	
0602	SOLENOIDS	Test		0.5				6	
		Replace		0.7				6	

Table 1. Maintenance Allocation Chart (MAC) for Containerized Batch Laundry – Continued.

(1) GROUP NUMBER	(2) COMPONENT/ ASSEMBLY	(3) MAINTENANCE FUNCTION	(4) MAINTENANCE LEVEL					(5) TOOLS AND EQUIPMENT REFERENCE CODE	(6) REMARKS CODE
			FIELD			SUSTAINMENT			
			UNIT		DIRECT SUPPORT	GENERAL SUPPORT	DEPOT		
			C	O	F	H	D		
0603	PUMP	Test		0.4				6	
		Replace		0.7				6	
07	DRYER	Inspect	0.1						A
		Replace			4.0			6, 9	
0701	SWITCH,	Inspect	0.1						A
	AIRFLOW	Test		0.4				6	
		Adjust		0.4				6	
		Repair		0.6				6	
0702	ASSEMBLY,	Inspect	0.1						A
	LOADING DOOR	Adjust		0.4				6	
	CATCH	Replace		0.4				5	
0703	CONTACTOR,	Test		0.5				6	
	FAN	Replace		0.5				6	
0704	CONTACTOR,	Test		0.5				6	
	REVERSING	Replace		0.5				6	
0705	TRANSFORMER	Test		0.5				6	
		Repair		0.2				6	
		Replace		0.5				6	
0706	CONTACTOR,	Test		0.5				6	
	HEAT	Replace		0.5				6	
0706	SWITCH, LINT	Test	0.1	0.2				6	A
	PANEL	Replace		0.3				6	
0708	THERMISTOR,	Test		0.4				6	
	LINT	Replace		0.4				6	
	COMPARTMENT								
0709	SCREEN, LINT	Inspect	0.1						A
		Service	0.1						A
		Replace	0.1						A
0710	THERMOSTATS	Test		0.4				6	
		Repair		0.4				6	
0711	CONTROLS,	Inspect	0.1						A
	DRYER	Test		0.4				6	
		Repair		0.8				6	
0712	FUSE, CONTROL	Test		0.2				6	
	PANEL	Replace		0.2				6	
0713	SWITCH,	Inspect	0.1						A
	EMERGENCY	Test	0.1	0.4				6	A
	STOP	Replace		0.4				6	
0714	SWITCH, DOOR	Test	0.1	0.4				6	A
		Replace		0.3				6	
0715	ELEMENTS,	Test		0.3				6	
	HEATING	Replace		0.5				6	
0716	BELTS, DRIVE	Inspect		0.4				6	
		Adjust		0.4				6	
		Replace		0.5				6	

Table 1. Maintenance Allocation Chart (MAC) for Containerized Batch Laundry – Continued.

(1) GROUP NUMBER	(2) COMPONENT/ ASSEMBLY	(3) MAINTENANCE FUNCTION	(4) MAINTENANCE LEVEL					(5) TOOLS AND EQUIPMENT REFERENCE CODE	(6) REMARKS CODE
			FIELD			SUSTAINMENT			
			UNIT		DIRECT SUPPORT	GENERAL SUPPORT	DEPOT		
			C	O	F	H	D		
0717	MOTOR,	Test		0.3				6	
	CYLINDER DRIVE	Replace		0.5				6	
0718	FAN MOTOR	Test		0.3				6	
		Replace		0.5				6	
0719	DUCT	Inspect	0.1					2, 4	A
		Service	0.3					2, 4	A
		Repair	0.1					2, 4	A
		Replace	0.2					2, 4	A
0720	VENT	Inspect	0.1					2, 4	A
		Service	0.2					2, 4	A
08	BOILER	Inspect	0.1						A
		Replace					4.0	6, 9	
0801	CONTROLS,	Inspect	0.1						A
	BURNER, AND	Test		0.4				6	
	BURNER	Service		0.3				6	
		Adjust		0.4				6	
		Repair		0.5				6	
0802	HOSES,	Inspect	0.1						A
	INTERNAL FUEL	Replace		0.4				6	
0803	HOSES,	Inspect	0.1						A
	EXTERNAL FUEL	Replace	0.2						A
0804	FILTER, FUEL	Inspect	0.1						A
		Replace		0.4				6	
0805	COOLANT,	Inspect	0.1						A
	RESERVOIR	Replace		0.5				6	
0806	INDUCER, DRAFT	Inspect	0.1						A
		Test		0.4				6	
		Replace		0.4				6	
0807	EXCHANGERS,	Inspect	0.1						A
	HEAT	Replace		0.4				6	
0808	VALVES, MIXING	Inspect	0.1						A
		Adjust	0.1						A
		Replace		0.4				6	
0809	PUMP,	Inspect	0.1						A
	CIRCULATION	Test		0.4				6	
		Replace		0.4				6	
0810	VALVE,	Inspect	0.1						A
	PRESSURE	Test	0.1						A
	RELIEF	Replace		0.4				6	
0811	GAUGE,	Inspect	0.1						A
	PRESSURE – TEMPERATURE	Replace		0.4				6	
0812	CAP, PRESSURE	Inspect	0.1						A
	REGULATING	Replace		0.2				6	

Table 1. Maintenance Allocation Chart (MAC) for Containerized Batch Laundry – Continued.

(1) GROUP NUMBER	(2) COMPONENT/ ASSEMBLY	(3) MAINTENANCE FUNCTION	(4) MAINTENANCE LEVEL					(5) TOOLS AND EQUIPMENT REFERENCE CODE	(6) REMARKS CODE
			FIELD			SUSTAINMENT			
			UNIT		DIRECT SUPPORT	GENERAL SUPPORT	DEPOT		
			C	O	F	H	D		
09	EQUIPMENT, COLD WEATHER								A, D
0901	JACKETS, INSULATING	Inspect	0.1						A
		Repair	0.1						A
		Replace	0.2						A
0902	HEATER, TANK	Inspect	0.1						A
		Replace	0.2						A
0903	CORD, EXTENSION	Inspect	0.1						A
		Test		0.2				6	
		Replace	0.1						A
0904	TAPE, HEAT	Inspect	0.1						A
		Test		0.3				6	
		Replace		0.3				6	
0905	COMPRESSOR, AIR	Inspect	0.1						A
		Test	0.1						A
		Service	0.1					7	A
		Repair	0.1						A

Table 2. Tools and Test Equipment for Containerized Batch Laundry.

