*TM 10–3510–221–24

TECHNICAL MANUAL

UNIT, DIRECT SUPPORT AND GENERAL SUPPORT MAINTENANCE MANUAL

FOR

LAUNDRY ADVANCED SYSTEM (LADS)

(NSN: 3510–01–463–0114)

*This manual supercedes TM 10–3510–221–24 dated 31 October 2000.

HEADQUARTERS, DEPARTMENT OF THE ARMY

31 OCTOBER 2003

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WARNING SUMMARY

This warning summary contains general safety warnings and hazardous material warnings that must be understood and applied during operation and maintenance of this equipment. Failure to observe these precautions could result in serious injury or death to personnel.

WARNING

The Laundry Advanced System requires 208 VAC, 3–phase, and 110 VAC, single–phase, 50–60 Hz electrical power. The MAIN POWER disconnect switch (SW1) located on the main control enclosure must be in the OFF position when performing maintenance. Failure to do so may result in unexpected start–up of equipment or release of stored energy. Contact with energized connections will result in personal injury or death.

WARNING

The fuel, JP–8 or DF–2, used in the Laundry Advanced System is a combustible liquid. Vapors and liquid may ignite or explode. Do not smoke or use open flames when connecting fuel hoses, refueling, or when performing maintenance. Flames and fire can occur resulting in severe burns, personal injury, or death.

WARNING

The Laundry Advanced System contains rotating and vibrating equipment. Personnel must keep their hands, feet, clothing, and loose personal items clear while equipment is operating. Never climb into the laundry drum. Failure to follow this warning may result in serious personal injury or death.

WARNING

This equipment generates high temperatures during operation. Heater exhaust temperatures can reach 600 degrees F. Thermal fluid circulating through the heating system plumbing can reach temperatures near 400 degrees F. Surface temperatures of the dryer ducts can reach 250 degrees F. Steam and condensate plumbing can reach 212 degrees F. Water tank and water plumbing temperatures can reach 160 degrees F. Operators must ensure a "cooldown" cycle is run prior to performing PMCS. Avoid contact with hot equipment surfaces. Failure to follow this warning may result in serious burn injury to personnel.

WARNING

Exhaust discharge contains deadly gases. Do not operate the Laundry Advanced System in an enclosed area unless exhaust discharge is properly vented outside. Severe personal injury or death due to carbon monoxide poisoning could result.

WARNING

When the Laundry Advanced System is operating, the noise levels at the curbside of the equipment could cause noise induced hearing loss. Hearing protection must be worn when working near this equipment.

WARNING

When the Laundry Advanced System is operating in a sheltered environment the noise levels could cause noise induced hearing loss. Hearing protection must be worn at all times when working near this equipment.

WARNING SUMMARY – Continued

WARNING

Detergent, sanitizer, and anti–foam used with the Laundry Advanced System are irritants. Operators must refer to Material Safety Data Sheets for pertinent information. Impermeable gloves and eye protection must be worn when handling or dispensing these items. Failure to follow this warning may result in personal illness or injury.

WARNING

Waste water generated during laundry operations may contain chemical and/or biological materials. When maintaining or servicing water plumbing or associated components, personnel must wear impermeable gloves and goggles for protection. Failure to follow this warning may result in serious illness.

WARNING

Precautions must be taken when working with pressurized (air, water, steam, or thermal fluid) systems. Residual pressure must be vented or isolated to prevent release before hoses, fittings, or equipment are connected or disconnected. Failure to follow this warning may result in personal injury or death.

WARNING

Keep hands and fingers away from hinge points on ladder halves when opening and closing. Keep hands and fingers away from inner and outer rungs of ladder when adjusting. Never climb on ladder unless knobs and inner locking devices are properly tightened, footings are placed securely upon ground, and/or ladder is placed securely upon equipment to prevent slipping. Failure to observe this precaution may result in severe personal injury.

WARNING

Before moving the Laundry System, ensure that all loose equipment is properly stowed and that nothing will drag on the ground. Failure to follow this warning may result in injury to personnel or damage to equipment.

WARNING

Improper cleaning methods and use of unauthorized cleaning liquids or solvents can injure personnel and damage equipment. To prevent this, refer to TM 9–247 for further instructions.

WARNING

Compressed air used for cleaning or drying purposes, or for clearing restrictions, should never exceed 30 psi (207 kPa). Wear protective clothing (goggles/shield, gloves, etc.), and use caution to avoid injury to personnel.

INSERT LATEST UPDATED PAGES/WORK PACKAGES, DESTROY SUPERSEDED DATA.

LIST OF EFFECTIVE PAGES/WORK PACKAGES

NOTE: The portion of the text affected by the updates is indicated by a vertical line in the outer margins of the page. Updates to illustrations are indicated by miniature pointing hands. Updates to wiring diagrams are indicated by shaded areas.

Dates of Issue for original and updated pages / work packages are:

Original.... 0 ...31 October 03

TOTAL NUMBER OF PAGES FOR FRONT AND REAR MATTER IS 24, AND TOTAL NUMBER OF WORK PACKAGES IS 284 CONSISTING OF THE FOLLOWING:

Page / WP No.	* Revision No.	Page / WP No.	* Revision No.	Page / WP No.	* Revision No.
Title	0				
A thru B	0				
A thru B	0				
i thru x	0				
WP0001 00 thru 0284 00	0				
Index–1 thru Index–8	0				

*** Zero in this column indicates an original page or work package.**

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*TM 10–3510–221–24

HEADQUARTERS,
DEPARTMENT OF THE ARMY
WASHINGTON, D.C., 31 OCTOBER 2003

TECHNICAL MANUAL

UNIT, DIRECT SUPPORT AND GENERAL SUPPORT MAINTENANCE MANUAL FOR LAUNDRY ADVANCED SYSTEM (LADS)

(NSN: 3510–01–463–0114)

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, DA Form 2028 (Recommended Changes to Publications and Blank Forms), or DA Form 2028–2, located in the back of this manual directly to: Commander, US Army Soldier and Biological Chemical Command, ATTN: AMSSB–RIM–L(N), Kansas St., Natick, MA 01760. You may also submit your recommended changes by E–mail directly to: <amssbriml@natick.army.mil>. A reply will be furnished directly to you. Instructions for sending electronic 2028 may be found at the back of this manual immediately preceding the hard copy 2028.

*This manual supercedes TM 10–3510–221–24 dated 31 October 2000.

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WP Sequence No.

CHAPTER 2 – TROUBLESHOOTING PROCEDURES – Continued

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CHAPTER 3 – UNIT MAINTENANCE INSTRUCTIONS

WP Sequence No.

CHAPTER 3 – UNIT MAINTENANCE INSTRUCTIONS – Continued

WP Sequence No.

CHAPTER 3 – UNIT MAINTENANCE INSTRUCTIONS – Continued

WP Sequence No.

CHAPTER 3 – UNIT MAINTENANCE INSTRUCTIONS – Continued

CHAPTER 4 – DIRECT SUPPORT MAINTENANCE INSTRUCTIONS

WP Sequence No.

HOW TO USE THIS MANUAL

In this manual, primary chapters appear in upper case/capital letters; work packages are presented in numeric sequence, e.g., 0001 00; paragraphs within a work package are not numbered and are presented in a titles format. For a first level paragraph title all upper case/capital letters , e.g., INTRODUCTION, the next subordinate paragraph title will have the first letter of the first word and of each principle word all upper case/capital letters , e.g., How to Use This Manual. The location of additional material that must be referenced is clearly marked. Figures supporting maintenance procedures/text are located as close as possible to their references.

FRONT MATTER. Front matter consists of front cover, warning summary, title block, table of contents, and how to use this manual page.

CHAPTER 1 – INTRODUCTION. Chapter 1 contains general information, equipment description, and theory of operation.

CHAPTER 2 – TROUBLESHOOTING PROCEDURES. Chapter 2 contains a description and use of controls and indicators, general troubleshooting information, a malfunctions/symptom index, and troubleshooting procedures authorized at unit level.

CHAPTER 3 – UNIT MAINTENANCE INSTRUCTIONS. Chapter 3 provides preventive maintenance checks and services (PMCS), and maintenance procedures authorized at unit level.

CHAPTER 4 – DIRECT SUPPORT MAINTENANCE INSTRUCTIONS. Chapter 4 provides maintenance procedures authorized at direct support level.

CHAPTER 5 – GENERAL SUPPORT. Chapter 5 provides maintenance procedures authorized at general support level.

CHAPTER 6 – SUPPORTING INFORMATION. Chapter 6 contains references, maintenance allocation chart (MAC), expendable and durable items list, tool identification list, illustrated list of manufactured items, torque limits, mandatory replacement parts list, and wiring diagrams.

REAR MATTER – Rear matter consists of alphabetical index, DA Form 2028, authentication page, and back cover.

CHAPTER 1

INTRODUCTORY INFORMATION WITH

THEORY OF OPERATION

FOR

LAUNDRY ADVANCED SYSTEM

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UNIT, DIRECT SUPPORT, AND GENERAL SUPPORT
LAUNDRY ADVANCED SYSTEM
(NSN 3510–01–463–0114)
GENERAL INFORMATION

SCOPE

This manual contains instructions for unit, direct support, and general support maintenance procedures for the Laundry Advanced System.

Type of Manual: Maintenance.

Model Number and Equipment Names: Laundry Advanced System.

Purpose of Equipment: The system is used to perform field laundering of Army clothing and equipment.

MAINTENANCE FORMS, RECORDS, AND REPORTS

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

REPORTING EQUIPMENT IMPROVEMENT RECOMMENDATIONS (EIR)

If your Laundry Advanced System 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 an SF 368 (Product Quality Deficiency Report). Mail it to the address specified in DA PAM 738–750, The Army Maintenance Management System (TAMMS), or as specified by the contracting activity. We will send you a reply.

CORROSION PREVENTION AND CONTROL (CPC)

Corrosion Prevention and Control (CPC) of 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 can be made to prevent the problem in future items.

While corrosion is typically associated with rusting of metals, it can also include deterioration of other materials, such as rubber and plastic. Unusual cracking, softening, swelling, or breaking of these materials may be a corrosion problem.

If a corrosion problem is identified, it can be reported using Standard Form SF 368, Product Quality Deficiency Report. Use of keywords such as "corrosion", "rust", "deterioration", or "cracking" will ensure that the information is identified as a CPC problem.

The form should be submitted to the address specified in DA PAM 738–750, The Army Maintenance Management System (TAMMS).

DESTRUCTION OF ARMY MATERIEL TO PREVENT ENEMY USE

References to "destruction of Army materiel to prevent enemy use" are contained in TM 750–244–3.

PREPARATION FOR STORAGE AND SHIPMENT

Refer to TM 10–3510–221–10.

WARRANTY INFORMATION

The Laundry Advanced System does not contain warranty provisions.

NOMENCLATURE CROSS–REFERENCE LIST

Common Name	Official Nomenclature
LADS	Laundry Advanced System
Laundry Unit	Laundry Advanced System

LIST OF ABBREVIATIONS

#	Number (Used to designate wire numbers.)
AC	Alternating Current
C	Centigrade
CAGEC	Commercial and Government Entity Code
cm	centimeter
CCW	Counter–Clockwise
CW	Clockwise
CPC	Corrosion Prevention and Control
DA	Department of the Army
DC	Direct Current
EIR	Equipment Improvement Recommendation
ESD	Electrostatic Discharge Sensitive
F	Fahrenheit
FRS	Finish Reapplication System
ft	foot
Gal	gallon
GFI	Ground Fault Interrupt
hp	horsepower
h	hour
Hz	Hertz (frequency or cycles per second)
in	inches
I/O	Input/Output
ISO	International Organization for Standardization
kg	Kilogram

LIST OF ABBREVIATIONS – Continued

kW	Kilowatt
kPa	Kilopascal
l	liter
lbs	pounds
ltrs	liters
MAC	Maintenance Allocation Chart
NSN	National Stock Number
PCB	Printed Circuit Board
psi	Pounds per square inch
psig	Pounds per square inch gauge
RPM	Revolutions Per Minute
RPSTL	Repair Parts and Special Tools List
SCF	Standard Cubic Feet
SMR	Source, Maintenance, and Recoverability [Code]
SSR	Solid State Relays
TM	Technical Manual
TMDE	Test, Measurement, and Diagnostics Equipment
VAC	Volts Alternating Current
VDC	Volts Direct Current

SAFETY, CARE, AND HANDLING

The following procedures should be observed when handling all electrostatic discharge sensitive (ESD) components and units containing such components. Failure to observe all of these precautions can cause permanent damage to the electrostatic device. This damage can cause the device to fail immediately or at a later date when exposed to an adverse environment.

1. Turn off and/or disconnect all power, signal sources and loads used with the unit.
2. Place the unit on a grounded non–conductive work surface.
3. Ground the repair operator using a non–conductive wrist strap or other device using a 50 megohm resistor to protect the operator.
4. Ground any tools (including soldering equipment) that will come into contact with unit. Contact with the operator’s hand provides a sufficient ground for tools that are otherwise electrically isolated.

SAFETY, CARE, AND HANDLING – Continued

5. All electrostatic discharge sensitive replacement components are shipped in non–conductive foam or tubes and must be stored in the original shipping container until installed.
6. When these devices or assemblies are removed from the unit, they should be placed on the non–conductive work surface or in non–conductive containers.
7. When not being worked on, place disconnected circuit boards in plastic bags that have been coated or impregnated with a non–conductive material.
8. Do not handle these devices unnecessarily or remove them from their packages until actually used or tested.

END OF WORK PACKAGE

UNIT, DIRECT SUPPORT, AND GENERAL SUPPORT

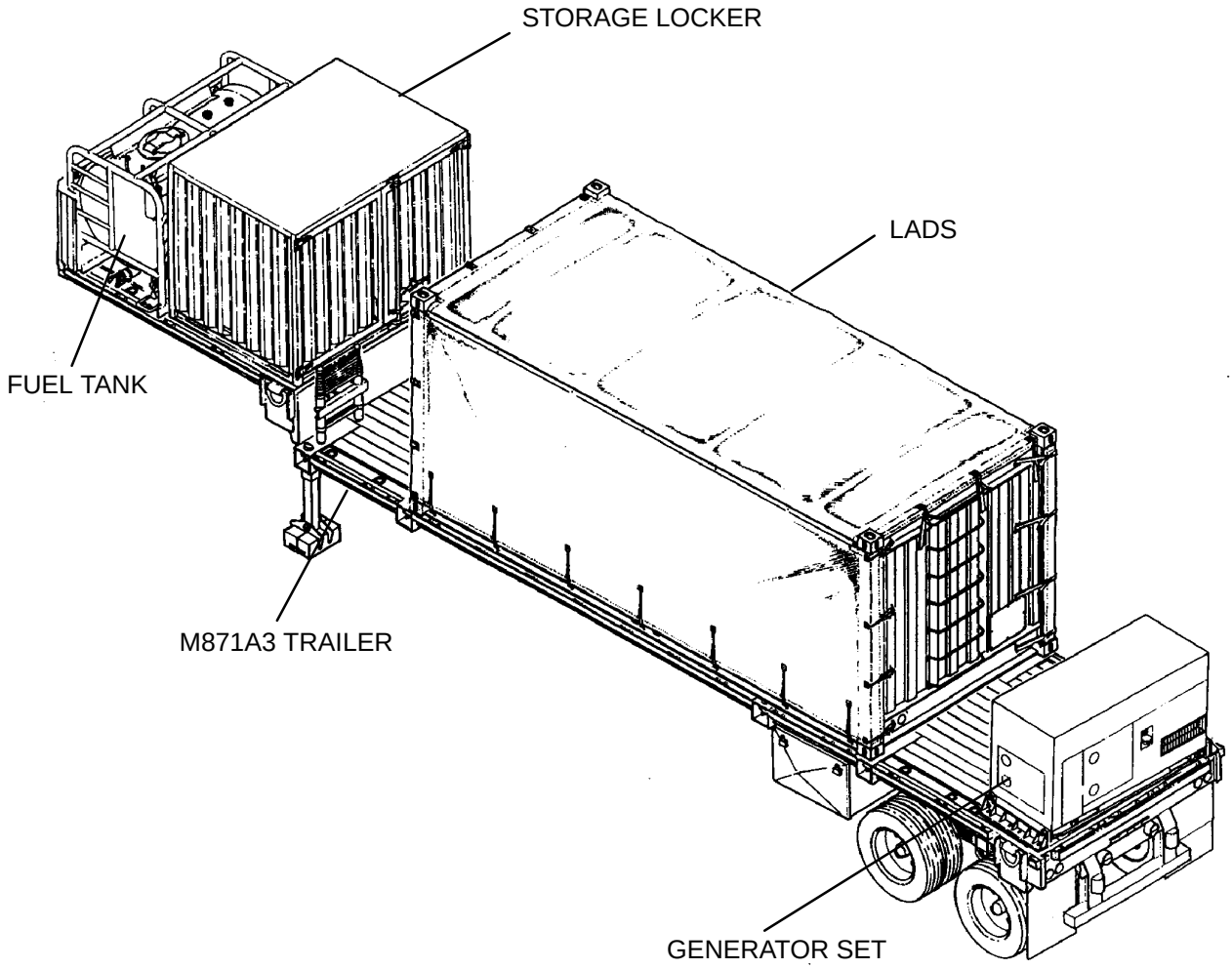
LAUNDRY ADVANCED SYSTEM

(NSN 3510–01–463–0114)

EQUIPMENT DESCRIPTION AND DATA

EQUIPMENT CHARACTERISTICS, CAPABILITIES, AND FEATURES

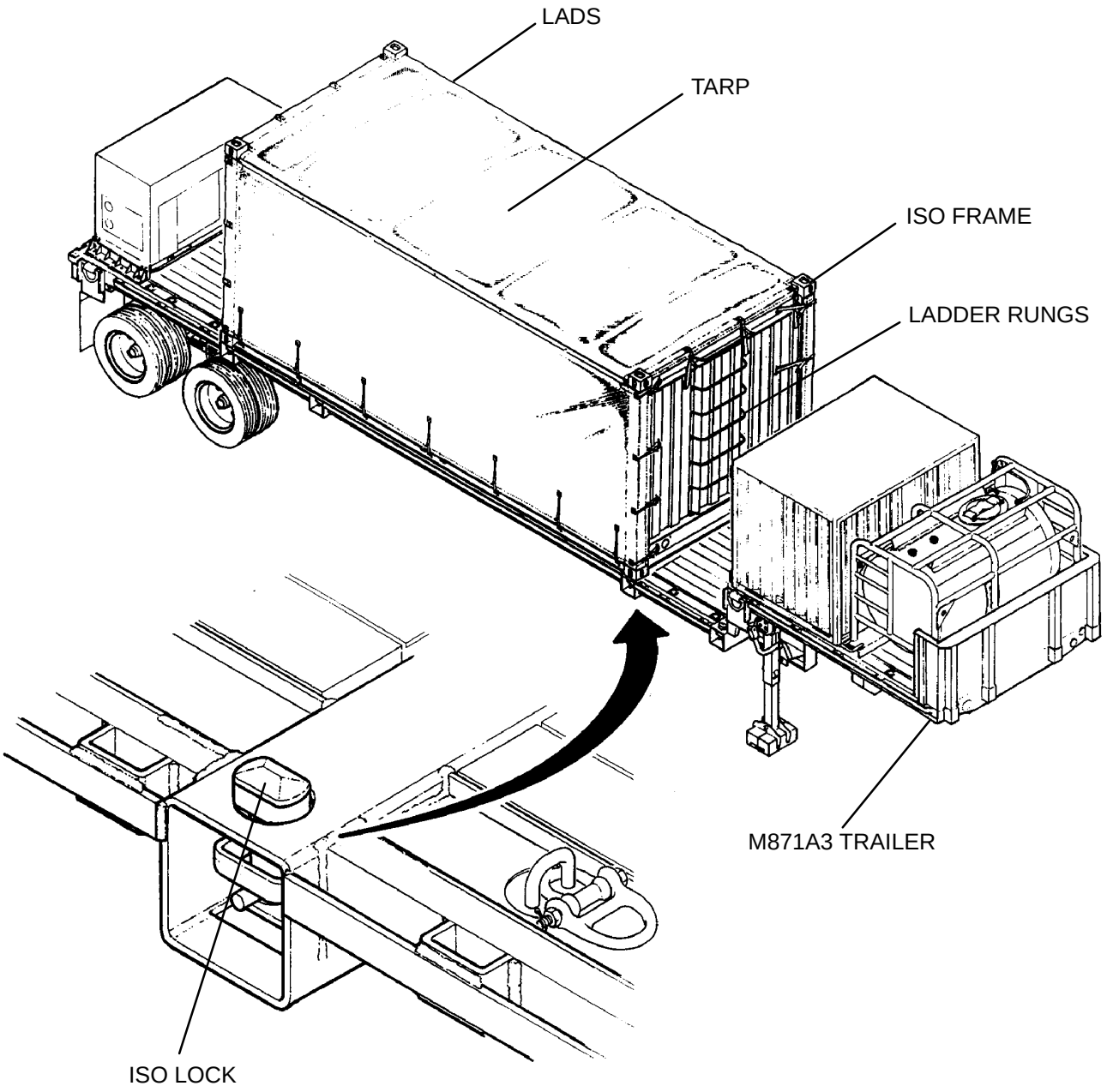
The Laundry Advanced System (LADS) consists of two washing/drying systems. The LADS also includes a water recycle system, heating system, air system, and control system. These systems support the operation of both washing/drying systems. The LADS components are mounted on an International Organization for Standardization (ISO) frame which is mounted on a 22−1/2 ton M871A3 semi−trailer. The LADS uses external electrical power. This power is normally provided by a 30 kilowatt (kW), MEP−805A Tactical Quiet Generator Set. The LADS can also be operated with other field generators or commercial power. The LADS requires an external supply of potable water and an external supply of JP−8 fuel. Fuel is normally provided from a 400−gallon fuel tank. A storage locker is provided to store accessories, auxiliary equipment, and consumables.



LOCATION AND DESCRIPTION OF MAJOR COMPONENTS

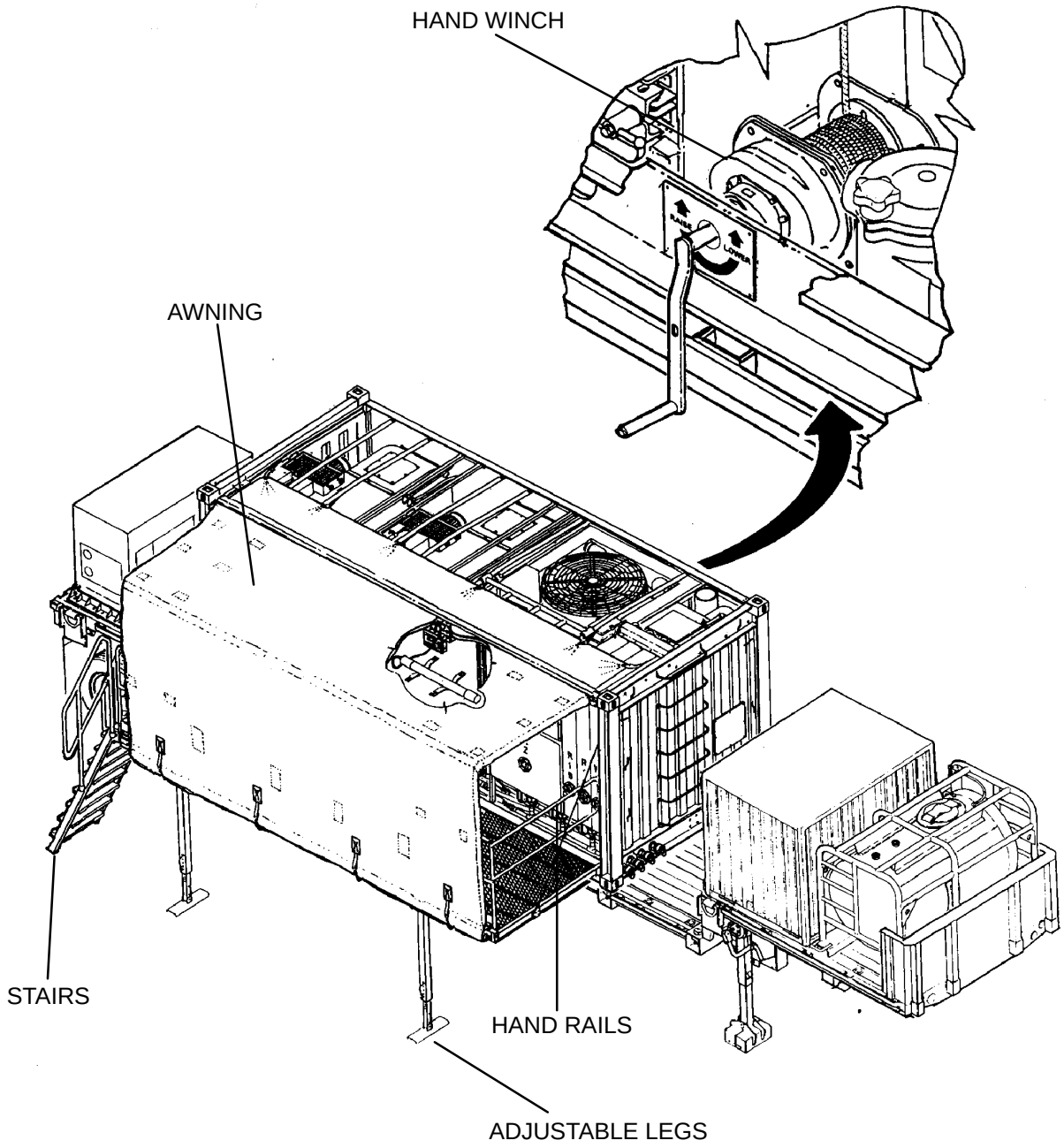
ISO FRAME

The LADS components are mounted to an 8 foot (ft) wide X 8 ft high X 20 ft long ISO frame. The frame mounts to the M871A3 Trailer via ISO locks. Ladder rungs are provided at both ends of the frame to access the top of the LADS. A protective tarp is provided to cover the front, rear, and top of the LADS during transport.



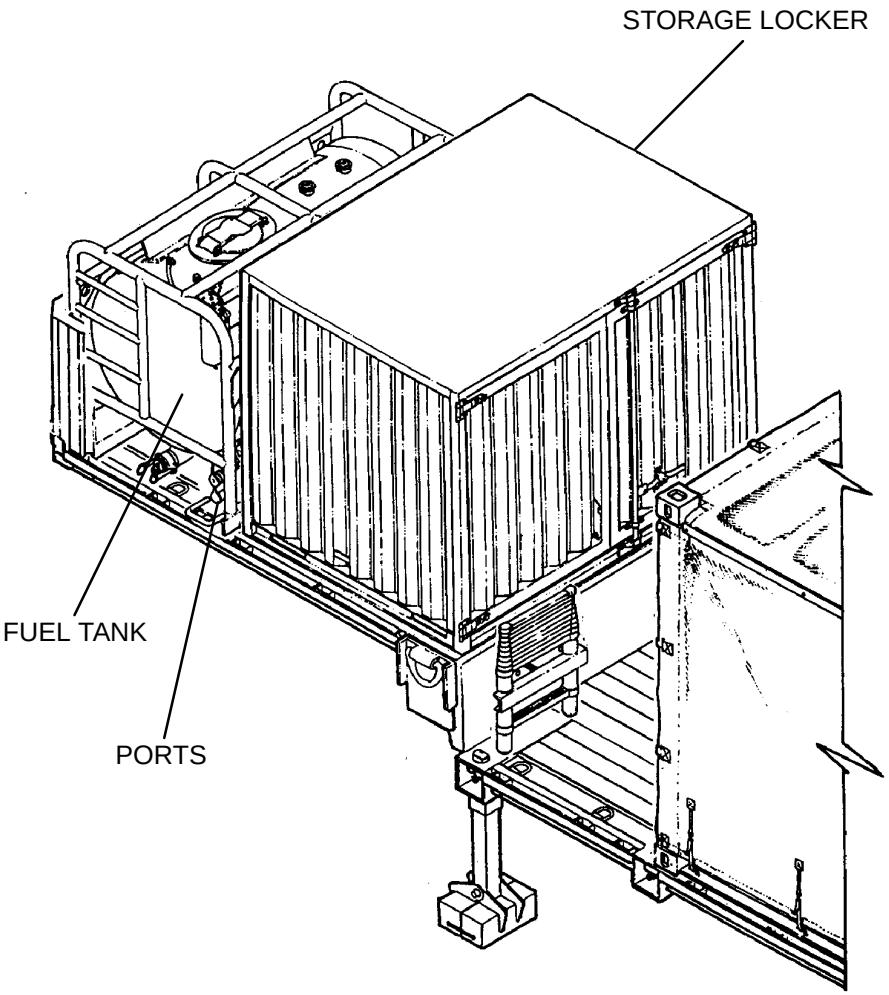
PLATFORM

A work platform is provided at the curbside of the LADS to facilitate laundry and maintenance operations. A hand winch is used to raise and lower the platform. Two adjustable legs are provided to support the front of the platform. Hand rails are provided at the platform sides to prevent personnel from falling. Stairs are located on the side of the platform for ground-level access. The protective tarp used to cover the LADS during transport converts into an awning to protect personnel on the platform from exposure to rain, sun, and wind.



STORAGE LOCKER AND FUEL TANK

A 400–gallon fuel tank and storage locker are mounted on the upper deck of the trailer. The fuel tank has ports that connect directly to the LADS heater and 30 kW generator. The storage locker has a 200 cubic foot capacity and is used to store the LADS accessories, auxiliary equipment, and consumable supplies. Document holders are also provided for storage of the LADS Technical Manuals.

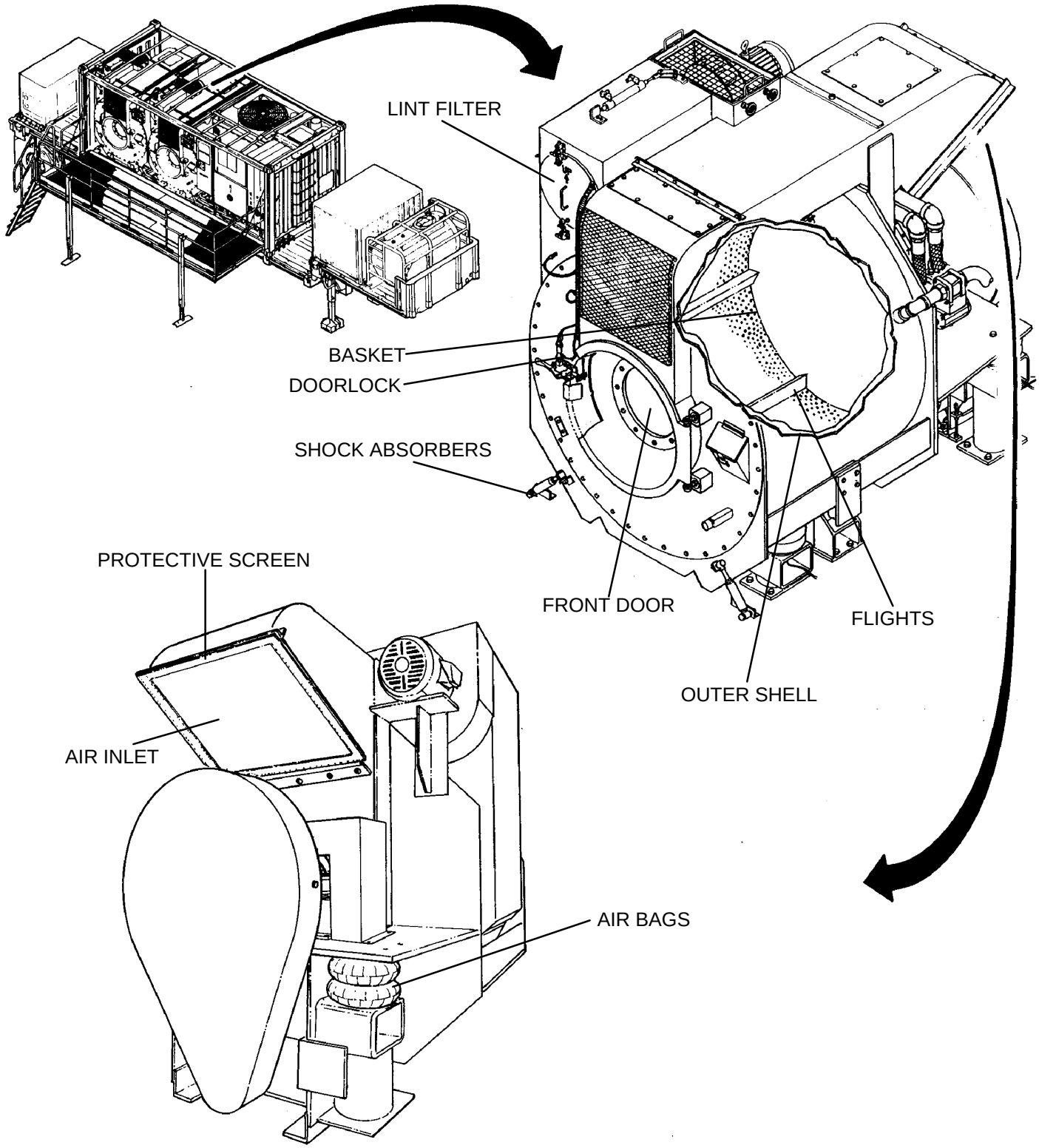


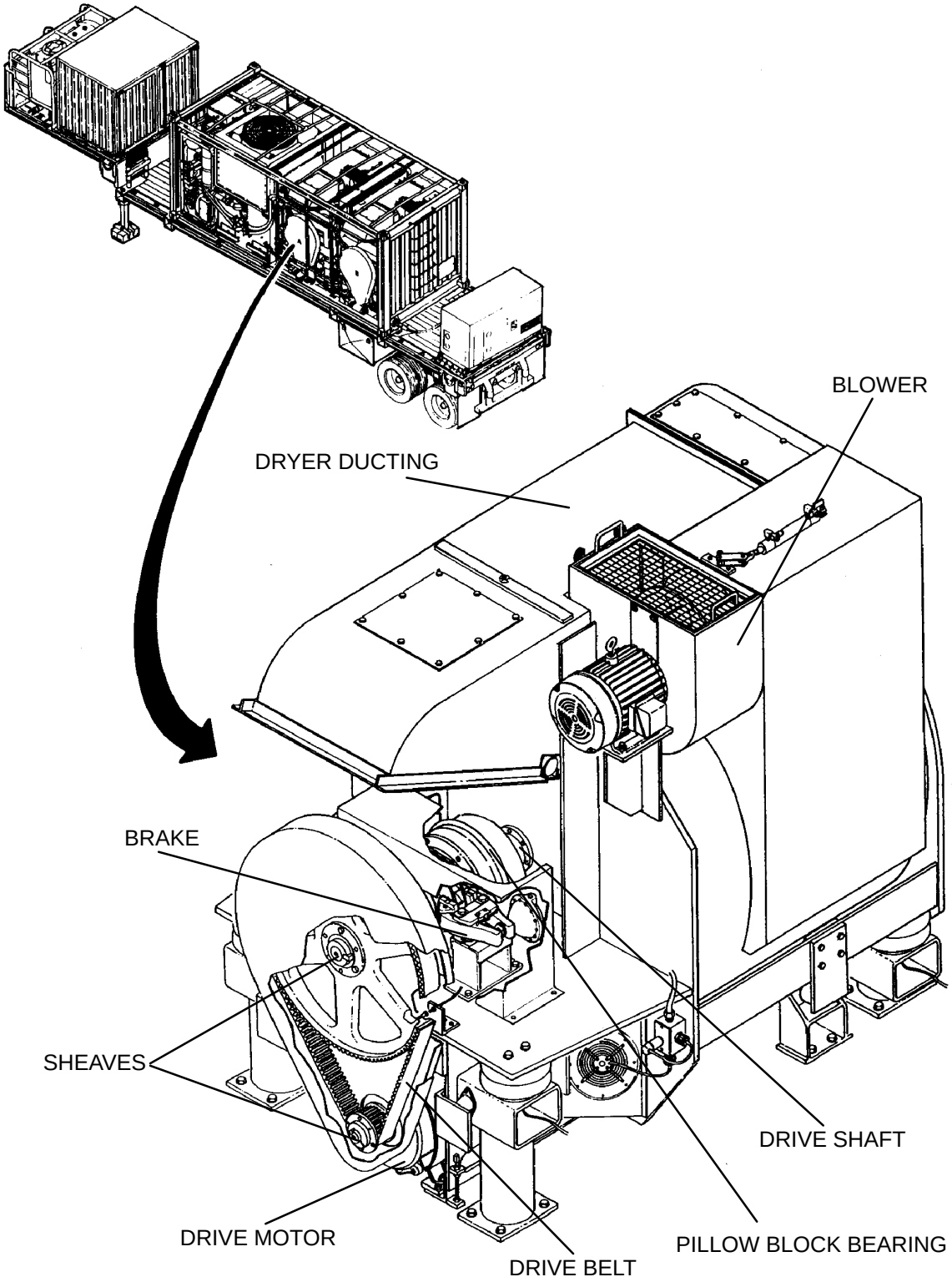
WASHING/DRYING SYSTEM

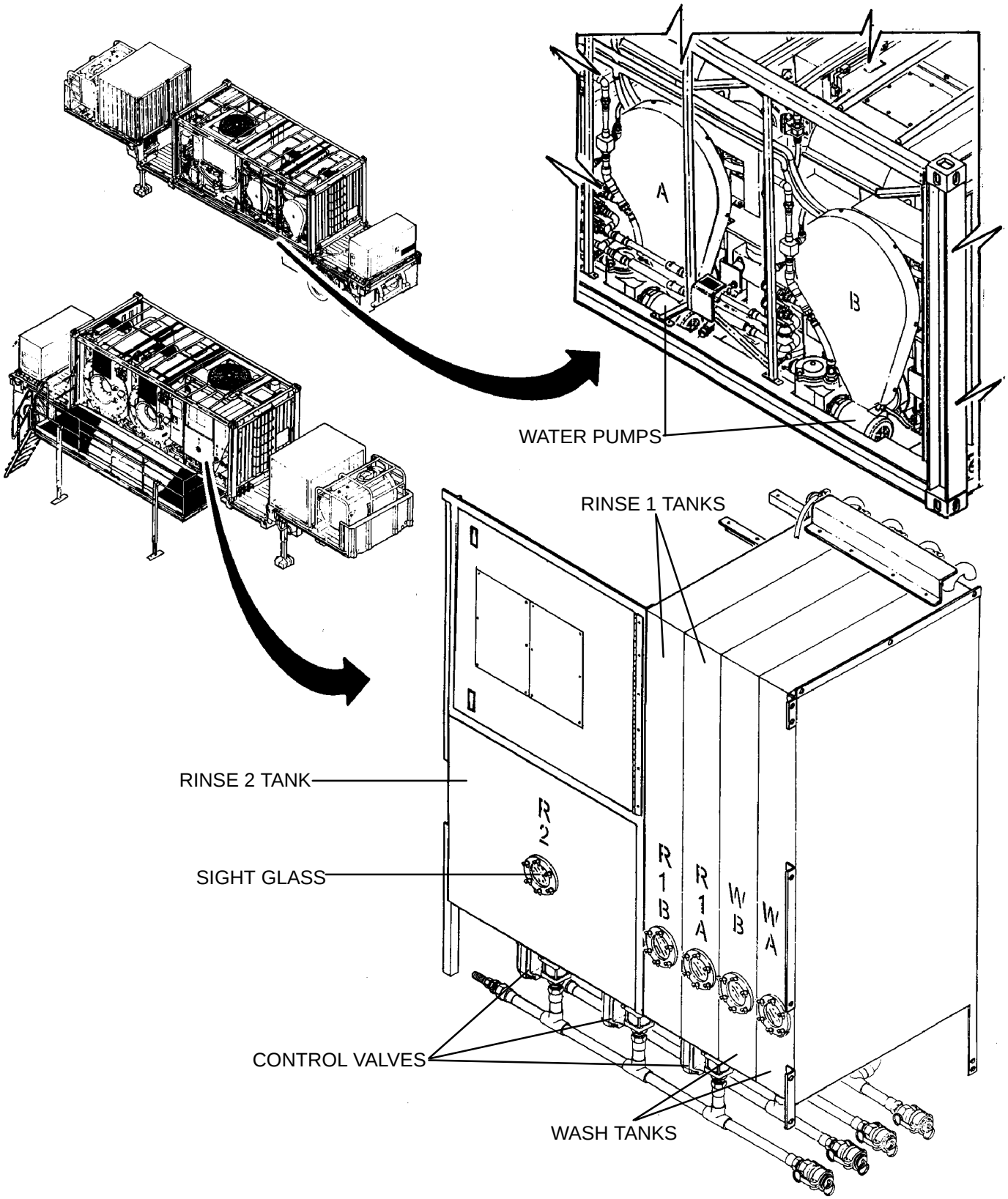
The washing/drying system contains two washing/drying drums. Each drum is capable of washing, rinsing, extracting, and drying 175 – 200 pounds of laundry per hour. Each drum is independently mounted to the LADS frame with four air bags and four shock absorbers. The air bags and shock absorbers reduce the amount of vibration that is transferred to the LADS structure when the drum(s) is rotating. Each drum consists of an outer shell which supports the basket, drive motor, brake, dryer ducting, blower, and front door. The basket consists of a metal housing with four flights that contain and distribute the laundry as it is rotated. The basket and outer edge of the flights are perforated to allow hot drying air to flow onto the laundry.

The basket is connected to a drive shaft that is attached to the drum housing with two pillow block bearings. This shaft is rotated by an electric motor that is connected to the shaft with two sheaves and a drive belt. The shaft also contains a brake rotor that is mounted between the calipers of an air brake. Laundry is loaded into the drum through the see–through front door. The door contains a lock that prevents it from being opened while the basket is rotating. Air used to dry the laundry is provided to each drum by independent electric blowers. A protective screen is located at the fresh air inlet to each blower. These screens prevent debris (sand, dirt, leaves, etc.) from entering the dryer ducting. A lint filter is used in the air recirculation path for each blower. These filters remove lint and other particles from the air that is circulating from the drum back to the blower. The screens and filters are easily removed and are reusable after cleaning.

The LADS contains five water tanks. Each washing/drying drum has a wash tank and a rinse 1 tank. These tanks have an 80 gallon capacity. The rinse 2 tank has a 150 gallon capacity and is shared by both drums. Each tank has a sight glass that provides a visual indication to the operator that the tank is full. Pumps and valves are used to control the flow of water between the tanks and drums.


LINT FILTER
BASKET
DOORLOCK
SHOCK ABSORBERS
PROTECTIVE SCREEN
FRONT DOOR
FLIGHTS
OUTER SHELL
AIR INLET
AIR BAGS

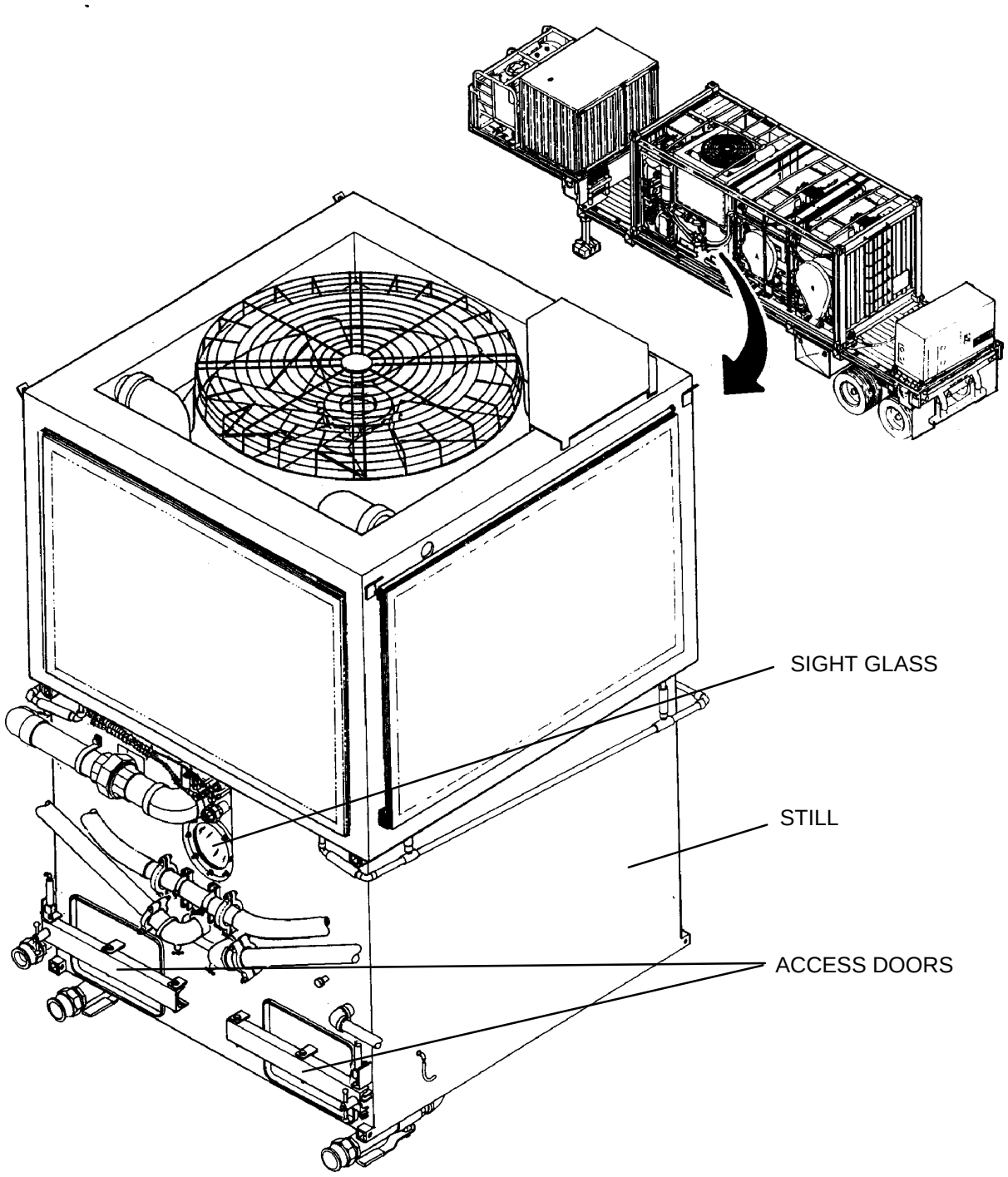

BLOWER
DRYER DUCTING
BRAKE
SHEAVES
DRIVE SHAFT
DRIVE MOTOR
DRIVE BELT
PILLOW BLOCK BEARING


A
B
WATER PUMPS
RINSE 1 TANKS
RINSE 2 TANK
SIGHT GLASS
R 2
R 1 B
R 1 A
W B
W A
CONTROL VALVES
WASH TANKS

WATER RECYCLE SYSTEM

The water recycle system contains a still that is used to clean the dirty wash water coming from the washing/drying drums. This is done by boiling (distilling) the water. This water is then reused during the second–stage rinse process. Two access doors, located on the back of the still, are provided to facilitate cleaning out sludge that is created during the distillation process. A sight glass is located on the back of the still. This provides the operator with a visual indication of the water level inside the still.

A condenser is used to turn the steam, produced by the still, back into water. The condenser consists of four heat exchangers and an electric fan. Screens are provided for each heat exchanger to prevent debris from clogging up the cooling fins on the heat exchangers. The screens are easily removed and are reusable after cleaning.

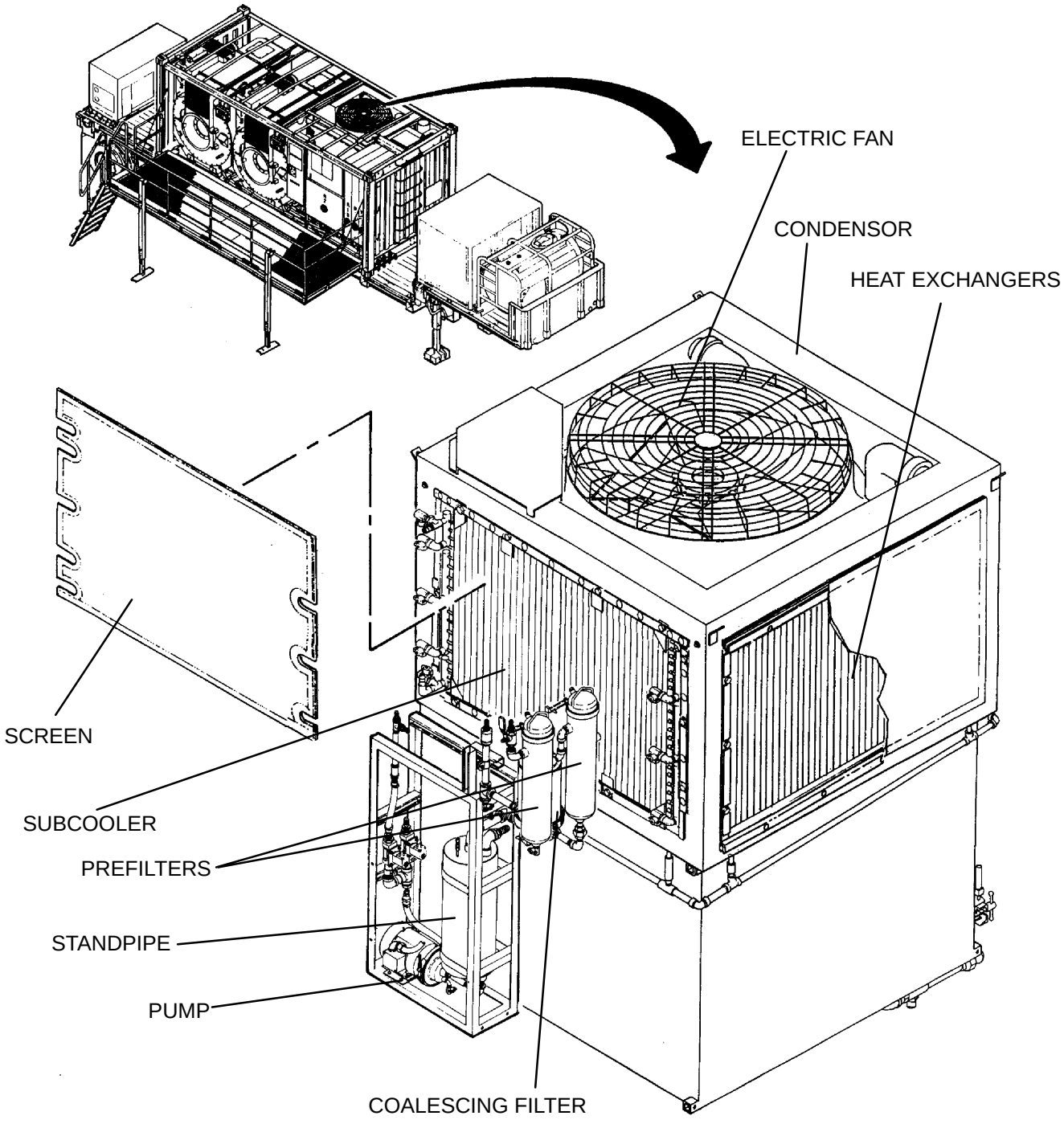


WATER RECYCLE SYSTEM – Continued

The water draining from the condenser flows to a standpipe. When the standpipe is about two–thirds full the distillate pump takes the water from the standpipe and circulates the water through a set of particulate filters and a coalescer back to the rinse 2 tank.

The prefilters remove particles from the water and the coalescer removes light oil from the water.

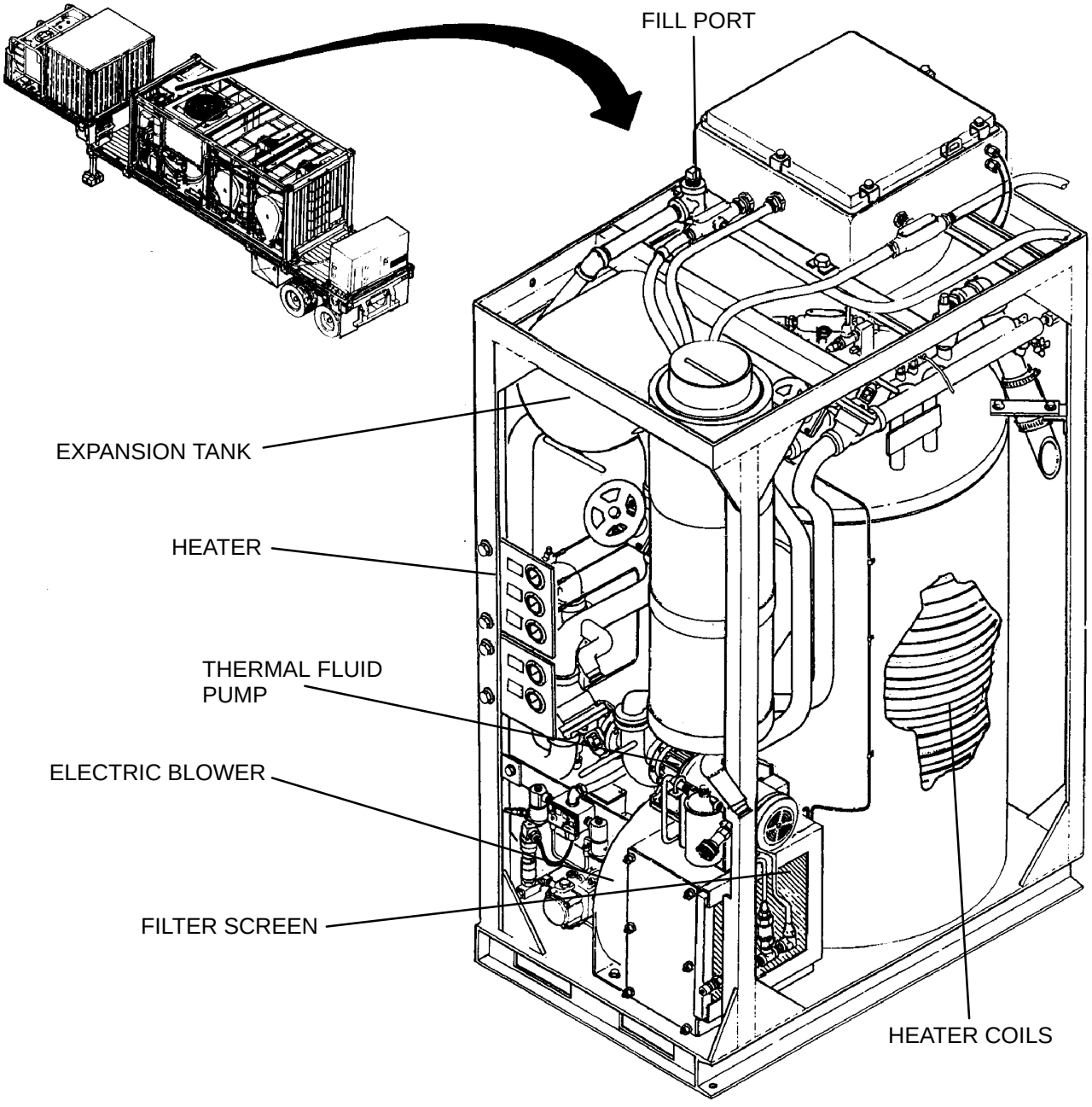
A subcooler is provided to help cool the water going back to the rinse 2 tank. The subcooler is used when 90 – 140 degrees Fahrenheit (F) rinse water is needed and the outside temperature is above 60 degrees F.



HEATING SYSTEM

An oil–fired heater is used to generate heat needed to boil water in the still and to heat the air used to dry the laundry. The heater uses an electric blower to draw in outside air. A screen is used to prevent debris in the air from entering the blower. The air is mixed with JP–8 and ignited to generate a flame inside the heater. The heater exhaust air is then used to heat thermal fluid that is moving through the heater coil.

The hot thermal fluid is circulated to heat exchangers in the washing/drying drums and still by the thermal fluid pump. An expansion tank is used to store thermal fluid and provide a place for the fluid to expand when it gets hot. The tank has a fill port to facilitate servicing of the thermal fluid.



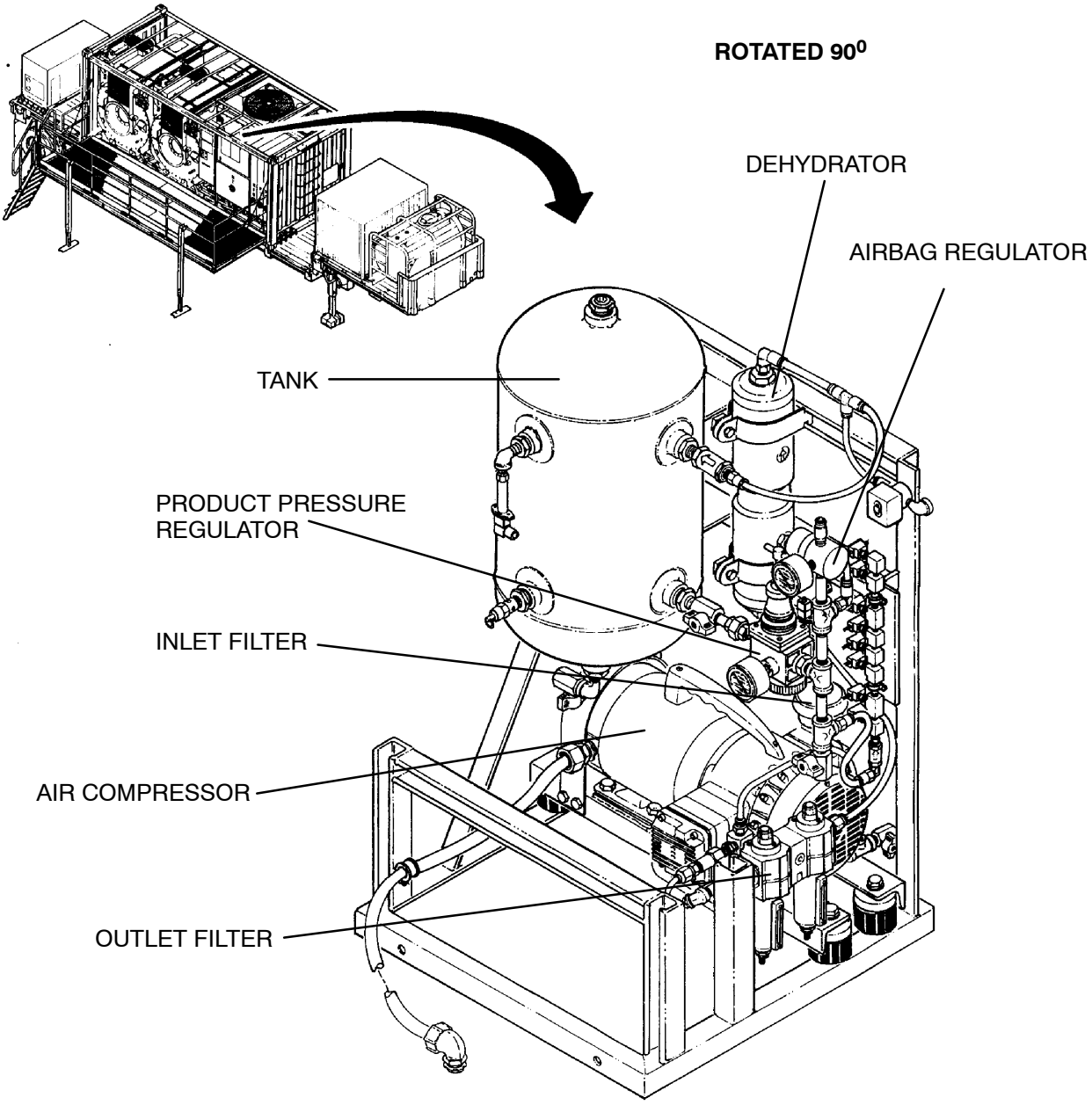
AIR SYSTEM

The air system provides dry compressed air to the other LADS systems. Air is used to pressurize the air bags that support the drums and to actuate ball valves, air dampers, brakes, and door locks used on the washing/drying system and water recycle system. A small amount of air is also used to detect the water level in the wash tanks, rinse tanks, standpipe, and still.

An air compressor is used to pressurize the air entering the system from atmospheric pressure to approximately 125 pounds per square inch gauge (psig). An inlet filter is used to prevent debris from entering the air compressor.

An outlet filter and dehydrator are located at the compressor outlet. These items remove particles and moisture from the compressed air.

A tank stores product air under pressure. The tank contains enough air to allow the compressor to operate intermittently while still allowing smooth operation of the air–driven components. Two pressure regulators are mounted at the tank outlet. One regulator controls the pressure of the product air at approximately 80 psig. The other regulator controls the inflation pressure of the air bags at 65 psig.



CONTROL SYSTEM

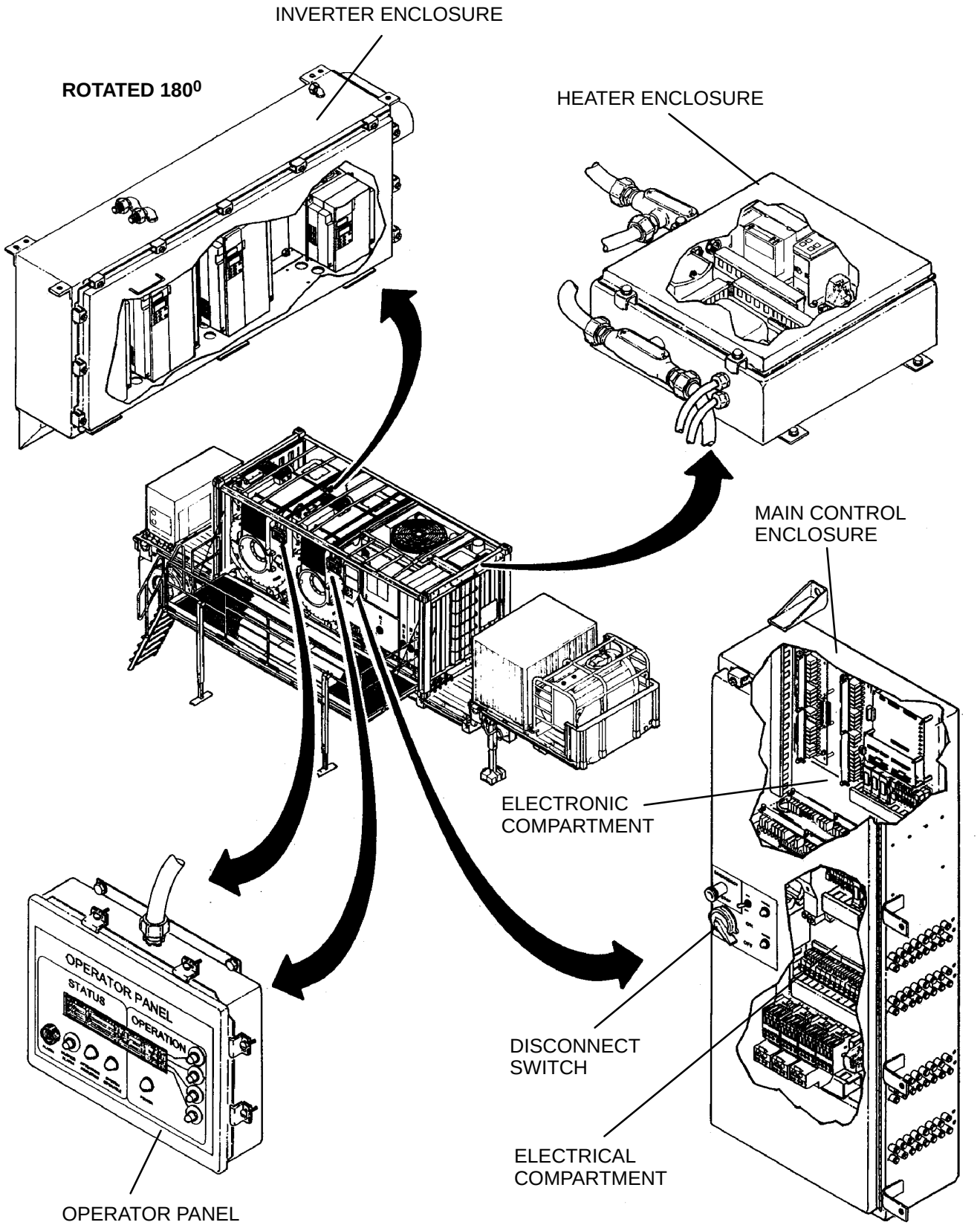
The control system provides the electrical interface between the external power and the LADS electrical and electronic components. This system also includes the controls and indicators that the operator uses when performing laundry operations.

Electrical power enters the LADS through the main control enclosure. This enclosure contains an electrical compartment and electronic compartment. The electrical compartment contains circuit breakers and relays that are connected to the inverter enclosure, heater enclosure, solenoid valves, and motors that utilize alternating current (AC) power. The electronic compartment contains the computer and related circuit boards that control the LADS operation. Items located in this compartment utilize direct current (DC) power. A disconnect switch is mounted on the main control enclosure. This switch removes power from the LADS when turned off.

An operator panel is provided for each washing/drying drum. These panels contain the controls and status indicators necessary for the operator to start and stop laundry operations as well as select different washing/drying formulas. Maintenance personnel also utilize operator panel (A) when communicating with the computer during troubleshooting and checkout.

The inverter enclosure protects the four AC inverters used on the LADS from the outside weather. These inverters communicate with the computer and control the operating speeds of the drum motors, drum blowers, condenser fan, and heater.

The heater enclosure protects the flame programmer, ignition transformer, relays, and switches used to control the LADS heating system from the outside weather.


INVERTER ENCLOSURE
ROTATED 180⁰
HEATER ENCLOSURE
MAIN CONTROL ENCLOSURE
ELECTRONIC COMPARTMENT
DISCONNECT SWITCH
ELECTRICAL COMPARTMENT
OPERATOR PANEL
OPERATOR PANEL
STATUS
OPERATION

EQUIPMENT DATA

Table 1 provides information pertaining to operational, electrical, mechanical, and environmental characteristics of LADS and related equipment.

Table 1. Equipment Data.

ITEM	
Operational Characteristics	
Laundry Output (Per Cycle)	350–400 lbs/cycle (159–181 kgs/cycle)
Laundry Output (Per Day)	6,300–7,200 lbs/day (2,862–3,258kgs/day)
Water Capacity (Initial Charge)	460 gal (1,741 ltrs)
Water Consumption (Per Day)	540 gal/day maximum (2,044 ltrs/day)
Fuel Consumption (Per Day)	270 gal/day maximum (1,022 ltrs/day)
Detergent Consumption	0.56 gal/day maximum (2.13 ltrs/day)
Anti–Foam Consumption	1.13 gal/day maximum (4.26 ltrs/day)
Electrical Characteristics	
Power Requirement	208 Vac, 3–Phase, 50–60 Hz
Mechanical Characteristics	
Shipping Configuration (LADS only)	
Length	240 in (610 cm)
Width	96 in (244 cm)
Height	96 in (244 cm)
Cubage	1,280 cu ft (36.24 cu m)
Weight	29,300 lbs (13,290 kg)
Shipping Configuration (LADS and Related Equipment on M871A3)	
Length	480 in (1,219 cm)
Width	96 in (244 cm)
Height	150 in (381 cm)
Cubage	4,000 cu ft (113.28 cu m)
Weight	51,240 lbs (23,263 kg)
Operating Configuration (LADS on M871A3)	
Length	480 in (1,219 cm)
Width	198 in (503 cm)
Height	169 in (429 cm)
Weight (LADS full of water)	33,000 lbs (14,969 kg)
Operating Configuration (LADS on M871A3 in LME)	
Length	480 in (1,219 cm)
Width	288 in (732 cm)
Height	181 in (460 cm)
Weight (LADS full of water)	34,334 lbs (15,588 kg)
Environmental Characteristics	
Storage Temperature	–50 degrees to 140 degrees F (–46 degrees to 60 degrees C)
Operating Temperature (Sheltered)	–25 degrees to 120 degrees F (–32 degrees to 49 degrees C)
Operating Temperature (Unsheltered)	33 degrees to 120 degrees F (1 degree to 49 degrees C)
Operating Altitude	7,500 ft maximum (2,286 meters)

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UNIT, DIRECT SUPPORT, AND GENERAL SUPPORT

LAUNDRY ADVANCED SYSTEM

(NSN 3510–01–463–0114)

WASHING/DRYING SYSTEM THEORY OF OPERATION

WASHING/DRYING SYSTEM

The washing/drying system performs all the operations related to washing, rinsing, extracting, and drying of the laundry. All other systems on the LADS are used to support these operations. Operation of the washing/drying system consists of the following sub–operations:

LOADING LAUNDRY AND STARTING CYCLE

The laundry is loaded into the drum through the front door. After the operator closes and latches the front door, a position switch (ZS100) mounted near the door provides a signal to the control system. If the door is not closed, the control system will not allow a laundry cycle to be selected. The operator selects the appropriate laundry formula and starts the laundry cycle. Before the washing operation begins, the control system provides a signal to extend the pneumatic lock (DN100) into the front door. This lock remains extended during the complete laundry cycle. A position switch (ZS101) mounted under the door lock provides a signal to the control system verifying that the lock is extended.

WASHING

During the washing portion of the laundry cycle, water is transferred from the wash tank to the drum. The laundry tumbles in the drum, mixing with the detergent and water. The dirty water is drained from the drum to the still then a low–speed extract (spin) is used to squeeze the water out of the laundry. A detailed description of the washing cycle is as follows:

Fill From Wash Tank

The control system provides a signal to start drive motor (M100) and water pump (M101). The control system also opens ball valves (FV101 and FV106). The basket starts rotating at tumble speed (approximately 36 revolutions per minute (RPM)). As the basket is rotating, the water pump draws water out of the wash tank and pumps it into the drum. Approximately one minute into the wash cycle, the wash tank is empty and the drum is full of water. The control system turns off the water pump and closes ball valves (FV101 and FV106).

Washing

The basket continues to tumble for three or more minutes as determined by the formula and the water level in the still. The laundry is mixed with water and detergent. Mechanical action of the material tumbling is used to break or loosen the contaminants from the laundry.

Drain To Still

At the end of the wash time, the control system opens ball valves (FV107 and FV109) and turns on the water pump (M101). Wash water is pumped out of the drum and into the still for approximately 2 minutes.

Extract To Still

While the drum is being drained the control system increases the drive motor speed until the basket is rotating at low extract speed (approximately 300 RPM). The basket remains at extract speed for approximately one minute while the drum is drained. At the end of extract, the control system turns off the drive motor and water pump, applies the brake, and closes ball valves (FV107 and FV109).

FIRST STAGE RINSING

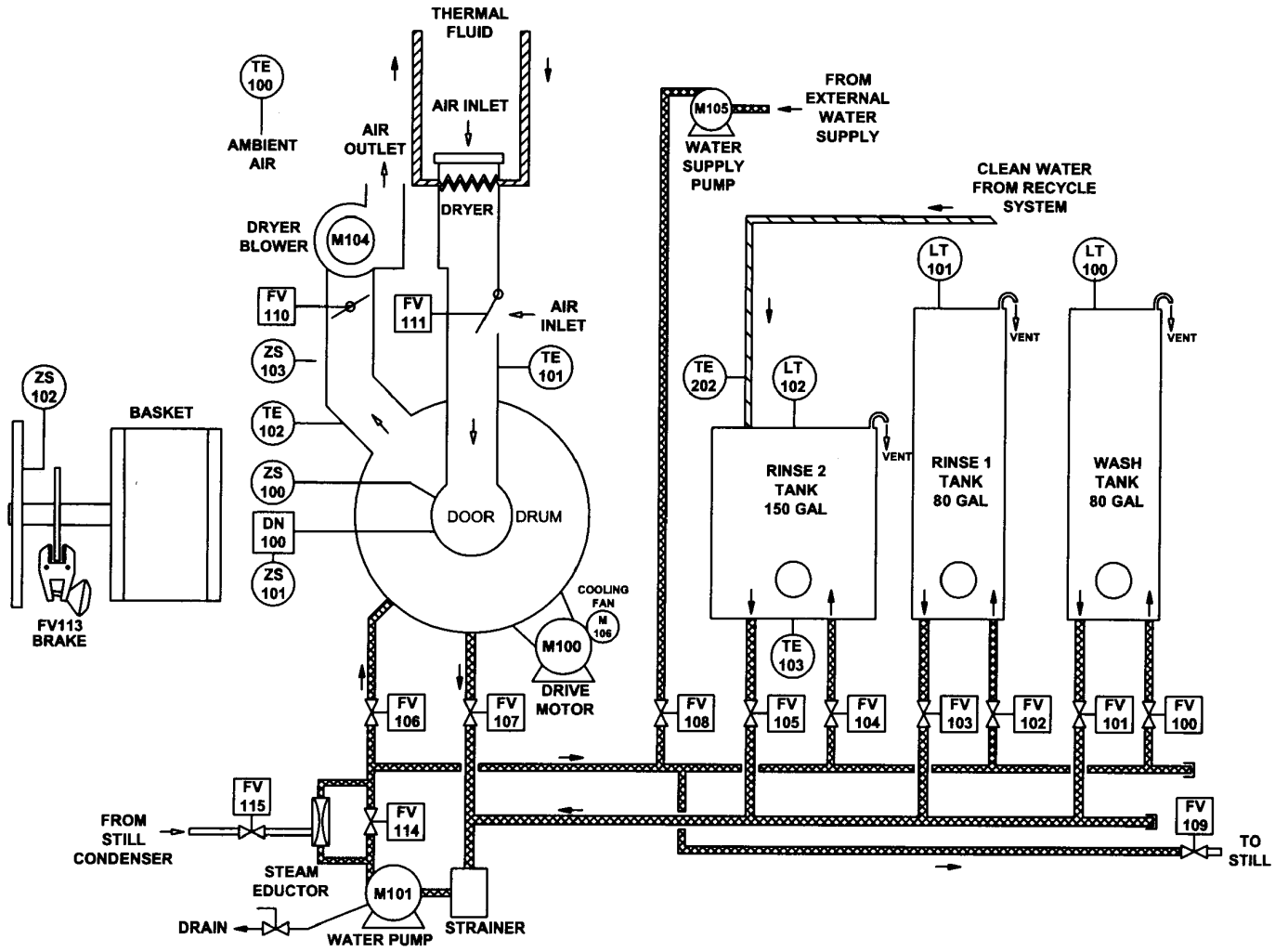
During the first stage rinsing portion of the laundry cycle, water is transferred from the rinse 1 tank to the drum. The laundry tumbles in the drum mixing with the water. The water is drained from the drum to the wash tank then a low–speed extract (spin) is used to squeeze the water out of the laundry. A detailed description of the first stage rinsing cycle is as follows:

Fill From Rinse 1 Tank

The control system provides a signal to start drive motor (M100) and water pump (M101). The control system also opens ball valves (FV103 and FV106). The basket starts rotating at tumble speed. As the basket is rotating, the water pump draws water out of the rinse 1 tank and pumps it into the drum. Approximately one minute into the rinse cycle, the rinse 1 tank is empty and the drum is full of water. The control system turns off the water pump and closes ball valves (FV103 and FV106).

Rinsing 1

The basket continues to tumble for approximately two more minutes as determined by the formula. The laundry is mixed with water to rinse residual soap and dirt off of the laundry.



NOTE

All functional components on this diagram are used for washing/drying system A and B. Example – FV100A is the inlet valve on wash tank A and FV100B is the inlet valve on wash tank B.

FIRST STAGE RINSING – Continued

Drain To Wash Tank

At the end of the rinse time, the control system opens ball valves (FV100 and FV107) and turns on the water pump (M101). Rinse water is pumped out of the drum and into the wash tank for approximately two minutes.

Extract To Wash Tank

While the drum is being drained, the control system increases the drive motor speed until the basket is rotating at low extract speed. The basket remains at extract speed for approximately one minute while the drum is drained. At the end of extract, the control system turns off the drive motor and water pump, applies the brake, and closes ball valves (FV100 and FV107).

SECOND STAGE RINSING

During the second stage rinsing portion of the laundry cycle, water is transferred from the rinse 2 tank to the drum. The laundry tumbles in the drum mixing with the water. The water is drained from the drum to the rinse 1 tank then a high–speed extract (spin) is used to squeeze the water out of the laundry. A detailed description of the second stage rinsing cycle is as follows:

Fill From Rinse 2 Tank

The control system provides a signal to start drive motor (M100) and water pump (M101). The control system also opens ball valves (FV105 and FV106). The basket starts rotating at tumble speed. As the basket is rotating, the water pump draws water out of the rinse 2 tank and pumps it into the drum. When the control system determines that 65 gallons of water has been moved out of the rinse 2 tank, it turns off the water pump and closes ball valves (FV105 and FV106). This occurs approximately one minute into the rinse cycle.

Rinsing 2

The basket continues to tumble for approximately two more minutes as determined by the formula. The laundry is mixed with water to rinse residual soap and dirt off of the laundry.

Drain To Rinse 1 Tank

The basket continues to tumble for approximately two more minutes as determined by the formula. At the end of the rinse time the control system opens ball valves (FV102 and FV107) and turns on the water pump (M101). Rinse water is pumped out of the drum and into the rinse 1 tank.

Extract To Rinse 1 Tank

While the drum is being drained the control system increases the drive motor speed until the basket is rotating at high extract speed (approximately 570 RPM). The basket remains at extract speed for approximately seven minutes while the drum is drained. At the end of extract, the control system turns off the drive motor (M100) and water pump (M101), applies the brake, and closes ball valves (FV102 and FV107).

Special Rinsing Steps

For the second stage rinsing process the operator has the option of selecting a formula that calls for sanitizer or Finish Reapplication System (FRS) application. When these formulas are selected, the operator will be notified by the control system when it is time to add sanitizer or FRS. The operator adds the sanitizer or FRS through a sluice located on the front of the drum.

DRYING

During the drying portion of the laundry cycle hot air is blown over the material while the laundry tumbles and water is evaporated. The laundry tumbles in the drum for 20–43 minutes as specified by the formula. A detailed description of the drying cycle is as follows:

Dry, Heating–Up

The control system provides a signal to start drive motor (M100) and blower (M104). The control system also opens outlet damper (FV110) and closes inlet damper (FV111). The basket starts rotating at tumble speed. As the basket tumbles, ambient air is drawn through a heat exchanger connected to the LADS heating system. The hot air passing through the heat exchanger is then directed into the drum inlet. As the air enters the drum, it passes through the laundry removing moisture. The air is then exhausted out of the blower exhaust duct.

DRYING – Continued

Dry, Controlled

While the air is circulating through the drum, temperature sensors (TE101 and TE102) monitor the temperature at the drum inlet and outlet. Once the air outlet temperature reaches a selected drying temperature, the control system will maintain the proper inlet temperature by opening and closing the inlet damper (FV111). This allows for accurate air temperature control regardless of the ambient temperature conditions and drying temperature selected.

Cool

Near the end of the drying cycle, the control system opens inlet damper (FV111) for approximately one minute to allow ambient air to circulate through the drum. This cools down the laundry so that it can be safely handled by the operator. At the end of the drying cycle, the control system turns off the drive motor (M100) and blower (M104) and applies the brake. The control system also closes outlet and inlet dampers (FV110 and FV111) and retracts the door lock (DN100).

UNLOAD LAUNDRY

The control system provides a signal to the operator panel that the laundry cycle is completed. The operator then opens the front door, removes the laundry, and repeats the process.

DRUM SUPPORT/VIBRATION DAMPENING

Before power is applied to the LADS, the drum rests on the ISO frame structure. In the operational mode, the air system pressurizes four air bags that inflate to support the weight of the drum. Leveling valves connected to the front two air bag mounts are used to adjust the height of the air bags by adding or bleeding air pressure. This allows for side–to–side leveling of the drum when the LADS is located on uneven terrain. Four shock absorbers, located at each corner of the drum, are used to restrain the drum while it is rotating. Vibration eliminators are also located on the sides and back of the drum mounts to dampen the amount of vibration that is transferred to the LADS structure during the extraction steps.

DRUM ROTATION

The drum basket is driven by an electric motor (M100) connected via a drive belt and two sheaves. A cooling fan (M106) is used to continuously direct fresh air onto the drive motor to prevent the motor from overheating. During a laundry cycle, the control system changes the speed and direction of the motor to achieve the proper basket rotation needed for tumble, distribute, low extract and high extract as follows:

Rotation Direction

At tumble speed, basket rotation is in the clockwise (CW) direction during washing, rinsing, drying, and any time the drum is filling. The basket rotates in the counter–clockwise (CCW) direction which is used during all draining steps at tumble speed, and at the distribute, low extract, and high extract speeds.

Rotation Speed

At tumble speed, the basket is rotating at about 28 RPM. Tumble speed is used during washing, rinsing, drying, and any time the drum is filling or draining. Distribute speed is at about 56 RPM. Distribute is used to transition between tumble and extract to allow the laundry to evenly distribute towards the outer wall of the basket using centrifugal force. Low and high extract speeds are 300 RPM and 530 RPM. Extract speed is used to force (squeeze) water out of the laundry.

Rotation Sensing

When the basket is rotating, proximity sensor (ZS102) monitors rotation of the drum sheave and provides a signal to the control system. This information is used to verify the drum basket is either rotating or stopped. During extracts, the drive motor has the potential to stall when the drum is severely unbalanced or the basket is overloaded. If a stall occurs, the basket will not maintain extract speed resulting in improper removal of water from the laundry. This can lead to water transfer and drying problems. The control system monitors the drive motor for a stall condition using the signal from ZS102 to verify the basket is rotating at the proper speed. If the basket begins to slow down when it should be speeding up, the control system will automatically stop drum rotation and restart the extract. If two stalls are sensed in a row, the control system will notify the operator of a stall condition.

DRUM BRAKING

After the extraction step or drying cycle is finished, the control system provides a signal to open solenoid valve (SV113). When this valve opens air pressure is directed to a thruster which extends the brake caliper. Pads on the brake caliper apply friction to the brake rotor thereby causing the basket to slow down rapidly. Any time the basket is stopped, the brake is automatically applied to prevent rotation. When the control system is ready to start basket rotation, the signal to solenoid valve (SV113) is removed and the brake caliper retracts allowing free rotation of the basket.

DRUM BALANCING

During extract steps, it is possible for the laundry load to be unbalanced. If not controlled, an out of balance load can cause excessive shock and vibration to be transferred to the LADS structure or a drum motor stall. This could result in improper processing of laundry, premature failure of LADS components, or structural failures. To compensate for unbalanced loads, the LADS uses a self balancing process. At the start of extract, the basket is slowly rotated, to give the laundry a chance to distribute. As the rotational speed is increased, centrifugal force pulls the laundry out against the basket walls. If the laundry load is balanced, the control system will allow the basket to rotate at full extract speed. If the laundry load is unbalanced, the drum will contact a limit switch (ZS103). The limit switch will provide a signal to the control system to stop basket rotation. The control system will then attempt to redistribute and restart the extract step. If a balanced load can not be obtained in five attempts, the control system will notify the operator of an unbalanced load condition.

WATER LEVEL MONITORING

Each water tank contains a bubbler tube that extends to the tank bottom. When the LADS is operating, a small amount of air is directed from the air system to each bubbler tube. When a tank is empty, there is no resistance to the air coming out of the bubbler tube. As the water level in the tank begins to rise, the force (pressure) required to push the air out of the bubbler tube increases. This increase in pressure is measured by pressure sensors (LT100, LT101, and LT102) which provide signals to the control system. The control system uses this pressure information to determine the water level. During operation, this information is used to verify that the tank is draining or filling and to determine when the tank is drained or filled. The control system continuously monitors the water level in each tank and will notify the operator if the tank water levels are not within required limits. Each tank contains an overflow tube that prevents the tank from overfilling in the event of a ball valve or level sensing failure. Water from the overflow tube is collected and routed to a drain port at the back of the LADS.

WATER FILLING

The LADS water tanks and still must be filled with water before laundry operations can begin. During continuous operations, the water level will drop and the tanks must be refilled. Both operations are described below:

Initial Water Filling

When the LADS is initially started, it is necessary to fill the water tanks and still prior to performing laundry operations. After the LADS is turned on, the control system will turn on the water supply pump (M105) and prompt the operator to select the tank filling sequence. If the filling function is selected, the control system will open ball valves (FV100 and FV108). The water supply pump will draw water from the external water supply and fill the wash tanks to 65 gallons. The control system will close ball valves (FV100) and open ball valves (FV102) to fill the rinse 1 tanks to 65 gallons. The control system will close ball valves (FV102) and open ball valves (FV104) to fill the rinse 2 tank to 100–110 gallons. The control system will open ball valves (FV108 and FV109) to fill the still to 25 gallons (2 inches). The control system will then close ball valves (FV108 and FV109) and turn off the water supply pump.

Water Refilling

During continuous operations, the water level in rinse 2 tank will gradually drop due to residual moisture left in the laundry. When the water level drops below the amount required to perform a laundry cycle, the control system will automatically add water to the still. When this occurs, the control system will open ball valves (FV108 and FV109) and turn on the water supply pump (M105). The water supply pump will draw water from the external water supply and add it to the still. When the proper amount of water has been added, the control system will close ball valves (FV108 and FV109) and turn off the water supply pump. This water will eventually return to the rinse 2 tank through the normal water recycling process (WP 0004 00). The refilling process is performed after each drying cycle is started.

WATER HEATING

After the water tanks have been filled, the control system prompts the operator to select the desired water temperature and then start the water heating sequence if desired. The water in the rinse 2 tank will be heated as described below:

Checking Water Temperature

The control system will open ball valves (FV104A and FV105A) and turn on the water pump (M101A) to obtain a representative sample temperature of the water in the rinse 2 tank. After the sample has been obtained, the control system will close the ball valves and turn off the water pump. If the actual water temperature is within 5 degrees F of the desired temperature, the water heating function will be bypassed. If the water is too hot, the operator can change the desired temperature or wait for the water to cool down. If the water is not hot enough, the heating process will continue.

Transfer Rinse 2 To Still

Once the control system has determined that water heating is required, it will open ball valves (FV105A and FV109A) and turn on the water pump (M101A) to transfer water from the rinse 2 tank to the still. The amount of water transferred will be 50 to 70 gallons, depending on the amount of heating required. When enough water has been transferred to support distillation, the control system will the close ball valves and turn off the water pump.

Heating Rinse 2

After the still has begun to produce steam, the control system will open ball valves (FV104, FV105, and FV115), close ball valves (FV114), and turn on both water pumps (M101). As the water coming out of the rinse 2 tank is pumped through the steam eductors, it mixes with steam water flowing from the still condenser. Using the input from temperature sensor (TE103), the control system will determine when the water is at the proper temperature. The control system will close ball valves (FV104, FV105, and FV115), open ball valve (FV114) and turn off both water pumps (M101). Any water left in the still will return to the rinse 2 tank through the normal water recycle process (WP 0004 00). After two laundry cycles have been completed, the water initially heated for the rinse 2 tank will be in the wash tank. All subsequent laundry cycles will be completed with heated water. If hot water is desired in all tanks before laundry operations are started, two Clean/Heat Wash Tank cycles can be performed as described in Water Transferring.

WATER TRANSFERRING

If a laundry cycle is interrupted and then restarted, it may be necessary to add water to the wash or rinse 1 tank in order to complete the cycle. In this circumstance, the control system will automatically transfer water from the rinse 2 tank to the wash tank or rinse 1 tank. Water can also be transferred from the wash tank to the still, from the rinse 1 tank to the wash tank, and from the rinse 2 tank to the rinse 1 tank utilizing a Clean/Heat Wash Tank cycle. When these functions are selected, the control system will open the appropriate ball valves and turn on the water pump (M101). The control system will close the ball valves and turn off the water pump when the level indication at that wash and rinse 1 tanks determine that they are at the proper level. In the transfer mode, the control system will prevent further laundry operations until the rinse 2 tank has been refilled through the normal water recycling process (WP 0004 00).

WATER DRAINING

When a fresh supply of water is desired, preparing the LADS for transport, or when maintenance requires that the tanks be drained, the operator selects the DRAIN CYCLE. The drain cycle will remove water from the water tanks, still, and plumbing as described below:

Cooldown

Before the draining sequence starts, the system performs a cooldown sequence so the still interior can be safely accessed by the operator who is required to perform AFTER PMCS. After the still is clean and the doors are shut, the control system will prompt the operator to continue the drain cycle.

WATER DRAINING – Continued

Drain System B

When the drain cycle continues, the control system will open ball valves (FV101B and FV109B) and turn on the water pump (M101B). Water in wash tank B will be pumped into the still and will gravity drain to the drain area. Anytime during the drain sequence, if the still level is more than 3 inches, the control system will hold up switching to the next tank draining sequence. This prevents overfilling the still. After wash tank B is drained, the control system will close ball valve (FV101B) and open ball valve (FV103B) to drain the rinse 1B tank. After the rinse 1B tank is drained, the control system will close ball valve (FV103B) and turn off water pump (M101B).

Drain System A

Once system B is empty, the control system will open ball valve (FV101A) and turn on the water pump (M101A) to drain wash tank A. After wash tank A is drained, the control system will close ball valve (FV101A) and open ball valve (FV103A) to drain the rinse 1A tank. After the rinse 1A tank is drained, the control system will close ball valve (FV103A) and open ball valve (FV105A) to drain the rinse 2 tank. When the rinse 2 tank is drained, the control system will turn off water pump (M101A) and close ball valve (FV105A).

Cycling Valves

The control system will prompt the operator to open manual drain valves and remove caps that are strategically located on the water plumbing. The control system will then cycle (open and close) all valves in the water plumbing several times to allow residual water to drain from the system.

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UNIT, DIRECT SUPPORT, AND GENERAL SUPPORT

LAUNDRY ADVANCED SYSTEM

(NSN 3510–01–463–0114)

WATER RECYCLE SYSTEM THEORY OF OPERATION

WATER RECYCLE SYSTEM

The water recycle system takes the dirty wash water from the drums and recycles the water for use during the second–stage rinse process. During start up of the LADS, the water recycle system also provides steam that is used to heat up the rinse 2 water. Water recycle system operation consists of the following sub–operations:

WATER DISTILLATION

The LADS uses a water distillation process to remove contaminants from the dirty water produced during the washing sequence. A still is the primary component used in the water distillation process as described below:

Still Operation

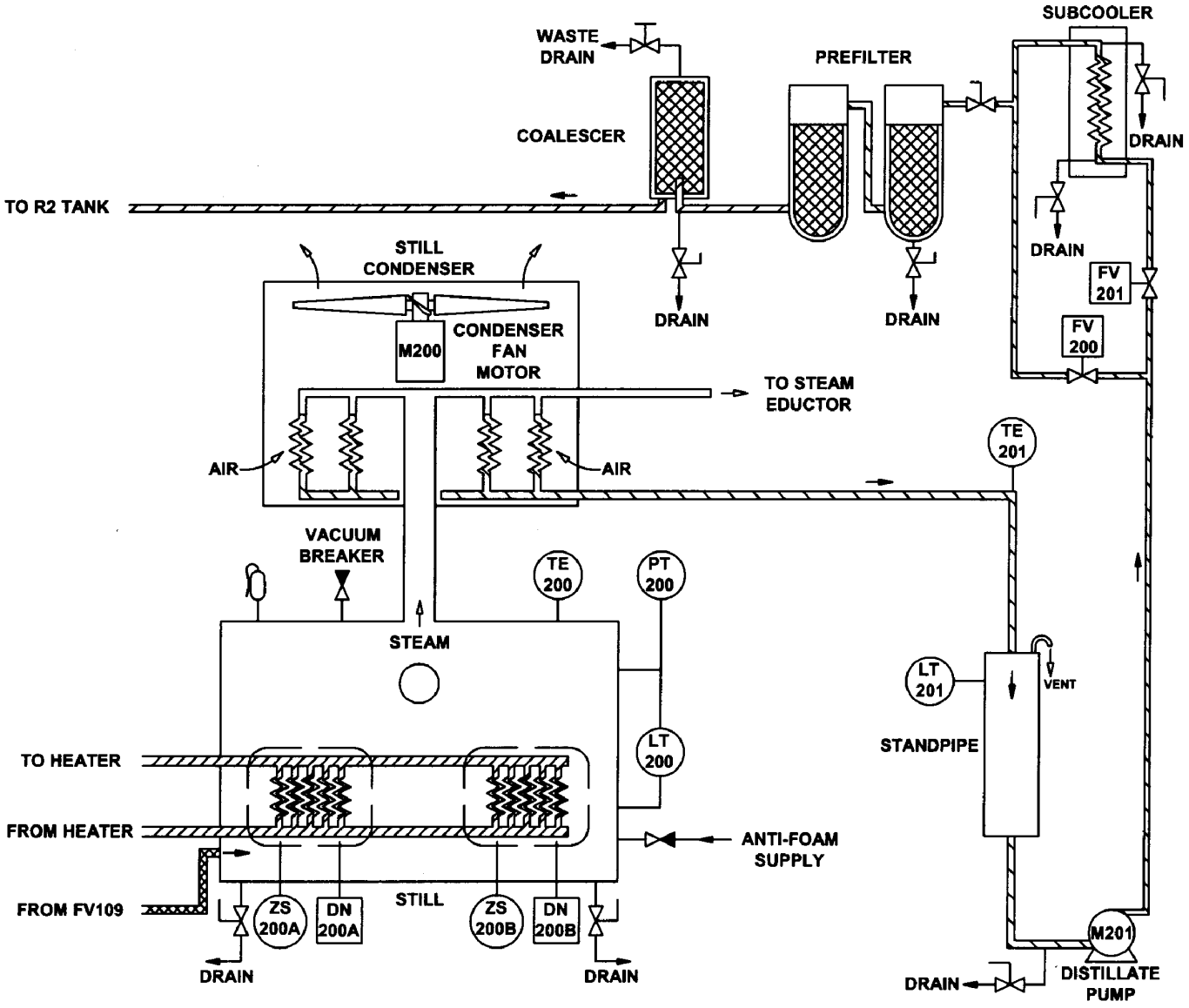
The still contains fourteen heatplates that have hot thermal fluid (from the heating system) circulating through them. When dirty water is dumped into the still, it heats up and begins to boil. The solid materials in the water such as dirt and sand collect in the bottom of the still while the water turns into steam and exits through the top of the still. Connected to the still are several monitoring and safety devices. Temperature sensor (TE200) monitors the temperature of the steam exiting the still. Pressure sensor (PT200) continuously monitors the still internal pressure. If the pressure rises to an unsafe level, a signal sent to the control system by the sensor will prompt the heater to turn off. A relief valve is mounted on the still to prevent it from over–pressurizing in the event of a pressure sensor or control system failure. Level-sensor (LT200) monitors the water level inside the still. A vacuum breaker is mounted on the still to prevent a negative pressure from being generated inside the still when cold water is dumped to the still from the drums or during the cooldown sequence.

Foam Control

During the distillation process, foam can be generated from detergent and other contaminates in the water. Excess foam can cause the still pressure to rise to undesirable levels. To prevent excessive foaming, an anti–foam solution must be injected into the still from an external container. As wash water is pumped from each laundry drum to the still, the control system will prompt the Operator to add anti–foam via a hand pump. Another method used to control the still boiling rate is by limiting the amount of water inside the still. If the still level is 7 inches or above, the control system will continue the washing step even after the normal wash time is completed. When the water level in the still drops below 7 inches, the control system will allow the drum to drain. This ensures the still does not get over filled and decreases the chances of a boil–over.

Still Cleaning

At the end of the daily washing operations, the sludge collected at the bottom of the still and on the heatplates must be cleaned out. If this cleaning is not performed, the distillation rate will drop causing low water levels in the rinse 2 tank and delays in starting of further laundry cycles. The number of laundry cycles that can be done depends on how dirty the laundry is. Normally, 10–20 laundry cycles can be completed between cleanings. The dirtier the laundry is, the more frequently the still will need to be cleaned. After the last daily laundry cycle is completed, the operator selects a COOLDOWN CYCLE. After level sensor (LT200) signals the control system that the water level in the still is below the heatplates, the control system will turn off the heater. At this time the thermal fluid will continue to circulate through the dryer heat exchangers and the still. The control system will turn on the dryer blowers (M104). Ambient air passing through the dryer heat exchangers will draw the residual heat out of the thermal fluid allowing the still to cooldown. Once the thermal fluid temperature is below 150 degrees F, the control system will stop thermal fluid circulation and turn off the dryer blowers. The control system will also release locks (DN200) mounted on the access doors at the back of the still. The door locks prevent opening of the doors while boiling water is present inside the still. The still is cleaned by brushing debris from the heatplates and flushing the waste material out drain ports, with manual valves at the still bottom. Once the still is cleaned and the doors are closed, a position switch (ZS200) mounted on each door will provide a signal to the control system. The control system will not allow water heating or laundry operations to be started unless the still doors are closed.


SUBCOOLER
WASTE DRAIN
PREFILTER
COALESCER
DRAIN
TO R2 TANK
DRAIN
DRAIN
DRAIN
FV 201
FV 200
STILL CONDENSER
M200
CONDENSER FAN MOTOR
TO STEAM EDUCTOR
AIR
AIR
TE 201
VACUUM BREAKER
TE 200
PT 200
STEAM
LT 201
VENT
STANDPIPE
TO HEATER
LT 200
FROM HEATER
ANTI-FOAM SUPPLY
FROM FV109
ZS 200A
DN 200A
STILL
ZS 200B
DN 200B
M201
DRAIN
DRAIN
DRAIN
DISTILLATE PUMP

WATER CONDENSING

A still condenser is used to turn the steam produced by the still back into water. The still condenser consists of four heat exchangers and an electric motor–driven fan (M200). As steam moves into the coils of the heat exchangers, ambient air passes by the cooling fins. This causes the steam to cool and turn back into liquid. The hot air is then directed out through the top of the fan. The water exiting the condenser gravity drains to the standpipe and is recirculated. Temperature sensor (TE201), located at the outlet of the condenser, is used to monitor the temperature of the condensed water.

WATER RECIRCULATION

The standpipe ensures a constant supply of water is available to the distillate pump (M201). As water flows out of the still condenser, it collects in the standpipe. When the water level is at sixteen inches in the standpipe, a signal from level sensor (LT201) will cause the control system to turn on the distillate pump. When the water level is at three inches in the standpipe, a signal from the level sensor to the control system will turn off the distillate pump. With the distillate pump on, water is pumped to the pre–filters, coalescer, and back to the rinse 2 tank.

PRE–FILTER/COALESCER OPERATION

During the distilling processes, some organic vapors such as light fractions of fuel or oil may codistill with the steam exiting the top of the still. In addition, if a boil–over occurs, particulates may be carried along with the condensed water. To ensure only clean water is returned to the rinse 2 tank, a two–stage particulate filter and a coalescer are used. The pre–filters trap particulate contamination from the water to prevent premature clogging of the coalescer. The pre–filters contain disposable bags that are less expensive than the coalescer element. The coalescer contains a disposable element that separates the lighter fuel/oils from the heavier water. While the water recycle system is operating, the coalescer drains the separated fluid into an external waste container.

WATER TEMPERATURE CONTROL

Prior to entering the pre–filters, water may pass through the subcooler for additional cooling. The subcooler is an air–to–water heat exchanger that is used when the temperature of the water returning to the rinse 2 tank is twenty or more degrees above the selected set–point. In this circumstance, the signal from temperature sensor (TE202), located at the inlet to the rinse 2 tank, will prompt the control system to close solenoid valve (FV200) and open solenoid valve (FV201). When the valves reposition, water is forced to circulate through the subcooler before it gets to the pre–filters. As the water is passing through the coils of the subcooler, ambient air is drawn through the cooling fins by the still condenser fan. When the temperature of the water returning to the rinse 2 tank is acceptable, solenoid valve (FV200) is opened, and solenoid valve (FV201) is closed. This allows the water going into the pre–filters to bypass the subcooler.

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UNIT, DIRECT SUPPORT, AND GENERAL SUPPORT
LAUNDRY ADVANCED SYSTEM
(NSN 3510–01–463–0114)
HEATING SYSTEM THEORY OF OPERATION

HEATING SYSTEM

The heating system provides hot thermal fluid to the water recycle system for boiling water, and to heat exchangers in the washing/drying systems for drying laundry. Heating system operation consists of the following sub–operations:

THERMAL FLUID HEATING

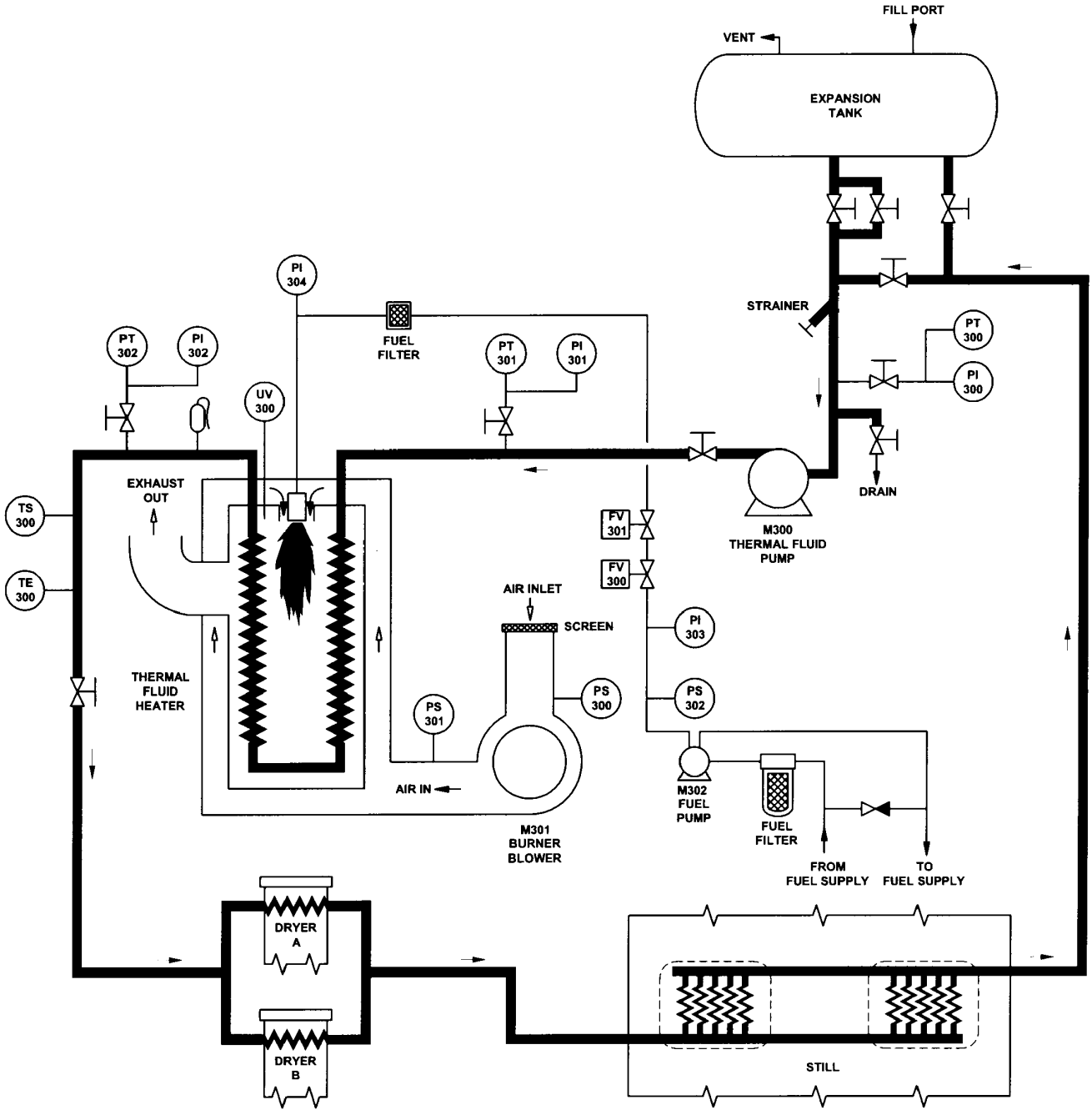
An oil–fired heater is used to heat the thermal fluid that is circulating through the heating system. Ambient air is drawn into the heater by the burner blower (M301). The blower consists of a squirrel–cage wheel driven by an electric motor. When the blower is on, it pushes air through the heater outer chamber into the burner chamber. As the air flows from the outer chamber to the burner chamber, it is preheated for maximum efficiency. The air gap created by routing the inlet air through the outer chamber creates a barrier that eliminates the need to insulate the burner chamber while also reducing the heater exterior surface temperature. This eliminates potential burn hazards to personnel and allows rapid cooldown of the heater after shutdown. When the blower is on, the fuel pump (M302) is also on. The fuel pump is a gear–type pump driven by an electric motor. The fuel pump draws fuel from an external supply. The fuel passes through a filter before entering the pump. The pressurized fuel coming out of the pump is supplied to two series–connected solenoid valves (FV300 and FV301). When the valves energize, fuel is supplied to the burner chamber. When air reaches the burner chamber, it is mixed with the fuel and ignited. Ignition of the fuel/air mixture occurs when two electrodes located in the burner chamber are energized with 10, 000 volts. The ignition transformer that is controlled by the flame programmer provides the high voltage. As the hot air flows through the burner chamber, the coil filled with circulating thermal fluid is heated. The exhaust air is then vented from the top of the heater through an exhaust stack. Operation of the burner blower and fuel pump are continuous when the heating system is on. Ignition is turned off by the flame programmer once combustion is established. There are times during laundry operations that the still is not being used. When this occurs, the control system will turn the heater on and off as necessary to maintain the required dryer air temperatures. This is accomplished by turning off the burner blower and de–energizing fuel solenoid valves. When combustion is required, the control system will provide a call for heat signal to start the burner blower and fuel pump. Once the flame programmer verifies the blower is operating and fuel pressure is available, it will energize the fuel solenoid valves and apply power to the ignition transformer.

THERMAL FLUID CIRCULATING

Thermal fluid is circulated through the heating system by the thermal fluid pump (M300). The thermal fluid pump is a centrifugal type pump driven by an electrical motor. When the thermal fluid exits the heater coil it is pumped through the heat exchangers in the drum drying ducts. The thermal fluid then passes through the heatplates in the still and is returned to the heater. During laundry operations, the thermal fluid pump is continuously circulating thermal fluid, even when the heater is off. When the heater is on, the thermal fluid temperature rises and the thermal fluid expands. To compensate for this expansion, the heater contains an expansion tank. When the thermal fluid is at ambient temperature, the expansion tank will be approximately one–third full of thermal fluid. As the heating system reaches its maximum operating temperature, the level in the expansion tank will rise to approximately two–thirds full. A vent is provided at the top of the expansion tank to bleed air pressure from the system as the thermal fluid expands. A relief valve is installed in the thermal fluid line at the outlet of the heater. This valve prevents the pressure of the thermal fluid from exceeding safe operating limits in the event of a control system failure. A strainer is provided at the thermal fluid pump inlet to prevent debris in the plumbing from entering the pump. Isolation valves are located throughout the thermal fluid plumbing to seal off portions of the heating system to reduce the amount of thermal fluid that will need to be drained for maintenance.

HEATER MONITORING AND CONTROL

Heater operation is monitored and controlled by a flame programmer (FP300). Once the flame programmer receives a call–for–heat signal from the control system to start the heater, the flame programmer will control heater operation until the control system removes the signal. Interface between the flame programmer and control system is discussed in SYSTEM MONITORING AND CONTROL (WP 0007 00). The flame programmer and control system contain interlock circuits that are connected to various sensors and switches located on the heater. The devices used to monitor and control the heater are described in the following paragraphs:


FILL PORT
VENT
EXPANSION TANK
STRAINER
PT 300
PI 300
DRAIN
PI 304
FUEL FILTER
PT 302
PI 302
PT 301
PI 301
UV 300
EXHAUST OUT
TS 300
TE 300
FV 301
FV 300
M300 THERMAL FLUID PUMP
AIR INLET
SCREEN
PI 303
PS 300
PS 302
PS 301
THERMAL FLUID HEATER
AIR IN
M301 BURNER BLOWER
M302 FUEL PUMP
FUEL FILTER
FROM FUEL SUPPLY
TO FUEL SUPPLY
DRYER A
DRYER B
STILL

Air Pressure Monitoring

Two pressure switches are provided for monitoring air flow through the burner blower (M301). Pressure switch (PS300) monitors air pressure at the blower inlet. Pressure switch (PS301) monitors air pressure at the blower outlet. Signals from both switches are continuously monitored to ensure that adequate air flow is provided to support combustion. If sufficient air flow is not detected, one or both switches will open the flame programmer interlock circuit to stop heater operation. Alarm signals will also be provided to the control system by the flame programmer and the pressure switch.

Fuel Pressure Monitoring

A pressure switch (PS302) is provided for monitoring pressure at the outlet of the fuel pump (M302). The signal from the switch is continuously monitored to ensure that adequate fuel pressure is available to support combustion. If sufficient fuel pressure is not detected, the switch will open the flame programmer interlock circuit to stop heater operation. Alarm signals will also be provided to the control system by the flame programmer and the pressure switch. When LADS is started, the heater fuel system must be primed. To prime the system, the operator lifts up a switch that connects 110 VAC power to the coil of the burner blower contactor (MC301). When the burner blower (M301) is operating the fuel pump is also operating. The operator releases the switch when the lines from the fuel supply are filled and the pump outlet pressure is high enough to sustain heater operation. Pressure gauge (PI303), connected to the fuel pump outlet, is provided to inform the operator when the fuel system is primed. Pressure gauge (PI304), connected to the burner chamber inlet, is provided to aid in troubleshooting fuel pressure problems.

Flame Monitoring

An ultra–violet light detector (UV300) is used to continuously monitor the presence of a flame inside the burner chamber. The signal from the detector is provided to the flame programmer (FP300). During start–up, the flame programmer uses this signal to turn off the ignition transformer. During operation, if this signal is not received by the flame programmer, the flame programmer will stop heater operation, and provide an interlock alarm signal to the control system.

Thermal Fluid Pressure Monitoring

Three pressure sensors are used for monitoring the pressure of the thermal fluid. Pressure sensor (PT300) monitors the thermal fluid pump (M300) inlet pressure. Pressure sensor (PT301) monitors the thermal fluid pump outlet pressure. Pressure sensor (PT302) monitors the thermal fluid heater outlet pressure. Signals from the pressure sensors are continuously monitored by the control system to ensure the thermal fluid is circulating at the proper flow rate. The control system will shut off operation of the heating system if the flow of thermal fluid is not within the required range. Pressure gauges (PI300, PI301, and PI302) are connected at the same locations as the pressure sensors, and are provided to monitor the thermal fluid pressure when troubleshooting and servicing the thermal fluid system.

Thermal Fluid Temperature Monitoring

Two temperature sensors are provided for monitoring the thermal fluid temperature at the heater outlet. Temperature sensor (TE300) is used to control operation of the heater and regulate the temperature of the thermal fluid going into the dryer heaters. When the still is not being used, the thermal fluid temperature will rise. The signal from TE300 will be used to detect this condition and the control system will turn off the call–for–heat signal to the flame programmer (FP300) as previously described. As long as the thermal fluid temperature is sufficient to maintain the selected drying temperature the heater will remain in this state. If the thermal fluid temperature must be increased to maintain the proper air drying temperature, the signal from TE300 will be used by the control system to apply the call–for–heat signal to the flame programmer. Temperature switch (TS300) continuously monitors the thermal fluid temperature to ensure that the thermal fluid does not overheat. If the thermal fluid temperature exceeds the specified limit, the switch will open the flame programmer interlock circuit to stop heater operation. Alarm signals will also be provided to the control system by the flame programmer and temperature switch.

Thermal Fluid Level Monitoring

The expansion tank contains a dipstick to periodically check the thermal fluid level in the tank. The dipstick has marks indicating when thermal fluid needs to added and when the expansion tank is full.

END OF WORK PACKAGE

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UNIT, DIRECT SUPPORT, AND GENERAL SUPPORT
LAUNDRY ADVANCED SYSTEM
(NSN 3510–01–463–0114)
AIR SYSTEM THEORY OF OPERATION

AIR SYSTEM

The air system provides dry compressed air to the other LADS systems. This air is used to pressurize the air bags that support the drums and to actuate ball valves, air dampers, brakes, and door locks used on the washing/drying system and water recycle system. A small amount of air is also used to detect the water level in the wash tanks, rinse tanks, still, and standpipe. Air system operation consists of the following sub–operations:

AIR COMPRESSION AND CONDITIONING

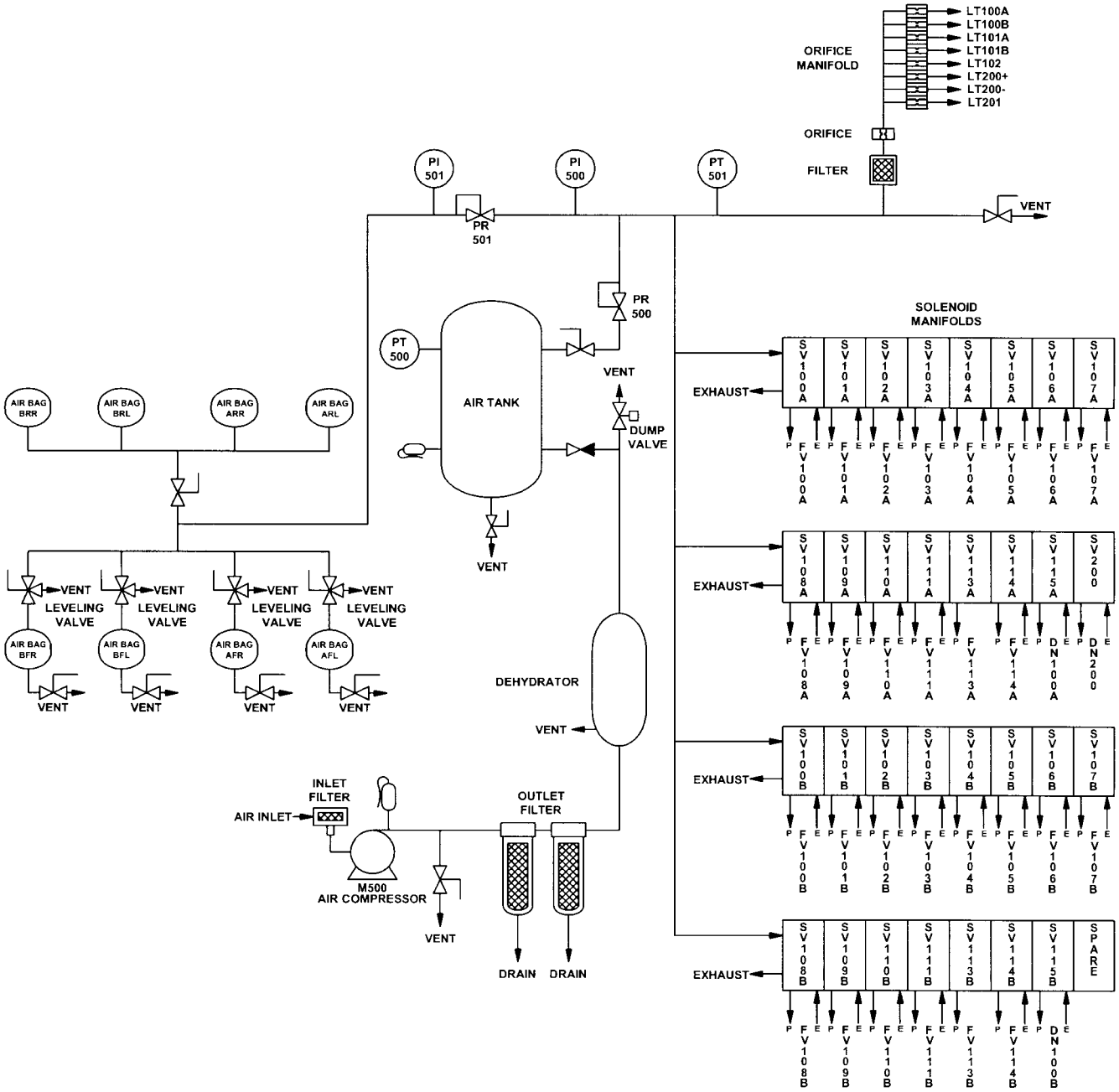
Ambient air enters the air system through an inlet filter. The inlet filter is used to prevent debris (sand, dirt, leaves, etc.) from entering the air compressor (M500). The air compressor is used to pressurize the air entering the system from atmospheric pressure to approximately 125 psig. The compressor is a two–stage, two–cylinder, reciprocating piston type that is driven by an electric motor. A relief valve is mounted at the compressor outlet to prevent the discharge pressure from exceeding safe limits. Air leaving the compressor is routed to an outlet filter that removes most of the water generated during the compression process from the product air. The filter contains two disposable elements that separate particles and water from the air. Float valves located in the filter bowls automatically drain the filters to remove the separated water. Once the air leaves the outlet filter, it passes through a dehydrator. The dehydrator is used to completely dry the product air. The dehydrator consists of a membrane vessel. When product air enters the vessel about 80 percent of the air passes through the membrane material where the water is squeezed out of the air. The other 20 percent of the air is used to sweep the moisture off of the membrane to a vent port. The dried product air is then routed to an air tank.

COMPRESSED AIR STORAGE

When the air leaves the dehydrator, it is stored in the air tank. When the tank is fully pressurized, it contains enough air to allow the compressor (M500) to operate intermittently (approximately 30 minutes per hour) while still allowing smooth operation of the air–driven components. Pressure sensor (PT500), mounted on the air tank, is used to determine when the compressor should turn on and off. When the pressure in the tank drops to 85 psig, due to operation of air driven components, the signal sent to the control system by the sensor will prompt the control system to turn on the compressor. Likewise, when the air tank has been recharged to the 125 psig, the signal from the sensor will turn off the compressor. A dump valve (FV500) opens to allow pressure trapped between the air tank and compressor to vent. A relief valve is mounted on the air tank to prevent the pressure of the stored air from exceeding safe limits. A storage tank vent valve is located at the tank bottom to allow the tank to be de–pressurized prior to performing maintenance on the air system. The air tank also contains an isolation valve that maintains the air pressure in the tank when the product pressure vent valve is opened. A check valve is provided at the tank inlet to prevent pressure in the air tank from bleeding back through the dehydrator, or out the dump valve, when the compressor is not operating.

PRODUCT AIR DISTRIBUTION

A pressure regulator (PR500) is used to control the pressure of the air delivered to the air–driven components. The regulator is set to deliver air at 80 psig regardless of normal changes in flow demand. The regulator is adjustable and contains a pressure gauge (PI500) that indicates the regulated pressure. Pressure sensor (PT501) is also mounted at the outlet of the pressure regulator. This sensor is used by the control system to verify that sufficient air pressure is available to operate the air–driven components. Product air leaving the pressure regulator is distributed to the solenoid manifolds, orifice manifold, and drum air bags. Four solenoid manifolds, each consisting of eight 4–way valves, are provided to control operation of the various air–actuated ball valves, air dampers, drum brakes and door locks. These 4–way valves use electrical signals received from the control system to control the direction of air flow to and from the air–driven components. The orifice manifold is used to control the flow of air to the tank level sensors. A filter is mounted at the manifold inlet to prevent particles from plugging the orifices. An inlet orifice is provided to isolate the individual level sensor orifices from pressure and flow surges. Eight level sensor orifices are used to supply a steady flow of low pressure air to the pressure sensor and bubbler tube used to determine the water levels in the wash tanks, rinse tanks, still, and standpipe. The air provided to the drum air bags passes through a regulator (PR501) that is set to deliver air at 65 psig. The regulator contains a pressure gauge (PI501) that indicates the regulated pressure. Each front air bag has a leveling valve that is mechanically connected to the drum. When the LADS is operating on unlevel terrain, the leveling valve adds or vents pressure from the air bag until the drum is level in the side–to–side direction.



END OF WORK PACKAGE

UNIT, DIRECT SUPPORT, AND GENERAL SUPPORT

LAUNDRY ADVANCED SYSTEM

(NSN 3510–01–463–0114)

CONTROL SYSTEM THEORY OF OPERATION

CONTROL SYSTEM

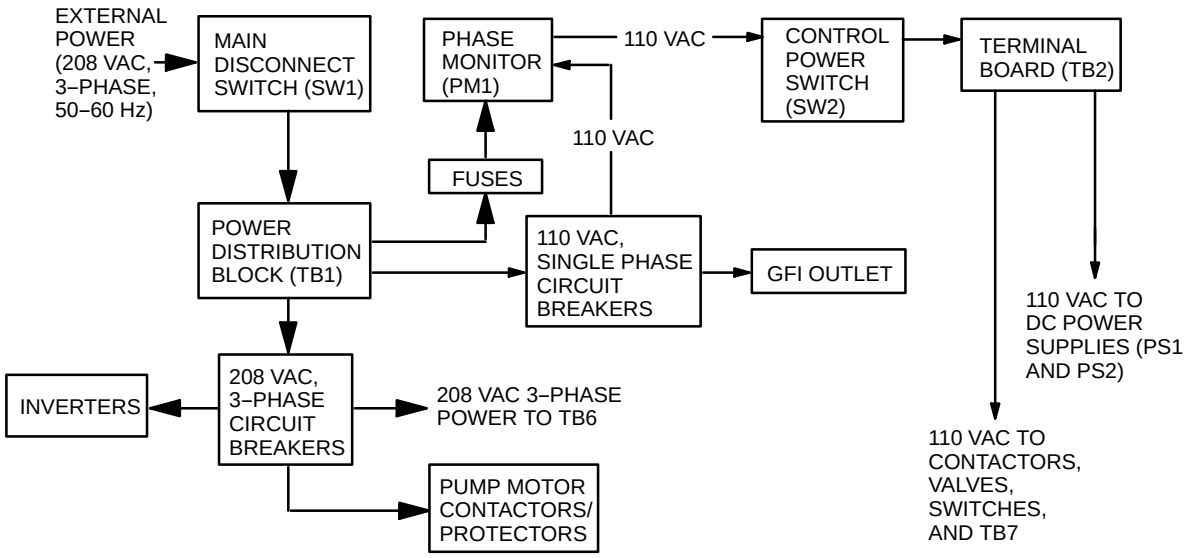
The control system provides the electrical interface between the external power and the LADS electrical and electronic components. This system also controls all aspects of LADS automated operation and provides the interface to the controls and indicators that the operator uses when performing laundry operations. Control system operation consists of the following sub–operations:

INPUT POWER DISTRIBUTION AND CONDITIONING

The LADS requires external 208 VAC, 3–Phase, 50–60 Hz electrical power in order to operate. Once power is supplied to the LADS the power is distributed as described below:

AC Power Distribution and Conditioning

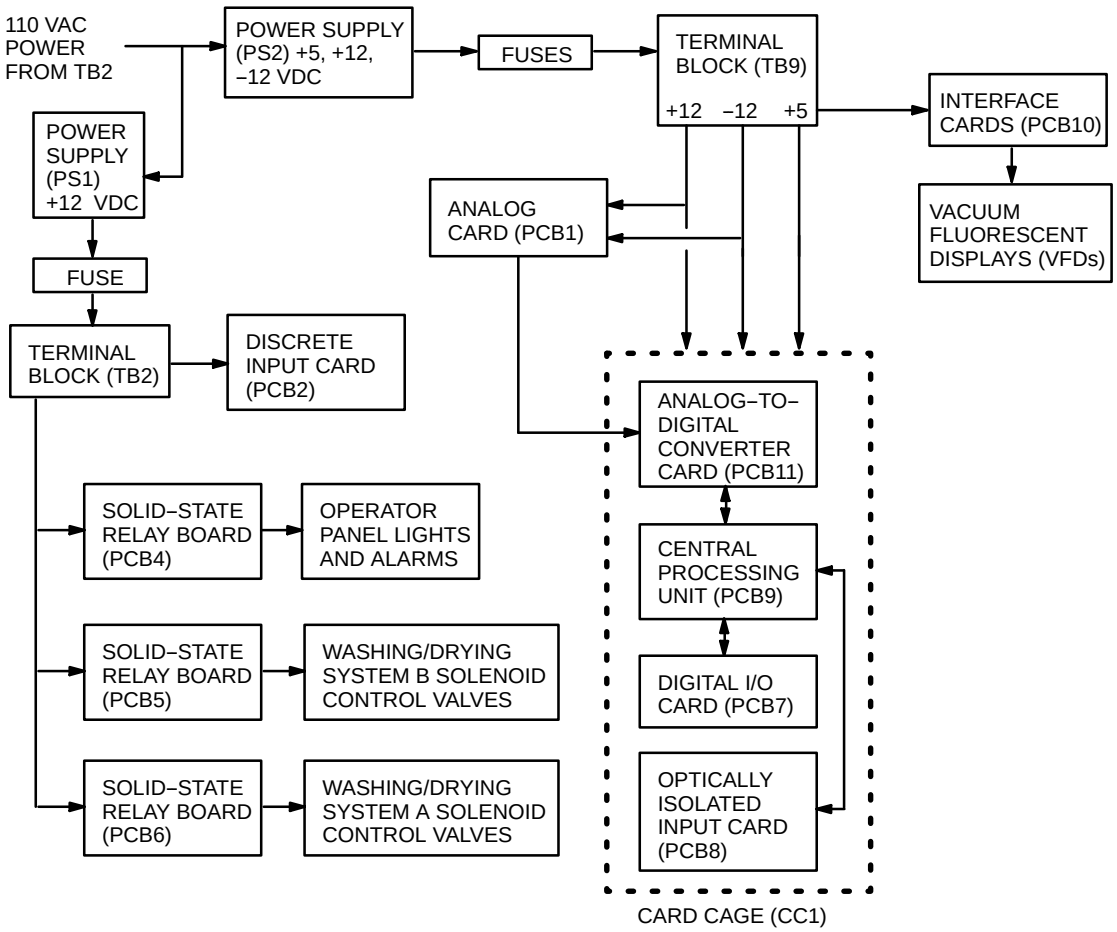
External power is connected to the disconnect switch (SW1) located in the main control enclosure. This switch removes power from the LADS when turned off and provides power to the power distribution block (TB1) when turned on. At TB1, power is divided and distributed to circuit breakers that protect 3–phase and single–phase circuits routed throughout the LADS. Three–phase power is connected to phase monitor (PM1), inverters, and individual contactors used to supply power to the various pump motors. PM1 continually analyzes the input power provided to the LADS. If an out–of–tolerance condition exists, power can not be applied, or will be automatically removed from the control system. Single–phase 110 VAC power is connected to a ground fault interrupt (GFI) circuit and the control power switch (SW2). When SW2 is turned on power is applied to two DC power supplies (PS1 and PS2).



DC Power Distribution and Conditioning

Power supplies (PS1 and PS2) are used to supply +5, +12, and –12 volts direct current (VDC) power to various circuit boards used to control LADS operation. PS1 is used to provide +12 VDC power to the DC portion of terminal board (TB2). DC power from TB2 is then provided to the switches connected to the discrete input board (PCB2), and the output side of solid–state relay boards (PCB4, PCB5, and PCB6). PS1 also provides power to the operator panel lights and alarms, and various control switches. PS2 is used to supply +5, +12, and –12 VDC to terminal board (TB9). From TB9 DC power is distributed to the analog board (PCB1), display interface boards (PCB10), and card cage (CC1). The card cage distributes DC power to the digital I/O board (PCB7), optically isolated input board (PCB8), CPU board (PCB9), and analog–to–digital converter board (PCB11).

DC Power Distribution and Conditioning – Continued



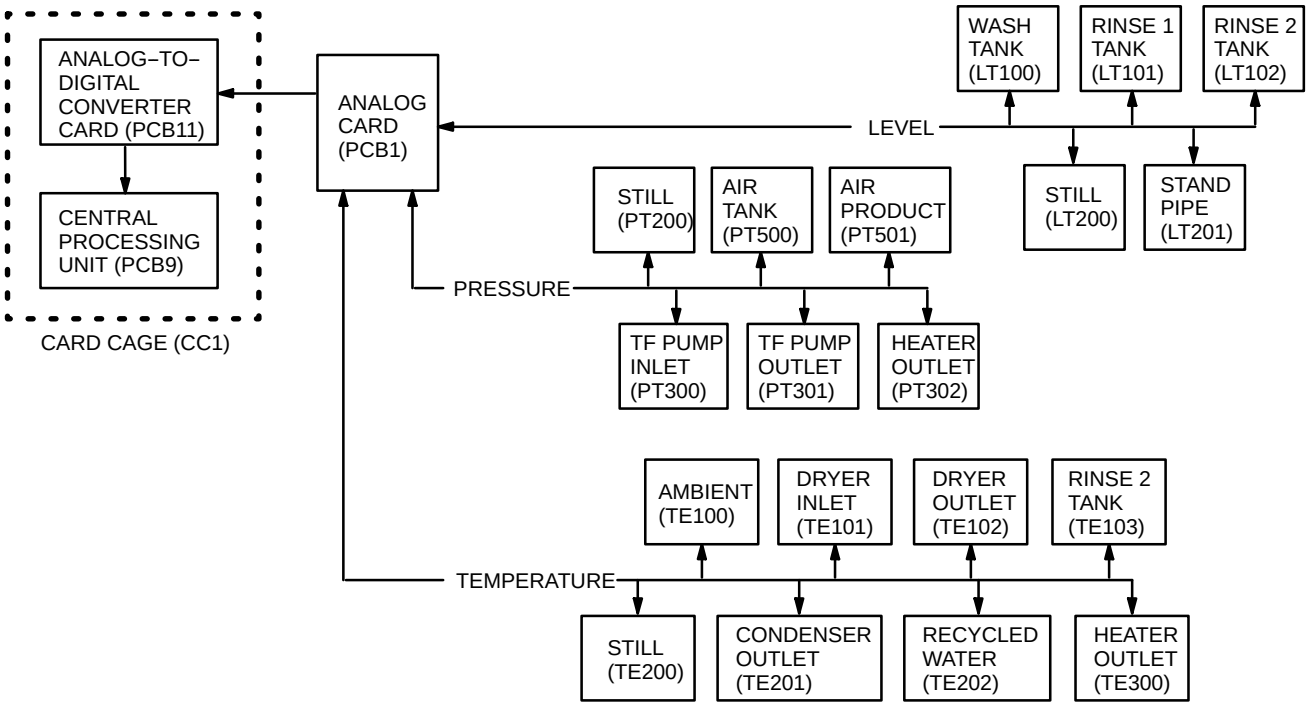
SYSTEM MONITORING AND CONTROL

LADS operation is electronically controlled. This control is accomplished using a central processing unit (PCB9) that contains custom software. PCB9 interfaces with an analog card (PCB1), discrete input card (PCB2), digital input/output (I/O) card (PCB7), optically isolated input card (PCB8), and solid–state relay boards (PCB3 through PCB8) to control and monitor all automatic operations as follows:

Level, Pressure, and Temperature Sensor Monitoring

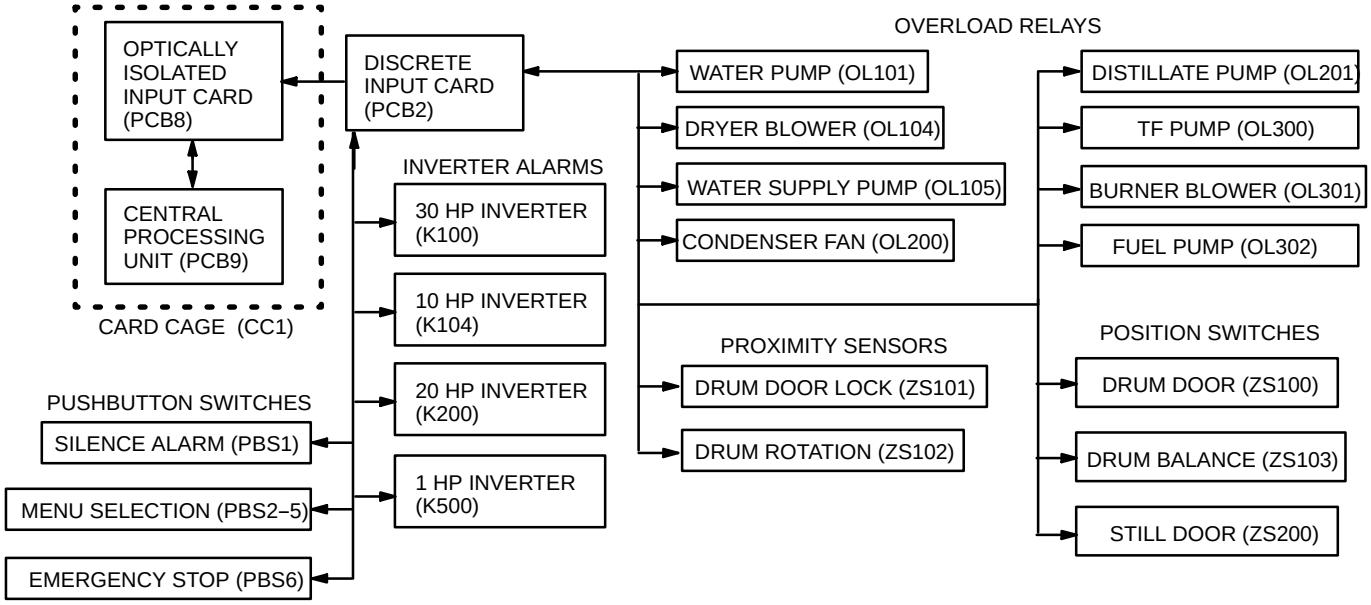
The analog card (PCB1) and analog–to–digital converter card (PCB11) provide the interface between the level, pressure, and temperature sensors used to monitor key system parameters and PCB9. The level and pressure sensors receive 12 VDC power from PCB1 and provide a 1–6 VDC signal back to the card. To monitor temperature, resistance temperature devices (RTDs) are used. The resistance of these sensors change as the temperature changes. These sensors provide an input to PCB1. After PCB1 conditions the signals from the level, pressure, and temperature sensors an analog voltage is provided to PCB11. PCB11 converts the analog signals to digital signals and provides this information PCB9.

Level, Pressure, and Temperature Sensor Monitoring – Continued



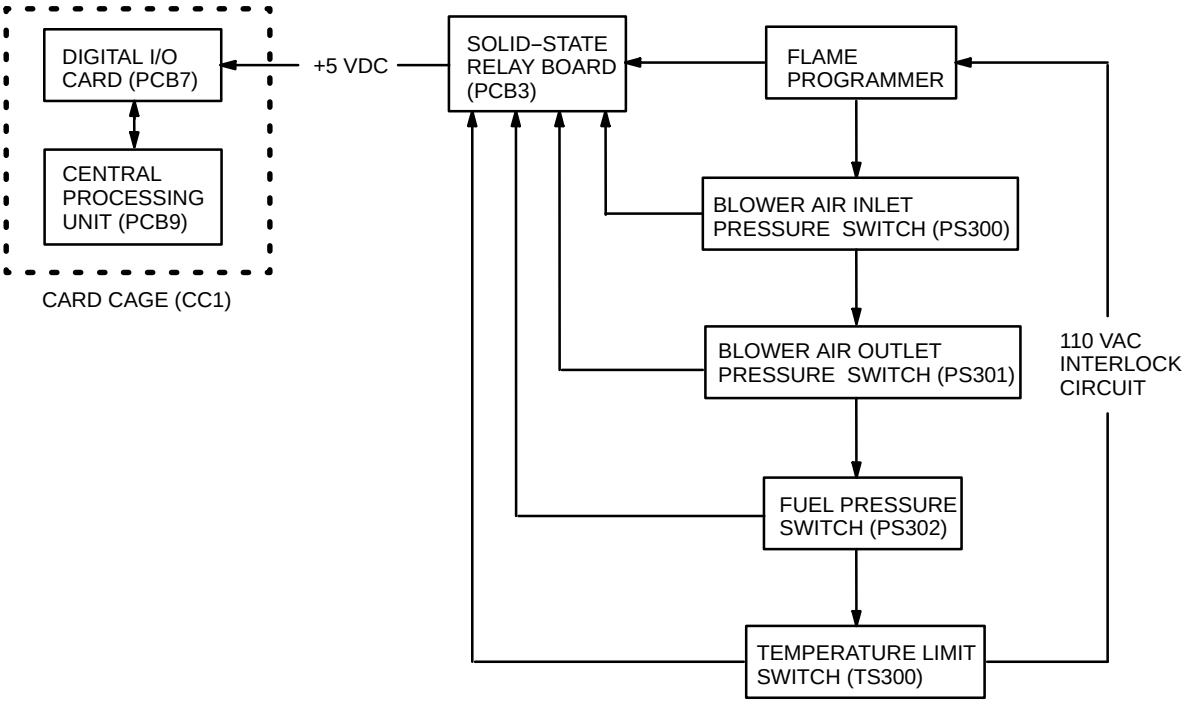
Switching Device Monitoring

Most switching devices used on the LADS use 0 or +12 VDC signals to communicate with PCB9. These devices receive +12 VDC through individual circuits on PCB2. If the switching device contacts are closed, a +12 VDC input received from the device will be provided as inputs to PCB8 through individual circuits on PCB2. PCB8 takes the 0 or +12 VDC inputs received from PCB2 and provides a 0 or +5 VDC input to PCB9. PCB9 uses this switching device information to sequence and verify correct operation.



Switching Device Monitoring – Continued

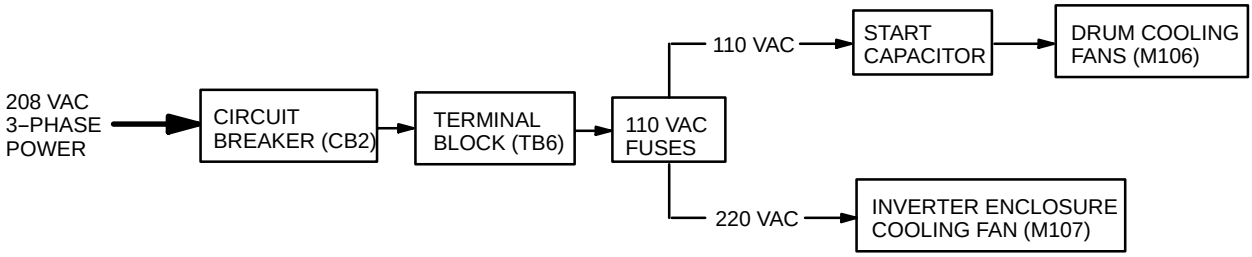
A few switching devices on the heater are connected to 110 VAC circuits. These devices are connected to an interlock circuit in the flame programmer (FP300). When the heater is operating, the switching device contacts are closed, and the FP300 interlock circuit is continuous. The switching devices also provide 110 VAC input signals to individual solid–state relays (SSR) located on PCB3. With the 110 VAC input signal available, the SSRs are energized, and provide 5 VDC signals to PCB7. PCB7 then provides 5 VDC inputs to PCB9. If any switching devices open during heater operation the interlock circuit will be interrupted resulting in a lost signal between PCB3, FP300, and the individual switching device. This loss of signal will cause the individual SSR on PCB3 to de–energize. With the SSR de–energized the 5 VDC signal between PCB7 and PCB9 for the individual circuit will be lost. PCB9 will then provide the appropriate alarm signal.



MOTOR CONTROL

Cooling Fan Motor Control

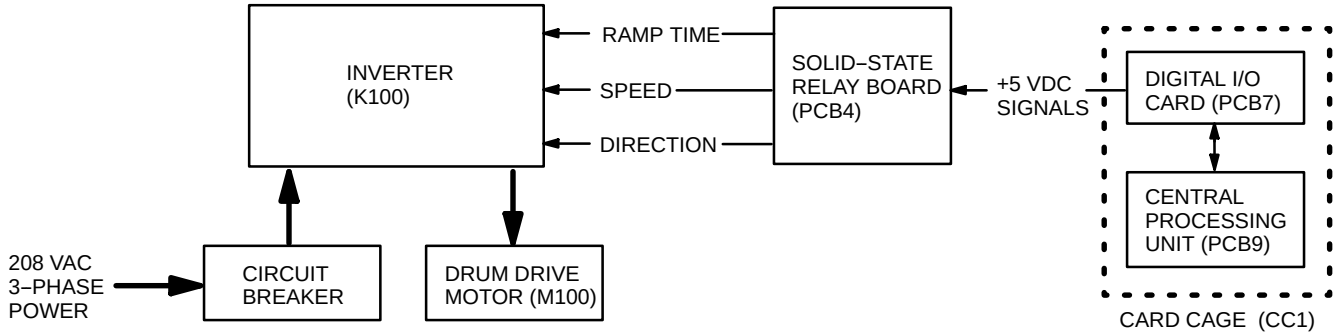
Operation of the motors used on the LADS is controlled using various methods. The drum motor cooling fans (M106) and inverter enclosure cooling fan (M107) receive power from circuit breaker (CB2) through terminal board (TB6). These fans are on anytime the main disconnect switch (SW1) is on.



MOTOR CONTROL – Continued

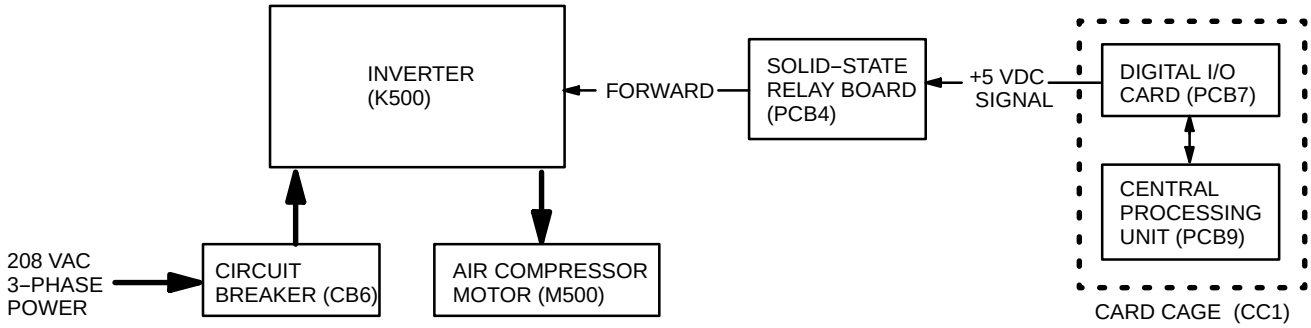
Drum Drive Motor Control

The drum drive motors (M100) are powered by 30 horsepower (HP) inverters (K100). K100 provides power to phase connections on M100 at various frequencies to control the motor's direction and speed. PCB9 provides signals to solid–state relays (SSRs) on PCB4 to control the direction, speed, and acceleration rate of the motor. This information is provided to K100. K100 is pre–programmed to provide power to M100 based on inputs received from the SSRs.



Air Compressor Motor Control

Power to run the air compressor (M500) is provided by a 1 HP inverter (K500). If 50 Hz power was supplied to M500, it would run too slow to maintain the proper air system air pressure. To prevent this from occurring, K500 is used to provide 60 Hz power regardless of whether the supplied power is 50 or 60 Hz. When the SSR on PCB4 receives a 5 VDC input signal from PCB9 through PCB7 the SSR energizes and applies a control signal to K500. K500 then turns on M500.

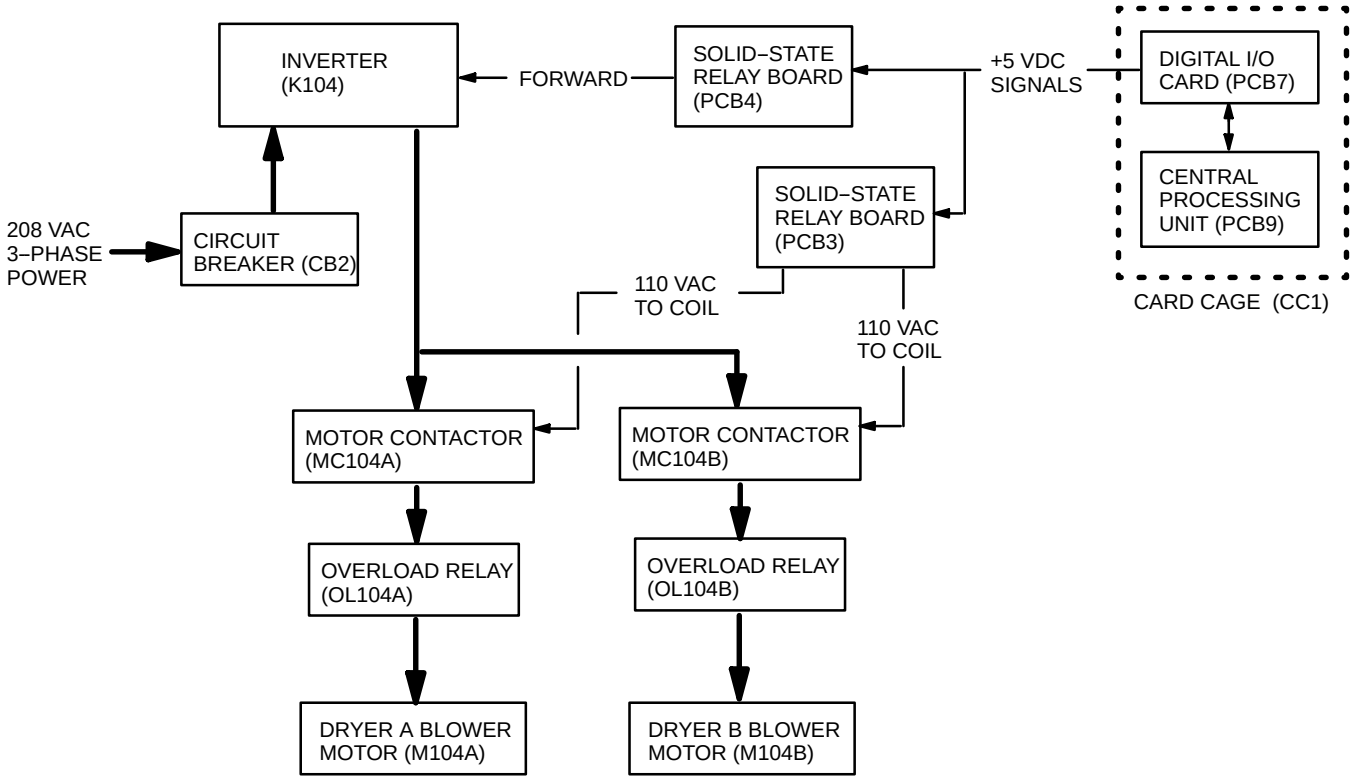


Dryer Blower Motor Control

The dryer blower motors (M104 A and B) are powered by a 10 HP inverter (K104). K104 is used to ensure the motors run at 60 Hz regardless of whether the supplied power is 50 or 60 Hz. Since there are times when one drum is washing or idle, while the other is drying, separate contactors (MC104A and B) are required to control the blowers. When the drying step begins, SSRs on PCB3 and PCB4 receive 5 VDC input signals from PCB9 through PCB7. The SSR on PCB4 applies a control signal to K104. K104 then applies 3–phase power to the input side of motor contactors (MC104A and B). SSRs on PCB3 apply 110 VAC to energize the coil of MC104A or B. When MC104A or B energizes, 3–phase power is connected to dryer blower motor (M104A or B).

MOTOR CONTROL – Continued

Dryer Blower Motor Control – Continued

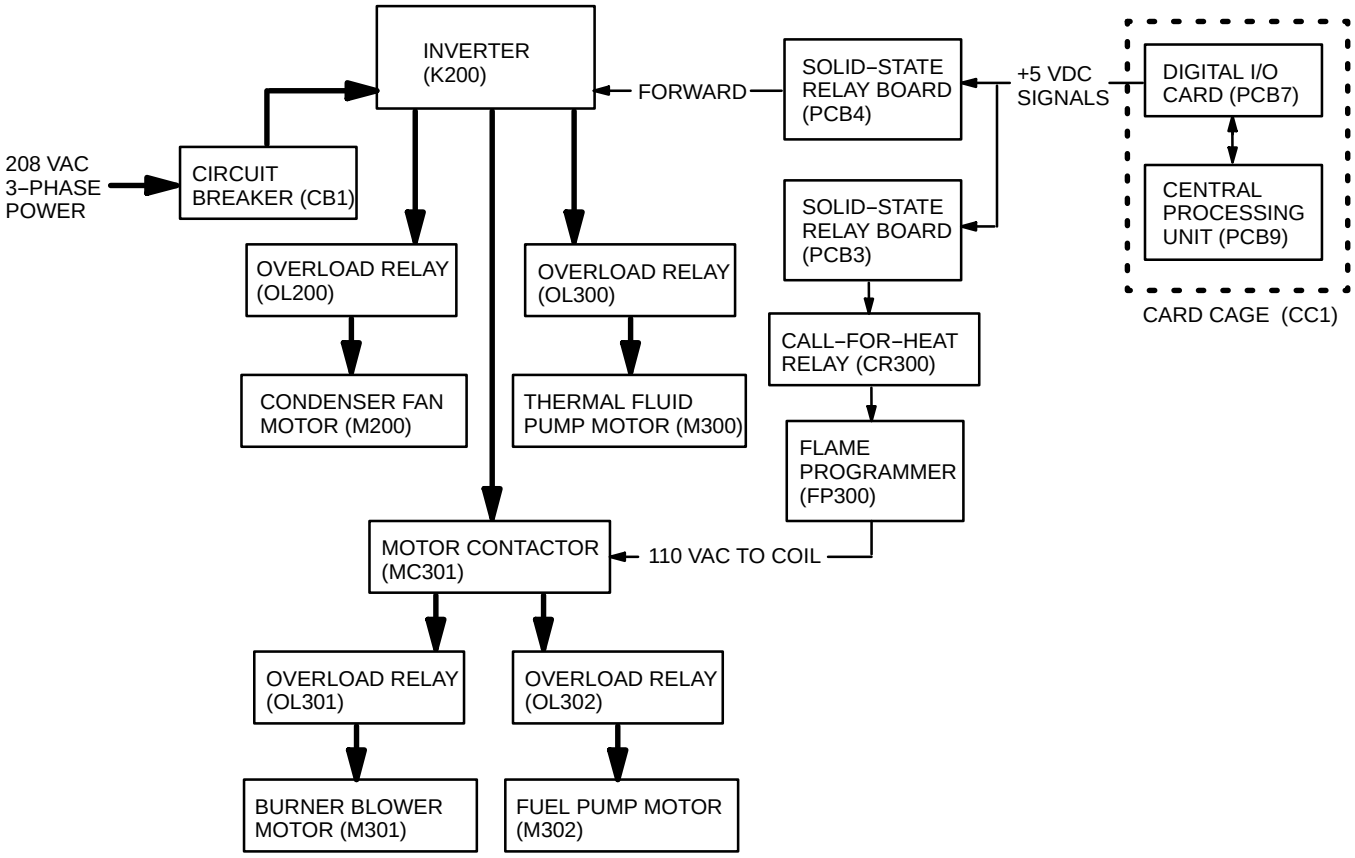


Condenser Fan and Heater Motor Control

Power to run the condenser fan (M200), thermal fluid pump (M300), burner blower (M301), and fuel pump (M302) is provided by a 20 HP inverter (K200). K200 is also used to ensure the motors run at 60 Hz regardless of whether the supplied power is 50 or 60 Hz. Since M200 and M300 are on at the same time, one signal from PCB9 is used to control both motors. When the SSR on PCB4 receives an 5 VDC input signal from PCB9, through PCB7, the SSR energizes and applies a control signal to K200. K200 then turns on M200 and M300. Power from K200 is also supplied to the burner blower (M301) and fuel pump (M302) through motor contactor (MC301). Since these motors only come on when the heater is started, control is provided through flame programmer (FP300). When FP300 provides 110 VAC power to energize the coil of MC301, the contactor energizes, and 3–phase power turns on M301 and M302.

MOTOR CONTROL – Continued

Condenser Fan And Heater Motor Control – Continued

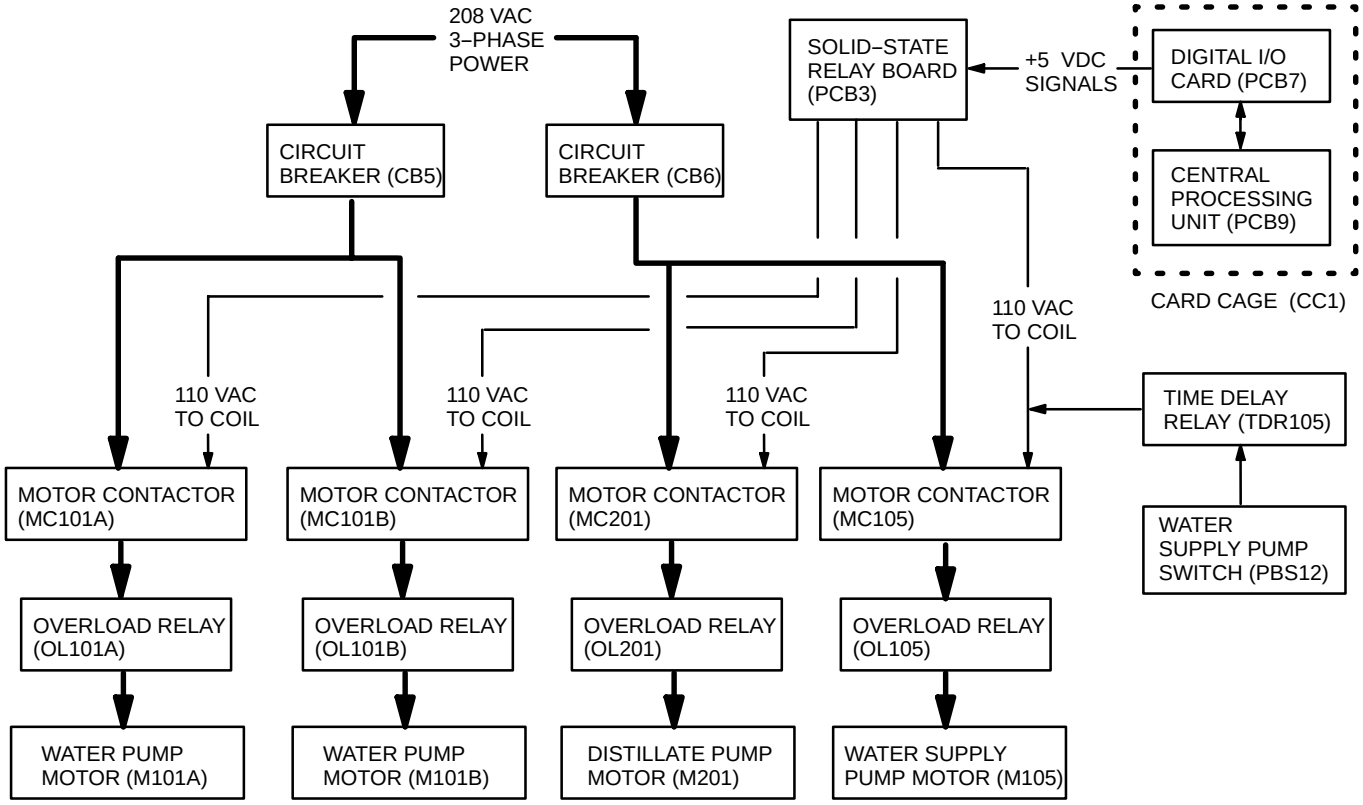


Water Pump Motor Control

Water pumps (M101A), (M101B), (M105), and (M201) are not connected to an inverter because they pump water at a fast enough rate, that running the LADS at 50 Hz will not affect their operation. The pumps turn on when an SSR on PCB3 receives a 5 VDC input signal from PCB9, through PCB7. This energizes the SSR and applies 110 VAC power to the coil of the appropriate motor contactor (MC101A), (MC101B), (MC105), or (MC201). When the contactor is energized, 3–phase power is connected to the pump motor and the pump turns on. The water supply pump (M105) can also be started using a pushbutton switch (PBS12). When PBS12 is pressed, a time–delay relay (TDR105) supplies 110 VAC power to the the coil of motor contactor (MC105) which turns on the water supply pump (M105). M105 will remain on for 10 minutes at which time TDR105 will de–energize MC105.

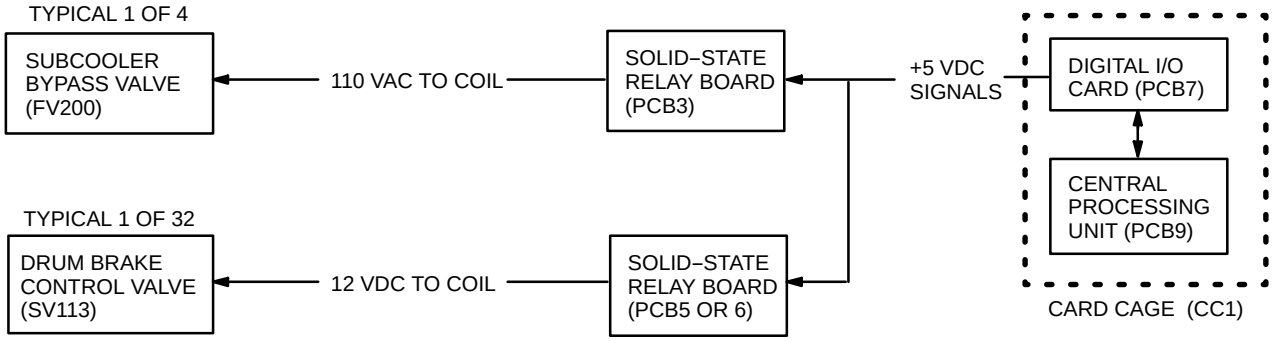
MOTOR CONTROL – Continued

Water Pump Motor Control – Continued



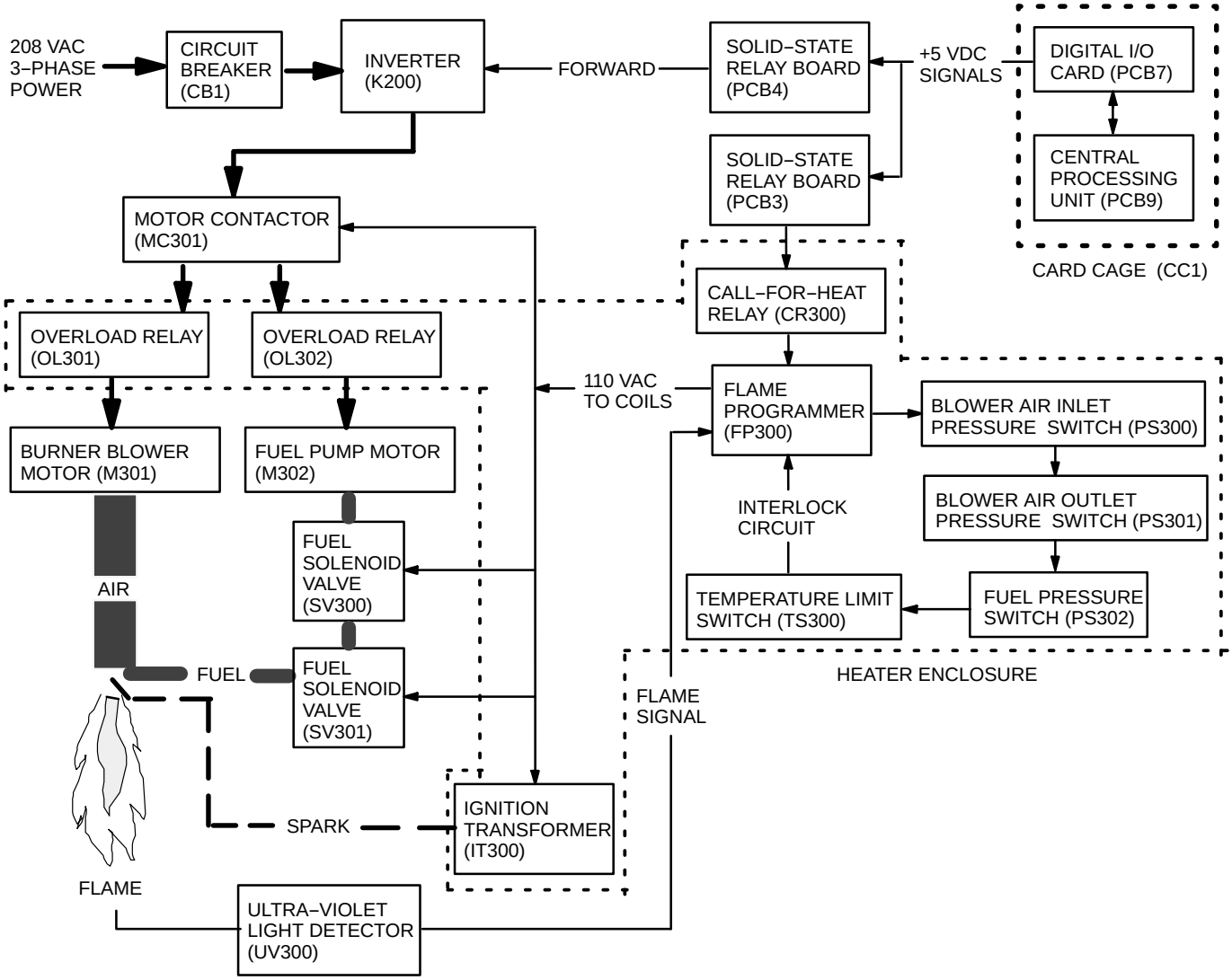
SOLENOID VALVE CONTROL

When the SSR receives a 5 VDC input signal from PCB9, through PCB7, the SSR switches and applies 110 VAC or 12 VDC power to the appropriate solenoid. When the 5 VDC signal is removed the SSR switches and power is removed from the solenoid.



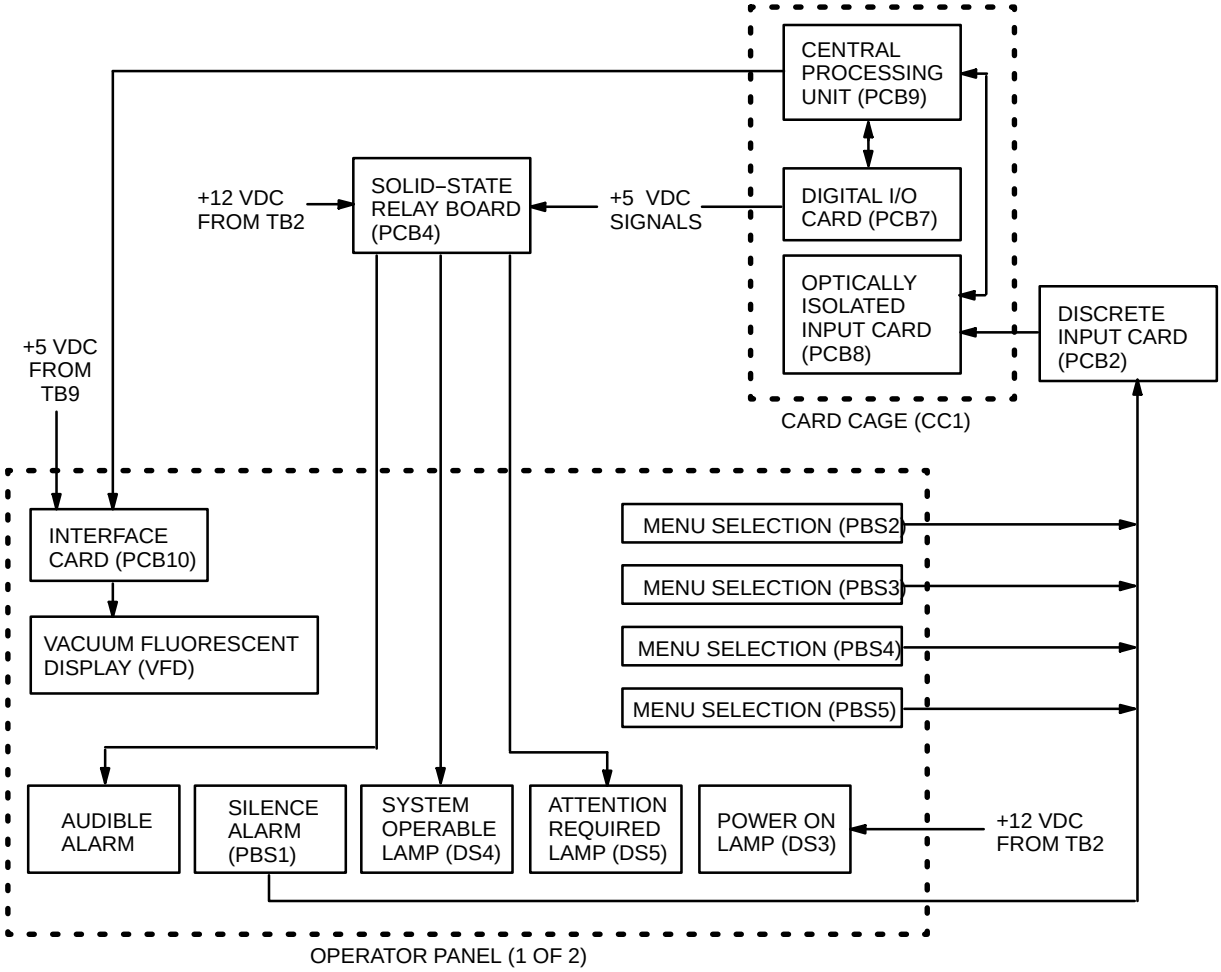
HEATER CONTROL

When control power is applied to the LADS, power is applied to the flame programmer (FP300). When this occurs, the FP300 will go through an initiation sequence to verify the correct voltage is present then switches to stand–by mode. In stand–by mode FP300 waits for a call–for–heat signal from the control system. When heat is required an SSR on PCB3 receives a 5 VDC input signal from PCB9, through PCB7. The SSR switches and applies 110 VAC to the heater control relay (CR300). CR300 then applies 110 VAC to the call–for–heat contact of FP300. FP300 starts a purge sequence by applying 110 VAC to the coil of motor contactor (MC301). This turns on the burner blower (M301) and fuel pump (M302). Once blower operation and fuel pressure are verified, FP300 will switch to the flame sequence. The flame sequence consists of energizing the fuel solenoid valves (SV300 and SV301) and ignition transformer (IT300). Once ignition occurs, and is verified by the ultra–violet light detector (UV300), FP300 de–energizes the ignition transformer and switches to the main mode. In the main mode FP300 monitors the heater interlock circuit and call–for–heat signal. When heat is not required PCB9 will remove the 5 VDC signal to the SSR. The SSR de–energizes removing the call–for–heat signal from CR300 and FP300. FP300 de–energizes the fuel solenoid valves (SV300 and SV301) and motor contactor (MC301). The burner blower (M301) and fuel pump (M302) stop and the heater returns to the standby mode.



OPERATOR INTERFACE

Main power and control power are applied to the LADS at the main control enclosure as previously discussed under input power distribution and conditioning. At the operator panels the operator uses pushbutton switches, indicating lights, an alarm, and a message display to control and monitor LADS operation. Operator panels A and B are used to selecting laundry formulas and to start and stop laundry cycles on their assigned washing/drying systems. Operator panel A is used to drain, fill, and heat water tanks on both washing/drying systems and control operation of the air system. Operator panel A is also used by maintenance personnel to observe system alarms, monitor operating parameters, and initiate specific system or component tests. Communication between the operator panels and PCB9 is accomplished using several methods. Selection of menu options and turning off the alarm is done using pushbutton switches. These switches communicate with PCB9 as previously discussed under switching device monitoring. Indicator lights and the audible alarm are turned on when an SSR receives an input signal from PCB9 through PCB7. When the 5 VDC signal is removed the SSR switches and power is removed from the indicator. The display contains its own processing circuit that communicates digitally with PCB9. An interface card (PCB10) provides an interconnection between the display and PCB9. PCB10 also provides 5 VDC power from PS2 to the display backlight. There are four alarm levels associated with LADS operation. When the system is operating normally the alarm is off. If the alarms comes on, and remains steady, this indicates that some type of operator action is required (i.e., close doors, laundry, cycle is complete, add FRS, etc.). If the alarm comes on with a slow pulse a non–critical fault has occurred. If the alarm comes on with a fast pulse a critical fault has occurred and LADS operation will be shut down by the control system.



CHAPTER 2

TROUBLESHOOTING PROCEDURES

FOR

LAUNDRY ADVANCED SYSTEM

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UNIT, DIRECT SUPPORT, AND GENERAL SUPPORT

LAUNDRY ADVANCED SYSTEM

(NSN 3510–01–463–0114)

INTRODUCTION TO TROUBLESHOOTING

GENERAL

This chapter contains information for troubleshooting common LADS malfunctions. This chapter cannot list all tests, inspections, and corrective actions needed to correct all malfunctions. If a malfunction is not listed, or if the actions listed do not correct the fault, notify your supervisor.

DESCRIPTION AND USE OF CONTROLS AND INDICATORS

The description and use of controls and indicators work package (WP 0009 00) contains information on the controls and indicators used to operate and maintain the LADS. Prior to performing troubleshooting procedures maintenance personnel should become familiar with this information.

MAINTENANCE MENU OPERATION

System alarm messages and operating parameters can be monitored by maintenance personnel using the maintenance menu at operator panel A. In addition, personnel can initiate operation of individual components using the maintenance menu. The maintenance menu operation work package (WP 0010 00) provides procedures on how to access and utilize the functions available in the maintenance menu.

TROUBLESHOOTING AIDS AND SUPPLEMENTARY DATA

The LADS contains many features that allow for quick and accurate isolation of faults. The troubleshooting aids and supplementary data work package (WP 0011 00) contains information pertaining to these features. Prior to performing troubleshooting procedures maintenance personnel should become familiar with this information.

TROUBLESHOOTING INDEX

The troubleshooting index work package (WP 0012 00) is a quick reference index for finding troubleshooting procedures. Malfunction/symptoms are listed alphabetically in the index as follows: The faults that would normally occur during startup are listed first. The remaining faults are listed by system. The faults indicated on the display listed before the faults observed by operator or maintenance personnel. Associated with each malfunction/symptom name is a work package sequence number representing the starting point in a troubleshooting sequence. Should any one malfunction/symptom require more than one troubleshooting procedure to arrive at the most likely fault, a reference will be made within the starting procedure to lead you to subsequent procedures, until successful fault isolation is achieved.

OPERATIONAL CHECKOUT AND TROUBLESHOOTING PROCEDURES

Operational checkout and troubleshooting work packages (WP 0013 00 through WP 0109 00) contain step by step procedures of the tests or inspections, and corrective actions required to return LADS to normal operation. Each work package is headed by initial setup information that outlines certain conditions which must be met before starting the task. DO NOT start a task until you understand what you are to do. Refer to the maintenance menu operation work package (WP 0010 00), troubleshooting aids and supplementary data work package (WP 0011 00), theory of operation in Chapter 1, and wiring diagrams work package (WP 0284 00) as necessary to gain an understanding of system operation.

END OF WORK PACKAGE

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CONTROLS AND INDICATORS

GENERAL

The following paragraphs contain illustrations that show the location of each control and indicator used to operate and maintain the LADS. Each control and indicator is clearly labeled as it appears on the equipment. Review these paragraphs thoroughly before operating the system.

MAIN CONTROL ENCLOSURE CONTROLS AND INDICATORS

Figure 1 shows the location of the controls and indicators found on the exterior of the main control enclosure. Table1 describes the use of these controls and indicators.

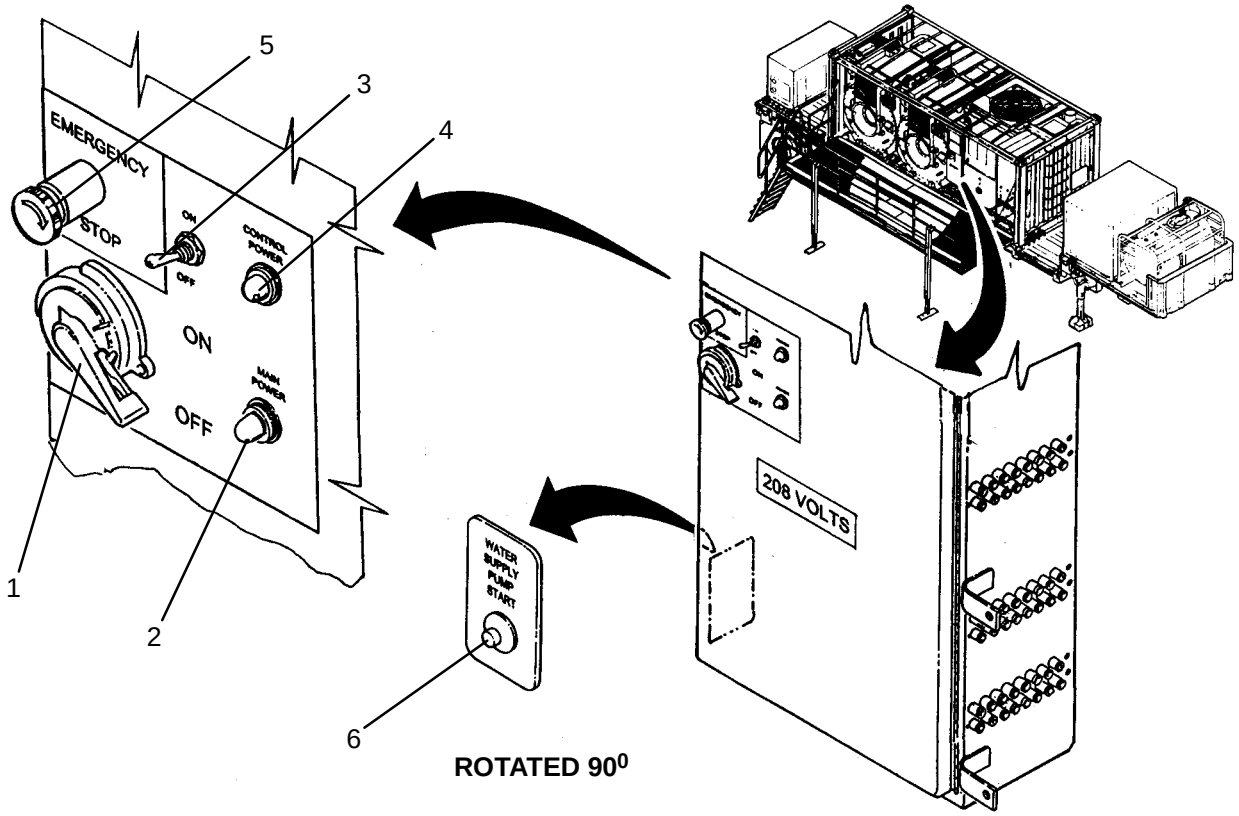

Figure 1. Location of Main Control Enclosure Exterior Controls and Indicators.

Table 1. Main Control Enclosure Exterior Controls and Indicators.

INDEX	DESCRIPTION	TYPE	FUNCTION
1	MAIN DISCONNECT ON/OFF	2 Position Switch	Turns main power on or off.
2	MAIN POWER	Indicator	Illuminates when main power is applied to LADS.
3	CONTROL POWER ON/OFF	2 Position Switch	Turns control power on or off.
4	CONTROL POWER	Indicator	Illuminates when control power is applied to LADS.
5	EMERGENCY STOP	Pushbutton Switch	Used to stop LADS operation under emergency situations.
6	WATER SUPPLY PUMP START	Pushbutton Switch	Used to start water supply pump. Once started, the pump will remain on for 10 minutes.

MAIN CONTROL ENCLOSURE CONTROLS AND INDICATORS – Continued

Figure 2 shows the location of the controls and indicators found inside the main control enclosure. Table 2 describes the use of these controls and indicators.

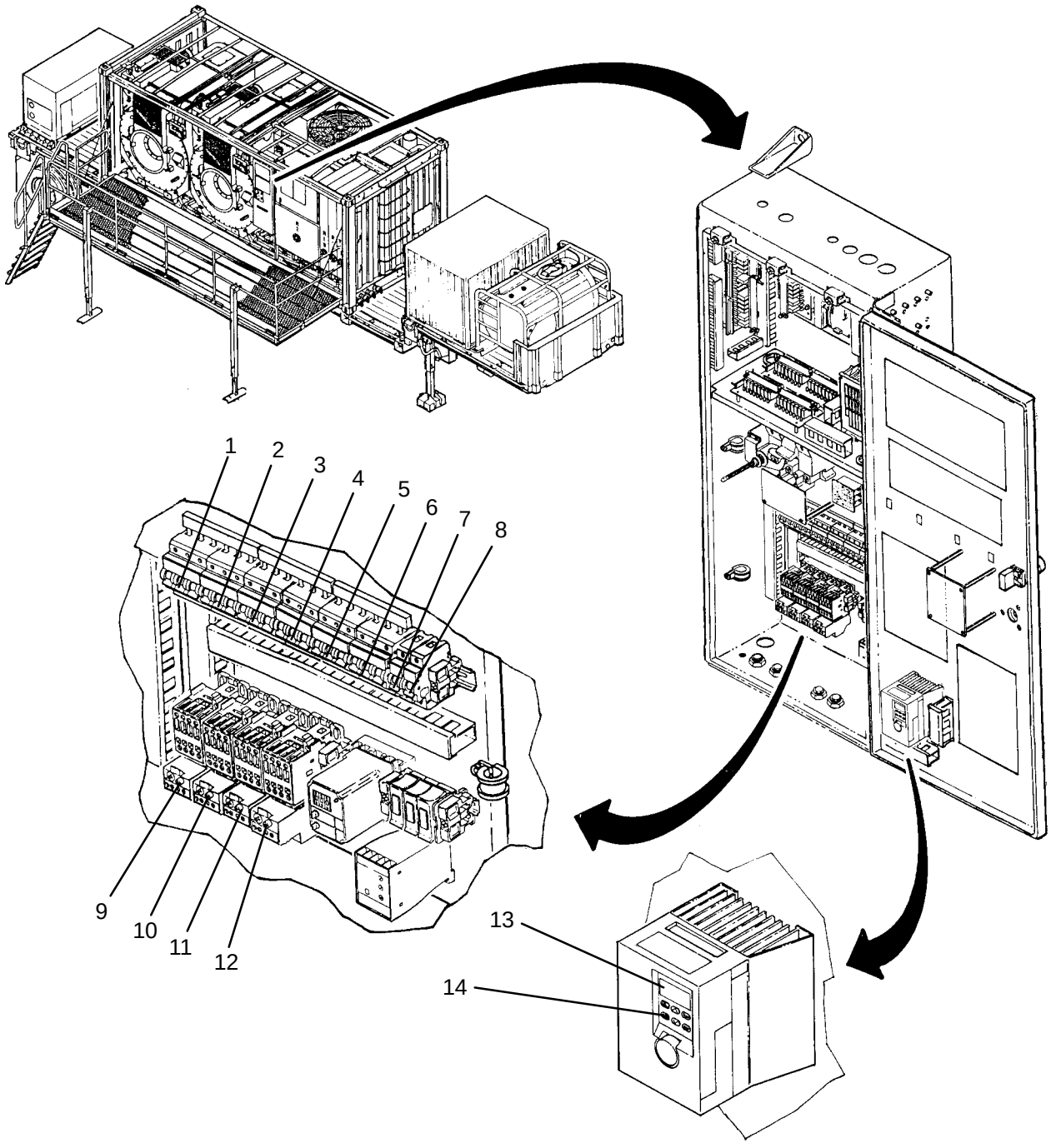

Figure 2. Location of Main Control Enclosure Interior Controls and Indicators.

MAIN CONTROL ENCLOSURE CONTROLS AND INDICATORS – Continued

Table 2. Main Control Enclosure Interior Controls and Indicators.

INDEX	DESCRIPTION	TYPE	FUNCTION
1	CIRCUIT BREAKER CB1	63 AMP, Lever Actuated	Used to protect wiring and components in the 20 HP inverter circuits.
2	CIRCUIT BREAKER CB2	40 AMP, Lever Actuated	Used to protect wiring and components in the 10 HP inverter circuits.
3	CIRCUIT BREAKER CB3	40 AMP, Lever Actuated	Used to protect wiring and components in the Drum A inverter circuits.
4	CIRCUIT BREAKER CB4	40 AMP, Lever Actuated	Used to protect wiring and components in the Drum B inverter circuits.
5	CIRCUIT BREAKER CB5	20 AMP, Lever Actuated	Used to protect wiring and components in the water pump circuits.
6	CIRCUIT BREAKER CB6	16 AMP, Lever Actuated	Used to protect wiring and components in the external water pump, distillate pump, and air compressor circuits.
7	CIRCUIT BREAKER CB7	16 AMP, Lever Actuated	Used to protect wiring and components in the control power circuits.
8	CIRCUIT BREAKER CB8	16 AMP, Lever Actuated	Used to protect wiring and components in the external GFI circuit.
9	OL101A RESET	Pushbutton Switch	Used to reset overload relay protecting water pump A (M101A).
10	OL101B RESET	Pushbutton Switch	Used to reset overload relay protecting water pump B (M101B).
11	OL105 RESET	Pushbutton Switch	Used to reset overload relay protecting water supply pump (M105).
12	OL201 RESET	Pushbutton Switch	Used to reset overload relay protecting distillate pump (M201).
13	DIGITAL MONITOR	4 X 1 Digital Display	Indicates error messages for air compressor inverter and related circuit.
14	PRG/RESET	Key	Used to reset inverter errors.

OPERATOR PANEL CONTROLS AND INDICATORS

Two operator panels are used on LADS. Operator panel A is used to operate washing/drying system A. Maintenance personnel also use operator panel A to control, monitor and test LADS operation. Operator panel B is used only to operate washing/drying system B. Figure 3 shows the location of the controls and indicators found on the operator panels. Table 3 describes the use of these controls and indicators found on each operator panel.

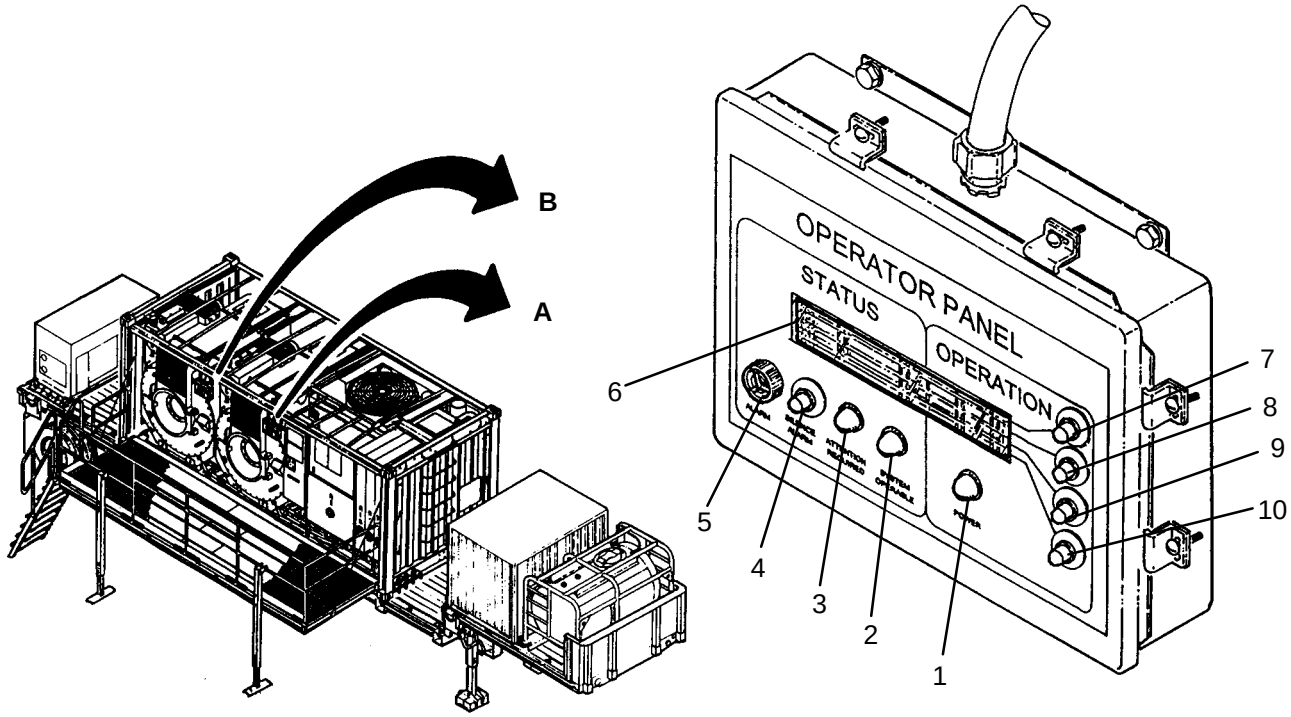

Figure 3. Location of Operator Panel Control Enclosure Controls and Indicators.

Table 3. Operator Panel Controls and Indicators.

INDEX	DESCRIPTION	TYPE	FUNCTION
1	POWER	Indicator	Illuminates when power is applied to operator panel.
2	SYSTEM OPERABLE	Indicator	Illuminates green when system is ready to operate.
3	ATTENTION REQUIRED	Indicator	Illuminates red when system requires attention.
4	SILENCE ALARM	Pushbutton Switch	Silences audible alarm.
5	ALARM	Audio	Sounds when a system attention or a fault occurs.
6	DISPLAY	Vacuum Fluorescent	Shows system status and listing of menu options.
7–10	MENU SELECTION	Pushbutton Switches	Used to select various menu options that appear on display.

HEATER CONTROLS AND INDICATORS

Figure 4 shows the location of the controls and indicators found on the heating system. Table 4 describes the use of these controls and indicators.

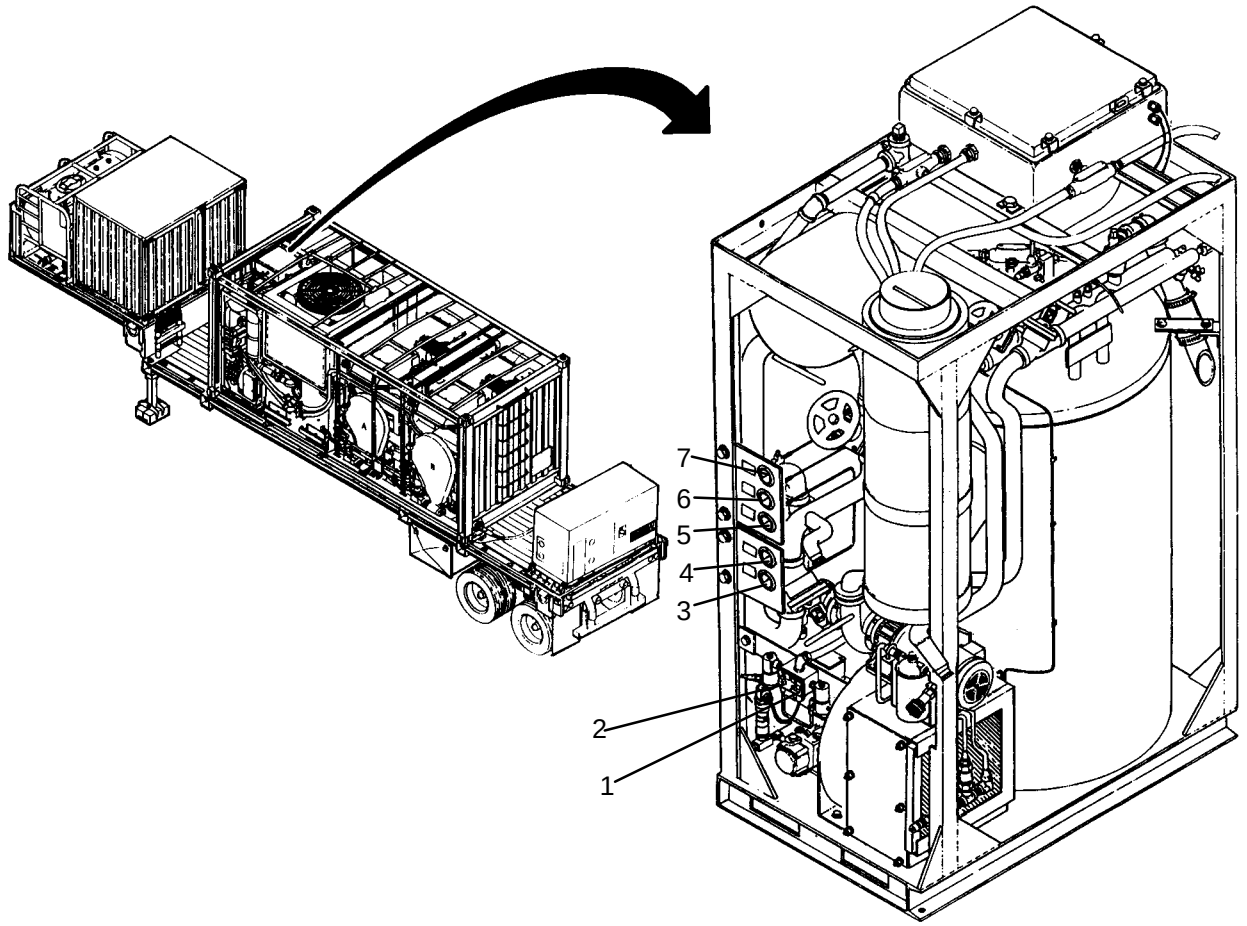

Figure 4. Location of Heating System Exterior Controls and Indicators.

Table 4. Heating System Exterior Controls and Indicators.

INDEX	DESCRIPTION	TYPE	FUNCTION
1	PRIME PUMP ON/OFF	Momentary Toggle Switch	Used to prime heater fuel system.
2	FP300 RESET	Pushbutton Switch	Used to reset heater flame programmer when a heating system related failure is displayed without opening heater enclosure.
3	FUEL PUMP PRESSURE (PI303)	Gage, 0–200 PSIG	Used to verify fuel pump is primed and proper fuel pressure is available to run heating system.
4	BURNER FUEL PRESSURE (PI304)	Gage, 0–200 PSIG	Used to verify fuel pressure is available to support heater ignition.
5	PUMP SUCTION (PI300)	Gage, VAC–60 PSIA	Used to verify thermal fluid pump suction (inlet) pressure during troubleshooting.
6	PUMP OUTLET (PI301)	Gage, 0–200 PSIG	Used to verify thermal fluid pump outlet (heater inlet) pressure during troubleshooting.
7	HEATER OUTLET (PI302)	Gage, 0–100 PSIG	Used to verify thermal fluid pressure at outlet of heating coils during troubleshooting.

HEATER ENCLOSURE CONTROLS AND INDICATORS – Continued

Figure 5 shows the location of the controls and indicators found on the heater enclosure. Table 5 describes the use of these controls and indicators.

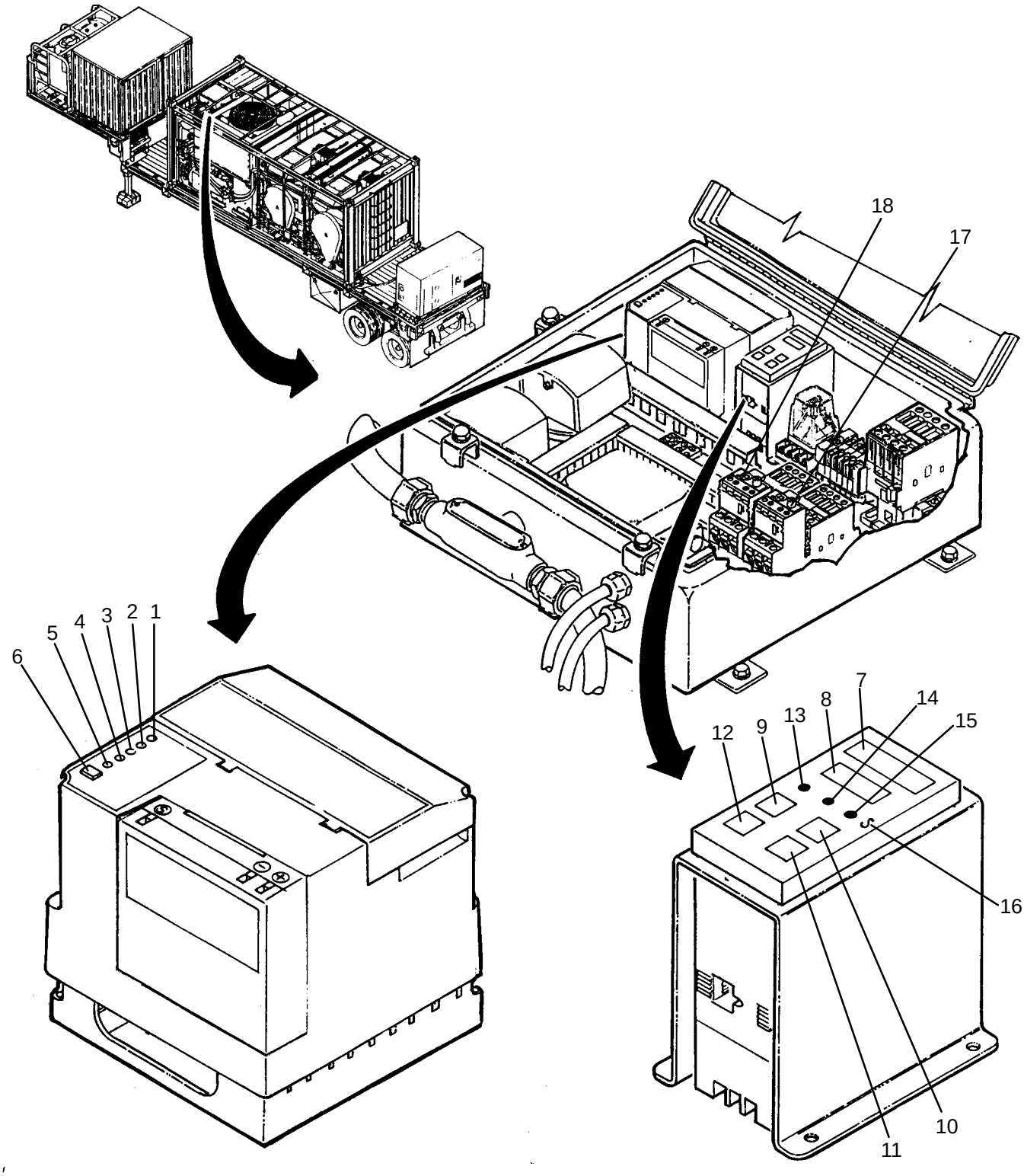

Figure 5. Location of Heater Enclosure Controls and Indicators.

HEATER ENCLOSURE CONTROLS AND INDICATORS – Continued

Table 5. Heater Enclosure Controls and Indicators.

INDEX	DESCRIPTION	TYPE	FUNCTION
1	POWER	Indicator	Illuminates green when flame programmer is controlling heater. Turns off if voltage input to flame programmer is not correct. Flashes when flame programmer has power but no call for heat.
2	PILOT	Indicator	Illuminates amber when flame programmer turns on burner blower, ignition and fuel valves.
3	FLAME	Indicator	Illuminates red when flame is verified.
4	MAIN	Indicator	Illuminates amber when combustion has been established.
5	ALARM	Indicator	Illuminates red when flame programmer or interlock failure occurs.
6	RESET KEY	Pushbutton Switch	Used to reset the flame programmer after a interlock alarm has been cleared.
7	UPPER DISPLAY	4 X1 Digital Display	Indicates thermal fluid temperature limit or function mode when adjusting limits.
8	LOWER DISPLAY	4 X1 Digital Display	Indicates actual thermal fluid temperature or function mode when adjusting limits.
9	RESET KEY	Key Pad	Used to reset the temperature limit switch after thermal fluid temperature is within limit.
10	SCROLL KEY	Key Pad	Changes function mode.
11	UP KEY	Key Pad	Increase temperature setpoint parameter.
12	DOWN KEY	Key Pad	Decrease temperature setpoint parameter.
13	OUT	Indicator	Illuminates red when the limit relay is de–energized.
14	EXCEED	Indicator	Illuminates red when temperature limit has been exceeded.
15	ALARM	Indicator	Illuminates red when a failure occurs.
16	S	Indicator	Illuminates red when SET–UP mode has been accessed.
17	OL301 RESET	Pushbutton Switch	Used to reset overload relay protecting burner blower (M301).
18	OL302 RESET	Pushbutton Switch	Used to reset overload relay protecting fuel pump blower (M302).

INVERTER ENCLOSURE CONTROLS AND INDICATORS

Figure 6 shows the location of the controls and indicators found in the inverter enclosure. Table 6 describes the use of these controls and indicators.

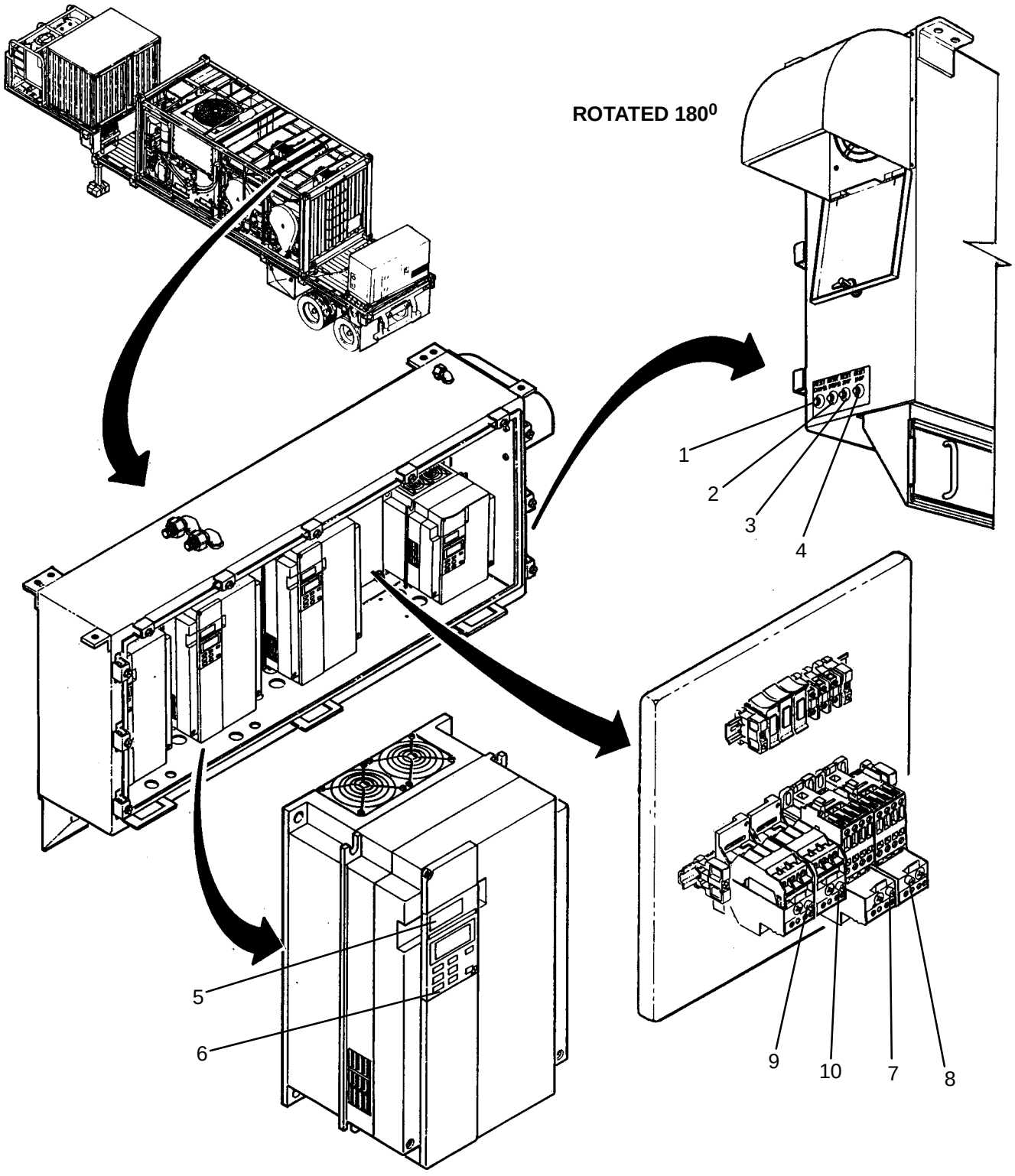

Figure 6. Location of Inverter Enclosure Controls and Indicators.