(1) TOOLS OR TEST EQUIPMENT REFERENCE CODE	(2) MAINTENANCE LEVEL	(3) NOMENCLATURE	(4) NATIONAL STOCK NUMBER	(5) TOOL NUMBER
1	F	Basin Wrench	5120-01-357-4775	
2	C	Nut Driver (Solid Shaft, 5/16 in.)	5120-01-354-2770	
3	C	Screwdriver, Phillips Tip, Size #1,	5120-00-060-2004	
4	C	Screwdriver, Standard Tip, 8-in L	5120-01-398-7979	
5	F	Shop Equipment, Automotive Maintenance and Repair: Organizational Maintenance, Common No.1	4910-00-754-0654	
6	O	Tool Kit, General Mechanic's: Automotive	5180-00-177-7033 5180-01-483-0249	
7	C	Wrench, Adjustable (10", Chrome, Crescent, 15/16 IN. Capacity)	5120-00-278-0341	
8	C	Wrench, Strap Large Size 6 3/8 in.	5120-01-461-1810	
9	F	Unspecified lifting equipment, 5000-lb minimum capacity (forklift, hoist)		

Table 3. Remarks for Containerized Batch Laundry.

(1) REMARKS CODE	(2) REMARKS
A	For Operator maintenance procedures refer to TM 10-3510-226-10
B	For Container maintenance procedures refer to TM 55-8115-204-23&P.
C	For Power Cable maintenance procedures refer to TM 9-6150-226-13 and TM 9-6150-226-23P.
D	Refer to TM 10-5430-237-12&P for procedures involving the 3000-Gallon Tank.

UNIT AND DIRECT SUPPORT MAINTENANCE
CONTAINERIZED BATCH LAUNDRY (CBL)
NSN 3510-01-527-2209
NSN 3510-01-527-2210
EXPENDABLE AND DURABLE ITEMS LIST

EXPENDABLE AND DURABLE ITEMS LIST

INTRODUCTION

Scope

This Work Package lists expendable and durable items that you will need to operate and maintain the Containerized Batch Laundry. This list is for information only and is not authority to requisition the listed items. These items are authorized to you by CTA 50-970, Expendable/Durable Items (except Medical, Class V Repair Parts, and Heraldic Items), or CTA 8-100, Army Medical Department Expendable/Durable Items.

Explanation of Columns in Expendable and Durable Items List

Column (1) - Item Number. This number is assigned to the entry in the list and is referenced in the narrative instructions to identify the item (e.g., "Use wire markers, WP 0087, Item 58").

Column (2) – Level. This column identifies the lowest level of maintenance that requires the listed item (C=Operator/Crew; O=Unit/Avum; F=Direct Support/Avum).

Column (3) - National Stock Number (NSN). This is the NSN assigned to the item which you can use to requisition it.

Column (4) – Item Name, Description, Commercial and Government Entity Code (CAGEC), and Part Number (P/N). This column provides the other information you need to identify the item.

Column (5) - Unit of Issue (U/I). Indicates the physical measurement or count of an item as issued per the National Stock Number shown in column (3).

EXPENDABLE AND DURABLE ITEMS LIST-CONTINUED

Table 1. Expendable and Durable Items List.

(1) ITEM NUMBER	(2) LEVEL	(3) NATIONAL STOCK NUMBER (NSN)	(4) ITEM NAME, DESCRIPTION, COMMERCIAL AND GOVERNMENT ENTITY CODE (CAGEC), AND PART NUMBER (P/N)	(5) UNIT OF ISSUE U/I
1	C	7920-01-339-6928	Absorbent material, spill cleanup (66735) F91D248	EA
2	O	8040-00-573-1502	Adhesive (81346) ASTM D2564	PT
3	C	8415-00-082-6108	Apron, utility (58536) A-A-55063	EA
4	C	8105-01-221-3239	Bag, plastic, contaminated waste, Size 3 (58536) A-A-2299	RL
5	C	7920-00-148-9666	Baled rag, general (58536) A-A-2522	BL
6	O	5110-00-277-4588	Blade, Hacksaw, 10 IN. (80244) GGG-B-451 TY1CL2GRA	PK
7	C		Bleach Solid Stainaway (85884) 13649	CS
8	C	6810-00-598-7316	Bleach, laundry, sodium hypoclorite, 1 GAL (0E7P7) Sani-Clor 6% bleach (1 GAL)	GL
9	O	7920-00-514-2417	Brush, acid swabbing (80244) 7920-00-514-2417	BX
10	C	9150-01-054-6453	Cleaner, Lubricant, and Preservative (CL&P), 1 PT. (07950) ROYCO 634	PT
11	C	6850-00-105-3084	Cleaner, solvent (13873) Class I ODS/CFC-113	PT
12	O	8030-01-166-0675	Compound, sealer pipe (05972) 56747	CN
13	O	5940-00-143-4780	Connector, #10 stud, #14-16 (81349) MIL-T-7928	EA
14	O	5940-00-168-3382	Connector, butt, #14-16 – Blue (60592) B4071	EA
15	O	5940-00-665-7317	Connector, butt, #18-22 (00779) 1-34070-1	EA
16	O	5940-00-283-5280	Connector, fork, #14-16 (81349) MIL-T-7928	EA
17	O	5940-01-008-6728	Connector, fork, #18-22 (14726) SS20912	EA
18	O	5940-00-283-5281	Connector, lug, #14 (81349) MIL-T-7928	EA
19	O	5940-00-230-0515	Connector, lug, #16 (81349) MIL-T-7928	EA

EXPENDABLE AND DURABLE ITEMS LIST-CONTINUED

Table 1. Expendable and Durable Items List-Continued.