INVERTER ENCLOSURE CONTROLS AND INDICATORS – Continued

Table 6. Inverter Enclosure Controls and Indicators.

INDEX	DESCRIPTION	TYPE	FUNCTION
1	RESET DRUM A	Pushbutton Switch	Used to externally reset drum A inverter when a ”DRUM A INVERTER FAULT” is displayed.
2	RESET DRUM B	Pushbutton Switch	Used to externally reset drum B inverter when a ”DRUM B INVERTER FAULT” is displayed.
3	RESET 20 HP	Pushbutton Switch	Used to externally reset a 20 HP inverter when a ”20 HP INVERTER FAULT” is displayed.
4	RESET 10 HP	Pushbutton Switch	Used to externally reset a 10 HP inverter when a ”10 HP INVERTER FAULT” is displayed.
5	DIGITAL MONITOR	4 X 1 Digital Display	Indicates error messages for inverter and LADS electrical components.
6	RESET	Key	Used to reset inverter errors.
7	OL104A RESET	Pushbutton Switch	Used to reset overload relay protecting dryer blower A (M104A).
8	OL104B RESET	Pushbutton Switch	Used to reset overload relay protecting dryer blower B (M104B).
9	OL200 RESET	Pushbutton Switch	Used to reset overload relay protecting still condenser fan (M200).
10	OL300 RESET	Pushbutton Switch	Used to reset overload relay protecting thermal fluid pump (M300).

END OF WORK PACKAGE

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UNIT, DIRECT SUPPORT, AND GENERAL SUPPORT

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MAINTENANCE MENU OPERATION

ACCESSING MAINTENANCE MENU

NOTE

Prior to using the maintenance menu, control system power must be removed and the processor restarted. When leaving, maintenance menu normal system operation can be started without powering down.

1. Cycle CONTROL POWER switch (SW2) to OFF then back to ON.
2. Monitor display at operator panel A, it should read:

TESTING CONTROL SYSTEM WAIT	

then

	PRESS TO START

3. Press MENU SELECTION switches (PBS2A, 3A, and 4A) sequentially.
4. Monitor display, it should read:

MAINTENANCE MENU	EXAMINE INPUTS CONTROL OUTPUTS UTILITY OPTIONS RETURN

5. Press appropriate MENU SELECTION switch as follows:
   a. Select EXAMINE INPUTS to monitor level, pressure, or temperature parameters or status of discrete switching devices. Proceed to step **EXAMINING INPUTS**.
   b. Select CONTROL OUTPUTS to check operation of systems or individual components such as motors and valves. Proceed to step **CONTROLLING OUTPUTS**.
   c. Select UTILITY OPTIONS to perform calibrations or cool thermal fluid. Proceed to step **USING UTILITY OPTIONS**.
   d. Select RETURN to exit maintenance menu and return to normal operation.

EXAMINING INPUTS

NOTE

All analog and discrete inputs that can be monitored using this function are listed in Tables 1 and 2. These inputs can also be accessed while laundry operations are in progress using the EXAMINE INPUTS function on the WASH CYCLE menu (TM 10–3510–221–10).

1. Monitor display, it should read:

EXAMINE INPUTS	ANALOG INPUTS DISCRETE INPUTS RETURN

2. Press appropriate MENU SELECTION switch as follows:
   a. Select ANALOG INPUTS to monitor status of analog inputs. Proceed to step 3.
   b. Select DISCRETE INPUTS to monitor status of discrete inputs. Proceed to step 3.
   c. Select RETURN to exit examine inputs menu and return to **ACCESSING MAINTENANCE MENU**, step 5.
3. Monitor display, it should read:

ANALOG INPUTS LT100A=1.50 VDC= 0 GALS	PREVIOUS INPUT NEXT INPUT RETURN

or

DISCRETE INPUTS ZS100A = ON	PREVIOUS INPUT NEXT INPUT RETURN

4. Press appropriate MENU SELECTION switch as follows:
   a. Select PREVIOUS INPUT to monitor previous input.
   b. Select NEXT INPUT to monitor next input.
   c. Select RETURN to exit analog or discrete inputs menu and return to step 2.

TABLE 1. Analog Inputs Data.

SENSOR	FUNCTION	RANGE	VOLTAGE
LT100A	Wash Tank A Level	0–80 GALS	1.4 – 5.05 VDC
LT100B	Wash Tank B Level	0–80 GALS	1.4 – 5.05 VDC
LT101A	Rinse 1 Tank A Level	0–80 GALS	1.4 – 5.05 VDC
LT101B	Rinse 1 Tank B Level	0–80 GALS	1.4 – 5.05 VDC
LT102	Rinse 2 Tank Level	0–150 GALS	1.4 – 3.11 VDC
LT200	Still Level	0–15 INCHES	1.4 – 5.56 VDC
LT201	Standpipe Level	0–25 INCHES	1.4 – 8.27 VDC

EXAMINING INPUTS – Continued

TABLE 1. Analog Inputs Data – Continued.

SENSOR	FUNCTION	RANGE	VOLTAGE
PT200	Still Internal Pressure	0–5 PSIG	1.0 – 9.0 VDC
PT300	Thermal Fluid Pump Inlet Pressure	VACUUM – 15 PSIA	.90 – 5.9 VDC
PT301	Thermal Fluid Pump Outlet Pressure	0–100 PSIG	.90 – 5.9 VDC
PT302	Heater Thermal Fluid Outlet Pressure	0–100 PSIG	.90 – 5.9 VDC
PT500	Air Tank Storage Pressure	0–200 PSIG	.90 – 5.9 VDC
PT501	Product Air Pressure	0–200 PSIG	.90 – 5.9 VDC
TE100	Ambient Air	–58 – 212 Degrees F	0.5 – 9.0 VDC
TE101A	Dryer A Inlet Air Temperature	–58 – 392 Degrees F	0 .5– 9.0 VDC
TE101B	Dryer B Inlet Air Temperature	–58 – 392 Degrees F	0.5 – 9.0 VDC
TE102A	Dryer A Outlet Air Temperature	–58 – 392 Degrees F	0.5 – 9.0 VDC
TE102B	Dryer B Outlet Air Temperature	–58 – 392 Degrees F	0.5 – 9.0 VDC
TE103	Rinse 2 Tank Water Temperature	–58 – 212 Degrees F	0.5 – 9.0 VDC
TE200	Still Internal Temperature	–58 – 392 Degrees F	0 .5– 9.5 VDC
TE201	Still Condenser Outlet Water Temperature	–58 – 392 Degrees F	0.5 – 9.5 VDC
TE202	Rinse 2 Tank Inlet Water Temperature	–58 – 392 Degrees F	0.5 – 9.5 VDC
TE300	Heater Outlet Thermal Fluid Temperature	–58 – 482 Degrees F	0.5 – 9.5 VDC
VREFL	PCB1 Voltage Reference Lo	N/A	0.75–0.79 VDC
VREFH	PCB1 Voltage Reference Hi	N/A	9.20–9.25 VDC

TABLE 2. Discrete Inputs Data.

DEVICE	FUNCTION	STATUS
FP300	Flame Programmer Alarm Signal	OFF = Normal/ON = Fault Detected
K100A	Drum A Inverter Fault Signal	OFF = Normal/ON = Fault Detected
K100B	Drum B Inverter Fault Signal	OFF = Normal/ON = Fault Detected
K104	Dryer Blowers A and B Inverter Fault Signal	OFF = Normal/ON = Fault Detected
K200	Still Condenser Fan/Heating System Inverter Fault Signal	OFF = Normal/ON = Fault Detected
K500	Air Compressor Inverter Fault Signal	OFF = Normal/ON = Fault Detected
OL101A	Water Pump A Overload Relay Trip Detector	OFF = Normal/ON = Trip Detected
OL101B	Water Pump B Overload Relay Trip Detector	OFF = Normal/ON = Trip Detected
OL104A	Dryer Blower A Overload Relay Trip Detector	OFF = Normal/ON = Trip Detected
OL104B	Dryer Blower B Overload Relay Trip Detector	OFF = Normal/ON = Trip Detected
OL105	Water Supply Pump Overload Relay Trip Detector	OFF = Normal/ON = Trip Detected

EXAMINING INPUTS – Continued

TABLE 2. Discrete Inputs Data – Continued.

DEVICE	FUNCTION	STATUS
OL200	Still Condenser Fan Overload Relay Trip Detector	OFF = Normal/ON = Trip Detected
OL201	Distillate Pump Overload Relay Trip Detector	OFF = Normal/ON = Trip Detected
OL300	Thermal Fluid Pump Overload Relay Trip Detector	OFF = Normal/ON = Trip Detected
OL301	Burner Blower Overload Relay Trip Detector	OFF = Normal/ON = Trip Detected
OL302	Fuel Pump Overload Relay Trip Detector	OFF = Normal/ON = Trip Detected
PBS5A	Operator Panel A SILENCE ALARM Switch	OFF = Switch Released/ON = Switch Depressed
PBS5B	Operator Panel B SILENCE ALARM Switch	OFF = Switch Released/ON = Switch Depressed
PS302	Burner Fuel Pressure Switch	OFF = No or Low Fuel Pressure/ON = Normal Fuel Pressure
PS300	Burner Blower Inlet Air Pressure Switch	OFF = No or Low Air Pressure/ON = Normal Air Pressure
PS301	Burner Blower Outlet Air Pressure Switch	OFF = No or Low Air Pressure/ON = Normal Air Pressure
TS300	Thermal Fluid Temperature Limit Switch	OFF = Normal Temperature/ON = High Temperature
ZS100A	Drum Door A Position Switch	OFF= Door Open/ON= Door Closed
ZS100B	Drum Door B Position Switch	OFF= Door Open/ON= Door Closed
ZS101A	Drum Door Lock A Position Switch	OFF= Lock Retracted/ON= Lock Extended
ZS101B	Drum Door Lock B Position Switch	OFF= Lock Retracted/ON= Lock Extended
ZS102A	Drum A Rotation Sensor	OFF = Sheave Spoke Not Aligned/ ON = Sprocket Spoke Aligned
ZS102B	Drum B Rotation Sensor	OFF = Sheave Spoke Not Aligned/ ON = Sprocket Spoke Aligned
ZS103A	Drum A Balance Switch	OFF = Drum Balanced/ON = Drum Not Balanced
ZS103B	Drum B Balance Switch	OFF = Drum Balanced/ON = Drum Not Balanced
ZS200	Still Doors Position Switch	OFF= Door(s) Open/ON= Doors Closed

CONTROLLING OUTPUTS

NOTE

Operation of the air system and heating system can be checked using this function as well as operation of individual motors, valves, and other components listed in Tables 3, 4, and 5.

1. Monitor display, it should read:

CONTROL OUTPUTS	CONTROL MOTORS CONTROL VALVES CONTROL OTHERS RETURN

2. Press appropriate MENU SELECTION switch as follows:
   a. Select CONTROL MOTORS to operate individual motors and pumps. Proceed to step 3.
   b. Select CONTROL VALVES to operate individual air–actuated ball valves and solenoid valves. Proceed to step 7.
   c. Select CONTROL OTHERS to operate discrete outputs or test air system, heating system, or drum balancing. Proceed to step 11.
   d. Select RETURN to exit control outputs function and return to **ACCESSING MAINTENANCE MENU**, step 5**.**
3. Monitor display, it should read:

CONTROL MOTORS M100A TUMBLE= OFF	PREVIOUS MOTOR NEXT MOTOR START MOTOR RETURN

CAUTION

When using the maintenance menu to start any motor ensure motor is not already rotating. Starting a motor while it is rotating can cause an over voltage condition which can result in damage to the motor, inverter, or related circuitry.

Never start or run pumps dry. Prior to using maintenance menu to check operation of a pump make sure water is available at the pump inlet. Operating a pump dry can cause internal damage to pump.

NOTE

Drum motors M100A and B will not rotate if air system pressure is less than 65 psig even if MENU SELECTION switch to START MOTOR is pressed.

Drum motors M100A and B can be checked at tumble, distribute, low extract and high extract speeds by selecting the corresponding display in the maintenance menu.

Water pumps M101A and B can be checked while circulating water through the wash, rinse 1, or rinse 2 tanks by selecting the corresponding display in the maintenance menu.

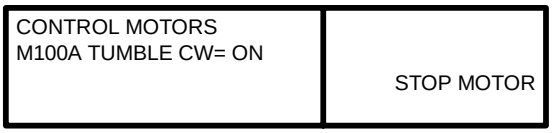
4. Press appropriate MENU SELECTION switch (refer to Table 3) as follows:
   a. Select PREVIOUS MOTOR to toggle to previous motor.
   b. Select NEXT MOTOR to toggle to next motor.
   c. Select START MOTOR to start displayed motor.
   d. Select RETURN to exit control motors menu and return to step 2.

CONTROLLING OUTPUTS – Continued

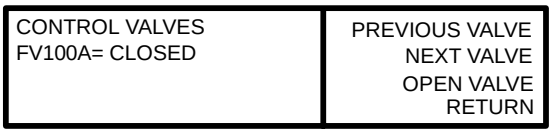
TABLE 3. Motor Data.

MOTOR	FUNCTION	CONTROL DEVICES	PROTECTION DEVICES
M100A	Drum A Rotation	K100A	K100A/CB3
M100B	Drum B Rotation	K100B	K100B/CB4
M101A	Water Pump A	MC101A	OL101A/CB5
M101B	Water Pump B	MC101B	OL101B/CB5
M104A	Dryer Blower A	K104/MC104A	OL/104A/K104/CB2
M104B	Dryer Blower B	K104/ MC104B	OL104B/K104/ CB2
M105	Water Supply Pump	MC105	OL105/CB5
M106A	Drum Motor A Fan	SW1	F4–6/CB2
M106B	Drum Motor B Fan	SW1	F4–6/CB2
M107	Inverter Enclosure Fan	SW1	F5–6/CB2
M200	Still Condenser Fan	K200	OL200/K200/CB1
M201	Distillate Pump	MC201	OL201/CB6
M300	Thermal Fluid Pump	K200	OL300/K200/CB1
M301	Burner Blower	K200/MC301	OL301/K200/CB1
M302	Fuel Pump	K200/MC301	OL302/K200/CB1
M500	Air Compressor	K500	CB6

5. Monitor display, it should read:



6. After operational check is completed press MENU SELECTION switch to stop motor operation. Return to step 4.
7. Monitor display, it should read:



8. Press appropriate MENU SELECTION switch (refer to Table 4) as follows:
   a. Select PREVIOUS VALVE to toggle to previous valve.
   b. Select NEXT VALVE to toggle to next valve.
   c. Select OPEN VALVE to open displayed valve.
   d. Select RETURN to exit control valves menu and return to step 2.

CONTROLLING OUTPUTS – Continued

TABLE 4. Valve Data.

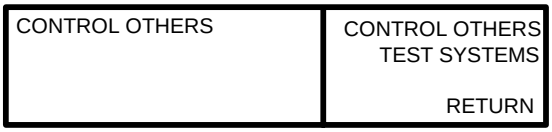
VALVE	FUNCTION	VALVE TYPE	PILOT CONTROL
FV100A	Wash Tank A Inlet	Air Actuated Ball Valve	SV100A
FV100B	Wash Tank B Inlet	Air Actuated Ball Valve	SV100B
FV101A	Wash Tank A Outlet	Air Actuated Ball Valve	SV101A
FV101B	Wash Tank B Outlet	Air Actuated Ball Valve	SV101B
FV102A	Rinse 1 Tank A Inlet	Air Actuated Ball Valve	SV102A
FV102B	Rinse 1 Tank B Inlet	Air Actuated Ball Valve	SV102B
FV103A	Rinse 1 Tank A Outlet	Air Actuated Ball Valve	SV103A
FV103B	Rinse 1 Tank B Outlet	Air Actuated Ball Valve	SV103A
FV104A	Rinse 2 Tank Inlet A	Air Actuated Ball Valve	SV104A
FV104B	Rinse 2 Tank Inlet B	Air Actuated Ball Valve	SV104B
FV105A	Rinse 2 Tank Outlet A	Air Actuated Ball Valve	SV105A
FV105B	Rinse 2 Tank Outlet B	Air Actuated Ball Valve	SV105B
FV106A	Drum A Inlet	Air Actuated Ball Valve	SV106A
FV106B	Drum B Inlet	Air Actuated Ball Valve	SV106B
FV107A	Drum A Outlet	Air Actuated Ball Valve	SV107A
FV107B	Drum B Outlet	Air Actuated Ball Valve	SV107B
FV108A	System A Water Supply Inlet	Air Actuated Ball Valve	SV108A
FV108B	System B Water Supply Inlet	Air Actuated Ball Valve	SV108B
FV109A	Still Inlet From System A	Air Actuated Ball Valve	SV109A
FV109B	Still Inlet From System B	Air Actuated Ball Valve	SV109B
FV114A	System A Steam Eductor Bypass	Air Actuated Ball Valve	SV114A
FV114B	System B Steam Eductor Bypass	Air Actuated Ball Valve	SV114B
FV115A	Steam Eductor A Steam Inlet	Air Actuated Ball Valve	SV114A
FV115B	Steam Eductor B Steam Inlet	Air Actuated Ball Valve	SV114B
FV200	Subcooler Bypass	Direct Acting Solenoid Valve	N/A
FV201	Subcooler Inlet	Direct Acting Solenoid Valve	N/A
FV500	Air Pressure Dump	Direct Acting Solenoid Valve	N/A

9. Monitor display, it should read:

10. After operational check is completed press MENU SELECTION switch to close valve. Return to step 8.

CONTROLLING OUTPUTS – Continued

11. Monitor display, it should read:



12. Press appropriate MENU SELECTION switch as follows:
    a. Select CONTROL OTHERS to control discrete outputs. Proceed to step 13.
    b. Select TEST SYSTEMS to test air system, heating system, or drum balancing. Proceed to step 17.
    c. Select RETURN to exit control others menu and return to step 2.
13. Monitor display, it should read:

14. Press appropriate MENU SELECTION switch (refer to Table 5) as follows:
    a. Select PREVIOUS OUTPUT to toggle to previous device.
    b. Select NEXT OUTPUT to toggle to next device.
    c. Select OUTPUT ON to turn on displayed device.
    d. Select RETURN to exit control discrete outputs menu and return to step 12.

TABLE 5. Other Component Data.

DEVICE	FUNCTION	DEVICE TYPE	PILOT CONTROL
AL1A	Operator Panel A Alarm	Audible Buzzer	N/A
AL1B	Operator Panel B Alarm	Audible Buzzer	N/A
DN100A	Drum Door A Lock	Air Cylinder	SV115A
DN100B	Drum Door B Lock	Air Cylinder	SV115B
DN200	Still Door Locks	Air Cylinders	SV200
DS4A	Operator Panel A SYSTEM OPERABLE Indicator	Incandescent Lamp	N/A
DS4B	Operator Panel B SYSTEM OPERABLE Indicator	Incandescent Lamp	N/A
DS5A	Operator Panel A ATTENTION REQUIRED Indicator	Incandescent Lamp	N/A
DS5B	Operator Panel B ATTENTION REQUIRED Indicator	Incandescent Lamp	N/A
FV110A	Dryer A Outlet Damper	Air Cylinder	SV110A
FV110B	Dryer B Outlet Damper	Air Cylinder	SV110B
FV111A	Dryer A Inlet Damper	Air Cylinder	SV111A
FV111B	Dryer B Inlet Damper	Air Cylinder	SV111B
FV113A	Drum A Brake Intensifier	Air Cylinder	SV113A
FV113B	Drum B Brake Intensifier	Air Cylinder	SV113B

CONTROLLING OUTPUTS – Continued

15. Monitor display, it should read:

CONTROL OTHERS DN100A= ON	OUTPUT OFF

16. After operational check is completed press MENU SELECTION switch to turn off device. Return to step 14.
17. Monitor display, it should read:

TEST SYSTEMS	START HEATING SYS START AIR SYSTEM TEST DRUM BALANC RETURN

18. Press appropriate MENU SELECTION switch as follows:
    a. Select START HEATING SYS to test heating system.
    b. Select START AIR SYSTEM to test air system.
    c. Select TEST DRUM BALANC to test balancing of drum A or B. Proceed to step 21.
    d. Select RETURN to exit test systems menu and return to step 12.
19. Monitor display, it should read:

HEATING SYSTEM ON TE300 XXX F PT300 X PSI PT301 XX PSI PT302 XX PSI	STOP HEATING SYS

or

AIR SYSTEM ON PT500 = XXX PSIG PT501 = XX PSIG	STOP AIR SYSTEM

20. After operational check is completed press MENU SELECTION switch to turn off air or heating system. Return to step 18.
21. Monitor display, it should read:

DRUM BALANCE TESTS	BAL TEST DRUM A BAL TEST DRUM B RETURN

CONTROLLING OUTPUTS – Continued

NOTE

The balance testing will not operate if air system pressure is less than 65 PSIG even if MENU SELECTION switch to TEST DRUM BALANCE is pressed.

Drum balance test will automatically stop if the drum balance switch (ZS103) is actuated when the drum is rotating.

22. Press appropriate MENU SELECTION switch as follows:
    a. Select BAL TEST DRUM A to test drum A balancing.
    b. Select BAL TEST DRUM B to test drum B balancing.
    c. Select RETURN to balance test menu and return to step 18.
23. Monitor display, it should read:

DRUM A BALANCE TESTING	STOP BALANC TEST

24. After operational check is completed press MENU SELECTION switch to stop test. Return to step 18.

UTILITY OPTIONS

1. Monitor display, it should read:

UTILITY OPTIONS	CALIBRATIONS COOL THRML FLUID RETURN

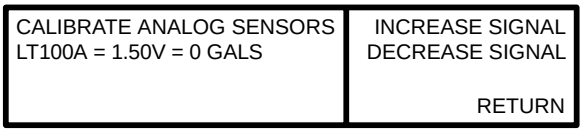
2. Press appropriate MENU SELECTION switch as follows:
    a. Select CALIBRATIONS to calibrate level, pressure, and temperature sensors. Proceed to step 3.
    b. Select COOL THRML FLUID to cool the thermal fluid system. Proceed to step 7.
    c. Select RETURN to exit utility options and return to **ACCESSING MAINTENANCE MENU**, step 5**.**
3. Monitor display, it should read:

CALIBRATE ANALOG SENSORS LT100A = 1.50V = 0 GALS	PREVIOUS SENSOR NEXT SENSOR CALIBRATE SENSOR RETURN

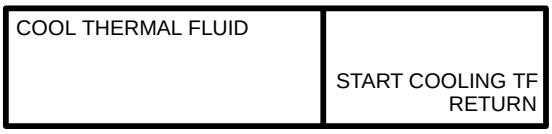
4. Press appropriate MENU SELECTION switch as follows:
    a. Select PREVIOUS SENSOR to toggle to previous sensor.
    b. Select NEXT SENSOR to toggle to next sensor.
    c. Select CALIBRATE SENSOR to perform calibration of displayed sensor. Proceed to step 5.
    d. Select RETURN to exit calibrate analog sensors menu and return to step 1.

UTILITY OPTIONS – Continued

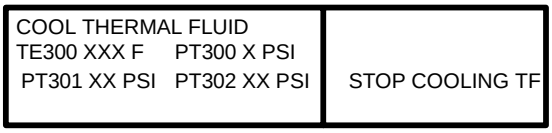
5. Monitor display, it should read:



6. Press appropriate MENU SELECTION switch as follows:
   a. Select INCREASE SIGNAL to increase displayed parameter.
   b. Select DECREASE SIGNAL to decrease displayed parameter.
   c. Select RETURN to accept changed parameters. Return to step 4.
7. Monitor display, it should read:



8. Press appropriate MENU SELECTION switch as follows:
   a. Select START COOLING TF to start thermal fluid system cooling.
   b. Select RETURN to exit cooling thermal fluid menu. Return to step 4.
9. Monitor display, it should read:



10. Wait for thermal fluid to reach desired temperature then press appropriate MENU SELECTION switch to stop cooling operation. Return to step 8.

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UNIT, DIRECT SUPPORT, AND GENERAL SUPPORT

LAUNDRY ADVANCED SYSTEM

(NSN 3510–01–463–0114)

OPERATIONAL CHECKOUT AND TROUBLESHOOTING PROCEDURES
TROUBLESHOOTING AIDS AND SUPPLEMENTARY DATA

SOLID–STATE RELAY BOARDS

There are four solid–state relay boards (SSR PCB3 through SSR PCB6) used on the LADS. These boards (1) are located in the main control enclosure (2). Light emitting diodes (LEDs) (3) are located next to the solid–state relays (SSRs) (4) mounted on each board. These LEDs will turn on when a control signal is applied to the SSR and will turn off when the control signal is removed. Knowing the status of the LED will help determine if the problem is caused by an electronic circuit failure versus an electrical circuit failure. Table 1 provides a listing of the SSRs on each board, showing the SSR's position, function, input voltage, and output voltage.

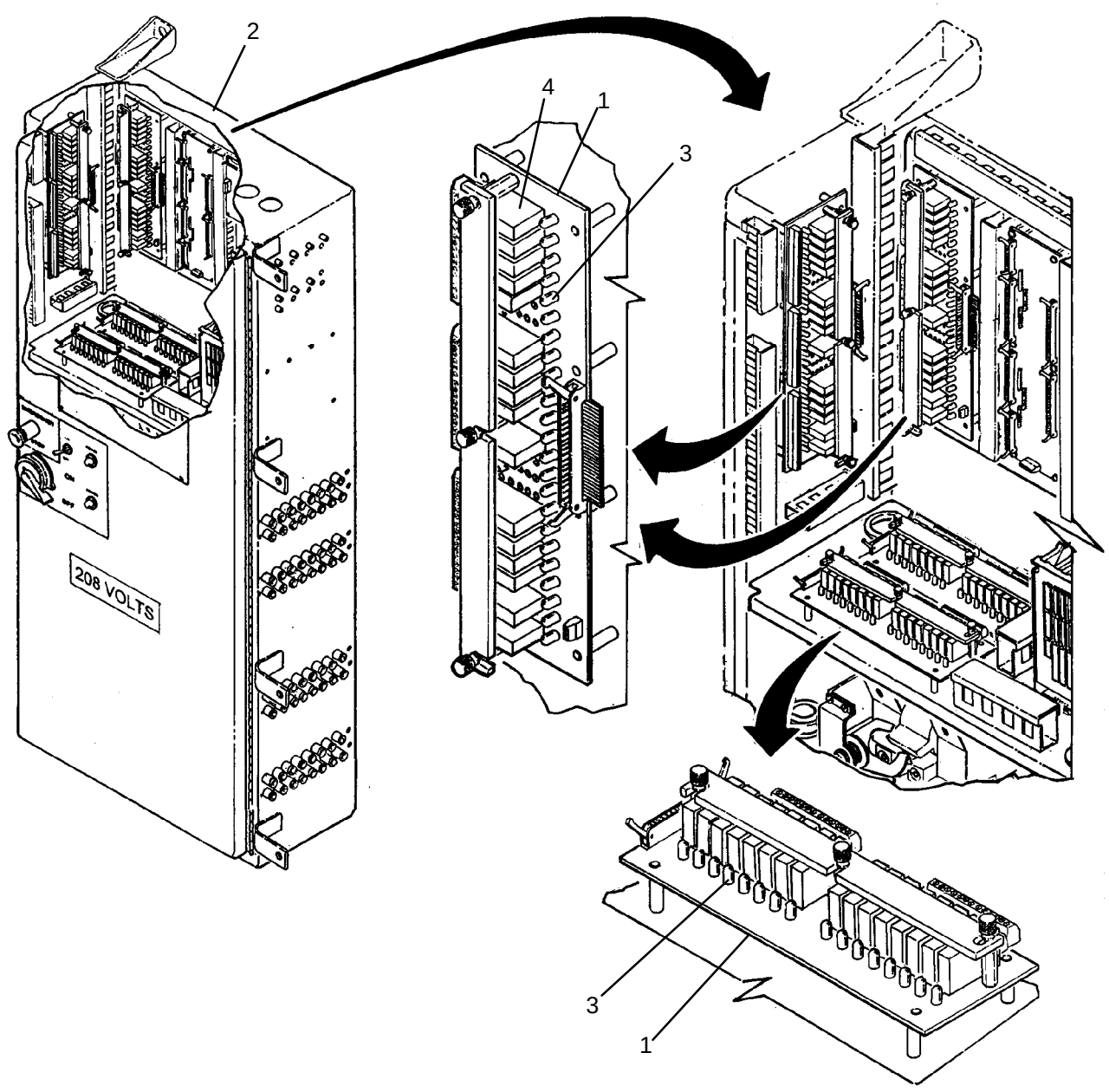

Figure 1. Solid–State Relay Board Troubleshooting Aids.

TABLE 1. Solid–State Relay Data.

PCB#	POSITION	FUNCTION	INPUT VOLTAGE	OUTPUT VOLTAGE
3	0	Spare	N/A	N/A
	1	Water Supply Pump Relay (MC105)	+5 VDC	110 VAC
	2	Heater Control Relay (CR300)	+5 VDC	110 VAC
	3	Spare	+5 VDC	110 VAC
	4	Air Pressure Dump Valve (FV500)	+5 VDC	110 VAC
	5	Distillate Pump Relay (MC201)	+5 VDC	110 VAC
	6	Flame Programmer (FP300) Alarm	110 VAC	+5 VDC
	7	Burner Blower Outlet Pressure Switch (PS301)	110 VAC	+5 VDC
	8	Burner Blower Inlet Pressure Switch (PS300)	110 VAC	+5 VDC
	9	Thermal Fluid Temperature Limit Switch (TS300)	110 VAC	+5 VDC
	10	Burner Fuel Pressure Switch (PS302)	110 VAC	+5 VDC
	11	Subcooler Bypass Solenoid Valve (FV200)	+5 VDC	110 VAC
	12	Dryer Blower B Motor Contactor (MC104B)	+5 VDC	110 VAC
	13	Spare	N/A	N/A
	14	Spare	N/A	N/A
	15	Water Pump B Contactor (MC101B)	+5 VDC	110 VAC
	16	Spare	N/A	N/A
	17	Spare	N/A	N/A
	18	Spare	N/A	N/A
	19	Subcooler Inlet Solenoid Valve (FV201)	+5 VDC	110 VAC
	20	Dryer Blower A Motor Contactor (MC104A)	+5 VDC	110 VAC
	21	Spare	N/A	N/A
	22	Spare	N/A	N/A
	23	Water Pump A Contactor (MC101A)	+5 VDC	110 VAC
4	0	Operator Panel B ATTENTION REQUIRED Indicator (DS5B)	+5 VDC	+12 VDC
	1	Operator Panel B SYSTEM OPERABLE Indicator (DS4B)	+5 VDC	+12 VDC
	2	Operator Panel B Audible Alarm (AL1B)	+5 VDC	+12 VDC
	3	Operator Panel A ATTENTION REQUIRED Indicator (DS5A)	+5 VDC	+12 VDC
	4	Operator Panel A SYSTEM OPERABLE Indicator (DS4A)	+5 VDC	+12 VDC
	5	Operator Panel A Audible Alarm (AL1A)	+5 VDC	+12 VDC
	6	Inverter Drive (K200) Forward Command	+5 VDC	+20 VDC
	7	Inverter Drive (K104) Forward Command	+5 VDC	+20 VDC
	8	Inverter Drive (K100B) Reverse Command	+5 VDC	+20 VDC
	9	Inverter Drive (K100B) Forward Command	+5 VDC	+20 VDC
	10	Inverter Drive (K100B) Speed 1 Command	+5 VDC	+20VDC

TABLE 1. Solid–State Relay Data – Continued.

PCB#	POSITION	FUNCTION	INPUT VOLTAGE	OUTPUT VOLTAGE
4	11	Inverter Drive (K100B) Speed 2 Command	+5 VDC	+20 VDC
	12	Inverter Drive (K100B) Speed 3 Command	+5 VDC	+20 VDC
	13	Inverter Drive (K100B) Ramp Time 1 Command	+5 VDC	+20 VDC
	14	Inverter Drive (K100B) Ramp Time 2 Command	+5 VDC	+20 VDC
	15	Spare	N/A	N/A
	16	Inverter Drive (K100A) Reverse Command	+5 VDC	+20 VDC
	17	Inverter Drive (K100A) Forward Command	+5 VDC	+20 VDC
	18	Inverter Drive (K100A) Speed 1 Command	+5 VDC	+20 VDC
	19	Inverter Drive (K100A) Speed 2 Command	+5 VDC	+20 VDC
	20	Inverter Drive (K100A) Speed 3 Command	+5 VDC	+20 VDC
	21	Inverter Drive (K100A) Ramp Time 1 Command	+5 VDC	+20 VDC
	22	Inverter Drive (K100A) Ramp Time 2 Command	+5 VDC	+20 VDC
	23	Inverter Drive (K500) Forward Command	+5 VDC	+20 VDC
5	0	Wash Tank B Inlet Valve (FV100B) Solenoid Valve (SV100B)	+5 VDC	+12 VDC
	1	Wash Tank B Outlet Valve (FV101B) Solenoid Valve (SV101B)	+5 VDC	+12 VDC
	2	Rinse 1 Tank B Inlet Valve (FV102B) Solenoid Valve (SV102B)	+5 VDC	+12 VDC
	3	Rinse 1 Tank B Outlet Valve (FV103B) Solenoid Valve (SV103B)	+5 VDC	+12 VDC
	4	Rinse 2 Tank B Inlet Valve (FV104B) Solenoid Valve (SV104B)	+5 VDC	+12 VDC
	5	Rinse 2 Tank B Outlet Valve (FV105B) Solenoid Valve (SV105B)	+5 VDC	+12 VDC
	6	Drum B Inlet Valve (FV106B) Solenoid Valve (SV106B)	+5 VDC	+12 VDC
	7	Drum B Outlet Valve (FV107B) Solenoid Valve (SV107B)	+5 VDC	+12 VDC
	8	Supply Water B Inlet Valve (FV108B) Solenoid Valve (SV108B)	+5 VDC	+12 VDC
	9	Still Inlet Valve (FV109B) Solenoid Valve (SV109B)	+5 VDC	+12 VDC
	10	Dryer B Outlet Damper (FV110B) Solenoid Valve (SV110B)	+5 VDC	+12 VDC
	11	Dryer B Inlet Damper (FV111B) Solenoid Valve (SV111B)	+5 VDC	+12 VDC
	12	Drum B Brake Thruster (FV113B) Solenoid Valve (SV113B)	+5 VDC	+12 VDC
	13	Eductor Bypass Valve (FV114B)/Steam Inlet Valve (FV115B) Solenoid Valve (SV114B)	+5 VDC	+12 VDC
	14	Drum B Door Lock (DN100B) Solenoid Valve (SV115B)	+5 VDC	+12 VDC
	15	Spare	N/A	N/A

TABLE 1. Solid–State Relay Data – Continued.

PCB#	POSITION	FUNCTION	INPUT VOLTAGE	OUTPUT VOLTAGE
6	0	Wash Tank A Inlet Valve (FV100A) Solenoid Valve (SV100A)	+5 VDC	+12 VDC
	1	Wash Tank A Outlet Valve (FV101A) Solenoid Valve (SV101A)	+5 VDC	+12 VDC
	2	Rinse 1 Tank A Inlet Valve (FV102A) Solenoid Valve (SV102A)	+5 VDC	+12 VDC
	3	Rinse 1 Tank A Outlet Valve (FV103A) Solenoid Valve (SV103A)	+5 VDC	+12 VDC
	4	Rinse 2 Tank A Inlet Valve (FV104A) Solenoid Valve (SV104A)	+5 VDC	+12 VDC
	5	Rinse 2 Tank A Outlet Valve (FV105A) Solenoid Valve (SV105A)	+5 VDC	+12 VDC
	6	Drum A Inlet Valve (FV106A) Solenoid Valve (SV106A)	+5 VDC	+12 VDC
	7	Drum A Outlet Valve (FV107A) Solenoid Valve (SV107A)	+5 VDC	+12 VDC
	8	Supply Water A Inlet Valve (FV108A) Solenoid Valve (SV108A)	+5 VDC	+12 VDC
	9	Still Inlet Valve (FV109A) Solenoid Valve (SV109A)	+5 VDC	+12 VDC
	10	Dryer A Outlet Damper (FV110A) Solenoid Valve (SV110A)	+5 VDC	+12 VDC
	11	Dryer A Inlet Damper (FV111A) Solenoid Valve (SV111A)	+5 VDC	+12 VDC
	12	Drum A Brake Thruster (FV113A) Solenoid Valve (SV113A)	+5 VDC	+12 VDC
	13	Eductor Bypass Valve (FV114A)/Steam Inlet Valve (FV115A) Solenoid Valve (SV114A)	+5 VDC	+12 VDC
	14	Drum A Door Lock (DN100A) Solenoid Valve (SV115A)	+5 VDC	+12 VDC
	15	Still Door Locks (DN200) Solenoid Valve (SV200)	+5 VDC	+12 VDC

SOLENOID VALVE MANIFOLDS

There are four solenoid manifolds (1) located in the main control enclosure (2). Each manifold has eight solenoid valves (3) that are used to control air flow to and from the air driven components (i.e., air–actuated ball valves, brake intensifiers, damper air cylinders, and door lock air cylinders). Each solenoid valve has an LED (4). The LED will turn on when power is applied to the solenoid valve and will turn off when power is removed. Knowing the status of the LED will help determine if the problem is caused by an electrical circuit failure or an air system failure. In addition, each solenoid valve contains a manual operator (5). When the manual operator is pressed the air driven component will actuate provided air pressure is available. Using the manual operator will help determine if the problem is caused by the solenoid valve or by the air driven component.

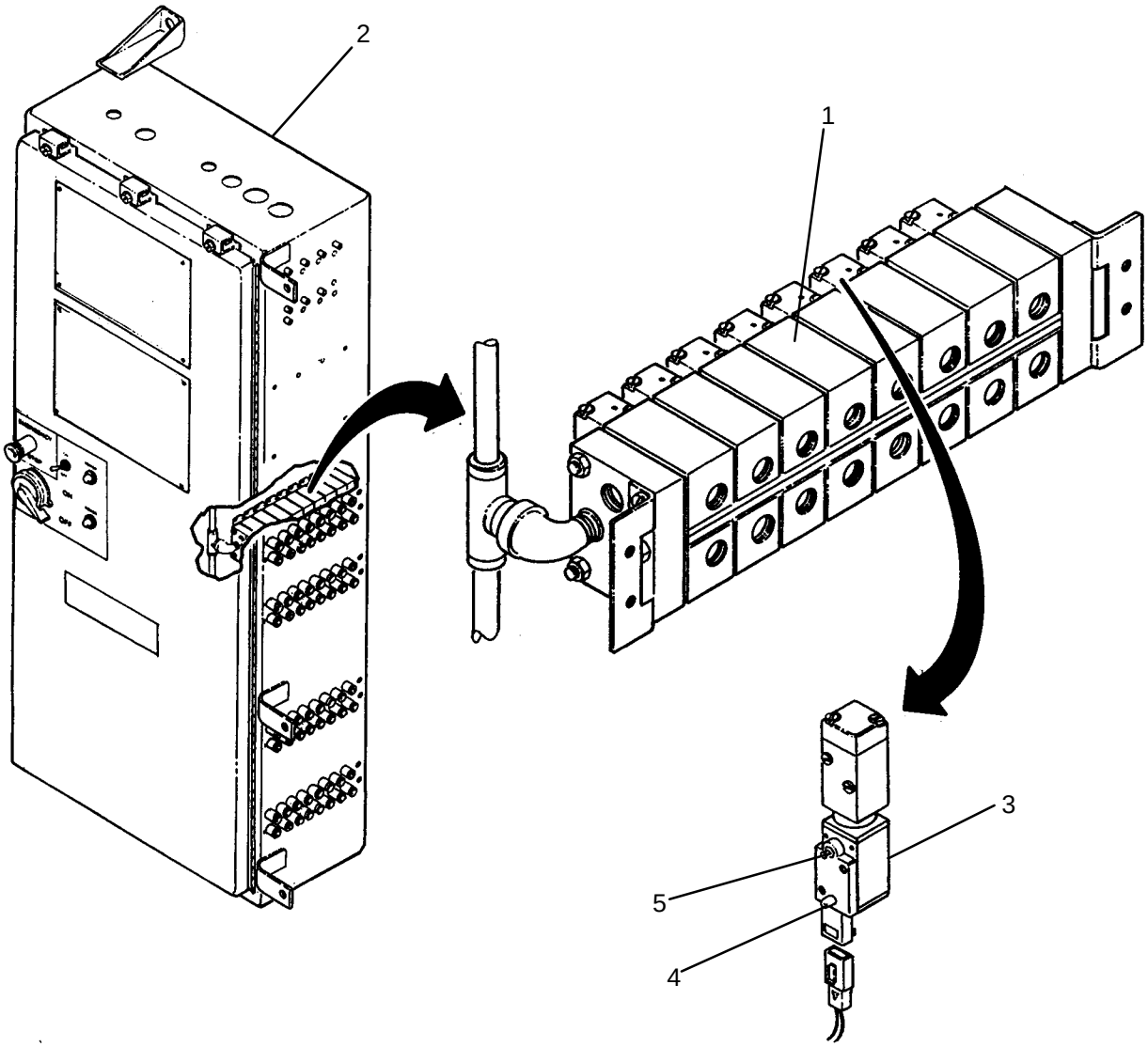

Figure 2. Solenoid Manifold Troubleshooting Aids.

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UNIT, DIRECT SUPPORT, AND GENERAL SUPPORT

LAUNDRY ADVANCED SYSTEM

(NSN 3510–01–463–0114)

OPERATIONAL CHECKOUT AND TROUBLESHOOTING PROCEDURES
TROUBLESHOOTING INDEX

Malfunction/Symptom	Troubleshooting Procedure
WASHING/DRYING SYSTEM (Display Warnings) – Continued	
24. R1 Tank A Not Emptying	WP 0036 00
25. R1 Tank A Not Filling	WP 0037 00
26. R1 Tank B Not Emptying	WP 0036 00
27. R1 Tank B Not Filling	WP 0037 00
28. R2 Tank Not Emptying	WP 0036 00
29. R2 Tank Not Filling	WP 0032 00
30. R2 Water Temperature Hi	WP 0040 00
31. R2 Water Temperature Lo	WP 0041 00
32. Stall Sensing Fault	WP 0024 00
33. TE100 Failure	WP 0035 00
34. TE101A Failure	WP 0035 00
35. TE101B Failure	WP 0035 00
36. TE102A Failure	WP 0035 00
37. TE102B Failure	WP 0035 00
38. TE103 Failure	WP 0035 00
39. Wash Tank A Not Emptying	WP 0036 00
40. Wash Tank A Not Filling	WP 0037 00
41. Wash Tank B Not Emptying	WP 0036 00
42. Wash Tank B Not Filling	WP 0037 00
43. Water Pump A Overload	WP 0038 00
44. Water Pump B Overload	WP 0038 00
45. Water Supply Pump Overload	WP 0039 00
WASHING/DRYING SYSTEM (Observed Faults)	
1. Drum Brake Stays On During Rotation	WP 0023 00
2. Drum Door Will Not Open	WP 0042 00
3. Drum Motor Cooling Fan Does Not Turn On	WP 0043 00
4. Drum Shaking Excessively	WP 0027 00
5. Dryer Blower Does Not Turn On	WP 0046 00
6. Laundry Cycle Cannot Be Started	WP 0029 00
7. Laundry Cycle Stuck in Washing Step	WP 0029 00
8. Laundry Not Drying	WP 0031 00
9. R2 Tank Not Heating	WP 0051 00
10. Typical Water Control Valve Not Opening/Closing	WP 0047 00

Malfunction/Symptom	Troubleshooting Procedure
WASHING/DRYING SYSTEM (Observed Faults) – Continued	
11. Water Not Draining From Drum	WP 0044 00
12. Water Over–Flowing from Wash, Rinse 1, or Rinse 2 Tank	WP 0037 00
13. Water Pump Does Not Turn On	WP 0048 00
14. Water Spraying From Dryer Blower	WP 0049 00
15. Water Supply Pump Does Not Turn On	WP 0050 00
16. Water Visible at Rear Seal of Drum	WP 0045 00
WATER RECYCLE SYSTEM (Display Warnings)	
1. Condensate Temp Hi	WP 0052 00
2. Condensate Temp Lo	WP 0053 00
3. Condenser Fan Overload	WP 0054 00
4. Distillate Pump Overload	WP 0055 00
5. LT200 Failure	WP 0033 00
6. LT201 Failure	WP 0033 00
7. PT200 Failure	WP 0033 00
8. Standpipe Level Lo	WP 0057 00
9. Standpipe Not Emptying	WP 0058 00
10. Still Door(s) Open	WP 0059 00
11. Still Not Boiling Down	WP 0062 00
12. Still Not Filling	WP 0063 00
13. Still Press Hi	WP 0052 00
14. Still Press Lo	WP 0060 00
15. Still Temp Lo	WP 0061 00
16. TE200 Failure	WP 0035 00
17. TE201 Failure	WP 0035 00
18. TE202 Failure	WP 0035 00
WATER RECYCLE SYSTEM (Observed Faults)	
1. Cooldown or Drain Cycle Will Not Finish	WP 0062 00
2. Condenser Fan Does Not Turn On	WP 0064 00
3. Distillate Pump Does Not Turn On	WP 0065 00
4. Recycled Water Temperature High	WP 0056 00
5. Still Door(s) Will Not Lock	WP 0066 00
6. Still Door(s) Will Not Unlock	WP 0067 00

Malfunction/Symptom	Troubleshooting Procedure
HEATING SYSTEM (Display Warnings)	
1. Burner Blower In Press Lo	WP 0068 00
2. Burner Blower Out Press Lo	WP 0069 00
3. Burner Blower Overload	WP 0070 00
4. Fuel Level Lo	WP 0071 00
5. Fuel Pressure Lo	WP 0071 00
6. Fuel Pump Overload	WP 0084 00
7. Heating System Failure	WP 0072 00
8. PT300 Failure	WP 0034 00
9. PT301 Failure	WP 0034 00
10. PT302 Failure	WP 0034 00
11. TE300 Failure	WP 0035 00
12. TF Flow Lo	WP 0074 00
13. TF Pump Inlet Pressure Lo	WP 0075 00
14. TF Pump Outlet Pressure Hi	WP 0076 00
15. TF Pump Outlet Pressure Lo	WP 0077 00
16. TF Pump Overload	WP 0078 00
17. TF Temp Hi	WP 0079 00
18. TF Temp Hi Limit	WP 0080 00
19. TF Temp Lo	WP 0081 00
HEATING SYSTEM (Observed Faults)	
1. Burner Blower Does Not Turn On	WP 0082 00
2. Flame Programmer Does Not Reset When FP300 RESET Switch Is Pressed	WP 0073 00
3. Fuel Pump Does Not Turn On	WP 0071 00
4. Fuel System Will Not Prime	WP 0071 00
5. Heater Does Not Turn On	WP 0072 00
6. Heater Smoking	WP 0083 00
7. TF Pump Does Not Turn On	WP 0085 00
AIR SYSTEM (Display Warnings)	
1. Air Product Press Hi	WP 0088 00
2. Air Product Press Lo	WP 0089 00
3. Air Tank Not Pressurizing	WP 0086 00
4. Air Tank Press Hi	WP 0087 00
5. PT500 Failure	WP 0034 00
6. PT501 Failure	WP 0034 00

Malfunction/Symptom	Troubleshooting Procedure
AIR SYSTEM (Observed Faults)	
1. Air Compressor Cycles Frequently	WP 0089 00
2. Air Compressor Does Not Turn On	WP 0090 00
3. Water In Air Lines	WP 0091 00
CONTROL SYSTEM (Display Warnings)	
1. CPU Test Failure	WP 0092 00
2. Drum A Inverter Fault	WP 0093 00
3. Drum B Inverter Fault	WP 0093 00
4. Emergency Stop Activated	WP 0094 00
5. PCB3 SSR7 Fault	WP 0103 00
6. PCB3 SSR8 Fault	WP 0103 00
7. PCB3 SSR9 Fault	WP 0103 00
8. RAM Test Failure	WP 0092 00
9. ROM Test Failure	WP 0092 00
10. VREF(S) Out Of Range	WP 0095 00
11. 10 HP Inverter Fault	WP 0096 00
12. 20 HP Inverter Fault	WP 0097 00
13. Air Compressor Inverter Fault	WP 0098 00
CONTROL SYSTEM (Observed Faults)	
1. Inverter Enclosure Fan Does Not Turn On	WP 0099 00
2. No +12 VDC Power Available	WP 0100 00
3. No +/–12 VDC Power Available	WP 0101 00
4. No +5 VDC Power Available	WP 0102 00
5. Typical AC Input Signal Fault	WP 0103 00
6. Typical AC Output Signal Fault	WP 0104 00
7. Typical Analog Input Signal Fault	WP 0105 00
8. Typical DC Output Signal Fault	WP 0106 00
9. Typical Discrete Input Signal Fault	WP 0107 00
10. Typical Inverter Does Not Reset When RESET Switch Is Pressed Fault	WP 0108 00
AUXILIARY EQUIPMENT (Observed Faults)	
1. Power is Not Available at Auxiliary Receptacle	WP 0109 00
2. GFCI Outlet Fails To Test Or Reset	WP 0109 00

END OF WORK PACKAGE

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UNIT, DIRECT SUPPORT, AND GENERAL SUPPORT

LAUNDRY ADVANCED SYSTEM

(NSN 3510–01–463–0114)

OPERATIONAL CHECKOUT AND TROUBLESHOOTING PROCEDURES CONTROL POWER LAMP (DS2) IS NOT ON WITH SW2 AT ON POSITION

INITIAL SETUP:

Tools
Tool Kit, General Mechanics
(Item 1, WP 0282 00)
Multimeter (Item 2, WP 0282 00)

Personnel Required

Materials/Parts

Equipment Conditions
Power must be applied at main control enclosure (WP 0010 00).

1. Check status of MAIN POWER lamp DS1.

   Is DS1 on?

   YES Go to step 2.

   NO Go to MAIN POWER LAMP DS1 IS NOT ON WITH SWITCH SW1 AT ON POSITION (WP 0014 00).

2. Check position of CONTROL POWER switch SW2.

   Is SW2 in ON position?

   YES Go to step 3.

   NO Position SW2 to ON. Return to normal operation.

3. Replace lamp on DS2 (TM 10–3510–221–10).

   Is lamp on?

   YES Return to normal operation.

   NO Go to step 4.

4. Open door on main control enclosure and position SW1 to ON.

5. Check for 110 VAC power between SW2 terminal (3) and TB1 terminal (N).

   Is 110 VAC power present?

   YES Go to step 6.

   NO Replace SW2 (WP 0235 00).

6. Check for 110 VAC power between DS2 terminal (+) and TB1 terminal (N).

   Is 110 VAC power present?

   YES Replace lamp socket (WP 0233 00).

   NO Check connections on wire #047 between DS2 terminal (+) and TB2 terminal (H) and wire #045 and between DS2 terminal (–) and DS1 terminal (–). Repair as necessary.

END OF WORK PACKAGE

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UNIT, DIRECT SUPPORT, AND GENERAL SUPPORT

LAUNDRY ADVANCED SYSTEM

(NSN 3510–01–463–0114)

OPERATIONAL CHECKOUT AND TROUBLESHOOTING PROCEDURES MAIN POWER LAMP (DS1) IS NOT ON WITH SW1 AT ON POSITION

INITIAL SETUP:

Tools
Tool Kit, General Mechanics
(Item 1, WP 0282 00)
Multimeter (Item 2, WP 0282 00)

Personnel Required

Materials/Parts

Equipment Conditions
Power must be applied at main control enclosure (WP 0010 00).

PATH A

1. Verify external power is connected to the LADS and is on–line.

   Is external power connected and on–line?

   YES Go to step 2.

   NO Connect external power or bring power on–line. Return to normal operation.

2. Check position of SW1.

   Is SW1 in ON position?

   YES Go to step 3.

   NO Position SW1 to ON. Return to normal operation.

3. Open door on main control enclosure and position SW1 to ON.

4. Check indicator on PM1.

   Is indicator on?

   YES Go to step 5.

   NO Go to **PATH B**.

5. Check position of CB7.

   Is CB7 in ON position?

   YES Go to step 6.

   NO Position CB7 to ON. Return to normal operation.

6. Replace lamp on DS1 (TM 10–3510–221–10).

   Does replacement lamp come on?

   YES Return to normal operation.

   NO Go to step 7.

7. Check for 110 VAC power between CB7 terminal (L1) and TB1 terminal (N).

   Is 110 VAC power present?

   YES Go to step 8.

   NO Check connections on wire #s 017 and 169 between CB7 and TB1. Repair as necessary.

PATH A – Continued

8. Check for 110 VAC power between CB7 terminal (T1) and TB1 terminal (N).

   Is 110 VAC power present?

   YES Go to step 9.

   NO Replace CB7 (WP 0223 00).

9. Check for 110 VAC power between PM1 terminal (C) and TB1 terminal (N).

   Is 110 VAC power present?

   YES Go to step 10.

   NO Check connections on wire # 038 between PM1 and CB7. Repair as necessary.

10. Check for 110 VAC power between PM1 terminal (NO) and TB1 terminal (N).

    Is 110 VAC power present?

    YES Go to step 11.

    NO Replace PM1 (WP 0231 00).

11. Check for 110 VAC power between SW2 terminal (2) and TB1 terminal (N).

    Is 110 VAC power present?

    YES Go to step 12.

    NO Check wire connections between SW2 and PM1. Repair as necessary.

12. Check for 110 VAC power between between DS1 terminal (+) and TB1 terminal (N).

    Is 110 VAC power present?

    YES Replace lamp socket (WP 0233 00).

    NO Check connections on wire #s 044, 045, and 046 between DS1 and SW2 and between DS1 and TB2. Repair as necessary.

PATH B (From PATH A, step 4)

1. Check indicators for F1, F2, and F3.

   Are all three indicators off?

   YES Go to **PATH C**.

   NO Go to step 2.

2. Position SW1 to OFF.
3. Replace fuse for any indicator that was on (WP 0229 00).
4. Position SW1 to ON.
5. Check indicator for fuse(s) that was replaced.

   Is indicator(s) off?

   YES Return to normal operation.

   NO Check for short between fuse and TB1 and between fuse and PM1. Repair as necessary

PATH C (From PATH B, step 1)

1. Check settings on PM1. Verify settings are 210 VAC, 5%, and 11 Seconds.

   Is PM1 properly set?

   YES Go to step 3.

   NO Go to step 2.

PATH C – Continued

2. Adjust PM1 to proper settings (WP 0231 00). Then check status of MAIN POWER indicator (DS1).

   Is indicator on?

   YES Return to normal operation.

   NO Go to step 3.

3. Check for 208 VAC power between PM1 terminals L1 and L2, L1 and L3, and L2 and L3.

   Is 208 VAC power present across all three phases?

   YES Go to step 4.

   NO Go to **PATH D**.

4. Position SW1 to OFF.
5. Secure power at external power source and switch phase connections at power source.
6. Bring external power online.
7. Position SW1 to ON. Then check status of MAIN POWER indicator (DS1).

   Is indicator on?

   YES Return to normal operation.

   NO Go to **PATH D**.

PATH D (From PATH C, steps 1 or 7)

1. Check for 110 VAC power between SW1 terminals (L1, L2, and L3) and TB1 terminal (N).

   Is 110 VAC power present?

   YES Go to step 2.

   NO Go to step 6.

2. Check for 110 VAC power between SW1 terminals (T1, T2, and T3) and TB1 terminal (N).

   Is 110 VAC power present?

   YES Go to step 3.

   NO Replace SW1 (WP 0222 00).

3. Check for 110 VAC power between TB1 terminals (L1, L2, and L3) and TB1 terminal (N).

   Is 110 VAC power present?

   YES Go to step 4.

   NO Check connections on wire #s 006, 007, and 008 between SW1 and TB1. Repair as necessary.

4. Check for 110 VAC power between terminal (1) on F1, F2, and F3 and TB1 terminal (N).

   Is 110 VAC power present?

   YES Go to step 5.

   NO Check connections on wire #s 034, 035, and 036, between TB1 and F1, F2, and F3. Repair as necessary.

5. Check for 110 VAC power between terminal (2) on F1, F2, and F3 and TB1 terminal (N).

   Is 110 VAC power present?

   YES Replace PM1 (WP 0231 00).

   NO Check continuity of F1, F2, and F3. Replace as necessary (WP 0230 00).

PATH D – Continued

6. Check voltage output at all three phases of power source.

Is 208–212 VAC power present?

YES Check connections between external power source and LADS and on wire #s 001, 002, and 003 between J1 and SW1. Repair as necessary.

NO Correct external power problem as necessary.

END OF WORK PACKAGE

UNIT, DIRECT SUPPORT, AND GENERAL SUPPORT

LAUNDRY ADVANCED SYSTEM

(NSN 3510–01–463–0114)

OPERATIONAL CHECKOUT AND TROUBLESHOOTING PROCEDURES
ALARM DOES NOT SOUND

INITIAL SETUP:

Tools

Personnel Required

Materials/Parts

Equipment Conditions
Power must be applied at main control enclosure (WP 0010 00).

Troubleshooting Alarm Does Not Sound Fault

Use maintenance menu to activate alarm (WP 0010 00).

Does alarm come on?

YES Press PBS5 to silence alarm. Return to normal operation.

NO Go to TYPICAL DC OUTPUT SIGNAL FAULT to check operation of alarm (WP 0106 00).

END OF WORK PACKAGE

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UNIT, DIRECT SUPPORT, AND GENERAL SUPPORT

LAUNDRY ADVANCED SYSTEM

(NSN 3510–01–463–0114)

OPERATIONAL CHECKOUT AND TROUBLESHOOTING PROCEDURES
ALARM WILL NOT TURN OFF WHEN SILENCE ALARM SWITCH IS PRESSED

INITIAL SETUP:

Tools
Tool Kit, General Mechanics
(Item 1, WP 0282 00)
Multimeter (Item 2, WP 0282 00)

Personnel Required

Materials/Parts

Equipment Conditions
Power must be applied at main control enclosure (WP 0010 00).

1. Press PBS5 to silence alarm.

   Does alarm turn off?

   YES Return to normal operation.

   NO Go to step 2.

2. Position SW2 to OFF.
3. Open door on operator panel.
4. Remove wires connected to PBS5.
5. Press PBS5, then check for continuity across (+) and (–) terminals.

   Does continuity exist?

   YES Go to step 6.

   NO Replace PBS5 (WP 0247 00).

6. Check connection on wire # 263 between PBS5 and TB2 COM.

   Are connections OK?

   YES Go to TYPICAL DISCRETE INPUT SIGNAL FAULT (WP 0107 00) to check operation of PBS5.

   No Repair as required.

END OF WORK PACKAGE

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UNIT, DIRECT SUPPORT, AND GENERAL SUPPORT

LAUNDRY ADVANCED SYSTEM

(NSN 3510–01–463–0114)

OPERATIONAL CHECKOUT AND TROUBLESHOOTING PROCEDURES
ATTENTION REQUIRED LAMP (DS5) DOES NOT COME ON WHEN SYSTEM HAS MALFUNCTIONED

INITIAL SETUP:

Tools

Personnel Required

Materials/Parts

Equipment Conditions
Power must be applied at main control enclosure (WP 0010 00).

1. Use maintenance menu to turn on DS5 (WP 0010 00).

   Does DS5 come on?

   YES Use maintenance menu to turn off DS5. Return to normal operation.

   NO Go to step 2.

2. Replace lamp on DS5 (TM 10–3510–221–10).

   Is lamp on?

   YES Return to normal operation.

   NO Go to TYPICAL DC OUTPUT SIGNAL FAULT (WP 0106 00) to check operation of DS5.

END OF WORK PACKAGE

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UNIT, DIRECT SUPPORT, AND GENERAL SUPPORT

LAUNDRY ADVANCED SYSTEM

(NSN 3510–01–463–0114)

OPERATIONAL CHECKOUT AND TROUBLESHOOTING PROCEDURES DISPLAY DOES NOT COME ON OR HAS SCRAMBLED CHARACTERS

INITIAL SETUP:

Tools
Tool Kit, General Mechanics
(Item 1, WP 0282 00)
Multimeter (Item 2, WP 0282 00)

Personnel Required

Materials/Parts

Equipment Conditions
Power must be applied at main control enclosure (WP 0010 00).

PATH A

1. Position SW2 to OFF then back to ON.
2. Observe display at operator panel A.

   Is PRESS TO START completely displayed?

   YES Go to step 3.

   NO Go to step 5.
3. At operator panel A press top menu selection switch.
4. Observe display at operator panel B.

   Is WAITING FOR SYSTEM A completely displayed?

   YES Return to normal operation.

   NO Go to step 5.
5. Check for > 4.9 VDC across terminals (+5) and (DCOM) on TB9 where wire #s 347 and 355 are connected.

   Is > 4.9 VDC present?

   YES Go to step 6.

   NO Go to NO +5 VDC POWER AVAILABLE FAULT (WP 0102 00).
6. Position SW2 to OFF.
7. Open door on both operator panels.
8. Position SW2 to ON.
9. Check for > 4.9 VDC across terminals (+5) and (DCOM) on PCB10A where wire #s 347 and 355 are connected.

   Is > 4.9 VDC present?

   YES Go to step 10.

   NO Check connections on wire #s 347 and 355 between PCB10A and TB9. Repair as necessary.
10. Check for > 4.9 VDC across terminals (+5) and (DCOM) on PCB10B where wire #s 349 and 357 are connected.

    Is > 4.9 VDC present?

    YES Go to step 11.

    NO Check connections on wire #s 349 and 357 between PCB10B and TB9. Repair as necessary.

11. Check for > 4.9 VDC across terminals (+5) and (DCOM) on PCB10A connector that is connected to display.

    Is > 4.9 VDC present?

    YES Go to step 12.

    NO Replace PCB10A (WP 0248 00).

12. Check for > 4.9 VDC across terminals (+5) and (DCOM) on PCB10B connector that is connected to display.

    Is > 4.9 VDC present?

    YES Go to step 13.

    NO Replace PCB10B (WP 0248 00).

13. Determine if problem is with both displays or only one display.

    Are both displays malfunctioning?

    YES Replace PCB9 (WP 0220 00).

    NO Go to step 14.

14. Position SW2 to OFF.
15. ESD. Check connections on wire # 345 or 356 between suspect PCB10 and PCB9.

    Are connections OK?

    YES Go to step 16.

    NO Repair as required.

16. ESD. At PCB9 switch connectors at J1 and J4 so that wire # 354 is connected to J4 and wire # 356 is connected to J1.
17. Position SW2 to ON.
18. Check status of both displays.

    Does malfunction change to other display?

    YES Replace PCB9 (WP 0220 00).

    NO Go to step 19.

19. Position SW2 to OFF.
20. ESD. At PCB9 reconnect wire # 354 to connector J1 and wire #356 to connector J4.
21. Replace suspect PCB10 (WP 0248 00).
22. Position SW2 to ON.
23. Check status of suspect display.

    Does display function properly?

    YES Return to normal operation.

    NO Replace display (WP 0249 00).

END OF WORK PACKAGE

UNIT, DIRECT SUPPORT, AND GENERAL SUPPORT

LAUNDRY ADVANCED SYSTEM

(NSN 3510–01–463–0114)

OPERATIONAL CHECKOUT AND TROUBLESHOOTING PROCEDURES DISPLAY STATE DOES NOT CHANGE WHEN SELECTION SWITCH IS PRESSED

INITIAL SETUP:

Tools
Tool Kit, General Mechanics
(Item 1, WP 0282 00)
Multimeter (Item 2, WP 0282 00)

Personnel Required

Materials/Parts

Equipment Conditions
Power must be applied at main control enclosure (WP 0010 00).

1. Press menu selection switch while monitoring display status.

   Does display state change to selected option?

   YES Return to normal operation.

   NO Go to step 2.
2. Position SW2 to OFF.
3. Open door on operator panel.
4. Remove wires connected to suspect pushbutton switch (+) and (–) terminals.
5. Press switch, then check for continuity across (+) and (–) terminals.

   Does continuity exist?

   YES Go to step 6.

   NO Replace pushbutton switch (WP 0247 00).
6. Check wire connections between pushbutton switch and TB2 COM.

   Are connections OK?

   YES Go to TYPICAL DISCRETE INPUT SIGNAL FAULT (WP 0107 00) to check operation of menu selection switch.

   NO Repair as necessary.

END OF WORK PACKAGE

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UNIT, DIRECT SUPPORT, AND GENERAL SUPPORT

LAUNDRY ADVANCED SYSTEM

(NSN 3510–01–463–0114)

OPERATIONAL CHECKOUT AND TROUBLESHOOTING PROCEDURES
POWER LAMP (DS3) DOES NOT COME ON

INITIAL SETUP:

Tools
Tool Kit, General Mechanics
(Item 1, WP 0282 00)
Multimeter (Item 2, WP 0282 00)

Personnel Required

Materials/Parts

Equipment Conditions
Power must be applied at main control enclosure (WP 0010 00).

1. Check status of CONTROL POWER lamp.

   Is CONTROL POWER lamp on?

   YES Go to step 2.

   NO Go to CONTROL POWER LAMP IS NOT ON FAULT (WP 0013 00).

2. Check status of POWER lamp at other operator panel.

   Is POWER lamp on?

   YES Go to step 3.

   NO Go to step 8.

3. Replace lamp on DS3 (TM 10–3510–221–10).

   Is lamp on?

   YES Return to normal operation.

   NO Go to step 4.

4. Open door on operator panel.

5. Check for > 11 VDC between terminal on DS3 where wire #351 (DS3A) or wire #353 (DS3B) is connected and PS1 terminal (COM).

   Is >11 VDC present?

   YES Go to step 6.

   NO Go to step 8.

6. Position SW2 to OFF.

7. Check wire connections between other terminal on DS3 and TB2 terminal (COM).

   Are wire connections OK?

   YES Replace lamp socket DS3 (WP 0246 00).

   NO Repair as necessary.

8. Check for > 11 VDC between SSR PCB4 terminal (3) and PS1 terminal (COM) and SSR PCB4 terminal (5) and PS1 terminal (COM).

   Is >11 VDC present?

   YES Check wire connections between SSR PCB4 and DS3A and between SSR PCB4 and DS3B. Repair as necessary.

   NO Go to NO +12 VDC POWER AVAILABLE (WP 0100 00).

END OF WORK PACKAGE

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UNIT, DIRECT SUPPORT, AND GENERAL SUPPORT

LAUNDRY ADVANCED SYSTEM

(NSN 3510–01–463–0114)

OPERATIONAL CHECKOUT AND TROUBLESHOOTING PROCEDURES
SYSTEM OPERABLE LAMP (DS4) IS NOT ON WHEN SYSTEM IS OPERATING PROPERLY

INITIAL SETUP:

Tools

Personnel Required

Materials/Parts

Equipment Conditions
Power must be applied at main control enclosure (WP 0010 00).

1. Use maintenance menu to turn on DS4 (WP 0010 00).

   Does DS4 come on?

   YES Use maintenance menu to turn off DS4. Return to normal operation.

   NO Go to step 2.

2. Replace lamp on DS4 (TM 10–3510–221–10).

   Is lamp on?

   YES Return to normal operation.

   NO Go to TYPICAL DC OUTPUT SIGNAL FAULT (WP 0106 00) to check operation of DS4.

END OF WORK PACKAGE

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UNIT, DIRECT SUPPORT, AND GENERAL SUPPORT

LAUNDRY ADVANCED SYSTEM

(NSN 3510–01–463–0114)

OPERATIONAL CHECKOUT AND TROUBLESHOOTING PROCEDURES AMBIENT TEMPERATURE HI OR LO

INITIAL SETUP:

Tools

Personnel Required

Materials/Parts

Equipment Conditions
Power must be applied at main control enclosure (WP 0010 00).

Obtain ambient (outside) temperature.

Is temperature between 33 and 120 degrees F?

YES Go TE100 FAILURE Fault (WP 0035 00).

NO Operate LADS only at ambient temperatures between 33 and 120 degrees F.

END OF WORK PACKAGE

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UNIT, DIRECT SUPPORT, AND GENERAL SUPPORT

LAUNDRY ADVANCED SYSTEM

(NSN 3510–01–463–0114)

OPERATIONAL CHECKOUT AND TROUBLESHOOTING PROCEDURES
DRUM BRAKE STAYS ON DURING ROTATION

INITIAL SETUP:

Tools
Tool Kit, General Mechanics
(Item 1, WP 0282 00)

Personnel Required

Materials/Parts

Equipment Conditions
Power must be applied at main control enclosure (WP 0010 00).

NOTE

During portions of this procedure where brake is being extended and retracted, pressure in air system must be maintained above 80 psig.

1. Position SW2 then SW1 to OFF.
2. Check position of brake caliper (1). Pads (2) should be retracted from rotor (3).

   Are pads retracted from brake rotor?

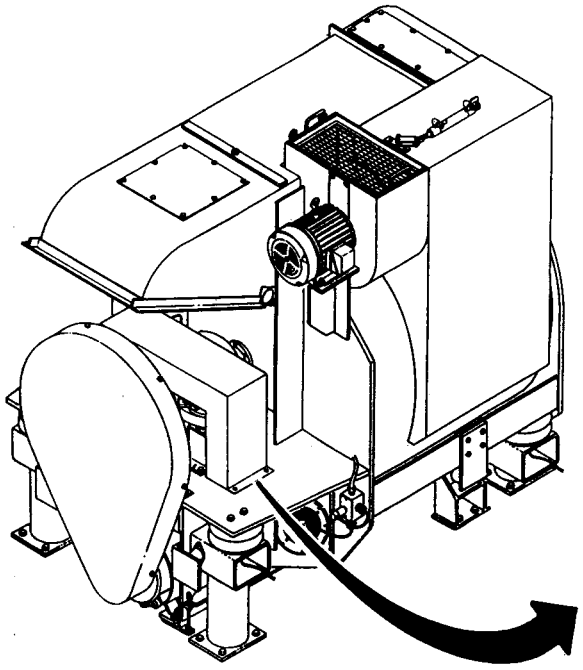
   YES Go to step 3.

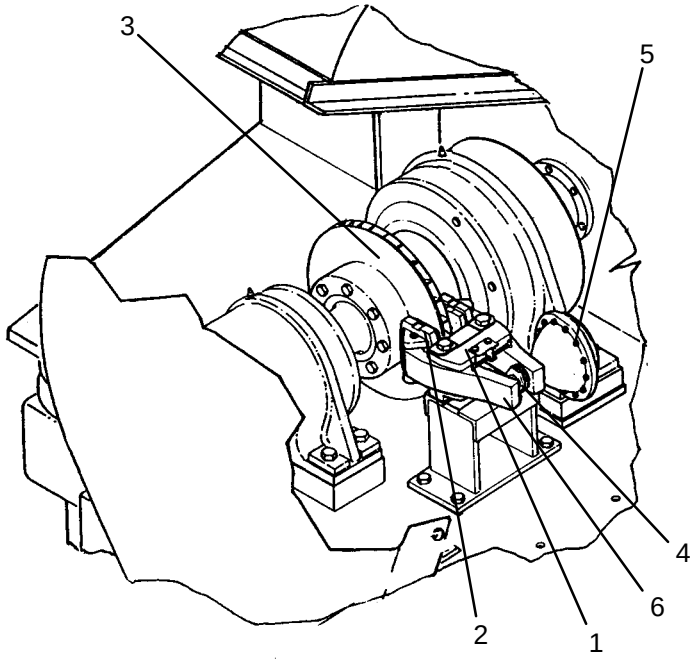
   NO Go to step 5.
3. Position SW1 then SW2 to ON.
4. Use maintenance menu to extend and retract brake (WP 0010 00) while observing operation of brake caliper (1).

   Does brake caliper extend and retract?

   YES Return to normal operation.

   NO Go to step 5.





5. Use maintenance menu to extend and retract brake (WP 0010 00) while observing operation of piston (4) on brake thruster (5).

   Does piston extend and retract?

   YES Go to step 6.

   NO Go to step 8.

6. Remove brake caliper (WP 0123 00).
7. Determine if there is any debris or corrosion preventing free movement of arms (6).

   Is debris or corrosion found?

   YES Repair as necessary. Return to step 2 of this procedure.

   NO Replace brake caliper (WP 0123 00).

8. Use maintenance menu to retract brake (brake off).
9. Disconnect air tube (7) from brake thruster (5).

   Is pressure venting from air tube?

   YES Reconnect air tube. Go to step 10.

   NO Replace brake thruster (WP 0122 00).

10. Observe LED on solenoid valve SV113.

    Is LED off?

    YES Replace solenoid valve SV113 (WP 0214 00).

    NO Go to TYPICAL DC OUTPUT SIGNAL FAULT (WP 0106 00) to check operation of SV113.

END OF WORK PACKAGE

UNIT, DIRECT SUPPORT, AND GENERAL SUPPORT

LAUNDRY ADVANCED SYSTEM

(NSN 3510–01–463–0114)

OPERATIONAL CHECKOUT AND TROUBLESHOOTING PROCEDURES STALL SENSING FAULT

INITIAL SETUP:

Tools
Tool Kit, General Mechanics
(Item 1, WP 0282 00)
Multimeter (Item 2, WP 0282 00)

Personnel Required

Materials/Parts

Equipment Conditions
Power must be applied at main control enclosure (WP 0010 00).

1. Verify SW1 and SW2 are OFF.
2. Open door on main control enclosure.
3. ESD. Check ribbon cable connections between PCB2 and PCB8.

   Are connections OK?

   YES Go to step 4.

   NO Repair as necessary.
4. ESD. Check to ensure PCB8 and PCB9 are properly seated in card cage.

   Are PCB8 and PCB9 properly seated?

   YES Go to step 5.

   NO Properly seat PCB8 or PCB9.
5. Position SW1 then SW2 to ON.
6. ESD. Check for >11 VDC between +12 V and ACOM test points on PCB12.

   Is >11 VDC present?

   YES Go to step 7.

   NO Go to NO +/–12 VDC POWER AVAILABLE (WP 0101 00).
7. ESD. Check for > –11 VDC between –12 V and ACOM test points on PCB12.

   Is > –11 VDC present?

   YES Go to step 8.

   NO Go to NO +/–12 VDC POWER AVAILABLE (WP 0101 00).
8. ESD. Check for > 4.9 VDC between +5 V and DCOM test points on PCB12.

   Is > 4.8 VDC present?

   YES Go to step 9.

   NO Go to NO +5 VDC POWER AVAILABLE (WP 0102 00).
9. Replace PCB2 and perform checkout (WP 0216 00).

   Is fault corrected?

   YES Return to normal operation.

   NO Go to step 10.

10. Replace PCB8 and perform checkout (WP 0218 00).

Is fault corrected?

YES Return to normal operation.

NO Go to step 11.

11. Replace PCB9 and perform checkout (WP 0220 00).

Is fault corrected?

YES Return to normal operation.

NO Replace card cage (WP 0221 00).

END OF WORK PACKAGE

UNIT, DIRECT SUPPORT, AND GENERAL SUPPORT

LAUNDRY ADVANCED SYSTEM

(NSN 3510–01–463–0114)

OPERATIONAL CHECKOUT AND TROUBLESHOOTING PROCEDURES NO DRUM ROTATION

INITIAL SETUP:

Tools
Tool Kit, General Mechanics
(Item 1, WP 0282 00)
Multimeter (Item 2, WP 0282 00)

Personnel Required

Materials/Parts

Equipment Conditions
Power must be applied at main control enclosure (WP 0010 00).

PATH A

1. Observe operator panel display.

   Does display indicate “DRUM INVERTER FAULT”?

   YES Go to DRUM INVERTER FAULT.

   NO Go to step 2.

2. Use maintenance menu to rotate drum at “TUMBLE CW”, “TUMBLE CCW” , “DISTRB CCW”, “LO EXT CCW”, and “HI EXT CCW” (WP 0010 00). Observe drum rotation.

   Does drum rotate at all directions and speeds?

   YES Go to step 3.

   NO Go to step **PATH B**.

3. Observe operator panel display.

   Does display indicate “DRUM NO ROTATION”?

   YES Go to step 4.

   NO Return to normal operation.

4. Use maintenance menu to rotate drum at CW tumble speed.

5. Observe LED on drum rotation sensor.

   Does LED come on and go off rapidly?

   YES Stop drum rotation. Go to TYPICAL DISCRETE INPUT SIGNAL FAULT (WP 0107 00) to check drum rotation sensor ZS102A or ZS102B input signal.

   NO Stop drum rotation. Go to step 6.

6. Check adjustment of drum rotation sensor ZS102A or ZS102B (WP 0119 00).

   Is sensor properly adjusted?

   YES Go to TYPICAL DISCRETE INPUT SIGNAL FAULT (WP 0107 00) to check operation of drum rotation sensor ZS102A or ZS102B.

   NO Adjust drum rotation sensor ZS102A or ZS102B as necessary.

PATH B (From PATH A, step 6)

1. Use maintenance menu to rotate drum at “TUMBLE CW”, “TUMBLE CCW” , “DISTRB CCW”, “LO EXT CCW”, and “HI EXT CCW”. Observe drum rotation.

   Does drum rotate at any speed?

   YES Stop drum rotation. Go to **PATH D**.

   NO Stop drum rotation. Go to step 2.

2. Position SW2 then SW1 to OFF.
3. Open door on inverter enclosure and main control enclosure
4. Check circuit breaker CB3 (drum A) or CB4 (drum B).

   Is CB3 or CB4 tripped?

   YES Reset CB3 or 4. Go to step 5.

   NO Go to **PATH C**.

5. Position SW1 then SW2 to ON.
6. Use maintenance menu to rotate drum at “TUMBLE CW”. Observe drum rotation.

   Does drum rotate?

   YES Stop drum rotation. Return to normal operation.

   NO Stop drum rotation. Go to step 7.

7. Check circuit breaker CB3 or CB4.

   Is CB3 or CB4 tripped?

   YES Check for shorted or open wire/connection between CB3 or CB4, drum inverter, and drum motor.

   NO Go to **PATH B**.

PATH C (From PATH B, step 4 or 7)

1. Check display on drum inverter K100A or K100B.

   Is a fault displayed?

   YES Go to DRUM INVERTER FAULT (WP 0093 00).

   NO Go to step 2.

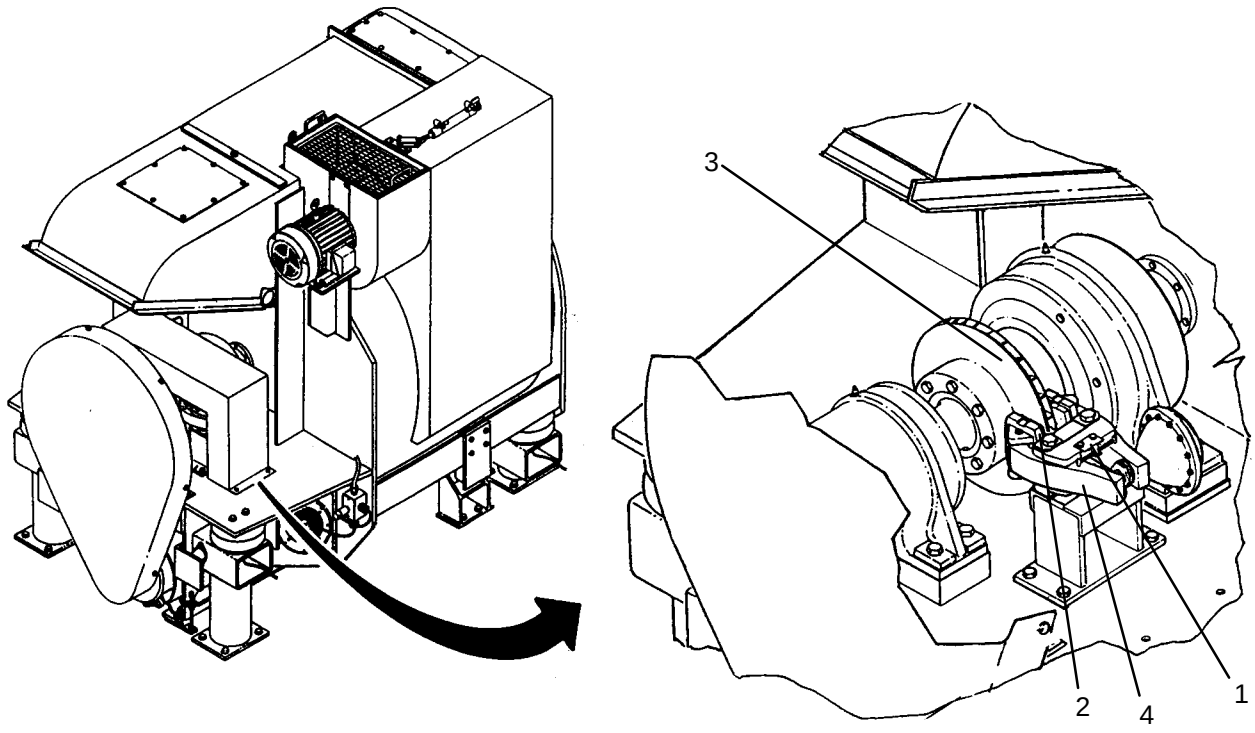
2. Position SW2 then SW1 to OFF.
3. Check drum brake caliper (1) position. Ensure pads (2) are not up against rotor (3) and arms (4) on caliper pivot freely.

   Does brake caliper pivot freely?

   YES Go to step 4.

   NO Go to DRUM BRAKE STAYS ON DURING ROTATION FAULT (WP 0023 00).

PATH C – Continued



4. Remove belt guard from drum (WP 0118 00).
5. Check drive belt for damage.

   Is drive belt broken or damaged?

   YES Replace drive belt (WP 0118 00).

   NO Go to step 6.
6. Check drive belt tension.

   Is drive belt loose?

   YES Adjust drive belt tension (WP 0118 00).

   NO Reinstall belt guard. Go to step 7.
7. Position SW1 then SW2 to ON.

NOTE

When measuring voltage on 3–phase circuits always check all three legs of the circuit before concluding that voltage is present. You may misdiagnose a problem if you do not check all three legs (L1, L2, and L3) and voltage is not available at one or two legs of the circuit you did not check.

8. Check for >200 VAC across CB3 or CB4 input terminals (L1 and L2), (L1 and L3), and (L2 and L3).

   Is >200 VAC present?

   YES Go to step 9.

   NO Check connections on wire #s 012, 013, and 014 between CB3 and TB1 and on jumper bar between CB3 and CB4. Repair as necessary.

PATH C – Continued

9. Check for >200 VAC across CB3 or CB4 output terminals (T1 and T2), (T1 and T3), and (T2 and T3).

   Is >200 VAC present?

   YES Go to step 10.

   NO Replace CB3 or CB4 (WP 0223 00).

10. Remove cover from drum inverter K100A or K100B.

11. Check for >200 VAC across K100A or K100B input terminals (L1 and L2), (L1 and L3), and (L2 and L3).

    Is >200 VAC present?

    YES Go to step 12.

    NO Check connections on wire #s 025, 026, and 027 between CB3 and K100A or wire #s 028, 029, and 030 between CB4 and K100B. Repair as necessary.

12. Use maintenance menu to rotate drum at “TUMBLE CW”, “TUMBLE CCW” , “DISTRB CCW”, “LO EXT CCW”, and “HI EXT CCW” while checking for >200 VAC across K100A or K100B input terminals (L1 and L2), (L1 and L3), and (L2 and L3).

    Is >200 VAC present?

    YES Stop drum rotation. Go to step 13.

    NO Stop drum rotation. Replace drum inverter K100A or K100B (WP 0250 00).

13. Use maintenance menu to rotate drum at “TUMBLE CW”, “TUMBLE CCW” , “DISTRB CCW”, “LO EXT CCW”, and “HI EXT CCW” while checking for >200 VAC across K100A or K100B output terminals (U and V), (U and W), and (V and W).

    Is >200 VAC present at all speeds and directions?

    YES Stop drum rotation. Go to step 14.

    NO Stop drum rotation. Go to **PATH D**.

14. Check connections on wire #s 054, 055, and 056 between K100A and M100A or wire #s 058, 059, and 060 between K100B and M100B.

    Are wire connections OK?

    YES Replace drive motor M100A or M100B (WP 0264 00)

    NO Repair as necessary.

PATH D (From PATH B, step 1 or PATH C, step 16)

1. Use maintenance menu to rotate drum at “TUMBLE CW”, “TUMBLE CCW” , “DISTRB CCW”, “LO EXT CCW”, and “HI EXT CCW” while verifying LEDs on PCB4 turn on as follows:

DRUM SPEED	DIRECTION	SSRs (DRUM A)	(DRUM B)
TUMBLE	CW	16, 18, 21	8, 10, 13
TUMBLE	CCW	17, 18, 21	9, 10, 13
DISTRBT	CCW	17, 19, 22	9, 11, 14
LO EXT	CCW	17, 20, 21	9, 12, 13
HI EXT	CCW	17–19, 21, 22	9–11, 13, 14

   Do LEDs come on as stated above?

   YES Stop drum rotation. Go to step 2.

   NO Stop drum rotation. Go to TYPICAL DC OUTPUT SIGNAL FAULT (WP 0106 00) to determine why suspect LED is not on.

PATH D – Continued

2. Check for > 15 VDC across K100A or K100B terminals (CM and FWD).

   Is > 15 VDC present?

   YES Go to step 3.

   NO Replace drum inverter K100A or K100B (WP 0250 00).

3. Check for > 15 VDC across K100A or K100B terminals (CM and REV).

   Is > 15 VDC present?

   YES Go to step 4.

   NO Replace drum inverter K100A or K100B (WP 0250 00).

4. Check for > 15 VDC across the following PCB4 terminals:

DRUM A	DRUM B
33 and 34	17 and 18
35 and 36	19 and 20
37 and 38	21 and 22
39 and 40	23 and 24
41 and 42	25 and 26
43 and 44	27 and 28
45 and 46	29 and 30

   Is > 15 VDC present across all terminals?

   YES Go to step 5.

   NO Check wire connections between K100A or K100B and PCB4.

5. Use maintenance menu to rotate drum at “TUMBLE CW”, “TUMBLE CCW” , “DISTRB CCW”, “LO EXT CCW”, and “HI EXT CCW” while checking for 0.1 to 1.0 VDC across PCB4 terminals listed in step 4.

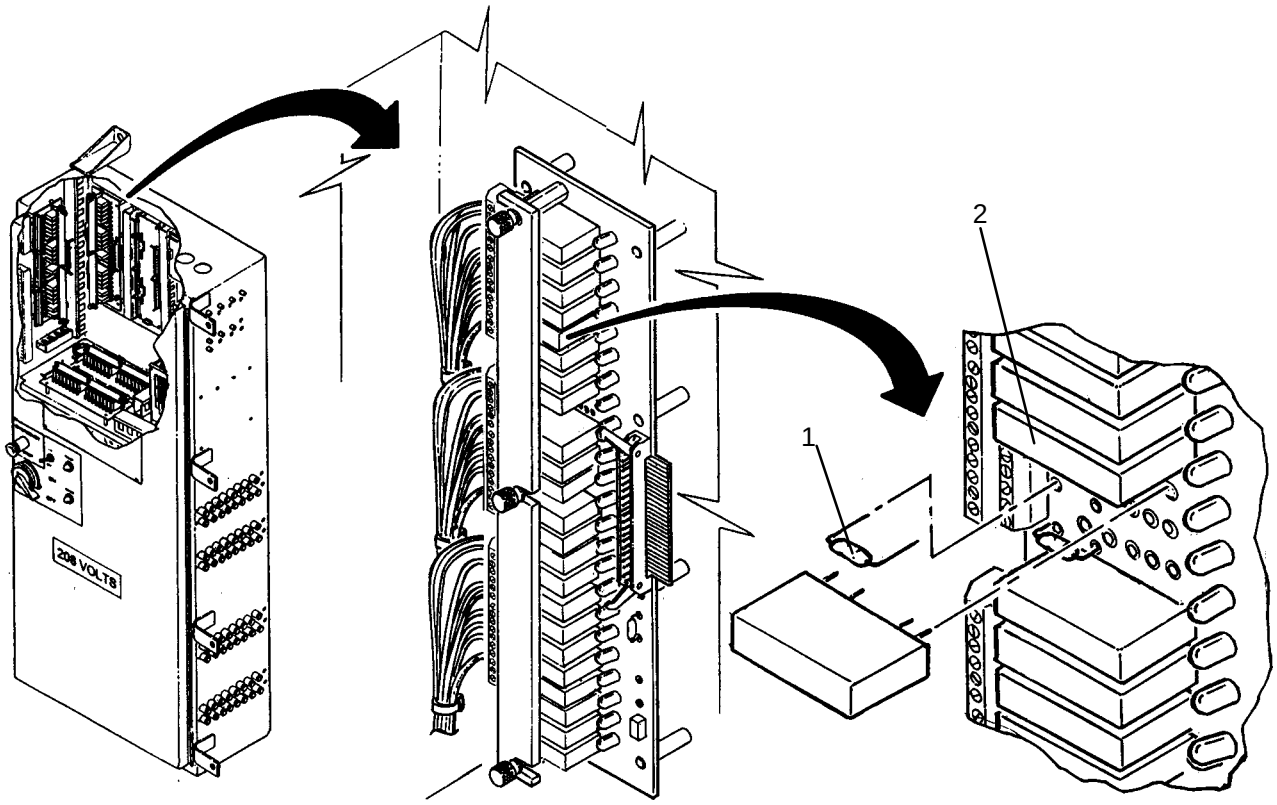
   Is 0.1 to 1.0 VDC present across all terminals?

   YES Stop drum rotation. Replace drum inverter K100A or K100B (WP 0250 00).

   NO Stop drum rotation. Go to step 6.

6. Position SW2 to OFF.

7. Check 5 amp fuse (1) next to any SSR (2) that did not have 0.1 to 1.0 VDC in step 5 for continuity.



Does fuse have continuity?

YES Replace SSR (WP 0241 00).

NO Replace fuse (WP 0242 00).

END OF WORK PACKAGE

UNIT, DIRECT SUPPORT, AND GENERAL SUPPORT

LAUNDRY ADVANCED SYSTEM

(NSN 3510–01–463–0114)

OPERATIONAL CHECKOUT AND TROUBLESHOOTING PROCEDURES
DRUM BRAKING SLOW

INITIAL SETUP:

Tools
Tool Kit, General Mechanics
(Item 1, WP 0282 00)

Personnel Required

Materials/Parts

Equipment Conditions
Power must be applied at main control enclosure (WP 0010 00).

PATH A

NOTE

Pressure in air system must be maintained above 80 psig while performing this procedure.

1. Use maintenance menu to apply and remove brake FV113A or FV113B (WP 0010 00) while observing operation of brake caliper.

   Does brake caliper extend and retract?

   YES Go to step 2.

   NO Go to **PATH B**.

2. Use maintenance menu to rotate drum motor M100A or M100B at LO extract speed.
3. Use maintenance menu to apply brake FV113A or FV113B. Observe braking operation

   Does drum rotation stop within 10 seconds?

   YES Go to step 4.

   NO Go to step 6.

4. Use maintenance menu to rotate drum motor M100A or M100B at HI extract speed.
5. Use maintenance menu to apply brake FV113A or FV113B. Observe braking operation.

   Does drum rotation stop within 20 seconds?

   YES Return to normal operation.

   NO Go to step 6.

6. Position SW2 then SW1 to OFF.
7. Check brake pads for wear (WP 0112 00).

   Are brake pads worn?

   YES Replace brake pads (WP 0121 00).

   NO Go to step 8.

8. Check brake rotor for wear or damage (WP 0112 00).

   Is brake rotor worn or damaged?

   YES Replace brake rotor (WP 0268 00).

   NO Go to step 9.

PATH A – Continued

9. Position SW1 then SW2 to ON.
10. Use maintenance menu to apply brake FV113A or FV113B. With brake applied determine if brake pads are contacting brake rotor.

    Are brake pads contacting brake rotor?

    YES Go to **PATH C**.

    NO Check adjustment of brake thruster (WP 0122 00).

PATH B (From PATH A, step 1)

1. Open door on main control enclosure. Verify SW1 and SW2 are ON.
2. Using maintenance menu, attempt to apply brake while monitoring LED (WP 0011 00, Figure 2, 4) on solenoid valve SV113A or SV113B (3).

    Does LED come on?

    YES Go to step 3.

    NO Go to TYPICAL DC OUTPUT SIGNAL FAULT (WP 0106 00) to check operation of SV113.
3. Push in manual operator (WP 0011 00, Figure 2, 5) on SV113A or SV113B (3) while observing operation of brake caliper.

    Does brake caliper extend?

    YES Replace solenoid valve SV113A or SV113B (WP 0214 00).

    NO Go to step 4.
4. Disconnect air tube from brake thruster.
5. Push in manual operator (WP 0011 00, Figure 2, 5) on SV113A or SV113B. Check for air pressure at tube disconnected from brake thruster.

    Does air pressure vent from tube?

    YES Reconnect tube. Go to **PATH C**.

    NO Replace solenoid valve SV113A or SV113B (WP 0214 00).

PATH C (From PATH A, step 10 or PATH B, step 5)

1. Disconnect brake thruster from brake caliper.
2. Attempt to manually engage and disengage brake caliper.

    Does brake caliper operate freely?

    YES Replace brake thruster (WP 0122 00).

    NO Replace brake caliper (WP 0123 00).

END OF WORK PACKAGE

UNIT, DIRECT SUPPORT, AND GENERAL SUPPORT

LAUNDRY ADVANCED SYSTEM

(NSN 3510–01–463–0114)

OPERATIONAL CHECKOUT AND TROUBLESHOOTING PROCEDURES DRUM WILL NOT BALANCE OR IS SHAKING EXCESSIVELY

INITIAL SETUP:

Tools
Tool Kit, General Mechanics
(Item 1, WP 0282 00)
Multimeter (Item 2, WP 0282 00)

Personnel Required

Materials/Parts

Equipment Conditions
Power must be applied at main control enclosure (WP 0010 00).

PATH A

NOTE

Laundry loads less than 50 lbs or exceeding 200 lbs per drum may have difficulty balancing.

1. Unlock and open drum door.
2. Check for undersized or oversized loads.

   Was an improper amount of laundry loaded?

   YES Properly load drum. Go to step 4.

   NO Go to step 3.
3. Check for laundry bags twisted into large groups.

   Were laundry bags twisted together?

   YES Untwist bags. Go to step 5.

   NO Go to step 4.
4. Check levelness of LADS per set–up procedures (TM 10–3510–221–10).

   Is LADS level?

   YES Go to step 5.

   NO Proper level LADS.
5. Ensure drum door is closed and locked.
6. Continue or start a laundry cycle (TM 10–3510–221–10).

   Does laundry cycle finish without any shaking or balancing problems?

   YES Return to normal operation.

   NO Pause laundry cycle. Go to step 7.
7. Check reading on air bag pressure regulator gauge PI501.

   Does gauge read 64 to 67 psig?

   YES Go to **PATH B**.

   NO Go to step 8.

PATH A – Continued

8. Check reading on product pressure regulator gauge PI500.

   Does gauge read > 78 psig?

   YES Replace air bag pressure regulator (WP 0209 00) .

   NO Go to PRODUCT PRESSURE LO FAULT (WP 0089 00).

PATH B (From PATH A, step 8)

1. Check position of shutoff valve for rear air bags.

   Is valve open?

   YES Go to step 2.

   NO Open valve. Return to normal operation.

2. Check height adjustment of both leveling valves (WP 0141 00).

   Are leveling valves properly adjusted?

   YES Go to step 4.

   NO Go to step 3.

3. Attempt to adjust leveling valve(s) (WP 0141 00).

   Can leveling valves be adjusted to correct height?

   YES Return to normal operation.

   NO Replace leveling valve(s) (WP 0141 00).

4. Check adjustment on drum balancing switch ZS103A or ZS103B (WP 0120 00).

   Is ZS103A or ZS103B properly adjusted?

   YES Go to step 5.

   NO Properly adjust ZS103A or ZS103B.

5. Use maintenance menu to examine status of Z103A or ZS103 B (WP 0010 00).

   Does display indicate switch is OFF?

   YES Go to step 6.

   NO Go to step 7.

6. Lift up on arm of ZS103A or ZS103B then check switch status.

   Does display indicate switch is ON?

   YES Go to **PATH C**.

   NO Go to step 7.

7 Position SW2 to OFF.

8. Disconnect electrical cable from ZS103A or ZS103B.

9. Check for continuity across contacts of ZS103A or ZS103B while lifting up on switch arm and no continuity while arm is not lifted up.

   Does switch operate correctly?

   YES Go to step TYPICAL DISCRETE INPUT SIGNAL FAULT (WP 0107 00) to check operation of drum balance switch circuit.

   NO Replace drum balance switch ZS103A or ZS103B (WP 0120 00).

PATH C (From PATH B, step 6)

1. Position SW2 then SW1 to OFF.
2. Disconnect one end of each shock absorber and check for excessive play (WP 0112 00).

   Do any shock absorbers have excessive play?

   YES Replace worn shock absorbers (WP 0137 00) or (WP 0138 00).

   NO Go to step 3.
3. Check front–to–back and side–to–side vibration mounts for excessive wear (WP 0112 00).

   Are any vibration mounts worn?

   YES Replace worn vibration mounts (WP 0142 00), (WP 0143 00), or (WP 0144 00).

   NO Go to step 4.
4. Check for air leaking from air bags

   Are any air bags leaking?

   YES Replace air bag (WP 0139 00) or (WP 0140 00).

   NO Return to start of this procedure.

END OF WORK PACKAGE

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UNIT, DIRECT SUPPORT, AND GENERAL SUPPORT

LAUNDRY ADVANCED SYSTEM

(NSN 3510–01–463–0114)

OPERATIONAL CHECKOUT AND TROUBLESHOOTING PROCEDURES
DRUM DOOR NOT LOCKED

INITIAL SETUP:

Tools
Tool Kit, General Mechanics
(Item 1, WP 0282 00)

Personnel Required

Materials/Parts

Equipment Conditions
Power must be applied at main control enclosure (WP 0010 00).

PATH A

NOTE

Pressure in air system must be maintained above 80 psig while performing this procedure.

1. Close and secure drum door.
2. Use maintenance menu to rotate drum at CW tumble speed (WP 0010 00). Observe door lock DN100A or DN100B.

   Does door lock extend past handle?

   YES Go to **PATH B**.

   NO Stop drum rotation. Go to step 3.
3. Check for obstruction that would prevent pin on DN100A or DN100B from extending.

   Are any obstructions found?

   YES Repair as necessary.

   NO Go to step 4.
4. Open door on main control enclosure. Verify SW1 and SW2 are ON.
5. Using maintenance menu, attempt to extend DN100A or DN100B while monitoring LED (WP 0011 00, Figure 2, 4) on solenoid valve SV115A or SV115B.

   Does LED come on?

   YES Retract DN100A or DN100B. Go to step 6.

   NO Go to TYPICAL DC OUTPUT SIGNAL FAULT (WP 0106 00) to check operation of SV115A or SV115B.
6. Push in manual operator (WP 0011 00, Figure 2, 5) on SV115A or SV115B.

   Does door lock extend?

   YES Replace solenoid valve SV115A or SV115B (WP 0214 00).

   NO Go to step 7.
7. Disconnect tube from top port of DN100A or DN100B.
8. Push in manual operator on SV115A or SV115B. Check for air pressure at tube disconnected from DN100A or DN100B.

   Does air pressure vent from tube?

   YES Replace door lock DN100A or DN100B (WP 0127 00).

   NO Go to step 9.

PATH A – Continued

9. Connect tube to top port of DN100A or DN100B and disconnect tube from side port.
10. Check for air pressure at disconnected tube while pushing in manual operator on SV115A or SV115B.

    Does air pressure vent from tube?

    YES Connect tube at DN100A or DN100B. Switch tubes connected at SV115A or SV115B.

    NO Replace solenoid valve SV115A or SV115B (WP 0214 00).

PATH B (From PATH A, step 2)

1. Observe operator panel display.

   Does display indicate “DRUM DOOR NOT LOCKED”?

   YES Go to step 2.

   NO Return to normal operation.
2. Use maintenance menu to extend DN100A or DN100B.
3. Observe LED on door lock switch ZS101A or ZS101B.

   Is LED on?

   YES Go to TYPICAL DISCRETE INPUT SIGNAL FAULT (WP 0107 00) to check operation of ZS101A or ZS101B.

   NO Go to step 4.
4. Check adjustment of ZS101A or ZS101B (WP 0128 00).

   Is switch properly adjusted?

   YES Go to TYPICAL DISCRETE INPUT SIGNAL FAULT (WP 0107 00) to check operation of ZS101A or ZS101B.

   NO Adjust ZS101A or ZS101B as necessary.

END OF WORK PACKAGE

UNIT, DIRECT SUPPORT, AND GENERAL SUPPORT

LAUNDRY ADVANCED SYSTEM

(NSN 3510–01–463–0114)

OPERATIONAL CHECKOUT AND TROUBLESHOOTING PROCEDURES
LAUNDRY CYCLE CAN NOT BE STARTED OR IS STUCK IN WASHING STEP

INITIAL SETUP:

Tools

Personnel Required

Materials/Parts

Equipment Conditions
Power must be applied at main control enclosure (WP 0010 00).

PATH A

1. Observe operator panel display. It should read:

WASH CYCLE X WASH= XXX F DRY= XXX F WASHING	PAUSE CYCLE EXAMINE INPUTS

or

WASH CYCLE X WASH= XXX F DRY= XXX F SELECT CYCLE, TEMP, START	SELECT CYCLE MODIFY TEMPS START CYCLE EXAMINE INPUTS

or

STAGGERING CYCLES	EXAMINE INPUTS

or

WATER RECYCLING, WAIT	EXAMINE INPUTS

2. Observe operator panel display.

   Is laundry cycle in “WASHING” step?

   YES Go to step **PATH B**.

   NO Go to step 3.

3. Observe operator panel display.

   Does left side of display read “STAGGERING CYCLES”?

   YES Wait for laundry cycle display to appear then go to step 5.

   NO Go to step 4.

PATH A – Continued

4. Observe operator panel display.

   Does left side of display read “WATER RECYCLING, WAIT”?

   YES Go to step 4.

   NO Got to step 6.

5. Open drain valve on still and monitor still water level LT200.

   Does LT200 reading drop?

   YES Allow water to drain from still until LT200 reading is < 7 inches. Go to step 6.

   NO Go to **PATH C**.

6. Observe operator panel display.

   Is “START CYCLE” option available on right side of display?

   YES Go to step 9.

   NO Go to step 7.

7. Make sure drum door is closed and handle is completely engaged.

   Is door closed and handle engaged?

   YES Go to step 8.

   NO Properly close door. Return to normal operation.

8. Check adjustment of door switch (WP 0129 00).

   Is switch properly adjusted?

   YES Go to TYPICAL DISCRETE INPUT SIGNAL FAULT (WP 0107 00) to check operation of door switch.

   NO Adjust door switch position as necessary.

9. Attempt to start a laundry cycle.

   Can laundry cycle be started?

   YES Go to **PATH B**.

   NO Go to DISPLAY STATE DOES NOT CHANGE WHEN MENU SELECTION SWITCH IS PRESSED (WP 0019 00).

PATH B (From PATH A, step 2 or 9)

1. Monitor operator panel to see if laundry cycle advances to ”DRAIN TO STILL” step.

   Does cycle advance to “DRAIN TO STILL” step within 4 – 7 minutes?

   YES Return to normal operation.

   NO Go to step 2.

2. Open drain valve on still and monitor still water level LT200.

   Does LT200 reading drop?

   YES Allow water to drain from still until LT200 reading is < 7 inches. Return to step 1.

   NO Go to **PATH C**.

PATH C (From PATH A, step 5 or PATH B, step 2)

1. Use EXAMINE INPUTS to monitor still temperature TE200.

   Is TE200 reading > 209 degrees F?

   YES Go to step 3.

   NO Go to step 2.

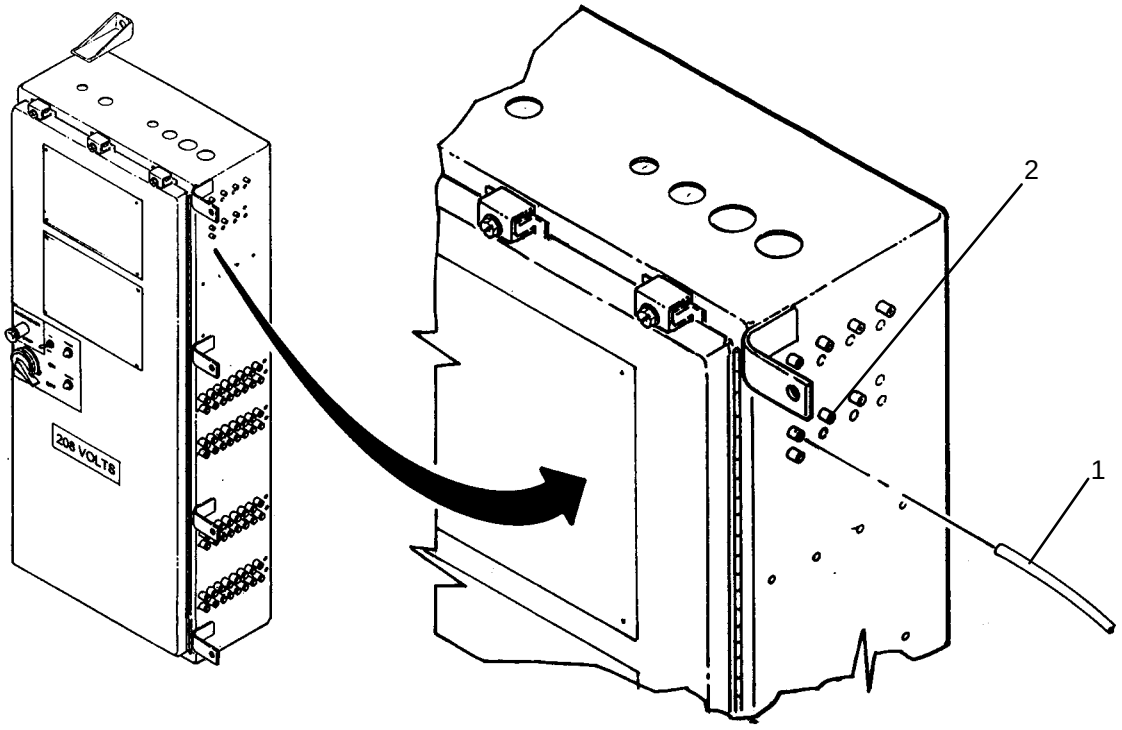
2. Use EXAMINE INPUTS to monitor heater TF temperature TE300.

   Is TE300 reading > 250 degrees F?

   YES Go to step 3

   NO Go to HEATING SYSTEM FAILURE (WP 0072 00).

3. Disconnect tube (1) from top port on level sensor LT200 (2).



4. Observe operator panel display.

   Does level reading drop towards 0 inches?

   YES Go to step 5.

   NO Go to TYPICAL ANALOG INPUT SIGNAL FAULT (WP 0105 00) to check for faulty LT200 level sensor.

5. Monitor operator panel to see if laundry cycle advances to “DRAIN TO STILL” step.

   Does cycle advance to “DRAIN TO STILL” step within 4 – 7 minutes?

   YES Complete cycle then go to STILL NOT BOILING DOWN FAULT (PATH B, step 3, WP 0062 00).

   NO Go to TYPICAL ANALOG INPUT SIGNAL FAULT (WP 0105 00) to check for faulty PCB9.

END OF WORK PACKAGE

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UNIT, DIRECT SUPPORT, AND GENERAL SUPPORT

LAUNDRY ADVANCED SYSTEM

(NSN 3510–01–463–0114)

OPERATIONAL CHECKOUT AND TROUBLESHOOTING PROCEDURES DRYER BLOWER OVERLOAD

INITIAL SETUP:

Tools
Tool Kit, General Mechanics
(Item 1, WP 0282 00)
Multimeter (Item 2, WP 0282 00)

Personnel Required

Materials/Parts

Equipment Conditions
Power must be applied at main control enclosure (WP 0010 00).

PATH A

1. Use maintenance menu to turn on M104A or M104B (WP 0010 00). Observe dryer blower operation.

   Does dryer blower come on?

   YES Go to step 2.

   NO Stop M104A or M104B. Go to step 3.

2. Allow dryer blower to operate for approximately 1 minute. Observe dryer blower operation.

   Does dryer blower stay on?

   YES Stop M104A or M104B. Return to normal operation.

   NO Stop M104A or M104B. Go to step 3.

3. Position SW2 then SW1 to OFF.
4. Open door on inverter enclosure.
5. Check OL104A or OL104B.

   Is lever tripped?

   YES Go to step 6.

   NO Go to **PATH B**.

6. Check trip setting on OL104A or OL104B.

   Is setting 13.3 amps?

   YES Go to step 7.

   NO Set trip setting to 13.3 amps. Reset trip lever. Return to step 1.

7. Reset trip lever.
8. Position SW1 then SW2 to ON.
9. Use maintenance menu to turn on M104A or M104B for approximately 1 minute. Observe dryer blower operation.

   Does dryer blower operate?

   YES Stop M104A or M104B. Return to normal operation.

   NO Stop M104A or M104B. Go to step 10.

PATH A – Continued

10. Position SW2 then SW1 to OFF.
11. Remove dryer outlet guard, then check for smooth rotation of wheel on dryer blower.

    Does wheel rotate freely?

    YES Reinstall dryer outlet guard. Go to step 12.

    NO Replace dryer blower motor M104A or M104B (WP 0131 00).

NOTE

When measuring voltage on 3–phase circuits, always check all three legs of the circuit before concluding that voltage is present. You may misdiagnose a problem if you do not check all three legs (L1, L2, and L3) and voltage is not available at one or two legs of the circuit you did not check.

12. Check for >200 VAC across CB2 terminals (L1 and L2), (L1 and L3), and (L2 and L3).

    Is >200 VAC present?

    YES Go to step 13.

    NO Check connections on wire #s 009, 010, and 011 and jumper bar between CB2 and TB1. Repair as necessary.

13. Check for >200 VAC across CB2 terminals (T1 and T2), (T1 and T3), and (T2 and T3).

    Is >200 VAC present?

    YES Go to step 14.

    NO Replace circuit breaker CB2 (WP0223 00).

14. Check for >200 VAC across K104 terminals (L1 and L2), (L1 and L3), and (L2 and L3).

    Is >200 VAC present?

    YES Go to step 15.

    NO Check connections on wire #s 022, 023, and 024 between K104 and TB6 and wire #s 170, 171, and 172 between TB6 and CB2. Repair as necessary.

15. Use maintenance menu to turn on M104A or M104B then check for >200 VAC across K104 terminals (U and V), (U and W), and (V and W).

    Is >200 VAC present?

    YES Stop M104A or M104B. Go to step 16.

    NO Stop M104A or M104B. Replace 10 HP inverter K104 (WP 0250 00).

16. Use maintenance menu to turn on M104A or M104B then check for >200 VAC across MC104A or MC104B terminals (L1 and L2), (L1 and L3), and (L2 and L3).

    Is >200 VAC present?

    YES Stop M104A or M104B. Go to step 17.

    NO Stop M104A or M104B. Check connections on wire #s 068, 069, and 070 between K104 and MC104A or wire #s 071, 072, and 073 between K104 and MC104B. Repair as necessary.

17. Position SW2 then SW1 to OFF.

PATH A – Continued

18. Check for continuity across contacts (L1 and T1), (L2 and T2), and (L3 and T3) of MC104A or MC104B while pushing in on latching mechanism in center of contactor.

    Do all contacts have continuity?

    YES Go to step 19.

    NO Replace 3–phase contactor MC104A or MC104B (WP 0252 00).

19. Check connections between MC104A and OL104A or between MC104B and OL104B.

    Are connections OK?

    YES Go to step 20.

    NO Repair as necessary.

20. Check for continuity between MC104 and OL104 while pushing in on latching mechanism in center of contactor as follows:

DRYER BLOWER A	DRYER BLOWER B
MC104A (L1) to OL104A (T1)	MC104B (L1) to OL104B (T1)
MC104A (L2) to OL104A (T2)	MC104B (L2) to OL104B (T2)
MC104A (L3) to OL104A (T3)	MC104B (L3) to OL104B (T3)

    Do all circuits have continuity?

    YES Go to step 21.

    NO Replace overload relay OL104A or OL104B (WP 0253 00).

21. Check for shorted or open connections on wire #s 085, 086, and 087 between OL104A and M104A or between wire #s 088, 089, and 090 between OL104B and M104B.

    Are wires and connections OK?

    YES Replace dryer blower motor M104A or M104B (WP 0131 00).

    NO Repair as necessary.

PATH B (From PATH A, step 5)

1. Check for >11 VDC between OL104A or OL104B terminal (98) and TB2 terminal (+12).

    Is >11 VDC present?

    YES Go to step 2.

    NO Check connections on wire #s 324 and 325 between OL104A, Ol104B, and PCB2. Repair as necessary.

2. Check for >11 VDC between OL104A or OL104B terminal (97) and TB2 terminal (+12).

    Is >11 VDC present?

    YES Replace dryer blower overload relay OL104A or OL104B (WP 0253 00).

    NO Go to step 3.

3. Check for shorted wire or connection between OL104A or OL104B terminals (97) and (98) and PCB2.

    Are wires and connections OK?

    YES Go to TYPICAL DISCRETE INPUT SIGNAL FAULT (WP 0107 00, PATH A, step 6).

    NO Repair as required.

END OF WORK PACKAGE

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UNIT, DIRECT SUPPORT, AND GENERAL SUPPORT

LAUNDRY ADVANCED SYSTEM

(NSN 3510–01–463–0114)

OPERATIONAL CHECKOUT AND TROUBLESHOOTING PROCEDURES DRYER INLET TEMPERATURE HI OR LO

INITIAL SETUP:

Tools
Tool Kit, General Mechanics
(Item 1, WP 0282 00)

Personnel Required

Materials/Parts

Equipment Conditions
Power must be applied at main control enclosure (WP 0010 00).

PATH A

1. Observe operator panel display.

   Does display indicate “TE101 or TE102 FAILURE”?

   YES Go to TYPICAL TE FAILURE (WP 0035 00).

   NO Go to step 2.

2. Observe operator panel display.

   Does display indicate “DRYER BLOWER OVERLOAD”?

   YES Go to DRYER BLOWER OVERLOAD FAULT (WP 0030 00).

   NO Go to step 3.

3. Observe operator panel display.

   Does display indicate “10 HP INVERTER FAULT”?

   YES Go to 10 HP INVERTER FAULT (WP 0096 00).

   NO Go to step 4.

4. Check cleanliness of dryer inlet screen.

   Is inlet screen clean?

   YES Go to step 5.

   NO Clean dryer inlet screen. Return to normal operation.

5. Check cleanliness of dryer outlet guard.

   Is guard clean?

   YES Go to step 6.

   NO Clean dryer outlet guard. Return to normal operation.

6. Remove and inspect lint filter.

   Is lint filter clean?

   YES Go to step 7.

   NO Clean and reinstall lint filter. Return to normal operation.

PATH A – Continued

NOTE

Pressure in air system must be maintained above 80 psig while performing the remaining steps this procedure.

Outlet damper should block off air flow to blower wheel when closed and allow air flow when opened. Inlet damper should allow air flow from heat exchanger when closed and block off air flow when opened.

7. Use maintenance menu to open and close outlet damper FV110A or FV110B (WP 0010 00). Observe damper operation.

   Does outlet damper open and close?

   YES Go to step 8.

   NO Go to **PATH B**.

8. Use maintenance menu to open and close FV110A or FV110B. Verify damper position corresponds with display (i.e., opened when display reads “OPEN” and closed when display reads “CLOSED”).

   Does damper position correspond with “OPEN” and “CLOSED” readings?

   YES Go to step 9.

   NO Go to **PATH B**.

9. Use maintenance menu to open and close FV110A or FV110B. Check damper opening and closing speed.

   Does outlet damper open and close in 1 to 5 seconds?

   YES Reinstall lint filter. Go to step 10.

   NO Go to step **PATH**.

10. Use maintenance menu to open and close inlet damper FV111A or FV111B. Observe damper operation.

    Does inlet damper open and close?

    YES Go to step 11.

    NO Go to **PATH B**.

11. Use maintenance menu to open and close FV111A or FV111B. Verify damper position corresponds with display (i.e., opened when display reads “OPEN” and closed when display reads “CLOSED”).

    Does damper position correspond with “OPEN” and “CLOSED” readings?

    YES Go to step 12.

    NO Go to **PATH B**.

12. Use maintenance menu to open and close FV111A or FV111B. Check damper opening and closing speed.

    Does inlet damper open and close in 10 to 25 seconds?

    YES Go to step 13.

    NO Go to step **PATH C**.

13. Use maintenance menu to turn on dryer blower M104A or M104B. Observe blower operation.

    Does blower come on?

    YES Stop M104A or M104B. Go to step 14.

    NO Stop M104A or M104B. DRYER BLOWER DOES NOT TURN ON FAULT (WP 0046 00).

14. Continue current laundry cycle then start another cycle (TM 10–3510–221–10).

PATH A – Continued

15. During wash and rinse extracts verify that water is being drained and extracted from laundry.

    Is water draining and extracting from drum?

    YES Go to HEATING SYSTEM FAILURE (WP 0072 00).

    NO Go to TYPICAL TANK NOT FILLING FAULT (WP 0037 00).

PATH B (From PATH A, steps 7, 8, 10, or 11)

1. Check for obstruction that would prevent free movement of damper.

   Are any obstructions found?

   YES Repair as necessary.

   NO Go to step 2.

2. Open door on main control enclosure. Verify SW1 and SW2 are ON.
3. Using maintenance menu, attempt to open suspect damper while monitoring LED (WP 0011 00, Figure 2, 4) on solenoid valve SV110A or B (outlet damper) or SV111A or B (inlet damper).

   Does LED come on?

   YES Close damper. Go to step 4.

   NO Go to TYPICAL DC OUTPUT SIGNAL FAULT (WP 0106 00) to check operation of SV110 or SV111.

4. Push in manual operator (WP 0011 00, Figure 2, 5) on SV110 or SV111.

   Does damper open?

   YES Replace solenoid valve SV110 or SV111 (WP 0214 00).

   NO Go to step 5.

5. Disconnect tube from port at fixed end of damper air cylinder.
6. Push in manual operator (5) on SV110 or SV111. Check for air pressure at tube disconnected from air cylinder.

   Does air pressure vent from tube?

   YES Go to step 7.

   NO Go to **PATH C**.

7. Connect tube and disconnect tube from other port on air cylinder.
8. Check for air pressure at tube disconnected from air cylinder while pushing in manual operator on SV110 or SV111.

   Does air pressure vent from tube?

   YES Connect tube at air cylinder. Switch tubes connected at solenoid valve SV110 or SV111.

   NO Replace solenoid valve SV110 or SV111 (WP 0214 00).

PATH C (From PATH A, steps 9 or 12 or PATH B, step 9)

1. Check adjustment on flow control valves on air cylinder (WP 0134 00).

   Are flow control valves properly adjusted?

   YES Replace air cylinder (WP 0132 00) or (WP 0133 00).

   NO Properly adjust flow control valves.

END OF WORK PACKAGE

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UNIT, DIRECT SUPPORT, AND GENERAL SUPPORT

LAUNDRY ADVANCED SYSTEM

(NSN 3510–01–463–0114)

OPERATIONAL CHECKOUT AND TROUBLESHOOTING PROCEDURES R2 TANK NOT FILLING

INITIAL SETUP:

Tools

Personnel Required

Materials/Parts

Equipment Conditions
Power must be applied at main control enclosure (WP 0010 00).

1. Observe operator panel display.

   Does “LT FAILURE” appear?

   YES Go to TYPICAL LT FAILURE FAULT (WP 0033 00).

   NO Go to step 2.

2. Observe operator panel display.

   Does “STANDPIPE LEVEL LO” appear?

   YES Go to STANDPIPE LEVEL LO FAULT (WP 0057 00).

   NO Go to step 3.

3. Observe operator panel display.

   Does “STANDPIPE NOT EMPTYING” appear?

   YES Go to STANDPIPE NOT EMPTYING FAULT (WP 0058 00).

   NO Go to step 4.

4. Determine if fault occurred when tank was filling during normal laundry operations or from external water supply.

   Was tank filling from external water supply?

   YES Go TYPICAL TANK NOT FILLING FAULT (WP 0037 00).

   NO Go to step 5.

5. Check drain valve on distillate pump M201)

   Is valve closed?

   YES Go to step 6.

   NO Close valve. Return to normal operation.

6. Check drain valve on pre–filter.

   Is valve closed?

   YES Go to step 7.

   NO Close valve. Return to normal operation.

7. Check drain valve on bottom of coalescer.

   Is valve closed?

   YES Go to step 8.

   NO Close valve. Return to normal operation.

8. Check drain valves on subcooler.

   Are valves closed?

   YES Go to step 9.

   NO Close valves. Return to normal operation.

9. Check drain valves at bottom of still.

   Are drain valves closed?

   YES Go to step 10.

   NO Close drain valves. Return to normal operation.

10. Check still doors for signs of leakage.

    Are doors leaking?

    YES Properly close or repair leakage as required.

    NO Go to step 11.

11. Check still relief valve for signs of class III leakage.

    Is relief valve leaking?

    YES Go to STILL PRESSURE HI FAULT (WP 0052 00).

    NO Go to step 12.

12. Check vacuum breaker for signs of class III leakage.

    Is vacuum breaker leaking?

    YES Replace vacuum breaker (WP 0157 00).

    NO Go to step 13.

13. Check all condensate and distillate plumbing for class III leakage.

    Are any leaks found?

    YES Repair leaks as required.

    NO Go to step 14.

14. Determine if heating system is operating properly by monitoring status of PT300, PT301, PT302, and TE300.

    Does heating system appear to be operating at proper temperature?

    YES Go to TYPICAL TANK NOT FILLING FAULT (WP 0037 00, PATH A, step 3).

    NO Go to HEATING SYSTEM FAILURE (WP 0072 00).

END OF WORK PACKAGE

UNIT, DIRECT SUPPORT, AND GENERAL SUPPORT

LAUNDRY ADVANCED SYSTEM

(NSN 3510–01–463–0114)

OPERATIONAL CHECKOUT AND TROUBLESHOOTING PROCEDURES TYPICAL LEVEL SENSOR FAILURE

INITIAL SETUP:

Tools

Personnel Required

Materials/Parts

Equipment Conditions
Power must be applied at main control enclosure (WP 0010 00).

NOTE

Occasionally, fault messages may be displayed due to voltage transients. If a LT FAILURE message is displayed, then goes away, the system is operating properly and can be returned to normal operation.

1. Observe operator panel display.

   Does “LTXXX FAILURE” reappear?

   YES Go to step 2.

   NO Return to normal operation.

2. Use maintenance menu to examine status of VOLTAGE REFERENCE HI (WP 0010 00).

   Does status indicate VOLTAGE REFERENCE HI is in 9.20 to 9.24 VDC range?

   YES Go to step 3.

   NO Go to VREF(S) OUT OF RANGE FAULT (WP 0095 00).

3. Use maintenance menu to examine status of VOLTAGE REFERENCE LO.

   Does status indicate VOLTAGE REFERENCE LO is in .75 to .79 VDC range?

   YES Go to step 4.

   NO Go to VREF(S) OUT OF RANGE FAULT (WP 0095 00).

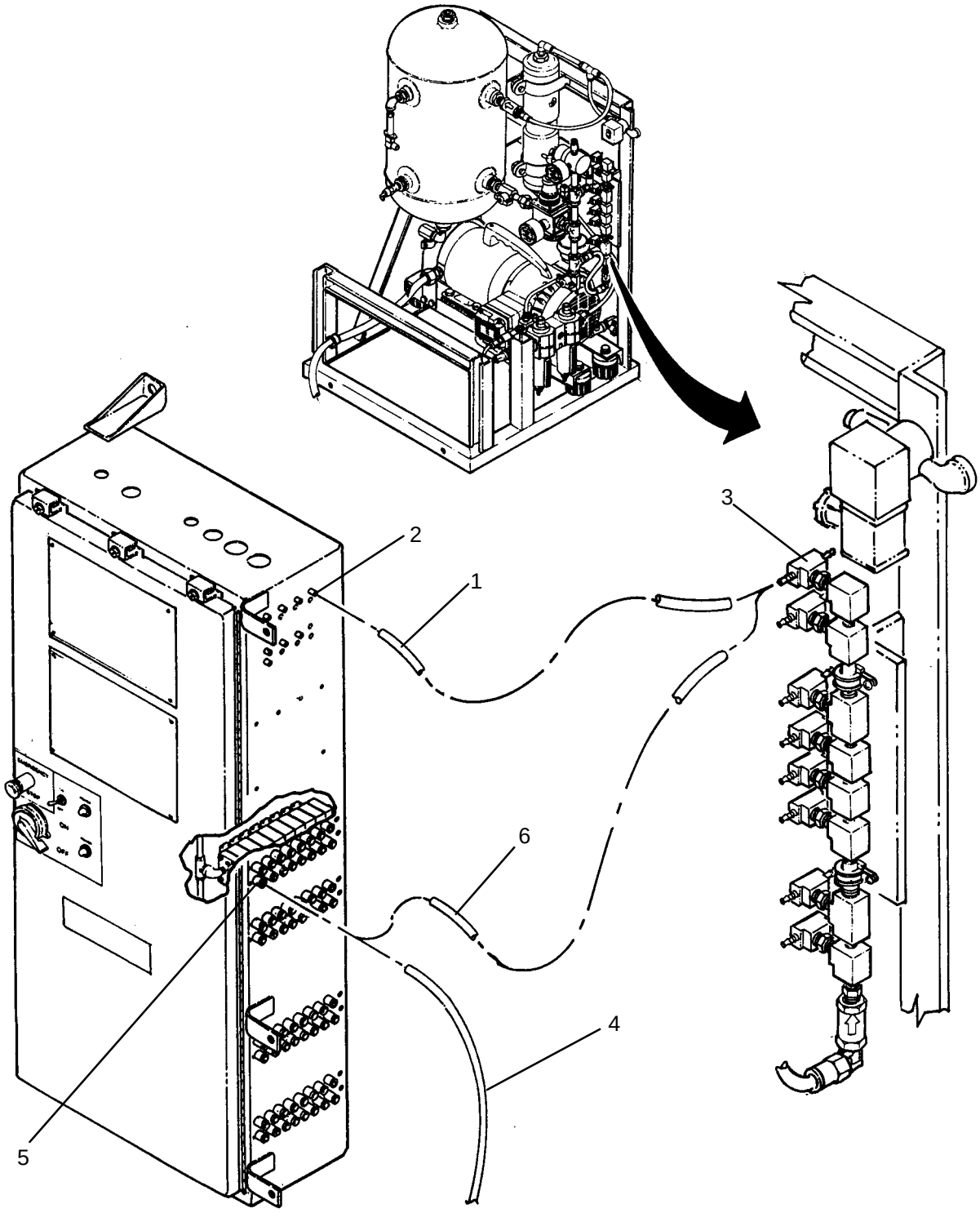
4. Use maintenance menu to examine status of suspect LT.

   Does status indicate voltage is in 1.40 to 8.50 VDC range?

   YES Return to normal operation.

   NO Go to step 5.

5. Disconnect tube (1) from suspect level sensor (2).



6. Observe operator panel display.

Does reading drop to approximately 1.50 VDC?

YES Go to step 7.

NO Go to TYPICAL ANALOG INPUT SIGNAL FAULT (WP 0105 00).

7. Attempt to clear restriction in tubing for suspect level sensor (2) as follows:
   a. Disconnect tube (1) for suspect sensor from orifice manifold (3).

CAUTION

Level sensor can not be subjected to high pressure air. Prior to connecting air pressure to level tube path ensure tube is disconnected from level sensor. For sensor LT200 tubes must be disconnected from both ports and from PT200. For PT200 tubes must also be disconnected from both ports on LT200. Failure to follow this precaution will result in damage to sensors.

   b. Disconnect air tube labeled FV107AE (4) from SV107A (5).
   c. Connect a piece of 1/4 inch tubing (6) between orifice manifold (3) and exhaust port on solenoid valve SV107A (5).
   d. Using maintenance menu open valve FV107A for about 5 seconds then close valve.
   e. Disconnect 1/4 inch tubing (6) from solenoid valve SV107A (5) and orifice manifold (3).
   f. Reconnect air tube (4) to solenoid valve SV107A (5).
   g. Reconnect tube (1) to level sensor (2) and orifice manifold (3).
8. Allow air system to build–up air pressure then use maintenance menu to examine water level in suspect tank.

   Does reading drop towards 1.50 VDC?

   YES Return to start of this procedure.

   NO Go to step 9.
9. Determine which sensor you are troubleshooting.

   Is fault on LT200 or PT200?

   YES Go to STILL PRESSURE HIGH FAULT (WP 0052 00, step 14).

   NO Go to step 10.
10. Repeat step 7 to try and clear restriction in tubing. If restriction can not be cleared, replace tubing as necessary.

END OF WORK PACKAGE

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UNIT, DIRECT SUPPORT, AND GENERAL SUPPORT

LAUNDRY ADVANCED SYSTEM

(NSN 3510–01–463–0114)

OPERATIONAL CHECKOUT AND TROUBLESHOOTING PROCEDURES
TYPICAL PRESSURE SENSOR FAILURE

INITIAL SETUP:

Tools

Personnel Required

Materials/Parts

Equipment Conditions
Power must be applied at main control enclosure (WP 0010 00).

NOTE

Occasionally, fault messages may be displayed due to voltage transients. If a PT FAILURE message is displayed, then goes away, the system is operating properly and can be returned to normal operation.

PT200 should be regarded as a level sensor. Use TYPICAL LT FAILURE procedure (WP 0033 00) to troubleshoot PT200.

1. Observe operator panel display.

   Does "PTXXX FAILURE" reappear?

   YES Go to step 2.

   NO Return to normal operation.

2. Use maintenance menu to examine status of VOLTAGE REFERENCE HI (WP 0010 00).

   Does status indicate VOLTAGE REFERENCE HI is in 9.20 to 9.24 VDC range?

   YES Go to step 3.

   NO Go to VREF(S) OUT OF RANGE FAULT (WP 0095 00).

3. Use maintenance menu to examine status of VOLTAGE REFERENCE LO.

   Does status indicate VOLTAGE REFERENCE LO is in .75 to .79 VDC range?

   YES Go to step 4.

   NO Go to VREF(S) OUT OF RANGE FAULT (WP 0095 00).

4. Use maintenance menu to examine status of suspect PT.

   Does status indicate voltage is in .90 to 5.50 VDC range?

   YES Return to normal operation.

   NO Go to TYPICAL ANALOG INPUT SIGNAL FAULT (WP 0105 00).

END OF WORK PACKAGE

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UNIT, DIRECT SUPPORT, AND GENERAL SUPPORT

LAUNDRY ADVANCED SYSTEM

(NSN 3510–01–463–0114)

OPERATIONAL CHECKOUT AND TROUBLESHOOTING PROCEDURES
TYPICAL TEMPERATURE SENSOR FAILURE

INITIAL SETUP:

Tools

Personnel Required

Materials/Parts

Equipment Conditions
Power must be applied at main control enclosure (WP 0010 00).

NOTE

Occasionally, fault messages may be displayed due to voltage transients. If a TE FAILURE message is displayed, then goes away, the system is operating properly and can be returned to normal operation.

1. Observe operator panel display.

   Does "TEXXX FAILURE" reappear?

   YES Go to step 2.

   NO Return to normal operation.

2. Use maintenance menu to examine status of VOLTAGE REFERENCE HI (WP 0010 00).

   Does status indicate VOLTAGE REFERENCE HI is in 9.20 to 9.24 VDC range?

   YES Go to step 3.

   NO Go to VREF(S) OUT OF RANGE FAULT (WP 0095 00).

3. Use maintenance menu to examine status of VOLTAGE REFERENCE LO.

   Does status indicate VOLTAGE REFERENCE LO is in .75 to .79 VDC range?

   YES Go to step 4.

   NO Go to VREF(S) OUT OF RANGE FAULT (WP 0095 00).

4. Use maintenance menu to examine status of suspect TE.

   Does status indicate voltage is in 0.50 to 9.00 VDC range?

   YES Return to normal operation.

   NO Go to TYPICAL ANALOG INPUT SIGNAL FAULT (WP 0105 00).

END OF WORK PACKAGE

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UNIT, DIRECT SUPPORT, AND GENERAL SUPPORT

LAUNDRY ADVANCED SYSTEM

(NSN 3510–01–463–0114)

OPERATIONAL CHECKOUT AND TROUBLESHOOTING PROCEDURES TYPICAL TANK NOT EMPTYING

INITIAL SETUP:

Tools
Tool Kit, General Mechanics
(Item 1, WP 0282 00)

Personnel Required

Materials/Parts

Equipment Conditions
Power must be applied at main control enclosure (WP 0010 00).

PATH A

NOTE

Pressure in air system must be maintained above 80 psig while performing this procedure.

Tank not emptying fault messages may be displayed if a laundry cycle is paused in the middle of a filling step (i.e., “FILL FROM WASH TANK”). Laundry cycle instructions specifically state not to pause a cycle during these steps. Prior to starting this procedure, check with laundry personnel to determine if the fault message is a result of a paused cycle.

1. Observe operator panel display.

   Does “LTXXX FAILURE” appear?

   YES Go to TYPICAL LT FAILURE FAULT (WP 0033 00).

   NO Go to step 2.

2. Use maintenance menu to turn on water pump M101A or M101B and circulate water through suspect tank (WP 0010 00).

3. Verify water pump comes on.

   Does water pump come on?

   YES Go to step 4.

   NO Go to WATER PUMP DOES NOT TURN ON FAULT (WP 0048 00).

4. Verify inlet and outlet valves on suspect tank are open.

   Are both valves open?

   YES Go to step 5.

   NO Go to TYPICAL WATER CONTROL VALVE NOT OPENING/CLOSING FAULT (WP 0047 00).

5. Observe suspect water tank.

   Is water circulating into and out of tank?

   YES Go to **PATH B**.

   NO Go to step 6.

6. Check for debris in water pump strainer (TM 10–3510–221–10).

   Is strainer clogged of debris?

   YES Clean and replace strainer. Return to normal operation.

   NO Go to step 7.

PATH A – Continued

7. Check for blockage in water plumping.

   Is blockage found?

   YES Clear blockage as required.

   NO Replace water pump (WP 0145 00).

PATH B (From PATH A, step 5)

1. Use maintenance menu to open drum inlet valve FV106A or FV106B.

   Does valve open?

   YES Close valve. Go to step 2.

   NO Go to TYPICAL WATER CONTROL VALVE NOT OPENING/CLOSING FAULT (WP 0047 00).

2. Verify drum outlet valve FV107A or FV107B is closed.

   Is valve closed?

   YES Go to step 3.

   NO Go to TYPICAL WATER CONTROL VALVE NOT OPENING/CLOSING FAULT (WP 0047 00).

3. Verify inlet valves on all other water tanks are closed.

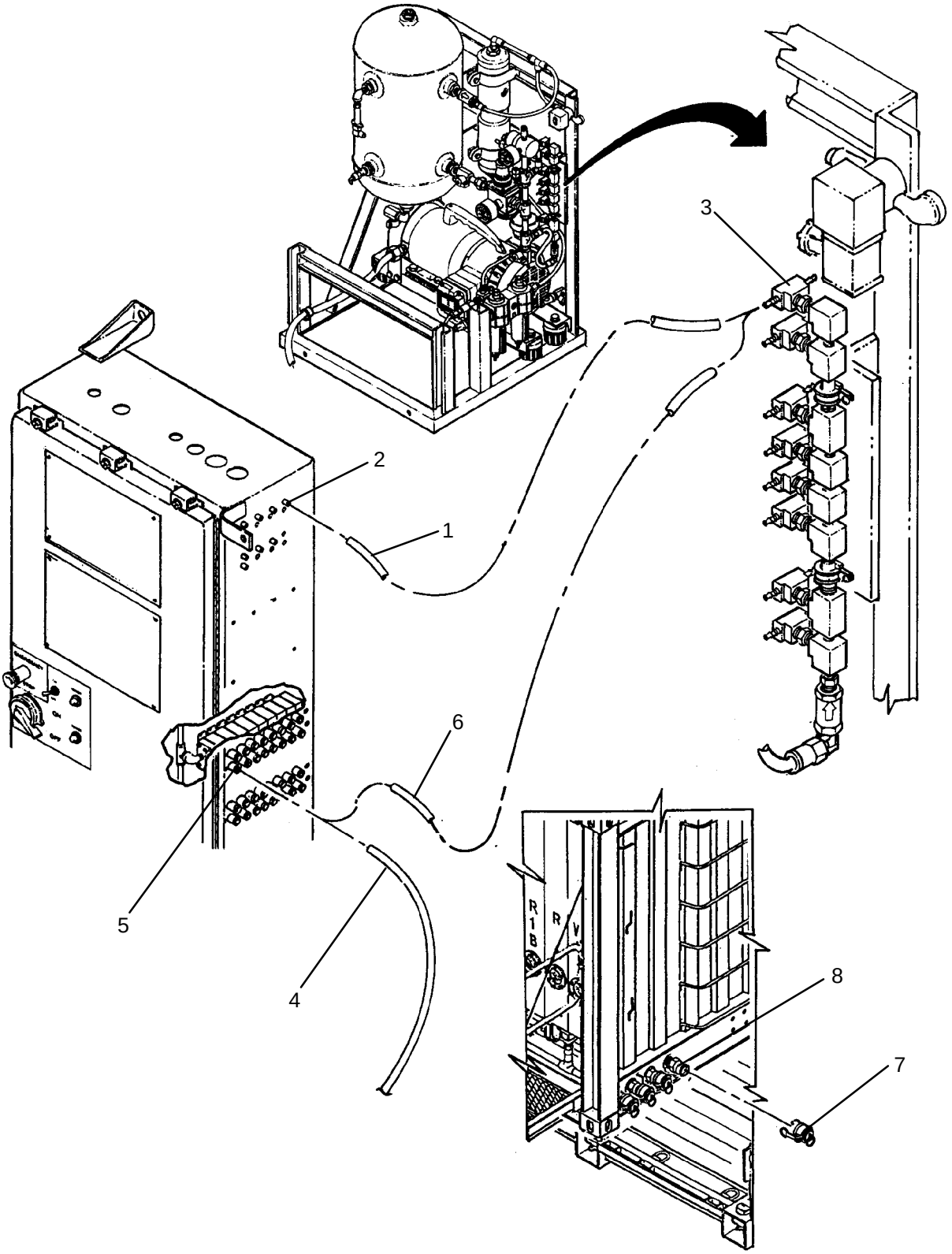
   Are valves closed?

   YES Go to step 4.

   NO Go to TYPICAL WATER CONTROL VALVE NOT OPENING/CLOSING FAULT (WP 0047 00).

PATH B – Continued

4. Disconnect tube (1) from level sensor (2) for suspect tank.



PATH B – Continued

5. Use maintenance menu to examine water level in suspect tank.

   Does reading drop towards 0 gallons.

   YES Go to step 6.

   NO Go to TYPICAL ANALOG INPUT SIGNAL FAULT (WP 0105 00).

CAUTION

Tube previously disconnected from level sensor must remain disconnected prior to pressurizing tank level tube. Applying high pressure to level sensor will cause permanent damage.

6. Attempt to clear restriction from level tubing of suspect tank as follows:
   a. Disconnect tube (1) for suspect tank level tube from orifice manifold (3).
   b. Disconnect air tube labeled FV107AE (4) from SV107A (5).
   c. Connect a piece of 1/4 inch tubing (6) between orifice manifold (3) and exhaust port on solenoid valve SV107A (5).
   d. Using maintenance menu, open valve FV107A for about 5 seconds then close valve.
   e. Disconnect 1/4 inch tubing (6) from solenoid valve SV107A (5) and orifice manifold (3).
   f. Reconnect air tube (4) to solenoid valve SV107A (5).
   g. Reconnect tube (1) to level sensor (2) and orifice manifold (3).
7. Allow air system to build up pressure then use maintenance menu to examine water level in suspect tank.
8. Record water level.
9. Remove cap (7) from manifold (8).
10. Using maintenance menu, open valve on suspect tank where cap (7) was removed for about 5 seconds then close valve.
11. Use maintenance menu to examine water level in suspect tank.

    Is water level recorded 3 or more gallons < level recorded in step 8?

    YES Replace cap (7) on manifold (8). Return to normal operation.

    NO Repeat step 6 to clear restriction. If restriction can not be cleared, replace tubing as necessary.

END OF WORK PACKAGE

UNIT, DIRECT SUPPORT, AND GENERAL SUPPORT

LAUNDRY ADVANCED SYSTEM

(NSN 3510–01–463–0114)

OPERATIONAL CHECKOUT AND TROUBLESHOOTING PROCEDURES TYPICAL TANK NOT FILLING

INITIAL SETUP:

Tools
Tool Kit, General Mechanics
(Item 1, WP 0282 00)

Personnel Required

Materials/Parts

Equipment Conditions
Power must be applied at main control enclosure (WP 0010 00).

PATH A

NOTE

Pressure in air system must be maintained above 80 psig while performing this procedure.

1. Observe operator panel display.

   Does “LTXXX FAILURE” appear?

   YES Go to TYPICAL LT FAILURE FAULT (WP 0033 00).

   NO Go to step 2.

2. Determine if fault occurred when tank was filling during a laundry cycle or during FILL TANKS operation.

   Was tank filling during a laundry cycle?

   YES Go to **PATH B**.

   NO Go to step 3.

3. Check external water supply.

   Is water supply adequate?

   YES Go to step 4.

   NO Replenish water supply. Return to normal operation.

4. Check hose connections at water supply, water supply pump, and LADS.

   Are hoses properly connected?

   YES Go to step 5.

   NO Properly connect hoses. Return to normal operation.

5. Check position of any shut–off valves that may be installed in water supply plumbing between water tank and LADS.

   Are valves open?

   YES Go to step 6.

   NO Open valve(s). Return to normal operation.

6. Check electrical cable connection at water supply pump and LADS.

   Is electrical cable properly connected?

   YES Go to step 7.

   NO Properly connect electrical cable. Return to normal operation.

PATH A – Continued

7. Check power switch on water supply pump.

   Is switch in ON position?

   YES Go to step 8.

   NO Position switch to ON. Return to normal operation.

8. Check petcock on water supply pump.

   Is petcock closed?

   YES Go to step 9.

   NO Close petcock. Return to normal operation.

9. Check shutoff valve at garden hose connection on water plumbing.

   Is valve closed?

   YES Go to step 10.

   NO Close valve. Return to normal operation.

10. Check drain valves on LADS water pumps M101A and M101B.

    Are valves closed?

    YES Go to step 11.

    NO Close valves. Return to normal operation.

11. Check caps on water supply manifolds.

    Are caps installed?

    YES Go to step 12.

    NO Install cap(s). Return to normal operation.

12. Check LADS water plumbing for class III leaks.

    Are any leaks found?

    YES Repair as necessary.

    NO Go to step 13.

13. Use maintenance menu to turn on water supply pump M105 (WP 0010 00).

    Does water supply pump come on?

    YES Stop pump. Go to step 14.

    NO Stop pump. Go to WATER SUPPLY PUMP DOES NOT TURN ON FAULT (WP 0050 00).

14. Use maintenance menu to check water level in each tank and/or visually check tank water levels.

    Are any tanks filled?

    YES Go to step 15.

    NO Go to step 16.

15. Repeat FILL TANKS (TM 10–3510–221–10).

    Do tanks fill to proper level?

    YES Return to normal operation.

    NO Go to step 16.

PATH A – Continued

16. Use maintenance menu to open water supply inlet valves FV108A and FV108B.

    Do valves open?

    YES Close valves. Go to step 17.

    NO Go to TYPICAL WATER CONTROL VALVE NOT OPENING/CLOSING FAULT (WP 0047 00).

17. Use maintenance menu to open inlet valve at any tank that did not fill.

    Do valve(s) open?

    YES Close valve. Go to step 18.

    NO Go to TYPICAL WATER CONTROL VALVE NOT OPENING/CLOSING FAULT (WP 0047 00).

18. Use maintenance menu to open and close still inlet valves FV109A and FV109B.

    Do valves open and close?

    YES Close valves. Go to step 19.

    NO Go to TYPICAL WATER CONTROL VALVE NOT OPENING/CLOSING FAULT (WP 0047 00).

19. During filling operation, check overflows on water tanks to see if water is overflowing.

    Is water overflowing from any tank?

    YES Go to step 20.

    NO Check water supply pump for proper rotation and for a clogged strainer.

20. Turn SW2 to OFF to stop filling operation then turn SW2 back to ON.

21. Use maintenance menu to check water level reading in tank that was overflowing.

    Is tank level reading >70 gallons for Wash or R1 tank or >140 gallons for R2 tank?

    YES Return to normal operation.

    NO Go to step 22.

22. Use maintenance menu to check water level in suspect tank.

    Is tank level <15 gallons?

    YES Go to step 24.

    NO Go to step 23.

23. Check for debris in water pump strainer (TM 10–3510–221–10).

    Is strainer clear of debris?

    YES Go to step 24.

    NO Clean and replace strainer. Return to normal operation.

24. Visually check tank water level.

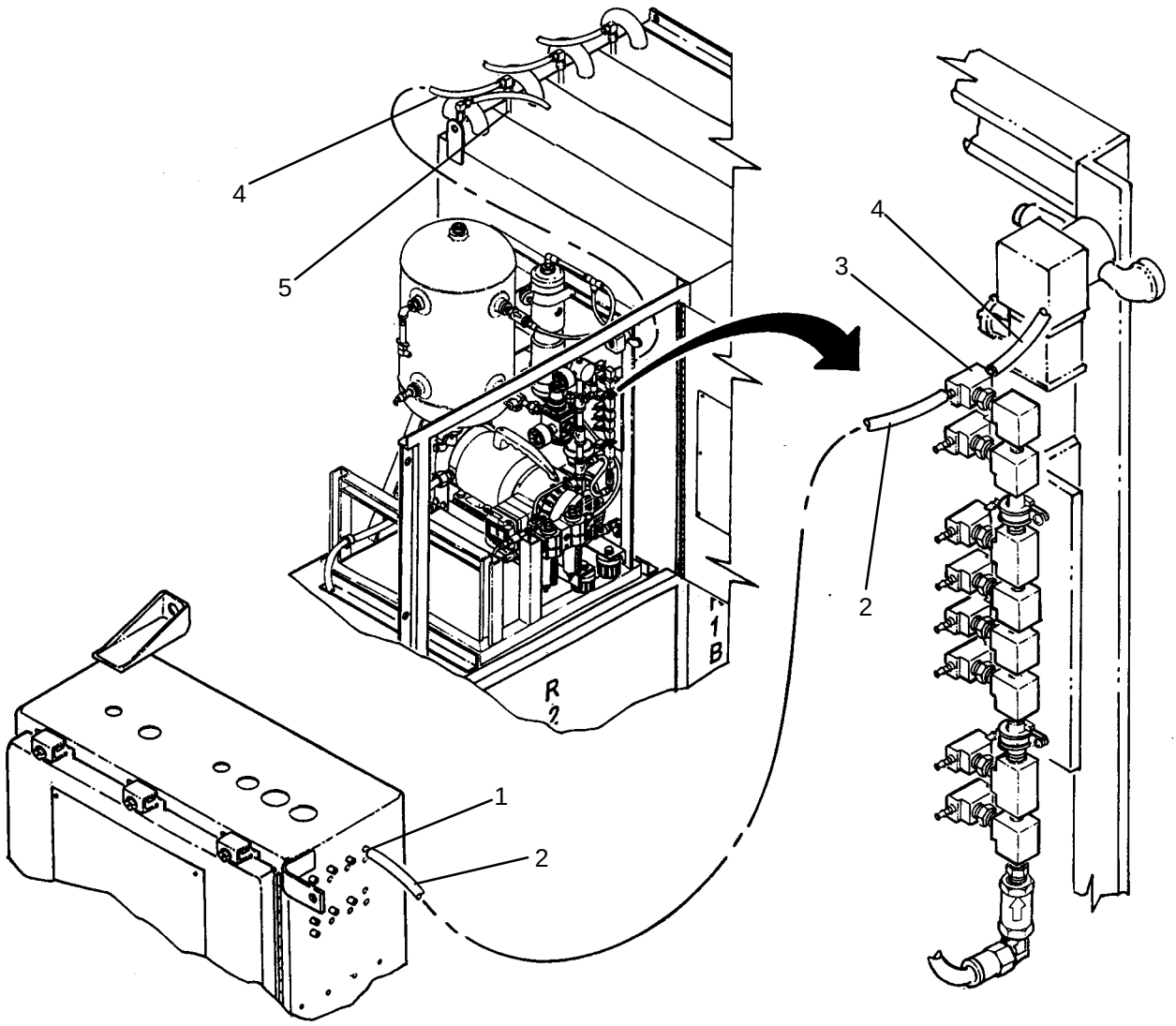
    Is water level above sight glass?

    YES Go step step 25.

    NO Go to step 28.

PATH A – Continued

25. Check tubes and connections between level sensor (1) and tube (2), between tube (2) and orifice manifold (3), between orifice manifold (3) and tube (4), and between tube (4) and level tube (5) for loose connections and blocked or damaged tubing.



Are any loose connections or blocked or damaged tubes found?

YES Repair as necessary.

NO Go to step 26.

26. Replace orifice for suspect water tank (WP 0211 00).

27. Use maintenance menu to check water level reading in tank that was overflowing.

Is tank level reading >70 gallons for Wash or R1 tank or >140 gallons for R2 tank?

YES Return to normal operation.

NO Go to TYPICAL ANALOG INPUT SIGNAL FAULT (WP 0105 00).

PATH B (From PATH A, step 2 or step 24)

1. Use maintenance menu to turn on water pump M101A or M101B.

   Does water pump come on?

   YES Stop pump. Go to step 2.

   NO Stop pump. Go to WATER PUMP DOES NOT TURN ON FAULT (WP 0048 00).

2. Use maintenance menu to open inlet valve on suspect tank.

   Does valve open?

   YES Close valve. Go to step 3.

   NO Close valve. Go to TYPICAL WATER CONTROL VALVE NOT OPENING/CLOSING FAULT (WP 0047 00).

3. Use maintenance menu to open drum outlet valve FV107A or FV107B.

   Does valve open?

   YES Close valve. Go to step 4.

   NO Close valve. Go to TYPICAL WATER CONTROL VALVE NOT OPENING/CLOSING FAULT (WP 0047 00).

4. Verify drum inlet valve FV106A or FV106B is closed.

   Is valve closed?

   YES Go to step 5.

   NO Go to TYPICAL WATER CONTROL VALVE NOT OPENING/CLOSING FAULT (WP 0047 00).

5. Verify still inlet valves FV109A and FV109B are closed.

   Are valves closed?

   YES Go to step 6.

   NO Go to TYPICAL WATER CONTROL VALVE NOT OPENING/CLOSING FAULT (WP 0047 00).

6. Check for debris in water pump strainer (TM 10–3510–221–10).

   Is strainer clear of debris?

   YES Go to step 7.

   NO Clean and replace strainer. Return to normal operation.

7. Check for blockage in water plumping.

   Is blockage found?

   YES Clear blockage as required.

   NO Replace water pump M101A or M101B (WP 0145 00).

END OF WORK PACKAGE

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UNIT, DIRECT SUPPORT, AND GENERAL SUPPORT

LAUNDRY ADVANCED SYSTEM

(NSN 3510–01–463–0114)

OPERATIONAL CHECKOUT AND TROUBLESHOOTING PROCEDURES WATER PUMP OVERLOAD

INITIAL SETUP:

Tools
Tool Kit, General Mechanics
(Item 1, WP 0282 00)
Multimeter (Item 2, WP 0282 00)

Personnel Required

Materials/Parts

Equipment Conditions
Power must be applied at main control enclosure (WP 0010 00).

PATH A

CAUTION

Never start or run pumps dry. Prior to using maintenance menu to check operation of a pump, make sure water is available at the pump inlet. Operating a pump dry can cause internal damage to pump.

1. Use maintenance menu to turn on water pump M101A or M101B (WP 0010 00). Observe pump operation.

   Does water pump come on?

   YES Stop pump. Go to step 2.

   NO Stop pump. Go to step 3.

2. Use maintenance menu to circulate water through any tank for approximately 1 minute. Observe pump operation.

   Does water pump stay on?

   YES Stop pump. Return to normal operation.

   NO Stop pump. Go to step 3.

3. Open door on main control enclosure

4. Check OL101A or OL101B.

   Is lever tripped?

   YES Go to step 5.

   NO Go to **PATH B**.

5. Check trip setting on OL101A or OL101B.

   Is setting 6.2 amps?

   YES Reset trip lever. Go to step 6.

   NO Set trip setting to 6.2 amps. Reset trip lever. Return to step 1.

6. Use maintenance menu to circulate water through any tank for approximately 1 minute. Observe pump operation.

   Does water pump stay on?

   YES Stop pump. Return to normal operation.

   NO Stop pump. Go to step 7.

PATH A – Continued

NOTE

When measuring voltage on 3–phase circuits, always check all three legs of the circuit before concluding that voltage is present. You may misdiagnose a problem if you do not check all three legs (L1, L2, and L3) and voltage is not available at one or two legs of the circuit you did not check.

7. Check for >200 VAC across CB5 terminals (L1 and L2), (L1 and L3), and (L2 and L3).

   Is >200 VAC present?

   YES Go to step 8.

   NO Check connections on wire #s 015, 016, and 017 between CB5 and TB1. Repair as necessary.

8. Check for >200 VAC across CB5 terminals (T1 and T2), (T1 and T3), and (T2 and T3).

   Is >200 VAC present?

   YES Go to step 9.

   NO Replace circuit breaker CB5 (WP0223 00).

9. Check for >200 VAC across MC101A or MC101B terminals (L1 and L2), (L1 and L3), and (L2 and L3).

   Is >200 VAC present?

   YES Go to step 10.

   NO Check connections on wire #s 031, 032, and 033 between CB5 and MC101B and wire #s 048, 049, and 050 between MC101A and MC101B. Repair as necessary.

10. Position SW2 then SW1 to OFF.

11. Check for continuity across contacts (L1 and T1), (L2 and T2), and (L3 and T3) of MC101A or MC101B while pushing in on latching mechanism in center of contactor.

    Do all contacts have continuity?

    YES Go to step 12.

    NO Replace 3–phase contactor MC101A or MC101B (WP 0225 00).

12. Check connections between MC101A and OL101A or between MC101B and OL101B.

    Are connections OK?

    YES Go to step 13.

    NO Repair as necessary.

13. Check for continuity between MC101 and OL101 while pushing in on latching mechanism in center of contactor as follows:

WATER PUMP A	WATER PUMP B
MC101A (L1) to OL101A (T1)	MC101B (L1) to OL101B (T1)
MC101A (L2) to OL101A (T2)	MC101B (L2) to OL101B (T2)
MC101A (L3) to OL101A (T3)	MC101B (L3) to OL101B (T3)

    Do all circuits have continuity?

    YES Go to step 14.

    NO Replace overload relay OL101A or OL101B (WP 0226 00).

PATH A – Continued

14. Check resistance across water pump contactor MC101A or MC101B output terminals (T1 and T2), (T1 and T3), and (T2 and T3).

    Is resistance < 1 ohm across any set of terminals?

    YES Go to step 16.

    NO Go to step 15.

15. Attempt to spin fan blade on back of water pump motor M101A or M101B.

    Does blade spin freely?

    YES Go to step 16.

    NO Replace water pump M101A or M101B (WP 0145 00).

16. Check for shorted or open connections on wire #s 091, 092, and 093 between OL101A and M101A or between wire #s 094, 094, and 096 between OL101B and M101B.

    Are wires and connections OK?

    YES Replace water pump M101A or M101B (WP 0145 00).

    NO Repair as required.

PATH B (From PATH A, step 4)

1. Check for >11 VDC between OL101A or OL101B terminal (98) and TB2 terminal (+12).

   Is >11 VDC present?

   YES Go to step 2.

   NO Check connections on wire #s 323, 330, and 331 between OL101A, OL101B, and PCB2. Repair as necessary.

2. Check for >11 VDC between OL101A or OL101B terminal (97) and TB2 terminal (+12).

   Is >11 VDC present?

   YES Replace water pump overload relay OL101A or OL101B (WP 0226 00).

   NO Go to step 3.

3. Check for shorted connections on wire #s 323, 330, and 331 between OL101A, OL101B, and PCB2.

   Are wires and connections OK?

   YES Go to TYPICAL DISCRETE INPUT SIGNAL FAULT (WP 0107 00, PATH A, step 6).

   NO Repair as required.

END OF WORK PACKAGE

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UNIT, DIRECT SUPPORT, AND GENERAL SUPPORT

LAUNDRY ADVANCED SYSTEM

(NSN 3510–01–463–0114)

OPERATIONAL CHECKOUT AND TROUBLESHOOTING PROCEDURES WATER SUPPLY PUMP OVERLOAD

INITIAL SETUP:

Tools
Tool Kit, General Mechanics
(Item 1, WP 0282 00)
Multimeter (Item 2, WP 0282 00)

Personnel Required

Materials/Parts

Equipment Conditions
Power must be applied at main control enclosure (WP 0010 00).

PATH A

CAUTION

Never start or run pumps dry. Prior to using maintenance menu to check operation of a pump, make sure water is available at the pump inlet. Operating a pump dry can cause internal damage to pump.

1. Use maintenance menu to turn on water supply pump M105 (WP 0010 00). Observe pump operation.

   Does water supply pump come on?

   YES Go to step 2.

   NO Stop pump. Go to step 3.

2. Allow water supply pump to run for approximately 1 minute. Observe pump operation.

   Does water supply pump stay on?

   YES Stop pump. Return to normal operation.

   NO Stop pump. Go to step 3.

3. Open door on main control enclosure

4. Check overload relay OL105.

   Is lever tripped?

   YES Go to step 5.

   NO Go to **PATH B**.

5. Check trip setting on OL105.

   Is setting 3 amps?

   YES Reset trip lever. Go to step 6.

   NO Set trip setting to 3 amps. Reset trip lever. Return to step 1.

6. Use maintenance menu to turn on water supply pump for approximately 1 minute. Observe pump operation.

   Does water supply pump stay on?

   YES Stop pump. Return to normal operation.

   NO Stop pump. Go to step 7.

PATH A – Continued

NOTE

When measuring voltage on 3–phase circuits, always check all three legs of the circuit before concluding that voltage is present. You may misdiagnose a problem if you do not check all three legs (L1, L2, and L3) and voltage is not available at one or two legs of the circuit you did not check.

7. Check for >200 VAC across CB6 terminals (L1 and L2), (L1 and L3), and (L2 and L3).

   Is >200 VAC present?

   YES Go to step 8.

   NO Check connections on wire #s 015, 016, and 017 and jumper bar between CB6 and TB1. Repair as necessary.

8. Check for >200 VAC across CB6 terminals (T1 and T2), (T1 and T3), and (T2 and T3).

   Is >200 VAC present?

   YES Go to step 9.

   NO Replace circuit breaker CB6 (WP0223 00).

9. Check for >200 VAC across water supply pump contactor MC105 terminals (L1 and L2), (L1 and L3), and (L2 and L3).

   Is >200 VAC present?

   YES Go to step 10.

   NO Check connections on wire #s 051, 052, and 053 between CB6 and MC105. Repair as necessary.

10. Position SW2 then SW1 to OFF.

11. Check for continuity across contacts (L1 and T1), (L2 and T2), and (L3 and T3) of MC105 while pushing in on latching mechanism in center of MC105.

    Do all contacts have continuity?

    YES Go to step 12.

    NO Replace 3–phase contactor MC105 (WP 0225 00).

12. Check connections between MC105 and OL105.

    Are connections OK?

    YES Go to step 13.

    NO Repair as necessary.

13. Check for continuity between MC105 and OL105 while pushing in on latching mechanism in center of MC105 as follows:

    MC105 (L1) to OL105 (T1)

    MC105 (L2) to OL105 (T2)

    MC105 (L3) to OL105 (T3)

    Do all circuits have continuity?

    YES Go to step 14.

    NO Replace overload relay OL105 (WP 0226 00).

PATH A – Continued

14. Check resistance across MC105 output terminals (T1 and T2), (T1 and T3), and (T2 and T3).

    Is resistance < 4 ohms across any set of terminals?

    YES Go to step 16.

    NO Go to step 15.

15. Attempt to spin fan blade on back of water supply pump motor M105.

    Does blade spin freely?

    YES Go to step 16.

    NO Replace water supply pump.

16. Check for shorted or open connections on wire #s 097, 098, and 099 between OL105 and junction box J2 and on 100 ft cable and M105.

    Are wires and connections OK?

    YES Replace water supply pump.

    NO Repair as required.

PATH B (From PATH A, step 4)

1. Check for >11 VDC between OL105 terminal (98) and TB2 terminal (+12).

   Is >11 VDC present?

   YES Go to step 2.

   NO Check connections on wire #s 319 and 331 between OL105, OL101B, and PCB2. Repair as necessary.

2. Check for >11 VDC between OL105 terminal (97) and TB2 terminal (+12).

   Is >11 VDC present?

   YES Replace water supply pump overload relay OL105 (WP 0226 00).

   NO Go to step 3.

3. Check for shorted connections on wire #s 319 and 331 between OL105, OL101B, and PCB2.

   Are wires and connections OK?

   YES Go to TYPICAL DISCRETE INPUT SIGNAL FAULT (WP 0107 00, PATH A, step 6).

   NO Repair as required.

END OF WORK PACKAGE

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UNIT, DIRECT SUPPORT, AND GENERAL SUPPORT

LAUNDRY ADVANCED SYSTEM

(NSN 3510–01–463–0114)

OPERATIONAL CHECKOUT AND TROUBLESHOOTING PROCEDURES
R2 WATER TEMPERATURE HI

INITIAL SETUP:

Tools

Personnel Required

Materials/Parts

Equipment Conditions
Power must be applied at main control enclosure (WP 0010 00).

1. Determine if setpoint for “WASH TEMP” was changed within last two laundry cycles

   Was “WASH TEMP” setpoint changed?

   YES Water temperature will not drop to setpoint for three laundry cycles. Return to normal operation.

   NO Go to step 2.

2. Observe operator panel display.

   Does “CONDENSATE TEMP HI” appear also?

   YES Go to CONDENSATE TEMP HI FAULT (WP 0052 00).

   NO Go to step 3.

3. Observe WASH TEMP setpoint on operator panel display.
4. Using EXAMINE INPUTS observe status of recycled water temperature (TE202).

   Is temperature displayed within 20 degrees F of WASH TEMP setpoint?

   YES Go to TE FAILURE FAULT (WP 0035 00) to checkout TE103.

   NO Go to RECYCLED WATER TEMPERATURE HI FAULT (WP 0056 00).

END OF WORK PACKAGE

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UNIT, DIRECT SUPPORT, AND GENERAL SUPPORT

LAUNDRY ADVANCED SYSTEM

(NSN 3510–01–463–0114)

OPERATIONAL CHECKOUT AND TROUBLESHOOTING PROCEDURES R2 WATER TEMPERATURE LO

INITIAL SETUP:

Tools

Personnel Required

Materials/Parts

Equipment Conditions
Power must be applied at main control enclosure (WP 0010 00).

NOTE

If water heating was bypassed during start–up or the LADS has been on but not running laundry cycles, it is normal for the water temperature in the rinse 2 tank to be lower than the wash temperatures selected at the operator panels. Once the R2 TEMP LO fault appears, it will take 20 minutes after the temperature setting is lowered for alarm message to clear.

1. Determine if fault occurred during normal laundry operations or during heating tanks.

   Did fault occur during HEAT WATER operation?

   YES Go to R2 TANK NOT HEATING FAULT (WP 0051 00).

   NO Go to step 2.

2. Determine if setpoint for “WASH TEMP” was changed within last two laundry cycles

   Was “WASH TEMP” setpoint changed?

   YES Water temperature will not reach setpoint for three laundry cycles. Return to normal operation.

   NO Go to step 3.

3. Observe WASH TEMP setpoint on operator panel display.

4. Using EXAMINE INPUTS observe status of recycled water temperature (TE202).

   Is temperature displayed within 20 degrees F of WASH TEMP setpoint?

   YES Go to TE FAILURE FAULT (WP 0035 00) to checkout TE103.

   NO Go to CONDENSATE TEMPERATURE LO FAULT (WP 0053 00).

END OF WORK PACKAGE

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UNIT, DIRECT SUPPORT, AND GENERAL SUPPORT

LAUNDRY ADVANCED SYSTEM

(NSN 3510–01–463–0114)

OPERATIONAL CHECKOUT AND TROUBLESHOOTING PROCEDURES DRUM DOOR WILL NOT OPEN

INITIAL SETUP:

Tools

Personnel Required

Materials/Parts

Equipment Conditions
Power must be applied at main control enclosure (WP 0010 00).

NOTE

Pressure in air system must be maintained above 80 psig while performing this procedure.

1. Use maintenance menu to retract door lock DN100A or DN100B (WP 0010 00).

   Does door lock retract?

   YES Return to normal operation.

   NO Go to step 2.

2. Check for obstruction that would prevent pin on door lock from retracting.

   Are any obstructions found?

   YES Repair as necessary.

   NO Go to step 3.

3. Disconnect air tube from side port on door lock.
4. Use maintenance menu to retract door lock.

   Does air pressure vent from tube?

   YES Replace door lock (WP 0127 00).

   NO Connect tube to door lock. Go to step 5.

5. Disconnect air tube from top port on door lock.
6. Use maintenance menu to retract door lock.

   Does air pressure vent from tube?

   YES Connect tube to door lock. Switch air tubes connected to door lock solenoid valve SV115 .

   NO Replace door lock solenoid valve SV115 (WP 0214 00).

END OF WORK PACKAGE

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UNIT, DIRECT SUPPORT, AND GENERAL SUPPORT

LAUNDRY ADVANCED SYSTEM

(NSN 3510–01–463–0114)

OPERATIONAL CHECKOUT AND TROUBLESHOOTING PROCEDURES DRUM MOTOR COOLING FAN DOES NOT TURN ON

INITIAL SETUP:

Tools
Tool Kit, General Mechanics
(Item 1, WP 0282 00)
Multimeter (Item 2, WP 0282 00)

Personnel Required

Materials/Parts

Equipment Conditions
Power must be applied at main control enclosure (WP 0010 00).

PATH A

1. Check fan operation.

   Is fan operating?

   YES Return to normal operation.

   NO Go to step 2.

2. Use maintenance menu to check operation of either dryer blower M104A or M104B.

   Is dryer blower operating?

   YES Go to step 3.

   NO Go to DRYER BLOWER DOES NOT TURN ON FAULT (WP 0046 00) to check for input power from CB2.

3. Open door on inverter enclosure.
4. Check indicators for F4, F5, and F6.

   Are indicators off?

   YES Go to **PATH B**.

   NO Go to step 5.

5. Position SW1 to OFF.
6. Replace fuse for any indicator that was on (WP 0256 00).
7. Position SW1 to ON.
8. Check indicator for fuse(s) that was replaced.

   Is indicator(s) off?

   YES Close door on inverter enclosure. Return to normal operation.

   NO Go to **PATH B**.

PATH B (From PATH A, step 4 or 8)

1. Check connections on wire #s 521 and 522 between F4, F5, and M106A or wire #s 523 and 524 between F5, F6, and M106B.

   Are wire connections OK?

   YES Go to step 2.

   NO Repair as necessary.

PATH B – Continued

2. Check wire connections between fan motor capacitor and M106A or M106B.

   Are wire connections OK?

   YES Replace fan motor capacitor (WP 0117 00). Go to step 3.

   NO Repair as necessary.

3. Check fan operation.

   Is fan operating?

   YES Return to normal operation.

   NO Replace drum motor cooling fan M106A or M106B (WP 0116 00).

END OF WORK PACKAGE

UNIT, DIRECT SUPPORT, AND GENERAL SUPPORT

LAUNDRY ADVANCED SYSTEM

(NSN 3510–01–463–0114)

OPERATIONAL CHECKOUT AND TROUBLESHOOTING PROCEDURES DRUM STALLING OR WATER NOT DRAINING FROM DRUM

INITIAL SETUP:

Tools
Tool Kit, General Mechanics
(Item 1, WP 0282 00)
Multimeter (Item 2, WP 0282 00)

Personnel Required

Materials/Parts

Equipment Conditions
Power must be applied at main control enclosure (WP 0010 00).

NOTE

Drum motor stalls will occur randomly during laundry operations. These random stalls are caused by unbalanced loads, not draining enough water from drum, and temporary voltage drops at the external power source. This procedure should only be used to troubleshoot a condition where the drum motor is stalling on extract steps of sequential laundry cycles.

1. Start or continue a laundry cycle (TM 10–3510–221–10).
2. Monitor drum and drum motor during extract.

   Does drum motor stall?

   YES Pause laundry cycle. Go to step 3.

   NO Return to normal operation.

NOTE

When checking voltage and frequency at power source do not rely on gauge readings. Use a multimeter to verify actual voltage and frequency outputs.

3. Check voltage and frequency output of external power source with a multimeter.

   Is voltage at 208 – 212 VAC and frequency at 50 – 60 Hz?

   YES Go to step 4.

   NO Adjust voltage and frequency levels as necessary. Return to normal operation.

4. Check for debris in water pump strainer (TM 10–3510–221–10).

   Is strainer clear of debris?

   YES Go to step 5.

   NO Clean and replace strainer. Return to normal operation.

5. Continue laundry cycle. During DRAIN or EXTRACT step observe inlet valve as follows:

STEP	VALVE
DRAIN/EXTRACT TO STILL	FV109
DRAIN/EXTRACT TO WASH TANK	FV100
DRAIN/EXTRACT TO RINSE 1 TANK	FV102

   Is inlet valve open?

   YES Go to step 6.

   NO Go to TYPICAL WATER CONTROL VALVE NOT OPENING/CLOSING FAULT (WP 0047 00).

6. Continue laundry cycle. During any DRAIN and EXTRACT step, monitor drum outlet valve (FV107).

   Is FV107 open?

   YES Go to step 7.

   NO Go to TYPICAL WATER CONTROL VALVE NOT OPENING/CLOSING FAULT (WP 0047 00).

7. Disconnect hose from drain port on bottom of drum. Check for blockage at drain port.

   Is blockage found?

   YES Clear blockage as required. Reconnect hose. Return to normal operation.

   NO Reconnect hose. Go to step 8.

8. Check for blockage in water plumbing between drum and still and drum and water tanks.

   Is blockage found?

   YES Clear blockage as required. Return to normal operation.

   NO Go to DRUM INVERTER FAULT (WP 0093 00).

END OF WORK PACKAGE

UNIT, DIRECT SUPPORT, AND GENERAL SUPPORT

LAUNDRY ADVANCED SYSTEM

(NSN 3510–01–463–0114)

OPERATIONAL CHECKOUT AND TROUBLESHOOTING PROCEDURES
WATER VISIBLE AT REAR SEAL OF DRUM

INITIAL SETUP:

Tools

Personnel Required

Materials/Parts

Equipment Conditions
Power must be applied at main control enclosure (WP 0010 00).

1. Start or continue a laundry cycle (TM 10–3510–221–10).
2. Monitor drum during extract step.

   Is water level in drum above door window?

   YES Pause laundry cycle. Go to DRUM STALLING FAULT (WP 0044 00).

   NO Go to step 3.
3. Pause laundry cycle.
4. Position SW2 to OFF then back to ON.
5. Using maintenance menu rotate drum at TUMBLE CW.
6. Lubricate rear drum seal (TM 10–3510–221–10).
7. Exit maintenance menu then continue laundry cycle (TM 10–3510–221–10).
8. Monitor rear drum seal during extract step.

   Is water leaking out of drum shaft seal?

   YES Replace drum shaft seal (WP 0267 00).

   NO Return to normal operation.

END OF WORK PACKAGE

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UNIT, DIRECT SUPPORT, AND GENERAL SUPPORT

LAUNDRY ADVANCED SYSTEM

(NSN 3510–01–463–0114)

OPERATIONAL CHECKOUT AND TROUBLESHOOTING PROCEDURES
DRYER BLOWER DOES NOT TURN ON

INITIAL SETUP:

Tools
Tool Kit, General Mechanics
(Item 1, WP 0282 00)
Multimeter (Item 2, WP 0282 00)

Personnel Required

Materials/Parts

Equipment Conditions
Power must be applied at main control enclosure (WP 0010 00).

PATH A

1. Observe operator panel display.

   Does display indicate “10 HP INVERTER FAULT”?

   YES Go to 10 HP INVERTER FAULT (WP 0096 00).

   NO Go to step 2.

2. Use maintenance menu to turn on M104A or M104B (WP 0010 00). Observe dryer blower operation.

   Does dryer blower come on?

   YES Stop blower. Return to normal operation.

   NO Stop blower. Go to step 3.

3. Position SW2 then SW1 to OFF.
4. Open door on inverter enclosure and main control enclosure
5. Check overload relay OL104A or OL104B.

   Is lever tripped?

   YES Go to DRYER BLOWER OVERLOAD FAULT (WP 0030 00).

   NO Go to step 6.

6. Check circuit breaker CB2.

   Is CB2 tripped?

   YES Reset CB2. Go to step 7.

   NO Go to **PATH B**.

7. Position SW1 then SW2 to ON.
8. Use maintenance menu to turn on M104A or M104B. Observe dryer blower operation.

   Does blower come on?

   YES Stop blower. Return to normal operation.

   NO Stop blower. Go to step 9.

PATH A – Continued

9. Check circuit breaker CB2.

   Is CB2 tripped?

   YES Check for shorted or open wires/connections between CB2, K104, MC104A and M104A, or MC104B and M104B.

   NO Go to **PATH B**.

PATH B (From PATH A step 6 or step 9)

1. Check display on 10 hp inverter K104.

   Is a fault displayed?

   YES Go to 10 HP INVERTER FAULT (WP 0096 00).

   NO Go to step 2.

2. Use maintenance menu, turn on M104A or M104B while monitoring LED for SSR 20 on PCB3 for M104A or SSR 12 on PCB3 for M104B.

   Does LED come on?

   YES Stop blower. Go to step 3.

   NO Stop blower. Go to TYPICAL AC OUTPUT SIGNAL FAULT (WP 0104 00).

3. Use maintenance menu, turn on M104A or M104B while checking for >100 VAC between output terminal (42) on PCB3 and TB1 terminal (N) for M104A or terminal (26) on PCB3 and TB1 terminal (N) for M104B.

   Is >100 VAC present?

   YES Stop blower. Go to step 4.

   NO Stop blower. Go to TYPICAL AC OUTPUT SIGNAL FAULT (WP 0104 00).

4. Use maintenance menu, turn on M104A or M104B while checking for >100 VAC between MC104A or MC104B terminals (A1) and (A2).

   Is >100 VAC present?

   YES Stop blower. Go to step 5.

   NO Stop blower. Go to **PATH C**.

NOTE

When measuring voltage on 3–phase circuits, always check all three legs of the circuit before concluding that voltage is present. You may misdiagnose a problem if you do not check all three legs (L1, L2, and L3) and voltage is not available at one or two legs of the circuit you did not check.

5. Use maintenance menu to turn on M104A or M104B then check for >200 VAC across MC104A or MC104B input terminals (L1 and L2), (L1 and L3), and (L2 and L3).

   Is >200 VAC present?

   YES Stop blower. Go to step 6.

   NO Stop blower. Go to **PATH D**.

6. Use maintenance menu to turn on M104A or M104B then check for >200 VAC across MC104A or MC104B output terminals (T1 and T2), (T1 and T3), and (T2 and T3).

   Is >200 VAC present?

   YES Stop blower. Go to step 7.

   NO Stop blower. Replace dryer blower contactor MC104A or Mc104B (WP 0252 00).

PATH B – Continued

7. Use maintenance menu to turn on M104A or M104B then check for >200 VAC across OL104A or OL104B output terminals (T1 and T2), (T1 and T3), and (T2 and T3).

   Is >200 VAC present?

   YES Stop blower. Go to step 8.

   NO Stop blower. Replace dryer blower overload relay OL104A or OL104B (WP 0253 00).

8. Position SW2 then SW1 to OFF.

9. Check connections on wire #s 085, 086, and 087 between OL104A and M104A or wire #s 088, 089, and 090 between OL104B and M104B.

   Are connections OK?

   YES Replace dryer blower motor M104A or M104B (WP 0131 00).

   NO Repair as necessary.

PATH C (From PATH B, step 4)

1. Position SW2 then SW1 to OFF.

2. Check connections on wire #224 between MC104A terminal (A1) and PCB3 terminal (42) or wire #229 between MC104B terminal (A1) and PCB3 terminal (26).

   Is connection OK?

   YES Go to step 3.

   NO Repair as necessary.

3. Check connections on wire #181 between MC104A terminal (A2) and OL104A terminal (95) or wire #182 between MC104B terminal (A2) and OL104B terminal (95).

   Is connection OK?

   YES Go to step 4.

   NO Repair as necessary.

4. Check connections on wire #173 between OL104A terminal (96) and TB2 terminal (N) and wire #174 between OL104A terminal (96) and OL104B terminal (96).

   Is connection OK?

   YES Replace overload relay OL104A or OL104B (WP 0253 00).

   NO Repair as necessary.

PATH D (From PATH B, step 5)

1. Use maintenance menu to turn on other dryer blower. Observe blower operation.

   Does dryer blower come on?

   YES Stop blower. Check wire connections from K104 to suspect dryer blower contactor MC104A or MC104B.

   NO Stop blower. Go to step 2.

2. Check for >200 VAC across CB2 input terminals (L1 and L2), (L1 and L3), and (L2 and L3).

   Is >200 VAC present?

   YES Go to step 3.

   NO Check connections on wire #s 009, 010, and 011 and jumper bar between CB2 and TB1. Repair as necessary.

PATH D – Continued

3. Check for >200 VAC across CB2 output terminals (T1 and T2), (T1 and T3), and (T2 and T3).

   Is >200 VAC present?

   YES Go to step 4.

   NO Replace CB2 (WP 0223 00).

4. Remove cover from K104.

5. Check for >200 VAC across K104 input terminals (L1 and L2), (L1 and L3), and (L2 and L3).

   Is >200 VAC present?

   YES Go to step 6.

   NO Check connections on wire #s 171, 172, and 173 between CB2 and TB6 and wire #s 022, 023, and 024 between TB6 and K104. Repair as necessary.

6. Use maintenance menu turn on M104A or M104B while monitoring LED 7 on SSR PCB4.

   Does LED come on?

   YES Stop blower. Go to step 7.

   NO Stop blower. Go to TYPICAL DC OUTPUT SIGNAL FAULT (WP 0106 00) to determine why SSR does not turn on.

7. Check for > 15 VDC across K104 terminals (CM and FWD).

   Is > 15 VDC present?

   YES Go to step 8.

   NO Replace 10 hp inverter K104 (WP 0250 00).

8. Check for > 15 VDC across SSR PCB4 terminals (15 and 16).

   Is > 15 VDC present?

   YES Go to step 9.

   NO Check connections on wire #s 252 and 253 between K104 and PCB4. Repair as necessary.

9. Use maintenance menu to turn on M104A or M104B while checking for 0.1 to 1.0 VDC across PCB4 terminals (15 and 16).

   Is 0.1 to 1.0 VDC present?

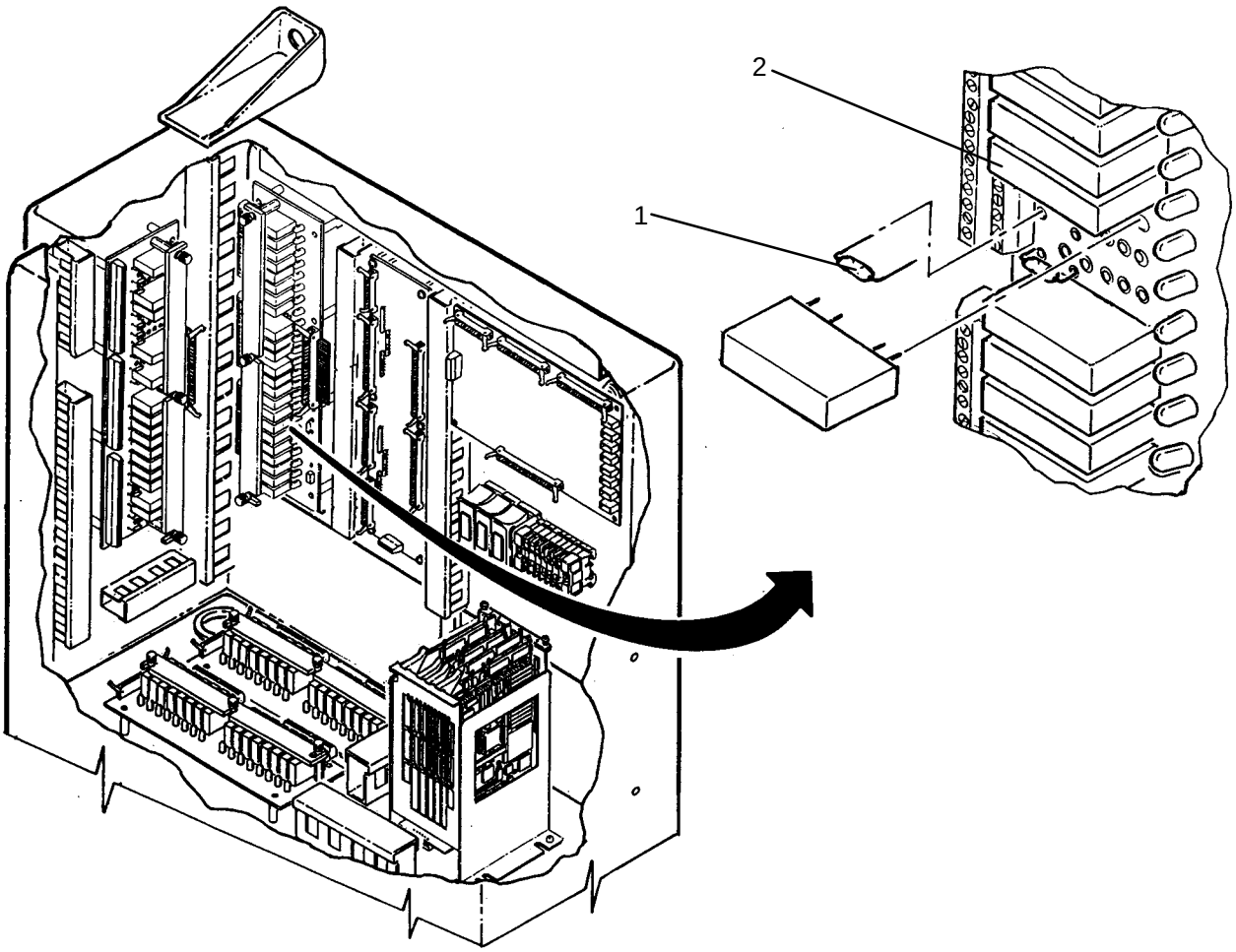
   YES Stop blower. Replace 10 hp inverter K104 (WP 0250 00).

   NO Stop blower. Go to step 10.

10. Position SW2 to OFF.

PATH D – Continued

11. Check 5 amp fuse (1) next to SSR 7 (2) for continuity.



Does fuse have continuity?

YES Replace SSR 7 (WP 0241 00).

NO Replace fuse (WP 0242 00).

END OF WORK PACKAGE

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LAUNDRY ADVANCED SYSTEM

(NSN 3510–01–463–0114)

OPERATIONAL CHECKOUT AND TROUBLESHOOTING PROCEDURES TYPICAL WATER CONTROL VALVE NOT OPENING/CLOSING

INITIAL SETUP:

Tools
Tool Kit, General Mechanics
(Item 1, WP 0282 00)

Personnel Required

Materials/Parts

Equipment Conditions
Power must be applied at main control enclosure (WP 0010 00).

NOTE

Pressure in air system must be maintained above 80 psig while performing this procedure.

All water control valves are normally closed when de–energized except the steam eductor bypass valve FV114.

1. Use maintenance menu to open suspect water control valve.

   Does valve open?

   YES Go to step 2.

   NO Go to step 3.

2. Use maintenance menu to close suspect water control valve.

   Does valve close?

   YES Return to normal operation.

   NO Go to step 3.

3. Open door on main control enclosure. Verify SW1 and SW2 are ON.
4. Determine which pilot solenoid valve controls air pressure the water control valve you are trying to check (Refer to WP 0010 00, Table 4).
5. Using maintenance menu, attempt to open suspect water control valve while monitoring LED (WP 0011 00, Figure 2, 4) on solenoid valve (3).

   Does LED come on?

   YES Go to step 6.

   NO Go to TYPICAL DC OUTPUT SIGNAL FAULT (WP 0106 00) to check operation of solenoid valve.

6. Push in manual operator (WP 0011 00, Figure 2, 5) on solenoid valve (3) for suspect water control valve(s).

   Does water control valve open?

   YES Replace solenoid valve (WP 0214 00).

   NO Go to step 7.

7. Disconnect tube from top port on solenoid valve for suspect water control valve.
8. Use maintenance menu to open suspect water control valve. Observe top port on solenoid valve.

   Does air pressure vent from top port?

   YES Go to step 9.

   NO Replace solenoid valve (WP 0214 00).

9. Switch tubes connected to solenoid valve.
10. Use maintenance menu to open suspect water control valve.

    Does valve open?

    YES Go to step 11.

    NO Go to step 12.
11. Use maintenance menu to close suspect water control valve.

    Does valve close?

    YES Return to normal operation.

    NO Go to step 12.
12. Switch tubes connected to solenoid valve back to original position.
13. Check for obstruction that would prevent water control valve from rotating.

    Are any obstructions found?

    YES Repair as necessary.

    NO Replace water control valve (WP 0146 00; WP 0147 00; WP 0148 00; WP 0149 00; WP 0152 00; WP 0153 00; WP 0154 00; or WP 0155 00).

END OF WORK PACKAGE

UNIT, DIRECT SUPPORT, AND GENERAL SUPPORT

LAUNDRY ADVANCED SYSTEM

(NSN 3510–01–463–0114)

OPERATIONAL CHECKOUT AND TROUBLESHOOTING PROCEDURES
WATER PUMP DOES NOT TURN ON

INITIAL SETUP:

Tools
Tool Kit, General Mechanics
(Item 1, WP 0282 00)
Multimeter (Item 2, WP 0282 00)

Personnel Required

Materials/Parts

Equipment Conditions
Power must be applied at main control enclosure (WP 0010 00).

PATH A

CAUTION

Never start or run pumps dry. Prior to using maintenance menu to check operation of a pump, make sure water is available at the pump inlet. Operating a pump dry can cause internal damage to pump.

1. Use maintenance menu to turn on water pump M101A or M101B (WP 0010 00). Observe pump operation.

   Does water pump come on?

   YES Return to normal operation.

   NO Go to step 2.

2. Position SW2 then SW1 to OFF.
3. Open door on main control enclosure
4. Check overload relay OL101A or OL101B for suspect water pump.

   Is lever tripped?

   YES Go to WATER PUMP OVERLOAD FAULT (WP 0038 00).

   NO Go to step 5.

5. Check circuit breaker CB5.

   Is CB5 tripped?

   YES Reset CB5. Go to step 6.

   NO Go to **PATH B**.

6. Position SW1 then SW2 to ON.
7. Use maintenance menu to turn on M101A or M101B. Observe pump operation.

   Does water pump come on?

   YES Return to normal operation.

   NO Go to step 8.

8. Check circuit breaker CB5.

   Is CB5 tripped?

   YES Go to step 9.

   NO Return to step 1.

PATH A – Continued

9. Position SW2 then SW1 to OFF.
10. Check resistance across water pump contactor MC101A or MC101B output terminals (T1 and T2), (T1 and T3), and (T2 and T3) while pushing in on latching mechanism in center of contactor.

    Is resistance < 1 ohm across any set of terminals?

    YES Go to step 11.

    NO Go to step 12.

11. Check for shorted wire connections as follows:

WIRE #S	FROM	TO
031, 032, and 033	CB5	MC101A
048, 049, and 050	MC101A	MC101B
091, 092, and 093	MC101A	M101A
094, 095, and 096	MC101B	M101B

    Are connections OK?

    YES Replace water pump M101A or M101B (WP 0145 00).

    NO Repair as necessary.

12. Attempt to spin fan blade on back of water pump motor M101A or M101B.

    Does blade spin freely?

    YES Replace circuit breaker CB5 (WP 0223 00).

    NO Replace water pump M101A or M101B (WP 0145 00).

PATH B (From PATH A, step 5)

1. Use maintenance menu control outputs function (WP 0010 00) to turn on SSR 23 for M101A or SSR 15 for M101B, then monitor corresponding LED.

    Does LED come on?

    YES Go to step 2.

    NO Go to TYPICAL AC OUTPUT SIGNAL FAULT (WP 0104 00).

2. Use maintenance menu, turn on water pump while checking for >100 VAC between PCB3 terminal (48) and TB1 terminal (N) for M101A or between PCB3 terminal (32) and TB1 terminal (N) for M101B.

    Is >100 VAC present?

    YES Go to step 3.

    NO Go to TYPICAL AC OUTPUT SIGNAL FAULT (WP 0104 00).

3. Use maintenance menu, turn on water pump while checking for >100 VAC between water pump contactor MC101A or MC101B terminals (A1) and (A2).

    Is >100 VAC present?

    YES Go to step 4.

    NO Go to **PATH C**.

PATH B – Continued

NOTE

When measuring voltage on 3–phase circuits, always check all three legs of the circuit before concluding that voltage is present. You may misdiagnose a problem if you do not check all three legs (L1, L2, and L3) and voltage is not available at one or two legs of the circuit you did not check.

4. Use maintenance menu to turn off water pump then check for >200 VAC across MC101A or MC101B input terminals (L1 and L2), (L1 and L3), and (L2 and L3).

   Is >200 VAC present?

   YES Go to step 5.

   NO Go to **PATH D**.

5. Use maintenance menu to turn on water pump then check for >200 VAC across MC101A or MC101B output terminals (T1 and T2), (T1 and T3), and (T2 and T3).

   Is >200 VAC present?

   YES Go to step 6.

   NO Replace water pump contactor MC101A or MC101B (WP 0225 00).

6. Use maintenance menu to turn on water pump then check for >200 VAC across water pump overload relay OL101A or OL101B output terminals (T1 and T2), (T1 and T3), and (T2 and T3).

   Is >200 VAC present?

   YES Go to step 7.

   NO Replace water pump overload relay OL101A or OL101B (WP 0226 00).

7. Position SW2 then SW1 to OFF.

8. Check connections on wire #s 091, 092, and 093 between OL101A and M101A or wire #s 094, 095, and 096 between OL101B and M101B.

   Are connections OK?

   YES Replace water pump M101A or M101B (WP 0145 00).

   NO Repair as necessary.

PATH C (From PATH B, step 3)

1. Position SW2 then SW1 to OFF.

2. Check connections on wire #211 between MC101A terminal (A1) and SSR PCB3 terminal (48) or wire #226 between MC101B terminal (A1) and SSR PCB3 terminal (32).

   Is connection OK?

   YES Go to step 3.

   NO Repair as necessary.

3. Check connections on wire #184 between MC101A terminal (A2) and OL101A terminal (95) or wire #185 between MC10BA terminal (A2) and OL101B terminal (95) .

   Is connection OK?

   YES Go to step 4.

   NO Repair as necessary.

PATH C – Continued

4. Check connections on wire #175 between OL101A terminal (96) and TB2 terminal (N) or wires #175 and 176 between OL101A terminal (96) and OL101B terminal (96) .

Is connection OK?

YES Replace overload relay OL101A or OL101B (WP 0226 00).

NO Repair as necessary.

PATH D (From PATH B, step 4)

1. Check for >200 VAC across CB5 input terminals (L1 and L2), (L1 and L3), and (L2 and L3).

Is >200 VAC present?

YES Go to step 2.

NO Check connections on wire #s 015, 016, and 017 between CB5 and TB1.

2. Check for >200 VAC across CB5 output terminals (T1 and T2), (T1 and T3), and (T2 and T3).

Is >200 VAC present?

YES Check connections on wire #s 031, 032, and 033 between CB5 and MC101A or wire #s 048, 049, and 050 between MC101A and MC101B.

NO Replace CB5 (WP 0223 00).

END OF WORK PACKAGE

UNIT, DIRECT SUPPORT, AND GENERAL SUPPORT

LAUNDRY ADVANCED SYSTEM

(NSN 3510–01–463–0114)

OPERATIONAL CHECKOUT AND TROUBLESHOOTING PROCEDURES
WATER SPRAYING FROM DRYER BLOWER

INITIAL SETUP:

Tools
Tool Kit, General Mechanics
(Item 1, WP 0282 00)

Personnel Required

Materials/Parts

Equipment Conditions
Power must be applied at main control enclosure (WP 0010 00).

PATH A

NOTE

Pressure in air system must be maintained above 80 psig while performing this procedure.

Normally, a small amount of water will come from dryer blower outlet during the extract portion of the wash and rinse steps. In cold weather this may appear as steam.

1. Remove lint filter.
2. Use maintenance menu to open and close outlet damper FV110A or FV110B. Observe damper operation.

   Does outlet damper open and close?

   YES Go to step 3.

   NO Go to step 4.
3. Use maintenance menu to open and close FV110A or FV110B. Verify that damper is closed (blocking air flow to blower wheel) when operator panel display reads closed, and open when display reads open.

   Is damper position in accordance with display?

   YES Return to normal operation.

   NO Go to **PATH B**.
4. Check for obstruction that would prevent free movement of damper.

   Are any obstructions found?

   YES Repair as necessary.

   NO Go to step 5.
5. Check for proper mechanical connection between outlet damper and air cylinder FV110A or FV110B.

   Is air cylinder properly connected to outlet damper?

   YES Go to step 6.

   NO Repair as necessary.
6. Open door on main control enclosure. Verify SW1 and SW2 are ON.
7. Using maintenance menu, attempt to open FV110A or FV110B while monitoring LED (WP 0011 00, Figure 2, 4) on solenoid valve SV110A or SV110B.

   Does LED come on?

   YES Close damper. Go to step 8.

   NO Go to TYPICAL DC OUTPUT SIGNAL FAULT (WP 0106 00) to check operation of SV110A or SV110B.

PATH A – Continued

8. Push in manual operator (WP 0011 00, Figure 2, 5) on SV110A or SV110B.

   Does damper open?

   YES Replace solenoid valve SV110 (WP 0214 00).

   NO Release manual operator (5). Go to step 9.

9. Disconnect tube from port on fixed end of FV110A or FV110B.

10. Use maintenance menu to select OPEN position for FV110A or FV110B. Observe disconnected tube.

    Does air pressure vent from tube?

    YES Go to step 11.

    NO Reconnect tube to fixed end of FV110A or FV110B. Go to **PATH B**.

11. Check adjustment on flow control valves on FV110A or FV110B (WP 0134 00).

    Are flow control valves properly adjusted?

    YES Replace air cylinder FV110A or FV110B (WP 0133 00).

    NO Properly adjust flow control valves. Return to step 3.

PATH B (From PATH A, step 3 or step 11)

1. Disconnect tube from free end of FV110A or FV110B.

   Does air pressure vent from tube?

   YES Connect tube at FV110A or FV110B. Switch tubes connected at solenoid valve SV110A or SV110B.

   NO Replace solenoid valve SV110A or SV110B (WP 0214 00).

END OF WORK PACKAGE

UNIT, DIRECT SUPPORT, AND GENERAL SUPPORT

LAUNDRY ADVANCED SYSTEM

(NSN 3510–01–463–0114)

OPERATIONAL CHECKOUT AND TROUBLESHOOTING PROCEDURES WATER SPRAYING FROM DRYER BLOWER

INITIAL SETUP:

Tools
Tool Kit, General Mechanics
(Item 1, WP 0282 00)
Multimeter (Item 2, WP 0282 00)

Personnel Required

Materials/Parts

Equipment Conditions
Power must be applied at main control enclosure (WP 0010 00).

PATH A

CAUTION

Never start or run pumps dry. Prior to using maintenance menu to check operation of a pump, make sure water is available at the pump inlet. Operating a pump dry can cause internal damage to pump.

1. Use maintenance menu to turn on water supply pump M105 (WP 0010 00). Observe pump operation.

   Does water supply pump come on?

   YES Turn off M105. Go to **PATH D**.

   NO Turn off M105. Go to step 2.

2. Check power switch on M105.

   Is switch in ON position?

   YES Go to step 3.

   NO Position switch to ON. Return to normal operation.

3. Position SW2 then SW1 to OFF.
4. Open door on main control enclosure
5. Check water supply pump overload relay OL105.

   Is lever tripped?

   YES Go to WATER SUPPLY PUMP OVERLOAD FAULT (WP 0039 00).

   NO Go to step 6.

6. Check circuit breaker CB6.

   Is CB6 tripped?

   YES Reset CB6. Go to step 7.

   NO Go to step **PATH B**.

7. Position SW1 then SW2 to ON.
8. Use maintenance menu to turn on M105. Observe pump operation.

   Does water supply pump come on?

   YES Turn off M105. Return to normal operation.

   NO Turn off M105. Go to step 9.

PATH A – Continued

9. Check circuit breaker CB6.

   Is CB6 tripped?

   YES Go to step 10.

   NO Return to step 1.

10. Position SW2 then SW1 to OFF.
11. Check resistance across water pump contactor MC105 output terminals (T1 and T2), (T1 and T3), and (T2 and T3) while pushing in on latching mechanism in center of contactor.

    Is resistance < 4 ohms across any set of terminals?

    YES Go to step 12.

    NO Go to step 13.

12. Check for shorted or open connections on wire #s 097, 098, and 099 between OL105 and junction box J2 and on 100 ft cable and M105.

    Are wires and connections OK?

    YES Replace water supply pump.

    NO Repair as required.

13. Attempt to spin fan blade on back of water supply pump motor M105.

    Does blade spin freely?

    YES Replace circuit breaker CB6 (WP 0223 00).

    NO Replace water supply pump.

PATH B (From PATH A, step 6)

1. Position SW1 then SW2 to ON.
2. Use maintenance menu to turn on M105 while monitoring LED for SSR 1 on PCB3.

   Does LED come on?

   YES Turn off M105. Go to step 2.

   NO Turn off M105. Go to TYPICAL AC OUTPUT SIGNAL FAULT (WP 0104 00).

3. Use maintenance menu, turn on M105 while checking for >100 VAC between PCB3 terminal (4) and TB1 terminal (N).

   Is >100 VAC present?

   YES Go to step 4.

   NO Go to TYPICAL AC OUTPUT SIGNAL FAULT (WP 0104 00).

4. Use maintenance menu to turn on M105 while checking for >100 VAC between water supply pump contactor MC105 terminals (A1) and (A2).

   Is >100 VAC present?

   YES Turn off M105. Go to step 5.

   NO Turn off M105. Go to **PATH C**.

PATH B – Continued

NOTE

When measuring voltage on 3–phase circuits, always check all three legs of the circuit before concluding that voltage is present. You may misdiagnose a problem if you do not check all three legs (L1, L2, and L3) and voltage is not available at one or two legs of the circuit you did not check.

5. Use maintenance menu to turn off M105 then check for >200 VAC across MC105 input terminals (L1 and L2), (L1 and L3), and (L2 and L3).

   Is >200 VAC present?

   YES Turn off M105. Go to step 6.

   NO Turn off M105. Go to **PATH D**.

6. Use maintenance menu to turn on M105 then check for >200 VAC across MC105 output terminals (T1 and T2), (T1 and T3), and (T2 and T3).

   Is >200 VAC present?

   YES Turn off M105. Go to step 7.

   NO Turn off M105. Replace water supply pump contactor MC105 (WP 0225 00).

7. Use maintenance menu to turn on water supply pump then check for >200 VAC across water supply pump overload relay OL105 output terminals (T1 and T2), (T1 and T3), and (T2 and T3).

   Is >200 VAC present?

   YES Turn off M105. Go to step 8.

   NO Turn off M105. Replace water supply pump overload relay OL105 (WP 0226 00).

8. Position SW2 then SW1 to OFF.

9. Check connections on wire #s 097, 098, and 099 between OL105 and junction box J2 and on 100 ft cable and M105.

   Are connections OK?

   YES Replace water supply pump.

   NO Repair as necessary.

PATH C (From PATH B, step 4)

1. Position SW2 then SW1 to OFF.

2. Check connections on wire #235 between MC105 terminal (A1) and PCB3.

   Is connection OK?

   YES Go to step 3.

   NO Repair as necessary.

3. Check connections on wire #186 between MC105 terminal (A2) and OL105 terminal (95).

   Is connection OK?

   YES Go to step 4.

   NO Repair as necessary.

PATH C – Continued

4. Check connections on wire #177 between OL105 terminal (96) and OL101B terminal (96), wire #176 between OL101B terminal (96) and OL101A terminal (96), and wire #175 between OL101A and TB2.

   Is connection OK?

   YES Replace overload relay OL105 (WP 0226 00).

   NO Repair as necessary.

PATH D (From PATH B, step 5)

1. Check for >200 VAC across CB6 input terminals (L1 and L2), (L1 and L3), and (L2 and L3).

   Is >200 VAC present?

   YES Go to step 3.

   NO Check connections on wire #s 015, 016, and 017 and jumper bar between CB6 and TB1.

2. Check for >200 VAC across CB5 output terminals (T1 and T2), (T1 and T3), and (T2 and T3).

   Is >200 VAC present?

   YES Check connections on wire #s 050, 052, 053 between CB6 and MC105.

   NO Replace CB6 (WP 0223 00).

3. Press WATER SUPPLY PUMP switch to turn on M105. Observe pump operation.

   Does water supply pump come on?

   YES Return to normal operation.

   NO Go to step 4.

4. Position SW2 then SW1 to OFF.
5. Open door on main control enclosure.
6. Check settings on time delay relay TD105 (WP 0227 00).

   Is TDR set properly?

   YES Properly set TDR105. Return to step **PATH A, step 1**.

   NO Go to step 7.

7. Position SW1 then SW2 to ON.
8. Check for >100 VAC between TDR105 terminal (1) and TB1 terminal (N).

   Is >100 VAC present?

   YES Go to step 9.

   NO Check connections on wire #427 between TDR105 terminal (1) and TB2 terminal (H). Repair as necessary.

9. Check for >100 VAC between TDR105 terminal (10) and TB2 terminal (H).

   Is >100 VAC present?

   YES Go to step 10.

   NO Check connections on wire #426 between TDR105 terminal (10) and TB2 terminal (N). Repair as necessary.

PATH D – Continued

10. Check for >100 VAC between TDR105 terminal (2) and TB1 terminal (N).

    Is >100 VAC present?

    YES Go to step 11.

    NO Check connections on wire #428 between TDR105 terminal (1) and TDR105 terminal (2). Repair as necessary.

11. Press WATER SUPPLY PUMP switch to turn on M105 then check for >100 VAC between TDR105 terminal (3) and TB1 terminal (N).

    YES Check connections on wire #429 between TDR105 terminal (3) and MC105 terminal (A1). Repair as necessary.

    NO Go to step 12.

12. Position SW2 then SW1 to OFF.
13. Remove wires connected to pushbutton switch PBS12 (+) and (–) terminals.
14. Press switch, then check for continuity across (+) and (–) terminals.

    Does continuity exist?

    YES Go to step 15.

    NO Replace pushbutton switch PBS12 (WP 0236 00).

15. Check connections on wire #s 430 and 431 between PBS12 and TDR105 terminals (5) and (6).

    Are connections OK?

    YES Replace time delay relay TD105 (WP 0227 00).

    NO Repair as necessary.

END OF WORK PACKAGE

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UNIT, DIRECT SUPPORT, AND GENERAL SUPPORT

LAUNDRY ADVANCED SYSTEM

(NSN 3510–01–463–0114)

OPERATIONAL CHECKOUT AND TROUBLESHOOTING PROCEDURES
R2 TANK NOT HEATING

INITIAL SETUP:

Tools

Personnel Required

Materials/Parts

Equipment Conditions
Power must be applied at main control enclosure (WP 0010 00).

NOTE

When a HEAT WATER cycle is selected, the LADS control system will check the water temperature in the rinse 2 tank to see if water heating is necessary. If the temperature in the rinse 2 tank is within 20 degrees F of the selected temperature, the control system will automatically bypass the HEAT WATER cycle.

1. Check temperature of water in rinse 2 tank (TE103).

   Is rinse 2 tank temperature < 130 degrees F?

   YES Go to step 2.

   NO Wait for rinse 2 temperature to drop below 130 degrees F before continuing.

2. Check water level in still (LT200).

   Is water level < 4 inches?

   YES Go to step 4.

   NO Go to step 3.

3. Record the time then wait for water level in still to drop to 4 inches. Periodically monitor still water level.

   Does water level drop to < 4 inches within 30 minutes?

   YES Go to step 4.

   NO Go to STILL NOT BOILING DOWN FAULT (WP 0062 00).

4. Initiate a HEAT TANKS operation using 150 degrees F setpoint (TM 10–3510–221–10).

5. Observe operator panel A display. When display reads “CHECKING RINSE 2 TEMPERATURE” observe operation of water pump A.

   Is water pump A operating?

   YES Go to step 6.

   NO Go to WATER PUMP DOES NOT TURN ON FAULT (WP 0048 00).

6. Observe sight glass at rinse 2 tank.

   Can water be seen circulating in tank?

   YES Go to step 7.

   NO Go to TYPICAL TANK NOT EMPTYING FAULT (WP 0036 00).

7. Observe operator panel A display. When display reads “TRANSFER RINSE 2 TO STILL” observe operation of still inlet valve (FV109A).

   Does FV109A open?

   YES Go to step 8.

   NO Go to TYPICAL WATER CONTROL VALVE NOT OPENING/CLOSING FAULT (WP 0047 00).

8. Record time and observe operator panel A. When display reads “HEATING STILL” use EXAMINE INPUTS mode to check still temperature (TE200).

   Did still temperature increase to > 209 degrees F within 30 minutes?

   YES Go to step 9.

   NO Go to HEATING SYSTEM FAILURE (WP 0072 00).

9. Observe operator panel A. When display reads “HEATING RINSE 2” observe water pumps A and B.

   Are both water pumps operating?

   YES Go to step 10.

   NO Go to WATER PUMP DOES NOT TURN ON FAULT (WP 0048 00).

10. Check position of steam eductor bypass valves FV114A and FV114B.

    Are FV114A and B closed?

    YES Go to step 11.

    NO Go to TYPICAL WATER CONTROL VALVE NOT OPENING/CLOSING FAULT (WP 0047 00).

11. Check position of steam inlet valves FV115A and FV115B.

    Are FV115A and B open?

    YES Go to step 12.

    NO Go to TYPICAL WATER CONTROL VALVE NOT OPENING/CLOSING FAULT (WP 0047 00).

12. Check position of rinse 2 tank valves FV104A, FV104B, FV105A, and FV105B.

    Are valves open?

    YES Go to step 13.

    NO Go TYPICAL WATER CONTROL VALVE NOT OPENING/CLOSING FAULT (WP 0047 00) to check suspect inlet or outlet valve.

13. Check for heat at outlet hose of both steam inlet valves FV115A and FV115B.

    Are both hoses hot?

    YES Go to step 15.

    NO Go to step 14.

14. Use EXAMINE INPUTS mode to check R2 tank temperature TE103 and condensate temperature TE201.

    Is temperatures > 125 degrees F?

    YES Go to step 15.

    NO Go to CONDENSATE OR RECYCLED WATER TEMPERATURE LO FAULT (WP 0053 00).

15. Check for heat at water plumbing at outlet of steam eductor.

    Is water plumbing hot?

    YES Go to step 16.

    NO Replace steam eductor on system that is not hot (WP 0150 00).

16. Observe operator panel A. When display reads “BOILING DOWN THE STILL” record time.

17. Continue to observe operator panel A.

    Does display change to laundry cycle menu in < 25 minutes?

    YES Return to normal operation.

    NO Go to STILL NOT BOILING DOWN FAULT (WP 0062 00).

END OF WORK PACKAGE

UNIT, DIRECT SUPPORT, AND GENERAL SUPPORT

LAUNDRY ADVANCED SYSTEM

(NSN 3510–01–463–0114)

OPERATIONAL CHECKOUT AND TROUBLESHOOTING PROCEDURES CONDENSATE TEMPERATURE OR STILL PRESSURE HI

INITIAL SETUP:

Tools
Tool Kit, General Mechanics
(Item 1, WP 0282 00)

Personnel Required

Materials/Parts

Equipment Conditions
Power must be applied at main control enclosure (WP 0010 00).

1. Use maintenance menu to turn on still condenser fan M200 (WP 0010 00).

   Does fan come on?

   YES Stop M200. Go to step 2.

   NO Stop M200. CONDENSER FAN DOES NOT TURN ON FAULT (WP 0064 00).

2. Position SW2 and SW1 to OFF.
3. Check for debris on screens covering still condenser heat exchangers.

   Are screens clean?

   YES Go to step 4.

   NO Clean screens (TM 10–3510–221–10). Return to normal operation.

4. Remove screens from still condenser (TM 10–3510–221–10).
5. Check for debris or bent fins that would prevent air flow through cooling fins of heat exchangers.

   Are cooling fins bent or blocked?

   YES Straighten fins or remove debris (TM 10–3510–221–10). Return to normal operation.

   NO Go to step 6.

6. Check for debris blocking still condenser fan guard.

   Is debris block fan guard?

   YES Clean fan guard. Return to normal operation.

   NO Go to step 7.

7. Check for dirt buildup or damage to still condenser fan blades.

   Are fan blades dirty or damaged?

   YES Clean fan blades if dirty or replace if damaged (WP 0161 00).

   NO Go to step 8.

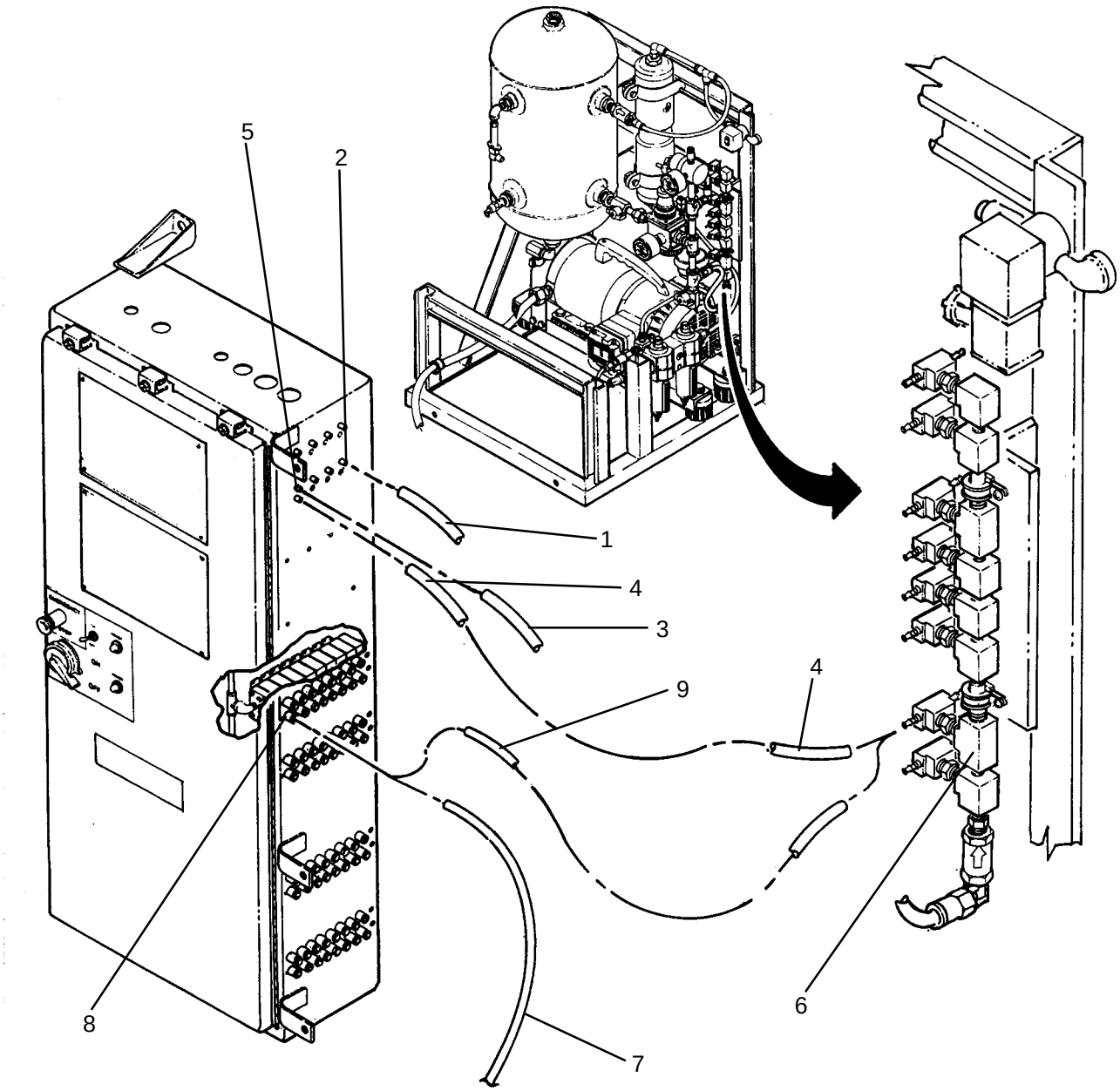
8. Use maintenance menu to check still pressure PT200.

   Is PT200 reading 2.75 VDC or higher?

   YES Got to step 9.

   NO Return to normal operation.

9. Disconnect tube (1) from pressure sensor PT200 (2).



10. Observe operator panel display.

Does PT200 reading drop towards 1.50 VDC?

YES Go to step 11.

NO Go to TYPICAL ANALOG INPUT SIGNAL FAULT (WP 0105 00) to check for faulty PT200.

11. Attempt to clear restriction in tubing for level sensor PT200 (2) as follows:

CAUTION

Level sensor can not be subjected to high pressure air. Prior to connecting air pressure to level tube path ensure all tubes are disconnected from level sensor. Failure to follow this precaution will result in damage to level sensor.

a. Disconnect tubes (3 and 4) from level sensor LT200 (5).

b. Disconnect tube (4) labeled LT200– from orifice manifold (6).

c. Disconnect air tube labeled FV107AE (7) from SV107A (8).

d. Connect a piece of 1/4 inch tubing (9) between orifice manifold (6) and exhaust port on solenoid valve SV107A (8).

e. Using maintenance menu, open valve FV107A for about 5 seconds then close valve.

f. Disconnect $^{1}/_{4}$ inch tubing (9) from solenoid valve SV107A (8) and orifice manifold (6).

g. Reconnect air tube (7) to solenoid valve SV107A (8).

h. Reconnect tubes (3 and 4) to to level sensor LT200 (5).

i. Reconnect tube (3) to orifice manifold (6).

j. Reconnect tube (1) to pressure sensor PT200 (2).

12. Use maintenance menu to build up air pressure then use EXAMINE INPUTS to check PT200 reading.

Is PT200 reading approximately 1.50 VDC?

YES Return to normal operation.

NO Go to step 13.

13. Use maintenance menu UTILITY OPTIONS to cool thermal fluid until TE300 temperature is 150 degrees F or lower.

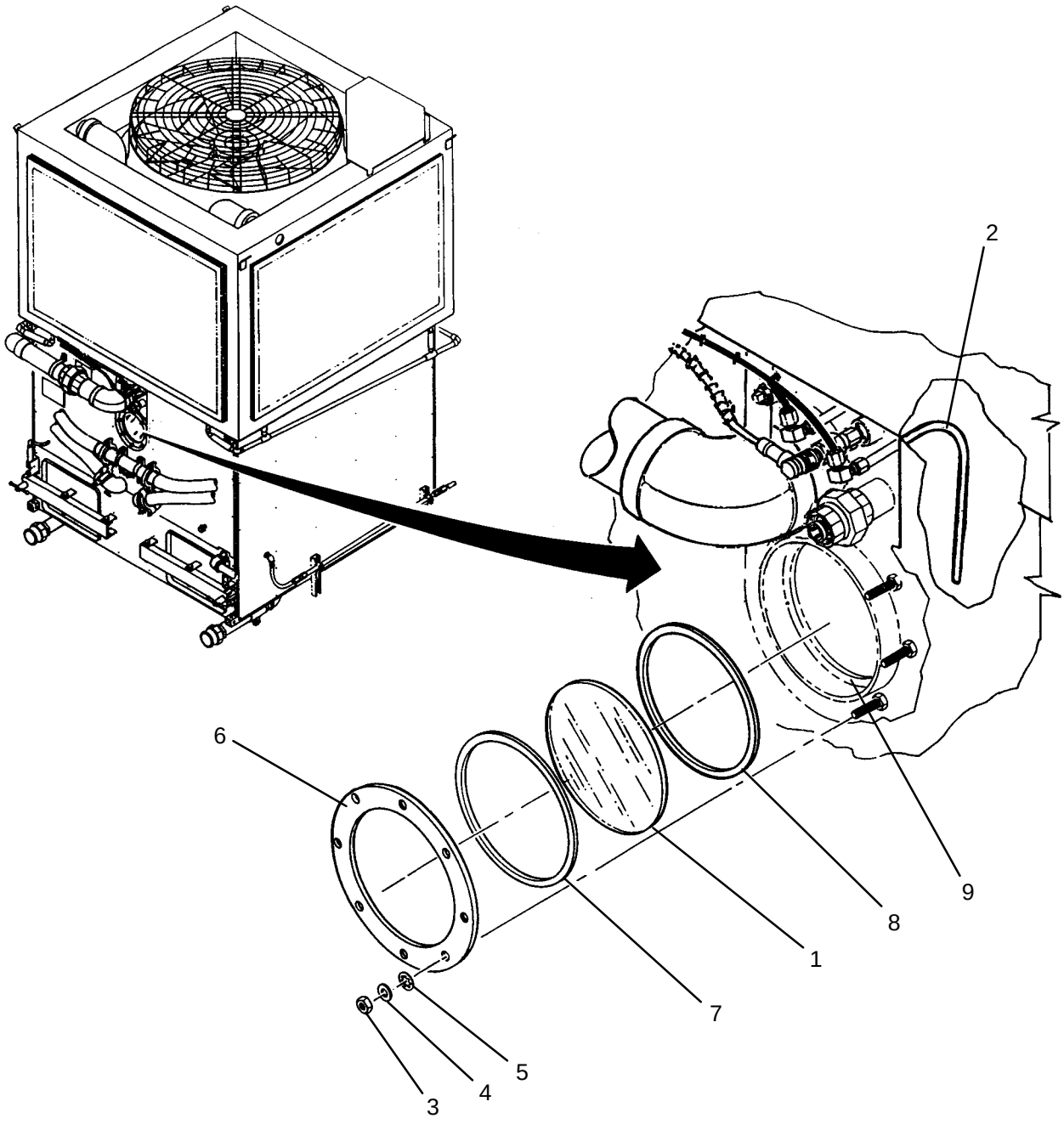
14. Clean still (TM 10–3510–221–10).

15. Remove sightglass (1) to gain access to level sensor pick–up tube (2) as follows:

CAUTION

Be careful when handling sight glass. Sight glass will shatter if dropped on edge.

a. Remove eight nuts (3), lock washers (4), and flat washers (5).
b. Remove ring (6), sight glass (1), and gaskets (7) and (8).
c. Ensure all debris and dirt is removed from sealing area (9).



16. Clean tip of pick–up tube (2).

CAUTION

Be careful when installing slight glass not to pinch or cut gasket on tank sealing area. A damaged gasket will cause water leakage around sight glass.

NOTE

Installation of sight glass requires the sight glass, gaskets, and ring be held in place while attaching hardware is installed.

Nuts must be tightened evenly to ensure pressure is applied equally around sight glass

17. Install sightglass (1) as follows:
    a. Place first gasket (8) on sealing area (9), then place sight glass (1) and second gasket (7) on top.
    b. Install ring (6) over sight glass (1).
    c. Loosely install eight flat washers (5), lock washers (4), and nuts (3)
    d. Ensure outer gasket (7) is inside of sealing area (9).
    e. Evenly tighten nuts (3) until ring (6) contacts all around sealing area (9).
18. Use maintenance menu to build up air pressure then use EXAMINE INPUTS to check PT200 reading.

Is PT200 reading approximately 1.50 VDC?

YES Return to normal operation.

NO Go to TYPICAL LT FAILURE (WP 0033 00).

END OF WORK PACKAGE

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UNIT, DIRECT SUPPORT, AND GENERAL SUPPORT

LAUNDRY ADVANCED SYSTEM

(NSN 3510–01–463–0114)

OPERATIONAL CHECKOUT AND TROUBLESHOOTING PROCEDURES CONDENSATE TEMPERATURE LO

INITIAL SETUP:

Tools

Personnel Required

Materials/Parts

Equipment Conditions
Power must be applied at main control enclosure (WP 0010 00).

PATH A

NOTE

During periods where the LADS has power applied, but is sitting idle (not performing laundry cycles) it is normal for the condensate temperature to be low. This is because there is no water boiling in the still and therefore no condensate in the standpipe. Once a laundry cycle is started, the condensate temperature will raise as water in the still begins to boil and flow to the standpipe.

Once a “CONDENSATE TEMP LO” message appears, it will take 20 minutes after the condensate temperature raises for the displayed fault to clear.

1. Record the time.
2. Attempt to start a laundry cycle.

   Can laundry cycle be started?

   YES Go to **PATH B**.

   NO Go to step 3.
3. Monitor display at operator panel where laundry cycle was started.

   Does display indicate “WATER RECYCLING”

   YES Go to step 5.

   NO Go to step 4.
4. Monitor display at operator panel where laundry cycle was started.

   Does display indicate “STAGGERING CYCLES”?

   YES Wait for cycle at other drum to finish then return to step 1.

   NO Go to LAUNDRY CYCLE CAN NOT BE STARTED FAULT (WP 0029 00).
5. Open drain valve on still and monitor still water level LT200.

   Does LT200 reading drop?

   YES Allow water to drain from still until LT200 reading is < 7 inches. Return to step 1.

   NO Go to STILL NOT BOILING DOWN FAULT (WP 0062 00) starting at step 2.

PATH B (From PATH A, step 2)

1. Monitor operator panel to see if laundry cycle advances to “DRAIN TO STILL” step.

   Does cycle advance to “DRAIN TO STILL” step within 4 – 7 minutes?

   YES Go to step 3.

   NO Go to step 2.

2. Open drain valve on still and monitor still water level LT200.

   Does LT200 reading drop”?

   YES Allow water to drain from still until LT200 reading is < 7 inches. Return to step 6.

   NO Go to STILL NOT BOILING DOWN FAULT (WP 0062 00, PATH A, STEP 2).

3. Wait for laundry cycle to get to “DRY, HEATING–UP” step then monitor still temperature (TE200).

   Is TE200 reading > 209 degrees F?

   YES Perform a cooldown and check integrity of insulation on steam piping between still and still condenser.

   NO Go to step 4.

4. Monitor heater TF temperature (TE300).

   Is TE300 reading > 250 degrees F?

   YES Perform cooldown and check cleanliness of heat plates in still (TM 10–3510–221–10).

   NO Go to HEATING SYSTEM FAILURE (WP 0072 00).

END OF WORK PACKAGE

UNIT, DIRECT SUPPORT, AND GENERAL SUPPORT

LAUNDRY ADVANCED SYSTEM

(NSN 3510–01–463–0114)

OPERATIONAL CHECKOUT AND TROUBLESHOOTING PROCEDURES CONDENSER FAN OVERLOAD

INITIAL SETUP:

Tools
Tool Kit, General Mechanics
(Item 1, WP 0282 00)
Multimeter (Item 2, WP 0282 00)

Personnel Required

Materials/Parts

Equipment Conditions
Power must be applied at main control enclosure (WP 0010 00).

PATH A

NOTE

When a CONDENSER FAN OVERLOAD fault occurs, a 20 HP INVERTER FAULT may also occur. In this case the 20 hp inverter K200 must be reset each time the condenser fan overload relay OL200 is reset.

1. Use maintenance menu to turn on condenser fan M200 (WP 0010 00). Observe fan operation.

   Does condenser fan come on?

   YES Go to step 2.

   NO Stop M200. Go to step 3.

2. Allow condenser fan to operate for approximately 1 minute. Observe fan operation.

   Does condenser fan stay on?

   YES Stop M200. Return to normal operation.

   NO Stop M200. Go to step 3.

3. Position SW2 then SW1 to OFF.
4. Open door on inverter enclosure.
5. Check condenser fan overload relay OL200.

   Is lever tripped?

   YES Go to step 6.

   NO Go to **PATH B**.

6. Check trip setting OL200.

   Is setting 29 amps?

   YES Reset trip lever. Go to step 7.

   NO Set trip setting to 29 amps. Reset trip lever. Return to step 1.

7. Position SW1 then SW2 to ON.
8. Use maintenance menu to turn on M200 for approximately 1 minute. Observe condenser fan operation.

   Does condenser fan operate?

   YES Stop M200. Return to normal operation.

   NO Stop M200. Go to step 9.

PATH A – Continued

NOTE

When measuring voltage on 3–phase circuits, always check all three legs of the circuit before concluding that voltage is present. You may misdiagnose a problem if you do not check all three legs (L1, L2, and L3) and voltage is not available at one or two legs of the circuit you did not check.

9. Check for >200 VAC across CB1 terminals (L1 and L2), (L1 and L3), and (L2 and L3).

   Is >200 VAC present?

   YES Go to step 10.

   NO Check connections on wire #s 009, 010, and 011 between CB1 and TB1. Repair as necessary.

10. Check for >200 VAC across CB1 terminals (T1 and T2), (T1 and T3), and (T2 and T3).

    Is >200 VAC present?

    YES Go to step 11.

    NO Replace circuit breaker CB1 (WP 0223 00).

11. Check for >200 VAC across 20 hp inverter K200 input terminals (L1 and L2), (L1 and L3), and (L2 and L3).

    Is >200 VAC present?

    YES Go to step 12.

    NO Check connections on wire #s 019, 020, and 021 between K200 and CB1. Repair as necessary.

12. Position SW2 then SW1 to OFF.

13. Check for smooth rotation of fan blade on condenser fan.

    Does fan blade rotate freely?

    YES Go to step 14.

    NO Replace condenser fan motor M200 (WP 0270 00).

14. Check connections on wire #s 062, 063, and 064 between K200 and OL200.

    Are wires and connections OK?

    YES Go to step 15.

    NO Repair as necessary.

15. Check for continuity between K200 and OL200 as follows:

    K200 (U) to OL200 (T1)

    K200 (V) to OL200 (T2)

    K200 (W) to OL200 (T3)

    Does continuity exist across all three circuits?

    YES Go to step 16.

    NO Replace condenser fan overload relay OL200 (WP 0254 00).

16. Check resistance across OL200 terminals (T1 and T2), (T1 and T3), and (T2 and T3).

    Is resistance < 0.3 ohms across any set of terminals?

    YES Go to step 17.

    NO Replace condenser fan motor M200 (WP 0270 00).

PATH A – Continued

17. Check for shorted or open connections on wire #s 079, 080, and 081 between OL200 and M200.

    Are wires and connections OK?

    YES Replace condenser fan motor M200 (WP 0270 00).

    NO Repair as necessary.

PATH B (From PATH A, step 5)

1. Check for >11 VDC between OL200 terminal (98) and TB2 terminal (+12).

   Is >11 VDC present?

   YES Go to step 2.

   NO Check connections on wire #s 326 and 327 between OL200, OL300, and PCB2. Repair as necessary.

2. Check for >11 VDC between OL200 terminal (97) and TB2 terminal (+12).

   Is >11 VDC present?

   YES Replace condenser fan overload relay OL200 (WP 0254 00).

   NO Go to step 3.

3. Check for shorted connections on wire #s 326 and 327 between OL200, OL300, and PCB2.

   Are wires and connections OK?

   YES Go to TYPICAL DISCRETE INPUT SIGNAL FAULT (WP 0107 00, PATH A, step 6).

   NO Repair as required.

END OF WORK PACKAGE

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UNIT, DIRECT SUPPORT, AND GENERAL SUPPORT

LAUNDRY ADVANCED SYSTEM

(NSN 3510–01–463–0114)

OPERATIONAL CHECKOUT AND TROUBLESHOOTING PROCEDURES DISTILLATE PUMP OVERLOAD

INITIAL SETUP:

Tools
Tool Kit, General Mechanics
(Item 1, WP 0282 00)
Multimeter (Item 2, WP 0282 00)

Personnel Required

Materials/Parts

Equipment Conditions
Power must be applied at main control enclosure (WP 0010 00).

PATH A

CAUTION

Never run distillate pump without water in standpipe. Running pump dry may cause permanent damage to pump's internal components

1. Use maintenance menu to read water level in standpipe LT201 (WP 0010 00).

   In standpipe level > 14 inches?

   YES Go to step 3.

   NO Go to step 2.

2. Fill standpipe as follows:

   a. Remove cover from 1st–stage prefilter.
   b. Use maintenance menu to open FV200.
   c. Add water to 1st–stage prefilter while periodically checking LT201 reading.
   d. When LT201 reading is 14 inches or more stop adding water.
   e. Use maintenance menu to close FV200.
   f. Reinstall cover on 1st–stage prefilter.

3. Use maintenance menu to turn on distillate pump M201. Observe pump operation for 10 to 20 seconds then turn pump off.

   Does distillate pump come on?

   YES Stop M201. Return to normal operation.

   NO Stop M201. Go to step 4.

4. Open door on main control enclosure.

5. Check distillate pump overload relay OL201.

   Is lever tripped?

   YES Go to step 6.

   NO Go to **PATH B**.

6. Check trip setting on OL201.

   Is setting 3 amps?

   YES Reset trip lever. Go to step 7.

   NO Set trip setting to 3 amps. Reset trip lever. Return to step 1.

PATH A – Continued

7. Use maintenance menu to turn on M201. Observe pump operation for 10 to 20 seconds then turn off pump.

   Does distillate pump operate?

   YES Stop M201. Return to normal operation.

   NO Stop M201. Go to step 8.

NOTE

When measuring voltage on 3–phase circuits, always check all three legs of the circuit before concluding that voltage is present. You may misdiagnose a problem if you do not check all three legs (L1, L2, and L3) and voltage is not availabe at one or two legs of the circuit you did not check.

8. Check for >200 VAC across CB6 terminals (L1 and L2), (L1 and L3), and (L2 and L3).

   Is >200 VAC present?

   YES Go to step 9.

   NO Check connections on wire #s 015, 016, and 017 and jumper bar between CB6 and TB1. Repair as necessary.

9. Check for >200 VAC across CB6 terminals (T1 and T2), (T1 and T3), and (T2 and T3).

   Is >200 VAC present?

   YES Go to step 10.

   NO Replace circuit breaker CB6 (WP0223 00).

10. Check for >200 VAC across distillate pump contactor MC201 terminals (L1 and L2), (L1 and L3), and (L2 and L3).

    Is >200 VAC present?

    YES Go to step 11.

    NO Check connections on wire #s 361, 362, and 363 between MC201 and MC105 and wire #s 051, 052, and 053 between MC105 and CB6. Repair as necessary.

11. Position SW2 then SW1 to OFF.

12. Check for continuity across contacts (L1 and T1), (L2 and T2), and (L3 and T3) of MC201 while pushing in on latching mechanism in center of MC201.

    Do all contacts have continuity?

    YES Go to step 13.

    NO Replace 3–phase contactor MC201 (WP 0225 00).

13. Check connections between MC201 and OL201.

    Are connections OK?

    YES Go to step 14.

    NO Repair as necessary.

PATH A – Continued

14. Check for continuity between MC201 and OL201 while pushing in on latching mechanism in center of MC201 as follows:

    MC201 (L1) to OL201 (T1)

    MC201 (L2) to OL201 (T2)

    MC201 (L3) to OL201 (T3)

    Do all circuits have continuity?

    YES Go to step 15.

    NO Replace overload relay OL201 (WP 0226 00).

15. Check resistance across MC201 output terminals (T1 and T2), (T1 and T3), and (T2 and T3).

    Is resistance < 8 ohms across any set of terminals?

    YES Go to step 17.

    NO Go to step 16.

16. Attempt to spin fan blade on back of distillate pump motor M201.

    Does blade spin freely?

    YES Go to step 17.

    NO Replace distillate pump M201 (WP 0163 00).

17. Check for shorted or open connections on wire #s 348, 350, and 352 between OL201 and M201.

    Are wires and connections OK?

    YES Replace distillate pump M201 (WP 0163 00).

    NO Repair as necessary.

PATH B (From PATH A, step 5)

1. Check for >11 VDC between OL201 terminal (98) and TB2 terminal (+12).

   Is >11 VDC present?

   YES Go to step 2.

   NO Check connections on wire #s 333 and 341 between OL201, OL105, and PCB2. Repair as necessary.

2. Check for >11 VDC between OL201 terminal (97) and TB2 terminal (+12).

   Is >11 VDC present?

   YES Replace distillate pump overload relay OL201 (WP 0226 00).

   NO Go to step 3.

3. Check for shorted connections on wire #s 333 and 341 between OL201, OL105, and PCB2.

   Are wires and connections OK?

   YES Go to TYPICAL DISCRETE INPUT SIGNAL FAULT (WP 0107 00, PATH A, step 6).

   NO Repair as required.

END OF WORK PACKAGE

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UNIT, DIRECT SUPPORT, AND GENERAL SUPPORT

LAUNDRY ADVANCED SYSTEM

(NSN 3510–01–463–0114)

OPERATIONAL CHECKOUT AND TROUBLESHOOTING PROCEDURES RECYCLED WATER TEMPERATURE HI

INITIAL SETUP:

Tools
Tool Kit, General Mechanics
(Item 1, WP 0282 00)

Personnel Required

Materials/Parts

Equipment Conditions
Power must be applied at main control enclosure (WP 0010 00).

1. Observe operator panel display.

   Does display read “CONDENSATE TEMP HI”?

   YES Go to CONDENSATE TEMPERATURE HI FAULT (WP 0052 00).

   NO Go to step 2.

2. Position SW2 and SW1 to OFF.
3. Check for debris on screen covering subcooler.

   Is screen clean?

   YES Go to step 4.

   NO Clean screen (TM 10–3510–221–10). Return to normal operation.

4. Remove screen from subcooler (TM 10–3510–221–10).
5. Check for debris or bent fins that would prevent air flow through cooling fins of subcooler.

   Are cooling fins bent or blocked?

   YES Straighten fins or remove debris (TM 10–3510–221–10). Return to normal operation.

   NO Return to normal operation.

END OF WORK PACKAGE

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UNIT, DIRECT SUPPORT, AND GENERAL SUPPORT

LAUNDRY ADVANCED SYSTEM

(NSN 3510–01–463–0114)

OPERATIONAL CHECKOUT AND TROUBLESHOOTING PROCEDURES STANDPIPE LEVEL LO

INITIAL SETUP:

Tools

Personnel Required

Materials/Parts

Equipment Conditions
Power must be applied at main control enclosure (WP 0010 00).

1. Observe operator panel display.

   Does “LT201 FAILURE” appear?

   YES Go to TYPICAL LT FAILURE FAULT (WP 0033 00).

   NO Go to step 2.

2. Check drain valve on distillate pump.

   Is valve closed?

   YES Go to step 3.

   NO Close valve. Return to normal operation.

3. Check drain valves at bottom of still.

   Are drain valves closed?

   YES Go to step 4.

   NO Close drain valves. Return to normal operation.

4. Check still doors for signs of leakage.

   Are doors leaking?

   YES Properly close or repair leakage as required.

   NO Go to step 5.

5. Check still relief valve for signs of class III leakage.

   Is relief valve leaking?

   YES Go to STILL PRESSURE HI (WP 0052 00).

   NO Go to step 6.

6. Check vacuum breaker for signs of class III leakage.

   Is vacuum breaker leaking?

   YES Replace vacuum breaker (WP 0157 00).

   NO Go to step 7.

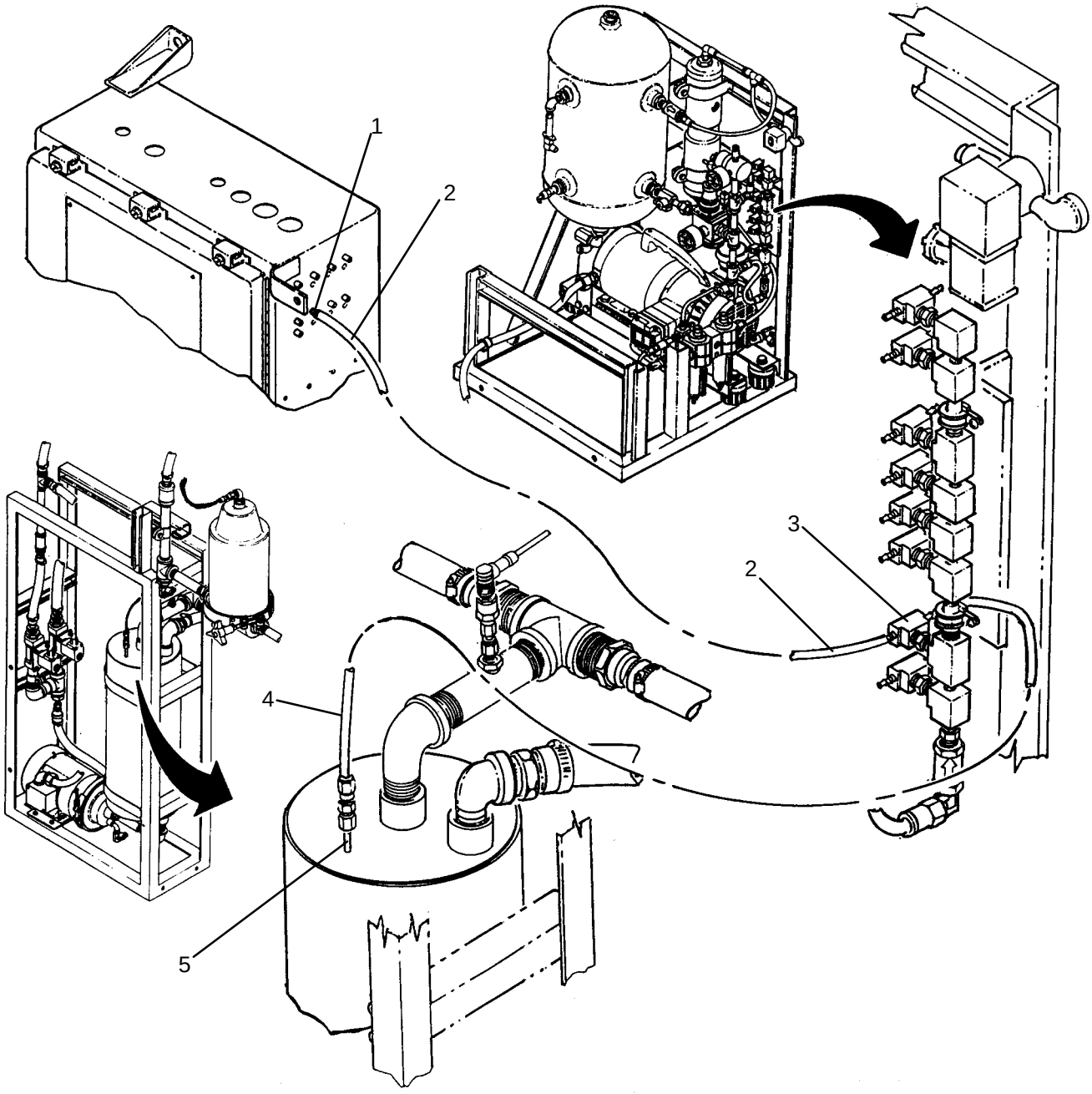
7. Check all condensate plumbing for class III leakage.

   Are any leaks found?

   YES Properly close or repair leakage as required.

   NO Go to step 8.

8. Check tubes and connections between level sensor LT201 (1) and tube (2), between tube (2) and orifice manifold (3), between orifice manifold (3) and tube (4), and between tube (4) and level tube (5) for loose connections and blocked or damaged tubing.



Are any loose connections or blocked or damaged tubes found?

YES Repair as necessary.

NO Go to TYPICAL ANALOG INPUT SIGNAL FAULT (WP 0105 00).

END OF WORK PACKAGE

UNIT, DIRECT SUPPORT, AND GENERAL SUPPORT

LAUNDRY ADVANCED SYSTEM

(NSN 3510–01–463–0114)

OPERATIONAL CHECKOUT AND TROUBLESHOOTING PROCEDURES STANDPIPE NOT EMPTYING

INITIAL SETUP:

Tools
Tool Kit, General Mechanics
(Item 1, WP 0282 00)

Personnel Required

Materials/Parts

Equipment Conditions
Power must be applied at main control enclosure (WP 0010 00).

1. Observe operator panel display.

   Does “LT201 FAILURE” appear?

   YES Go to TYPICAL LT FAILURE FAULT (WP 0033 00).

   NO Go to step 2.

2. Observe operator panel display.

   Does “DISTILLATE PUMP OVERLOAD” appear?

   YES Go to DISTILLATE PUMP OVERLOAD FAULT (WP 0055 00).

   NO Go to step 3.

3. Check position of manual valve at inlet to 1st–stage prefilter.

   Is valve open?

   YES Go to step 4.

   NO Open valve. Return to normal operation.

4. Check for a clogged bag filter in 1st–stage prefilter (TM 10–3510–221–10).

   Is 1st–stage prefilter clogged?

   YES Replace replace filter bag.

   NO Reinstall filter bag. Go to step 5.

5. Check for a clogged bag filter in 2nd–stage prefilter (TM 10–3510–221–10).

   Is 2nd–stage prefilter clogged?

   YES Replace replace filter bag.

   NO Reinstall filter bag. Go to step 6.

6. Check for a clogged cartridge in coalescer (TM 10–3510–221–10).

   Is coalescer cartridge clogged?

   YES Replace coalescer cartridge.

   NO Reinstall coalescer cartridge. Go to step 7.

7. Use maintenance menu to open and close subcooler bypass valve FV200 (WP 0010 00). Audibly check valve operation.

   Is valve opening and closing?

   YES Go to step 8.

   NO Go to TYPICAL AC OUTPUT SIGNAL FAULT (WP 0104 00).

8. Use maintenance menu to open and close subcooler inlet valve FV201. Audibly check valve operation.

   Is valve opening and closing?

   YES Go to step 9.

   NO Go to TYPICAL AC OUTPUT SIGNAL FAULT (WP 0104 00).

9. Open drain valve on distillate pump and allow water to drain for a few seconds, then close valve.

CAUTION

Never run distillate pump without water in standpipe. Running pump dry may cause permanent damage to pump internal components

10. Use maintenance menu to read water level in standpipe LT201.

    In standpipe level > 14 inches?

    YES Go to step 12.

    NO Go to step 11.

11. Fill standpipe as follows:
    a. Remove cover from 1st–stage prefilter.
    b. Use maintenance menu to open FV200.
    c. Add water to 1st–stage prefilter while periodically checking LT201 reading.
    d. When LT201 reading is 14 inches or more, stop adding water.
    e. Use maintenance menu to close FV200.
    f. Reinstall cover on 1st–stage prefilter.

12. Use maintenance menu to turn on distillated pump M201. Observe pump operation for 5 to 10 seconds then turn off M201.

    Does pump come on?

    YES Go to step 13.

    NO DISTILLATE PUMP DOES NOT TURN ON FAULT (WP 0065 00).

13. Use maintenance menu to read standpipe water level LT201. Record LT201 reading.

14. Use maintenance menu to turn on M201. Allow pump to run for about 10 seconds then turn off M201.

15. Use maintenance menu to observe LT201 water level.

    Is reading at least 2 inches less than reading in step 13?

    YES Return to normal operation.

    NO Go to step 16.

16. Check for clogged orifice installed between outlet of distillate pump M201 and inlet to valves FV200 and FV201.

    Is orifice clogged?

    YES Clear restriction as necessary.

    NO Go to TYPICAL LT FAILURE (WP 0033 00, PATH A, step 5).

END OF WORK PACKAGE

UNIT, DIRECT SUPPORT, AND GENERAL SUPPORT

LAUNDRY ADVANCED SYSTEM

(NSN 3510–01–463–0114)

OPERATIONAL CHECKOUT AND TROUBLESHOOTING PROCEDURES STILL DOOR(S) OPEN

INITIAL SETUP:

Tools

Personnel Required

Materials/Parts

Equipment Conditions
Power must be applied at main control enclosure (WP 0010 00).

1. Make sure still doors are closed and knobs are tightened (TM 10–3510–221–10).

   Were doors closed and knobs tightened properly?

   YES Go to step 2.

   NO Properly secure doors. Return to normal operation.

2. Check adjustment of both door switches (WP 0159 00).

   Are switches properly adjusted?

   YES Go to TYPICAL DISCRETE INPUT SIGNAL FAULT (WP 0107 00) to check operation of door switches.

   NO Adjust door(s) switch position as necessary.

END OF WORK PACKAGE

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UNIT, DIRECT SUPPORT, AND GENERAL SUPPORT

LAUNDRY ADVANCED SYSTEM

(NSN 3510–01–463–0114)

OPERATIONAL CHECKOUT AND TROUBLESHOOTING PROCEDURES STILL PRESSURE LO

INITIAL SETUP:

Tools

Personnel Required

Materials/Parts

Equipment Conditions
Power must be applied at main control enclosure (WP 0010 00).

1. Check drain valves at bottom of still.

   Are drain valves closed?

   YES Go to step 2.

   NO Close drain valves. Return to normal operation.

2. Check vacuum breaker for signs of class III leakage.

   Is vacuum breaker leaking?

   YES Replace vacuum breaker (WP 0157 00).

   NO Return to normal operation.

END OF WORK PACKAGE

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UNIT, DIRECT SUPPORT, AND GENERAL SUPPORT

LAUNDRY ADVANCED SYSTEM

(NSN 3510–01–463–0114)

OPERATIONAL CHECKOUT AND TROUBLESHOOTING PROCEDURES
STILL TEMPERATURE LO

INITIAL SETUP:

Tools

Personnel Required

Materials/Parts

Equipment Conditions
Power must be applied at main control enclosure (WP 0010 00).

Obtain ambient temperature.

Is temperature between >33 degrees F?

YES Go TE200 FAILURE (WP 0035 00).

NO Operate LADS only at ambient temperatures above 33 degrees F.

END OF WORK PACKAGE

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UNIT, DIRECT SUPPORT, AND GENERAL SUPPORT

LAUNDRY ADVANCED SYSTEM

(NSN 3510–01–463–0114)

OPERATIONAL CHECKOUT AND TROUBLESHOOTING PROCEDURES STILL NOT BOILING DOWN OR COOLDOWN/DRAIN CYCLE WILL NOT FINISH

INITIAL SETUP:

Tools
Tool Kit, General Mechanics
(Item 1, WP 0282 00)

Personnel Required

Materials/Parts

Equipment Conditions
Power must be applied at main control enclosure (WP 0010 00).

PATH A

NOTE

This procedure must be performed during a heating tanks operation, cooldown cycle, or drain cycle.

1. Observe operator panel A display.

   Does display read “STILL NOT BOILING DOWN”.

   YES Go to step 2.

   NO Control system will provide alarm message if still does not boil down. Return to normal operation.

2. Use EXAMINE INPUTS to monitor still temperature TE200.

   Is TE200 reading > 209 degrees F?

   YES Go to step 4.

   NO Go to step 3.

3. Use EXAMINE INPUTS to monitor heater TF temperature TE300.

   Is TE300 reading > 250 degrees F?

   YES Go to step 4

   NO Go to HEATING SYSTEM FAILURE (WP 0072 00).

4. Use EXAMINE INPUTS to monitor still water level LT200.

5. Open drain valve and continue to monitor LT200.

   Does LT200 level start to drop?

   YES Go to step 6.

   NO Go to **PATH B**.

6. Continue to monitor LT200.

   Does LT200 reading drop to 3 inches or less?

   YES Go to step 7.

   NO Go to **PATH B**.

7. Allow water to drain from still until LT200 reading is < 3 inches.

PATH A – Continued

8. Monitor operator panel to see if operation advances past “BOILING DOWN THE STILL” step.

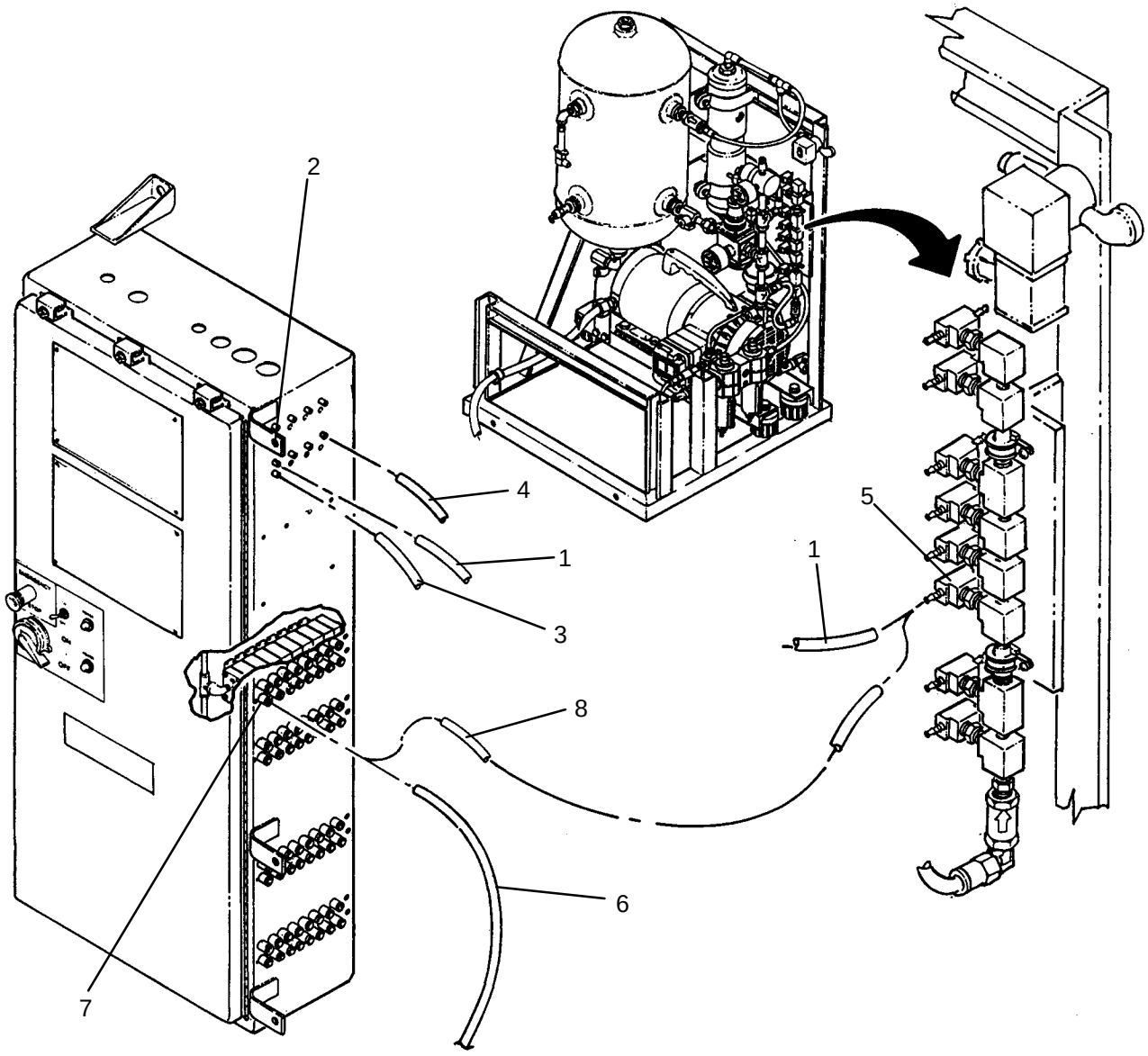
Does cycle advance past “BOILING DOWN THE STILL” step?

YES Perform cooldown cycle and clean heatplates on still (TM 10–3510–221–10).

NO Go to **PATH B**.

PATH B (From Path A, step 5, 6, or 8)

1. Disconnect tube (1) from top port on level sensor LT200 (2).



2. Observe operator panel display.

Does level reading drop towards 0 inches?

YES Go to step 3.

NO Go to TYPICAL ANALOG INPUT SIGNAL FAULT (WP 0105 00) to check for faulty LT200 level sensor.

PATH B – Continued

3. Attempt to clear restriction in tubing for level sensor LT200 (2) as follows:

CAUTION

Level sensor can not be subjected to high pressure air. Prior to connecting air pressure to level tube path ensure all tubes are disconnected from level sensor. Failure to follow this precaution will result in damage to level sensor.

   a. Disconnect tube (3) from bottom port on level sensor LT200 (2) and tube (4) from pressure sensor PT200 (5).
   b. Disconnect tube (2) for LT200+ from orifice manifold (5).
   c. Disconnect air tube labeled FV107AE (6) from SV107A (7).
   d. Connect a piece of 1/4 inch tubing (8) between orifice manifold (5) and exhaust port on solenoid valve SV107A (7).
   e. Using maintenance menu, open valve FV107A for about 5 seconds then close valve.
   f. Disconnect 1/4 inch tubing (8) from solenoid valve SV107A (7) and orifice manifold (5).
   g. Reconnect air tube (6) to solenoid valve SV107A (7).
   h. Reconnect tube (3) to bottom port on level sensor LT200 (2) and tube (4) to pressure sensor PT200 (5).
   i. Reconnect tube (1) to top port on level sensor LT200 (2) and orifice manifold (4).

4. Use maintenance menu to build up air pressure then use EXAMINE INPUTS to check LT200 reading.

   Is LT200 reading approximately 0 inches?

   YES Return to **PATH A, step 8**.

   NO Go to step 5.

5. Use maintenance menu UTILITY OPTIONS to cool thermal fluid until TE300 temperature is 150 degrees F or lower.

6. Clean still (TM 10–3510–221–10). Prior to closing still doors inspect tip of level sensor pick–up tube (9).

   Is tube clogged with debris?

   YES Repeat step 3 to clear restriction. If restriction can not be cleared with air pressure, clean out pick–up tube as necessary.

   NO Go to step 7.

7. Use maintenance menu to build up air pressure then use EXAMINE INPUTS to check LT200 reading.

   Is LT200 reading approximately 0 inches?

   YES Return to normal operation.

   NO Go to TYPICAL LT FAILURE (WP 0033 00).

END OF WORK PACKAGE

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UNIT, DIRECT SUPPORT, AND GENERAL SUPPORT

LAUNDRY ADVANCED SYSTEM

(NSN 3510–01–463–0114)

OPERATIONAL CHECKOUT AND TROUBLESHOOTING PROCEDURES STILL NOT FILLING

INITIAL SETUP:

Tools
Tool Kit, General Mechanics
(Item 1, WP 0282 00)

Personnel Required

Materials/Parts

Equipment Conditions
Power must be applied at main control enclosure (WP 0010 00).

PATH A

NOTE

Pressure in air system must be maintained above 80 psig while performing this procedure.

1. Observe operator panel display.

   Does “LT200 FAILURE” appear?

   YES Go to TYPICAL LT FAILURE FAULT (WP 0033 00).

   NO Go to step 2.

2. Determine if fault occurred during “DRAIN/EXTRACT TO STILL” or when during water filling/heating operations.

   Did fault occur during “DRAIN/EXTRACT TO STILL” step?

   YES Go to **PATH B**.

   NO Go to step 3.

3. Check position of still drain valves

   Are valves closed?

   YES Go to step 4.

   NO Close valves. Return to normal operation.

4. Check for leakage at still doors.

   Are doors leaking?

   YES Properly close doors or repair as necessary.

   NO Go to step 5.

5. Check LADS water plumbing for class III leaks.

   Are any leaks found?

   YES Repair as necessary.

   NO Go to step 6.

6. Observe operator panel display.

   Does “WASH TANK NOT EMPTYING” fault appear?

   YES Go to WASH TANK NOT EMPTYING FAULT (WP 0036 00).

   NO Go to **PATH B**.

PATH B (From PATH A, step 2 or 6)

1. Use maintenance menu to turn on water supply pump M105 (WP 0010 00).

   Does water supply pump come on?

   YES Stop M105. Go to step 2.

   NO Stop M105. Go to WATER SUPPLY PUMP DOES NOT TURN ON FAULT (WP 0050 00).

2. Use maintenance menu to turn on water supply pumps M101A and B.

   Do water pumps come on?

   YES Stop pumps. Go to step 3.

   NO Stop pumps. Go to WATER PUMP DOES NOT TURN ON FAULT (WP 0048 00).

3. Use maintenance menu to open and close still inlet valves FV109A and B. Verify valves open and close.

   Do valves open and close?

   YES Go to step 4.

   NO Go to TYPICAL WATER CONTROL VALVE NOT OPENING/CLOSING FAULT (WP 0047 00).

4. Use maintenance menu to open and close drum outlet valves FV107A and B. Verify valves open and close.

   Do valves open and close?

   YES Go to step 5.

   NO Go to TYPICAL WATER CONTROL VALVE NOT OPENING/CLOSING FAULT (WP 0047 00).

5. Use maintenance menu to open and close rinse 2 tank outlet valves FV105A and B. Verify valves open and close.

   Do valves open and close?

   YES Go to step 6.

   NO Go to TYPICAL WATER CONTROL VALVE NOT OPENING/CLOSING FAULT (WP 0047 00).

6. Use maintenance menu to open and close drum inlet valves FV106A and B. Verify valves open and close.

   Do valves open and close?

   YES Go to step 7.

   NO Go to TYPICAL WATER CONTROL VALVE NOT OPENING/CLOSING FAULT (WP 0047 00).

7. Use maintenance menu to open and close wash tank inlet valves FV100A and B. Verify valves open and close.

   Do valves open and close?

   YES Go to step 8.

   NO Go TYPICAL WATER CONTROL VALVE NOT OPENING/CLOSING FAULT (WP 0047 00).

8. Check for debris in water pump strainer (TM 10–3510–221–10).

   Is strainer clear of debris?

   YES Go to step 9.

   NO Clean and replace strainer. Return to normal operation.

PATH B – Continued

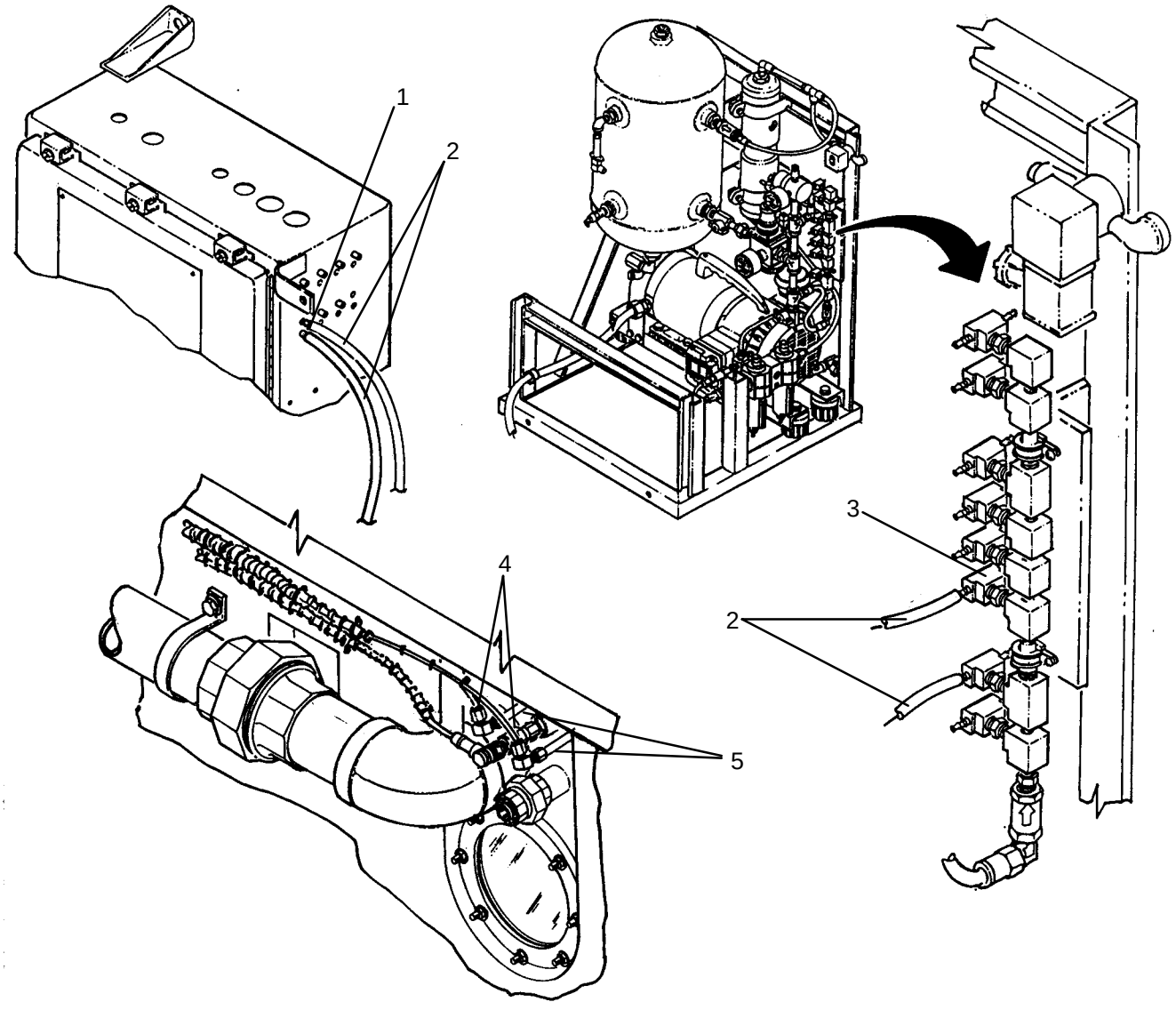
9. Check for blockage in water plumbing.

   Is blockage found?

   YES Clear blockage as required.

   NO Go to step 10.

10. Check tubes and connections between level sensor (1) and tube (2), between tube (2) and orifice manifold (3), between orifice manifold (3) and tube (4), and between tube (4) and level tube (5) for loose connections and damaged tubing.



   Are any loose connections or damaged tubes found?

   YES Repair as necessary.

   NO Go to TYPICAL ANALOG INPUT SIGNAL FAULT (WP 0105 00).

END OF WORK PACKAGE

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UNIT, DIRECT SUPPORT, AND GENERAL SUPPORT

LAUNDRY ADVANCED SYSTEM

(NSN 3510–01–463–0114)

OPERATIONAL CHECKOUT AND TROUBLESHOOTING PROCEDURES CONDENSER FAN DOES NOT TURN ON

INITIAL SETUP:

Tools
Tool Kit, General Mechanics
(Item 1, WP 0282 00)
Multimeter (Item 2, WP 0282 00)

Personnel Required

Materials/Parts

Equipment Conditions
Power must be applied at main control enclosure (WP 0010 00).

PATH A

1. Observe operator panel display.

   Does display indicate “CONDENSER FAN OVERLOAD”?

   YES Go to CONDENSER FAN OVERLOAD FAULT (WP 0054 00).

   NO Go to step 2.

2. Observe operator panel display.

   Does display indicate “20 HP INVERTER FAULT”?

   YES Go to 20 HP INVERTER FAULT (WP 0097 00).

   NO Go to step 3.

3. Use maintenance menu to turn on still condenser fan M200 (WP 0010 00). Observe fan operation.

   Does fan come on?

   YES Stop M200. Return to normal operation.

   NO Go to step 4.

4. Observe TF pump M300 operation.

   Does TF pump come on?

   YES Go to **PATH C**.

   NO Go to step 5.

5. Position SW2 then SW1 to OFF.
6. Open door on inverter enclosure and main control enclosure
7. Check condenser fan overload relay OL200.

   Is lever tripped?

   YES Go to CONDENSER FAN OVERLOAD FAULT (WP 0054 00).

   NO Go to step 8.

8. Check TF pump overload relay OL300.

   Is lever tripped?

   YES Go to TF PUMP OVERLOAD FAULT (WP 0078 00).

   NO Go to step 9.

PATH A – Continued

9. Check circuit breaker CB1.

   Is CB1 tripped?

   YES Reset CB1. Go to step 10.

   NO Go to **PATH B**.

10. Position SW1 then SW2 to ON.
11. Use maintenance menu to turn on M200. Observe fan operation for about 1 minute.

    Does fan come on and stay on?

    YES Stop M200. Return to normal operation.

    NO Stop M200. Go to step 12.

12. Check circuit breaker CB1.

    Is CB1 tripped?

    YES Check for shorted wire or connection between CB1 and K200, K200 and OL200, and K200 and OL300.

    NO Go to **PATH A**.

PATH B (From PATH A, step 9 or 12)

1. Check display on 20 hp inverter K200.

   Is a fault displayed?

   YES Go to 20 HP INVERTER FAULT (WP 0097 00).

   NO Go to step 2.

NOTE

When measuring voltage on 3–phase circuits, always check all three legs of the circuit before concluding that voltage is present. You may misdiagnose a problem if you do not check all three legs (L1, L2, and L3) and voltage is not available at one or two legs of the circuit you did not check.

2. Check for >200 VAC across CB1 input terminals (L1 and L2), (L1 and L3), and (L2 and L3).

   Is >200 VAC present?

   YES Go to step 3.

   NO Check connections on wire #s 009, 010, and 011 between CB1 and TB1. Repair as necessary.

3. Check for >200 VAC across CB1 output terminals (T1 and T2), (T1 and T3), and (T2 and T3).

   Is >200 VAC present?

   YES Go to step 4.

   NO Replace CB1 (WP 0223 00).

4. Remove cover from 20 hp inverter K200.
5. Check for >200 VAC across K200 input terminals (L1 and L2), (L1 and L3), and (L2 and L3).

   Is >200 VAC present?

   YES Go to step 6.

   NO Check connections on wire #s 019, 020, and 021 between CB1 and K200. Repair as necessary.

PATH B – Continued

6. Use maintenance menu turn on M200 while monitoring LED for SSR 6 on PCB4.

   Does LED come on?

   YES Stop M200. Go to step 7.

   NO Stop M200. Go to TYPICAL DC OUTPUT SIGNAL FAULT (WP 0106 00) to determine why SSR does not turn on.

7. Check for > 15 VDC across K200 inverter terminals (CM and FWD).

   Is > 15 VDC present?

   YES Go to step 8.

   NO Replace 20 hp inverter K200 (WP 0250 00).

8. Check for > 15 VDC across PCB4 terminals (13 and 14).

   Is > 15 VDC present?

   YES Go to step 9.

   NO Check connections on wire #s 254 and 255 between K200 and PCB4.

9. Use maintenance menu to turn on M200 while checking for 0.1 to 1.0 VDC across PCB4 terminals (13 and 14).

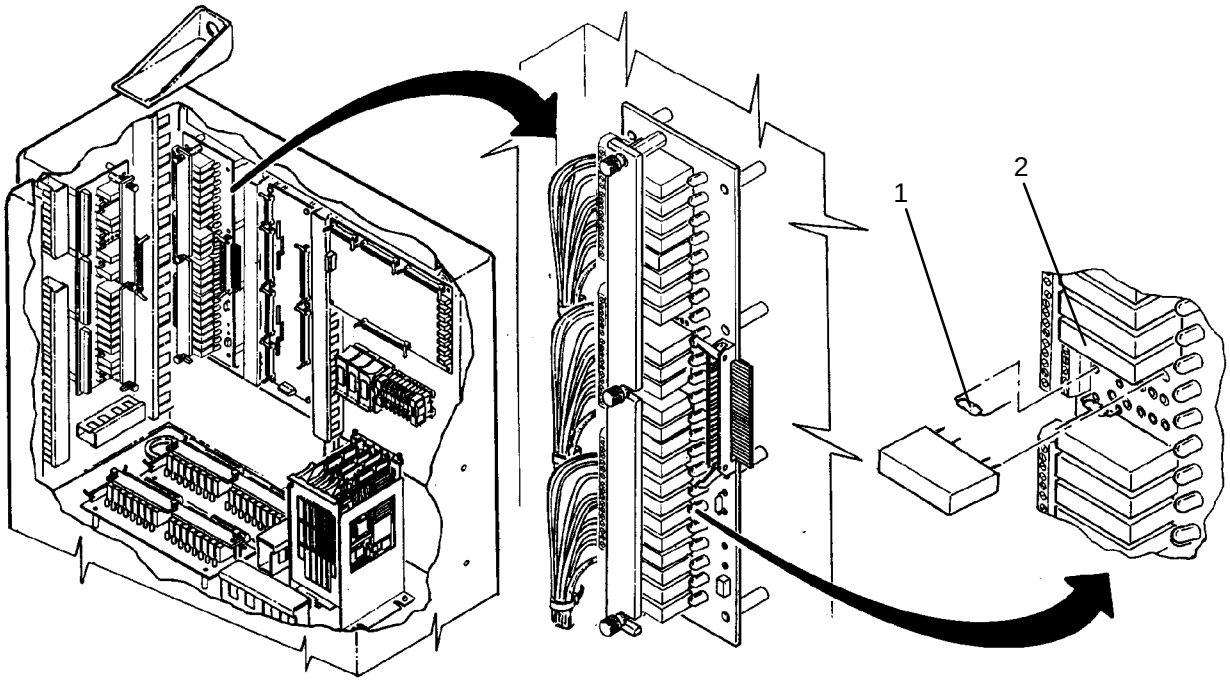
   Is 0.1 to 1.0 VDC present?

   YES Replace 20 hp inverter K200 (WP 0250 00).

   NO Go to step 10.

10. Position SW2 to OFF.

11. Check 5 amp fuse (1) next to SSR 6 (2) for continuity.



Does fuse have continuity?

YES Replace SSR 6 (WP 0241 00).

NO Replace fuse (WP 0242 00).

PATH C (From PATH A, step 4)

1. Open door on inverter enclosure and main control enclosure
2. Use maintenance menu to turn on M200 then check for >200 VAC across condenser fan overload relay OL200 input terminals (L1 and L2), (L1 and L3), and (L2 and L3).

   Is >200 VAC present?

   YES Stop fan. Go to step 3.

   NO Stop fan. Check connections on wire #s 062, 063, and 064 between 20 hp inverter K200 and OL200. Repair as necessary
3. Use maintenance menu to turn on M200 then check for >200 VAC across OL200 output terminals (T1 and T2), (T1 and T3), and (T2 and T3).

   Is >200 VAC present?

   YES Stop fan. Go to step 4.

   NO Stop fan. Replace condenser fan overload relay OL200 (WP 0254 00).
4. Position SW2 then SW1 to OFF.
5. Check connections on wire #s 079, 080, 081 between OL200 and M200.

   Are connections OK?

   YES Replace condenser fan motor M200 (WP 0270 00).

   NO Repair as necessary.

END OF WORK PACKAGE

UNIT, DIRECT SUPPORT, AND GENERAL SUPPORT

LAUNDRY ADVANCED SYSTEM

(NSN 3510–01–463–0114)

OPERATIONAL CHECKOUT AND TROUBLESHOOTING PROCEDURES DISTILLATE PUMP DOES NOT TURN ON

INITIAL SETUP:

Tools
Tool Kit, General Mechanics
(Item 1, WP 0282 00)
Multimeter (Item 2, WP 0282 00)

Personnel Required

Materials/Parts

Equipment Conditions
Power must be applied at main control enclosure (WP 0010 00).

PATH A

NOTE

Never run distillate pump without water in standpipe. Running pump dry may cause permanent damage to pump's internal components

1. Use maintenance menu to read water level in standpipe LT201 (WP 0010 00).

   In standpipe level > 14 inches?

   YES Go to step 3.

   NO Go to step 2.

2. Fill standpipe as follows:
   a. Remove cover from 1st–stage prefilter.
   b. Use maintenance menu to open FV200.
   c. Add water to 1st–stage prefilter while periodically checking LT201 reading.
   d. When LT201 reading is 14 inches or more, stop adding water.
   e. Use maintenance menu to close FV200.
   f. Reinstall cover on 1st–stage prefilter.

3. Use maintenance menu to turn on distillate pump M201. Observe pump operation for 10 to 20 seconds then turn pump off.

   Does distillate pump come on?

   YES Return to normal operation.

   NO Go to step 4.

4. Position SW2 then SW1 to OFF.
5. Open door on main control enclosure.
6. Check distillate pump overload relay OL201.

   Is lever tripped?

   YES Go to DISTILLATE PUMP OVERLOAD FAULT (WP 0055 00).

   NO Go to step 7.

PATH A – Continued

7. Check circuit breaker CB6.

   Is CB6 tripped?

   YES Reset CB6. Go to step 8.

   NO Go to **PATH B**.

8. Position SW1 then SW2 to ON.
9. Use maintenance menu to turn on M201. Observe pump operation.

   Does distillate pump come on?

   YES Stop M201. Return to normal operation.

   NO Stop M201. Go to step 10.

10. Check circuit breaker CB6.

    Is CB6 tripped?

    YES Go to step 11.

    NO Return to step 1.

11. Position SW2 then SW1 to OFF.
12. Check resistance across distillate pump contactor MC201 output terminals (T1 and T2), (T1 and T3), and (T2 and T3) while pushing in on latching mechanism in center of contactor.

    Is resistance < 6 ohms across any set of terminals?

    YES Go to step 13.

    NO Go to step 14.

13. Check for shorted or open connections on wire #s 348, 350, and 352 between OL201 and M201.

    Are wires and connections OK?

    YES Replace distillate pump M201 (WP 0163 00).

    NO Repair as required.

14. Attempt to spin fan blade on back of distillate pump motor M201.

    Does blade spin freely?

    YES Replace circuit breaker CB6 (WP 0223 00).

    NO Replace distillate pump M201 (WP 0163 00).

PATH B (From PATH A, step 7)

1. Position SW1 then SW2 to ON.
2. Use maintenance menu to turn on M201 while monitoring LED for SSR 5 on PCB3.

   Does LED come on?

   YES Stop M201. Go to step 3.

   NO Stop M201. Go to TYPICAL AC OUTPUT SIGNAL FAULT (WP 0104 00).

3. Use maintenance menu, turn on M201 while checking for >100 VAC between PCB3 terminal (12) and TB1 terminal (N).

   Is >100 VAC present?

   YES Stop M201. Go to step 4.

   NO Stop M201. Go to TYPICAL AC OUTPUT SIGNAL FAULT (WP 0104 00).

PATH B – Continued

4. Use maintenance menu, turn on M201 while checking for >100 VAC between distillate pump contactor MC201 terminals (A1) and (A2).

   Is >100 VAC present?

   YES Stop M201. Go to step 5.

   NO Stop M201. Go to **PATH C**.

   NOTE

   When measuring voltage on 3–phase circuits, always check all three legs of the circuit before concluding that voltage is present. You may misdiagnose a problem if you do not check all three legs (L1, L2, and L3) and voltage is not available at one or two legs of the circuit you did not check.

5. Use maintenance menu to turn off M201 then check for >200 VAC across MC201 input terminals (L1 and L2), (L1 and L3), and (L2 and L3).

   Is >200 VAC present?

   YES Go to step 5.

   NO Go to **PATH D**.

6. Use maintenance menu to turn on M201 then check for >200 VAC across MC201 output terminals (T1 and T2), (T1 and T3), and (T2 and T3).

   Is >200 VAC present?

   YES Stop M201. Go to step 7.

   NO Stop M201. Replace distillate pump contactor MC201 (WP 0225 00).

7. Use maintenance menu to turn on M201 then check for >200 VAC across OL201 output terminals (T1 and T2), (T1 and T3), and (T2 and T3).

   Is >200 VAC present?

   YES Stop M201. Go to step 8.

   NO Stop M201. Replace distillate pump overload relay OL201 (WP 0226 00).

8. Position SW2 then SW1 to OFF.
9. Check connections on wire #s 348, 250, and 352 between OL201 and M201.

   Are connections OK?

   YES Replace distillate pump M201 (WP 0163 00).

   NO Repair as necessary.

PATH C (From PATH B, step 4)

1. Position SW2 then SW1 to OFF.
2. Check connections on wire #528 between MC201 terminal (A1) and PCB3 terminal (12).

   Are connections OK?

   YES Go to step 3.

   NO Repair as necessary.

3. Check connections on wire #529 between MC201 terminal (A2) and OL200 terminal (95).

   Are connections OK?

   YES Go to step 4.

   NO Repair as necessary.

PATH C – Continued

4. Check connections on wire #183 between OL201 terminal (96) and OL105 terminal (96), wire #177 between OL105 terminal (96) and OL101B terminal (96), wire #176 between OL101B terminal (96) and OL101A terminal (96), wire #175 between OL101A terminal (96) and TB2 terminal (N).

   Are connections OK?

   YES Replace distillate pump overload relay OL201 (WP 0226 00).

   NO Repair as necessary.

PATH D (From PATH B, step 5)

1. Check for >200 VAC across CB6 input terminals (L1 and L2), (L1 and L3), and (L2 and L3).

   Is >200 VAC present?

   YES Go to step 2.

   NO Check connections on wire #s 015, 016, and 017 and jumper bar between CB6 and TB1.

2. Check for >200 VAC across CB6 output terminals (T1 and T2), (T1 and T3), and (T2 and T3).

   Is >200 VAC present?

   YES Check connections on wire #s 361, 362, and 363 between CB6 and MC201.

   NO Replace CB6 (WP 0223 00).

END OF WORK PACKAGE

UNIT, DIRECT SUPPORT, AND GENERAL SUPPORT

LAUNDRY ADVANCED SYSTEM

(NSN 3510–01–463–0114)

OPERATIONAL CHECKOUT AND TROUBLESHOOTING PROCEDURES STILL DOOR(S) WILL NOT LOCK

INITIAL SETUP:

Tools

Personnel Required

Materials/Parts

Equipment Conditions
Power must be applied at main control enclosure (WP 0010 00).

1. Check for binding between arms on still doors and pins on door locks.

   Are arms preventing pins from extending?

   YES Adjust position of still door(s) by slightly loosening or tightening door knob(s).

   NO Go to step 2.

2. Use maintenance menu to extend still door locks (WP 0010 00).

   Do both door locks extend?

   YES Return to normal operation.

   NO If neither lock extends go to step 3. If one lock extends replace door lock that did not extend (WP 0158 00).

3. Disconnect tubes from top ports of both door locks.

4. Attempt to extend door locks while checking for air pressure venting from disconnected tubes.

   Does air pressure vent from tubes?

   YES Replace both door locks (WP 0158 00).

   NO Connect tubes to door locks. Go to step 5.

5. Disconnect tubes from side ports on door locks then check for air pressure venting from disconnected tubes.

   Does air pressure vent from tubes?

   YES Connect tubes to door locks. Switch tubes connected at solenoid valve (SV200)

   NO Replace solenoid valve SV200 (WP 0214 00).

END OF WORK PACKAGE

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UNIT, DIRECT SUPPORT, AND GENERAL SUPPORT

LAUNDRY ADVANCED SYSTEM

(NSN 3510–01–463–0114)

OPERATIONAL CHECKOUT AND TROUBLESHOOTING PROCEDURES STILL DOOR(S) WILL NOT UNLOCK

INITIAL SETUP:

Tools
Tool Kit, General Mechanics
(Item 1, WP 0282 00)

Personnel Required

Materials/Parts

Equipment Conditions
Power must be applied at main control enclosure (WP 0010 00).

1. Use maintenance menu to examine still temperature TE200 (WP 0010 00).

   Is temperature > 150 degrees F?

   YES Still door locks will not unlock when still temperature is above 150 degrees F.

   NO Go to step 2.

2. Use maintenance menu to examine still water level LT200.

   Is water level >2 inches?

   YES Still door locks will not unlock when still water level is above 2 inches.

   NO Go to step 3.

3. Check for binding between arms on still doors and pins on door locks.

   Are arms preventing pins from retracting?

   YES Adjust position of still door(s).

   NO Go to step 4.

4. Use maintenance menu to retract still door locks DN200.

   Do both door locks retract?

   YES Return to normal operation.

   NO If neither lock retracts go to step 5. If one lock retracts replace door lock that did not retract (WP 0158 00).

5. Open door on main control enclosure. Verify SW1 and SW2 are ON.

6. Using maintenance menu, attempt to retract DN200 while monitoring LED (WP 0011 00, Figure 2, 4) on solenoid valve SV200 (3) on solenoid valve SV200.

   Does LED come on?

   YES Go to step 7.

   NO Go to TYPICAL DC OUTPUT SIGNAL FAULT (WP 0106 00) to check operation of SV200.

7. Push in manual operator (WP 0011 00, Figure 2, 5) on solenoid valve SV200 (3).

   Do door locks retract?

   YES Replace solenoid valve SV200 (WP 0214 00).

   NO Go to step 8.

8. Disconnect tubes from side ports of door locks.

9. Push in manual operator (WP 0011 00, Figure 2, 5) on solenoid valve SV200 (3). Check for air pressure at tubes disconnected from door locks.

   Does air pressure vent from tubes?

   YES Replace door lock (WP 0158 00).

   NO Go to step 10.

10. Connect tubes to side ports of door locks and disconnect tubes from top ports of door locks.

11. Check for air pressure at tubes disconnected from door locks while pushing in manual operator (WP 0011 00, Figure 2, 5) on SV200 (3).

    Does air pressure vent from tubes?

    YES Connect tubes at door locks. Switch tubes connected at solenoid valve SV200.

    NO Replace solenoid valve SV200 (WP 0214 00).

END OF WORK PACKAGE

UNIT, DIRECT SUPPORT, AND GENERAL SUPPORT

LAUNDRY ADVANCED SYSTEM

(NSN 3510–01–463–0114)

OPERATIONAL CHECKOUT AND TROUBLESHOOTING PROCEDURES BURNER BLOWER INLET PRESSURE LO

INITIAL SETUP:

Tools
Tool Kit, General Mechanics
(Item 1, WP 0282 00)
Multimeter (Item 2, WP 0282 00)

Personnel Required

Materials/Parts

Equipment Conditions
Power must be applied at main control enclosure (WP 0010 00).

1. Check for debris blocking burner blower inlet filter.

   Is filter blocked?

   YES Remove debris. Return to normal operation.

   NO Go to step 2.

2. Remove and inspect inlet filter (TM 10–3510–221–10).

   Is filter clean?

   YES Go to step 3.

   NO Clean and reinstall or replace filter. Return to normal operation.

3. Check adjustment of air damper (TM 10–3510–221–10).

   Is air damper adjusted properly for current altitude?

   YES Go to step 4.

   NO Adjust air damper as necessary. Return to normal operation.

4. Check for debris blocking screen on air damper.

   Is debris blocking screen?

   YES Remove debris. Return to normal operation.

   NO Go to step 5.

5. Check connection and tubing between port on blower inlet box and air inlet pressure switch PS300.

   Are connections and tube OK?

   YES Go to step 6.

   NO Repair as necessary.

6. Use FP300 RESET switch to reset flame programmer.
7. Use maintenance menu to turn on TF pump M300 (WP 0010 00).
8. Lift up on PRIME PUMP switch and observe burner blower operation.

   Does burner blower come on?

   YES Go to step 9.

   NO Go to BURNER BLOWER DOES NOT TURN ON FAULT (WP 0082 00).

9. Position SW2 then SW1 to OFF.
10. Open door on heater control enclosure.
11. Remove cover from PS300.

12. Position SW1 then SW2 to ON.
13. Use maintenance menu to test heating system. When burner blower comes on, check for >100 VAC between PS300 terminal (C) and TB7 terminal (N).

    Is >100 VAC present?

    YES Stop heating system. Go to step 14.

    NO Stop heating system. Check connections on wire #139 between PS300 terminal (C) and PS301 terminal (NO). Repair as necessary.

14. Use maintenance menu to test heating system. When burner blower comes on, check for >100 VAC between PS300 terminal (NC) and TB7 terminal (N).

    Is >100 VAC present?

    YES Stop heating system. Go to TYPICAL AC INPUT SIGNAL FAULT (WP 0103 00).

    NO Stop heating system. Replace air inlet pressure switch PS300 (WP 0195 00).

END OF WORK PACKAGE

UNIT, DIRECT SUPPORT, AND GENERAL SUPPORT

LAUNDRY ADVANCED SYSTEM

(NSN 3510–01–463–0114)

OPERATIONAL CHECKOUT AND TROUBLESHOOTING PROCEDURES
BURNER BLOWER OUTLET PRESSURE LO

INITIAL SETUP:

Tools
Tool Kit, General Mechanics
(Item 1, WP 0282 00)
Multimeter (Item 2, WP 0282 00)

Personnel Required

Materials/Parts

Equipment Conditions
Power must be applied at main control enclosure (WP 0010 00).

PATH A

1. Check for debris blocking burner blower inlet filter.

   Is filter blocked?

   YES Remove debris. Return to normal operation.

   NO Go to step 2.

2. Remove and inspect inlet filter (TM 10–3510–221–10).

   Is filter clean?

   YES Go to step 3.

   NO Clean and reinstall or replace filter. Return to normal operation.

3. Check adjustment of air damper (TM 10–3510–221–10).

   Is air damper adjusted properly for current altitude?

   YES Go to step 4.

   NO Adjust air damper as necessary. Return to normal operation.

4. Check for debris blocking screen on air damper.

   Is debris blocking screen?

   YES Remove debris. Return to normal operation.

   NO Go to step 5.

5. Check connection and tubing between port on blower inlet box and air inlet pressure switch PS300.

   Are connections and tube OK?

   YES Go to step 6.

   NO Repair as necessary.

6. Use FP300 RESET switch to reset flame programmer.
7. Use maintenance menu to turn on TF pump M300 (WP 0010 00).
8. Lift up on PRIME PUMP switch and observe burner blower operation.

   Does burner blower come on?

   YES Turn off M300. Go to step 9.

   NO Turn off M300. Go to **PATH B**.

PATH A – Continued

9. Use maintenance menu to test heating system and observe burner blower operation without lifting up on PRIME PUMP switch.

   Does burner blower come on?

   YES Stop heating system. Go to setp 10.

   NO Stop heating system. Go to **PATH B**.

10. Position SW2 then SW1 to OFF.
11. Open door on heater control enclosure.
12. Remove cover from air outlet pressure switch PS301.
13. Position SW1 then SW2 to ON.
14. Use maintenance menu to test heating system. When burner blower comes on, check for >100 VAC between PS301 terminal (C) and TB7 terminal (N).

    Is >100 VAC present?

    YES Stop heating system test. Go to step 15.

    NO Check connections on wire #140 between PS301 terminal (C) and relay CR300 terminal (8). Repair as necessary.

15. Use maintenance menu to test heating system. When burner blower comes on, check for >100 VAC between PS300 terminal (NO) and TB7 terminal (N).

    Is >100 VAC present?

    YES Stop heating system test. Go to TYPICAL AC INPUT SIGNAL FAULT (WP 0103 00).

    NO Stop heating system test. Go to step 16.

16. Replace air outlet pressure switch PS301 (WP 0196 00).
17. Use maintenance menu to test heating system.

    Does another “BLOWER OUTLET PRESS LO” fault occur?

    YES Stop heating system test. Go to step 18.

    NO Stop heating system test. Return to normal operation.

18. Remove air damper from inside air box to access blower wheel.
19. Inspect blower fan wheel for debris.

    Is blower fan wheel clean?

    YES Go to step 20.

    NO Clean blower fan wheel. Reinstall air damper. Return to step 17.

20. Check security of fan wheel on shaft of blower motor M301.

    Is fan wheel properly secured to blower motor shaft?

    YES Replace blower motor M301 (WP 0184 00).

    NO Tighten or repair as necessary. Return to step 17.

PATH B (From PATH A, step 8)

1. Open door on main control enclosure or heater control enclosure.

NOTE

For remainder of this procedure, use flame programmer RESET switch to reset any heating system related alarm conditions as necessary.

PATH B – Continued

2. Check “POWER” indicator on flame programmer.

   Is indicator on?

   YES Go to step 3.

   NO Go to HEATING SYSTEM FAILURE (WP 0072 00).

3. Use maintenance menu to test heating system while monitoring LED for SSR 2 on PCB3.

   Does LED come on?

   YES Stop heating system test. Go to step 3.

   NO Stop heating system test. Go to TYPICAL AC OUTPUT SIGNAL FAULT (WP 0104 00).

4. Use maintenance menu to test heating system while checking for >100 VAC between PCB3 terminal (6) and TB1 terminal (N).

   Is >100 VAC present?

   YES Stop heating system test. Go to step 5.

   NO Stop heating system test. Go to TYPICAL AC OUTPUT SIGNAL FAULT (WP 0104 00).

5. Use maintenance menu to test heating system while checking for >100 VAC between CR300 terminal (2) and TB7 terminal (N).

   Is >100 VAC present?

   YES Stop heating system test. Go to step 6.

   NO Check connection on wire #141 between CR300 and PCB3 terminal (6). Repair as necessary.

6. Check for >100 VAC between terminal (6) on CR300 and TB7 terminal (N).

   Is >100 VAC present?

   YES Go to step 7.

   NO Check connections on wire #151 between CR300 terminal (6) and TB7 terminal (H). Repair as necessary.

7. Check connections on wire #148 between CR300 terminal (7) and TB7 terminal (N).

   Are wire connections OK?

   YES Go to step 8.

   NO Repair as necessary.

8. Use maintenance menu to test heating system while checking for >100 VAC between CR300 terminal (8) and TB7 terminal (N).

   Is >100 VAC present?

   YES Stop heating system test. Go to step 9.

   NO Stop heating system test. Replace heater control relay CR300 (WP 0199 00).

9. Use maintenance menu to test heating system while checking for >100 VAC between FP300 terminal (6) and TB7 terminal (N).

   Is > 100 VAC present?

   YES Stop heating system test. Return to **PATH A, step 8**.

   NO Stop heating system test. Check connections on wire #128 between FP300 terminal (6) and CR300 terminal (8). Repair as necessary.

END OF WORK PACKAGE

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UNIT, DIRECT SUPPORT, AND GENERAL SUPPORT

LAUNDRY ADVANCED SYSTEM

(NSN 3510–01–463–0114)

OPERATIONAL CHECKOUT AND TROUBLESHOOTING PROCEDURES BURNER BLOWER OVERLOAD

INITIAL SETUP:

Tools
Tool Kit, General Mechanics
(Item 1, WP 0282 00)
Multimeter (Item 2, WP 0282 00)

Personnel Required

Materials/Parts

Equipment Conditions
Power must be applied at main control enclosure (WP 0010 00).

PATH A

1. Use maintenance menu to turn on TF pump M300 (WP 0010 00).
2. With M300 on, lift up on PRIME PUMP switch and observe burner blower M301 operation.

   Does burner blower come on?

   YES Go to step 3.

   NO Stop M300. Go to step 4.
3. Continue to lift up on PRIME PUMP switch. Allow M301 to operate for approximately 1 minute while observing operation.

   Does burner blower stay on?

   YES Stop M300. Return to normal operation.

   NO Stop M300. Go to step 4.
4. Position SW2 then SW1 to OFF.
5. Open door on heater control enclosure.
6. Check burner blower overload relay OL301.

   Is lever tripped?

   YES Go to step 7.

   NO Go to **PATH B**.
7. Check trip setting on OL301.

   Is setting 8.8 amps?

   YES Reset trip lever. Go to step 8.

   NO Set trip setting to 8.8 amps. Reset trip lever. Return to step 1.
8. Position SW1 then SW2 to ON.
9. Use maintenance menu to turn on M300.
10. With M300 on, lift up on PRIME PUMP switch and observe burner blower M301 operation.

    Does burner blower operate?

    YES Stop M300. Go to step 11.

    NO Stop M300. Go to step 12.

PATH A –Continued

11. Continue to lift up on PRIME PUMP switch. Allow M301 to operate for approximately 1 minute while observing operation.

    Does burner blower stay on?

    YES Stop M300. Return to normal operation.

    NO Stop M300. Go to step 12.

12. Reset OL301 if necessary then use maintenance menu to turn on M300.

NOTE

When measuring voltage on 3–phase circuits, always check all three legs of the circuit before concluding that voltage is present. You may misdiagnose a problem if you do not check all three legs (L1, L2, and L3) and voltage is not available at one or two legs of the circuit you did not check.

13. Check for >200 VAC across MC301 terminals (L1 and L2), (L1 and L3), and (L2 and L3).

    Is >200 VAC present?

    YES Stop M300. Go to step 14.

    NO Stop M300. Check connections on wire #s 100, 101, and 102 between MC301 and OL300. Repair as necessary.

14. Position SW2 then SW1 to OFF.

15. Check for continuity across contacts (L1 and T1), (L2 and T2), and (L3 and T3) of MC301 while pushing in on latching mechanism in center of contactor.

    Do all contacts have continuity?

    YES Go to step 16.

    NO Replace burner blower contactor MC301 (WP 0197 00).

16. Check connections on wire #s 432, 433, and 434 between MC301 and OL301.

    Are connections OK?

    YES Go to step 17.

    NO Repair as necessary.

17. Check for continuity between MC301 and OL301 while pushing in on latching mechanism in center of contactor as follows:

    MC301 (L1) to OL301 (T1)

    MC301 (L2) to OL301 (T2)

    MC301 (L3) to OL301 (T3)

    Do all circuits have continuity?

    YES Go to step 18.

    NO Replace burner blower overload relay OL301 (WP 0198 00).

18. Position SW2 then SW1 to OFF.

19. Check for smooth rotation of fan on motor end of burner blower M301.

    Does fan rotate freely?

    YES Go to step 20.

    NO Replace burner blower motor M301 (WP 0184 00).

PATH A –Continued

20. Check for shorted or open connections on wire #s104, 105, or 106 between OL301 and M301.

Are wires and connections OK?

YES Replace burner blower motor (WP 0184 00).

NO Repair as necessary.

PATH B (From PATH A, step)

1. Check for >11 VDC between OL301 terminal (98) and TB2 terminal (+12).

Is >11 VDC present?

YES Go to step 2.

NO Check connections on wire #s 316 and 328 between OL301 and PCB2. Repair as necessary.

2. Check for >11 VDC between OL301 terminal (97) and TB2 terminal (+12).

Is >11 VDC present?

YES Replace burner blower overload relay OL301 (WP 0198 00).

NO Go to step 3.

3. Check for shorted connections on wire #s 316 and 328 between OL301 terminals (97) and (98) and PCB2.

Are wires and connections OK?

YES Go to TYPICAL DISCRETE INPUT SIGNAL FAULT (WP 0107 00, PATH A, step 6).

NO Repair as required.

END OF WORK PACKAGE

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UNIT, DIRECT SUPPORT, AND GENERAL SUPPORT

LAUNDRY ADVANCED SYSTEM

(NSN 3510–01–463–0114)

OPERATIONAL CHECKOUT AND TROUBLESHOOTING PROCEDURES FUEL LEVEL OR PRESSURE FAULT

INITIAL SETUP:

Tools
Tool Kit, General Mechanics
(Item 1, WP 0282 00)
Multimeter (Item 2, WP 0282 00)

Personnel Required

Materials/Parts

Equipment Conditions
Power must be applied at main control enclosure (WP 0010 00).

PATH A

1. Observe operator panel display.

   Does display indicate “BURNER BLOWER OVERLOAD”?

   YES Go to BURNER BLOWER OVERLOAD FAULT (WP 0070 00).

   NO Go to step 2.

2. Observe operator panel display.

   Does display indicate “FUEL PUMP OVERLOAD”?

   YES Go to FUEL PUMP OVERLOAD FAULT (WP 0084 00).

   NO Go to step 3.

3. Observe operator panel display.

   Does display indicate “20 HP INVERTER FAULT”?

   YES Go to 20 HP INVERTER FAULT (WP 0097 00).

   NO Go to step 4.

4. Check fuel supply.

   Is fuel supply adequate?

   YES Go to step 5.

   NO Replenish fuel supply. Return to normal operation.

5. Check hose connections at fuel source and at heater.

   Are hoses properly connected?

   YES Go to step 6.

   NO Properly connect fuel hose(s). Return to normal operation.

6. Check entire length of fuel hose for leaks or kinks.

   Are hoses leaking or kinked?

   YES Repair leaks or remove kink(s) from hoses. Return to normal operation.

   NO Go to step 7.

7. Position SW2 to OFF then back to ON.

PATH A – Continued

8. Use maintenance menu to turn on TF pump M300 (WP 0010 00). Observe pump operation.

   Does pump come on?

   YES Stop M300. Go to step 9.

   NO Stop M300. Go to TF PUMP DOES NOT TURN ON FAULT (WP 0085 00).

9. Use maintenance menu utility options to cool thermal fluid to < 200 degrees F.
10. Use maintenance menu to turn on M300.
11. Lift up on PRIME PUMP switch then monitor operation of fuel pump M302.

    Does fuel pump come on?

    YES Go to **PATH C**.

    NO Go to step 12.

12. Continue to lift up on PRIME PUMP switch then monitor operation of burner blower M301.

    Does burner blower come on?

    YES Go to step 13.

    NO Go to step **PATH B**.

13. Open door on heater enclosure.

NOTE

When measuring voltage on 3–phase circuits, always check all three legs of the circuit before concluding that voltage is present. You may misdiagnose a problem if you do not check all three legs (L1, L2, and L3) and voltage is not available at one or two legs of the circuit you did not check.

14. Lift up PRIME PUMP switch then check for >200 VAC across fuel pump overload relay OL302 input terminals (L1 and L2), (L1 and L3), and (L2 and L3).

    Is >200 VAC present?

    YES Go to step 15.

    NO Stop M300. Check connections on wire #s 435, 436, and 437 between OL302 and contactor MC301. Repair as necessary.

15. Lift up PRIME PUMP switch then check for >200 VAC across OL302 output terminals (T1 and T2), (T1 and T3), and (T2 and T3).

    Is >200 VAC present?

    YES Stop M300. Go to step 16.

    NO Stop M300. Replace fuel pump overload relay OL302 (WP 0198 00).

16. Position SW2 then SW1 to OFF.
17. Check connections on wire #s 438, 439, and 440 between OL302 and fuel pump M302.

    Are connections OK?

    YES Replace fuel pump motor M302 (WP 0178 00).

    NO Repair as necessary.

PATH B (From PATH A, step 12)

1. Position SW2 then SW1 to OFF.
2. Remove cover from electrical box where FUEL PRIMING switch SW4 is installed.
3. Remove wires connected to SW4 terminals (2) and (3).
4. Lift up on SW4, then check for continuity across terminals (2) and (3).

   Does continuity exist?

   YES Go to step 5.

   NO Replace PRIME PUMP switch SW4 (WP 0185 00).
5. Check connections on wire # 544 between SW4 terminal (2) and TB7 terminal (H) and wire #545 between SW4 terminal (3) and MC301 terminal (A1).

   Are connections OK?

   YES Go to BURNER BLOWER DOES NOT TURN ON FAULT (WP 0082 00).

   No Repair as required.

PATH C (From PATH A, step 11)

1. Continue to lift up on PRIME PUMP switch then monitor fuel pump pressure gauge (PI303).

   Does gauge PI303 read in 140 – 150 psig range?

   YES Go to step 2.

   NO Go to step 3.
2. Continue to lift up on PRIME PUMP switch for 2 minutes while monitoring gauge (PI303).

   Does gauge PI303 read in 140 – 150 psig range for last 20 seconds?

   YES Go to **PATH D**.

   NO Go to step 3.
3. Check fuel system from fuel hose connections at fuel source to fuel valves FV300 and FV301 for leaks.

   Are any leaks found?

   YES Repair leaks as necessary. Return to step 2.

   NO Go to step 4.
4. Check fuel hose between heater and 30 kW generator for loose connections.

   Are connections OK?

   YES Go to step 5.

   NO Tighten connections. Return to step 2.
5. Attempt to adjust fuel pump pressure (WP 0177 00).

   Can fuel pump pressure be adjusted properly?

   YES Go to step **PATH D**.

   NO Go to step 6.
6. Remove elements from heater inlet fuel filter (WP 0175 00) and fuel/water separator (WP 0263 00).

PATH C – Continued

7. Inspect fuel filter elements for debris.

   Is either fuel filter element clogged?

   YES Replace or reinstall elements as necessary. Return to step 2.

   NO Go to step 8.

8. Inspect fuel filter elements for water contamination.

   Is either fuel filter element contaminated with water?

   YES Replace both elements. Purge fuel lines. Obtain new fuel supply.

   NO Reinstall elements. Go to step 9.

9. Separate fuel pump from motor M302 (WP 0178 00).

10. Inspect coupling insert between fuel pump and motor for cracked or damaged spider legs.

    Are insert legs cracked or damaged?

    YES Replace coupling (WP 0179 00).

    NO Replace fuel pump (WP 0177 00).

NOTE

For the remainder of this procedure, use flame programmer RESET switch to reset any heating system related alarm conditions as necessary.

When checking heater operation, heater should: 1) receive a call–for–heat signal about 3 seconds after “START” heating system is selected; 2) turn on for a 10 second purge step (burner blower and fuel pump on, interlocks made); 3) advance to pilot step (ignition transformer and fuel valves on); 4) advance to flame step (ignition verified); 5) rapidly advance to main step (combustion established) for about 20 seconds; 6) automatically stop to check TF pressures; 7) automatically restart about 30 seconds later; then 8) remain on until “STOP” is selected or TF reaches temperature.

PATH D (From PATH C, step 2 or 5)

1. Use maintenance menu to test heating system. Monitor heater operation.

   Does heater make it past 10 second purge step to pilot step?

   YES Go to step 2.

   NO Stop heating system. Go to **PATH E**.

2. Continue heating system test. During pilot step observe burner fuel pressure gauge PI304.

   Does gauge PI304 read in 125 – 140 psig range?

   YES Go to step 3.

   NO Stop heating system. Go to step 4.

3. While heater is operating, observe operator panel display.

   Does display indicate another “FUEL PRESS or LEVEL LO” fault?

   YES Stop heating system. Go to TYPICAL AC INPUT SIGNAL FAULT (WP 0103 00) to check for faulty input signal at SSR10.

   NO Stop heating system. Return to normal operation.

PATH D – Continued

4. Check fuel system from fuel valves FV300 and FV301 to burner assembly for leaks.

   Are any leaks found?

   YES Repair leaks as necessary.

   NO Go to step 5.

5. Clean burner fuel filter (WP 0181 00).
6. Use maintenance menu to test heating system. During heater combustion observe burner fuel pressure gauge PI304.

   Does gauge PI304 read in 125 – 140 psig range?

   YES Stop heating system. Return to normal operation.

   NO Stop heating system. Go to step 7.

7. Clean fuel nozzle (WP 0182 00).
8. Use maintenance menu to test heating system. During heater combustion, observe burner fuel pressure gauge PI304.

   Does gauge PI304 read in 125 – 140 psig range?

   YES Stop heating system. Return to normal operation.

   NO Stop heating system. Replace burner assembly (WP 0183 00).

PATH E (From PATH D, step 1)

1. Position SW2 then SW1 to OFF.
2. Disconnect connector from fuel pressure switch PS302.
3. Position SW1 then SW2 to ON.
4. Use maintenance menu to turn on M300.
5. Lift up on PRIME PUMP switch then check for continuity across PS302 terminals (1) and (3).

   Does continuity exist?

   YES Release switch. Stop M300. Reconnect cable to PS302. Go to **PATH F**.

   NO Go to step 6.

6. Attempt to adjust fuel pressure switch (WP 0176 00).

   Can fuel pressure switch be adjusted properly?

   YES Return to **PATH D, step 1**.

   NO Replace fuel pressure switch PS302 (WP 0176 00).

PATH F (From PATH E, step 1)

1. Open door on heater control enclosure.
2. Use maintenance menu to test heating system. During purge step, check for >100 VAC across temperature switch relay CR301 coil terminals (A1) and (A2).

   Is >100 VAC present?

   YES Stop heating system test. Go to step 3.

   NO Stop heating system test. Check connections on wire #547 between CR301 terminal (A1) and temperature limit switch TS300 terminal (20) and wire #548 between CR301 terminal (A2) and TB7 terminal (N). Repair as necessary.

PATH F – Continued

3. Use maintenance menu to test heating system. During purge step, check for >100 VAC between CR301 terminal (NO) and TB7 terminal (N).

   Is >100 VAC present?

   YES Stop heating system test. Go to step 4.

   NO Stop heating system test. Check connections on wire #546 between CR301 terminal (NO) and TS300 terminal (21). Repair as necessary.

4. Use maintenance menu to test heating system. During purge step, check for >100 VAC between CR301 terminal (C) and TB7 terminal (N).

   Is >100 VAC present?

   YES Stop heating system test. Check connections on wire #129 between PS302 terminal (3) and FP300 terminal (7) and wire #136 between PS302 terminal (1) and CR301 terminal (C). Repair as necessary.

   NO Stop heating system test. Replace temperature limit switch relay CR301 (WP 0200 00).

END OF WORK PACKAGE

UNIT, DIRECT SUPPORT, AND GENERAL SUPPORT

LAUNDRY ADVANCED SYSTEM

(NSN 3510–01–463–0114)

OPERATIONAL CHECKOUT AND TROUBLESHOOTING PROCEDURES HEATING SYSTEM FAILURE

INITIAL SETUP:

Tools
Tool Kit, General Mechanics
(Item 1, WP 0282 00)
Multimeter (Item 2, WP 0282 00)

Personnel Required

Materials/Parts

Equipment Conditions
Power must be applied at main control enclosure (WP 0010 00).

PATH A

WARNING

Thermal fluid can reach temperatures near 400 degrees F when the heating system is operating. Be careful when working with system piping. Failure to follow this precaution could result in severe burn injuries.

1. Turn SW2 then SW1 to OFF.
2. Turn SW1 then SW2 to ON.
3. Use maintenance menu to turn on TF pump M300 (WP 0010 00). Observe pump operation.

   Does pump come on?

   YES Go to step 4.

   NO Stop M300. Go to TF PUMP DOES NOT TURN ON FAULT (WP 0085 00).
4. Lift up on PRIME PUMP switch then monitor operation of fuel pump M302.

   Does fuel pump come on?

   YES Go to step 5.

   NO Stop M300. Go to FUEL PRESSURE LO FAULT (WP 0071 00).
5. Continue to lift up on PRIME PUMP switch then monitor operation of burner blower M301.

   Does burner blower come on?

   YES Go to step 6.

   NO Stop M300. Go to step BURNER BLOWER DOES NOT TURN ON FAULT (WP 0082 00).
6. Continue to lift up on PRIME PUMP switch for 2 minutes while monitoring gauge (PI303).

   Does gauge PI303 read in 140 – 150 psig range for last 20 seconds?

   YES Stop M300. Go to step 7.

   NO Stop M300. Go to FUEL PRESSURE LO FAULT (WP 0071 00).
7. Use maintenance menu utility options to cool thermal fluid to < 200 degrees F.

PATH A – Continued

NOTE

When the heater is operating, the TF temperature will climb rapidly to 250 degrees F unless there is more than 3 inches of water in the still. Once the heater reaches this temperature, it will turn off and won't turn on again until the TF temperature drops to 220 degrees F. To allow heater to reach 350 degrees, and prevent rapid heating of the TF plumbing, there should be at least 4 inches of water in the still.

8. Use maintenance menu to examine the water level in still LT200.

   Is water level < 4 inches?

   YES Go to step 9.

   NO Go to step 10.

9. Use normal mode of operation to select HEAT WATER (TM 10–3510–221–10). After the TRANSFER R2 TO STILL step is completed, interrupt the water heating operation.
10. Open door on heater enclosure.
11. Observe ALARM indicator on flame programmer FP300.

    Is ALARM indicator ON?

    YES Go to step 12.

    NO Go to **PATH B**.

12. Press RESET key on FP300.

    Does ALARM indicator go OFF?

    YES Go to **PATH B**.

    NO Go to step 13.

13. Position SW2 then SW1 to OFF.
14. Replace purge card (WP 0192 00).
15. Position SW1 then SW2 to ON.
16. Observe ALARM indicator on flame programmer FP300.

    Is ALARM indicator ON?

    YES Go to step 17.

    NO Go to step **PATH B**.

17. Press RESET key on FP300.

    Does ALARM indicator go OFF?

    YES Go to **PATH B**.

    NO Replace flame programmer FP300 (WP 0189 00).

PATH B (From PATH A, step 11, 12, 16, or 17)

1. Wait about 20 seconds then observe operator panel display.

   Is "HEATING SYSTEM FAILURE" message displayed?

   YES Go to step 2.

   NO Go to step 3.

PATH B – Continued

2. Check for shorted connections on wire #503 between FP300 terminal (3) and PCB3 terminal (14).

   Are connections OK?

   YES Go to TYPICAL AC INPUT SIGNAL FAULT (WP 0103 00, PATH B, step 6).

   NO Repair as necessary.

NOTE

For remainder of this procedure use FP300 RESET switch to reset any “HEATING SYSTEM FAILURE” alarm conditions as necessary.

3. Observe operator panel display for fault messages.

   Are there any heating system related faults displayed?

   YES Correct all other heating system related faults before using this procedure unless another procedure sent you to this procedure.

   NO Go to step 4.

4. Open door on main control enclosure.

NOTE

When checking heater operation, heater should: 1) receive a call–for–heat when “START” heating system is selected; 2) turn on for a 10 second purge step (burner blower and fuel pump on, interlocks made); 3) advance to pilot step (ignition transformer and fuel valves on); 4) advance to flame step (ignition verified); 5) rapidly advance to main step (combustion established) for about 20 seconds; 6) automatically stop to check TF pressures; 7) automatically restart about 30 seconds later; then 8) remain on until “STOP” is selected or TF reaches temperature.

When “START” is pressed there will be about a 2 second time delay before the call–for–heat signal is sent from the LADS control system to the flame programmer. This signal should remain steady until: 1) “STOP” is selected; 2) thermal fluid reaches temperature; or 3) a fault is sensed by the LADS control system.

5. Use maintenance menu to test heating system (WP 0010 00). Observe LED for SSR2 on PCB3.

   Does LED come on and remain steady about 2 seconds after “START” is pressed?

   YES Stop heating system test. Go to step 6.

   NO Go to BURNER BLOWER OUT PRESS LO FAULT (WP 0069 00).

6. Observe POWER indicator on FP300.

   Is POWER indicator on or slowly flashing on and off?

   YES Go to **PATH C**.

   NO Go to step 7.

7. Observe digital display on temperature switch TS300.

   Is display on?

   YES Go to step 8.

   NO Check connections on wire #s152 and 153 between TB7 and TB2. Repair as necessary.

8. Check connections on wire #125 between FP300 terminal (L2) and TB7 terminal (N), wire #127 between FP300 terminal (5) and TB7 terminal (H), and wire #483 between FP300 terminal (G) and TB8.

   Are connections OK?

   YES Replace flame programmer FP300 (WP 0189 00).

   NO Repair as necessary.

PATH C (From PATH B, step 6)

1. Use maintenance menu to test heating system while monitoring heater burner blower contactor (MC301).

   Does heater start purge step (as indicated by MC301 energizing)?

   YES Stop heating system test. Go to step 3.

   NO Stop heating system test. Go to step 2.

2. Check connections on wire #126 between FP300 terminal (4) and MC301 terminal (A1).

   Are connections OK?

   YES Replace flame programmer FP300 (WP 0189 00).

   NO Repair as necessary.

3. Observe operator panel display for fault messages.

   Are there any heating system related faults other than "HEATING SYSTEM FAILURE" displayed?

   YES Correct all other heating system related faults before using this procedure unless the other procedure sent you to this procedure.

   NO Go to step 4.

4. Use maintenance menu to test heating system while monitoring FP300.

   Does heater make it past 10 second purge step to pilot step (as indicated by PILOT indicator coming on)?

   YES Stop heating system test. Go to step 6.

   NO Stop heating system test. Go to step 5.

5. Observe operator panel display for fault messages.

   Are there any heating system related faults other than "HEATING SYSTEM FAILURE" displayed?

   YES Correct all other heating system related faults before using this procedure unless the other procedure sent you to this procedure.

   NO Return to **PATH A, step 1**.

6. Use maintenance menu to test heating system while monitoring FP300.

   After after PILOT indicator comes on does FLAME indicator come on?

   YES Stop heating system test. Go to **PATH F**.

   NO Stop heating system test. Go to step 7.

NOTE

When troubleshooting fuel supply and ignition related problems, the signals to the fuel solenoid valves and ignition transformer will only be available for a few seconds immediately following the 10 second purge step. Be prepared to check signal quickly. Repeat check if necessary to ensure questions are answered accurately.

7. Use maintenance menu to test heating system while monitoring FP300 and burner fuel pressure gauge PI304.

   Does gauge PI304 read in 125 – 140 psig range when PILOT indicator comes on?

   YES Stop heating system test. Go to **PATH D**.

   NO Stop heating system test. Go to step 8.

PATH C – Continued

8. Use maintenance menu to test heating system. When PILOT indicator comes on check for >100 VAC across FP300 terminal (8) and TB7 terminal (N).

   Is voltage >100 VAC?

   YES Stop heating system test. Go to step 9.

   NO Stop heating system test. Replace flame programmer FP300 (WP 0189 00).

9. Position SW2 then SW1 to OFF.

10. Check connections on wire #130 from FP300 terminal (8) to fuel solenoid valves FV300 and FV301 and wire #145 between FV300 and FV301 and TB7 terminal (N).

    Are connections OK?

    YES Go to step 11.

    NO Repair as necessary.

WARNING

The fuels used on the heating system are highly explosive. DO NOT smoke or use open flame when performing maintenance. Flames and explosion could occur resulting in severe personal injury or death.

11. Loosen fuel tube connection at outlet of FV300.

12. Position SW1 then SW2 to ON.

13. Use maintenance menu to test heating system. When PILOT indicator comes on, check for pressure available at SV300 outlet.

    Is fuel pressure available?

    YES Stop heating system test. Go to step 14.

    NO Stop heating system test. Replace fuel solenoid valve FV300 (WP 0180 00).

14. Position SW2 then SW1 to OFF.

15. Tighten fuel tube at outlet of FV300. Loosen fuel tube connection at outlet of FV301.

16. Position SW1 then SW2 to ON.

17. Use maintenance menu to test heating system. When PILOT indicator comes on, check for pressure available at SV301 outlet.

    Is fuel pressure available?

    YES Stop heating system test. Tighten fuel tube. Go to FUEL PRESSURE LO FAULT (WP 0071 00) starting at **PATH D, step 5**.

    NO Stop heating system test. Replace fuel solenoid valve FV301 (WP 0180 00).

PATH D (From PATH C, step 7)

1. Use maintenance menu to test heating system. When PILOT indicator on FP300 comes on, check for flame through sight glass on burner assembly.

   Is flame observed?

   YES Stop heating system test. Go to **PATH E**.

   NO Stop heating system test. Go to step 2.

PATH D – Continued

2. Use maintenance menu to test heating system. When PILOT indicator comes on check for > 100 VAC between FP300 terminal (10) and TB7 terminal (N).

   Is >100 VAC present?

   YES Stop heating system test. Go to step 3.

   NO Stop heating system test. Replace flame programmer FP300 (WP 0189 00).

3. Position SW2 then SW1 to OFF.
4. Check ignition wire connections at ignition transformer IT300 and burner assembly.

   Are ignition wires properly connected?

   YES Go to step 5.

   NO Properly connect ignition wires. Return to **PATH C, step 6**.

5. Check insulation on ignition wires for signs of damage or arcing on insulation.

   Are ignition wires damaged or are signs of arcing present?

   YES Replace ignition wires (WP 0187 00). Return to **PATH C, step 6**.

   NO Go to step 6.

6. Remove cover to ignition transformer IT300.
7. Check connections on wire #131 between FP300 terminal (10) and IT300 and wire #142 between IT300 and TB7 terminal (N).

   Are connections OK?

   YES Reinstall cover on IT300. Go to step 8.

   NO Repair as necessary.

8. Disconnect ignition wires from ignition transformer.
9. Check resistance across output terminals of IT300.

   Is resistance > 22K ohms to < 30K ohms?

   YES Reconnect ignition wires to IT300. Go to step 10.

   NO Replace ignition transformer IT300 (WP 0193 00).

10. Replace ignition wires (WP 0187 00).
11. Use maintenance menu to test heating system while monitoring FP300.

    After after PILOT indicator comes on does FLAME indicator come on?

    YES Stop heating system test. Go to **PATH F**.

    NO Stop heating system test. Replace burner assembly (WP 0183 00).

PATH E (From PATH D, step 1)

NOTE

When troubleshooting ignition detection related problems, the signal from the flame detector to the flame detector amplifier will only be available for a few seconds during the pilot step. Be prepared to check signal quickly. Repeat check if necessary to ensure questions are answered accurately.

Test points on flame detector amplifier have a small copper band on one side of the test point hole. Ensure multimeter probes are contacting these bands during voltage check otherwise you will not be accurately measuring voltage output.

1. Use maintenance menu to test heating system. When PILOT indicator comes on, check for > 4 VDC across (+) and (–) test points on flame detector amplifier.

   Is >4 VDC present?

   YES Replace flame programmer FP300 (WP 0189 00).

   NO Stop heating system test. Go to step 2.

2. Position SW2 then SW1 to OFF.
3. Check connections on wire #s 124 and 132 between flame detector UV300 and FP300.

   Are connections OK?

   NO Repair as necessary. Return to **PATH C, step 6**.

   YES Go to step 4.

4. Unthread UV300 from burner assembly and inspected lens.

   Is lens covered with soot?

   YES Remove soot from lens with a soft clean wiping cloth. Go to step 5.

   NO Go to step 5.

CAUTION

Sight tube for flame detector must be straight so that light from flame at bottom of tube can be detected by flame detector mounted at top of tube. Be careful not to bend or drop tube when cleaning. Heater will not operate with a bent sight tube.

5. Remove sight tube from top of burner assembly and inspect for soot.

   Is sight tube coated with soot?

   YES Clean and reinstall sight tube. Go to step 6.

   NO Reinstall sight tube. Go to step 6.

6. Thread UV300 back into sight tube.
7. Position SW1 then SW2 to ON.
8. Use maintenance menu to test heating system. When PILOT indicator comes on, check for > 4 VDC across (+) and (–) test points on flame detector amplifier.

   YES Stop heating system test. Return to **PATH C, step 6**.

   NO Replace flame detector amplifier (WP 0191 00). Go to step 9.

9. Use maintenance menu to test heating system. When PILOT indicator comes on, check for > 4 VDC across (+) and (–) test points on flame detector amplifier.

   Is >4 VDC present?

   YES Stop heating system test. Return to **PATH C, step 6**.

   NO Replace flame detector (WP 0188 00). Go to step 10.

PATH E – Continued

10. Use maintenance menu to test heating system. When PILOT indicator comes on, check for > 4 VDC across (+) and (–) test points on flame detector amplifier.

Is >4 VDC present?

YES Stop heating system test. Return to **PATH C, step 6**.

NO Replace flame programmer FP300 (WP 0189 00).

PATH F (From PATH C, step 6 or PATH D, step 11)

1. Use maintenance menu to test heating system while monitoring FP300.

After after FLAME indicator comes on does MAIN indicator come on?

YES Go to step 2.

NO Replace flame programmer FP300 (WP 0189 00).

2. Wait for heater to turn off to check TF pump outlet pressure, then automatically restart.

Does heater automatically restart?

YES Go to step 4.

NO Stop heating system test. Go to step 3.

3. Observe operator panel display for fault messages.

Are there any heating system related faults other than “HEATING SYSTEM FAILURE” displayed?

YES Correct all other heating system related faults before using this procedure unless the other procedure sent you to this procedure.

NO Return to **PATH A, step 1**.

4. Monitor heater operation.

Is white or black smoke visible?

YES Stop heating system test. Go to HEATER SMOKING FAULT (WP 0083 00).

NO Go to step 5.

5. Monitor heater operation and TF temperature.

Does heater operation continue and TF begin to heat–up?

YES Go to step 7.

NO Stop heating system test. Go to step 6.

6. Observe operator panel display for fault messages.

Are there any heating system related faults other than “HEATING SYSTEM FAILURE” displayed?

YES Correct all other heating system related faults before using this procedure unless the other procedure sent you to this procedure.

NO Return to **PATH A, step 1**.

7. Continue to monitor heater operation. When TF temperature is 350 degrees F stop heating system test.
8. Use maintenance menu utility options to cool TF to < 200 degrees F.
9. Observe operator panel display for fault messages.

Are there any heating system related faults displayed?

YES Go to procedure for displayed fault.

NO Return to normal operation.

END OF WORK PACKAGE

UNIT, DIRECT SUPPORT, AND GENERAL SUPPORT

LAUNDRY ADVANCED SYSTEM

(NSN 3510–01–463–0114)

OPERATIONAL CHECKOUT AND TROUBLESHOOTING PROCEDURES
FLAME PROGRAMMER DOES NOT RESET WHEN FP300 RESET SWITCH IS PRESSED

INITIAL SETUP:

Tools
Tool Kit, General Mechanics
(Item 1, WP 0282 00)
Multimeter (Item 2, WP 0282 00)

Personnel Required

Materials/Parts

Equipment Conditions
Power must be applied at main control enclosure (WP 0010 00).

1. Position SW2 then SW1 to OFF.
2. Remove cover from electrical box to access back side of FP300 RESET switch PBS11 (WP 0186 00).
3. Disconnect wire #s 559 and 560 from PBS11 (+) and (–) terminals.
4. Press PBS11 and check continuity across switch terminals.

   Does continuity exist when PBS11 is pressed?

   YES Go to step 5.

   NO Replace FP300 RESET switch PBS11 (WP 0186 00).
5. Reconnect wires to PBS11.
6. Open door on heater enclosure.
7. Check connections for wire #s 559 and 560 at flame programmer FP300.

   Are wires and connections OK?

   YES Replace flame programmer FP300 (WP 0189 00) and display module (WP 0190 00).

   NO Repair wires or connections as necessary.

END OF WORK PACKAGE

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UNIT, DIRECT SUPPORT, AND GENERAL SUPPORT

LAUNDRY ADVANCED SYSTEM

(NSN 3510–01–463–0114)

OPERATIONAL CHECKOUT AND TROUBLESHOOTING PROCEDURES
TF FLOW LO

INITIAL SETUP:

Tools
Tool Kit, General Mechanics
(Item 1, WP 0282 00)

Personnel Required

Materials/Parts

Equipment Conditions
Power must be applied at main control enclosure (WP 0010 00).

PATH A

1. Observe operator panel display.

   Does “PT301 FAILURE” or “PT302 FAILURE” appear?

   YES Go to TYPICAL PT FAILURE (WP 0034 00).

   NO Go to step 2.

2. Check TF plumbing for class II or III leakage.

   Are any leaks found?

   YES Repair leaks as necessary. Replenish TF supply (WP 0168 00).

   NO Go to step 3.

3. Verify all isolation valves are in proper positions (WP 0168 00).

   Are isolation valves in proper positions?

   YES Go to step 4.

   NO Properly position valve(s). Return to normal operation.

4. Check TF level in expansion tank (WP 0168 00).

   Is TF level low?

   YES Replenish TF supply. Return to normal operation.

   No Go to step 5.

NOTE

If the TF plumbing is severely blocked or if an isolation valve that is supposed to be opened is closed, the LADS control system may not let the TF pump stay on for more than a few seconds to prevent damaging the TF pump.

5. Use maintenance menu to check operation of TF pump M300 (WP 0010 00).

   Does TF pump come on?

   YES Stop M300. Go to step 6.

   NO Stop M300. Go to TF PUMP DOES NOT TURN ON FAULT (WP 0085 00).

6. Use maintenance menu utility options to cool thermal fluid then observe PT300 reading at operator panel display.

   Is PT300 reading between –2 and 1 psi?

   YES Go to step 7.

   NO Stop TF cooling. Clean TF pump strainer (WP 0169 00).

PATH A – Continued

7. In cooling TF mode, observe PT301 reading at operator panel display.

   Is PT301 reading 35 – 48 psi?

   YES Go to step 8.

   NO Go to **PATH B**.

8. In cooling TF mode, observe PT302 reading at operator panel display.

   Is PT302 reading 15 – 24 psi?

   YES Go to step 9.

   NO Go to **PATH B**.

NOTE

The LADS control system will not allow the TF temperature to climb above 250 degrees F unless there is more than 3 inches of water in the still. If the still is empty, add water by starting a normal HEAT WATER operation then interrupt the cycle after the TRANSFER R2 TO STILL step is completed.

9. Use maintenance menu to test heating system. Allow TF temperature to climb to at least 350 degrees F while observing operator panel display.

   Does "TF FLOW LO" reappear?

   YES Return to step 1.

   NO Cool TF down to < 220 degrees F using maintenance menu utility options. Return to normal operation.

PATH B (From PATH A, step 7 or 8)

1. In cooling TF mode observe reading on pressure gauge at back of heater that corresponds to sensor that was reading out of normal range.

   Does gauge reading correspond with sensor reading +/– 2 psig?

   YES Stop TF cooling. Go to step 4.

   NO Stop TF cooling. Go to step 2.

2. Use maintenance menu to examine reading for sensor that is out of range.

   Is reading –1 to 1 psi?

   YES Go to step 4.

   NO Go to step 3.

3. Use maintenance menu utility options to recalibrate sensor to 0 psi.

   Can sensor be calibrated to 0 psi?

   YES Return to **PATH A, step 9**.

   NO Go to TYPICAL ANALOG INPUT SIGNAL FAULT (WP 0105 00) to check suspect sensor.

4. Disconnect tube between isolation valve and gauge for suspect reading then check for debris blocking tubing.

   Is tubing blocked?

   YES Clear blockage as necessary. Return to **PATH A, step 9**.

   NO Reconnect tube. Check for blockage in other portions of TF plumbing.

END OF WORK PACKAGE

UNIT, DIRECT SUPPORT, AND GENERAL SUPPORT

LAUNDRY ADVANCED SYSTEM

(NSN 3510–01–463–0114)

OPERATIONAL CHECKOUT AND TROUBLESHOOTING PROCEDURES
TF PUMP INLET PRESSURE LO

INITIAL SETUP:

Tools
Tool Kit, General Mechanics
(Item 1, WP 0282 00)

Personnel Required

Materials/Parts

Equipment Conditions
Power must be applied at main control enclosure (WP 0010 00).

PATH A

1. Observe operator panel display.

   Does “PT300 FAILURE” appear?

   YES Go to TYPICAL PT FAILURE (WP 0034 00).

   NO Go to step 2.

2. Check TF plumbing for class II or III leakage.

   Are any leaks found?

   YES Repair leaks as necessary. Replenish TF supply (WP 0168 00).

   NO Go to step 3.

3. Check for proper positions on all isolation valves (WP 0168 00).

   Are isolation valves in proper positions?

   YES Go to step 4.

   NO Properly position valve(s). Go to step 4.

4. Check TF level in expansion tank (WP 0168 00).

   Is TF level low?

   YES Replenish TF supply. Go to step 5.

   NO Go to step 5.

5. Use maintenance menu utility options to cool thermal fluid then observe PT300 reading at operator panel display.

   Is PT300 reading between –2 and 1 psi?

   YES Go to **PATH B**.

   NO Stop TF cooling. Go to step 6.

6. Check TF pump strainer for debris (WP 0169 00).

   Is strainer clogged?

   YES Clean TF pump strainer (WP 0169 00).

   NO Go to step 7.

7. Use maintenance menu to examine reading for PT300.

   Is reading –1 to 1 psi?

   YES Go to **PATH B**.

   NO Go to step 8.

PATH A – Continued

8. Use maintenance menu utility options to recalibrate sensor PT300 to 0 psi.

Can PT300 be calibrated back to 0 psi?

YES Return to step 5.

NO Go to TYPICAL ANALOG INPUT SIGNAL FAULT (WP 0105 00) to check suspect pressure sensor.

NOTE

The LADS control system will not allow the TF temperature to climb above 250 degrees F unless there is more than 3 inches of water in the still. If the still is empty, add water by starting a normal HEAT WATER operation, then interrupt the cycle after the TRANSFER R2 TO STILL step is completed.

PATH B (From PATH A, step 5 or 7)

1. Use maintenance menu to test heating system. Allow TF temperature to climb to at least 350 degrees F while observing operator panel display.

Does “TF PUMP INLET PRESS LO” reappear?

YES Return to **PATH A, step 5**.

NO Cool TF down to < 220 degrees F using maintenance menu utility options. Return to normal operation.

END OF WORK PACKAGE

UNIT, DIRECT SUPPORT, AND GENERAL SUPPORT

LAUNDRY ADVANCED SYSTEM

(NSN 3510–01–463–0114)

OPERATIONAL CHECKOUT AND TROUBLESHOOTING PROCEDURES
TF PUMP OUTLET PRESSURE HI

INITIAL SETUP:

Tools
Tool Kit, General Mechanics
(Item 1, WP 0282 00)

Personnel Required

Materials/Parts

Equipment Conditions
Power must be applied at main control enclosure (WP 0010 00).

PATH A

1. Observe operator panel display.

   Does "PT301 FAILURE" appear?

   YES Go to TYPICAL PT FAILURE (WP 0034 00).

   NO Go to step 2.

2. Check for proper positions on all isolation valves (WP 0168 00).

   Are isolation valves in proper positions?

   YES Go to step 3.

   NO Properly position valve(s). Go to step 3.

NOTE

The viscosity of the thermal fluid is lower at colder temperatures. The colder the temperature, the thicker the thermal fluid will become. When cold fluid is circulated through the TF pump, it results in higher pump outlet pressures. The pump outlet pressure should drop into normal range once the thermal fluid warms up. As the heater is trying to warm up it will automatically turn on for 10 seconds. Check the pump pressure, then turn off if the pump pressure is too high. The heater will repeat this jogging sequence until the pump outlet pressure is in the normal range. If the pump outlet pressure does not drop into normal range, the heater will never go into continuous operation mode.

3. Use maintenance menu to check TF temperature TE300.

   Is TE300 reading > 32 degrees F?

   YES Go to step 4.

   NO LADS should only be operated at temperatures of 33 degrees F or higher.

4. Use maintenance menu to test heating system (WP 0010 00) and observe PT300 reading at operator panel display.

   Is PT300 reading between –2 and 1 psi?

   YES Stop heating system test. Go to step 5.

   NO Stop heating system test. Clean TF pump strainer (WP 0169 00).

5. Use maintenance menu to test heating system then observe PT301 reading at operator panel display.

   Is PT301 reading 35 – 48 psi?

   YES Go to step 6.

   NO Stop heating system test. Go to step 7.

PATH A – Continued

6. Allow heater to operate until TF temperature to climbs to at least 200 degrees F while observing operator panel display.

   Does “TF PUMP OUTLET PRESS HI” reappear?

   YES Stop heating system test. Go to step 7.

   NO Stop heating system test. Return to normal operation.

7. Use maintenance menu to test heating system then observe reading on HEATER INLET pressure gauge PI301 at back of heater.

   Does gauge reading correspond with sensor PT300 reading +/– 2 psig?

   YES Stop heating system test. Go to **PATH B**.

   NO Stop heating system test. Go to step 8.

8. Use maintenance menu to examine reading for PT301.

   Is reading –1 to 1 psi?

   YES Go to **PATH B**.

   NO Go to step 9.

9. Use maintenance menu utility options to recalibrate sensor PT301 to 0 psi.

   Can PT301 be calibrated back to 0 psi?

   YES Go to **PATH B**.

   NO Go to TYPICAL ANALOG INPUT SIGNAL FAULT (WP 0105 00) to check suspect pressure sensor.

PATH B (From PATH A, step 7, 8, or 9)

1. Use maintenance menu to test heating system. Allow TF temperature to climb to at least 250 degrees F while observing operator panel display.

   Does “TF PUMP OUTLET PRESS HI” reappear?

   YES Stop heating system test. Go to step 2.

   NO Stop heating system test. Return to normal operation.

2. Verify all isolation valves are in proper positions (WP 0169 00).

   Are isolation valves in proper positions?

   YES Check for blockage in TF plumbing.

   NO Properly position valve(s). Return to normal operation.

END OF WORK PACKAGE

UNIT, DIRECT SUPPORT, AND GENERAL SUPPORT

LAUNDRY ADVANCED SYSTEM

(NSN 3510–01–463–0114)

OPERATIONAL CHECKOUT AND TROUBLESHOOTING PROCEDURES
TF PUMP OUTLET PRESSURE LO

INITIAL SETUP:

Tools
Tool Kit, General Mechanics
(Item 1, WP 0282 00)

Personnel Required

Materials/Parts

Equipment Conditions
Power must be applied at main control enclosure (WP 0010 00).

PATH A

1. Observe operator panel display.

   Does “PT301 FAILURE” appear?

   YES Go to TYPICAL PT FAILURE (WP 0034 00).

   NO Go to step 2.

2. Check TF plumbing for class II or III leakage.

   Are any leaks found?

   YES Repair leaks as necessary. Replenish TF supply (WP 0168 00).

   NO Go to step 3.

3. Check for proper positions on all isolation valves (WP 0168 00).

   Are isolation valves in proper positions?

   YES Go to step 4.

   NO Properly position valve(s). Go to step 4.

4. Check TF level in expansion tank (WP 0168 00).

   Is TF level low?

   YES Replenish TF supply. Go to step 5.

   NO Go to step 5.

5. Use maintenance menu to check operation of TF pump M300 (WP 0010 00).

   Is TF pump operating?

   YES Stop M300. Go to step 6.

   NO Stop M300. Go to TF PUMP DOES NOT TURN ON FAULT (WP 0085 00).

6. Use maintenance menu utility options to cool thermal fluid then observe PT300 reading at operator panel display.

   Is PT300 reading between –2 and 1 psi?

   YES Go to step 7.

   NO Stop TF cooling. Clean TF pump strainer (WP 0169 00).

PATH A – Continued

7. In cooling TF mode, observe PT301 reading at operator panel display.

   Is PT301 reading 35 – 48 psi?

   YES Stop TF cooling. Go to step 8.

   NO Go to **PATH B**.

NOTE

The LADS control system will not allow the TF temperature to climb above 250 degrees F unless there is more than 3 inches of water in the still. If the still is empty, add water by starting a normal HEAT WATER operation then interrupt the cycle after the TRANSFER R2 TO STILL step is completed.

8. Use maintenance menu to test heating system. Allow TF temperature to climb to at least 350 degrees F while observing operator panel display.

   Does “TF PUMP OUTLET PRESS LO” reappear?

   YES Return to step 1.

   NO Cool TF down to < 220 degrees F using maintenance menu utility options. Return to normal operation.

PATH B (From PATH A, step 7)

1. In cooling TF mode, observe reading on HEATER INLET pressure gauge PI301 at back of heater.

   Does gauge reading correspond with sensor reading +/– 2 psig?

   YES Stop TF cooling. Go to step 4.

   NO Stop TF cooling. Go to step 2.

2. Use maintenance menu to examine reading for sensor that is out of range.

   Is reading –1 to 1 psi?

   YES Go to step 4.

   NO Go to step 3.

3. Use maintenance menu utility options to recalibrate sensor PT301 to 0 psi.

   Can PT301 be calibrated to 0 psi?

   YES Return to **PATH A, step 8**.

   NO Go to TYPICAL ANALOG INPUT SIGNAL FAULT (WP 0105 00) to check sensor PT301.

4. Disconnect tube between isolation valve, gauge PI301, and sensor PT301 then check for debris blocking tubing.

   Is tubing blocked?

   YES Clear blockage as necessary. Return to **PATH A, step 8**.

   NO Reconnect tube. Replace TF pump M300 (WP 0273 00).

END OF WORK PACKAGE

UNIT, DIRECT SUPPORT, AND GENERAL SUPPORT

LAUNDRY ADVANCED SYSTEM

(NSN 3510–01–463–0114)

OPERATIONAL CHECKOUT AND TROUBLESHOOTING PROCEDURES TF PUMP OVERLOAD

INITIAL SETUP:

Tools
Tool Kit, General Mechanics
(Item 1, WP 0282 00)
Multimeter (Item 2, WP 0282 00)

Personnel Required

Materials/Parts

Equipment Conditions
Power must be applied at main control enclosure (WP 0010 00).

PATH A

NOTE

When a TF PUMP OVERLOAD fault occurs, a 20 HP INVERTER FAULT may also occur. In this case, the 20 hp inverter K200 must be reset each time the TF pump overload relay OL300 is reset.

1. Use maintenance menu to turn on TF pump M300 (WP 0010 00). Observe pump operation.

   Does TF pump come on?

   YES Go to step 2.

   NO Stop M300. Go to step 3.

2. Allow TF pump to operate for approximately 1 minute. Observe pump operation.

   Does TF pump stay on?

   YES Stop M300. Return to normal operation.

   NO Stop M300. Go to step 3.

3. Position SW2 then SW1 to OFF.
4. Open door on inverter enclosure.
5. Check TF pump overload relay OL300.

   Is lever tripped?

   YES Go to step 6.

   NO Go to **PATH B**.

6. Check trip setting on OL300.

   Is setting 13.3 amps?

   YES Reset trip lever. Go to step 7.

   NO Set trip setting to 13.3 amps. Reset trip lever. Return to step 1.

7. Position SW1 then SW2 to ON.
8. Use maintenance menu to turn on M300 for approximately 1 minute. Observe TF pump operation.

   Does TF pump operate?

   YES Stop M300. Return to normal operation.

   NO Stop M300. Go to step 9.

PATH A – Continued

NOTE

When measuring voltage on 3–phase circuits, always check all three legs of the circuit before concluding that voltage is present. You may misdiagnose a problem if you do not check all three legs (L1, L2, and L3) and voltage is not available at one or two legs of the circuit you did not check.

9. Check for >200 VAC across CB1 terminals (L1 and L2), (L1 and L3), and (L2 and L3).

   Is >200 VAC present?

   YES Go to step 10.

   NO Check connections on wire #s 009, 010, and 011 between CB1 and TB1. Repair as necessary.

10. Check for >200 VAC across CB1 terminals (T1 and T2), (T1 and T3), and (T2 and T3).

    Is >200 VAC present?

    YES Go to step 11.

    NO Replace circuit breaker CB1 (WP 0223 00).

11. Check for >200 VAC across 20 hp inverter K200 input terminals (L1 and L2), (L1 and L3), and (L2 and L3).

    Is >200 VAC present?

    YES Go to step 12.

    NO Check connections on wire #s 019, 020, and 021 between K200 and CB1. Repair as necessary.

12. Position SW2 then SW1 to OFF.

13. Attempt to spin fan blade on back of TF pump motor M300.

    Does TF pump rotate freely?

    YES Go to step 14.

    NO Replace TF pump M300 (WP 0273 00).

14. Check connections on wire #s 065, 066, and 067 between K200 and OL300.

    Are wires and connections OK?

    YES Go to step 15.

    NO Repair as necessary.

15. Check for continuity between K200 and OL300 as follows:

    K200 (U) to OL300 (T1)

    K200 (V) to OL300 (T2)

    K200 (W) to OL300 (T3)

    Does continuity exist across all three circuits?

    YES Go to step 16.

    NO Replace TF pump overload relay OL300 (WP 0254 00).

16. Check resistance across OL300 terminals (T1 and T2), (T1 and T3), and (T2 and T3).

    Is resistance < 0.4 ohms across any set of terminals?

    YES Go to step 17.

    NO Replace TF pump M300 (WP 0273 00).

PATH A – Continued

17. Check for shorted or open connections on wire #s 082, 083, and 084 between OL300 and M300.

    Are wires and connections OK?

    YES Replace TF pump M300 (WP 0273 00).

    NO Repair as necessary.

PATH B (From Path A, step 5)

1. Check for >11 VDC between OL300 terminal (98) and TB2 terminal (+12).

   Is >11 VDC present?

   YES Go to step 2.

   NO Check connections on wire #s 317, 326, and 327 between OL300, OL200, and PCB2. Repair as necessary.

2. Check for >11 VDC between OL300 terminal (97) and TB2 terminal (+12).

   Is >11 VDC present?

   YES Replace TF pump overload relay OL300 (WP 0254 00).

   NO Go to step 3.

3. Check for shorted connections on wire #s 317, 326, and 327 between OL300, OL200, and PCB2.

   Are wires and connections OK?

   YES Go to TYPICAL DISCRETE INPUT SIGNAL FAULT (WP 0107 00, PATH A, step 6).

   NO Repair as required.

END OF WORK PACKAGE

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UNIT, DIRECT SUPPORT, AND GENERAL SUPPORT

LAUNDRY ADVANCED SYSTEM

(NSN 3510–01–463–0114)

OPERATIONAL CHECKOUT AND TROUBLESHOOTING PROCEDURES TF TEMPERATURE HI

INITIAL SETUP:

Tools
Tool Kit, General Mechanics
(Item 1, WP 0282 00)
Multimeter (Item 2, WP 0282 00)

Personnel Required

Materials/Parts

Equipment Conditions
Power must be applied at main control enclosure (WP 0010 00).

PATH A

1. Observe operator panel display.

   Does “TE300 FAILURE” appear?

   YES Go to TYPICAL TE FAILURE (WP 0035 00).

   NO Go to step 2.

2. Use maintenance menu to examine TF temperature sensor TE300. Record TE300 reading.
3. Open door on heater control enclosure.
4. Observe TF temperature reading on temperature limit switch (TS300).

   Is reading within ±5 degrees F of TE300 reading observed in step 2?

   YES Go to step 5.

   NO Go to TYPICAL TE FAILURE (WP 0035 00) to check sensor TE300.

5. Remove heater control relay CR300 (WP 0199 00).
6. Use maintenance to turn on TF pump M300.
7. Use maintenance utility options to cool thermal fluid to < 200 degrees F.

   Does a “TF FLOW LO” or “TF PUMP INLET PRESS LO” fault occur?

   YES Stop TF cooling. Go to TF FLOW LO FAULT (WP 0074 00) or TF PUMP INLET PRESS LO FAULT (WP 0075 00).

   NO Stop TF cooling. Go to step 8.

8. Open door on main control enclosure. Verify SW1 and SW2 are on.
9. Verify LED for SSR2 on PCB3 is not on.

   Is LED on?

   YES Go to **PATH B**.

   NO Go to step 10.

10. Check for >100 VAC between PCB3 terminal (6) and TB1 terminal (N).

    Is >100 VAC present?

    YES Check for shorted wire connection at terminal (6) on PCB3.

    NO Go to step 11.

PATH A – Continued

11. Check for >100 VAC between CR300 terminal (2) and TB7 terminal (N).

    Is >100 VAC present?

    YES Check for shorted connections on wire #141 between CR300 terminal (2) and PCB3 terminal (6). Repair as necessary.

    NO Replace heater control relay CR300 (WP 0199 00).

PATH B (From PATH A, step 9)

1. Position SW2 the SW1 to OFF.
2. Reinstall heater control relay CR300 (WP 0199 00).
3. Replace SSR at position 2 on PCB3 (WP 0241 00).
4. Position SW1 then SW2 to ON.
5. Verify LED for SSR2 on PCB3 is not on.

   Is LED on?

   YES Go to TYPICAL AC OUTPUT SIGNAL FAULT (WP 0104 00, PATH D, step 6).

   NO Go to step 6.

6. Use maintenance to turn on TF pump M300. Verify TF pump comes on but heater does not start.

   Does heater start?

   YES Stop M300. Return to **PATH A, step 10**.

   NO Stop M300. Go to step 7.

7. Drain all water from still.

   NOTE

   When checking heater operation, heater should: turn on; automatically stop to check TF pressures; automatically restart; and stay on until TF temperature is about 250 degrees F.

8. Use maintenance to test heating system. Continually monitor TE300 reading and TS300 reading.

   Does heater operate then shutdown when TE300 reading is about 250 degrees F.

   YES Stop heating system test. Return to normal operation.

   NO Stop heating system test. Cool TF. Go to TYPICAL TE FAILURE (WP 0035 00) to check sensor TE300.

END OF WORK PACKAGE

UNIT, DIRECT SUPPORT, AND GENERAL SUPPORT

LAUNDRY ADVANCED SYSTEM

(NSN 3510–01–463–0114)

OPERATIONAL CHECKOUT AND TROUBLESHOOTING PROCEDURES
TF TEMPERATURE HI LIMIT

INITIAL SETUP:

Tools
Tool Kit, General Mechanics
(Item 1, WP 0282 00)
Multimeter (Item 2, WP 0282 00)

Personnel Required

Materials/Parts

Equipment Conditions
Power must be applied at main control enclosure (WP 0010 00).

PATH A

1. Observe operator panel display.

   Does “TE300 FAILURE” appear?

   YES Go to step 2.

   NO Go to step 4.
2. Open door on heater control enclosure.
3. Press RESET key on temperature switch TS300. Go to TYPICAL TE FAILURE (WP 0035 00).
4. Observe operator panel display.

   Does “TF TEMPERATURE HI” appear?

   YES Go to step 5.

   NO Go to step 7.
5. Open door on heater control enclosure.
6. Press RESET key on temperature switch TS300. Go to TF TEMPERATURE HI (WP 0079 00).
7. Open door on heater control enclosure.
8. Observe temperature switch TS300 upper display.

   Does display read SnSr?

   YES Go to step 9.

   NO Go to **PATH B**.
9. Position SW2 then SW1 to OFF.
10. Check wire connections TS300 terminals (2) and (3).

    Are connections OK?

    YES Replace thermocouple (WP 0173 00).

    NO Repair as necessary.

PATH B (From PATH A, step 8)

1. Observe TS300 upper display.

   Does display indicate any other alpha–character message?

   YES Replace temperature switch TS300 (WP 0194 00).

   NO Go to step 2.

PATH B – Continued

2. Observe setpoint on TS300 upper display.

   Is setpoint 425 degrees F?

   YES Go to step 3.

   NO Change setpoint on TS300 to 425 degrees F (WP 0194 00). Press RESET key on TS300. Return to normal operation.

3. Use maintenance to examine TF temperature TE300.

   Is TE300 reading < 220 degrees F?

   YES Go to step 5.

   NO Go to step 4.

4. Use maintenance utility options to cool thermal fluid. When TE300 reading is < 220 degrees F proceed to step 5.
5. Observe and record TE300 reading.
6. Observe reading on TS300 lower display.

   Is reading within ± 5 degrees F of TE300 reading in step 4?

   YES Stop TF cooling. Go to TF TEMPERATURE HI FAULT (WP 0079 00).

   NO Stop TF cooling. Go to step 7.

7. Position SW2 then SW1 to OFF.
8. Remove TS300 from heater subpanel but do not disconnect wires (WP 0194 00).
9. Position SW1 then SW2 to ON.
10. Press RESET key on TS300.
11. Use maintenance menu to test heating system. When burner blower is on check for >100 VAC between TS300 terminal (21) and TB7 terminal (N)

    Is >100 VAC present?

    YES Stop heating system test. Go to step 12.

    NO Stop heating system test. Check wire connections between PS300 terminal (NC) and TS300 terminal (21). Repair as necessary.

12. Press RESET key on TS300.
13. Use maintenance menu to test heating system. When burner blower comes on, check for >100 VAC between TS300 terminal (20) and TB7 terminal (N).

    Is >100 VAC present?

    YES Stop heating system test. Go to Typical AC Input Signal Fault (WP 0103 00).

    NO Stop heating system test. Replace temperature switch TS300 (WP 0194 00).

END OF WORK PACKAGE

UNIT, DIRECT SUPPORT, AND GENERAL SUPPORT

LAUNDRY ADVANCED SYSTEM

(NSN 3510–01–463–0114)

OPERATIONAL CHECKOUT AND TROUBLESHOOTING PROCEDURES
TF TEMPERATURE LO

INITIAL SETUP:

Tools **Personnel Required**

Materials/Parts **Equipment Conditions**
Power must be applied at main control enclosure (WP 0010 00).

1. Obtain ambient temperature.

   Is ambient temperature > 32 degrees F?

   YES Go TYPICAL TE FAILURE (WP 0035 00) to check TE300.

   NO Operate LADS only at ambient temperatures above 32 degrees F.

END OF WORK PACKAGE

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UNIT, DIRECT SUPPORT, AND GENERAL SUPPORT

LAUNDRY ADVANCED SYSTEM

(NSN 3510–01–463–0114)

OPERATIONAL CHECKOUT AND TROUBLESHOOTING PROCEDURES BURNER BLOWER DOES NOT TURN ON

INITIAL SETUP:

Tools
Tool Kit, General Mechanics
(Item 1, WP 0282 00)
Multimeter (Item 2, WP 0282 00)

Personnel Required

Materials/Parts

Equipment Conditions
Power must be applied at main control enclosure (WP 0010 00).

PATH A

1. Observe operator panel display.

   Does display indicate “BURNER BLOWER OVERLOAD FAULT”?

   YES Go to BURNER BLOWER OVERLOAD FAULT (WP 0070 00).

   NO Go to step 2.

2. Observe operator panel display.

   Does display indicate “FUEL PUMP OVERLOAD FAULT”?

   YES Go to BURNER BLOWER OVERLOAD FAULT (WP 0070 00).

   NO Go to step 3.

3. Observe operator panel display.

   Does display indicate “20 HP INVERTER FAULT”?

   YES Go to 20 HP INVERTER FAULT (WP 0097 00).

   NO Go to step 4.

4. Use maintenance menu to turn on TF pump M300 (WP 0010 00). Observe pump operation.

   Does pump come on?

   YES Go to step 5.

   NO Stop M300. Go to TF PUMP DOES NOT TURN ON FAULT (WP 0085 00).

NOTE

Burner blower motor contactor MC301 receives power to energize from two sources. During fuel priming, MC301 is energized by the PRIME FUEL switch SW4. During automatic heater start–up, MC301 is energized by the flame programmer FP300.

5. With M300 operating, lift up on PRIME PUMP switch and observe operation of burner blower M301.

   Does burner blower come on?

   YES Stop M300. Go to step 6.

   NO Go to **PATH B**.

PATH A – Continued

NOTE

When checking heater operation, heater should receive a call–for–heat about 2 seconds after “START” heating system is selected. Once the call–for–heat is received, the flame programmer FP300 should start a 10 second purge step. During the purge step, the burner blower and fuel pump should be on.

6. Use maintenance menu to start heating system then observe operation of M301 during purge step.

   Does burner blower come on?

   YES Stop heating system test. Return to normal operation.

   NO Stop heating system test. Go to HEATING SYSTEM FAILURE (WP 0072 00 PATH B, step 4).

PATH B (From PATH A, step 5)

1. Continue to lift up on PRIME PUMP switch and observe operation of fuel pump M302.

   Is fuel pump on?

   YES Go to **PATH C**.

   NO Go to step 2.

NOTE

When measuring voltage on 3–phase circuits, always check all three legs of the circuit before concluding that voltage is present. You may misdiagnose a problem if you do not check all three legs (L1, L2, and L3) and voltage is not available at one or two legs of the circuit you did not check.

2. With M300 on, lift up PRIME PUMP switch then check for >200 VAC across burner blower overload relay OL301 input terminals (L1 and L2), (L1 and L3), and (L2 and L3).

   Is >200 VAC present?

   YES Go to step 3.

   NO Stop M300. Check connections on wire #s 432, 433, and 434 between OL301 and contactor MC301. Repair as necessary

3. With M300 on, lift up PRIME PUMP switch then check for >200 VAC across OL301 output terminals (T1 and T2), (T1 and T3), and (T2 and T3).

   Is >200 VAC present?

   YES Stop M300. Go to step 4.

   NO Stop M300. Replace burner blower overload relay OL301 (WP 0198 00).

4. Position SW2 then SW1 to OFF.

5. Check connections on wire #s 104, 105, and 106 between OL301 and burner blower M301.

   Are connections OK?

   YES Replace burner blower motor M301 (WP 0184 00).

   NO Repair as necessary.

PATH C (From PATH B, step 1)

1. Open door on heater enclosure.
2. Check burner blower overload relay OL301.

   Is lever tripped?

   YES Go to BURNER BLOWER OVERLOAD FAULT (WP 0070 00).

   NO Go to step 3.
3. Check fuel pump overload relay OL302.

   Is lever tripped?

   YES Go to FUEL PUMP OVERLOAD FAULT (WP 0084 00).

   NO Go to step 4.
4. Lift up PRIME PUMP switch while checking for >100 VAC between MC301 terminal (A1) and TB7 terminal (N).

   Is >100 VAC present?

   YES Stop M300. Go to **PATH D**.

   NO Stop M300. Go to step 5.
5. Position SW2 then SW1 to OFF.
6. Remove cover from electrical box where FUEL PRIMING switch SW4 is installed.
7. Remove wires connected to SW4 terminals (2) and (3).
8. Lift up on SW4, then check for continuity across terminals (2) and (3).

   Does continuity exist?

   YES Go to step 9.

   NO Replace PRIME PUMP switch SW4 (WP 0185 00).
9. Check connections on wire # 544 between SW4 terminal (2) and TB7 terminal (H) and wire #545 between SW4 terminal (3) and MC301 terminal (A1).

   Are connections OK?

   YES Check connections on wires #152 and 153 between TB7 and TB2. Repair as necessary.

   No Repair as required.

PATH D (From PATH C, step 4)

1. Check for >100 VAC between MC301 terminal (A2) and TB7 terminal (H).

   Is >100 VAC present?

   YES Go to **PATH E**.

   NO Go to step 2.
2. Position SW2 then SW1 to OFF.
3. Check continuity across fuel pump overload relay OL302 terminals (95) and (96).

   Does continuity exist?

   YES Go to step 4.

   NO Replace fuel pump overload relay OL302 (WP 0198 00).

PATH D – Continued

4. Check continuity across burner blower overload relay OL301 terminals (95) and (96).

   Does continuity exist?

   YES Check connections on wire #s 149, 150, and 441 between MC301 terminal (A2), OL302 terminals (95) and (96), OL301 terminals (95) and (96), ant TB7 terminal (N). Repair as necessary.

   NO Replace burner blower overload relay OL302 (WP 0198 00).

PATH E (From PATH D, step 1)

1. Use maintenance menu to turn on M300.

   NOTE

   When measuring voltage on 3–phase circuits, always check all three legs of the circuit before concluding that voltage is present. You may misdiagnose a problem if you do not check all three legs (L1, L2, and L3) and voltage is not available at one or two legs of the circuit you did not check.

2. Check for >200 VAC across MC301 input terminals (L1 and L2), (L1 and L3), and (L2 and L3).

   Is >200 VAC present?

   YES Go to step 3.

   NO Stop M300. Check connections on wire #s 100, 101, and 102 between MC301 and TF pump overload relay OL300. Repair as necessary.

3. Lift up on PRIME PUMP switch while checking for >200 VAC across MC301 output terminals (T1 and T2), (T1 and T3), and (T2 and T3).

   Is >200 VAC present?

   YES Stop M300. Return to **PATH A, step 6**.

   NO Stop M300. Replace burner blower motor contactor (WP 0197 00)

END OF WORK PACKAGE

UNIT, DIRECT SUPPORT, AND GENERAL SUPPORT

LAUNDRY ADVANCED SYSTEM

(NSN 3510–01–463–0114)

OPERATIONAL CHECKOUT AND TROUBLESHOOTING PROCEDURES HEATER SMOKING

INITIAL SETUP:

Tools
Tool Kit, General Mechanics
(Item 1, WP 0282 00)

Personnel Required

Materials/Parts

Equipment Conditions
Power must be applied at main control enclosure (WP 0010 00).

WARNING

Fuel pressure should not be available at burner when heater is in purge stage of operation. Allowing fuel vapor to collect in combustion chamber can cause an explosion when heater ignition occurs. Flames and explosion may result in severe personal injury or death.

NOTE

During heater operation, white smoke visible at heater exhaust is a sign of too much air or not enough fuel (lean mixture). Black smoke in heater exhaust is a sign of too much fuel or not enough air (rich mixture).

1. Determine if heater is operating. If heater is on turn it off.
2. Use maintenance menu utility options to cool thermal fluid to < 200 degrees F (WP 0010 00).
3. Lift up on PRIME PUMP switch and monitor burner pressure gauge (PI304).

   Does gauge PI304 read 0 psig?

   YES Go to step 4.

   NO Stop TF cooling. Replace fuel solenoid valve FV300 and FV301 (WP 0180 00).
4. Continue to lift up on PRIME PUMP switch for 2 minutes to purge heater combustion chamber.
5. Use maintenance menu to test heating system. When heater comes on check for smoke from heater exhaust.

   Is smoke coming out exhaust stack?

   YES Stop heating system test. Go to step 6.

   NO Stop heating system test. Return to normal operation.
6. Check for debris blocking burner blower inlet filter.

   Is filter blocked?

   YES Remove debris. Return to step 4.

   NO Go to step 7.
7. Remove and inspect inlet filter (TM 10–3510–221–10).

   Is filter clean?

   YES Go to step 8.

   NO Clean and reinstall or replace filter. Return to step 4.

8. Check adjustment of air damper (TM 10–3510–221–10).

   Is air damper adjusted properly for current altitude?

   YES Go to step 9.

   NO Adjust air damper as necessary. Return to step 4.

9. Check for debris blocking screen on air damper.

   Is debris blocking screen?

   YES Remove debris. Return to step 4.

   NO Go to step 10.

10. Check exhaust stack for debris.

    Is exhaust stack blocked with debris?

    YES Remove debris. Return to step 4.

    NO Go to step 11.

11. Check bottom of exhaust stack for standing water.

    Is water in bottom of exhaust stack?

    YES Drain water (TM 10–3510–221–10). Return to step 4.

    NO Go to step 12.

12. Use maintenance menu to turn on TF pump M300.

13. Lift up on PRIME PUMP switch and monitor fuel pressure gauge (PI303).

    Does gauge PI303 read in 140 – 150 psig range?

    YES Release PRIME PUMP switch. Stop M300. Go to step 14.

    NO Adjust fuel pump pressure (WP 0178 00). Return to step 4.

14. Clean burner fuel filter (WP 0181 00).

15. Use maintenance menu to test heating system. When heater comes on, check for smoke from heater exhaust.

    Is smoke coming out exhaust stack?

    YES Stop heating system test. Go to step 16.

    NO Stop heating system test. Return to normal operation.

16. Clean fuel nozzle (WP 0182 00).

17. Use maintenance menu to test heating system. When heater comes on, check for smoke from heater exhaust.

    Is smoke coming out exhaust stack?

    YES Stop heating system test. Replace burner assembly (WP 0183 00).

    NO Stop heating system test. Return to normal operation.

END OF WORK PACKAGE

UNIT, DIRECT SUPPORT, AND GENERAL SUPPORT

LAUNDRY ADVANCED SYSTEM

(NSN 3510–01–463–0114)

OPERATIONAL CHECKOUT AND TROUBLESHOOTING PROCEDURES FUEL PUMP OVERLOAD

INITIAL SETUP:

Tools
Tool Kit, General Mechanics
(Item 1, WP 0282 00)
Multimeter (Item 2, WP 0282 00)

Personnel Required

Materials/Parts

Equipment Conditions
Power must be applied at main control enclosure (WP 0010 00).

PATH A

1. Use maintenance menu to turn on TF pump M300 (WP 0010 00).
2. With M300 on, lift up on PRIME PUMP switch and observe fuel pump operation M302 operation.

   Does fuel pump come on?

   YES Go to step 3.

   NO Stop M300. Go to step 4.
3. Continue to lift up on PRIME PUMP switch. Allow M302 to operate for approximately 1 minute while observing operation.

   Does fuel pump stay on?

   YES Stop M300. Return to normal operation.

   NO Stop M300. Go to step 4.
4. Position SW2 then SW1 to OFF.
5. Open door on heater control enclosure.
6. Check fuel pump overload relay OL302.

   Is lever tripped?

   YES Go to step 7.

   NO Go to **PATH C**.
7. Check trip setting on OL302.

   Is setting 2.6 amps?

   YES Reset trip lever. Go to step 8.

   NO Set trip setting to 2.6 amps. Reset trip lever. Return to step 1.
8. Position SW1 then SW2 to ON.
9. Use maintenance menu to turn on M300.
10. With M300 on, lift up on PRIME PUMP switch and observe fuel pump M302 operation.

    Does fuel pump operate?

    YES Stop M300. Go to step 11.

    NO Stop M300. Go to step 12.

PATH A – Continued

11. Continue to lift up on PRIME PUMP switch. Allow M302 to operate for approximately 1 minute while observing operation.

    Does fuel pump stay on?

    YES Stop M300. Return to normal operation.

    NO Stop M300. Go to step 12.

12. Reset OL302 if necessary then use maintenance menu to turn on M300.

NOTE

When measuring voltage on 3–phase circuits, always check all three legs of the circuit before concluding that voltage is present. You may misdiagnose a problem if you do not check all three legs (L1, L2, and L3) and voltage is not available at one or two legs of the circuit you did not check.

13. Check for >200 VAC across MC301 terminals (L1 and L2), (L1 and L3), and (L2 and L3).

    Is >200 VAC present?

    YES Stop M300. Go to step 14.

    NO Stop M300. Check connections on wire #s 100, 101, and 102 between MC301 and OL300. Repair as necessary.

14. Position SW2 then SW1 to OFF.

15. Check for continuity across contacts (L1 and T1), (L2 and T2), and (L3 and T3) of MC301 while pushing in on latching mechanism in center of contactor.

    Do all contacts have continuity?

    YES Go to step 16.

    NO Replace burner blower contactor MC301 (WP 0197 00).

16. Check connections on wire #s 435, 436, and 437 between MC301 and OL301.

    Are connections OK?

    YES Go to step 17.

    NO Repair as necessary.

17. Check for continuity between MC301 and OL302 while pushing in on latching mechanism in center of contactor as follows:

    MC301 (L1) to OL302 (T1)

    MC301 (L2) to OL302 (T2)

    MC301 (L3) to OL302 (T3)

    Do all circuits have continuity?

    YES Go to step 18.

    NO Replace fuel pump overload relay OL302 (WP 0198 00).

18. Position SW2 then SW1 to OFF.

19. Check for smooth rotation of fan on motor end of fuel pump M302.

    Does fan rotate freely?

    YES Go to step 20.

    NO Go to **PATH B**.

PATH A – Continued

20. Check for shorted or open connections on wire #s438, 439, or 440 between OL302 and M302.

Are wires and connections OK?

YES Replace fuel pump motor M302 (WP 0178 00).

NO Repair as necessary.

PATH B (From PATH A step 19)

1. Separate fuel pump from motor M302 (WP 0177 00).
2. Check for smooth rotation of fan on motor end of fuel pump M302.

Does fan rotate freely?

YES Replace fuel pump (WP 0177 00).

NO Replace fuel pump motor M302 (WP 0178 00).

PATH C (From PATH A step 6)

1. Check for >11 VDC between OL302 terminal (98) and TB2 terminal (+12).

Is >11 VDC present?

YES Go to step 2.

NO Check connections on wire #s 376 and 377 between OL301 and PCB2. Repair as necessary.

2. Check for >11 VDC between OL302 terminal (97) and TB2 terminal (+12).

Is >11 VDC present?

YES Replace fuel pump overload relay OL302 (WP 0198 00).

NO Go to step 3.

3. Check for shorted connections on wire #s 376 and 377 between OL301 terminals (97) and (98) and PCB2.

Are wires and connections OK?

YES Go to TYPICAL DISCRETE INPUT SIGNAL FAULT (WP 0107 00, PATH A, step 6).

NO Repair as required.

END OF WORK PACKAGE

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UNIT, DIRECT SUPPORT, AND GENERAL SUPPORT

LAUNDRY ADVANCED SYSTEM

(NSN 3510–01–463–0114)

OPERATIONAL CHECKOUT AND TROUBLESHOOTING PROCEDURES
TF PUMP DOES NOT TURN ON

INITIAL SETUP:

Tools
Tool Kit, General Mechanics
(Item 1, WP 0282 00)
Multimeter (Item 2, WP 0282 00)

Personnel Required

Materials/Parts

Equipment Conditions
Power must be applied at main control enclosure (WP 0010 00).

PATH A

1. Observe operator panel display.

   Does display indicate “CONDENSER FAN OVERLOAD”?

   YES Go to CONDENSER FAN OVERLOAD FAULT (WP 0054 00).

   NO Go to step 2.

2. Observe operator panel display.

   Does display indicate “20 HP INVERTER FAULT”?

   YES Go to 20 HP INVERTER FAULT.

   NO Go to step 3.

3. Use maintenance menu to turn on TF pump M300 (WP 0010 00). Observe pump operation.

   Does pump come on?

   YES Stop M300. Return to normal operation.

   NO Go to step 4.

4. Observe condenser fan M200 operation.

   Does condenser fan come on?

   YES Go to step **PATH C**.

   NO Stop M300. Go to step 5.

5. Position SW2 then SW1 to OFF.
6. Open door on inverter enclosure and main control enclosure
7. Check TF pump overload relay OL300.

   Is lever tripped?

   YES Go to TF PUMP OVERLOAD FAULT (WP 0078 00).

   NO Go to step 8.

8. Check condenser fan overload relay OL200.

   Is lever tripped?

   YES Go to CONDENSER FAN OVERLOAD FAULT (WP 0054 00).

   NO Go to step 9.

PATH A – Continued

9. Check circuit breaker CB1.

   Is CB1 tripped?

   YES Reset CB1. Go to step 10.

   NO Go to **PATH B**.

10. Position SW1 then SW2 to ON.
11. Use maintenance menu to turn on M300. Observe pump operation.

    Does pump come on?

    YES Stop M300. Return to normal operation.

    NO Stop M300. Go to step 12.

12. Check circuit breaker CB1.

    Is CB1 tripped?

    YES Check for shorted wire or connection between CB1 and K200, K200 and OL200, and K200 and OL300.

    NO Go to **PATH B**.

PATH B (From PATH A step 9 or 12)

1. Check display on 20 hp inverter K200.

   Is a fault displayed?

   YES Go to 20 HP INVERTER FAULT (WP 0097 00).

   NO Go to step 2.

NOTE

When measuring voltage on 3–phase circuits, always check all three legs of the circuit before concluding that voltage is present. You may misdiagnose a problem if you do not check all three legs (L1, L2, and L3) and voltage is not available at one or two legs of the circuit you did not check.

2. Check for >200 VAC across CB1 input terminals (L1 and L2), (L1 and L3), and (L2 and L3).

   Is >200 VAC present?

   YES Go to step 3.

   NO Check connections on wire #s 009, 010, and 011 between CB1 and TB1. Repair as necessary.

3. Check for >200 VAC across CB1 output terminals (T1 and T2), (T1 and T3), and (T2 and T3).

   Is >200 VAC present?

   YES Go to step 4.

   NO Replace CB1 (WP 0223 00).

4. Remove cover from 20 hp inverter K200.
5. Check for >200 VAC across K200 input terminals (L1 and L2), (L1 and L3), and (L2 and L3).

   Is >200 VAC present?

   YES Go to step 6.

   NO Check connections on wire #s 019, 020, and 021 between CB1 and K200. Repair as necessary.

PATH B – Continued

6. Use maintenance menu turn on M300 while monitoring LED for SSR 6 on PCB4.

   Does LED come on?

   YES Stop M300. Go to step 7.

   NO Stop M300. Go to TYPICAL DC OUTPUT SIGNAL FAULT (WP 0106 00) to determine why SSR does not turn on.

7. Check for > 15 VDC across K200 inverter terminals (CM and FWD).

   Is > 15 VDC present?

   YES Go to step 8.

   NO Replace 20 hp inverter K200 (WP 0250 00).

8. Check for > 15 VDC across PCB4 terminals (13 and 14).

   Is > 15 VDC present?

   YES Go to step 9.

   NO Check connections on wire #s 254 and 255 between K200 and PCB4.

9. Use maintenance menu to turn on M300 while checking for 0.1 to 1.0 VDC across PCB4 terminals (13 and 14).

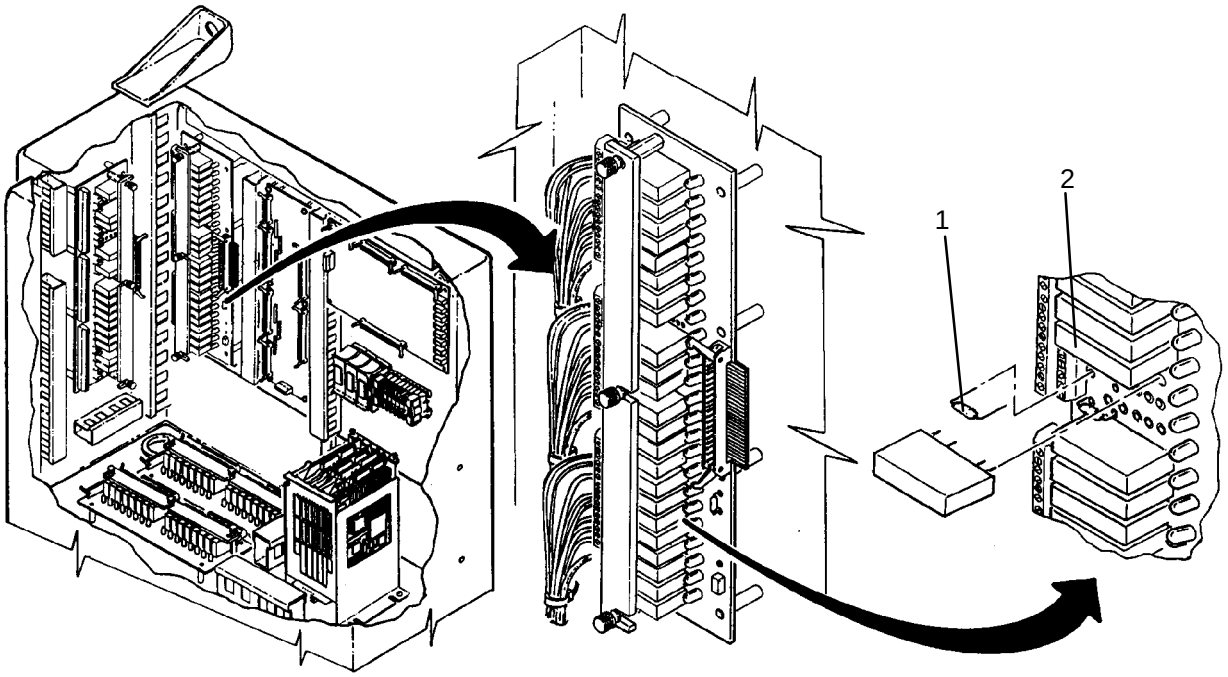
   Is 0.1 to 1.0 VDC present?

   YES Stop M300. Replace 20 hp inverter K200 (WP 0250 00).

   NO Stop M300. Go to step 10.

10. Position SW2 to OFF.

11. Check 5 amp fuse (1) next to SSR 6 (2) for continuity.



Does fuse have continuity?

YES Replace SSR 6 (WP 0241 00).

NO Replace fuse (WP 0242 00).

PATH C (From PATH A, step 4)

1. Open door on inverter enclosure and main control enclosure.
2. Use maintenance menu to turn on M300 then check for >200 VAC across TF pump overload relay OL300 input terminals (L1 and L2), (L1 and L3), and (L2 and L3).

   Is >200 VAC present?

   YES Stop M300. Go to step 3.

   NO Stop M300. Check connections on wire #s 065, 066, and 067 between 20 hp inverter K200 and OL300. Repair as necessary
3. Use maintenance menu to turn on M300 then check for >200 VAC across OL300 output terminals (T1 and T2), (T1 and T3), and (T2 and T3).

   Is >200 VAC present?

   YES Stop M300. Go to step 4.

   NO Stop M300. Replace TF pump overload relay OL300 (WP 0254 00).
4. Position SW2 then SW1 to OFF.
5. Check connections on wire #s 082, 083, 084 between OL300 and M300.

   Are connections OK?

   YES Replace TF pump M300 (WP 0273 00).

   NO Repair as necessary.

END OF WORK PACKAGE

UNIT, DIRECT SUPPORT, AND GENERAL SUPPORT

LAUNDRY ADVANCED SYSTEM

(NSN 3510–01–463–0114)

OPERATIONAL CHECKOUT AND TROUBLESHOOTING PROCEDURES AIR TANK NOT PRESSURIZING

INITIAL SETUP:

Tools
Tool Kit, General Mechanics
(Item 1, WP 0282 00)

Personnel Required

Materials/Parts

Equipment Conditions
Power must be applied at main control enclosure (WP 0010 00).

PATH A

1. Open access door to gain access to air system.
2. Close manual valve at outlet of air tank.
3. Open valve at bottom of air tank. Allow air pressure to vent then close valve.
4. Record time, then use maintenance menu to start air system (WP 0010 00).
5. Observe air compressor M500 operation.

   Is air compressor operating?

   YES Go to step 6.

   NO Stop air system test. Go to AIR COMPRESSOR DOES NOT TURN ON FAULT (WP 0090 00).
6. Check for air leaking from valve on air compressor discharge tube.

   Is air venting from valve?

   YES Stop air system test. Close valve. Return to normal operation.

   NO Go to step 7.
7. Check for air venting from relief valve on air compressor.

   Is air venting from relief valve?

   YES Stop air system test. Replace leaking relief valve (WP 0202 00).

   NO Go to step 8.
8. Check for air venting from drain ports on outlet filter.

   Is air venting from either drain port?

   YES Stop air system test. Replace automatic drain for leaking filter (TM 10–3510–221–10).

   NO Go to step 9.
9. Check for air leaking from around areas on outlet filter where bowls are attached.

   Is air venting from around either filter bowl area?

   YES Stop air system test. Replace filter bowl o–ring (TM 10–3510–221–10).

   NO Go to step 10.

PATH A – Continued

10. Check for air leaking from vent port on dump valve FV500.

    Is air venting from dump valve?

    YES Stop air system test. Replace dump valve FV500 (WP 0213 00).

    NO Go to step 11.

11. Check for air leaking from valve at bottom of air tank.

    Is air venting from valve?

    YES Stop air system test. Close valve. Return to normal operation.

    NO Go to step 12.

12. Check for air venting from relief valve on air tank.

    Is air venting from relief valve?

    YES Stop air system test. Replace relief valve (WP 0202 00).

    NO Go to step 13.

13. Check for air leaking from tubing and fittings between air compressor and air tank.

    Is air leaking from tubing or fittings?

    YES Stop air system test. Repair as required.

    NO Go to step 14.

14. Monitor air system operation and “AIR TANK PRESS” reading.

    Does air pressure reading increase to >123 PSIG in 10 minutes or less?

    YES Wait for air compressor to stop. Go to step 15.

    NO Stop air system test. Go to **PATH B**.

15. Record “AIR TANK PRESS” and time.

16. Observe “AIR TANK PRESS” reading for approximately 5 minutes.

    Does “AIR TANK PRESS drop more than 3 psig after five minutes?

    YES Go to step 17.

    NO Go to PRODUCT PRESSURE LO FAULT (WP 0089 00, PATH A, step 7).

17. Disconnect air tube from inlet of check valve.

    Is air leaking out of check valve?

    YES Replace check valve (WP 0205 00).

    NO Reconnect tube to check valve. Go to step 18.

18. Check for air leak at all connections on air tank.

    Are any leaks found?

    YES Repair as necessary.

    NO Go to step 19.

PATH A – Continued

19. Check for air leaking from piping and fittings between air tank and manual valve.

Is air leaking from piping or fittings?

YES Repair as required.

NO Return to start of this procedure.

PATH B (From PATH A, step 14)

1. Remove and inspect air compressor inlet filter (TM 10–3510–221–10).

Is filter element clogged?

YES Replace inlet filter. Open manual valve. Close access door. Return to normal operation.

NO Go to step 2.

2. Replace particulate and coalescing filter elements in outlet filter (TM 10–3510–221–10).
3. Open valve at bottom of air tank. Allow air pressure to vent from tank then close valve.
4. Record time then use maintenance menu to start air system.
5. Observe air system operation and “AIR TANK PRESS” reading for 10 minutes.

Does air pressure reading increase to >123 PSIG in 10 minutes or less?

YES Stop air system test. Open manual valve. Close access door. Return to normal operation.

NO Stop air system test. Replace air compressor M500 (WP 0201 00).

END OF WORK PACKAGE

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UNIT, DIRECT SUPPORT, AND GENERAL SUPPORT

LAUNDRY ADVANCED SYSTEM

(NSN 3510–01–463–0114)

OPERATIONAL CHECKOUT AND TROUBLESHOOTING PROCEDURES
AIR TANK PRESSURE HI

INITIAL SETUP:

Tools

Personnel Required

Materials/Parts

Equipment Conditions
Power must be applied at main control enclosure (WP 0010 00).

1. Use maintenance menu to start air system (WP 0010 00).
2. Allow air system to pressurize while observing air compressor and operator panel display.

   Does air compressor turn off when "AIR TANK PRESS" reading is 124–125 psig?

   YES Go to step 3.

   NO Stop air system. Go to step 4.
3. Monitor operator panel display.

   Does another "AIR TANK PRESS HI" message appear?

   YES Go to step 4.

   NO Return to normal operation.
4. Check relief valve on air tank

   Is air venting from relief valve?

   YES Go to step 5.

   NO Replace relief valve on air tank (WP 0202 00). Go to step 5.
5. Open door on main control enclosure. Verify SW1 and SW2 are ON.
6. Open valve on bottom of air tank. Allow pressure to vent then close valve.
7. Use maintenance menu to start air system.
8. Allow air system to pressurize while observing operator panel display and LED on PCB4 position 23.

   Does LED go off when "AIR TANK PRESS" reading is 124–125 psig?

   YES Stop air system. Check for shorted connections on wire #s 236 and 527 between PCB4 and K500. Repair as necessary.

   NO Stop air system. Check for shorted connections in ribbon cable between PCB4 and PCB7.

END OF WORK PACKAGE

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UNIT, DIRECT SUPPORT, AND GENERAL SUPPORT

LAUNDRY ADVANCED SYSTEM

(NSN 3510–01–463–0114)

OPERATIONAL CHECKOUT AND TROUBLESHOOTING PROCEDURES
AIR PRODUCT PRESSURE HI

INITIAL SETUP:

Tools

Personnel Required

Materials/Parts

Equipment Conditions
Power must be applied at main control enclosure (WP 0010 00).

1. Use maintenance menu to examine product pressure PT501 (WP 0010 00).

   Does PT501 read > 82 PSIG?

   YES Adjust setting of pressure regulator PR500 (WP 0208 00). Go to step 2.

   NO Return to normal operation.

2. Use maintenance menu to cycle any water control valve several times, then examine product pressure PT501.

   Does PT501 read > 82 PSIG?

   YES Replace product pressure regulator PR500 (WP 0208 00).

   NO Return to normal operation.

END OF WORK PACKAGE

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UNIT, DIRECT SUPPORT, AND GENERAL SUPPORT

LAUNDRY ADVANCED SYSTEM

(NSN 3510–01–463–0114)

OPERATIONAL CHECKOUT AND TROUBLESHOOTING PROCEDURES AIR PRODUCT PRESSURE LO OR AIR COMPRESSOR CYCLES FREQUENTLY

INITIAL SETUP:

Tools
Tool Kit, General Mechanics
(Item 1, WP 0282 00)

Personnel Required

Materials/Parts

Equipment Conditions
Power must be applied at main control enclosure (WP 0010 00).

PATH A

1. Open access door to gain access to air system.
2. Position SW2 to OFF, then back to ON to audibly check for operation of dump valve FV500.

   Can dump valve be heard energizing?

   YES Go to step 3.

   NO Go to **PATH C**.
3. Use maintenance menu to start air system (WP 0010 00).
4. Observe air compressor operation.

   Is air compressor operating?

   YES Stop air system. Go to step 5.

   NO Stop air system. Go to AIR COMPRESSOR DOES NOT TURN ON FAULT (WP 0090 00).
5. Close manual valve at outlet of air tank.
6. Open valve at bottom of air tank. Allow air pressure to vent then close valve.
7. Use maintenance menu to start air system then measure time required for air system to pressurize and air compressor M500 to stop.

   Does air system pressurize > 123 PSIG in less than 10 minutes?

   YES Stop air system. Go to step 8.

   NO Stop air system. Go to AIR TANK NOT PRESSURIZING FAULT (WP 0086 00).
8. Open manual valve at outlet of air tank.
9. Use maintenance menu to start air system.
10. Check for air venting from valve at outlet of product pressure regulator PR500.

    Is air venting from valve?

    YES Close valve. Return to normal operation.

    NO Go to step 11.
11. Check for air venting from valves on four front air bags.

    Is air venting from valve(s)?

    YES Close valve(s). Return to normal operation.

    NO Go to step 12.

PATH A – Continued

12. Check reading on product pressure regulator gauge PI500.

    Is reading < 79 psig?

    YES Go to step 13.

    NO Go to step 20.

13. Attempt to adjust PR500 until gauge reads and maintains 79 to 81 psig (WP 0208 00).

    Can PR500 be adjusted to proper setting?

    YES Return to normal operation.

    NO Go to step 14.

14. Check all air tubes and connections starting at PR500 and ending at air bag pressure regulator PR501, orifice manifold, and four solenoid manifolds.

    Are any leaks found?

    YES Repair as required.

    NO Go to step 15.

15. Check for leak in tubes and connections between solenoid manifolds and all air actuated components.

    Are any leaks found?

    YES Repair as required.

    NO Go to step 16.

16. Check for air venting from PR501.

    Is air venting from PR501?

    YES Replace air bag pressure regulator P501 (WP 0209 00).

    NO Go to step 17.

17. Check all air tubes and connections in air bag system starting at PR501 and ending at air bags.

    Are any leaks found?

    YES Repair as required.

    NO Go to step 18.

18. With drums stable, check for air leaking from front air bag leveling valves.

    Are any leaks found?

    YES Replace leveling valve (WP 0141 00).

    NO Go to step 19.

19. Move drums side–to–side and front–to–back while checking for leaks on air bags.

    Are any leaks found?

    YES Replace leaking air bag(s) (WP 0139 00 or 0140 00).

    NO Go to step 20.

20. Use maintenance menu to cycle each air actuated component one at a time while observing pressure gauge PI500.

    Does reading drop and remain below 80 psig when component is actuated?

    YES Check for leak in tube and connections between solenoid manifold and that component.

    NO Replace product pressure regulator PR500 (WP 0208 00).

PATH B (From PATH A, step 2)

1. Open door on main control enclosure.

NOTE

Dump valve FV500 is a normally open valve. When control power is on, the valve is energized (opened) to allow air pressure to vent. When the air compressor is on, the valve is de–energized (closed) to keep air pressure from venting.

2. With SW2 in ON position, and operator panel display reading “PRESS TO START”, observe LED for SSR4 on PCB3.

Is LED on?

YES Go to step 3.

NO Go to TYPICAL AC OUTPUT SIGNAL FAULT (WP 0104 00, PATH C, step 1).

3. Check for >100 VAC between PCB3 terminal (3) and TB1 terminal (N).

Is >100 VAC present?

YES Go to step 4.

NO Check connections on wire #158 between PCB3 and TB2. Repair as necessary

4. Check for >100 VAC between PCB3 terminal (9) and TB1 terminal (N).

Is >100 VAC present?

YES Go to step 5.

NO Check jumper connection on PCB3 from terminal (3) to terminal (9).

5. Check for >100 VAC between PCB3 terminal (10) and TB1 terminal (N).

Is >100 VAC present?

YES Go to step 6.

NO Go to TYPICAL AC OUTPUT SIGNAL FAULT (WP 0104 00, PATH B, step 1).

6. Position SW2 then SW1 to OFF.
7. Disconnect cable from FV500.
8. Perform continuity check of wire #232 between PCB3 terminal (10) and connector for FV500 cable and wire #161 between connector for FV500 cable and TB2 terminal (N).

Does continuity exist?

YES Replace dump valve FV500 (WP 0213 00).

NO Check connections on wire #s 161 and 232. Repair as necessary.

END OF WORK PACKAGE

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UNIT, DIRECT SUPPORT, AND GENERAL SUPPORT

LAUNDRY ADVANCED SYSTEM

(NSN 3510–01–463–0114)

OPERATIONAL CHECKOUT AND TROUBLESHOOTING PROCEDURES AIR COMPRESSOR DOES NOT TURN ON

INITIAL SETUP:

Tools
Tool Kit, General Mechanics
(Item 1, WP 0282 00)
Multimeter (Item 2, WP 0282 00)

Personnel Required

Materials/Parts

Equipment Conditions
Power must be applied at main control enclosure (WP 0010 00).

PATH A

NOTE

The air compressor will not turn on if the air tank pressure PT500 is > 80 psig. If PT500 reading is above 80 psig, use manual valve at bottom of air tank to vent pressure.

1. Use maintenance menu to start air system (WP 0010 00).

   Does air compressor run?

   YES Stop air system. Return to normal operation.

   NO Stop air system. Go to step 2.

2. Observe operator panel display.

   Does "AIR COMPRESSOR INVRTR FAULT" appear?

   YES Go to AIR COMPRESSOR INVERTER FAULT (WP 0098 00).

   NO Go to step 3.

3. Open door on main control enclosure. Verify SW1 and SW2 are ON.

4. Check circuit breaker CB6.

   Is CB6 tripped?

   YES Reset CB6. Go to step 5.

   NO Go to step 7.

5. Use maintenance menu to start air system. Observe air compressor operation.

   Does air compressor come on?

   YES Stop air system. Return to normal operation.

   NO Stop air system. Go to step 6.

6. Check circuit breaker CB6.

   Is CB6 tripped?

   YES Check for shorted or open wire connections between CB6, air compressor inverter K500, and air compressor M500. Repair as necessary.

   NO Return to step 1.

PATH A – Continued

7. Check display on air compressor inverter K500.

   Is a fault displayed?

   YES Go to AIR COMPRESSOR INVERTER FAULT (WP 0098 00).

   NO Go to step 8.

NOTE

When measuring voltage on 3–phase circuits, always check all three legs of the circuit before concluding that voltage is present. You may misdiagnose a problem if you do not check all three legs (L1, L2, and L3) and voltage is not available at one or two legs of the circuit you did not check.

8. Check for >200 VAC across CB6 input terminals (L1 and L2), (L1 and L3), and (L2 and L3).

   Is >200 VAC present?

   YES Go to step 9.

   NO Check connections on wire #s 015, 016, and 017 between CB6 and TB1. Repair as necessary.

9. Check for >200 VAC across CB6 output terminals (T1 and T2), (T1 and T3), and (T2 and T3).

   Is >200 VAC present?

   YES Go to step 10.

   NO Replace CB6 (WP 0223 00).

10. Remove cover from K500 (WP 0228 00).

11. Check for >200 VAC across K500 input terminals (L1 and L2), (L1 and L3), and (L2 and L3).

    Is >200 VAC present?

    YES Go to step 12.

    NO Check connections on wire #s 358, 359, and 360 between CB6 and K500. Repair as necessary.

12. Use maintenance menu start air system.

13. Check for >200 VAC across K500 output terminals (U and V), (U and W), and (V and W).

    Is >200 VAC present?

    YES Stop air system. Go to step 14.

    NO Stop air system. Go to **PATH B**.

14. Position SW2 then SW1 to OFF.

15. Check connections on wire #s 205, 206, and 207 between K500 and M500.

    Are wires and connections OK?

    YES Replace air compressor M500 (WP 0201 00).

    NO Repair as necessary.

PATH B (From PATH A, step 13)

1. Use maintenance menu to start air system while monitoring LED for SSR 23 on PCB4.

   Does LED come on?

   YES Stop air system. Go to step 2.

   NO Stop air system. Go to TYPICAL DC OUTPUT SIGNAL FAULT (WP 0106 00) to determine why SSR does not turn on.

PATH B – Continued

2. Check for > 15 VDC across K500 terminals (CM and FWD).

   Is > 15 VDC present?

   YES Go to step 3.

   NO Replace air compressor inverter K500 (WP 0228 00).

3. Check for > 15 VDC across PCB4 terminals (47 and 48).

   Is > 15 VDC present?

   YES Go to step 4.

   NO Check connections on wire #s 209 and 210 between K500 and PCB4.

4. Use maintenance menu to start air system while checking for 0.1 to 1.0 VDC across PCB4 terminals (47 and 48).

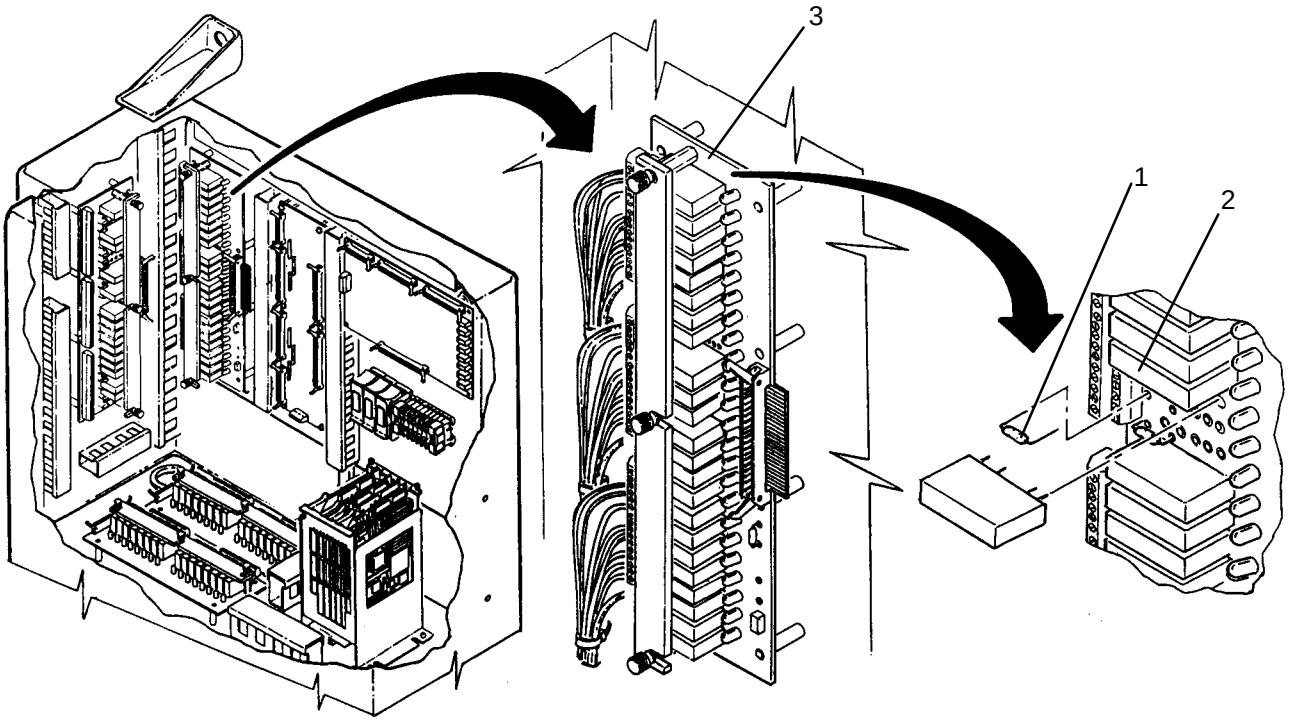
   Is 0.1 to 1.0 VDC present?

   YES Stop air system. Replace air compressor inverter K500 (WP 0228 00).

   NO Stop air system. Go to step 5.

5. Position SW2 to OFF.

6. Check 5 amp fuse (1) next to SSR 23 (2) on PCB4 (3) for continuity.



Does fuse have continuity?

YES Replace SSR 23 (WP 0241 00).

NO Replace fuse (WP 0242 00).

END OF WORK PACKAGE

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UNIT, DIRECT SUPPORT, AND GENERAL SUPPORT

LAUNDRY ADVANCED SYSTEM

(NSN 3510–01–463–0114)

OPERATIONAL CHECKOUT AND TROUBLESHOOTING PROCEDURES WATER IN AIR LINES

INITIAL SETUP:

Tools
Tool Kit, General Mechanics
(Item 1, WP 0282 00)

Personnel Required

Materials/Parts

Equipment Conditions
Power must be applied at main control enclosure (WP 0010 00).

1. Position SW2 and SW1 to OFF.

NOTE

When the air tank vent valve is opened, it is normal for ice to form on the outlet port as the air tank is rapidly depressurized. The formation of ice in this manner should not be considered as moisture.

Presence of moisture in air stream at inlet to dehydrator is a sign that the air system outlet filter is not being serviced properly (TM 10–3510–221–10).

2. Slowly open air tank vent valve (at bottom of air tank) and check for moisture in air venting from tank.

Is moisture present in air?

YES Go to step 3.

NO Return to normal operation.

3. Replace particulate filter element, coalescing filter element, and both automatic drains on outlet filter (TM 10–3510–221–10).
4. Remove air tube from between outlet filter and dehydrator. Dry out inside of tube.
5. Remove air tube from between dehydrator and air tank. Dry out inside of tube.
6. Replace dehydrator (WP 0204 00) and reconnect both air tubes.
7. Close air tank isolation valve and slightly crack air tank vent valve vent
8. Purge air from the air tank as follows:
   a. Use maintenance menu to turn on air compressor (M500) (WP 0010 00).
   b. Allow M500 to run for about 15 minutes then turn off M500.
   c. Allow M500 to cooldown run for about 15 minutes then turn M500 back on.
   d. Repeat steps b and c for 2 hours.
   e. Close air tank vent valve and open air tank isolation valve.

END OF WORK PACKAGE

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UNIT, DIRECT SUPPORT, AND GENERAL SUPPORT

LAUNDRY ADVANCED SYSTEM

(NSN 3510–01–463–0114)

OPERATIONAL CHECKOUT AND TROUBLESHOOTING PROCEDURES CPU, RAM, OR ROM TEST FAILURE

INITIAL SETUP:

Tools

Personnel Required

Materials/Parts

Equipment Conditions
Power must be applied at main control enclosure (WP 0010 00).

NOTE

Voltage spikes can occur when the CONTROL POWER switch (SW2) is rapidly raised to the ON position. These voltage spikes may cause a temporary fault of the LADS computer processor and result in nuisance or false “CPU, RAM, or ROM TEST FAILURE” messages. These faults can normally be cleared by slowly positioning SW2 to OFF and then back to ON.

1. Position SW2 to OFF then back to ON.

   Does CPU, RAM, or RAM TEST FAILURE display warning reappear?

   YES Go to step 2.

   NO Return to normal operation.

2. Position SW2 to OFF then back to ON.

   Does CPU, RAM, ROM TEST FAILURE display warning reappear?

   YES Replace PCB9 (WP 0220 00).

   NO Return to normal operation.

END OF WORK PACKAGE

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UNIT, DIRECT SUPPORT, AND GENERAL SUPPORT

LAUNDRY ADVANCED SYSTEM

(NSN 3510–01–463–0114)

OPERATIONAL CHECKOUT AND TROUBLESHOOTING PROCEDURES
DRUM INVERTER FAULT

INITIAL SETUP:

Tools
Tool Kit, General Mechanics
(Item 1, WP 0282 00)
Multimeter (Item 2, WP 0282 00)

Personnel Required

Materials/Parts

Equipment Conditions
Power must be applied at main control enclosure (WP 0010 00).

PATH A

1. Open door on inverter enclosure.
2. Press RESET on drum inverter K100A or K100B keypad.
3. Observe display on K100A or K100B.

   Does fault code disappear?

   YES Go to step 4.

   NO Go to step 6.
4. Wait about 30 seconds then observe operator panel display.

   Does “DRUM INVERTER FAULT” disappear?

   YES Go to step 5.

   NO Go to TYPICAL DISCRETE INPUT SIGNAL FAULT (WP 0107 00) to check false signal.
5. Continue laundry cycle or use maintenance menu to rotate drum at “TUMBLE CW”, “TUMBLE CCW” , “DISTRB CCW”, “LO EXT CCW”, and “HI EXT CCW” (WP 0010 00).

   Does another “DRUM INVERTER FAULT” occur?

   YES Pause cycle or stop drum rotation. Go to step 6.

   NO Return to normal operation.
6. Observe display on K100A or K100B.

   Is display blank or does it indicate “LIN”?

   YES Go to step 7.

   NO Go to **PATH B**.
7. Position SW2 then SW1 to OFF.
8. Check connections on wires between TB1 and CB3 (drum A) or TB1 and CB4 (drum B) and between CB3 and K100A or CB4 and K100B.

   Are connections OK?

   YES Replace drum inverter K100A or K100B (WP 0250 00).

   NO Repair as necessary.

PATH B (From PATH A, step 6)

NOTE

Some of the older model inverters have a THR terminal with a jumper connected to the CM terminal. On these inverters an “OH2” error code will appear if the jumper is loose or is missing. If the jumper is installed and the error code “OH2” still exists, the inverter is faulty.

1. Observe display on K100A or K100B.

   Does display indicate “Er1, Er2, Er3, Er4, Er5, Er6, Er7, Er8, FUS, or OH2” ?