(1) ITEM NUMBER	(2) LEVEL	(3) NATIONAL STOCK NUMBER (NSN)	(4) ITEM NAME, DESCRIPTION, COMMERCIAL AND GOVERNMENT ENTITY CODE (CAGEC), AND PART NUMBER (P/N)	(5) UNIT OF ISSUE U/I
20	O	5940-00-113-3137	Connector, lug, uninsulated (02929) A18-6	EA
21	O	5940-00-143-4794	Connector, lug, yellow (81349) MIL-T-7928	EA
22	O	5935-01-076-9464	Connector, plug (81349) MIL-C-26482	EA
23	O	5940-01-079-1936	Connector, splice, yellow (53553) 58A15-5	EA
24	C	7930-01-418-1436	Detergent, laundry (85884) 16801	CS
25	C	7930-00-929-1220	Detergent, low-phosphate (Type II), 50 LB (4S923)Type 1 laundry detergent	DR
26	C	7930-00-252-6797	Detergent, non-phosphate (Type II), 50 lb. (053H7) Detergent, laundry, Type II	DR
27	C		Ethylene glycol, solution (1KZJ9) 55786	GL
28	C	6545-00-656-1093	First-Aid Kit, general purpose (04024) 6170-008	EA
29	O	3439-00-009-8808	Flux, soldering (96613) ALPHA 100 FLUX 1QT	QT
30	C	8415-00-009-1900	Gloves, chemical and oil protective (05963) N35	PR
31	C	4240-00-190-6432	Goggles, industrial (58536) A-A-1110	PR
32	C	8520-00-782-2183	Hand cleaner (58536) A-A-279	CN
33	O	5970-00-815-1295	Insulation sleeving, heat shrink, 1/4 in. (81349) MIL-I-23053/2	PK
34	O	5970-00-990-9912	Insulation sleeving, heat shrink, 1/8 in. (81349) MIL-I-23053/2	PK
35	O	5970-00-954-1622	Insulation sleeving, heat shrink , 3/16 in. (81349) MIL-I-23053/5	PK
36	O	5970-00-903-8733	Insulation sleeving, heat shrink, 3/36 in. (81349) MIL-I-23053/5	PK
37	O	5970-00-954-1624	Insulation sleeving, heat shrink, 3/8 in. (81349) MIL-I-23053/5	PK
38	C	6240-00-152-2987	Lamp, fluorescent, 120V, 40W (08805) F40CW	EA

EXPENDABLE AND DURABLE ITEMS LIST-CONTINUED

Table 1. Expendable and Durable Items List-Continued.

(1) ITEM NUMBER	(2) LEVEL	(3) NATIONAL STOCK NUMBER (NSN)	(4) ITEM NAME, DESCRIPTION, COMMERCIAL AND GOVERNMENT ENTITY CODE (CAGEC), AND PART NUMBER (P/N)	(5) UNIT OF ISSUE U/I
39	C	9150-00-261-8146	Lubricating oil, general purpose (81349) MIL-PRF-32033	OZ
40	O	5975-01-102-1587	Mounting base, tiedown, electrical (26863) ABM-4	HD
41	O	5330-00-105-0100	Paper, gasket .03 in. thick, 36 in. X 36 in. (81349) MILC6183	EA
42	C	7520-01-368-7771	Pen, ball-point (58536) A-A-2905	DZ
43	O	9330-00-618-4623	Plastic sheet 1/8 in. plastic 36 in. X 36 in. (81349) MIL-P-22241	SH
44	O	8040-01-004-2705	Primer, adhesive (81346) ASTM F656-80	PT
45	F	3439-00-268-9652	Rod, welding (81348) QQ-RR-566	CO
46	O	8040-01-331-8047	Sealant, RTV (80244) MIL-A-46106 Type 1 Group 1	EA
47	O	6850-00-702-4297	Silicone compound (71984) DC 6 compound	TB
48	O	3439-01-019-9100	Solder, tin alloy (81346) ASTM B32	BR
49	C		Sour Navisour Solid 2/6# (85884) 16005	CS
50	C	7930-00-291-8321	Sour, laundry (58536) A-A-1374	DR
51	C	8030-00-889-3535	Tape, antisieze, 1/2 in. wide X 260 in. long (80244) MIL-T-27730, SIZE II	RL
52	C	5970-00-644-3167	Tape, electrical insulation, ¾-inch width (58536) A-A-2094	RL
53	O	5940-00-926-0085	Terminal, quick connect, female - blue - 14 AWG max (83330) 5010	EA
54	O	5975-00-727-5153	Tie, wire, 2.5 in. (81349) MIL-S-23190	PK
55	O	5975-00-074-2072	Tie, wire, 6.3 in. (56501) TY-25M	PK
56	O	5975-00-838-7450	Tie, wire, large - 14 in. (56501) AS40144	PK

EXPENDABLE AND DURABLE ITEMS LIST-CONTINUED

Table 1. Expendable and Durable Items List-Continued.

(1) ITEM NUMBER	(2) LEVEL	(3) NATIONAL STOCK NUMBER (NSN)	(4) ITEM NAME, DESCRIPTION, COMMERCIAL AND GOVERNMENT ENTITY CODE (CAGEC), AND PART NUMBER (P/N)	(5) UNIT OF ISSUE U/I
57	C	5975-00-984-6582	Tie, wire, medium - 6 in. (81349) MIL-S-23190	PK
58	C	7690-00-689-5212	Wire markers (56501) WM-A-33	PK

UNIT AND DIRECT SUPPORT MAINTENANCE
CONTAINERIZED BATCH LAUNDRY (CBL)
NSN 3510-01-527-2209
NSN 3510-01-527-2210
MANDATORY REPLACEMENT PARTS LIST

MANDATORY REPLACEMENT PARTS LIST

This work package includes a list of all mandatory replacement parts referenced in the task initial setups and procedures. Theses are items that must be replaced during maintenance whether they have failed or not. This includes items based on usage intervals such as miles, time, rounds, fired, etc.

MANDATORY REPLACEMENT PARTS LIST

Table 1. Mandatory Replacement Parts List.

Item No.	Part Number/CAGEC	NSN	Nomenclature	Qty
1	96525433/3GJM5		O-ring kit	1

GLOSSARY

Term	Definition
Cut-in	The point at which a pressure or temperature switch closes.
Cut-out	The point at which a pressure or temperature switch opens.
Differential	An adjustable range setting on a pressure or temperature activated switch. For example, a pressure activated switch might have a cut-in adjustment and a differential adjustment. The cut-in will activate at a set pressure; the differential will provide cut-out at the range set. If cut-in, then, is set at 30 psig, and the differential is set at 30 psig, then the cut-out will be 60 psig. See Cut-in; Cut-out
Double Service Door	Two adjacent container doors which together provide access to the container.
Extractor	An extractor spins laundry items at high speed to remove excess water from the fabric.
Graywater	Liquid waste not contaminated with human excrement or food waste; recyclable.
Laundry Sour	An acidic compound used to adjust the alkalinity of laundered articles. Laundry sour is usually added in the final rinse.
Potable Water	Clean, uncontaminated, treated water suitable for drinking.
Reversing	A dryer cycle in which the dryer will spin in one direction for a specified amount of time, and then spin in the other direction for the same amount of time. This serves to adjust the dryer load, preventing articles from being compressed. A reversing cycle will alternate direction many times in the drying process.
Single Service Door	One door which alone provides access to the container.
Space Heater	A small heater used to keep the interior of the container above freezing.
TEMPER	Tent, Expandable, Modular, Personnel.
TRICON	Storage Container, Triple

ALPHABETICAL INDEX

A

B

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R -Continued

Subject WP Sequence No. – Page No.

R -Continued

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S

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T –Continued

Subject WP Sequence No. – Page No.

T -Continued

U

V

W

W -Continued

By Order of the Secretary of the Army:

PETER J. SCHOOMAKER
General, United States Army
Chief of Staff

Official:

SANDRA R. RILEY
Administrative Assistant to the
Secretary of the Army
0523802

Distribution: To be distributed in accordance with initial distribution number (IDN) 256847 requirements for TM 10-3510-226-23.

These are the instructions for sending an electronic 2028

The following format must be used if submitting an electronic 2028. The subject line must be exactly the same and all fields must be included; however only the following fields are mandatory: 1, 3, 4, 5, 6, 7, 8, 9, 10, 13, 15, 16, 17, and 27.

From: "Whomever" <whomever@avma27.army.mil>
To: amssbriml@natick.army.mil

Subject: DA Form 2028

1. From: Joe Smith
2. Unit: home
3. Address: 4300 Park
4. City: Hometown
5. St: MO
6. Zip: 77777
7. Date Sent: 19-OCT-93
8. Pub no: 55-2840-229-23
9. Pub Title: TM
10. Publication Date: 04-JUL-85
11. Change Number: 7
12. Submitter Rank: MSG
13. Submitter FName: Joe
14. Submitter MName: T
15. Submitter LName: Smith
16. Submitter Phone: 123-123-1234
17. Problem: 1
18. Page: 2
19. Paragraph: 3
20. Line: 4
21. NSN: 5
22. Reference: 6
23. Figure: 7
24. Table: 8
25. Item: 9
26. Total: 123
27. Text:

This is the text for the problem below line 27.

RECOMMENDED CHANGES TO PUBLICATIONS AND BLANK FORMS For use of this form, see AR 25-30; the proponent agency is ODISC4.	Use Part II *(reverse)* for Repair Parts and Special Tool Lists (RPSTL) and Supply Catalogs/Supply Manuals (SC/SM).	**DATE** *21 October 2003*

TO: *(Forward to proponent of publication or form) (Include ZIP Code)* COMMANDER U.S. ARMY TANK-AUTOMOTIVE AND ARMAMENT COMMAND ATTN: AMSTA LC-CECT KANSAS STREET NATICK, MA 01760-5052	**FROM:** *(Activity and location) (Include ZIP Code)* *PFC Jane Doe* *CO A 3rd Engineer BR* *Ft. Leonardwood, MO 63108*

PART I – ALL PUBLICATIONS (EXCEPT RPSTL AND SC/SM) AND BLANK FORMS

PUBLICATION/FORM NUMBER	**DATE**	**TITLE**
TM 10-1670-296-23&P	30 October 2002	Unit Manual for Ancillary Equipment for Low Velocity Air Drop Systems

ITEM NO.	**PAGE NO.**	**PARA-GRAPH**	**LINE NO. ***	**FIGURE NO.**	**TABLE NO.**	**RECOMMENDED CHANGES AND REASON** *(Provide exact wording of recommended changes, if possible).*
	0036 00-2				*1*	*In table 1, Sewing Machine Code Symbols, the second sewing machine code symbol should be MD ZZ not MD 22.* *Change the manual to show Sewing Machine, Industrial: Zig-Zag; 308 stitch; medium-duty; NSN 3530-01-181-1421 as a MD ZZ code symbol.*

**Reference to line numbers within the paragraph or subparagraph.*

TYPED NAME, GRADE OR TITLE	**TELEPHONE EXCHANGE/AUTOVON, PLUS EXTENSION**	**SIGNATURE**
Jane Doe, PFC	508-233-4141	Jane Doe *Jane Doe*

TO: (*Forward direct to addressee listed in publication)* COMMANDER U.S. ARMY TANK-AUTOMOTIVE AND ARMAMENT COMMAND ATTN: AMSTA LC-CECT KANSAS STREET NATICK, MA 01760-5052	**FROM:** (*Activity and location) (Include ZIP Code)* *PFC Jane Doe* *CO A 3rd Engineer BR* *Ft. Leonardwood, MO 63108*	**DATE** *21 October 2003*

PART II – REPAIR PARTS AND SPECIAL TOOL LISTS AND SUPPLY CATALOGS/SUPPLY MANUALS

PUBLICATION NUMBER	**DATE**	**TITLE**
TM 10-1670-296-23&P	30 October 2002	Unit Manual for Ancillary Equipment for Low Velocity Air Drop Systems

PAGE NO.	**COLM NO.**	**LINE NO.**	**NATIONAL STOCK NUMBER**	**REFERENCE NO.**	**FIGURE NO.**	**ITEM NO.**	**TOTAL NO. OF MAJOR ITEMS SUPPORTED**	**RECOMMENDED ACTION**
0066 00-1					*4*			*Callout 16 in figure 4 is pointed to a D-Ring. In the Repair Parts List key for figure 4, item 16 is called a Snap Hook. Please correct one or the other.*

PART III – REMARKS (*Any general remarks or recommendations, or suggestions for improvement of publications and blank forms. Additional blank sheets may be used if more space is needed.)*

TYPED NAME, GRADE OR TITLE	TELEPHONE EXCHANGE/AUTOVON, PLUS EXTENSION	SIGNATURE

RECOMMENDED CHANGES TO PUBLICATIONS AND BLANK FORMS For use of this form, see AR 25-30; the proponent agency is ODISC4.	Use Part II *(reverse)* for Repair Parts and Special Tool Lists (RPSTL) and Supply Catalogs/Supply Manuals (SC/SM).	DATE
TO: *(Forward to proponent of publication or form) (Include ZIP Code)* Commander U.S. Army Tank-automotive and Armament Command ATTN: AMSTA-LC-CECT Kansas Street, Natick, MA 01760-5052.	**FROM:** *(Activity and location) (Include ZIP Code)*	