   YES Replace drum inverter K100A or K100B (WP 0250 00).

   NO Go to step 2.

2. Observe display on K100A or K100B.

   Does display indicate “dbH, EF, LU, OC1, OC2, OC3, OL1, OL2, OLU, OU1, OU2, or OU3”?

   YES Go to step 4.

   NO Go to step 3.

3. Observe display on K100A or K100B.

   Does display indicate “OH1 or OH3”?

   YES Go to **PATH C**.

   NO Return to **PATH A, step 1**.

4. Check for excess or uneven distribution of laundry in drum.

   Is laundry load too heavy or not properly distributed?

   YES Remove excess laundry or manually redistribute as necessary.

   NO Go to step 5.

5. Check for blockage in water plumbing between drum outlet and water pump M101A or M101B.

   Is blockage found?

   YES Remove blockage as necessary.

   NO Go to step 6.

6. Use maintenance menu to extend and retract brake FV113A or FV113B.

   Does brake extend and retract properly?

   YES Go to step 7.

   NO Go to DRUM BRAKE STAYS ON DURING ROTATION (WP 0023 00).

7. Position SW2 then SW1 to OFF.
8. Empty laundry from drum then rotate drum by hand and check for smooth rotation of drum.

   Does drum rotate smoothly?

   YES Go to **PATH D**.

   NO Go to step 9.

9. Remove drive belt (WP 0118 00).

PATH B – Continued

10. Rotate drum by hand and check for smooth rotation.

    Does drum rotate smoothly?

    YES Go to step 11.

    NO Replace rear bearing (WP 0265 00) or front bearing (WP 0266 00).

11. Rotate drive motor M100A or M100B by hand and check for smooth rotation.

    Does motor rotate smoothly?

    YES Reinstall and properly adjust belt alignment and tension (WP 0118 00).

    NO Replace drum drive motor M100A or M100B (WP 0264 00).

PATH C (From PATH B, step 3)

1. Observe position on inverter inlet and outlet doors.

   Are doors open?

   YES Go to step 2.

   NO Open doors. Go to step 5.

2. Check cooling fans on K100A or K100B.

   Are fans operating?

   YES Go to step 3.

   NO Replace drum inverter K100A or K100B (WP 0250 00).

3. Check cooling fan M107 on inverter enclosure outlet duct.

   Is fan operating?

   YES Go to step 4.

   NO Press RESET on inverter keypad. Go to INVERTER ENCLOSURE FAN DOES NOT TURN ON (WP 0099 00).

4. Check demister mesh at air inlet to inverter enclosure.

   Is demister mesh dirty?

   YES Clean or replace demister mesh (WP 0112 00). Return to **PATH A, step 2**.

   NO Go to step 5.

5. Wait for inverter enclosure to cool down (at least 30 minutes) then press RESET on inverter keypad.

6. Observe display on K100A or K100B.

   Does fault code disappear?

   YES Reinstall door on inverter enclosure. Return to **PATH A, step 5** .

   NO Replace drum inverter K100A or K100B (WP 0250 00).

PATH D (From PATH B, step 8)

1. Check connections on wire #s 054, 055, and 056 between K100A and M100A or wire #s 058, 059, and 060 between K100B and M100B.

   Are wire connections OK?

   YES Go to step 2.

   NO Repair as necessary.

PATH D – Continued

2. Check for shorted winding across M100A or M100B.

Is a short found across any set of windings?

YES Replace drive motor M100A or M100B (WP 0264 00).

NO Replace drum inverter K100A or K100B (WP 0250 00).

END OF WORK PACKAGE

UNIT, DIRECT SUPPORT, AND GENERAL SUPPORT

LAUNDRY ADVANCED SYSTEM

(NSN 3510–01–463–0114)

OPERATIONAL CHECKOUT AND TROUBLESHOOTING PROCEDURES EMERGENCY STOP ACTIVATED

INITIAL SETUP:

Tools
Tool Kit, General Mechanics
(Item 1, WP 0282 00)
Multimeter (Item 2, WP 0282 00)

Personnel Required

Materials/Parts

Equipment Conditions
Power must be applied at main control enclosure (WP 0010 00).

PATH A

1. Check position of EMERGENCY STOP switch PBS66.

   Is switch pushed in?

   YES Go to step 2.

   NO Go to step 3.

2. Determine if circumstances causing EMERGENCY STOP switch activation have been corrected.

   Has problem been corrected?

   YES Pull out on PBS6 then return to normal operation.

   NO Correct problem as necessary.

3. Position SW2 to OFF.
4. Position SW2 to ON then observe display status.

   Does status indicate emergency stop is activated?

   YES Go to step 5.

   NO Go to **PATH B**.

5. Position SW2 and SW1 to OFF.
6. Open door on main control enclosure.
7. Tag and disconnect wires #s 379 and 380 from PBS6 switch.
8. With PBS6 pulled out, check for continuity across (+) and (–) terminals of switch.

   Does switch have continuity?

   YES Go to TYPICAL DISCRETE INPUT SIGNAL FAULT (WP 0107 00).

   NO Replace EMERGENCY STOP switch (WP 0234 00).

PATH B (From PATH A, step 4)

1. Position SW2 and SW1 to OFF.
2. Open door on main control enclosure.
3. Check settings on PM1. Verify settings are 210 VAC, 5%, and 11 Seconds.

   Is PM1 properly set?

   YES Go to step 4.

   NO Adjust PM1 to proper settings (WP 0231 00). Go to step 4.

PATH B – Continued

4. Position SW1 to ON.
5. Check for 208 – 212 VAC power between PM1 terminals L1 and L2, L1 and L3, and L2 and L3.

   Is correct voltage present across all three phases?

   YES Go to step 6.

   NO Correct voltage level at external power source as necessary.

6. Continue laundry cycle or start a new laundry cycle at drum that was operating when fault occurred (TM 10–3510–221–10).
7. Observe indicator at bottom of phase monitor PM1 as drum goes through extract cycles.

   Does indicator remain in ON status during each extract?

   YES Go to step 8.

   NO Go to step 9.

8. Wait for laundry cycle to be completed.

   Was laundry cycle interrupted with another “EMERGENCY STOP ACTIVATED” fault message?

   YES Go to step 9.

   NO Return to normal operation.

9. Continue laundry cycle or start a new laundry cycle at drum that was operating when fault occurred (TM 10–3510–221–10).
10. During extracts check for 208 – 212 VAC power between PM1 terminals L1 and L2, L1 and L3, and L2 and L3.

    Does voltage remain between 208–212 VAC during extracts?

    YES Go to step 11.

    NO Correct voltage level at external power source as necessary.

11. Check for >200 VAC across CB3 and CB4 output terminals (T1 and T2), (T1 and T3), and (T2 and T3).

    Is >200 VAC present?

    YES Return to **PATH A, step 1**.

    NO Go to step 12.

12. Position SW2 then SW1 to OFF.
13. Check wire connections between CB3, CB4, drum inverters K104A and K104B and drum motors M100A and M100B.

    Are wires and connections OK?

    YES Replace drum inverter with low voltage reading in step 11 (WP 0250 00).

    NO Repair as necessary.

END OF WORK PACKAGE

UNIT, DIRECT SUPPORT, AND GENERAL SUPPORT

LAUNDRY ADVANCED SYSTEM

(NSN 3510–01–463–0114)

OPERATIONAL CHECKOUT AND TROUBLESHOOTING PROCEDURES
VREF(S) OUT OF RANGE

INITIAL SETUP:

Tools
Tool Kit, General Mechanics
(Item 1, WP 0282 00)
Multimeter (Item 2, WP 0282 00)

Personnel Required

Materials/Parts

Equipment Conditions
Power must be applied at main control enclosure (WP 0010 00).

1. Use maintenance menu to examine status of VOLTAGE REFERENCE LO (WP 0010 00).

   Does status indicate VOLTAGE REFERENCE LO is in .74 to .79 VDC range?

   YES Go to step 2.

   NO Go to step 5.

2. Use maintenance menu to examine status of VOLTAGE REFERENCE HI.

   Does status indicate VOLTAGE REFERENCE HI is in 9.19 to 9.25 VDC range?

   YES Go to step 3.

   NO Go to step 5.

3. Position SW2 to OFF then back to ON.
4. Observe operator panel display.

   Does “VREF(S) OUT OF RANGE” reappear?

   YES Go to step 5.

   NO Return to normal operation.

5. Open door on main control enclosure. Verify SW1 and SW2 are ON.
6. Check for > +11 VDC power across PCB1 terminals (J1–2) and (J1–3).

   Is voltage > +11 VDC?

   YES Go to step 7.

   NO Go to NO +/–12 VDC POWER AVAILABLE FAULT (WP 0101 00).

7. Check for > –11 VDC power across PCB1 terminals (J1–4) and (J1–3).

   Is voltage > –11 VDC?

   YES Replace ANALOG PCB1 (WP 0215 00).

   NO Go to NO +/–12 VDC POWER AVAILABLE FAULT (WP 0101 00).

END OF WORK PACKAGE

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UNIT, DIRECT SUPPORT, AND GENERAL SUPPORT

LAUNDRY ADVANCED SYSTEM

(NSN 3510–01–463–0114)

OPERATIONAL CHECKOUT AND TROUBLESHOOTING PROCEDURES
10 HP INVERTER FAULT

INITIAL SETUP:

Tools
Tool Kit, General Mechanics
(Item 1, WP 0282 00)
Multimeter (Item 2, WP 0282 00)

Personnel Required

Materials/Parts

Equipment Conditions
Power must be applied at main control enclosure (WP 0010 00).

PATH A

1. Open door on inverter enclosure.
2. Press RESET on 10 hp inverter K104 keypad.
3. Observe display on K104.

   Does fault code disappear?

   YES Go to step 7.

   NO Go to step 4.
4. Turn SW2 then SW1 to OFF.
5. Wait about 30 seconds then turn SW1 and SW2 to ON.
6. Observe display on K104.

   Does fault code disappear?

   YES Go to step 7.

   NO Go to step 9.
7. Wait about 30 seconds then observe operator panel display.

   Does “10 HP INVERTER FAULT” disappear?

   YES Go to step 8.

   NO Go to TYPICAL DISCRETE INPUT SIGNAL FAULT (WP 0107 00) to check false signal.
8. Continue laundry cycle or use maintenance menu to turn on dryer blower M104A or M104B (WP 0010 00).

   Does another “10 HP INVERTER FAULT” occur?

   YES Pause cycle or stop blower. Go to step 9.

   NO Return to normal operation.
9. Observe display on K104.

   Is display blank or does it indicate “LIN”?

   YES Go to step 10.

   NO Go to **PATH B**.
10. Position SW2 then SW1 to OFF.

PATH A – Continued

11. Check connections on wires between TB1 and CB2 and between CB2 and K104.

    Are connections OK?

    YES Replace 10 hp inverter K104 (WP 0250 00).

    NO Repair as necessary.

PATH B (From PATH A, step 9)

NOTE

Some of the older model inverters have a THR terminal with a jumper connected to the CM terminal. On these inverters an “OH2” error code will appear if the jumper is loose or is missing. If the jumper is installed and the error code “OH2” still exists, the inverter is faulty.

1. Observe display on K104.

   Does display indicate “Er1, Er2, Er3, Er4, Er5, Er6, Er7, Er8, FUS, or OH2” ?

   YES Replace 10 hp inverter K104 (WP 0250 00).

   NO Go to step 2.

2. Observe display on K104.

   Does display indicate “dbH, EF, LU, OC1, OC2, OC3, OL1, OL2, OLU, OU1, OU2, or OU3?

   YES Go to DRYER BLOWER OVERLOAD (WP 0030 00, PATH A, step 11).

   NO Go to step 3.

3. Observe display on K104.

   Does display indicate “OH1 or OH3”?

   YES Go to step 4.

   NO Return to **PATH A, step 1**.

4. Observe position on inverter inlet and outlet doors.

   Are doors open?

   YES Go to step 5.

   NO Open doors. Go to step 8.

5. Check cooling fans on K104.

   Are fans operating?

   YES Go to step 6.

   NO Replace 10 hp inverter K104 (WP 0250 00).

6. Check cooling fan M107 on inverter enclosure outlet duct.

   Is fan operating?

   YES Go to step 7.

   NO Press RESET on inverter keypad. Go to INVERTER ENCLOSURE FAN DOES NOT TURN ON (WP 0099 00).

7. Check demister mesh at air inlet to inverter enclosure.

   Is demister mesh dirty?

   YES Clean or replace demister mesh (WP 0112 00). Return to **PATH A, step 2**.

   NO Go to step 8.

PATH B – Continued

8. Wait for inverter enclosure to cool down (at least 30 minutes) then press RESET on inverter keypad.
9. Observe display on K104.

Does fault code disappear?

YES Reinstall door on inverter enclosure. Return to **PATH A, step 8**.

NO Replace 10 hp inverter K104 (WP 0250 00).

END OF WORK PACKAGE

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UNIT, DIRECT SUPPORT, AND GENERAL SUPPORT

LAUNDRY ADVANCED SYSTEM

(NSN 3510–01–463–0114)

OPERATIONAL CHECKOUT AND TROUBLESHOOTING PROCEDURES 20 HP INVERTER FAULT

INITIAL SETUP:

Tools
Tool Kit, General Mechanics
(Item 1, WP 0282 00)
Multimeter (Item 2, WP 0282 00)

Personnel Required

Materials/Parts

Equipment Conditions
Power must be applied at main control enclosure (WP 0010 00).

PATH A

1. Observe operator panel display.

   Does “CONDENSER FAN OVERLOAD” appear?

   YES Go to CONDENSER FAN OVERLOAD FAULT (WP 0054 00).

   NO Go to step 2.

2. Observe operator panel display.

   Does “TF PUMP OVERLOAD” appear?

   YES Go to TF PUMP OVERLOAD FAULT (WP 0078 00).

   NO Go to step 3.

3. Observe operator panel display.

   Does “BURNER BLOWER OVERLOAD” appear?

   YES Go to BURNER BLOWER OVERLOAD FAULT (WP 0070 00).

   NO Go to step 4.

4. Observe operator panel display.

   Does “FUEL PUMP OVERLOAD” appear?

   YES Go to FUEL PUMP OVERLOAD FAULT (WP 0084 00).

   NO Go to step 5.

5. Open door on inverter enclosure.
6. Press RESET on 20 hp inverter K200 keypad.
7. Observe display on K200.

   Does fault code disappear?

   YES Go to step 11.

   NO Go to step 8.

8. Turn SW2 then SW1 to OFF.
9. Wait about 30 seconds then turn SW1 and SW2 to ON.

PATH A – Continued

10. Observe display on K200.

    Does fault code disappear?

    YES Go to step 11.

    NO Go to step 13.

11. Wait about 30 seconds then observe operator panel display.

    Does “10 HP INVERTER FAULT” disappear?

    YES Go to step 12.

    NO Go to TYPICAL DISCRETE INPUT SIGNAL FAULT (WP 0107 00) to check false signal.

12. Continue laundry cycle or use maintenance menu to test heating system (WP 0010 00).

    Does another “20 HP INVERTER FAULT” occur?

    YES Pause cycle or stop heating system. Go to step 13.

    NO Return to normal operation.

13. Observe display on K200.

    Is display blank or does it indicate “LIN”?

    YES Go to step 14.

    NO Go to **PATH B**.

14. Position SW2 then SW1 to OFF.

15. Check connections on wire #s 009, 010, and 011 between TB1 and CB1 and wire #s 019, 020, and 021 between CB1 and K200.

    Are connections OK?

    YES Replace 20 hp inverter K200 (WP 0250 00).

    NO Repair as necessary.

PATH B (From PATH A, step 13)

1. Observe display on K200.

   Does display indicate “Er1, Er2, Er3, Er4, Er5, Er6, Er7, Er8, or FUS” ?

   YES Replace 20 hp inverter K200 (WP 0250 00).

   NO Go to step 2.

2. Observe display on K200.

   Does display indicate “dbH, EF, LU, OC1, OC2, OC3, OL1, OL2, OLU, OU1, OU2, or OU3”?

   YES Go to **PATH C**.

   NO Go to step 3.

3. Observe display on K200.

   Does display indicate “OH2”?

   YES Go to **PATH D**.

   NO Go to step 4.

PATH B – Continued

4. Observe display on K200.

   Does display indicate “OH1 or OH3?

   YES Go to **PATH E**.

   NO Return to **PATH A, step 1**.

PATH C (From PATH B, step 2)

1. Position SW2 then SW1 to OFF.
2. Rotate still condenser fan M200 by hand and check for smooth rotation.

   Do fan rotate smoothly?

   YES Go to step 3.

   NO Replace condenser fan motor M200 (WP 0270 00).

3. Rotate cooling fan on motor end of TF pump M300 by hand, and check for smooth rotation.

   Do TF pump rotate smoothly?

   YES Go to step 4.

   NO Replace TF pump M300 (WP 0273 00).

4. Rotate cooling fan on motor end of burner blower by hand, and check for smooth rotation.

   Do burner blower rotate smoothly?

   YES Go to step 5.

   NO Replace burner blower motor M301 (WP 0184 00).

5. Rotate cooling fan on motor end of fuel pump by hand and check for smooth rotation.

   Do fuel pump rotate smoothly?

   YES Go to step 6.

   NO Go to FUEL PUMP OVERLOAD FAULT (WP 0084 00, PATH B, step 1).

6. Check connections on wire #s 062, 063, and 064 between K200 and OL200 and wire #s 065, 066, and 067 between K200 and OL300.

   Are wire connections OK?

   YES Go to step 7.

   NO Repair as necessary.

7. Check connections on wire #s 100, 101, and 102 between OL300 and MC301.

   Are wire connections OK?

   YES Go to step 8.

   NO Repair as necessary.

8. Check connections on wire #s 079, 080, and 081 between OL200 and M200.

   Are wire connections OK?

   YES Go to step 9.

   NO Repair as necessary.

PATH C – Continued

9. Check connections on wire #s 082, 083, and 084 between OL300 and M300.

   Are wire connections OK?

   YES Go to step 10.

   NO Repair as necessary.

10. Check connections on wire #s 432, 433, and 434 between MC301 and OL301 and wire #s 435, 436, and 437 between MC301 and OL302.

    Are wire connections OK?

    YES Go to step 11.

    NO Repair as necessary.

11. Check connections on wire #s 104, 105, and 106 between OL301 and M301.

    Are wire connections OK?

    YES Go to step 12.

    NO Repair as necessary.

12. Check connections on wire #s 438, 439, and 440 between OL302 and M302.

    Are wire connections OK?

    YES Replace 20 hp inverter K200 (WP 0250 00).

    NO Repair as necessary.

PATH D (From PATH B, step 3)

1. Position SW2 then SW1 to OFF.
2. Check condenser fan overload relay OL200.

   Is lever tripped?

   YES Go to CONDENSER FAN OVERLOAD FAULT (WP 0054 00).

   NO Go to step 3.

3. Check TF pump overload relay OL300.

   Is lever tripped?

   YES Go to TF PUMP OVERLOAD FAULT (WP 0078 00).

   NO Go to step 4.

4. Check for continuity across OL200 terminals (95) and (96).

   Does continuity exist?

   YES Go to step 36.

   NO Replace condenser fan overload relay OL200 (WP 0254 00).

5. Check for continuity across OL300 terminals (95) and (96).

   Does continuity exist?

   YES Go to step 5.

   NO Replace TF pump overload relay OL300 (WP 0254 00).

PATH D – Continued

6. Check connections on wire #180 between K200 terminal (CM) and overload relay OL300 terminal (96), wire #178 between K200 terminal (THR or X7) and overload relay OL200 terminal (95), and wire #179 between OL200 terminal (96) and OL300 terminal (95).

   Are wires and connections OK?

   YES Replace 20 hp inverter (WP 0250 00).

   NO Repair as required.

PATH E (From PATH B, step 4)

1. Observe position on inverter inlet and outlet doors.

   Are doors open?

   YES Go to step 2.

   NO Open doors. Go to step 5.

2. Check cooling fans on K200.

   Are fans operating?

   YES Go to step 3.

   NO Replace 20 hp inverter K200 (WP 0250 00).

3. Check cooling fan M107 on inverter enclosure outlet duct.

   Is fan operating?

   YES Go to step 4.

   NO Press RESET on inverter keypad. Go to INVERTER ENCLOSURE FAN DOES NOT TURN ON (WP 0099 00).

4. Check demister mesh at air inlet to inverter enclosure.

   Is demister mesh dirty?

   YES Clean or replace demister mesh (WP 0112 00). **Return to PATH A, step 6**.

   NO Go to step 5.

5. Wait for inverter enclosure to cool down (at least 30 minutes) then press RESET on inverter keypad.

6. Observe display on K200.

   Does fault code disappear?

   YES Reinstall door on inverter enclosure. Return to **PATH A, step 7**.

   NO Replace 20 hp inverter K200 (WP 0250 00).

END OF WORK PACKAGE

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UNIT, DIRECT SUPPORT, AND GENERAL SUPPORT

LAUNDRY ADVANCED SYSTEM

(NSN 3510–01–463–0114)

OPERATIONAL CHECKOUT AND TROUBLESHOOTING PROCEDURES AIR COMPRESSOR INVERTER FAULT

INITIAL SETUP:

Tools
Tool Kit, General Mechanics
(Item 1, WP 0282 00)
Multimeter (Item 2, WP 0282 00)

Personnel Required

Materials/Parts

Equipment Conditions
Power must be applied at main control enclosure (WP 0010 00).

PATH A

1. Open door on main control enclosure. Verify SW1 and SW2 are ON.
2. Press PRG/RESET on air compressor inverter K500 keypad.
3. Wait about 30 seconds then observe operator panel display.

   Does "AIR COMPRESSOR INVRTR FAULT" disappear?

   YES Go to step 4.

   NO Go to step 5.
4. Continue laundry cycle or use maintenance menu to start air system (WP 0010 00).

   Does another "AIR COMPRESSOR INVERTER FAULT" occur?

   YES Pause laundry cycle or stop air system. Go to step 5.

   NO Return to normal operation.
5. Observe display on K500.

   Is display blank or does it indicate "LIN"?

   YES Go to step 6.

   NO Go to **PATH B**.
6. Position SW2 then SW1 to OFF.
7. Check connections on wires between TB1 and CB6 and between CB6 and K500.

   Are connections OK?

   YES Replace air compressor inverter K500 (WP 0228 00).

   NO Repair as necessary.

PATH B (From PATH A, step 5)

1. Observe display on K500.

   Does display indicate "Er1, Er3, Er6, Er8, or OH2" ?

   YES Replace air compressor inverter K500 (WP 0228 00).

   NO Go to step 2.

PATH B – Continued

2. Observe display on K500.

   Does display indicate “LU, OC1, OC2, OC3, OL, OLU, OU1, OU2, or OU3” ?

   YES Go to step 4.

   NO Go to step 3.

3. Observe display on K500.

   Does display indicate “OH1” ?

   YES Go to step **PATH C**.

   NO Return to **PATH A, step 2**.

4. Position SW2 then SW1 to OFF.

5. Check connections on wire #s 205, 206, and 207 between K500 and M500.

   Are wire connections OK?

   YES Go to step 6.

   NO Repair as necessary.

6. Check resistance across K500 terminals (T1 and T2), (T1 and T3), and (T2 and T3).

   Is resistance < 4.0 ohms across any set of terminals?

   YES Replace air compressor M500 (WP 0210 00).

   NO Go to step 7.

NOTE

Fan blade on air compressor will not spin due to the friction of the piston rings on the cylinder walls but it should rotate with slight pressure.

7. Attempt to rotate fan blade on compressor end of M500.

   Does fan blade rotate?

   YES Replace air compressor inverter K500 (WP 0228 00).

   NO Replace air compressor M500 (WP 0201 00).

PATH C (From PATH B, step 3)

1. Allow K500 to cool down for about 30 minutes.

2. Press RESET on K500 keypad.

3. Wait about 30 seconds then observe operator panel display.

   Does “AIR COMPRESSOR INVRTR FAULT” disappear?

   YES Go to step 4.

   NO Replace air compressor inverter K500 (WP 0228 00).

4. Use maintenance menu to test air system.

   Does another “air compressor INVERTER FAULT” occur?

   YES Stop air system. Replace air compressor inverter K500 (WP 0228 00).

   NO Stop air system. Return to normal operation.

END OF WORK PACKAGE

UNIT, DIRECT SUPPORT, AND GENERAL SUPPORT

LAUNDRY ADVANCED SYSTEM

(NSN 3510–01–463–0114)

OPERATIONAL CHECKOUT AND TROUBLESHOOTING PROCEDURES
INVERTER ENCLOSURE FAN DOES NOT TURN ON

INITIAL SETUP:

Tools
Tool Kit, General Mechanics
(Item 1, WP 0282 00)
Multimeter (Item 2, WP 0282 00)

Personnel Required

Materials/Parts

Equipment Conditions
Power must be applied at main control enclosure (WP 0010 00).

1. Check operation or inverter enclosure cooling fan M107.

   Is fan operating?

   YES Return to normal operation.

   NO Go to step 3.

2. Use maintenance menu to check operation of either dryer blower M104A or M104B (WP 0010 00).

   Is dryer blower operating?

   YES Go to step 3.

   NO Go to DRYER BLOWER DOES NOT TURN ON FAULT (WP 0046 00) to check for input power from CB2.

3. Open door on inverter enclosure.
4. Check indicators for fuses F5 and F6.

   Are both indicators off?

   YES Go to step 9.

   NO Go to step 5.

5. Position SW1 to OFF.
6. Replace fuse for any indicator that was on (WP 0256 00).
7. Position SW1 to ON.
8. Check indicator for fuse(s) that was replaced.

   Is indicator(s) off?

   YES Close door on inverter enclosure. Return to step 1.

   NO Go to step 9.

9. Check connections on wire #187 between F5 and M107 and wire #188 between F6 and M107.

   Are wire connections OK?

   YES Replace fan M107 (WP 0251 00).

   NO Repair as necessary.

END OF WORK PACKAGE

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UNIT, DIRECT SUPPORT, AND GENERAL SUPPORT

LAUNDRY ADVANCED SYSTEM

(NSN 3510–01–463–0114)

OPERATIONAL CHECKOUT AND TROUBLESHOOTING PROCEDURES NO +12 VDC POWER AVAILABLE

INITIAL SETUP:

Tools
Tool Kit, General Mechanics
(Item 1, WP 0282 00)
Multimeter (Item 2, WP 0282 00)

Personnel Required

Materials/Parts

Equipment Conditions
Power must be applied at main control enclosure (WP 0010 00).

PATH A

NOTE

If PCB2 and PCB4 through PCB6 do not have +12 VDC, use this procedure to find the problem. If PCB1 or card cage do not have +12 VDC, use NO +/– 12 VDC POWER AVAILABLE (WP 0098 00) to find the problem.

1. Open door on main control enclosure. Verify SW1 and SW2 are ON.
2. Check for 110 VAC power between terminals (AC) and (AC) on power supply PS1.

   Is 110 VAC power present?

   YES Go to step 3.

   NO Check connections on wire #s 154 and 155 between PS1 and TB2. Repair as necessary.
3. Check for >11 VDC between terminals (+12) and (COM) on PS1.

   Is >11 VDC present?

   YES Go to step 4.

   NO Replace power supply PS1 (WP 0232 00).
4. Position SW2 then SW1 to OFF.

NOTE

Fuse indicator installed on fuse F10 is used only as a fuse puller. The indicator will not illuminate to show a blown fuse because the indicator only works on AC circuits and fuse F10 is on a DC circuit.

5. Remove fuse F10 (WP 0230 00). Check continuity of fuse.

   Does fuse have continuity?

   YES Reinstall fuse. Go to **PATH B**.

   NO Replace fuse. Go to step 6.
6. Position SW1 then SW2 to ON.
7. Check >11 VDC between TB2 terminals (+12) and (COM).

   Is >11 VDC present?

   YES Return to normal operation.

   NO Check for short between fuse F10 and PS1 and between F10 and all components using +12 VDC. Repair as necessary.

PATH B (From PATH A, step 5)

1. Position SW1 then SW2 to ON.
2. Check for >11 VDC between TB2 terminals where wire #s 190, 202, 212, 213, 214, 215, and 220 are connected and (COM) on PS1.

   Is >11 VDC present?

   YES Go to step 3.

   NO Check connections on wire #190 TB2 and F10 and wire #497 between F10 and PS1. Repair as necessary.

3. Check for >11 VDC between TB2 terminal where wire #191 is connected and (+12) on PS1.

   Is >11 VDC present?

   YES Check wire connections between TB2 and location where +12 VDC was not found. Repair as necessary.

   NO Check connections on wire #191 between PS1 (COM) and TB2. Repair as necessary.

END OF WORK PACKAGE

UNIT, DIRECT SUPPORT, AND GENERAL SUPPORT

LAUNDRY ADVANCED SYSTEM

(NSN 3510–01–463–0114)

OPERATIONAL CHECKOUT AND TROUBLESHOOTING PROCEDURES NO +/– 12 VDC POWER AVAILABLE

INITIAL SETUP:

Tools
Tool Kit, General Mechanics
(Item 1, WP 0282 00)
Multimeter (Item 2, WP 0282 00)

Personnel Required

Materials/Parts

Equipment Conditions
Power must be applied at main control enclosure (WP 0010 00).

PATH A

NOTE

If PCB1 or card cage do not have +/–12 VDC, use this procedure to find the problem. If PCB2 and PCB4 through PCB6 do not have +12 VDC, use NO +12 VDC POWER AVAILABLE (WP 0097 00) to find the problem.

1. Open door on main control enclosure. Verify SW1 and SW2 are ON.
2. Check for 110 VAC power between terminals (L1) and (L2) on power supply PS2.

   Is 110 VAC power present?

   YES Go to step 3.

   NO Check connections on wire #s 156 and 157 between PS2 and TB2. Repair as necessary.
3. Check for > (+)11 VDC between terminals (+12) and (ACOM) on PS2.

   Is > (+) 12 VDC present?

   YES Go to step 4.

   NO Replace power supply PS2 (WP 0238 00).
4. Check for > (–)12 VDC between terminals (–12) and (ACOM) on PS2.

   Is > (–) 12 VDC present?

   YES Go to step 5.

   NO Replace power supply PS2 (WP 0238 00).
5. Position SW2 then SW1 to OFF.

NOTE

Fuse indicators installed on fuses F7 and F8 are used only as a fuse pullers. The indicators will not illuminate to show a blown fuse because the indicators only works on AC circuits and fuse F7 and F8 are on DC circuits.

6. Remove fuses F7 and F8 (WP 0230 00). Check continuity of fuses.

   Do fuses have continuity?

   YES Reinstall fuses. Go to **PATH B**.

   NO Replace any blown fuses. Go to step 7.
7. Position SW1 then SW2 to ON.

PATH A – Continued

8. Check for > (+) 11 VDC between TB9 terminal (+12) where wire #494 is connected and PS2 (ACOM).

   Is > (+) 11 VDC present?

   YES Return to normal operation.

   NO Check for short between fuse F7 and PS2 and between F7 and all components using +12 VDC. Repair as necessary.

9. Check for > (–) 11 VDC between TB9 terminal (–12) where wire #495 is connected and PS2 (ACOM).

   Is >(–) 11 VDC present?

   YES Return to normal operation.

   NO Check for short between fuse F8 and PS2 and between F8 and all components using –12 VDC. Repair as necessary.

PATH B (From PATH A, step 6)

1. Position SW1 then SW2 to ON.
2. Check for > (+)11 VDC between TB9 terminal where wire #s 192 and 197 are connected and (ACOM) on PS2.

   Is > (+) 11 VDC present?

   YES Go to step 3.

   NO Check connections on wire #494 between TB9 and F7 and wire #489 between TB9 and PS2. Repair as necessary.

3. Check for > (–) 11 VDC between TB9 terminal where wire #s 194 and 199 are connected and (ACOM) on PS2.

   Is > (–) 12 VDC present?

   YES Go to step 4.

   NO Check connections on wire #495 between TB9 and F8 and wire #491 between TB9 and PS2. Repair as necessary.

4. Check for > (+) 11 VDC between TB9 terminal wire #490 is connected and (+12) on PS2.

   Is > 12 VDC present?

   YES Check wire connections between TB9 and location where +/–12 VDC was not found. Repair as necessary.

   NO Check connections on wire #490 between TB9 and PS2. Repair as necessary.

END OF WORK PACKAGE

UNIT, DIRECT SUPPORT, AND GENERAL SUPPORT

LAUNDRY ADVANCED SYSTEM

(NSN 3510–01–463–0114)

OPERATIONAL CHECKOUT AND TROUBLESHOOTING PROCEDURES NO +5 VDC POWER AVAILABLE

INITIAL SETUP:

Tools
Tool Kit, General Mechanics
(Item 1, WP 0282 00)
Multimeter (Item 2, WP 0282 00)

Personnel Required

Materials/Parts

Equipment Conditions
Power must be applied at main control enclosure (WP 0010 00).

PATH A

1. Open door on main control enclosure.
2. Check for 110 VAC power between terminals (L1) and (L2) on power supply PS2.

   Is 110 VAC power present?

   YES Go to step 3.

   NO Check connections on wire #s 156 and 157 between PS2 and TB2. Repair as necessary.

   NOTE

   When checking +5 VDC output on PS2 hold meter probes on terminals for at least 10 seconds to verify that voltage does not fluctuate and drop below 4.99 VDC.

3. Check for > 4.99 VDC between terminals (+5) and (DCOM) on PS2.

   Does voltage drop below 4.99 VDC?

   YES Go to step 4.

   NO Go to **PATH B**.

4. ESD. Verify trim circuit is installed into PS2 at the correct orientation and is properly seated (WP 0237 00).

   Is trim circuit installed correctly?

   YES Replace trim circuit (WP 0237 00). Go to step 5.

   NO Properly install trim circuit. Go to step 5.

5. Check for > 4.99 VDC between terminals (+5) and (DCOM) on PS2.

   Is correct voltage present?

   YES Return to normal operation.

   NO Replace power supply PS2 (WP 0238 00).

PATH B (From PATH A, step 3)

1. Position SW2 then SW1 to OFF.

NOTE

Fuse indicator installed on fuse F9 is used only as a fuse puller. The indicator will not illuminate to show a blown fuse because the indicator only works on AC circuits and fuse F9 is on a DC circuit.

2. Remove fuse F9 (WP 0230 00). Check continuity of fuse.

Does fuse have continuity?

YES Reinstall fuse. Go to **PATH C**.

NO Replace blown fuse. Go to step 3.

3. Position SW1 then SW2 to ON.
4. Check > 4.99 VDC between TB9 terminal (+12) where wire #494 is connected and PS2 (ACOM).

Is correct voltage present?

YES Return to normal operation.

NO Check for short between fuse F9 and PS2 and between F9 and all components using +5 VDC. Repair as necessary.

PATH B (From PATH B, step 2)

1. Position SW1 then SW2 to ON.
2. Check for > 4.99 VDC between TB9 terminals where wire #s 195, 347, and 496 are connected and (DCOM) on PS2.

Is correct voltage present?

YES Go to step 3.

NO Check connections on wire #492 between TB9 and F9 and wire #496 between F9 and PS2. Repair as necessary.

3. Check for > 4.99 VDC between TB9 terminal where wire #493 is connected and (+5) on PS2.

Is correct voltage present?

YES Check wire connections between TB9 and location where +5 VDC was not found. Repair as necessary.

NO Check connections on wire #493 between TB9 and PS2 (DCOM). Repair as necessary.

END OF WORK PACKAGE

UNIT, DIRECT SUPPORT, AND GENERAL SUPPORT

LAUNDRY ADVANCED SYSTEM

(NSN 3510–01–463–0114)

OPERATIONAL CHECKOUT AND TROUBLESHOOTING PROCEDURES TYPICAL AC INPUT SIGNAL FAULT

INITIAL SETUP:

Tools
Tool Kit, General Mechanics
(Item 1, WP 0282 00)
Multimeter (Item 2, WP 0282 00)

Personnel Required

Materials/Parts

Equipment Conditions
Power must be applied at main control enclosure (WP 0010 00).

PATH A

1. Open door on main control enclosure. Verify SW1 and SW2 are ON.
2. Determine which SSR on PCB 3 is activated by the AC input circuit you are trying to check (WP 0011 00, Table 1).
3. Use maintenance menu control outputs function (WP 0010 00) to test heating system.
4. Wait for heater to come on then check LED for suspect SSR on PCB3.

   Does LED come on?

   YES Stop heating system test. Go to step 5.

   NO Stop heating system test. Go to **PATH B**.

5. Position SW2 to OFF.
6. ESD. Check ribbon cable connection from PCB3 to PCB7.

   Is cable properly connected?

   YES Go to step 7.

   NO Properly connect ribbon cable.

7. ESD. Check to ensure PCB7 is properly seated in card cage.

   Is PCB7 properly seated?

   YES Replace PCB7 (WP 0217 00). Go to step 8.

   NO Properly seat PCB7.

8. Use maintenance menu to test heating system. Wait for heater to come on then monitor operator panel display.

   Does fault message reappear while heater is on?

   YES Stop heating system. Replace PCB9 (WP 0220 00). Go to step 9.

   NO Stop heating system. Return to normal operation.

9. Use maintenance menu to test heating system. Wait for heater to come on then monitor operator panel display.

   Does fault message reappear while heater is on?

   YES Stop heating system. Replace PCB3 (WP 0239 00).

   NO Stop heating system. Return to normal operation.

PATH B (From PATH A, step 4)

1. Check for >100 VAC between PCB3 terminal (13) and TB2 terminal (H).

   Is >100 VAC present?

   YES Go to step 2.

   NO Check connections on wire #503 between PCB3 and TB2. Repair as necessary

2. Use maintenance to test heating system. Check for >100 VAC between even numbered input terminal (for suspect signal) on PCB3 and TB2 terminal (H).

   Is >100 VAC present?

   YES Stop heating system. Go to step 3.

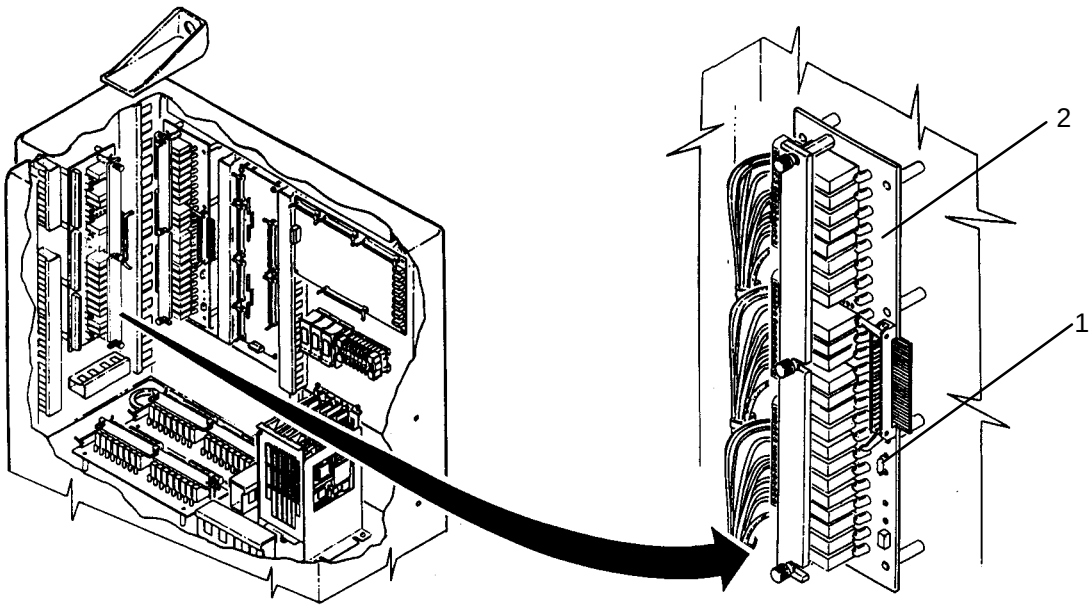
   NO Stop heating system. Check jumper connection on PCB3 from even numbered input terminal to terminal (13).

3. Check for > 4.9 VDC between DCOM on PS2 and both sides of 1 amp fuse (1) on PCB3 (2).

   Is >4.9 VDC present?

   YES Go to **PATH C**.

   NO Go to step 4.



4. Position SW2 to OFF.
5. Check 1 amp fuse on PCB3 for continuity.

   Does fuse have continuity?

   YES Go to step 6.

   NO Replace fuse (WP 0243 00).

6. ESD. Check ribbon cable connection on PCB3.

   Is cable properly connected?

   YES Go to NO +5 VDC POWER AVAILABLE (WP 0102 00).

   NO Properly connect ribbon cable. Return to **PATH A, step 3**.

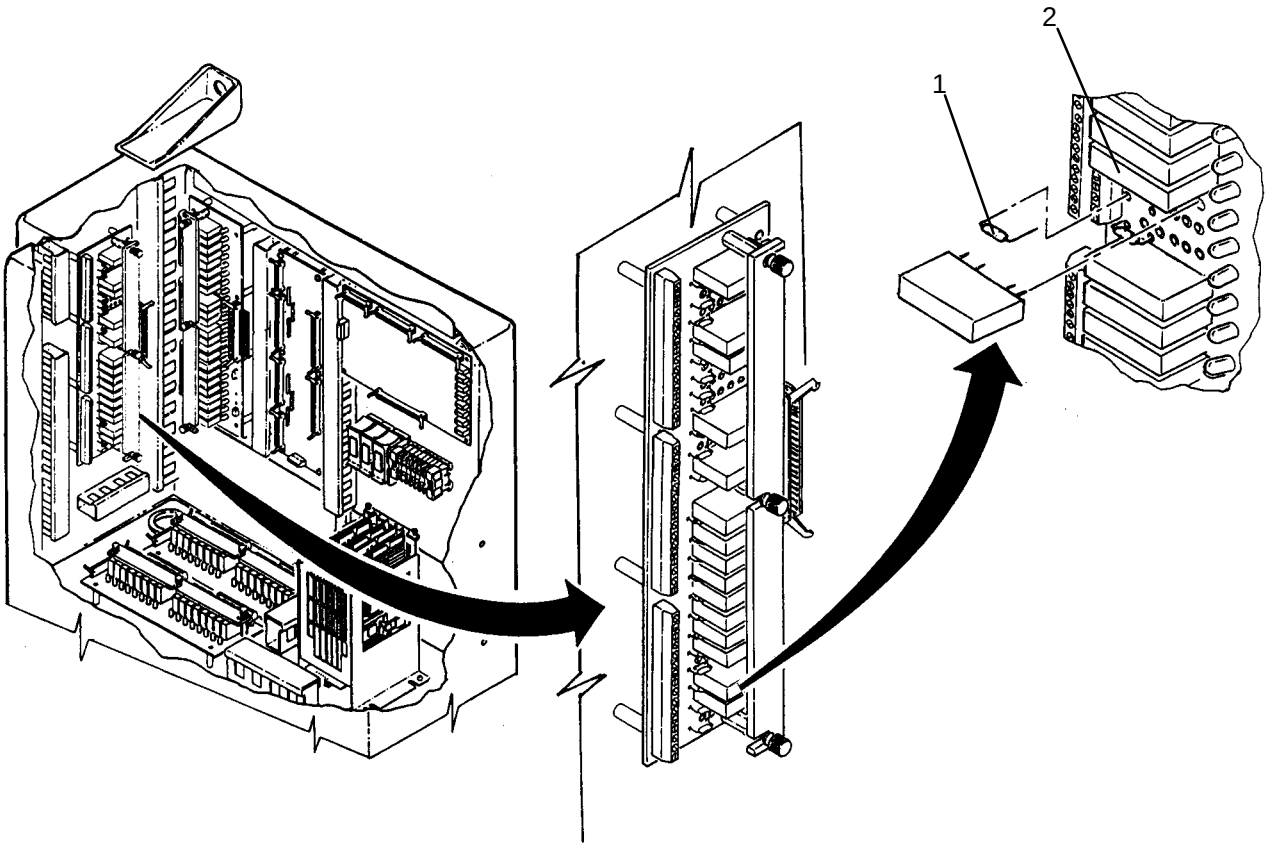
PATH C (From PATH B, step 3)

1. Position SW2 and SW1 to OFF.
2. Check wire connections between suspect heater interlock circuit and PCB3.

   Are wire connections OK?

   YES Go to step 3.

   NO Repair as necessary.
3. Check 5 amp fuse (1) next to suspect SSR (2) for continuity.



Does fuse have continuity?

YES Replace SSR (WP 0241 00).

NO Replace 5 amp fuse (WP 0242 00).

END OF WORK PACKAGE

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UNIT, DIRECT SUPPORT, AND GENERAL SUPPORT

LAUNDRY ADVANCED SYSTEM

(NSN 3510–01–463–0114)

OPERATIONAL CHECKOUT AND TROUBLESHOOTING PROCEDURES TYPICAL AC OUTPUT SIGNAL FAULT

INITIAL SETUP:

Tools
Tool Kit, General Mechanics
(Item 1, WP 0282 00)
Multimeter (Item 2, WP 0282 00)

Personnel Required

Materials/Parts

Equipment Conditions
Power must be applied at main control enclosure (WP 0010 00).

PATH A

1. Open door on main control enclosure. Verify SW1 and SW2 are ON.
2. Determine which SSR on PCB 3 activates the component you are trying to check (Table 1, WP 0011 00).
3. Use maintenance menu control outputs function (WP 0010 00) to turn on SSR, then monitor corresponding LED.

   Does LED come on?

   YES Go to step 4.

   NO Go to **PATH C**.
4. Check for >100 VAC between PCB3 terminal (3) and TB1 terminal (N).

   Is >100 VAC present?

   YES Go to step 5.

   NO Check connections on wire #158 between PCB3 and TB2. Repair as necessary
5. Check for >100 VAC between odd numbered input terminal (for suspect signal) on PCB3 and TB1 terminal (N).

   Is >100 VAC present?

   YES Go to step 6.

   NO Check jumper connection on PCB3 from odd numbered input terminal to terminal (3).
6. Use maintenance menu to activate suspect output signal while checking for >100 VAC between even numbered output terminal (for suspect signal) on PCB3 and TB1 terminal (N).

   Is >100 VAC present?

   YES Go to step 7.

   NO Go to **PATH B**.
7. Position SW2 then SW1 to OFF.
8. Disconnect cable or wiring from suspect component.
9. Perform continuity check of wiring between suspect component and PCB3 and between suspect component and TB2 (N).

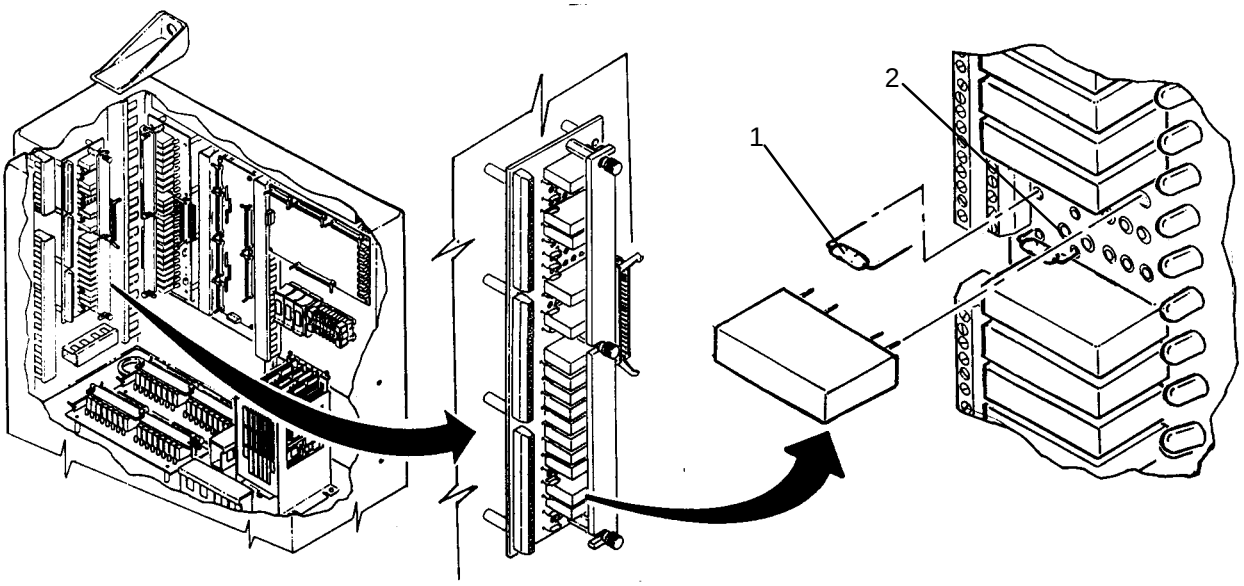
   Does continuity exist?

   YES Replace suspect component.

   NO Check wire connections between suspect component and PCB3 and between suspect component and TB2. Repair as necessary.

PATH B (From PATH A, step 6)

1. Position SW2 to OFF.
2. Check 5 amp fuse (1) next to suspect SSR (2) for continuity.



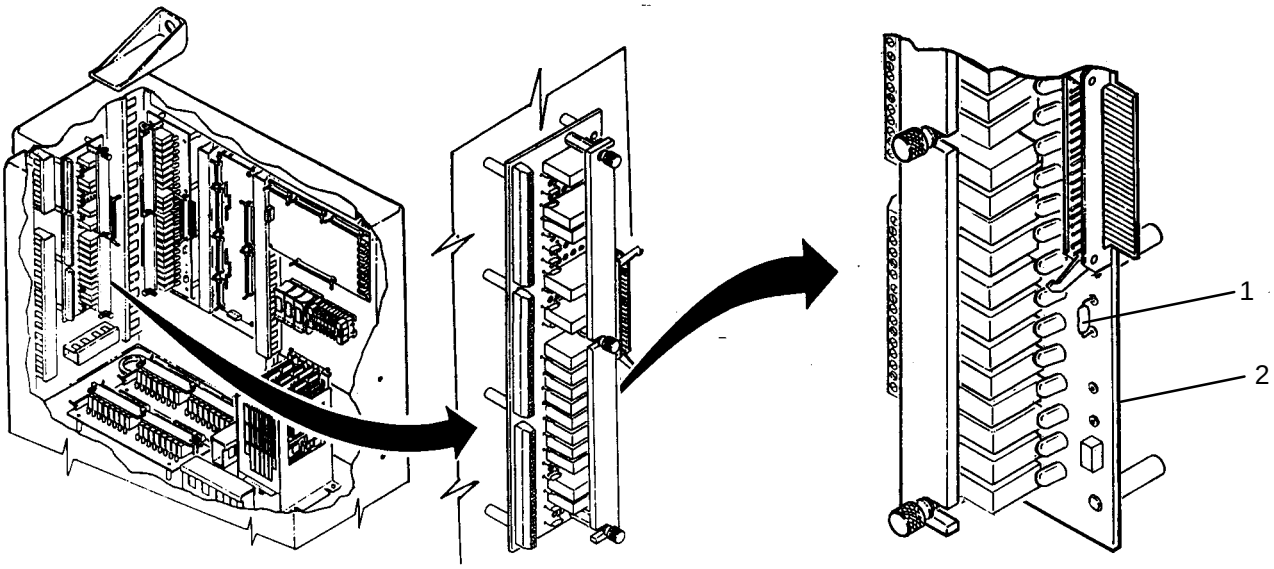
Does fuse have continuity?

YES Replace SSR (WP 0241 00).

NO Replace 5 amp fuse (WP 0242 00).

PATH C (From PATH A, step 3)

1. Check for > 4.9 VDC between DCOM on PS2 and both sides of 1 amp fuse (1) on PCB3 (2).



Is >4.9 VDC present?

YES Go to **PATH D**.

NO Go to step 2.

PATH C – Continued

2. Position SW2 to OFF.
3. Check 1 amp fuse on PCB3 for continuity.

   Does fuse have continuity?

   YES Go to step 4.

   NO Replace fuse (WP 0243 00).

4. ESD. Check ribbon cable connection on PCB3.

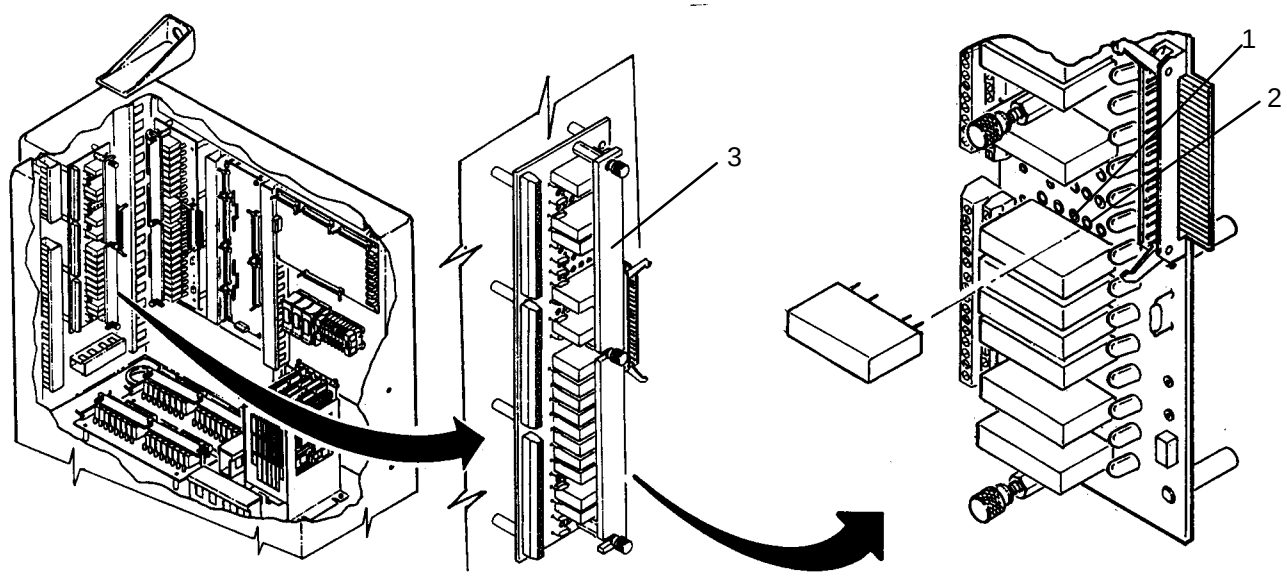
   Is cable properly connected?

   YES Go to NO +5 VDC POWER AVAILABLE (WP 0102 00).

   NO Properly connect ribbon cable.

PATH D (From PATH B, step 1)

1. Position SW2 to OFF.
2. Remove suspect SSR (WP 0241 00).
3. Position SW2 to ON.
4. Use maintenance menu to activate suspect output signal while checking for > 3 VDC across input terminals (1 and 2) on PCB3 (3) for removed SSR.



   Is > 3 VDC present?

   YES Replace SSR (WP 0241 00).

   NO Go to step 5.

5. Position SW2 to OFF.
6. ESD. Check ribbon cable connection from PCB3 to PCB7.

   Is cable properly connected?

   YES Go to step 7.

   NO Properly connect ribbon cable and reinstall SSR.

PATH D – Continued

7. ESD. Check to ensure PCB7 is properly seated in card cage.

   Is PCB7 properly seated?

   YES Replace PCB7 (WP 0217 00). Go to step 8.

   NO Properly seat PCB7 and reinstall SSR.

8. Use maintenance menu to activate suspect output signal while checking for > 3 VDC across input terminals on PCB3 for removed SSR.

   Is > 3 VDC present?

   YES Reinstall SSR and return to normal operation.

   NO Replace PCB9 (WP 0220 00). Go to step 8.

9. Use maintenance menu to activate suspect output signal while checking for > 3 VDC across input terminals on PCB3 for removed SSR.

   Is > 3 VDC present?

   YES Reinstall SSR and return to normal operation.

   NO Replace PCB3 (WP 0239 00).

END OF WORK PACKAGE

UNIT, DIRECT SUPPORT, AND GENERAL SUPPORT

LAUNDRY ADVANCED SYSTEM

(NSN 3510–01–463–0114)

OPERATIONAL CHECKOUT AND TROUBLESHOOTING PROCEDURES
TYPICAL ANALOG INPUT SIGNAL FAULT

INITIAL SETUP:

Tools
Tool Kit, General Mechanics
(Item 1, WP 0282 00)
Multimeter (Item 2, WP 0282 00)

Personnel Required

Materials/Parts

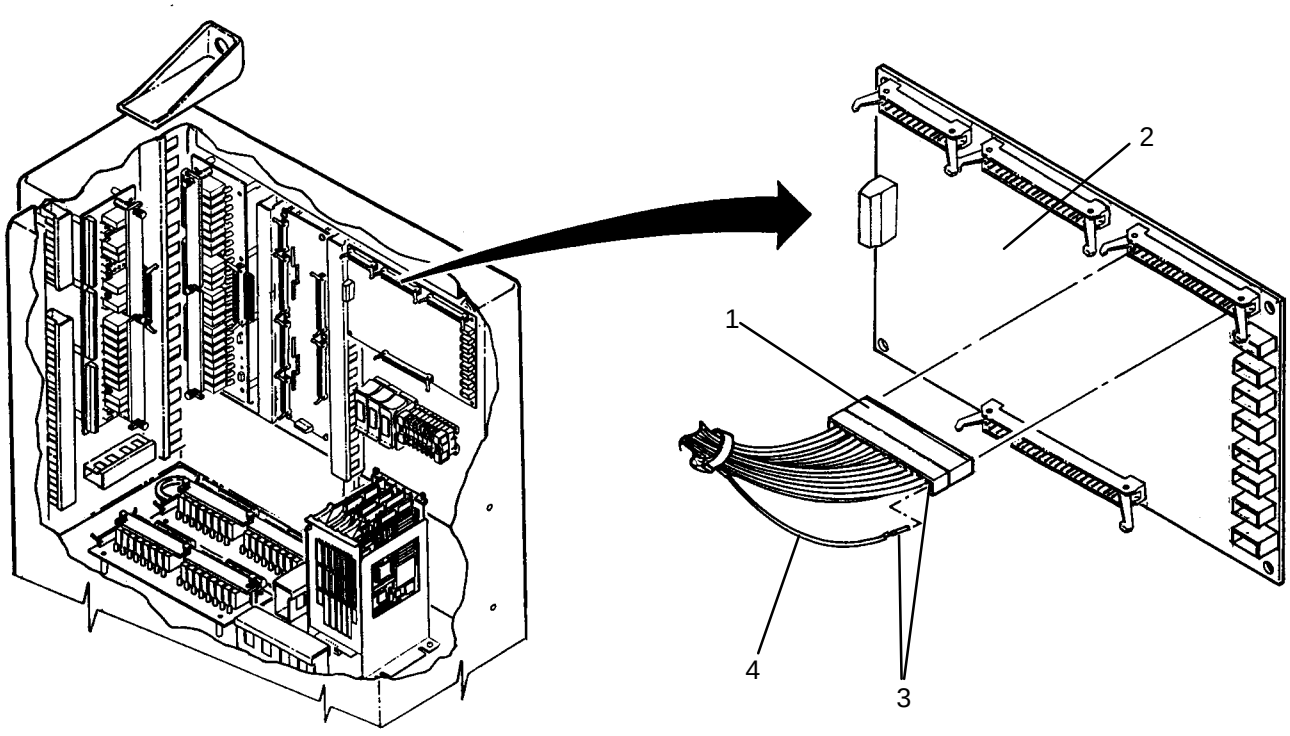
Equipment Conditions
Power must be applied at main control enclosure (WP 0010 00).

1. Position SW2 and SW1 to OFF.
2. Open door on main control enclosure.
3. ESD. Check cable or wire connections at suspect analog sensor.

   Are connections OK?

   YES Go to step 4.

   NO Repair as necessary.
4. ESD. Disconnect the appropriate connector (1) for suspect analog sensor from PCB1 (2).



5. Visually check to ensure contacts (3) are properly seated and wires (4) is properly crimped to contact.

   Are connections OK?

   YES Go to step 6.

   NO Repair as necessary.

6. Reconnect connector (1) to PCB1 (2).
7. ESD. Check ribbon cable connections between PCB1 and PCB11.

   Are connections OK?

   YES Go to step 8.

   NO Repair as necessary.
8. ESD. Check to ensure PCB9 and PCB11 are properly seated in card cage.

   Are PCB9 and PCB11 properly seated?

   YES Go to step 9.

   NO Properly seat PCB9 or PCB11.
9. Position SW1 then SW2 to ON.
10. ESD. Check for >11 VDC between PCB1 terminals J1–2 (+12) and J1–3 (ACOM) where wire #s 197 and 198 are connected.

    Is >11 VDC present?

    YES Go to step 11.

    NO Go to NO +/–12 VDC POWER AVAILABLE (WP 0101 00).
11. ESD. Check for > –11 VDC between PCB1 terminals J1–3 (ACOM) and J1–4 (–12) where wire #s 198 and 199 are connected.

    Is > –11 VDC present?

    YES Go to step 12.

    NO Go to NO +/–12 VDC POWER AVAILABLE (WP 0101 00).
12. Check voltage between suspect analog sensor test point (5) and PCB1 terminal J1–3 (ACOM).

    Is voltage in range specified in Table 1 of WP 0010 00?

    YES Go to step 14.

    NO Go to step 13.
13. Replace suspect analog component and perform checkout.

    Is fault corrected?

    YES Return to normal operation.

    NO Replace PCB1 (WP 0215 00).
14. Replace PCB11 and perform checkout (WP 0219 00).

    Is fault corrected?

    YES Return to normal operation.

    NO Go to step 15.
15. Replace PCB9 and perform checkout (WP 0220 00).

    Is fault corrected?

    YES Return to normal operation.

    NO Replace card cage (WP 0221 00).

END OF WORK PACKAGE

UNIT, DIRECT SUPPORT, AND GENERAL SUPPORT

LAUNDRY ADVANCED SYSTEM

(NSN 3510–01–463–0114)

OPERATIONAL CHECKOUT AND TROUBLESHOOTING PROCEDURES TYPICAL DC OUTPUT SIGNAL FAULT

INITIAL SETUP:

Tools
Tool Kit, General Mechanics
(Item 1, WP 0282 00)
Multimeter (Item 2, WP 0282 00)

Personnel Required

Materials/Parts

Equipment Conditions
Power must be applied at main control enclosure (WP 0010 00).

PATH A

1. Open door on main control enclosure. Verify SW1 and SW2 are ON.
2. Determine which SSR on PCB 4, 5, or 6 activates the component you are trying to check (Refer to WP 0011 00, Table 1).
3. Use maintenance menu control outputs function (WP 0010 00) to turn on SSR, then monitor corresponding LED.

   Does LED come on?

   YES Go to step 4.

   NO Go to **PATH C**.
4. Check for >11 VDC between (refer to table) and PS1 terminal COM.

SSR PCB(X)	TERMINAL
PCB4	1
PCB5	31
PCB6	31

   Is >11 VDC present?

   YES Go to step 5.

   NO Go to NO +12 VDC POWER AVAILABLE FAULT (WP 0100 00).
5. Check for >11 VDC between odd numbered input terminal (for suspect signal) on SSR PCB and PS1 terminal COM.

   Is >11 VDC present?

   YES Go to step 6.

   NO Check jumper connection on SSR PCB from odd numbered input terminal to terminal listed in table of step 4.
6. Use maintenance menu to activate suspect output signal while checking for >11 VDC between output terminal (for suspect signal) on SSR PCB and PS1 terminal COM.

   Is >11 VDC present?

   YES Go to step 7.

   NO Go to **PATH B**.
7. Disconnect cable or wiring from suspect component.

PATH A – Continued

8. Perform continuity check of wiring between suspect component and SSR PCB and between suspect component and TB2 COM.

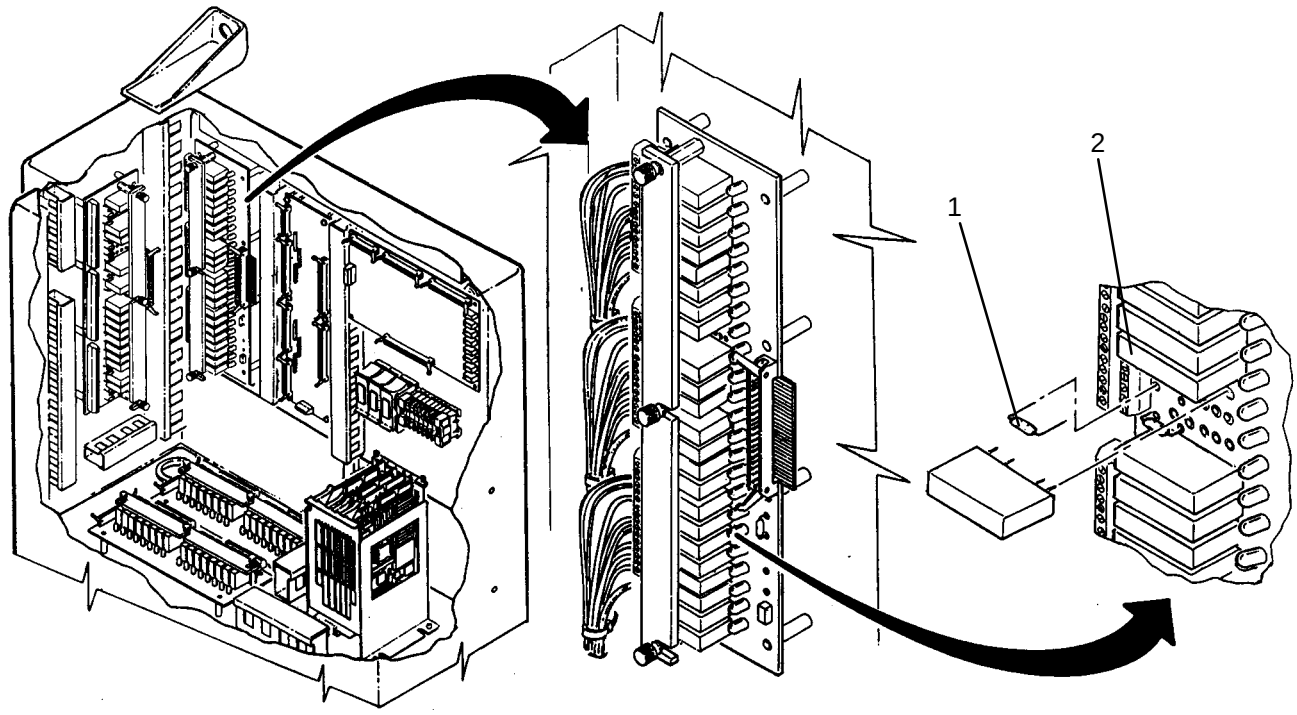
Does continuity exist?

YES Replace suspect component.

NO Check wire connections between suspect component and SSR PCB and between suspect component and TB2. Repair as necessary.

PATH B (From PATH A, step 6)

1. Position SW2 to OFF.
2. Check 5 amp fuse (1) next to suspect SSR (2)for continuity.



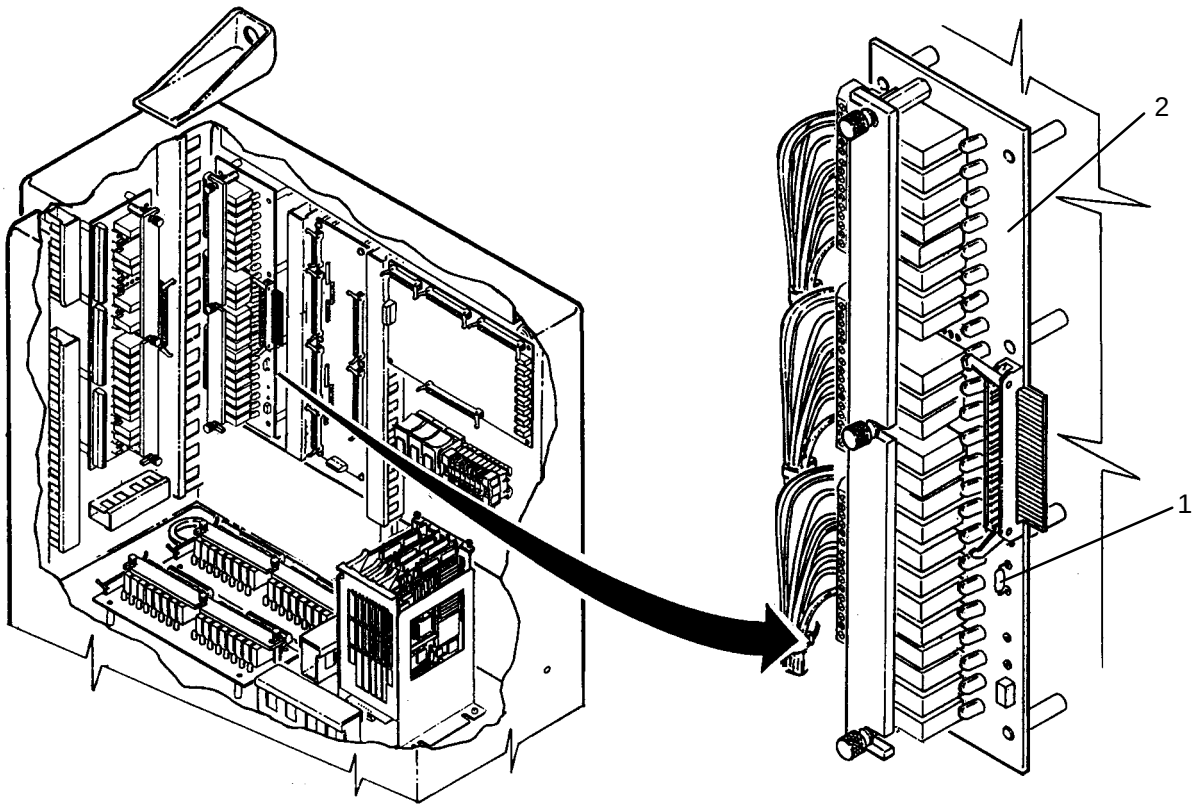
Does fuse have continuity?

YES Replace SSR (WP 0241 00).

NO Replace 5 amp fuse (WP 0242 00).

PATH C (From PATH A, step 3)

1. Check for > 4.9 VDC between DCOM on PS2 and both sides of 1 amp fuse (1) on SSR PCB (2).



Is >4.9 VDC present?

YES Go to step **PATH D**.

NO Go to step 2.

2. Position SW2 to OFF.
3. Check 1 amp fuse on SSR PCB for continuity.

Does fuse have continuity?

YES Go to step 4.

NO Replace fuse (WP 0243 00).

4. Check ribbon cable connection on SSR PCB.

Is cable properly connected?

YES Go to NO +5 VDC POWER AVAILABLE (WP 0102 00).

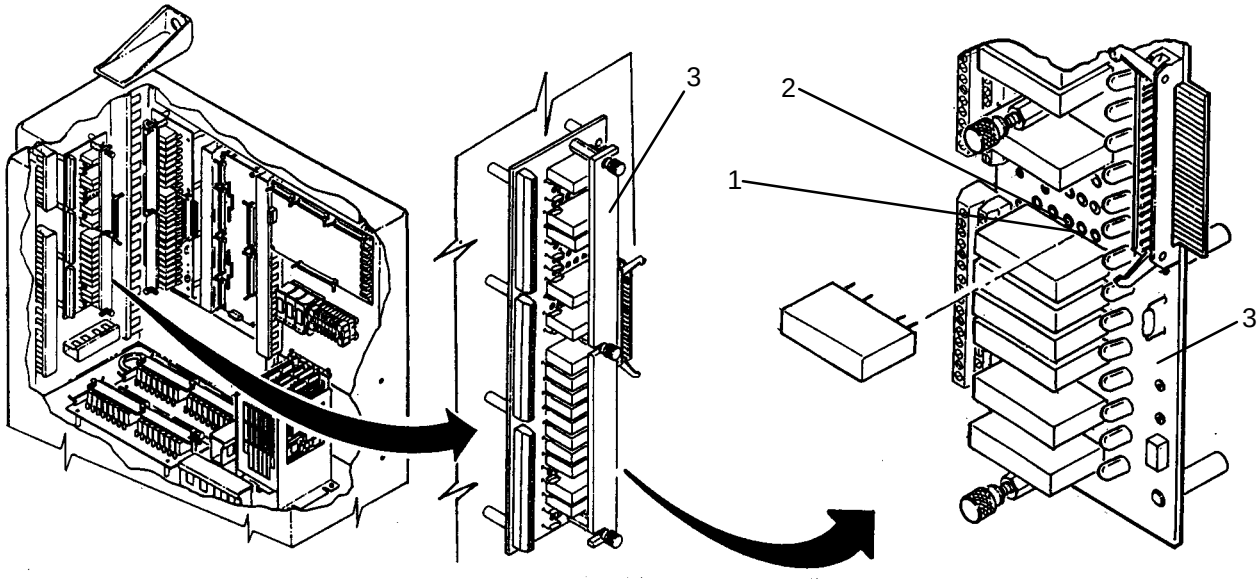
NO Properly connect ribbon cable.

PATH D (From PATH C, step 1)

1. Position SW2 to OFF.
2. Remove suspect SSR (WP 0241 00).
3. Position SW2 to ON.

PATH D – Continued

4. Use maintenance menu to activate suspect output signal while checking for > 3 VDC across input terminals (1 and 2) on SSR PCB (3) for removed SSR.



Is > 3 VDC present?

YES Replace SSR (WP 0241 00).

NO Go to step 5.

5. Position SW2 to OFF.
6. Check ribbon cable connection from SSR PCB to PCB7.

Is cable properly connected?

YES Go to step 7.

NO Properly connect ribbon cable and reinstall SSR.

7. Check to ensure PCB7 is properly seated in card cage.

Is PCB7 properly seated?

YES Replace PCB7 (WP 0217 00). Go to step 8.

NO Properly seat PCB7 and reinstall SSR.

8. Use maintenance menu to activate suspect output signal while checking for > 3 VDC across input terminals on SSR PCB for removed SSR.

Is > 3 VDC present?

YES Reinstall SSR. Return to normal operation.

NO Replace PCB9 (WP 0220 00). Go to step 9.

9. Use maintenance menu to activate suspect output signal while checking for > 3 VDC across input terminals on SSR PCB for removed SSR.

Is > 3 VDC present?

YES Reinstall SSR. Return to normal operation.

NO Replace SSR PCB (WP 0239 00) or (WP0240 00).

END OF WORK PACKAGE

UNIT, DIRECT SUPPORT, AND GENERAL SUPPORT

LAUNDRY ADVANCED SYSTEM

(NSN 3510–01–463–0114)

OPERATIONAL CHECKOUT AND TROUBLESHOOTING PROCEDURES
TYPICAL DISCRETE INPUT SIGNAL FAULT

INITIAL SETUP:

Tools
Tool Kit, General Mechanics
(Item 1, WP 0282 00)
Multimeter (Item 2, WP 0282 00)

Personnel Required

Materials/Parts

Equipment Conditions
Power must be applied at main control enclosure (WP 0010 00).

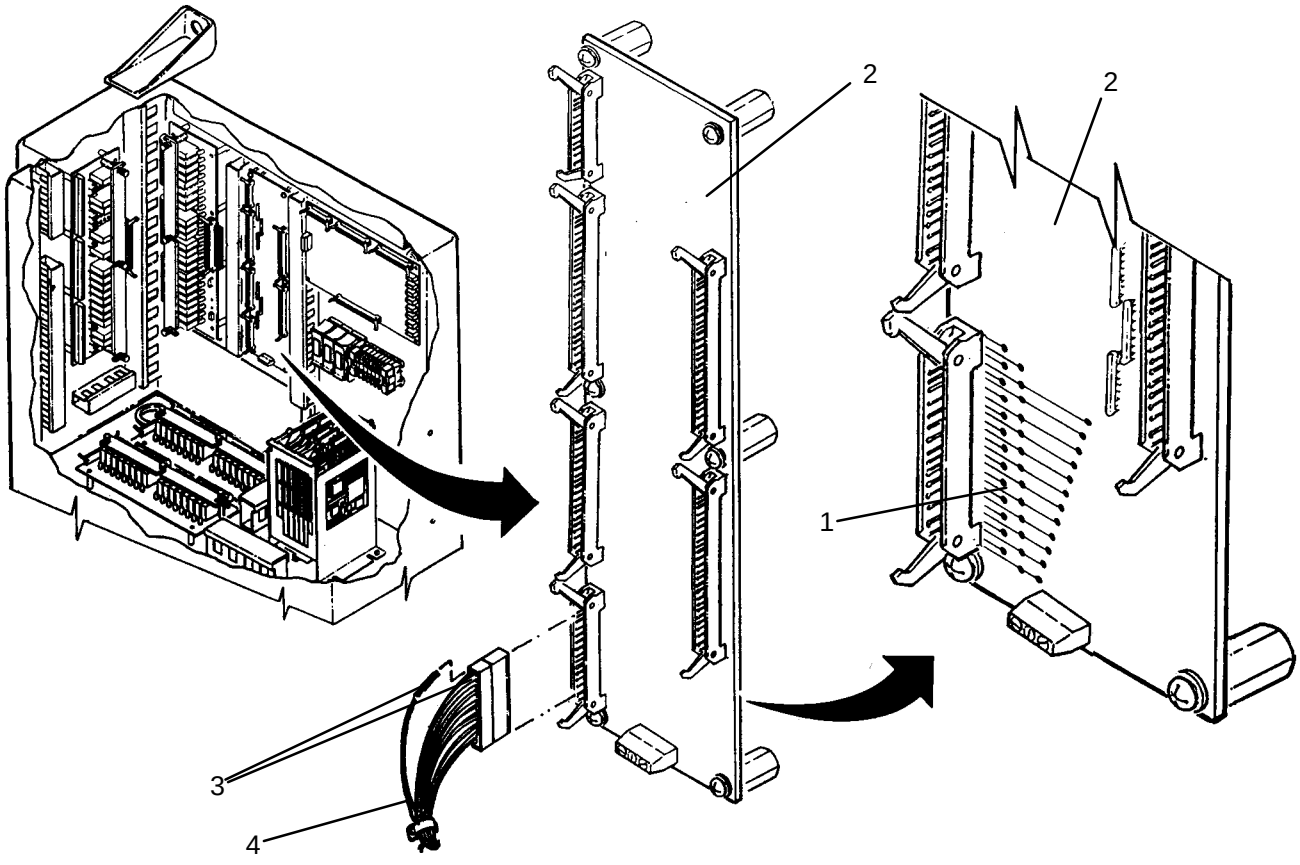
PATH A

1. Open door on main control enclosure. Verify SW1 and SW2 are ON.
2. ESD. Check for >11 VDC between PCB2 J1 terminals (2) and (3).

   Is >11 VDC present?

   YES Go to step 3.

   NO Go to NO +12 VDC POWER AVAILABLE (WP 0100 00).
3. Position SW1 then SW2 to OFF.
4. ESD. Disconnect cable or wiring from suspect discrete component.
5. ESD. Perform continuity check between wiring for suspect component and test points (1) on PCB2 (2).



PATH A – Continued

Does continuity exist?

YES Reconnect cable or wiring. Go to **PATH B**.

NO Go to step 6.

6. ESD. Disconnect the appropriate connector (1) from PCB2 (2) and visually check to ensure contacts (3) are properly seated and wires (4) is properly crimped to contact.

Are connections OK?

YES Check wiring between PCB2 and suspect discrete component. Repair as necessary.

NO Repair as necessary.

PATH B (From PATH A, step 5)

1. ESD. Check ribbon cable connections between PCB2 and PCB8.

Are connections OK?

YES Go to step 2.

NO Repair as necessary.

2. ESD. Check to ensure PCB8 and PCB9 are properly seated in card cage.

Are PCB8 and PCB9 properly seated?

YES Go to step 3.

NO Properly seat PCB8 or PCB9.

3. Position SW1 then SW2 to ON.
4. ESD. Check for >11 VDC between +12 V and ACOM test points on PCB12.

Is >11 VDC present?

YES Go to step 5.

NO Go to NO +/–12 VDC POWER AVAILABLE (WP 0101 00).

5. ESD. Check for > –11 VDC between –12 V and ACOM testpoints on PCB12.

Is > –11 VDC present?

YES Go to step 6.

NO Go to NO +/–12 VDC POWER AVAILABLE (WP 0101 00).

NOTE

When checking +5 VDC, hold meter probes on terminals for at least 10 seconds to verify that voltage does not fluctuate and drop below 4.99 VDC.

6. ESD. Check for > 4.99 VDC between +5 V and DCOM testpoints on PCB12.

Is > 4.8 VDC present?

YES Go to step 7.

NO Go to NO +5 VDC POWER AVAILABLE (WP 0102 00).

7. Replace suspect discrete component and perform checkout.

Is fault corrected?

YES Return to normal operation.

NO Go to step 8.

PATH B – Continued

8. Replace PCB8 and perform checkout (WP 0218 00).

   Is fault corrected?

   YES Return to normal operation.

   NO Go to step 9.

9. Replace PCB2 and perform checkout (WP 0216 00).

   Is fault corrected?

   YES Return to normal operation.

   NO Go to step 10.

10. Replace PCB9 and perform checkout (WP 0220 00).

    Is fault corrected?

    YES Return to normal operation.

    NO Replace card cage (WP 0221 00).

END OF WORK PACKAGE

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UNIT, DIRECT SUPPORT, AND GENERAL SUPPORT

LAUNDRY ADVANCED SYSTEM

(NSN 3510–01–463–0114)

OPERATIONAL CHECKOUT AND TROUBLESHOOTING PROCEDURES TYPICAL INVERTER DOES NOT RESET WHEN RESET SWITCH IS PRESSED

INITIAL SETUP:

Tools
Tool Kit, General Mechanics
(Item 1, WP 0282 00)
Multimeter (Item 2, WP 0282 00)

Personnel Required

Materials/Parts

Equipment Conditions
Power must be applied at main control enclosure (WP 0010 00).

1. Observe operator panel A display.

   Is a “10HP, 20HP, or DRUM INVERTER FAULT” message displayed?

   YES Go to step 2.

   NO Return to normal operation.

2. Press appropriate RESET switch on inverter enclosure.
3. Wait about 30 seconds then observe operator panel A display.

   Is a “10HP, 20HP, or DRUM INVERTER FAULT” message displayed?

   YES Go to step 4.

   NO Return to normal operation.

4. Open door on inverter enclosure.
5. Press appropriate RESET switch on suspect inverter.
6. Wait about 30 seconds then observe operator panel A display.

   Is a “10HP, 20HP, or DRUM INVERTER FAULT” message displayed?

   YES Go to appropriate inverter fault troubleshooting procedure (WP 0093 00), (WP 0096 00), or (WP 0097 00).

   NO Go to step 7.

7. Position SW2 to OFF.
8. Remove wires connected to suspect RESET switch PBS7, PBS8, PBS9, or PBS10.
9. Press suspect RESET switch, then check for continuity across (+) and (–) terminals.

   Does continuity exist?

   YES Go to step 10.

   NO Replace inverter RESET switch (WP 0257 00).

10. Check wire connections between suspect RESET switch and inverter.

    Are connections OK?

    YES Replace suspect inverter (WP 0250 00).

    No Repair as required.

END OF WORK PACKAGE

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UNIT, DIRECT SUPPORT, AND GENERAL SUPPORT

LAUNDRY ADVANCED SYSTEM

(NSN 3510–01–463–0114)

OPERATIONAL CHECKOUT AND TROUBLESHOOTING PROCEDURES POWER IS NOT AVAILABLE AT AUXILIARY RECEPTACLE

INITIAL SETUP:

Tools
Tool Kit, General Mechanics
(Item 1, WP 0282 00)
Multimeter (Item 2, WP 0282 00)

Personnel Required

Materials/Parts

Equipment Conditions
Power must be applied at main control enclosure (WP 0010 00).

PATH A

1. Check position of SW1.

   Is SW1 in ON position?

   YES Go to step 2.

   NO Position SW1 to ON. Return to normal operation.

2. Turn on auxiliary light.

   Does auxiliary light turn on?

   YES Return to normal operation.

   NO Go to step 3.

3. Check plug connection for light at light box J3.

   Is auxiliary light plugged in?

   YES Go to step 4.

   NO Plug in overhead light. Return to normal operation.

4. Check status of trip button on GFI receptacle on light box J3.

   Is button tripped?

   YES Unplug light. Reset button. Go to step 5.

   NO Go to **PATH B**.

5. Plug overhead light back into receptacle on light box J3.

   Does auxiliary light turn on and stay on?

   YES Return to normal operation.

   NO Check for shorted wire connection on auxiliary light(s).

PATH B (From PATH A, step 4)

1. Plug auxiliary light into other receptacle on light box J3.

   Does auxiliary light turn on?

   YES Replace receptacle (WP 0258 00).

   NO Go to step 2.

2. Open door on main control enclosure and position SW1 to ON.

PATH B –Continued

3. Check position of CB8.

   Is CB8 in ON position?

   YES Go to step 4.

   NO Position CB8 to ON. Go to **PATH C**.

4. Check for >100 VDC between CB8 terminal (L1) and TB1 terminal (N).

   Is > 100 VDC present?

   YES Go to step 5.

   NO Check connections on wire #201 between CB8 and TB1. Repair as necessary.

5. Check for > 100 VDC between CB8 terminal (T1) and TB1 terminal (N).

   Is > 100 VDC present?

   YES Go to step 6.

   NO Replace CB8 (WP 0223 00).

6. Check for > 100 VDC between (+) terminal on GFI receptacle and TB1 terminal (N).

   Is > 100 VDC present?

   YES Go to step 7.

   NO Check connections on wire #549 between CB8 and GFI receptacle. Repair as necessary.

7. Check connections on wire #551 between (–) terminal on GFI receptacle and TB1 (N).

   Are wire connections OK?

   YES Obtain new auxiliary light.

   NO Repair as necessary.

PATH C (From PATH B step 3)

1. Turn on overhead light.

   Does overhead light turn on and stay on?

   YES Return to normal operation.

   NO Go to step 2.

2. Check connections on wire #549 between CB8 and receptacle.

   Are wire connections OK?

   YES Replace receptacles (WP 0258 00).

   NO Repair as necessary.

END OF WORK PACKAGE

CHAPTER 3

UNIT MAINTENANCE INSTRUCTIONS

FOR

LAUNDRY ADVANCED SYSTEM

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UNIT

LAUNDRY ADVANCED SYSTEM

(NSN 3510–01–463–0114)

SERVICE UPON RECEIPT

There is no Service Upon Receipt for the LADS.

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UNIT

LAUNDRY ADVANCED SYSTEM

(NSN 3510–01–463–0114)

PREVENTIVE MAINTENANCE CHECKS and SERVICES (PMCS) INTRODUCTION

GENERAL

Preventive Maintenance Checks and Services (PMCS) are performed to keep the LADS in operating condition. The checks are used to find, correct, or report problems. Maintainers are to do the PMCS jobs as shown in the PMCS table. Pay attention to WARNING and CAUTION statements. A WARNING means someone could get hurt. A CAUTION means equipment could be damaged.

Do Quarterly PMCS once a every three months while performing Monthly PMCS. Perform Quarterly PMCS Monthly in hot, sandy, or dusty conditions.

Do Annual PMCS once a year while performing Quarterly PMCS.

Do Post–Deployment PMCS after returning from any deployment requiring the LADS to be moved, set–up, operated for laundry processing, drained, and packed–up.

If you find something wrong when performing PMCS, fix it if you can, using troubleshooting procedures and/or maintenance procedures. If you do not have the tools required to perform a repair, or if repair is too difficult, notify DS maintenance.

The right–hand column of the PMCS table lists conditions that make the LADS not fully mission capable. Write up items not repaired on DA Form 2404 for maintenance. For further information on how to use this form, see DA PAM 738–750.

CORROSION PREVENTION AND CONTROL (CPC)

Corrosion Prevention and Control (CPC) of 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 can be made to prevent the problem in future items.

While corrosion is typically associated with rusting of metals, it can also include deterioration of other materials, such as rubber and plastic. Unusual cracking, softening, swelling, or breaking of these materials may be a corrosion problem.

If a corrosion problem is identified, it can be reported using Standard Form SF 368, Product Quality Deficiency Report. Use of keywords such as “corrosion”, “rust”, “deterioration”, or “cracking” will ensure that the information is identified as a CPC problem.

The form should be submitted to the address specified in DA PAM 738–750, The Army Maintenance Management System (TAMMS).

LEAKAGE DEFINITION

CAUTION

Equipment operation is allowable with minor leakages (Class I or II) except for fuel or thermal fluid leaks. Consideration must be given to the fluid capacity of the item or system being checked. When in doubt, ask your supervisor.

When operating with class I or II fluid leaks, continue to check fluid levels as required in your PMCS.

Class III leaks should be reported immediately to your supervisor.

It is necessary to know how fluid leakage affects the status of the LADS. The following are definitions of the classes of leakage an maintainer needs to know to be able to determine the condition of the leak. Learn and then be familiar with them, and REMEMBER – WHEN IN DOUBT, ASK YOUR SUPERVISOR.

Leakage definitions for Operator PMCS.

CLASS I – Seepage 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.

CLASS III – Leakage of fluid great enough to form drops that fall from the item being checked.

INSPECTION

Look for signs of a problem or trouble. Rely on your senses for help. You can feel, smell, hear, or see many problems. Be alert when inspecting LADS.

Inspect to see if items are in good condition. Are they correctly assembled, stowed, secured, excessively worn, leaking, corroded, or properly lubricated? Correct any problems found.

There are some common items to check all over the LADS. These include the following:

1. Bolts, clamps, nuts, and screws: Continuously check for looseness. Look for chipped paint, bare metal, rust, or corrosion around bolt and screw heads and nuts. Tighten them when you find them loose.

2. Welds: Many items on the LADS are welded. To check these welds, look for chipped paint, rust, corrosion, or gaps. When these conditions exist, repair as necessary.

3. Electrical wires, connectors, and harnesses: Tighten loose connectors. Look for cracked or broken insulation, bare wires and broken connectors. If any are found, repair as necessary.

4. Hoses and fluid lines: Look for wear, damage and leaks, and make sure clamps and fittings are tight. Wet spots mean a leak. A stain by a fitting or connector can also mean a leak. Correct any problems found.

LUBRICATION SERVICE INTERVALS

For safer, more trouble free operations, make sure that your LADS is serviced when it needs it.

Your LADS will require extra service and care when you operate under unusual conditions. High or low temperatures, long periods of hard use, or continued use in sand, water, mud, or snow will break down the lubricant, requiring you to add or change the lubricant more often.

UNIT

LAUNDRY ADVANCED SYSTEM

(NSN 3510–01–463–0114)

PREVENTIVE MAINTENANCE CHECKS and SERVICES (PMCS)
UNIT PMCS

INITIAL SETUP:

Tools
Tool Kit, General Mechanics
(Item 14, WP 0282 00)

Personnel Required
Two

Materials/Parts

Equipment Conditions
LADS power on at main control enclosure (WP 0113 00) for item 1

LADS power shut off at main control enclosure (WP 0113 00) for items 2 and 3

TABLE 1. Unit PMCS.

ITEM NO.	INTERVAL	MAN–HOUR	ITEM TO BE CHECKED OR SERVICED	PROCEDURE	EQUIPMENT NOT READY/ AVAILABLE IF:
1	Monthly		GFCI convenience outlet	a. Plug Auxillary Lighting into GFCI Outlet. Ensure light is on. b. Press “Test” button on GFCI Outlet. Light should go off. c. Press “Reset” button on GFCI outlet. Light should turn on. **NOTE** For remaining items, ensure power is shut off at main control enclosure	GFCI fails to test or reset.
2	Quarterly and Post–Deployment		Inverter enclosure demister mesh	Clean demister mesh (1). a. Loosen six 1/4–turn fasteners (2) to allow inlet duct (3) to swing down. b. Pull demister mesh (1) out of inlet duct (3). c. Rinse demister mesh (1) with water until all dirt is removed. Let air dry d. Inspect demister mesh (1) for obvious damage. Replace if damaged. e. Install demister mesh (1) into inlet duct (3). f. Push up on inlet duct (3) until it mates with inverter enclosure (4), then tighten six 1/4–turn fasteners (2).	Demister mesh is damaged or not clean
3	Quarterly and Post–Deployment		Fuel Tank	Replace fuel/water separator element (WP 0263 00).	Element is contaminated.

The callouts on this illustration match the callouts in the QUARTERLY PMCS for item number 1.

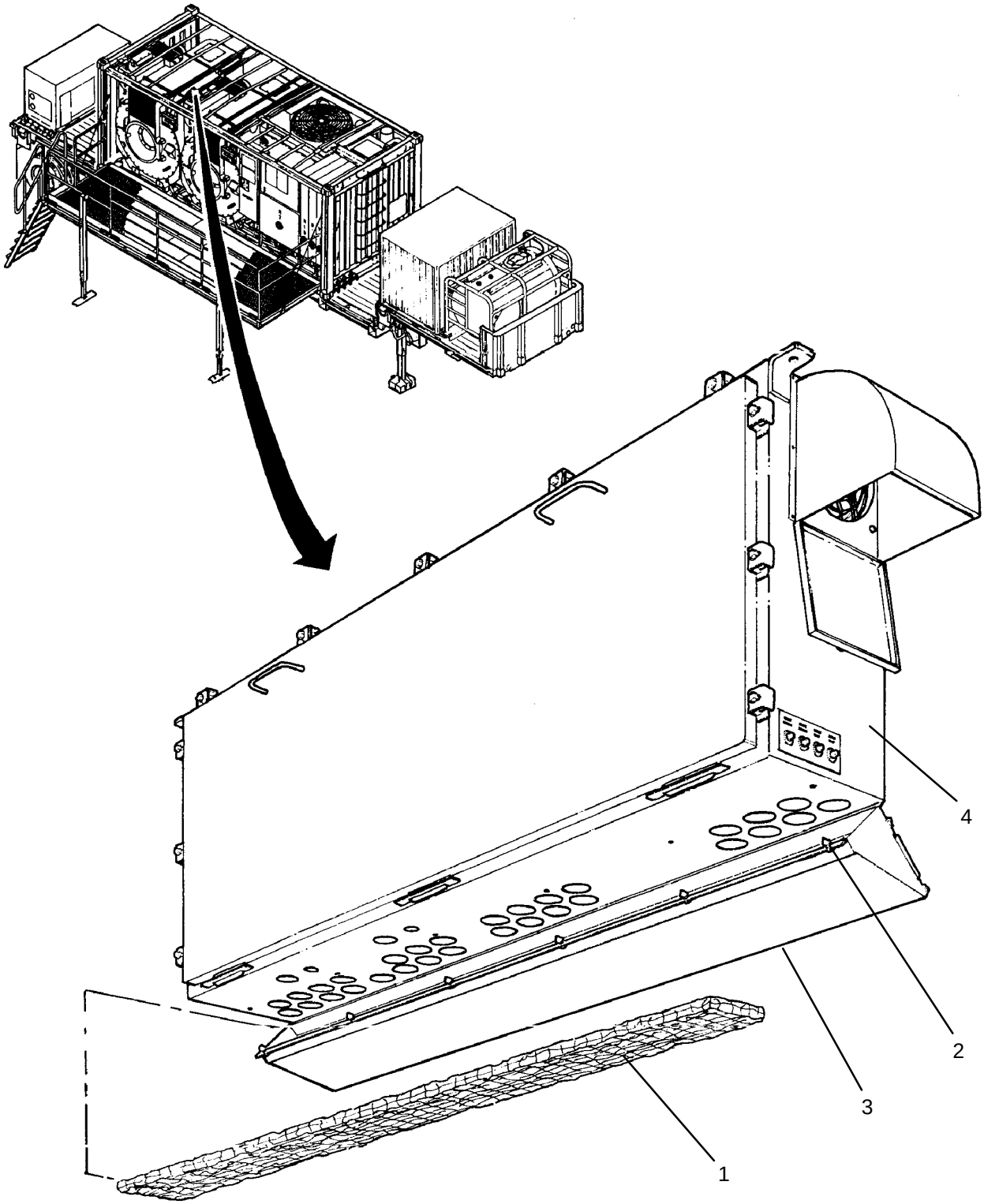


TABLE 1. Unit PMCS – Continued.

ITEM NO.	INTERVAL	MAN–HOUR	ITEM TO BE CHECKED OR SERVICED	PROCEDURE	EQUIPMENT NOT READY/ AVAILABLE IF:
3	Annually		Washing/drying drums	Inspect drive belts for wear. Replace if cracks, fraying, or worn cogs are found. Check belt tension and alignment of sheaves (WP 0118 00). Inspect brake pads (1) and brake rotor (2) for wear and scouring. a. Remove four screws (3) and lock washers (4). b. Remove brake guard (5). c. Measure thickness of brake pads (1). Replace if worn (WP 0121 00). d. Inspect surface of brake rotor (2) for cracks and scouring. Replace if damaged (WP 0268 00). e. Ensure arms (6) of caliber (7) pivot back and forth freely. f. Reinstall brake guard (5) and secure with four screws (2) and lock washers (3).	Drive belt worn, loose, or misaligned Brake pad thickness is < 11/32 inches. Brake rotor is cracked or scoured. Caliper arms are bound up.

The callouts on this illustration match the callouts in the ANNUAL PMCS for item number 3.

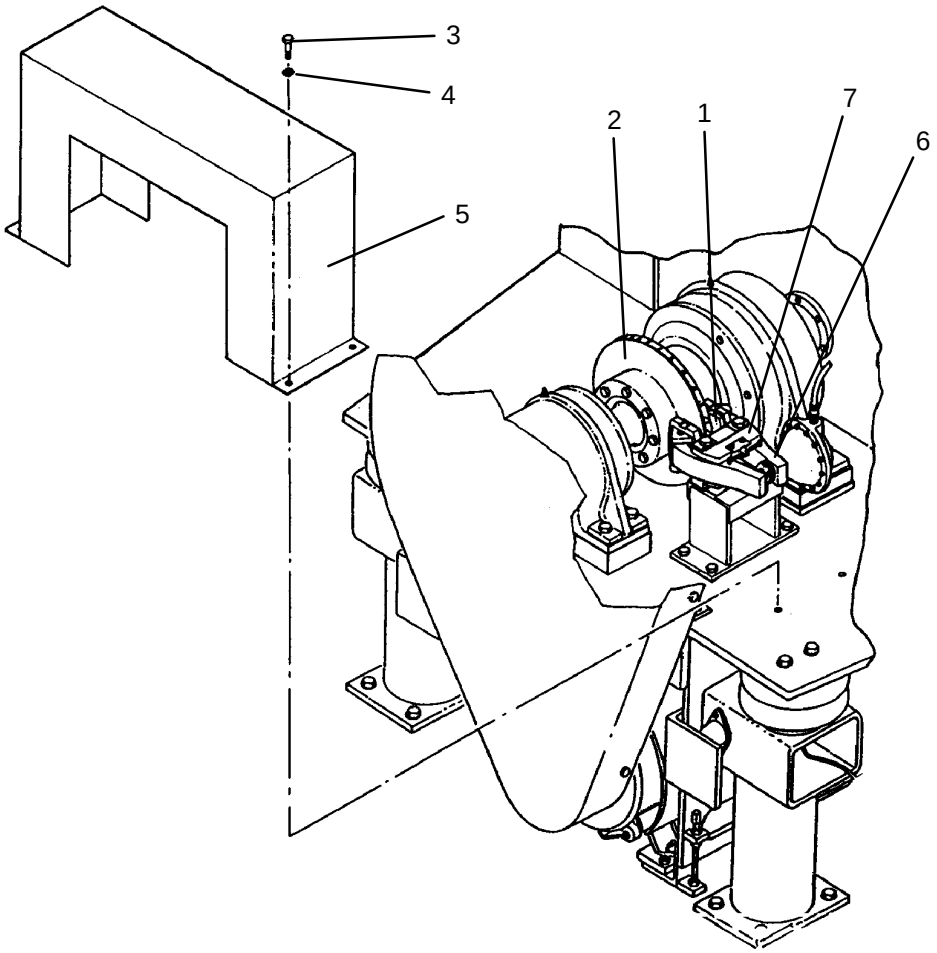


TABLE 1. Unit PMCS.

ITEM NO.	INTERVAL	MAN–HOUR	ITEM TO BE CHECKED OR SERVICED	PROCEDURE	EQUIPMENT NOT READY/ AVAILABLE IF:
4	Annually or Post–Deployment		Washing/drying drums suspension	Inspect air bags (1) for wear. Replace if cracks or other surface defects are found (WP 0139 00) or (WP 0140 00).	Air bags are worn.
				Inspect front side–to–side vibration eliminators (2) for wear and preload. Attempt to spin eliminators on both sides of drum. If both eliminators spin, replace (WP 0142 00).	Vibration eliminators are worn.
				Inspect rear side–to–side vibration eliminators (3) for wear. Push each mount against pedestal (4) and measure clearance. Replace eliminators if total clearance for both eliminators exceeds 3/4 inches (WP 0143 00).	Vibration eliminators are worn.
				Inspect front shock absorbers (5). Disconnect one end of shock. Attempt to extend and retract by hand. Replace if shock offers little resistance or reattach if resistance is acceptable (WP 0137 00).	Shock absorber(s) are worn.
				Inspect rear front–to–back vibration eliminators (6) for wear. Replace if metal insert (7) at front of mount is exposed. (WP 0144 00).	Vibration eliminators are worn.

The callouts on these illustrations match the callouts in the ANNUAL PMCS for item number 4.

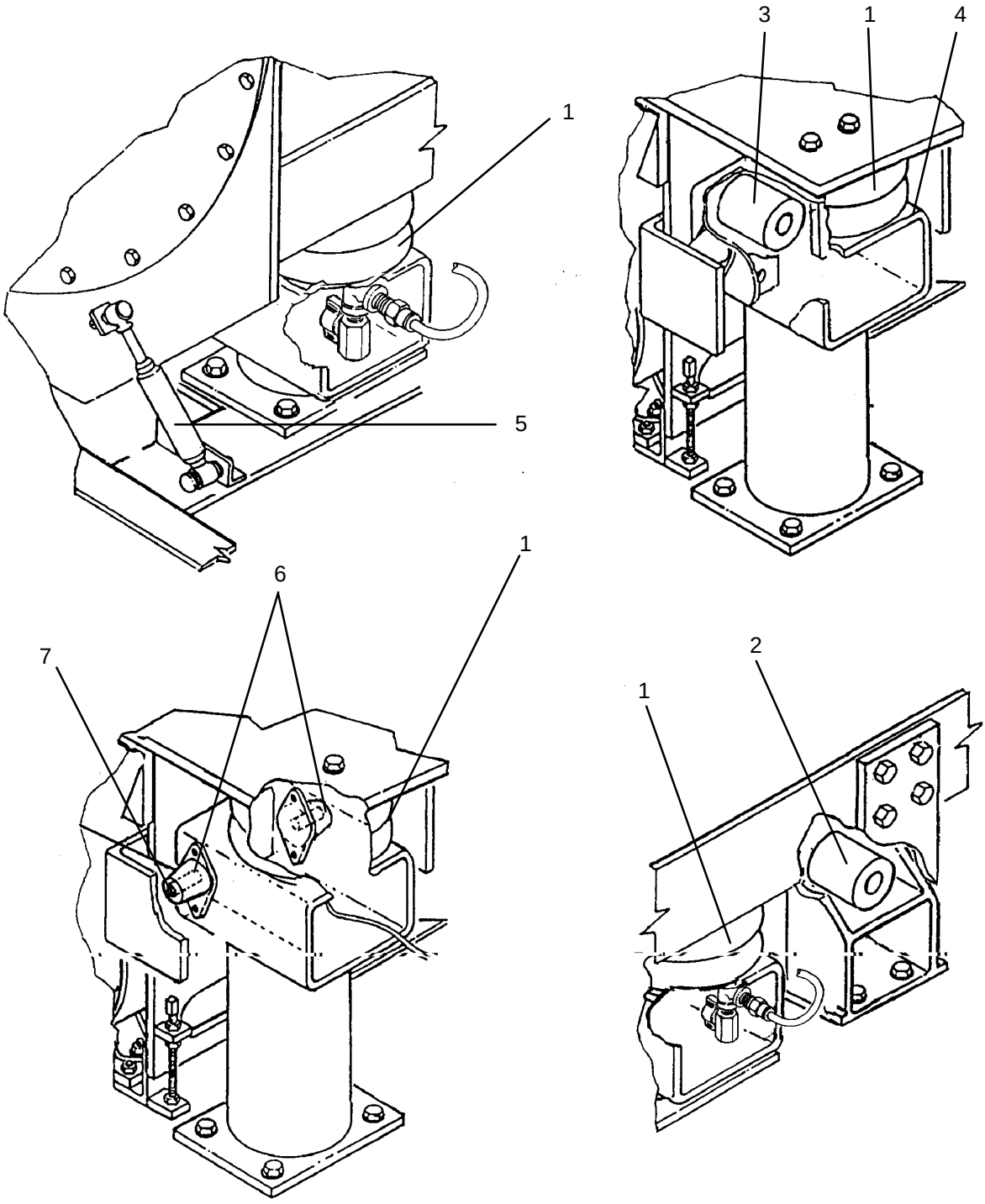


TABLE 1. Unit PMCS.

ITEM NO.	INTERVAL	MAN–HOUR	ITEM TO BE CHECKED OR SERVICED	PROCEDURE	EQUIPMENT NOT READY/ AVAILABLE IF:
5	Annually or Post–Deployment		Washing/Drying system	Inspect welds on washing/drying drums (1) and drum pedestals (2).	Cracks in welds are present.
				Inspect security of drum pedestals (2). Verify pedestals are not damaged.	Pedestals are loose or damaged.
				Inspect security of doors (3). Verify windows (4) and gaskets (5) are not damaged.	Doors are loose or windows or gaskets are damaged.
				Inspect walls of water tank (6).	Water tank walls are damaged or leaking.
				Inspect security of water tank (6).	Water tank is loose.
				Inspect sight glasses (7) on water tank (6) for security and damage.	Sight glasses are loose or damaged.
				Inspect security of water pumps (8).	Pumps are loose.
				Inspect conduit (9) for rubbing and loose connections.	Conduit is loose or rubbing.
				Inspect water plumbing (10) for loose hose and fitting connections, rubbing hoses or piping, and loose clamps.	Connections are loose, clamps are loose, or hoses and piping are rubbing.

The callouts on these illustrations match the callouts in the ANNUAL PMCS for item number 5.

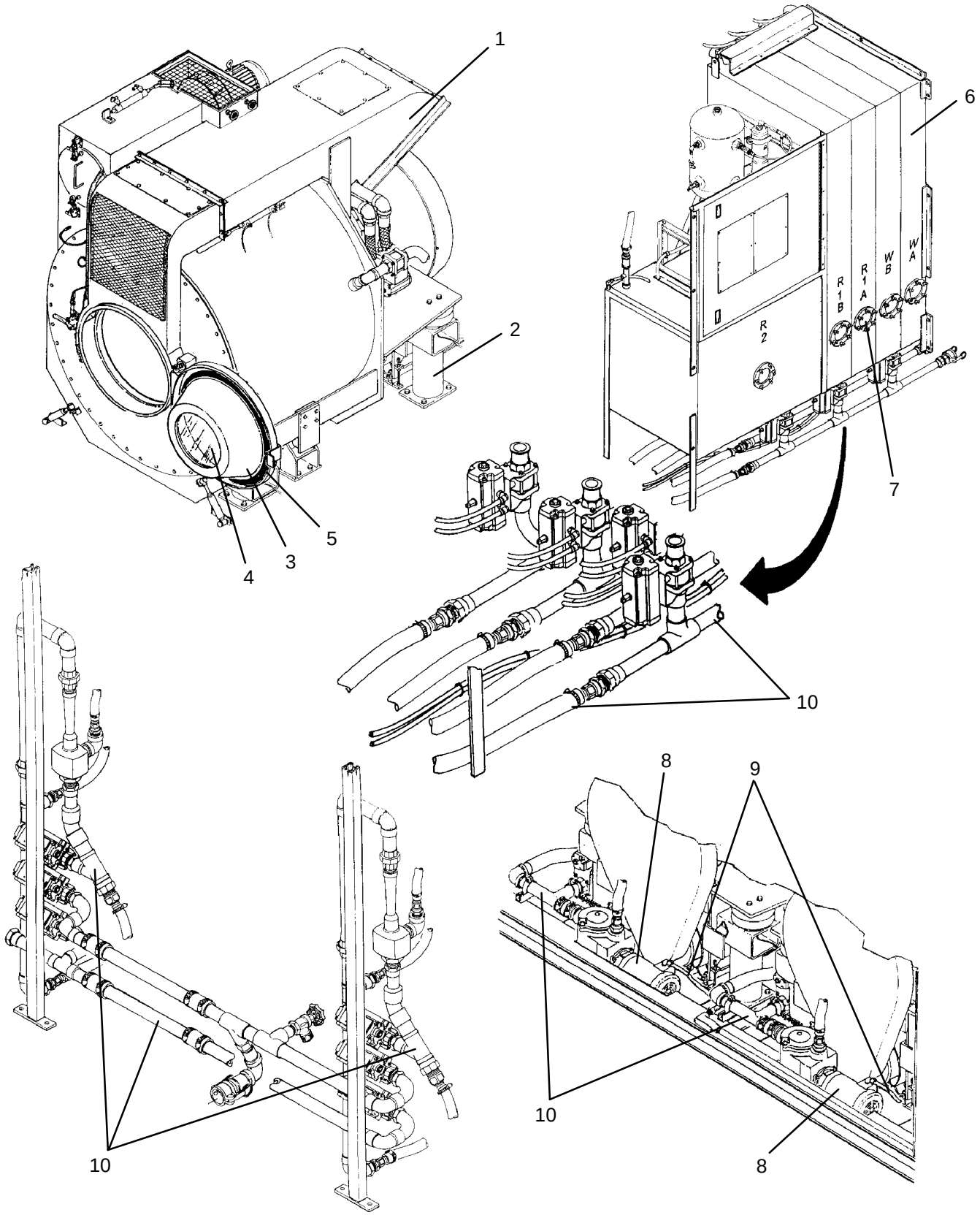


TABLE 1. Unit PMCS – Continued.

ITEM NO.	INTERVAL	MAN–HOUR	ITEM TO BE CHECKED OR SERVICED	PROCEDURE	EQUIPMENT NOT READY/ AVAILABLE IF:
6	Annually or Post–Deployment		Water Recycle System	Inspect welds on still (1), still condenser (2), and distillate frame (3).	Cracks in welds are present.
				Inspect security of still (1), still condenser (2), and distillate frame (3).	Components are loose.
				Inspect door arms (4) and knobs (5) on still doors (6) for loose connections.	Arms or knobs are loose.
				Inspect for bent pins (7) on door locks (8). Ensure pins engage properly with door arms (4).	Door lock pins are bent or do not engage door arms.
				Inspect relief valve piping (9) for security.	Relief valve piping is loose.
				Inspect sight glass (10) for security and damage.	Sight glass is loose or damaged.
				Inspect still condenser fan blade (11) for damage.	Fan blade is damaged.
				Inspect heat exchangers (12) and subcooler (13) for bent or damaged fins. Straighten fins if necessary.	Fins are bent over, blocking air flow.
				Inspect steam piping (14) and insulation (15) between still (1) and still condenser (2).	Steam piping is loose or insulation is damaged or not covering piping.
				Inspect condensate drain plumbing (16) and distillate plumbing (17) for loose hose and fitting connections, rubbing hoses or piping, and loose clamps.	Connections are loose, clamps are loose, or hoses and piping are rubbing.
				Inspect security of pre–filter (18) and coalescer (19).	Components are loose.
				Inspect conduit (20) for rubbing and loose connections.	Conduit is loose or rubbing.

The callouts on these illustrations match the callouts in the ANNUAL PMCS for item number 6.

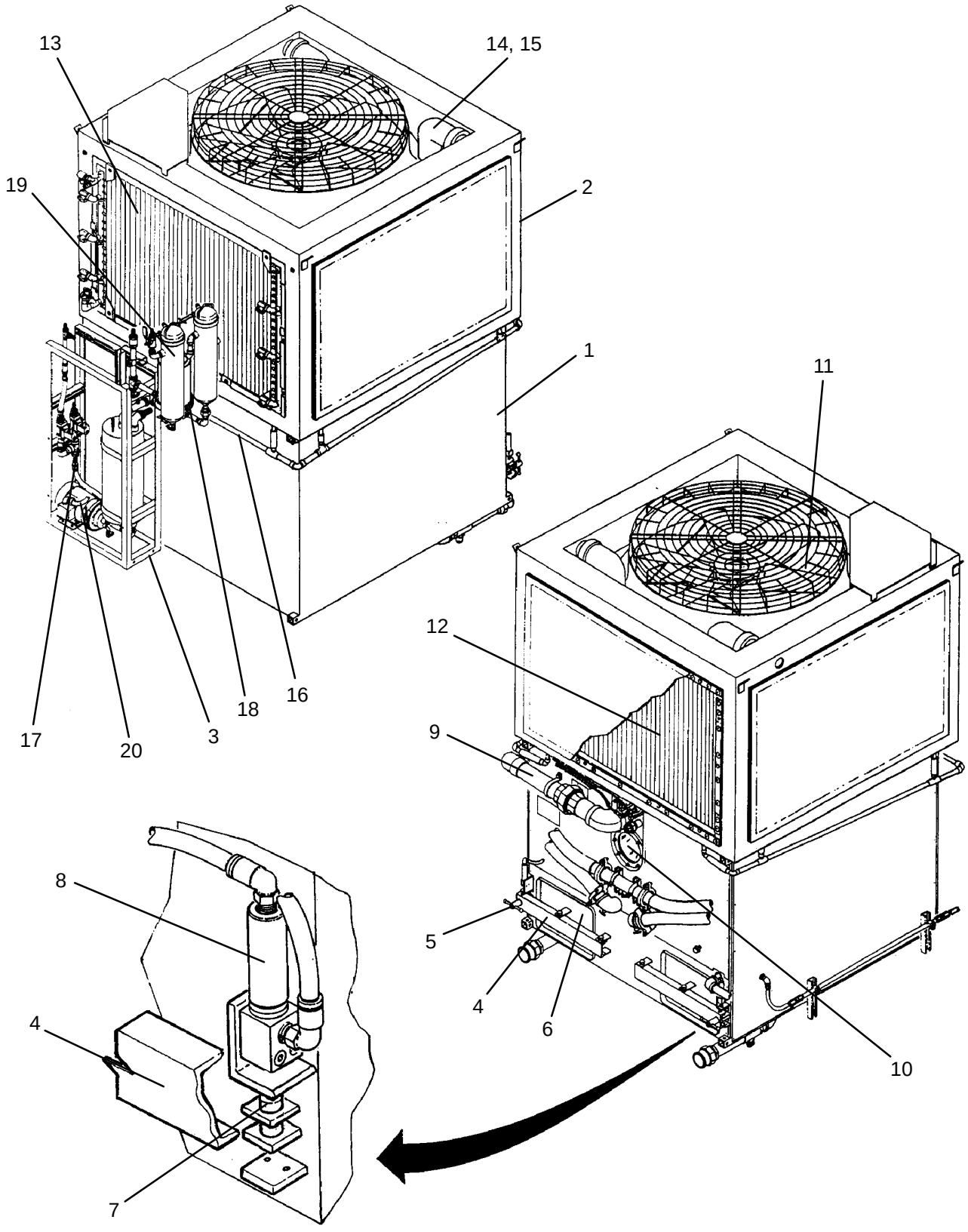


TABLE 1. Unit PMCS – Continued.

ITEM NO.	INTERVAL	MAN–HOUR	ITEM TO BE CHECKED OR SERVICED	PROCEDURE	EQUIPMENT NOT READY/ AVAILABLE IF:
7	Annually or Post–Deployment		Heating System	Inspect welds on heater frame (1) and expansion tank (2).	Cracks in welds are present.
				Check security of heater frame (1).	Heater is loose.
				Inspect chimney (3) and extension (4) for damage.	Chimney or extension are loose or bent.
				Inspect electrical enclosure (5) for security. Ensure door (6) seals properly and inside of enclosure shows no evidence of water.	Door does not seal or water is entering enclosure.
				Inspect electrical enclosure (5) and conduit (7) for loose connections, rubbing wires, and loose clamps.	Connections are loose, clamps are loose, or conduit or wiring is rubbing.
				Inspect thermal fluid plumbing (8) for leaking hose and fitting connections, rubbing hoses or piping, and loose clamps.	Connections are leaking, clamps are loose, or hoses and piping are rubbing.
				Inspect fuel plumbing (9) for loose tubing and fitting connections, rubbing tubing or piping, and loose clamps.	Connections are loose, clamps are loose, or tubing and piping are rubbing.
				Check thermal fluid level in expansion tank (WP 0168 00).	Thermal fluid level is low.
				Replace heater fuel filter element (WP 0175 00).	Filter is contaminated.
				Clean and inspect burner fuel filter (WP 0181 00).	Burner fuel filter is not clean.

The callouts on this illustration match the callouts in the ANNUAL PMCS for item number 7.

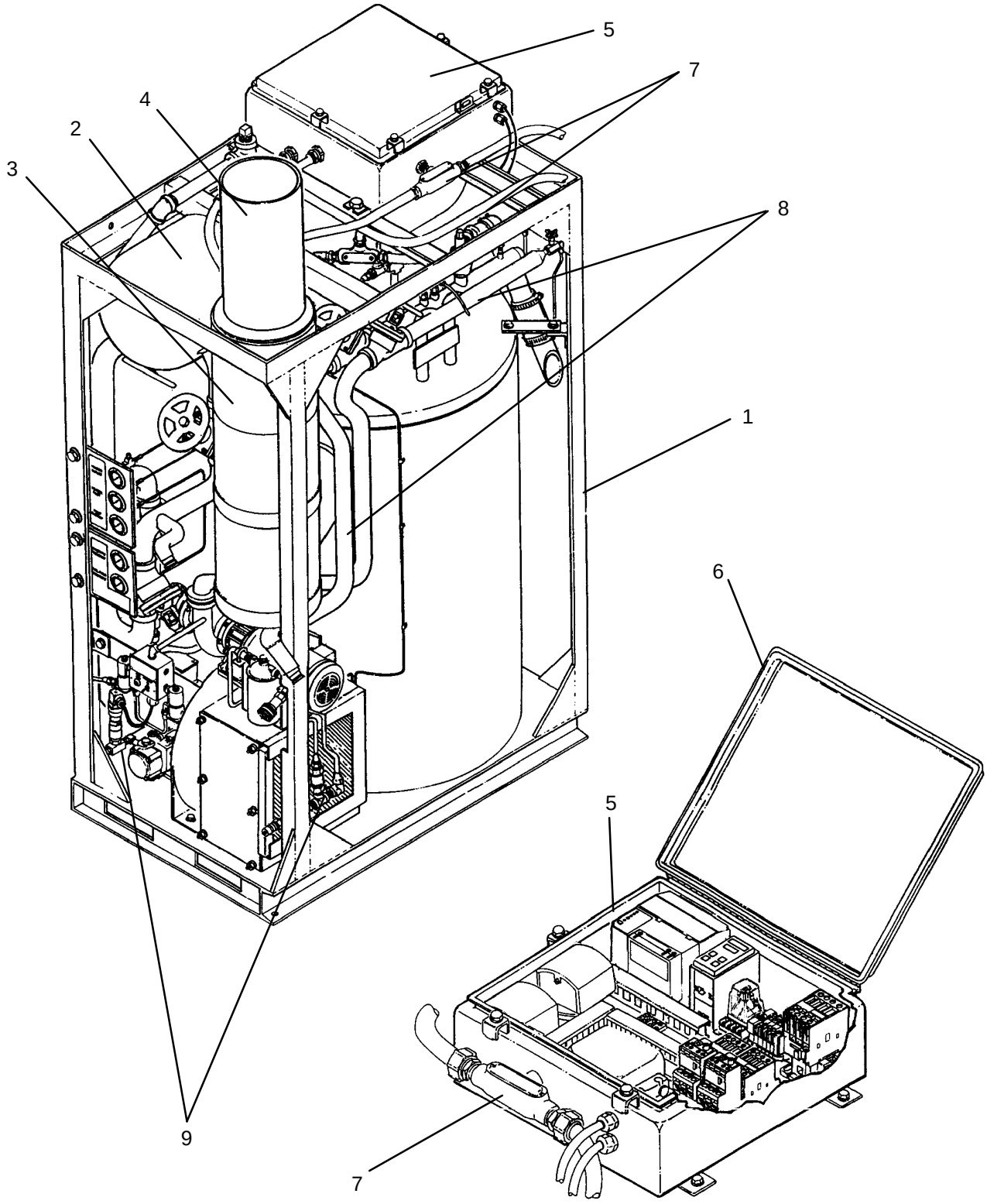


TABLE 1. Unit PMCS – Continued.

ITEM NO.	INTERVAL	MAN–HOUR	ITEM TO BE CHECKED OR SERVICED	PROCEDURE	EQUIPMENT NOT READY/ AVAILABLE IF:
8	Annually or Post–Deployment		Air System	Inspect welds on air system frame (1) and air tank (2).	Cracks in welds are present.
				Inspect security of air tank (2), compressor (3), outlet filter (4), dehydrator (5), and orifice manifold (6).	Components are not secured.
				Inspect air tubes (7) for rubbing and loose connections.	Connections are loose or tubing is rubbing.
				Inspect conduit (8) for rubbing and loose connections. Verify security of clamp (9).	Conduit is loose or rubbing or clamp is loose.
				Replace orifice manifold inlet filter (WP 0212 00).	Filter is contaminated.

The callouts on this illustration match the callouts in the ANNUAL PMCS for item number 8.

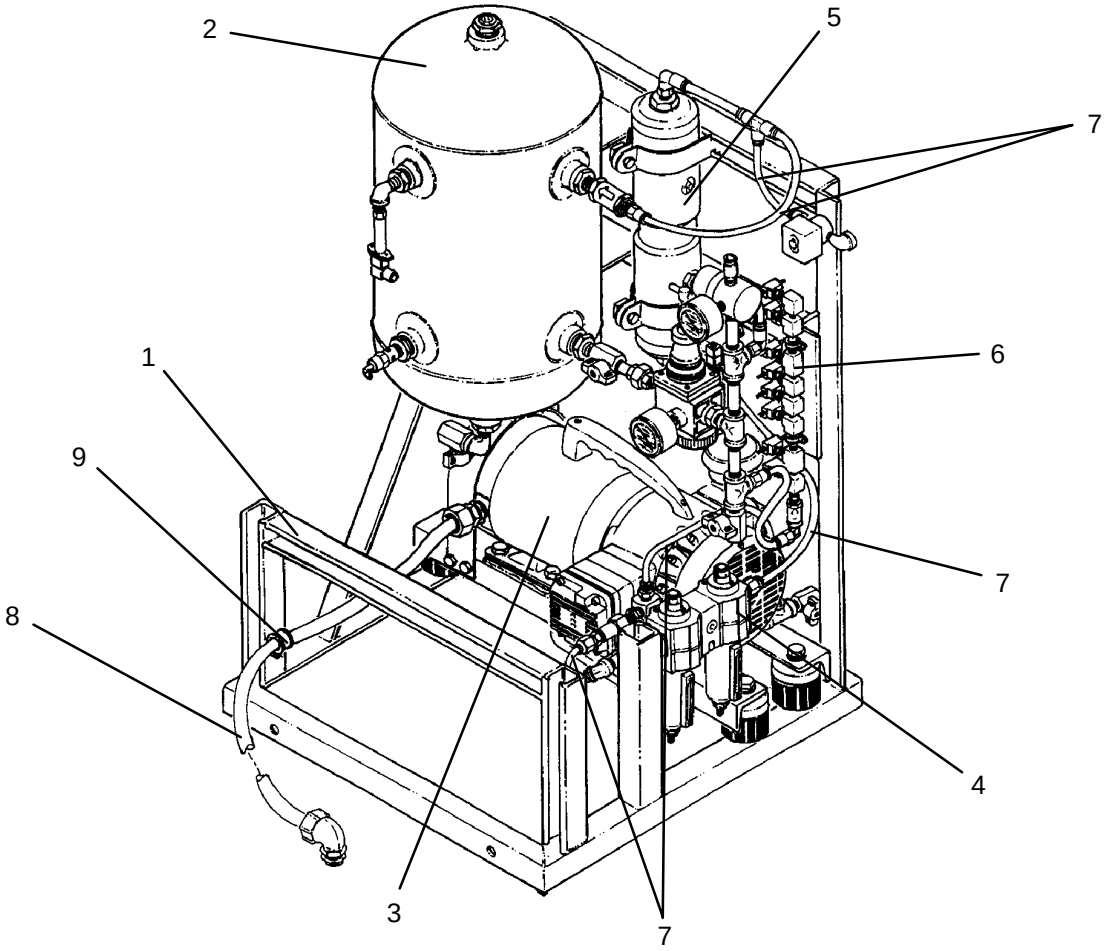


TABLE 1. Unit PMCS – Continued.

ITEM NO.	INTERVAL	MAN–HOUR	ITEM TO BE CHECKED OR SERVICED	PROCEDURE	EQUIPMENT NOT READY/ AVAILABLE IF:
9	Annually or Post–Deployment		Control System	Inspect welds on main control enclosure (1), operator panels (2) and inverter enclosure (3).	Cracks in welds are present.
				Inspect all enclosures for security. Ensure doors (4) or panels (5) seal properly and inside of enclosures show no evidence of water.	Doors or panels do not seal or water is entering enclosure.
				Inspect enclosures and conduit/cables (6) for loose connections, rubbing wires, and loose clamps.	Connections are loose, clamps are loose, or wiring is rubbing.
				Inspect inside enclosures for loose components, loose connections, or rubbing wires. Verify wire ducts (7) and duct covers (8) are secure.	Components or connections are loose, wiring is rubbing, or wire duct is loose.
				Inspect inlet duct (9) and outlet duct (10) for security. Ensure each opens and closes properly.	Ducts cannot be opened and closed.

The callouts on these illustrations match the callouts in the ANNUAL PMCS for item number 9.

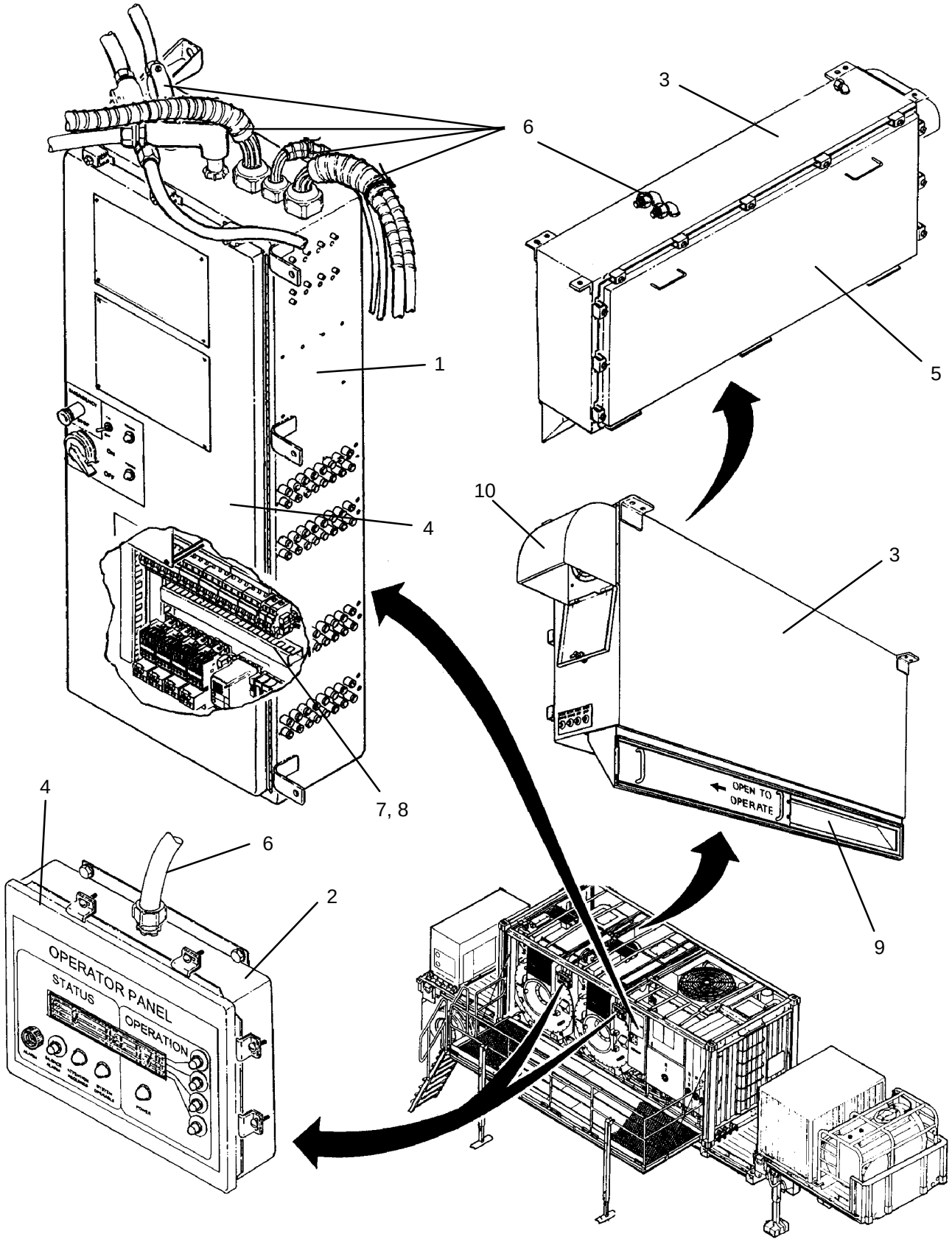


TABLE 1. Unit PMCS – Continued.

ITEM NO.	INTERVAL	MAN–HOUR	ITEM TO BE CHECKED OR SERVICED	PROCEDURE	EQUIPMENT NOT READY/ AVAILABLE IF:
10	Annually		ISO Frame	Inspect welds on ISO frame (1) and all structural support brackets. Ensure brackets (2), (3), (4), (5), and (6) are secure.	Cracks in welds are present. Brackets are loose.

The callouts on these illustrations match the callouts in the ANNUAL PMCS for item number 10.

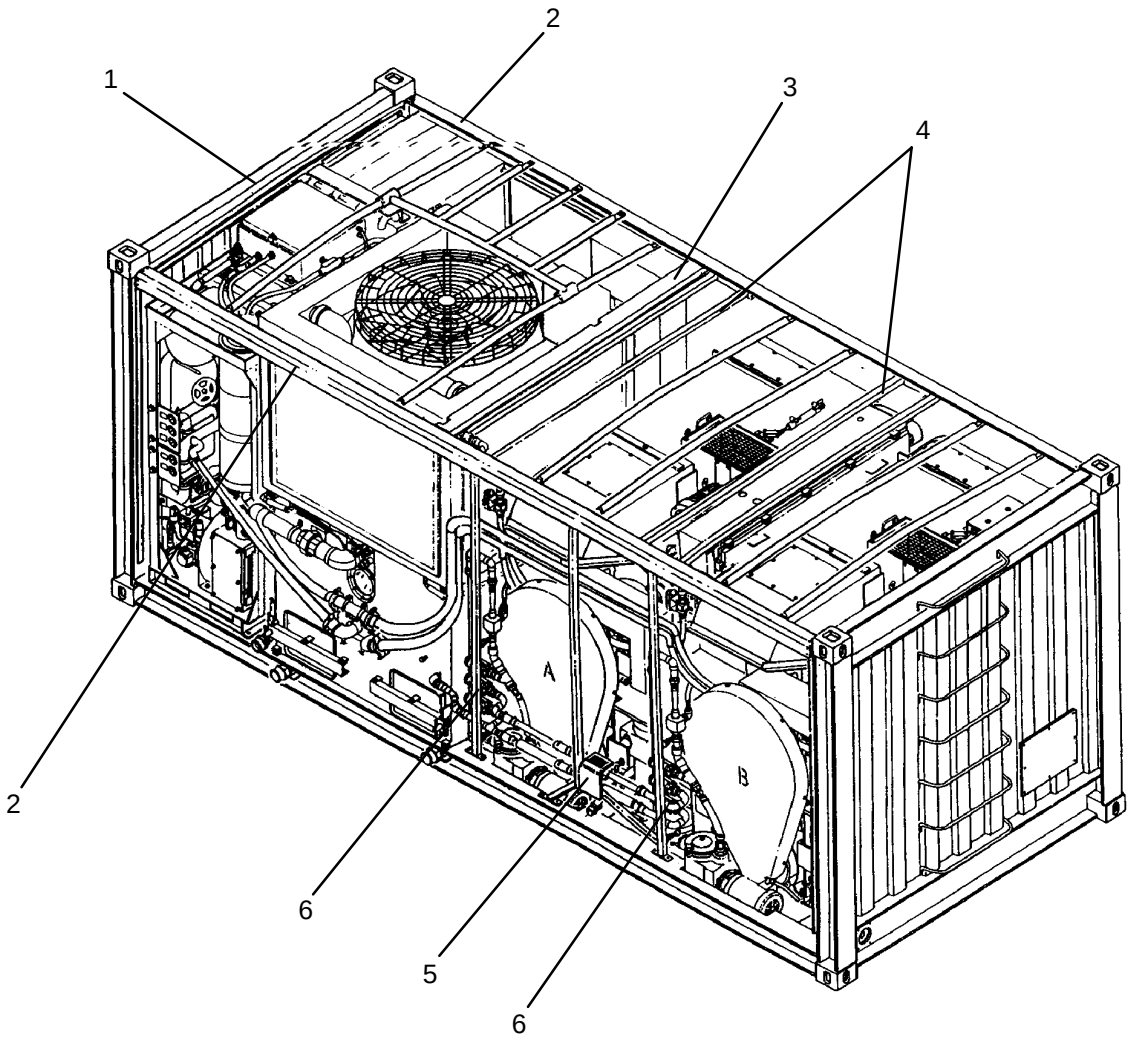


TABLE 1. Unit PMCS – Continued.

ITEM NO.	INTERVAL	MAN–HOUR	ITEM TO BE CHECKED OR SERVICED	PROCEDURE	EQUIPMENT NOT READY/ AVAILABLE IF:
11	Annually or Post–Deployment		Fuel Tank	Inspect welds on fuel tank (1).	Cracks in welds are present.
				Inspect tank shell (2) for leaks or damage.	Cracks in welds are present.
				Verify plugs (3) are installed in fill ports (4) and drain port (5).	Plugs are missing.
				Inspect manhole cover (6) for security.	Cover is loose.
				Inspect gasket (7) for cuts or tears.	Gasket is damaged.
				Inspect ground lug (8) for security.	Ground lug is loose or missing.
				Inspect fuel plumbing for loose tubing (9) and fitting connections (10).	Connections or tubing are loose or damaged.

The callouts on these illustrations match the callouts in the ANNUAL PMCS for item number 11.

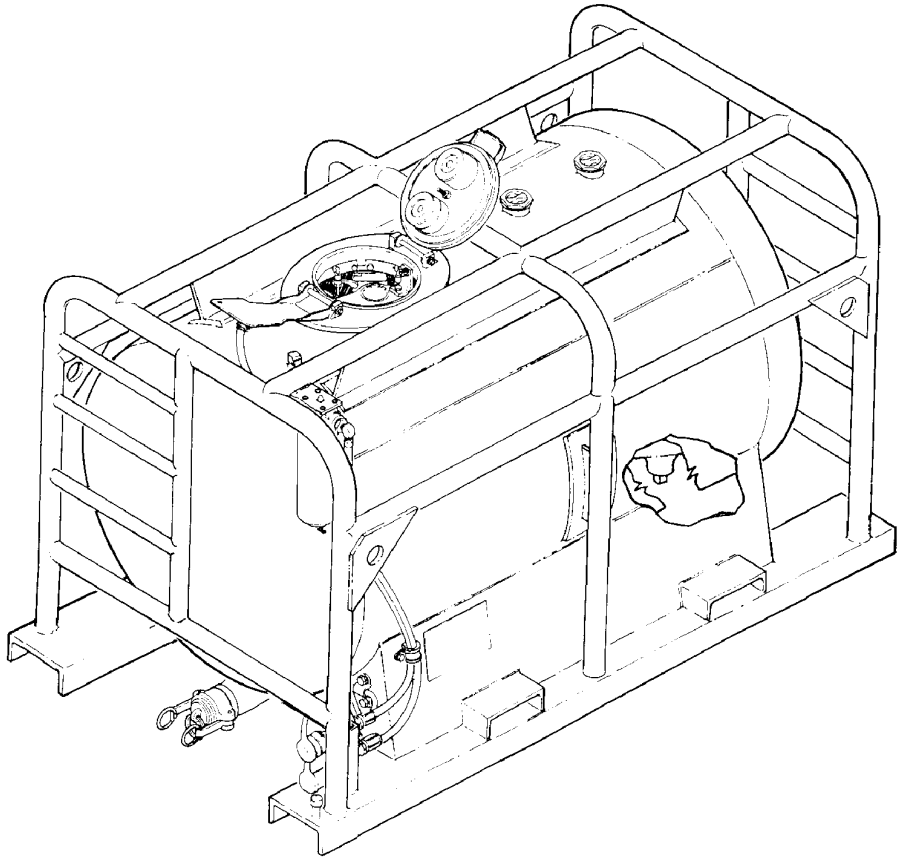
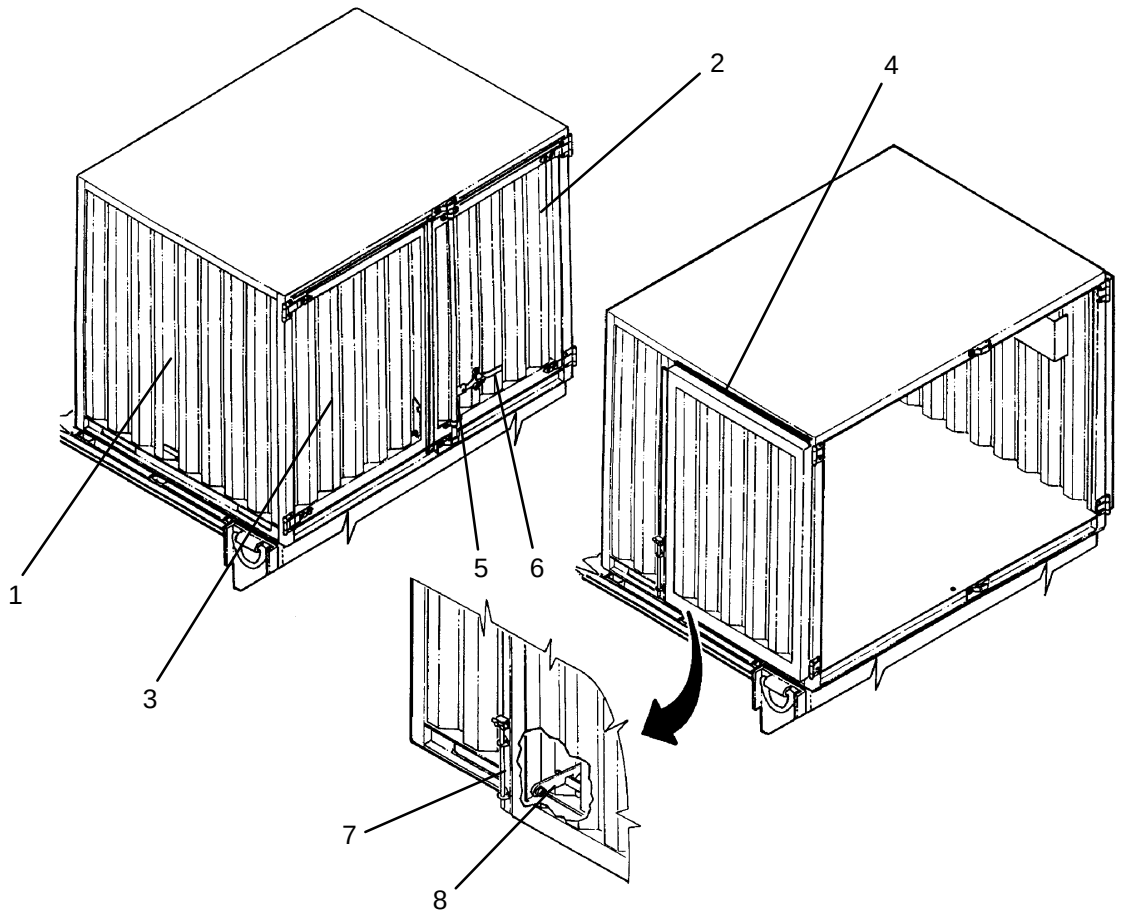


TABLE 1. Unit PMCS – Continued.

ITEM NO.	INTERVAL	MAN–HOUR	ITEM TO BE CHECKED OR SERVICED	PROCEDURE	EQUIPMENT NOT READY/ AVAILABLE IF:
12	Annually or Post–Deployment		Storage Locker	Inspect welds on locker walls (1) and doors (2 and 3).	Cracks in welds are present.
				Inspect doors (2 and 3) for security.	Doors are loose.
				Inspect door seal (4) for security, cuts, or tears.	Gasket is loose or damaged.
				Inspect locking rod (5) and handle (6) for security.	Locking rod or handle are loose.
				Inspect cane lock (7) for security.	Cane lock is missing or loose.
				Inspect door holders (8) for security and damage.	Door holders are loose or bent.

The callouts on these illustrations match the callouts in the ANNUAL PMCS for item number 12.



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UNIT

LAUNDRY ADVANCED SYSTEM

(NSN 3510–01–463–0114)

SECURING LADS ELECTRICAL POWER

INITIAL SETUP:

Tools
Multimeter (Item 8, WP 0282 00)
Padlock (Item 12, WP 0282 00)

Personnel Required

Materials/Parts

Equipment Conditions

WARNING

This procedure is used to prevent electrical power from inadvertently being applied while maintenance is being performed on LADS equipment. When LADS electrical power is secured using this procedure, 208 VAC electrical power will still be applied to input side of disconnect switch at main electrical enclosure.

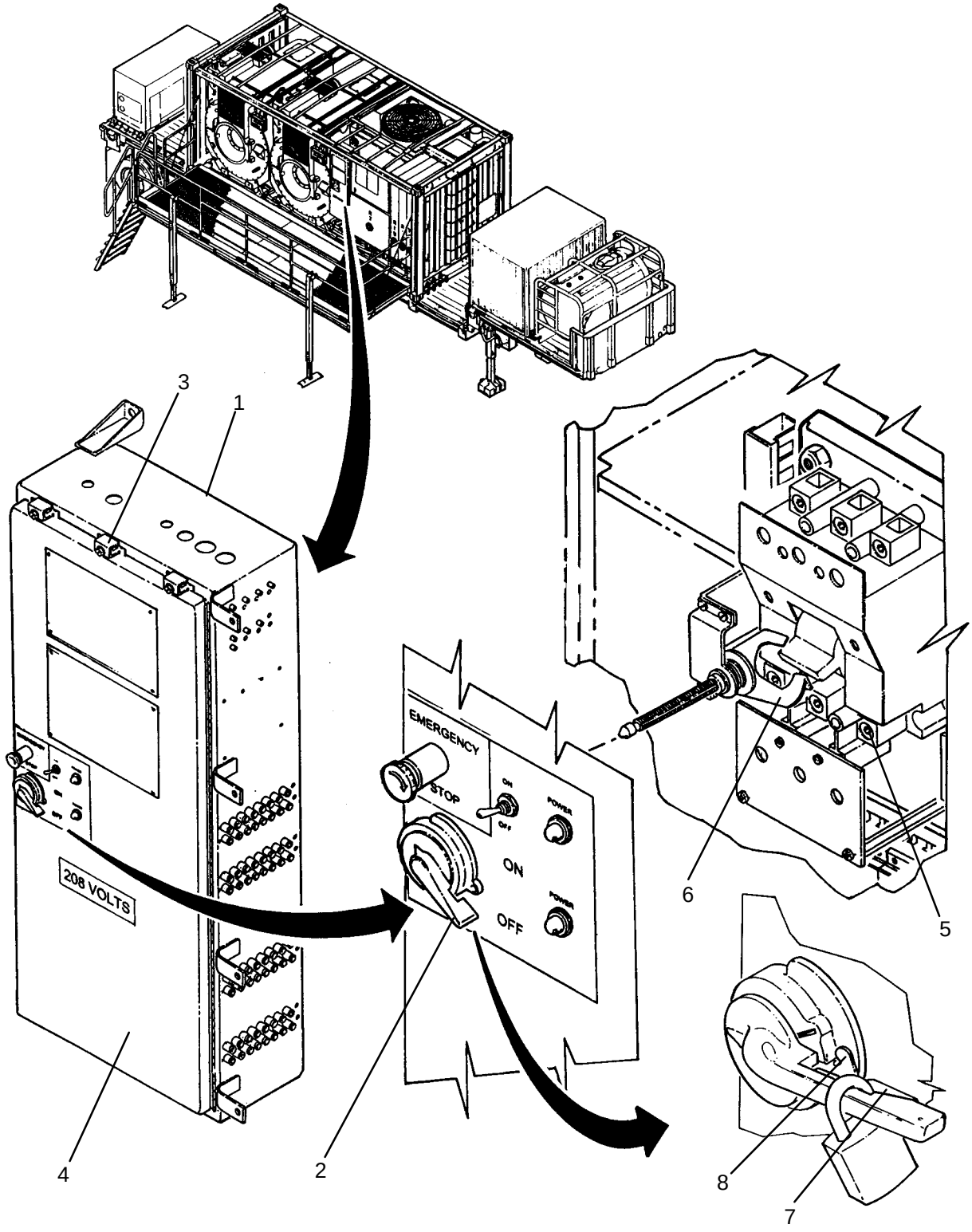
1. Position CONTROL POWER switch (WP 0009 00, Figure 1, 3) to OFF.
2. At main control enclosure (1) turn handle (2) past OFF position.
3. Loosen eleven latches (3), then open door (4) on main control enclosure (1).
4. Using a multimeter, verify that voltage is not present at output terminals (5) of disconnect switch (6).

NOTE

If maintenance is to be performed inside main control enclosure, the remaining portion of this procedure need not be completed.

5. Turn handle (2) CW, then close door (4).
6. Secure door (4) to main control enclosure (1) by tightening eleven latches (3).
7. Push out on lever (7) so that it engages with notch (8).
8. Insert a padlock between lever (7) and handle (2).

Securing Lads Electrical Power – Continued



END OF WORK PACKAGE

UNIT

LAUNDRY ADVANCED SYSTEM

(NSN 3510–01–463–0114)

VENTING AIR PRESSURE

INITIAL SETUP:

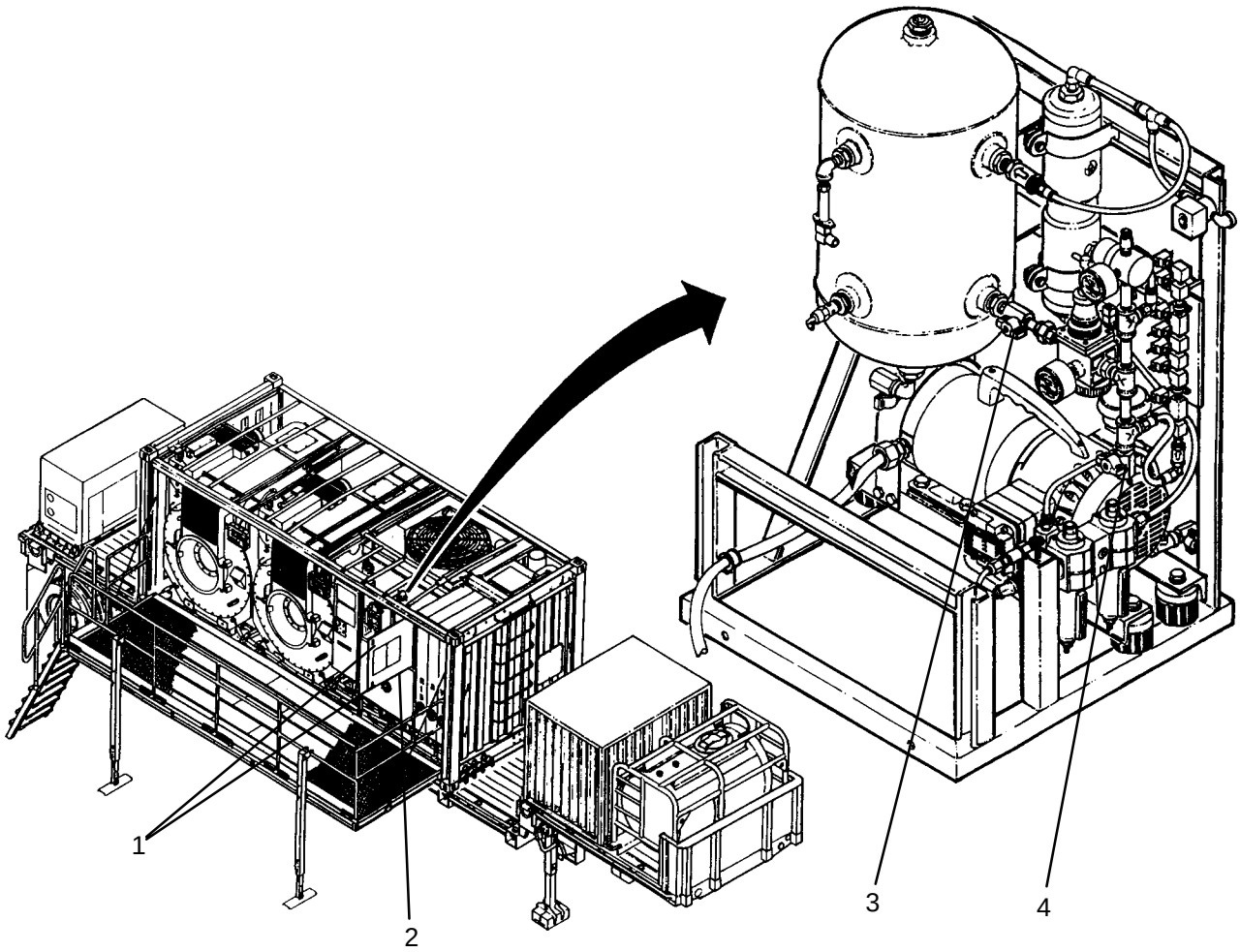
Tools

Personnel Required

Materials/Parts

Equipment Conditions
LADS power shut off at main control enclosure (WP 0113 00).

1. Disengage two latches (1), then open access door (2).
2. Ensure manual valve (3) is open.
3. Open valve (4), allow product air to vent, then close valve.



END OF WORK PACKAGE

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UNIT

LAUNDRY ADVANCED SYSTEM

(NSN 3510–01–463–0114)

DRAINING WATER TANKS

INITIAL SETUP:

Tools
Adapter, Air Tube (Item 1, WP 0282 00)
Tool Kit, General Mechanics
(Item 14, WP 0282 00)

Personnel Required

Materials/Parts

Equipment Conditions
Power must be applied at main control enclosure (WP 0113 00).

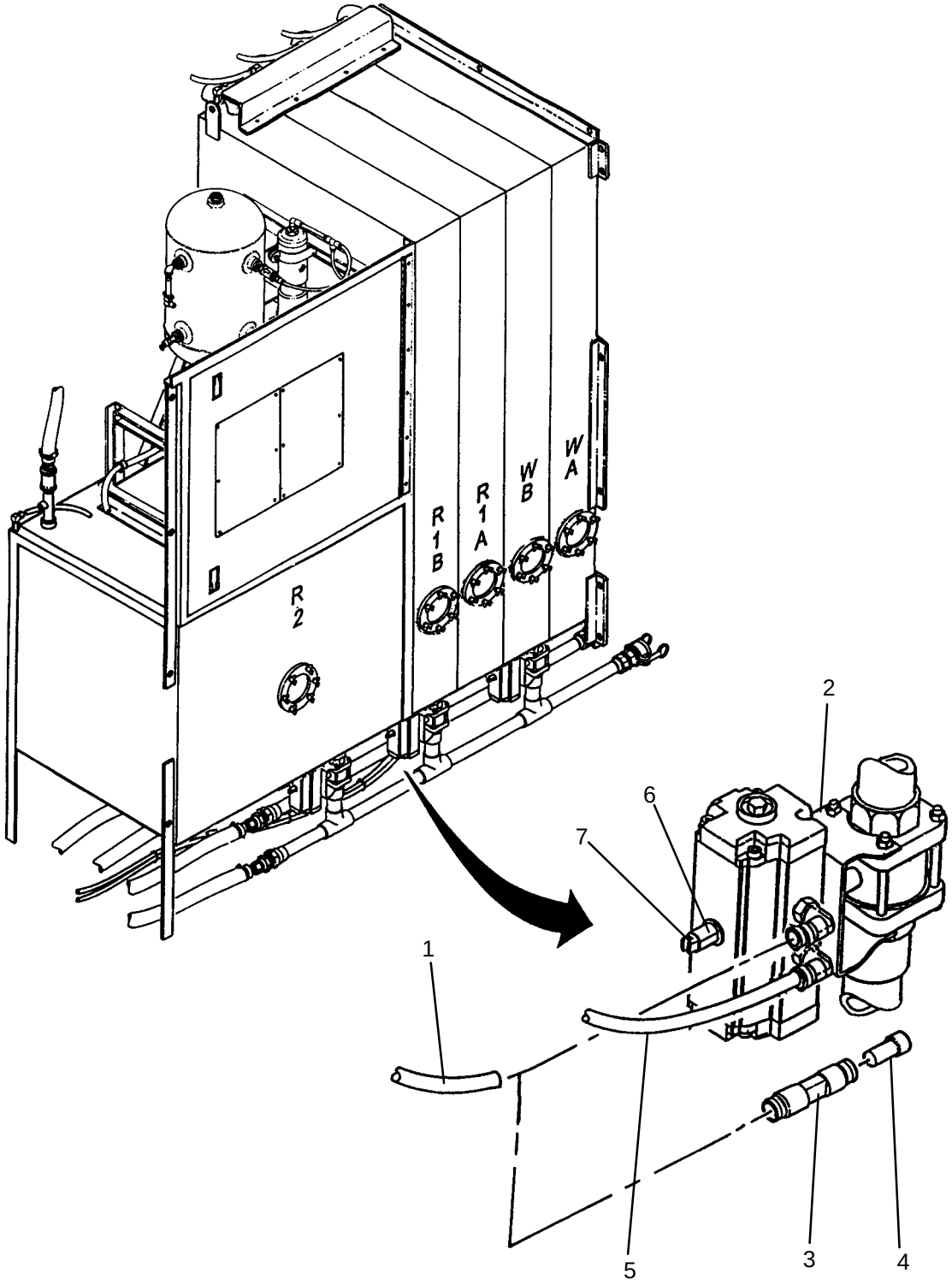
NOTE

If water tanks are being drained so that a faulty control valve can be replaced on water manifolds under tank, it may be necessary to manually open the faulty control valve.

NOTE

Tubes connected to water control valves where you **can not** see the elbows on the front of the valve have the exhaust ”E” tube at the top. Tubes connected to valves where you **can** see the elbows have the exhaust ”E” tube at the bottom.

1. If a control valve is being replaced on a suction or discharge manifold under water tanks, and valve is failed in the closed position, continue to step 2, otherwise proceed to step 8.
2. Tag and disconnect pressure air tube (1) on faulty control valve (2) then install a splice connector (3) on air tube and plug (4) into splice connector.
3. Use maintenance menu to pressurize air system (WP 0010 00).
4. Use maintenance menu to access control outputs function (WP 0010 00). Open faulty control valve (2).
5. Tag and disconnect exhaust air tube (5) on faulty control valve (2) then install a splice connector (3) on air tube and plug (4) into splice connector.
6. Use maintenance menu to access control outputs function (WP 0010 00). Close faulty control valve (2).
7. Manually open faulty control valve (2) by rotating stem (6) so that slot (7) is vertical.
8. Perform a DRAIN CYCLE (TM 10–3510–221–10).



END OF WORK PACKAGE

UNIT

LAUNDRY ADVANCED SYSTEM

(NSN 3510–01–463–0114)

MOTOR COOLING FAN (M106) REPLACEMENT REMOVAL, INSTALLATION

INITIAL SETUP:

Tools
Tool Kit, General Mechanics
(Item 14, WP 0282 00)

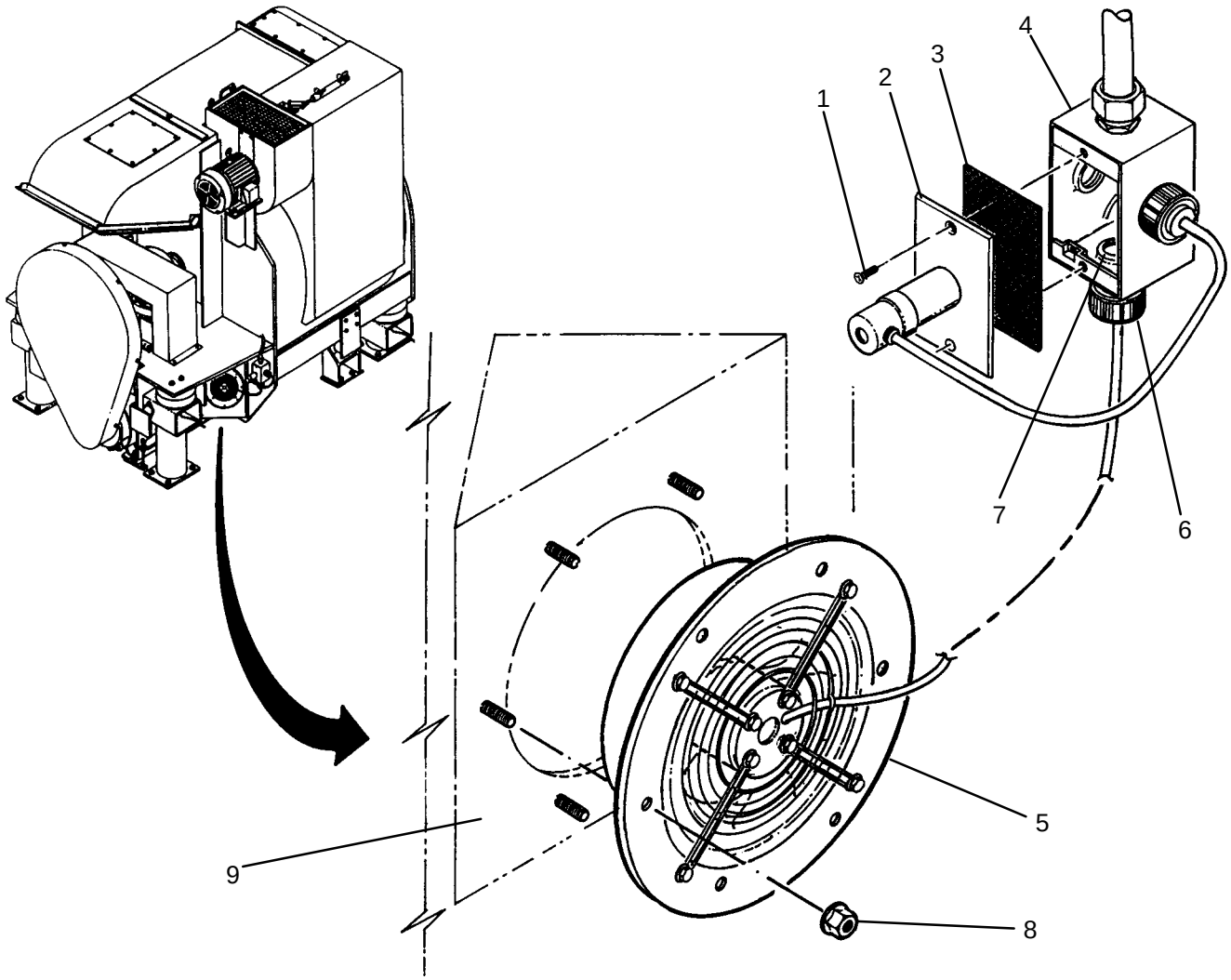
Personnel Required

Materials/Parts

Equipment Conditions
LADS power shut off at main control enclosure (WP 0113 00).

REMOVAL

1. Remove two screws (1), then remove cover (2) and gasket (3) from outlet box (4).
2. Tag and disconnect wires for cooling fan (5).
3. Loosen nut (6) on cord grip (7), then pull wires for cooling fan (5) out of outlet box (4).
4. Remove six locknuts (8), then remove cooling fan (5) from duct (9).



INSTALLATION

1. Position new cooling fan (5) on duct (9), then secure with six locknuts (8).
2. Insert wires for cooling fan (5) into outlet box (4), then tighten nut (6) on cord grip (7),
3. Connect wires for cooling fan (5) as tagged.
4. Install cover (2) and gasket (3) onto outlet box (4), then secure with two screws (1).
5. Position MAIN DISCONNECT switch (WP 0009 00, Figure 1, 1) to ON. Verify fan is operating.

END OF WORK PACKAGE

UNIT

LAUNDRY ADVANCED SYSTEM

(NSN 3510–01–463–0114)

FAN MOTOR CAPACITOR REPLACEMENT
REMOVAL, INSTALLATION

INITIAL SETUP:

Tools
Tool Kit, General Mechanics
(Item 14, WP 0282 00)

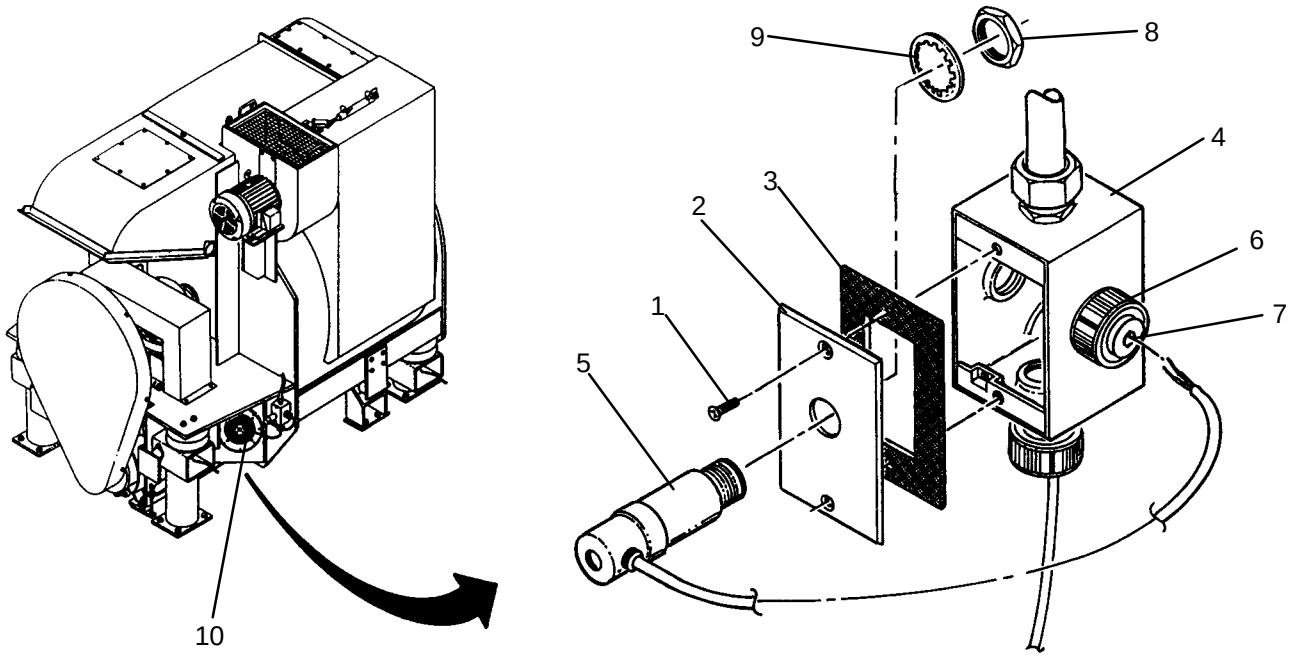
Personnel Required

Materials/Parts
Tags (Item 9, WP 0281 00)

Equipment Conditions
LADS power shut off at main control enclosure (WP 0113 00).

REMOVAL

1. Remove two screws (1), then remove cover (2) and gasket (3) from junction box (4).
2. Tag and disconnect lead wires of capacitor (5).
3. Loosen nut (6) on cord grip (7), then pull lead wires out of junction box (4).
4. Remove jam nut (8) and lock washer (9), then remove capacitor (5) from cover (2).



INSTALLATION

1. Position new capacitor (5) on cover (2), then secure with lock washer (9) and jam nut (8).
2. Insert lead wires through cord grip (7) and into junction box (4), then tighten nut (6).
3. Connect lead wires of capacitor (5) as tagged.
4. Install cover (2) and gasket (3) on junction box (4), then secure with two screws (1).
5. Position MAIN DISCONNECT switch (WP 0009 00, Figure 1, 1) to ON. Verify fan (10) is operating.

END OF WORK PACKAGE

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UNIT

LAUNDRY ADVANCED SYSTEM

(NSN 3510–01–463–0114)

DRUM DRIVE BELT REPLACEMENT REMOVAL, INSTALLATION

INITIAL SETUP:

Tools
Level, 48 Inch (Item 7, WP 0282 00)
Tool Kit, General Mechanics
(Item 14, WP 0282 00)

Personnel Required

Materials/Parts
Washer, Lock (Item 14, WP 0283 00)

Equipment Conditions
LADS power shut off at main control enclosure (WP 0113 00).

REMOVAL

NOTE

Steps 1 thru 4 apply to drum A only.

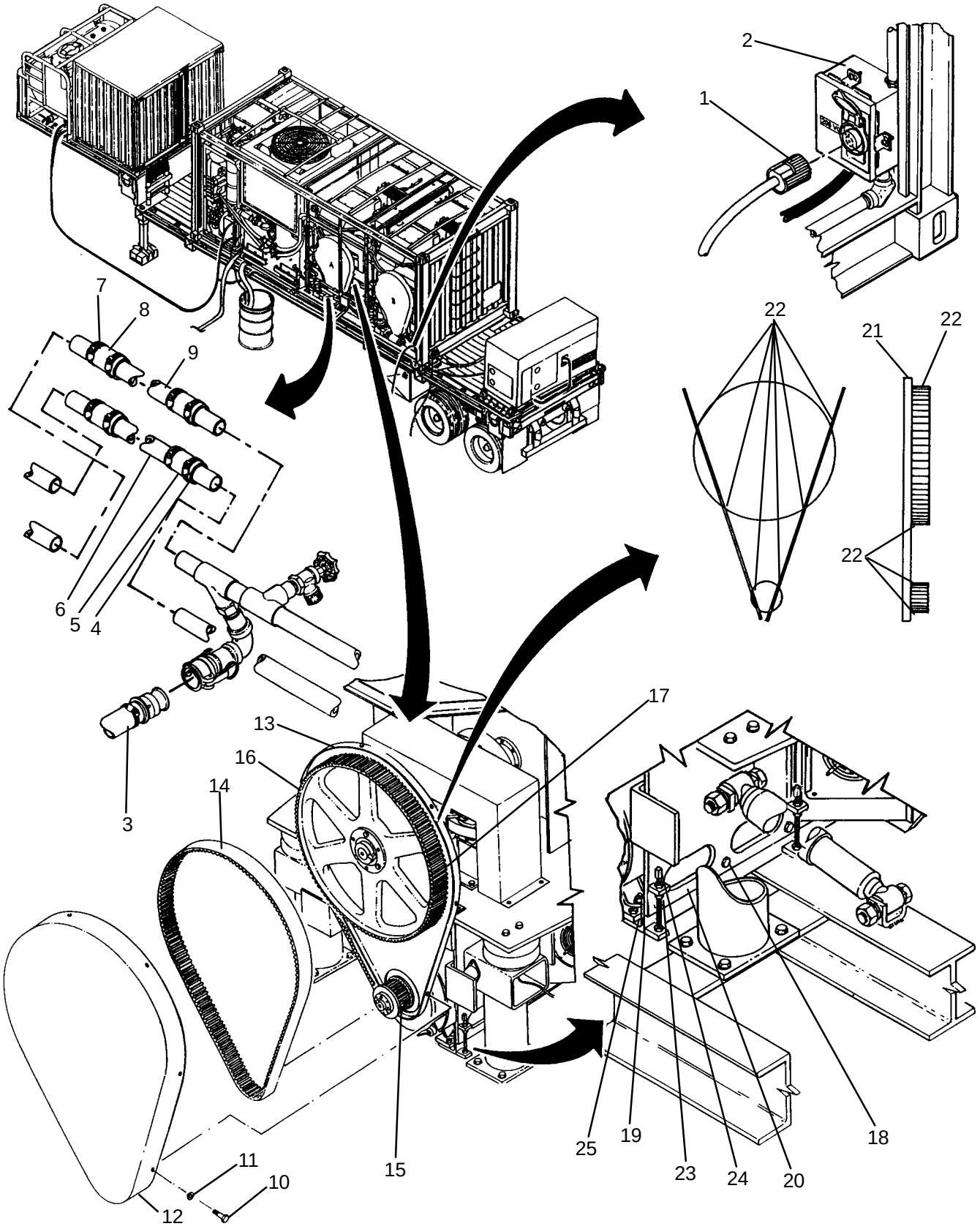
1. Unplug water supply pump (1) from junction box (2).
2. Disconnect water supply line (3).
3. Loosen four hose clamps (4) slide two couplings (5) over pipe (6), then remove pipe.
4. Loosen four hose clamps (7) slide two couplings (8) over pipe (9), then remove pipe.
5. Remove eight screws (10) and lock washers (11), then remove front belt guard (12) from rear belt guard (13).

WARNING

Use extreme caution when removing drive belt. Keep fingers clear of sheave and belt contact points. Failure to follow this precaution could result in severe personal injury.

6. Remove drive belt (14) from drive sheave (15) and drum sheave (16) as follows:
   a. Pull outward on drive belt (14) at belt entry point (17) on drum sheave (16).
   b. Slowly rotate drum sheave (16) while continuing to pull outward on drive belt (14) until drive belt slips off of sheaves (15) and (16).

REMOVAL – Continued



INSTALLATION

1. Install drive belt (14) onto drive sheave (15) and drum sheave (16) as follows:
   a. Install drive belt (14) onto drive sheave (15).
   b. Push inward on drive belt (14) at belt entry point (17) on drum sheave (16).
   c. Slowly rotate drum sheave (16) while continuing to push inward on drive belt (14) until drive belt slips onto sheaves (15) and (16).
2. Loosen six screws (18) securing mounting angle (19) to mounting plate (20).
3. Check sheave alignment as follows:
   a. Place a straight edge (21) across contact points (22) on sheaves (15) and (16).
   b. Check for a gap between any contact points (22) and straight edge (21).
   c. Repeat steps a and b for opposite side of sheaves. If a gap is present, continue to step 4, otherwise proceed to step 6.
4. Loosen jam nuts (23) on four adjusting screws (24).
5. Tighten or loosen adjusting screws (24) to move motor mounting plate (25) up or down until correct sheave alignment is obtained.
6. Check drive belt tension as follows:
   a. Grasp belt (14) approximately halfway between sheaves (15) and (16).
   b. Move belt (14) in from neutral position to check deflection in both directions.
   c. If belt deflection is not 3/8 to 5/8 inches in both directions continue to step 7, otherwise proceed to step 9.

NOTE

When adjusting belt deflection, the motor mounting plate must be raised or lowered evenly with all four adjusting screws. Otherwise, the sheaves will have to be realigned.

7. Tighten or loosen adjusting screws (24) to move motor mounting plate (25) up or down until correct belt deflection is obtained.
8. Recheck sheave alignment and belt deflection following steps 3 and 6.
9. Tighten jam nuts (23).
10. Tighten six screws (18) securing mounting angle (19) to mounting plate (20).
11. Install front belt guard (12) onto rear belt guard (13), then secure with eight screws (10) and lock washers (11).

NOTE

Steps 12 thru 15 apply to drum A only.

12. Install pipe (9), connect hose couplings (8) then tighten hose clamps (7).
13. Install pipe (6), connect hose couplings (5) then tighten hose clamps (4).
14. Connect water supply line (3).
15. Plug water supply pump (1) into junction box (2).
16. Use maintenance menu to test drum rotation in both directions and at all speeds (WP 0010 00). Ensure drum rotates freely and smoothly.
17. Perform a test laundry cycle (TM 10–3510–221–10). Check for leaks at any disconnected water connections.

END OF WORK PACKAGE

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UNIT

LAUNDRY ADVANCED SYSTEM

(NSN 3510–01–463–0114)

DRUM ROTATION SENSOR (ZS102) REPLACEMENT REMOVAL, INSTALLATION

INITIAL SETUP:

Tools
Tool Kit, General Mechanics
(Item 14, WP 0282 00)

Personnel Required

Materials/Parts
Washer, Lock (Item 14, WP 0283 00)

Equipment Conditions
LADS power shut off at main control enclosure (WP 0113 00).

REMOVAL

NOTE

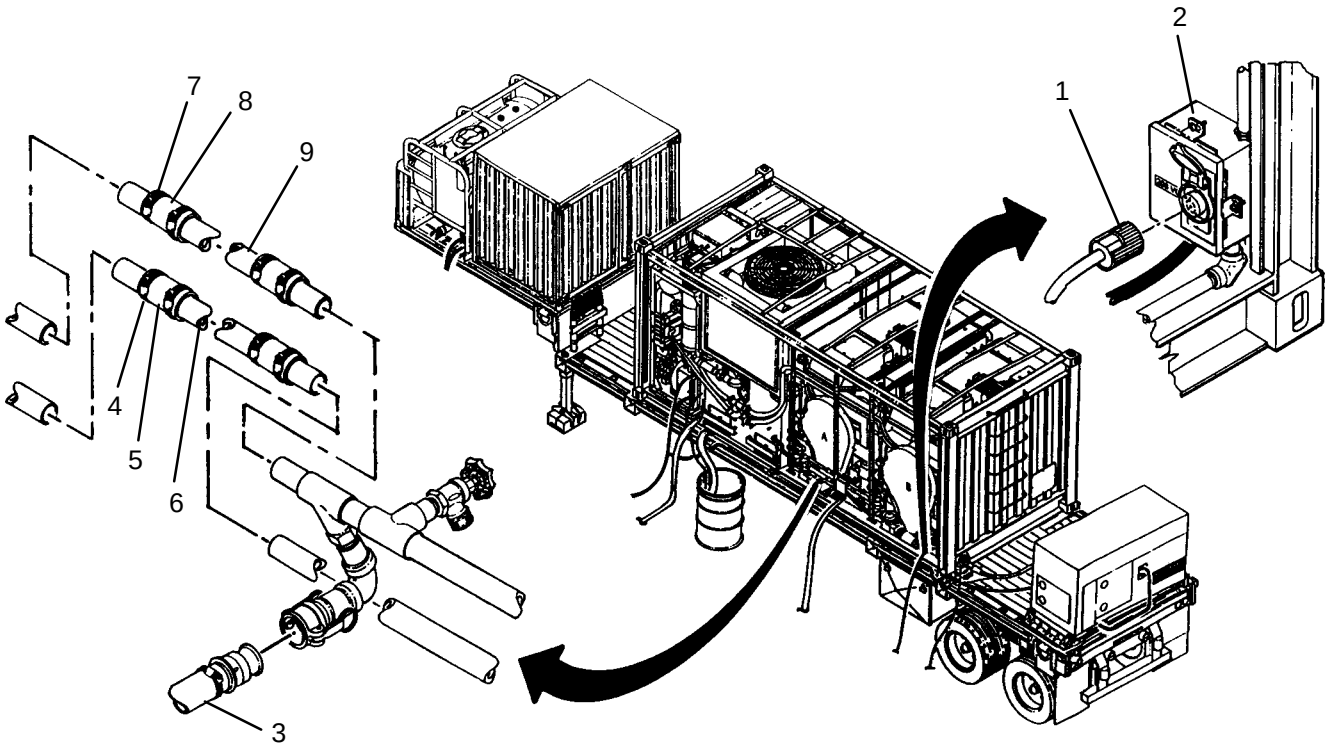
Steps 2 thru 4 apply to drum A only.

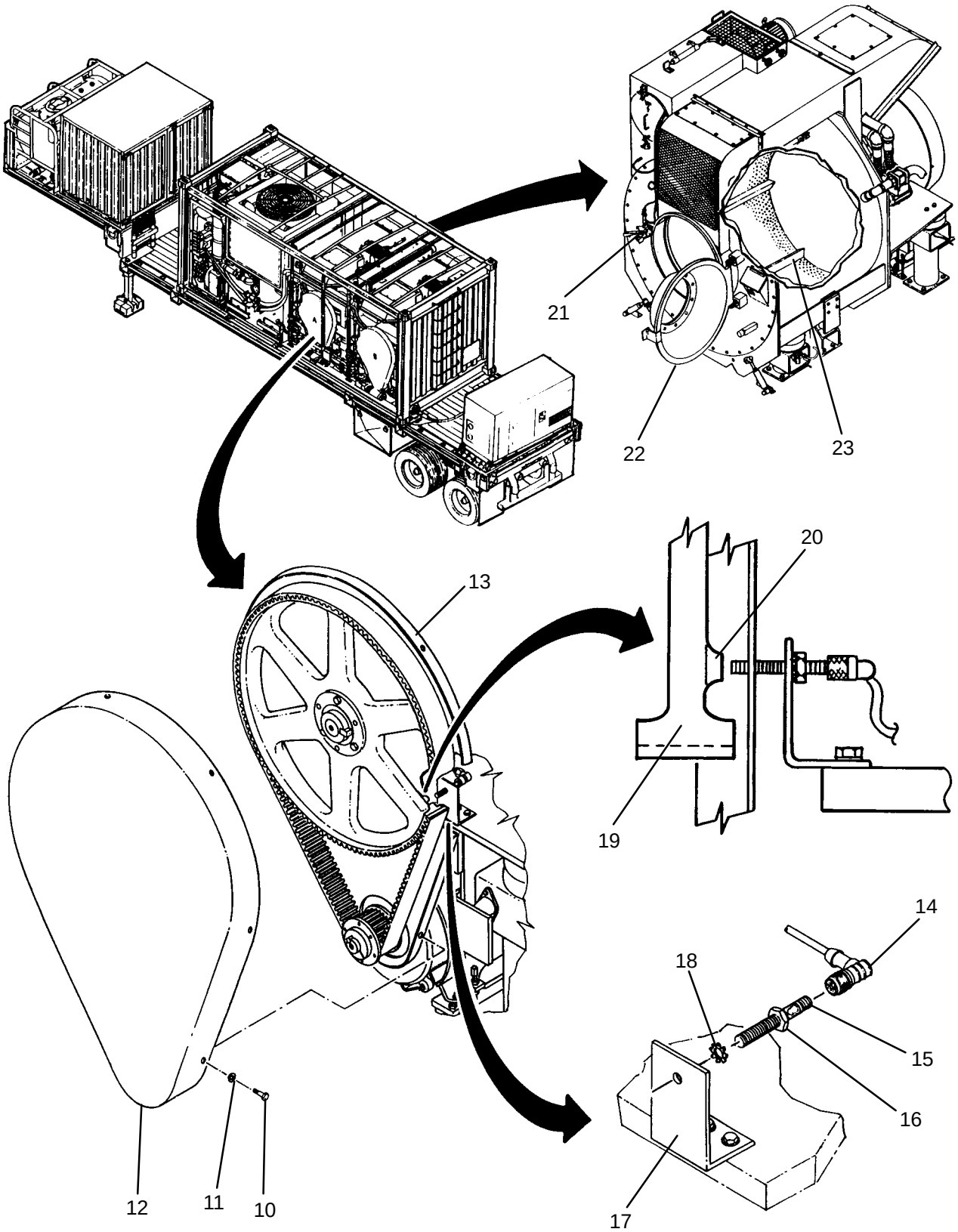
1. Unplug water supply pump (1) from junction box (2).
2. Disconnect water supply line (3).
3. Loosen four hose clamps (4), slide hose couplings (5) over pipe (6), then remove pipe.
4. Loosen four hose clamps (7), slide hose couplings (8) over pipe (9), then remove pipe.
5. Remove eight screws (10) and lock washers (11), then remove front belt guard (12) from rear belt guard (13).
6. Disconnect electrical connector (14) from sensor (15).

WARNING

Use extreme caution when rotating drum sheave. Keep fingers clear of sheave and belt contact points. Failure to follow this precaution could result in severe personal injury.

7. Loosen jam nut (16), unthread sensor (15) from mounting bracket (17).




21
22
23
20
13
19
14
18
15
16
17
12
11
10

INSTALLATION

NOTE

Only two sensor targets are located on each drum sheave. Ensure that all sensor alignments and measurements are performed on targets.

1. Thread jam nut (16) onto new rotation sensor (15) so that nut is located at connector end of sensor. Install lock washer (18) onto sensor.
2. Thread sensor into mounting bracket (17) until tip of sensor (15) protrudes through mounting bracket.
3. Rotate drum sheave (19) until target (20) is aligned with sensor (15). Continue threading sensor until contact is made with target.
4. Unthread sensor (15) two turns, connect electrical connector (14) to sensor. Unthread sensor an additional $^{1}/_{2}$ turn if necessary to ensure electrical connector does not interfere with bearing plate (21) then tighten jam nut (16).
5. Rotate drum until next sensor target is aligned with sensor (15). Ensure there is a gap between tip of sensor and target (20).
7. If gap is present with second target (20) proceed to step 9, otherwise continue to step 8.
8. Loosen jam nut (16) then adjust position of sensor (15) until correct gap is obtained at both targets (20).
9. Connect electrical connector (14) to sensor (15).
10. Install front belt guard (12) onto rear belt guard (13), then secure with eight screws (10) and lock washers (11).

NOTE

Steps 11 thru 13 apply to drum A only.

11. Install pipe (9) connect hose couplings (8) tighten hose clamps (7).
12. Install pipe (6) connect hose couplings (5) tighten hose clamps (4).
13. Connect water supply line (3).
14. Plug water supply pump (1) into junction box (2).
15. Verify correct operation as follows:
    a. Use maintenance menu to access examine inputs function (WP 0010 00).
    b. Pull out on handle (21) and open door (22).
    c. Rotate basket (23) while monitoring ZS102.
    d. Ensure indication is ON when each target (20) passes over tip of sensor (15) and is OFF at all other times.
    e. Close door (22) and engage handle (21).
    f. Run a test laundry cycle (TM 10–3510–221–10). Verify smooth rotation of drum. Check for water leaks at connections on pipes (6 and 9).

END OF WORK PACKAGE

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UNIT

LAUNDRY ADVANCED SYSTEM

(NSN 3510–01–463–0114)

DRUM BALANCE SWITCH (ZS103) REPLACEMENT REMOVAL, INSTALLATION

INITIAL SETUP:

Tools
Tool Kit, General Mechanics
(Item 14, WP 0282 00)

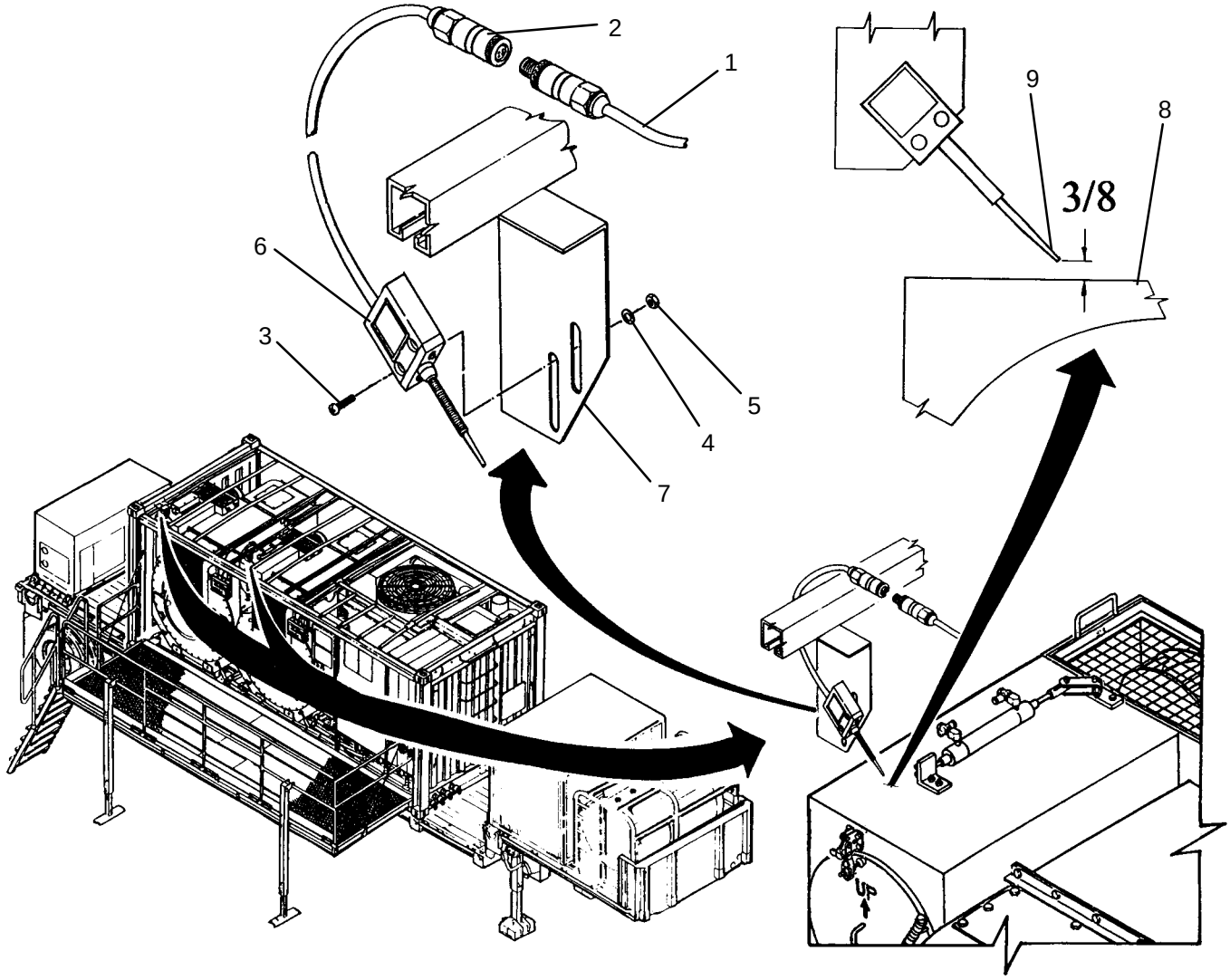
Personnel Required

Materials/Parts
Strap, Tiedown (Item 35, WP 0283 00)

Equipment Conditions
LADS power shut off at main control enclosure (WP 0113 00).

REMOVAL

1. Cut tiedown straps securing switch cable (1).
2. Disconnect electrical connector (2) from switch cable (1).
3. Remove two screws (3), flat washers (4), and nuts (5) then remove switch (6) from adjusting bracket (7).



INSTALLATION

1. Position switch (6) onto adjustment bracket (7), then secure with two screws (3), flat washers (4), and nuts (5).
2. Connect electrical connector (2) to switch cable (1).
3. Secure switch cable (1) with tiedown straps.

ADJUSTMENT

1. Use maintenance menu to pressurize air bags (WP 0010 00).
2. Measure distance from top of outlet duct (8) to switch tip (9). If distance is 3/8 inches proceed to step 4. Otherwise continue to step 3.
3. Adjust position of switch (6) as follows:
   a. Loosen two screws (3).
   b. Readjust position of switch (6) to obtain proper distance between switch tip (9) and outlet duct (8).
   c. Tighten two screws (3).
4. Perform a test laundry cycle (TM 10–3510–221–10). Verify smooth operation of drum.

END OF WORK PACKAGE

UNIT

LAUNDRY ADVANCED SYSTEM

(NSN 3510–01–463–0114)

BRAKE PAD REPLACEMENT
REMOVAL, INSTALLATION

INITIAL SETUP:

Tools
Tool Kit, General Mechanics
(Item 14, WP 0282 00)

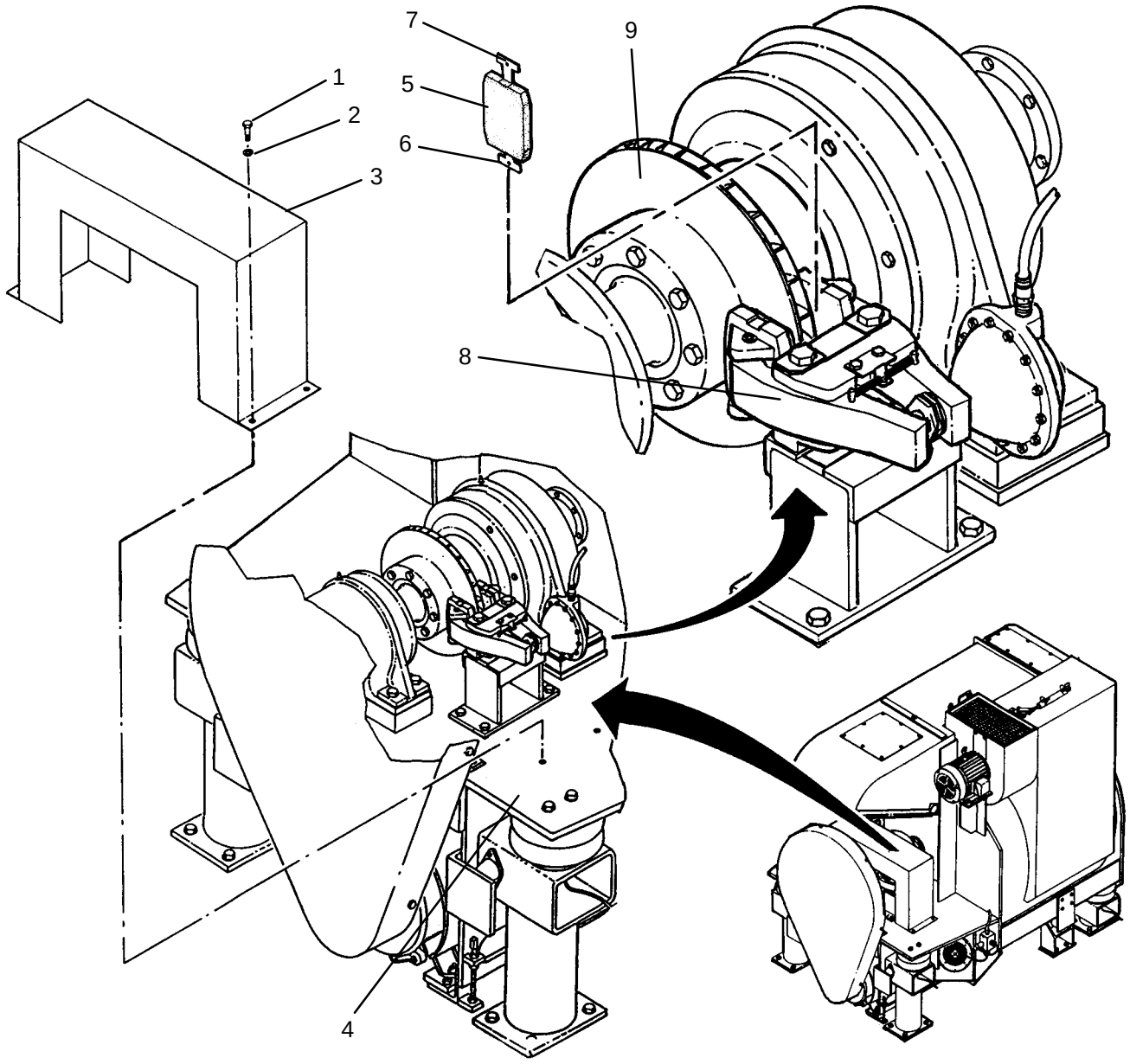
Personnel Required

Materials/Parts
Brake Cleaner (Item 1, WP 0281 00)
Rag, Wiping (Item 4, WP 0281 00)
Washer, Lock (Item 16, WP 0283 00)

Equipment Conditions
LADS power shut off at main control enclosure (WP 0113 00).
Air pressure must be vented (WP 0114 00).

REMOVAL

1. Remove four screws (1) and lock washers (2) securing brake guard (3) to bearing plate (4).
2. Lift and remove brake guard (3).
3. Remove brake pads (5) as follows:
   a. Straighten bottom tab (6).
   b. Straighten top tab (7). Slide brake pad (5) out from between brake caliper (8) and brake rotor (9).
   c. Repeat steps a and b for other brake pad (5).
4. Use brake cleaner and a clean rag to clean brake rotor (9).
5. Inspect brake rotor (9). Replace if cracks or scouring are found (WP 0268 00).



INSTALLATION

1. Install new brake pads (5) as follows:
   a. Mate brake pad (5) with brake caliper (8) then bend top tab (7) over onto brake caliper.
   b. Bend bottom tab (6) over onto brake caliper (8)
   c. Repeat steps a and b for other brake pad (5).
2. Position brake guard (3) onto bearing plate (4) then secure with four screws (1) and lock washers (2).
3. Use maintenance menu to test drum rotation (WP 0010 00). Ensure drum rotates freely and smoothly.
4. Use maintenance menu to test drum braking (WP 0010 00). Ensure drum stops when brake is applied.

END OF WORK PACKAGE

UNIT

LAUNDRY ADVANCED SYSTEM

(NSN 3510–01–463–0114)

BRAKE THRUSTER REPLACEMENT
REMOVAL, INSTALLATION

INITIAL SETUP:

Tools
Tool Kit, General Mechanics
(Item 14, WP 0282 00)

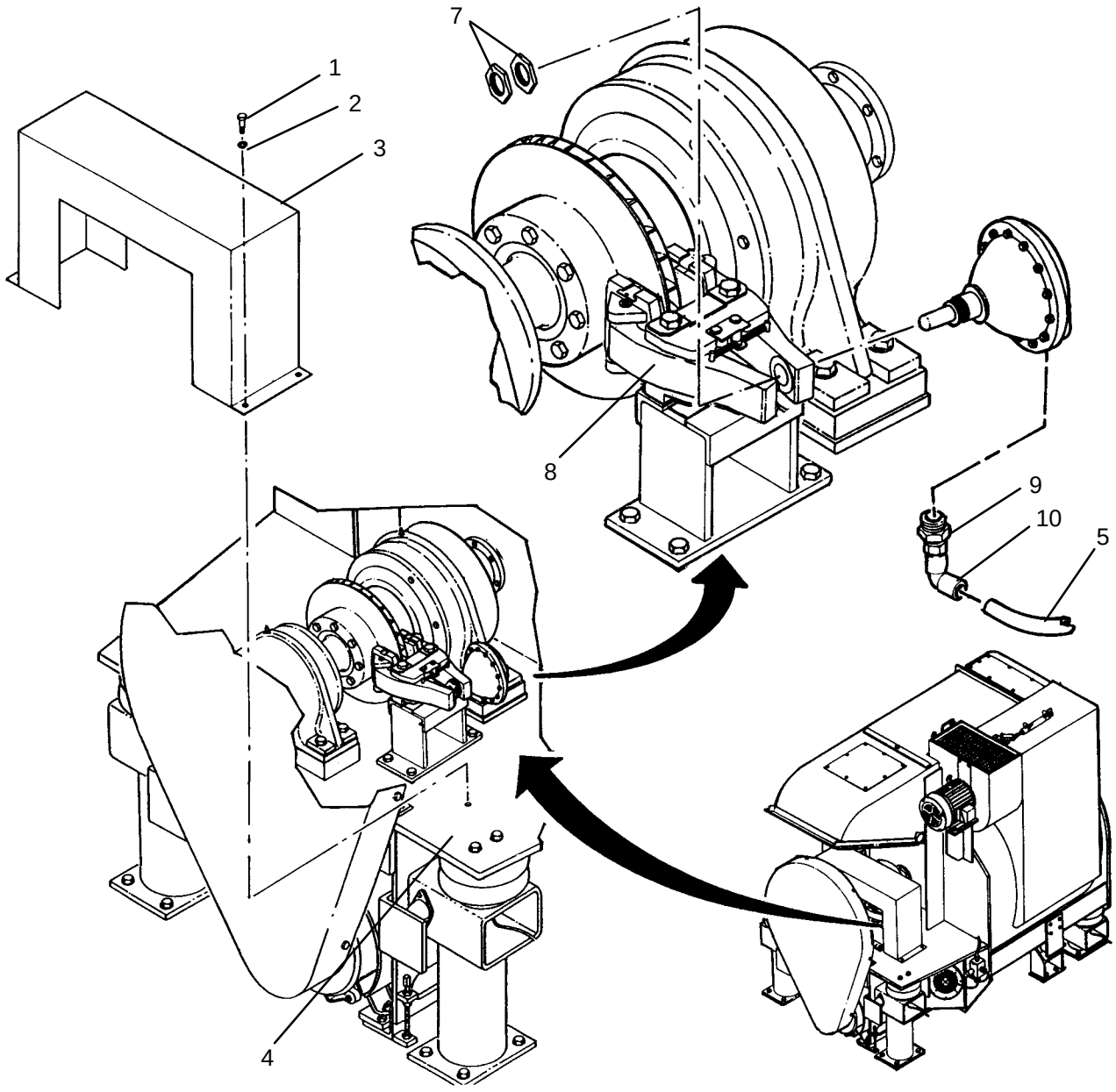
Personnel Required

Materials/Parts
Tape, Anti–Seize (Item 10, WP 0281 00)
Washer, Lock (Item 16, WP 0283 00)

Equipment Conditions
LADS power shut off at main control enclosure (WP 0113 00).
Air pressure must be vented (WP 0114 00).

REMOVAL

1. Remove four screws (1) and lock washers (2) securing brake guard (3) to bearing plate (4).
2. Disconnect air line (5) from brake thruster (6).
3. Remove two jam nuts (7) then pull brake thruster (6) out of brake caliper (8).
4. Unthread hex bushing (9) with attached elbow (10) from brake thruster (6).
5. Clean anti–seize tape from threads of hex bushing (9).



INSTALLATION

1. Apply anti–seize tape to threads of hex bushing (9).
2. Thread hex bushing (9) with attached elbow (10) into brake thruster (6).
3. Insert brake thruster (6) into brake caliper (8) then secure by installing two jam nuts (7) hand tight.
4. Position brake thruster (6) with hex bushing (9) on bottom then tighten two jam nuts (7).
5. Connect air line (5) to brake thruster (6).
6. Position brake guard (3) onto bearing plate (4) then secure with four screws (1) and lock washers (2).
7. Use maintenance menu to test drum rotation (WP 0010 00). Ensure drum rotates freely and smoothly.
8. Use maintenance menu to test drum braking (WP 0010 00). Ensure drum stops when brake is applied.