PART I – ALL PUBLICATIONS (EXCEPT RPSTL AND SC/SM) AND BLANK FORMS

PUBLICATION/FORM NUMBER	DATE	TITLE
TM 10-3510-226-23	31 August 2005	Unit and Direct Support Maintenance Manual for Containerized Batch Laundry(CBL)

ITEM NO.	PAGE NO.	PARA-GRAPH	LINE NO. *	FIGURE NO.	TABLE NO.	RECOMMENDED CHANGES AND REASON *(Provide exact wording of recommended changes, if possible).*

**Reference to line numbers within the paragraph or subparagraph.*

TYPED NAME, GRADE OR TITLE	TELEPHONE EXCHANGE/AUTOVON, PLUS EXTENSION	SIGNATURE

TO: (*Forward direct to addressee listed in publication*)	**FROM:** (*Activity and location) (Include ZIP Code)*	**DATE**
Commander U.S. Army Tank-automotive and Armament Command ATTN: AMSTA-LC-CECT Kansas Street, Natick, MA 01760-5052.		

PART II – REPAIR PARTS AND SPECIAL TOOL LISTS AND SUPPLY CATALOGS/SUPPLY MANUALS

PUBLICATION NUMBER	DATE	TITLE
TM 10-3510-226-23	31 August 2005	Unit and Direct Support Maintenance Manual for Containerized Batch Laundry(CBL)

PAGE NO.	COLM NO.	LINE NO.	NATIONAL STOCK NUMBER	REFERENCE NO.	FIGURE NO.	ITEM NO.	TOTAL NO. OF MAJOR ITEMS SUPPORTED	RECOMMENDED ACTION

PART III – REMARKS (*Any general remarks or recommendations, or suggestions for improvement of publications and blank forms. Additional blank sheets may be used if more space is needed.)*

TYPED NAME, GRADE OR TITLE	TELEPHONE EXCHANGE/AUTOVON, PLUS EXTENSION	SIGNATURE

RECOMMENDED CHANGES TO PUBLICATIONS AND BLANK FORMS For use of this form, see AR 25-30; the proponent agency is ODISC4.	Use Part II *(reverse)* for Repair Parts and Special Tool Lists (RPSTL) and Supply Catalogs/Supply Manuals (SC/SM).	DATE
TO: *(Forward to proponent of publication or form) (Include ZIP Code)* Commander U.S. Army Tank-automotive and Armament Command ATTN: AMSTA-LC-CECT Kansas Street, Natick, MA 01760-5052.	**FROM:** *(Activity and location) (Include ZIP Code)*	

PART I – ALL PUBLICATIONS (EXCEPT RPSTL AND SC/SM) AND BLANK FORMS

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TYPED NAME, GRADE OR TITLE	TELEPHONE EXCHANGE/AUTOVON, PLUS EXTENSION	SIGNATURE

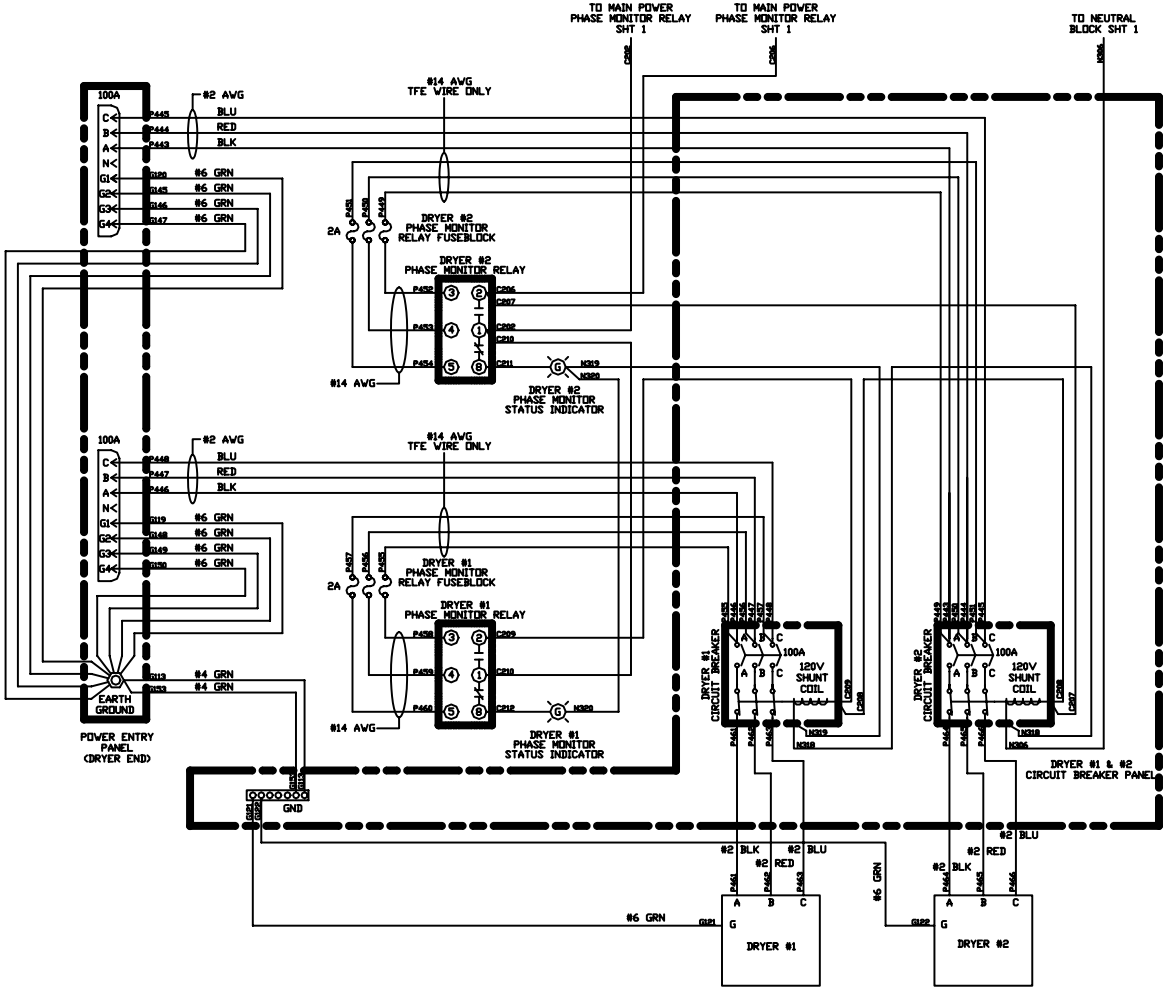

Figure 1. Electrical System.