END OF WORK PACKAGE

UNIT

LAUNDRY ADVANCED SYSTEM

(NSN 3510–01–463–0114)

BRAKE CALIPER REPLACEMENT REMOVAL, INSTALLATION

INITIAL SETUP:

Tools
Tool Kit, General Mechanics
(Item 14, WP 0282 00)

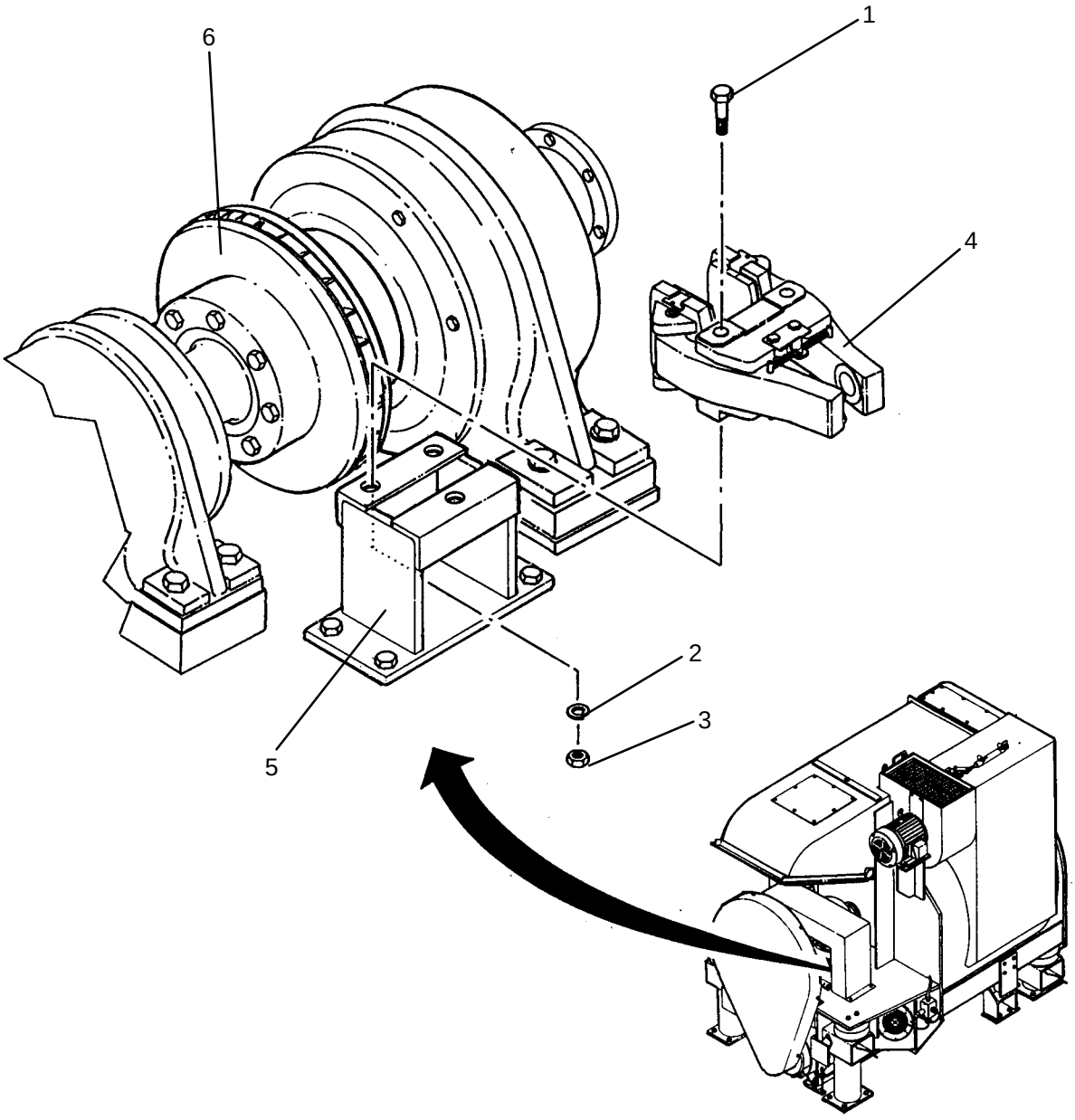
Personnel Required

Materials/Parts
Brake Cleaner (Item 1, WP 0281 00)
Rag, Wiping (Item 4, WP 0281 00)
Washer, Lock (Item 16, WP 0283 00)

Equipment Conditions
LADS power shut off at main control enclosure (WP 0113 00).
Air pressure must be vented (WP 0114 00).

REMOVAL

1. Remove brake thruster (WP 0122 00).
2. Remove three screws (1), lock washers (2), and nuts (3) securing brake caliper (4) to mount bracket (5).
3. Lift brake caliper (4) off of brake rotor (6).
4. Use brake cleaner and a clean rag to clean brake rotor (6).
5. Inspect brake rotor (6). Replace if cracks or scouring are found (WP 0268 00).



INSTALLATION

1. Position brake caliper (4) over brake rotor (6) and mate with mount bracket (5).
2. Secure brake caliper (4) to mount bracket (5) with three screws (1), lock washers (2), and nuts (3).
3. Install brake thruster (WP 0122 00).

END OF WORK PACKAGE

UNIT

LAUNDRY ADVANCED SYSTEM

(NSN 3510–01–463–0114)

DOOR ASSEMBLY REPLACEMENT REMOVAL, INSTALLATION

INITIAL SETUP:

Tools
Tool Kit, General Mechanics
(Item 14, WP 0282 00)

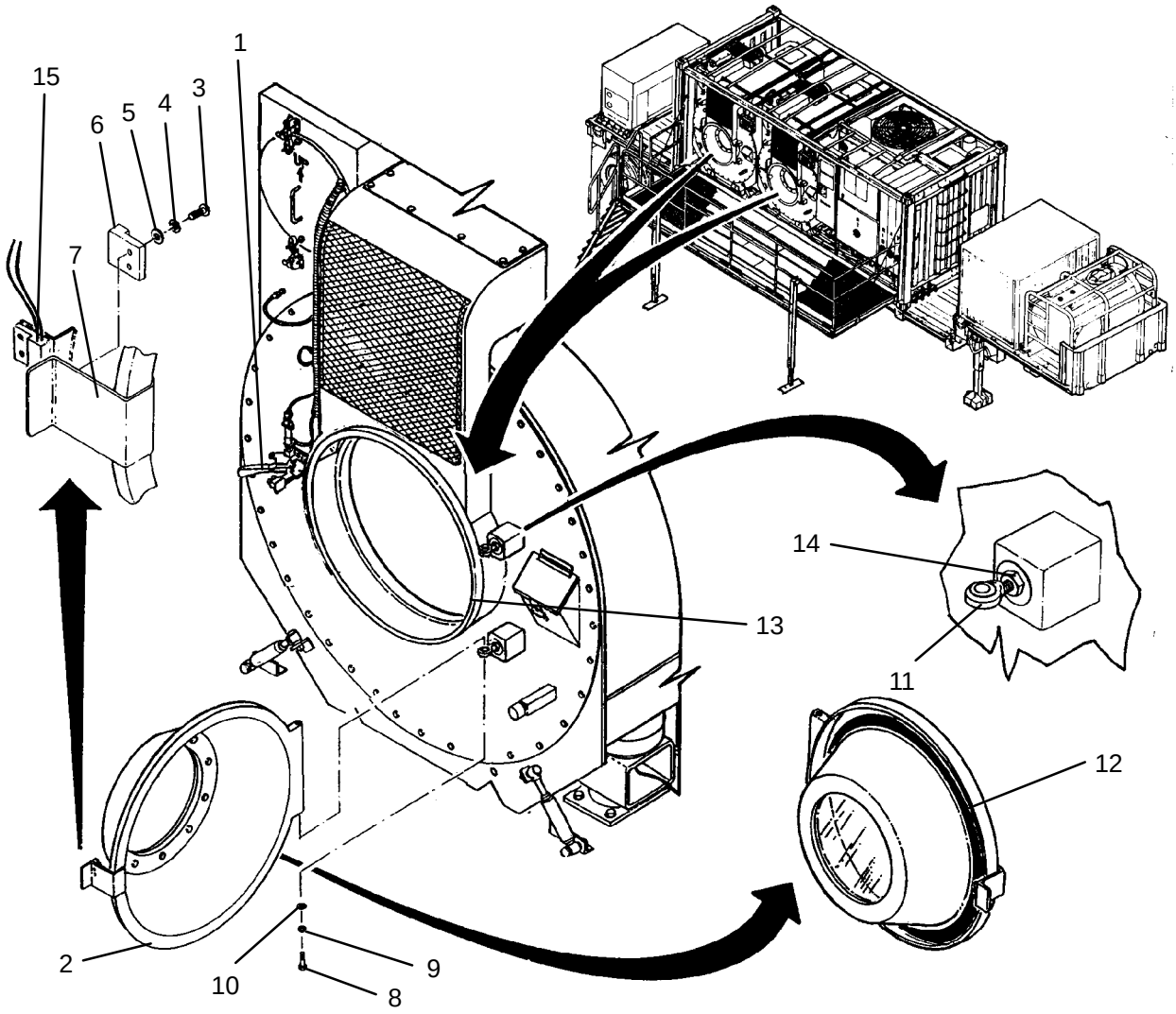
Personnel Required

Materials/Parts
Washer, Lock (Item 8, WP 0283 00)
Washer, Lock (Item 9, WP 0283 00)

Equipment Conditions
LADS power shut off at main control enclosure (WP 0113 00).

REMOVAL

1. Pull out on handle (1) and open door (2).
2. Remove two screws (3), lock washers (4), and flat washers (5); then remove actuator (6) from mounting bracket (7).
3. Remove two screws (8), lock washers (9), and flat washers (10); then remove door (2) from rod ends (11).



INSTALLATION

1. Install new door (2) onto rod ends (11); then secure with two screws (8), lock washers (9), and flat washers (10).

CAUTION

When checking door alignment, forcing door to close or handle to latch, may result in damage to either component.

2. Verify correct alignment of door (2) as follows:
   a. Swing door (2) back and forth. Door movement should be free with no binding.
   b. Close door (2) and engage handle (1). Handle should engage without excessive force.
   c. With door (2) closed and handle (1) engaged, verify door gasket (12) is contacting ring (13) around entire circumference.
   d. Pull out on handle (1) and open door (2). Handle should disengage without excessive force.
3. If door (2) is properly aligned proceed to step 4, otherwise realign door as follows:
   a. Remove two screws (8), lock washers (9), and flat washers (10); then remove door (2) from rod ends (11).
   b. Loosen two jam nuts (14).
   c. Thread rod ends (11) in or out as necessary to correct door alignment.
   d. Install door (2) onto rod ends (11); then secure with two screws (8), lock washers (9), and flat washers (10).
   e. Tighten two jam nuts (14).
   f. Repeat step 2 to check alignment of door (2).
4. Locate actuator (6) on mounting bracket (7); then secure with two screws (3), lock washers (4), and flat washers (5).
5. Check alignment and adjustment between actuator (6) and position switch (15) (WP 0129 00).
6. Perform a test laundry cycle (TM 10–3510–221–10). Visually check for water leaks around door (2) while laundry cycle is underway.

END OF WORK PACKAGE

UNIT

LAUNDRY ADVANCED SYSTEM

(NSN 3510–01–463–0114)

DOOR ASSEMBLY REPAIR
REPLACING DOOR WINDOW

INITIAL SETUP:

Tools
Tool Kit, General Mechanics
(Item 14, WP 0282 00)

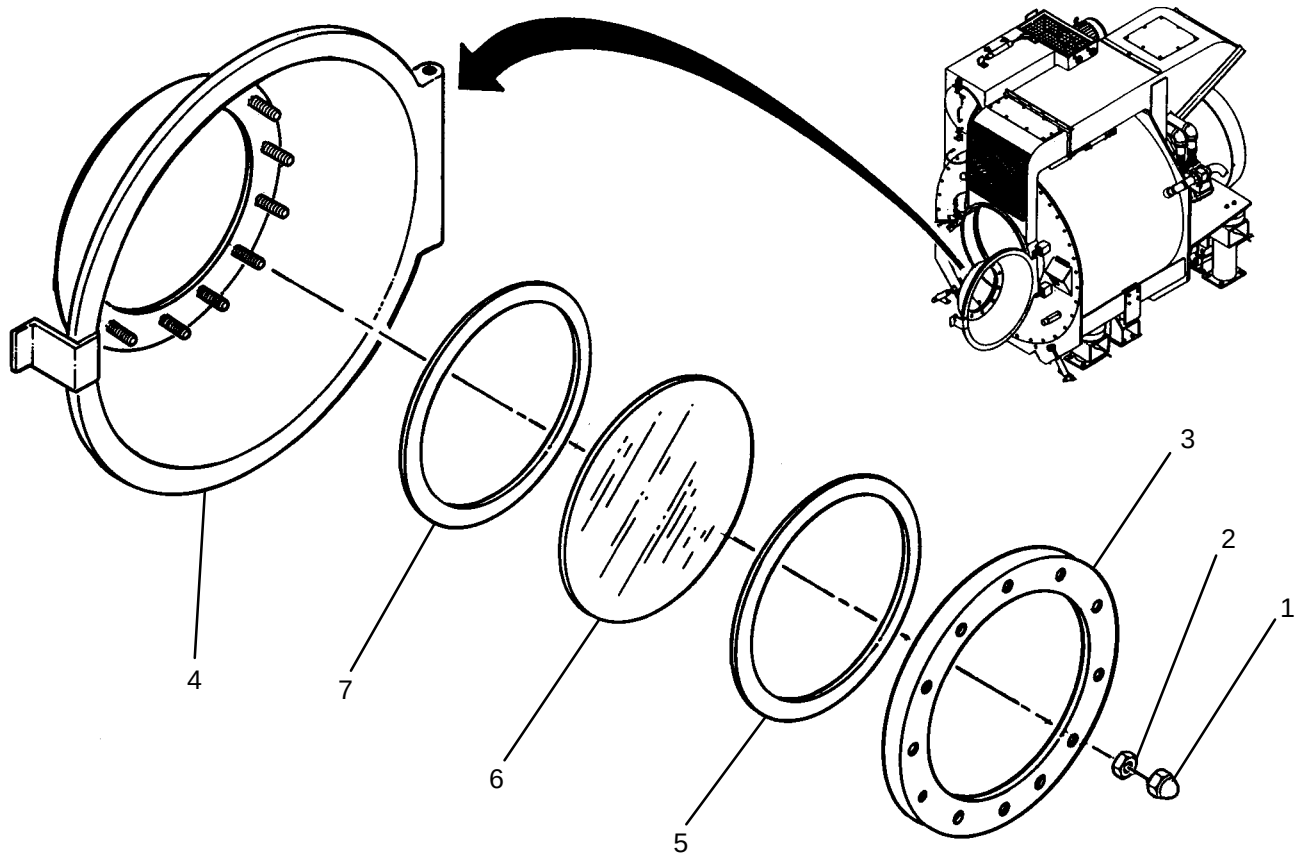
Personnel Required

Materials/Parts
Sealant, Multi–purpose (Item 5, WP 0281 00)
Gasket, Door (Qty 2) (Item 29, WP 0283 00)

Equipment Conditions

DISASSEMBLY

1. Remove twelve cap nuts (1) and nuts (2) securing retaining ring (3) to door (4).
2. Separate retaining ring (3) and gasket (5) from window (6) and door (4).
3. Separate window (6) and gasket (7) from door (4).
4. Clean remnants of gaskets (5) and (7) and sealant from retaining ring (3) and door (4).



ASSEMBLY

1. Apply a coat of sealant to both sides of new gaskets (5) and (7).
2. Place new gasket (7) onto door (4).
3. Place new window (6) on top of gasket (7) ensuring window is centered.
4. Place new gasket (5) on top of window (6).
5. Place retaining ring (3) on top of gasket (5).
6. Install twelve nuts (2), tightening in a crisscross pattern until gaskets (5) and (7) seal against retaining ring (3), door (4), and window (6).
7. Install cap nuts (1).
8. Apply a bead of sealant between back inside edge of door and window (6).

END OF WORK PACKAGE

UNIT

LAUNDRY ADVANCED SYSTEM

(NSN 3510–01–463–0114)

DOOR ASSEMBLY REPAIR
REPLACING DOOR GASKET

INITIAL SETUP:

Tools
Tool Kit, General Mechanics
(Item 14, WP 0282 00)

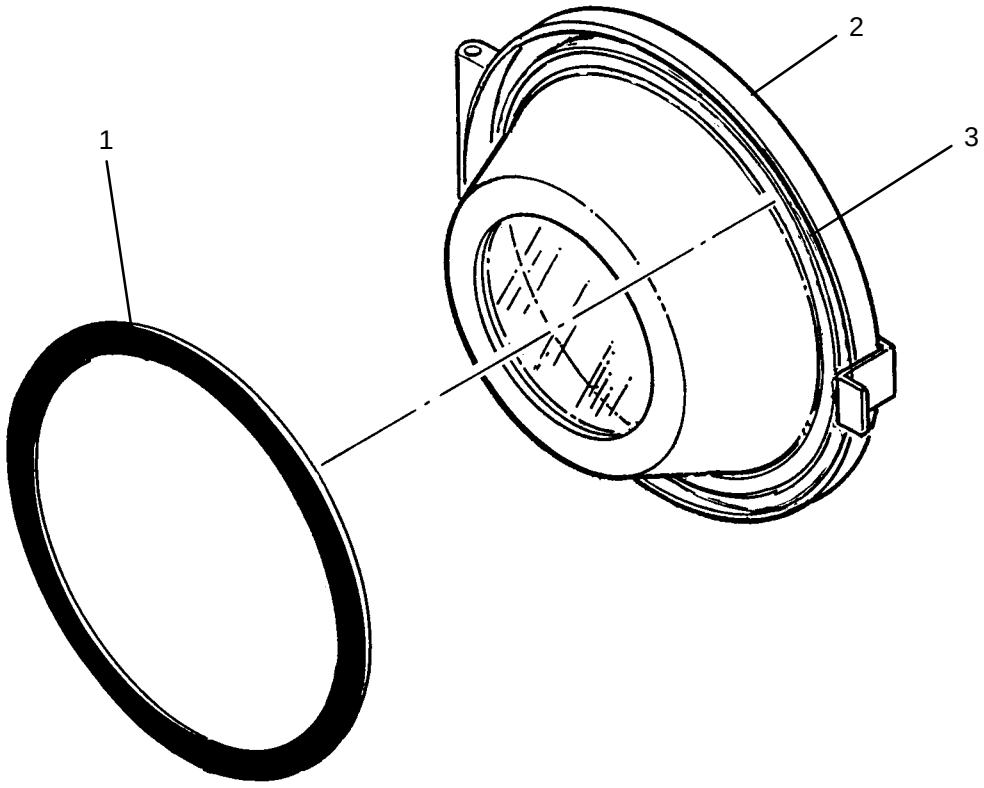
Personnel Required

Materials/Parts
Sealant, Multi–Purpose (Item 5, WP 0281 00)
Gasket, Door (Item 29, WP 0283 00)

Equipment Conditions

DISASSEMBLY

1. Remove old gasket (1) from door (2).
2. Clean remnants of gasket (1) and sealant from door (2).



INSTALLATION

1. Apply a coat of sealant to gasket channel (3) on door (2).
2. Install new gasket (1) onto door (2). Allow sealant to cure for 24 hours before using door.
3. Perform a test laundry cycle (TM 10–3510–221–10). Visually check for water leaks while laundry cycle is underway.

END OF WORK PACKAGE

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UNIT

LAUNDRY ADVANCED SYSTEM

(NSN 3510–01–463–0114)

DOOR LOCK (DN100) REPLACEMENT REMOVAL, INSTALLATION

INITIAL SETUP:

Tools
Tool Kit, General Mechanics
(Item 14, WP 0282 00)

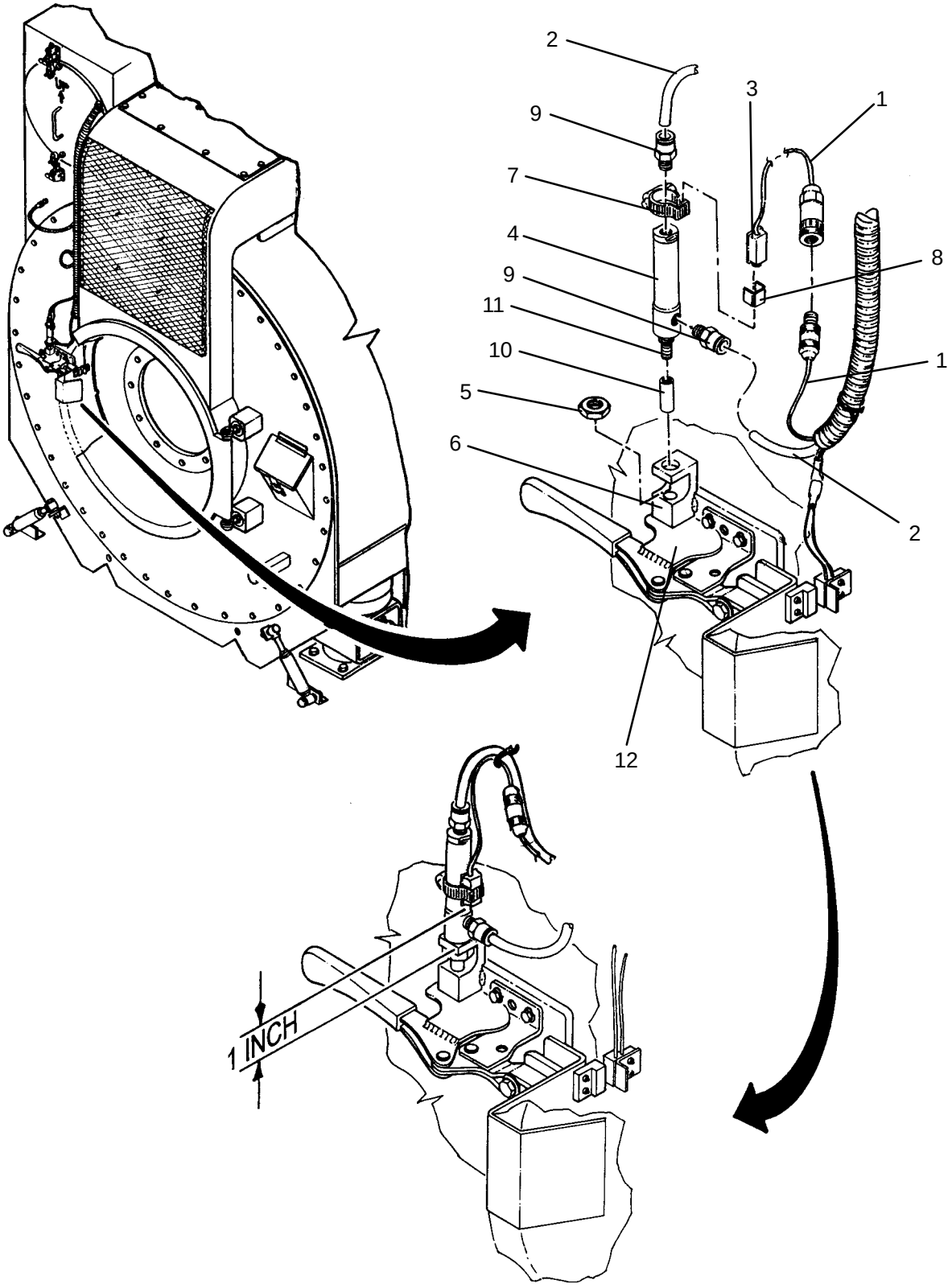
Personnel Required

Materials/Parts
Tags (Item 9, WP 0281 00)
Tape, Anti–Seize (Item 10, WP 0281 00)
Straps, Tiedown (Item 31, WP 0283 00)

Equipment Conditions
LADS power shut off at main control enclosure (WP 0113 00).
Air pressure must be vented (WP 0114 00).

REMOVAL

1. Cut tiedown straps securing electrical cable (1) to air tubes (2).
2. Disconnect electrical cable (1) from door lock position switch (3).
3. Tag and disconnect air tubes (2) from door lock (4).
4. Unthread jam nut (5) securing door lock (4) to mounting bracket (6), then remove door lock.
5. Loosen clamp (7), then remove rubber spacer (8) and door lock position switch (3).
6. Unthread connectors (9) from door lock (4).
7. Unthread locking pin (10) from piston (11).
8. Clean anti–seize tape from threads of connectors (9).


2
3
1
9
7
4
8
9
11
10
1
5
6
2
12
1 INCH

INSTALLATION

1. Apply anti–seize tape to threads of connectors (9).
2. Thread connectors (9) into new door lock (4).
3. Thread locking pin (10) on to piston (11).
4. Install door lock position switch (3) as follows:
   a. Position door lock position switch (3) with rubber spacer (8) and clamp (7) onto door lock (4) oriented as shown.
   b. Measure 1 inch from base of door lock (4) to bottom of sensor (3), then tighten clamp (7).
5. Hold jam nut (5) in mounting bracket (6) and insert door lock (4) into mounting bracket (6). Thread jam nut (5) onto door lock (4).
6. Orient door lock (4) as shown, then tighten jam nut (5).
7. Connect air tubes (2) to door lock (4) as tagged.
8. Connect electrical cable (1) to door lock position switch (3).
9. Secure electrical cable (1) to air tubes (2) with tie straps.
10. Use maintenance menu to pressurize air system (WP 0010 00).
11. Use maintenance menu to access control outputs function (WP 0010 00). Extend and retract door lock DN100 several cycles and verify the following:
    a. Air connections do not leak
    b. Locking pin (10) moves in and out of handle (12) without binding.
    c. LED on the end of door lock position switch (3) is on when lock is extended, and is off when lock is retracted.

END OF WORK PACKAGE

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UNIT

LAUNDRY ADVANCED SYSTEM

(NSN 3510–01–463–0114)

DOOR LOCK POSITION SWITCH (ZS101) REPLACEMENT REMOVAL, INSTALLATION

INITIAL SETUP:

Tools
Tool Kit, General Mechanics
(Item 14, WP 0282 00)

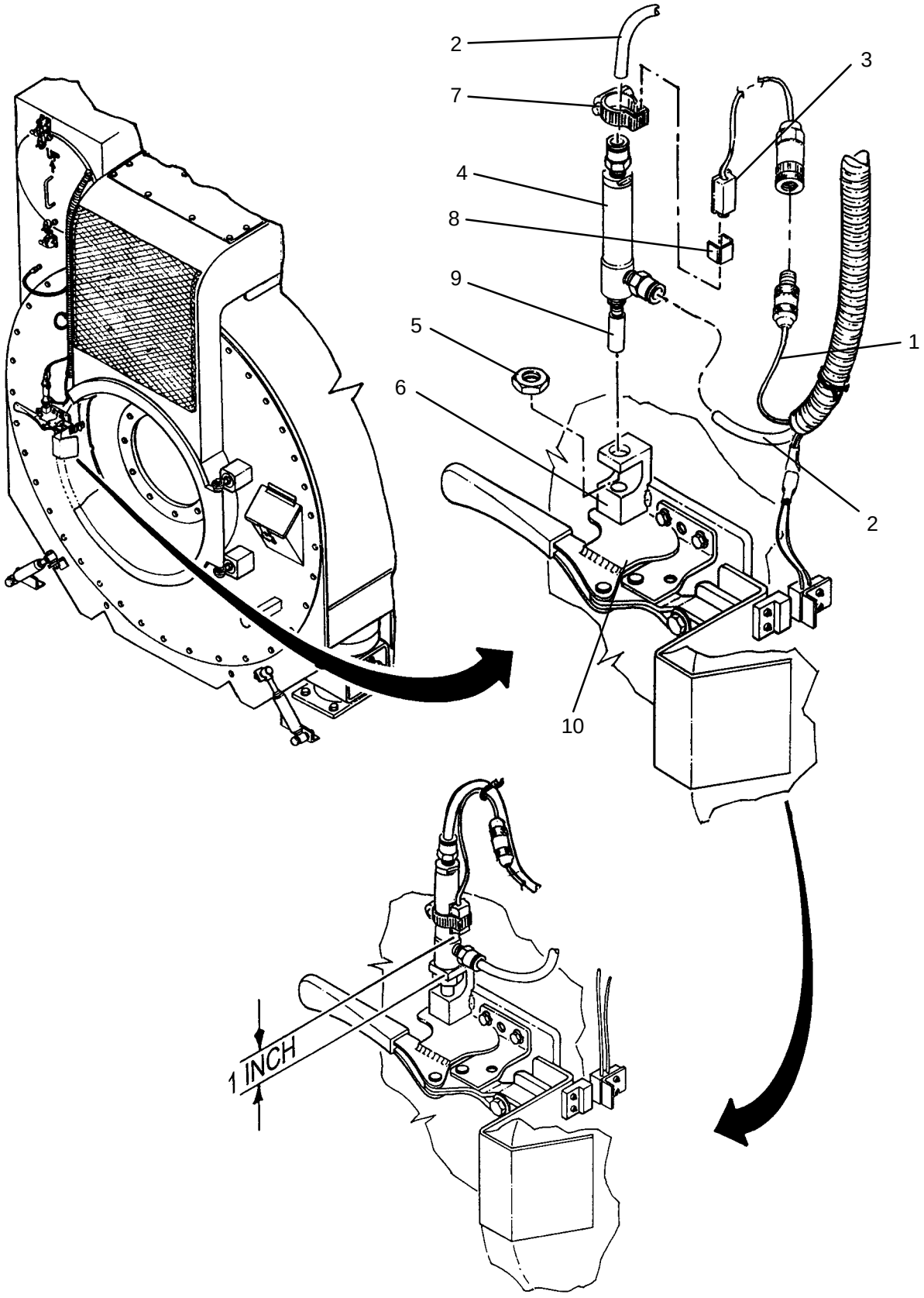
Personnel Required

Materials/Parts
Tags (Item 9, WP 0281 00)
Straps, Tiedown (Item 31, WP 0283 00)

Equipment Conditions
LADS power shut off at main control enclosure (WP 0113 00).
Air pressure must be vented (WP 0114 00).

REMOVAL

1. Cut tiedown straps securing electrical cable (1) to air tubes (2).
2. Disconnect electrical cable (1) from door lock position switch (3).
3. Tag and disconnect air tubes (2) from door lock (4).
4. Unthread jam nut (5) securing door lock (4) to mounting bracket (6), then remove door lock.
5. Loosen clamp (7), then remove rubber spacer (8) and door lock position switch (3).


2
7
3
4
8
9
5
1
6
2
10
1 INCH

INSTALLATION

1. Install new door lock position switch (3) as follows:
   a. Position door lock position switch (3) with rubber spacer (8) and clamp (7) onto door lock (4) oriented as shown.
   b. Measure 1 inch from base of door lock (4) to bottom of sensor (3), then tighten clamp (7).
2. Hold jam nut (5) in mounting bracket (6) and insert door lock (4) into mounting bracket. Thread jam nut (5) onto door lock (4).
3. Orient door lock (4) as shown, then tighten jam nut (5).
4. Connect air tubes (2) to door lock (4) as tagged.
5. Connect electrical cable (1) to door lock position switch (3).
6. Secure electrical cable (1) to air tubes (2) with tie straps.
7. Use maintenance menu to pressurize air system (WP 0010 00).
8. Use maintenance menu to access control outputs function (WP 0010 00). Extend and retract door lock DN100 several cycles and verify the following:
   a. Locking pin (9) moves in and out of handle (10) without binding.
   b. LED on the end of door lock position switch (3) is on when lock is extended, and is off when lock is retracted.

END OF WORK PACKAGE

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UNIT

LAUNDRY ADVANCED SYSTEM

(NSN 3510–01–463–0114)

DOOR LOCK POSITION SWITCH (ZS100) REPLACEMENT REMOVAL, INSTALLATION, ADJUSTMENT

INITIAL SETUP:

Tools
Tool Kit, General Mechanics
(Item 14, WP 0282 00)

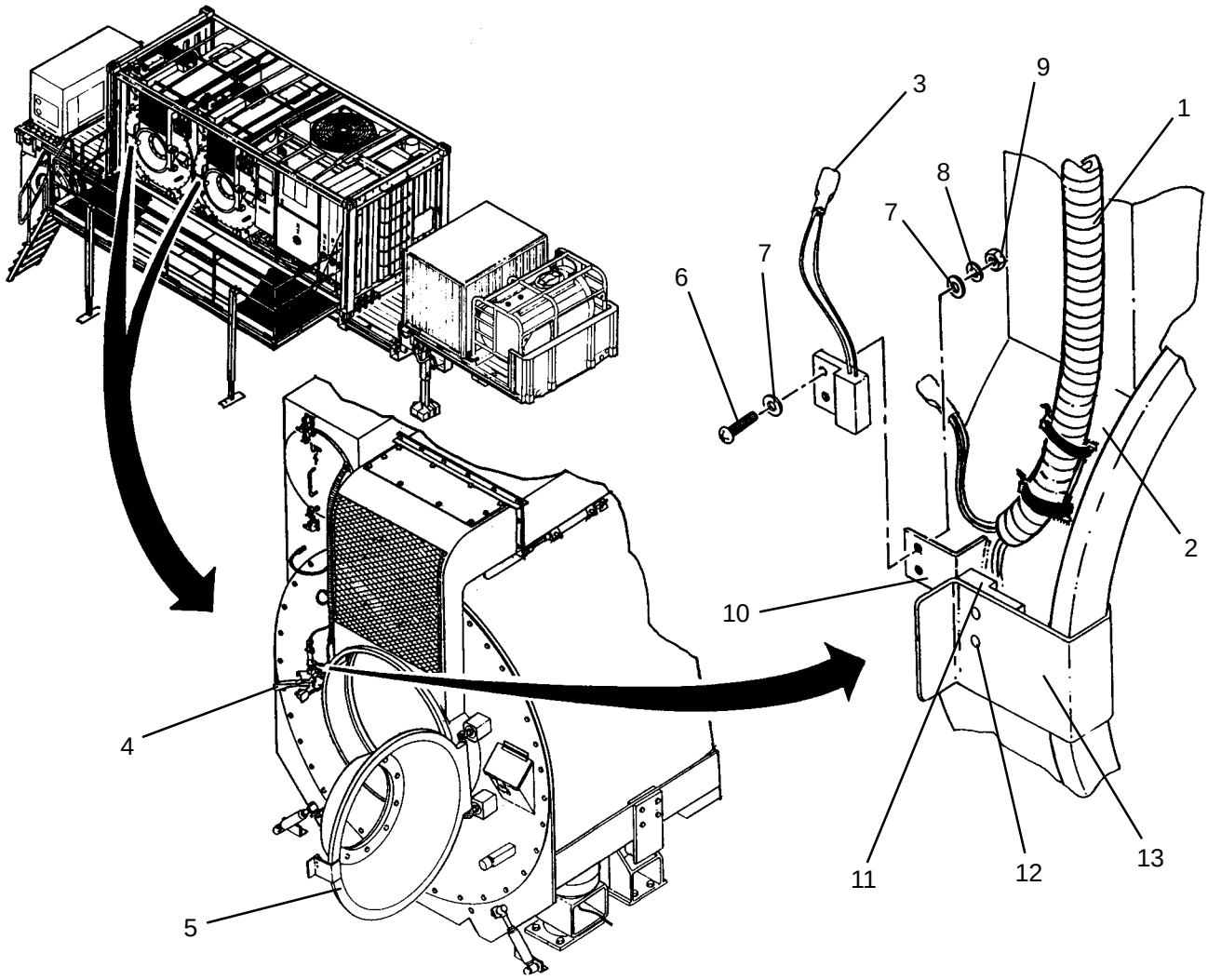
Personnel Required

Materials/Parts
Tags (Item 9, WP 0281 00)
Strap, Tiedown (Item 35, WP 0283 00)

Equipment Conditions
LADS power shut off at main control enclosure (WP 0113 00).

REMOVAL

1. Cut tiedown straps securing protective loom (1) to drum (2).
2. Pull lead wires of door lock position switch (3) out of protective loom (1) then tag and disconnect lead wires.
3. Pull out on handle (4) and open drum door (5).
4. Remove two screws (6), flat washers (7), lock washers (8), and nuts (9); then remove door lock position switch (3) from mounting bracket (10).



INSTALLATION

NOTE

When installing door lock position switch (3) top edge of switch should be aligned with top edge of actuator (11).

1. Locate new door lock position switch (3) on mounting bracket (10), then secure with two screws (6), flat washers (7), lock washers (8), and nuts (9).
2. Close drum door (5) and engage handle (4).
3. Check alignment between top edge of door lock position switch (3) and top edge of actuator (11). Realign switch if necessary.
4. Connect lead wires of door lock position switch (3) as tagged.
5. Insert lead wires of door lock position switch (3) into protective loom (1).
6. Secure protective loom (1) to drum (2) with tiedown straps.

ADJUSTMENT

1. Close drum door (5) and engage handle (4).
2. Measure gap between door lock position switch (3) and actuator (11). It should be 1/8 to1/4 inches. If gap is not correct continue to step 3, otherwise proceed to step 4.
3. Adjust position of actuator (11) as follows:
   a. Pull out on handle (4) and open drum door (5).
   b. Loosen two screws (12) securing actuator (11) to mounting bracket (13).
   c. Slide actuator (11) in or out to achieve proper gap then tighten screws (12).
   d. Close drum door (5) and engage handle (4).
   e. Check gap between door lock position switch (3) and actuator (11). Repeat steps a through d as necessary.
4. Using maintenance menu to access examine inputs function (WP 0010 00), verify correct operation of door lock position switch (1) as follows:
   a. Verify door lock position switch ZS100 status is ON.
   b. Pull out on handle (4) and open drum door (5).
   c. Verify door lock position switch ZS100 status is OFF.
   d. Close drum door (5) and engage handle (4).

END OF WORK PACKAGE

UNIT

LAUNDRY ADVANCED SYSTEM

(NSN 3510–01–463–0114)

LINT FILTER GASKET REPLACEMENT REMOVAL, INSTALLATION

INITIAL SETUP:

Tools
Tool Kit, General Mechanics
(Item 14, WP 0282 00)

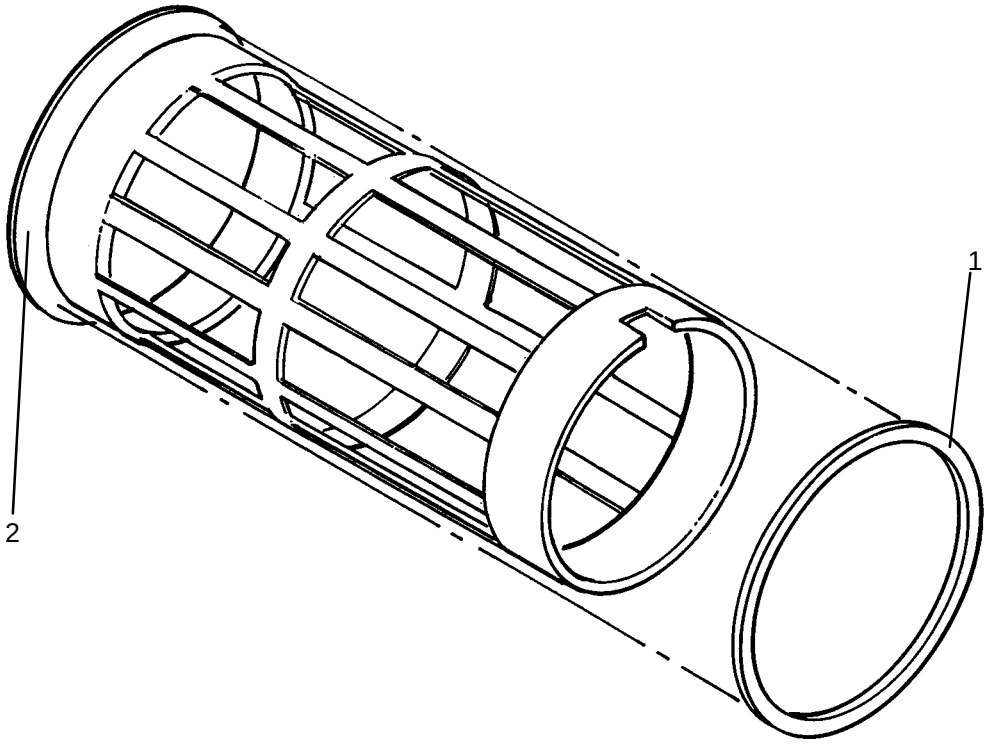
Personnel Required

Materials/Parts
Sealant, Multi–Purpose (Item 5, WP 0281 00)

Equipment Conditions
Lint filter removed (TM 10–3510–221–10).

DISASSEMBLY

1. Peel old gasket (1) from cover plate (2).
2. Clean remnants of gasket (1) and sealant from cover plate (2).



INSTALLATION

1. Apply a coat of sealant to cover plate (2).
2. Install new gasket (1) onto cover plate (2). Allow sealant to cure for 24 hours before using lint filter.
3. Perform a test laundry cycle (TM 10–3510–221–10). Visually check for water leaks while laundry cycle is underway.

END OF WORK PACKAGE

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UNIT

LAUNDRY ADVANCED SYSTEM

(NSN 3510–01–463–0114)

DRYER BLOWER MOTOR (M104) REPLACEMENT REMOVAL, INSTALLATION

INITIAL SETUP:

Tools
Puller, Bearing (Item 9, WP 0282 00)
Tool Kit, General Mechanics
(Item 14, WP 0282 00)

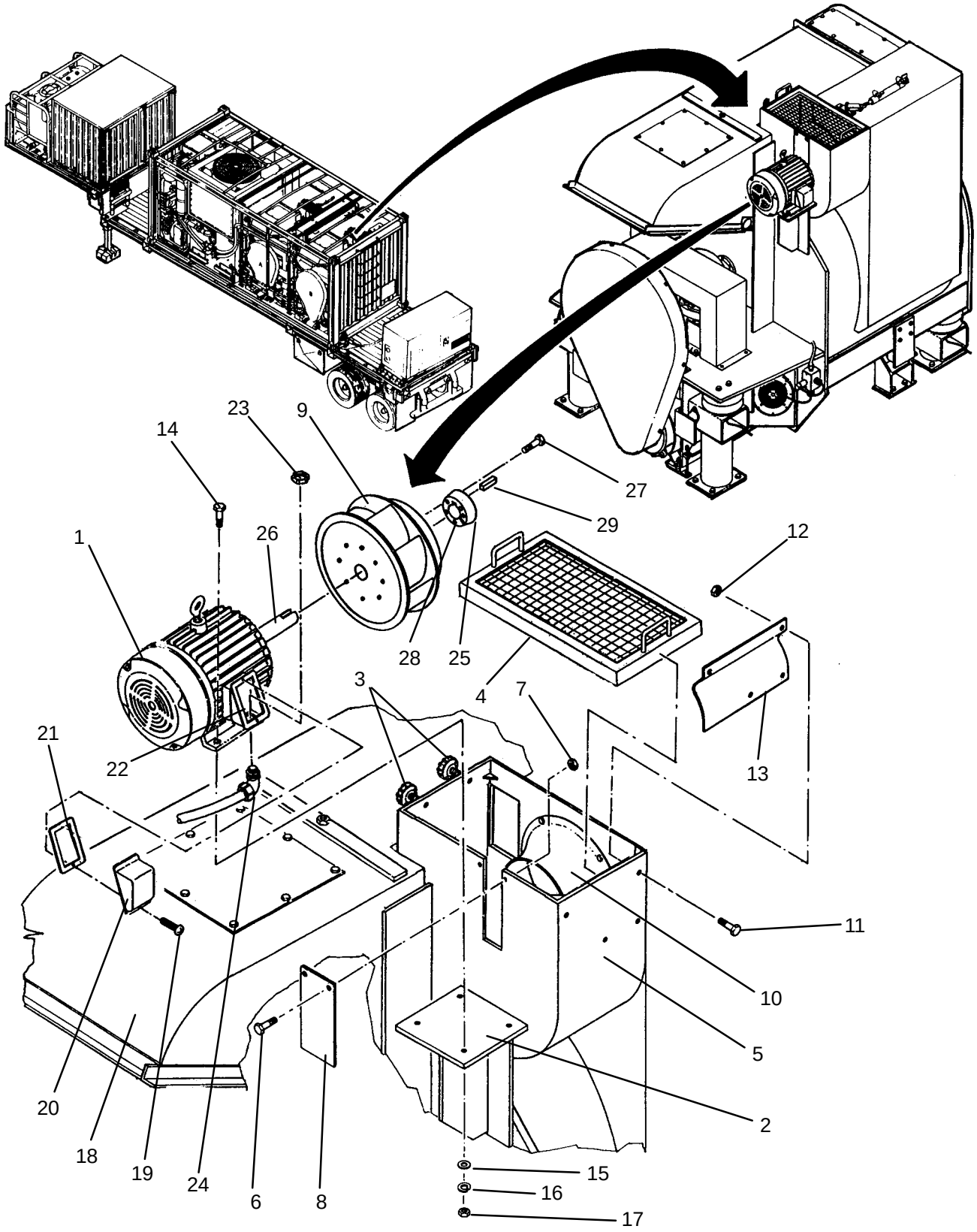
Personnel Required

Materials/Parts
Tags (Item 9, WP 0281 00)
Washer, Lock (Item 16, WP 0283 00)

Equipment Conditions
LADS power shut off at main control enclosure (WP 0113 00).

REMOVAL

1. Mark location of motor (1) on mounting bracket (2).
2. Loosen two clamping knobs (3) then pull outlet guard (4) out of blower duct (5).
3. Remove two screws (6) and nuts (7), then cover plate (8) from blower duct (5).
4. Measure and record distance from end of blower wheel (9) to end of cone (10).
5. Remove four screws (11) and nuts (12), then remove blower guide (13) from blower duct (5).
6. Remove four screws (14), flat washers (15), lock washers (16), and nuts (17) securing motor (1) to mounting bracket (2).
7. Lift motor (1) with attached blower wheel (9) from blower duct (5) and mounting bracket (2). Carefully place motor on edge of dryer inlet duct (18) so that blower wheel (9) is not resting on duct (18).
8. Remove screw (19), then remove cover (20) and gasket (21) from junction box (22).
9. Tag and disconnect wiring at motor (1).
10. Remove conduit nut (23), then pull conduit fitting (24) and wiring out of junction box (22).
11. Measure and record distance from end of tapered bushing (25) to end of motor shaft (26).
12. Remove three screws (27) securing blower wheel (9) to tapered bushing (25).
13. Insert two screws (27) into jacking holes (28) on tapered bushing (25) and jack blower wheel (9) off of tapered bushing.
14. Remove two screws (27) from jacking holes (28).
15. Remove tapered bushing (25) and key (29) using a bearing puller.
16. Remove blower wheel (9) from motor shaft (26).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INSTALLATION

1. Install blower wheel (9) onto motor shaft (26).
2. Install tapered bushing (25) and key (29) onto motor shaft (26) to achieve previously recorded dimension.
3. Secure blower wheel (9) to tapered bushing (25) with three screws (27).
4. Position motor (1) with attached blower wheel (9) onto dryer inlet duct (18). Carefully place motor on edge of dryer inlet duct (18) so that blower wheel (9) is not resting on duct (18).
5. Remove screw (19), then remove cover (20) and gasket (21) from junction box (22).
6. Insert conduit fitting (24) and wiring into junction box (22), then secure with conduit locknut (23).
7. Connect wiring at motor (1) as tagged.
8. Install cover (20) and gasket (21) onto junction box (22), then secure with screw (19).
9. Position motor (1) with attached blower wheel (9) into blower duct (5) and mounting bracket (2). Align motor (1) to marks on mounting bracket (2).
10. Install four screws (14), flat washers (15), lock washers (16), and nuts (17); but do not tighten.
11. Position end of blower wheel (9) to end of cone (10) at previously recorded dimension.
12. Secure motor with four screws (14), flat washers (15), lock washers (16), and nuts (17).
13. Install blower guide (13) into blower duct (5), then secure with four screws (11) and nuts (12).
14. Install cover plate (8) onto blower duct (5), then secure with two screws (6) and nuts (7).
15. Install outlet guard (4) into blower duct (5) then tighten two clamping knobs (3).
16. Use maintenance menu to test blower rotation (WP 0010 00). Ensure blower rotates freely and smoothly.

END OF WORK PACKAGE

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UNIT

LAUNDRY ADVANCED SYSTEM

(NSN 3510–01–463–0114)

INLET DAMPER AIR CYLINDER (FV111) REPLACEMENT REMOVAL, INSTALLATION

INITIAL SETUP:

Tools
Tool Kit, General Mechanics
(Item 14, WP 0282 00)

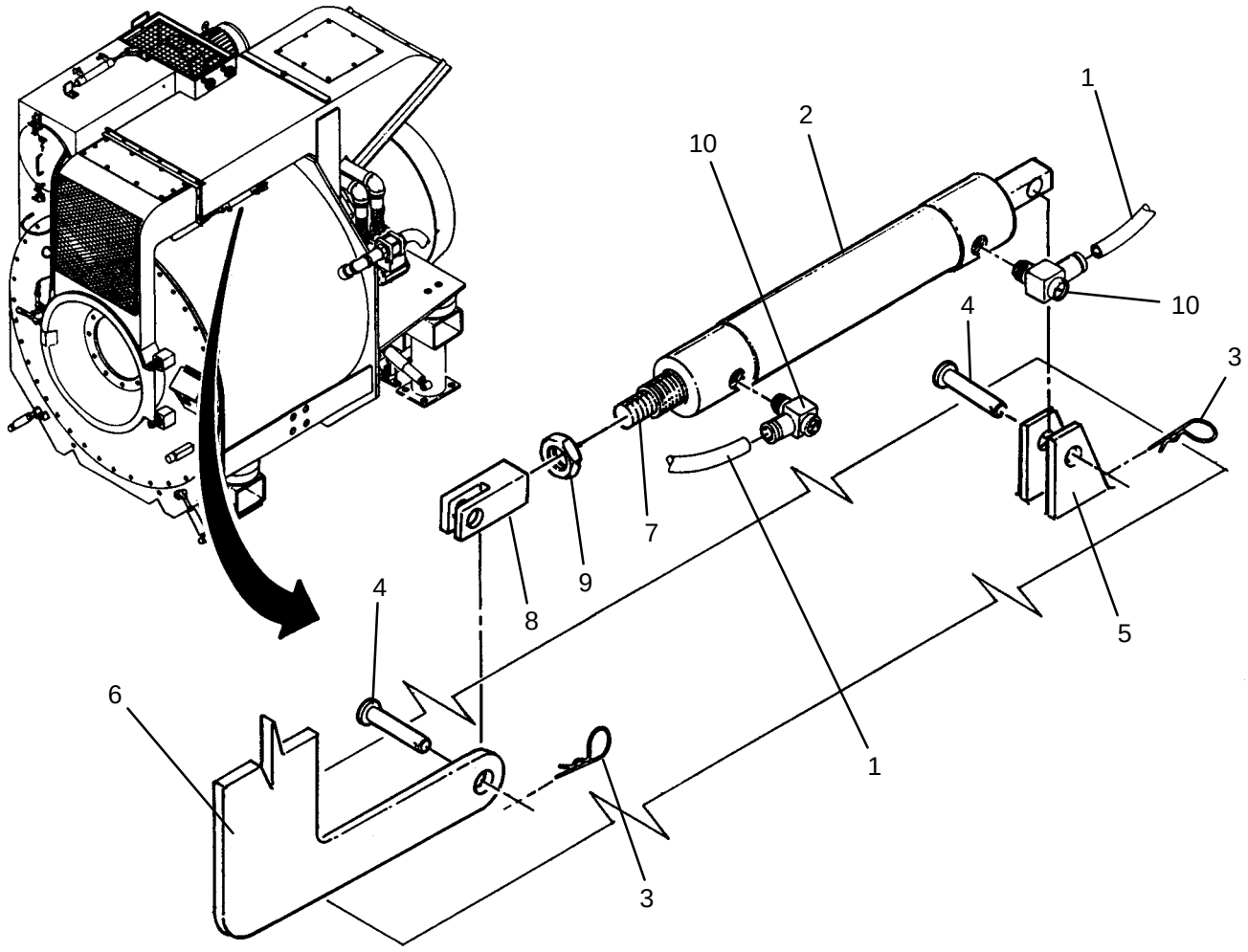
Personnel Required

Materials/Parts
Tags (Item 9, WP 0281 00)
Tape, Anti–Seize (Item 10, WP 0281 00)

Equipment Conditions
LADS power shut off at main control enclosure (WP 0113 00).
Air pressure must be vented (WP 0114 00).

REMOVAL

1. Tag and disconnect air tubes (1) from air cylinder (2).
2. Remove hairpins (3) from clevis pins (4) at both ends of air cylinder (2).
3. Remove clevis pins (4) securing air cylinder (2) to mounting pad (5) and inlet damper (6).
4. Remove air cylinder (2) from between mounting pad (5) and inlet damper (6).
5. Extend piston (7). Measure and record distance from tip of rod adapter (8) to front end of air cylinder (2).
6. Loosen jam nut (9). Unthread rod adapter (8) and jam nut from piston (7).
7. Remove flow control valves (10) from air cylinder (2).
8. Clean anti–seize tape from threads of flow control valves (10).



INSTALLATION

1. Apply anti–seize tape to threads of flow control valves (10).
2. Install flow control valves (10) into new air cylinder (2).
3. Thread thread jam nut (9) and rod adapter (8) on to piston (7).
4. Adjust position of rod adapter (8) as follows:
   a. Extend piston (7).
   b. Thread rod adapter (8) in or out to achieve previously recorded dimension.
   c. Tighten jam nut (9).
5. Insert air cylinder (2) between mounting pad (5) and inlet damper (6).
6. Install clevis pins (4) to secure air cylinder (2) to mounting pad (5) and inlet damper (6).
7. Install hairpins (3) to secure clevis pins (4).
8. Connect air tubes (1) to air cylinder (2) as tagged.
9. Adjust flow control valves (WP 0134 00).

END OF WORK PACKAGE

UNIT

LAUNDRY ADVANCED SYSTEM

(NSN 3510–01–463–0114)

OUTLET DAMPER AIR CYLINDER (FV110) REPLACEMENT REMOVAL, INSTALLATION

INITIAL SETUP:

Tools
Tool Kit, General Mechanics
(Item 14, WP 0282 00)

Personnel Required

Materials/Parts
Tags (Item 9, WP 0281 00)
Tape, Anti–Seize (Item 10, WP 0281 00)

Equipment Conditions
LADS power shut off at main control enclosure (WP 0113 00).
Air pressure must be vented (WP 0114 00).

REMOVAL

1. Tag and disconnect air tubes (1) from air cylinder (2).

NOTE

Step 2 applies to drum B only.

2. Remove six screws (3) and lock washers (4) then remove protective cover (5) from outlet duct (6).
3. Remove hair pin (7) from clevis pin (8).
4. Remove clevis pin (8) securing air cylinder (2) to link arm (9).
5. Remove hair pin (10) from clevis pin (11).
6. Remove clevis pin (11) securing air cylinder (2) to mounting bracket (12).
7. Remove air cylinder (2) from between link arm (9) and mounting bracket (12).
8. Extend piston (13). Measure and record distance from tip of rod adapter (14) to front end of air cylinder (2).
9. Loosen jam nut (15). Unthread rod adapter (14) and jam nut from piston (13).
10. Remove flow control valves (16) from air cylinder (2).

NOTE

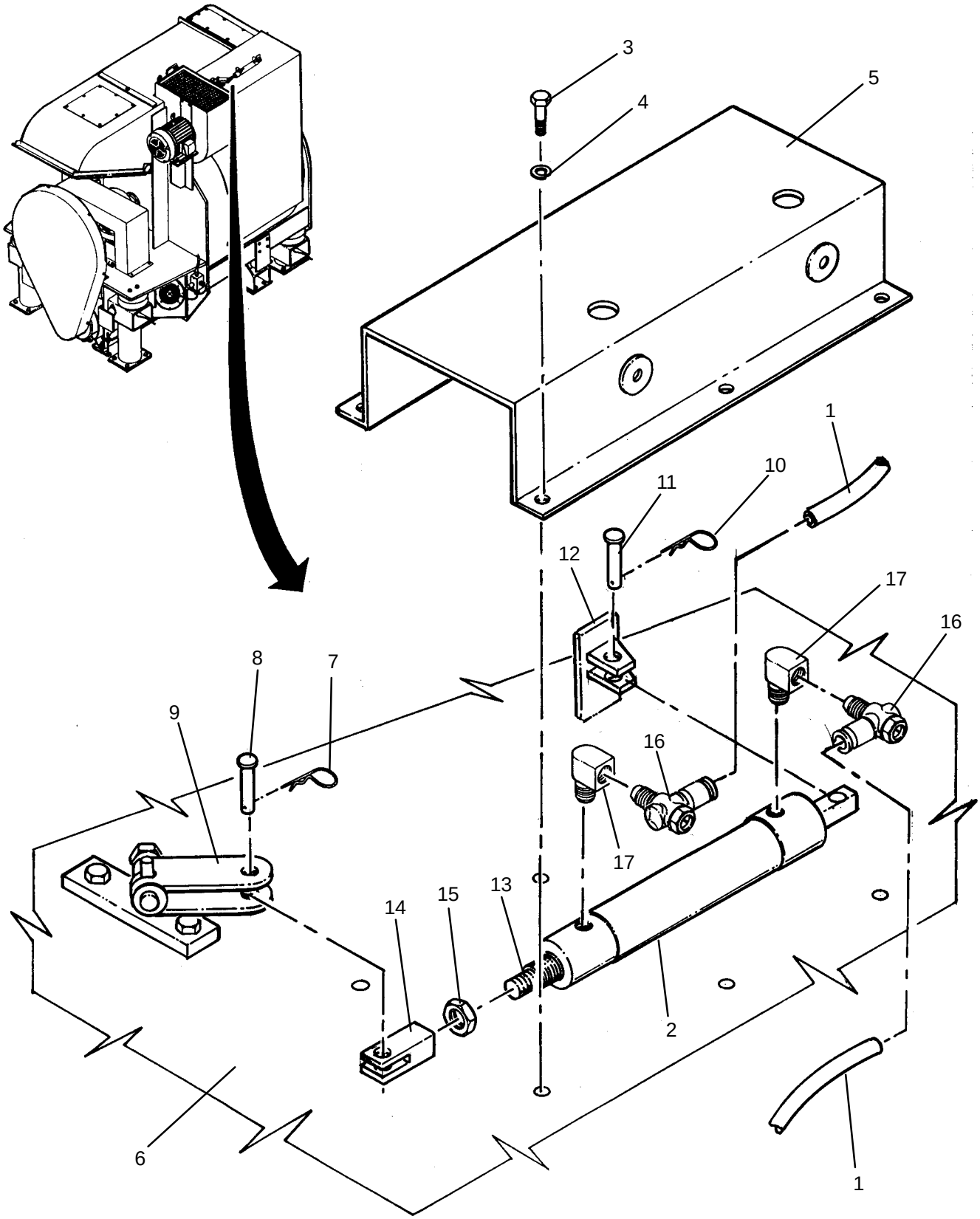
Step 11 applies to drum A only

11. Remove elbows (17) from air cylinder (2).
12. Clean anti–seize tape from threads of flow control valves (16).

NOTE

Step 13 applies to drum A only

13. Clean anti–seize tape from threads of elbows (17).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INSTALLATION

1. Apply anti–seize tape to threads of flow control valves (16).

NOTE

Steps 2 and 3 apply to drum A only.

2. Apply anti–seize tape to threads of elbows (17).
3. Install elbows (17) into new air cylinder (2).
4. Install flow control valves (16) into new air cylinder (2).
5. Thread jam nut (15) and rod adapter (14) on to piston (13).
6. Adjust position of rod adapter (14) as follows:
   a. Extend piston (13).
   b. Thread rod adapter (14) in or out to achieve previously recorded dimension.
   c. Tighten jam nut (15).
7. Insert air cylinder (2) between mounting bracket (12) and link arm (9).
8. Install clevis pin (11) to secure air cylinder (2) to mounting bracket (12).
9. Install hair pin (10) to secure clevis pin (11).
10. Install clevis pin (8) to secure air cylinder (2) to link arm (9).
11. Install hair pin (7) to secure clevis pin (8).

NOTE

Step 12 applies to drum B only.

12. Install protective cover (5) on top of outlet duct (6) then secure with six screws (3) and lock washers (4).
13. Connect air tubes (1) to air cylinder (2) as tagged.
14. Adjust flow control valves (WP 0134 00).

END OF WORK PACKAGE

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UNIT

LAUNDRY ADVANCED SYSTEM

(NSN 3510–01–463–0114)

AIR FLOW CONTROL VALVE REPLACEMENT REMOVAL, INSTALLATION

INITIAL SETUP:

Tools
Tool Kit, General Mechanics
(Item 14, WP 0282 00)

Personnel Required

Materials/Parts
Tape, Anti–Seize (Item 10, WP 0281 00)

Equipment Conditions
LADS power shut off at main control enclosure (WP 0113 00).
Air pressure must be vented (WP 0114 00).

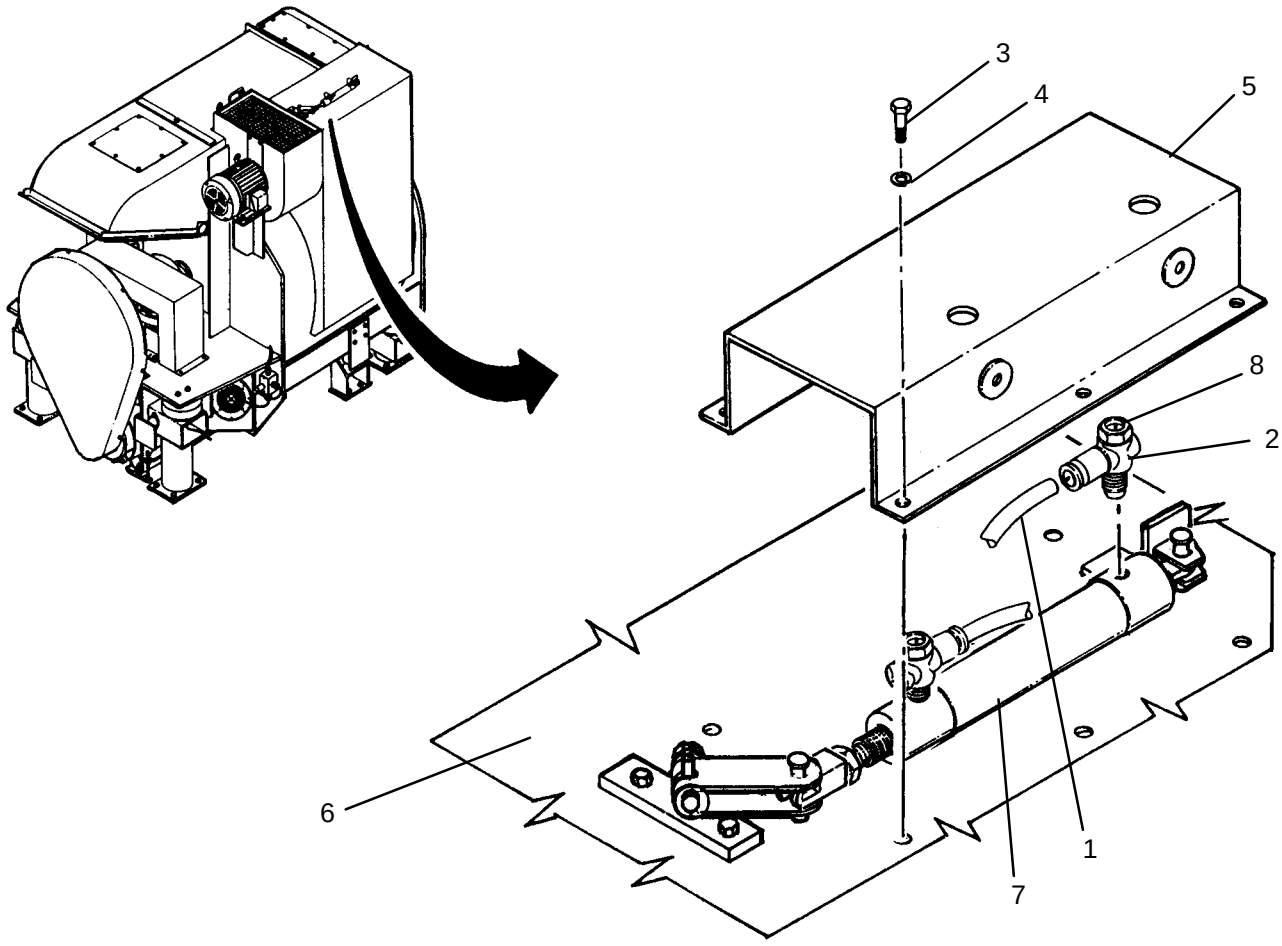
REMOVAL

1. Disconnect air tube (1) from flow control valve (2).

NOTE

Step 2 applies to drum B only.

2. Remove six screws (3) and lock washers (4) then remove protective cover (5) from outlet duct (6).
3. Unthread flow control valve (2) from air cylinder (7).



INSTALLATION

1. Apply anti–seize tape to threads of new flow control valve (2).
2. Thread flow control valve (2) into air cylinder (7).

NOTE

Step 3 applies to drum B only.

3. Install protective cover (5) on top of outlet duct (6) then secure with six screws (3) and lock washers (4).
4. Connect air tube (1) to flow control valve (2).

ADJUSTMENT

1. Use maintenance menu to access control outputs function (WP 0010 00). Open and close inlet damper FV111 or outlet damper FV110 several times and verify:
   a. Air cylinder travel is smooth and steady.
   b. Damper reaches open and closed position without banging.
   c. Damper opening and closing speed is 15 – 20 seconds for inlet damper FV111 and about 1 second for outlet damper FV110.
2. If air cylinder and damper operation is correct, proceed to step 5; otherwise, continue to step 3.
3. Change travel speed using adjusting screw (8). Turn screw CW to decrease speed or CCW to increase speed.
4. Repeat step 1 to recheck damper operation.
5. Open and close inlet damper FV111 or outlet damper FV110 several times and audibly check for air leaks at connections on air cylinder (7).

END OF WORK PACKAGE

UNIT

LAUNDRY ADVANCED SYSTEM

(NSN 3510–01–463–0114)

AMBIENT AIR TEMPERATURE SENSOR (TE100) REPLACEMENT REMOVAL, INSTALLATION

INITIAL SETUP:

Tools
Tool Kit, General Mechanics
(Item 14, WP 0282 00)

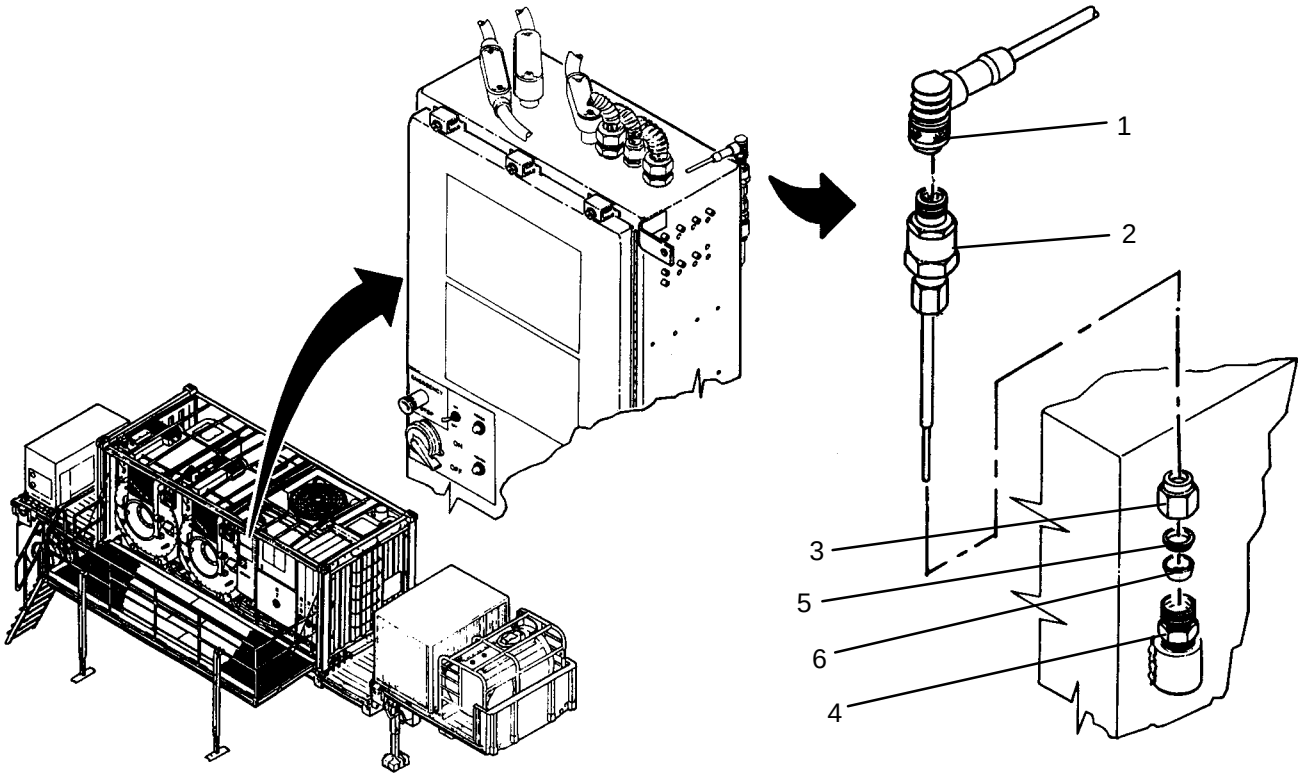
Personnel Required

Materials/Parts

Equipment Conditions
LADS power shut off at main control enclosure (WP 0113 00).

REMOVAL

1. Disconnect electrical connector (1) from temperature sensor (2).
2. Loosen nut (3) then remove temperature sensor (2) from fitting (4).



INSTALLATION

1. Slide new nut (3), upper ferrule (5) and lower ferrule (6) onto new temperature sensor (2).
2. Insert temperature sensor (2) into fitting (4) then tighten nut (3).
3. Connect electrical connector (1) to temperature sensor (2).
4. Access examine inputs function using maintenance menu (WP 0010 00), then observe and record temperature reading for TE101.
5. Access temperature sensor calibration function using maintenance menu (WP 0010 00), then set output of temperature sensor TE100 to same temperature reading as recorded for TE101.

END OF WORK PACKAGE

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UNIT

LAUNDRY ADVANCED SYSTEM

(NSN 3510–01–463–0114)

DRYER AIR TEMPERATURE SENSOR (TE101 OR TE102) REPLACEMENT REMOVAL, INSTALLATION

INITIAL SETUP:

Tools
Tool Kit, General Mechanics
(Item 14, WP 0282 00)

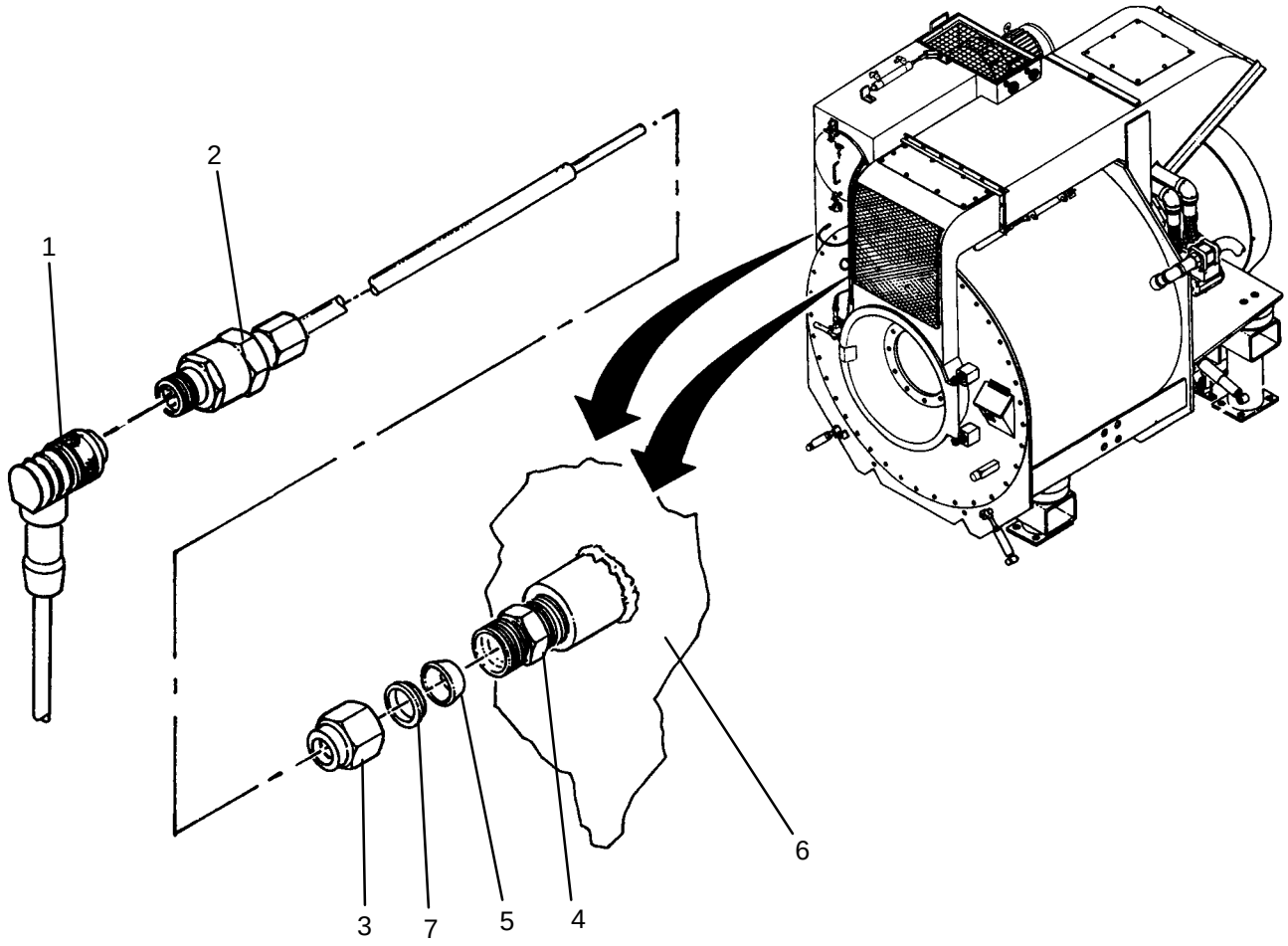
Personnel Required

Materials/Parts
Tape, Anti–Seize (Item 10, WP 0281 00)

Equipment Conditions
LADS power shut off at main control enclosure (WP 0113 00).

REMOVAL

1. Disconnect electrical connector (1) from temperature sensor (2).
2. Loosen nut (3) then remove temperature sensor (2) from fitting (4).
3. Measure and record distance from tip of temperature sensor (2) to lower ferrule (5).
4. Unthread fitting (4) from inlet duct (6).
5. Clean anti–seize tape from threads of fitting (4).



INSTALLATION

1. Connect electrical connector (1) to temperature sensor (2).
2. Access examine inputs function using maintenance menu (WP 0010 00), then observe and record temperature reading for TE100.
3. Access temperature sensor calibration function using maintenance menu (WP 0010 00), then set output of temperature sensor TE101 (inlet) or TE102 (outlet) to same temperature reading as recorded for TE100.
4. Slide new nut (3), upper ferrule (7) and lower ferrule (5) onto new temperature sensor (2).
5. Insert temperature sensor (2) into fitting (4) at previously recorded dimension.
6. Tighten nut (3) onto fitting (4) to swage lower ferrule (5) on temperature sensor (2).
7. Loosen nut (3) and remove temperature sensor (2) from fitting (4).
8. Apply anti–seize tape to threads of fitting (4).
9. Thread fitting (4) into inlet duct (6).
10. Insert temperature sensor (2) into fitting (4) then tighten nut (3).
11. Perform a test laundry cycle (TM 10–3510–221–10). Verify normal drying operation.

END OF WORK PACKAGE

UNIT

LAUNDRY ADVANCED SYSTEM

(NSN 3510–01–463–0114)

FRONT SHOCK ABSORBER REPLACEMENT REMOVAL, INSTALLATION

INITIAL SETUP:

Tools
Tool Kit, General Mechanics
(Item 14, WP 0282 00)

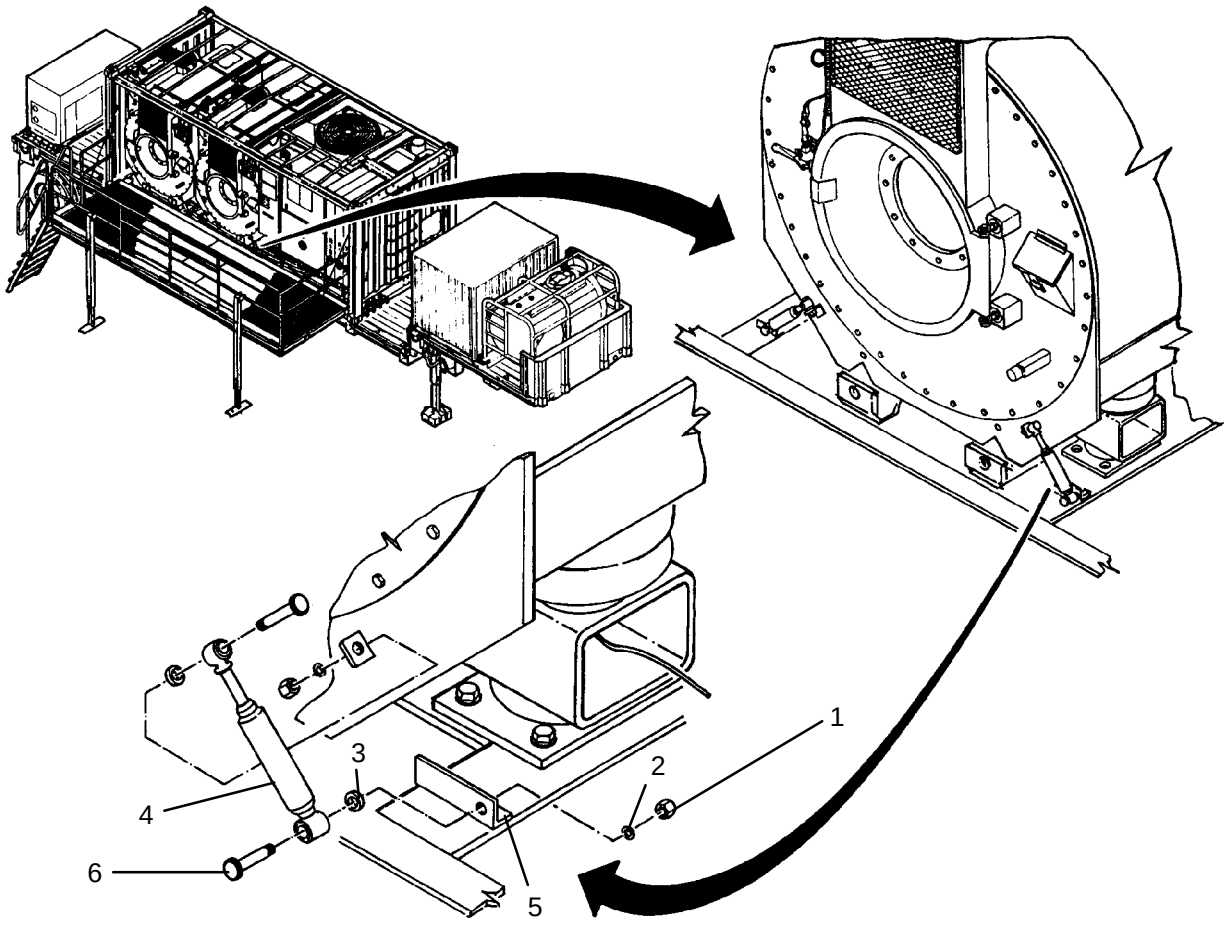
Personnel Required

Materials/Parts

Equipment Conditions
LADS power shut off at main control enclosure (WP 0113 00).

REMOVAL

1. Remove two nuts (1), lock washers (2), and spacers (3) securing shock absorber (4) to mounting brackets (5).
2. Remove two clevis bolts (6) then pull shock absorber (4) off of mounting brackets (5).



INSTALLATION

1. Adjust length of new shock absorber (4) to align with holes in mounting brackets (5), then install two clevis bolts (6).
2. Install two spacers (3), lock washers (2), and nuts (1) to secure shock absorber (4) to mounting brackets (5).

END OF WORK PACKAGE

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UNIT

LAUNDRY ADVANCED SYSTEM

(NSN 3510–01–463–0114)

REAR SHOCK ABSORBER REPLACEMENT REMOVAL, INSTALLATION

INITIAL SETUP:

Tools
Tool Kit, General Mechanics
(Item 14, WP 0282 00)

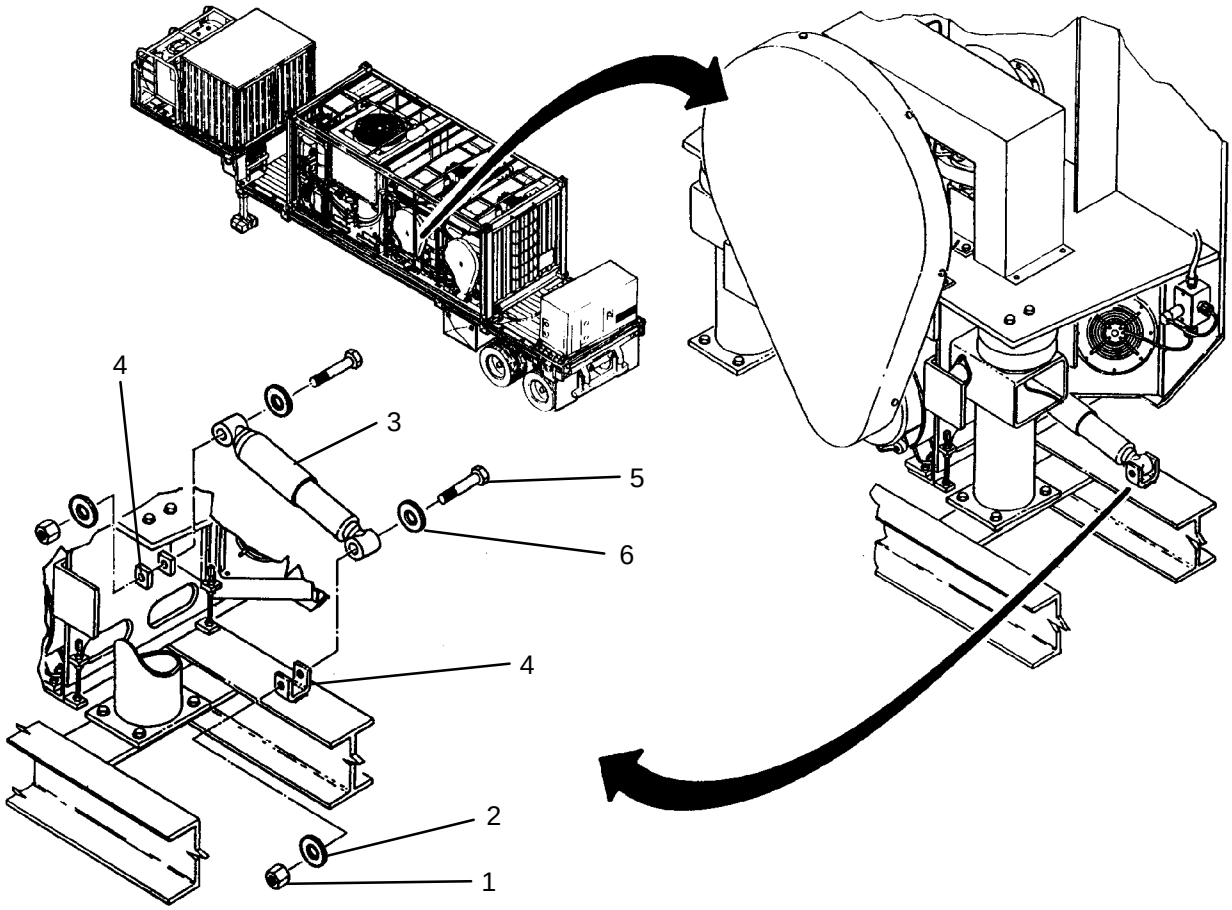
Personnel Required

Materials/Parts

Equipment Conditions
LADS power shut off at main control enclosure (WP 0113 00).

REMOVAL

1. Remove two nuts (1) and flat washers (2) securing shock absorber (3) to mounting brackets (4).
2. Remove two screws (5) and flat washers (6) then pull shock absorber (3) off of mounting brackets (4).



INSTALLATION

1. Adjust length of new shock absorber (3) to align with holes in mounting brackets (4), then install two screws (5) and flat washers (6).
2. Install two nuts (1) and flat washers (2) to secure shock absorber (3) to mounting brackets (4).

END OF WORK PACKAGE

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UNIT

LAUNDRY ADVANCED SYSTEM

(NSN 3510–01–463–0114)

FRONT AIR BAG REPLACEMENT REMOVAL, INSTALLATION

INITIAL SETUP:

Tools
Tool Kit, General Mechanics
(Item 14, WP 0282 00)

Personnel Required

Materials/Parts
Tape, Anti–Seize (Item 10, WP 0281 00)
Washer, Lock (Item 16, WP 0283 00)

Equipment Conditions
LADS power shut off at main control enclosure (WP 0113 00).

REMOVAL

NOTE

In order to maintain optimal drum balancing performance, front air bags should be replaced in pairs.

WARNING

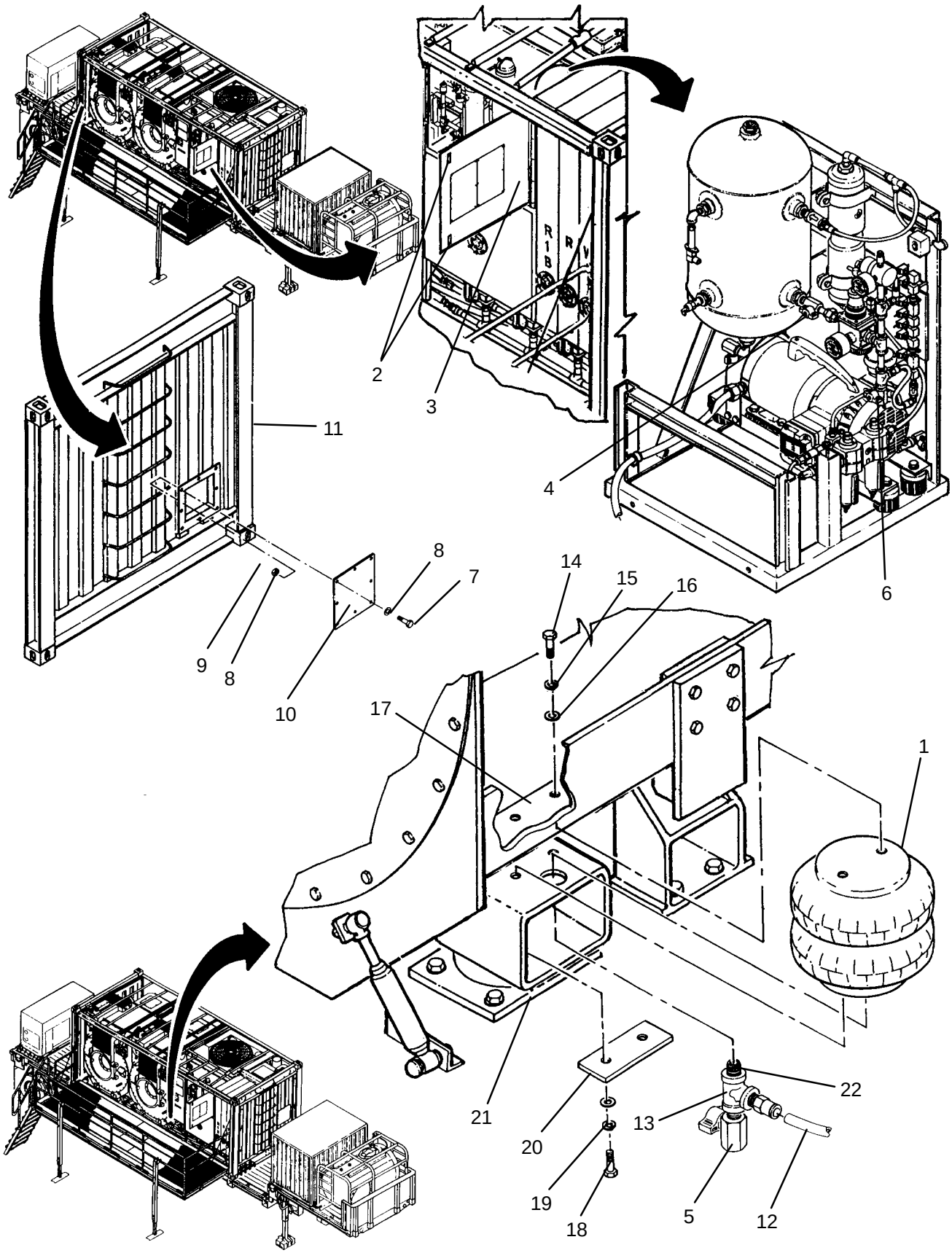
Keep hands and feet clear of drums when venting air bags. Failure to follow this precaution could result in severe personnel injury.

1. Vent air pressure from air bags (1) as follows:
   a. Disengage two latches (2), then open access door (3).
   b. Close manual valve (4).
   c. Open valves (5) on front air bags (1).
   d. Open valve (6).
   e. Allow air pressure to vent from air bags (1) then close valves (5) and (6).

NOTE

Step 2 applies to right front air bag on drum B only.

2. Remove eight screws (7), flat washers (8), and nuts (9), then remove access panel (10) from ISO frame (11).
3. Disconnect air line (12) from air bag (1).
4. Unthread valve (5) with attached piping (13) from air bag (1).
5. Remove two screws (14), lock washers (15), and flat washers (16) securing air bag (1) to drum frame (17).
6. Remove two screws (18), lock washers (19), and plate (20) securing air bag (1) to pedestal (21).
7. Compress air bag (1) and remove from between drum frame (17) and pedestal (21).
8. Clean anti–seize tape from threads of nipple (22).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INSTALLATION

1. Apply anti–seize tape to threads of nipple (22).
2. Compress air bag (1) and insert between drum frame (17) and pedestal (21).
3. Install two screws (18), lock washers (19) and plate (20) to secure air bag (1) to pedestal (21).
4. Install two screws (14), lock washers (15), and flat washers (16) to secure air bag (1) to drum frame (17).
5. Thread piping (13) into air bag (1) ensuring valve (6) is oriented as shown.
6. Connect air line (12) to air bag (1).

NOTE

Step 7 applies to right front air bag on drum B only.

7. Install access panel (10) onto ISO frame (11), then secure with eight screws (7), flat washers (8), and nuts (9).
8. Open manual valve (4).
9. Close access door (3) and secure by engaging two latches (2).
10. Use maintenance menu to test air system (WP 0010 00). After air system is pressurized, audibly check for air leaks at air bag(s) (1).
11. Perform a test laundry cycle (TM 10–3510–221–10). Verify smooth operation of drum.

END OF WORK PACKAGE

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UNIT

LAUNDRY ADVANCED SYSTEM

(NSN 3510–01–463–0114)

REAR AIR BAG REPLACEMENT REMOVAL, INSTALLATION

INITIAL SETUP:

Tools
Tool Kit, General Mechanics
(Item 14, WP 0282 00)

Personnel Required

Materials/Parts
Tape, Anti–Seize (Item 10, WP 0281 00)
Washer, Lock (Item 16, WP 0283 00)

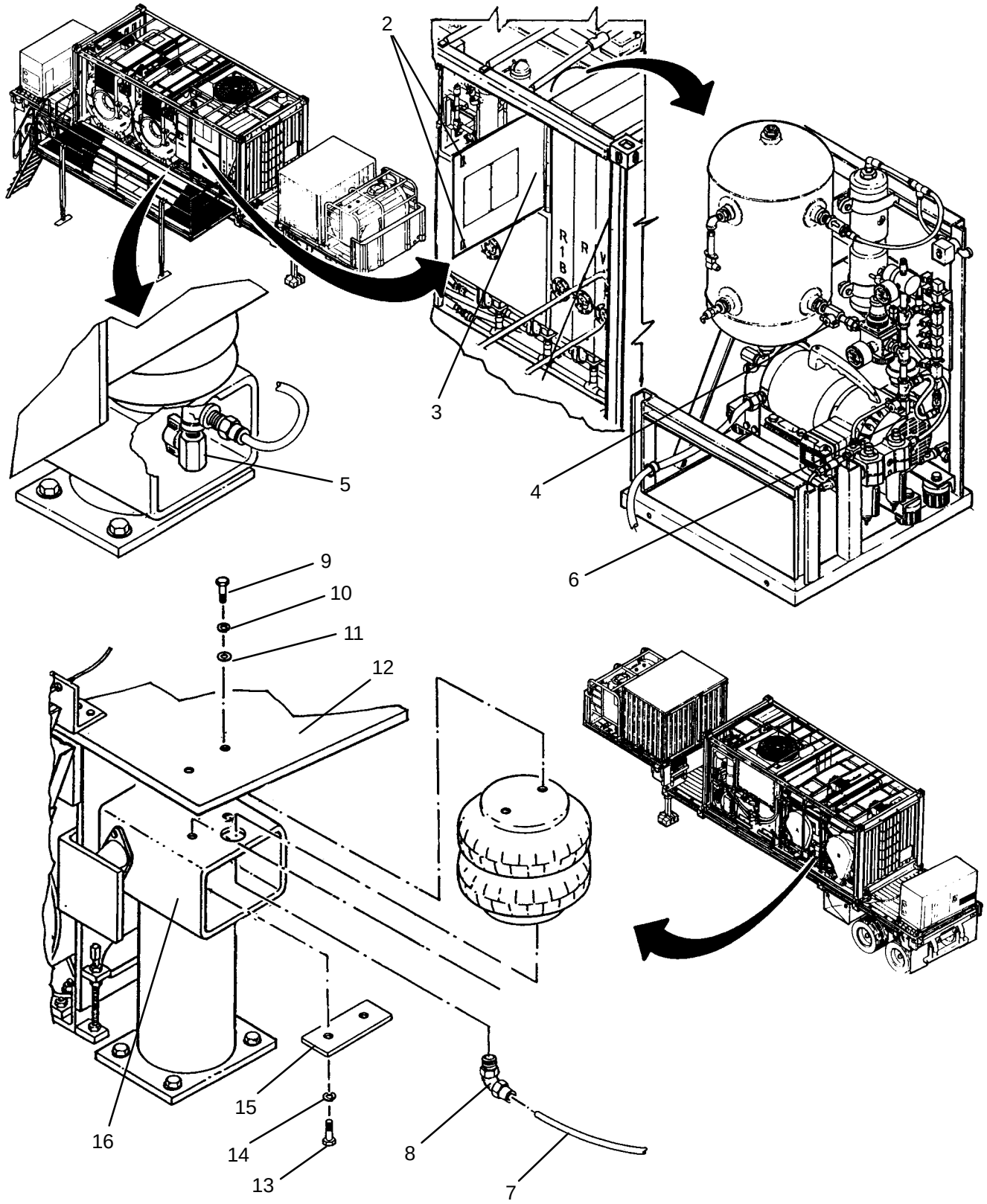
Equipment Conditions
LADS power shut off at main control enclosure (WP 0113 00).

REMOVAL

WARNING

Keep hands and feet clear of drums when venting air bags. Failure to follow this precaution could result in severe personnel injury.

1. Vent air pressure from air bags (1) as follows:
   a. Disengage two latches (2), then open access door (3).
   b. Close manual valve (4).
   c. Open valves (5) on front air bags (1).
   d. Open valve (6).
   e. Allow air pressure to vent from air bags (1) then close valves (5) and (6).
2. Disconnect air tube (7) from faulty air bag (1).
3. Unthread elbow (8) from air bag (1).
4. Remove two screws (9), lock washers (10), and flat washers (11) securing air bag (1) to bearing frame (12).
5. Remove two screws (13), lock washers (14), and plate (15) securing air bag (1) to pedestal (16).
6. Compress air bag (1) and remove from between bearing frame (12) and pedestal (16).
7. Clean anti–seize tape from threads of elbow (8).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INSTALLATION

1. Apply anti–seize tape to threads of elbow (8).
2. Compress air bag (1) and insert between bearing frame (12) and pedestal (16).
3. Install two screws (13), lock washers (14) and plate (15) to secure air bag (1) to pedestal (16).
4. Install two screws (9), lock washers (10), and flat washers (11) to secure air bag (1) to bearing frame (12).
5. Thread elbow (8) into new air bag (1).
6. Connect air tube (7) to air bag (1).
7. Open manual valve (4).
8. Close access door (3) and secure by engaging two latches (2).
9. Use maintenance menu to test air system (WP 0010 00). After air system is pressurized, audibly check for air leaks at air bag(s) (1).
10. Perform a test laundry cycle (TM 10–3510–221–10). Verify smooth operation of drum.

END OF WORK PACKAGE

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UNIT

LAUNDRY ADVANCED SYSTEM

(NSN 3510–01–463–0114)

LEVELING VALVE REPLACEMENT REMOVAL, INSTALLATION

INITIAL SETUP:

Tools
Tool Kit, General Mechanics
(Item 14, WP 0282 00)

Personnel Required

Materials/Parts
Tape, Anti–Seize (Item 10, WP 0281 00)
Tags (Item 9, WP 0281 00)
Washer, Lock (Item 14, WP 0283 00)

Equipment Conditions
LADS power shut off at main control enclosure (WP 0113 00).

REMOVAL

WARNING

Keep hands and feet clear of drums when venting air bags. Failure to follow this precaution could result in severe personnel injury.

1. Vent air pressure from air bags (1) as follows:
   a. Disengage two latches (2), then open access door (3).
   b. Close manual valve (4).
   c. Open valves (5) on front air bags (1).
   d. Open valve (6).
   e. Allow air pressure to vent from air bags (1) then close valves (5) and (6).

NOTE

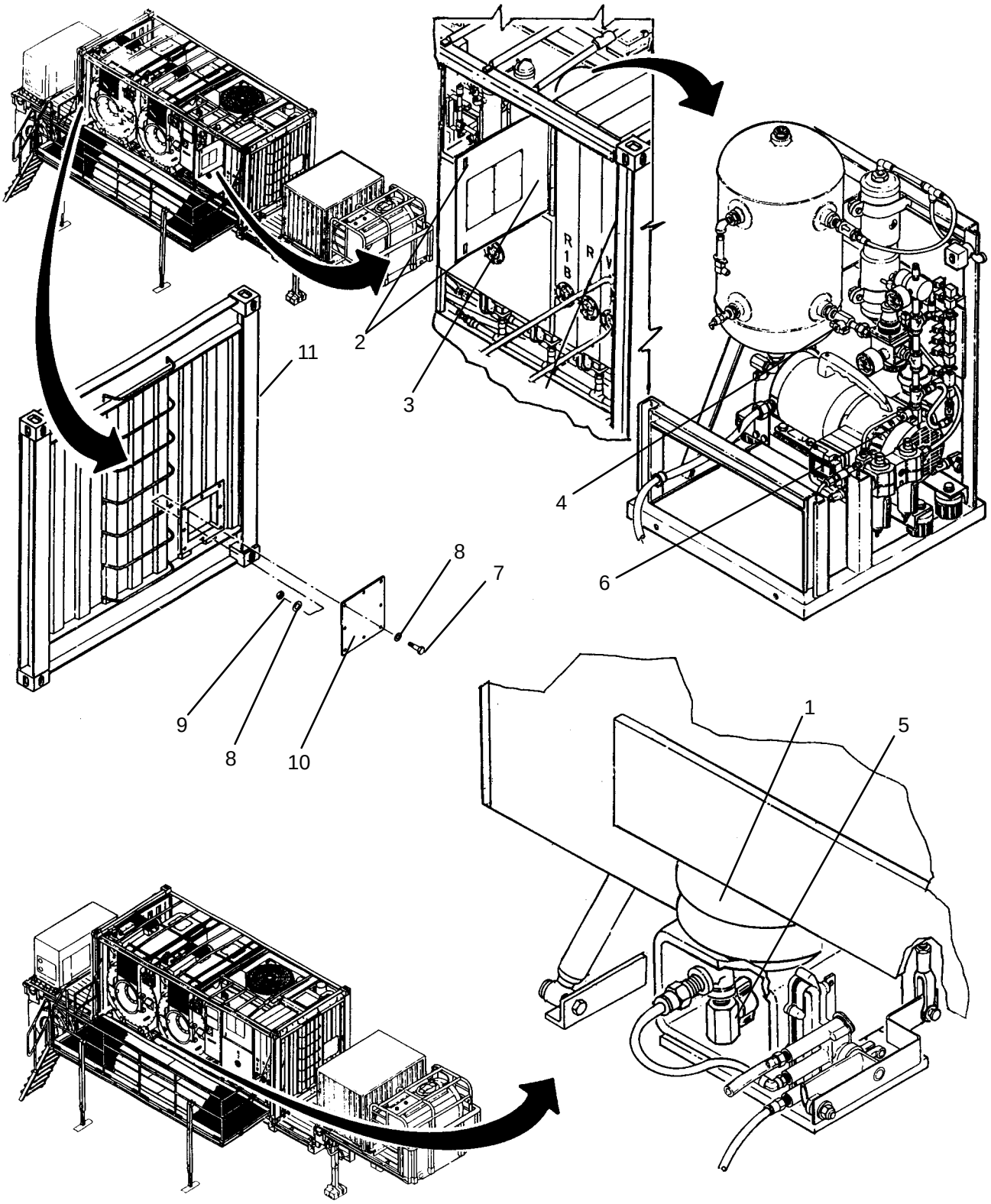
Step 2 applies to right front air bag on drum B only.

2. Remove eight screws (7), flat washers (8), and nuts (9), then remove access panel (10) from ISO frame (11).
3. Tag and disconnect air tubes (12) from leveling valve (13).
4. Remove hair pin (14) from clevis pin (15).
5. Remove clevis pin (15) then slide linkage (16) off of leveling valve (13).
6. Remove two screws (17), lock washers (18), flat washers (19) and nuts (20), then remove leveling valve (13) from pedestal (21).
7. Unthread connector (22) and elbow (23) from leveling valve (13).

NOTE

Step 8 applies to right front air bag on drum B only.

8. Unthread two elbows (23) from leveling valve (13).
9. Clean anti–seize tape from threads of connector (22) and elbow (23).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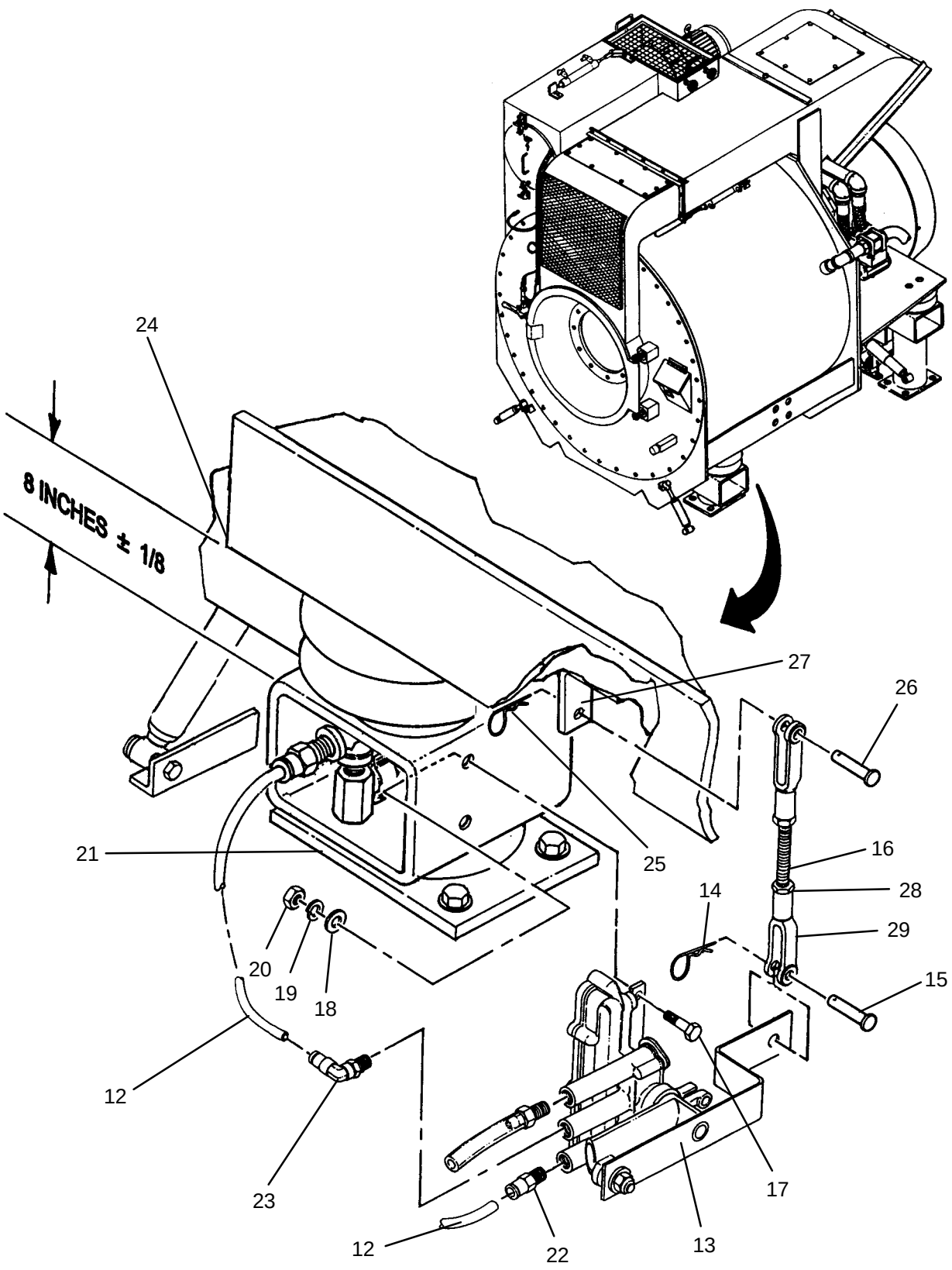
8 INCHES ± 1/8
24
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INSTALLATION

1. Apply anti–seize tape to threads of connector (22) and elbow (23).
2. Thread connector (22) and elbow (23) into new leveling valve (13).

NOTE

Step 3 applies to right front air bag on drum B only.

3. Thread two elbows (23) into new leveling valve (13).
4. Position leveling valve (13) onto pedestal (21), then secure with two screws (17), lock washers (19), flat washers (18) and nuts (20).
5. Align linkage (16) with leveling valve (13) then install clevis pin (15).
6. Install hair pin (14) to secure clevis pin (15).
7. Connect air tubes (12) to leveling valve (13) as tagged.
8. Open manual valve (4).
9. Close access door (3) and secure by engaging two latches (2).

ADJUSTMENT

NOTE

Replacing or adjusting a leveling valve can affect the adjustment of the other leveling valve. Always check the adjustment of both leveling valves before completing this procedure.

1. Use maintenance menu to pressurize air bags (WP 0010 00).
2. Measure distance between top of pedestal (21) and bottom of drum frame (24) on both sides of drum. If measurements are 8 inches on each side and within 1/8 inch of each other proceed to step 14, otherwise continue to step 3.
3. Remove hair pins (14) and (25) from clevis pins (15) and (26).
4. Remove clevis pins (15) and (26) then pull linkage (16) off of leveling valve (13) and link bracket (27).

NOTE

Linkage must be shortened to lower level or lengthened to raise level. When adjusting linkage maintain an equal amount of thread engagement at both ends of threaded rod. If linkage is already adjusted to the maximum length it may be necessary to adjust linkage on opposite leveling valve.

5. Loosen jam nut (28) at one end of linkage (16).
6. Thread rod end (29) in or out as necessary to adjust length of linkage (16).
7. Ensure rod ends (29) are pointing in same direction then tighten jam nut (28).
8. Connect linkage (16) at link bracket (27) then install clevis pin (26).
9. Slide linkage (16) onto leveling valve (13) then install clevis pin (15).
10. Install hair pins (14) and (25) to secure clevis pins (15) and (26).
11. Close valve (4), open valves (5) and (6). allow air pressure to vent.
12. Close valves (5) and (6), Open valve (4). allow air pressure to vent.
13. Repeat step 2.

ADJUSTMENT– Continued

NOTE

Step 14 applies to right front air bag on drum B only.

14. Install access panel (10) onto ISO frame (11), then secure with eight screws (7), flat washers (8), and nuts (9).
15. Perform a test laundry cycle (TM 10–3510–221–10). Verify smooth operation of drum.

END OF WORK PACKAGE

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UNIT

LAUNDRY ADVANCED SYSTEM

(NSN 3510–01–463–0114)

FRONT SIDE–TO–SIDE VIBRATION ELIMINATOR REPLACEMENT REMOVAL, INSTALLATION

INITIAL SETUP:

Tools
Tool Kit, General Mechanics
(Item 14, WP 0282 00)

Personnel Required

Materials/Parts

Equipment Conditions
LADS power shut off at main control enclosure (WP 0113 00).

REMOVAL

WARNING

Keep hands and feet clear of drums when venting air bags. Failure to follow this precaution could result in severe personnel injury.

NOTE

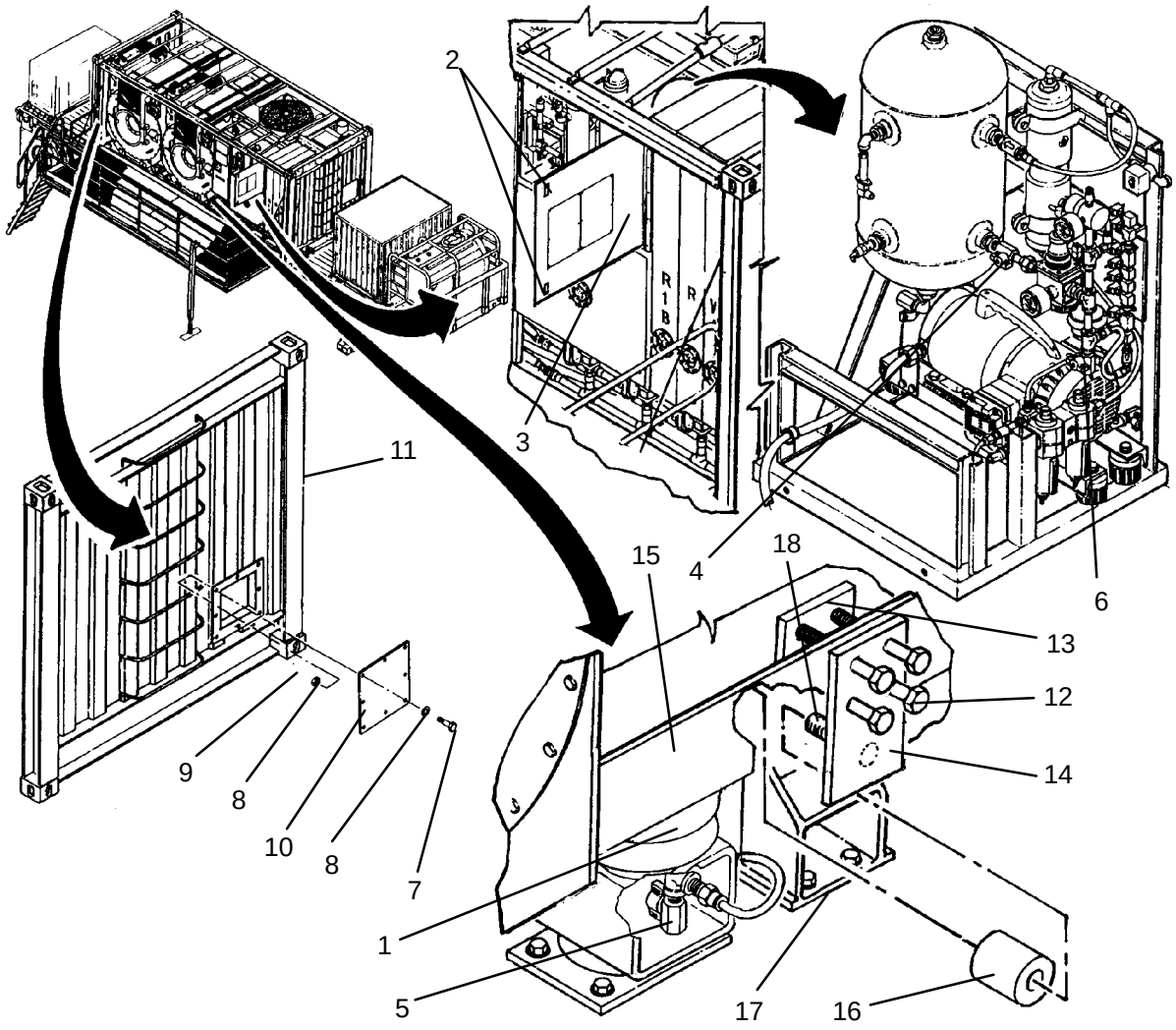
In order to maintain optimal drum balancing performance, front vibration eliminators should be replaced in pairs.

1. Vent air pressure from air bags (1) as follows:
   a. Disengage two latches (2), then open access door (3).
   b. Close manual valve (4).
   c. Open valves (5) on front air bags (1).
   d. Open valve (6).
   e. Allow air pressure to vent from air bags (1) then close valves (5 and 6).

NOTE

Step 2 applies to right front vibration eliminator on drum B only.

2. Remove eight screws (7), flat washers (8), and nuts (9), then remove access panel (10) from ISO frame (11).
3. Loosen, but do not remove four screws (12), securing nut plate (13) and pre–load plate (14) to drum frame (15).
4. Pull vibration eliminator (16) from between pre–load plate (14) and bumper support (17).



INSTALLATION

1. Insert vibration eliminator (16) between pre–load plate (14) and bumper support (17). Ensure inner hole on vibration eliminator is centered over pin (18).

NOTE

When compressing vibration eliminator, ensure ends remain square against pre–load plate and bumper support.

2. Tighten four screws (12) to secure nut plate (13) and pre–load plate (14) to drum frame (15). Tighten screws in a crisscross manner.

NOTE

Step 3 applies to right front vibration eliminator on drum B only.

3. Install access panel (10) onto ISO frame (11), then secure with eight screws (7), flat washers (8), and nuts (9).
4. Open manual valve (4).
5. Close access door (3) and secure by engaging two latches (2).
6. Perform a test laundry cycle (TM 10–3510–221–10). Verify smooth operation of drum.

END OF WORK PACKAGE

UNIT

LAUNDRY ADVANCED SYSTEM

(NSN 3510–01–463–0114)

REAR SIDE–TO–SIDE VIBRATION ELIMINATOR REPLACEMENT REMOVAL, INSTALLATION

INITIAL SETUP:

Tools
Tool Kit, General Mechanics
(Item 14, WP 0282 00)

Personnel Required

Materials/Parts
Washer, Lock (Item 17, WP 0283 00)

Equipment Conditions
LADS power shut off at main control enclosure (WP 0113 00).

REMOVAL

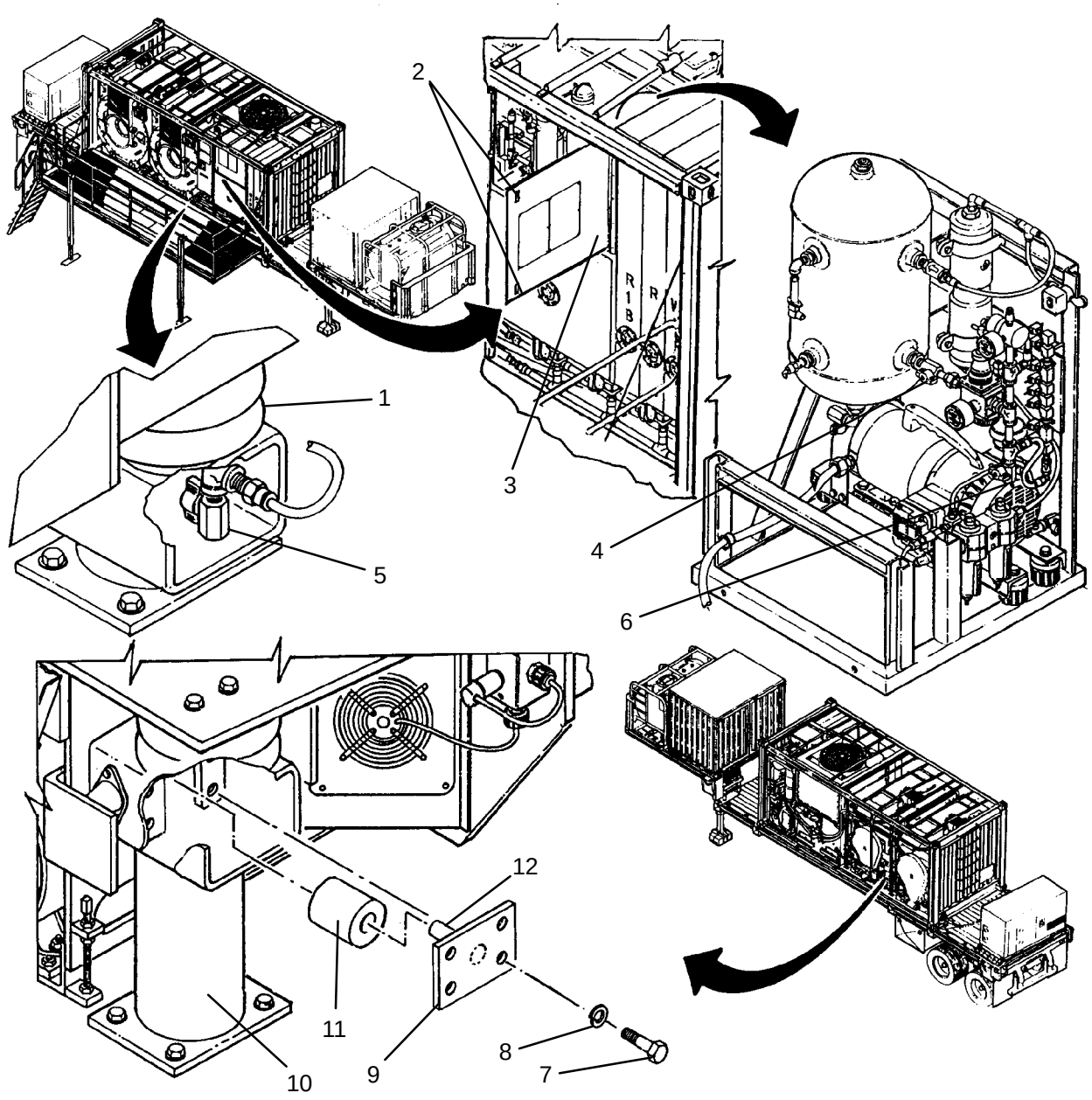
NOTE

In order to maintain optimal drum balancing performance, rear vibration eliminator should be replaced in pairs.

WARNING

Keep hands and feet clear of drums when venting air bags. Failure to follow this precaution could result in severe personnel injury.

1. Vent air pressure from air bags (1) as follows:
   a. Disengage two latches (2), then open access door (3).
   b. Close manual valve (4).
   c. Open valves (5) on front air bags (1).
   d. Open valve (6).
   e. Allow air pressure to vent from air bags (1) then close valves (5 and 6).
2. Remove four screws (7) and lock washers (8) securing nut plate (9) to pedestal (10).
3. Remove nut plate (9) and vibration eliminator (11) from pedestal (10).



INSTALLATION

1. Install new vibration eliminator (11) onto nut plate (9). Ensure inner hole on vibration eliminator is centered over pin (12).

NOTE

When compressing vibration eliminator ensure end remains square against nut plate.

2. Mate nut plate (9) with pedestal (10).
3. Install four screws (7) and lock washers (8) to secure nut plate (9). Tighten screws in a crisscross manner.
4. Open manual valve (4).
5. Close access door (3) and secure by engaging two latches (2).
6. Perform a test laundry cycle (TM 10–3510–221–10). Verify smooth operation of drum.

END OF WORK PACKAGE

UNIT

LAUNDRY ADVANCED SYSTEM

(NSN 3510–01–463–0114)

FRONT–TO–BACK VIBRATION ELIMINATOR REPLACEMENT REMOVAL, INSTALLATION

INITIAL SETUP:

Tools
Tool Kit, General Mechanics
(Item 14, WP 0282 00)

Personnel Required

Materials/Parts
Washer, Lock (Item 14, WP 0283 00)
Washer, Lock (Item 17, WP 0283 00)

Equipment Conditions
LADS power shut off at main control enclosure (WP 0113 00).

REMOVAL

WARNING

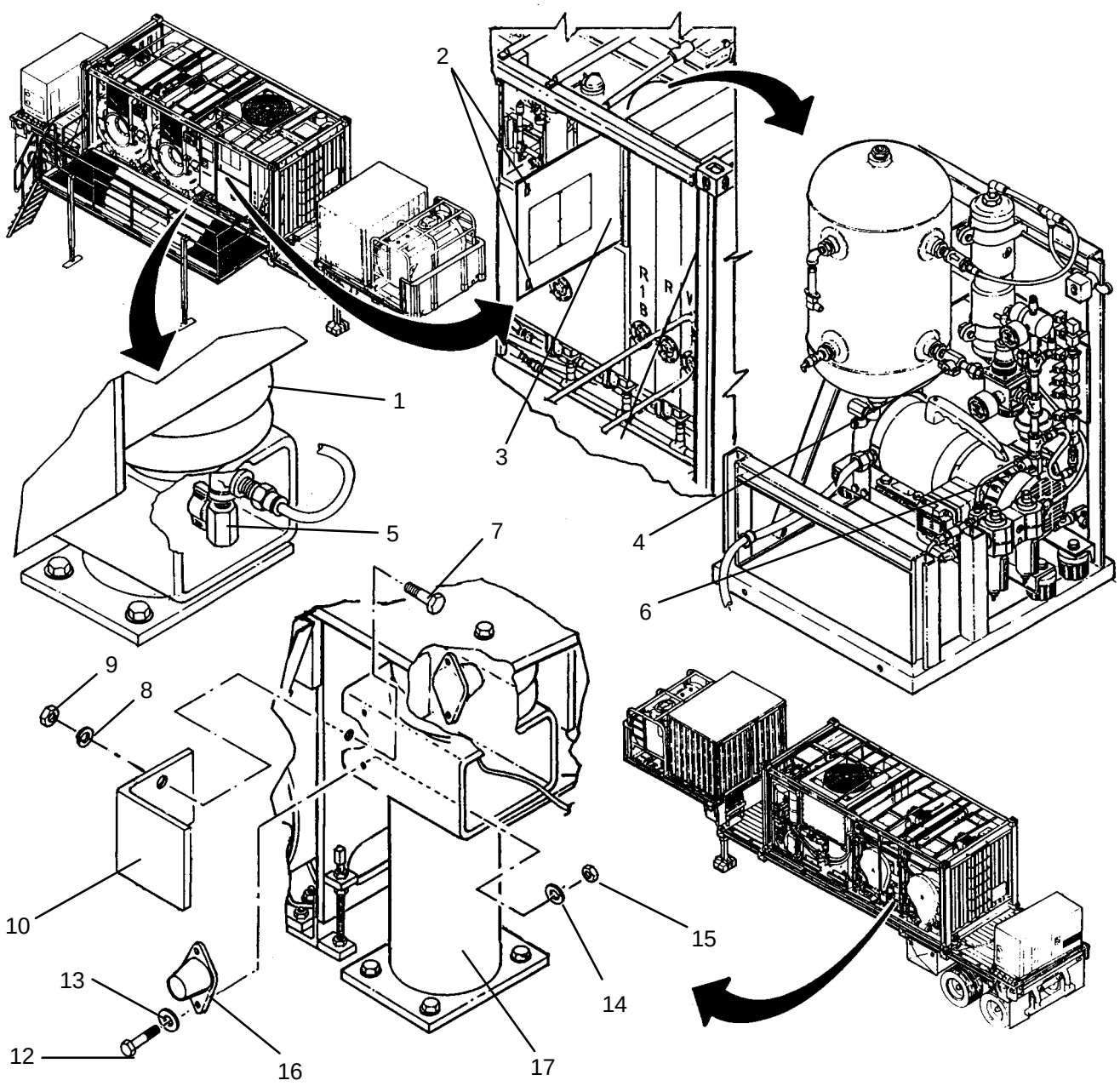
Keep hands and feet clear of drums when venting air bags. Failure to follow this precaution could result in severe personnel injury.

1. Vent air pressure from air bags (1) as follows:
   a. Disengage two latches (2), then open access door (3).
   b. Close manual valve (4).
   d. Open valves (5) on front air bags (1).
   c. Open valve (6).
   e. Allow air pressure to vent from air bags (1) then close valves (5 and 6).

NOTE

Step 2 applies only to rear vibration eliminator.

2. Remove two screws (7), lock washers (8), and nuts (9), then remove stop bracket (10) from bearing support (11).
3. Remove two screws (12), flat washers (13), lock washers (14), and nuts (15), then remove vibration eliminator (16) from pedestal (17).



INSTALLATION

1. Position new vibration eliminator (16) onto pedestal (17), then secure with two screws (12), flat washers (13), lock washers (14), and nuts (15).

NOTE

Step 2 applies only to rear vibration eliminator.

2. Mate stop bracket (10) to bearing support (11), then secure with two screws (7), lock washers (8), and nuts (9).
3. Open manual valve (4).
4. Close access door (3) and secure by engaging two latches (2).
5. Perform a test laundry cycle (TM 10–3510–221–10). Verify smooth operation of drum.

END OF WORK PACKAGE

UNIT

LAUNDRY ADVANCED SYSTEM

(NSN 3510–01–463–0114)

WATER PUMP (M101) REPLACEMENT REMOVAL, INSTALLATION

INITIAL SETUP:

Tools
Tool Kit, General Mechanics
(Item 14, WP 0282 00)

Personnel Required

Materials/Parts
Sealant, Pipe Thread (Item 6, WP 0281 00)
Tags (Item 9, WP 0281 00)
Tape, Anti–Seize (Item 10, WP 0281 00)
Washer, Lock (Item 16, WP 0283 00)

Equipment Conditions
LADS power shut off at main control enclosure (WP 0113 00).

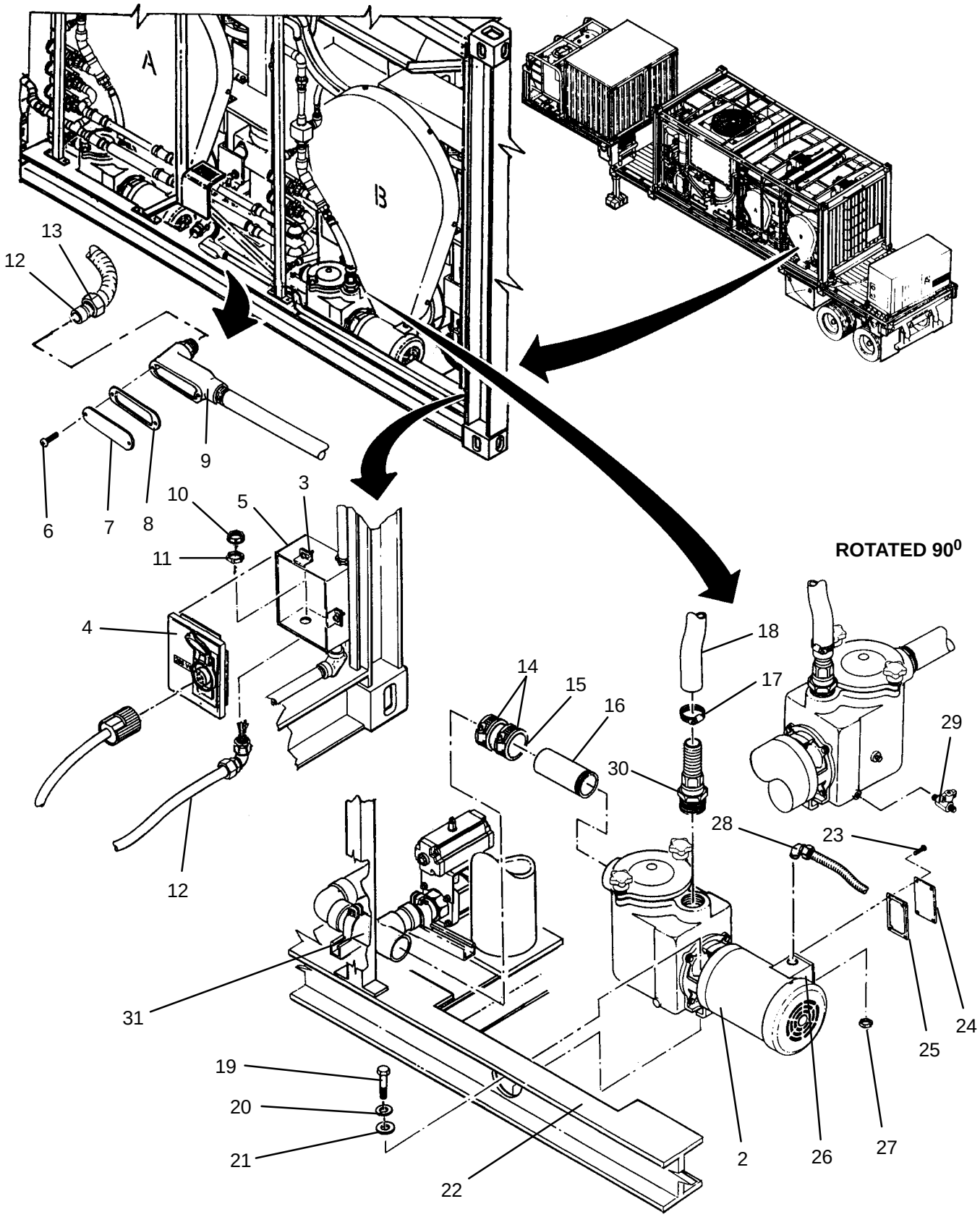
REMOVAL

NOTE

Procedures for removing water pump A and B are the same except where noted.

To ensure proper clearance between drum and ISO frame, rear air bags must be inflated before removing water pump.

1. Open valve (1). Allow water to drain from water pump (2) then close valve.
2. For pump B: loosen four latches (3), then remove cover (4) from junction box (5). For pump A: remove two screws (6) then remove cover (7) and gasket (8) from outlet body (9).
3. Tag and disconnect wiring for water pump (2).
4. For pump B: remove insulating bushing (10) and conduit locknut (11), then pull conduit (12) and wiring from junction box (5). For pump A: loosen conduit nut (13) then pull conduit (12) and wiring from outlet body (9).
5. Loosen clamps (14) on coupling (15) then slide coupling over nipple (16).
6. Loosen clamp (17) then pull outlet hose (18) from pump (2).
7. Remove two screws (19), lock washers (20), and flat washers (21).
8. Lift water pump (2) out of of ISO frame (22).
9. Remove four screws (23), then remove cover (24) and gasket (25) from junction box (26).
10. Tag and disconnect wiring at junction box (26).
11. Remove conduit nut (27), then pull conduit fitting (28) and wiring out of junction box (26).
12. Unthread nipple (29) with attached valve (1) from water pump (2).
13. Unthread hex bushing (30) from water pump (2).
14. Unthread nipple (16) from water pump (2).
15. Clean thread sealant from threads of nipple (16) and hex bushing (30).
16. Clean anti–seize tape from threads of nipple (29).


A
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ROTATED 90⁰
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14
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INSTALLATION

NOTE

Procedures for installing water pump A and B are the same except where noted.

1. Apply thread sealant to threads of nipple (16) and hex bushing (30).
2. Apply anti–seize tape to threads of nipple (29).
3. Thread nipple (16) into inlet of new water pump (2).
4. Slide coupling (15) over nipple (16).
5. Thread hex bushing (30) into outlet of water pump (2).
6. Thread nipple (29) with attached valve (1) into water pump (2). Make sure valve is closed.
7. Remove four screws (23), then remove cover (24) and gasket (25) from junction box (26).
8. Insert conduit fitting (28) and wiring into junction box (26), then secure with conduit nut (27).
9. Connect wiring at junction box (26) as tagged.
10. Install cover (24) and gasket (25) onto junction box (26), then secure with four screws (23).
11. Position water pump (2) onto ISO frame (22) then secure with two screws (19), lock washers (20), and flat washers (21).
12. Connect outlet hose (18) to pump (2) then tighten clamp (17).
13. Slide coupling (15) over tee (31), then tighten clamps (12).
14. For pump B: insert conduit (12) and wiring into junction box (5), then secure with conduit locknut (11) and insulating bushing (10). For pump A: insert conduit (12) and wiring into outlet body (9) then tighten conduit nut (10).
15. Connect wiring for water pump (2) as tagged.
16. For pump B: install cover (4) and secure to junction box (5) by tightening four latches (3). For pump A: install cover (7) and gasket (8) onto outlet body (9) and secure with two screws (6).
17. Use maintenance menu to test water circulation (WP 0010 00). While water is circulating visually check for water leaks.

END OF WORK PACKAGE

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UNIT

LAUNDRY ADVANCED SYSTEM

(NSN 3510–01–463–0114)

DRUM INLET VALVE (FV106) REPLACEMENT REMOVAL, INSTALLATION

INITIAL SETUP:

Tools
Tool Kit, General Mechanics
(Item 14, WP 0282 00)

Personnel Required

Materials/Parts
Tags (Item 9, WP 0281 00)
Tape, Anti–Seize (Item 10, WP 0281 00)
Washer, Lock (Item 13, WP 0283 00)

Equipment Conditions
LADS power shut off at main control enclosure (WP 0113 00).
Air pressure must be vented (WP 0114 00).

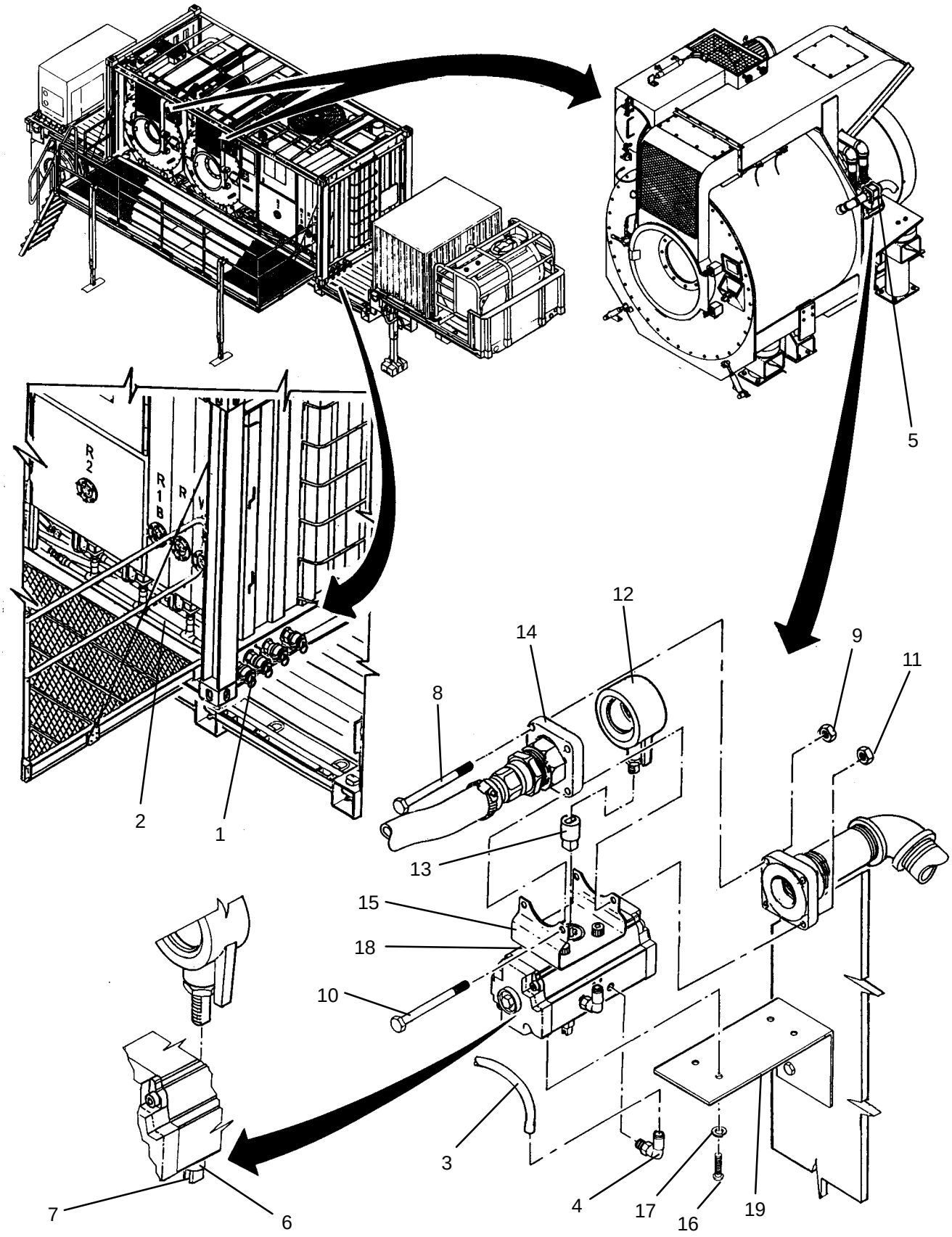
REMOVAL

1. Remove cap (1) from outlet piping A or B (2). Allow residual water to drain then reinstall cap.
2. Tag and disconnect air tubes (3) from elbows (4) on control valve (5).

NOTE

Valve must be in open position before valve body can be removed.

3. If faulty control valve (5) is failed closed, continue to step 4, otherwise proceed to step 5.
4. Manually open faulty control valve (5) by rotating stem (6) so that slot (7) is in the direction of flow.
5. Remove two screws (8) and nuts (9).
6. Remove two screws (10) and nuts (11).
7. Remove valve body (12) and adapter (13).
8. Pull flange (14) out from bracket (15).
9. Remove four screws (16) and lock washers (17) then remove actuator (18) from mounting bracket (19).
10. Remove elbows (4) from actuator (18).
11. Clean anti–seize tape from threads of elbows (4).


R2
R1B
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INSTALLATION

1. Apply anti–seize tape to threads of elbows (4).
2. Install elbows (4) onto new actuator (18).
3. Position actuator (18) on mounting bracket (19) then secure with four screws (16) and lock washers (17).

NOTE

When installing valve body, ensure valve is open and slot on actuator is oriented with flats on stem, otherwise, valve will be opened when it should be closed or vice versa.

4. Rotate stem (20) on valve body (12) so that it is aligned with slot (7) on actuator (18).
5. Insert flange (14) into bracket (15).
6. Install adapter (13) and valve body (12).
7. Install, but do not tighten, two screws (10) and nuts (11).
8. Install, but do not tighten, two screws (8) and nuts (9).
9. Evenly tighten screws (8) and (10).
10. Connect tubes (3) to elbows (4) as tagged.
11. Perform a test laundry cycle (TM 10–3510–221–10). Visually check for water leaks while laundry cycle is underway.

END OF WORK PACKAGE

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UNIT

LAUNDRY ADVANCED SYSTEM

(NSN 3510–01–463–0114)

DRUM OUTLET VALVE (FV107) REPLACEMENT REMOVAL, INSTALLATION

INITIAL SETUP:

Tools
Tool Kit, General Mechanics
(Item 14, WP 0282 00)

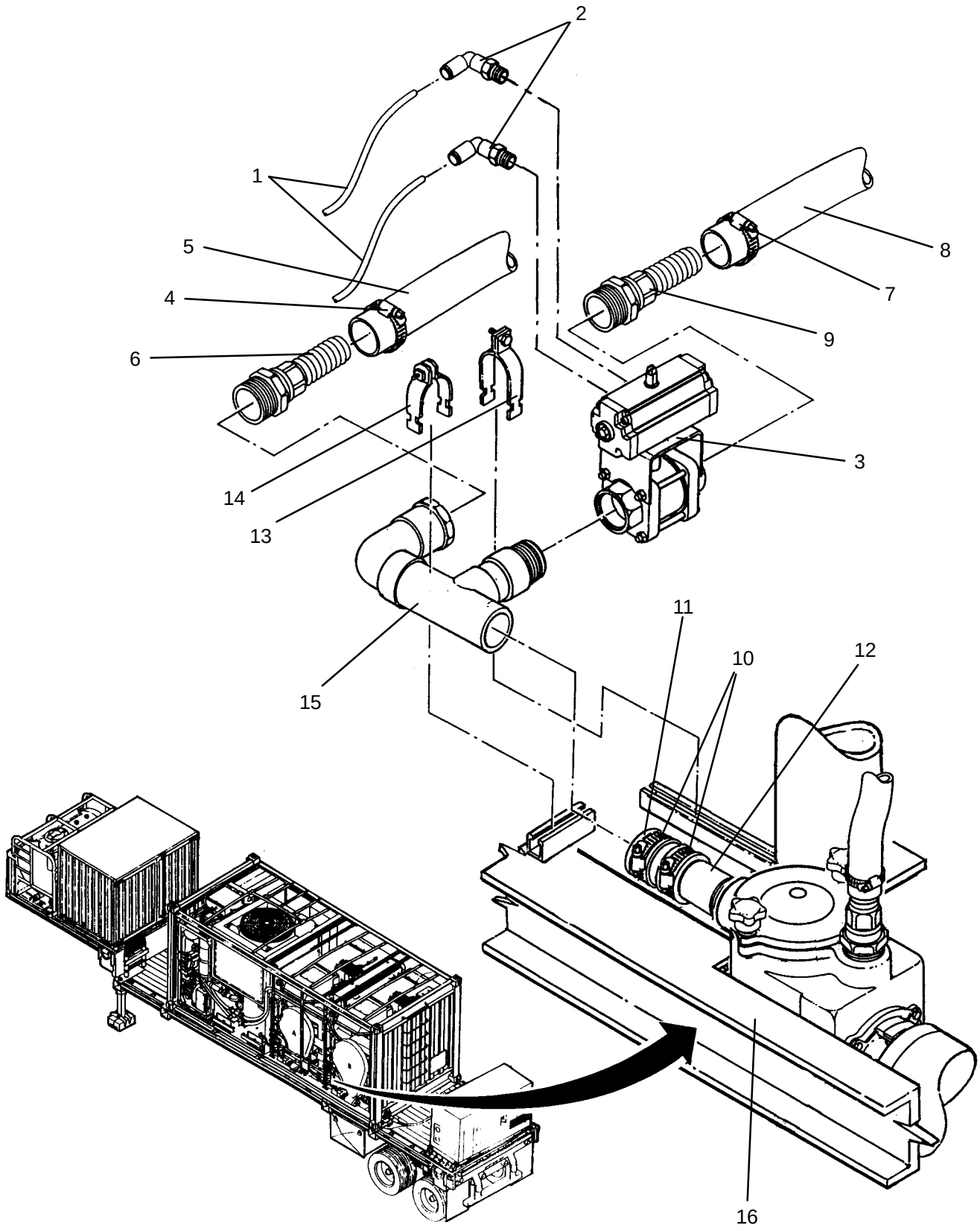
Personnel Required

Materials/Parts
Sealant, Pipe Thread (Item 6, WP 0281 00)
Tape, Anti–Seize (Item 10, WP 0281 00)

Equipment Conditions
LADS power shut off at main control enclosure (WP 0113 00).
Air pressure must be vented (WP 0114 00).

REMOVAL

1. Tag and disconnect air tubes (1) from elbows (2) on control valve (3).
2. Loosen clamp (4) then pull hose (5) off of barb fitting (6).
3. Loosen clamp (7) then pull hose (8) off of barb fitting (9).
4. Loosen clamps (10) then slide coupling (11) onto nipple (12).
5. Loosen and remove pipe clamps (13) and (14).
6. Lift control valve (3) with attached piping (15) off of ISO frame (16).
7. Remove barb fitting (6) from piping (15).
8. Remove barb fitting (9) from control valve (3).
9. Remove piping (15) from control valve (3).
10. Remove elbows (2) from control valve (3).
11. Clean thread sealant from threads of barb fittings (6 and 9) and piping (15).
12. Clean anti–seize tape from threads of elbows (2).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16

INSTALLATION

1. Apply anti–seize tape to threads of elbows (2).
2. Apply thread sealant to threads of barb fittings (6 and 9) and piping (15).
3. Thread piping (15) into outlet port of new control valve (3) as shown.
4. Thread barb fitting (6) into piping (15).
5. Thread barb fitting (9) into control valve (3).
6. Install elbows (2) into control valve (3).
7. Position control valve (3) with attached piping (15) onto ISO frame (16).
8. Connect hose (5) at barb fitting (6) then tighten clamp (4).
9. Connect hose (8) at barb fitting (9) then tighten clamp (7).
10. Slide coupling (11) onto piping (15) then tighten clamps (10).
11. Install and tighten pipe clamps (13) and (14).
12. Connect air tubes (1) to elbows (2) as tagged.
13. Perform a test laundry cycle (TM 10–3510–221–10). Visually check for water leaks while laundry cycle is underway.

END OF WORK PACKAGE

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UNIT

LAUNDRY ADVANCED SYSTEM

(NSN 3510–01–463–0114)

DISCHARGE A OR B WATER CONTROL VALVE (FV108, FV109, OR FV114) REPLACEMENT REMOVAL, INSTALLATION

INITIAL SETUP:

Tools
Tool Kit, General Mechanics
(Item 14, WP 0282 00)

Personnel Required

Materials/Parts
Tags (Item 9, WP 0281 00)
Tape, Anti–Seize (Item 10, WP 0281 00)
Washer, Lock (Item 6, WP 0283 00)

Equipment Conditions
LADS power shut off at main control enclosure (WP 0113 00).
Air pressure must be vented (WP 0114 00).

REMOVAL

WARNING

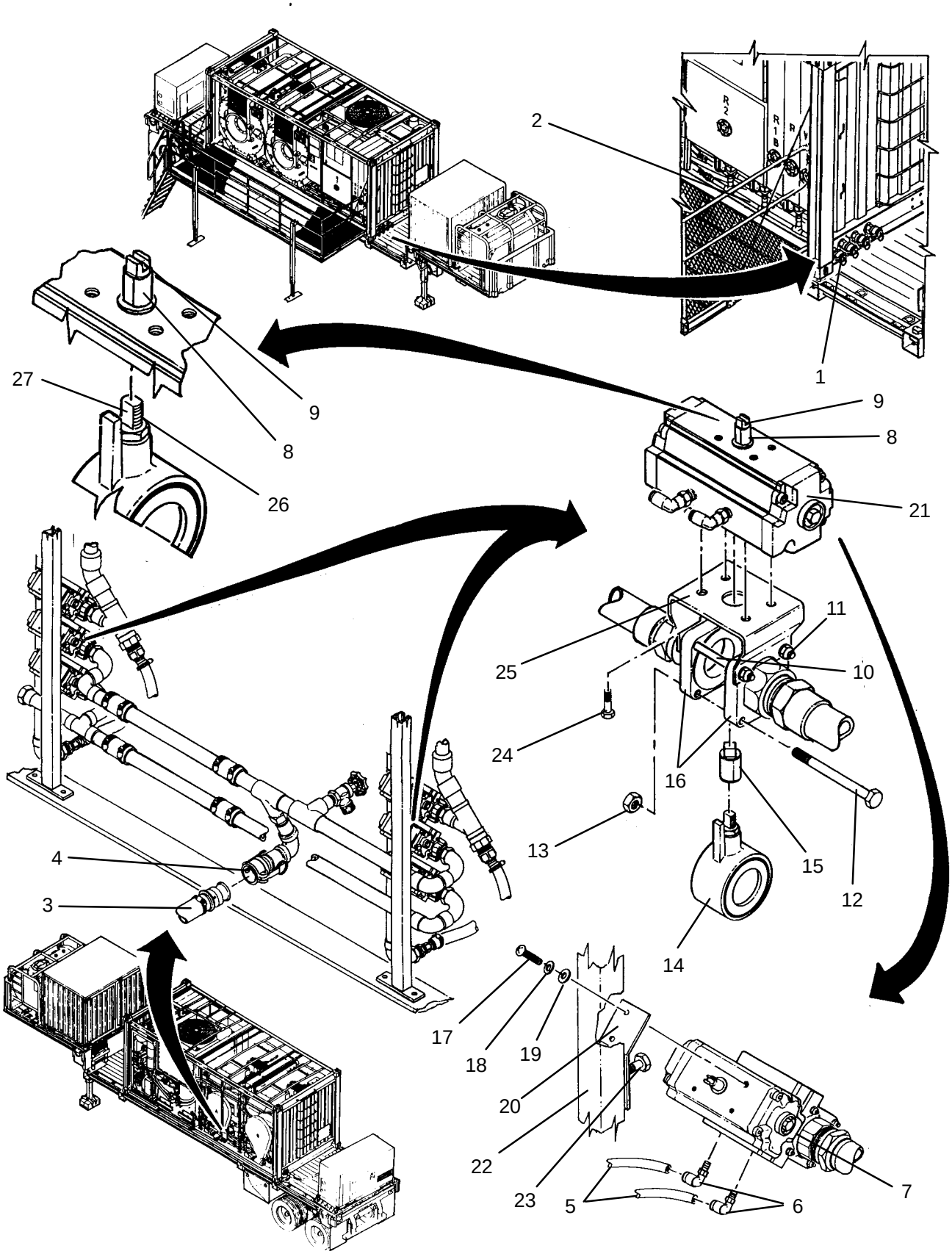
Still and steam piping can reach temperatures near 220 degress F when the water recycle system is operating. Allow piping to cool prior to performing maintenance. Always wear gloves and eye protection. Failure to follow this precaution could result in severe burn injuries.

1. Remove cap (1) from outlet piping A or B (2). Allow residual water to drain, then reinstall cap.
2. Disconnect water supply hose (3) at water supply port (4).
3. Tag and disconnect air tubes (5) from elbows (6) on faulty control valve (7).

NOTE

If faulty control valve is failed closed, valve must be opened manually.

4. If a control valve is failed closed, continue to step 5; otherwise, proceed to step 6.
5. Manually open faulty control valve (7) by rotating stem (8) so that slot (9) is in the direction of flow.
6. At faulty control valve (7)Loosen but do not remove two screws (10) and nuts (11).
7. Remove two screws (12) and nuts (13).
8. Remove valve body (14) and adapter (15) from between flanges (16)
9. Remove two screws (17) and lock washers (18) and flat washers (19) from mounting bracket (20) securing actuator (21) to vertical support (22).
10. Loosen, but do not remove one screw (23) and slide mounting bracket (20) out of the way.
11. Remove four screws (24), then remove actuator (21) from mounting bracket (25).
12. Remove elbows (6) from actuator (21).
13. Clean anti–seize tape from threads of elbows (6).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INSTALLATION

1. Apply anti–seize tape to threads of elbows (6).
2. Install elbows (6) into new actuator (21).
3. Position actuator (21) onto valve mounting bracket (25), then secure with four screws (24).
4. Position bracket (20) onto actuator (21), then secure with two screws (17), lock washers (18) and flat washers (19).
5. Tighten screw (23), securing bracket (20) to vertical support (22).

NOTE

Valve body must be in the open position prior to installation. Ensure that slot on the actuator is oriented with the flats on the valve stem. Otherwise, valve will be opened when it should be closed or vice versa.

6. Rotate stem (26) on new valve body (14) so that it is opened and flats (27) are oriented with slot (9) on actuator(21).
7. Insert valve body (14) and adapter (15) between flanges (16). Install, but do not tighten, two screws (12) and nuts (13).
8. Evenly tighten screws (10) and (12).
9. Connect water supply hose (3) at water supply port (4).
10. Connect air tubes (5) at elbows (6) on control valve (7) as tagged.
11. Use maintenance menu to test water circulation (WP 0010 00). While water is circulating, visually check for water leaks.

END OF WORK PACKAGE

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UNIT

LAUNDRY ADVANCED SYSTEM

(NSN 3510–01–463–0114)

STEAM INLET VALVE (FV115) REPLACEMENT REMOVAL, INSTALLATION

INITIAL SETUP:

Tools
Tool Kit, General Mechanics
(Item 14, WP 0282 00)

Personnel Required

Materials/Parts
Tags (Item 9, WP 0281 00)
Tape, Anti–Seize (Item 10, WP 0281 00)

Equipment Conditions
LADS power shut off at main control enclosure (WP 0113 00).
Air pressure must be vented (WP 0114 00).

REMOVAL

WARNING

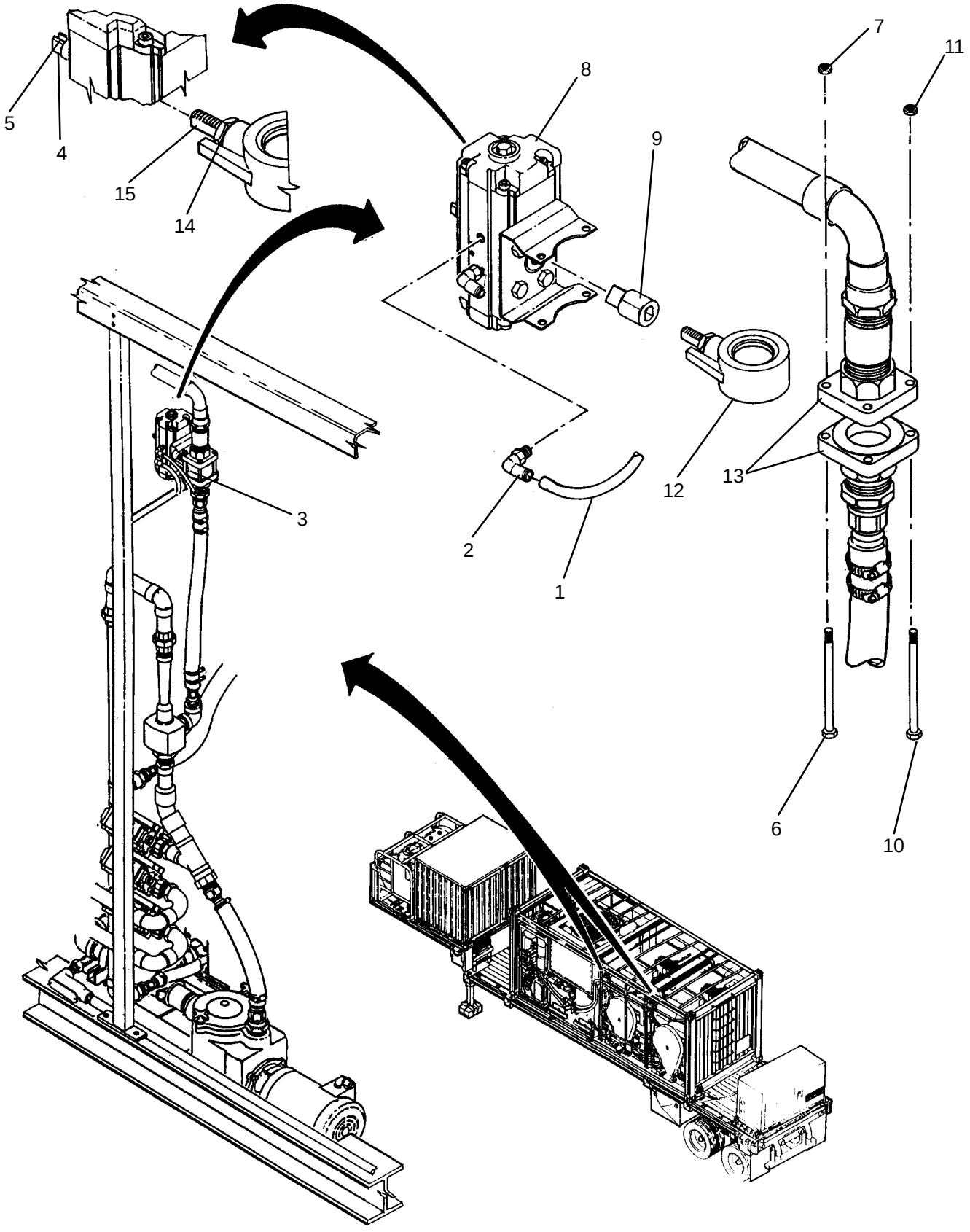
Steam piping can reach temperatures near 220 degress F when the water recycle system is operating. Allow piping to cool prior to performing maintenance. Always wear gloves and eye protection. Failure to follow this precaution could result in severe burn injuries.

1. Tag and disconnect air tubes (1) from elbows (2) on control valve (3).

NOTE

If faulty control valve is failed closed, valve must be opened manually.

2. If a control valve is failed closed, continue to step 3, otherwise proceed to step 4.
3. Manually open faulty control valve (3) by rotating stem (4) so that slot (5) is in the direction of flow.
4. Remove two screws (6) and nuts (7).
5. Remove actuator (8) and adapter (9).
6. Remove two screws (10) and nuts (11) then remove valve body (12) from between flanges (13).
7. Remove elbows (2) from actuator (8).
8. Clean anti–seize tape from threads of elbows (2).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INSTALLATION

1. Apply anti–seize tape to elbows (2).
2. Install elbows (2) onto new actuator (9).

NOTE

Valve body must be in the open position prior to installation. Ensure that slot on the actuator is oriented with the flats on the valve stem. Otherwise, valve will be opened when it should be closed or vice versa.

3. Rotate stem (14) on new valve body (12) so that it is open and flats (15) are oriented with slot (5) on actuator (8).
4. Insert valve body (12) between flanges (13). Install, but do not tighten, two screws (10) and nuts (11).
5. Install actuator (8) and adapter (9).
6. Install, but do not tighten, two screws (6) and nuts (7).
7. Evenly tighten screws (6) and (10).
8. Connect air tubes (1) to elbows (2) as tagged.
9. Perform a HEAT WATER operation (TM 10–3510–221–10). While water is heating, visually check for steam/water leaks.

END OF WORK PACKAGE

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UNIT

LAUNDRY ADVANCED SYSTEM

(NSN 3510–01–463–0114)

STEAM EDUCTOR REPLACEMENT
REMOVAL, INSTALLATION

INITIAL SETUP:

Tools
Tool Kit, General Mechanics
(Item 14, WP 0282 00)

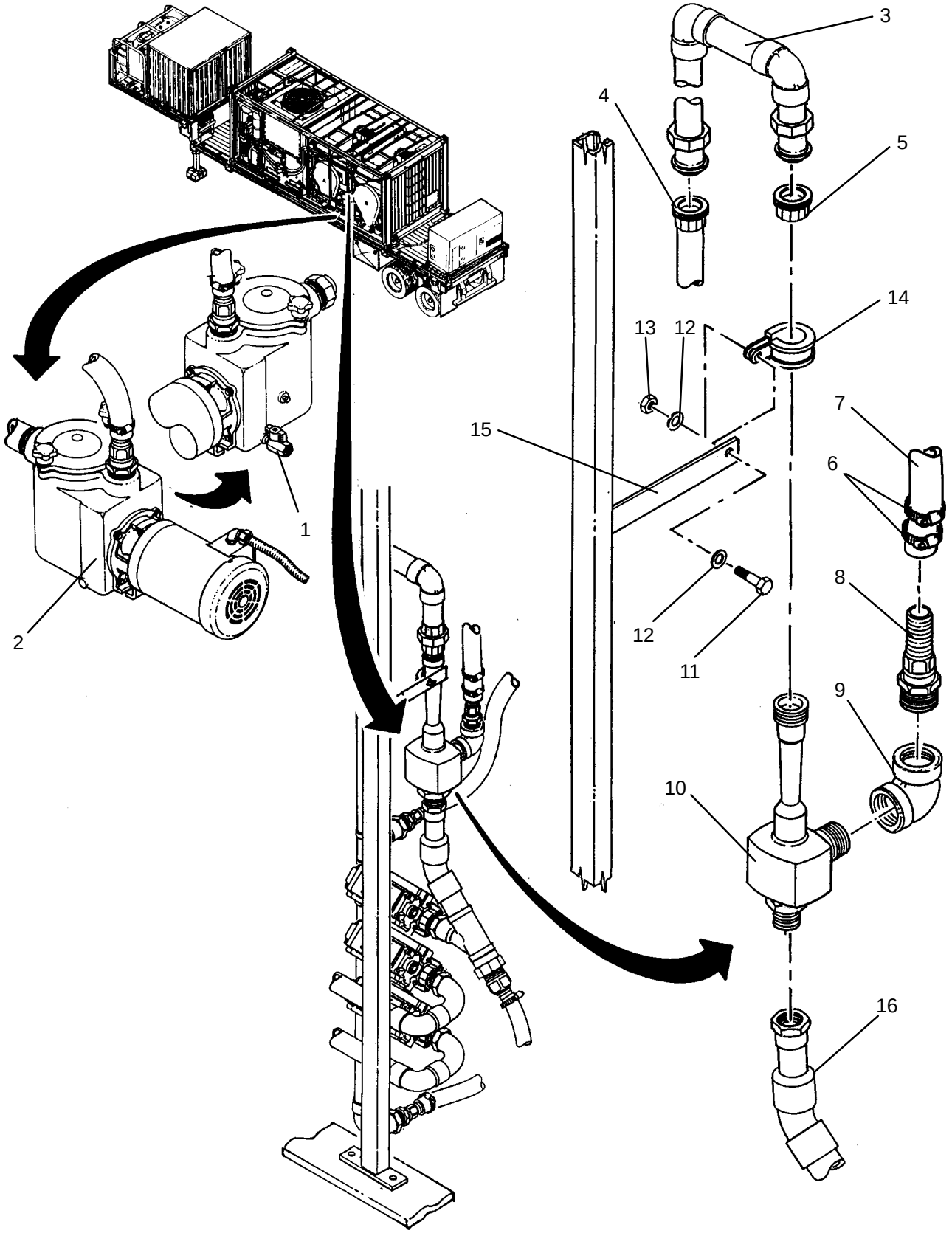
Personnel Required

Materials/Parts
Sealant, Pipe Thread (Item 6, WP 0281 00)

Equipment Conditions
LADS power shut off at main control enclosure (WP 0113 00).

REMOVAL

1. Open valve (1). Allow water to drain from water pump (2), then close valve (1).
2. Disconnect piping (3) at unions (4) and (5).
3. Loosen clamps (6) then disconnect steam hose (7).
4. Unthread barb fitting (8) from elbow (9),
5. Unthread elbow (9) from steam eductor (10).
6. Remove screw (11), flat washers (12), and nut (13), then remove clamp (14) from steam eductor (10) and mounting bracket (15).
7. Unthread steam eductor (10) from piping (16).
8. Unthread union (5) from steam eductor (10).
9. Clean pipe thread sealant from threads and mating surfaces of unions (4) and (5), barb fitting (8) and piping (3).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16

INSTALLATION

1. Apply pipe thread sealant to threads and mating surfaces of unions (4) and (5), new steam eductor (10), barb fitting (8), and piping (3).
2. Thread union (5) onto steam eductor (10).
3. Thread steam eductor (10) onto piping (16) and tighten to position shown.
4. Install clamp (14) onto steam eductor (10) and mounting bracket (15), then secure with screw (11), flat washers (12), and nut (13).
5. Thread elbow (9) onto steam eductor (10) and tighten to position shown.
6. Thread barb fitting (8) onto elbow (9).
7. Connect steam hose (7), then tighten clamps (6).
8. Connect piping (3) at unions (4) and (5).
9. Perform a HEAT WATER operation (TM 10–3510–221–10). While water is heating, visually check for steam/water leaks.

END OF WORK PACKAGE

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UNIT

LAUNDRY ADVANCED SYSTEM

(NSN 3510–01–463–0114)

WATER TEMPERATURE SENSOR (TE103) REPLACEMENT REMOVAL, INSTALLATION

INITIAL SETUP:

Tools
Tool Kit, General Mechanics
(Item 14, WP 0282 00)

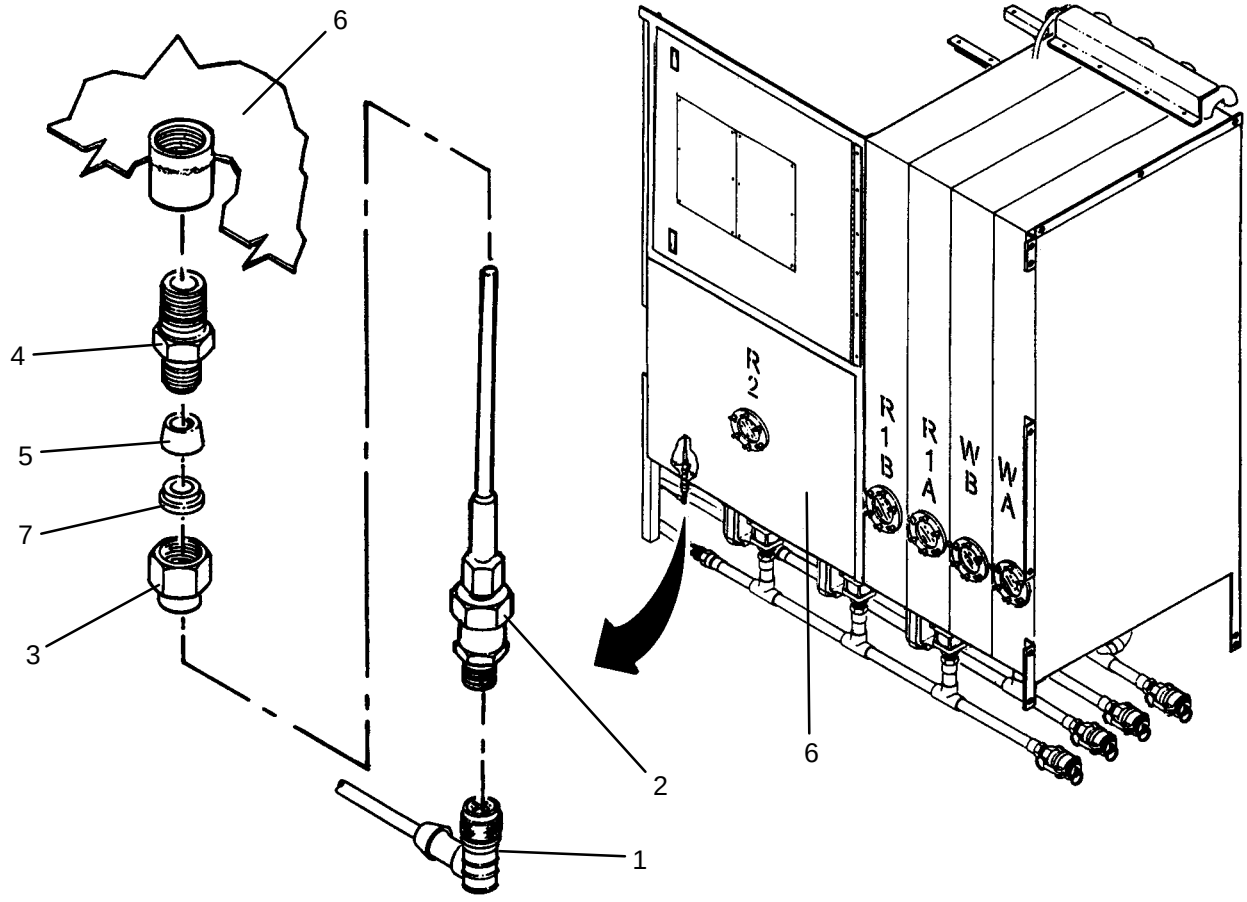
Personnel Required

Materials/Parts
Tape, Anti–Seize (Item 10, WP 0281 00)

Equipment Conditions
Water must be drained from rinse 2 tank (WP 0115 00).
LADS power shut off at main control enclosure (WP 0113 00).

REMOVAL

1. Disconnect electrical connector (1) from temperature sensor (2).
2. Loosen nut (3), then remove temperature sensor (2) from fitting (4).
3. Measure and record distance from tip of temperature sensor (2) to lower ferrule (5).
4. Unthread fitting (4) from rinse 2 tank (6).
5. Clean anti–seize tape from threads of fitting (4).



INSTALLATION

1. Connect electrical connector (1) to new temperature sensor (2).
2. Access examine inputs function using maintenance menu (WP 0010 00), then observe and record temperature reading for TE100.
3. Access temperature sensor calibration function using maintenance menu (WP 0010 00), then set output of temperature sensor TE103 to same temperature reading as recorded for TE100.
4. Slide nut (3), upper ferrule (7) and lower ferrule (5) onto temperature sensor (2).
5. Insert temperature sensor (2) into fitting (4) at previously recorded dimension.
6. Tighten nut (3) onto fitting (4) to swage lower ferrule (5) on temperature sensor (2).
7. Loosen nut (3) and remove temperature sensor (2) from fitting (4).
8. Apply anti–seize tape to threads of fitting (4).
9. Thread fitting (4) into rinse 2 tank (6).
10. Insert temperature sensor (2) into fitting (4), then tighten nut (3).
11. Perform a FILL TANKS operation (TM 10–3510–221–10). When rinse 2 tank (6) is full, visually check for water leaks at fitting (4).

END OF WORK PACKAGE

UNIT

LAUNDRY ADVANCED SYSTEM

(NSN 3510–01–463–0114)

INLET B WATER CONTROL VALVE (FV100B, FV102B, OR FV104B) REPLACEMENT REMOVAL, INSTALLATION

INITIAL SETUP:

Tools
Tool Kit, General Mechanics
(Item 14, WP 0282 00)

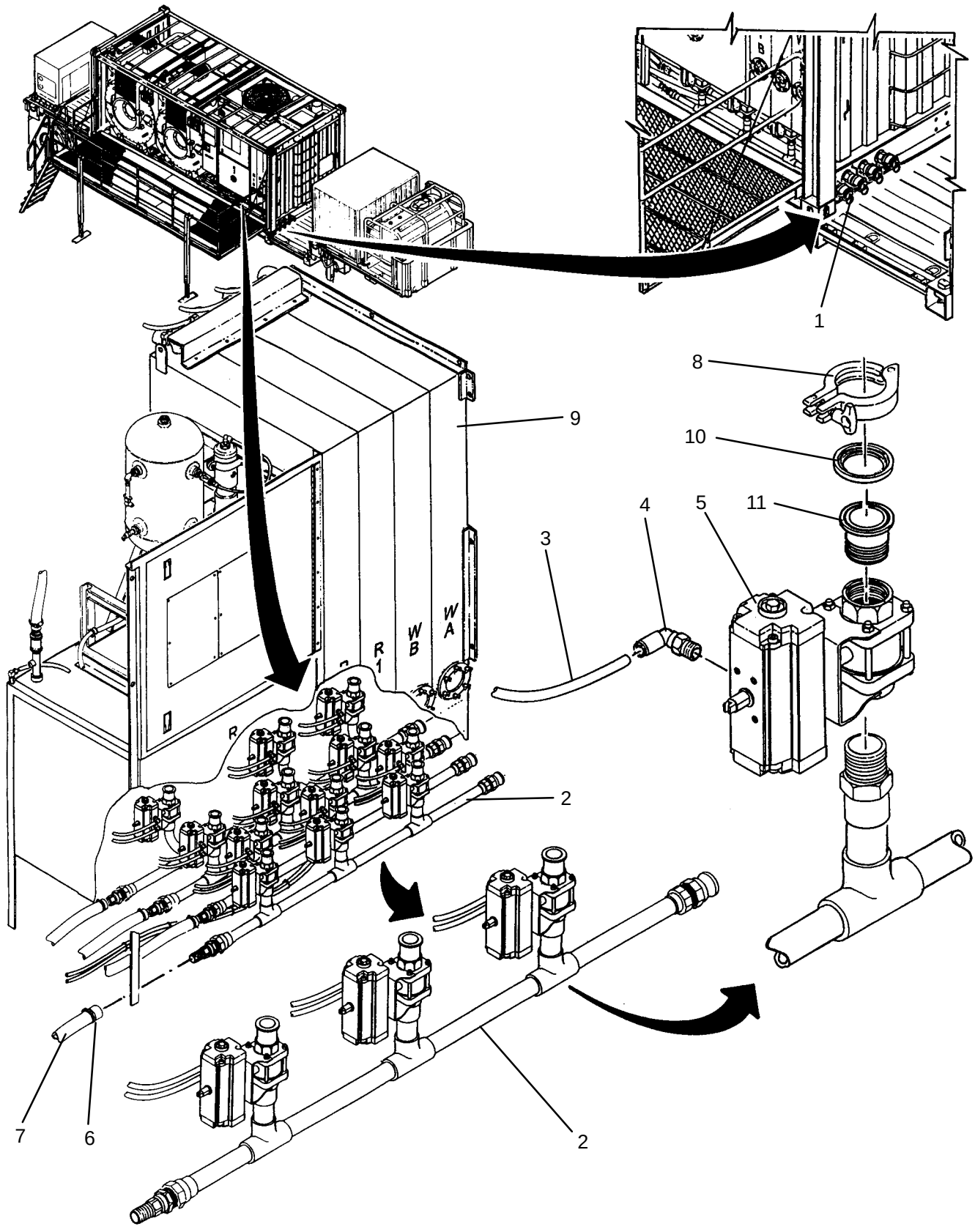
Personnel Required

Materials/Parts
Sealant, Pipe Thread (Item 6, WP 0281 00)
Tags (Item 9, WP 0281 00)
Tape, Anti–Seize (Item 10, WP 0281 00)
Gasket, Sanitary (Qty 3) (Item 2, WP 0283 00)

Equipment Conditions
Water must be drained from water tanks (WP 0115 00).
LADS power shut off at main control enclosure (WP 0113 00).

REMOVAL

1. Remove cap (1) from inlet B manifold (2).
2. Tag and disconnect air tubes (3) from elbows (4) on three control valves (5).
3. Loosen clamp (6), then pull hose (7) off of inlet B manifold (2).
4. Remove three clamps (8), then pull inlet B manifold (2) out from under water tanks (9).
5. Remove and discard gaskets (10) from inlet B manifold (2).
6. Unthread faulty control valve (5) from inlet B manifold (2).
7. Unthread adapter (11) from control valve (5).
8. Unthread two elbows (2) from control valve (5).
9. Clean anti–seize tape from threads of elbows (4).
10. Clean pipe thread sealant from threads of inlet B manifold (2), and adapter (11).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INSTALLATION

1. Apply anti–seize tape to threads of elbows (4).
2. Thread two elbows (4) into new control valve (5).
3. Apply pipe thread sealant to threads of inlet B manifold (2) and adapter (11).
4. Thread adapter (11) into control valve (5).
5. Thread control valve (5) onto inlet B manifold (2) and orient as shown.
6. Install new gaskets (10) onto inlet B manifold (2).
7. Position inlet B manifold (2) under water tanks (9).
8. Attach inlet B manifold (2) to water tanks (9) as follows:
   a. Mate each adapter (11) to fitting on water tanks (9) ensuring gasket (10) remains in place.
   b. Install clamp (8).
   c. Repeat steps a and b at other two connection points.
9. Connect hose (7) to inlet B manifold (2) tighten clamp (6).

NOTE

Tubes connected to water control valves where you **can not** see the elbows on the front of the valve have the exhaust “E” tube at the top. Tubes connected to valves where you **can** see the elbows have the exhaust “E” tube at the bottom.

10. Connect air tubes (3) to elbows (4) on three control valves (5) as tagged.
11. Install cap (1) onto inlet B manifold (2).
12. Perform a FILL TANKS, HEAT TANKS, and test laundry cycle operation (TM 10–3510–221–10). While water is circulating, visually check for water leaks.

END OF WORK PACKAGE

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UNIT

LAUNDRY ADVANCED SYSTEM

(NSN 3510–01–463–0114)

INLET A WATER CONTROL VALVE (FV100A, FV102A, OR FV104A) REPLACEMENT REMOVAL, INSTALLATION

INITIAL SETUP:

Tools
Tool Kit, General Mechanics
(Item 14, WP 0282 00)

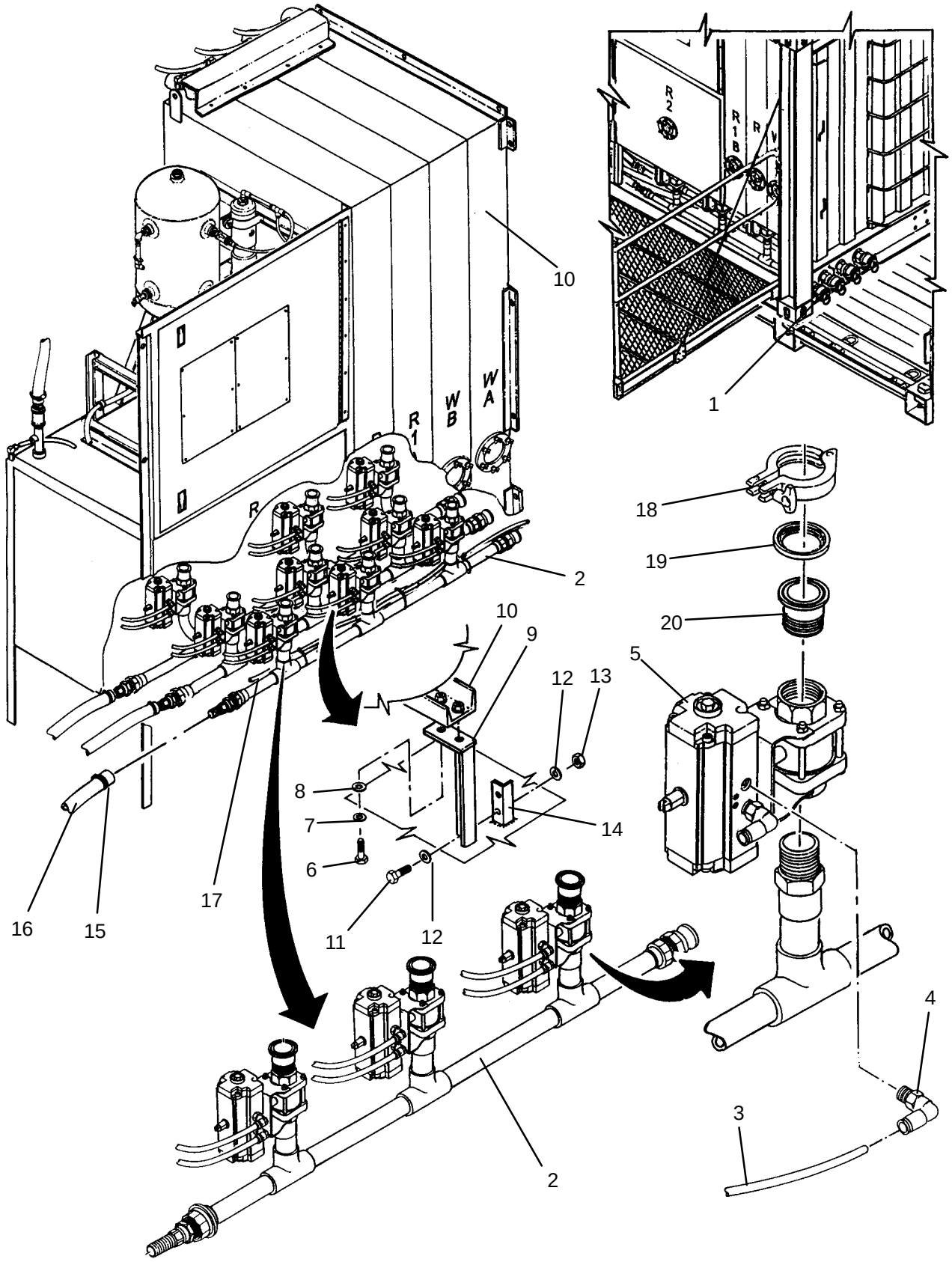
Personnel Required

Materials/Parts
Sealant, Pipe Thread (Item 6, WP 0281 00)
Tags (Item 9, WP 0281 00)
Tape, Anti–Seize (Item 10, WP 0281 00)
Gasket, Sanitary (Qty 3) (Item 2, WP 0283 00)
Strap, Tiedown (Item 33, WP 0283 00)

Equipment Conditions
Water must be drained from water tanks (WP 0115 00).
Air pressure must be vented (WP 0114 00).

REMOVAL

1. Remove inlet B manifold (WP 0152 00).
2. Remove cap (1) from inlet A manifold (2).
3. Tag and disconnect air tubes (3) from elbows (4) on three control valves (5).
4. Remove two screws (6), lock washers (7) and flat washers (8) securing support leg (9) to water tanks (10).
5. Remove two screws (11), flat washers (12), and nuts (13), then remove support leg (9) from ISO frame (14).
6. Loosen clamp (15), then pull hose (16) off of inlet A manifold (2).
7. Cut tiedown straps securing anti–foam injection tube (17) to inlet A manifold (2).
8. Remove three clamps (18), then pull inlet A manifold (2) out from under water tanks (10).
9. Remove and discard gaskets (19) from inlet A manifold (2).
10. Unthread faulty control valve (5) from inlet A manifold (2).
11. Unthread adapter (20) from control valve (5).
12. Unthread two elbows (4) from control valve (5).
13. Clean anti–seize tape from threads of elbows (4).
14. Clean pipe thread sealant from threads of inlet A manifold (2), and adapter (20).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INSTALLATION

1. Apply anti–seize tape to threads of elbows (4).
2. Thread two elbows (4) into new control valve (5).
3. Apply pipe thread sealant to threads of inlet A manifold (2) and adapter (20).
4. Thread adapter (20) into control valve (5).
5. Thread control valve (5) onto inlet A manifold (2) and orient as shown.
6. Install new gaskets (19) onto inlet A manifold (2).
7. Position inlet A manifold (2) under water tanks (10).
8. Attach inlet A manifold (2) to water tanks (10) as follows:
   a. Mate each adapter (20) to fitting on water tanks (10) ensuring gasket (19) remains in place.
   b. Install clamp (18).
   c. Repeat steps a and b at other two connection points.

NOTE

Air tubes connected to water control valves where you **can not** see the elbows on the front of the valve have the exhaust “E” tube at the top. Air tubes connected to valves where you **can** see the elbows have the exhaust “E” tube at the bottom.

9. Connect air tubes (3) to elbows (4) on three control valves (5) as tagged.
10. Attach anti–foam tube (17) to inlet A manifold with tiedown straps.
11. Mate support leg (9) to water tanks (10), then install, but do not tighten, two screws (6), lock washers (7) and flat washers (8).
12. Install two screws (11), flat washers (12), and nuts (13) to secure support leg (9) to ISO frame (14).
13. Tighten two screws (6).
14. Connect hose (16) to inlet A manifold (2) tighten clamp (15).
15. Install cap (1) onto inlet A manifold (2).
16. Install inlet B manifold (WP 0152 00).
17. Perform a FILL TANKS, HEAT TANKS, and test laundry cycle operation (TM 10–3510–221–10). While water is circulating, visually check for water leaks.

END OF WORK PACKAGE

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UNIT

LAUNDRY ADVANCED SYSTEM

(NSN 3510–01–463–0114)

OUTLET B WATER CONTROL VALVE (FV101B, FV103B, OR FV105B) REPLACEMENT REMOVAL, INSTALLATION

INITIAL SETUP:

Tools
Tool Kit, General Mechanics
(Item 14, WP 0282 00)

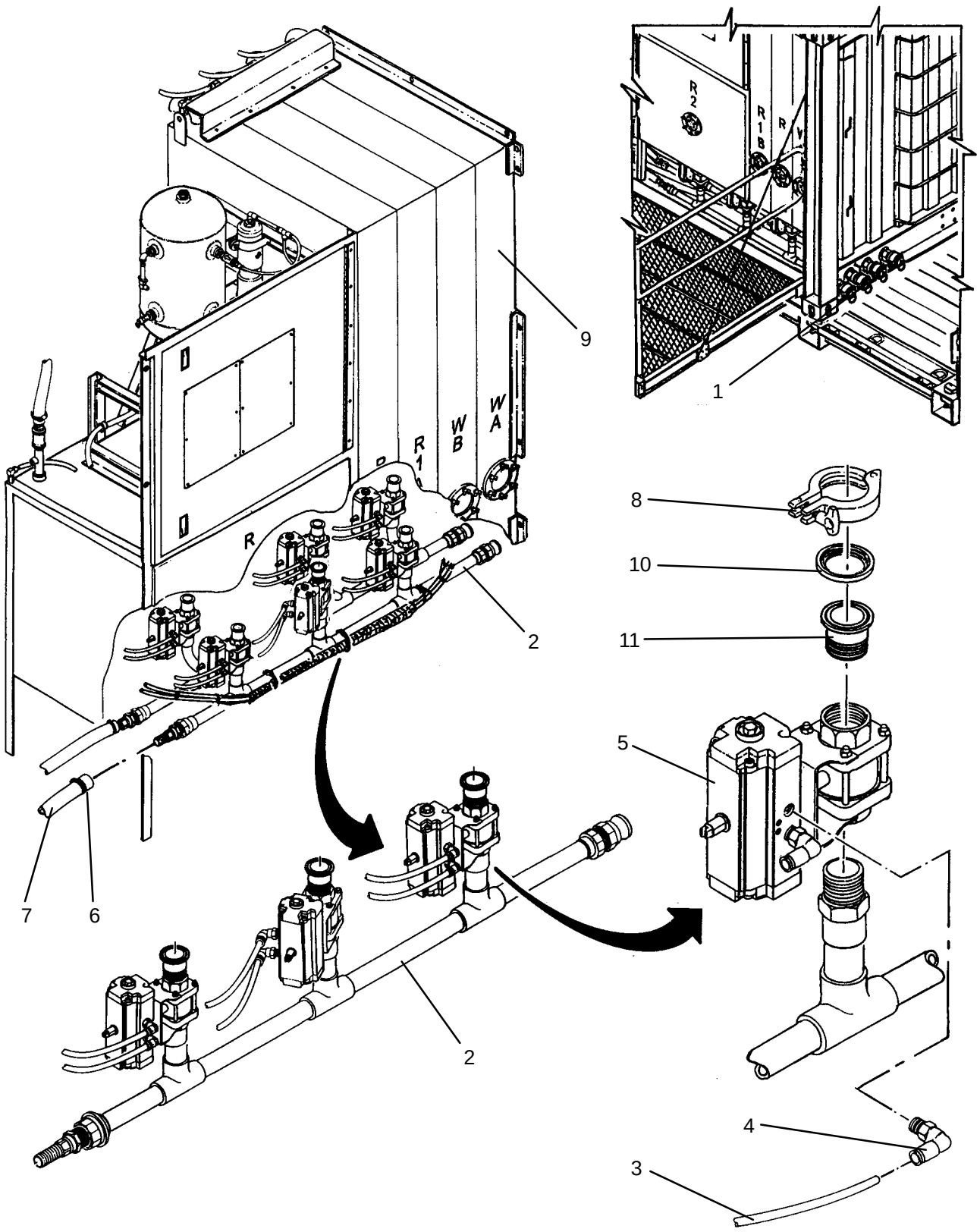
Personnel Required

Materials/Parts
Sealant, Pipe Thread (Item 6, WP 0281 00)
Tags (Item 9, WP 0281 00)
Tape, Anti–Seize (Item 10, WP 0281 00)
Gasket, Sanitary (Qty 3) (Item 2, WP 0283 00)
Strap, Tiedown (Item 33, WP 0283 00)

Equipment Conditions
Water must be drained from water tanks (WP 0115 00).
Air pressure must be vented (WP 0114 00).

REMOVAL

1. Remove inlet B manifold (WP 0152 00).
2. Remove inlet A manifold (WP 0153 00).
3. Remove cap (1) from outlet B manifold (2).
4. Tag and disconnect air tubes (3) from elbows (4) on three control valves (5).
5. Loosen clamp (6) then pull hose (7) off of outlet B manifold (2).
6. Cut tiedown straps securing tubes (3) to outlet B manifold (2).
7. Remove three clamps (8), then pull outlet B manifold (2) out from under water tanks (9).
8. Remove and discard gaskets (10) from outlet B manifold (2).
9. Unthread faulty control valve (5) from outlet B manifold (2).
10. Unthread adapter (11) from control valve (2).
11. Unthread two elbows (4) from control valve (2).
12. Clean anti–seize tape from threads of elbows (4).
13. Clean pipe thread sealant from threads of outlet B manifold (2), and adapter (11).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INSTALLATION

1. Apply anti–seize tape to threads of elbows (4).
2. Thread two elbows (4) into new control valve (5).
3. Apply pipe thread sealant to threads of outlet B manifold (2) and adapter (11).
4. Thread adapter (11) into control valve (5).
5. Thread control valve (5) onto outlet B manifold (2) and orient as shown.
6. Install new gaskets (10) onto outlet B manifold (2).
7. Position outlet B manifold (2) under water tanks (9).
8. Attach outlet B manifold (2) to water tanks (9) as follows:
   a. Mate each adapter (11) to fitting on water tanks (9) ensuring gasket (10) remains in place.
   b. Install clamp (8).
   c. Repeat steps a and b at other two connection points.
9. Connect hose (7) to outlet B manifold (2) and tighten clamp (6).

NOTE

Air tubes connected to water control valves where you **can not** see the elbows on the front of the valve have the exhaust “E” tube at the top. Air tubes connected to valves where you **can** see the elbows have the exhaust “E” tube at the bottom.

10. Connect tubes (3) to elbows (4) on three control valves (5) as tagged.
11. Attach air tubes (3) to outlet B manifold with tiedown straps.
12. Install cap (1) onto outlet B manifold (2).
13. Install inlet A manifold (WP 0153 00).
14. Install inlet B manifold (WP 0152 00).
15. Perform a FILL TANKS, HEAT TANKS, and test laundry cycle operation (TM 10–3510–221–10). While water is circulating, visually check for water leaks.

END OF WORK PACKAGE

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UNIT

LAUNDRY ADVANCED SYSTEM

(NSN 3510–01–463–0114)

OUTLET B WATER CONTROL VALVE (FV101A, FV103A, OR FV105A) REPLACEMENT REMOVAL, INSTALLATION

INITIAL SETUP:

Tools
Tool Kit, General Mechanics
(Item 14, WP 0282 00)

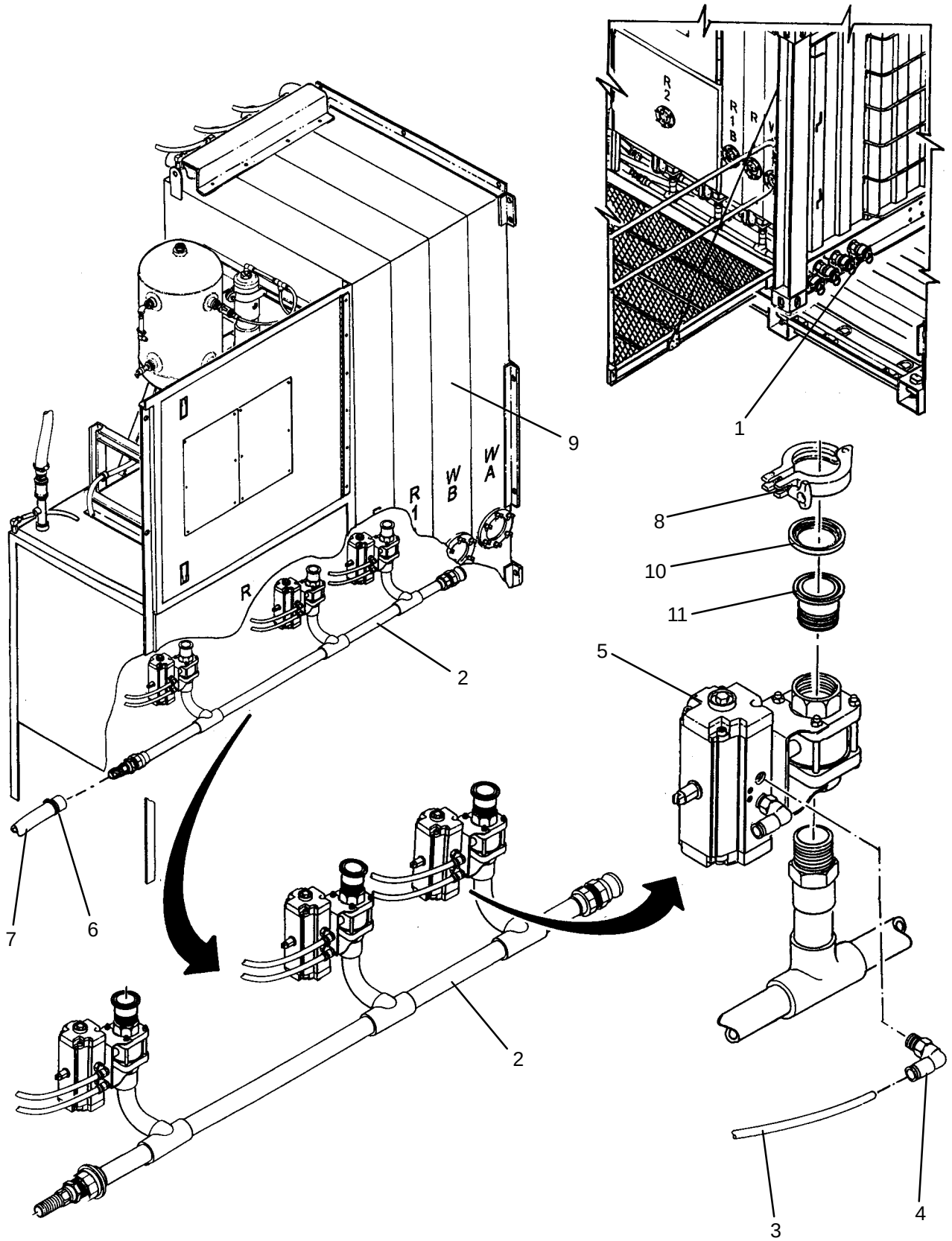
Personnel Required

Materials/Parts
Sealant, Pipe Thread (Item 6, WP 0281 00)
Tags (Item 9, WP 0281 00)
Tape, Anti–Seize (Item 10, WP 0281 00)
Gasket, Sanitary (Qty 3) (Item 2, WP 0283 00)
Strap, Tiedown (Item 33, WP 0283 00)

Equipment Conditions
Water must be drained from water tanks (WP 0115 00).
Air pressure must be vented (WP 0114 00).

REMOVAL

1. Remove inlet B manifold (WP 0152 00).
2. Remove inlet A manifold (WP 0153 00).
3. Remove outlet B manifold (WP 0154 00).
4. Remove cap (1) from outlet A manifold (2).
5. Tag and disconnect air tubes (3) from elbows (4) on three control valves (5).
6. Loosen clamp (6) then pull hose (7) off of outlet A manifold (2).
7. Remove three clamps (8), then pull outlet A manifold (2) out from under water tanks (9).
8. Remove and discard gaskets (10) from outlet A manifold (2).
9. Unthread faulty control valve (5) from outlet A manifold (2).
10. Unthread adapter (11) from control valve (2).
11. Unthread two elbows (4) from control valve (2).
12. Clean anti–seize tape from threads of elbows (4).
13. Clean pipe thread sealant from threads of outlet B manifold (2), and adapter (11).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INSTALLATION

1. Apply anti–seize tape to threads of elbows (4).
2. Thread two elbows (4) into new control valve (5).
3. Apply pipe thread sealant to threads of outlet A manifold (2) and adapter (11).
4. Thread adapter (11) into control valve (5).
5. Thread control valve (5) onto outlet A manifold (2) and orient as shown.
6. Install new gaskets (10) onto outlet A manifold (2).
7. Position outlet A manifold (2) under water tanks (9).
8. Attach outlet A manifold (2) to water tanks (9) as follows:
   a. Mate each adapter (11) to fitting on water tanks (9) ensuring gasket (10) remains in place.
   b. Install clamp (8).
   c. Repeat steps a and b at other two connection points.
9. Connect hose (7) to outlet A manifold (2) tighten clamp (6).

NOTE

Air tubes connected to water control valves where you **can not** see the elbows on the front of the valve have the exhaust “E” tube at the top. Air tubes connected to valves where you **can** see the elbows have the exhaust “E” tube at the bottom.

10. Connect air tubes (3) to elbows (4) on three control valves (5) as tagged.
11. Install cap (1) onto outlet A manifold (2).
12. Install outlet B manifold (WP 0154 00).
13. Install inlet A manifold (WP 0153 00).
14. Install inlet B manifold (WP 0152 00).
15. Perform a FILL TANKS, HEAT TANKS, and test laundry cycle operation (TM 10–3510–221–10). While water is circulating, visually check for water leaks.

END OF WORK PACKAGE

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UNIT

LAUNDRY ADVANCED SYSTEM

(NSN 3510–01–463–0114)

STILL RELIEF VALVE REPLACEMENT REMOVAL, INSTALLATION

INITIAL SETUP:

Tools
Tool Kit, General Mechanics
(Item 14, WP 0282 00)

Personnel Required

Materials/Parts
Sealant, Pipe Thread (Item 6, WP 0281 00)

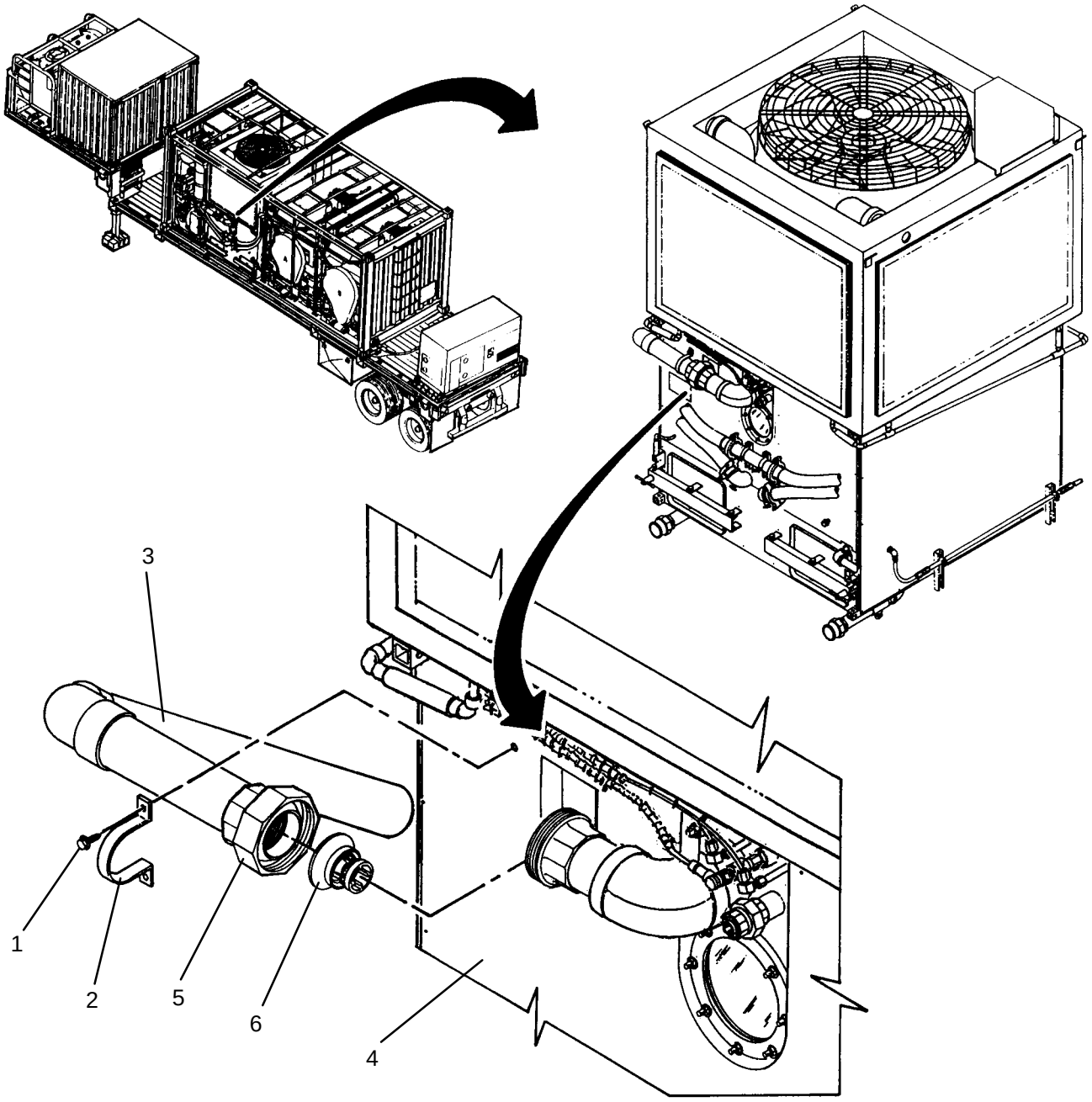
Equipment Conditions
LADS power shut off at main control enclosure (WP 0113 00).