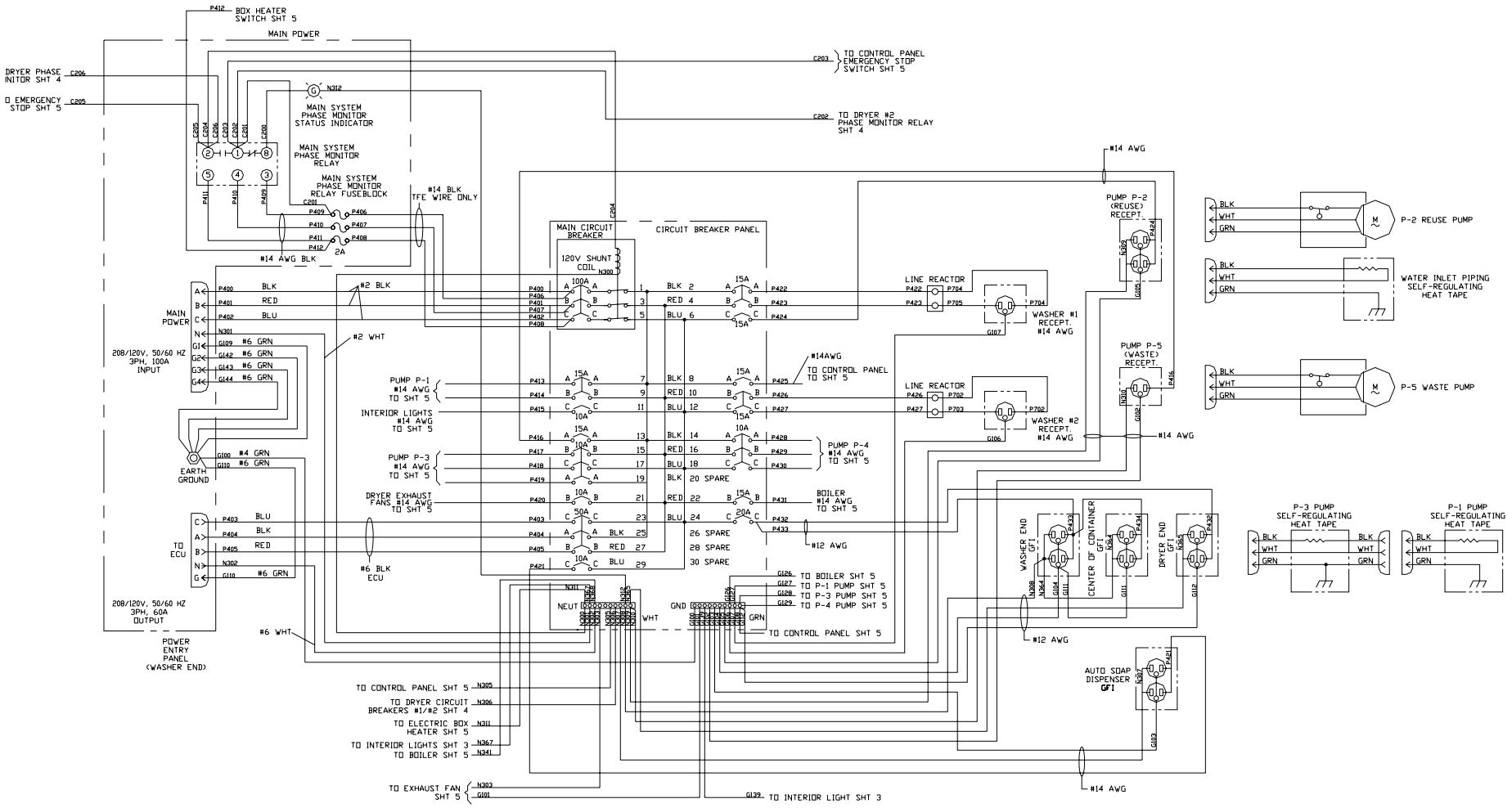

Figure 2. Electrical System.

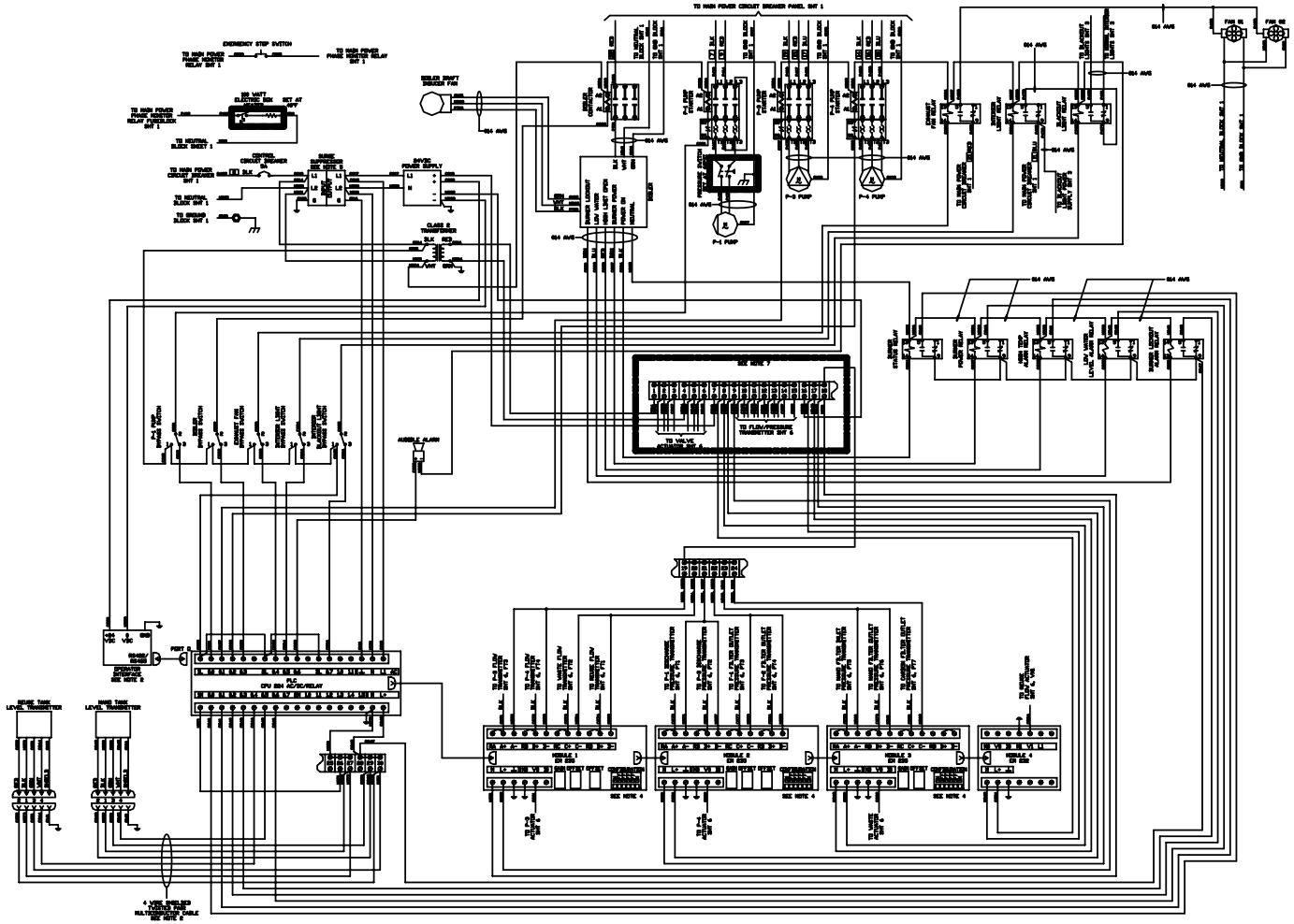

Figure 3. Programmable Logic Control.

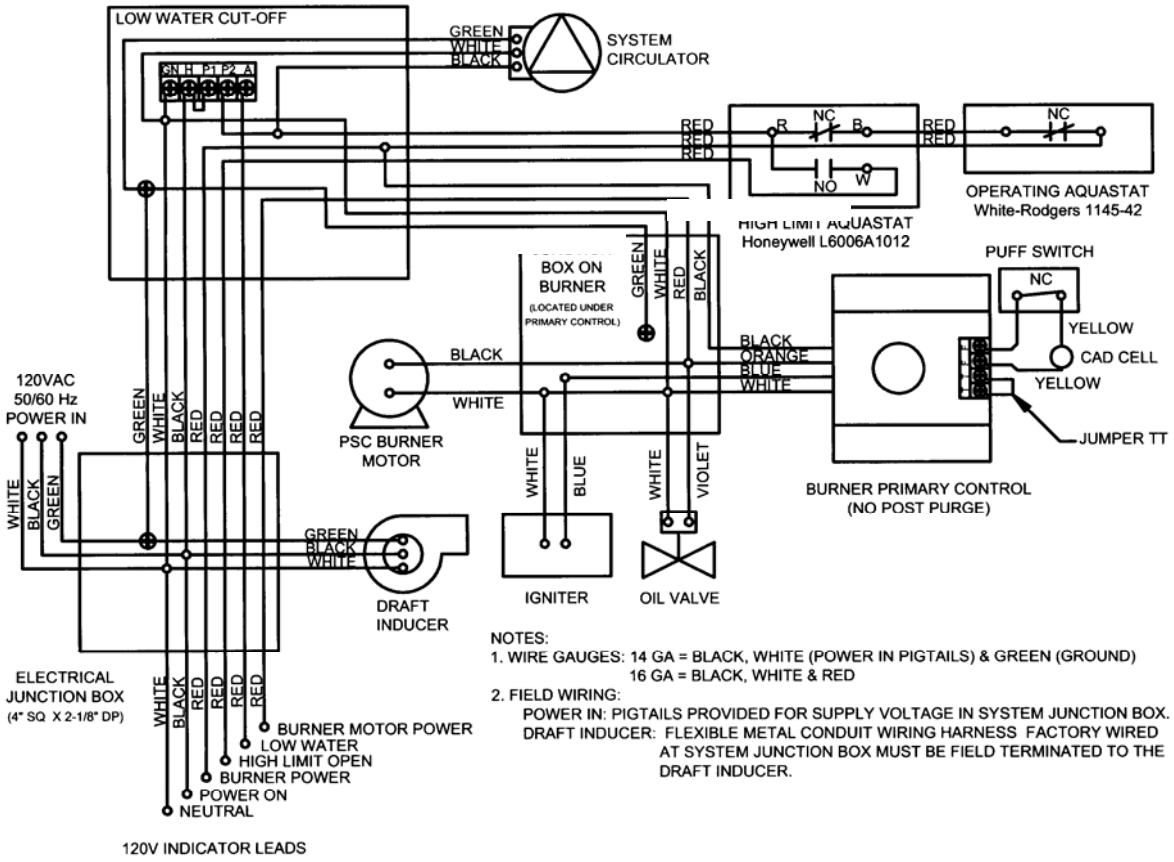

Figure 4. Boiler.