REMOVAL

WARNING

Still piping can reach temperatures near 220 degrees F when the water recycle system is operating. Allow still piping to cool prior to performing maintenance. Always wear gloves and eye protection. Failure to follow this precaution could result in severe burn injuries.

1. Remove two screws (1) then remove clamp (2) securing piping (3) to still (4).
2. Separate halves of union (5) and remove piping (3).
3. Remove relief valve (6) from union (5).
4. Clean pipe thread sealant from threads and mating surfaces of union (5).



INSTALLATION

1. Apply pipe thread sealant to threads of union (5).
2. Install new relief valve (6) into union (5).
3. Apply pipe thread sealant to mating surfaces of union (5).
4. Position piping (3), then thread halves of union (5) together.
5. Position clamp (2) on piping (3) then secure to still (4) with two screws (1).
6. Perform a HEAT WATER operation (TM 10–3510–221–10) . While water is boiling in still, check for steam leaks at relief valve (5).

END OF WORK PACKAGE

UNIT

LAUNDRY ADVANCED SYSTEM

(NSN 3510–01–463–0114)

VACUUM BREAKER REPLACEMENT
REMOVAL, INSTALLATION

INITIAL SETUP:

Tools
Tool Kit, General Mechanics
(Item 14, WP 0282 00)

Personnel Required

Materials/Parts
Sealant, Pipe Thread (Item 6, WP 0281 00)

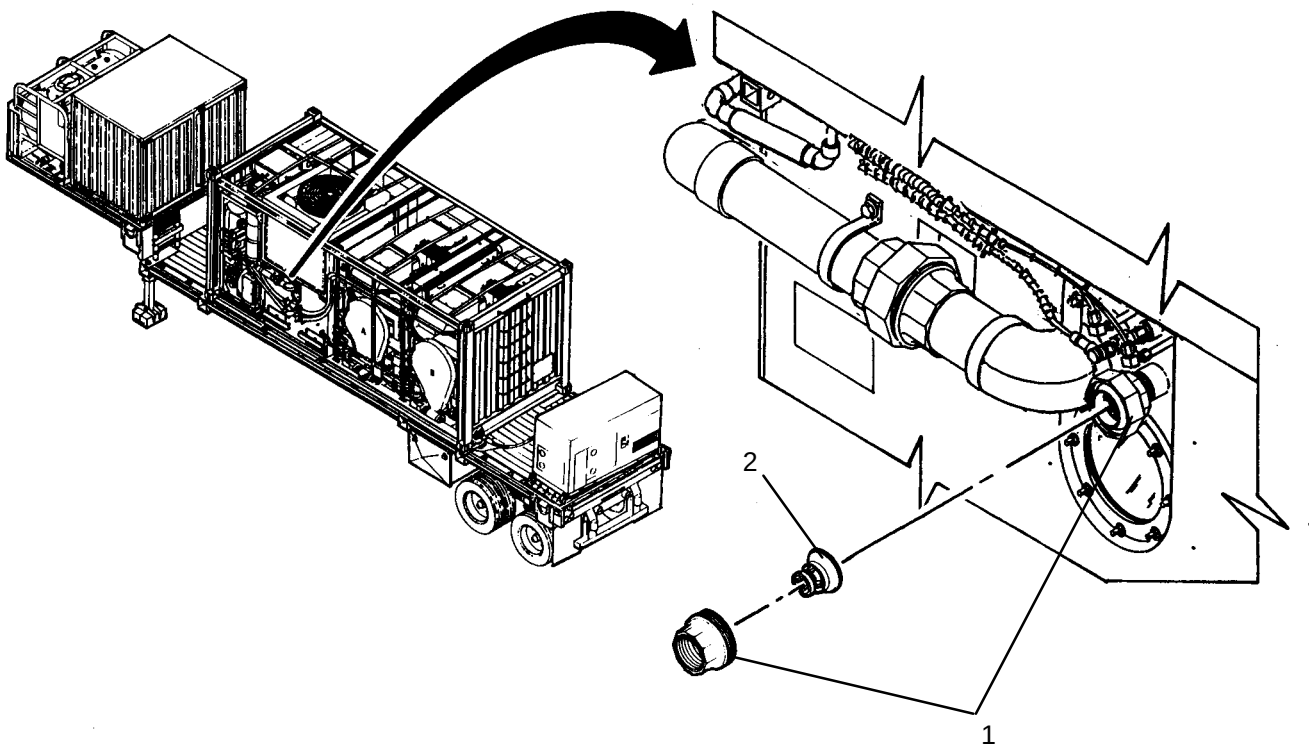
Equipment Conditions
LADS power shut off at main control enclosure (WP 0113 00).

REMOVAL

WARNING

Still piping can reach temperatures near 220 degrees F when the water recycle system is operating. Allow still piping to cool prior to performing maintenance. Always wear gloves and eye protection. Failure to follow this precaution could result in severe burn injuries.

1. Separate halves of union (1).
2. Remove vacuum breaker (2) from union (1).
3. Clean pipe thread sealant from mating surfaces of union (1).



INSTALLATION

1. Apply pipe thread sealant to mating surfaces of union (1).
2. Install new vacuum breaker (2) into union (1).
3. Thread halves on union (1) together.
4. Perform a HEAT WATER operation (TM 10–3510–221–10). While water is boiling in still, check for steam leaks at vacuum breaker (2).

END OF WORK PACKAGE

UNIT

LAUNDRY ADVANCED SYSTEM

(NSN 3510–01–463–0114)

DOOR LOCK (DN200) REPLACEMENT REMOVAL, INSTALLATION

INITIAL SETUP:

Tools
Tool Kit, General Mechanics
(Item 14, WP 0282 00)

Personnel Required

Materials/Parts
Tags (Item 9, WP 0281 00)
Tape, Anti–Seize (Item 10, WP 0281 00)
Strap, Tiedown (Item 31, WP 0283 00)

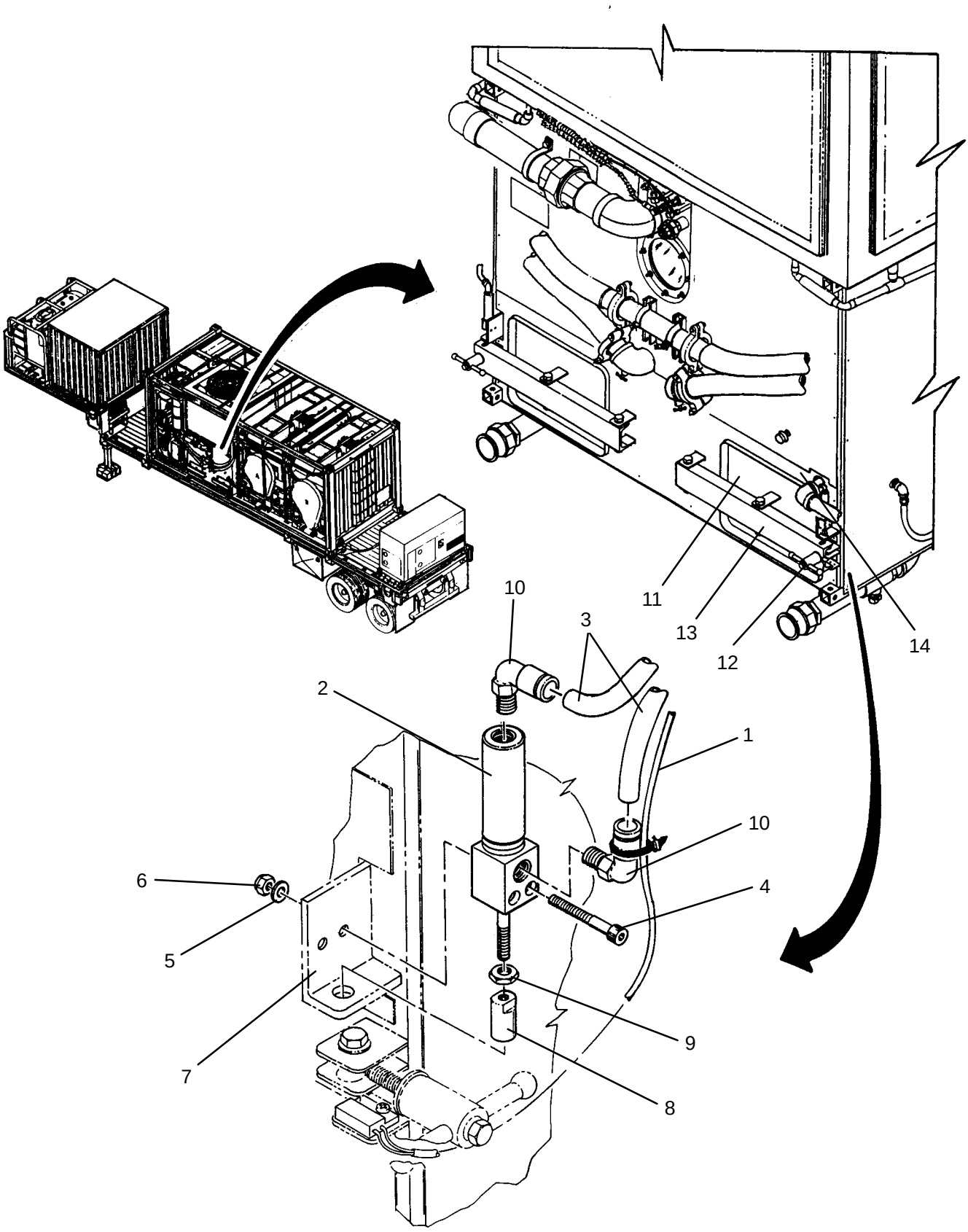
Equipment Conditions
Power must be applied at main control enclosure (WP 0113 00).
Air pressure must be vented (WP 0114 00).

REMOVAL

WARNING

Still piping can reach temperatures near 220 degrees F when the water recycle system is operating. Allow still piping to cool prior to performing maintenance. Always wear gloves and eye protection. Failure to follow this precaution could result in severe burn injuries.

1. Drain and clean still (TM 10–3510–221–10).
2. Cut tiedown straps securing door position switch lead wires (1) to door lock (2).
3. Tag and disconnect air tubes (3) from door lock (2).
4. Remove two screws (4), flat washers (5), and nuts (6), then remove door lock (2) from mounting angle (7).
5. Unthread pin (8) and nut (9) from door lock (2).
6. Remove two elbows (10) from door lock (2).
7. Clean anti–seize tape from threads of elbows (10).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INSTALLATION

1. Apply anti–seize tape to threads of elbows (10).
2. Install elbows (10) into new door lock (2).
3. Thread nut (9) completely onto door lock (2).
4. Thread pin (8) onto door lock (2) and tighten against nut (9).
5. Unless already accomplished, open door (11) as follows:
   a. Loosen clamping knob (12) and pivot off of door arm (13).
   b. Swing door (11) open.
6. Position door lock (2) on mounting angle (7), then secure with two screws (4), flat washers (5), and nuts (6).
7. Manually extend and retract pin (8). Verify pin slides easily through hole in mounting angle (7). If pin slides properly, proceed to step 9, otherwise continue to step 8.
8. Loosen two screws (4) then reposition door lock (2) as necessary to ensure pin (8) slides easily through hole in mounting angle (7).
9. Manually retract pin (8).
10. Close door (11) as follows:
    a. Swing door (11) closed. Ensure door is tight against still (14).
    b. Pivot clamping knob (12) onto door arm (13) then hand tighten until door arm is approximately flush with mounting angle (7).
11. Manually retract and extend pin (8) and verify pin does not bind on mounting angle (7) or door arm (13). If pin slides properly, proceed to step 12, otherwise return to step 8.
12. Secure door position switch lead wires (1) to door lock (2) with tiedown straps.
13. Connect air tubes (3) to door lock (2) as tagged.
14. Using maintenance menu to access control outputs and examine inputs functions (WP 0010 00), verify correct operation of door lock (2) as follows:
    a. Extend door lock DN200. Verify pin (8) extends into door arm (13).
    b. Retract door lock DN200. Verify pin (8) is clear of door arm (13).
    c. Extend and retract door lock DN200 and audibly check for air leaks.

END OF WORK PACKAGE

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UNIT

LAUNDRY ADVANCED SYSTEM

(NSN 3510–01–463–0114)

DOOR POSITION SWITCH (ZS200) REPLACEMENT REMOVAL, INSTALLATION

INITIAL SETUP:

Tools
Multimeter (Item 8, WP 0282 00)
Tool Kit, General Mechanics (Item 14, WP 0282 00)

Personnel Required

Materials/Parts
Washer, Lock (Item 3, WP 0283 00)
Strap, Tiedown (Item 31, WP 0283 00)

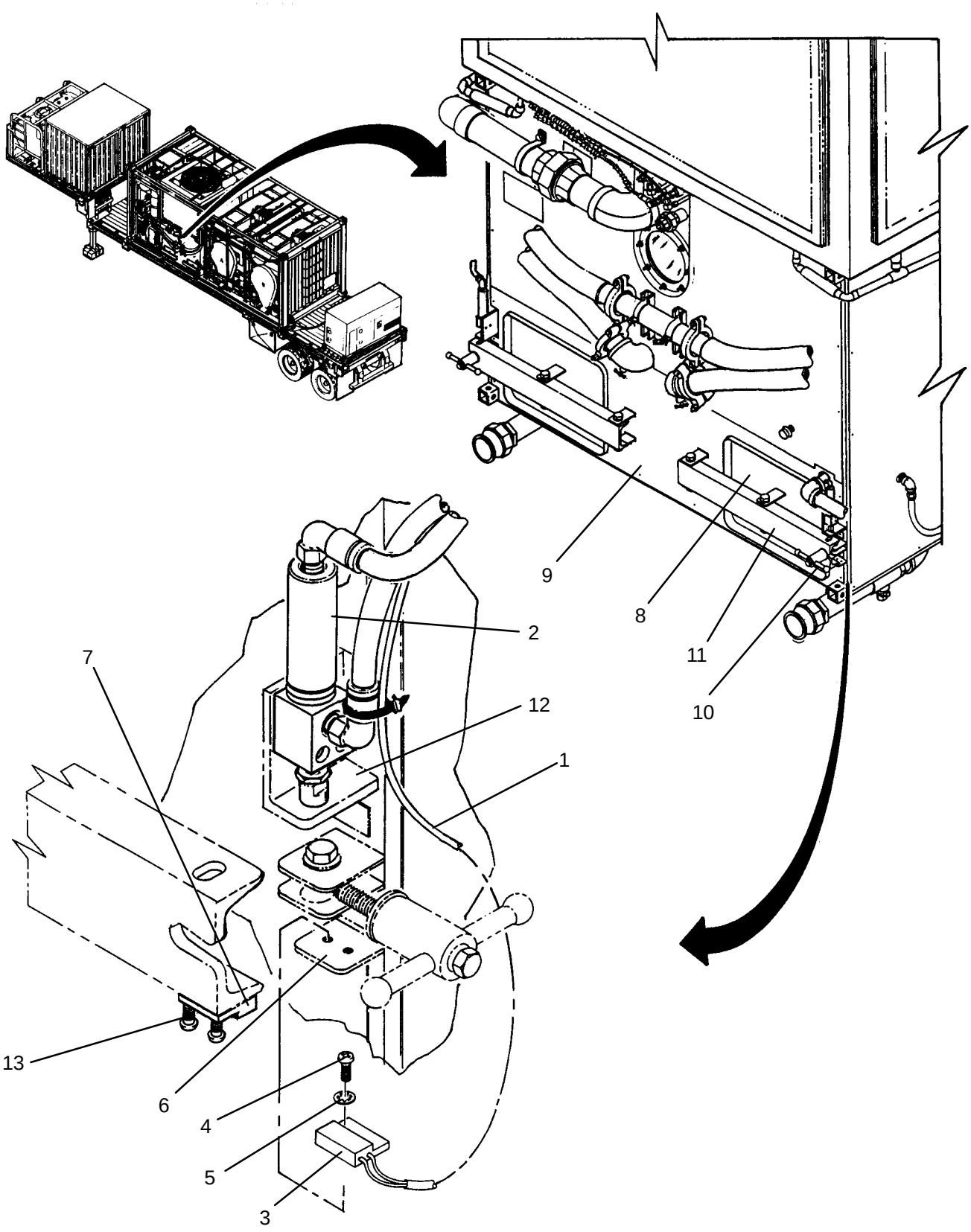
Equipment Conditions
Power shut off at main control enclosure (WP 0113 00).
Air pressure must be vented (WP 0114 00).

REMOVAL

WARNING

Still piping can reach temperatures near 220 degrees F when the water recycle system is operating. Allow still piping to cool prior to performing maintenance. Always wear gloves and eye protection. Failure to follow this precaution could result in severe burn injuries.

1. Drain and clean still (TM 10–3510–221–10).
2. Cut tiedown straps securing door position switch lead wires (1) to door lock (2).
3. Disconnect lead wires (1) of position switch (3).
4. Remove two screws (4) and lock washers (5), then remove position switch (3) from mounting bracket (6).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INSTALLATION

NOTE

When installing position switch (3), side edge of switch should be aligned with side edge of actuator (7).

1. Locate new position switch (3) on mounting bracket (6), then secure with two screws (4) and lock washers (5).
2. Unless already accomplished, close door (8) as follows:
   a. Swing door (8) closed. Ensure door is tight against still (9).
   b. Pivot clamping knob (10) onto door arm (11) then hand tighten until door arm is approximately flush with mounting angle (12).
3. Check alignment between side edge of position switch (3) and side edge of actuator (7). Realign switch if necessary.

ADJUSTMENT

1. Measure gap between position switch (3) and actuator (7). It should be 1/8 to 1/4 inches. Use a multimeter to measure continuity. Connect multimeter probes to lead wires (1) of position switch. If continuity is present, proceed to step 3. If continuity is not present, continue to step 2.
2. Adjust position of actuator (7) as follows:
   a. Loosen two screws (13) securing actuator (7) to door arm (11).
   b. Connect multimeter probes to lead wires (1) of position switch (3).
   c. Slide actuator (7) in to achieve continuity, then tighten screws (13).
   d. Check gap between position switch (3) and actuator (7). Repeat steps a and b as necessary.
3. Connect lead wires (1) of position switch (3) as tagged.
4. Secure door position switch lead wires (1) to door lock (2) with tiedown straps.
5. Using maintenance menu to access examine inputs function (WP 0010 00), verify correct operation of position switch (3) as follows:
   a. Verify position switch ZS200 status is ON.
   b. Loosen clamping knob (10) and pivot off of door arm (11).
   c. Swing door (8) open.
   d. Verify position switch ZS200 status is OFF.
6. Close door (8) as follows:
   a. Swing door (8) closed. Ensure door is tight against still (9).
   b. Pivot clamping knob (10) onto door arm (11) then hand tighten until door arm is approximately flush with mounting angle (12).

END OF WORK PACKAGE

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UNIT

LAUNDRY ADVANCED SYSTEM

(NSN 3510–01–463–0114)

STILL TEMPERATURE SENSOR (TE200) REPLACEMENT REMOVAL, INSTALLATION

INITIAL SETUP:

Tools
Tool Kit, General Mechanics
(Item 14, WP 0282 00)

Personnel Required

Materials/Parts
Tape, Anti–seize (Item 10, WP 0281 00)

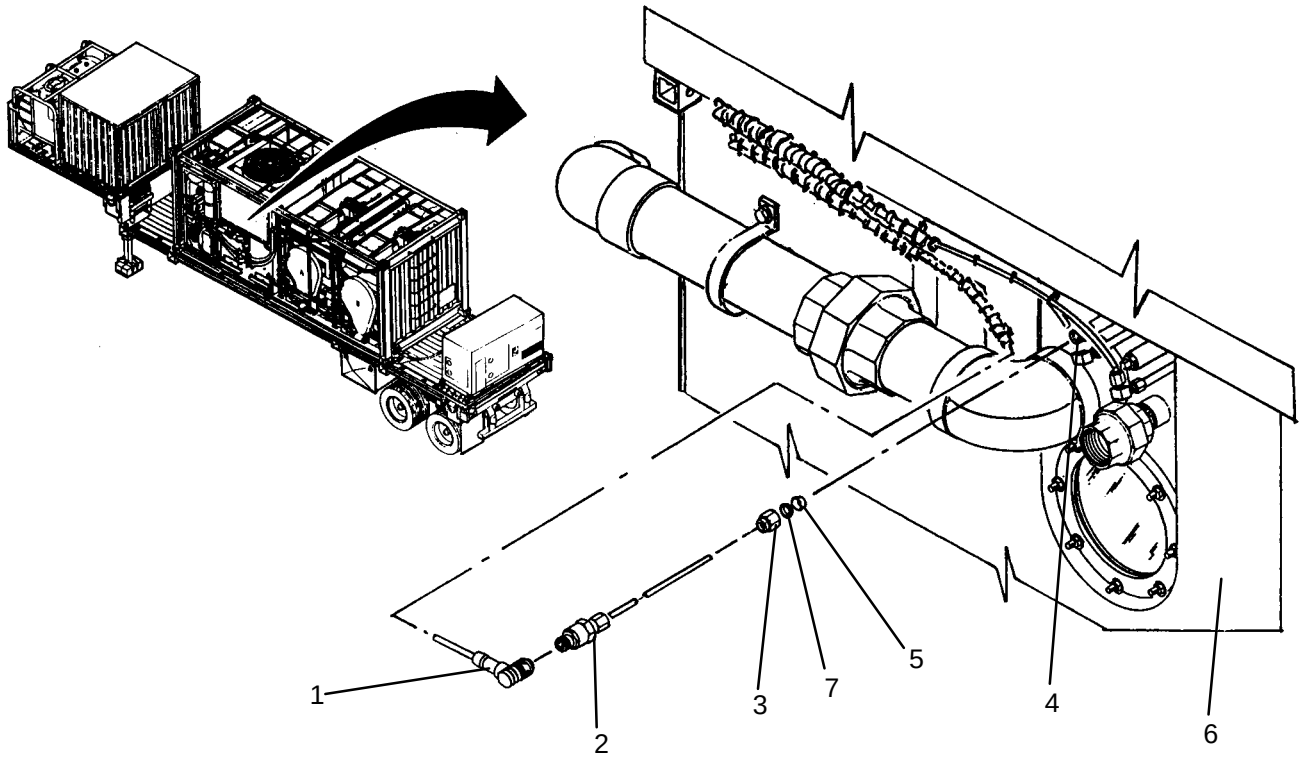
Equipment Conditions
Power shut off at main control enclosure (WP 0113 00).

REMOVAL

WARNING

Still piping can reach temperatures near 220 degrees F when the water recycle system is operating. Allow still piping to cool prior to performing maintenance. Always wear gloves and eye protection. Failure to follow this precaution could result in severe burn injuries.

1. Disconnect electrical connector (1) from temperature sensor (2).
2. Loosen nut (3) then remove temperature sensor (2) from fitting (4).
3. Measure and record distance from tip of temperature sensor (2) to lower ferrule (5).
4. Unthread fitting (4) from still (6).
5. Clean anti–seize tape from threads of fitting (4).



INSTALLATION

1. Connect electrical connector (1) to temperature sensor (2).
2. Access examine inputs function using maintenance menu (WP 0010 00), then observe and record temperature reading for TE100.
3. Access temperature sensor calibration function using maintenance menu (WP 0010 00), then set output of temperature sensor TE200 to same temperature reading as recorded for TE100.
4. Slide new nut (3), upper ferrule (7) and lower ferrule (5) onto new temperature sensor (2).
5. Insert temperature sensor (2) into fitting (4) at previously recorded dimension.
6. Tighten nut (3) onto fitting (4) to swage lower ferrule (5) on temperature sensor (2).
7. Loosen nut (3) and remove temperature sensor (2) from fitting (4).
8. Apply anti–seize tape to threads of fitting (4).
9. Thread fitting (4) into still (6).
10. Insert temperature sensor (2) into fitting (4) then tighten nut (3).
11. Perform a HEAT TANKS operation (TM 10–3510–221–10). While water is boiling, verify no steam leaks exist.

END OF WORK PACKAGE

UNIT

LAUNDRY ADVANCED SYSTEM

(NSN 3510–01–463–0114)

STILL CONDENSER FAN BLADE REPLACEMENT REMOVAL, INSTALLATION

INITIAL SETUP:

Tools
Puller, Bearing (Item 9, WP 0282 00)
Tool Kit, General Mechanics
(Item 14, WP 0282 00)

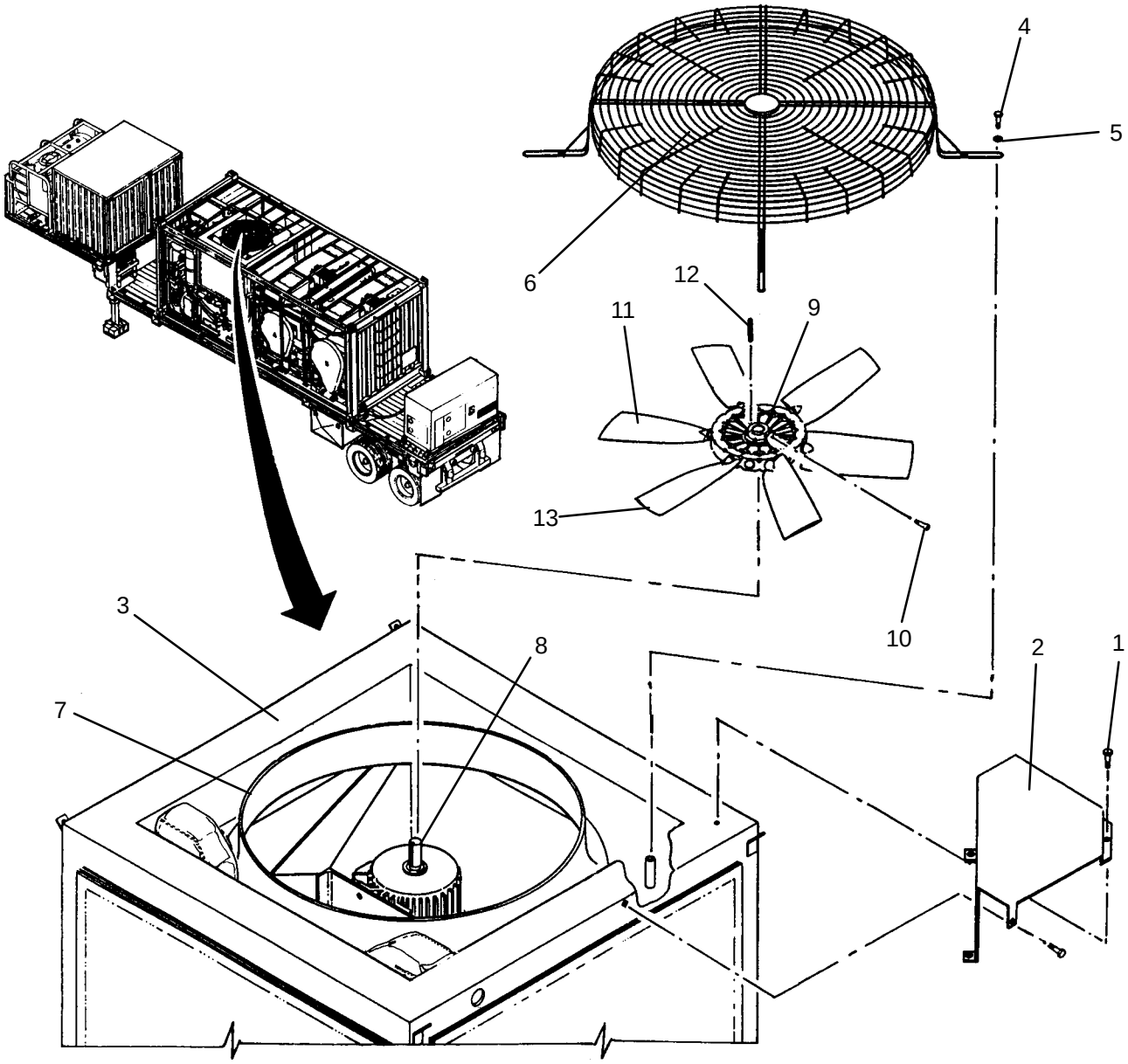
Personnel Required

Materials/Parts
Washer, Lock (Item 16, WP 0283 00)

Equipment Conditions
LADS power shut off at main control enclosure (WP 0113 00).

REMOVAL

1. Remove five screws (1) then remove cooling air shroud (2) from still condenser frame (3).
2. Remove four screws (4) and lock washers (5), then remove blade guard (6) from fan shroud (7).
3. Measure and record distance from top surface of top of motor shaft (8) to collar (9).
4. Loosen two setscrews (10), then remove fan blade (11) from motor shaft (8) using a bearing puller.
5. Remove machine key (12) from motor shaft (8).



INSTALLATION

1. Install machine key (12) onto motor shaft (8).
2. Slide new fan blade (11) over machine key (12) onto motor shaft (8).
3. Position fan blade (11) to previously recorded dimension, then tighten two setscrews (10).
4. Slowly spin fan blade (11) and check gap between blade tips (13) and fan shroud (7). If gap is less than 1/8 inch at any location adjust fan motor position (WP 0270 00).
5. Position blade guard (6) onto fan shroud (7), then secure with four screws (4) and lock washers (5).
6. Position cooling air shroud (2) onto still condenser frame (3), then secure with five screws (1).
7. Perform a HEAT TANKS operation (TM 10–3510–221–10). Verify smooth rotation of condenser fan.

END OF WORK PACKAGE

UNIT

LAUNDRY ADVANCED SYSTEM

(NSN 3510–01–463–0114)

SUBCOOLER REPLACEMENT
REMOVAL, INSTALLATION

INITIAL SETUP:

Tools
Puller, Bearing (Item 9, WP 0282 00)
Tool Kit, General Mechanics
(Item 14, WP 0282 00)

Personnel Required

Materials/Parts
Tape, Anti–Seize (Item 10, WP 0281 00)
Washer, Lock (Item 9, WP 0283 00)

Equipment Conditions
LADS power shut off at main control enclosure (WP 0113 00).

REMOVAL

WARNING

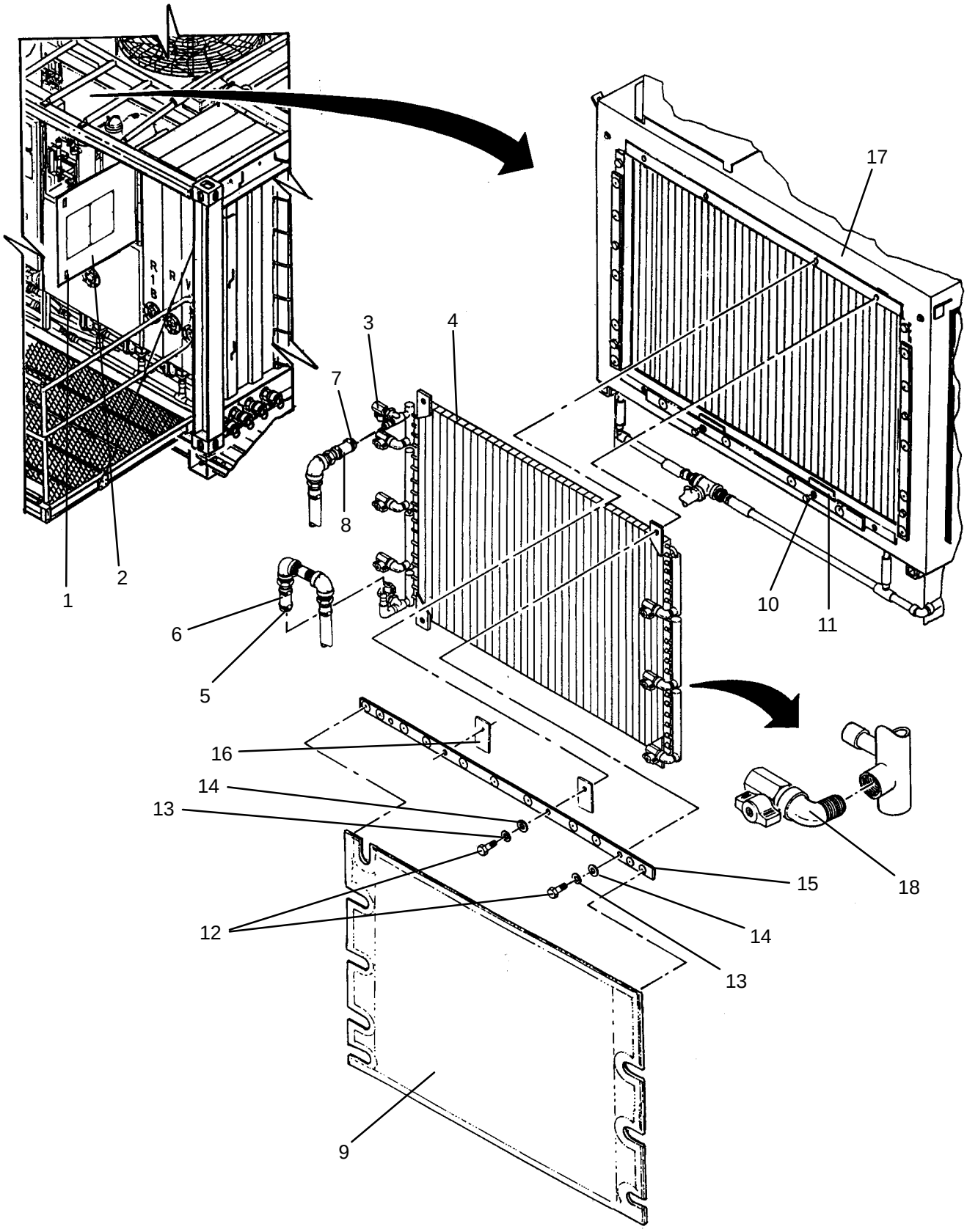
Distillate piping can reach temperatures near 200 degrees F when the water recycle system is operating. Allow piping to cool prior to performing maintenance. Always wear gloves and eye protection. Failure to follow this precaution could result in severe burn injuries.

1. Disengage two latches (1), then open access door (2).
2. Open eight valves (3) on subcooler (4). Allow water to drain, then close valves.
3. Loosen clamp (5), then pull hose (6) off of bottom of subcooler (4).
4. Loosen clamp (7), then pull hose (8) off of top of subcooler (4).
5. Remove inlet screen (9) from subcooler (4).
6. Loosen two screws (10), then rotate two retaining plates (11) to clear subcooler (4).

NOTE

Subcooler must be removed from top of LADS.

7. Remove six screws (12), lock washers (13), and flat washers (14), securing backing plate (15), two retaining plates (16) and subcooler (4).
8. Remove subcooler (4) from frame (17) by pulling out and lifting up from top of LADS.
9. Remove eight elbows (18) with attached valves (3) from subcooler (4).
10. Clean anti–seize tape from threads of elbows (18).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INSTALLATION

CAUTION

Be careful when installing subcooler not to damage fins. Bent fins will reduce the cooling efficiency of the subcooler.

1. Apply anti–seize tape to threads of elbows (18).
2. Install eight elbows (18) with attached valves (3) into new subcooler (4). Make sure valves are closed.

NOTE

Subcooler must be installed from top of LADS.

3. Position subcooler into frame (17) from top of LADS.
4. Install retaining plates, (16) and backing plate (15) onto frame (17), then secure with six screws (12), lock washers (13), and flat washers (14).
5. Rotate retaining plates (11) in front of subcooler (4), then secure to frame (17) with two screws (10).
6. Install inlet screen (9) onto subcooler (4).
7. Connect hose (8) at top of subcooler (4) then tighten clamp (7).
8. Connect hose (6) at bottom of subcooler (4) then tighten clamp (5).
9. Perform a HEAT WATER operation with a water temperature setpoint of 100 degrees F (TM 10–3510–221–10). Verify no water leaks exist.
10. Close access door (2) and secure by engaging two latches (1).

END OF WORK PACKAGE

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UNIT

LAUNDRY ADVANCED SYSTEM

(NSN 3510–01–463–0114)

DISTILLATE PUMP (M201) REPLACEMENT REMOVAL, INSTALLATION

INITIAL SETUP:

Tools
Tool Kit, General Mechanics
(Item 14, WP 0282 00)

Personnel Required

Materials/Parts
Sealant, Pipe Thread (Item 6, WP 0281 00)
Tags (Item 9, WP 0281 00)
Tape, Anti–Seize (Item 10, WP 0281 00)
Washer, Lock (Item 11, WP 0283 00

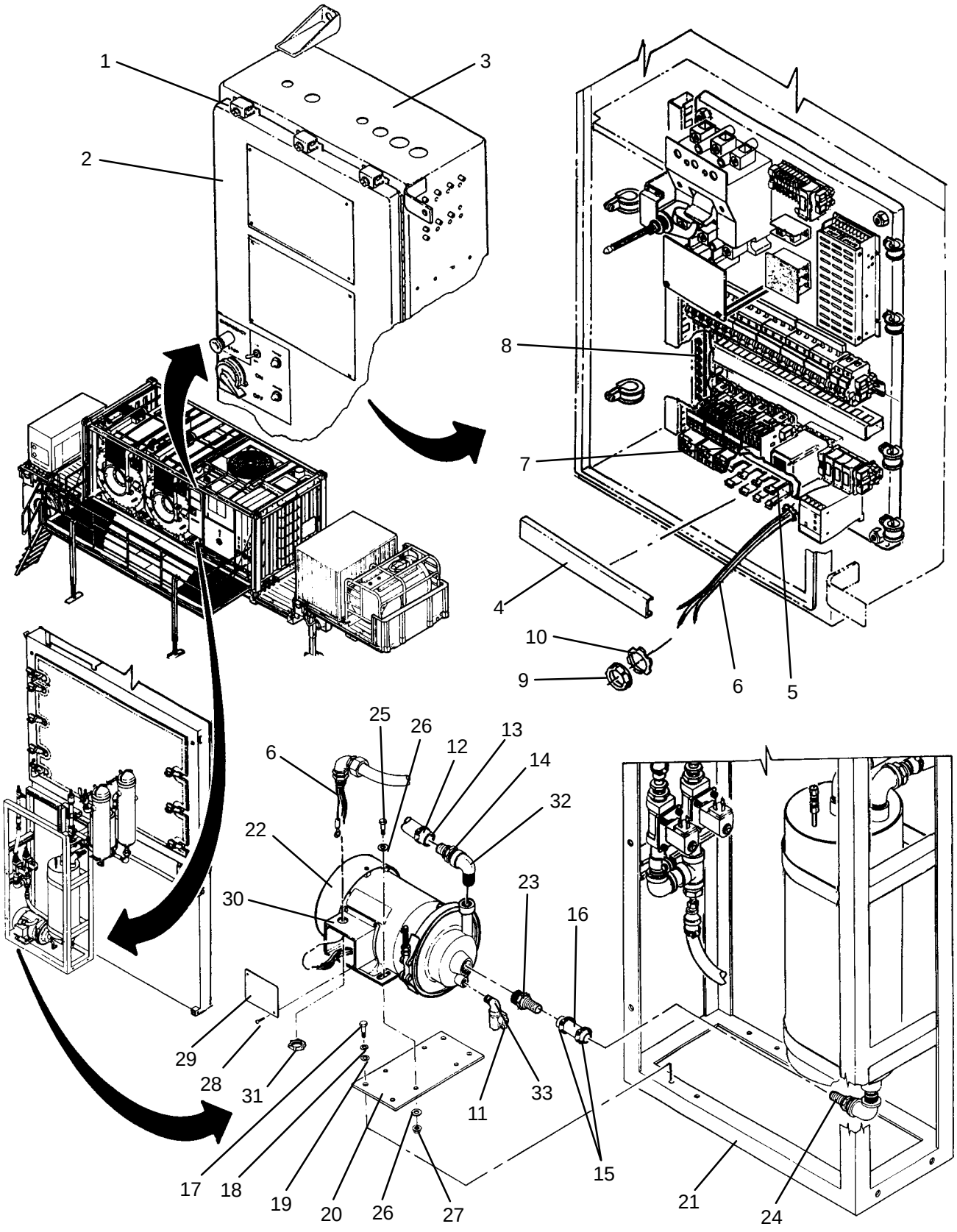
Equipment Conditions
LADS power shut off at main control enclosure (WP 0113 00).

REMOVAL

WARNING

Distillate piping can reach temperatures near 200 degrees F when the water recycle system is operating. Allow piping to cool prior to performing maintenance. Always wear gloves and eye protection. Failure to follow this precaution could result in severe burn injuries.

1. Loosen eleven latches (1), then open door (2) on main control enclosure (3).
2. Remove cover (4) from wire duct (5).
3. Tag and disconnect electrical wires (6) from relay (7) and ground bar TB3 (8).
4. Remove insulating bushing (9) and conduit lock nut (10) then pull electrical wires (6) out of main control enclosure (3).
5. Open valve (11) and allow water to drain.
6. Loosen clamp (12), then pull hose (13) off of barb (14).
7. Loosen clamps (15) on hose (16).
8. Remove four screws (17), lock washers (18) and flat washers (19), securing mounting plate (20) to distillate frame (21).
9. Move distillate pump (22) back and remove hose (16) from hose barbs (23) and (24).
10. Pull distillate pump (22) out from under distillate frame (21).
11. Remove four screws (25), flat washers (26), and nuts (27), then remove mounting plate (20) from distillate pump (22).
12. Remove two screws (28) and cover (29) from junction box (30) on distillate pump (22).
13. Tag and disconnect electrical wires (6) inside junction box (30).
14. Remove conduit lock nut (31), then pull electrical wires (6) out of junction box (30).
15. Unthread hose barb (23), elbow (32), and elbow (33) from distillate pump (22).
16. Clean pipe thread sealant from threads of hose barb (23) and elbow (32).
17. Clean anti–seize tape from threads of elbow (33).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INSTALLATION

1. Apply pipe thread sealant to threads of hose barb (23) and elbow (32).
2. Apply anti–seize tape to threads of elbow (33).
3. Thread hose barb (23), elbow (32), and elbow (33) into new distillate pump (22).
4. Remove two screws (28) and cover (29) from junction box (30) on distillate pump (22).
5. Insert electrical wires (6) into junction box (30), then install conduit nut (31).
6. Connect electrical wires (6) inside junction box (30) as tagged.
7. Install cover (29) onto junction box (30), then secure with two screws (28).
8. Mate mounting plate (20) to distillate pump (22), then secure with four screws (25), flat washers (26), and nuts (27).
9. Position distillate pump (22) on distillate frame (21).
10. Slide hose (16) onto hose barbs (23) and (24).
11. Install, but do not tighten four screws (17), lock washers (18) and flat washers (19).
12. Slide hose (13) onto barb (14), then tighten clamp (12).
13. Tighten clamps (15) on hose (16).
14. Tighten screws (17) to secure mounting plate (20) to distillate frame (21).
15. Insert electrical wires (6) into main control enclosure (3), then install insulating bushing (9) and conduit nut (10).
16. Connect electrical wires (6) to relay (7) and ground bar TB3 (8) as tagged.
17. Install cover (4) onto wire duct (5).
18. Close door (2) on main control enclosure (3), then tighten eleven latches (1).
19. Open valve (11).
20. Start a HEAT WATER operation (TM 10–3510–221–10), then perform the following:
    a. Observe valve (11). When water starts flowing out of valve, close valve.
    b. Observe distillate pump (22). When pump turns on, verify there are no water leaks.
    c. Using maintenance menu EXAMINE INPUTS (WP 0010 00), observe standpipe level LT201.
    d. Verify that distillate pump (22) comes on when LT201 level is about 16 inches.
    e. Verify that within five minutes, LT201 level drops to 3 inches at least once.

END OF WORK PACKAGE

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UNIT

LAUNDRY ADVANCED SYSTEM

(NSN 3510–01–463–0114)

SUBCOOLER BYPASS VALVE (FV200) REPLACEMENT REMOVAL, INSTALLATION

INITIAL SETUP:

Tools
Tool Kit, General Mechanics
(Item 14, WP 0282 00)

Personnel Required

Materials/Parts
Sealant, Pipe Thread (Item 6, WP 0281 00)
Tags (Item 9, WP 0281 00)

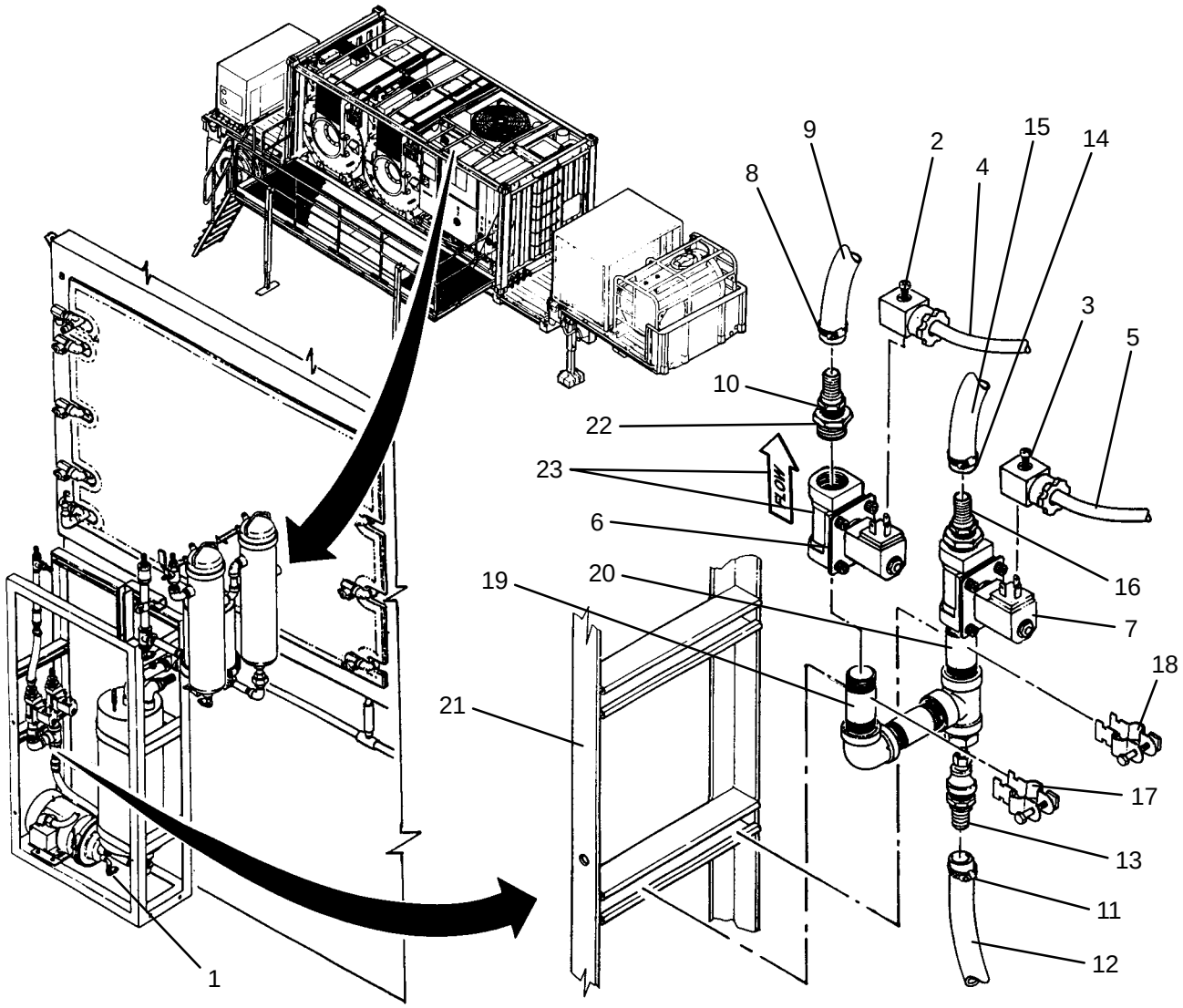
Equipment Conditions
LADS power shut off at main control enclosure (WP 0113 00).

REMOVAL

WARNING

Distillate piping can reach temperatures near 200 degrees F when the water recycle system is operating. Allow piping to cool prior to performing maintenance. Always wear gloves and eye protection. Failure to follow this precaution could result in severe burn injuries.

1. Open valve (1). Allow water to drain then close valve.
2. Loosen screws (2) and (3), then tag and disconnect electrical cables (4) and (5) from solenoid valve (6) and (7).
3. Loosen clamp (8), then pull hose (9) off of barb (10).
4. Loosen clamp (11), then pull hose (12) off of barb (13).
5. Loosen clamp (14), then pull hose (15) off of barb (16).
6. Loosen clamps (17) and (18) securing piping (19) and (20) to distillate frame (21).
7. Remove solenoid valves (6) and (7) with attached piping (10), (13), and (16).
8. Unthread hex bushing (22) from outlet of solenoid valve (6).
9. Unthread solenoid valve (6) from nipple (19).
10. Clean pipe thread sealant from threads of hex bushing (22), and nipple (19).



INSTALLATION

1. Apply pipe thread sealant to threads hex bushing (22) and nipple (19).
2. Note direction arrow (23) on new solenoid valve (6) then thread hex bushing (22) into valve outlet.
3. Thread solenoid valve (6) into nipple (19) oriented as shown.
4. Position solenoid valves (6) and (7) onto distillate frame (21).
5. Install clamps (17) and (18) securing piping (19) and (20).
6. Connect hose (15) at barb (16), then tighten clamp (14).
7. Connect hose (12) at barb (13), then tighten clamp (11).
8. Connect hose (9) at barb (10), then tighten clamp (8).
9. Connect electrical cables (4) and (5) to solenoid valve (6) and (7) then tighten screw (2) and (3).
10. Perform a HEAT WATER operation with a water temperature setpoint of 150 degrees F (TM 10–3510–221–10). Verify no water leaks exist.

END OF WORK PACKAGE

UNIT

LAUNDRY ADVANCED SYSTEM

(NSN 3510–01–463–0114)

SUBCOOLER INLET VALVE (FV201) REPLACEMENT REMOVAL, INSTALLATION

INITIAL SETUP:

Tools
Tool Kit, General Mechanics
(Item 14, WP 0282 00)

Personnel Required

Materials/Parts
Sealant, Pipe Thread (Item 6, WP 0281 00)

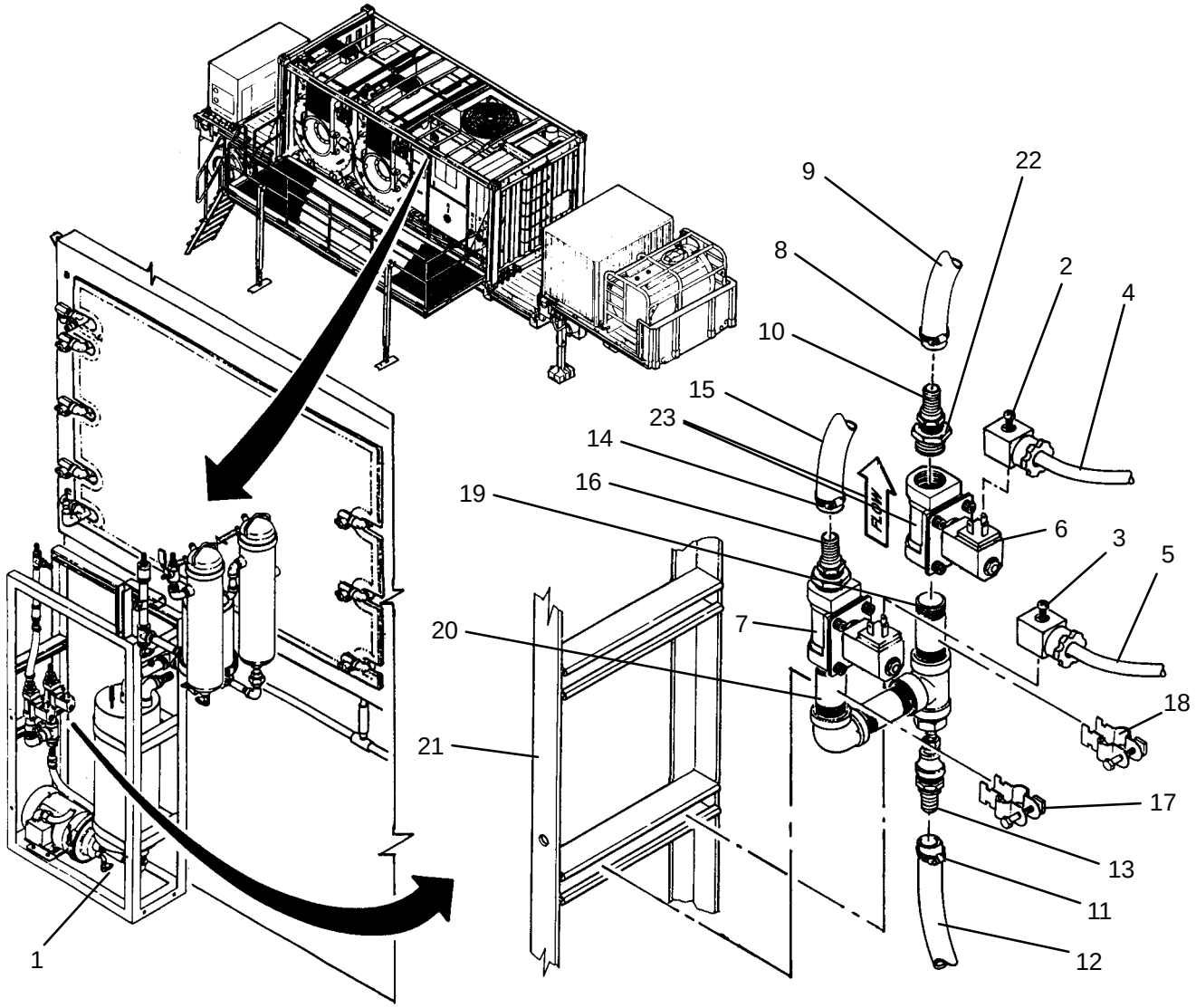
Equipment Conditions
LADS power shut off at main control enclosure (WP 0113 00).

REMOVAL

WARNING

Distillate piping can reach temperatures near 200 degrees F when the water recycle system is operating. Allow piping to cool prior to performing maintenance. Always wear gloves and eye protection. Failure to follow this precaution could result in severe burn injuries.

1. Open valve (1). Allow water to drain then close valve.
2. Loosen screws (2) and (3) then tag and disconnect electrical cables (4) and (5) from solenoid valve (6) and (7).
3. Loosen clamp (8), then pull hose (9) off of barb (10).
4. Loosen clamp (11), then pull hose (12) off of barb (13).
5. Loosen clamp (14), then pull hose (15) off of barb (16).
6. Loosen clamps (17) and (18) securing piping (19) and (20) to distillate frame (21).
7. Remove solenoid valves (6) and (7) with attached piping (10), (13), and (16).
8. Unthread hex bushing (22) from outlet of solenoid valve (6).
9. Unthread solenoid valve (6) from nipple (19).
10. Clean pipe thread sealant from threads of hex bushing (22), and nipple (19).



INSTALLATION

1. Apply pipe thread sealant to threads of hex bushing (22) and nipple (19).
2. Note direction arrow (23) on new solenoid valve (6), then thread hex bushing (22) into valve outlet.
3. Thread solenoid valve (6) into nipple (19), oriented as shown.
4. Position solenoid valves (6) and (7) onto distillate frame (21).
5. Install clamps (17) and (18), securing piping (19) and (20).
6. Connect hose (15) at barb (16), then tighten clamp (14).
7. Connect hose (12) at barb (13), then tighten clamp (11).
8. Connect hose (9) at barb (10), then tighten clamp (8).
9. Connect electrical cables (4) and (5) to solenoid valve (6) and (7), then tighten screw (2) and (3).
10. Perform a HEAT WATER operation with a water temperature setpoint of 110 degrees F (TM 10–3510–221–10). Verify no water leaks exist.

END OF WORK PACKAGE

UNIT

LAUNDRY ADVANCED SYSTEM

(NSN 3510–01–463–0114)

CONDENSER OUTLET TEMPERATURE SENSOR (TE201) REPLACEMENT REMOVAL, INSTALLATION

INITIAL SETUP:

Tools
Tool Kit, General Mechanics
(Item 14, WP 0282 00)

Personnel Required

Materials/Parts
Tape, Anti–Seize (Item 10, WP 0281 00)

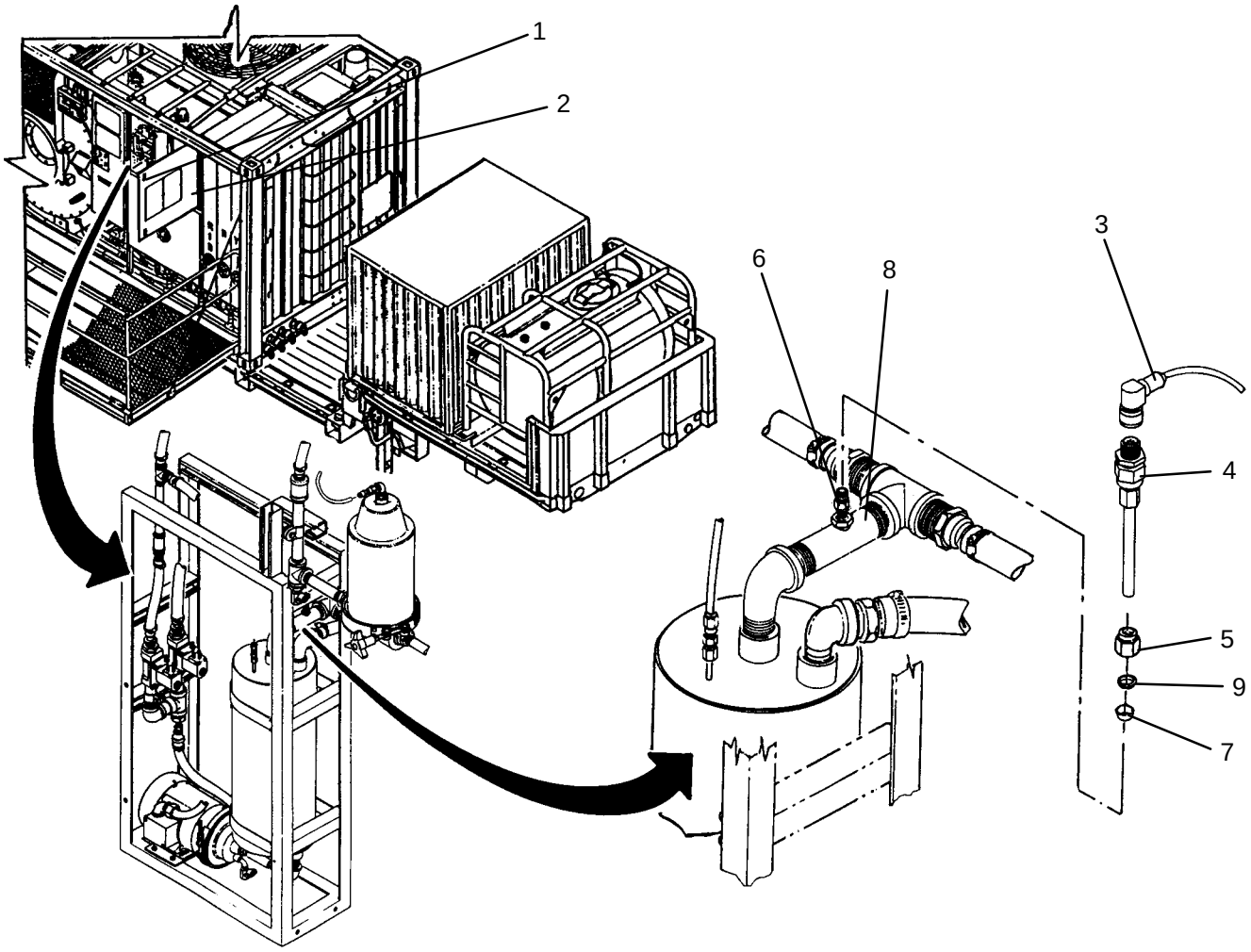
Equipment Conditions
LADS power shut off at main control enclosure (WP 0113 00).

REMOVAL

WARNING

Distillate piping can reach temperatures near 200 degrees F when the water recycle system is operating. Allow piping to cool prior to performing maintenance. Always wear gloves and eye protection. Failure to follow this precaution could result in severe burn injuries.

1. Disengage two latches (1), then open access door (2).
2. Disconnect electrical connector (3) from temperature sensor (4).
3. Loosen nut (5) then remove temperature sensor (4) from fitting (6).
4. Measure and record distance from tip of temperature sensor (4) to lower ferrule (7).
5. Unthread fitting (6) from piping (8).
6. Clean anti–seize tape from threads of fitting (6).



INSTALLATION

1. Connect electrical connector (3) to temperature sensor (4).
2. Access examine inputs function using maintenance menu (WP 0010 00), then observe and record temperature reading for TE100.
3. Access temperature sensor calibration function using maintenance menu (WP 0010 00), then set output of temperature sensor TE201 to same temperature reading as recorded for TE100.
4. Slide new nut (5), upper ferrule (9) and lower ferrule (7) onto new temperature sensor (4).
5. Insert temperature sensor (4) into fitting (6) at previously recorded dimension.
6. Tighten nut (5) onto fitting (6) to swage lower ferrule (7) on temperature sensor (4).
7. Loosen nut (5) and remove temperature sensor (4) from fitting (6).
8. Apply anti–seize tape to threads of fitting (6).
9. Thread fitting (6) into piping (8).
10. Insert temperature sensor (4) into fitting (6) then tighten nut (5).
11. Perform a HEAT WATER operation with a water temperature setpoint of 150 degrees F (TM 10–3510–221–10). Verify no water leaks exist.
12. Close access door (2) and secure by engaging two latches (1).

END OF WORK PACKAGE

UNIT

LAUNDRY ADVANCED SYSTEM

(NSN 3510–01–463–0114)

RINSE 2 TANK INLET TEMPERATURE SENSOR (TE202) REPLACEMENT REMOVAL, INSTALLATION

INITIAL SETUP:

Tools
Tool Kit, General Mechanics
(Item 14, WP 0282 00)

Personnel Required

Materials/Parts
Sealant, Pipe Thread (Item 6, WP 0281 00)

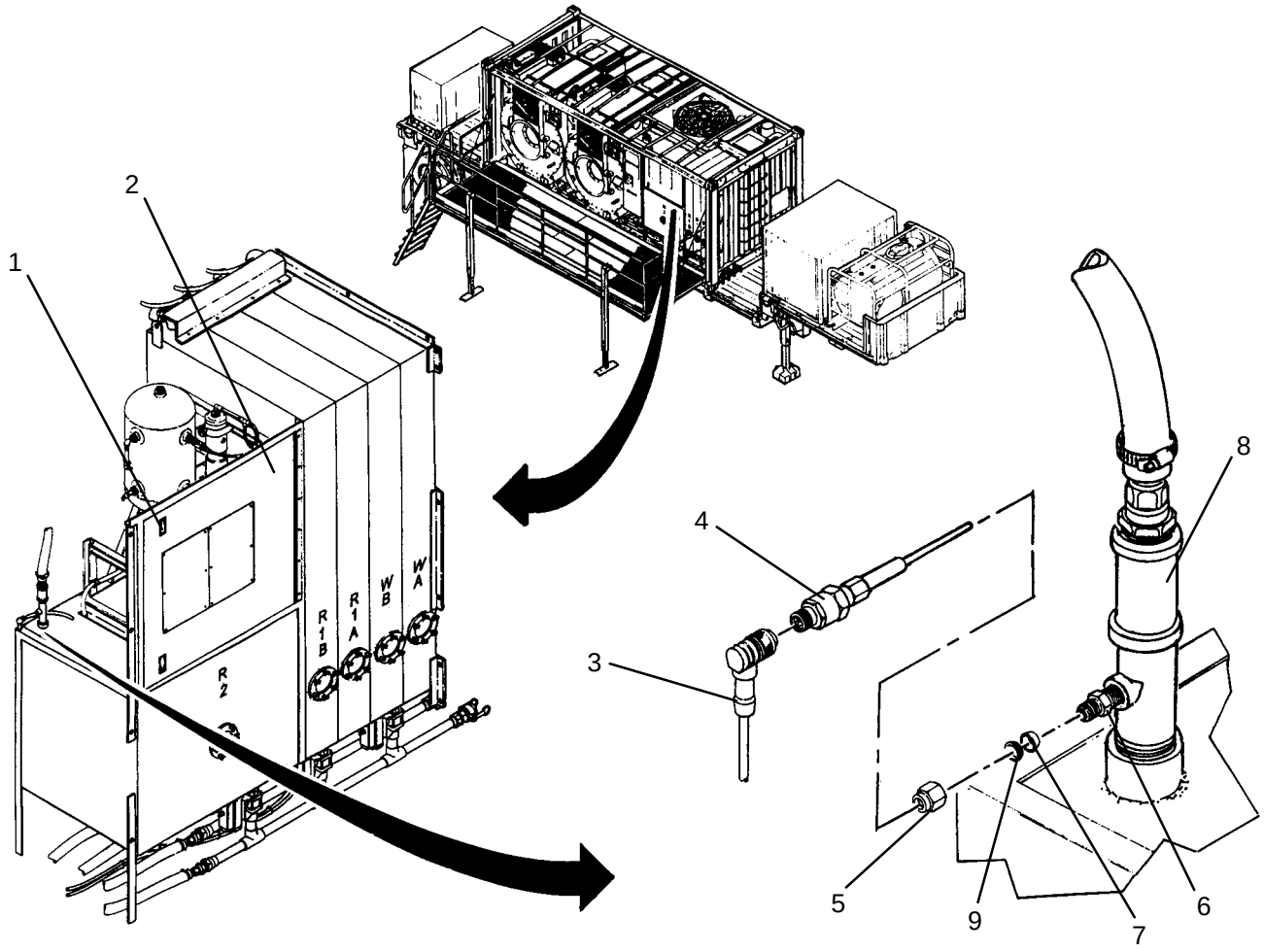
Equipment Conditions
LADS power shut off at main control enclosure (WP 0113 00).

REMOVAL

WARNING

Distillate piping can reach temperatures near 200 degrees F when the water recycle system is operating. Allow piping to cool prior to performing maintenance. Always wear gloves and eye protection. Failure to follow this precaution could result in severe burn injuries.

1. Disengage two latches (1), then open access door (2).
2. Disconnect electrical connector (3) from temperature sensor (4).
3. Loosen nut (5) then remove temperature sensor (4) from fitting (6).
4. Measure and record distance from tip of temperature sensor (4) to lower ferrule (7).
5. Unthread fitting (6) from piping (8).
6. Clean pipe thread sealant from threads of fitting (6).



INSTALLATION

1. Connect electrical connector (3) to temperature sensor (4).
2. Access examine inputs function using maintenance menu (WP 0010 00), then observe and record temperature reading for TE100.
3. Access temperature sensor calibration function using maintenance menu (WP 0010 00), then set output of temperature sensor TE202 to same temperature reading as recorded for TE100.
4. Slide new nut (5), upper ferrule (9) and lower ferrule (7) onto new temperature sensor (4).
5. Insert temperature sensor (4) into fitting (6) at previously recorded dimension.
6. Tighten nut (5) onto fitting (6) to swage lower ferrule (7) on temperature sensor (4).
7. Loosen nut (5) and remove temperature sensor (4) from fitting (6).
8. Apply pipe thread sealant to threads of fitting (6).
9. Thread fitting (6) into piping (8).
10. Insert temperature sensor (4) into fitting (6) then tighten nut (5).
11. Perform a HEAT WATER operation with a water temperature setpoint of 150 degrees F (TM 10–3510–221–10). Verify no water leaks exist.
12. Close access door (2) and secure by engaging two latches (1).

END OF WORK PACKAGE

UNIT

LAUNDRY ADVANCED SYSTEM

(NSN 3510–01–463–0114)

THERMAL FLUID SERVICING
REPLENISHING THERMAL FLUID SUPPLY

INITIAL SETUP:

Tools
Container, 5–Gallon (Item 3, WP 0282 00)
Funnel, W/Filter (Item 5, WP 0282 00)
Tool Kit, General Mechanics
(Item 14, WP 0282 00)

Personnel Required

Materials/Parts
Thermal Fluid (Item 2, WP 0281 00)
Rag, Wiping (Item 4, WP 0281 00)
Sealant, Pipe Thread (Item 8, WP 0281 00)

Equipment Conditions
LADS power shut off at main control enclosure (WP 0113 00).

WARNING

Thermal fluid can reach temperatures near 400 degrees F when the heating system is operating. Allow thermal fluid and heating system piping to cool prior to performing maintenance. Always wear gloves and eye protection. Failure to follow this precaution could result in severe personal burn injuries.

CAUTION

Overfilling expansion tank can cause high thermal fluid system pressure. Never fill tank higher than full mark on dip stick. Over–pressurization of the thermal fluid system can cause premature failure of components and result in hot thermal fluid be vented out onto heater and surrounding equipment.

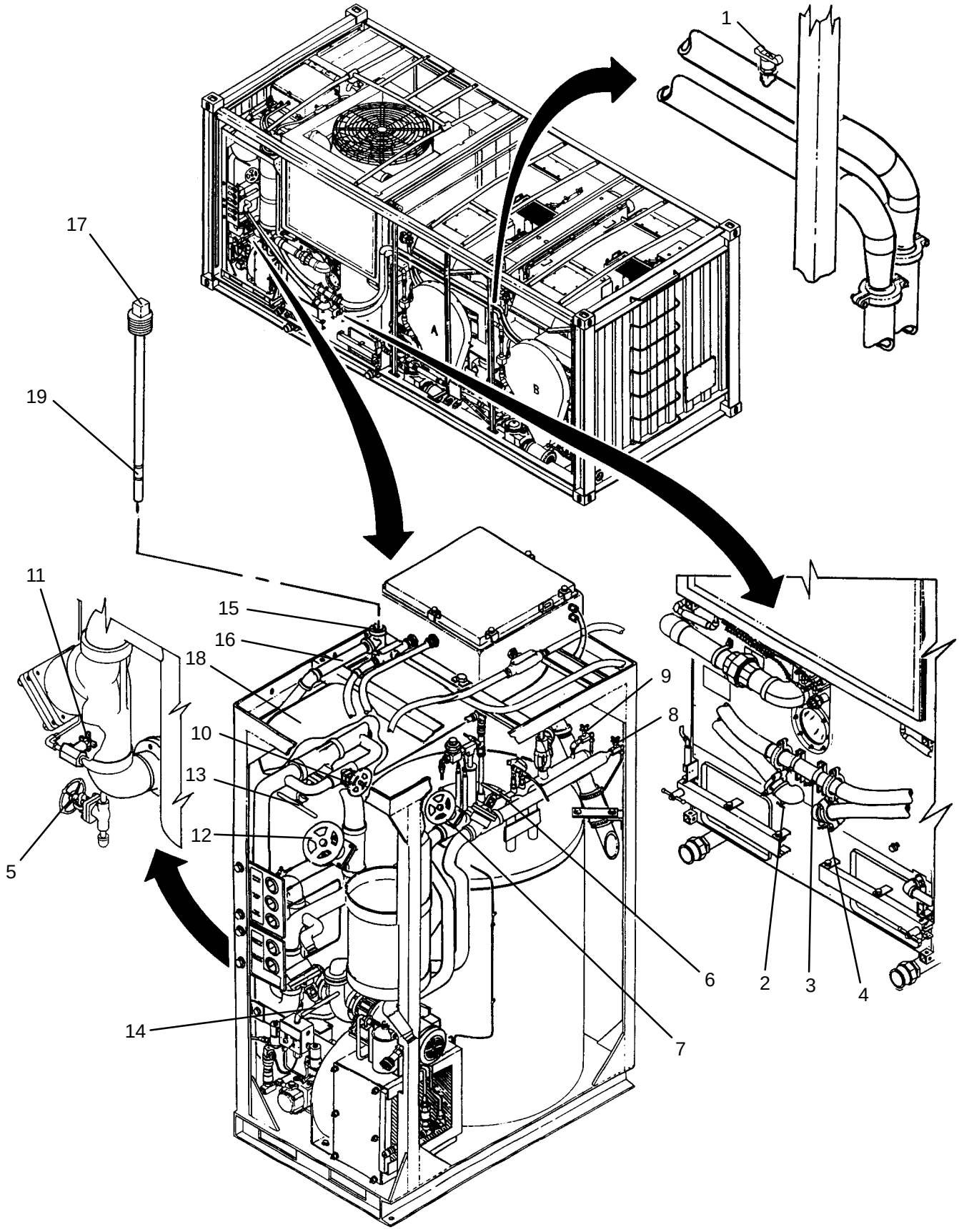
CAUTION

Introducing water into thermal fluid system can cause a steam excursion which may result in damage to thermal fluid plumbing.

CAUTION

Adding thermal fluid too fast causes debris in expansion tank to be stirred which will result in an immediate clogging of the thermal fluid strainer. A clogged thermal fluid strainer may cause premature failure of components.

1. Check thermal fluid plumbing and verify the following:
   a. All connections that were disconnected for maintenance have been reconnected.
   b. Bleed valve (1) is closed.
   c. Drain valves (2), (3), (4), and (5) are closed.
   d. Isolation valves (6 through 13) are open.
   e. Isolation valve (14) is closed.
2. Place wiping rags under fill port (15) and vent port (16).
3. Unthread dip stick (17) from fill port (15).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4. Clean pipe thread sealant off of threads of dip stick (17) and fill port (15).
5. Determine approximately how much thermal fluid was drained. If less than four gallons was drained, proceed to step 10, otherwise, continue to step 6.
6. Slowly fill expansion tank (18) until approximately four gallons have been added.
7. Place a clean wiping rag around bleed valve (1) then slightly open valve.
8. Allow air to bleed. When no more air can be heard, close bleed valve (1).
9. Thread dip stick (17) into fill port (15) hand tight.
10. Unthread dip stick (17) and check for thermal fluid on dip stick. If thermal fluid level is between full marks (19) continue to step 12, otherwise continue to step 11.
11. Using funnel, slowly add thermal fluid to expansion tank (18) stopping periodically to check level. When fluid level is at full marks (19), continue to step 12.
12. Thread dip stick (17) into fill port (15) hand tight.
13. Use maintenance menu to start thermal fluid pump (WP 0010 00). Allow thermal fluid to circulate for approximately fifteen minutes then stop thermal fluid pump. Check for leaks while thermal fluid is circulating.
14. Unthread dip stick (17) and check for thermal fluid on dip stick. If thermal fluid level is between full marks (19) continue to step 15, otherwise repeat steps 11 through 13.
15. Apply pipe thread sealant to threads of dip stick (17).
16. Thread dip stick (17) into fill port (15) hand tight, then tighten 1/2 turn.
17. Clean up any residual thermal fluid.
18. Perform a HEAT WATER operation (TM 10–3510–221–10). While heating system is operating, visually check for thermal fluid and fuel leaks.
19. While HEAT WATER operation is underway, begin closing isolation valves (12) and (13) and opening isolation valve (14); one turn every 5 minutes.
20. When isolation valves (12) and (13) are fully closed and isolation valve (14) is fully closed, perform a COOLDOWN cycle (TM 10–3510–221–10).

END OF WORK PACKAGE

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UNIT

LAUNDRY ADVANCED SYSTEM

(NSN 3510–01–463–0114)

THERMAL FLUID STRAINER SERVICING
REMOVAL, CLEANING, INSTALLATION

INITIAL SETUP:

Tools
Container, 5–Gallon (Item 3, WP 0282 00)
Hose Assy, Drain, Thermal Fluid
(Item 6, WP 0282 00)
Tool Kit, General Mechanics
(Item 14, WP 0282 00)

Personnel Required

Materials/Parts
Rag Wiping (Item 4, WP 0281 00)
Gasket, Strainer(Item 24, WP 0283 00)

Equipment Conditions
LADS power shut off at main control enclosure (WP 0113 00).

REMOVAL

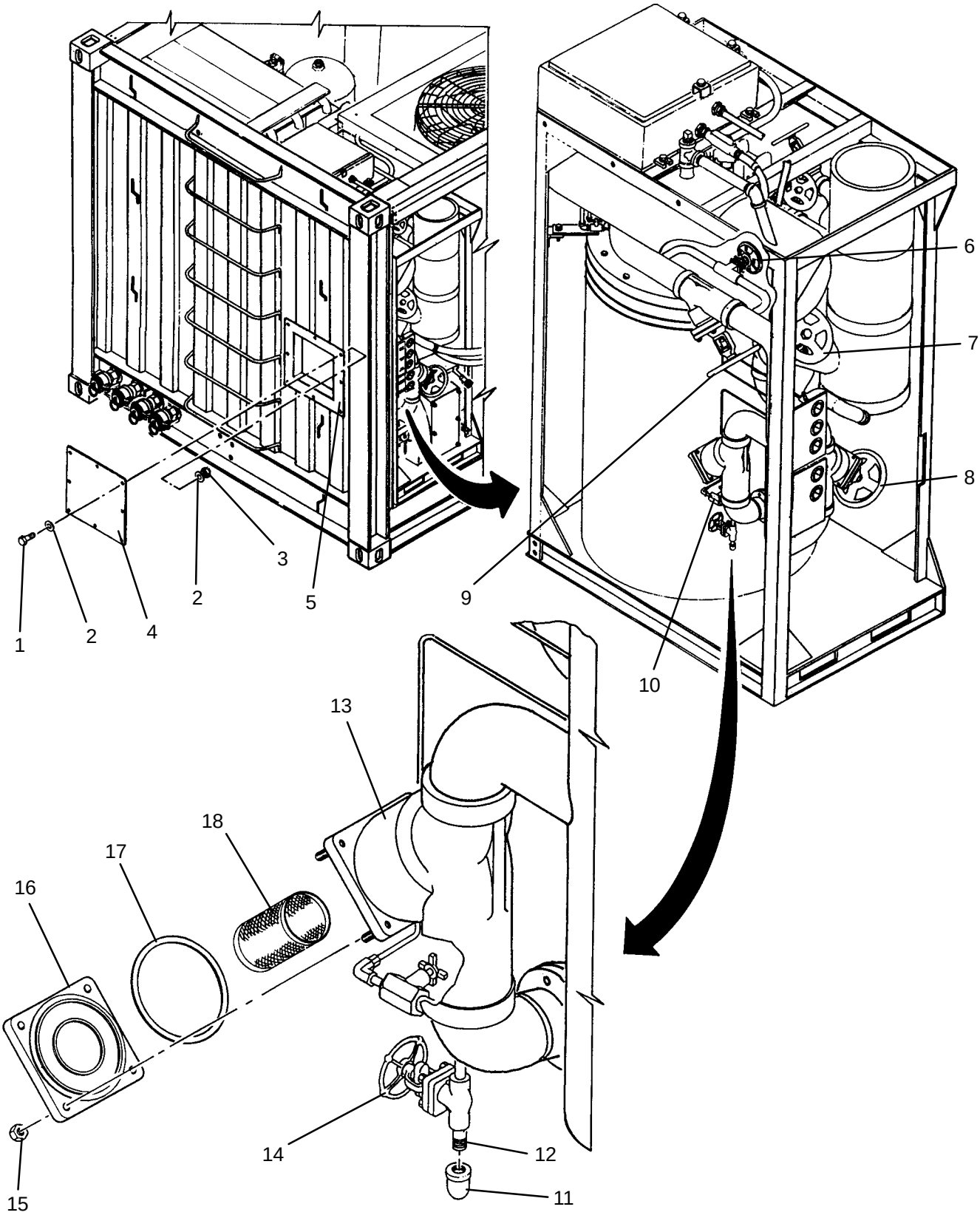
WARNING

Thermal fluid can reach temperatures near 400 degrees F when the heating system is operating. Allow thermal fluid and heating system piping to cool prior to performing maintenance. Always wear gloves and eye protection. Failure to follow this precaution could result in severe burn injuries.

1. Remove eight screws (1), sixteen flat washers (2), and eight nuts (3), then remove access plate (4) from ISO frame (5).
2. Close isolation valves (6), (7), and (8). Ensure isolation valves (9) and (10) are closed.
3. Remove cap (11) then thread drain hose into drain port (12).
4. Place clean container on ground then place drain hose into container.
5. Place a wiping rags under strainer housing (13)
6. Open manual valve (14).
7. Loosen, but do not remove, four nuts (15) securing cover plate (16) to strainer housing (13).
8. Break seal between cover plate (16) and strainer housing (13) and allow thermal fluid to drain.
9. When all thermal fluid has drained, remove four nuts (15) and cover plate (16) from strainer housing (13).
10. Remove gasket (17) from cover plate (16).
11. Remove strainer (18) from strainer housing (13).
12. Remove drain hose from drain port (12) then reinstall cap (11) and close drain valve (14).

CLEANING

1. Rinse cover plate (16) and strainer (18) with clean water to remove all contaminants.
2. Thoroughly dry cover plate (16) and strainer (18) with a clean rag. Ensure all remnants of old gasket (17) are removed from cover plate.
3. Wipe any contamination out of strainer housing (13) with a clean rag. Ensure all remnants of old gasket (17) are removed from strainer housing.
4. Clean up any residual thermal fluid in heater area.
5. Inspect strainer (18) for tears. Replace if torn.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INSTALLATION

CAUTION

Strainer and cover plate must be completely dry prior to installation. Introducing water into thermal fluid system can cause a steam excursion which may result in damage to thermal fluid plumbing.

1. Insert strainer (18) into strainer housing (13).
2. Apply a thin film of thermal fluid to one side of a new gasket (17).
3. Install new gasket (17) into strainer housing (13) with the side coated with thermal fluid facing towards the stainer housing.
4. Mate cover plate (16) to strainer housing (13) ensuring that stainer (18) and gasket (17) are fully seated to cover plate.
5. Install four nuts (15) to secure cover plate (16) to strainer housing (13). Tighten nuts in a crisscross manner to ensure cover plate remains flat against strainer housing.
6. Open isolation valves (6), (7), (9), and (10). Verify isolation valve (8) is closed.
7. Replenish thermal fluid supply and leak check connections (WP 0168 00).
8. Install access plate (4) on ISO frame (5) then secure with eight screws (1), sixteen flat washers (2), and eight nuts (3).

END OF WORK PACKAGE

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UNIT

LAUNDRY ADVANCED SYSTEM

(NSN 3510–01–463–0114)

THERMAL FLUID PRESSURE SENSOR (PT300, PT301, OR PT302) REPLACEMENT REMOVAL, CLEANING, INSTALLATION

INITIAL SETUP:

Tools
Tool Kit, General Mechanics
(Item 14, WP 0282 00)

Personnel Required

Materials/Parts
Rag Wiping (Item 4, WP 0281 00)
Sealant, Pipe Thread (Item 8, WP 0281 00)

Equipment Conditions
LADS power shut off at main control enclosure (WP 0113 00).

REMOVAL

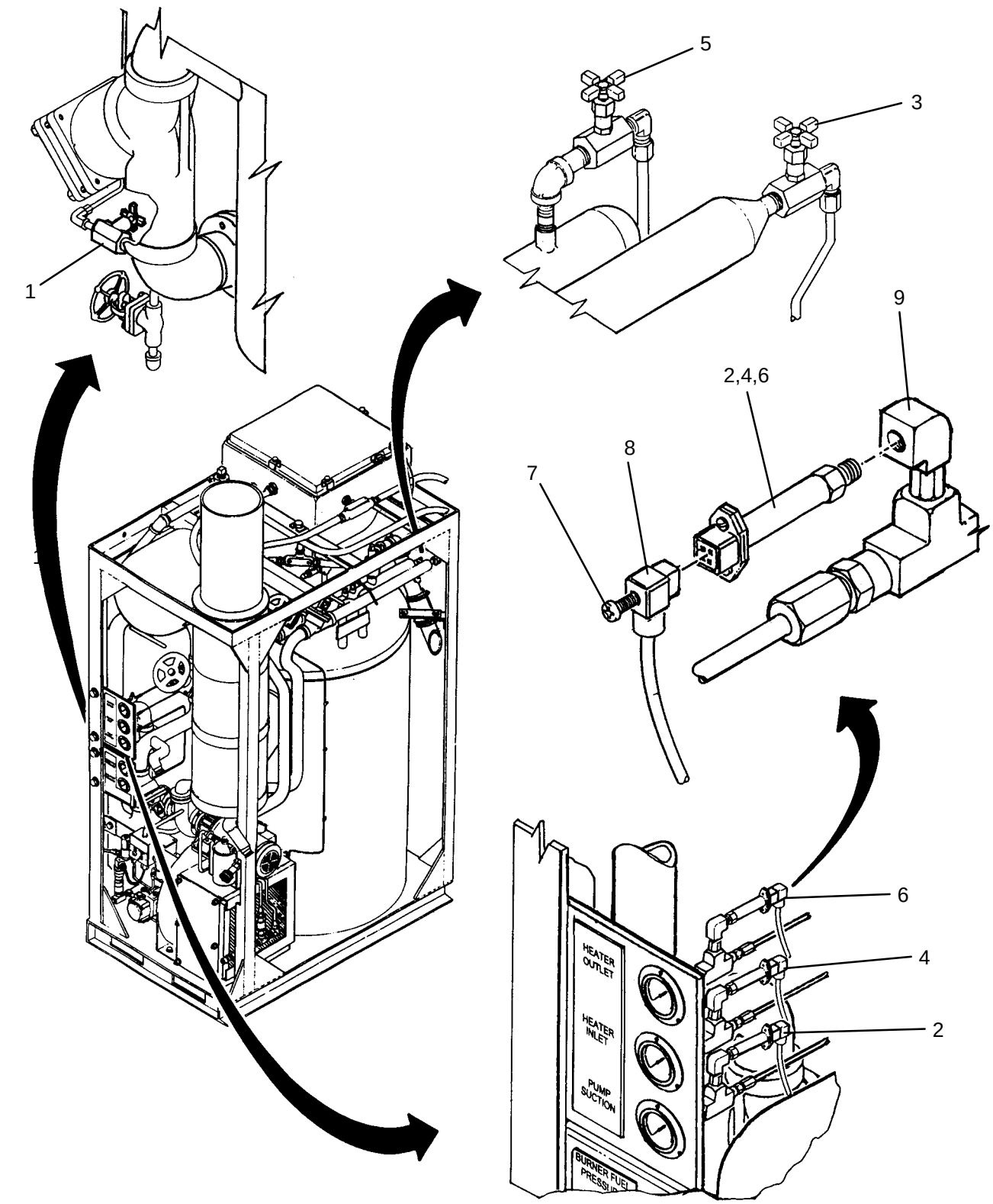
WARNING

Thermal fluid can reach temperatures near 400 degrees F when the heating system is operating. Allow thermal fluid and heating system piping to cool prior to performing maintenance. Always wear gloves and eye protection. Failure to follow this precaution could result in severe burn injuries.

NOTE

This Procedure is used to replace PT300, PT301 or PT302.

1. Close isolation valve (1) for PT300 (2), valve (3) for PT301 (4), or valve (5) for PT302 (6).
2. Loosen screw (7), then disconnect electrical connector (8) from pressure sensor (2), (4), or (6).
3. Place a wiping rag under pressure sensor (2), (4), or (6).
4. Unthread pressure sensor (2), (4), or (6) from elbow (9).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HEATER OUTLET
HEATER INLET
PUMP SUCTION
BURNER FUEL

INSTALLATION

NOTE

Procedures for installing PT300, PT301 and PT302 are the same except where noted.

1. Apply pipe thread sealant to threads of new pressure sensor (2), (4), or (6).
2. Thread pressure sensor (2), (4), or (6) into elbow (9).
3. Connect electrical connector (8) to pressure sensor (2), (4), or (6), then secure by tightening screw (7).
4. Open isolation valve (1), (3), or (5).
5. Wipe any residual thermal fluid with a clean rag.
6. Access pressure sensor calibration function using maintenance menu (WP 0010 00), then set output of pressure sensor PT300, PT301 or PT302 to 0 psi.
7. Use maintenance menu to test heating system. While heating system is operating visually check for thermal fluid leaks.
8. Allow heater to stay on until heater shuts off automatically.
9. Stop heating system. Perform cooling thermal fluid (WP 0010 00) until TE300 is 200 degrees F or less.

END OF WORK PACKAGE

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UNIT

LAUNDRY ADVANCED SYSTEM

(NSN 3510–01–463–0114)

THERMAL FLUID PRESSURE GAUGE (PI300, PI301, OR PI302) REPLACEMENT REMOVAL, INSTALLATION

INITIAL SETUP:

Tools
Tool Kit, General Mechanics
(Item 14, WP 0282 00)

Personnel Required

Materials/Parts
Rag Wiping (Item 4, WP 0281 00)
Sealant, Pipe Thread (Item 8, WP 0281 00)

Equipment Conditions
LADS power shut off at main control enclosure (WP 0113 00).

REMOVAL

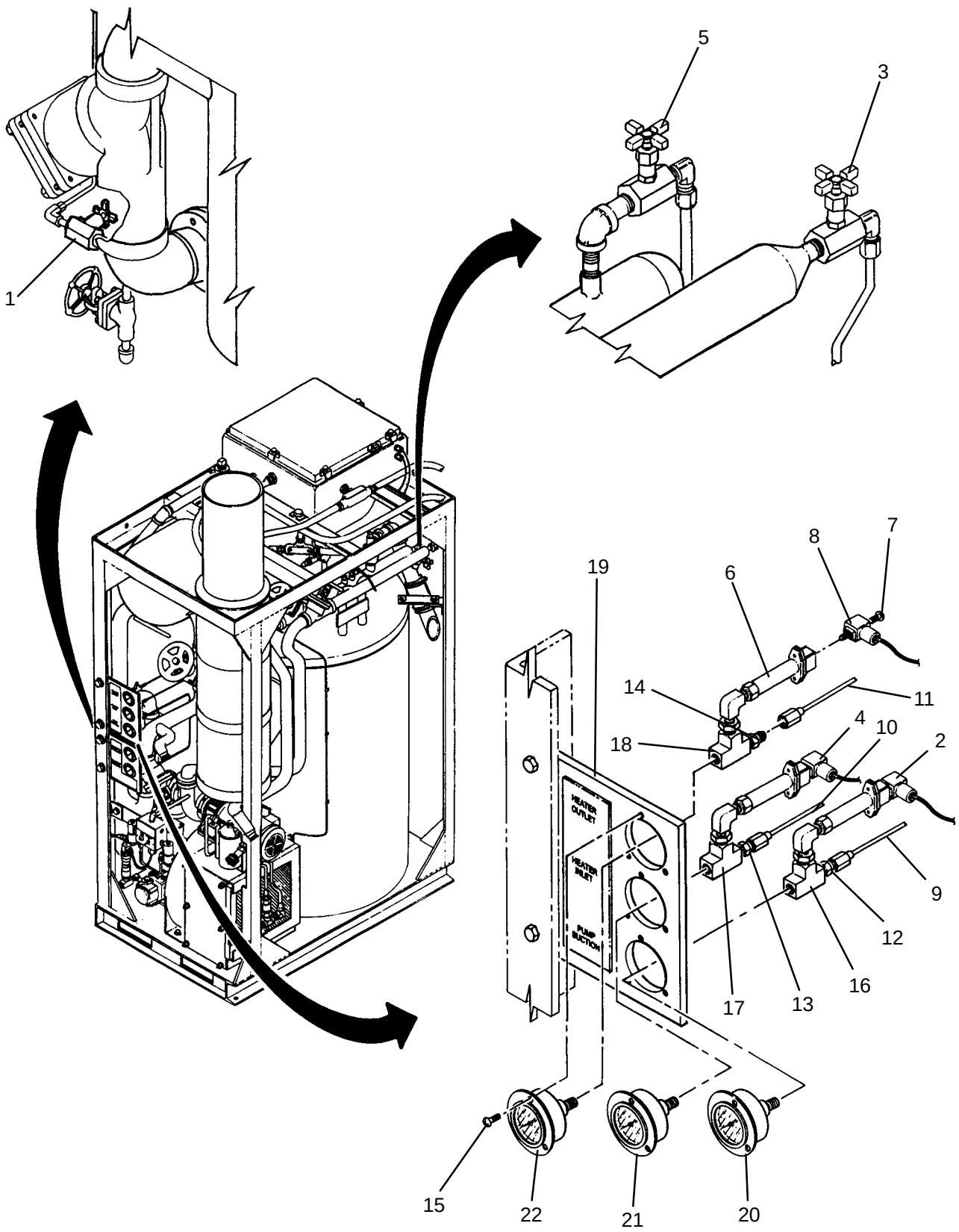
WARNING

Thermal fluid can reach temperatures near 400 degrees F when the heating system is operating. Allow thermal fluid and heating system piping to cool prior to performing maintenance. Always wear gloves and eye protection. Failure to follow this precaution could result in severe burn injuries.

NOTE

This procedure can be used to replace PI300, PI301 or PI302.

1. Close isolation valve (1) for PT300 (2), valve (3) for PT301 (4), or valve (5) for PT302 (6).
2. Loosen screw (7), then disconnect electrical connector (8) from pressure sensor (2), (4), or (6).
3. Place a wiping rag under pressure sensor (2), (4), or (6).
4. Unthread thermal fluid tube (9), (10), or (11) from adapter (12), (13), or (14).
5. Loosen three screws (15), then remove gauge with attached piping (16), (17) or (18) from panel (19).
6. Unthread gauge (20), (21), or (22) from piping (16), (17), or (18).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HEATER OUTLET
HEATER INLET
PUMP SUCTION

INSTALLATION

NOTE

Procedures for installing PT300, PT301 and PT302 gauges are the same except where noted.

1. Apply pipe thread sealant to threads of new gauge (20), (21), or (22).
2. Thread gage (20), (21), or (22) into assembly (16), (17), or (18).
3. Install gauge assembly (16), (17), or (18) into panel (19), then secure by tightening three screws (15).
4. Connect electrical connector (8) to pressure sensor(2), (4), or (6), then secure by tightening screw (7).
5. Open isolation valve (1), (3), or (5).
6. Wipe any residual thermal fluid with a clean rag.
7. Use maintenance menu to test heating system. While heating system is operating, visually check for thermal fluid leaks.
8. Allow heater to stay on until heater shuts off automatically.
9. Stop heating system. Perform cooling thermal fluid (WP 0010 00) until TE300 is 200 degrees F or less.

END OF WORK PACKAGE

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UNIT

LAUNDRY ADVANCED SYSTEM

(NSN 3510–01–463–0114)

HEATER OUTLET TEMPERATURE SENSOR (TE300) REPLACEMENT REMOVAL, INSTALLATION

INITIAL SETUP:

Tools
Tool Kit, General Mechanics
(Item 14, WP 0282 00)

Personnel Required

Materials/Parts
Rag Wiping (Item 4, WP 0281 00)
Sealant, Pipe Thread (Item 8, WP 0281 00)

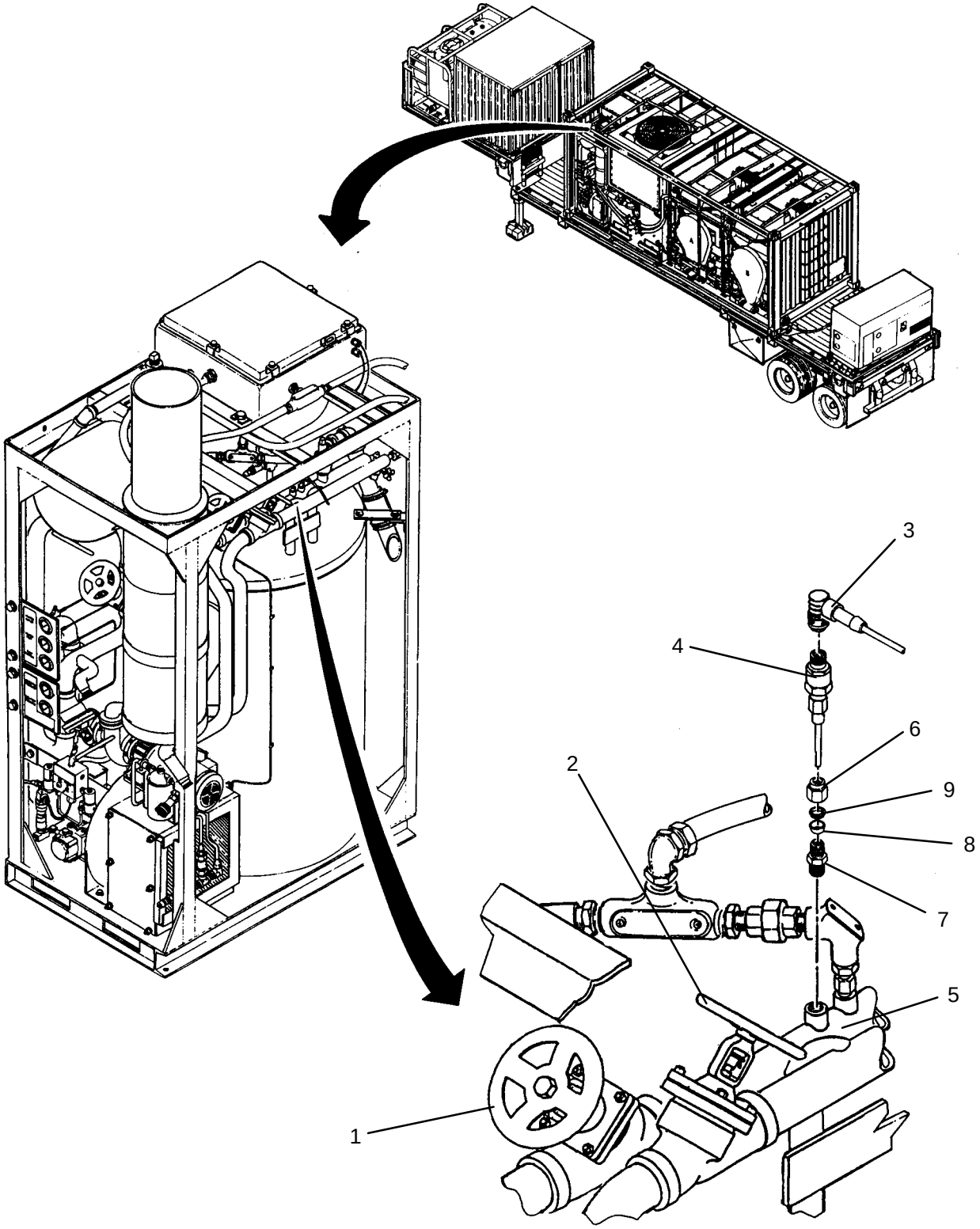
Equipment Conditions
LADS power shut off at main control enclosure (WP 0113 00).

REMOVAL

WARNING

Thermal fluid can reach temperatures near 400 degrees F when the heating system is operating. Allow thermal fluid and heating system piping to cool prior to performing maintenance. Always wear gloves and eye protection. Failure to follow this precaution could result in severe burn injuries.

1. Close isolation valves (1) and (2).
2. Disconnect electrical connector (3) from temperature sensor (4).
3. Place a wiping rag around heater piping (5) where temperature sensor (4) is installed.
4. Loosen nut (6) then remove temperature sensor (4) from fitting (7).
5. Measure and record distance from tip of temperature sensor (4) to lower ferrule (8).
6. Unthread fitting (7) from heater piping (5).
7. Clean pipe sealant off of threads of fitting (7) and heater piping (5).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INSTALLATION

1. Connect electrical connector (3) to temperature sensor (4).
2. Access examine inputs function using maintenance menu (WP 0010 00), then observe and record temperature reading for TE100.
3. Access temperature sensor calibration function using maintenance menu, then set output of temperature sensor TE300 to same temperature reading as recorded for TE100.
4. Slide new nut (6), upper ferrule (9) and lower ferrule (8) onto new temperature sensor (4).
5. Insert new temperature sensor (4) into fitting (7) at previously recorded dimension.
6. Tighten nut (6) onto fitting (7) to swage lower ferrule (8) on temperature sensor (4).
7. Loosen nut (6) and remove temperature sensor (4) from fitting (7).
8. Apply pipe thread sealant to threads of fitting (7).
9. Thread fitting (7) into heater piping (5).
10. Insert temperature sensor (4) into fitting (7) then tighten nut (6).
11. Wipe any residual thermal fluid with a clean rag.
12. Open isolation valve (1) and (2).
13. Use maintenance menu to test heating system (WP 0010 00). While heating system is operating, visually check for thermal fluid leaks.
14. Allow heater to stay on until heater shuts off automatically.
15. Stop heating system. Perform cooling thermal fluid (WP 0010 00) until TE300 is 200 degrees F or less.

END OF WORK PACKAGE

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UNIT

LAUNDRY ADVANCED SYSTEM

(NSN 3510–01–463–0114)

HEATER THERMOCOUPLE (TL300) REPLACEMENT REMOVAL, INSTALLATION

INITIAL SETUP:

Tools
Tool Kit, General Mechanics
(Item 14, WP 0282 00)

Personnel Required

Materials/Parts
Rag Wiping (Item 4, WP 0281 00)
Sealant, Pipe Thread (Item 8, WP 0281 00)
Tags (Item 9, WP 0281 00)

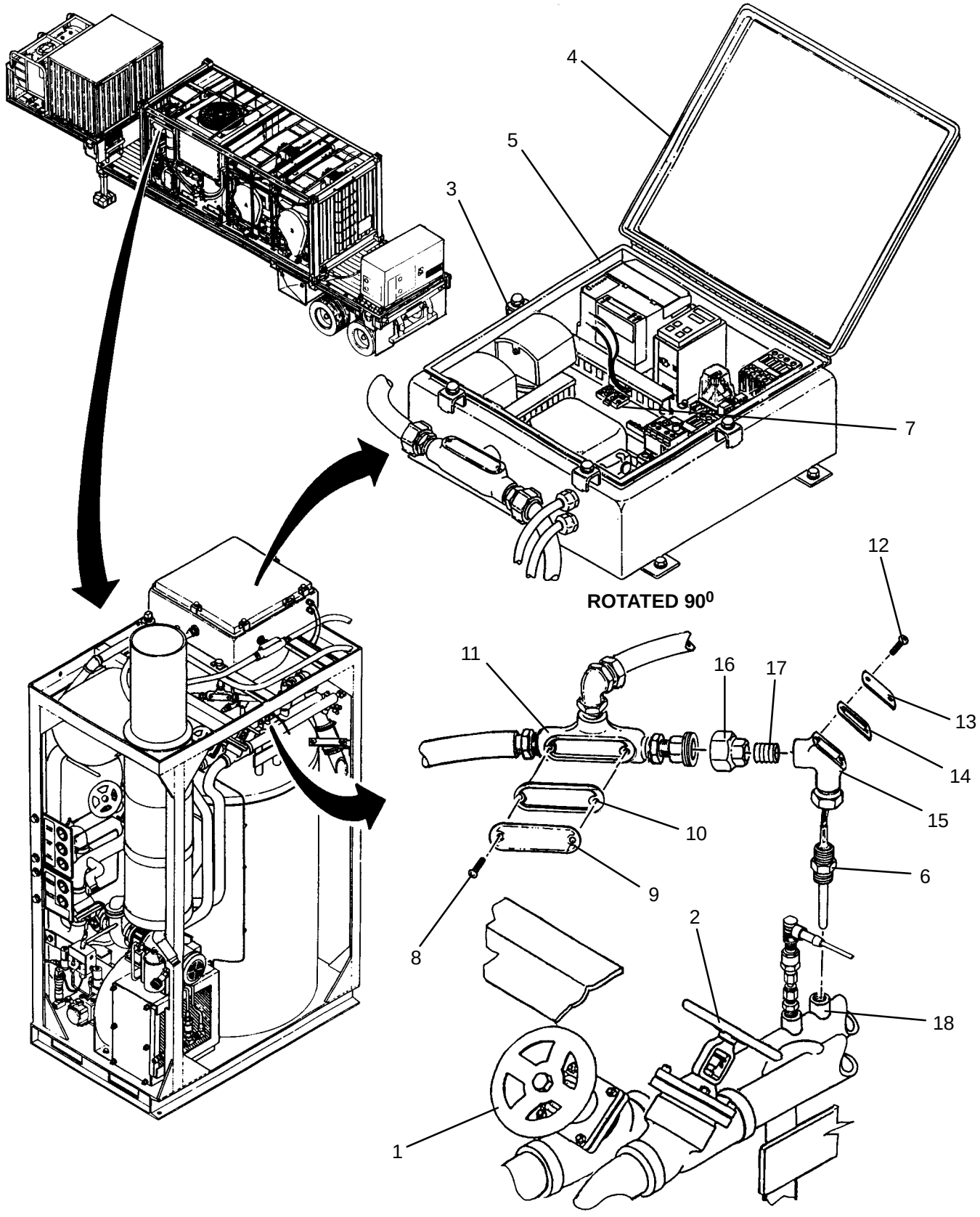
Equipment Conditions
LADS power shut off at main control enclosure (WP 0113 00).

REMOVAL

WARNING

Thermal fluid can reach temperatures near 400 degrees F when the heating system is operating. Allow thermal fluid and heating system piping to cool prior to performing maintenance. Always wear gloves and eye protection. Failure to follow this precaution could result in severe burn injuries.

1. Close isolation valves (1) and (2).
2. Loosen four latches (3), then open door (4) on heater enclosure (5).
3. Tag and disconnect lead wires of thermocouple (6) from terminal board (7).
4. Loosen two screws (8) then remove cover (9) and gasket (10) from outlet body (11).
5. Loosen two screws (12) then remove cover (13) and gasket (14) from pulling elbow (15).
6. Pull lead wires of thermocouple (6) out of outlet body (11) and pulling elbow (15).
7. Separate conduit union (16) then unthread nipple (17) from pulling elbow (15).
8. Place a wiping rag around heater piping (18) where thermocouple (6) is installed.
9. Unthread thermocouple (6) from heater piping (18).
10. Unthread pulling elbow (15) from thermocouple (6).
11. Clean pipe sealant off of threads of heater piping (18).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INSTALLATION

1. Thread pulling elbow (15) onto new thermocouple (6).
2. Apply pipe thread sealant to threads of thermocouple (6).
3. Thread thermocouple (6) into heater piping (18).
4. Thread nipple (17) into pulling elbow (15), then connect conduit union (16).
5. Insert lead wires of thermocouple (6) through pulling elbow (15), outlet body (11), and heater enclosure (5).
6. Install cover (13) and gasket (14) onto pulling elbow (15), then secure with two screws (12).
7. Install cover (9) and gasket (10) onto outlet body (11), then secure with two screws (8).
8. Connect lead wires of thermocouple (6) to terminal board (7) as tagged.
9. Close door (4) and secure to heater enclosure (5) by tightening four latches (3).
10. Wipe any residual thermal fluid with a clean rag.
11. Open isolation valves (1) and (2).
12. Use maintenance menu to test heating system (WP 0010 00). While heating system is operating visually check for thermal fluid leaks.
13. Allow heater to stay on until heater shuts off automatically.
14. Stop heating system. Perform cooling thermal fluid (WP 0010 00) until TE300 is 200 degrees F or less.

END OF WORK PACKAGE

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UNIT

LAUNDRY ADVANCED SYSTEM

(NSN 3510–01–463–0114)

FUEL PRESSURE GAUGE (PI303, OR PI304) REPLACEMENT REMOVAL, INSTALLATION

INITIAL SETUP:

Tools
Tool Kit, General Mechanics
(Item 14, WP 0282 00)

Personnel Required

Materials/Parts
Rag Wiping (Item 4, WP 0281 00)
Sealant, Pipe Thread (Item 7, WP 0281 00)

Equipment Conditions
LADS power shut off at main control enclosure (WP 0113 00).

REMOVAL

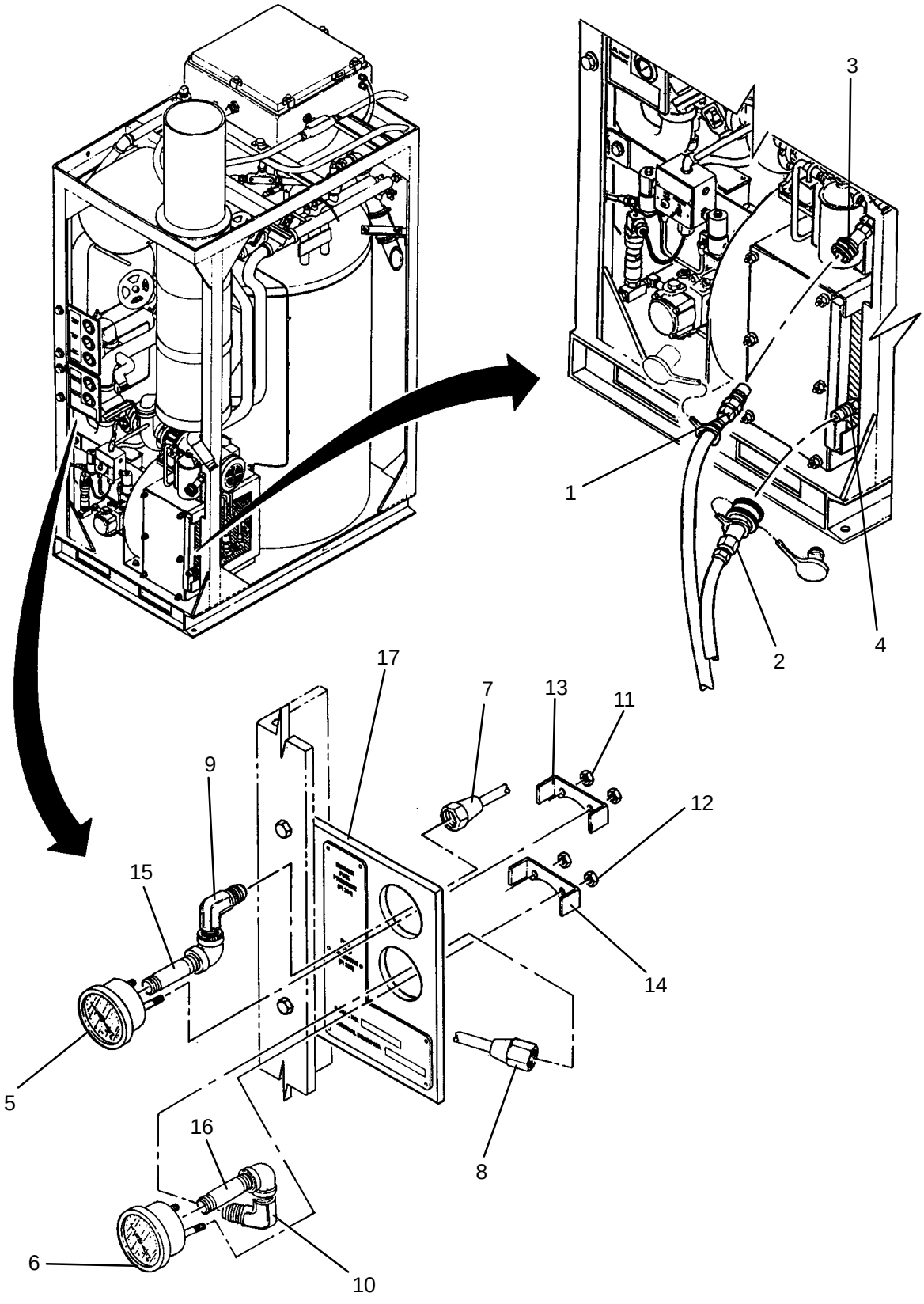
WARNING

The fuels used on the heating system are highly explosive. DO NOT smoke or use open flame when performing maintenance. Flames and explosion could occur resulting in severe personal injury or death.

NOTE

This procedure is used for replacing PI303 or PI304.

1. Disconnect fuel hoses (1) and (2) from quick–connect fittings (3) and (4).
2. Place a clean container under gauge (5) or (6).
3. Remove fuel tube (7) or (8) from elbow (9) or (10).
4. Loosen nuts (11) or (12), then remove bracket (13) or (14) and gauge (5) or (6) with attached piping (15) or (16) from gauge panel (17).
5. Unthread gauge (5) or (6) from piping (15) or (16).
6. Clean pipe thread sealant from piping (15) or (16).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INSTALLATION

1. Apply pipe thread sealant to threads of new gauge (5) or (6).
2. Thread gauge (5) or (6) into piping (15) or (16) as shown.
3. Position gauge assembly (5) or (6) into panel (17), install bracket (13) or (14) and nuts (11) or (12).
4. Secure gauge (5) or (6) by tightening nuts (11) or (12).
5. Connect fuel tube (7) or (8) to elbow (9) or (10).
6. Wipe any residual fuel with a clean rag.
7. Connect fuel hoses (1) and (2) to quick–connect fittings (3) and (4).
8. Use maintenance menu to test heating system. While heating system is operating, visually check for fuel leaks.
9. Allow heater to stay on until heater shuts off automatically.
10. Stop heating system. Perform cooling thermal fluid (WP 0010 00) until TE 300 is 200 degrees F or less.

END OF WORK PACKAGE

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UNIT

LAUNDRY ADVANCED SYSTEM

(NSN 3510–01–463–0114)

FUEL INLET FILTER SERVICING
FUEL INLET FILTER ELEMENT REPLACEMENT

INITIAL SETUP:

Tools
Tool Kit, General Mechanics
(Item 14, WP 0282 00)

Personnel Required

Materials/Parts
Rag Wiping (Item 4, WP 0281 00)

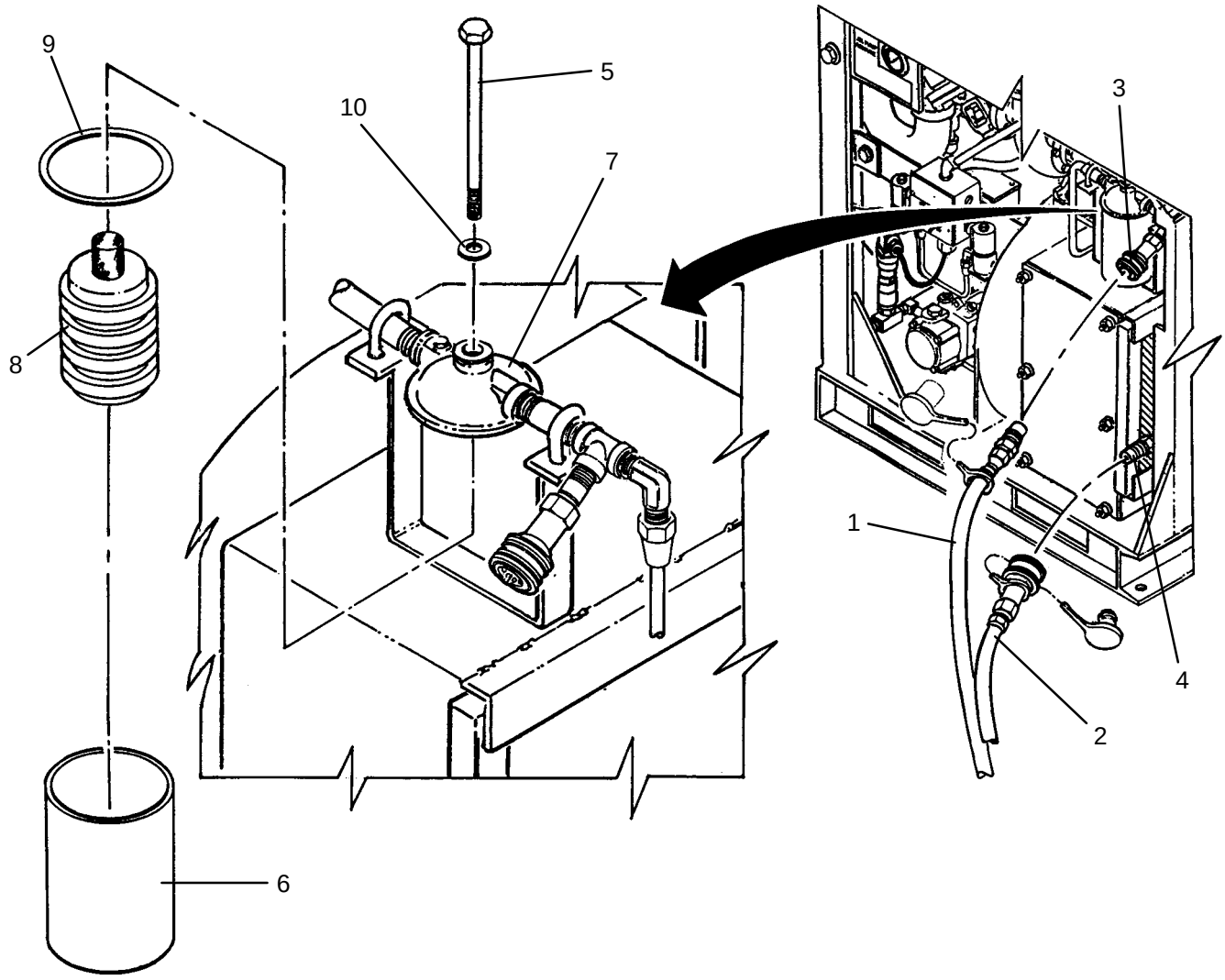
Equipment Conditions
LADS power shut off at main control enclosure (WP 0113 00).

REMOVAL

WARNING

The fuels used on the heating system are highly explosive. DO NOT smoke or use open flame when performing maintenance. Flames and explosion could occur resulting in severe personal injury or death.

1. Disconnect fuel hoses (1) and (2) from quick–connect fittings (3) and (4).
2. Remove center bolt (5), then filter bowl (6) from filter housing (7).
3. Remove filter element (8) from filter bowl (6).
4. Remove bowl gasket (9) from filter bowl (6).
5. Remove center bolt gasket (10) from filter housing (7).
6. Wipe inside of filter bowl (6) and filter housing (7) with a clean rag.



INSTALLATION

1. Install new center bolt gasket (10) onto filter housing (7).
2. Install new bowl gasket (9) into filter bowl (6).
3. Install filter element (8) into filter bowl (6).
4. Place filter bowl (6) under filter housing (7).
5. Mate filter bowl (6) with filter housing (7) ensuring filter element (8) is properly inserted into center of filter housing (7).
6. Install center bolt (5) to secure filter bowl (6) to filter housing (7).
7. Connect fuel hoses (1) and (2) to quick–connect fittings (3) and (4).
8. Use maintenance menu to test heating system (WP 0010 00). While heating system is operating, visually check for fuel leaks.
9. Allow heater to stay on until heater shuts off automatically.
10. Stop heating system. Perform cooling thermal fluid (WP 0010 00) until TE 300 is 200 degrees F or less.

END OF WORK PACKAGE

UNIT

LAUNDRY ADVANCED SYSTEM

(NSN 3510–01–463–0114)

FUEL PRESSURE SWITCH (PS302) REPLACEMENT REMOVAL, INSTALLATION, ADJUSTMENT

INITIAL SETUP:

Tools
Multimeter (Item 8, WP 0282 00)
Tool Kit, General Mechanics (Item 14, WP 0282 00)

Personnel Required

Materials/Parts
Rag Wiping (Item 4, WP 0281 00)
Sealant, Pipe Thread (Item 7, WP 0281 00)

Equipment Conditions
LADS power shut off at main control enclosure (WP 0113 00).

REMOVAL

WARNING

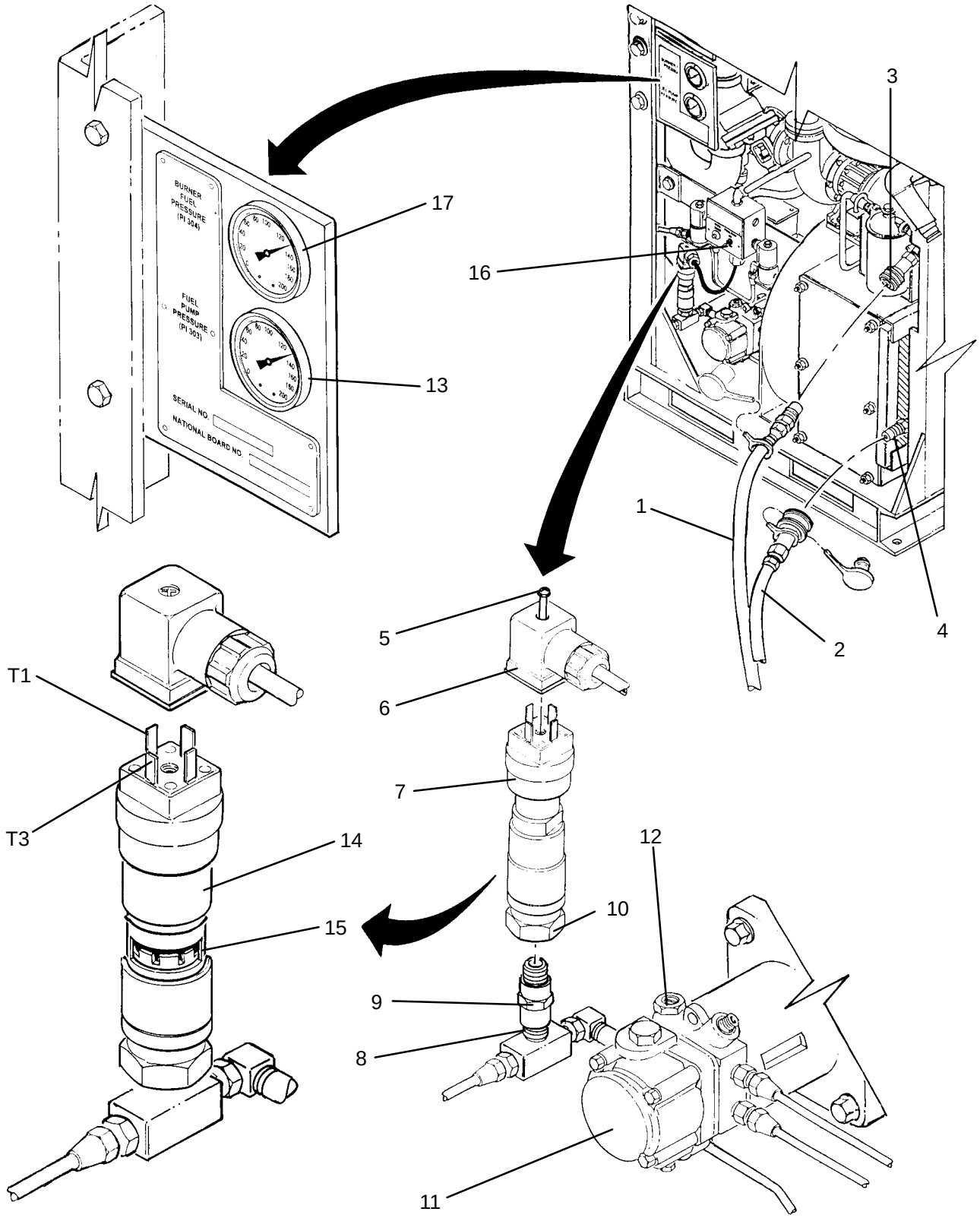
The fuels used on the heating system are highly explosive. DO NOT smoke or use open flame when performing maintenance. Flames and explosion could occur resulting in severe personal injury or death.

1. Disconnect fuel hoses (1) and (2) from quick–connect fittings (3) and (4).
2. Loosen screw (5), disconnect electrical connector (6) from pressure switch (7).

CAUTION

Use hex flats at base of switch when loosening and tightening. Using hex flats at center and top of switch may damage internal wire connections leading to switch failure.

3. Unthread pressure switch (7) from piping (8) using hex flats (9) and (10).
4. Clean pipe thread sealant off of piping (8).


BURNER FUEL PRESSURE (PI 304)
FUEL PUMP PRESSURE (PI 303)
SERIAL NO.
NATIONAL BOARD NO.
17
13
16
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T1
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9
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11

INSTALLATION

1. Apply pipe thread sealant to piping (8).
2. Thread new pressure switch (7) onto piping (8) using hex flats (9) and (10).
3. Connect fuel hoses (1) and (2) to quick–connect fittings (3) and (4).
4. Wipe any residual fuel with a clean rag.

ADJUSTMENT

1. Prime fuel pump (9) (TM 10–3510–221–10).

NOTE

While performing steps 2 through 9 fuel pump (11) must be operating.

2. Turn adjusting screw (12) on fuel pump (11) until reading on pressure gauge (13) is 125 psig.
3. Slide cover (14) up to expose plunger (15). Adjust plunger until continuity exists across terminals 1 and 3 on fuel pressure switch (7) then adjust plunger slightly until continuity does not exist.
4. Turn adjusting screw (12) until reading on pressure gauge (13) is 130 psig.
5. Check for continuity across terminals 1 and 3 on fuel pressure switch (7). If switch has continuity continue to step 6, otherwise repeat steps 2 through 4.
6. Turn adjusting screw (12) until pressure gauge (13) reads 125 psig.
7. Check for continuity across terminals 1 and 3 on fuel pressure switch (7). If switch has continuity repeat steps 3 through 6, otherwise continue to step 8.
8. Turn adjusting screw (12) until pressure gauge (13) reads 140 psig.
9. Visually check for fuel leaks.
10. Release PRIME PUMP switch (16).
11. Connect electrical connector (6) to pressure switch (7), then tighten screw (5).
12. Replace cover (14) over plunger (15).
13. Use maintenance menu to test heating system (WP 0010 00).
14. Wait for heater to come on and stay on for at least 30 seconds.
15. Monitor burner pressure gauge (17). Turn adjusting screw (12) until burner pressure gauge reads 130–134 psig.
16. Allow heater to stay on until heater shuts off automatically.
17. Stop heating system. Perform cooling thermal fluid (WP 0010 00) until TE300 is 200 degrees F or less.

END OF WORK PACKAGE

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UNIT

LAUNDRY ADVANCED SYSTEM

(NSN 3510–01–463–0114)

FUEL PUMP REPLACEMENT REMOVAL, INSTALLATION

INITIAL SETUP:

Tools
Tool Kit, General Mechanics
(Item 14, WP 0282 00)

Personnel Required

Materials/Parts
Tags (Item 9, WP 0281 00)
Washer, Lock (Item 16, WP 0283 00)
Insert, Coupling (Item 21, WP 0283 00)

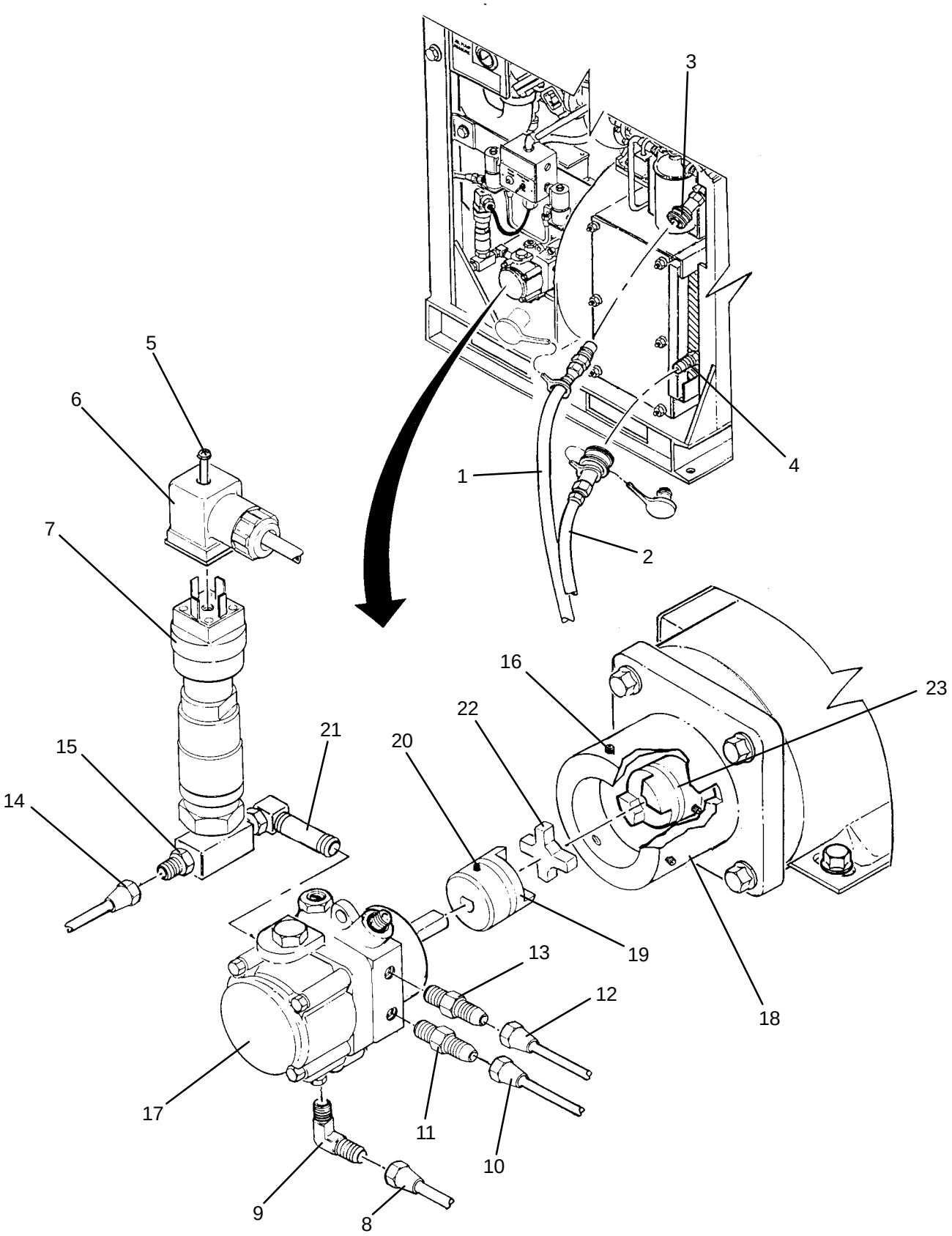
Equipment Conditions
LADS power shut off at main control enclosure (WP 0113 00).

REMOVAL

WARNING

The fuels used on the heating system are highly explosive. DO NOT smoke or use open flame when performing maintenance. Flames and explosion could occur resulting in severe personal injury or death.

1. Disconnect fuel hoses (1) and (2) from quick–connect fittings (3) and (4).
2. Loosen screw (5) disconnect electrical connector (6) from fuel pressure switch (7).
3. Tag and disconnect fuel tube (8) from elbow (9).
4. Tag and disconnect fuel tube (10) from adapter (11).
5. Tag and disconnect fuel tube (12) from adapter (13).
6. Tag and disconnect fuel tube (14) from adapter (15).
7. Loosen three set screws (16) then remove fuel pump (17) from housing (18).
8. Measure and record position of coupling (19) in relation to edge of fuel pump (17).
9. Loosen set screw (20), then slide coupling (19) off of fuel pump (17).
10. Unthread nipple (21) from fuel pump (17).
11. Unthread elbow (9) from fuel pump (17).
12. Unthread adapters (11) and (13) from fuel pump (17).
13. Clean pipe thread sealant off of elbow (9), adapters (11) and (13), and nipple (21).
14. Remove coupling insert (22) from coupling (19) or coupling (23). Discard coupling insert.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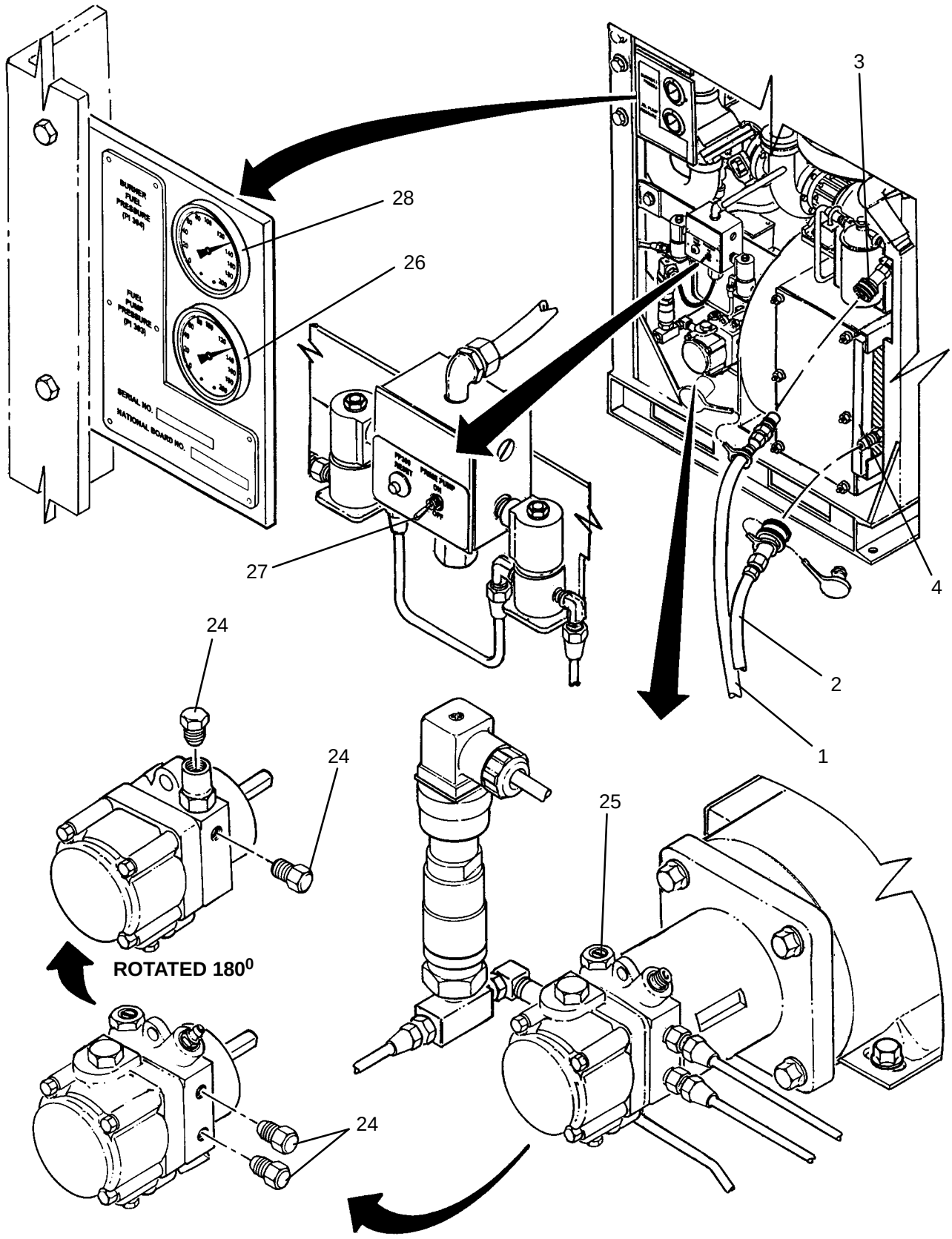
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ROTATED 180⁰
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INSTALLATION

1. Remove plugs (24) from new fuel pump (17).
2. Apply pipe thread sealant to elbow (9), adapters (11) and (13), and nipple (21).
3. Thread nipple (21) into fuel pump (17) as shown.
4. Thread elbow (9) into fuel pump (17) as shown.
5. Thread adapters (11) and (13) into fuel pump (17).
6. Position coupling (19) onto fuel pump (17) at previously recorded dimension, then tighten set screw (20).
7. Install new coupling insert (22) into coupling (19).
8. Insert fuel pump (17) into housing (18), then tighten three set screws (16). Ensure coupling insert is properly mated with coupling.
9. Connect fuel tube (14) to adapter (15).
10. Connect fuel tube (12) to adapter (13).
11. Connect fuel tube (10) to adapter (11).
12. Connect fuel tube (8) to elbow (9).
13. Connect electrical connector (6) to fuel pressure switch (7) then tighten screw (5).
14. Connect fuel hoses (1) and (2) to quick–connect fittings (3) and (4).

ADJUSTMENT

1. Prime fuel pump (17) (TM 10–3510–221–10).
2. Turn adjusting screw (25) until pressure gauge (26) reads 140 psig.
3. Visually check for fuel leaks.
4. Release PRIME PUMP switch (27).
5. Use maintenance menu to test heating system (WP 0010 00). While heating system is operating visually check for fuel leaks.
6. Wait for heater to come on and stay on for at least 30 seconds.
7. Monitor burner pressure gauge (28). Turn adjusting screw (25) until burner pressure gauge reads 130–134 psig.
8. Allow heater to stay on until heater shuts off automatically.
9. Stop heating system. Perform cooling thermal fluid (WP 0010 00) until TE300 is 200 degrees F or less.

END OF WORK PACKAGE

UNIT

LAUNDRY ADVANCED SYSTEM

(NSN 3510–01–463–0114)

FUEL PUMP MOTOR (M302) REPLACEMENT REMOVAL, INSTALLATION

INITIAL SETUP:

Tools
Tool Kit, General Mechanics
(Item 14, WP 0282 00)

Personnel Required

Materials/Parts
Tags (Item 9, WP 0281 00)
Washer, Lock (Item 16, WP 0283 00)
Insert, Coupling (Item 21, WP 0283 00)

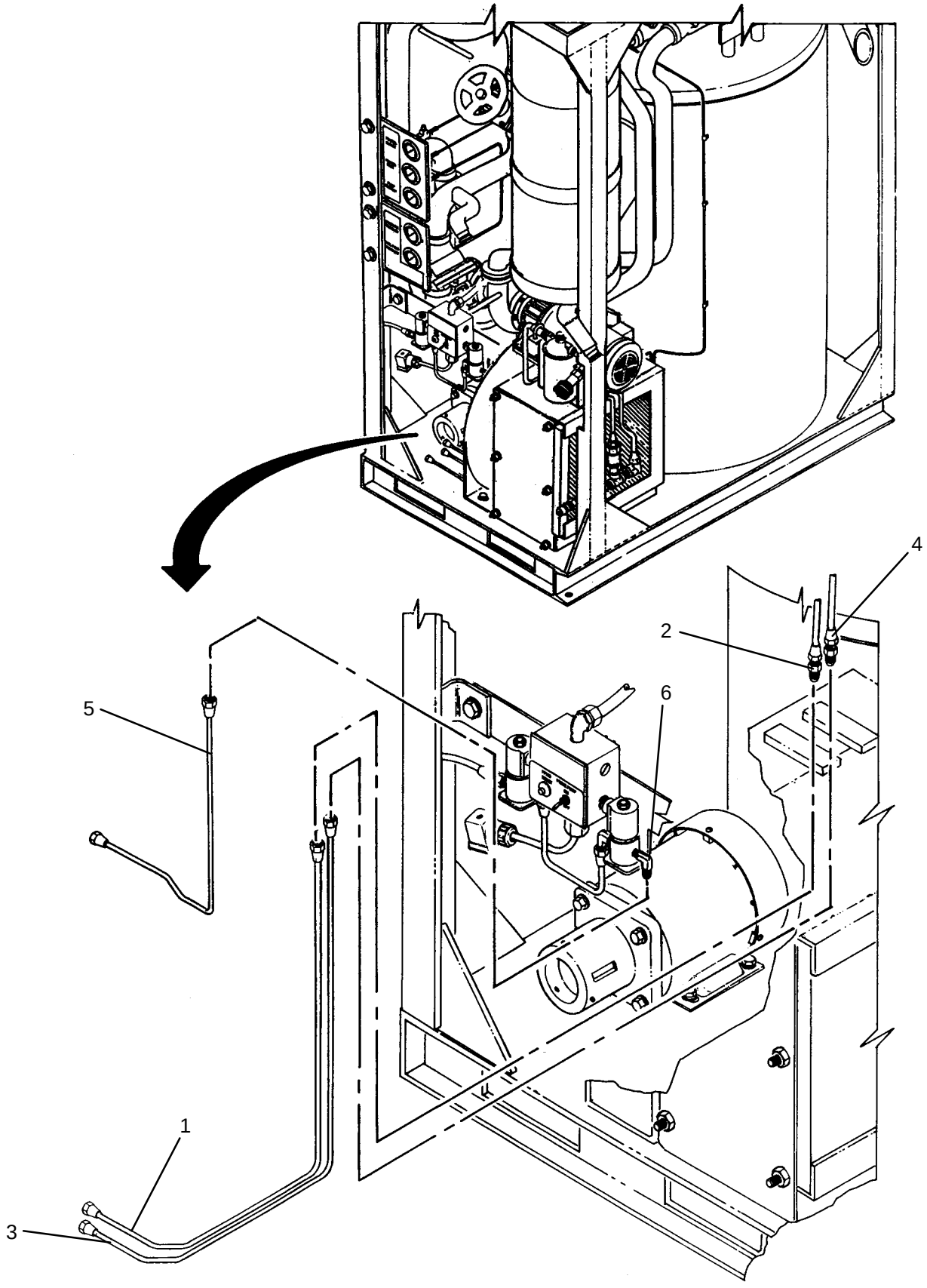
Equipment Conditions
LADS power shut off at main control enclosure (WP 0113 00).

REMOVAL

WARNING

The fuels used on the heating system are highly explosive. DO NOT smoke or use near open flame when performing maintenance. Flames and explosion could occur resulting in severe personal injury or death.

1. Remove fuel pump (WP 0177 00).
2. Disconnect fuel tube (1) from coupling (2).
3. Disconnect fuel tube (3) from coupling (4).
4. Disconnect fuel tube (5) from elbow (6).
5. Loosen two screws (7), remove cover (8) and gasket (9) from outlet body (10).
6. Tag and disconnect wires from outlet body (10).
7. Loosen conduit nut (11) then pull conduit (12) from elbow (13).
8. Remove three screws (14), lock washers (15) and flat washers (16) then carefully slide motor (17) rearward. When clear of other components, lift motor from heater frame (18).
9. Remove four screws (19) and lock washers (20) then remove pump housing (21) from motor (17).
10. Measure and record distance between coupling half (22) and edge of motor (17).
11. Loosen set screw (23), then slide coupling half (22) off of motor (17).
12. Loosen two screws (24), remove cover (25) and gasket (26) from junction box (27).
13. Tag and disconnect wires from junction box (27).
14. Remove insulating bushing (28) and conduit lock nut (29), then remove conduit (12) from junction box (27).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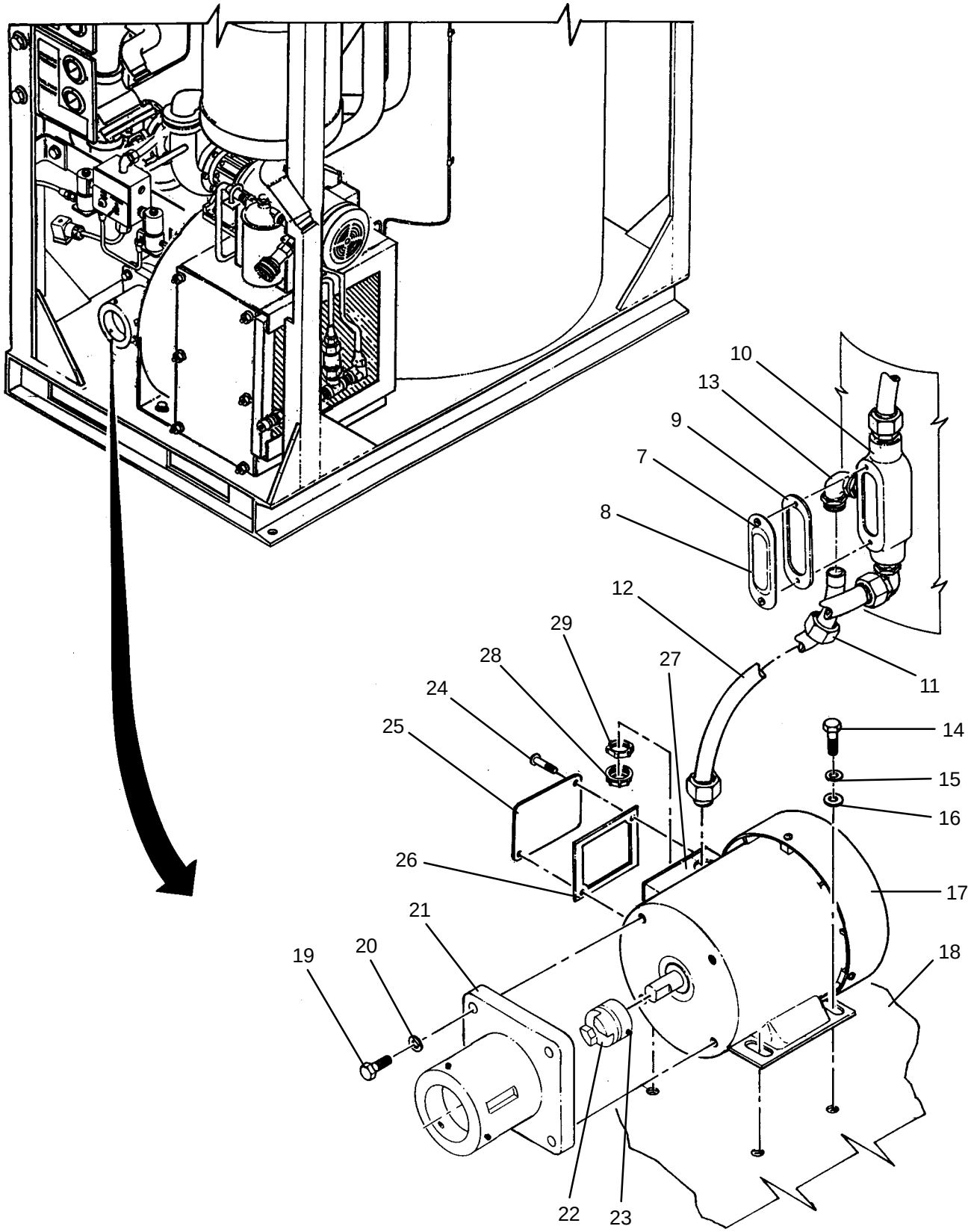
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INSTALLATION

1. Loosen two screws (24), remove cover (25) and gasket (26) from junction box (27) on new motor (17).
2. Insert conduit (12) into junction box (27) then install conduit lock nut (29) and insulating bushing (28).
3. Connect wires as tagged to junction box (27).
4. Install cover (25) and gasket (26) onto junction box (27), then tighten two screws (24).
5. Slide coupling half (22) onto motor (17) until previously recorded dimension is obtained, then tighten set screw (23).
6. Install pump housing (21) onto motor (17) then secure with four screws (19) and lock washers (20).
7. Lift motor onto heater frame (18) then carefully slide motor (17) forward. Secure with three screws (14), lock washers (15) and flat washers (16).
8. Insert conduit (12) into elbow (13), then tighten conduit nut (11) .
9. Connect wires to outlet body (10) as tagged.
10. Install cover (8) and gasket (9) onto outlet body (10) then tighten two screws (7).
11. Connect fuel tube (5) to elbow (6).
12. Connect fuel tube (3) to coupling (4).
13. Connect fuel tube (1) to coupling (2).
14. Install fuel pump (WP 0177 00).
15. Use maintenance menu to test heating system (WP 0010 00). While heating system is operating, visually check for fuel leaks.
16. Allow heater to stay on until heater shuts off automatically.
17. Stop heating system. Perform cooling thermal fluid (WP 0010 00) until TE300 is 200 degrees F or less.

END OF WORK PACKAGE

UNIT

LAUNDRY ADVANCED SYSTEM

(NSN 3510–01–463–0114)

FUEL PUMP COUPLING INSERT REPLACEMENT REMOVAL, INSTALLATION

INITIAL SETUP:

Tools
Tool Kit, General Mechanics
(Item 14, WP 0282 00)

Personnel Required

Materials/Parts
Insert, Coupling (Item 21, WP 0283 00)

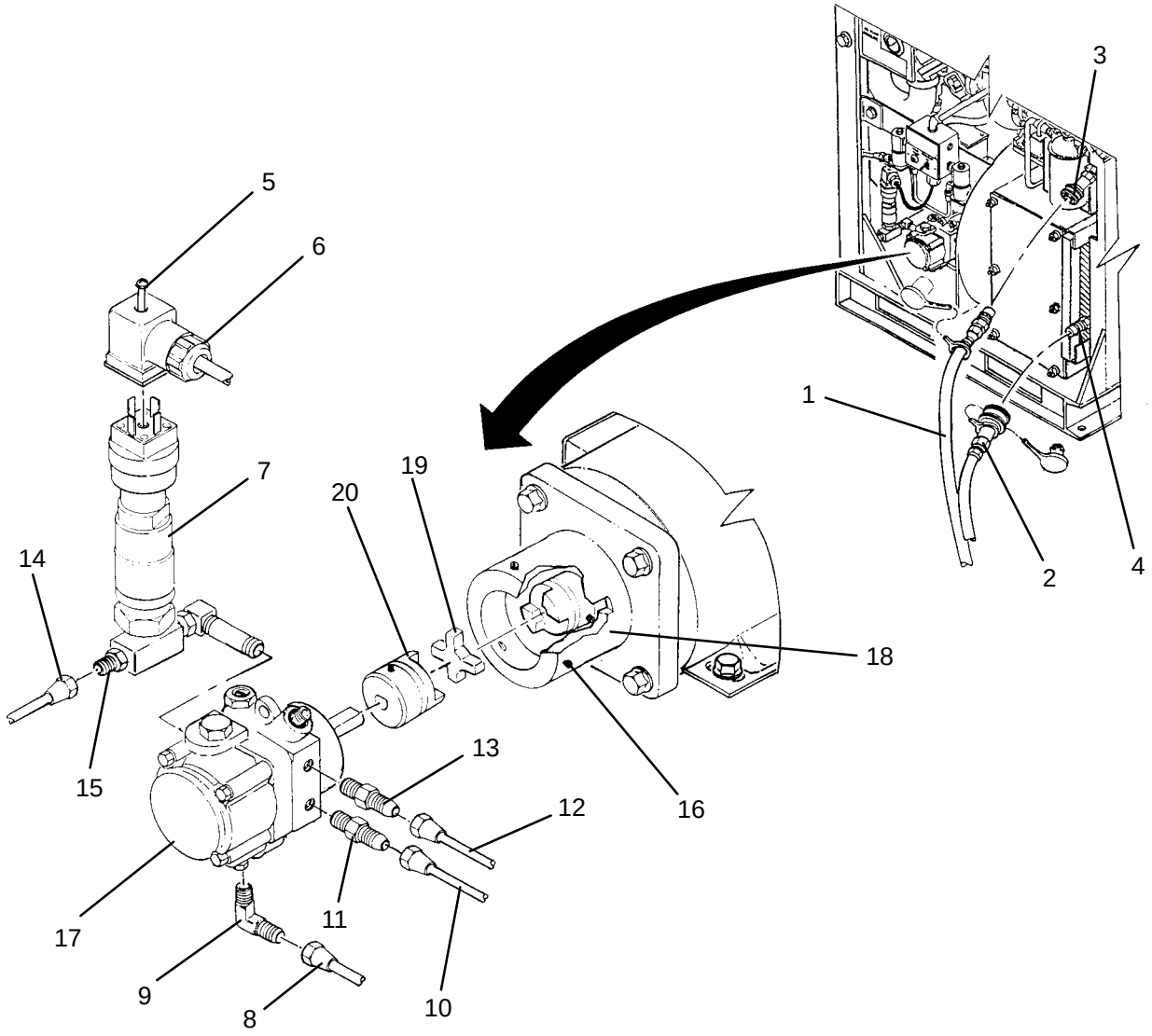
Equipment Conditions
LADS power shut off at main control enclosure (WP 0113 00).

REMOVAL

WARNING

The fuels used on the heating system are highly explosive. DO NOT smoke or use open flame when performing maintenance. Flames and explosion could occur resulting in severe personal injury or death.

1. Disconnect fuel hoses (1) and (2) from quick–connect fittings (3) and (4).
2. Loosen screw (5) disconnect electrical connector (6) from fuel pressure switch (7).
3. Disconnect fuel tube (8) from elbow (9).
4. Disconnect fuel tube (10) from adapter (11).
5. Disconnect fuel tube (12) from adapter (13).
6. Disconnect fuel tube (14) from adapter (15).
7. Loosen three set screws (16) then remove fuel pump (17) from housing (18).
8. Remove coupling insert (19) from coupling (20) or (21). Discard coupling insert.



INSTALLATION

1. Install new coupling insert (19) into coupling (20).
2. Insert fuel pump (17) into housing (18), then tighten three set screws (16). Ensure coupling insert is properly mated with coupling.
3. Connect fuel tube (14) to adapter (15).
4. Connect fuel tube (12) to adapter (13).
5. Connect fuel tube (10) to adapter (11).
6. Connect fuel tube (8) from elbow (9).
7. Connect electrical connector (6) to fuel pressure switch (7) then tighten screw (5).
8. Connect fuel hoses (1) and (2) to quick–connect fittings (3) and (4).
9. Use maintenance menu to test heating system (WP 0010 00).
10. Allow heater to stay on until heater shuts off automatically.
11. Stop heating system. Perform cooling thermal fluid (WP 0010 00) until TE300 is 200 degrees F or less.

END OF WORK PACKAGE

UNIT

LAUNDRY ADVANCED SYSTEM

(NSN 3510–01–463–0114)

FUEL SHUTOFF VALVE (FV300 or FV301) REPLACEMENT REMOVAL, INSTALLATION

INITIAL SETUP:

Tools
Tool Kit, General Mechanics
(Item 14, WP 0282 00)

Personnel Required

Materials/Parts
Sealant, Pipe Thread (Item 7, WP 0281 00)
Washer, Lock (Item 16, WP 0283 00)

Equipment Conditions
LADS power shut off at main control enclosure (WP 0113 00).

REMOVAL

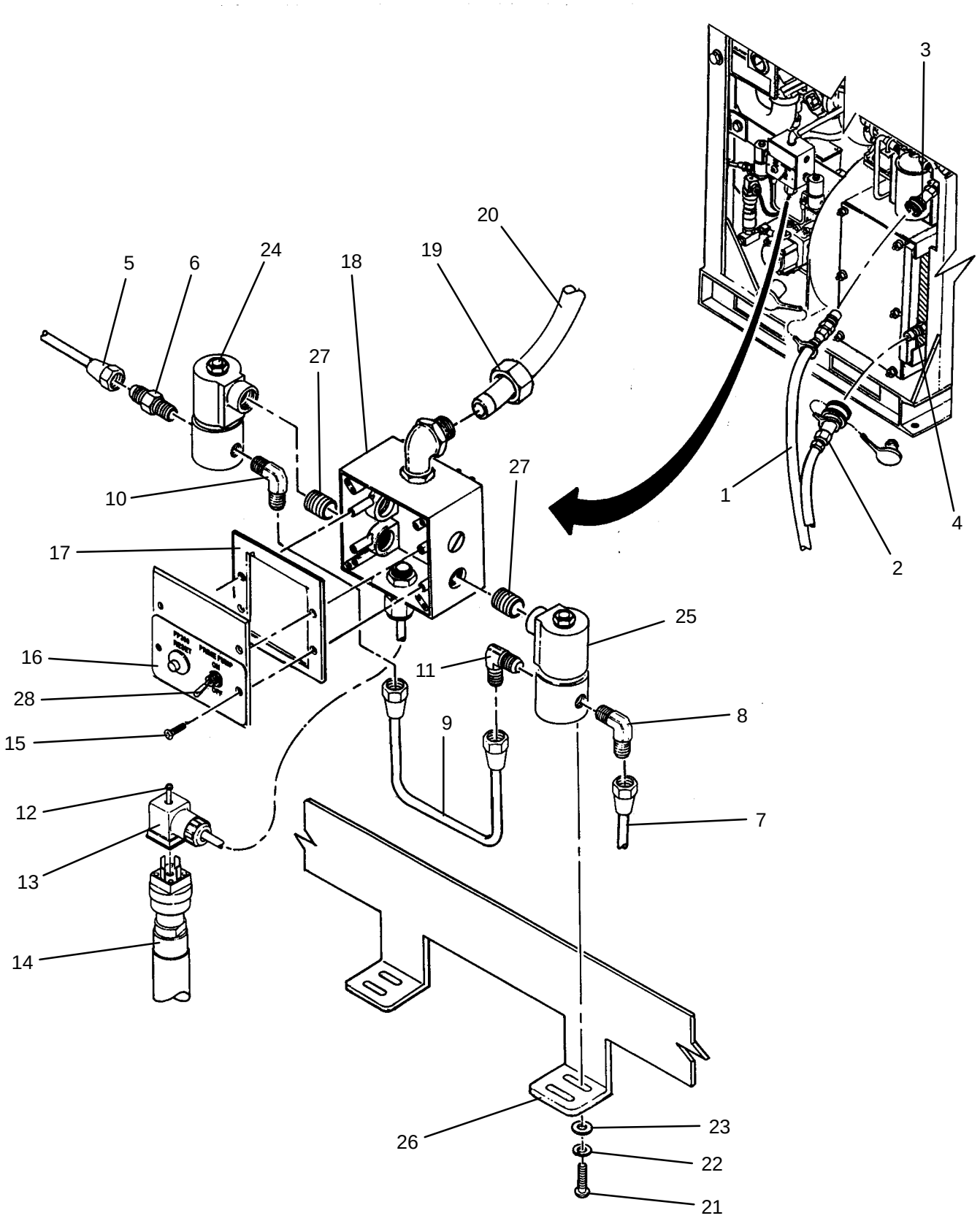
WARNING

The fuels used on the heating system are highly explosive. DO NOT smoke or use open flame when performing maintenance. Flames and explosion could occur resulting in severe personal injury or death.

NOTE

This procedure can be used to replace either fuel solenoid valve.

1. Disconnect fuel hoses (1) and (2) from quick–connect fittings (3) and (4).
2. Disconnect fuel tube (5) at adapter (6).
3. Disconnect fuel tube (7) at elbow (8).
4. Disconnect fuel tube (9) at elbows (10) and (11).
5. Loosen screw (12) then disconnect electrical connector (13) from fuel pressure switch (14).
6. Loosen four screws (15), then remove cover (16) and gasket (17) from junction box (18).
7. Tag and disconnect all wires inside junction box (18).
8. Loosen conduit nut (19) then pull conduit (20) off of junction box (18).
9. Remove four screws (21), lock washers (22) and flat washers (23) then remove solenoid valves (24) and (25) with attached junction box (18) from mounting bracket (26).
10. Unthread faulty solenoid valve (24) or (25) from junction box (18).
11. Unthread nipple (27) from solenoid valve (24) or (25).
12. Unthread adapter (6) and elbow (10) from solenoid valve (24) or elbows (8) and (11) from solenoid valve (25).
13. Clean pipe thread sealant off of adapter (6) and elbow (10) or elbows (8) and (11).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INSTALLATION

1. Apply pipe thread sealant to threads of adapter (6) and elbow (10) or elbows (8) and (11).
2. Thread adapter (6) and elbow (10) from solenoid valve (24) or elbows (8) and (11) into new solenoid valve (25).
3. Thread nipple (27) into solenoid valve (24) or (25).
4. Thread solenoid valve (24) or (25) into junction box (18) as shown.
5. Position solenoid valves (24) and (25) with attached junction box (18) to mounting bracket (26) then install but do not tighten four screws (21), lock washers (22) and flat washers (23).
6. Connect fuel tube (9) at elbows (10) and (11).
7. Connect fuel tube (7) at elbow (8).
8. connect fuel tube (5) at adapter (6).
9. Tighten four screws (21), lock washers (22) and flat washers (23).
10. Insert conduit (20) into junction box (18) then tighten conduit nut (19)
11. Connect all wires inside junction box (18) as tagged.
12. Position cover (16) and gasket (17) onto junction box (18) then tighten four screws (15).
13. Connect electrical connector (13) to fuel pressure switch (14) then tighten screw (12).
14. Connect fuel hoses (1) and (2) to quick–connect fittings (3) and (4).

WARNING

Allowing fuel vapors to collect in combustion chamber can cause an explosion when heater combustion occurs. Flames and explosion could occur resulting in severe personal injury or death.

NOTE

Priming the pump while M300 is operating will allow fuel vapors to dissipate in the combustion chamber.

15. Use maintenance menu to turn on M300 (WP 0010 00). While M300 is operating lift and hold prime pump switch (28). Hold switch on for approximately 2 minutes.
16. Use maintenance menu to test heating system (WP 0010 00). While heating system is operating, visually check for fuel leaks.
17. Allow heater to stay on until heater shuts off automatically.
18. Stop heating system. Perform cooling thermal fluid (WP 0010 00) until TE300 is 200 degrees F or less.

END OF WORK PACKAGE

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UNIT

LAUNDRY ADVANCED SYSTEM

(NSN 3510–01–463–0114)

BURNER FUEL FILTER SERVICING REMOVAL, INSTALLATION

INITIAL SETUP:

Tools
Tool Kit, General Mechanics
(Item 14, WP 0282 00)

Personnel Required

Materials/Parts
Rag, Wiping (Item 4, WP 0281 00)

Equipment Conditions
LADS power shut off at main control enclosure (WP 0113 00).

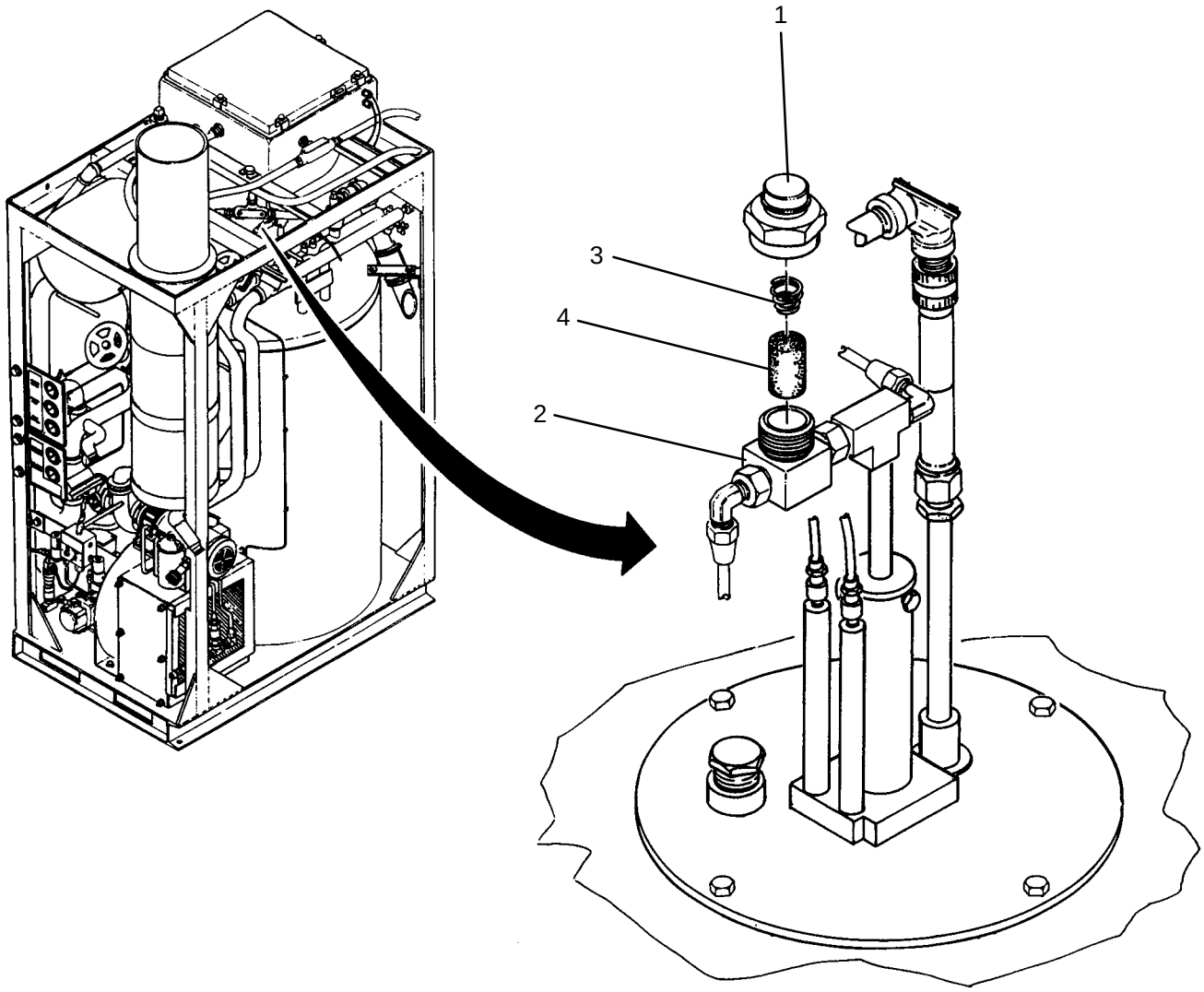
REMOVAL

WARNING

The fuels used on the heating system are highly explosive. DO NOT smoke or use open flame when performing maintenance. Flames and explosion could occur resulting in severe personal injury or death.

Thermal fluid can reach temperatures near 400 degrees F when the heating system is operating. Allow thermal fluid and heating system piping to cool prior to performing maintenance. Always wear gloves and eye protection. Failure to follow this precaution could result in severe burn injuries.

1. Unthread captive nut (1) from filter housing (2) then remove spring (3) and filter element (4).
2. Inspect filter element for damage. If damaged, replace filter element otherwise proceed to step 3.
3. Soak filter element (4) in a cleaning solution compatible with fuels.
4. Wipe filter element (4) with a clean wiping rag and inspect for debris. If debris is present, repeat step 3.



INSTALLATION

1. Install filter element (4) and spring (3) into filter housing (2) then secure with captive nut (1).
2. Use maintenance menu to test heating system (WP 0010 00). While heating system is operating, visually check for fuel leaks.
3. Allow heater to stay on until heater shuts off automatically.
4. Stop heating system. Perform cooling thermal fluid (WP 0010 00) until TE300 is 200 degrees F or less.

END OF WORK PACKAGE

UNIT

LAUNDRY ADVANCED SYSTEM

(NSN 3510–01–463–0114)

BURNER FUEL NOZZLE SERVICING REMOVAL, INSTALLATION

INITIAL SETUP:

Tools
Brush, Wire (Item 2, WP 0282 00)
Tool Kit, General Mechanics (Item 14, WP 0282 00)

Personnel Required

Materials/Parts
Rag, Wiping (Item 4, WP 0281 00)
Washer, Lock (Item 14, WP 0283 00)

Equipment Conditions
LADS power shut off at main control enclosure (WP 0113 00).

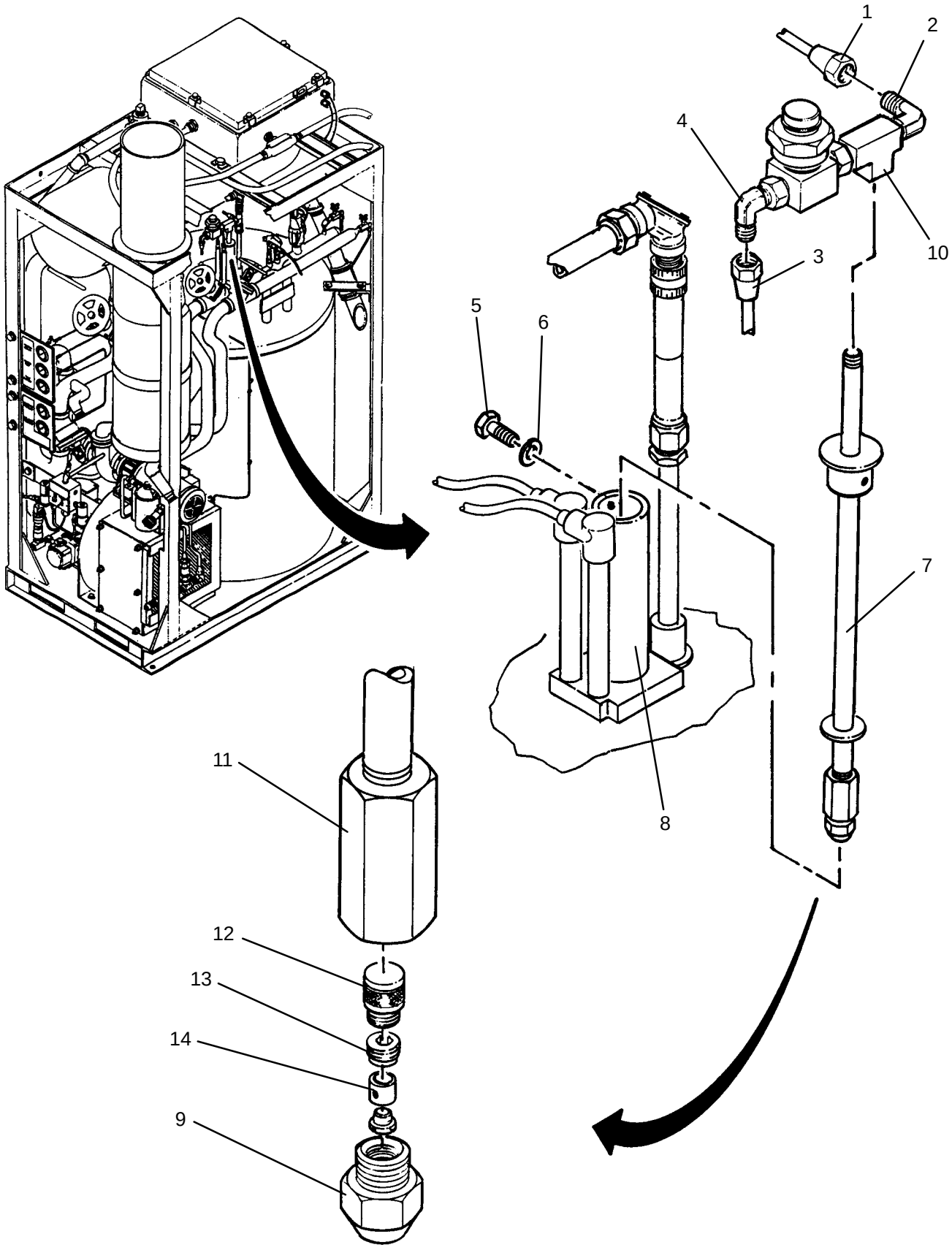
REMOVAL

WARNING

The fuels used on the heating system are highly explosive. DO NOT smoke or use open flame when performing maintenance. Flames and explosion could occur resulting in severe personal injury or death.

Thermal fluid can reach temperatures near 400 degrees F when the heating system is operating. Allow thermal fluid and heating system piping to cool prior to performing maintenance. Always wear gloves and eye protection. Failure to follow this precaution could result in severe burn injuries.

1. Disconnect fuel tube (1) from elbow (2). Cover fuel tube to prevent contamination.
2. Disconnect fuel tube (3) from elbow (4). Cover fuel tube to prevent contamination.
3. Loosen screw (5) and lock washer (6) securing fuel pipe (7) to burner assembly (8).
4. Lift fuel pipe (7) with attached fuel nozzle (9) from burner assembly (8).
5. Unthread fuel pipe (7) from piping (10).
6. Unthread fuel nozzle (9) from adapter (11).
7. Unthread filter (12) from fuel nozzle (9).
8. Unthread retainer (13) from fuel nozzle (9) then remove atomizer–jet (14).
9. Inspect filter (12) and atomizer–jet (14) for damage. If damaged replace fuel nozzle (9).
10. Soak fuel pipe (7), fuel nozzle (9), filter (12), retainer (13) and atomizer–jet (14) in a cleaning solution compatible with fuels.
11. Wipe fuel nozzle (9) filter (12), retainer (13) and atomizer–jet (14) with a clean wiping rag.
12. Push wire brush through fuel pipe (7) until pipe is clean.
13. Inspect fuel nozzle (7), filter (9), retainer (10) and atomizer–jet (14) for debris. If debris is present repeat step 10.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INSTALLATION

1. Install atomizer–jet (14) into fuel nozzle (9) then thread retainer (13) into fuel nozzle ensuring atomizer–jet is centered in fuel nozzle.
2. Thread filter (12) into fuel nozzle (9).
3. Thread fuel nozzle (9) into adapter (11).
4. Thread fuel pipe (7) into piping (10).
5. Insert fuel pipe (7) with attached fuel nozzle (9) into burner assembly (8) then tighten screw (5) and lock washer (6).
6. Connect fuel tube (3) to elbow (4).
7. Connect fuel tube (1) elbow (2).
8. Use maintenance menu to test heating system (WP 0010 00). While heating system is operating, visually check for fuel leaks.
9. Allow heater to stay on until heater shuts off automatically.
10. Stop heating system. Perform cooling thermal fluid (WP 0010 00) until TE300 is 200 degrees F or less.

END OF WORK PACKAGE

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UNIT

LAUNDRY ADVANCED SYSTEM

(NSN 3510–01–463–0114)

BURNER ASSEMBLY REPLACEMENT
REMOVAL, INSTALLATION

INITIAL SETUP:

Tools
Tool Kit, General Mechanics
(Item 14, WP 0282 00)

Personnel Required

Materials/Parts
Rag, Wiping (Item 4, WP 0281 00)
Washer, Lock (Item 15, WP 0283 00)

Equipment Conditions
LADS power shut off at main control enclosure (WP 0113 00).

REMOVAL

WARNING

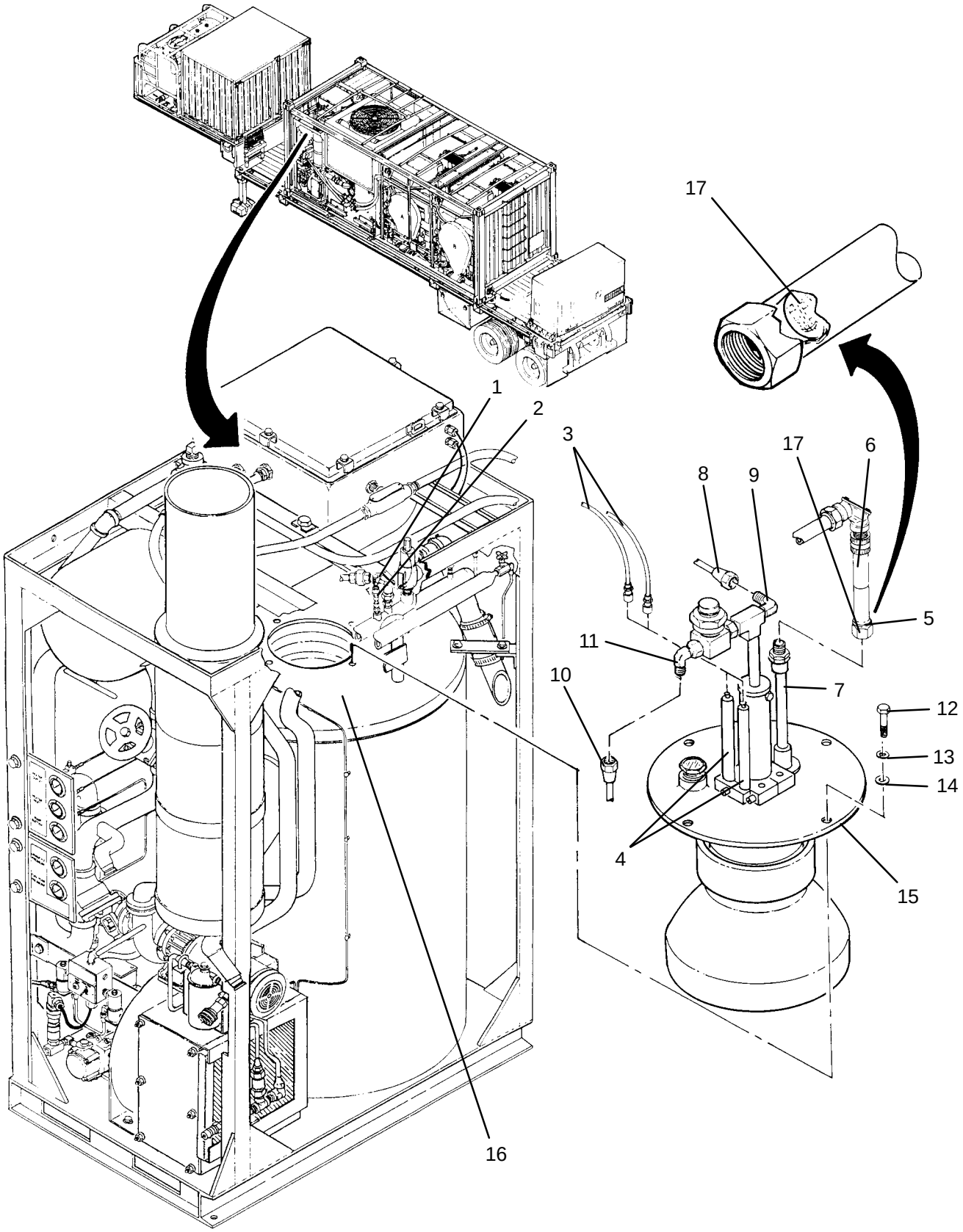
The fuels used on the heating system are highly explosive. DO NOT smoke or use open flame when performing maintenance. Flames and explosion could occur resulting in severe personal injury or death.

Thermal fluid can reach temperatures near 400 degrees F when the heating system is operating. Allow thermal fluid and heating system piping to cool prior to performing maintenance. Always wear gloves and eye protection. Failure to follow this precaution could result in severe burn injuries.

NOTE

Due to close component clearances heating system must be at ambient temperature before burner assembly can be removed from combustion chamber

1. Disconnect cable (1) from tempeature sensor (2).
2. Disconnect ignition wires (3) from electrodes (4).
3. Loosen captive nut (5) and remove flame detector (6) from sight tube (7).
4. Disconnect fuel tube (8) from elbow (9). Cover elbow to prevent contamination.
5. Disconnect fuel tube (10) from elbow (11). Cover elbow to prevent contamination.
6. Remove four screws (12), lock washers (13), and flat washers (14) securing burner assembly (15) to combustion chamber (16).
7. Lift burner assembly (15) out of combustion chamber (16).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INSTALLATION

1. Position burner assembly (15) in combustion chamber (16).
2. Secure burner assembly (15) to combustion chamber (16) with four screws (12), lock washers (13), and flat washers (14).
3. Connect fuel tube (10) to elbow (11).
4. Connect fuel tube (8) to elbow (9).
5. Wipe soot from lens (17) of flame detector (6) with a soft clean wiping rag.
6. Position flame detector (6) on sight tube (7), then tighten captive nut (5).
7. Connect ignition wires (3) to electrodes (4).
8. Connect cable (1) to temperature sensor (2).
9. Use maintenance menu to test heating system (WP 0010 00). While heating system is operating, visually check for fuel leaks.
10. Allow heater to stay on until heater shuts off automatically.
11. Stop heating system. Perform cooling thermal fluid (WP 0010 00) until TE300 is 200 degrees F or less.

END OF WORK PACKAGE

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UNIT

LAUNDRY ADVANCED SYSTEM

(NSN 3510–01–463–0114)

BLOWER MOTOR (M301) REPLACEMENT REMOVAL, INSTALLATION

INITIAL SETUP:

Tools
Tool Kit, General Mechanics
(Item 14, WP 0282 00)

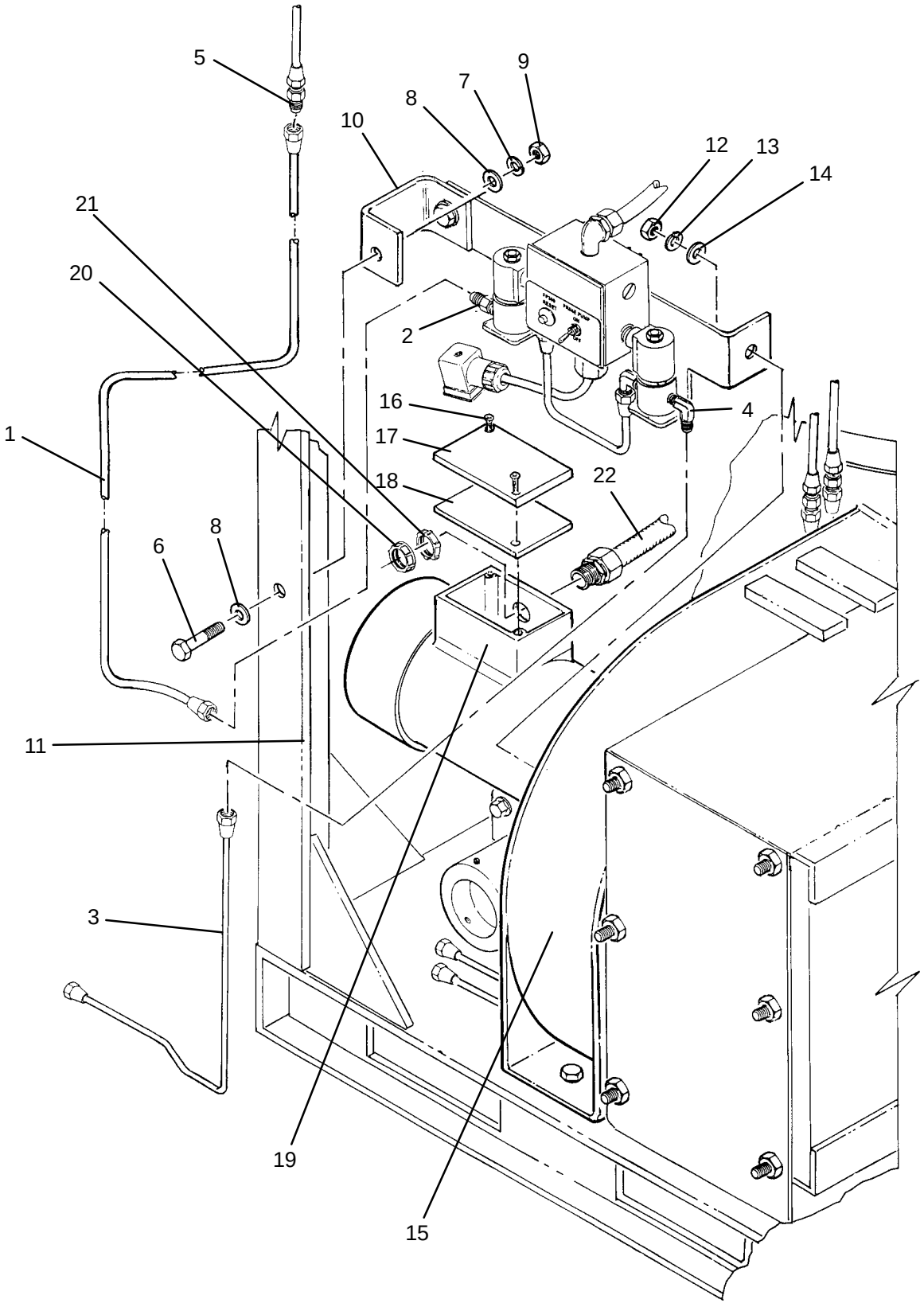
Personnel Required

Materials/Parts
Tags (Item 9, WP 0281 00)
Washer, Lock (Item 14, WP 0283 00)
Washer, Lock (Item 16, WP 0283 00)

Equipment Conditions
LADS power shut off at main control enclosure (WP 0113 00).

REMOVAL

1. Remove fuel pump (WP 0177 00).
2. Disconnect fuel tube (1) from adapter (2).
3. Disconnect fuel tube (3) from elbow (4).
4. Disconnect fuel tube (1) from coupling (5).
5. Remove screw (6), lock washer (7), flat washers (8) and nut (9) securing bracket (10) to frame (11).
6. Remove nut (12), lock washer (13) and flat washer (14) securing bracket (10) to blower shroud (15).
7. Remove and position bracket (10) with attached components out of the way.
8. Loosen two screws (16) remove cover (17) and gasket (18) from junction box (19).
9. Tag and disconnect wires from junction box (19).
10. Remove insulating bushing (20) and conduit lock nut (21) then pull conduit (22) off of junction box (19).
11. Remove remaining five nuts (12), lock washers (13) and flat washers (14) then remove motor (23) from blower shroud (15).
12. Measure distance between fan wheel (24) and mounting plate (25). Record this measurement as dimension A.
13. Loosen two set screws (26), then slide fan wheel (24) off of adapter (27).
14. Measure distance between adapter (27) and motor (23). Record this measurement as dimension B.
15. Loosen two set screws (28), then slide adapter (27) off of motor (23).
16. Remove four screws (29) and lock washers (30) then remove mounting plate (25) from motor (23).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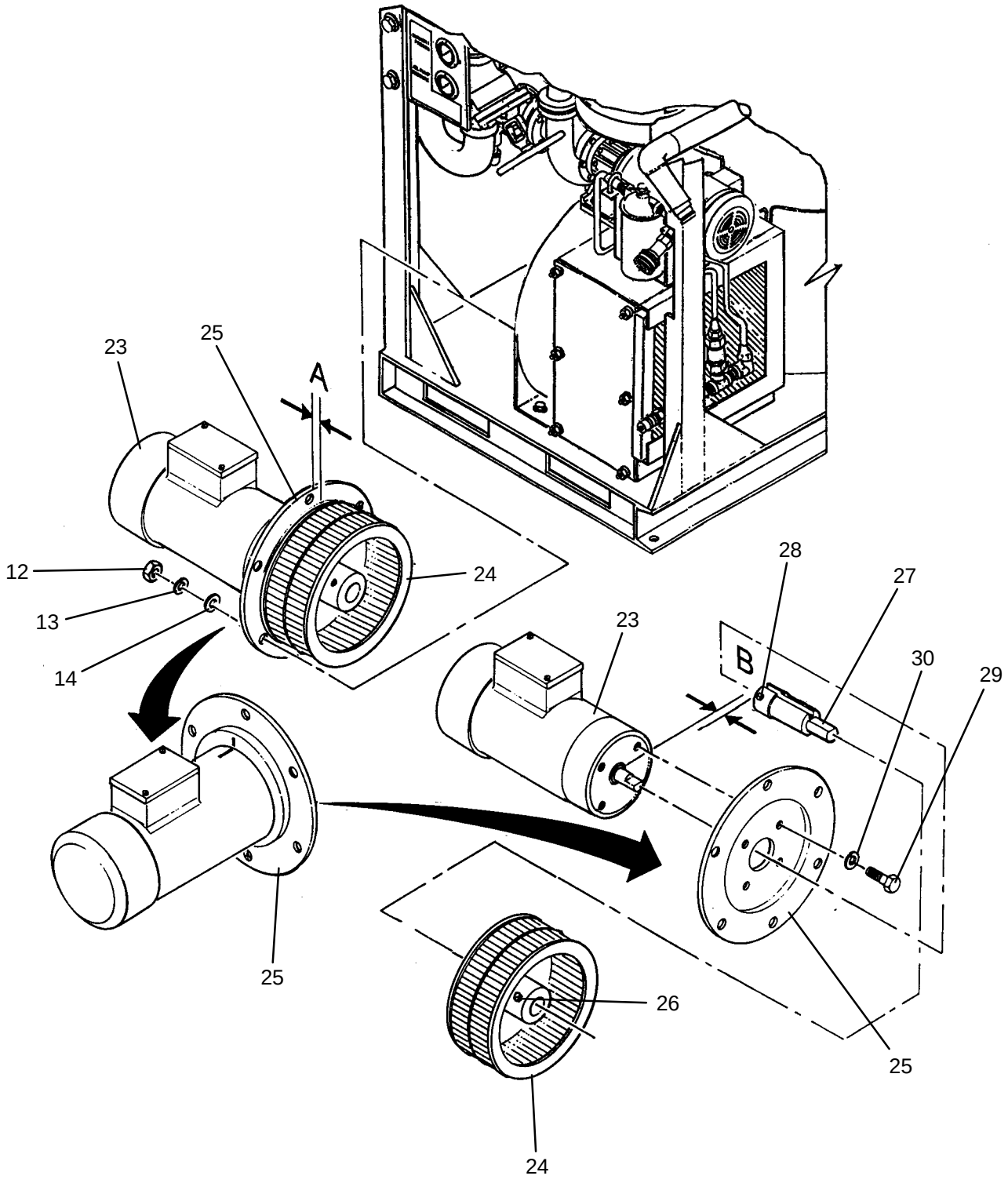
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INSTALLATION

1. Secure mounting plate (25) to motor (23) with four screws (29) and lock washers (30).
2. Slide adapter (27) onto motor (23) until dimension B is obtained, then tighten two set screws (28),
3. Slide fan wheel (24) onto adapter (27) until dimension A is obtained, then tighten two set screws (26),
4. Ensure junction box (19) is pointing up as shown, then mate motor (23) with blower shroud (15).
5. Secure motor (23) with five nuts (12), lock washers (13) and flat washers (14).
6. Loosen two screws (16), then remove cover (17) and gasket (18) from junction box (19).
7. Insert conduit (22) into junction box (19), then secure with conduit lock nut (21) and insulating bushing (20).
8. Connect wires inside junction box (19) as tagged.
9. Install cover (17) and gasket (18) onto junction box (19), then secure with two screws (16).
10. Position bracket (10) with attached components onto frame (11) and blower shroud (15) then secure with screw (6), lock washer (7), flat washers (8), nut (9) and nut (12), lock washer (13) and flat washer (14).
11. Connect fuel tube (1) to coupling (5).
12. Connect fuel tube (3) to elbow (4).
13. Connect fuel tube (1) to adapter (2).
14. Install fuel pump (WP 0177 00).
15. Use maintenance menu to test heating system (WP 0010 00). While heating system is operating, visually check for fuel leaks.
16. Allow heater to stay on until heater shuts off automatically.
17. Stop heating system. Perform cooling thermal fluid (WP 0010 00) until TE300 is 200 degrees F or less.

END OF WORK PACKAGE

UNIT

LAUNDRY ADVANCED SYSTEM

(NSN 3510–01–463–0114)

PRIME PUMP SWITCH (SW4) REPLACEMENT REMOVAL, INSTALLATION

INITIAL SETUP:

Tools
Tool Kit, General Mechanics
(Item 14, WP 0282 00)

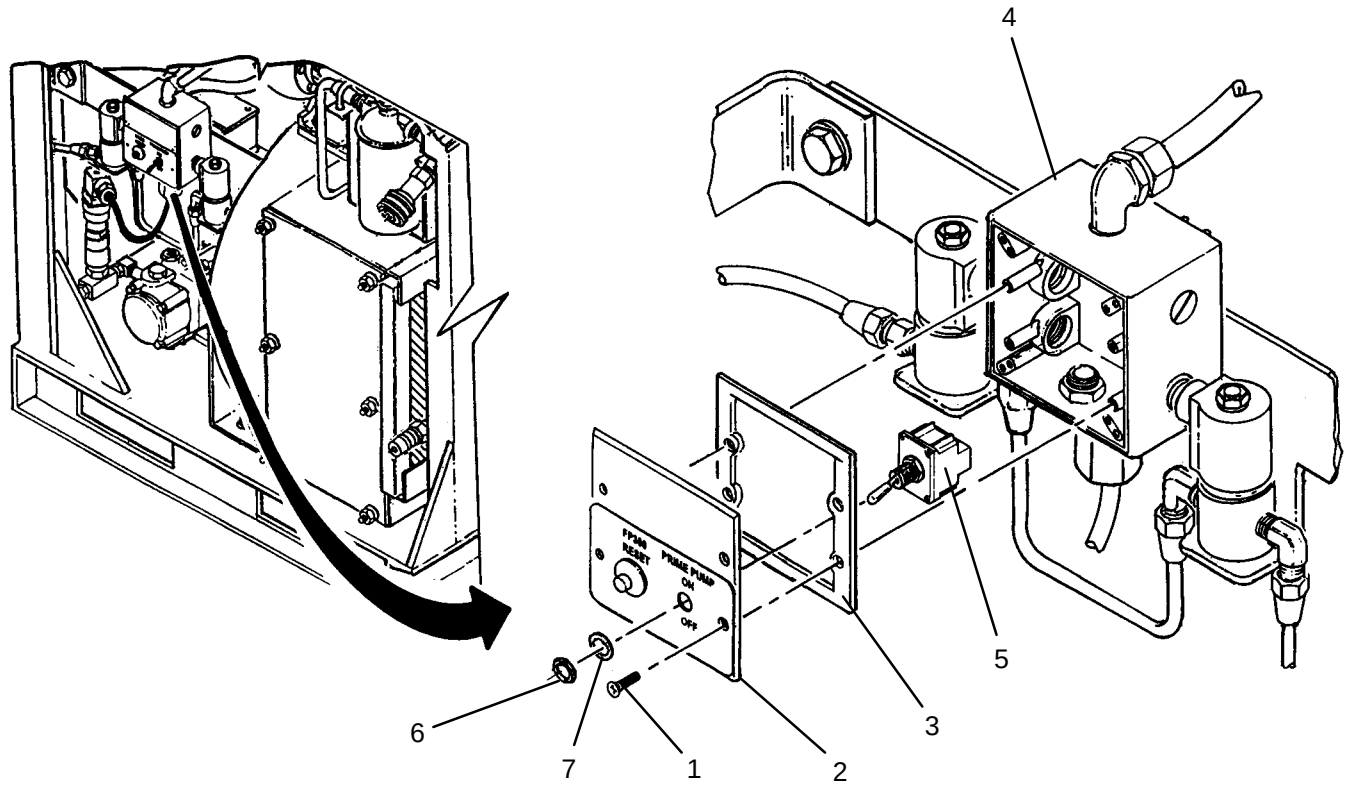
Personnel Required

Materials/Parts
Tags (Item 9, WP 0281 00)

Equipment Conditions
LADS power shut off at main control enclosure (WP 0113 00).

REMOVAL

1. Remove four screws (1) then remove cover (2) and gasket (3) from junction box (4).
2. Tag and disconnect wiring from switch (5).
3. Remove nut (6) and lock washer (7) then pull switch (5)) out of cover (2).



INSTALLATION

1. Insert new switch (5) into cover (2) then secure with nut (6) and lock washer (7).
2. Connect wiring to switch (5) as tagged.
3. Install cover (2) and gasket (3) onto junction box (4) then secure with four screws (1).
4. Perform fuel pump priming procedures (TM 10–3510–221–10).

END OF WORK PACKAGE

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UNIT

LAUNDRY ADVANCED SYSTEM

(NSN 3510–01–463–0114)

FP300 RESET SWITCH (PBS11) REPLACEMENT REMOVAL, INSTALLATION

INITIAL SETUP:

Tools
Tool Kit, General Mechanics
(Item 14, WP 0282 00)

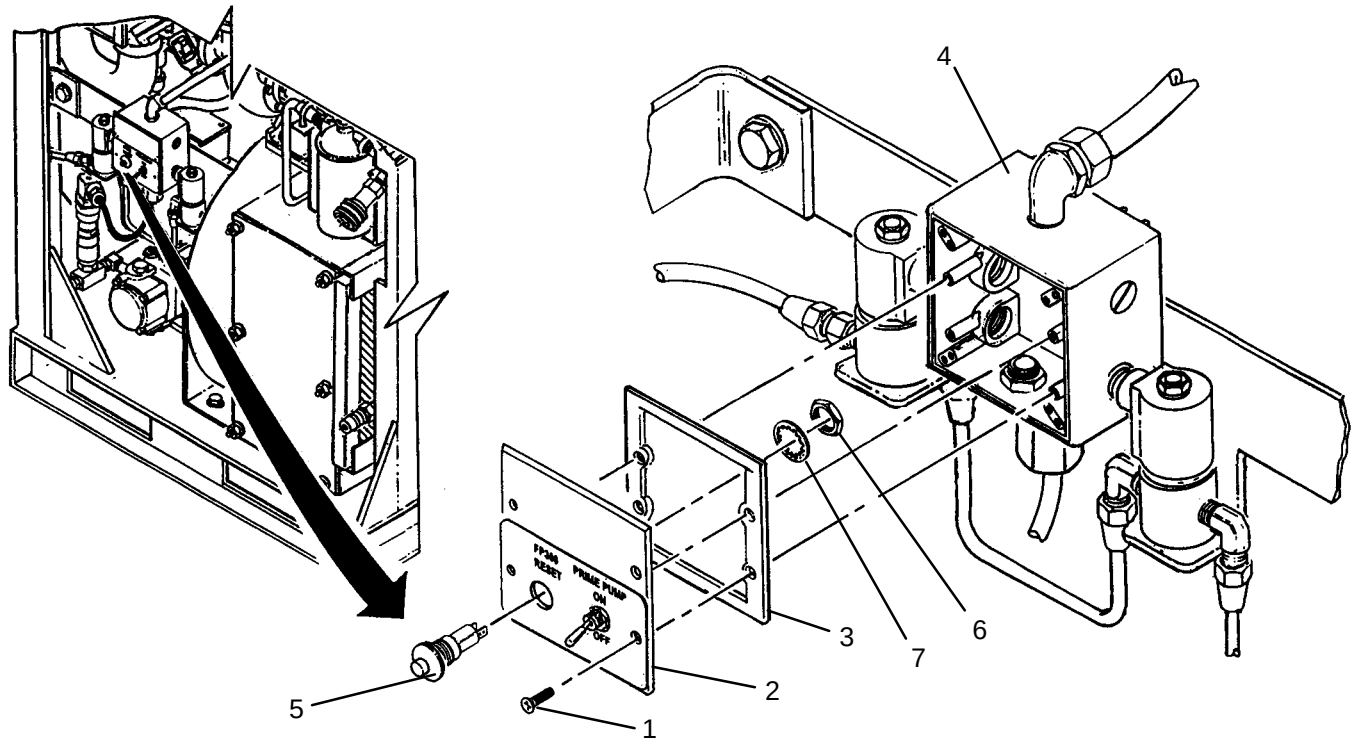
Personnel Required

Materials/Parts
Tags (Item 9, WP 0281 00)

Equipment Conditions
LADS power shut off at main control enclosure (WP 0113 00).

REMOVAL

1. Loosen four screws (1), then remove cover (2) and gasket (3) from junction box (4).
2. Tag and disconnect wires from push button switch (5).
3. Remove nut (6) and lock washer (7) then remove push button switch (5) from cover (2).



INSTALLATION

1. Position new push button switch into cover (2) then secure with nut (6) and lock washer (7).
2. Connect wires to push button switch (5) as tagged.
3. Install cover (2) and gasket (3) onto junction box (4), then tighten four screws (1).
4. Use maintenance menu to test heating system (WP 0010 00). Verify normal operation.
5. Stop heating system. Perform cooling thermal fluid (WP 0010 00) until TE300 is 200 degrees F or less.

END OF WORK PACKAGE

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UNIT

LAUNDRY ADVANCED SYSTEM

(NSN 3510–01–463–0114)

IGNITION WIRE REPLACEMENT REMOVAL, INSTALLATION

INITIAL SETUP:

Tools
Tool Kit, General Mechanics
(Item 14, WP 0282 00)

Personnel Required

Materials/Parts
Strap, Tiedown (Item 33, WP 0283 00)

Equipment Conditions
LADS power shut off at main control enclosure (WP 0113 00).

REMOVAL

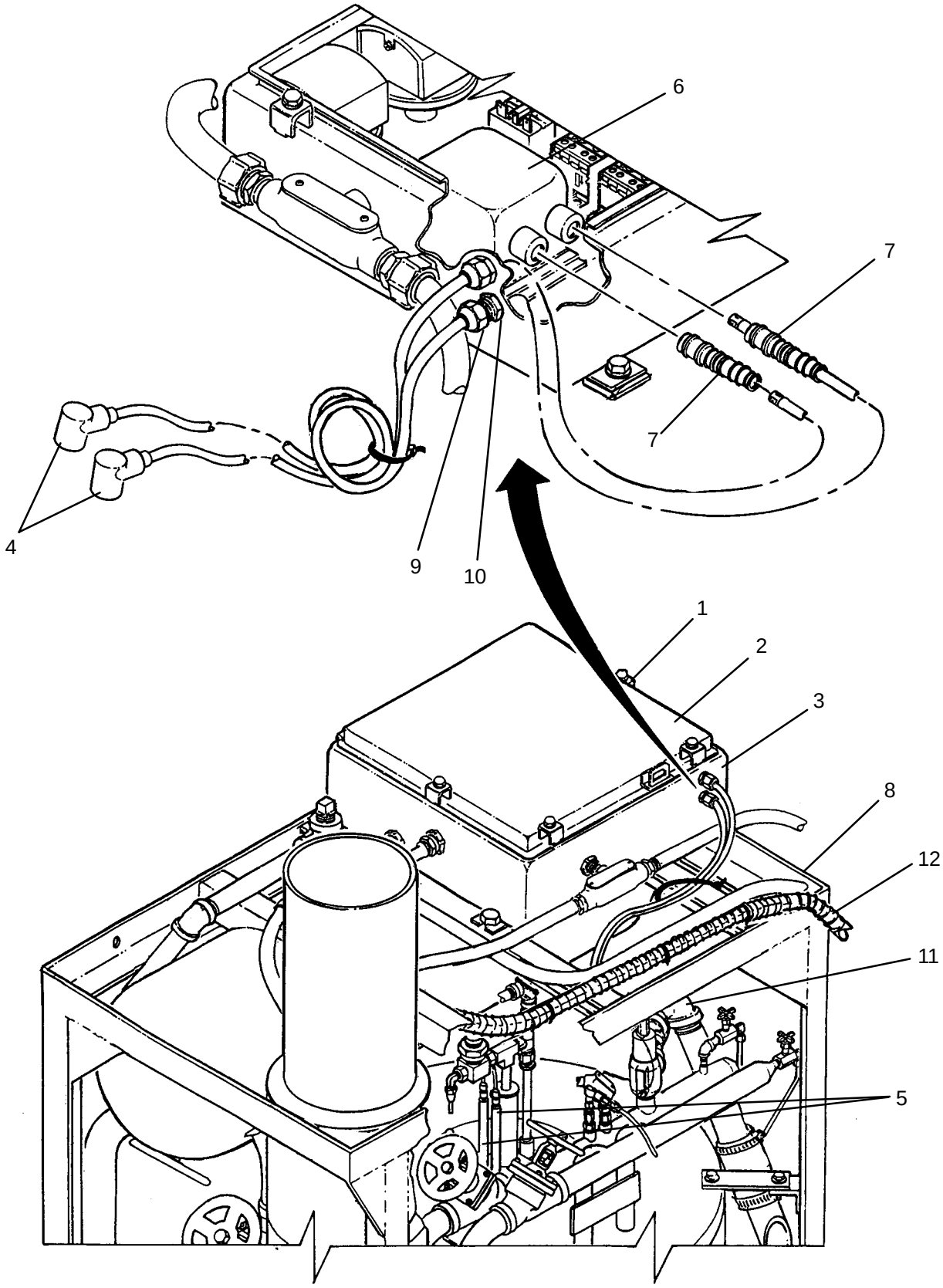
WARNING

Thermal fluid can reach temperatures near 400 degrees F when the heating system is operating. Allow thermal fluid and heating system piping to cool prior to performing maintenance. Always wear gloves and eye protection. Failure to follow this precaution could result in severe burn injuries.

NOTE

In order to maintain optimal heater performance, ignition wires should be replaced in pairs.

1. Loosen four latches (1), then open door (2) on heater enclosure (3).
2. Disconnect ignition wires (4) from electrodes (5).
3. Disconnect ignition wires (4) from transformer (6).
4. Slide insulating boots (7) off ends of ignition wires (4).
5. Note routing of ignition wires (4). Cut tiedown straps securing ignition wires (4) to each other and heater frame (8).
6. Loosen nuts (9) then remove ignition wires (4) from cord grips (10).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INSTALLATION

1. Insert ignition wires (4) into cord grips (10).
2. Slide insulating boots (7) onto ends of ignition wires (4).
3. Connect ignition wires (4) to transformer (6). Ensure ignition wires are seated in transformer, then tighten nuts (9).
4. Connect ignition wires (4) to electrodes (5).

NOTE

When securing ignition wires to heater frame, ensure wires are clear of thermal fluid plumbing (11) and sensor cables (12). Ignition wires in close proximity to thermal fluid piping can cause wires to fail prematurely. Ignition wires in close proximity to sensor cables can cause voltage transients leading to erratic control system operation.

5. Secure ignition wires (4) to each other and to heater frame (8) with tiedown straps as previously noted.
6. Close door (2) and secure to heater enclosure (3) by tightening four latches (1).
7. Use maintenance menu to test heating system (WP 0010 00). Verify normal operation.
8. Allow heater to stay on until heater shuts off automatically.
9. Stop heating system. Perform cooling thermal fluid (WP 0010 00) until TE300 is 200 degrees F or less.

END OF WORK PACKAGE

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UNIT

LAUNDRY ADVANCED SYSTEM

(NSN 3510–01–463–0114)

FLAME DETECTOR (UV300) REPLACEMENT REMOVAL, INSTALLATION

INITIAL SETUP:

Tools
Tool Kit, General Mechanics
(Item 14, WP 0282 00)

Personnel Required

Materials/Parts

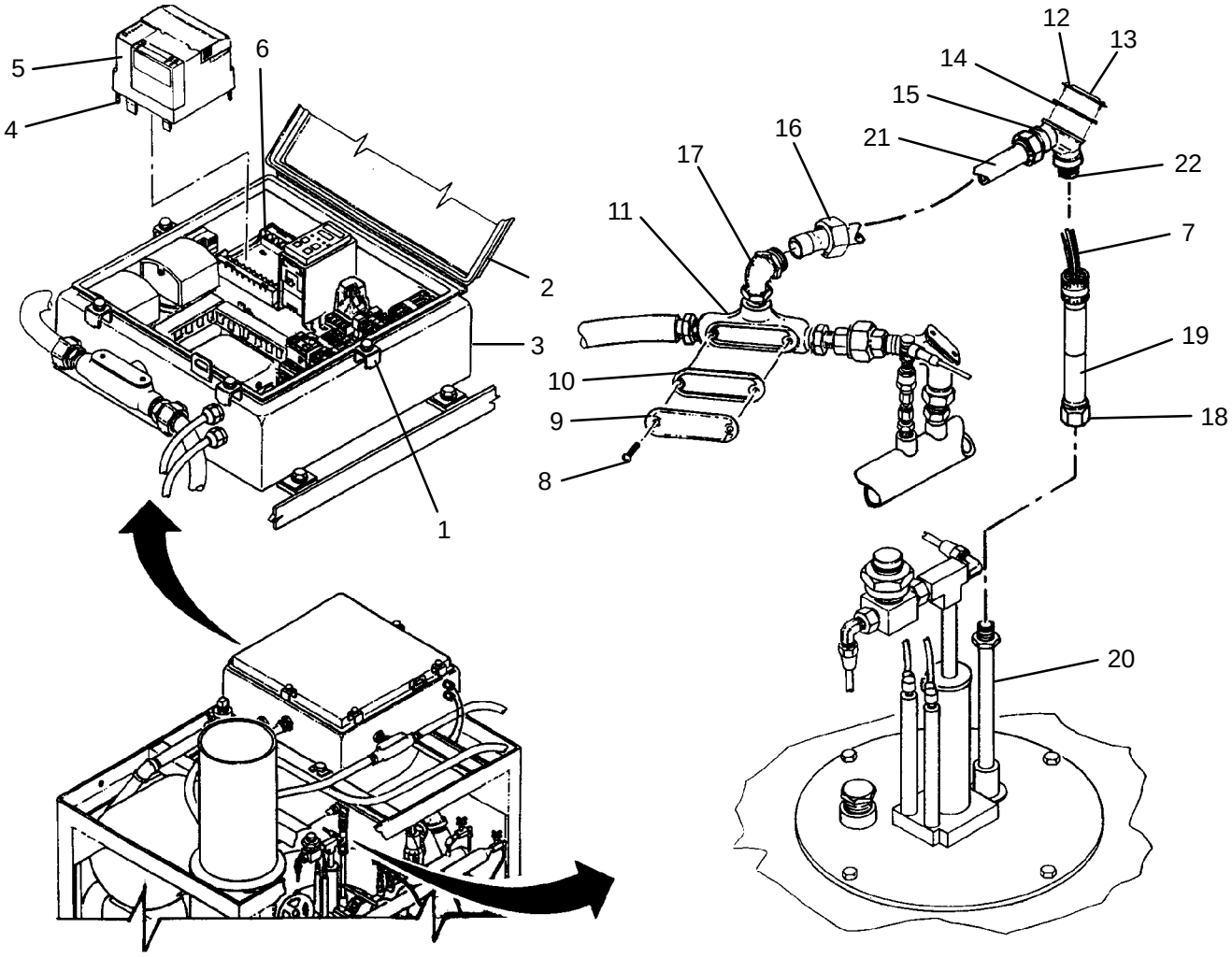
Equipment Conditions
LADS power shut off at main control enclosure (WP 0113 00).

REMOVAL

WARNING

Thermal fluid can reach temperatures near 400 degrees F when the heating system is operating. Allow thermal fluid and heating system piping to cool prior to performing maintenance. Always wear gloves and eye protection. Failure to follow this precaution could result in severe burn injuries.

1. Loosen four latches (1), then open door (2) on heater enclosure (3).
2. Loosen two captive screws (4), then lift flame programmer (5) from sub–base (6).
3. Disconnect flame detector lead wires (7) from sub–base (6).
4. Loosen two screws (8), then remove cover (9) and gasket (10) from outlet body (11).
5. Pull lead wires (7) out of heater enclosure (3).
6. Loosen two screws (12), then remove cover (13) and gasket (14) from pulling elbow (15).
7. Loosen conduit nut (16) at elbow (17).
8. Loosen captive nut (18), then remove flame detector (19) from sight tube (20).
9. Pull lead wires (7) out of outlet body (11), conduit (21) and pulling elbow (15).
10. Unthread nipple (22) with attached conduit from flame detector (19).



INSTALLATION

1. Insert lead wires (7) of new flame detector (19) through nipple (22) and pulling elbow (15).
2. Thread nipple (22) into flame detector (19).
3. Insert lead wires (7) through conduit (21) and out of outlet body (11).
4. Insert lead wires (7) through outlet body (11) and into heater enclosure (3).
5. Position flame detector (19) on sight tube (20) then tighten captive nut (18).
6. Tighten conduit nut (16).
7. Install cover (13) and gasket (14) onto pulling elbow (15), then secure with two screws (12).
8. Install cover (9) and gasket (10) onto outlet body (11), then secure with two screws (8).
9. Connect leadwires (7) to sub–base (6).
10. Install flame programmer (5) onto sub–base (6) and secure with two captive screws (4).
11. Close door (2) and secure to heater enclosure (3) by tightening four latches (1).
12. Use maintenance menu to test heating system (WP 0010 00).
13. Allow heater to stay on until heater shuts off automatically.
14. Stop heating system. Perform cooling thermal fluid (WP 0010 00) until TE300 is 200 degrees F or less.

END OF WORK PACKAGE

UNIT

LAUNDRY ADVANCED SYSTEM

(NSN 3510–01–463–0114)

FLAME PROGRAMMER (FP300) REPLACEMENT REMOVAL, INSTALLATION

INITIAL SETUP:

Tools
Tool Kit, General Mechanics
(Item 14, WP 0282 00)

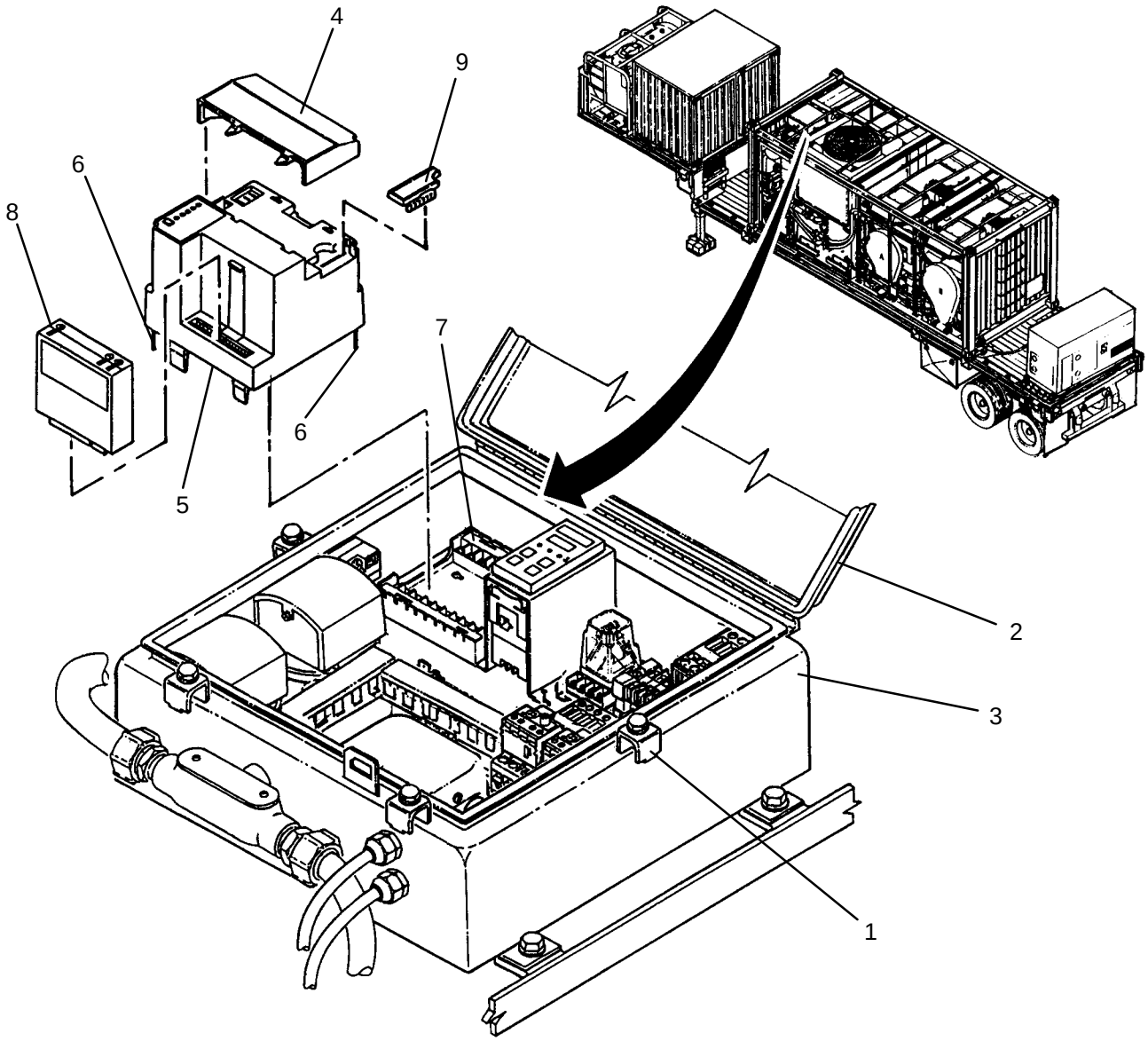
Personnel Required

Materials/Parts

Equipment Conditions
LADS power shut off at main control enclosure (WP 0113 00).

REMOVAL

1. Loosen four latches (1), then open door (2) on heater enclosure (3).
2. Remove display module (4) from flame programmer (5).
3. Loosen two captive screws (6), then remove flame programmer (5) from sub–base (7).
4. Remove flame detector amplifier (8) from flame programmer (5).
5. Pull purge card (9) out of flame programmer (5).



INSTALLATION

1. Insert purge card (9) into flame programmer (5).
2. Insert flame detector amplifier (8) onto flame programmer (5).
3. Install flame programmer (5) onto sub–base (7) and secure with two captive screws (6).
4. Install display module (4) onto flame programmer (5).
5. Close door (2) and secure to heater enclosure (3) by tightening four latches (1).
6. Use maintenance menu to test heating system (WP 0010 00).
7. Allow heater to stay on until heater shuts off automatically.
8. Stop heating system. Perform cooling thermal fluid (WP 0010 00) until TE300 is 200 degrees F or less.

END OF WORK PACKAGE

UNIT

LAUNDRY ADVANCED SYSTEM

(NSN 3510–01–463–0114)

FLAME PROGRAMMER DISPLAY MODULE REPLACEMENT REMOVAL, INSTALLATION

INITIAL SETUP:

Tools
Tool Kit, General Mechanics
(Item 14, WP 0282 00)

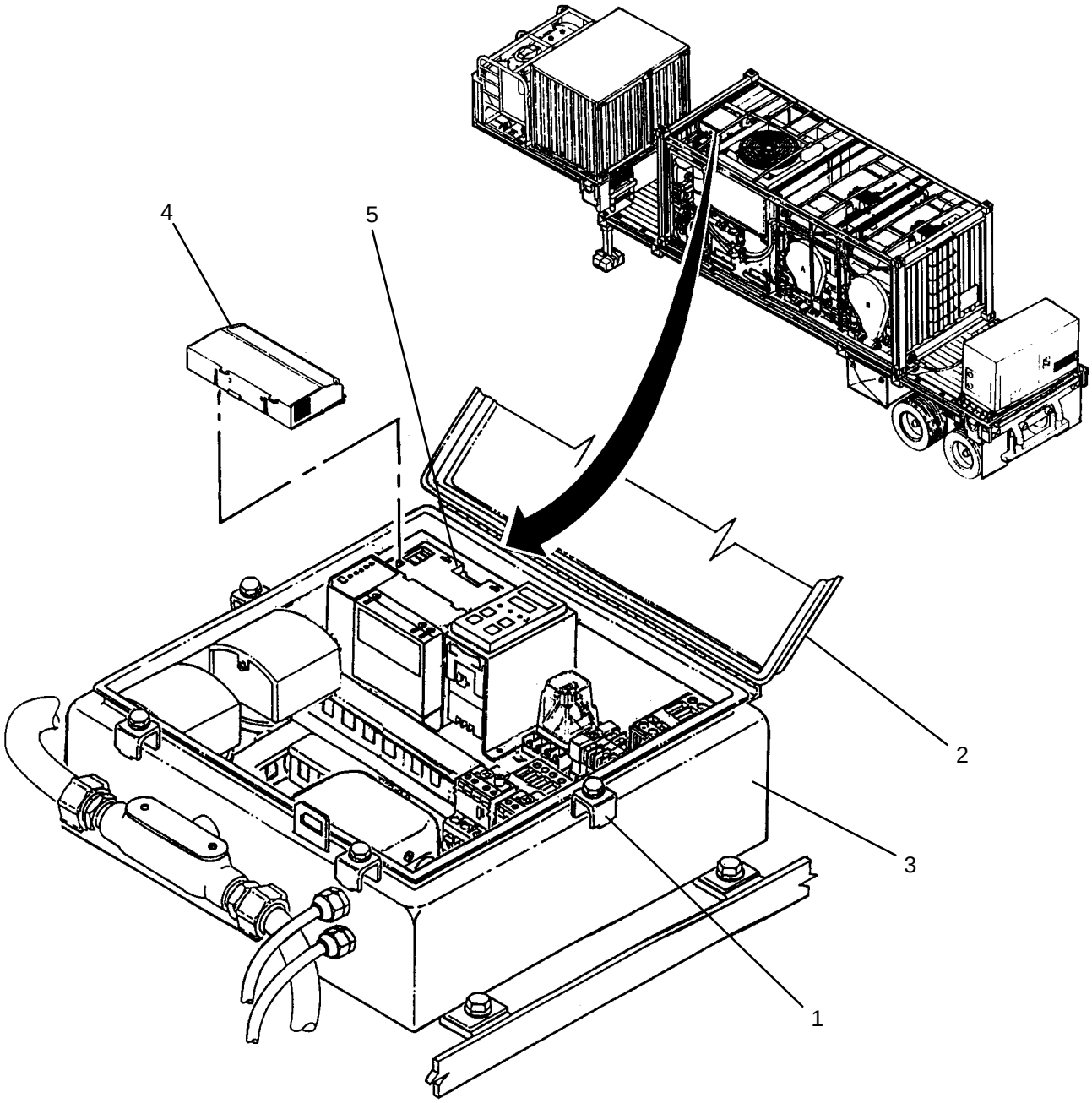
Personnel Required

Materials/Parts
Tags (Item 9, WP 0281 00)

Equipment Conditions
LADS power shut off at main control enclosure (WP 0113 00).

REMOVAL

1. Loosen four latches (1), then open door (2) on heater enclosure (3).
2. Remove display module (4) from flame programmer (5).
3. Tag and disconnect wires from display module (4).



INSTALLATION

1. Connect wiring to new display module (4) as tagged.
2. Install display module (4) onto flame programmer (5).
3. Close door (2) and secure to heater enclosure (3) by tightening four latches (1).
4. Use maintenance menu to test heating system (WP 0010 00).
5. Allow heater to stay on until heater shuts off automatically.
6. Stop heating system. Perform cooling thermal fluid (WP 0010 00) until TE300 is 200 degrees F or less.

END OF WORK PACKAGE

UNIT

LAUNDRY ADVANCED SYSTEM

(NSN 3510–01–463–0114)

FLAME DETECTOR AMPLIFIER REPLACEMENT REMOVAL, INSTALLATION

INITIAL SETUP:

Tools
Tool Kit, General Mechanics
(Item 14, WP 0282 00)

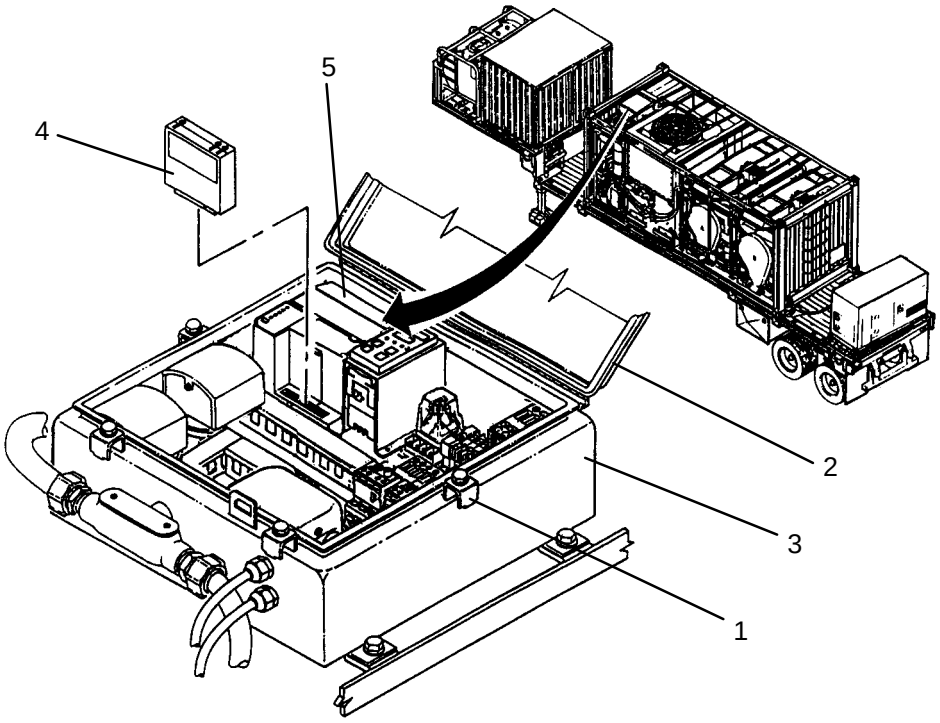
Personnel Required

Materials/Parts

Equipment Conditions
LADS power shut off at main control enclosure (WP 0113 00).

REMOVAL

1. Loosen four latches (1), then open door (2) on heater enclosure (3).
2. Remove flame detector amplifier (4) from flame programmer (5).



INSTALLATION

1. Insert new flame detector amplifier (4) onto flame programmer (5)
2. Close door (2) and secure to heater enclosure (3) by tightening four latches (1).
3. Use maintenance menu to test heating system (WP 0010 00).
4. Allow heater to stay on until heater shuts off automatically.
5. Stop heating system. Perform cooling thermal fluid (WP 0010 00) until TE300 is 200 degrees F or less.

END OF WORK PACKAGE

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UNIT

LAUNDRY ADVANCED SYSTEM

(NSN 3510–01–463–0114)

PURGE CARD REPLACEMENT
REMOVAL, INSTALLATION

INITIAL SETUP:

Tools
Tool Kit, General Mechanics
(Item 14, WP 0282 00)

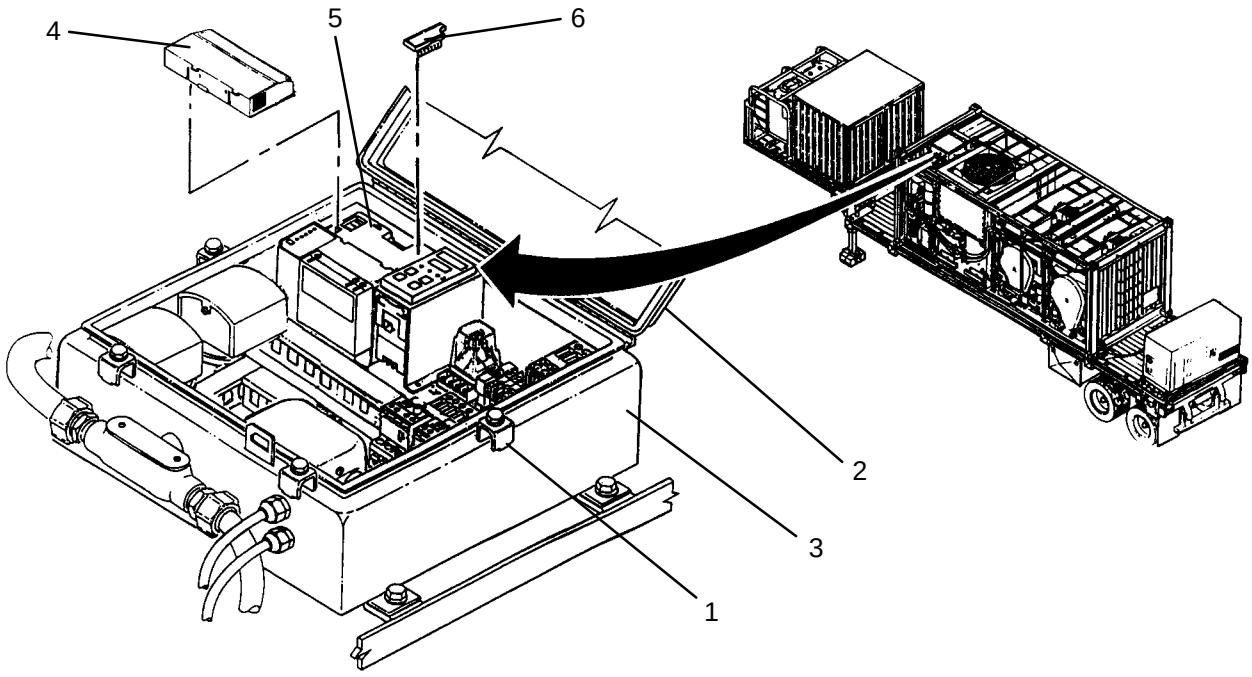
Personnel Required

Materials/Parts

Equipment Conditions
LADS power shut off at main control enclosure (WP 0113 00).

REMOVAL

1. Loosen four latches (1), then open door (2) on heater enclosure (3).
2. Remove display module (4) from flame programmer (5).
3. Pull purge card (6) out of flame programmer (5).



INSTALLATION

1. Insert new purge card (6) into flame programmer (5).
2. Install display module (4) onto flame programmer (5).
3. Close door (2) and secure to heater enclosure (3) by tightening four latches (1).
4. Use maintenance menu to test heating system (WP 0010 00).
5. Allow heater to stay on until heater shuts off automatically.
6. Stop heating system. Perform cooling thermal fluid (WP 0010 00) until TE300 is 200 degrees F or less.

END OF WORK PACKAGE

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UNIT

LAUNDRY ADVANCED SYSTEM

(NSN 3510–01–463–0114)

IGNITION TRANSFORMER (IT300) REPLACEMENT REMOVAL, INSTALLATION

INITIAL SETUP:

Tools
Tool Kit, General Mechanics
(Item 14, WP 0282 00)

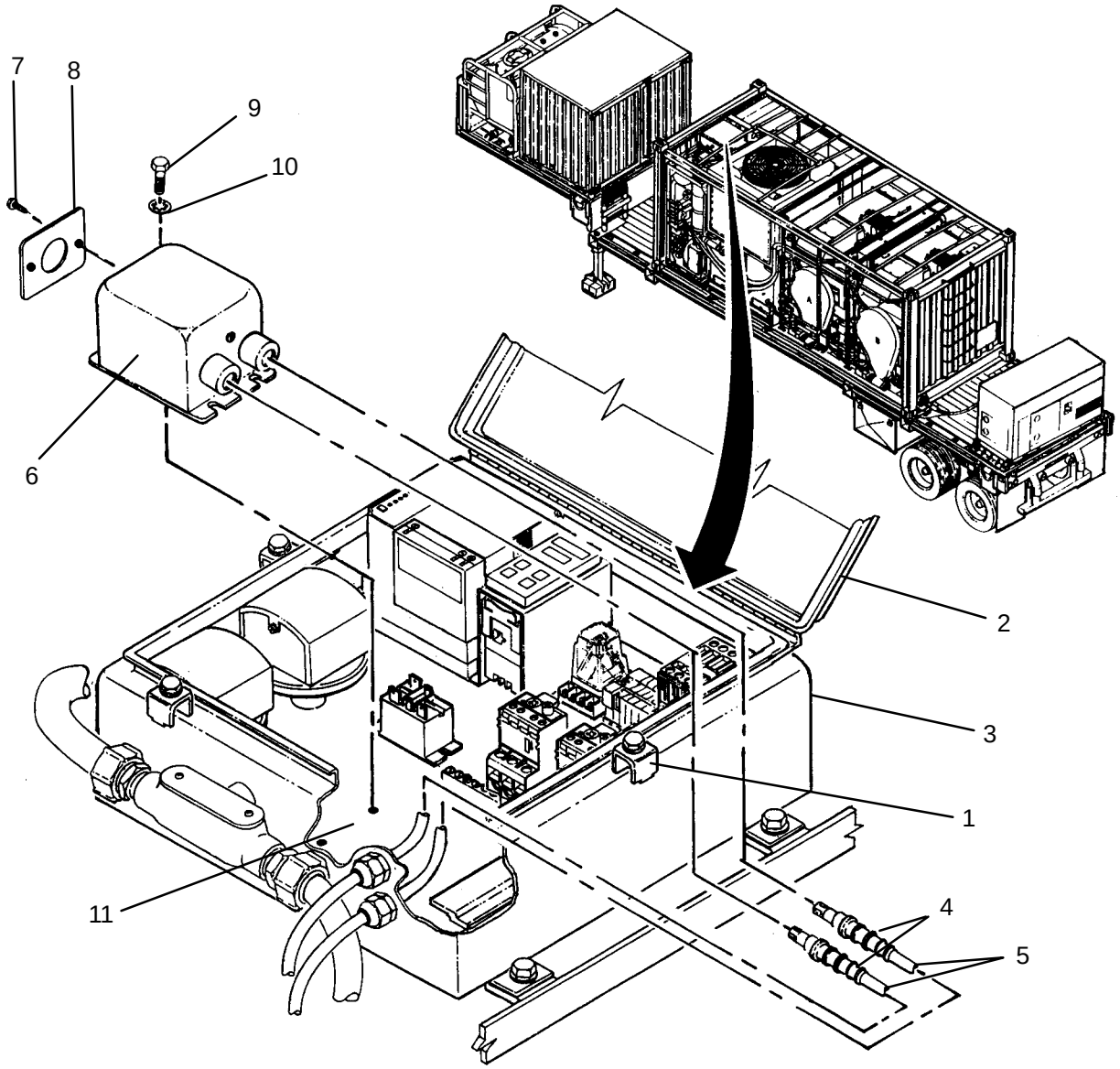
Personnel Required

Materials/Parts
Tags (Item 9, WP 0281 00)
Washer, Lock (Item 20, WP 0283 00)

Equipment Conditions
LADS power shut off at main control enclosure (WP 0113 00).

REMOVAL

1. Loosen four latches (1), then open door (2) on heater enclosure (3).
2. Slide boots (4) back, then disconnect ignition wires (5) from ignition transformer (6).
3. Remove screws (7) and cover plate (8) from ignition transformer (6).
4. Tag and disconnect wires from ignition transformer (6).
5. Remove two screws (9) and lock washers (10), securing ignition transformer (6) to subpanel (11).
6. Remove ignition transformer (6) from subpanel (11).



INSTALLATION

1. Position new ignition transformer (6) onto subpanel (11).
2. Secure ignition transformer (6) with two screws (9) and lock washers (10).
3. Remove screws (7) and cover plate (8) from ignition transformer (6).
4. Insert wires into ignition transformer (6) and connect as tagged.
5. Install cover plate (8) onto ignition transformer (6), then secure with screw (7).
6. Connect ignition wires (5) to ignition transformer (6), then slide boots (4) over wires.
7. Close door (2) and secure to heater enclosure (3) by tightening four latches (1).
8. Use maintenance menu to test heating system (WP 0010 00).
9. Allow heater to stay on until heater shuts off automatically.
10. Stop heating system. Perform cooling thermal fluid (WP 0010 00) until TE300 is 200 degrees F or less.

END OF WORK PACKAGE

UNIT

LAUNDRY ADVANCED SYSTEM

(NSN 3510–01–463–0114)

TEMPERATURE LIMIT SWITCH (TS300) REPLACEMENT REMOVAL, INSTALLATION, ADJUSTMENT

INITIAL SETUP:

Tools
Tool Kit, General Mechanics
(Item 14, WP 0282 00)

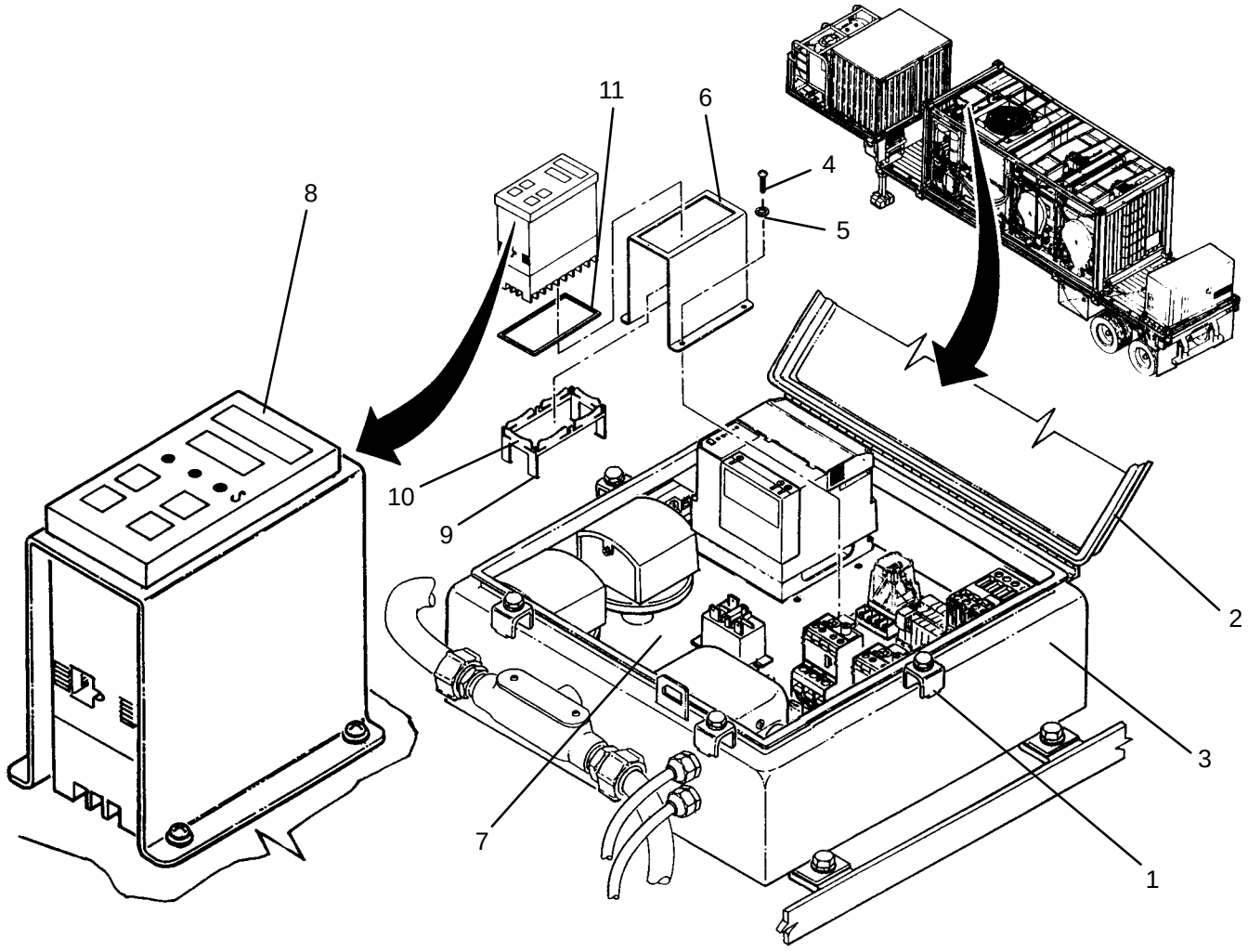
Personnel Required

Materials/Parts
Tags (Item 9, WP 0281 00)
Washer, Lock (Item 18, WP 0283 00)

Equipment Conditions
LADS power shut off at main control enclosure (WP 0113 00).

REMOVAL

1. Loosen four latches (1), then open door (2) on heater enclosure (3).
2. Remove four screws (4) and lock washers (5), securing mounting bracket (6) to subpanel (7).
3. Tag and disconnect wires from bottom of temperature limit switch (8).
4. Release locking tabs (9), then slide retainer (10) off of temperature limit switch (8).
5. Remove temperature limit switch (8) and gasket (11) from mounting bracket (7).



INSTALLATION

1. Release locking tabs (9), then slide retainer (10) off of new temperature limit switch (8).
2. Install temperature limit switch (8) and gasket (11) onto mounting bracket (6).
3. Reinstall retainer (10) to secure temperature limit switch (8) to mounting bracket (6).
4. Connect wires to temperature limit switch (8) as tagged.
5. Position mounting bracket (6) on subpanel (7), then secure with four screws (4) and lock washers (5).

ADJUSTMENT

1. Perform system start–up (WP 0010 00).

NOTE

When attempting to access setpoint mode, keys must be pressed within five seconds of each other, or temperature switch will automatically reset. If this occurs, the setpoint adjustment procedure must be restarted at step 2.

2. Press scroll key (WP 0009 00, Figure 5, 10). Lower display (7) reads “ULoc”. Upper display (7) reads “0”.
3. Press up key (11) until upper display (7) reads “10”.
4. Press scroll key (10). Lower display (8) reads “Ctrl”.
5. Press scroll key (10). Lower display (8) reads “Prog”.
6. Press scroll key (10). Lower display (8) reads “Set”.
7. Press down key (12). Lower display (8) reads “SP”.
8. Press scroll key (10). Lower display (8) reads “SP”. Upper display (7) reads the current setpoint.
9. Press and hold up key (11) or down key (12) until upper display (7) reads “425”.
10. Press scroll key (10). Lower display (8) reads “HiHd”. Upper display (7) is blank.
11. Press up key (11) to exit set–up.
12. Monitor displays. Lower display (8) should read “425”. Upper display should read actual thermal fluid temperature. If displays are not as stated, return to step 2.
13. Close door (2) and secure to heater enclosure (3) by tightening four latches (1).
14. Use maintenance menu to test heating system (WP 0010 00).
15. Allow heater to stay on until heater shuts off automatically.
16. Stop heating system. Perform cooling thermal fluid (WP 0010 00) until TE300 is 200 degrees F or less.

END OF WORK PACKAGE

UNIT

LAUNDRY ADVANCED SYSTEM

(NSN 3510–01–463–0114)

AIR INLET PRESSURE SWITCH (PS300) REPLACEMENT REMOVAL, INSTALLATION

INITIAL SETUP:

Tools
Tool Kit, General Mechanics
(Item 14, WP 0282 00)

Personnel Required

Materials/Parts
Tags (Item 9, WP 0281 00)
Tape, Anti–Seize (Item 10, WP 0281 00)

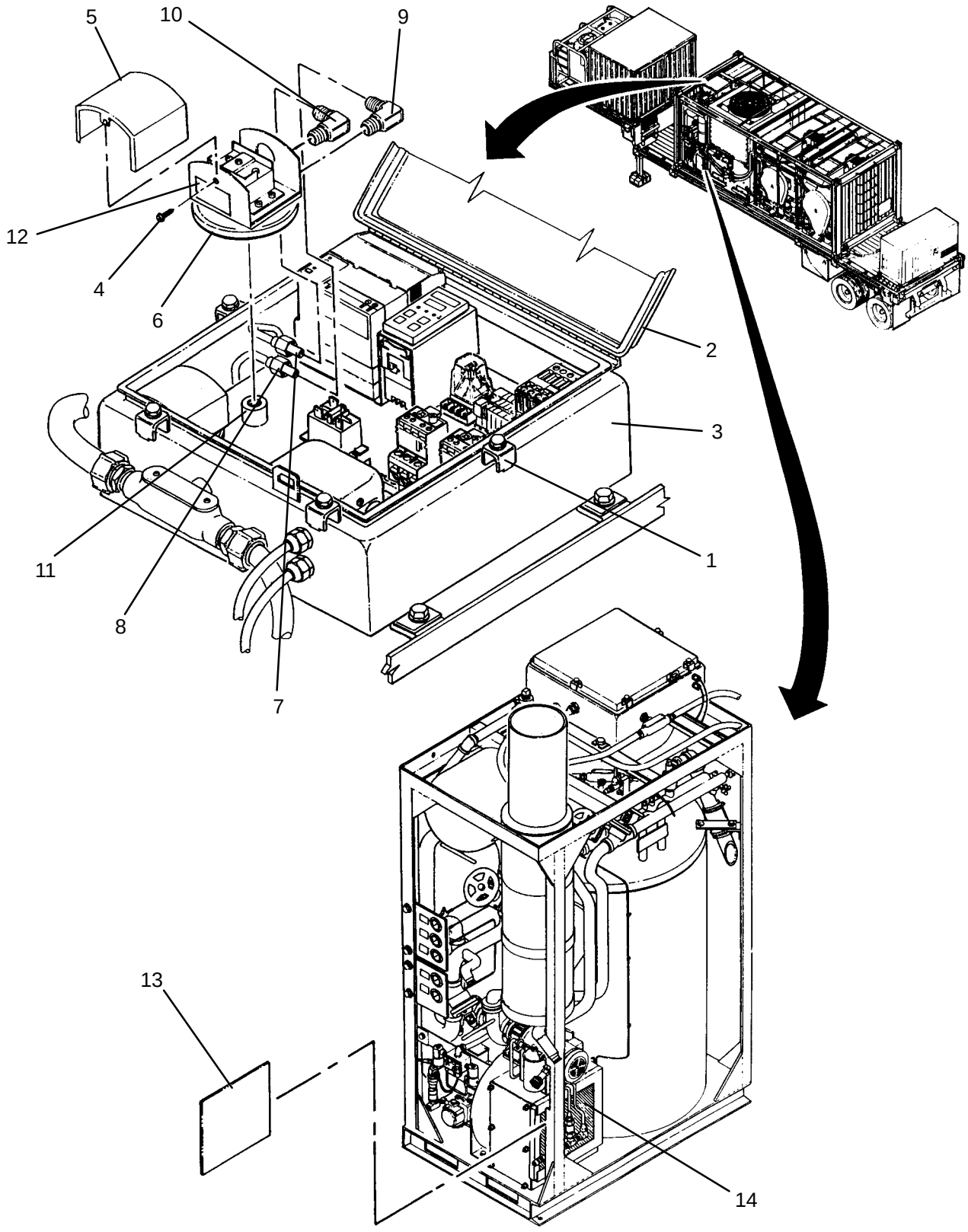
Equipment Conditions
LADS power shut off at main control enclosure (WP 0113 00).

REMOVAL

WARNING

Thermal fluid can reach temperatures near 400 degrees F when the heating system is operating. Allow thermal fluid and heating system piping to cool prior to performing maintenance. Always wear gloves and eye protection. Failure to follow this precaution could result in severe burn injuries.

1. Loosen four latches (1), then open door (2) on heater enclosure (3).
2. Remove screw (4), then remove cover (5) from pressure switch (6).
3. Tag and disconnect wires from pressure switch (6).
4. Disconnect tubes (7) and (8) at elbows (9) and (10).
5. Unthread pressure switch (6) from subpanel (11).
6. Remove elbows (9) and (10) from pressure switch.
7. Clean anti–seize tape from threads of elbows (9) and (10).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INSTALLATION

CAUTION

Air pressure switch should come with switching limit preset. Changing adjustment on switch could allow heater operation without adequate air flow, resulting in damage to heating system components.

1. Check label (12) on new pressure switch (6). Label should be marked 1823–1. If marking is not as stated, obtain correct pressure switch.
2. Apply anti–seize tape to threads of elbows (9) and (10).
3. Install elbows (9) and (10) into pressure switch (6) and orient as shown.
4. Thread pressure switch (6) onto subpanel (11)
5. Connect tubes (7) and (8) to elbows (9) and (10).
6. Remove screw (4), then remove cover (5) from pressure switch (6).
7. Connect wires to pressure switch (6) as tagged.
8. Install cover (5) onto pressure switch (6), then secure with screw (4).
9. Close door (2) and secure to heater enclosure (3) by tightening four latches (1).

CAUTION

When the heater is operated with reduced air flow, black smoke will be generated in the combustion chamber. If the heater is allowed to operate in this condition for an extended period of time, the heater coils will become coated with soot leading to loss of heat transfer between the flame and the thermal fluid. Proper operation of the burner blower inlet and outlet pressure switches prevent heater combustion if inadequate air flow is sensed.

10. Test heating system as follows:
    a. Place a piece of cardboard (or other suitable blocking device) (13) over first two–thirds of air inlet filter (14).
    b. Use maintenance menu to start heating system (WP 0010 00).
    c. Verify heating system starts then turns off and a “BURNER BLWR IN PRESS LO” fault is displayed.
    d. Remove cardboard (13) from air inlet filter (14).
    e. Use maintenance menu to test heating system (WP 0010 00). Verify normal operation
11. Stop heating system. Perform cooling thermal fluid (WP 0010 00) until TE300 is 200 degrees F or less.

END OF WORK PACKAGE

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UNIT

LAUNDRY ADVANCED SYSTEM

(NSN 3510–01–463–0114)

BLOWER OUTLET AIR PRESSURE SWITCH (PS301) REPLACEMENT REMOVAL, INSTALLATION

INITIAL SETUP:

Tools
Tool Kit, General Mechanics
(Item 14, WP 0282 00)

Personnel Required

Materials/Parts
Tags (Item 9, WP 0281 00)
Tape, Anti–Seize (Item 10, WP 0281 00)

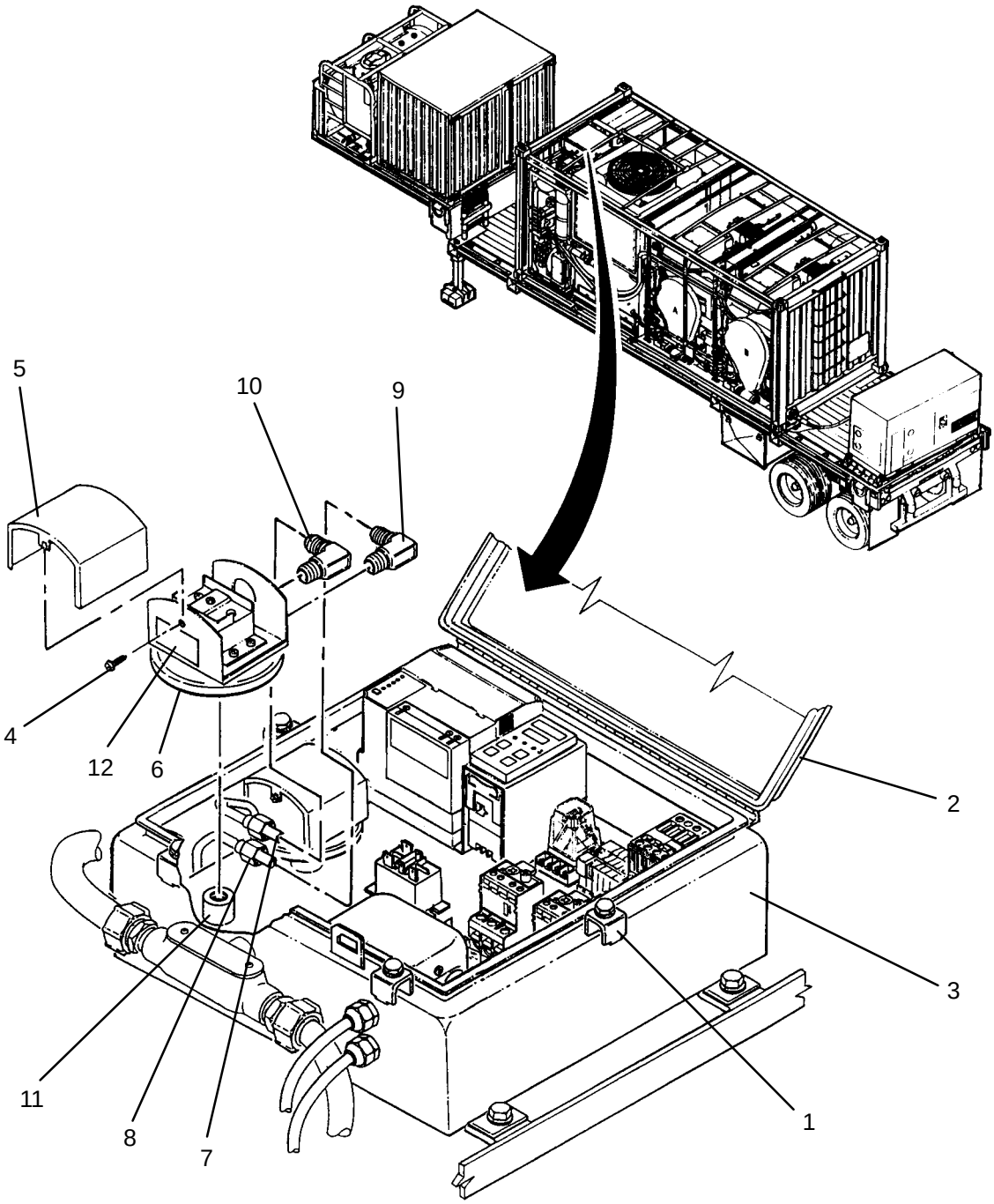
Equipment Conditions
LADS power shut off at main control enclosure (WP 0113 00).

REMOVAL

WARNING

Thermal fluid can reach temperatures near 400 degrees F when the heating system is operating. Allow thermal fluid and heating system piping to cool prior to performing maintenance. Always wear gloves and eye protection. Failure to follow this precaution could result in severe burn injuries.

1. Loosen four latches (1), then open door (2) on heater enclosure (3).
2. Remove screw (4), then remove cover (5) from pressure switch (6).
3. Tag and disconnect wires from pressure switch (6).
4. Disconnect tubes (7) and (8) at elbows (9) and (10).
5. Unthread pressure switch (6) from subpanel (11).
6. Remove elbows (9) and (10) from pressure switch (6).
7. Clean anti–seize tape from threads of elbows (9) and (10).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INSTALLATION

CAUTION

Air pressure switch should come with switching limit preset. Changing adjustment on switch could allow heater operation without adequate air flow, resulting in damage to heating system components.

1. Check label (12) on new pressure switch (6). Label should be marked 1823–2. If marking is not as stated, obtain correct pressure switch.
2. Apply anti–seize tape to threads of elbows (9) and (10).
3. Install elbows (9) and (10) into pressure switch (6) and orient as shown.
4. Thread pressure switch (6) onto subpanel (11).
5. Connect tube (7) and (8) at elbows (9) and (10).
6. Remove screw (4), then remove cover (5) from pressure switch (6).
7. Connect wires to pressure switch (6) as tagged.
8. Install cover (5) onto pressure switch (6), then secure with screw (4).
9. Close door (2) and secure to heater enclosure (3) by tightening four latches (1).

CAUTION

When the heater is operated with reduced air flow, black smoke will be generated in the combustion chamber. If the heater is allowed to operate in this condition for an extended period of time, the heater coils will become coated with soot leading to loss of heat transfer between the flame and the thermal fluid. Proper operation of the burner blower inlet and outlet pressure switches prevent heater combustion if inadequate air flow is sensed.

10. Use maintenance menu to test heating system (WP 0010 00). Verify normal operation.
11. Stop heating system. Perform cooling thermal fluid (WP 0010 00) until TE300 is 200 degrees F or less.

END OF WORK PACKAGE

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UNIT

LAUNDRY ADVANCED SYSTEM

(NSN 3510–01–463–0114)

CONTACTOR (MC301) REPLACEMENT REMOVAL, INSTALLATION

INITIAL SETUP:

Tools
Tool Kit, General Mechanics
(Item 14, WP 0282 00)
Multimeter (Item 2, WP 0282 00)

Personnel Required

Materials/Parts
Tags (Item 9, WP 0281 00)

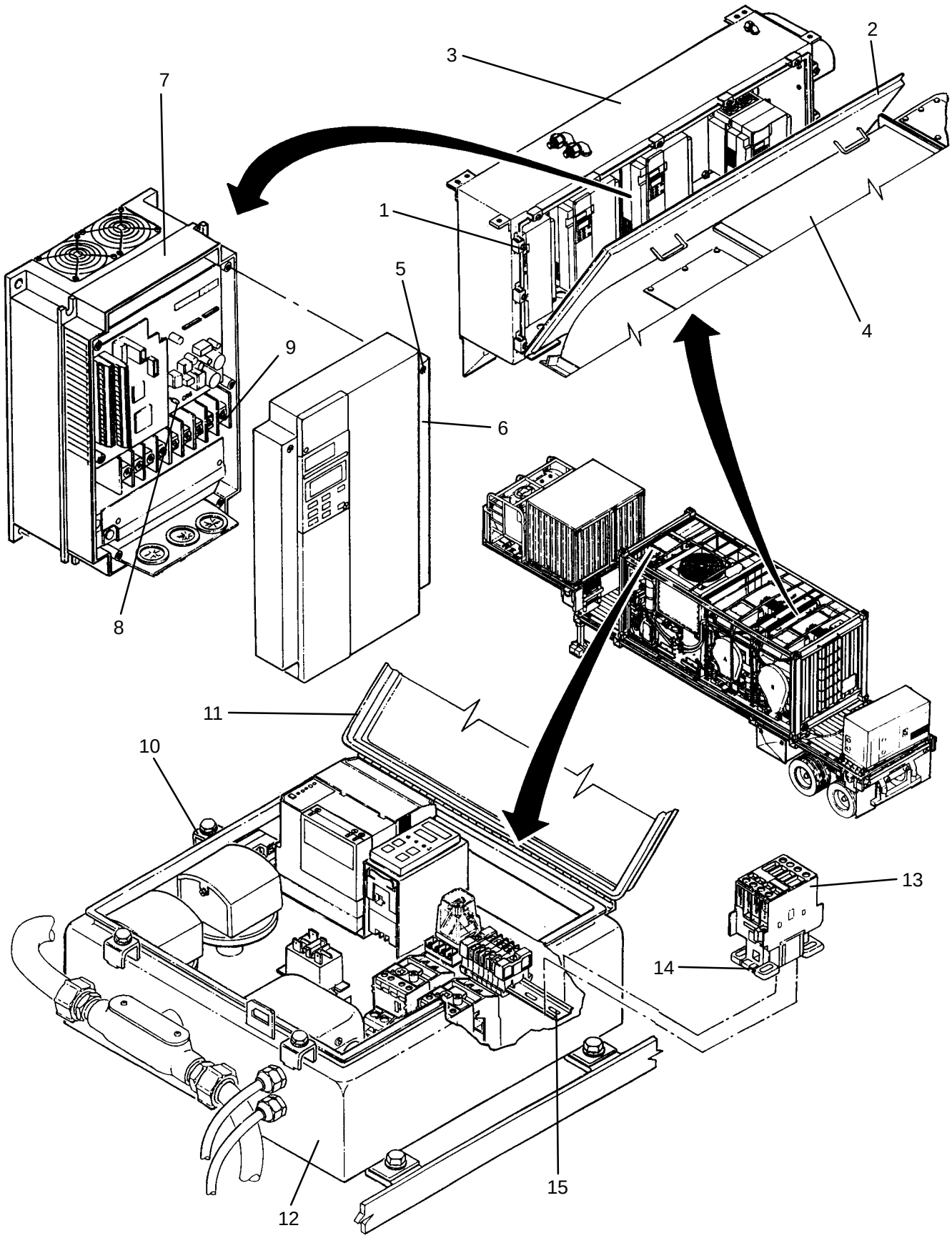
Equipment Conditions
LADS power shut off at main control enclosure (WP 0113 00).

REMOVAL

WARNING

The inverter drive must discharge before it is safe to disconnect wire connections. DEATH ON CONTACT may result if personnel fail to observe this safety precaution.

1. Loosen eleven latches (1), then open door (2) on inverter enclosure (3) and rest against drum (4).
2. Loosen two captive screws (5), then remove cover (6) from inverter drive (7).
3. Wait for CRG indicator (8) to go off, then use a multimeter to verify voltage is not present at output bus (9).
4. Install cover (6) onto inverter drive (7), then secure with two captive screws (5).
5. Place door (2) onto inverter enclosure (3), then secure by tightening eleven latches (1).
6. Loosen four latches (10), then open door (11) on heater enclosure (12).
7. Tag and disconnect wires from contactor (13).
8. Pull out on locking tab (14), then remove contactor (13) from mounting rail (15).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INSTALLATION

1. Pull out on locking tab (14), then install new contactor (13) onto mounting rail (15).
2. Connect wires to contactor (13) as tagged.
3. Close door (11) and secure to heater enclosure (12) by tightening four latches (10).
4. Use maintenance menu to test heating system (WP 0010 00). Verify normal operation.
5. Stop heating system. Perform cooling thermal fluid (WP 0010 00) until TE300 is 200 degrees F or less.

END OF WORK PACKAGE

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UNIT

LAUNDRY ADVANCED SYSTEM

(NSN 3510–01–463–0114)

OVERLOAD RELAY (OL301 OR OL302) REPLACEMENT REMOVAL, INSTALLATION

INITIAL SETUP:

Tools
Tool Kit, General Mechanics
(Item 14, WP 0282 00)
Multimeter (Item 2, WP 0282 00)

Personnel Required

Materials/Parts
Tags (Item 9, WP 0281 00)

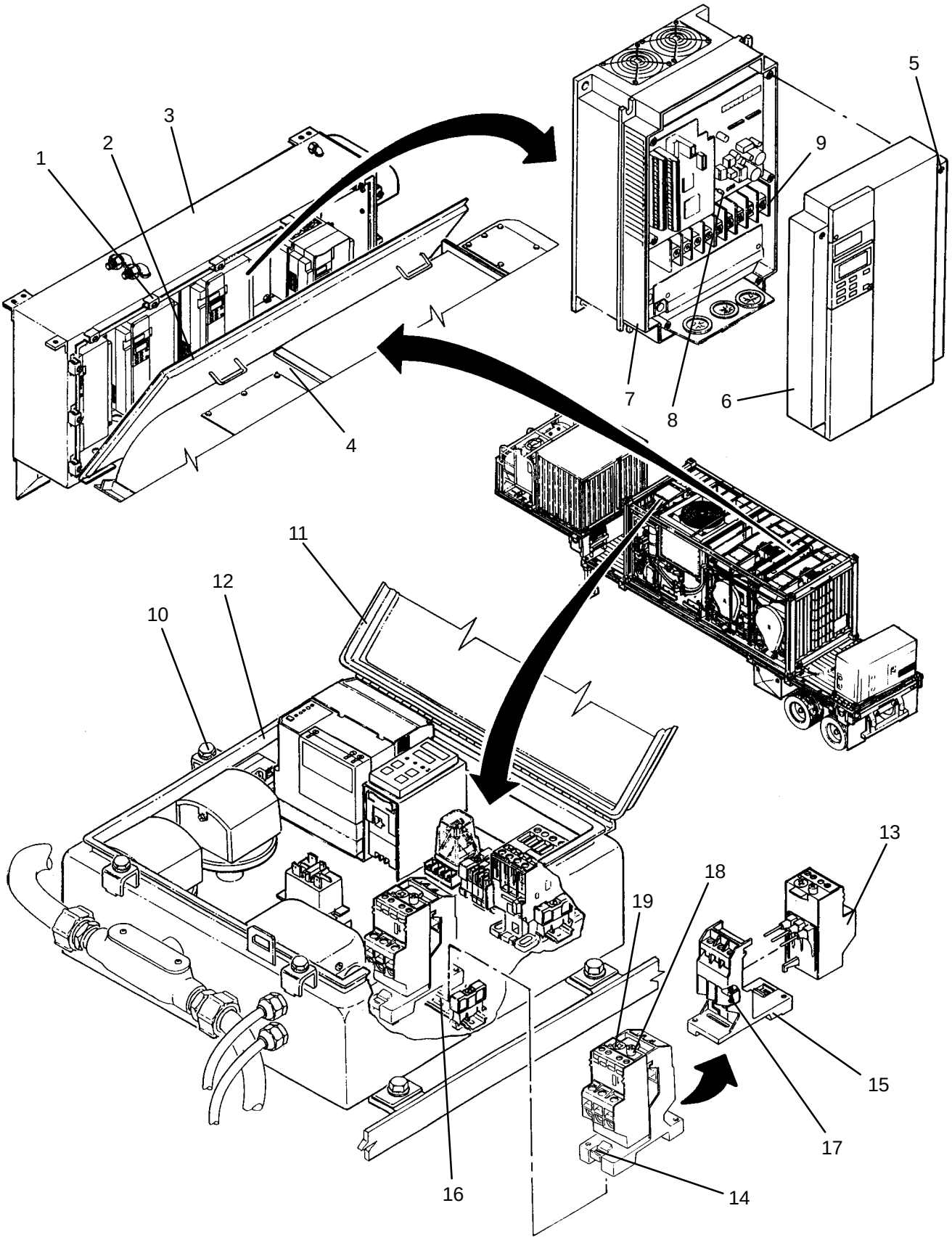
Equipment Conditions
LADS power shut off at main control enclosure (WP 0113 00).

REMOVAL

WARNING

The inverter drive must discharge before it is safe to disconnect wire connections. DEATH ON CONTACT may result if personnel fail to observe this safety precaution.

1. Loosen eleven latches (1), then open door (2) on inverter enclosure (3) and rest on drum (4).
2. Loosen two captive screws (5), then remove cover (6) from inverter drive (7).
3. Wait for CRG indicator (8) to go off, then use a multimeter to verify voltage is not present at output bus (9).
4. Install cover (6) onto inverter drive (7), then secure with two captive screws (5).
5. Close door (2) on inverter enclosure (3), then secure by tightening eleven latches (1).
6. Loosen four latches (10), then open door (11) on heater enclosure (12).
7. Tag and disconnect wires from overload relay (13).
8. Pull out on locking tab (14), then remove base adapter (15) from mounting rail (16).
9. Loosen three screw terminals (17), then pull overload relay (13) off of base adapter (15).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INSTALLATION

1. Insert new overload relay (13) into base adapter (15), then secure by tightening three screw terminals (17).
2. Pull out on locking tab (14), then install base adapter (15) onto mounting rail (16).
3. Connect wires to overload relay (13) as tagged.
4. Set reset control (18) to MO.
5. Adjust amperage control (19) to 8.8 for OL301 or 2.6 for OL302.
6. Close door (11) and secure to heater enclosure (12) by tightening four latches (10).
7. Use maintenance menu to test heating system (WP 0010 00). Verify normal operation.
8. Stop heating system. Perform cooling thermal fluid (WP 0010 00) until TE300 is 200 degrees F or less.

END OF WORK PACKAGE

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UNIT

LAUNDRY ADVANCED SYSTEM

(NSN 3510–01–463–0114)

HEATER CONTROL RELAY (CR300) REPLACEMENT REMOVAL, INSTALLATION

INITIAL SETUP:

Tools
Tool Kit, General Mechanics
(Item 14, WP 0282 00)

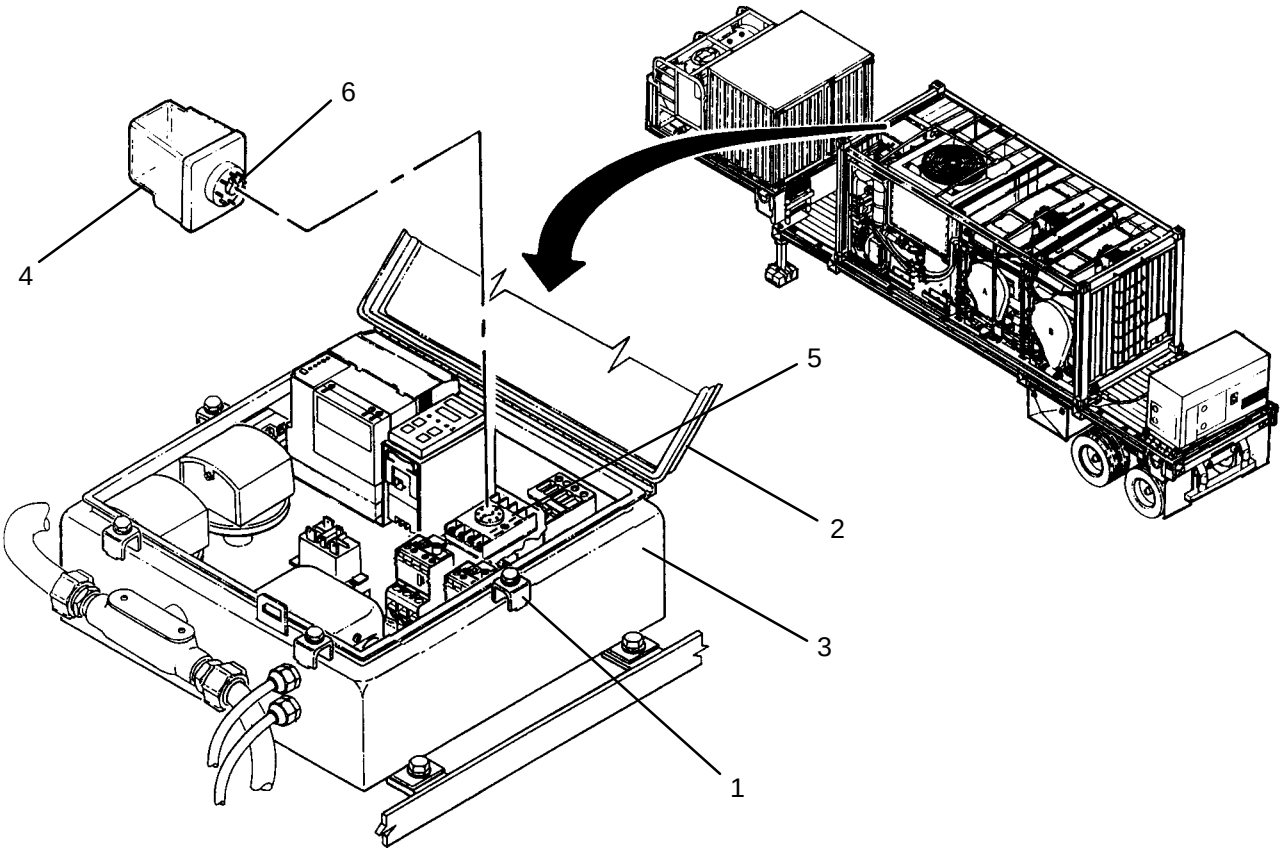
Personnel Required

Materials/Parts

Equipment Conditions
LADS power shut off at main control enclosure (WP 0113 00).

REMOVAL

1. Loosen four latches (1), then open door (2) on heater enclosure (3).
2. Unplug relay (4) from socket base (5).



INSTALLATION

1. Align key (6) on new relay (4), then insert relay into socket base (5).
2. Close door (2) and secure to heater enclosure (3) by tightening four latches (1).
3. Use maintenance menu to test heating system (WP 0010 00). Verify normal operation.
4. Stop heating system. Perform cooling thermal fluid (WP 0010 00) until TE300 is 200 degrees F or less.

END OF WORK PACKAGE

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UNIT

LAUNDRY ADVANCED SYSTEM

(NSN 3510–01–463–0114)

TEMPERATURE SWITCH RELAY (CR301) REPLACEMENT REMOVAL, INSTALLATION

INITIAL SETUP:

Tools
Tool Kit, General Mechanics
(Item 14, WP 0282 00)

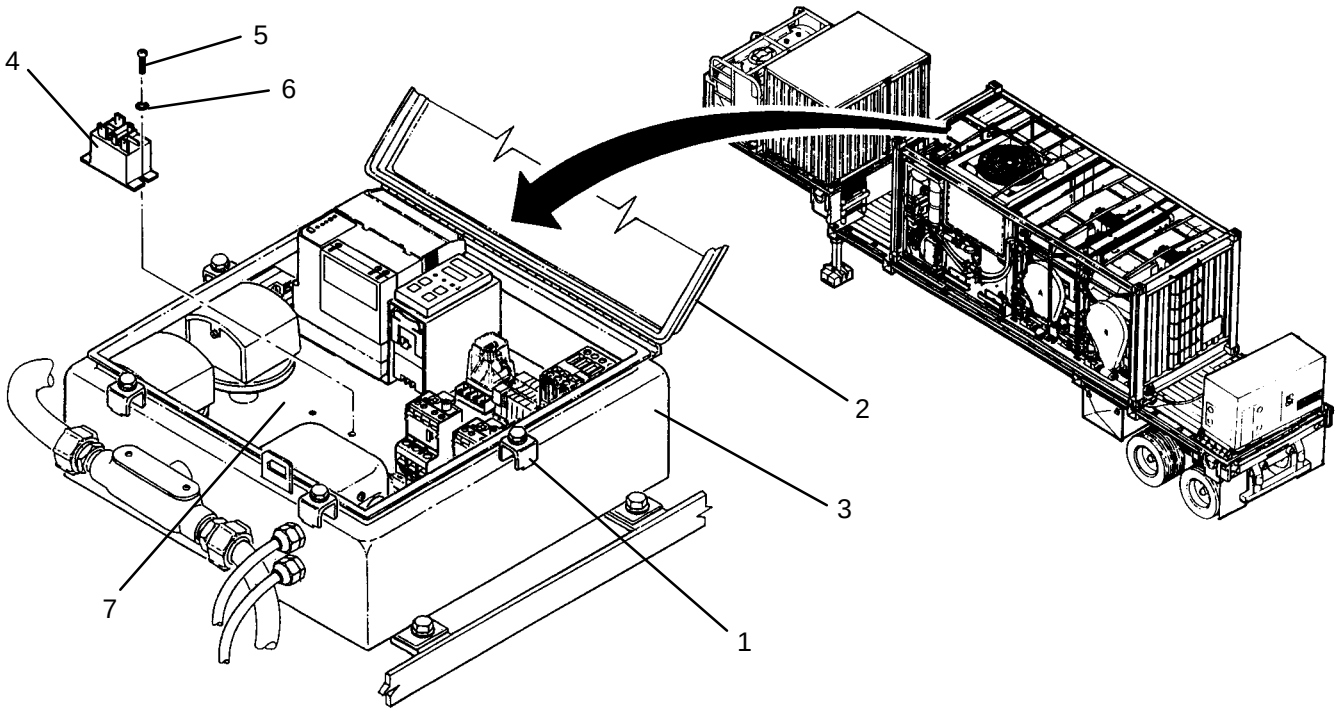
Personnel Required

Materials/Parts
Tags (Item 9, WP 0281 00)
Washer, Lock (Item 18, WP 0283 00)

Equipment Conditions
LADS power shut off at main control enclosure (WP 0113 00).

REMOVAL

1. Loosen four latches (1), then open door (2) on heater enclosure (3).
2. Tag and disconnect wires from relay (4).
3. Remove two screws (5) and lock washers (6), then remove relay (4) from subpanel (7).



INSTALLATION

1. Position new relay (4) onto subpanel (7), then secure with two screws (5) and lock washers (6).
2. Connect wires to relay (4) as tagged.
3. Close door (2) and secure to heater enclosure (3) by tightening four latches (1).
4. Use maintenance menu to test heating system (WP 0010 00). Verify normal operation.
5. Stop heating system. Perform cooling thermal fluid (WP 0010 00) until TE300 is 200 degrees F or less.

END OF WORK PACKAGE

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UNIT

LAUNDRY ADVANCED SYSTEM

(NSN 3510–01–463–0114)

AIR COMPRESSOR (M500) REPLACEMENT REMOVAL, INSTALLATION

INITIAL SETUP:

Tools
Multimeter (Item 2, WP 0282 00
Tool Kit, General Mechanics
(Item 14, WP 0282 00)

Personnel Required

Materials/Parts
Tape, Anti–Seize (Item 10, WP 0281 00)
Washer, Lock (Item 11, WP 0283 00)
Washer, Lock (Item 14, WP 0283 00)

Equipment Conditions
LADS power shut off at main control enclosure (WP 0113 00).
Air pressure must be vented (WP 0114 00).

REMOVAL

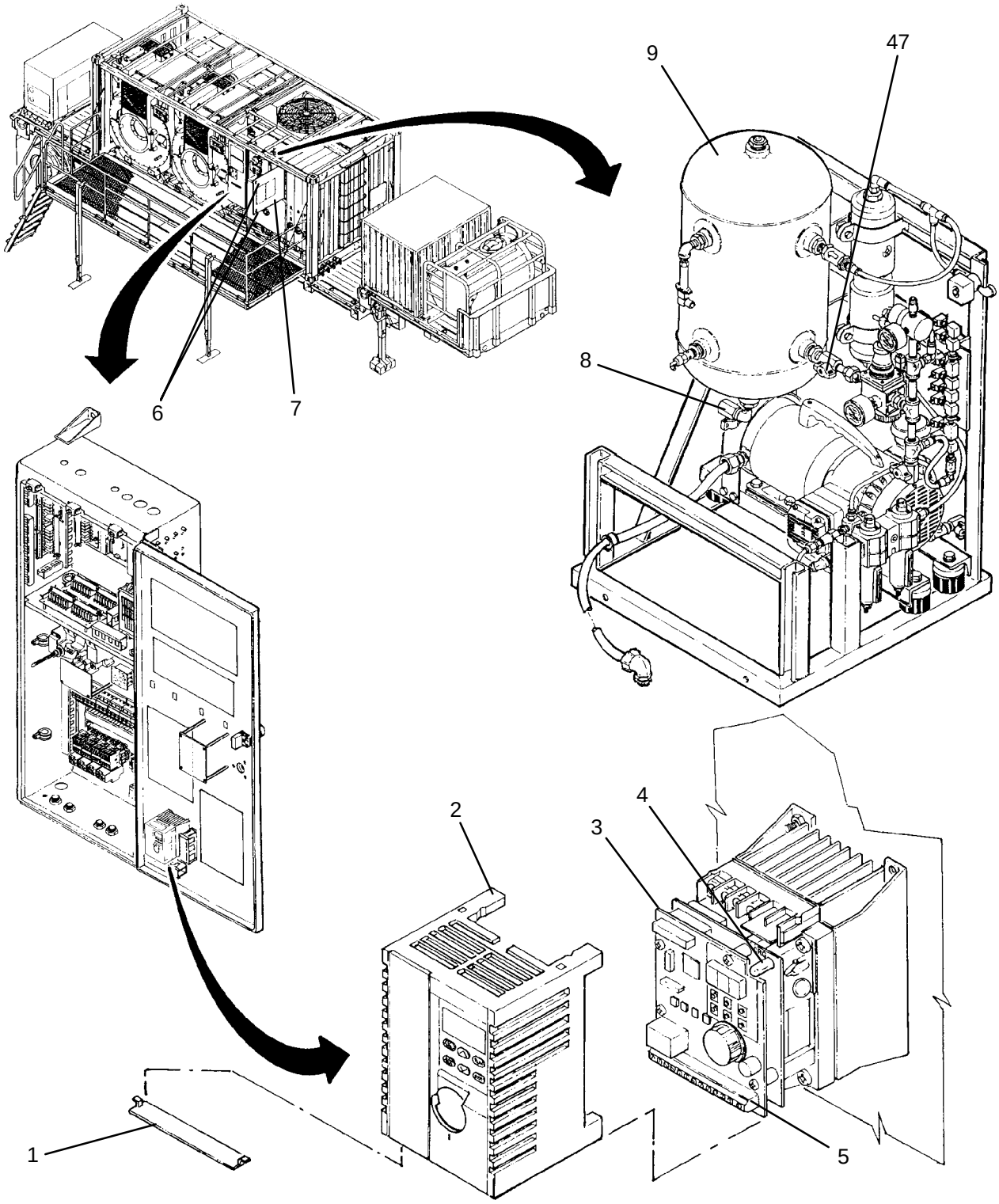
WARNING

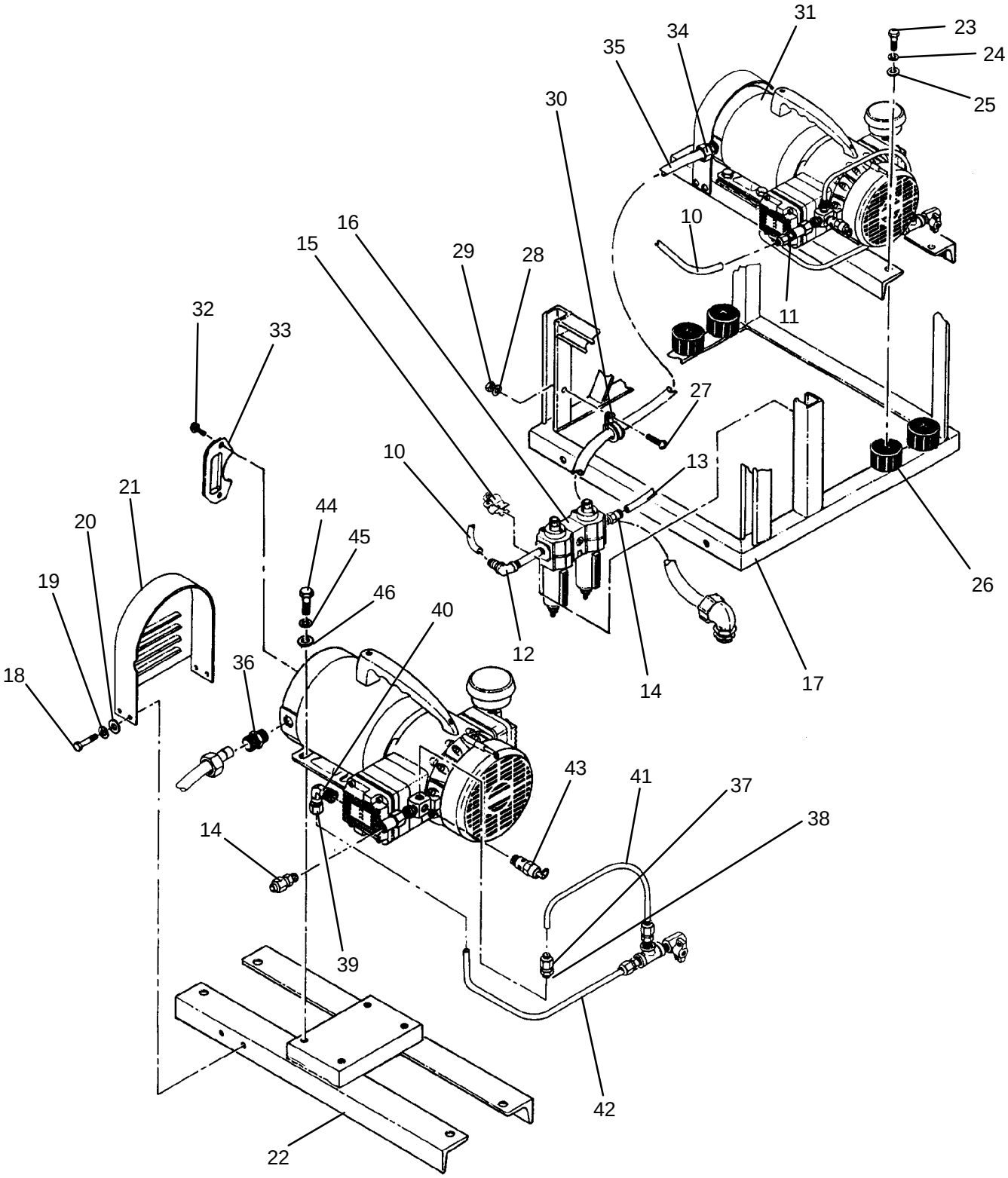
The inverter drive must discharge before it is safe to disconnect wire connections. DEATH ON CONTACT may result if personnel fail to observe this safety precaution.

1. Remove protective cover (1), then remove cover (2) from inverter drive (3).
2. Wait for CRG indicator (4) to go off, then use a multimeter to verify voltage is not present at terminal strip (5).
3. Install cover (2) onto inverter drive (3), then install protective cover (1).
4. Disengage two latches (6), then open access door (7).
5. Open valve (8) to ensure air has vented from air tank (9), then close valve.
6. Disconnect air tube (10) at adapters (11 and 12).
7. Disconnect air tube (13) at adapter (14).
8. Remove clamp (15) securing outlet filter assembly (16) to air system frame (17).
9. Remove four screws (18), lock washers (19), and flat washers (20), then remove cover (21) from mounting bracket (22).
10. Remove four screws (23), lock washers (24), and flat washers (25) securing mount bracket (22) to shock mounts (26).
11. Remove screw (27), flat washer (28), and nut (29) securing clamp (30) to air system frame (17).
12. Carefully slide air compressor (31) forward to gain access to wiring.
13. Remove two screws (32), then remove cover (33) from air compressor (31).
14. Tag and disconnect wires at air compressor (31).
15. Loosen conduit nut (34) then pull conduit (35) and wiring out of air compressor (31).
16. Lift air compressor (31) off of frame (17) being careful not to damage components above compressor.
17. Remove conduit straight connector (36) from air compressor (31).
18. Loosen nut (37) at adapter (38).
19. Loosen nut (39) at elbow (40) , then remove tubes (41 and 42).
20. Remove adapter (11), adapter (38), elbow (40), and relief valve (43) from air compressor (31).

REMOVAL – Continued

21. Remove four screws (44), lock washers (45), and flat washers (46), then remove air compressor (31) from mounting bracket (22).
22. Clean anti–seize tape from threads of adapter (11), adapter (38), elbow (40), and relief valve (43).

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INSTALLATION

1. Apply anti–seize tape to threads of adapter (11), adapter (38), elbow (40), and relief valve (43).
2. Position new air compressor (31) onto mounting bracket (22) then secure with four screws (44), lock washers (45), and flat washers (46).
3. Install adapter (11), adapter (38), elbow (40), and relief valve (43) into air compressor (31).
4. Install tubes (41 and 42) then tighten nuts (37 and 39).
5. Install conduit straight connector (36) into air compressor (31).
6. Lift air compressor (31) onto frame (17) being careful not to damage components above compressor. Position compressor to gain access to wiring.
7. Remove two screws (32), then remove cover (33) and from air compressor (31).
8. Insert conduit (35) and wiring into conduit straight connector (36) then tighten conduit nut (34).
9. Connect wires at air compressor (31) as tagged.
10. Install cover (33) and onto air compressor (31), then secure with two screws (32).
11. Carefully slide air compressor (31) rearward. Position air compressor onto frame (17) and align mounting holes with shock mounts (26).
12. Position cover (21) onto mounting bracket (22), then secure with four screws (18), lock washers (19), and flat washers (20).
13. Secure mount bracket (22) to shock mounts (26) with four screws (23), lock washers (24), and flat washers (25).
14. Position clamp (30) onto air system frame (17) then secure with screw (27), flat washer (28), and nut (29).
15. Install outlet filter assembly (16) to air system frame (17), then secure with clamp (15).
16. Connect air tube (13) at adapter (14).
17. Connect air tube (10) at adapters (11 and 12).
18. Test air compressor as follows:
    a. Close valve (47)
    b. Use maintenance menu to test air system (WP 0010 00).
    c. Record time. Start air system test.
    d. During air system test check for audible leaks at air tube connections.
    e. When air compressor (31) shuts off, record time. Air system must pressurize in 10 minutes or less.
    f. Stop air system test. Open valve (47).
19. Close access door (7) and secure by engaging two latches (6).

END OF WORK PACKAGE

UNIT

LAUNDRY ADVANCED SYSTEM

(NSN 3510–01–463–0114)

RELIEF VALVE REPLACEMENT
REMOVAL, INSTALLATION

INITIAL SETUP:

Tools
Tool Kit, General Mechanics
(Item 14, WP 0282 00)

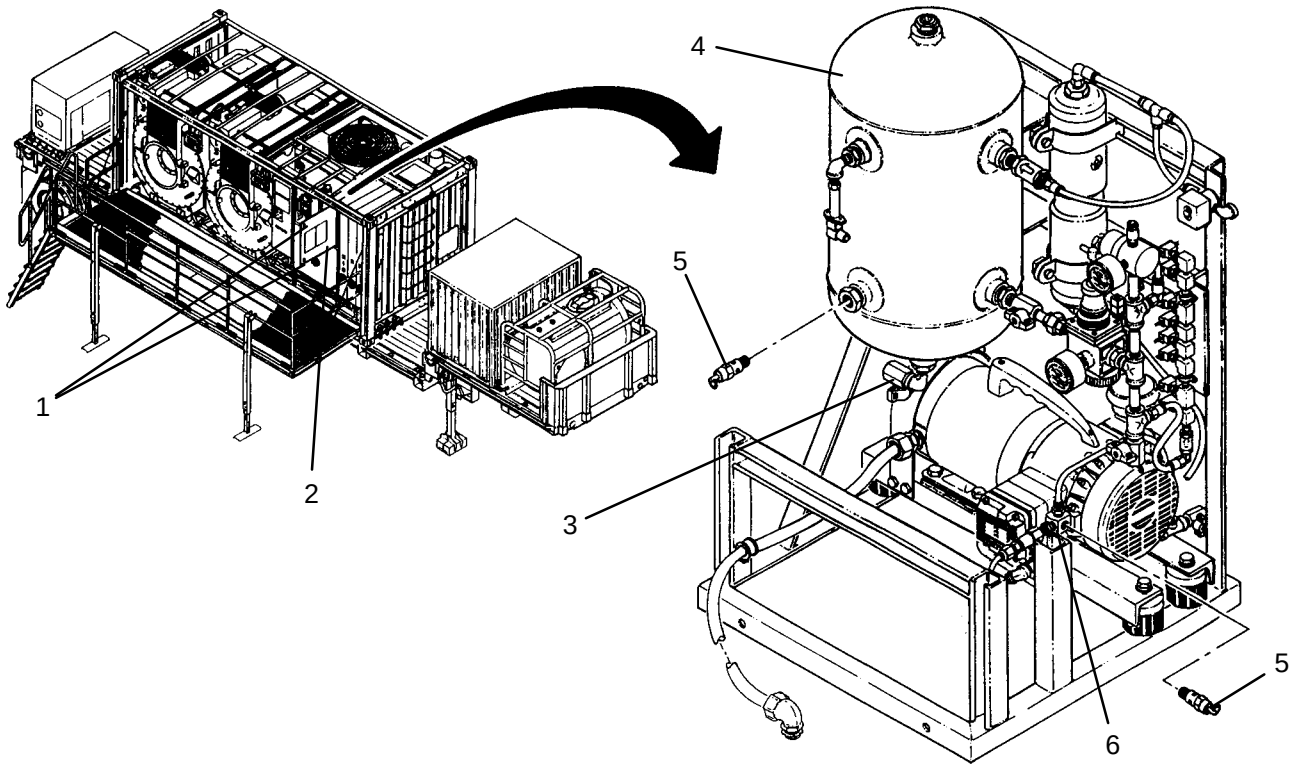
Personnel Required

Materials/Parts
Tape, Anti–Seize (Item 10, WP 0281 00)

Equipment Conditions
LADS power shut off at main control enclosure (WP 0113 00).
Air pressure must be vented (WP 0114 00).

REMOVAL

1. Disengage two latches (1), then open access door (2).
2. Open valve (3), to ensure air has vented from air tank (4), then close valve.
3. Unthread relief valve (5) from air tank (4) or manifold block (6).



INSTALLATION

1. Apply anti–seize tape to threads of new relief valve (5).
2. Thread relief valve (5) into tank (4) or manifold block (6).
3. Use maintenance menu to test air system (WP 0010 00). While air system is pressurizing, audibly check for air leaks.
4. Close access door (2) and secure by engaging two latches (1).

END OF WORK PACKAGE

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UNIT

LAUNDRY ADVANCED SYSTEM

(NSN 3510–01–463–0114)

OUTLET FILTER REPLACEMENT REMOVAL, INSTALLATION

INITIAL SETUP:

Tools
Tool Kit, General Mechanics
(Item 14, WP 0282 00)

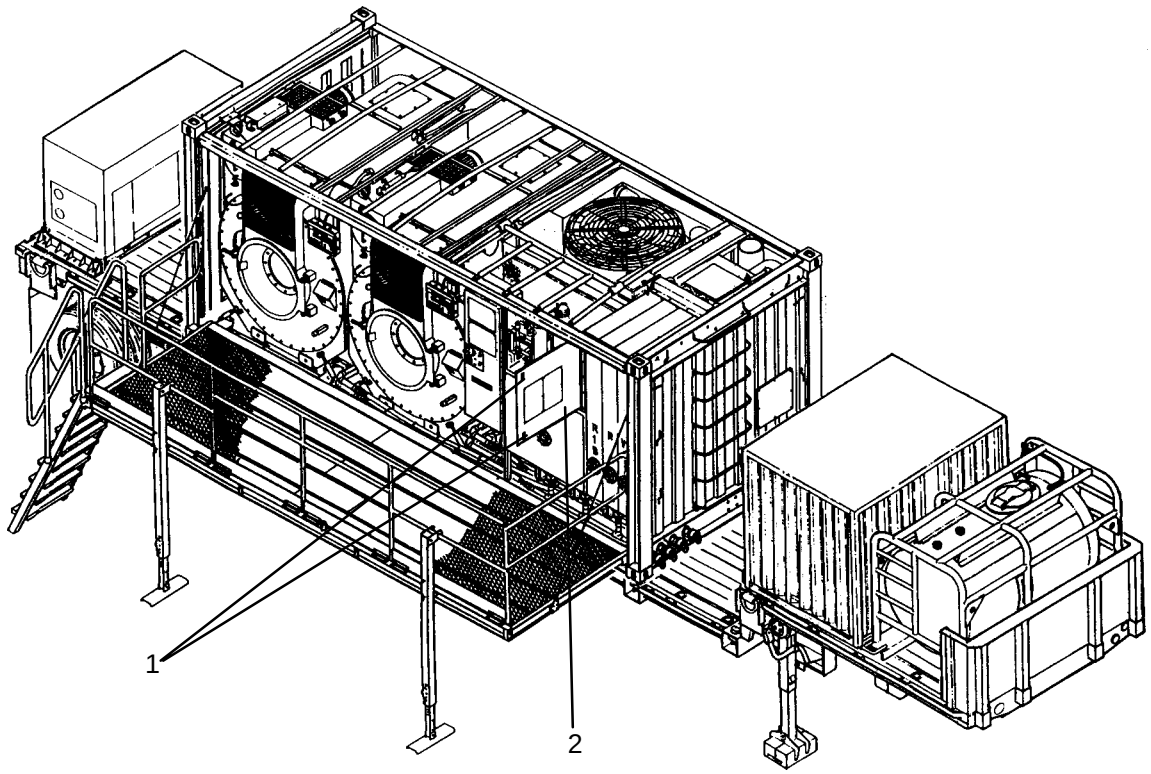
Personnel Required

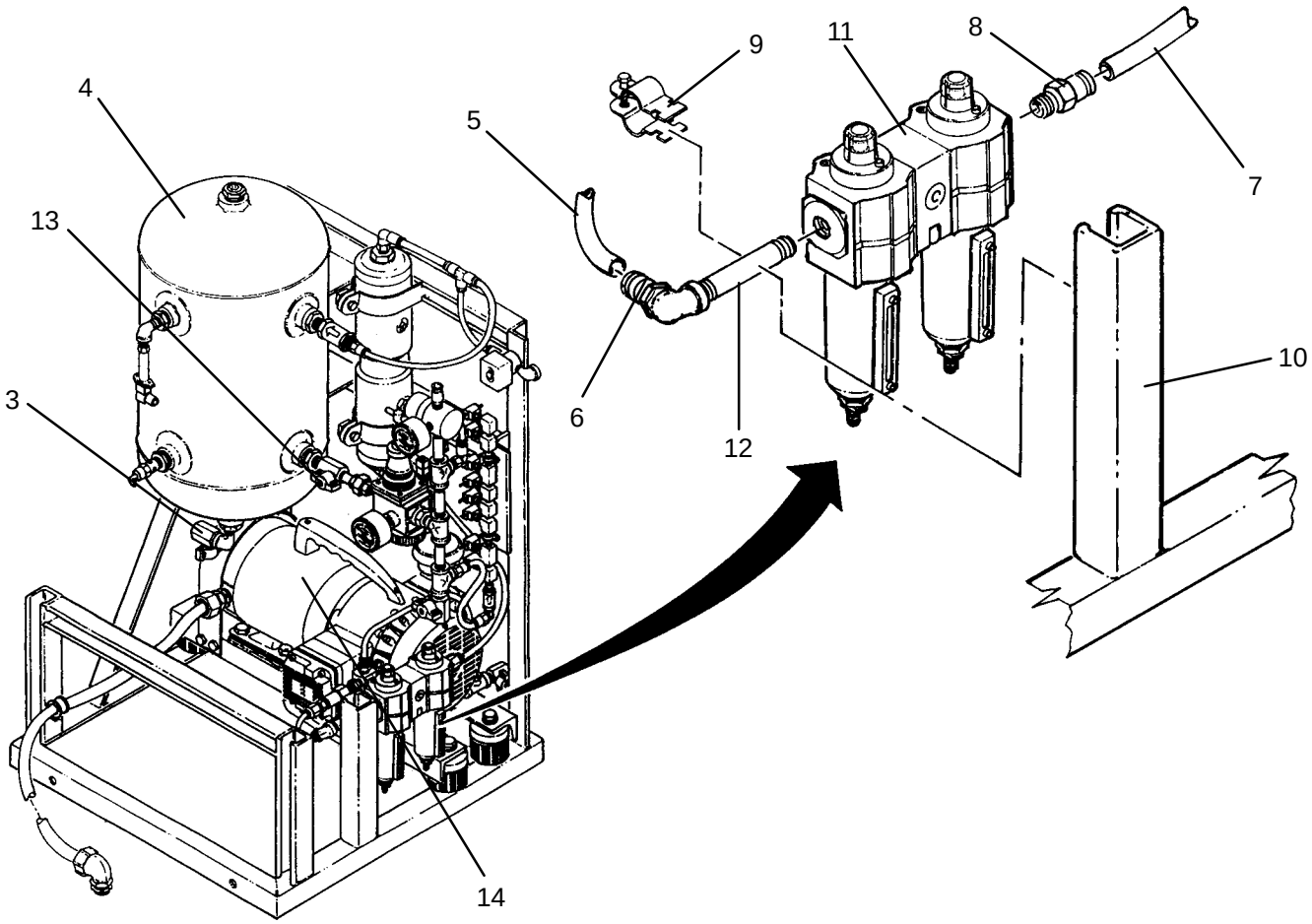
Materials/Parts
Tape, Anti–Seize (Item 10, WP 0281 00)

Equipment Conditions
LADS power shut off at main control enclosure (WP 0113 00).
Air pressure must be vented (WP 0114 00).

REMOVAL

1. Disengage two latches (1), then open access door (2).
2. Open valve (3), to ensure air has vented from air tank (4), then close valve.
3. Disconnect tube (5) from connector (6).
4. Disconnect tube (7) from connector (8).
5. Remove clamp (9) from bracket (10), then remove outlet filter (11).
6. Unthread nipple (12) and connector (8) from outlet filter (11).
7. Clean anti–seize tape from threads of connector (8) and nipple (12).





INSTALLATION

1. Apply anti–seize tape to threads of connector (8) and nipple (12).
2. Thread nipple (12) into inlet of new outlet filter (11). Orient as shown.
3. Thread connector (8) into outlet of filter (11).
4. Position outlet filter (11) on bracket (10), then secure with clamp (9).
5. Connect tube (7) to connector (8).
6. Connect tube (5) to connector (6).
7. Test air system as follows:
   a. Close valve (13).
   b. Use maintenance menu to test air system (WP 0010 00).
   c. Record time. Start air system test.
   d. During air system test, check for audible leaks at air tube connections.
   e. When air compressor (14) shuts off, record time. Air system must pressurize in 10 minutes or less.
   f. Stop air system test. Open valve (13).
8. Close access door (2) and secure by engaging two latches (1).

END OF WORK PACKAGE

UNIT

LAUNDRY ADVANCED SYSTEM

(NSN 3510–01–463–0114)

DEHYDRATOR REPLACEMENT REMOVAL, INSTALLATION

INITIAL SETUP:

Tools
Tool Kit, General Mechanics
(Item 14, WP 0282 00)

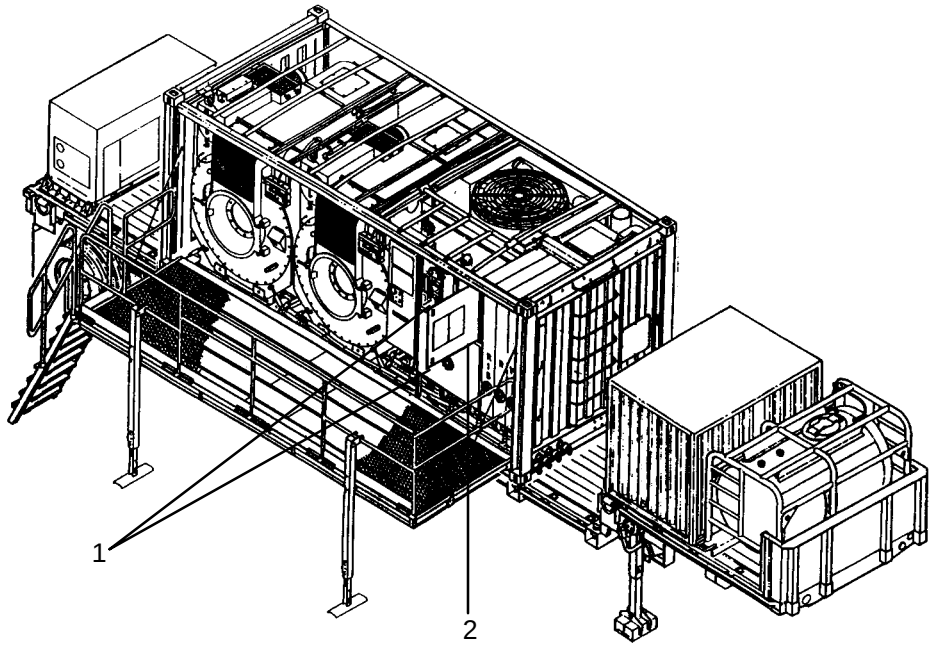
Personnel Required

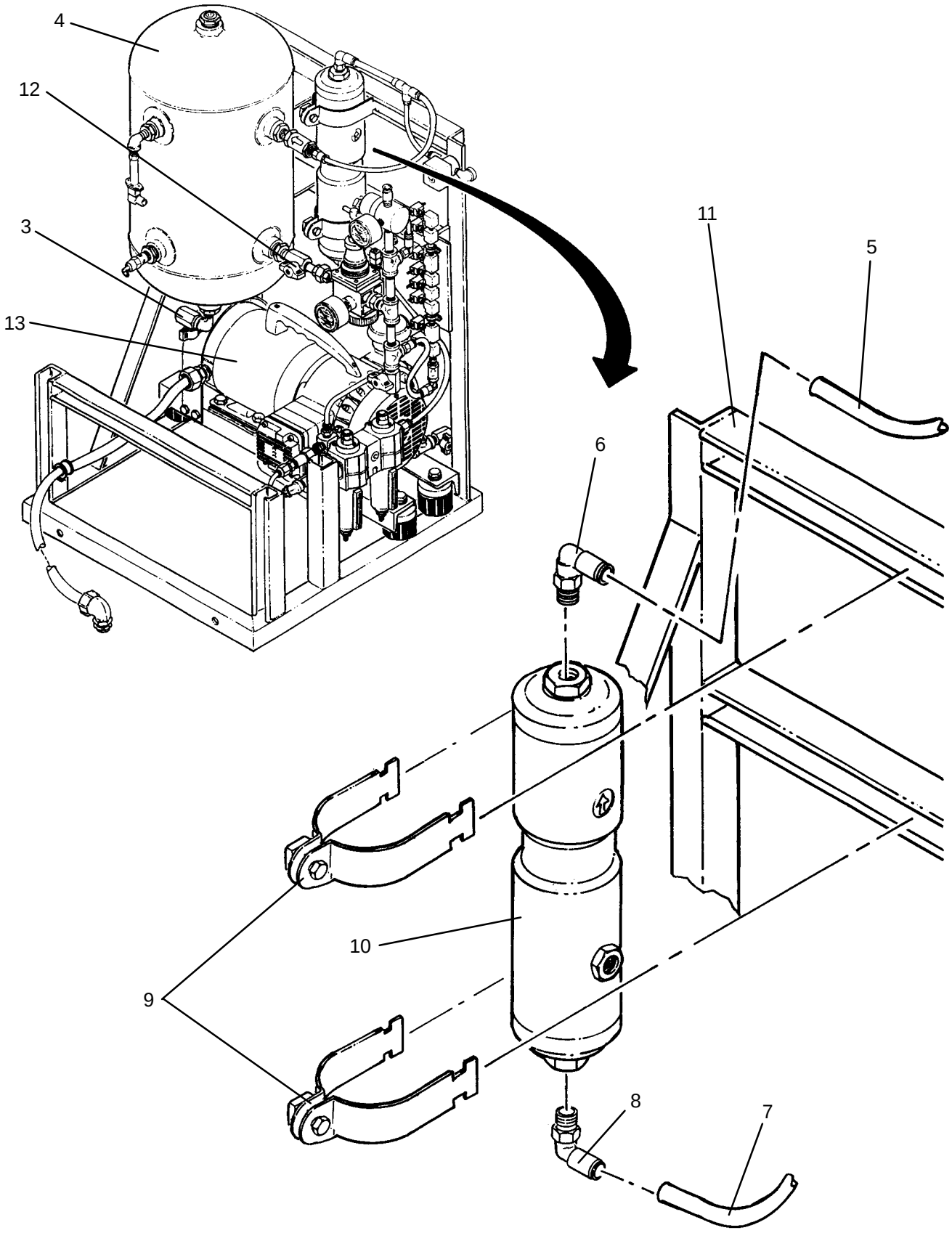
Materials/Parts
Tape, Anti–Seize (Item 10, WP 0281 00)

Equipment Conditions
LADS power shut off at main control enclosure (WP 0113 00).
Air pressure must be vented (WP 0114 00).

REMOVAL

1. Disengage two latches (1), then open access door (2).
2. Open valve (3), to ensure air has vented from air tank (4), then close valve.
3. Disconnect tube (5) from elbow (6).
4. Disconnect tube (7) from elbow (8).
5. Remove two clamps (9), then remove dehydrator (10) from frame (11).
6. Unthread elbow (6) from dehydrator (10).
7. Unthread elbow (8) from dehydrator (10).
8. Clean anti–seize tape from threads of elbows (6) and (8).

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INSTALLATION

1. Apply anti–seize tape to threads of elbows (6) and (8).
2. Thread elbow (6) into outlet and elbow (8) into inlet of dehydrator (10).
3. Position dehydrator (10) on frame (11), then secure with two clamps (9).
4. Connect tube (7) to elbow (8).
5. Connect tube (5) to elbow (6).
6. Test air system as follows:
   a. Close valve (12).
   b. Use maintenance menu to test air system (WP 0010 00).
   c. Record time. Start air system test.
   d. During air system test, check for audible leaks at air tube connections.
   e. When air compressor (13) shuts off, record time. Air system must pressurize in 10 minutes or less.
   f. Stop air system test. Open valve (12).
7. Close access door (2) and secure by engaging two latches (1).

END OF WORK PACKAGE

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UNIT

LAUNDRY ADVANCED SYSTEM

(NSN 3510–01–463–0114)

CHECK VALVE REPLACEMENT REMOVAL, INSTALLATION

INITIAL SETUP:

Tools
Tool Kit, General Mechanics
(Item 14, WP 0282 00)

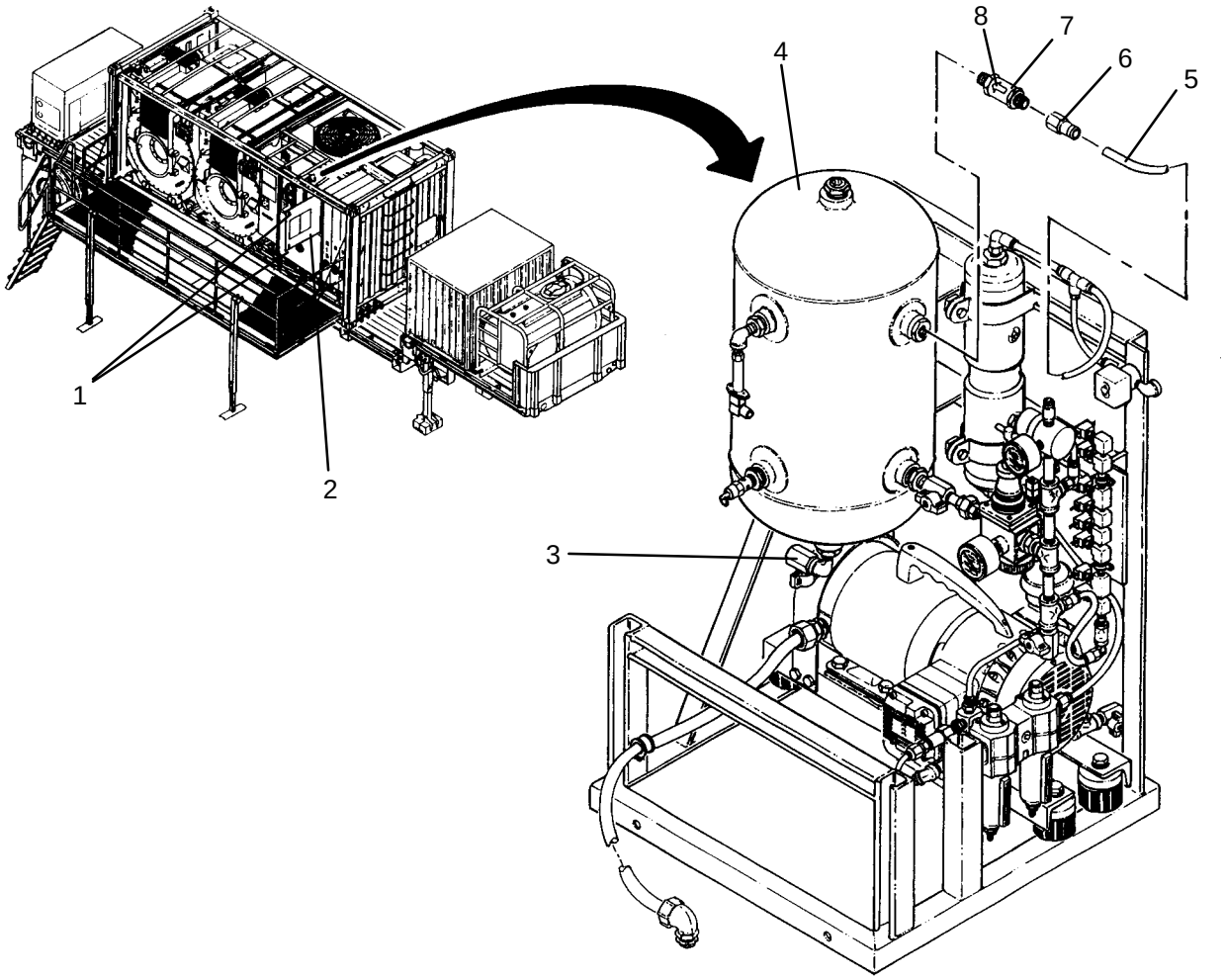
Personnel Required

Materials/Parts
Tape, Anti–Seize (Item 10, WP 0281 00)

Equipment Conditions
LADS power shut off at main control enclosure (WP 0113 00).
Air pressure must be vented (WP 0114 00).

REMOVAL

1. Disengage two latches (1), then open access door (2).
2. Open valve (3), to ensure air has vented from air tank (4), then close valve.
3. Disconnect tube (5) from connector (6).
4. Unthread connector (6) from check valve (7).
5. Unthread check valve (7) from air tank (4).



INSTALLATION

1. Apply anti–seize tape to threads of new check valve (7).
2. Thread check valve (7) into air tank (4) with direction arrow (8) pointing towards air tank.
3. Thread connector (6) onto check valve (7).
4. Connect tube (5) to connector (6).
5. Use maintenance menu to test air system (WP 0010 00). After air system is pressurized, audibly check for air leaks.
6. Close access door (2) and secure by engaging two latches (1).

END OF WORK PACKAGE

UNIT

LAUNDRY ADVANCED SYSTEM

(NSN 3510–01–463–0114)

TANK PRESSURE SENSOR (PT500) REPLACEMENT REMOVAL, INSTALLATION

INITIAL SETUP:

Tools
Tool Kit, General Mechanics
(Item 14, WP 0282 00)

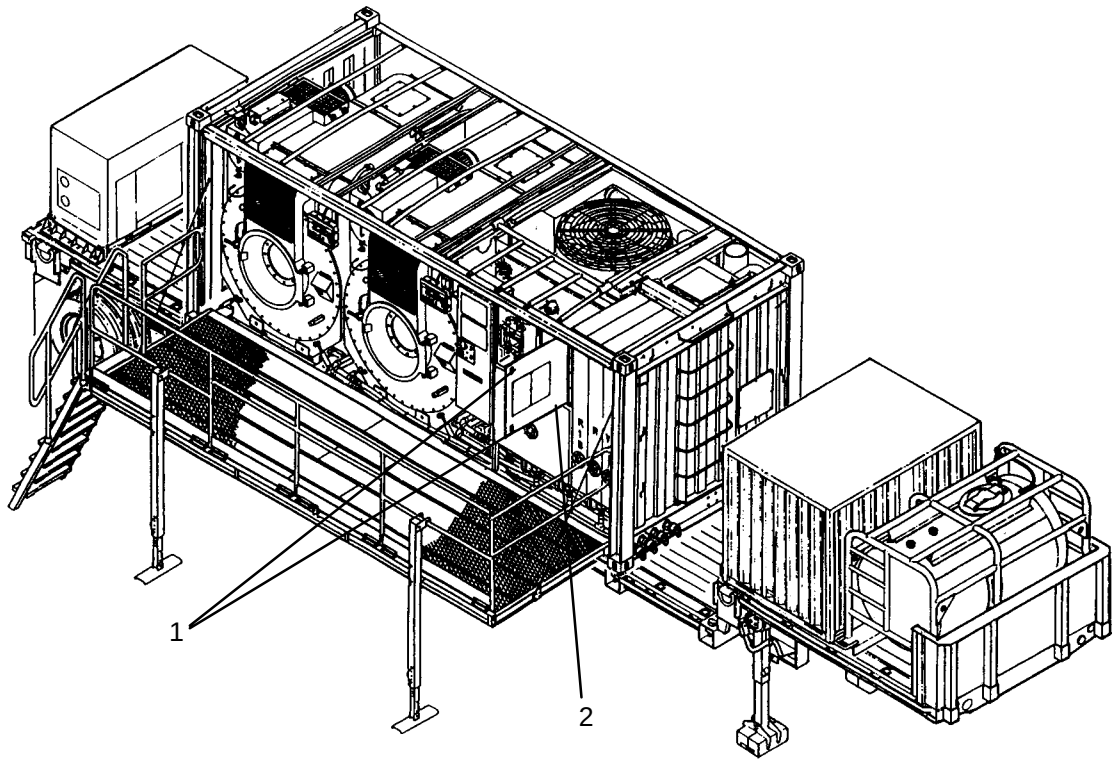
Personnel Required

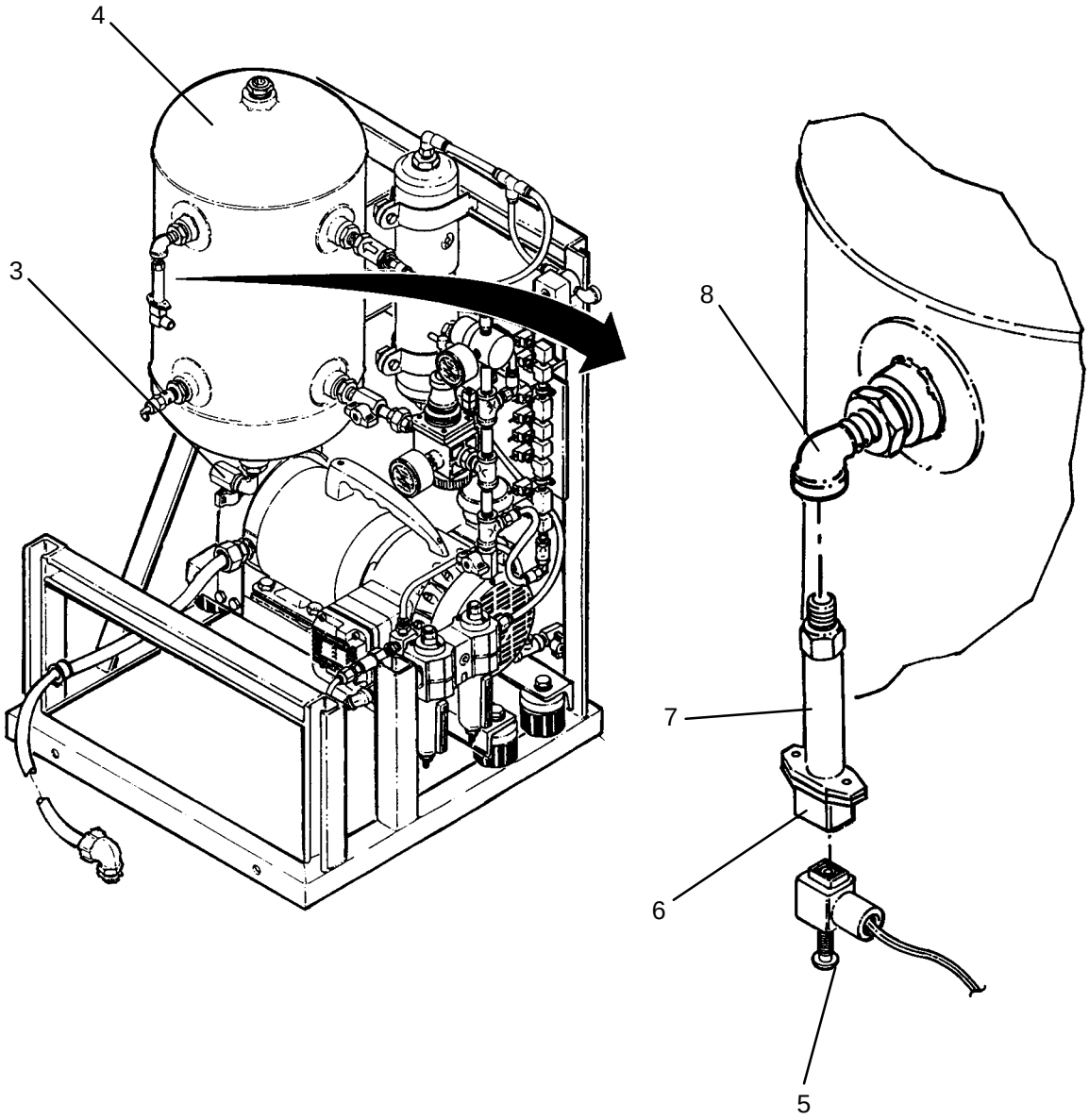
Materials/Parts
Tape, Anti–Seize (Item 10, WP 0281 00)

Equipment Conditions
LADS power shut off at main control enclosure (WP 0113 00).
Air pressure must be vented (WP 0114 00).

REMOVAL

1. Disengage two latches (1), then open access door (2).
2. Open valve (3) to ensure air has vented from air tank (4), then close valve.
3. Loosen screw (5), then disconnect electrical connector (6) from pressure sensor(7).
4. Unthread pressure sensor (7) from elbow (8).





INSTALLATION

1. Apply anti–seize tape to threads of new pressure sensor (7).
2. Thread pressure sensor (7) into elbow (8).
3. Connect electrical connector (6) to pressure sensor(7), then secure by tightening screw (5).
4. Access pressure sensor calibration function using maintenance menu (WP 0010 00). Set output of sensor PT500 to 0 psig.
5. Use maintenance menu to test air system. After air system is pressurized, audibly check for air leaks.
6. Close access door (2) and secure by engaging two latches (1).

END OF WORK PACKAGE

UNIT

LAUNDRY ADVANCED SYSTEM

(NSN 3510–01–463–0114)

PRODUCT PRESSURE SENSOR (PT501) REPLACEMENT
REMOVAL, INSTALLATION

INITIAL SETUP:

Tools
Tool Kit, General Mechanics
(Item 14, WP 0282 00)

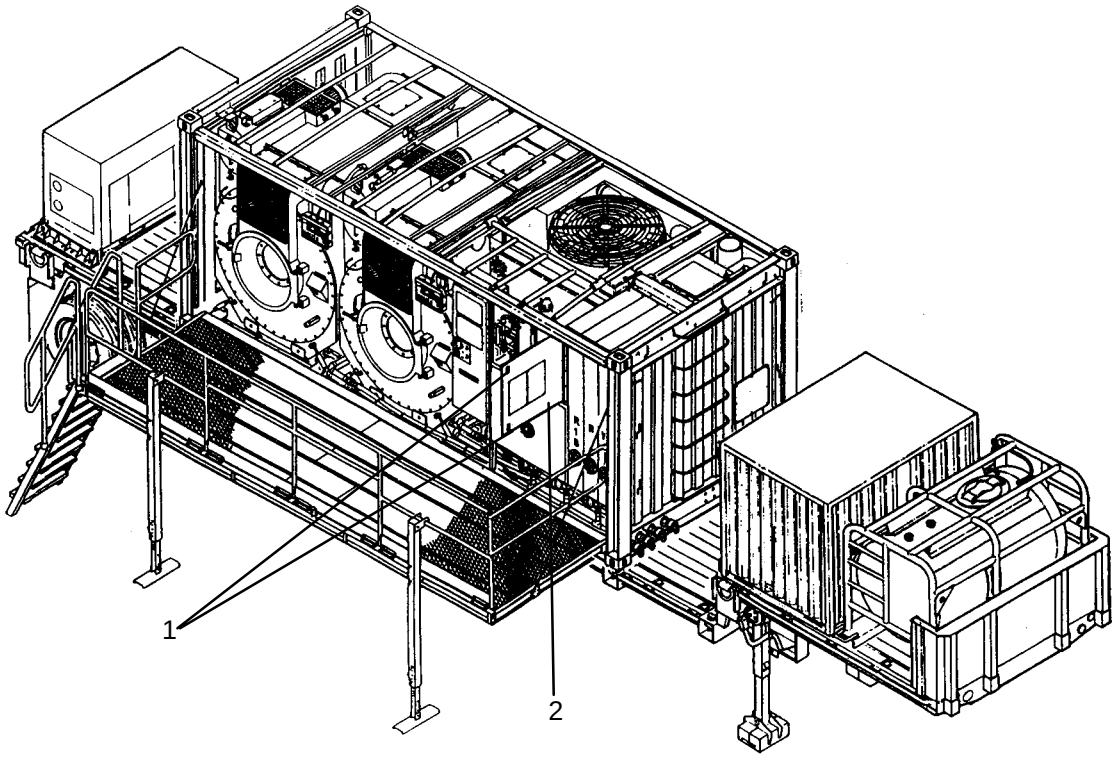
Personnel Required

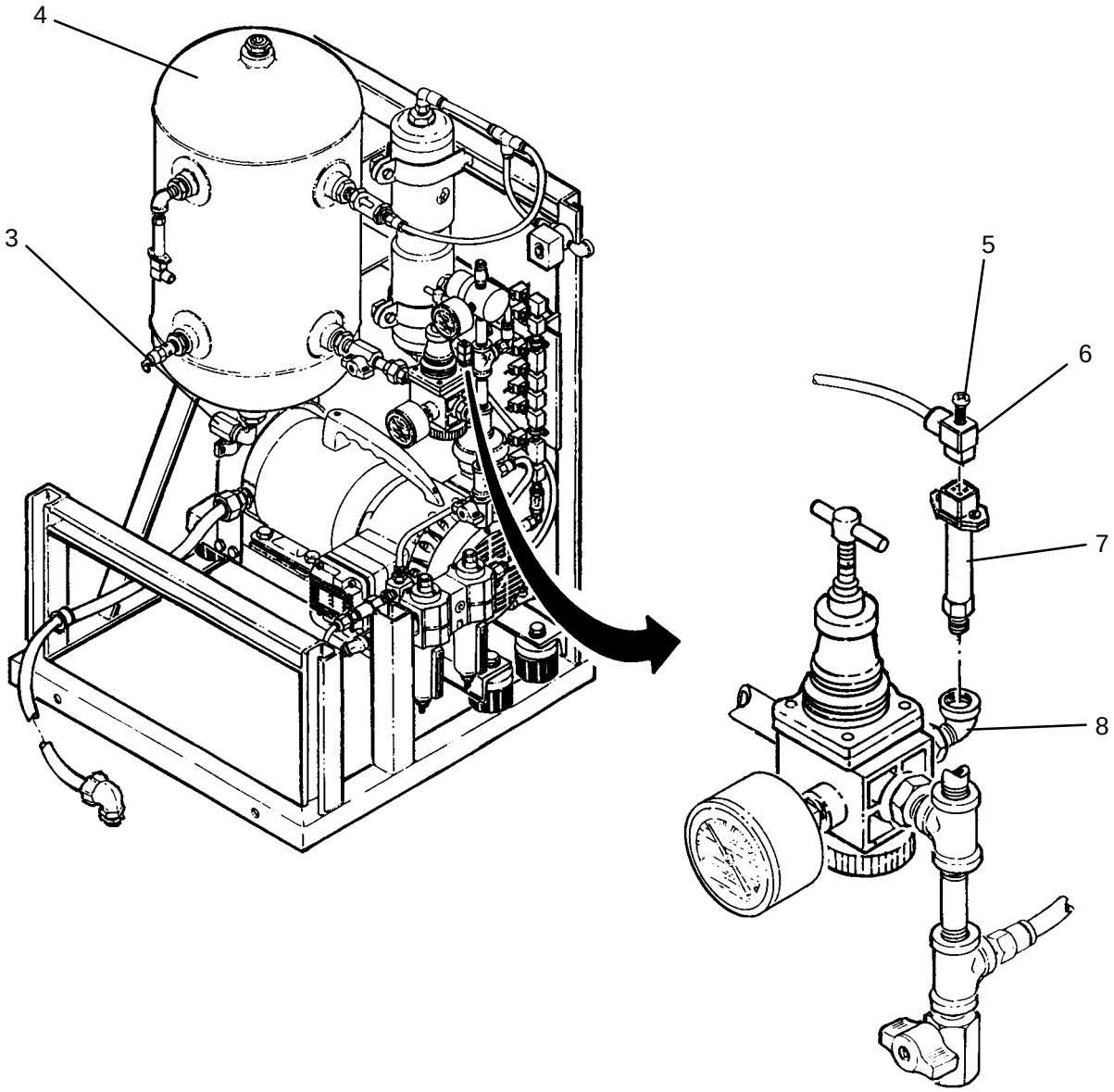
Materials/Parts
Tape, Anti–Seize (Item 10, WP 0281 00)

Equipment Conditions
LADS power shut off at main control enclosure (WP 0113 00).
Air pressure must be vented (WP 0114 00).

REMOVAL

1. Disengage two latches (1), then open access door (2).
2. Open valve (3), to ensure air has vented from air tank (4), then close valve.
3. Loosen screw (5), then disconnect electrical connector (6) from pressure sensor(7).
4. Unthread pressure sensor (7) from elbow (8).





INSTALLATION

1. Apply anti–seize tape to threads of new pressure sensor (7).
2. Thread pressure sensor (7) into elbow (8).
3. Connect electrical connector (6) to pressure sensor(7), then secure by tightening screw (5).
4. Access pressure sensor calibration function using maintenance menu (WP 0010 00), then set output of sensor PT501 to 0 psig.
5. Use maintenance menu to test air system. After air system is pressurized, audibly check for air leaks.
6. Close access door (2) and secure by engaging two latches (1).

END OF WORK PACKAGE

UNIT

LAUNDRY ADVANCED SYSTEM

(NSN 3510–01–463–0114)

PRODUCT PRESSURE REGULATOR (PR500) REPLACEMENT REMOVAL, INSTALLATION, ADJUSTMENT

INITIAL SETUP:

Tools
Tool Kit, General Mechanics
(Item 14, WP 0282 00)

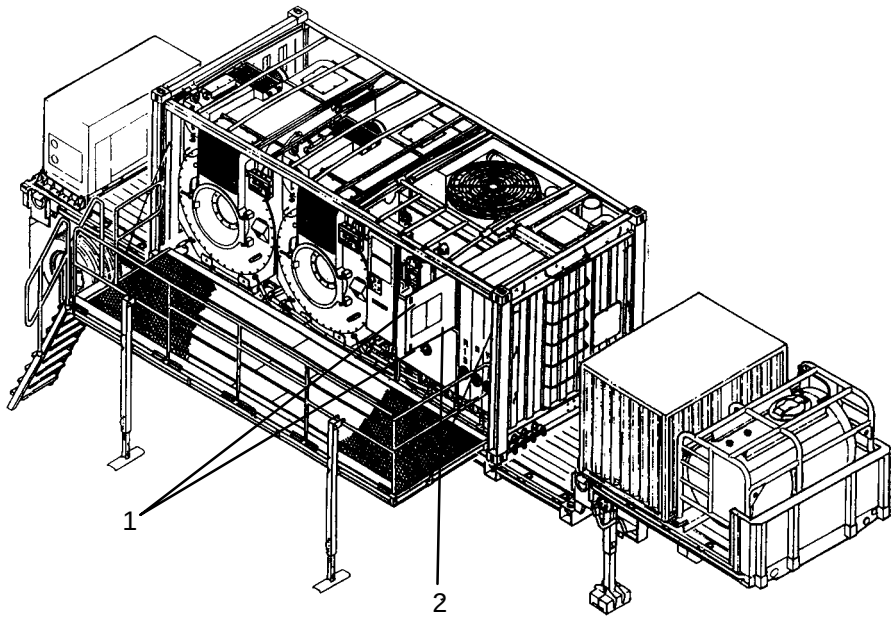
Personnel Required

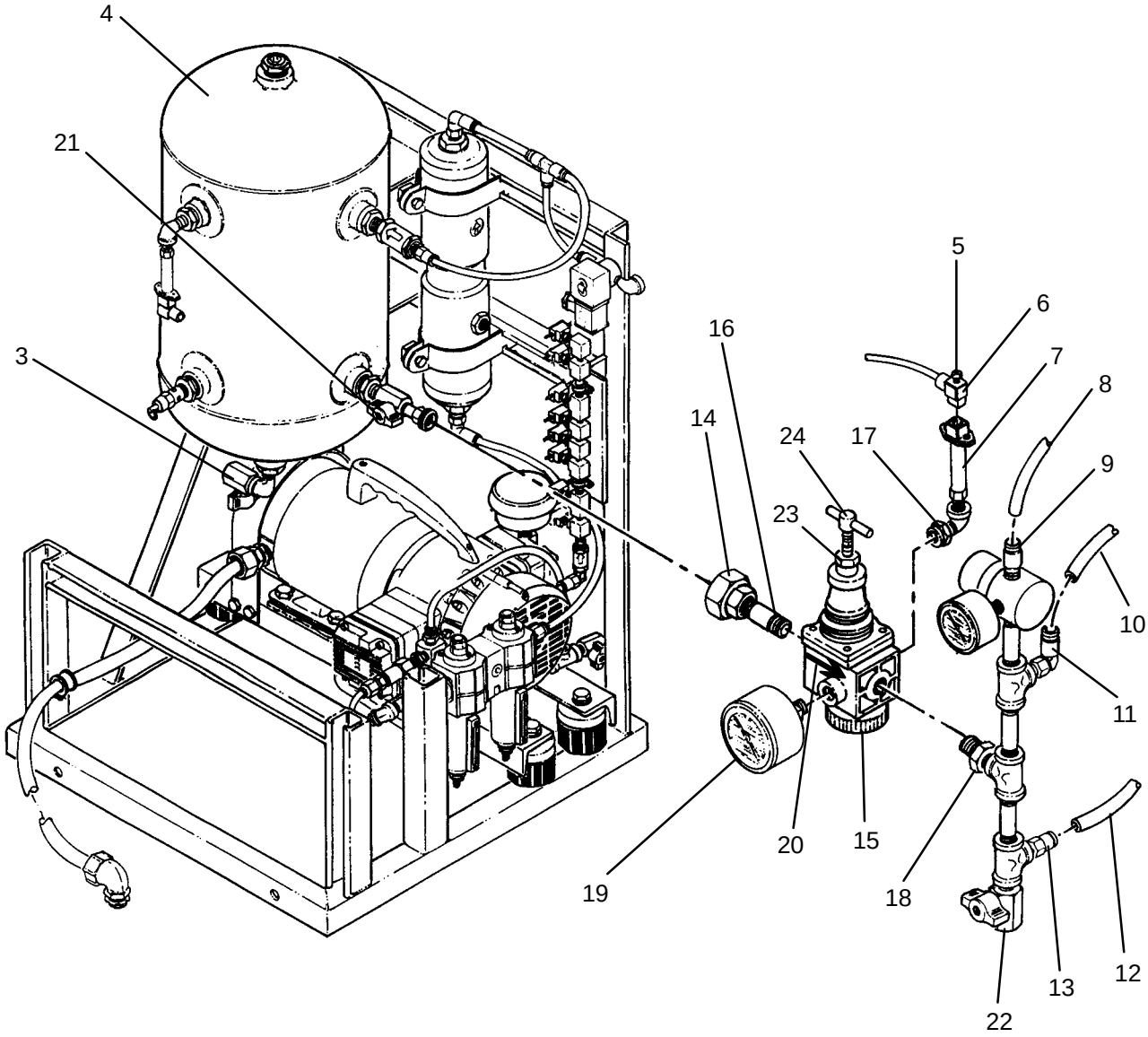
Materials/Parts
Tape, Anti–Seize (Item 10, WP 0281 00)

Equipment Conditions
LADS power shut off at main control enclosure (WP 0113 00).
Air pressure must be vented (WP 0114 00).

REMOVAL

1. Disengage two latches (1), then open access door (2).
2. Open valve (3), to ensure air has vented from air tank (4), then close valve.
3. Loosen screw (5), then disconnect electrical connector (6) from pressure sensor(7).
4. Disconnect tube (8) from connector (9).
5. Disconnect tube (10) from elbow (11).
6. Disconnect tube (12) from connector (13).
7. Disconnect union (14) to remove pressure regulator (15).
8. Unthread nipple (16) from pressure regulator (15).
9. Unthread hex bushing (17) from pressure regulator (15).
10. Unthread hex bushing (18) from pressure regulator (15).
11. Clean anti–seize tape from threads of nipple (16) and hex bushings (17) and (18).





INSTALLATION

1. Apply anti–seize tape to threads of nipple (16), hex bushings (17) and (18), and new pressure gauge (19).
2. Using direction arrow (20) for orientation, thread nipple (16) into inlet of new pressure regulator (15).
3. Thread pressure gauge (19) into pressure regulator (15).
4. Thread hex bushing (18) into pressure regulator (15).
5. Thread hex bushing (17) into pressure regulator (15).
6. Thread nipple (16) into pressure regulator (15).
7. Connect union (14) ensuring that pressure regulator (15) is properly oriented before tightening.
8. Connect tube (12) to connector (13).
9. Connect tube (10) to elbow (11).
10. Connect tube (8) to connector (9).
11. Connect electrical connector (6) to pressure sensor (7), then secure by tightening screw (5).

ADJUSTMENT

1. Close manual valve (21).
2. Open valve (22), allow product air to vent, then close valve.
3. Loosen jam nut (23), then turn adjusting knob (24) CCW until spring tension is removed from pressure regulator (15).
4. Use maintenance menu to test air system (WP 0010 00).
5. While air system is pressurizing, open manual valve (21).
6. Slowly turn adjusting knob (24) CW until product pressure is 80 to 81 psig.
7. Tighten jam nut (23) while holding adjusting knob (24) in position.
8. When air system is pressurized, audibly check for air leaks.
9. Close access door (2) and secure by engaging two latches (1).

END OF WORK PACKAGE

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UNIT

LAUNDRY ADVANCED SYSTEM

(NSN 3510–01–463–0114)

AIR BAG PRESSURE REGULATOR (PR501) REPLACEMENT REMOVAL, INSTALLATION

INITIAL SETUP:

Tools
Tool Kit, General Mechanics
(Item 14, WP 0282 00)

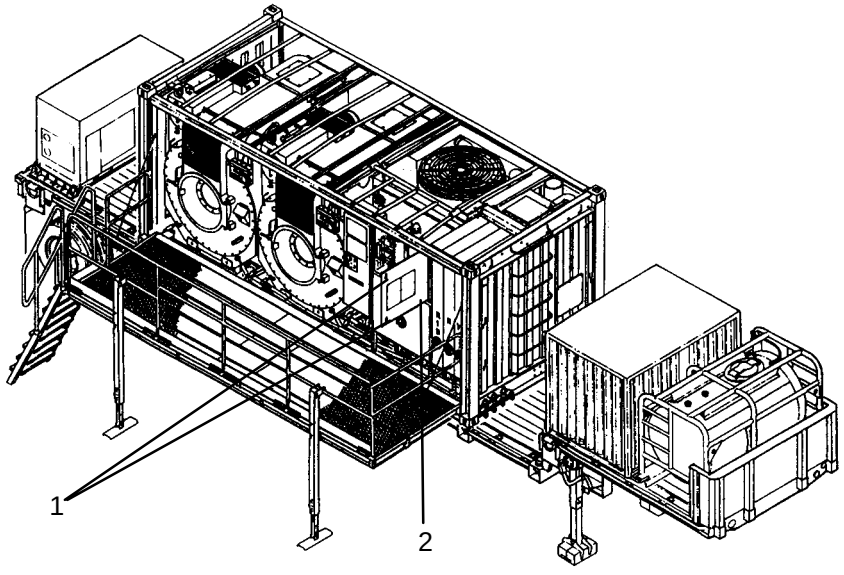
Personnel Required

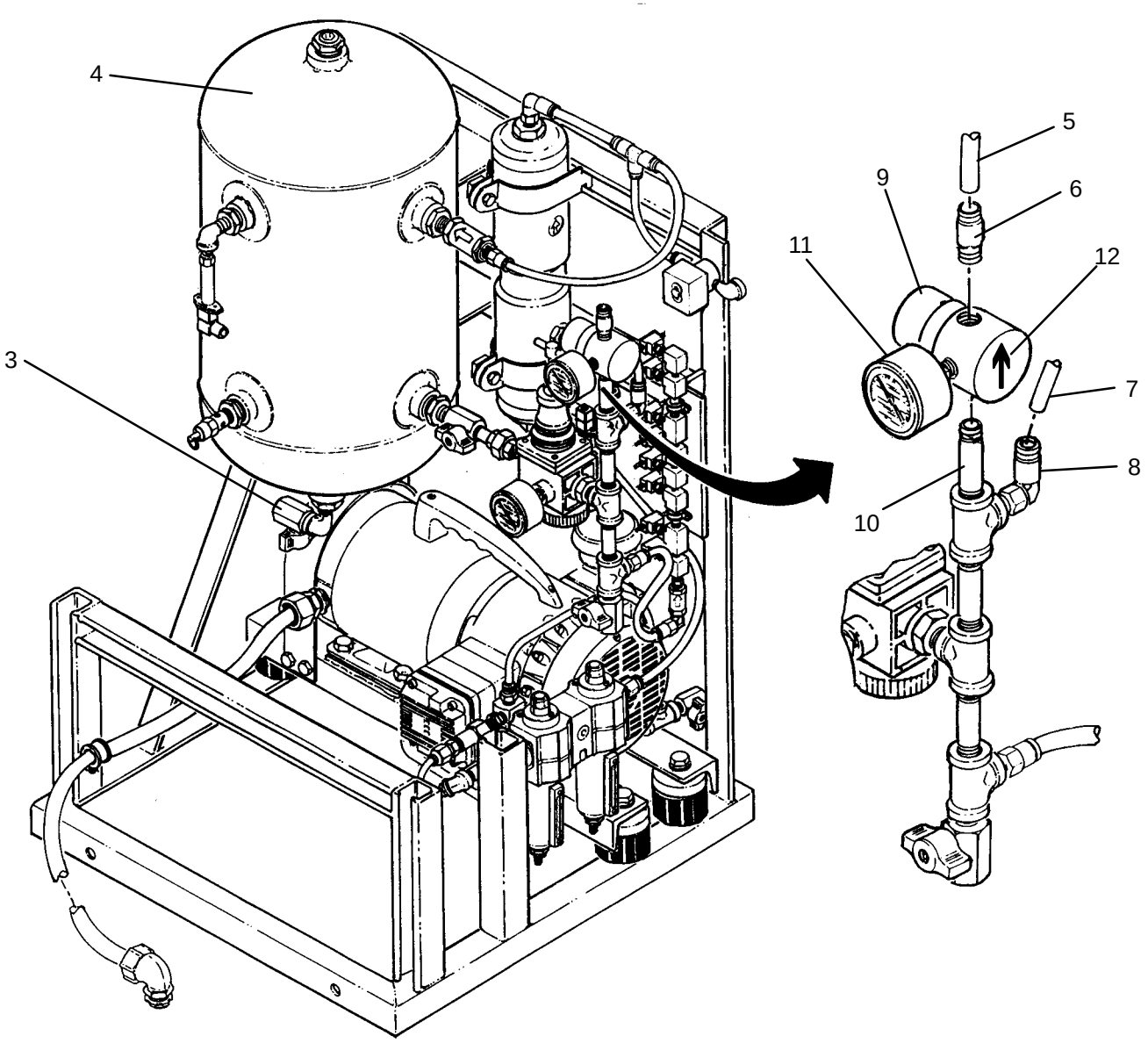
Materials/Parts
Tape, Anti–Seize (Item 10, WP 0281 00)

Equipment Conditions
LADS power shut off at main control enclosure (WP 0113 00).
Air pressure must be vented (WP 0114 00).

REMOVAL

1. Disengage two latches (1), then open access door (2).
2. Open valve (3), to ensure air has vented from air tank (4), then close valve.
3. Disconnect tube (5) from connector (6).
4. Disconnect tube (7) from elbow (8).
5. Unthread pressure regulator (9) from nipple (10).
6. Unthread connector (6) from pressure regulator (9).
7. Clean anti–seize tape from threads of connector (6) and nipple (10).





INSTALLATION

1. Apply anti–seize tape to threads of nipple (10), connector (6) and new pressure gauge (11).
2. Using direction arrow (12) for orientation, thread connector (6) into outlet of new pressure regulator (9).
3. Thread pressure gauge (11) into pressure regulator (9).
4. Thread pressure regulator (9) onto nipple (10).
5. Connect tube (7) to elbow (8).
6. Connect tube (5) to connector (6).
7. Use maintenance menu to test air system (WP 0010 00).
8. When air system is pressurized, audibly check for air leaks.
9. Monitor pressure gauge (11). Verify pressure is between 64 and 66 psig.
10. Close access door (2) and secure by engaging two latches (1).

END OF WORK PACKAGE

UNIT

LAUNDRY ADVANCED SYSTEM

(NSN 3510–01–463–0114)

PRIMARY ORIFICE REPLACEMENT
REMOVAL, INSTALLATION

INITIAL SETUP:

Tools
Tool Kit, General Mechanics
(Item 14, WP 0282 00)

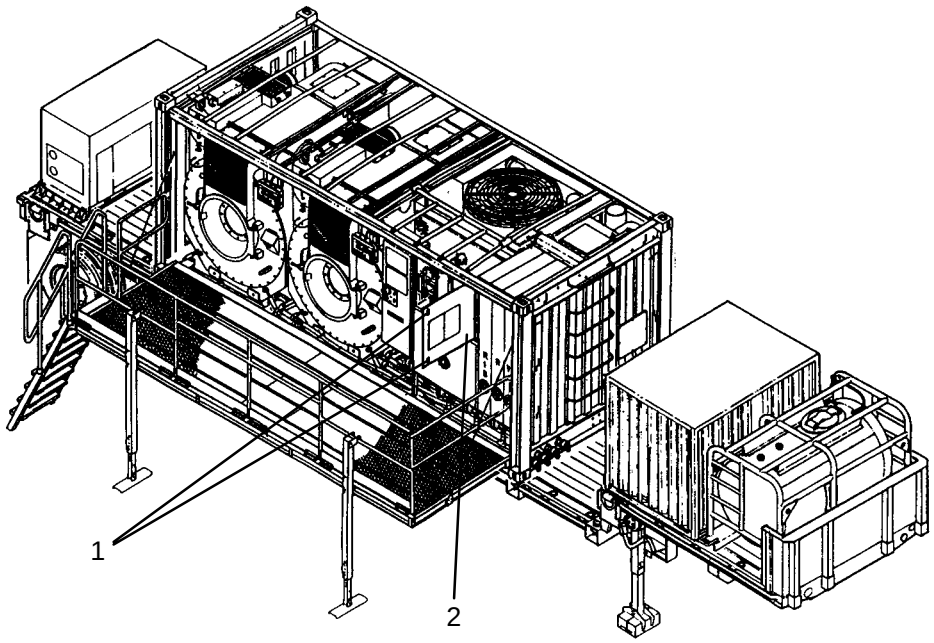
Personnel Required

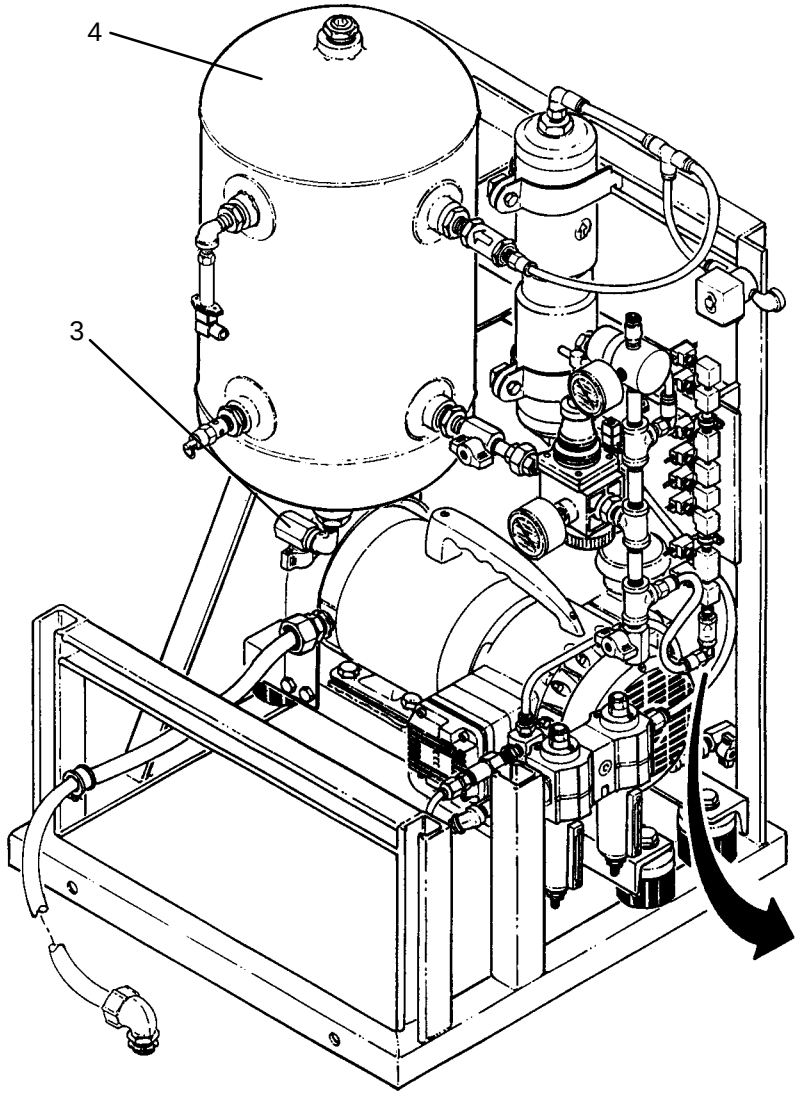
Materials/Parts
Tape, Anti–Seize (Item 10, WP 0281 00)

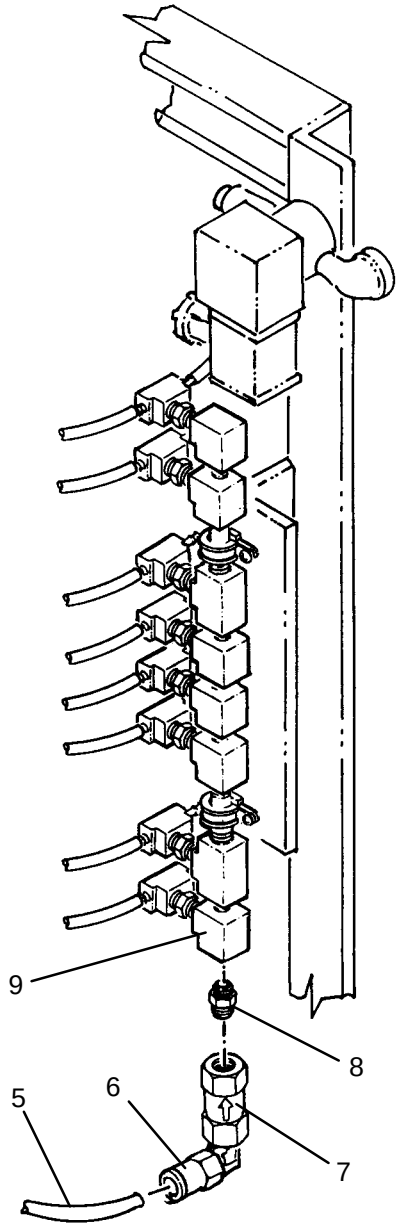
Equipment Conditions
LADS power shut off at main control enclosure (WP 0113 00).
Air pressure must be vented (WP 0114 00).

REMOVAL

1. Disengage two latches (1), then open access door (2).
2. Open valve (3), to ensure air has vented from air tank (4), then close valve.
3. Disconnect tube (5) from elbow (6).
4. Unthread filter (7) from primary orifice (8).
5. Unthread primary orifice (8) from orifice manifold (9).







INSTALLATION

1. Apply anti–seize tape to threads of new primary orifice (8).
2. Thread primary orifice into orifice manifold (9).
3. Thread filter (7) onto primary orifice (8).
4. Connect tube (5) to elbow (6).
5. Use maintenance menu to test air system (WP 0010 00). After air system is pressurized, audibly check for air leaks.
6. Close access door (2) and secure by engaging two latches (1).

END OF WORK PACKAGE

UNIT

LAUNDRY ADVANCED SYSTEM

(NSN 3510–01–463–0114)

SECONDARY ORIFICE REPLACEMENT
REMOVAL, INSTALLATION

INITIAL SETUP:

Tools
Tool Kit, General Mechanics
(Item 14, WP 0282 00)

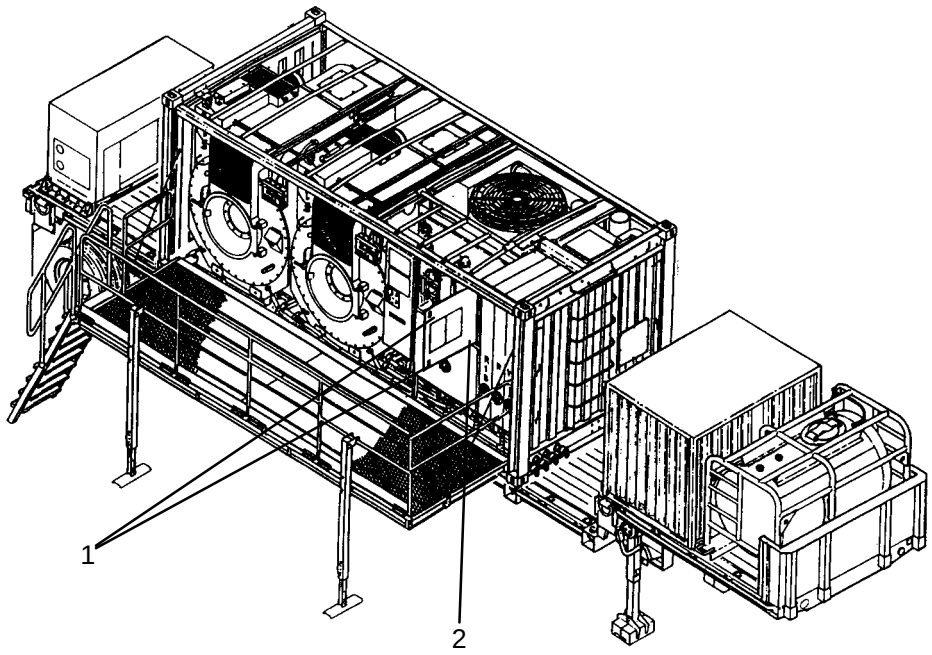
Personnel Required

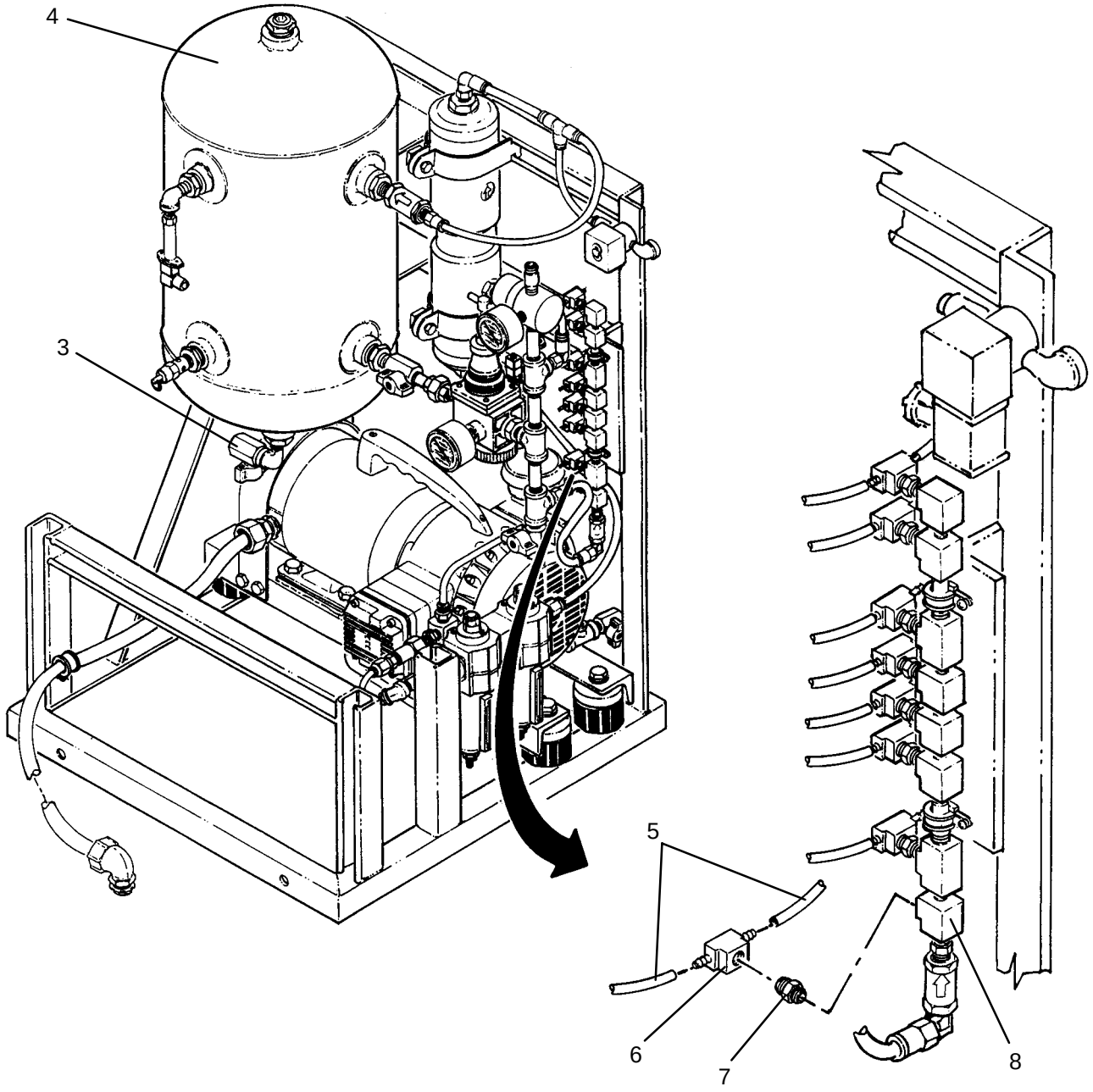
Materials/Parts
Tape, Anti–Seize (Item 10, WP 0281 00)

Equipment Conditions
LADS power shut off at main control enclosure (WP 0113 00).
Air pressure must be vented (WP 0114 00).

REMOVAL

1. Disengage two latches (1), then open access door (2).
2. Open valve (3), to ensure air has vented from air tank (4), then close valve.
3. Tag and disconnect air tubes (5) from tee (6) of faulty orifice (7).
4. Unthread tee (6) from orifice (7), then unthread orifice from orifice manifold (8).





INSTALLATION

1. Apply anti–seize tape to threads of new orifice (7).
2. Thread orifice (7) into orifice manifold (8).
3. Thread tee (6) onto orifice (7).
4. Connect air tubes (5) to tee (6).
5. Use maintenance menu to test air system (WP 0010 00). After air system is pressurized, audibly check for air leaks.
6. Close access door (2) and secure by engaging two latches (1).

END OF WORK PACKAGE

UNIT

LAUNDRY ADVANCED SYSTEM

(NSN 3510–01–463–0114)

ORIFICE MANIFOLD FILTER REPLACEMENT
REMOVAL, INSTALLATION

INITIAL SETUP:

Tools
Tool Kit, General Mechanics
(Item 14, WP 0282 00)

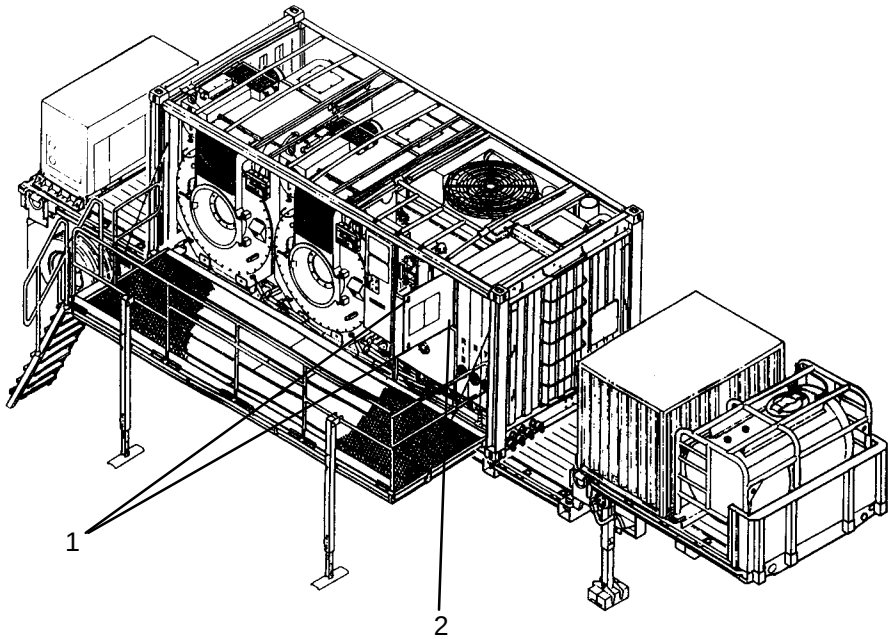
Personnel Required

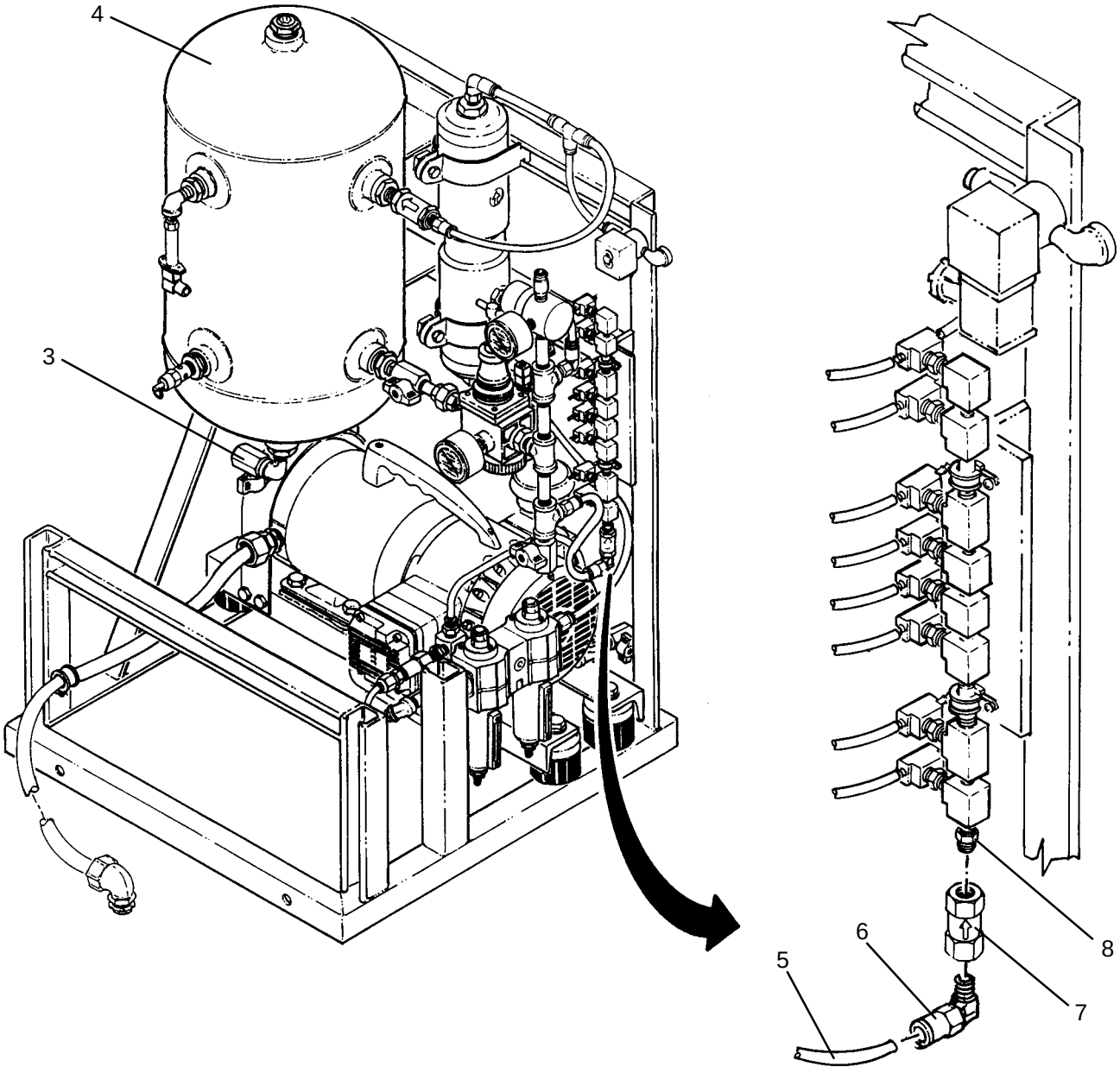
Materials/Parts
Tape, Anti–Seize (Item 10, WP 0281 00)

Equipment Conditions
LADS power shut off at main control enclosure (WP 0113 00).
Air pressure must be vented (WP 0114 00).

REMOVAL

1. Disengage two latches (1), then open access door (2).
2. Open valve (3), to ensure air has vented from air tank (4), then close valve.
3. Disconnect air tube (5) from elbow (6).
4. Unthread filter (7) from orifice (8).
5. Unthread elbow (6) from filter (7).
6. Clean anti–seize tape from threads of elbow (6) and orifice (8).





INSTALLATION

1. Apply anti–seize tape to threads of elbow (6) and orifice (8).
2. Thread elbow (6) onto new filter (7) with direction arrow (9) pointing away from elbow.
3. Thread filter (7) onto orifice (8).
4. Connect air tube (5) to elbow (6).
5. Use maintenance menu to test air system (WP 0010 00). After air system is pressurized, audibly check for air leaks.
6. Close access door (2) and secure by engaging two latches (1).

END OF WORK PACKAGE

UNIT

LAUNDRY ADVANCED SYSTEM

(NSN 3510–01–463–0114)

SOLENOID VALVE (SV500) REPLACEMENT REMOVAL, INSTALLATION

INITIAL SETUP:

Tools
Tool Kit, General Mechanics
(Item 14, WP 0282 00)

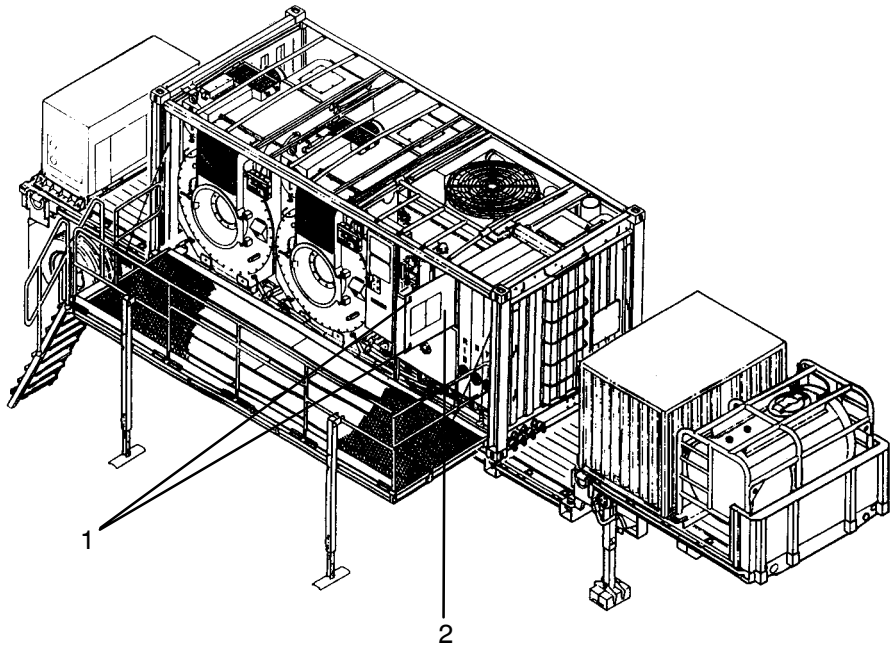
Personnel Required

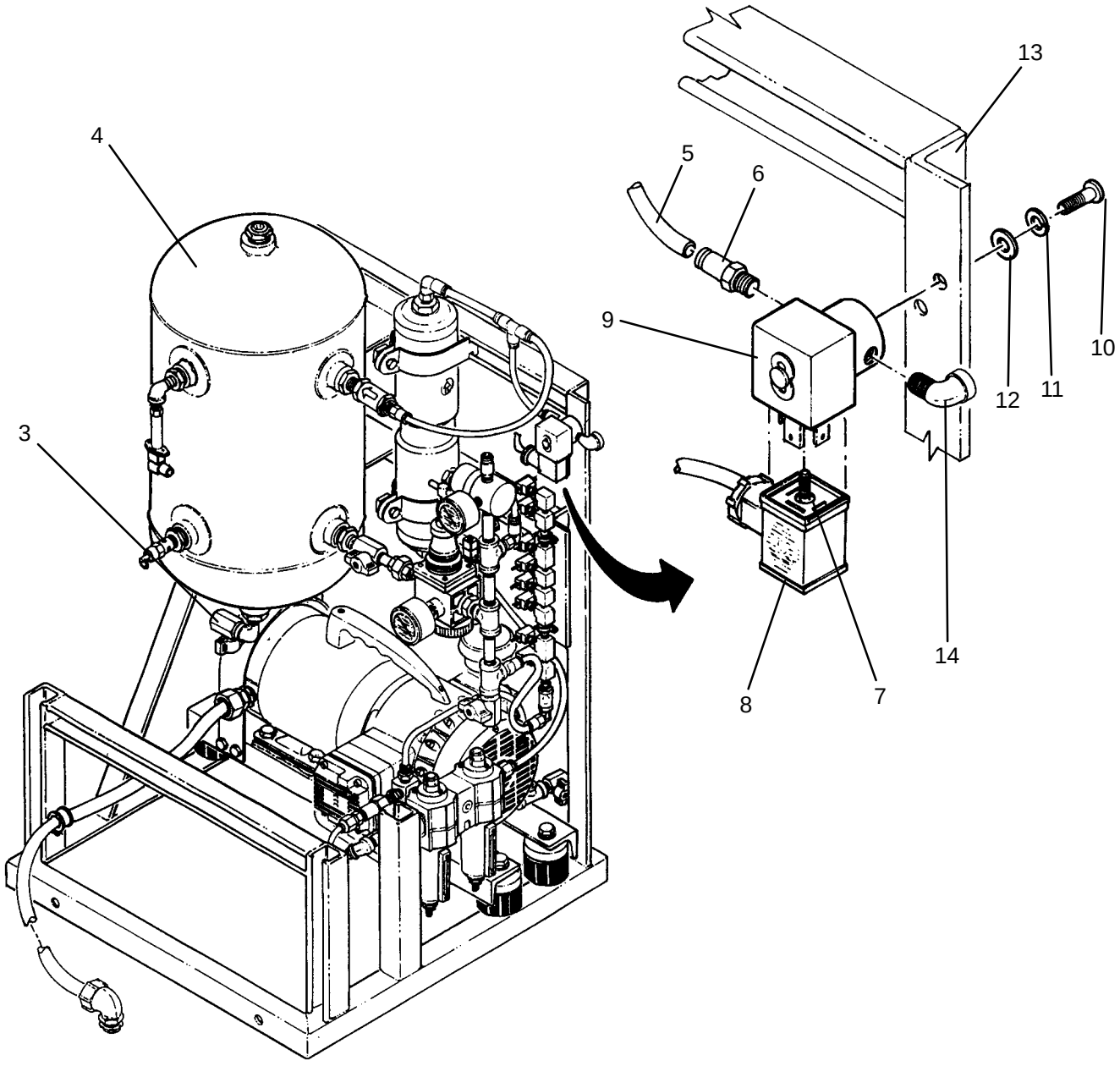
Materials/Parts
Tape, Anti–Seize (Item 10, WP 0281 00)

Equipment Conditions
LADS power shut off at main control enclosure (WP 0113 00).
Air pressure must be vented (WP 0114 00).

REMOVAL

1. Disengage two latches (1), then open access door (2).
2. Open valve (3), to ensure air has vented from air tank (4), then close valve.
3. Disconnect air tube (5) from connector (6).
4. Loosen screw (7), then disconnect electrical connector (8) from solenoid valve (9).
5. Remove two screws (10), lock washers (11) and flat washers (12) then remove solenoid valve (9) from air system frame (13).
6. Unthread connector (6) and elbow (14) from solenoid valve (9).
7. Clean anti–seize tape from threads of connector (6) and elbow (14).





INSTALLATION

1. Apply anti–seize tape to threads of connector (6) and elbow (14).
2. Thread connector (6) into inlet of new solenoid valve (9).
3. Thread elbow (14) into outlet of solenoid valve (9).
4. Position solenoid valve (9) on frame (13), then secure with two screws (10), lock washers (11) and flat washers (12).
5. Connect electrical connector (8) to solenoid valve (9), then tighten screw (7).
6. Connect air tube (5) to connector (6).
7. Close access door (2) and secure by engaging two latches (1).
8. Use maintenance menu to test air system (WP 0010 00). Verify proper operation of solenoid valve (9).

END OF WORK PACKAGE

UNIT

LAUNDRY ADVANCED SYSTEM

(NSN 3510–01–463–0114)

SOLENOID VALVE (SV100 – SV200) REPLACEMENT REMOVAL, INSTALLATION

INITIAL SETUP:

Tools
Tool Kit, General Mechanics
(Item 14, WP 0282 00)

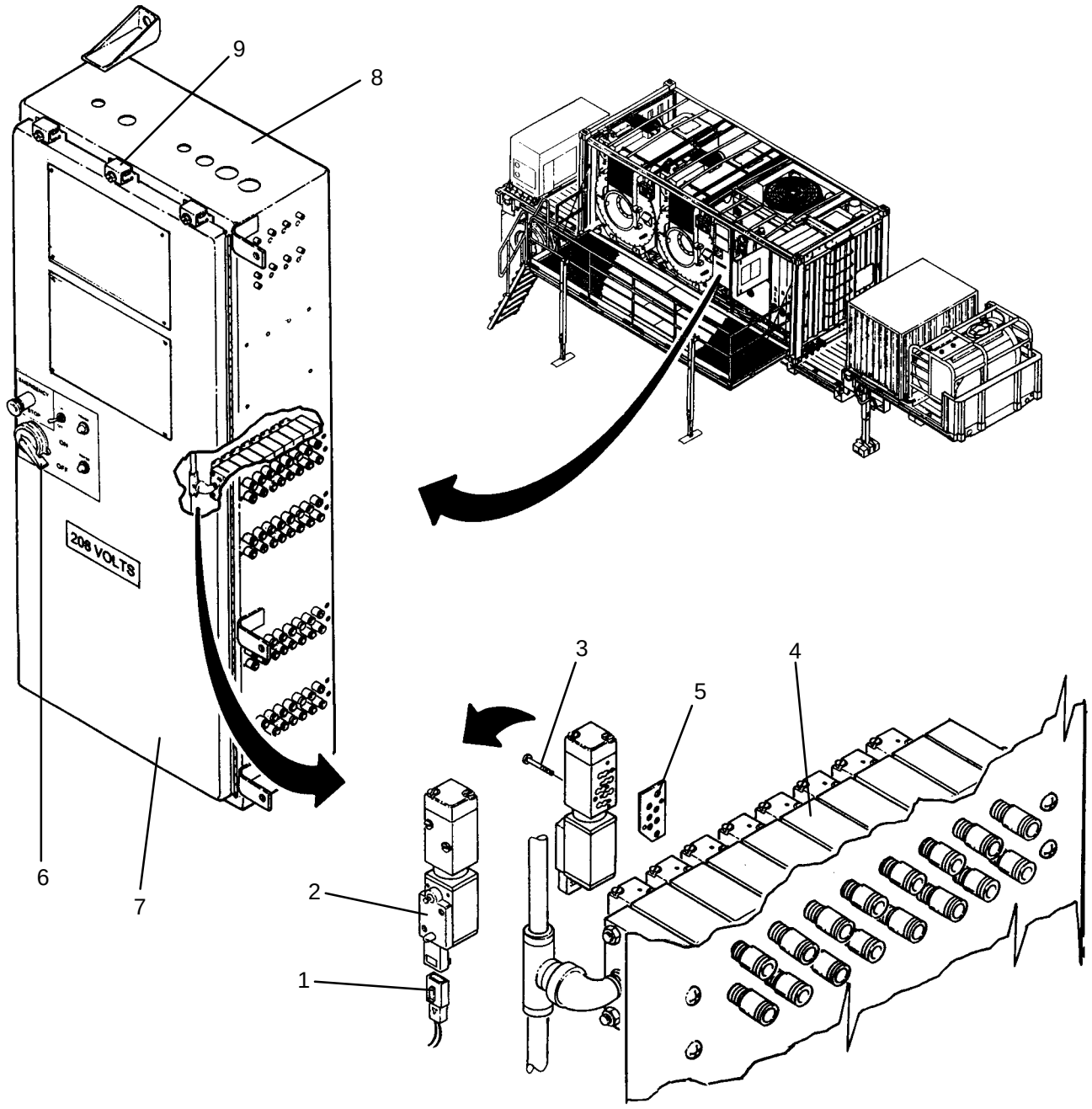
Personnel Required

Materials/Parts

Equipment Conditions
LADS power shut off and door opened at main control enclosure (WP 0113 00).
Air pressure must be vented (WP 0114 00).

REMOVAL

1. Disconnect electrical connector (1) from solenoid valve (2).
2. Remove two screws (3), then remove solenoid valve (2) from solenoid manifold (4).
3. Remove gasket (5) from solenoid manifold (4) and discard gasket.



INSTALLATION

1. Position new solenoid valve (2) and new gasket (5) onto solenoid manifold (4), then secure with two screws (3).
2. Connect electrical connector (1) to solenoid valve (2).
3. Check for air leaking at mating surface between solenoid valve (2) and solenoid manifold (4).
4. Turn handle (6) CW, then close door (7).
5. Secure door (7) to main control enclosure (8) by tightening eleven latches (9).
6. Use maintenance menu control outputs function to verify proper operation of solenoid valve (2) (WP 0010 00).

END OF WORK PACKAGE

UNIT

LAUNDRY ADVANCED SYSTEM

(NSN 3510–01–463–0114)

ANALOG PCB ASSEMBLY (PCB1) REPLACEMENT REMOVAL, INSTALLATION

INITIAL SETUP:

Tools
Tool Kit, General Mechanics
(Item 14, WP 0282 00)

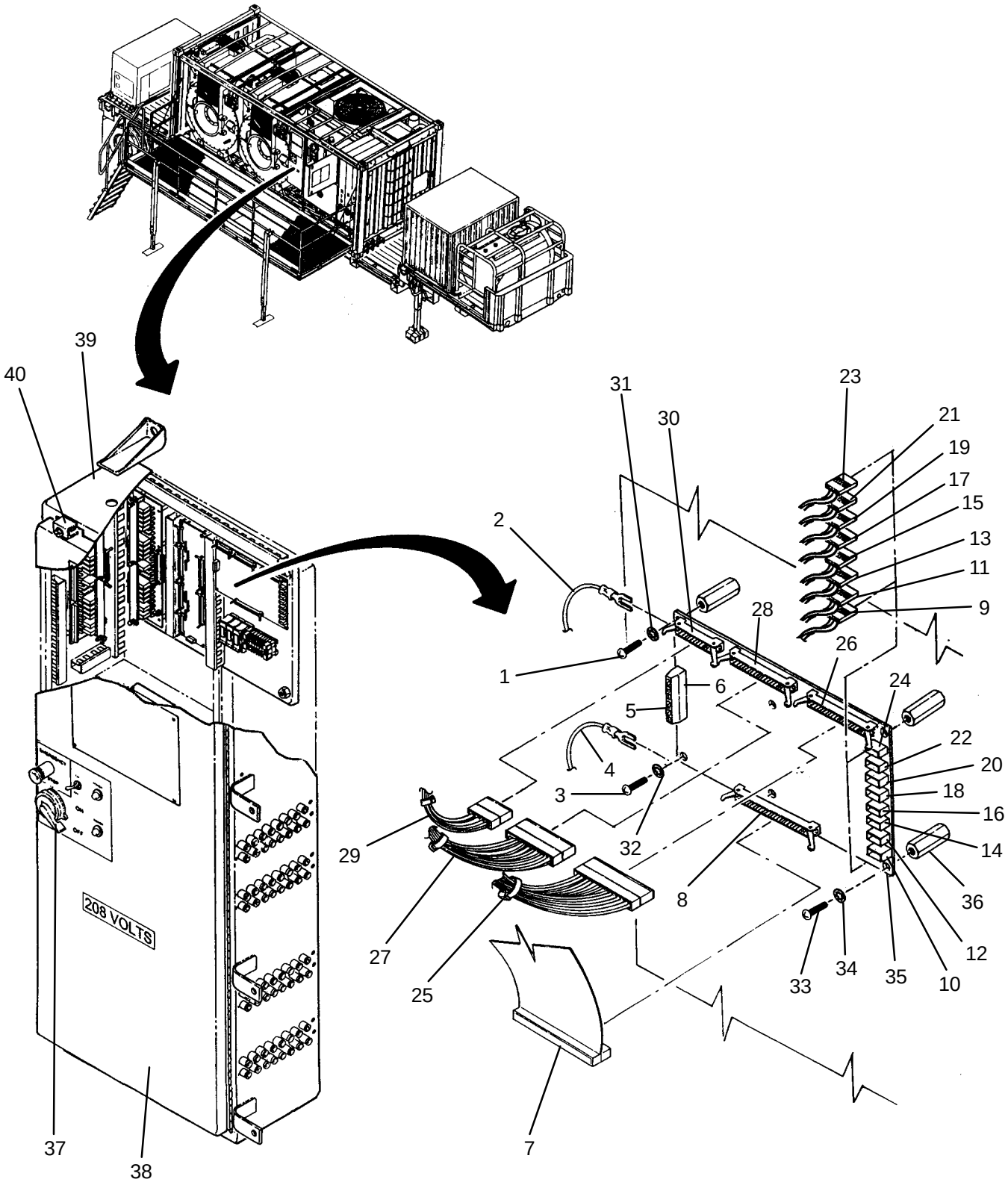
Personnel Required

Materials/Parts
Tags (Item 9, WP 0281 00)
Washer, Lock (Item 17, WP 0283 00)

Equipment Conditions
LADS water tanks must be drained and air system vented (TM 10–3510–221–10).
LADS power must be shut off and door opened at main control enclosure (WP 0113 00).

REMOVAL

1. ESD. Loosen screw (1) then disconnect ground wire (2).
2. ESD. Loosen screw (3) then disconnect shield wire (4).
3. ESD. Loosen screw terminals (5), then tag and disconnect wiring from J1 connector (6).
4. ESD. Disconnect ribbon cable (7) from J2 connector (8).
5. ESD. Disconnect pressure sensor PT200 (9) from J5 connector (10).
6. ESD. Disconnect level sensor LT102 (11) from J6 connector (12).
7. ESD. Disconnect level sensor LT201 (13) from J7 connector (14).
8. ESD. Disconnect level sensor LT200 (15) from J8 connector (16).
9. ESD. Disconnect level sensor LT101B (17) from J9 connector (18).
10. ESD. Disconnect level sensor LT100B (19) from J10 connector (20).
11. ESD. Disconnect level sensor LT101A (21) from J11 connector (22).
12. ESD. Disconnect level sensor LT100A (23) from J12 connector (24).
13. ESD. Disconnect wire harness (25) from J13 connector (26).
14. ESD. Disconnect wire harness (27) from J14 connector (28).
15. ESD. Disconnect wire harness (29) from J15 connector (30).
16. ESD. Remove screws (1) and (3) and lock washers (31) and (32).
17. ESD. Remove four screws (33) and lock washers (34) then remove analog PCB (35) from standoffs (36).


208 VOLTS
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INSTALLATION

1. ESD. Position new analog PCB (35) on standoffs (36). Install, but do not tighten, four screws (33) and lock washers (34).
2. ESD. Install, but do not tighten, screws (1) and (3) and lock washers (31) and (32).
3. ESD. Connect shield wire (4) then tighten screw (3).
4. ESD. Connect ground wire (2) then tighten screw (1).
5. ESD. Tighten four screws (33).
6. ESD. Connect wire harness (29) to J15 connector (30).
7. ESD. Connect wire harness (27) to J14 connector (28).
8. ESD. Connect wire harness (25) to J13 connector (26).
9. ESD. Connect level sensor LT100A (23) to J12 connector (24).
10. ESD. Connect level sensor LT101A (21) to J11 connector (22).
11. ESD. Connect level sensor LT100B (19) to J10 connector (20).
12. ESD. Connect level sensor LT101B (17) to J9 connector (18).
13. ESD. Connect level sensor LT200 (15) to J8 connector (16).
14. ESD. Connect level sensor LT201 (13) to J7 connector (14).
15. ESD. Connect level sensor LT102 (11) to J6 connector (12).
16. ESD. Connect pressure sensor PT200 (9) to J5 connector (10).
17. ESD. Connect ribbon cable (7) to J2 connector (8).
18. ESD. Connect wiring to J1 connector (6) as tagged then tighten screw terminals (5).
19. Turn handle (37) CW, then close door (38).
20. Secure door (38) to main control enclosure (39) by tightening eleven latches (40).
21. Using maintenance menu calibrate levels sensors (LT100A through LT201), pressure sensors (PT200 through PT501), and temperature sensors (TE100 through TE300) (WP 0010 00).
22. Perform DAILY START–UP and a test LAUNDRY CYCLE (TM 10–3510–221–10). Verify normal operation.

END OF WORK PACKAGE

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UNIT

LAUNDRY ADVANCED SYSTEM

(NSN 3510–01–463–0114)

DISCRETE INPUT PCB ASSEMBLY (PCB2) REPLACEMENT REMOVAL, INSTALLATION

INITIAL SETUP:

Tools
Tool Kit, General Mechanics
(Item 14, WP 0282 00)

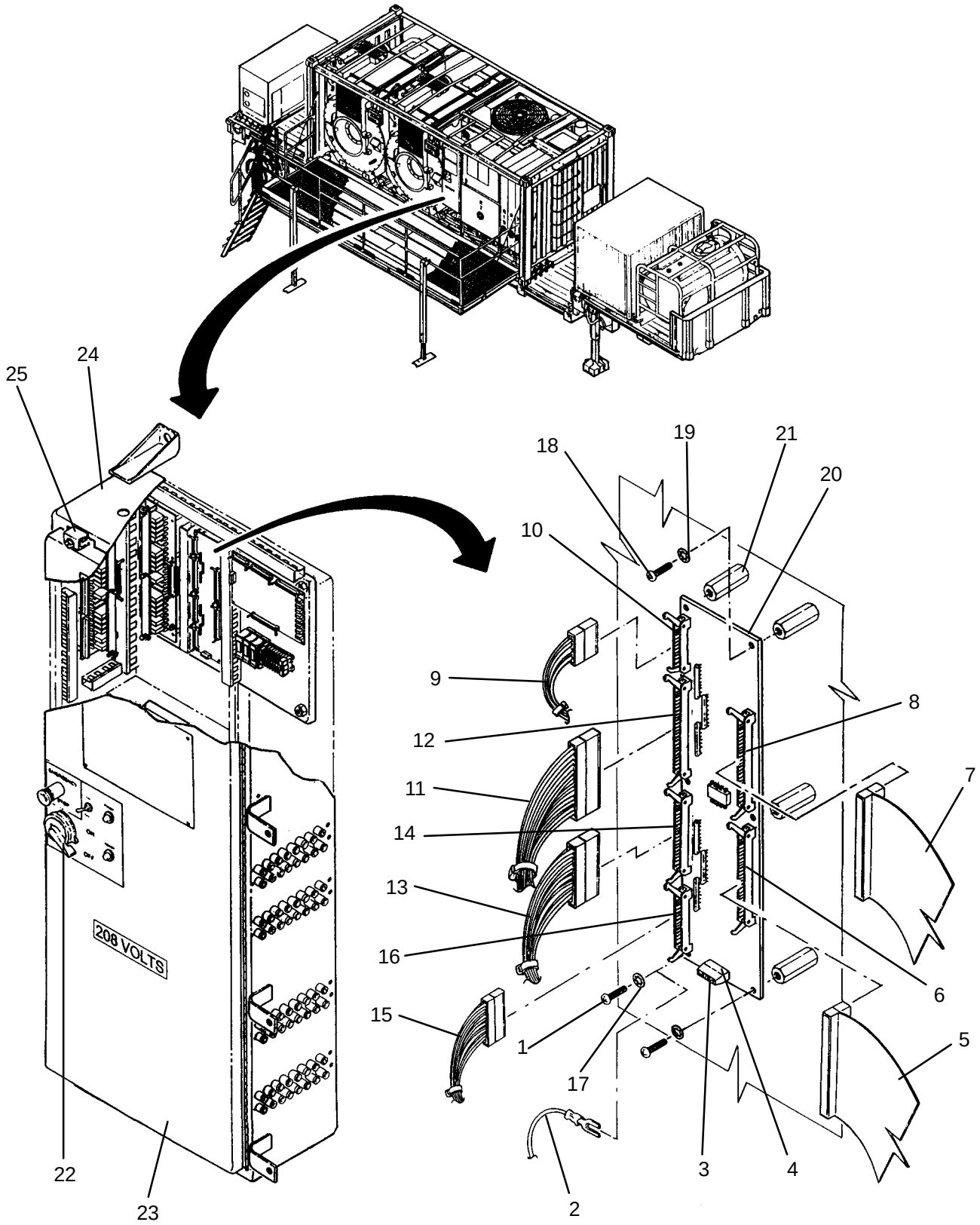
Personnel Required

Materials/Parts
Tags (Item 9, WP 0281 00)
Washer, Lock (Item 17, WP 0283 00)

Equipment Conditions
LADS power must be shut off and door opened at main control enclosure (WP 0113 00).

REMOVAL

1. ESD. Loosen screw (1) then disconnect ground wire (2).
2. ESD. Loosen screw terminals (3), then tag and disconnect wiring from J1 connector (4).
3. ESD. Disconnect ribbon cable (5) from J2 connector (6).
4. ESD. Disconnect ribbon cable (7) from J3 connector (8).
5. ESD. Disconnect wire harness (9) from J4 connector (10).
6. ESD. Disconnect wire harness (11) from J5 connector (12).
7. ESD. Disconnect wire harness (13) from J6 connector (14).
8. ESD. Disconnect wire harness (15) from J7 connector (16).
9. ESD. Remove screw (1) and lock washer (17).
10. ESD. Remove five screws (18) and lock washers (19), then remove input PCB (20) from standoffs (21).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INSTALLATION

1. ESD. Position new input PCB (20) on standoffs (21). Install, but do not tighten, five screws (18) and lock washers (19).
2. ESD. Install, but do not tighten, screw (1) and lock washer (17).
3. ESD. Connect ground wire (2) then tighten screw (1).
4. ESD. Tighten five screws (18).
5. ESD. Connect wire harness (15) to J7 connector (16).
6. ESD. Connect wire harness (13) to J6 connector (14).
7. ESD. Connect wire harness (11) to J5 connector (12).
8. ESD. Connect wire harness (9) to J4 connector (10).
9. ESD. Connect ribbon cable (7) to J3 connector (8).
10. ESD. Connect ribbon cable (5) to J2 connector (6).
11. ESD. Connect wiring to J1 connector (4) as tagged, then tighten screw terminals (3).
12. Turn handle (22) CW, then close door (23).
13. Secure door (23) to main control enclosure (24) by tightening eleven latches (25).
14. Perform a DAILY START−UP and test LAUNDRY CYCLE (TM 10−3510−221−10). Verify normal operation.

END OF WORK PACKAGE

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UNIT

LAUNDRY ADVANCED SYSTEM

(NSN 3510–01–463–0114)

DIGITAL I/O PCB (PCB7) REPLACEMENT REMOVAL, INSTALLATION

INITIAL SETUP:

Tools
Tool Kit, General Mechanics
(Item 14, WP 0282 00)

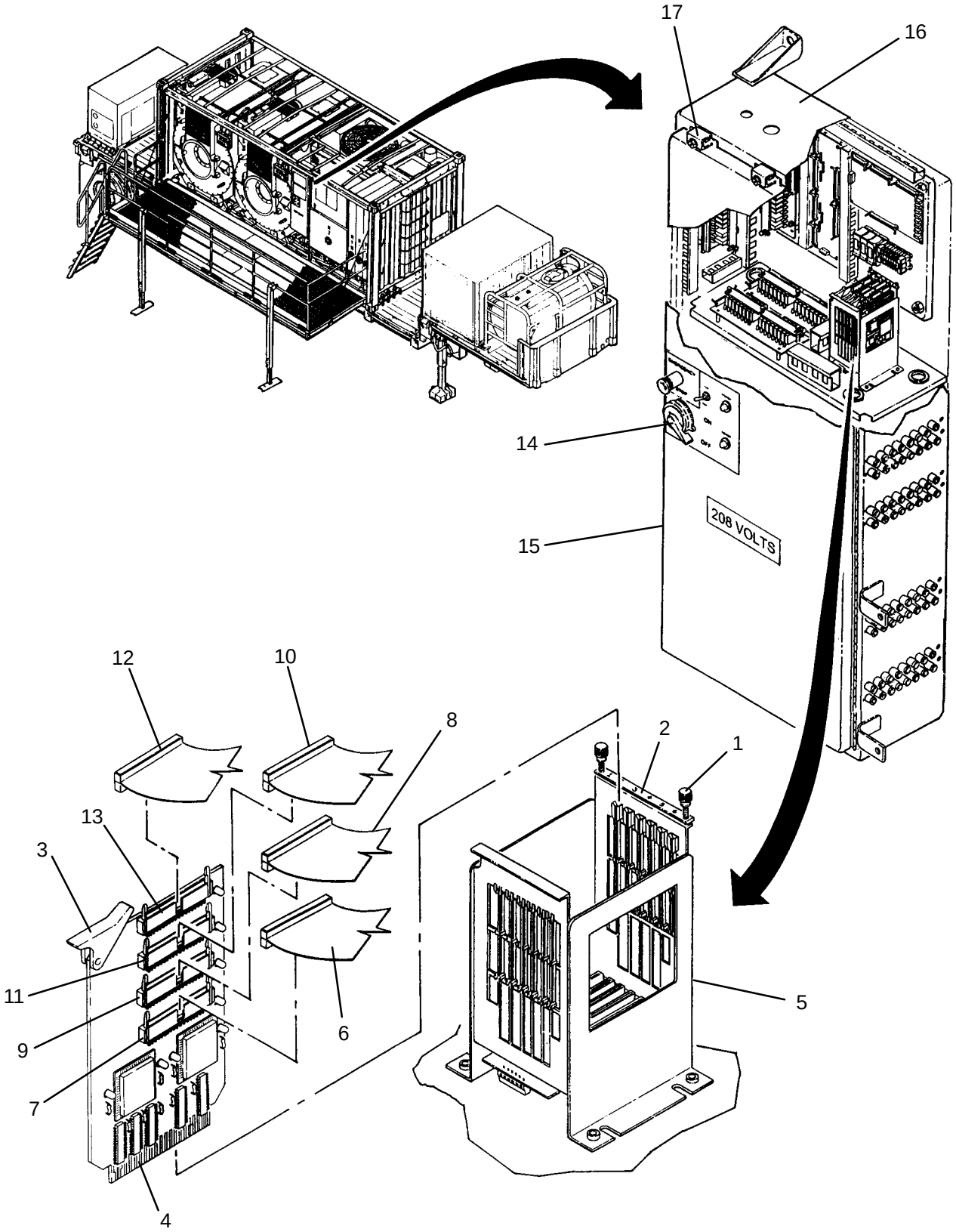
Personnel Required

Materials/Parts

Equipment Conditions
LADS power must be shut off and door opened at main control enclosure (WP 0113 00).

REMOVAL

1. ESD. Loosen two screws (1) and slide back retaining plate (2).
2. ESD. Lift up on ejection latch (3) then slide digital I/O PCB (4) up out of card cage (5).
3. ESD. Disconnect ribbon cable (6) from connector J4 (7).
4. ESD. Disconnect ribbon cable (8) from connector J3 (9).
5. ESD. Disconnect ribbon cable (10) from connector J2 (11).
6. ESD. Disconnect ribbon cable (12) from connector J1 (13).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INSTALLATION

1. ESD. Connect ribbon cable (12) to connector J1 (13) on new digital I/O PCB (4).
2. ESD. Connect ribbon cable (10) to connector J2 (11).
3. ESD. Connect ribbon cable (8) to connector J3 (9).
4. ESD. Connect ribbon cable (6) to connector J4 (7).
5. ESD. Slide digital I/O PCB (4) into card cage (5). Make sure PCB is fully seated.
6. ESD. Slide retaining plate (2) forward and tighten two screws (1).
7. Turn handle (14) CW, then close door (15).
8. Secure door (15) to main control enclosure (16) by tightening eleven latches (17).
9. Perform a SYSTEM START–UP and test LAUNDRY CYCLE (TM 10–3510–221–10). Verify normal operation.

END OF WORK PACKAGE

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UNIT

LAUNDRY ADVANCED SYSTEM

(NSN 3510–01–463–0114)

OPTICALLY ISOLATED INPUT PCB (PCB8) REPLACEMENT REMOVAL, INSTALLATION

INITIAL SETUP:

Tools
Tool Kit, General Mechanics
(Item 14, WP 0282 00)

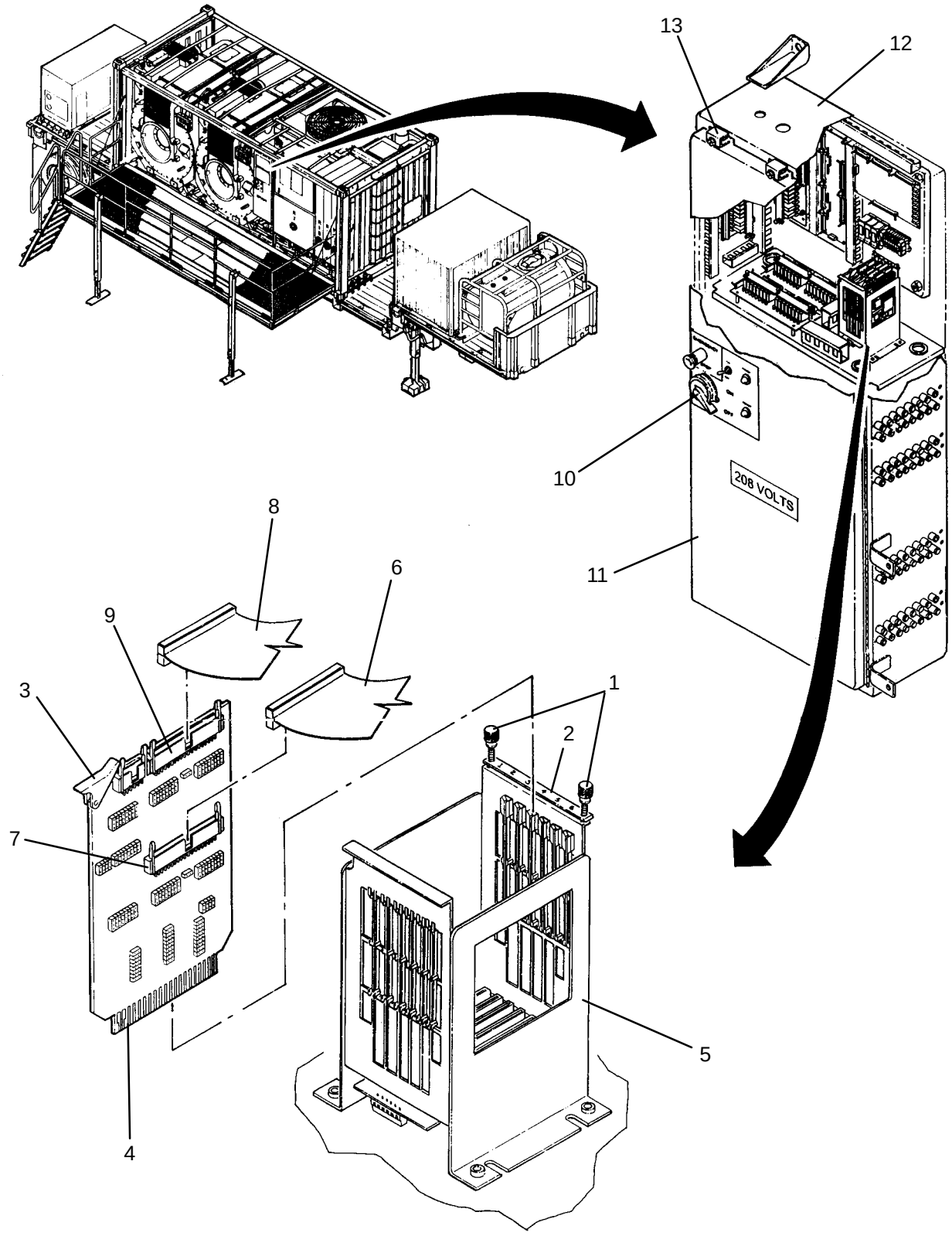
Personnel Required

Materials/Parts

Equipment Conditions
LADS power must be shut off and door opened at main control enclosure (WP 0113 00).

REMOVAL

1. ESD. Loosen two screws (1) and slide back retaining plate (2).
2. ESD. Lift up on ejection latch (3) and slide optically isolated input PCB (4) up out of card cage (5).
3. ESD. Disconnect ribbon cable (6) from connector J2 (7).
4. ESD. Disconnect ribbon cable (8) from connector J1 (9).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INSTALLATION

1. ESD. Connect ribbon cable (8) to connector J1 (9) on new optically isolated input PCB (4).
2. ESD. Connect ribbon cable (6) to connector J2 (7).
3. ESD. Slide optically isolated input PCB (4) into card cage (5). Make sure PCB is fully seated.
4. ESD. Slide retaining plate (2) forward and tighten two screws (1).
5. Turn handle (10) CW, then close door (11).
6. Secure door (11) to main control enclosure (12) by tightening eleven latches (13).
7. Perform a SYSTEM START–UP and test LAUNDRY CYCLE (TM 10–3510–221–10). Verify normal operation.