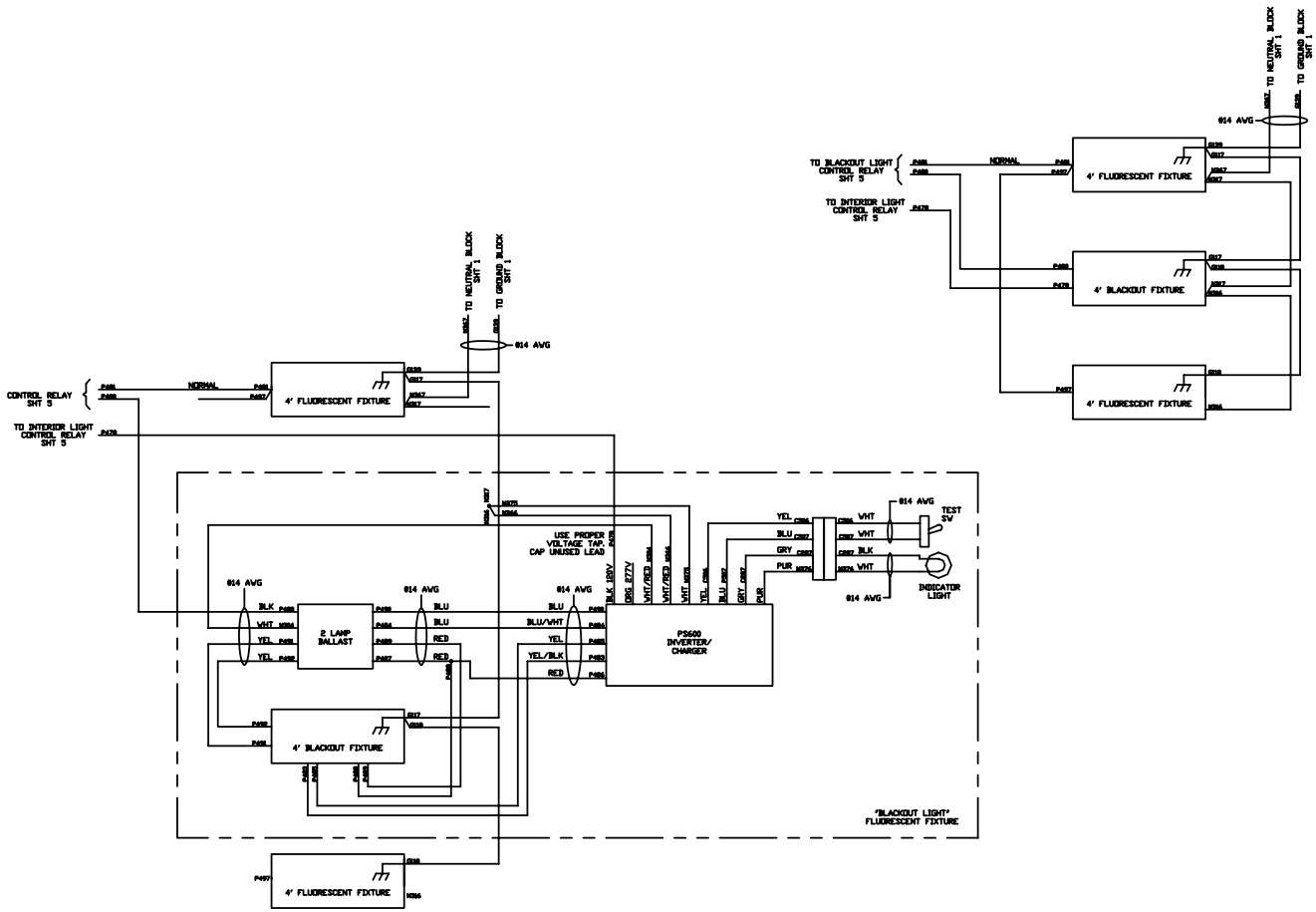

Figure 5. Lighting.

The Metric System and Equivalents

Linear Measure

1 centimeter = 10 millimeters = .39 inch
1 decimeter = 10 centimeters = 3.94 inches
1 meter = 10 decimeters = 39.37 inches
1 dekameter = 10 meters = 3 2.8 feet
1 hectometer = 10 dekameters = 328.08 feet
1 kilometer = 10 hectometers = 3,280.8 feet

Liquid Measure

1 centiliter = 10 milliliters = .34 fl. ounce
1 deciliter = 10 centiliters = 3.38 fl. ounces
1 liter = 10 deciliters = 33.81 fl. ounces
1 dekaliter = 10 liters = 2.64 gallons
1 hectoliter = 10 dekaliters = 26.42 gallons
1 kiloliter = 10 hectoliters = 264.18 gallons

Weights

1 centigram = 10 milligrams = .15 grain
1 decigrarn = 10 centigrams = 1.54 grains
1 gram = 10 decigrams = .035 ounce
1 dekagrarn = 10 grams = .35 ounce
1 hectogram = 10 dekagrams = 3.52 ounces
1 kilogram = 10 hectograms = 2.2 pounds
1 quintal = 100 kilograms = 220.46 pounds
1 metric ton = 10 quintals = 1.1 short tons

Square Measure

1 sq. centimeter = 100 sq. millimeters = .15 5 sq. inch
1 sq. decimeter =100 sq. centimeters = 15.5 sq. inches
1 sq. meter (centare) = 100 sq. decimeters = 10.76 sq. feet
1 sq. dekameter (are) = 100 sq. meters = 1,076.4 sq. feet
1 sq. hectometer (hectare) = 100 sq. dekameters = 2.47 acres
1 sq. kilometer = 100 sq. hectometers = .386 sq. mile

Cubic Measure

1 cu. centimeter = 1000 cu. millimeters = .06 cu. inch
1 cu. decimeter = 1000 cu. centimeters = 61.02 cu. inches
1 cu. meter = 1000 cu. decimeters = 35.31 feet

Approximate Conversion Factors

To change	*To*	*Multiply by*	*To change*	*To*	*Multiply by*
inches	centimeters	2.540	ounce-inches	newton-meters	.007062
feet	meters	.305	centimeters	inches	.394
yards	meters	.914	meters	feet	3.280
miles	kilometers	1.609	meters	yards	1.094
square inches	square centimeters	6.451	kilometers	miles	.621
square feet	square meters	.093	square centimeters	square inches	.155
square yards	square meters	.836	square meters	square feet	10.764
square miles	square kilometers	2.590	square meters	square yards	1.196
acres	square hectometers	.405	square kilometers	square miles	.386
cubic feet	cubic meters	.028	square hectometers	acres	2.471
cubic yards	cubic meters	.765	cubic meters	cubic feet	35.315
fluid ounces	milliliters	29.573	cubic meters	cubic yards	1.308
pints	Iiters	.473	milliliters	fluid ounces	.034
quarts	Iiters	.946	liters	pints	2.113
gallons	Iiters	3.785	liters	quarts	1.057
ounces	grams	28.349	liters	gallons	.264
pounds	kilograms	.454	grams	ounces	.035
short tons	metric tons	.907	kilograms	pounds	2.205
pound-feet	newton-meters	1.356	metric tons	short tons	1.102
pound-inches	newton-meters	.11296			

Temperature (Exact)

_F	Fahrenheit temperature	5/9 (after subtracting 32)	Celsius temperature	_C

PIN: 082612-000