END OF WORK PACKAGE

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UNIT

LAUNDRY ADVANCED SYSTEM

(NSN 3510–01–463–0114)

ANALOG TO DIGITAL CONVERTER (PCB11) REPLACEMENT REMOVAL, INSTALLATION

INITIAL SETUP:

Tools
Tool Kit, General Mechanics
(Item 14, WP 0282 00)

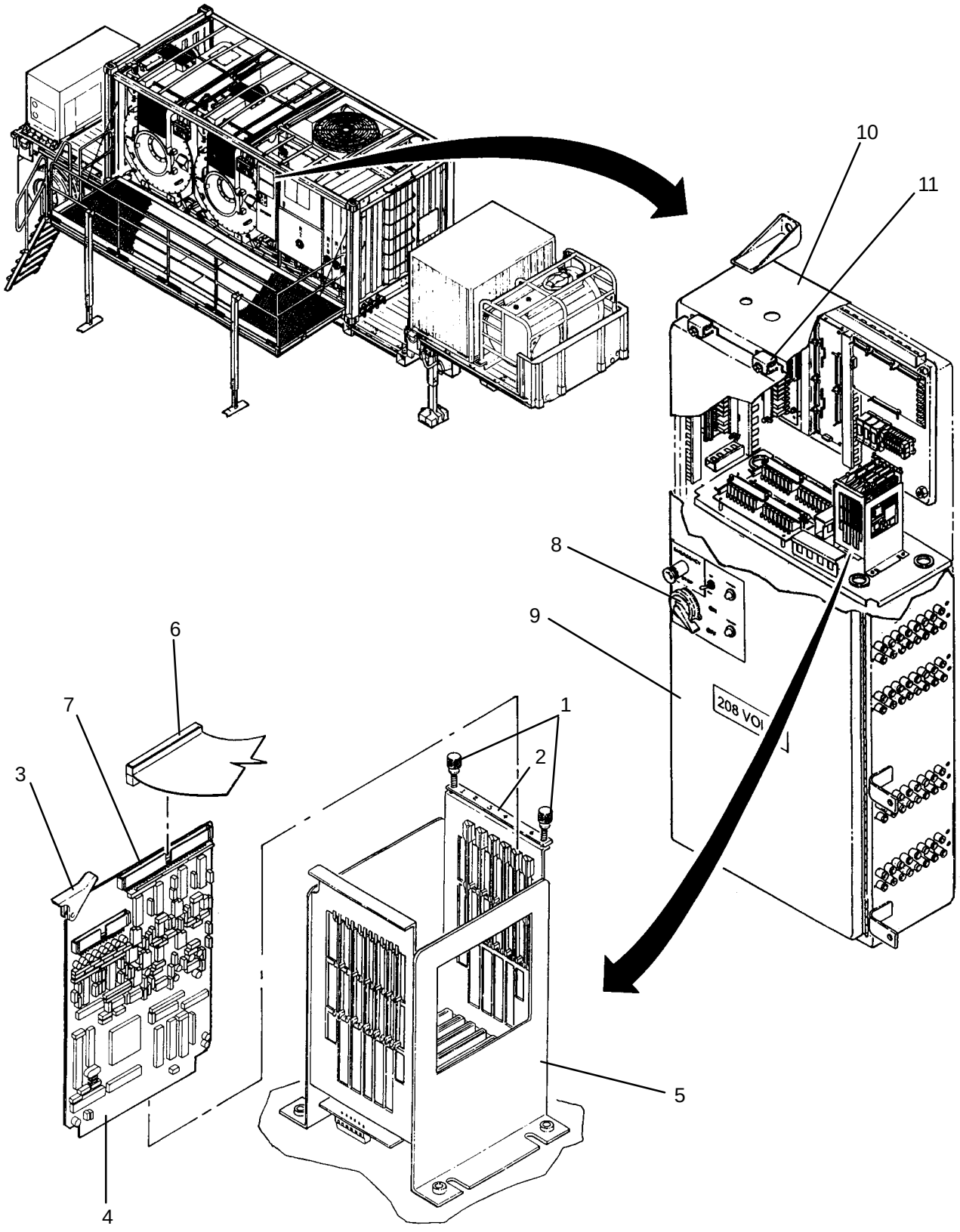
Personnel Required

Materials/Parts

Equipment Conditions
LADS power must be shut off and door opened at main control enclosure (WP 0113 00).

REMOVAL

1. ESD. Loosen two screws (1) and slide back retaining plate (2).
2. ESD. Lift up on ejection latch (3) and slide analog to digital converter PCB (4) up out of card cage (5).
3. ESD. Disconnect ribbon cable (6) from connector (7).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INSTALLATION

1. ESD. Slide new analog to digital converter PCB (4) into card cage (5). Make sure PCB is fully seated.
2. ESD. Connect ribbon cable (6) to connector (7).
3. ESD. Slide retaining plate (2) forward and tighten two screws (1).
4. Turn handle (8) CW, then close door (9).
5. Secure door (9) to main control enclosure (10) by tightening eleven latches (11).
6. Perform DAILY START–UP and a test LAUNDRY CYCLE (TM 10–3510–221–10). Verify normal operation.

END OF WORK PACKAGE

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UNIT

LAUNDRY ADVANCED SYSTEM

(NSN 3510–01–463–0114)

CPU (PCB9) REPLACEMENT
REMOVAL, INSTALLATION

INITIAL SETUP:

Tools
Tool Kit, General Mechanics
(Item 14, WP 0282 00)

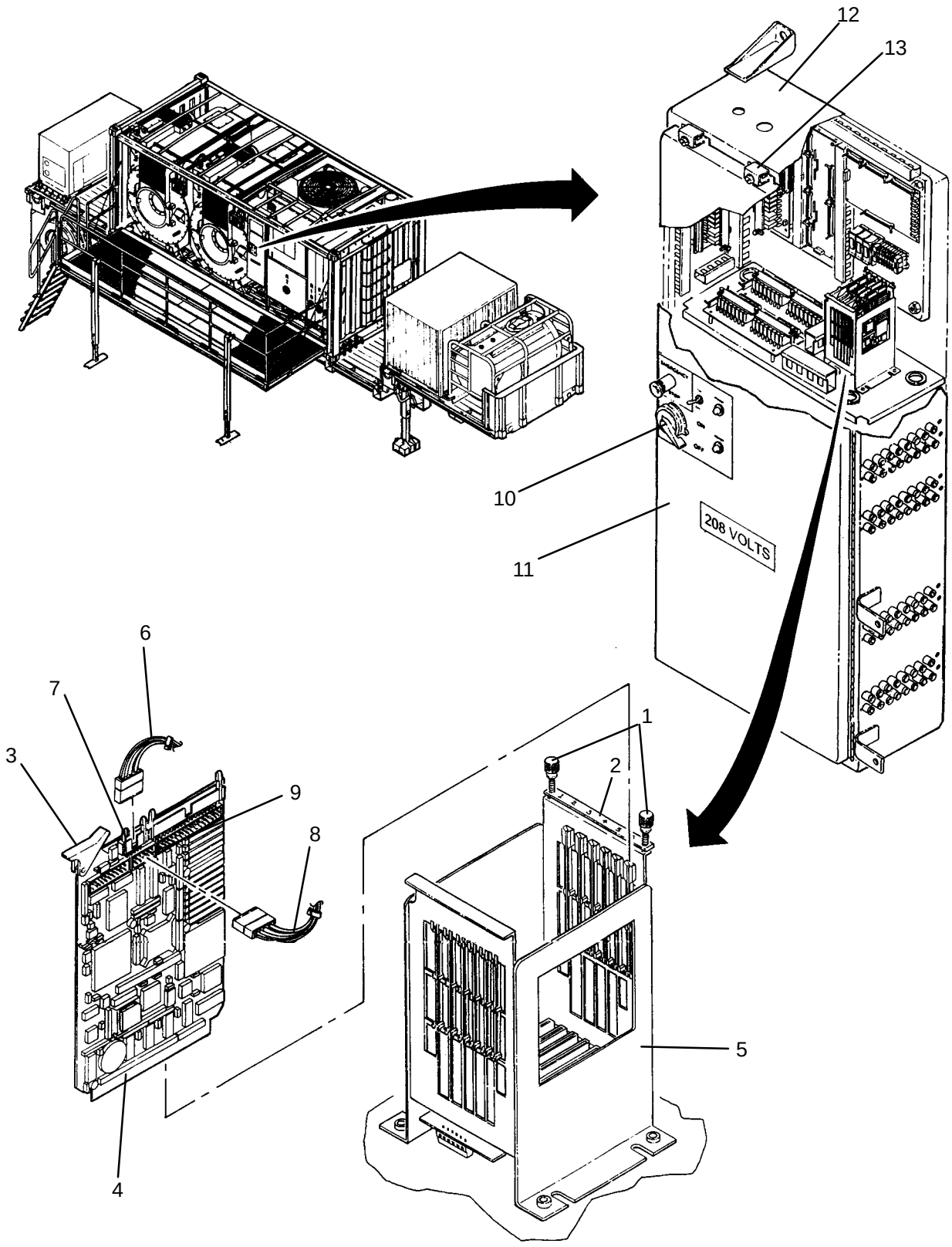
Personnel Required

Materials/Parts

Equipment Conditions
LADS water tanks must be drained and air system vented (TM 10–3510–221–10).
LADS power must be shut off and door opened at main control enclosure (WP 0113 00).

REMOVAL

1. ESD. Loosen two screws (1) and slide back retaining plate (2).
2. ESD. Lift up on ejection latch (3) and slide CPU PCB (4) up out of card cage (5).
3. ESD. Disconnect wire harness (6) from J1 connector (7).
4. ESD. Disconnect wire harness (8) from J4 connector (9).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INSTALLATION

1. ESD. Connect wire harness (8) to J4 connector (9) on new CPU PCB (4).
2. ESD. Connect wire harness (6) to J1 connector (7).
3. ESD. Slide CPU PCB (4) into card cage (5). Make sure PCB is fully seated.
4. ESD. Slide retaining plate (2) forward and tighten two screws (1).
5. Turn handle (10) CW, then close door (11).
6. Secure door (11) to main control enclosure (12) by tightening eleven latches (13).
7. Using maintenance menu, calibrate levels sensors (LT100A through LT201), pressure sensors (PT200 through PT501), and temperature sensors (TE100 through TE300) (WP 0010 00).
8. Perform DAILY START–UP and a test LAUNDRY CYCLE (TM 10–3510–221–10). Verify normal operation.

END OF WORK PACKAGE

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UNIT

LAUNDRY ADVANCED SYSTEM

(NSN 3510–01–463–0114)

CARD CAGE (CC1) REPLACEMENT
REMOVAL, INSTALLATION

INITIAL SETUP:

Tools
Tool Kit, General Mechanics
(Item 14, WP 0282 00)

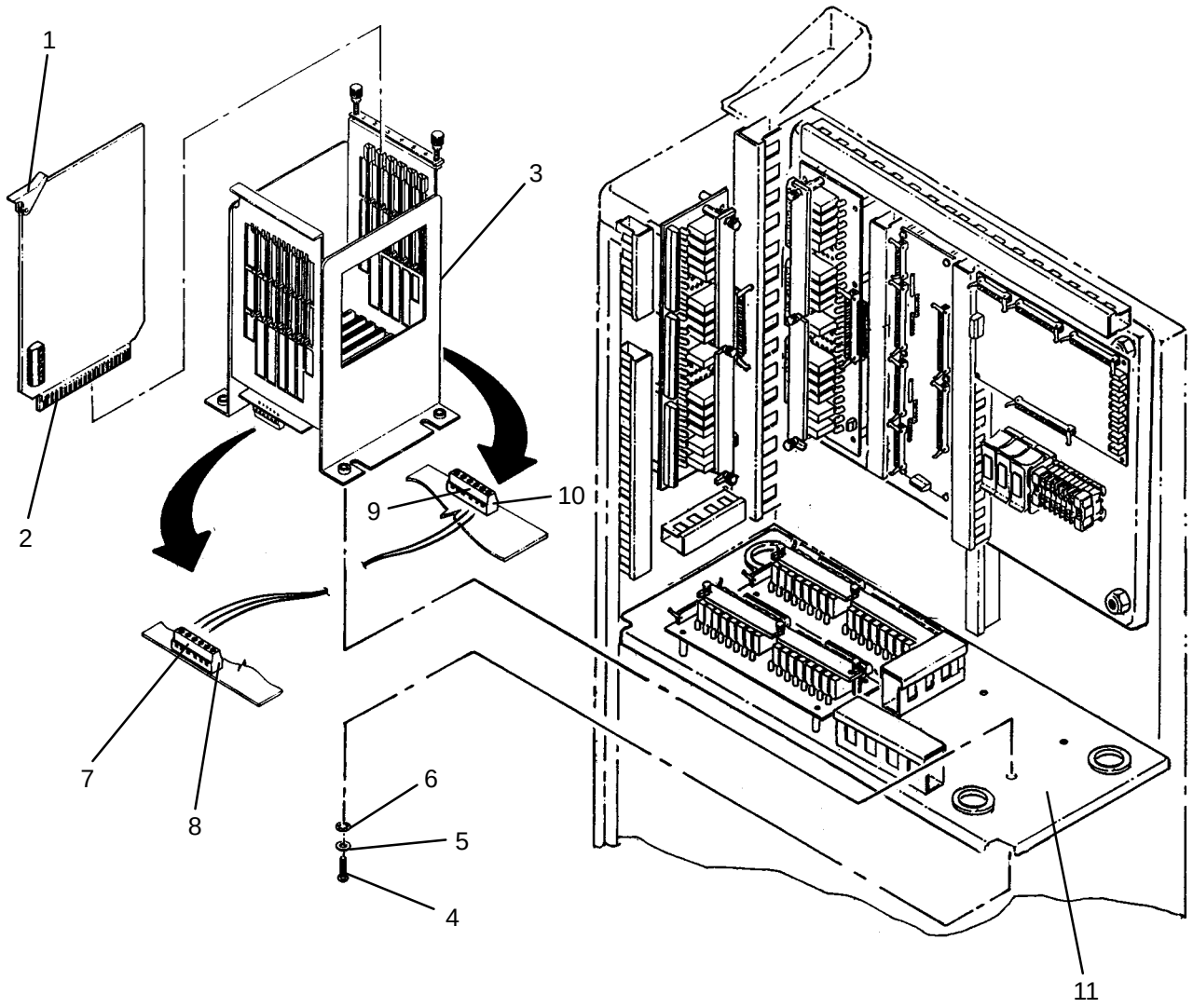
Personnel Required

Materials/Parts
Tags (Item 9, WP 0281 00)
Washer, Lock (Item 18, WP 0283 00)

Equipment Conditions
LADS power must be shut off and door opened at main control enclosure (WP 0113 00).

REMOVAL

1. Remove digital I/O PCB (WP 0217 00).
2. Remove optically isolated PCB (WP 0218 00).
3. Remove analog–to–digital converter PCB (WP 0219 00).
4. Remove CPU PCB (WP 0220 00).
5. Lift up on ejection latch (1) and slide POWER TEST POINT PCB (2) up out of card cage (3).
6. ESD. Remove four screws (4), lock washers (5) and flat washers (6), then lift card cage (3) up to access bottom wire connections.
7. ESD. Loosen screw terminals (7) then tag and disconnect wires from connector (8).
8. ESD. Loosen screw terminals (9) then tag and disconnect wires from connector (10).



INSTALLATION

1. ESD. Connect wires to connector (10) on new card cage (3) then tighten screw terminals (9).
2. ESD. Connect wires to connector (8) then tighten screw terminals (7).
3. ESD. Position card cage (3) onto mounting plate (11) then secure with four screws (4), lock washers (5), and flat washers (6).
4. Slide POWER TEST POINT PCB (2) into card cage (3). Make sure PCB is fully seated.
5. Install CPU PCB (WP 0220 00).
6. Install analog–to–digital converter PCB (WP 0219 00).
7. Install optically isolated (WP 0218 00).
8. Install digital I/O PCB (WP 0217 00).

END OF WORK PACKAGE

UNIT

LAUNDRY ADVANCED SYSTEM

(NSN 3510–01–463–0114)

MAIN DISCONNECT SWITCH (SW1) REPLACEMENT REMOVAL, INSTALLATION

INITIAL SETUP:

Tools
Tool Kit, General Mechanics
(Item 14, WP 0282 00)

Personnel Required

Materials/Parts
Tags (Item 9, WP 0281 00)
Washer, Lock (Item 19, WP 0283 00)

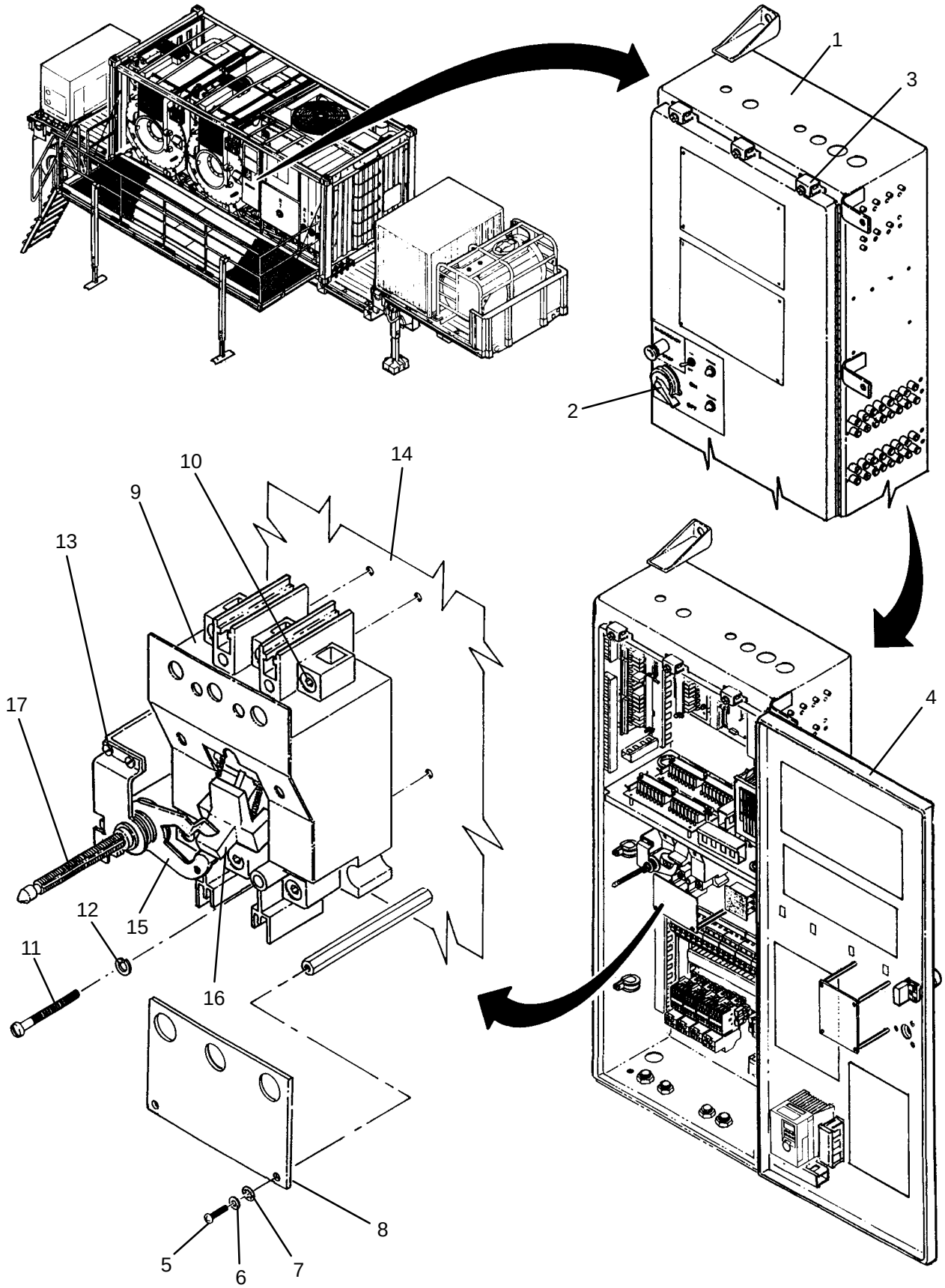
Equipment Conditions
LADS power must be shut off and door opened at main control enclosure (WP 0113 00).

REMOVAL

WARNING

Power must be removed at external power source prior to performing this procedure. DEATH ON CONTACT may result if personnel fail to observe this safety precaution.

1. Disconnect LADS electrical cable at power source (TM 10–3510–221–10).
2. At main control enclosure (1), turn handle (2) past OFF position.
3. Loosen eleven latches (3), then open door (4) on main control enclosure (1).
4. Remove two screws (5), lock washers (6), and flat washers (7) then remove cover (8) from disconnect switch (9).
5. Tag all wires connected to disconnect switch (9).
6. Loosen screw terminals (10), then disconnect wires from disconnect switch (9).
7. Remove four screws (11) and lock washers (12) then remove disconnect switch (9) and handle mechanism (13) from subpanel (14).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INSTALLATION

1. Mate handle mechanism (13) with new disconnect switch (9) ensuring rotating latch (15) is engaged with switch lever (16).
2. Position disconnect switch (9) and handle mechanism (13) on subpanel (14) then secure with four screws (11) and lock washers (12).
3. Verify proper alignment between disconnect switch (9) and handle (2) as follows:
   a. Close door (4) until tip of shaft (17) engages with opening in handle (2).
   b. Turn handle (2) CW and close (4) door. Verify door (4) closes tight against main control enclosure (1).
   c. If door (4) properly closes continue to step 4, otherwise proceed to step d.
   d. Loosen four screws(11) then reposition main disconnect switch (9) as necessary to achieve correct alignment between shaft (17) and handle (2).
4. Loosen screw terminals (11), then connect wires to disconnect switch (9) as tagged.
5. Tighten all screw terminals (10).
6. Position cover (8) on disconnect switch (9) then secure with two screws (5), lock washers (6), and flat washers (7).
7. Ensure switch lever (16) is in down (OFF) position.
8. Turn handle (2) CW, then close door (4).
9. Secure door (4) to main control enclosure (1) by tightening eleven latches (3).
10. Connect LADS electrical cable at power source.
11. Apply external power to LADS.
12. Turn handle (2) to ON.
13. Verify MAIN POWER lamp (WP 0009 00, Figure 1, 2) is on.
14. Position CONTROL POWER switch (3) to ON.
15. Verify CONTROL POWER lamp (4) is on.

END OF WORK PACKAGE

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UNIT

LAUNDRY ADVANCED SYSTEM

(NSN 3510–01–463–0114)

3–POLE CIRCUIT BREAKER (CB1 – CB6) REPLACEMENT REMOVAL, INSTALLATION

INITIAL SETUP:

Tools
Tool Kit, General Mechanics
(Item 14, WP 0282 00)

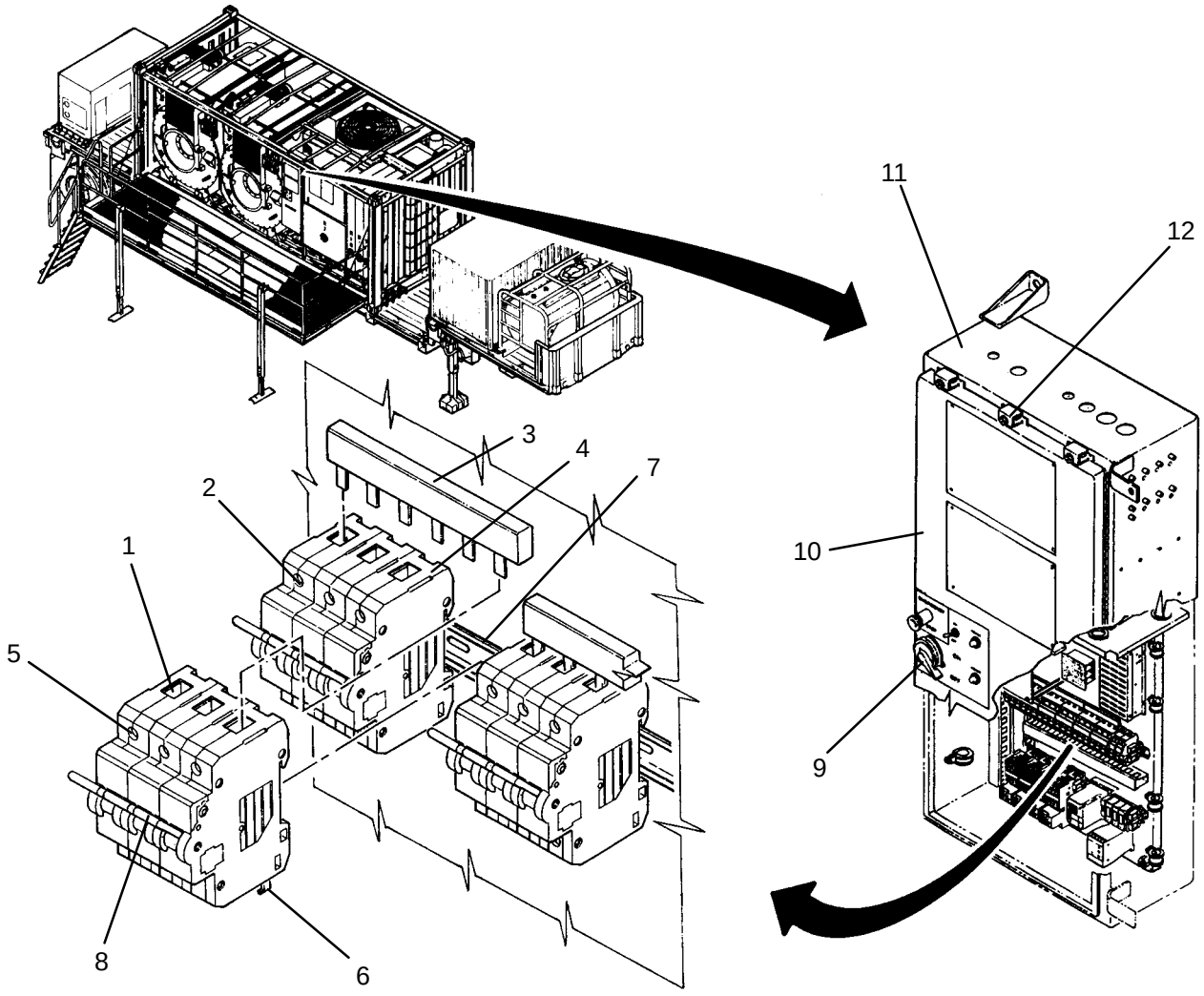
Personnel Required

Materials/Parts
Tags (Item 9, WP 0281 00)

Equipment Conditions
LADS power must be shut off and door opened at main control enclosure (WP 0113 00).

REMOVAL

1. Tag all wires connected to circuit breaker (1).
2. Loosen screw terminals (2) where bus bar (3) is connected at adjacent circuit breaker (4).
3. Loosen screw terminals (5), then disconnect wires and remove bus bar (3) from circuit breaker (1).
4. Pull out on locking tab (6), then remove circuit breaker (1) from mounting rail (7).



INSTALLATION

1. Pull out on locking tab (6), then install new circuit breaker (1) onto mounting rail (7).
2. Loosen screw terminals (5), then connect wires as tagged.
3. Insert bus bar (3) into circuit breakers (1) and (4), then tighten screw terminals (2) and (5).
4. Position lever (8) to ON.
5. Turn handle (9) CW, then close door (10).
6. Secure door (10) to main control enclosure (11) by tightening eleven latches (12).
7. Using maintenance menu (WP 0010 00) verify correct operation as follows:
   a. For circuit breaker CB1 test still condenser fan M200 and thermal fluid pump M300 operation. Also test heating system.
   b. For circuit breaker CB2, test dryer blower motors M104A and B operation.
   c. For circuit breaker CB3, test drum motor M100A rotation.
   d. For circuit breaker CB4, test drum motor M100B rotation.
   e. For circuit breaker CB5, test water pumps M101A and M101B operation.
   f. For circuit breaker CB6, test water pump M105, distillate pump (M201), and air compressor (M500) operation.

END OF WORK PACKAGE

UNIT

LAUNDRY ADVANCED SYSTEM

(NSN 3510–01–463–0114)

1–POLE CIRCUIT BREAKER (CB7 OR CB8) REPLACEMENT REMOVAL, INSTALLATION

INITIAL SETUP:

Tools
Tool Kit, General Mechanics
(Item 14, WP 0282 00)

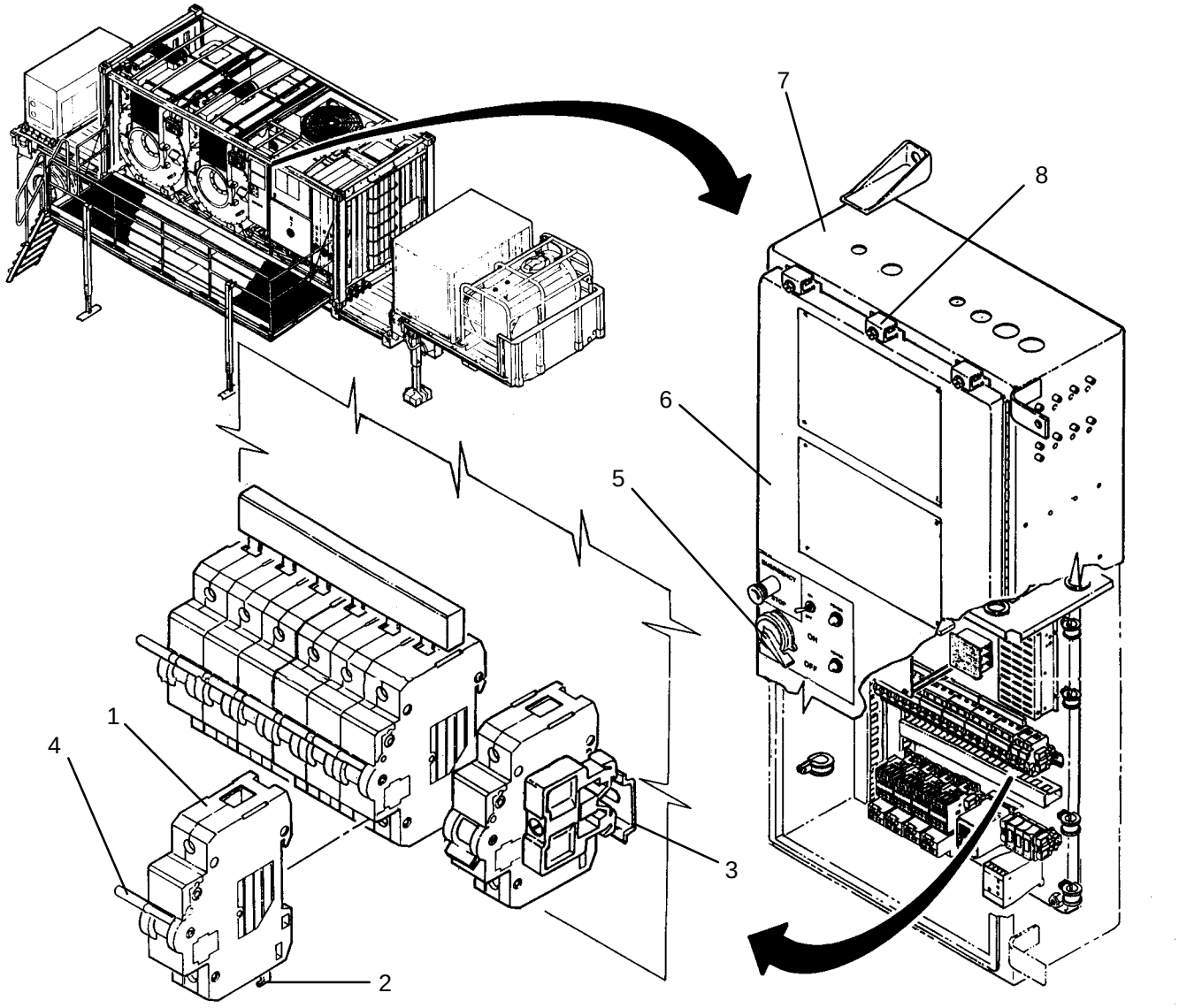
Personnel Required

Materials/Parts
Tags (Item 9, WP 0281 00)

Equipment Conditions
LADS power must be shut off and door opened at main control enclosure (WP 0113 00).

REMOVAL

1. Tag and disconnect wires from circuit breaker (1).
2. Pull out on locking tab (2), then remove circuit breaker (1) from mounting rail (3).



INSTALLATION

1. Pull out on locking tab (2), then install new circuit breaker (1) onto mounting rail (3).
2. Connect wires to circuit breaker (1) as tagged.
3. Position lever (4) to ON.
4. Turn handle (5) CW, then close door (6).
5. Secure door (6) to main control enclosure (7) by tightening eleven latches (8).
6. Verify correct operation as follows:
   a. For circuit breaker CB7:
      1. Position MAIN POWER switch (WP 0009 00, Figure 1, 1) to ON.
      2. Verify MAIN POWER lamp (2) is on.
      3. Position CONTROL POWER switch (3) to ON.
      4. Verify CONTROL POWER lamp (4) is on.
   b. For circuit breaker CB8 :
      1. Position MAIN POWER switch (WP 0009 00, Figure 1, 1) to ON.
      2. Test auxiliary lighting.

END OF WORK PACKAGE

UNIT

LAUNDRY ADVANCED SYSTEM

(NSN 3510–01–463–0114)

3–PHASE CONTACTOR (MC101, MC105, OR MC201) REPLACEMENT REMOVAL, INSTALLATION

INITIAL SETUP:

Tools
Tool Kit, General Mechanics
(Item 14, WP 0282 00)

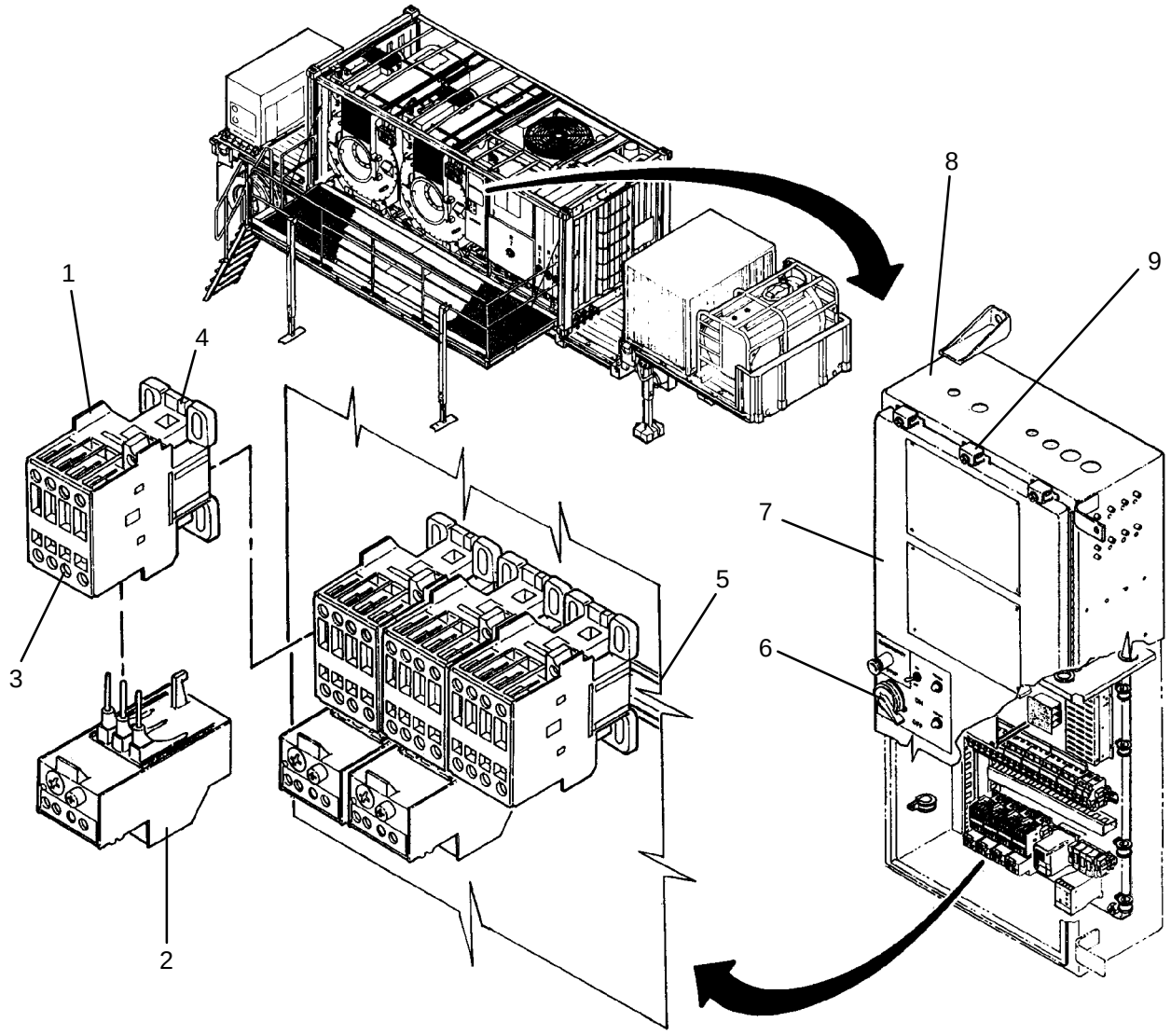
Personnel Required

Materials/Parts
Tags (Item 9, WP 0281 00)

Equipment Conditions
LADS power must be shut off and door opened at main control enclosure (WP 0113 00).

REMOVAL

1. Tag and disconnect wires from contactor (1) and overload relay (2).
2. Loosen three screw terminals (3), then pull overload relay (2) off of contactor (1).
3. Pull out on locking tab (4), then remove contactor (1) from mounting rail (5).



INSTALLATION

1. Pull out on locking tab (4), then install new contactor (1) onto mounting rail (5).
2. Insert overload relay (2) into contactor (1), then secure by tightening three screw terminals (3).
3. Connect wires to contactor (1) and overload relay (2) as tagged.
4. Turn handle (6) CW, then close door (7).
5. Secure door (7) to main control enclosure (8) by tightening eleven latches (9).
6. Using maintenance menu control outputs function (WP 0010 00), verify correct operation as follows:
   a. For contactor MC101A, test operation of water pump M101A.
   b. For contactor MC101B, test operation of water pump M101B.
   c. For contactor MC105, test operation of water supply pump M105.
   d. For contactor MC201, test operation of distillate pump M201.

END OF WORK PACKAGE

UNIT

LAUNDRY ADVANCED SYSTEM

(NSN 3510–01–463–0114)

OVERLOAD RELAY (OL101, OL105, OR OL201) REPLACEMENT REMOVAL, INSTALLATION

INITIAL SETUP:

Tools
Tool Kit, General Mechanics
(Item 14, WP 0282 00)

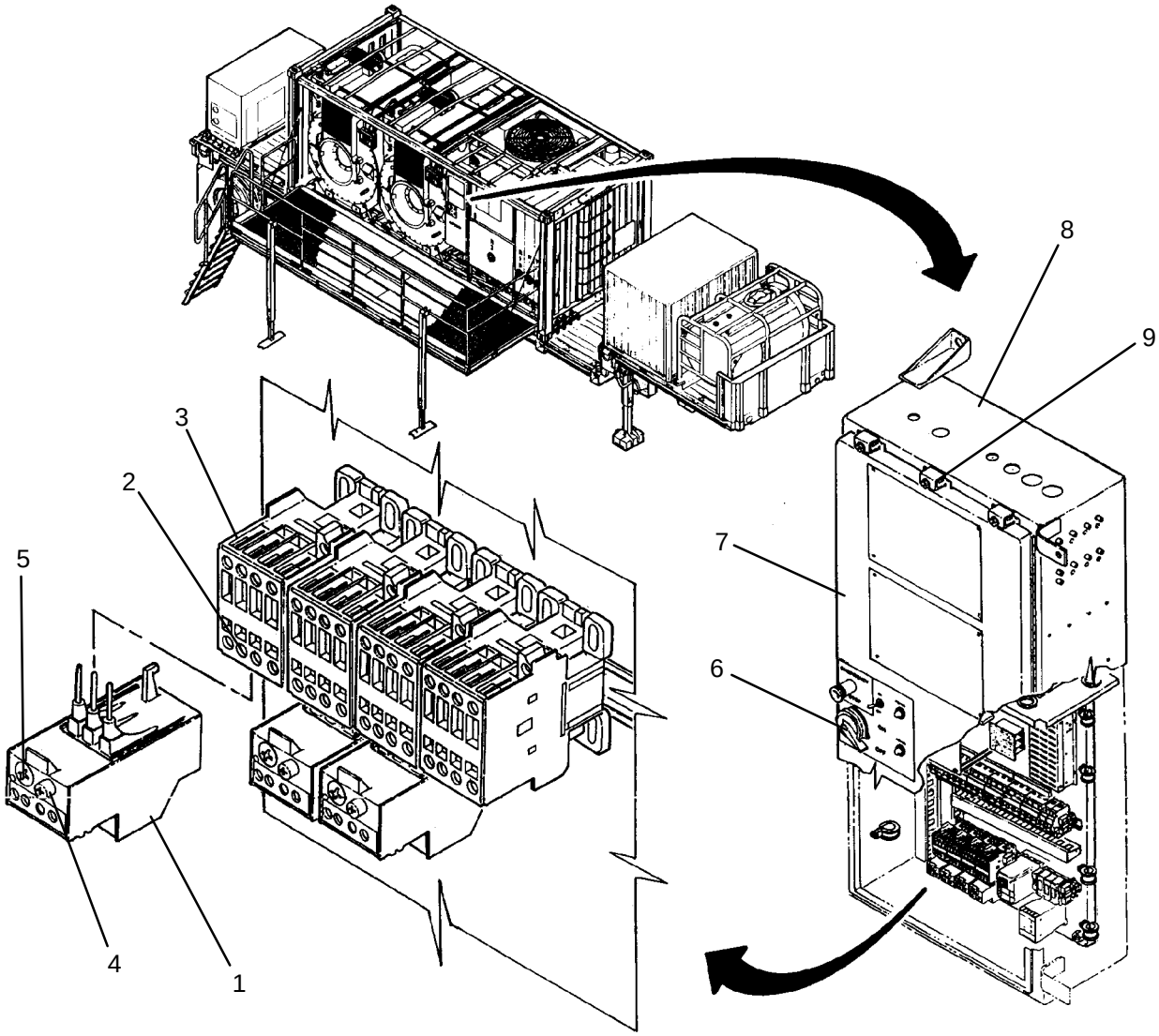
Personnel Required

Materials/Parts
Tags (Item 9, WP 0281 00)

Equipment Conditions
LADS power must be shut off and door opened at main control enclosure (WP 0113 00).

REMOVAL

1. Tag and disconnect wires from overload relay (1).
2. Loosen three screw terminals (2), then pull overload relay (1) off of contactor (3).



INSTALLATION

1. Insert new overload relay (1) into contactor (3), then secure by tightening three screw terminals (2).
2. Connect wires to overload relay (1) as tagged.
3. Set reset control (4) to MO.
4. Adjust amperage control (5) to setting as follows:
   a. For overload relays OL101A and OL101B, adjust amperage control to “6.2”.
   b. For overload relay OL105, adjust amperage control to “3”.
   c. For overload relay OL201, adjust amperage control to “2.6”.
5. Turn handle (6) CW, then close door (7).
6. Secure door (7) to main control enclosure (8) by tightening eleven latches (9).

CAUTION

Never start or run pumps dry. Prior to using maintenance menu to check operation of a pump make sure water is available at the pump inlet. Operating a pump dry can cause internal damage to pump.

7. Using maintenance menu control outputs function (WP 0010 00) verify correct operation as follows:
   a. For overload relay OL101A, test operation of water pump M101A.
   b. For overload relay OL101B, test operation of water pump M101B.
   c. For overload relay OL105, test operation of water supply pump M105.
   d. For overload relay OL201, test operation of distillate pump M105.

END OF WORK PACKAGE

UNIT

LAUNDRY ADVANCED SYSTEM

(NSN 3510–01–463–0114)

TIME DELAY RELAY (TDR105) REPLACEMENT REMOVAL, INSTALLATION

INITIAL SETUP:

Tools
Tool Kit, General Mechanics
(Item 14, WP 0282 00)

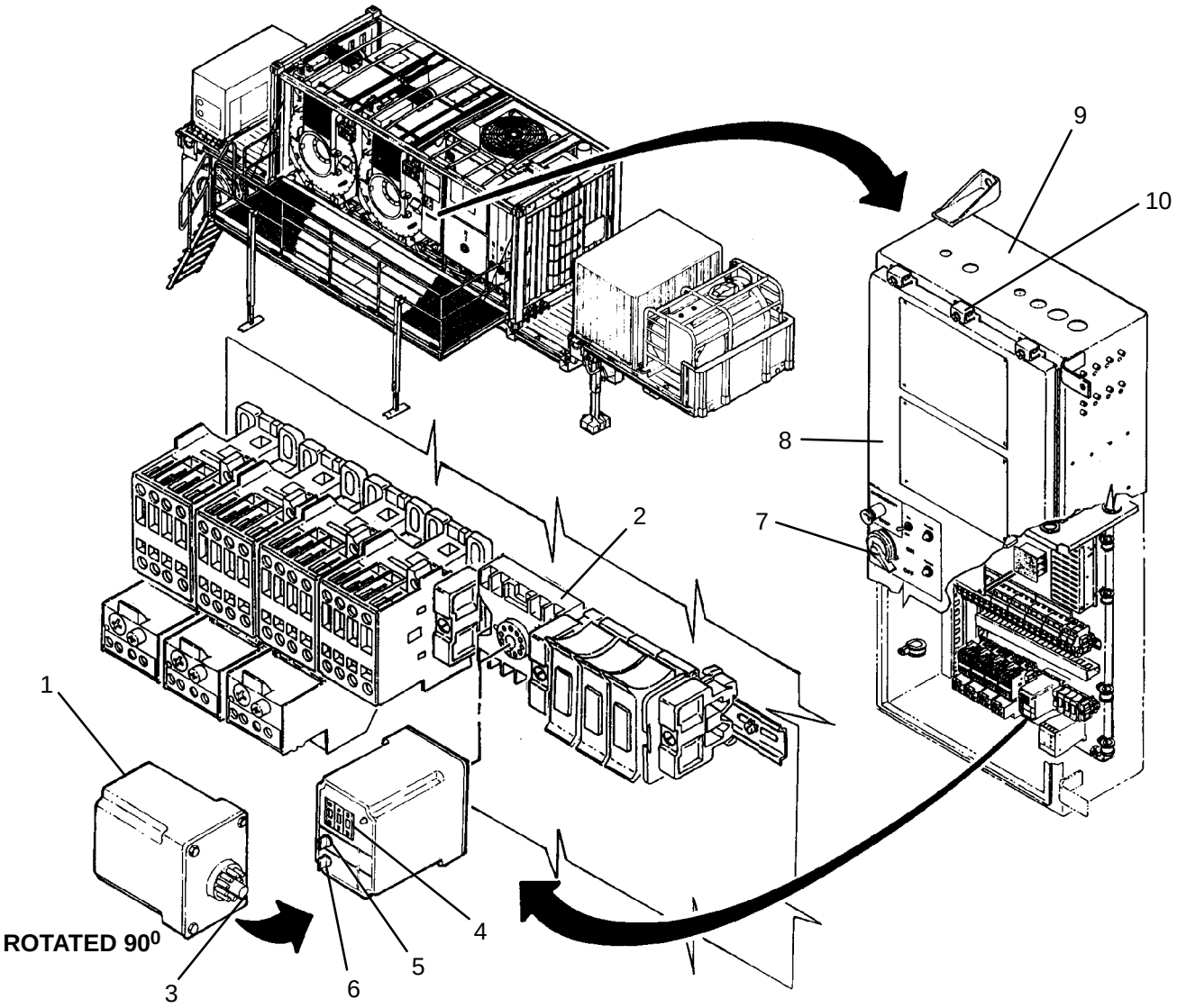
Personnel Required

Materials/Parts
Tags (Item 9, WP 0281 00)

Equipment Conditions
LADS power must be shut off and door opened at main control enclosure (WP 0113 00).

REMOVAL

1. Unplug relay (1) from socket base (2).



INSTALLATION

1. Align key (3) on new relay (1) then insert relay into socket base (2).
2. Set time select control (4) to “010”.
3. Set range select control (5) to “999M”.
4. Set function select control (6) to “1–SHOT”.
5. Turn handle (7) CW, then close door (8).
6. Secure door (8) to main control enclosure (9) by tightening eleven latches (10).
7. Verify correct operation as follows:
   a. Position MAIN POWER switch (WP 0009 00, Figure 1, 1) to ON.
   b. Position CONTROL POWER switch (WP 0009 00, Figure 1, 3) to ON.
   c. Press WATER SUPPLY PUMP START switch (WP 0009 00, Figure 1, 6). Verify water supply pump turns on.

END OF WORK PACKAGE

UNIT

LAUNDRY ADVANCED SYSTEM

(NSN 3510–01–463–0114)

AIR COMPRESSOR INVERTER (K500) REPLACEMENT REMOVAL, INSTALLATION

INITIAL SETUP:

Tools
Multimeter (Item 2, WP 0282 00)
Tool Kit, General Mechanics (Item 14, WP 0282 00)

Personnel Required

Materials/Parts
Tags (Item 9, WP 0281 00)

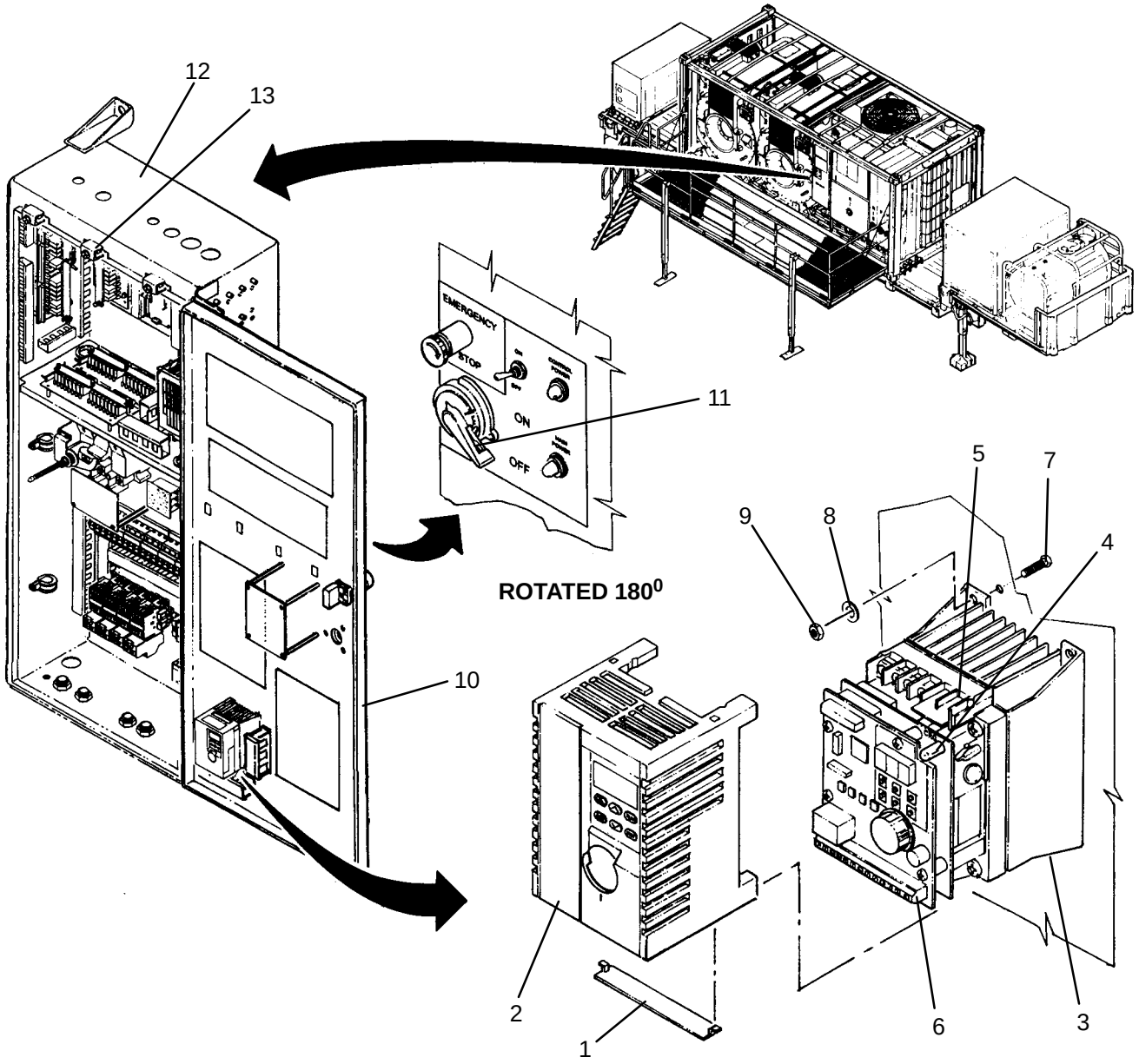
Equipment Conditions
LADS power must be shut off and door opened at main control enclosure (WP 0113 00).

REMOVAL

WARNING

The inverter drive must discharge before it is safe to disconnect wire connections. DEATH ON CONTACT may result if personnel fail to observe this safety precaution.

1. Remove wire retainer (1), then remove cover (2) from inverter drive (3).
2. Wait for CRG indicator (4) to go off, then use a multimeter to verify voltage is not present at terminal strip (5).
3. Tag and disconnect wiring at terminal strip (6).
4. Tag and disconnect wiring at terminal strip (5).
5. Remove two screws (7), flat washers (8) and nuts (9), then remove inverter drive (3) from door (10).



INSTALLATION

1. Position inverter drive (3) on inside of door (10) then secure with two screws (7), flat washers (8) and nuts (9).
2. Remove wire retainer (1), then remove cover (2) from new inverter drive (3).
3. Connect wiring at terminal strip (5) as tagged.
4. Connect wiring at terminal strip (6) as tagged.
5. Install cover (2) onto inverter drive (3) then install wire retainer (1).
6. Turn handle (11) CW, then close door (10).
7. Secure door (10) to main control enclosure (12) by tightening eleven latches (13).
8. Use maintenance menu to air system (WP 0010 00).

END OF WORK PACKAGE

UNIT

LAUNDRY ADVANCED SYSTEM

(NSN 3510–01–463–0114)

BLOWN FUSE INDICATOR REPLACEMENT REMOVAL, INSTALLATION

INITIAL SETUP:

Tools
Tool Kit, General Mechanics
(Item 14, WP 0282 00)

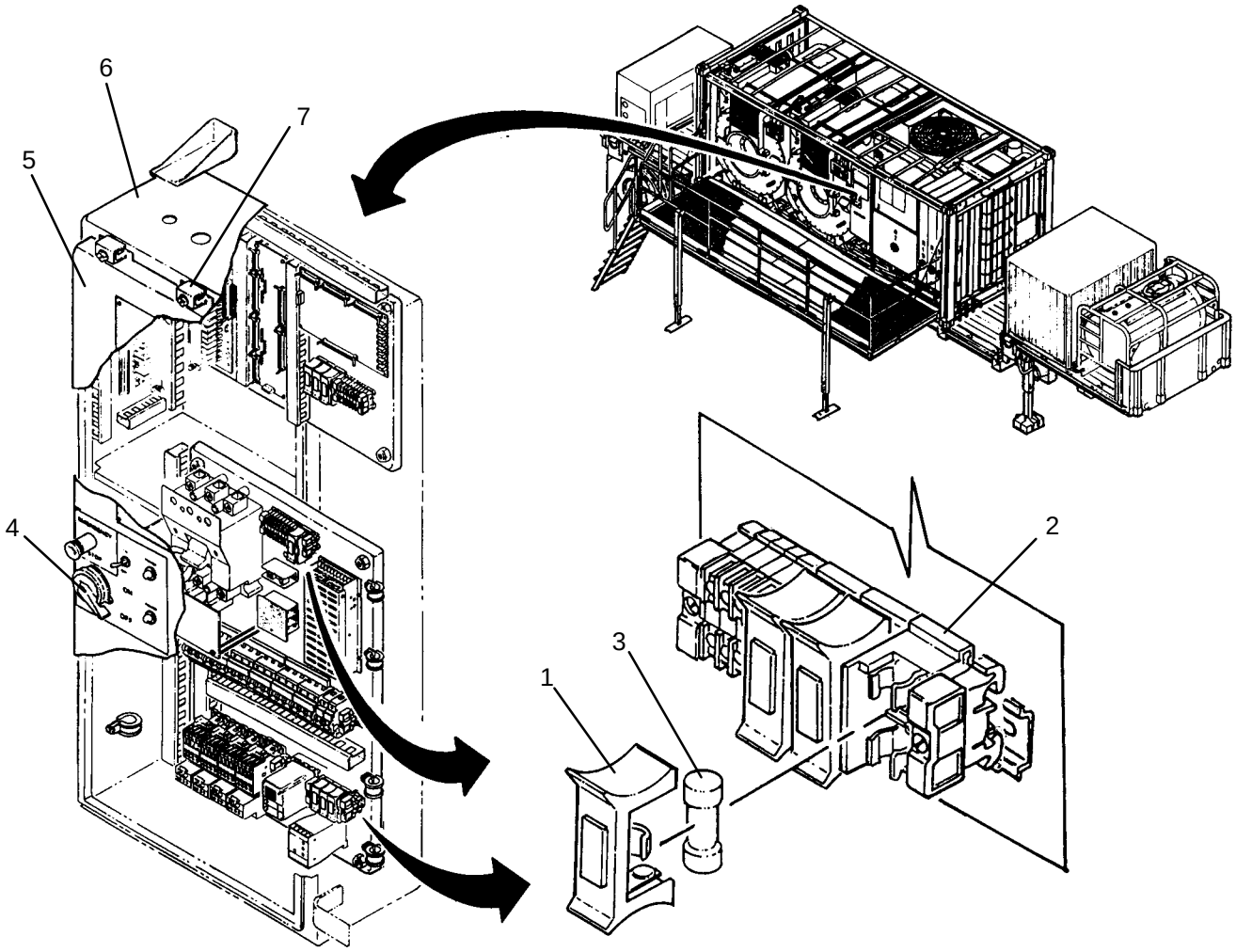
Personnel Required

Materials/Parts

Equipment Conditions
LADS power must be shut off and door opened at main control enclosure (WP 0113 00).

REMOVAL

1. Remove blown fuse indicator (1) from fuse block (2).
2. Remove fuse (3) from blown fuse indicator (1).



INSTALLATION

1. Insert fuse (3) into new blown fuse indicator (1).
2. Install blown fuse indicator (1) onto fuse block (2).
3. Turn handle (4) CW, then close door (5).
4. Secure door (5) to main control enclosure (6) by tightening eleven latches (7).
5. Perform a test laundry cycle (TM 10–3510–221–10). Verify normal operation.

END OF WORK PACKAGE

UNIT

LAUNDRY ADVANCED SYSTEM

(NSN 3510–01–463–0114)

FUSE (F1, F2, F3, F7, F8, F9 OR F10) REPLACEMENT REMOVAL, INSTALLATION

INITIAL SETUP:

Tools
Tool Kit, General Mechanics
(Item 14, WP 0282 00)

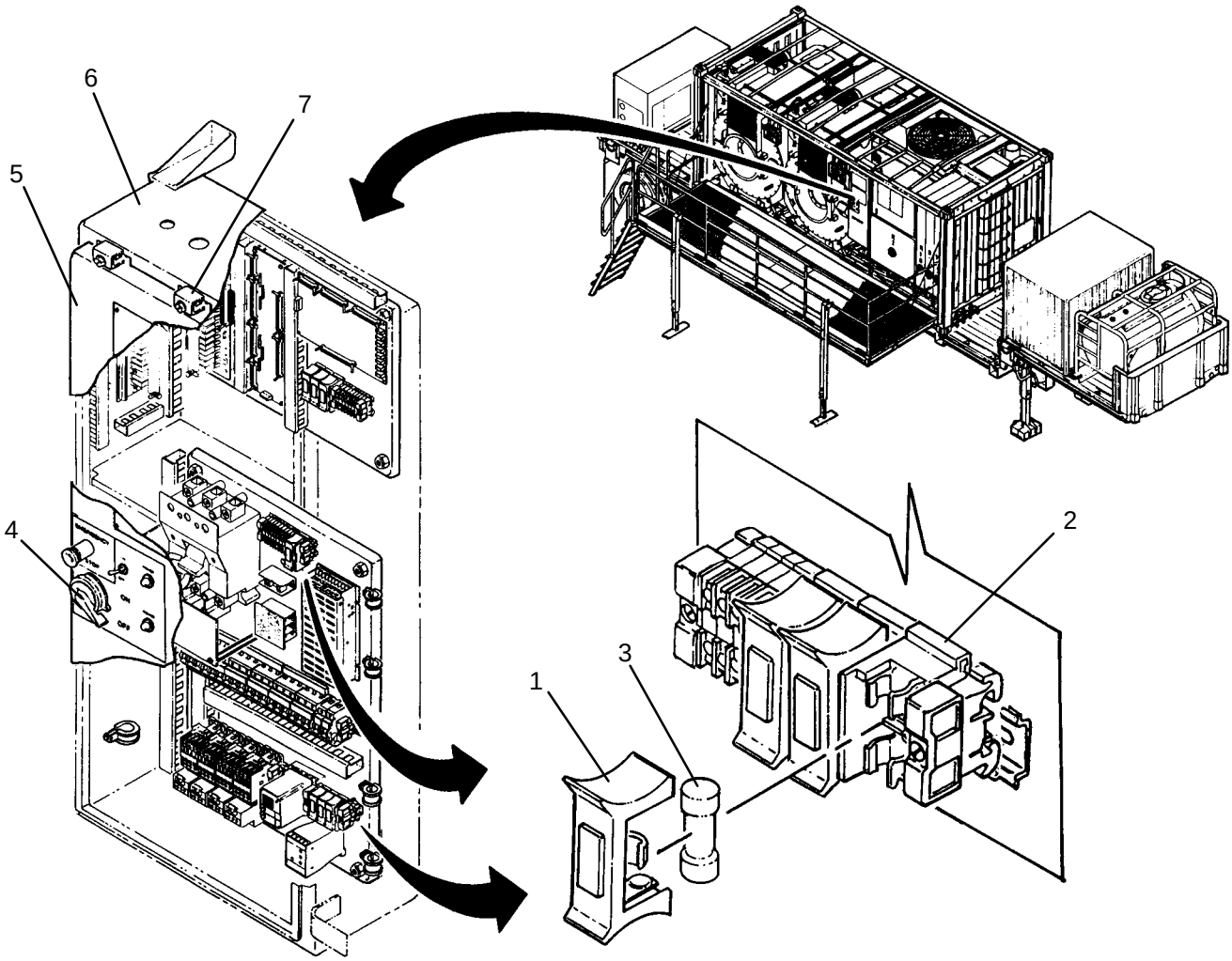
Personnel Required

Materials/Parts

Equipment Conditions
LADS power must be shut off and door opened at main control enclosure (WP 0113 00).

REMOVAL

1. Remove blown fuse indicator (1) from fuse block (2).
2. Remove fuse (3) from blown fuse indicator (1).



INSTALLATION

1. Insert new fuse (3) into blown fuse indicator (1).
2. Install blown fuse indicator (1) onto fuse block (2).
3. Turn handle (4) CW, then close door (5).
4. Secure door (5) to main control enclosure (6) by tightening eleven latches (7).
5. Perform a test laundry cycle (TM 10–3510–221–10). Verify normal operation.

END OF WORK PACKAGE

UNIT

LAUNDRY ADVANCED SYSTEM

(NSN 3510–01–463–0114)

PHASE MONITOR (PM1) REPLACEMENT REMOVAL, INSTALLATION

INITIAL SETUP:

Tools
Tool Kit, General Mechanics
(Item 14, WP 0282 00)

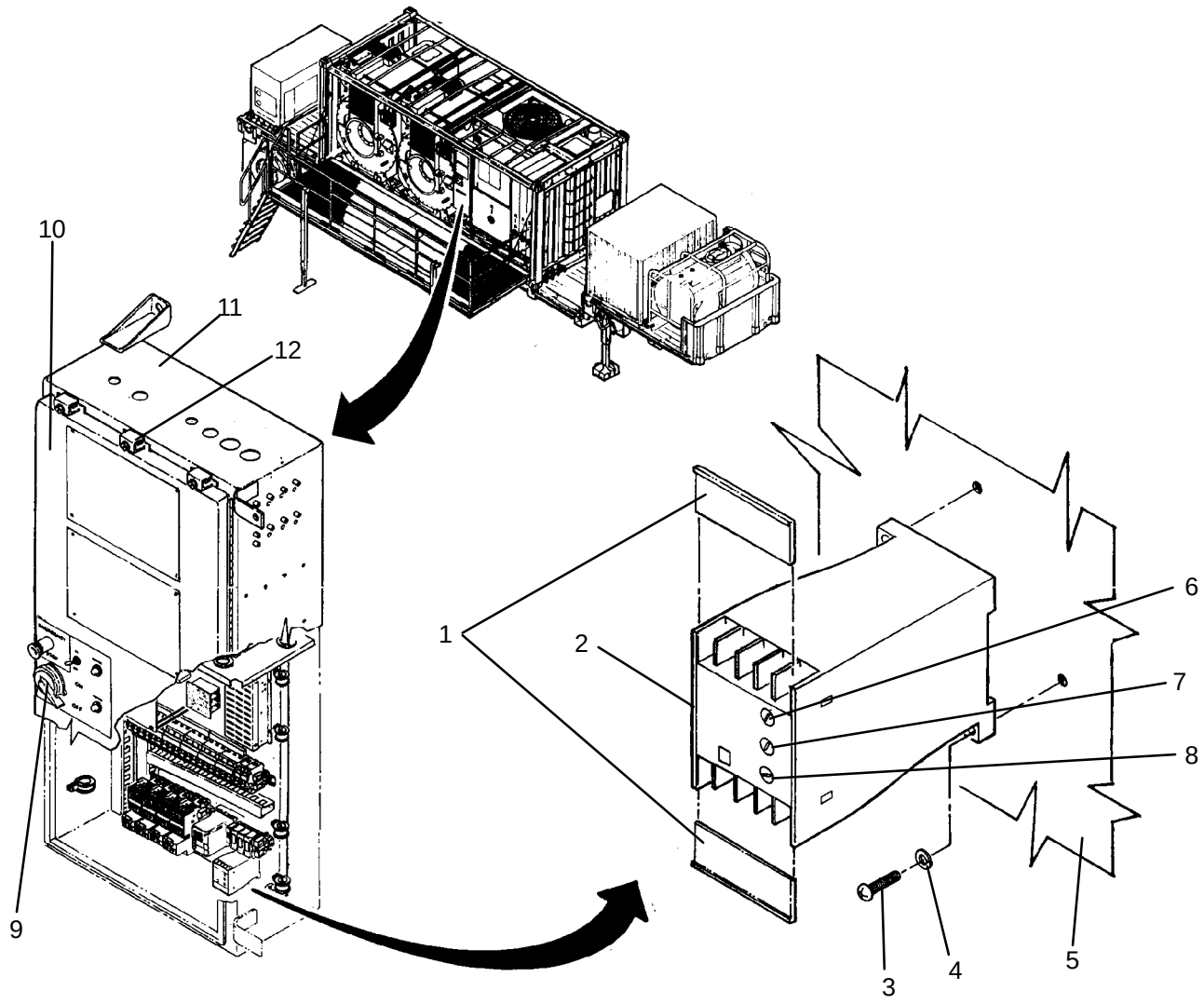
Personnel Required

Materials/Parts
Tags (Item 9, WP 0281 00)
Washer, Lock (Item 18, WP 0283 00)

Equipment Conditions
LADS power must be shut off and door opened at main control enclosure (WP 0113 00).

REMOVAL

1. Slide covers (1) out of phase monitor (2).
1. Tag and disconnect wires from phase monitor (2).
2. Remove two screws (3) and lock washers (4), then remove phase monitor (2) from subpanel (5).



INSTALLATION

1. Install new phase monitor (2) onto subpanel (5), then secure with two screws (3) and lock washers (4).
2. Slide covers (1) out of phase monitor (2).
3. Connect wires to phase monitor (2) as tagged.
4. Slide covers (1) into phase monitor (2).
5. Set LINE VOLTAGE adjustment (6) to 210 VAC.
6. Set % VOLTAGE UNBALANCE adjustment (7) to 5.
7. Set TRIP DELAY adjustment (8) to 11.
8. Turn handle (9) CW, then close door (10).
9. Secure door (10) to main control enclosure (11) by tightening eleven latches (12).
10. Position MAIN DISCONNECT switch (WP 0009 00, Figure 1, 1) to ON.
11. Position CONTROL POWER switch (WP 0009 00, Figure 1, 3) to ON.
12. Verify CONTROL POWER lamp (WP 0009 00, Figure 1, 4) is on.

END OF WORK PACKAGE

UNIT

LAUNDRY ADVANCED SYSTEM

(NSN 3510–01–463–0114)

+12 VDC POWER SUPPLY (PS1) REPLACEMENT REMOVAL, INSTALLATION

INITIAL SETUP:

Tools
Tool Kit, General Mechanics
(Item 14, WP 0282 00)

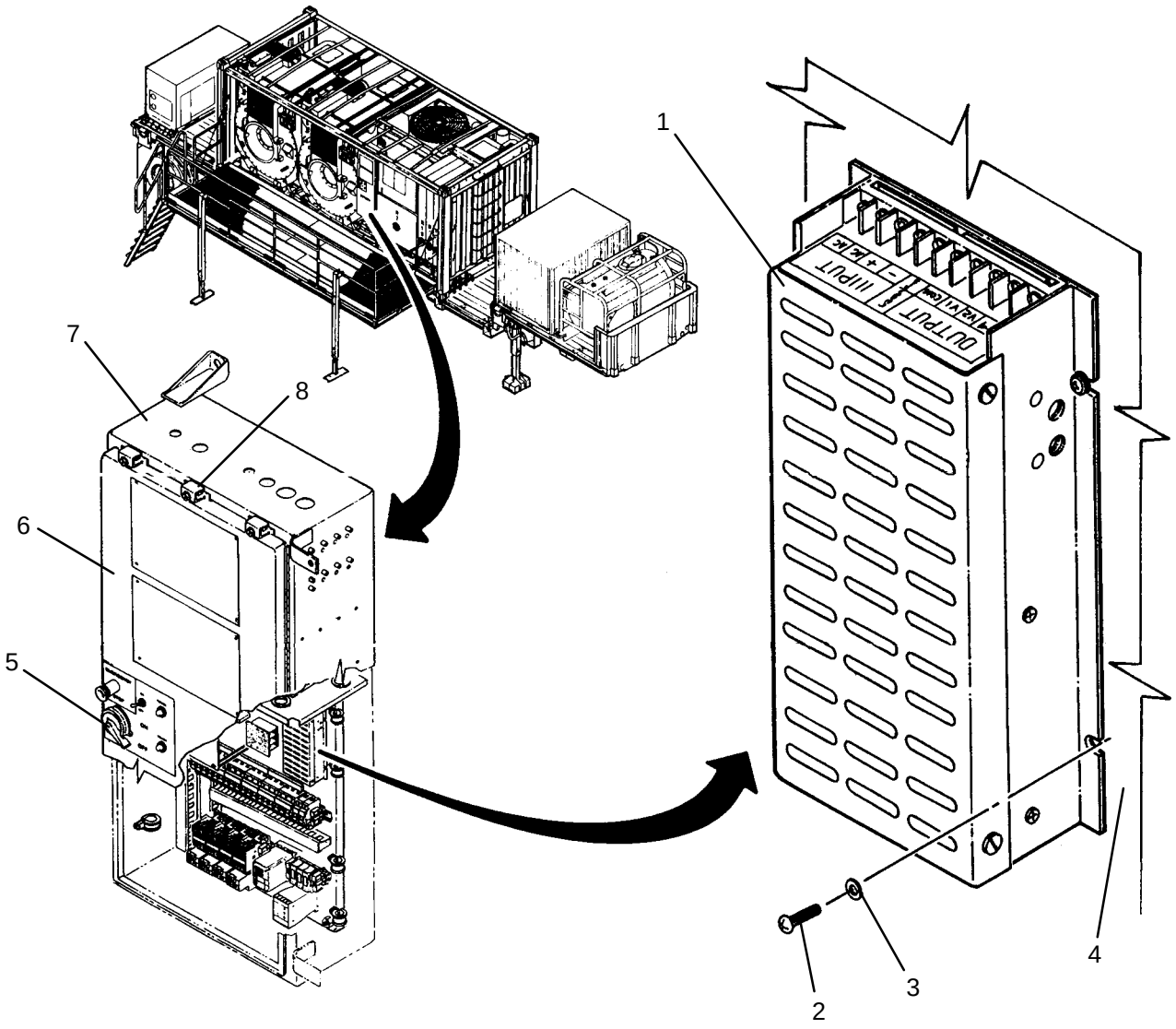
Personnel Required

Materials/Parts
Tags (Item 9, WP 0281 00)
Washer, Lock (Item 18, WP 0283 00)

Equipment Conditions
LADS power must be shut off and door opened at main control enclosure (WP 0113 00).

REMOVAL

1. Tag and disconnect wires from power supply (1).
2. Remove four screws (2) and lock washers (3), then remove power supply (1) from subpanel (4).



INSTALLATION

1. Install new power supply (1) onto subpanel (4), then secure with four screws (2) and lock washers (3).
2. Connect wires to power supply (1) as tagged.
3. Turn handle (5) CW, then close door (6).
4. Secure door (6) to main control enclosure (7) by tightening eleven latches (8).
5. Perform a test laundry cycle (TM 10–3510–221–10). Verify normal operation.

END OF WORK PACKAGE

UNIT

LAUNDRY ADVANCED SYSTEM

(NSN 3510–01–463–0114)

LAMP SOCKET (DS1 OR DS2) REPLACEMENT REMOVAL, INSTALLATION

INITIAL SETUP:

Tools
Tool Kit, General Mechanics
(Item 14, WP 0282 00)

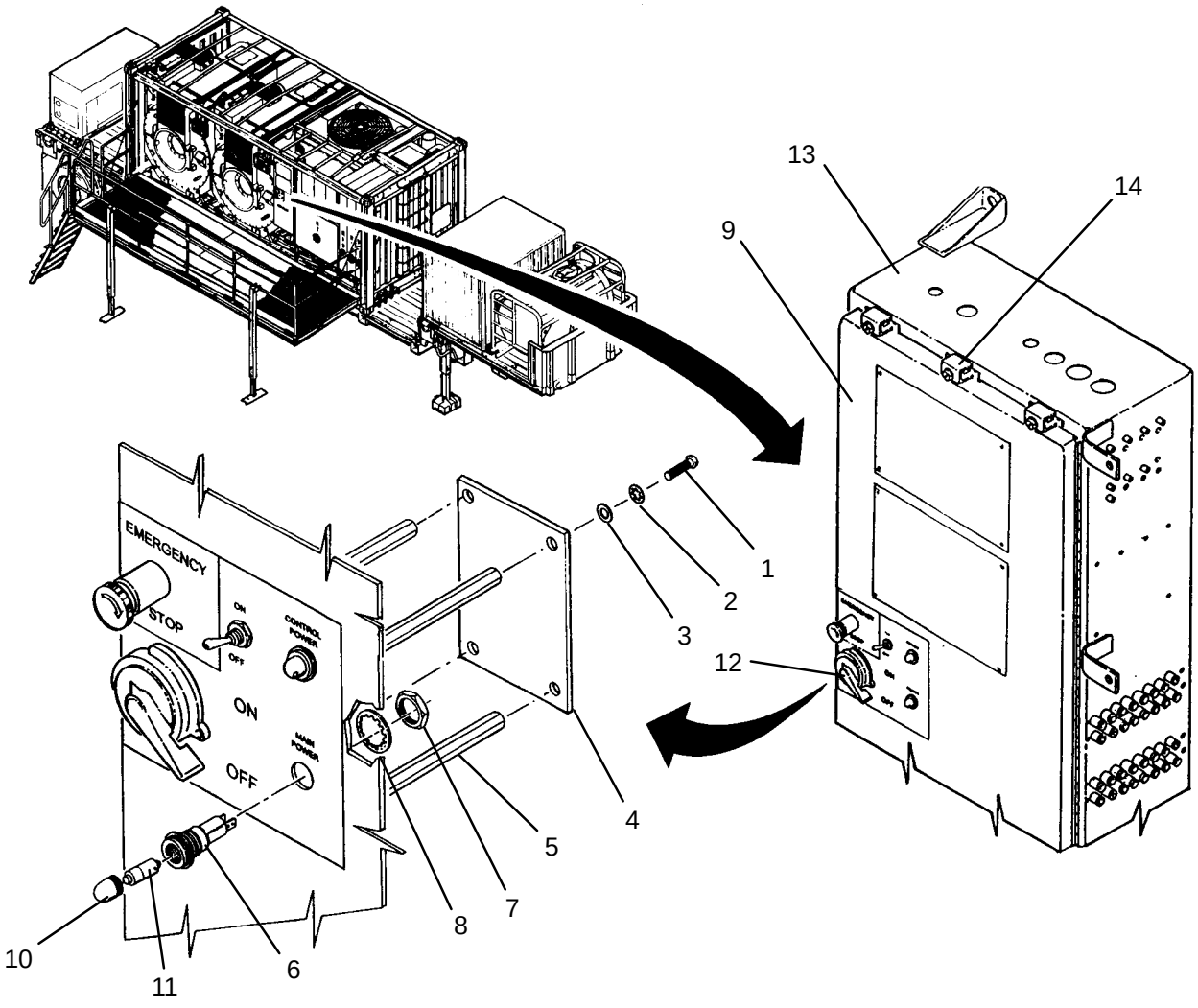
Personnel Required

Materials/Parts
Tags (Item 9, WP 0281 00)

Equipment Conditions
LADS power must be shut off and door opened at main control enclosure (WP 0113 00).

REMOVAL

1. Remove four screws (1), lock washers (2), and flat washers (3), then remove cover (4) from standoffs (5).
2. Tag and disconnect wires from lamp socket (6).
3. Remove nut (7) and lock washer (8), then remove lamp socket (6) from door (9).
4. Remove lens (10) and lamp (11) from lamp socket (6).



INSTALLATION

1. Install lamp (11) and lens (10) onto new lamp socket (6).
2. Remove nut (7) and lock washer (8) from lamp socket (6).
3. Install lamp socket (6) onto door (9) then secure with nut (7) and lock washer (8).
4. Connect wires to lamp socket (6) as tagged.
5. Position cover (4) on standoffs (5) then secure with four screws (1), lock washers (2), and flat washers (3).
6. Turn handle (12) CW, then close door (9).
7. Secure door (9) to main control enclosure (13) by tightening eleven latches (14).
8. Position MAIN DISCONNECT switch (WP 0009 00, Figure 1, 1) to ON.
9. Verify MAIN POWER lamp (WP 0009 00, Figure 1, 2) is on.
10. Position CONTROL POWER switch (WP 0009 00, Figure 1, 3) to ON.
11. Verify CONTROL POWER lamp (WP 0009 00, Figure 1, 4) is on.

END OF WORK PACKAGE

UNIT

LAUNDRY ADVANCED SYSTEM

(NSN 3510–01–463–0114)

EMERGENCY STOP SWITCH (PBS6) REPLACEMENT REMOVAL, INSTALLATION

INITIAL SETUP:

Tools
Tool Kit, General Mechanics
(Item 14, WP 0282 00)

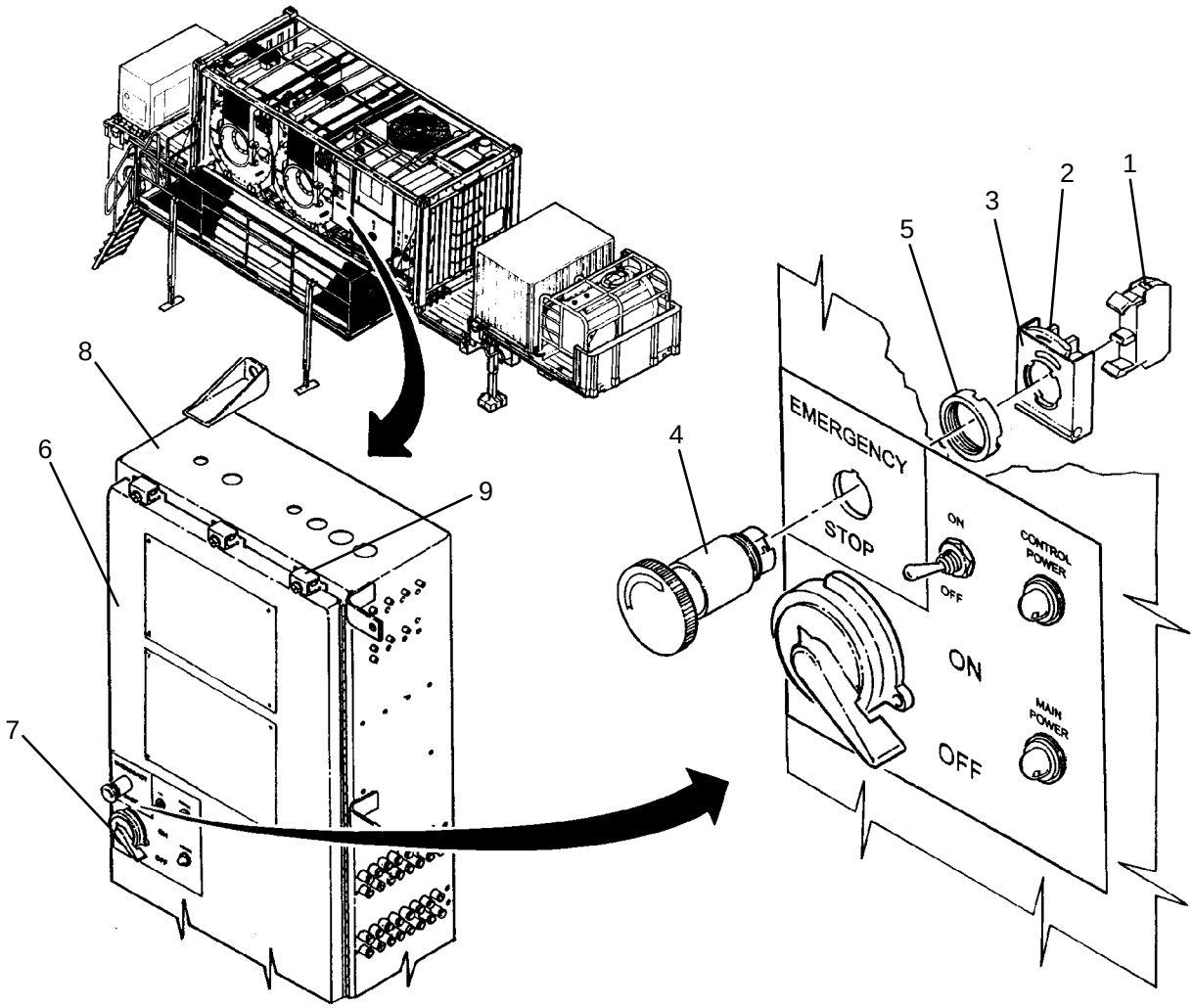
Personnel Required

Materials/Parts
Tags (Item 9, WP 0281 00)

Equipment Conditions
LADS power must be shut off and door opened at main control enclosure (WP 0113 00).

REMOVAL

1. Tag and disconnect wires from contact block (1).
2. Slide locking lever (2) over, then pull switch base (3) and contact block (1) off of emergency stop switch (4).
3. Remove nut (5), then remove emergency stop switch (4) from door (6).



INSTALLATION

1. Remove nut (5) from new emergency stop switch (4).
2. Install emergency stop switch (4) onto door (6) then secure with nut (5).
3. Install new contact block (1) onto switch base (3).
4. Slide locking lever (2) over, then insert switch base (3) onto emergency stop switch (4).
5. Connect wires to contact block (1) as tagged.
6. Turn handle (7) CW, then close door (6).
7. Secure door (6) to main control enclosure (8) by tightening eleven latches (9).
8. Rotate knob (10) CW to ensure emergency stop switch (1) is not engaged.
9. Position MAIN DISCONNECT switch (WP 0009 00, Figure 1, 1) to ON.
10. Position CONTROL POWER switch (WP 0009 00, Figure 1, 3) to ON.
11. Wait for control system to complete self–test then press EMERGENCY STOP switch (WP 0009 00, Figure 1, 5).
12. Verify display (WP 0009 00, Figure 2, 6) at operator panel A, reads:

SYSTEM SHUTDOWN EMERGENCY STOP	

13. Position CONTROL POWER switch (WP 0009 00, Figure 1, 3) to OFF.
14. Rotate and pull out on EMERGENCY STOP switch (WP 0009 00, Figure 1, 5).
15. Position CONTROL POWER switch (WP 0009 00, Figure 1, 3) to ON.
16. Wait for control system to complete self–test then verify display (WP 0009 00, Figure 2, 6) reads:

	PRESS TO START

END OF WORK PACKAGE

UNIT

LAUNDRY ADVANCED SYSTEM

(NSN 3510–01–463–0114)

CONTROL POWER SWITCH (SW2) REPLACEMENT REMOVAL, INSTALLATION

INITIAL SETUP:

Tools
Tool Kit, General Mechanics
(Item 14, WP 0282 00)

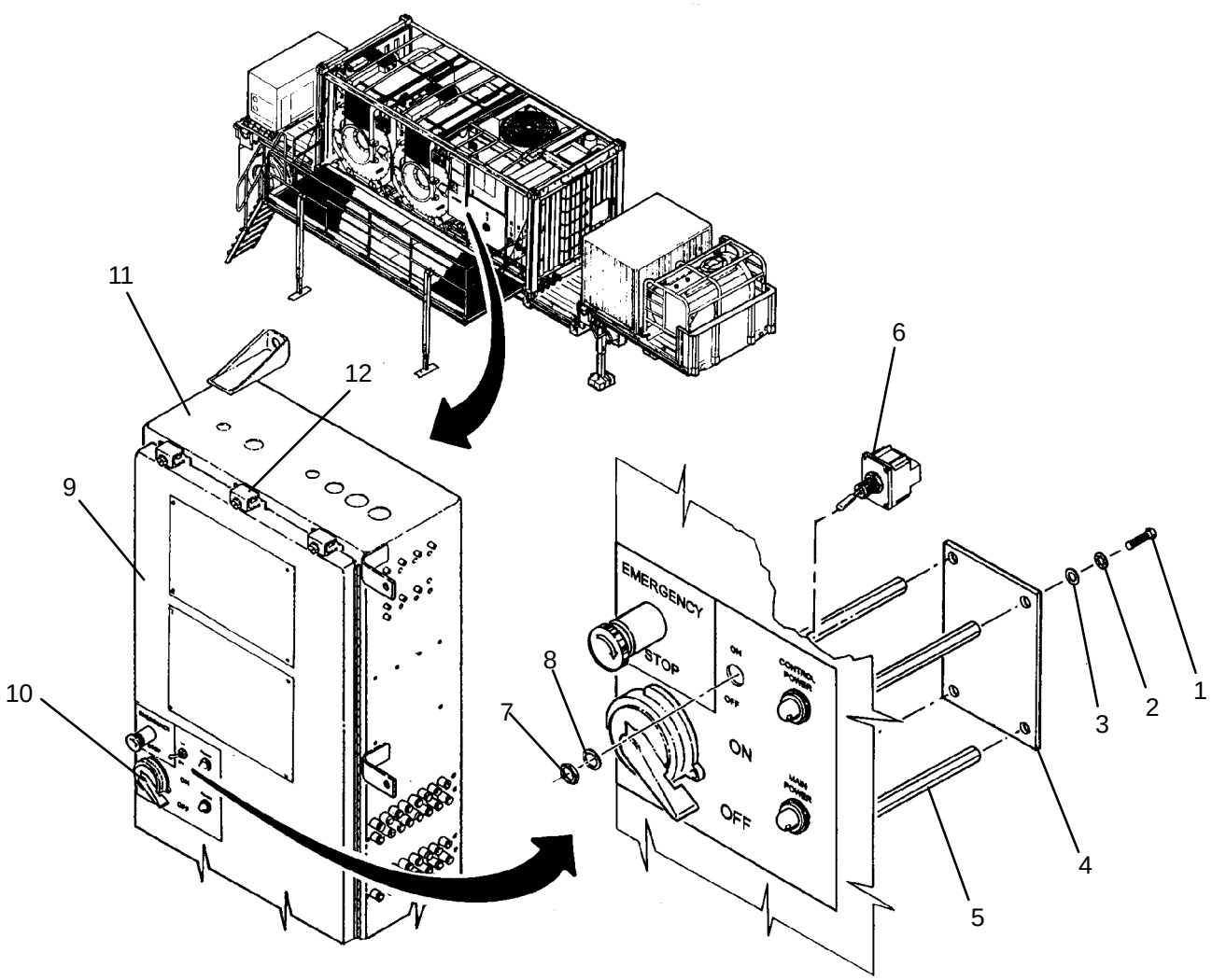
Personnel Required

Materials/Parts
Tags (Item 9, WP 0281 00)
Washer, Lock (Item 17, WP 0283 00)

Equipment Conditions
LADS power must be shut off and door opened at main control enclosure (WP 0113 00).

REMOVAL

1. Remove four screws (1), lock washers (2), and flat washers (3), then remove cover (4) from standoffs (5).
2. Tag and disconnect wires from toggle switch (6).
3. Remove nut (7) and lock washer (8), then remove toggle switch (6) from door (9).



INSTALLATION

1. Remove nut (7) and lock washer (8) from new toggle switch (6).
2. Install toggle switch (6) onto door (9) then secure with nut (7) and lock washer (8).
3. Connect wires to toggle switch (6) as tagged.
4. Position cover (4) on standoffs (5) then secure with four screws (1), lock washers (2), and flat washers (3).
5. Turn handle (10) CW, then close door (9).
6. Secure door (9) to main control enclosure (11) by tightening eleven latches (12).
7. Position MAIN DISCONNECT switch (WP 0009 00, Figure 1, 1) to ON.
8. Position CONTROL POWER switch (WP 0009 00, Figure 1, 3) to ON.
9. Verify CONTROL POWER lamp (WP 0009 00, Figure 1, 4) is on.

END OF WORK PACKAGE

UNIT

LAUNDRY ADVANCED SYSTEM

(NSN 3510–01–463–0114)

WATER PUMP START SWITCH (DS2) REPLACEMENT REMOVAL, INSTALLATION

INITIAL SETUP:

Tools
Tool Kit, General Mechanics
(Item 14, WP 0282 00)

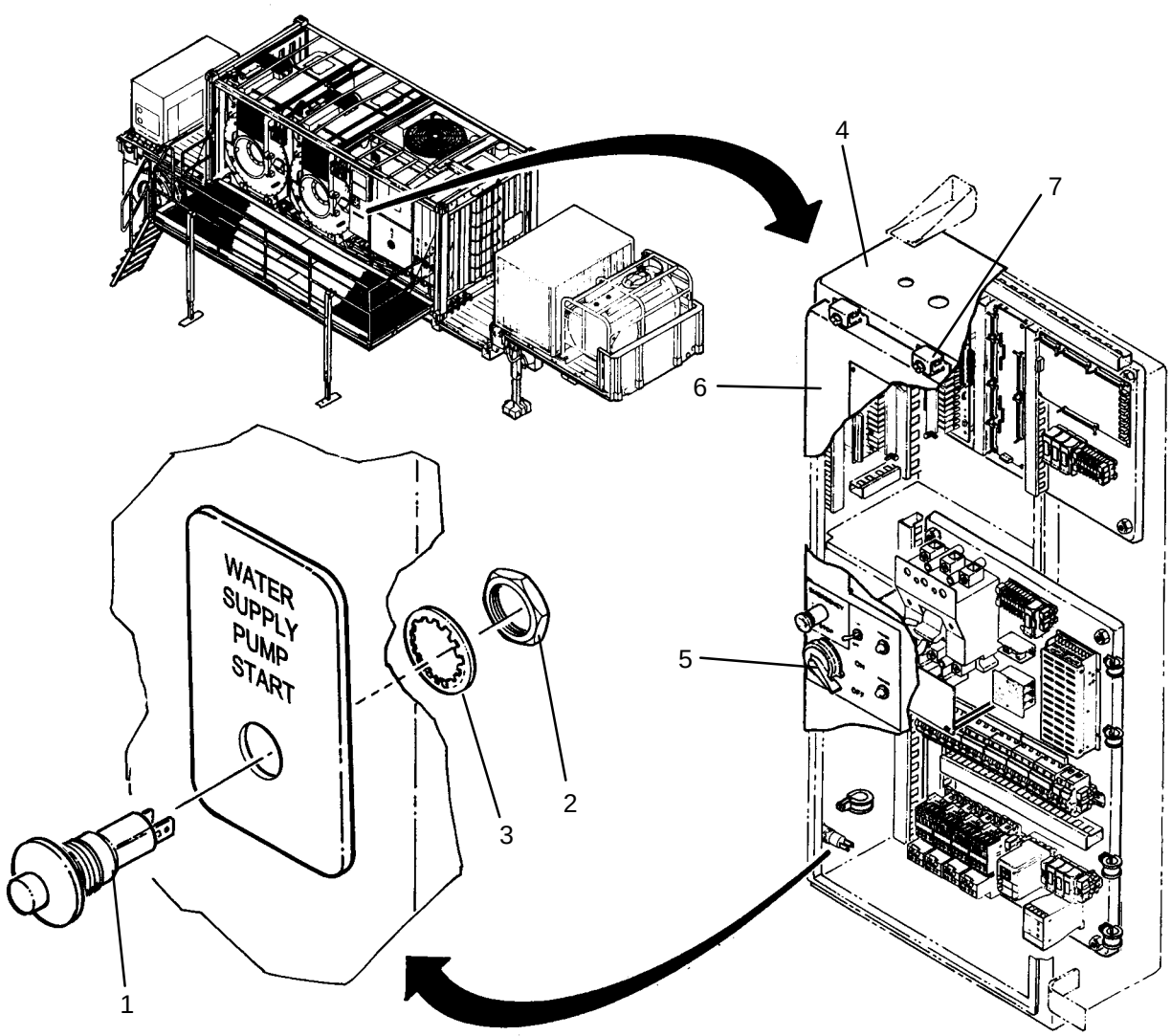
Personnel Required

Materials/Parts
Tags (Item 9, WP 0281 00)

Equipment Conditions
LADS power must be shut off and door opened at main control enclosure (WP 0113 00).

REMOVAL

1. Tag and disconnect wires from pushbutton switch (1).
2. Remove nut (2) and lock washer (3), then remove pushbutton switch (1) from enclosure (4).



INSTALLATION

1. Remove nut (2) and lock washer (3) from new pushbutton switch (1).
2. Install pushbutton switch (1) onto enclosure (4) then secure with nut (2) and lock washer (3).
3. Connect wires to pushbutton switch (1) as tagged.
4. Turn handle (5) CW, then close door (6).
5. Secure door (6) to main control enclosure (4) by tightening eleven latches (7).
6. Position MAIN DISCONNECT switch (WP 0009 00, Figure 1, 1) to ON.
7. Position CONTROL POWER switch (WP 0009 00, Figure 1, 3) to ON.
8. Press WATER SUPPLY PUMP START pushbutton switch (WP 0009 00, Figure 1, 6). Verify water supply pump turns on.

END OF WORK PACKAGE

UNIT

LAUNDRY ADVANCED SYSTEM

(NSN 3510–01–463–0114)

POWER SUPPLY TRIM CIRCUIT REPLACEMENT REMOVAL, INSTALLATION

INITIAL SETUP:

Tools
Tool Kit, General Mechanics
(Item 14, WP 0282 00)

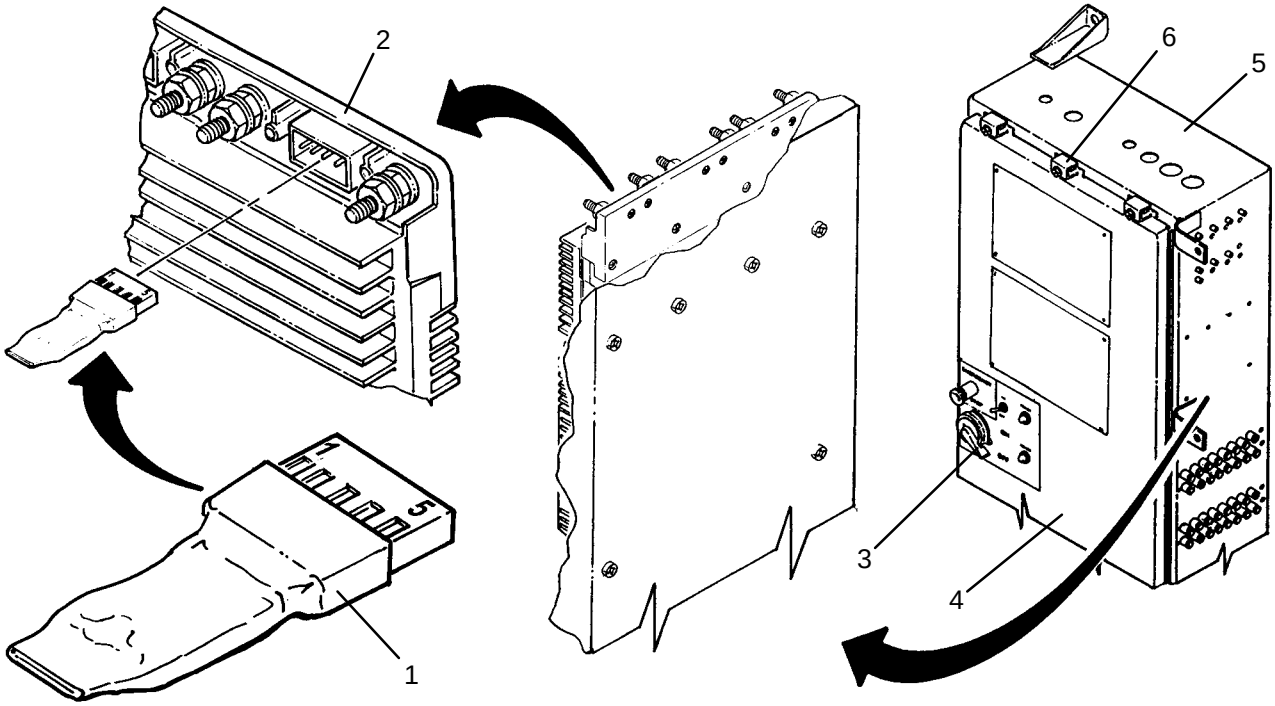
Personnel Required

Materials/Parts

Equipment Conditions
LADS power must be shut off and door opened at main control enclosure (WP 0113 00).

REMOVAL

1. Remove trim circuit (1) from power supply (2).



INSTALLATION

NOTE

Ensure pin number locators are facing up with pin 1 on the left and pin 5 on the right.

1. Install trim circuit (1) onto power supply (2).
4. Turn handle (3) CW, then close door (4).
2. Secure door (4) to main control enclosure (5) by tightening eleven latches (6).
3. Perform a test laundry cycle (TM 10–3510–221–10). Verify normal operation.

END OF WORK PACKAGE

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UNIT

LAUNDRY ADVANCED SYSTEM

(NSN 3510–01–463–0114)

+5, +/–12 VDC POWER SUPPLY (PS2) REPLACEMENT REMOVAL, INSTALLATION

INITIAL SETUP:

Tools
Tool Kit, General Mechanics
(Item 14, WP 0282 00)

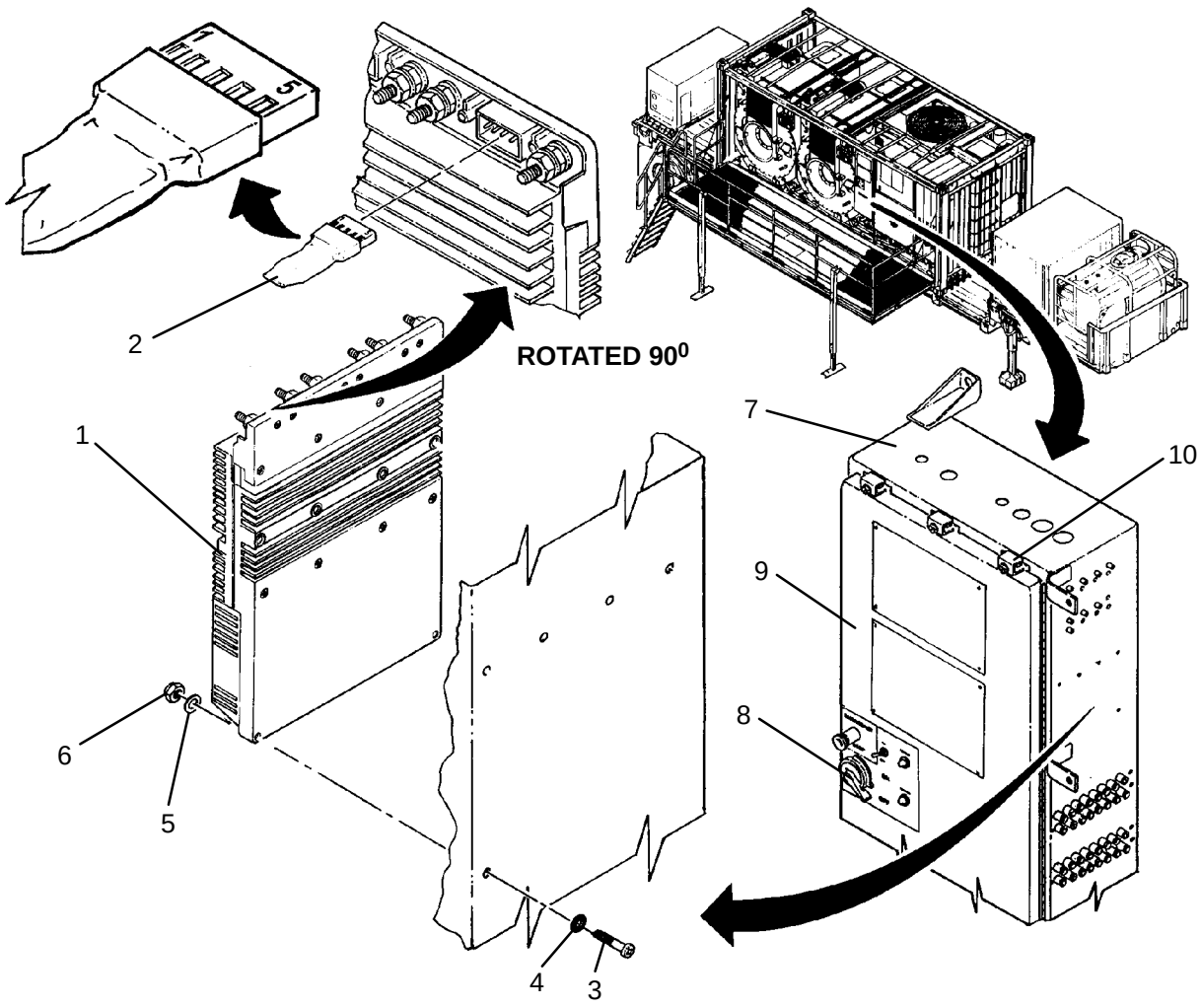
Personnel Required

Materials/Parts
Tags (Item 9, WP 0281 00)

Equipment Conditions
LADS power must be shut off and door opened at main control enclosure (WP 0113 00).

REMOVAL

1. Tag and disconnect wires from power supply (1).
2. Remove trim circuit (2) from power supply (1)
3. Remove six screws (3), sealing washers (4), flat washers (5), and nuts (6), then remove power supply (1) from main control enclosure (7).



INSTALLATION

1. Install new power supply (1) onto main control enclosure (7), then secure with six screws (3), sealing washers (4), flat washers (5), and nuts (6).
2. Connect wires to power supply (1) as tagged.
3. Install trim circuit (2), ensuring pin number locators are facing up with pin 1 on the left and pin 5 on the right
4. Turn handle (8) CW, then close door (9).
5. Secure door (9) to main control enclosure (7) by tightening eleven latches (10).
6. Perform a test laundry cycle (TM 10–3510–221–10). Verify normal operation.

END OF WORK PACKAGE

UNIT

LAUNDRY ADVANCED SYSTEM

(NSN 3510–01–463–0114)

24 CHANNEL SSR PCB (PCB3 OR PCB4) REPLACEMENT REMOVAL, INSTALLATION

INITIAL SETUP:

Tools
Tool Kit, General Mechanics
(Item 14, WP 0282 00)

Personnel Required

Materials/Parts
Washer, Lock (Item 17, WP 0283 00)

Equipment Conditions
LADS power must be shut off and door opened at main control enclosure (WP 0113 00).

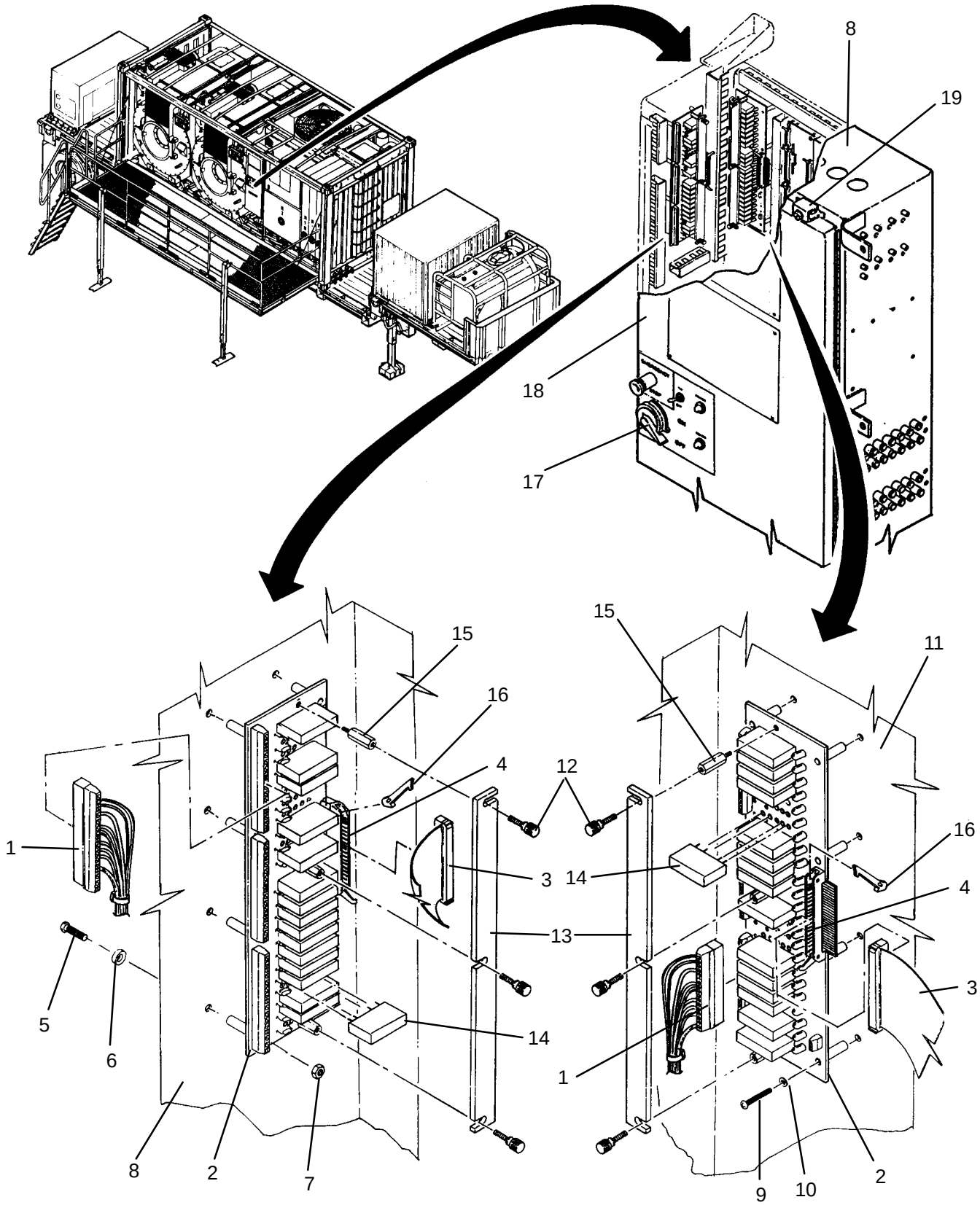
REMOVAL

1. Unplug three wire headers (1) from SSR PCB (2).
2. Disconnect ribbon cable (3) from cable header (4).

NOTE

Step 3 applies to PCB3 only and step 4 applies to PCB4 only.

3. Remove eight screws (5), sealing washers (6), and nuts (7), then remove SSR PCB3 (2) from enclosure (8).
4. Remove eight screws (9) and lock washers (10), then remove SSR PCB4 (2) from subpanel (11).
5. Loosen three thumb screws (12), then remove retaining bar (13).
6. Note position of each SSR (14) then remove SSRs from SSR PCB (2).


8
19
18
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16
4
12
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3
14
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13
8
2
7
15
11
16
4
3
1
9
10
2

INSTALLATION

1. Install three standoffs (15) onto new SSR PCB (2)
2. Insert two latch ejectors (16) into cable header (4).
3. Install SSRs (14) onto SSR PCB (2) as previously noted.
4. Install retaining bar (13), then secure with three thumb screws (12).

NOTE

Step 5 applies to PCB3 only and step 6 applies to PCB4 only.

5. Position SSR PCB3 (2) onto enclosure (8), then secure with eight screws (5), sealing washers (6), and nuts (7).
6. Position SSR PCB4 (2) onto subpanel (11), then secure with eight screws (9) and lock washers (10).
7. Connect ribbon cable (3) to cable header (4).
8. Plug three wire headers (1) into SSR PCB (2).
9. Turn handle (17) CW, then close door (18).
10. Secure door (18) to main control enclosure (8) by tightening eleven latches (19).
11. Perform a test laundry cycle (TM 10–3510–221–10). Verify normal operation.

END OF WORK PACKAGE

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UNIT

LAUNDRY ADVANCED SYSTEM

(NSN 3510–01–463–0114)

16 CHANNEL SSR PCB (PCB5 OR PCB6) REPLACEMENT REMOVAL, INSTALLATION

INITIAL SETUP:

Tools
Tool Kit, General Mechanics
(Item 14, WP 0282 00)

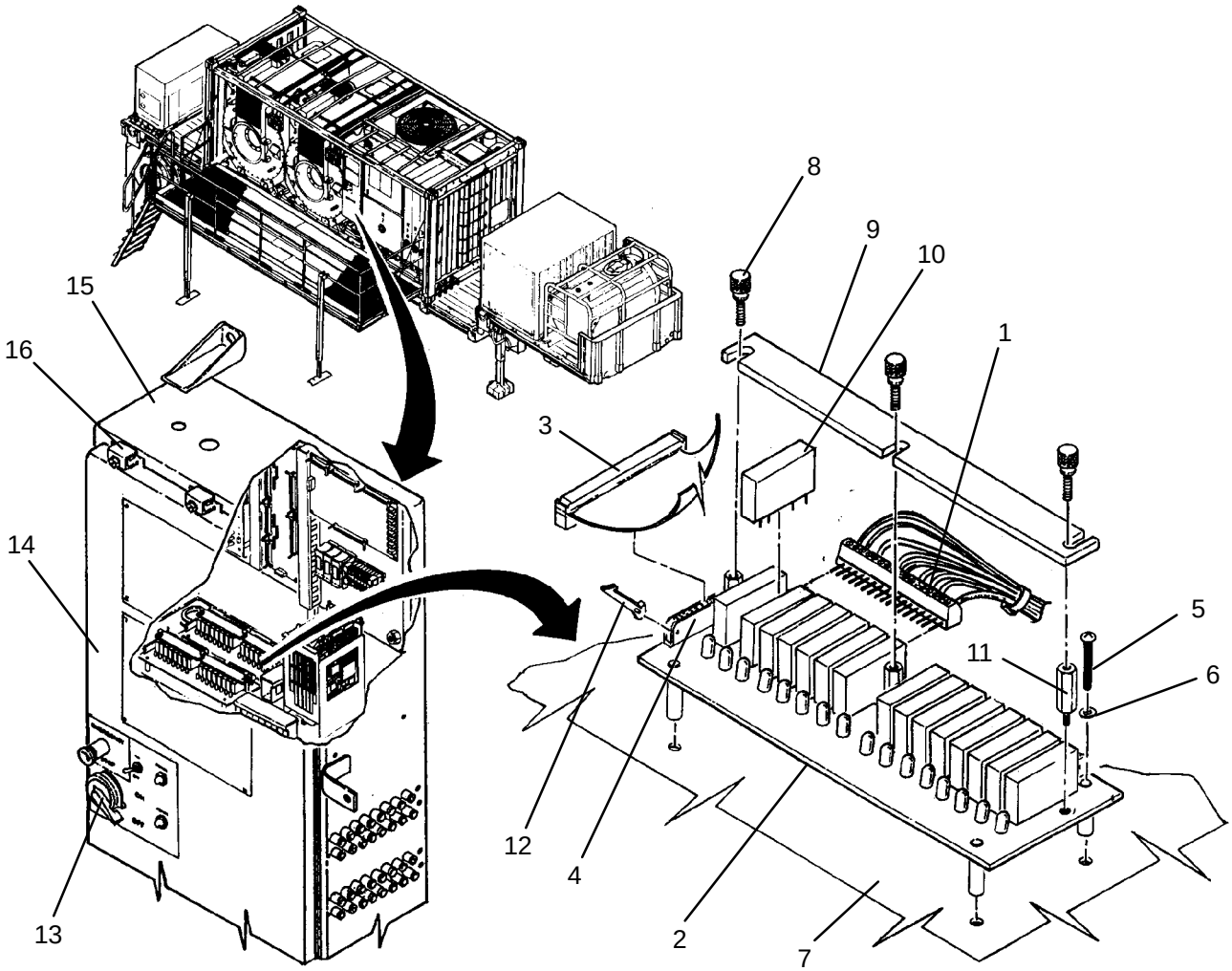
Personnel Required

Materials/Parts
Washer, Lock (Item 17, WP 0283 00)

Equipment Conditions
LADS power must be shut off and door opened at main control enclosure (WP 0113 00).

REMOVAL

1. Unplug two wire headers (1) from SSR PCB (2).
2. Disconnect ribbon cable (3) from cable header (4).
3. Remove four screws (5) and lock washers (6), then remove SSR PCB (2) from panel (7).
4. Loosen three thumb screws (8), then remove retaining bar (9).
5. Note position of each SSR (10), then remove SSRs from SSR PCB (2).



INSTALLATION

1. Install three standoffs (11) onto new SSR PCB (2)
2. Insert two latch ejectors (12) into cable header (4).
3. Install SSRs (10) onto SSR PCB (2) as previously noted.
4. Install retaining bar (9), then secure with three thumb screws (8).
5. Position SSR PCB (2) onto panel (7), then secure with four screws (5) and lock washers (6).
6. Connect ribbon cable (3) to cable header (4).
7. Plug two wire headers (12) into SSR PCB (2).
8. Turn handle (13) CW, then close door (14).
9. Secure door (14) to main control enclosure (15) by tightening eleven latches (16).
10. Perform a test laundry cycle (TM 10–3510–221–10). Verify normal operation.

END OF WORK PACKAGE

UNIT

LAUNDRY ADVANCED SYSTEM

(NSN 3510–01–463–0114)

SSR REPLACEMENT REMOVAL, INSTALLATION

INITIAL SETUP:

Tools
Tool Kit, General Mechanics
(Item 14, WP 0282 00)

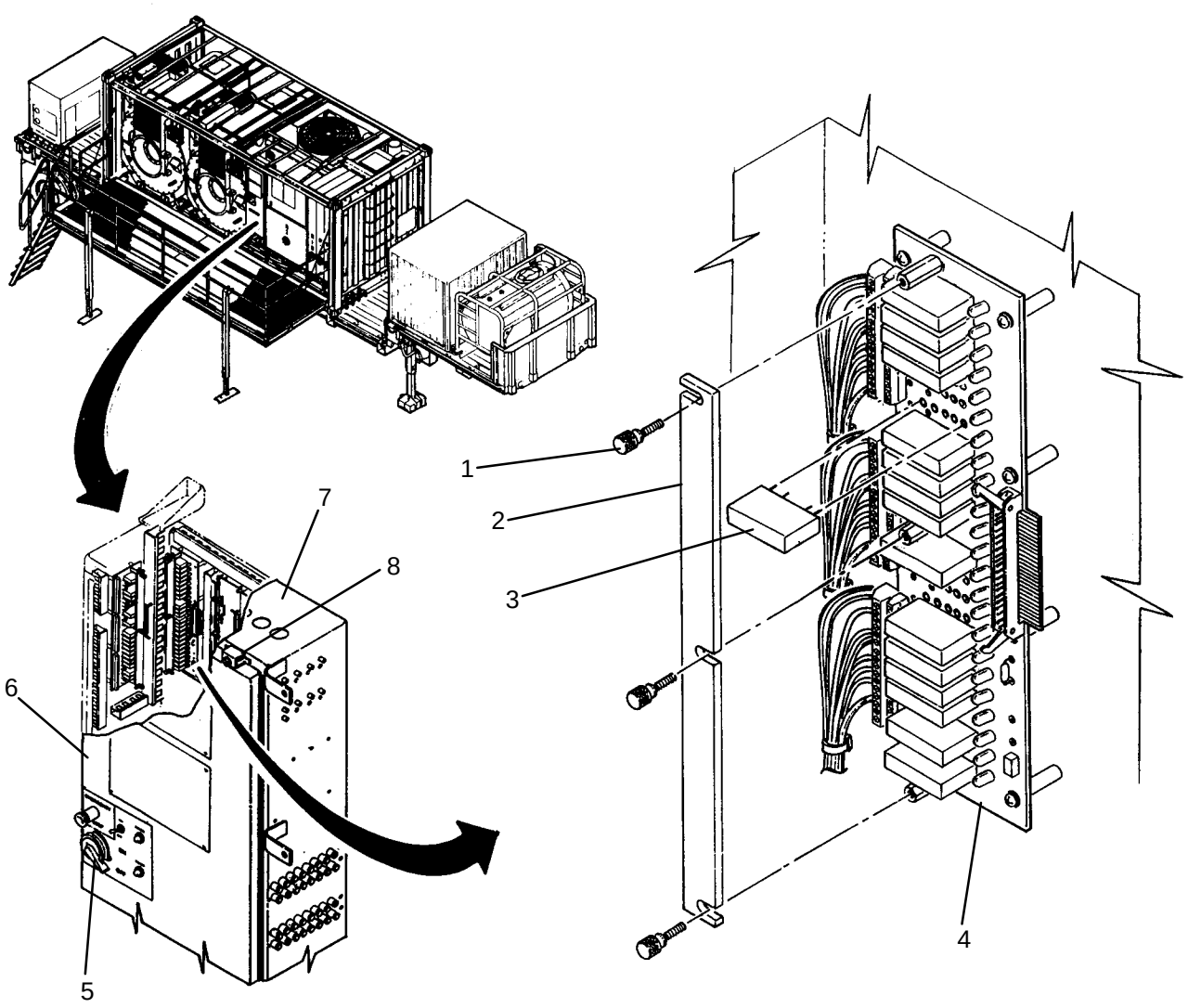
Personnel Required

Materials/Parts

Equipment Conditions
LADS power must be shut off and door opened at main control enclosure (WP 0113 00).

REMOVAL

1. Loosen three thumb screws (1), then remove retaining bar (2).
2. Remove SSR (3) from SSR PCB (4).



INSTALLATION

1. Insert new SSR (3) into SSR PCB (4).
2. Install retaining bar (2), then secure with three thumb screws (1).
3. Turn handle (5) CW, then close door (6).
4. Secure door (6) to main control enclosure (7) by tightening eleven latches (8).
5. Use maintenance menu (WP 0010 00) to verify normal operation as follows:
   a. For SSRs 6 through 10 on SSR PCB3 test heating system.
   b. For all other SSRs use control outputs function to verify correct operation of component controlled by SSR.

END OF WORK PACKAGE

UNIT

LAUNDRY ADVANCED SYSTEM

(NSN 3510–01–463–0114)

5 AMP SSR FUSE REPLACEMENT REMOVAL, INSTALLATION

INITIAL SETUP:

Tools
Tool Kit, General Mechanics
(Item 14, WP 0282 00)

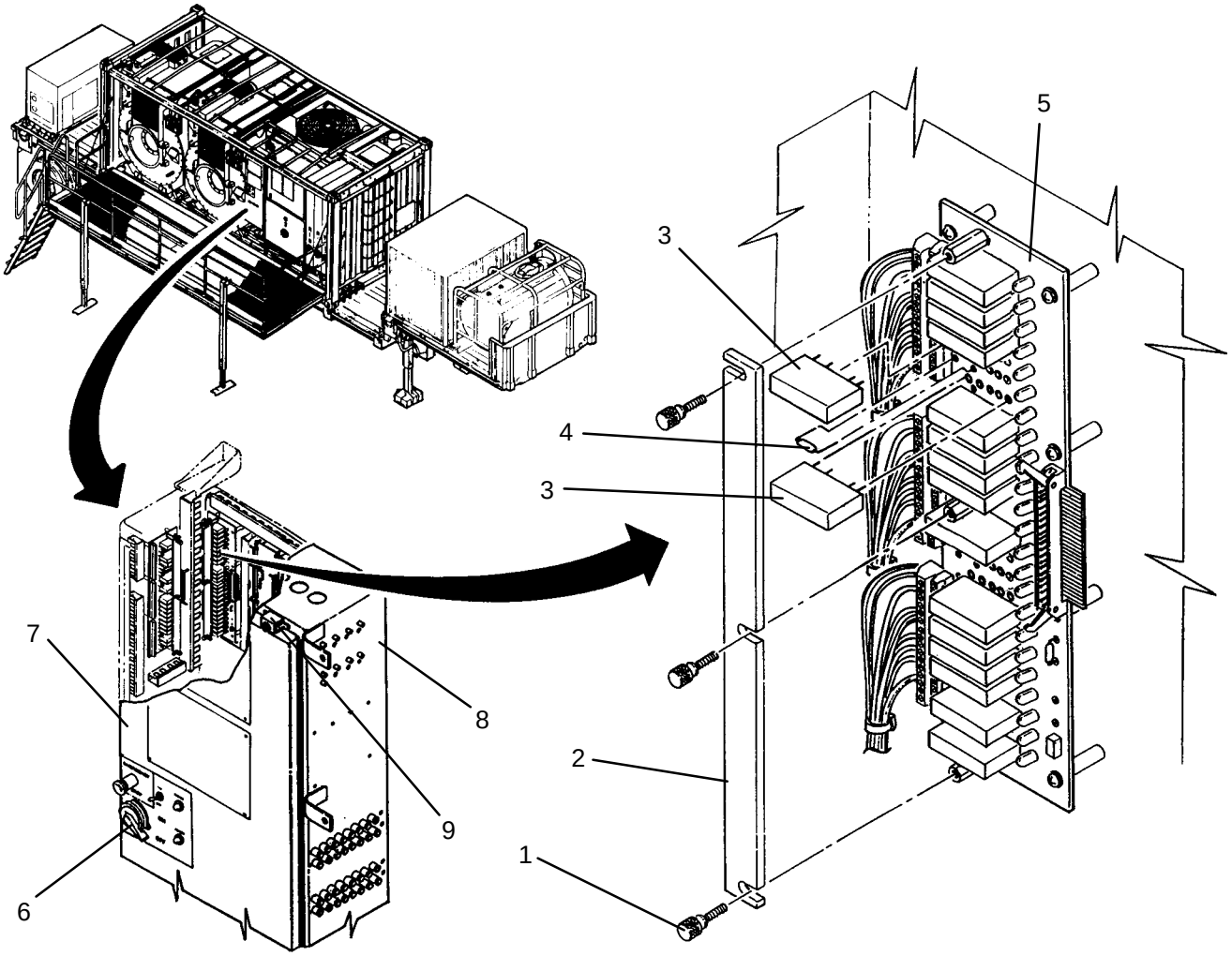
Personnel Required

Materials/Parts

Equipment Conditions
LADS power must be shut off and door opened at main control enclosure (WP 0113 00).

REMOVAL

1. Loosen three thumb screws (1), then remove retaining bar (2).
2. Remove SSRs (3) on both sides of faulty fuse (4).
3. Remove fuse (4) from SSR PCB (5).



INSTALLATION

1. Using old fuse (4) as a guide, cut and bend lead wires of new fuse.
2. Insert fuse (4) into SSR PCB (5).
3. Insert SSRs (3) into SSR PCB (5).
4. Install retaining bar (2), then secure with three thumb screws (1).
5. Turn handle (6) CW, then close door (7).
6. Secure door (7) to main control enclosure (8) by tightening eleven latches (9).
7. Use maintenance menu (WP 0010 00) to verify normal operation as follows:
   a. For SSRs 6 through 10 on SSR PCB3 test heating system.
   b. For all other SSRs use control outputs function to verify correct operation of component controlled by SSR.

END OF WORK PACKAGE

UNIT

LAUNDRY ADVANCED SYSTEM

(NSN 3510–01–463–0114)

1 AMP SSR FUSE REPLACEMENT REMOVAL, INSTALLATION

INITIAL SETUP:

Tools
Tool Kit, General Mechanics
(Item 14, WP 0282 00)

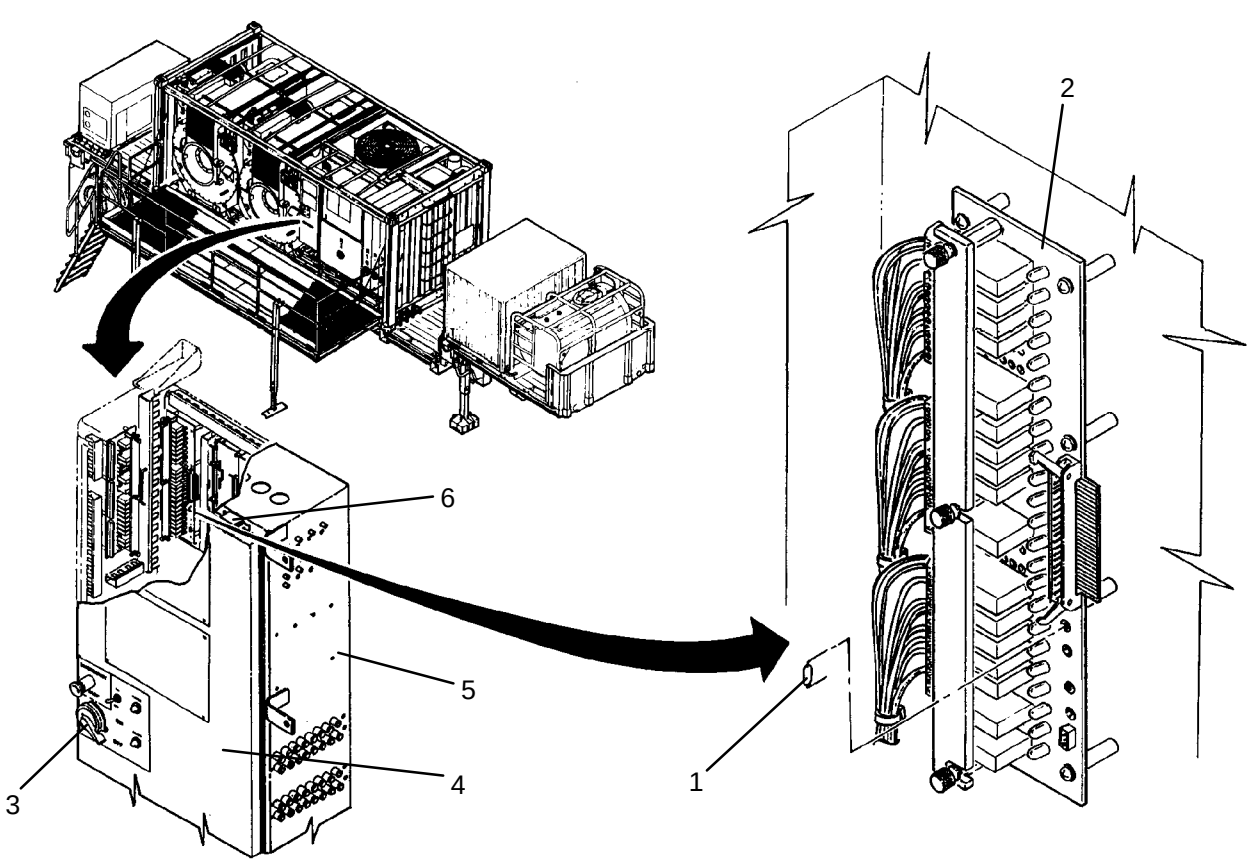
Personnel Required

Materials/Parts

Equipment Conditions
LADS power must be shut off and door opened at main control enclosure (WP 0113 00).

REMOVAL

1. Remove fuse (1) from SSR PCB (2).



INSTALLATION

1. Using old fuse (1) as a guide, cut and bend lead wires of new fuse.
2. Insert fuse (1) into SSR PCB (2).
3. Turn handle (3) CW, then close door (4).
4. Secure door (4) to main control enclosure (5) by tightening eleven latches (6).
5. Perform a test laundry cycle (TM 10–3510–221–10). Verify normal operation.

END OF WORK PACKAGE

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UNIT

LAUNDRY ADVANCED SYSTEM

(NSN 3510–01–463–0114)

LEVEL SENSOR (LT100, LT101, LT102, LT200, LT201, OR PT200) REPLACEMENT REMOVAL, INSTALLATION

INITIAL SETUP:

Tools
Tool Kit, General Mechanics
(Item 14, WP 0282 00)

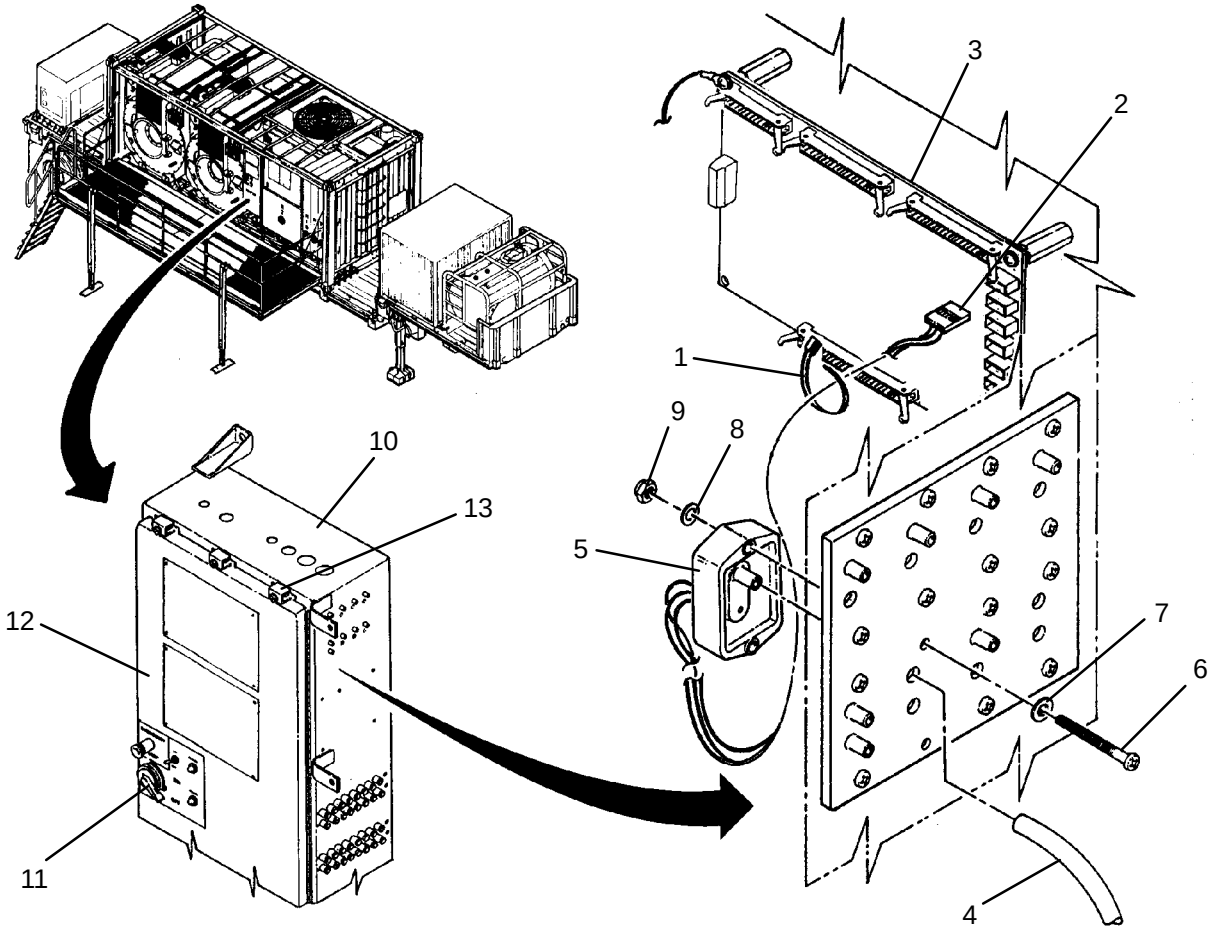
Personnel Required

Materials/Parts
Strap, Tiedown (Item 10, WP 0283 00)

Equipment Conditions
LADS power must be shut off and door opened at main control enclosure (WP 0113 00).

REMOVAL

1. Remove tiedown straps (1) holding sensor wiring together.
2. Tag and disconnect electrical connector (2) from analog PCB (3).
3. Tag and disconnect tube(s) (4) from pressure sensor (5).
4. Remove two screws (6), sealing washers (7), flat washers (8), and nuts (9); then remove pressure sensor (5) from main control enclosure (10).



INSTALLATION

1. Position pressure sensor (5) in main control enclosure (10), then secure with two screws (6), sealing washers (7), flat washers (8), and nuts (9).
2. Connect electrical connector (2) to analog PCB (3) as tagged.
3. Install tiedown straps (1), securing sensor wiring together.
4. Turn handle (11) CW, then close door (12).
5. Secure door (12) to main control enclosure (10) by tightening eleven latches (13).
6. Access level sensor calibration function using maintenance menu (WP 0010 00), then set output of level sensor to 0 inches or gallons as applicable.
7. Connect tube(s) (4) to pressure sensor (5) as tagged.

END OF WORK PACKAGE

UNIT

LAUNDRY ADVANCED SYSTEM

(NSN 3510–01–463–0114)

ALARM (AL1) REPLACEMENT REMOVAL, INSTALLATION

INITIAL SETUP:

Tools
Tool Kit, General Mechanics
(Item 14, WP 0282 00)

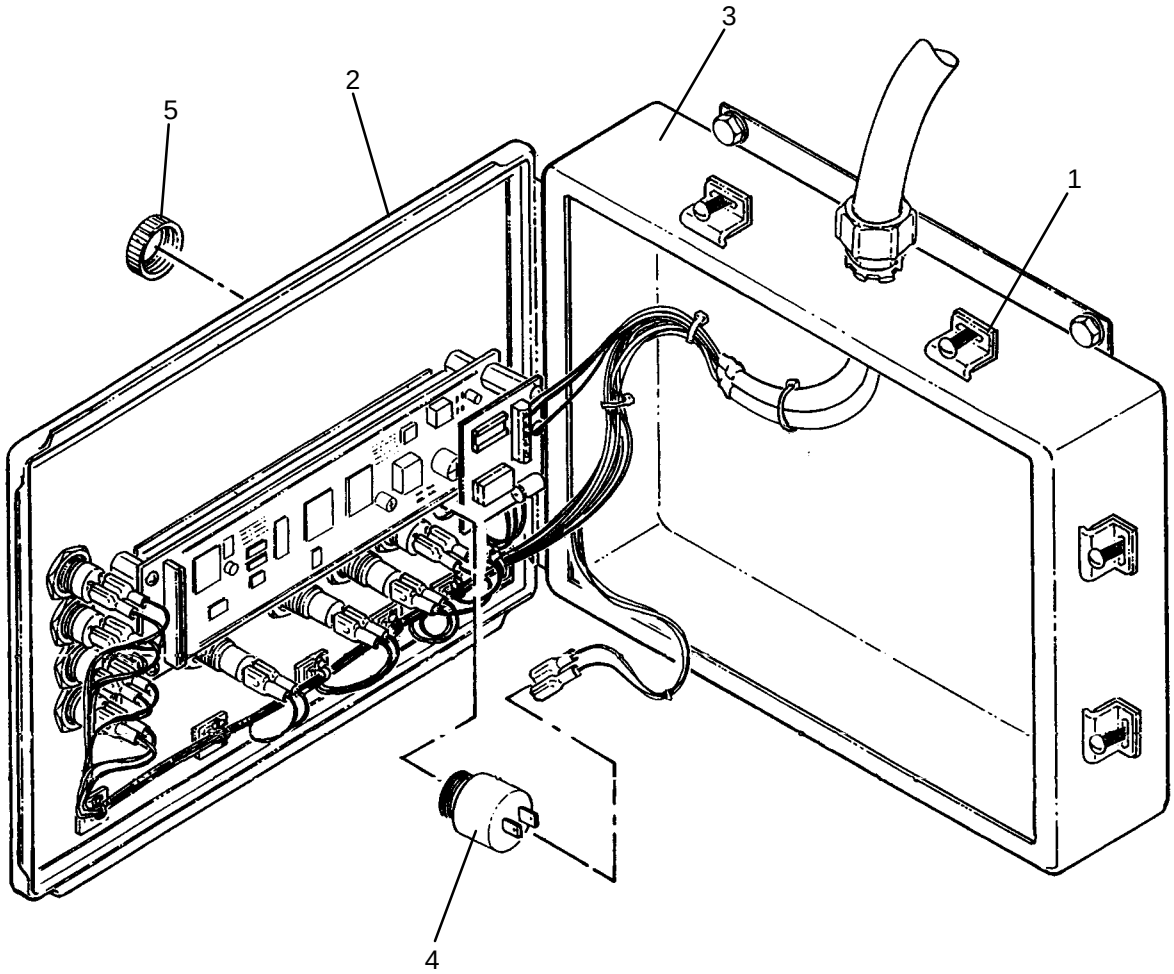
Personnel Required

Materials/Parts

Equipment Conditions
LADS power shut off at main control enclosure (WP 0113 00).

REMOVAL

1. Loosen six latches (1), then open door (2) on operator panel (3).
2. Tag and disconnect wires from alarm (4).
3. Remove panel nut (5), then remove alarm (4) from door (2).



INSTALLATION

1. Remove panel nut (5) from new alarm (4).
2. Install alarm (4) onto door (2) then secure with panel nut (5).
3. Connect wires to alarm (4) as tagged.
4. Close door (2) and secure to operator panel (3) by tightening six latches (1).
5. Use maintenance menu control outputs function (WP 0010 00) to turn alarm (4) on. Verify alarm turns on.

END OF WORK PACKAGE

UNIT

LAUNDRY ADVANCED SYSTEM

(NSN 3510–01–463–0114)

LAMP SOCKET (DS3, DS4, OR DS5) REPLACEMENT REMOVAL, INSTALLATION

INITIAL SETUP:

Tools
Tool Kit, General Mechanics
(Item 14, WP 0282 00)

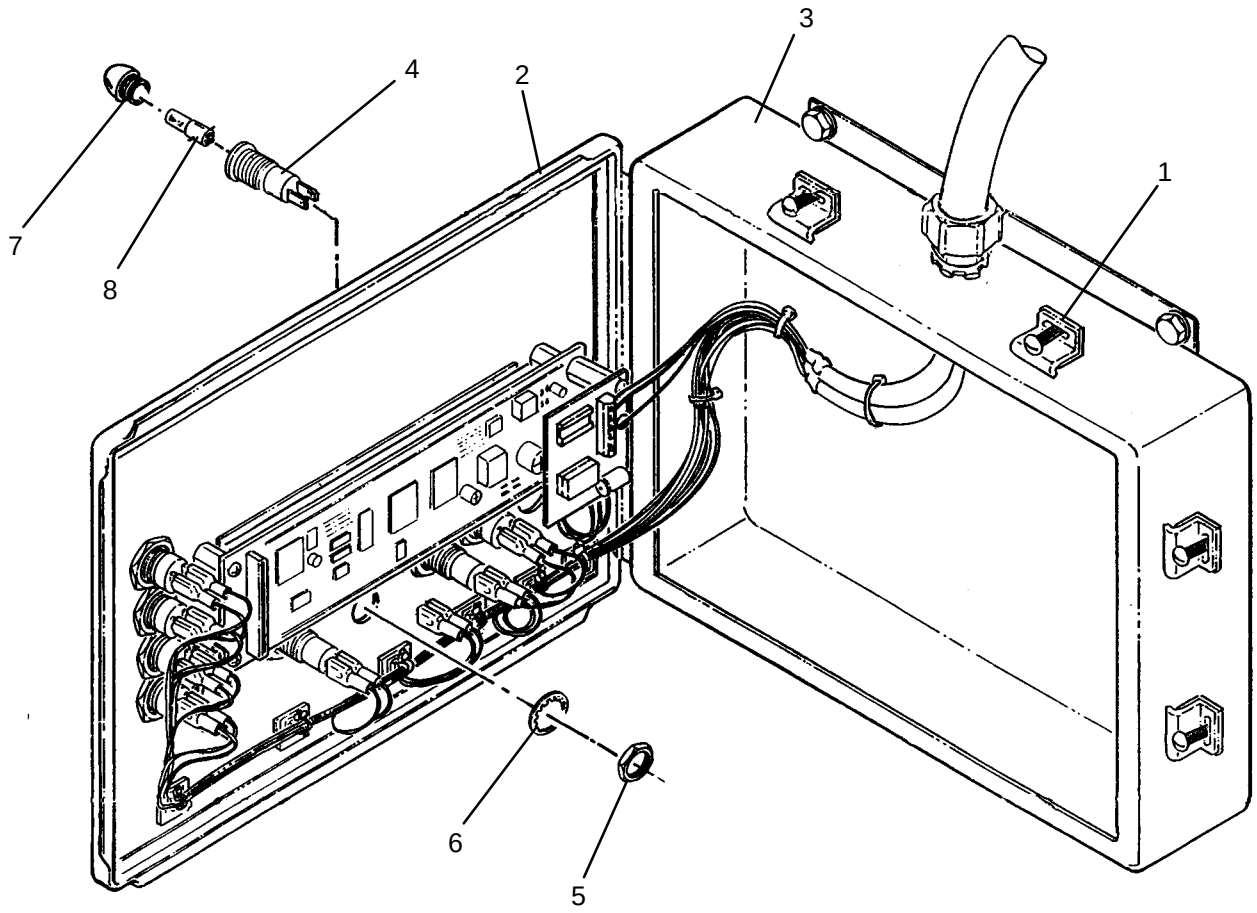
Personnel Required

Materials/Parts
Tags (Item 9, WP 0281 00)

Equipment Conditions
LADS power shut off at main control enclosure (WP 0113 00).

REMOVAL

1. Loosen six latches (1), then open door (2) on operator panel (3).
2. Tag and disconnect wires from lamp socket (4).
3. Remove nut (5) and lock washer (6), then remove lamp socket (4) from door (2).
4. Remove lens (7) and lamp (8) from lamp socket (4).



INSTALLATION

1. Install lamp (8) and lens (7) into new lamp socket (4).
2. Remove nut (5) and lock washer (6) from lamp socket (4).
3. Install lamp socket (4) onto door (2) then secure with nut (5) and lock washer (6).
4. Connect wires to lamp socket (4) as tagged.
5. Close door (2) and secure to operator panel (3) by tightening six latches (1).
6. Position MAIN DISCONNECT switch (WP 0009 00, Figure 1, 1) to ON.
7. Position CONTROL POWER switch (WP 0009 00, Figure 1, 3) to ON.
8. Verify POWER lamp (WP 0009 00, Figure 2, 1) is on.
9. Use maintenance menu control outputs function (WP 0010 00) to turn on SYSTEM OPERATIONAL lamp (WP 0009 00, Figure 3, 2). Verify lamp turns on.
10. Use maintenance menu control outputs function to turn on ATTENTION REQUIRED lamp (WP 0009 00, Figure 3, 3). Verify lamp turns on.

END OF WORK PACKAGE

UNIT

LAUNDRY ADVANCED SYSTEM

(NSN 3510–01–463–0114)

PUSHBUTTON SWITCH (PBS1 – PBS5) REPLACEMENT REMOVAL, INSTALLATION

INITIAL SETUP:

Tools
Tool Kit, General Mechanics
(Item 14, WP 0282 00)

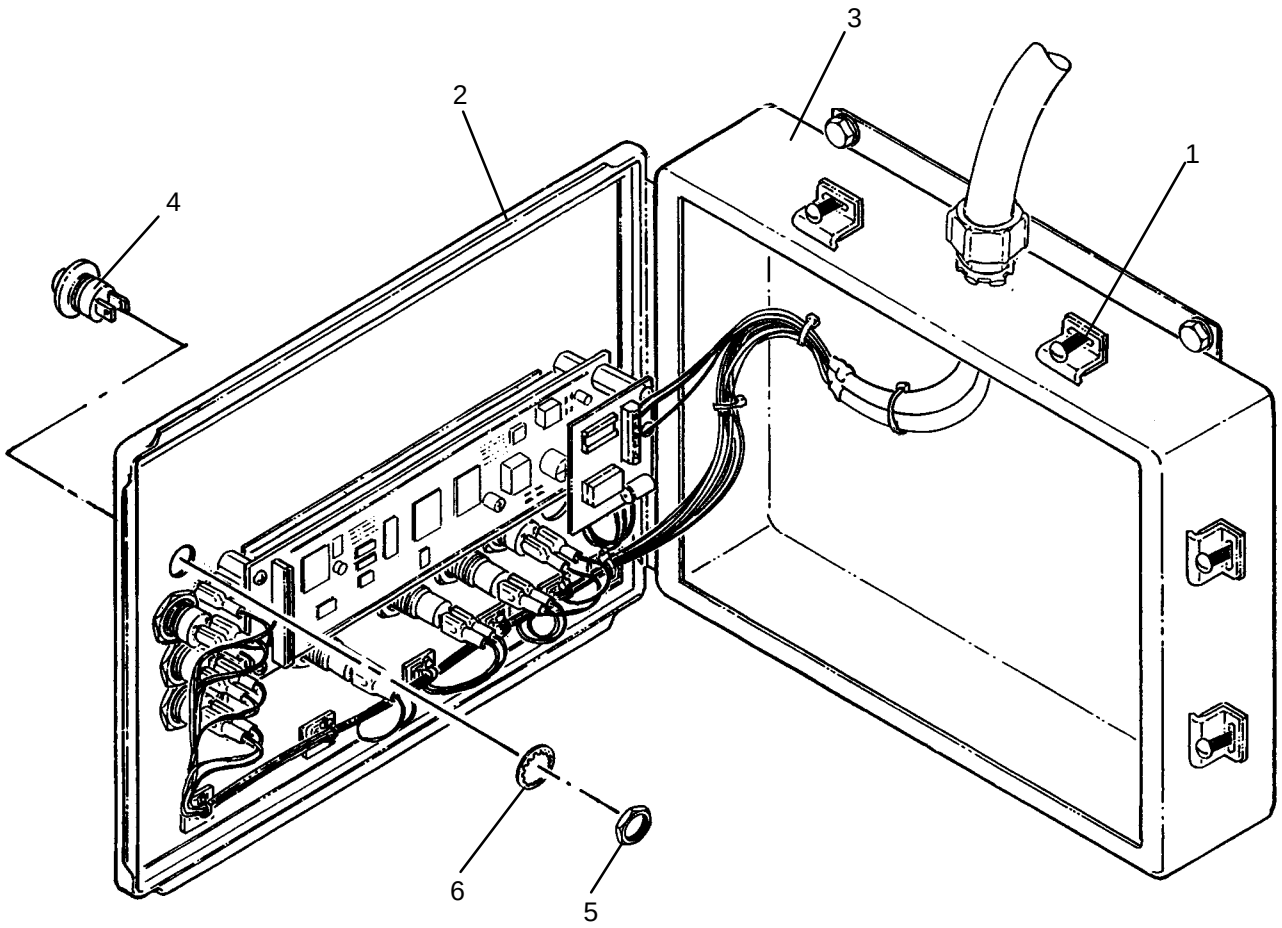
Personnel Required

Materials/Parts
Tags (Item 9, WP 0281 00)

Equipment Conditions
LADS power shut off at main control enclosure (WP 0113 00).

REMOVAL

1. Loosen six latches (1), then open door (2) on operator panel (3).
2. Tag and disconnect wires from pushbutton switch (4).
3. Remove nut (5) and lock washer (6), then remove pushbutton switch (4) from door (2).



INSTALLATION

1. Remove nut (5) and lock washer (6) from new pushbutton switch (4).
2. Install pushbutton switch (4) onto door (2) then secure with nut (5) and lock washer (6).
3. Connect wires to pushbutton switch (4) as tagged.
4. Close door (2) and secure to operator panel (3) by tightening six latches (1).
5. Use maintenance menu control outputs function (WP 0010 00) to turn on alarm (WP 0009 00, Figure 3, 5).
6. Press SILENCE ALARM switch (WP 0009 00, Figure 3, 5). Verify alarm is silenced.
7. Move through maintenance menu until operation of all MENU SELECTION switches (WP 0009 00, Figure 3, 7–10) is verified.

END OF WORK PACKAGE

UNIT

LAUNDRY ADVANCED SYSTEM

(NSN 3510–01–463–0114)

DISPLAY INTERFACE (PCB10) REPLACEMENT
REMOVAL, INSTALLATION

INITIAL SETUP:

Tools
Tool Kit, General Mechanics
(Item 14, WP 0282 00)

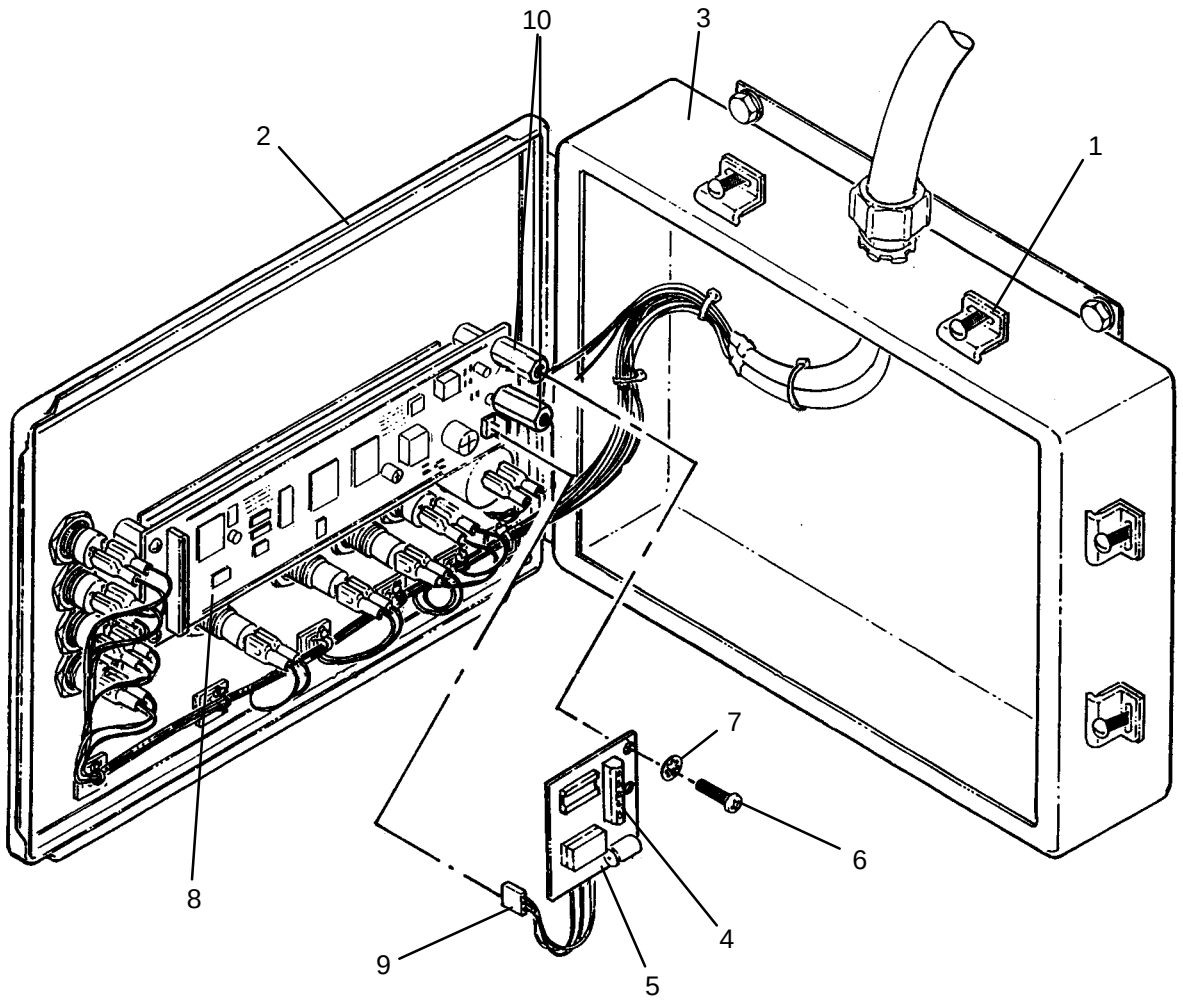
Personnel Required

Materials/Parts
Washer, Lock (Item 17, WP 0283 00)

Equipment Conditions
LADS power shut off at main control enclosure (WP 0113 00).

REMOVAL

1. Loosen six latches (1), then open door (2) on operator panel (3).
2. ESD. Loosen screw terminals (4), then tag and disconnect wiring from interface PCB (5).
3. ESD. Remove two screws (6) and lock washers (7), then lift interface PCB (5) up to access connection on display (8).
4. ESD. Disconnect electrical connector (9) from display (8).



INSTALLATION

NOTE

Ensure +5 wire on interface PCB connector is installed on pin 1 of display.

1. ESD. Connect electrical connector (9) on new interface PCB (5) to display (8).
2. ESD. Position interface PCB (5) on standoffs (10), then secure with two screws (6) and lock washers (7).
3. ESD. Connect wiring to interface PCB (5) as tagged, then tighten screw terminals (4).
4. Close door (2) and secure to operator panel (3) by tightening six latches (1).
5. Position MAIN DISCONNECT switch (WP 0009 00, Figure 1, 1) to ON.
6. Position CONTROL POWER switch (WP 0009 00, Figure 1, 3) to ON.
7. Access maintenance menu (WP 0010 00) and verify display is properly indicating characters.
8. Use maintenance menu control outputs function to turn on SYSTEM OPERATIONAL lamp (WP 0009 00, Figure 3, 2). Verify lamp turns on.
9. Use maintenance menu control outputs function to turn on ATTENTION REQUIRED lamp (WP 0009 00, Figure 3, 3). Verify lamp turns on.

END OF WORK PACKAGE

UNIT

LAUNDRY ADVANCED SYSTEM

(NSN 3510–01–463–0114)

DISPLAY (VFDA) REPLACEMENT REMOVAL, INSTALLATION

INITIAL SETUP:

Tools
Tool Kit, General Mechanics
(Item 14, WP 0282 00)

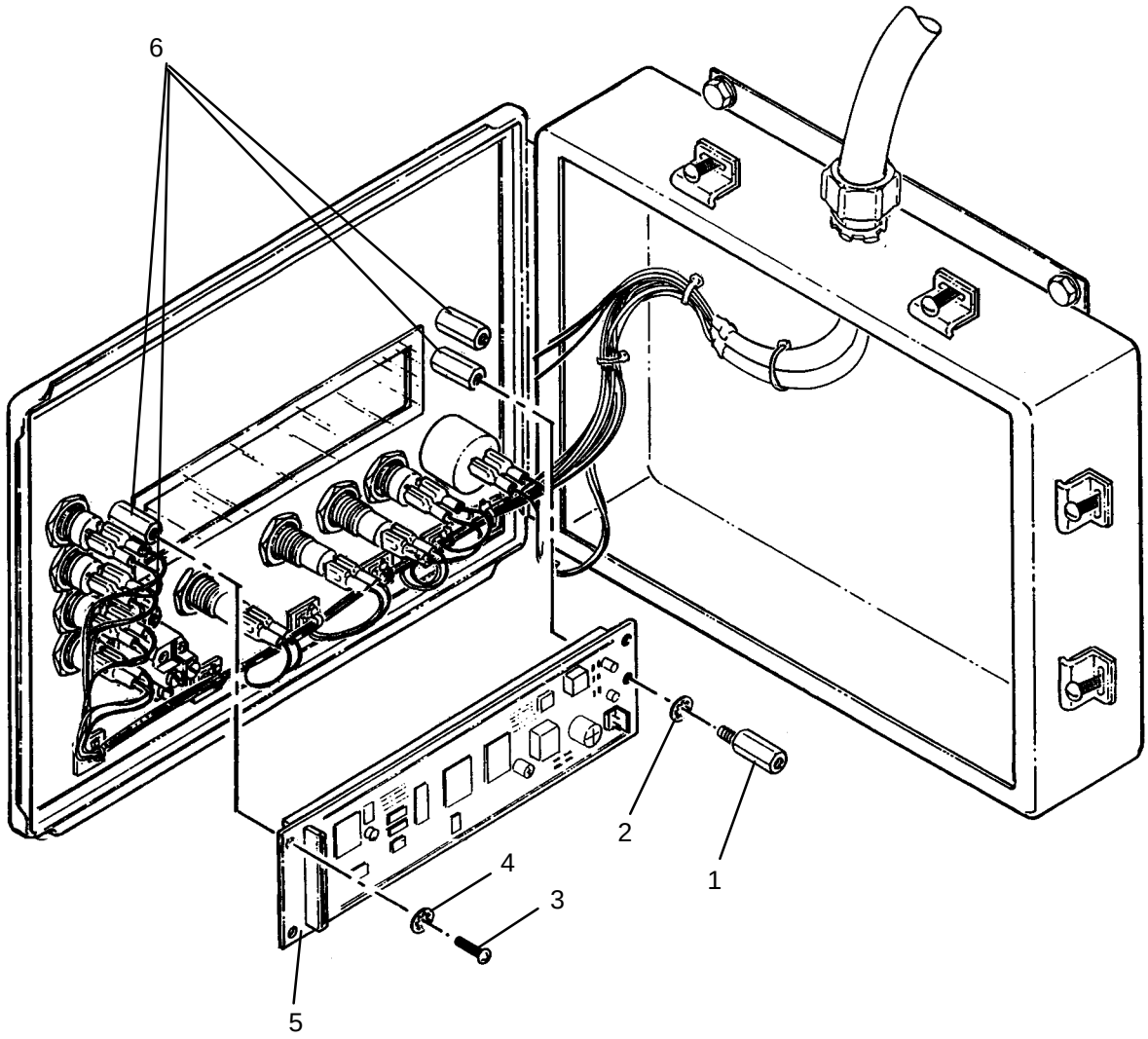
Personnel Required

Materials/Parts
Washer, Lock (Item 17, WP 0283 00)

Equipment Conditions
LADS power shut off at main control enclosure (WP 0113 00).

REMOVAL

1. Remove interface PCB (WP 0248 00).
2. ESD. Remove two standoffs (1) and lock washers (2).
3. ESD. Remove two screws (3) and lock washers (4), then remove display (5) from standoffs (6).



INSTALLATION

1. ESD. Position new display (5) on standoffs (6). Install, but do not tighten two screws (3) and lock washers (4).
2. ESD. Install and tighten two standoffs (1) and lock washers (2).
3. ESD. Tighten two screws (3).
4. Install interface PCB (WP 0248 00).

END OF WORK PACKAGE

UNIT

LAUNDRY ADVANCED SYSTEM

(NSN 3510–01–463–0114)

INVERTER DRIVE K100, K104, OR K200 REPLACEMENT REMOVAL, INSTALLATION

INITIAL SETUP:

Tools
Tool Kit, General Mechanics
(Item 14, WP 0282 00)

Personnel Required

Materials/Parts
Tags (Item 9, WP 0281 00)

Equipment Conditions
LADS power shut off at main control enclosure (WP 0113 00).

REMOVAL

WARNING

The inverter drive must discharge before it is safe to disconnect wire connections. DEATH ON CONTACT may result if personnel fail to observe this safety precaution.

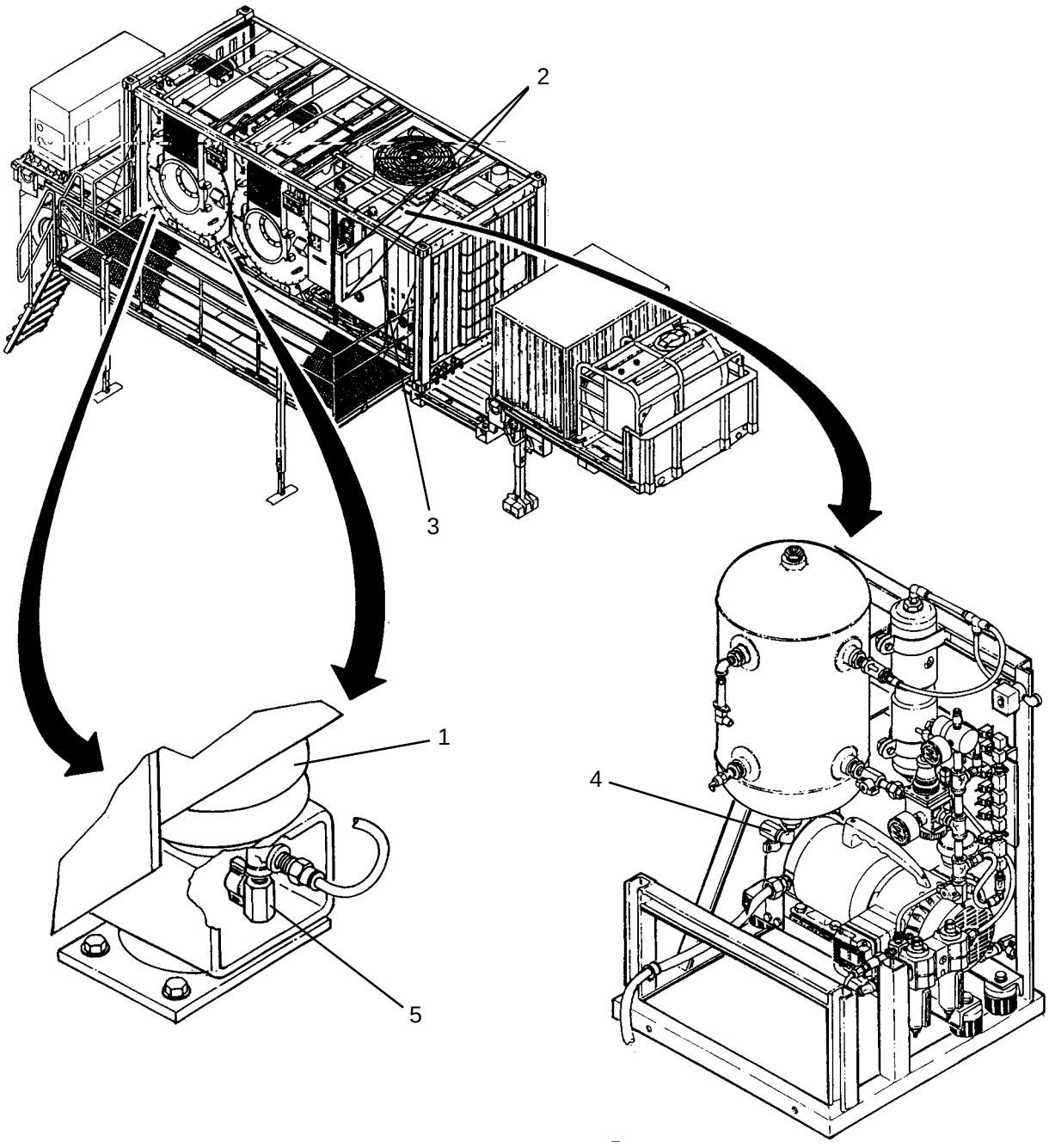
NOTE

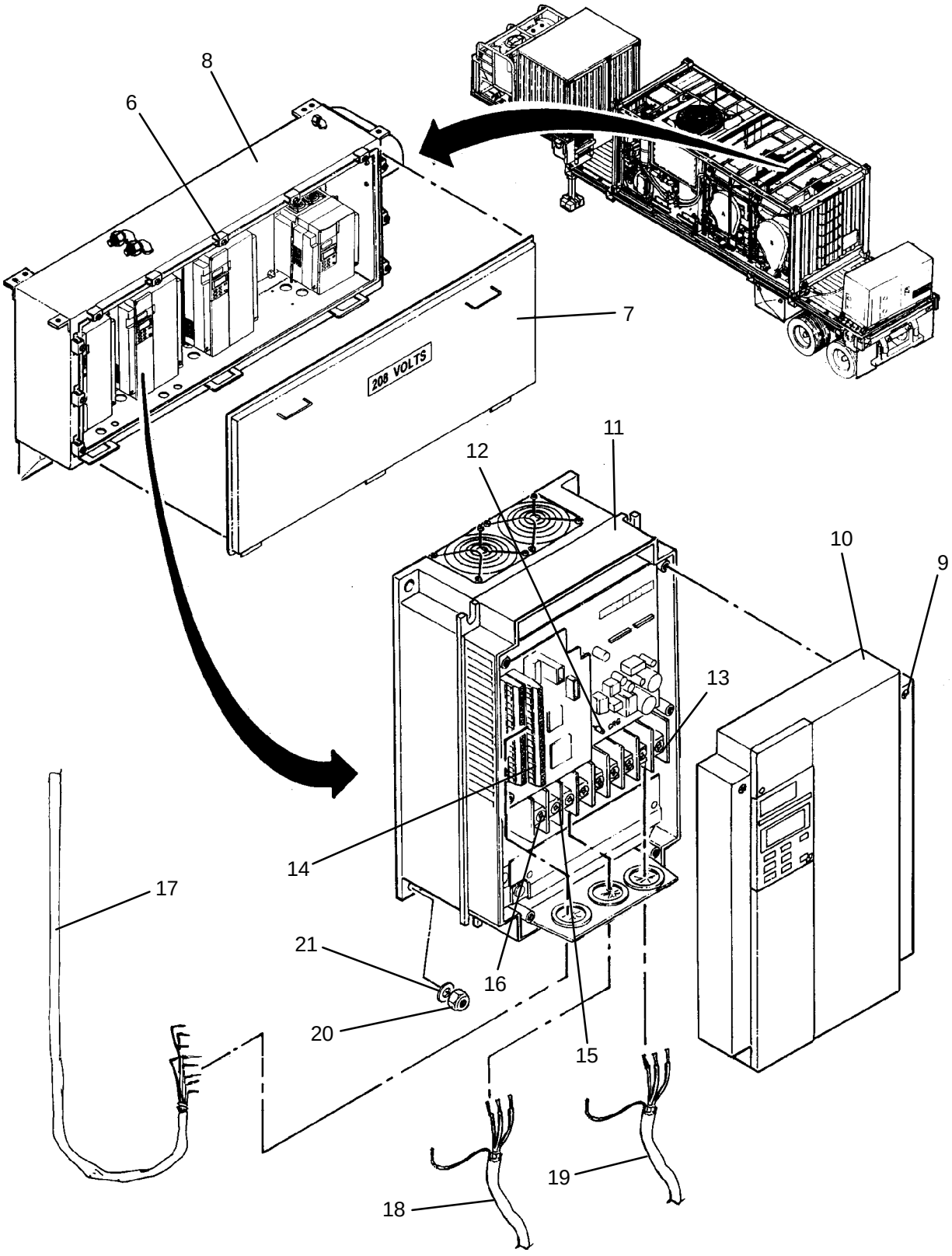
In order to remove inverter door, drum B must be lowered.

1. Vent air pressure from air bags (1) as follows:
   a. Disengage two latches (2), then open access door (3).
   b. Open valve (4).
   c. Open valves (5) on front air bags (1).
   d. Allow air pressure to vent from air bags (1) then close valves (4 and 5).
   e. Close access door (3) then engage two latches (2).

REMOVAL – Continued

2. Loosen eleven latches (6), then lift door (7) off of inverter enclosure (8).
3. Loosen two captive screws (9), then remove cover (10) from inverter drive (11).
4. Wait for CRG indicator (12) to go off, then use a multimeter to verify voltage is not present at output bus (13).
5. Tag and disconnect wiring at control bus (14), input bus (15), output bus (13) and ground lug (16).
6. Pull control cable (17), input wiring (18), and output wiring (19) out of inverter drive (11).
7. Remove four nuts (20) and flat washers (21), then remove inverter drive (11) from inverter enclosure (8).

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INSTALLATION

1. Loosen two captive screws (9), then remove cover (10) from new inverter drive (11).
2. Position inverter drive (11) into inverter enclosure (8), then secure with four nuts (20) and flat washers (21).
3. Insert control cable (17) input wiring (18), and output wiring (19) into inverter drive (11).
4. Connect wires to control bus (14), input bus (15), output bus (13) and ground lug (16) as tagged.
5. Install cover (10) onto inverter drive (11), then secure with two captive screws (9).
6. Place door (7) onto inverter enclosure (8), then secure by tightening eleven latches (6).
7. Using maintenance menu (WP 0010 00), verify correct operation as follows:
   a. For inverter drive K100A or B test drum motor M100A or B rotation at all speeds and directions.
   b. For inverter drive K104 test dryer blower motor M104A and B operation.
   c. For inverter drive K200 test still condenser fan M200 and thermal fluid pump M300 operation. Also test heating system.

END OF WORK PACKAGE

UNIT

LAUNDRY ADVANCED SYSTEM

(NSN 3510–01–463–0114)

TUBE AXIAL FAN (M107) REPLACEMENT REMOVAL, INSTALLATION

INITIAL SETUP:

Tools
Tool Kit, General Mechanics
(Item 14, WP 0282 00)

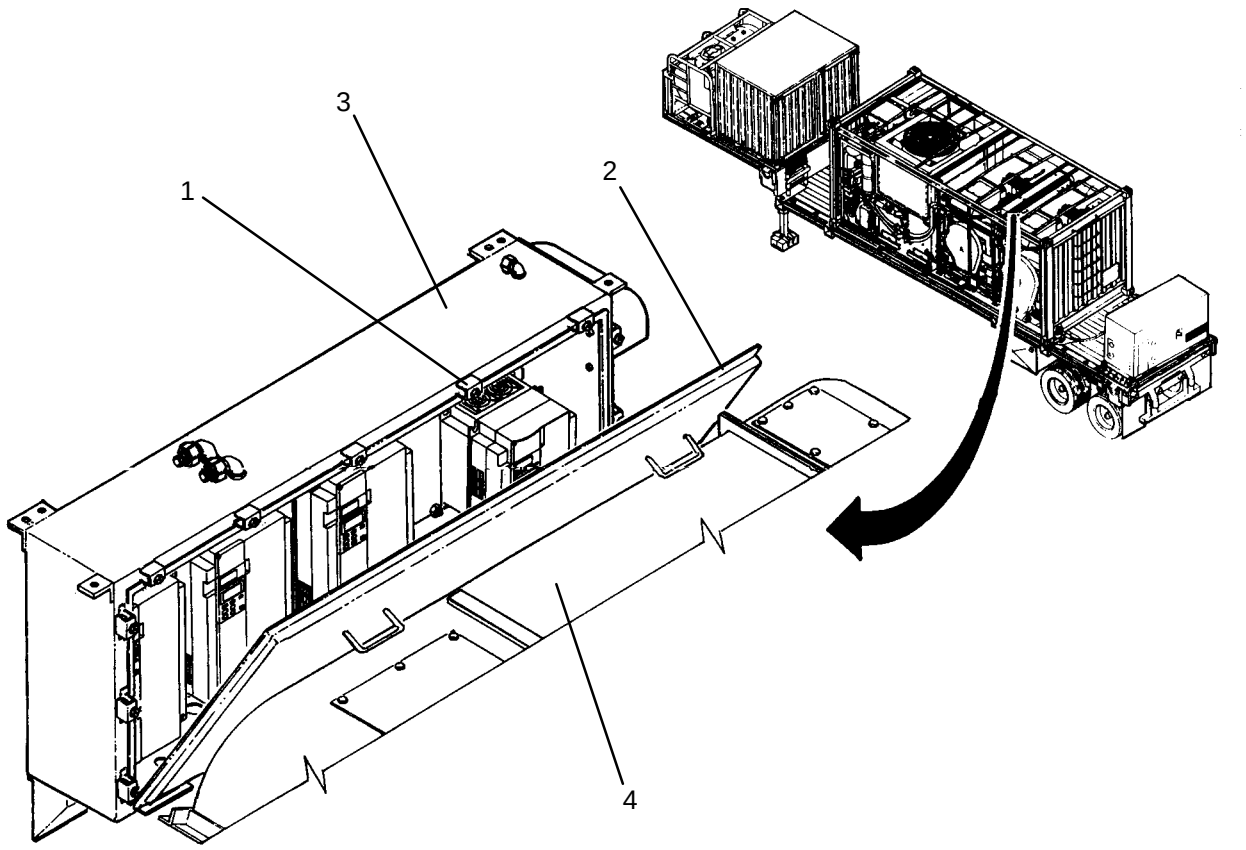
Personnel Required

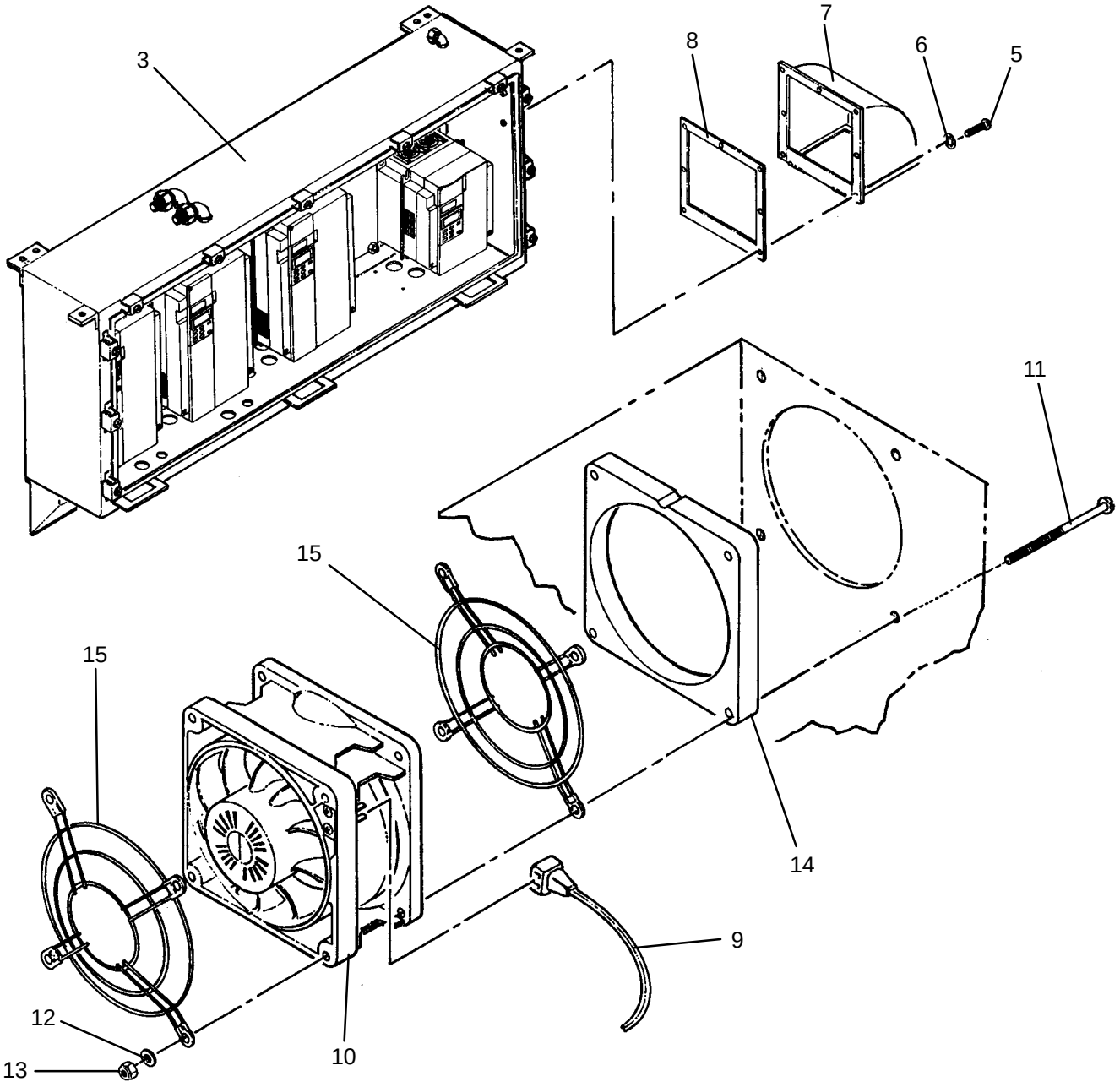
Materials/Parts
Washer, Lock (Item 17, WP 0281 00)

Equipment Conditions
LADS power shut off at main control enclosure (WP 0113 00).

REMOVAL

1. Loosen eleven latches (1), then open door (2) on inverter enclosure (3) and rest against drum (4).
2. Remove seven screws (5) and lock washers (6), then remove outlet duct (7) and gasket (8) from inverter enclosure (3).
3. Disconnect plug & cord (9) from fan (10).
4. Remove four screws (11), flat washers (12), and nuts (13), then remove fan (10), spacer (14), and two finger guards (15) from inverter enclosure (3).





INSTALLATION

1. Position new fan (10), spacer (14), and two finger guards (15) on inverter enclosure (3), then secure with four screws (11), flat washers (12), and nuts (13).
2. Connect plug & cord (9) to fan (10).
3. Position outlet duct (7) and gasket (8) on inverter enclosure (3), then secure with seven screws (5) and lock washers (6).
4. Close door (2) onto inverter enclosure (3), then secure by tightening eleven latches (1).
5. Position MAIN DISCONNECT switch (WP 0009 00, Figure 1, 1) to ON. Verify fan (10) is operating.

END OF WORK PACKAGE

UNIT

LAUNDRY ADVANCED SYSTEM

(NSN 3510–01–463–0114)

CONTACTOR (MC104) REPLACEMENT REMOVAL, INSTALLATION

INITIAL SETUP:

Tools
Multimeter (Item 2, WP 0282 00)
Tool Kit, General Mechanics (Item 14, WP 0282 00)

Personnel Required

Materials/Parts
Tags (Item 9, WP 0281 00)

Equipment Conditions
LADS power shut off at main control enclosure (WP 0113 00).

REMOVAL

WARNING

The inverter drive must discharge before it is safe to disconnect wire connections. DEATH ON CONTACT may result if personnel fail to observe this safety precaution.

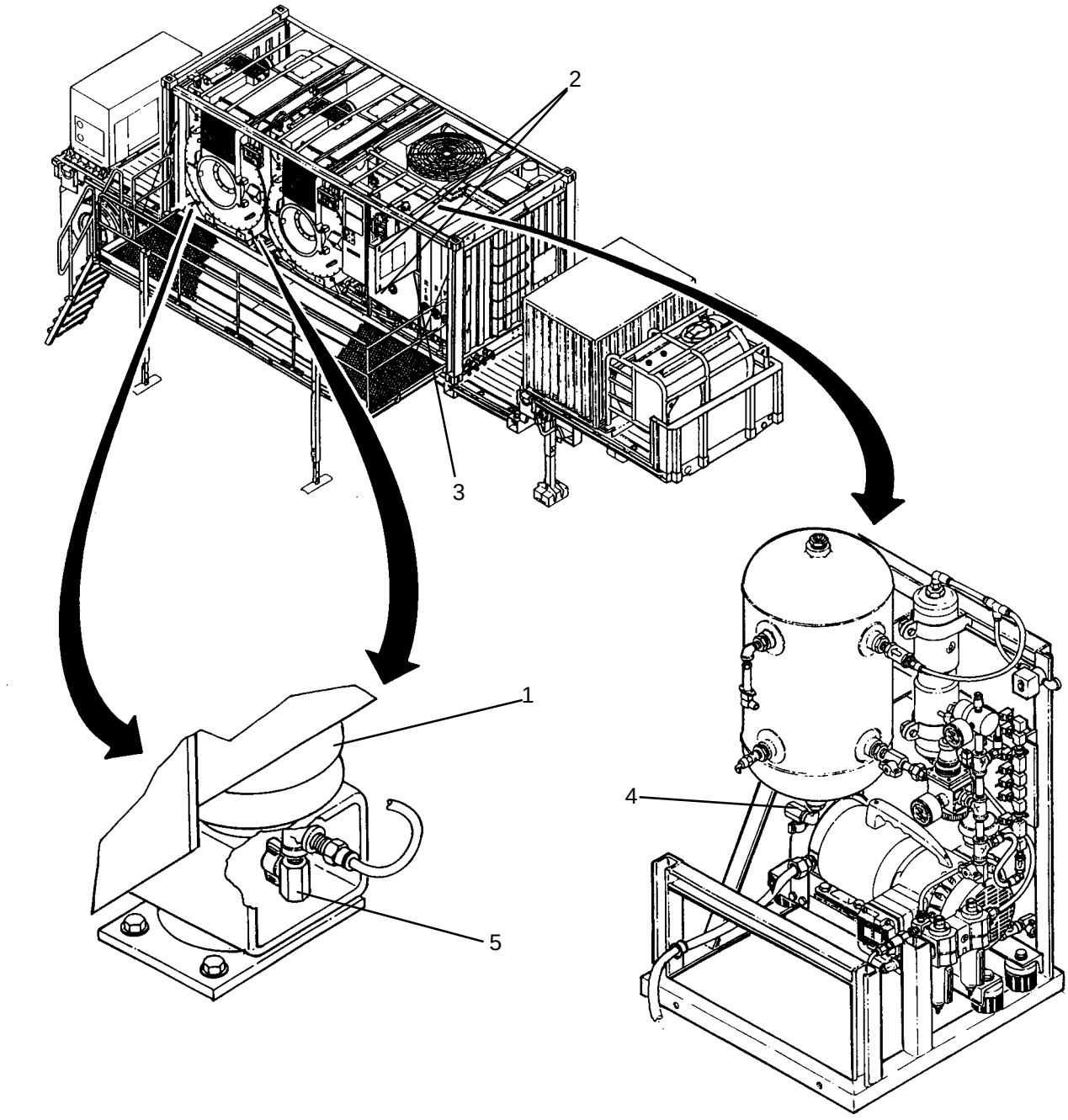
NOTE

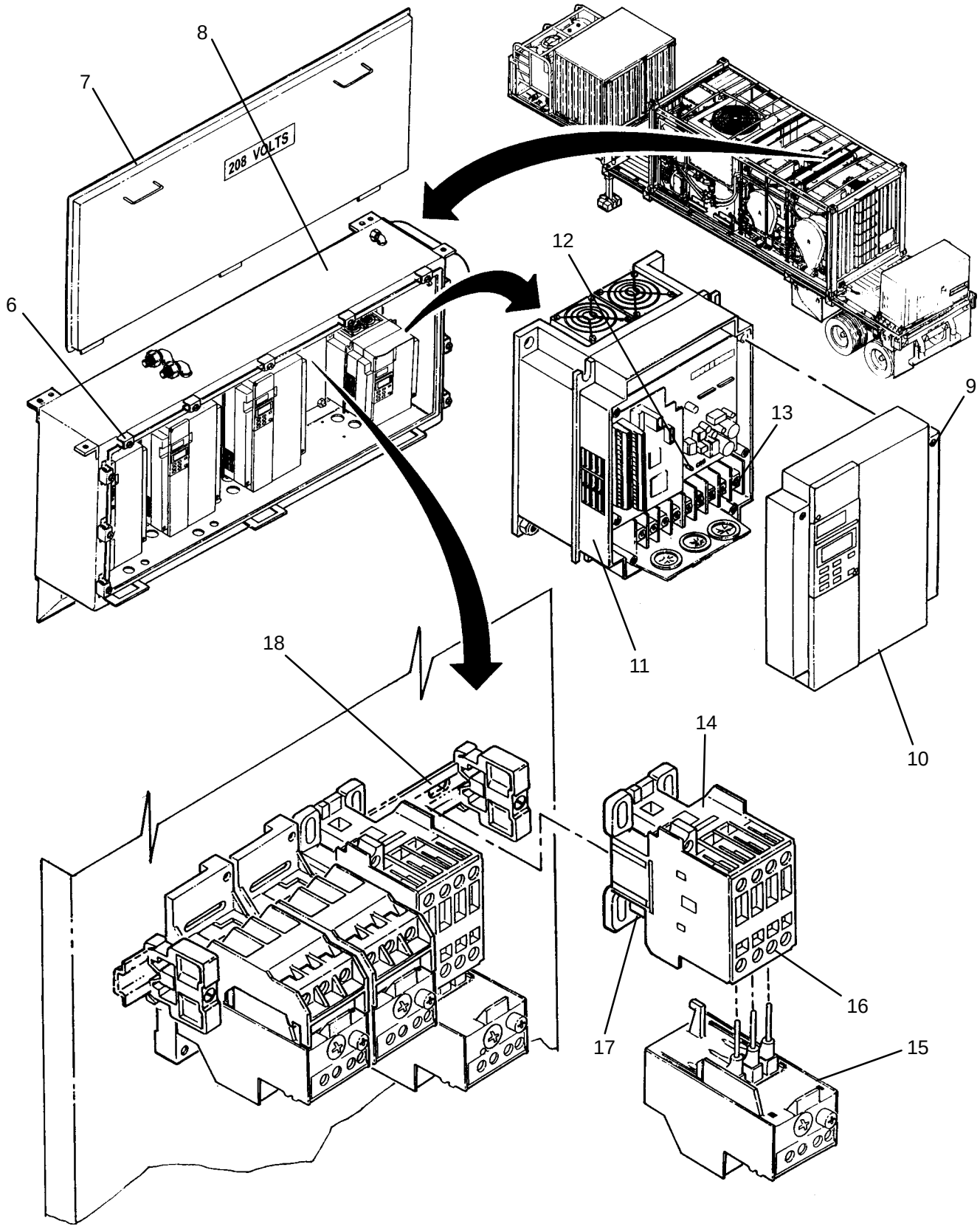
In order to remove inverter door, drum B must be lowered.

1. Vent air pressure from air bags (1) as follows:
   a. Disengage two latches (2), then open access door (3).
   b. Open valve (4).
   c. Open valves (5) on front air bags (1).
   d. Allow air pressure to vent from air bags (1) then close valves (4 and 5).
   e. Close access door (3) then engage two latches (2).

REMOVAL – Continued

2. Loosen eleven latches (6), then lift door (7) off of inverter enclosure (8).
3. Loosen two captive screws (9), then remove cover (10) from inverter drive (11).
4. Wait for CRG indicator (12) to go off, then use a multimeter to verify voltage is not present at output bus (13).
5. Install cover (10) onto inverter drive (11), then secure with two captive screws (8).
6. Tag and disconnect wires from contactor (14) and overload relay (15).
7. Loosen three screw terminals (16), then pull overload relay (15) off of contactor (14).
8. Pull out on locking tab (17), then remove contactor (14) from mounting rail (18).




208 VOLTS
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INSTALLATION

1. Pull out on locking tab (17), then install new contactor (14) onto mounting rail (18).
2. Insert overload relay (15) into contactor (14), then secure by tightening three screw terminals (16).
3. Connect wires to contactor (14) and overload relay (15) as tagged.
4. Place door (7) onto inverter enclosure (8), then secure by tightening eleven latches (6).
5. Use maintenance menu control outputs function (WP 0010 00) to verify correct operation of dryer blower motor MC104.

END OF WORK PACKAGE

UNIT

LAUNDRY ADVANCED SYSTEM

(NSN 3510–01–463–0114)

OVERLOAD RELAY (OL104) REPLACEMENT REMOVAL, INSTALLATION

INITIAL SETUP:

Tools
Multimeter (Item 2, WP 0282 00)
Tool Kit, General Mechanics
(Item 14, WP 0282 00)

Personnel Required

Materials/Parts
Tags (Item 9, WP 0281 00)

Equipment Conditions
LADS power shut off at main control enclosure (WP 0113 00).

REMOVAL

WARNING

The inverter drive must discharge before it is safe to disconnect wire connections. DEATH ON CONTACT may result if personnel fail to observe this safety precaution.

NOTE

In order to remove inverter door, drum B must be lowered.

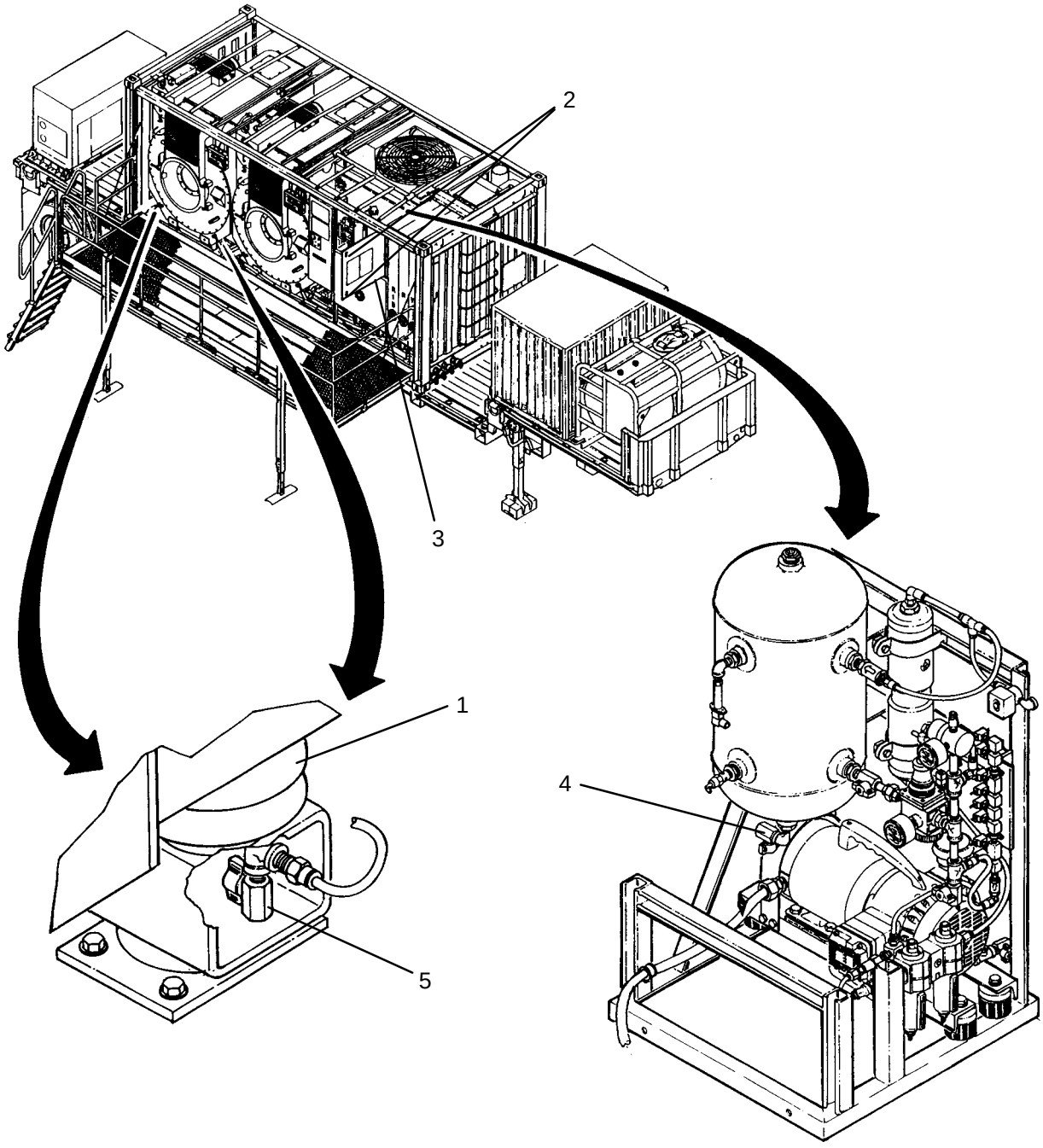
1. Vent air pressure from air bags (1) as follows:
   a. Disengage two latches (2), then open access door (3).
   b. Open valve (4).
   c. Open valves (5) on front air bags (1).
   d. Allow air pressure to vent from air bags (1) then close valves (4 and 5).
   e. Close access door (3) then engage two latches (2).

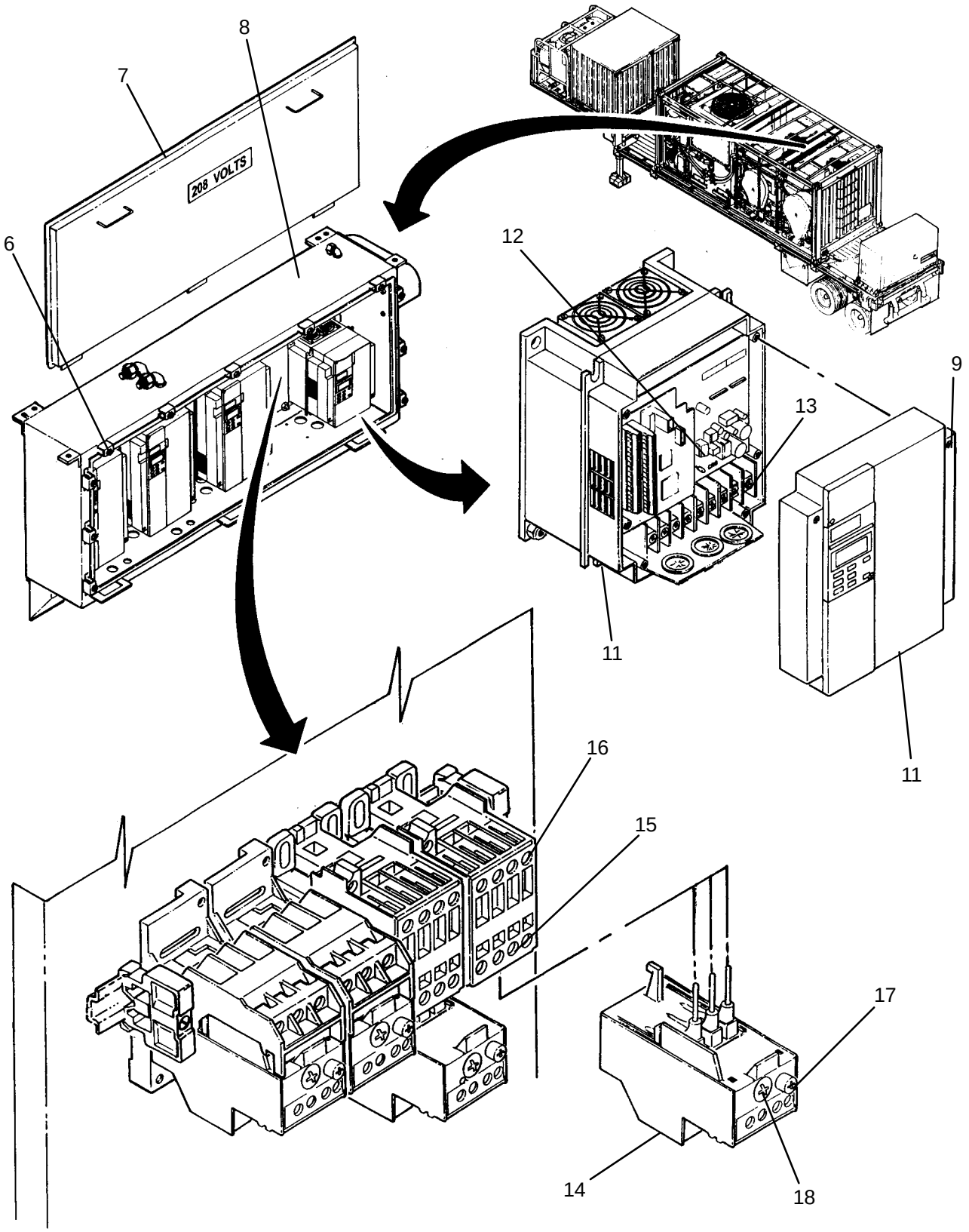
REMOVAL – Continued

NOTE

Use this procedure to replace overload relay OL104A or B. To replace overload relay OL200 or OL300, use WP 0254 00.

2. Loosen eleven latches (6), then lift door (7) off of inverter enclosure (8).
3. Loosen two captive screws (9), then remove cover (10) from inverter drive (11).
4. Wait for CRG indicator (12) to go off, then use a multimeter to verify voltage is not present at output bus (13).
5. Install cover (10) onto inverter drive (11), then secure with two captive screws (9).
6. Tag and disconnect wires from overload relay (14).
7. Loosen three screw terminals (15), then pull overload relay (14) off of contactor (16).

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INSTALLATION

1. Insert new overload relay (14) into contactor (16), then secure by tightening three screw terminals (15).
2. Connect wires to overload relay (14) as tagged.
3. Set reset control (17) to MO.
4. Adjust amperage control (18) to “13.3”.
5. Place door (7) onto inverter enclosure (8), then secure by tightening eleven latches (6).
6. Use maintenance menu control outputs function (WP 0010 00) to verify correct operation of dryer blower motors MC104A and MC104B.

END OF WORK PACKAGE

UNIT

LAUNDRY ADVANCED SYSTEM

(NSN 3510–01–463–0114)

OVERLOAD RELAY (OL200 OR OL300) REPLACEMENT REMOVAL, INSTALLATION

INITIAL SETUP:

Tools
Multimeter (Item 2, WP 0282 00)
Tool Kit, General Mechanics (Item 14, WP 0282 00)

Personnel Required

Materials/Parts
Tags (Item 9, WP 0281 00)

Equipment Conditions
LADS power shut off at main control enclosure (WP 0113 00).

REMOVAL

WARNING

The inverter drive must discharge before it is safe to disconnect wire connections. DEATH ON CONTACT may result if personnel fail to observe this safety precaution.

NOTE

In order to remove inverter door, drum B must be lowered.

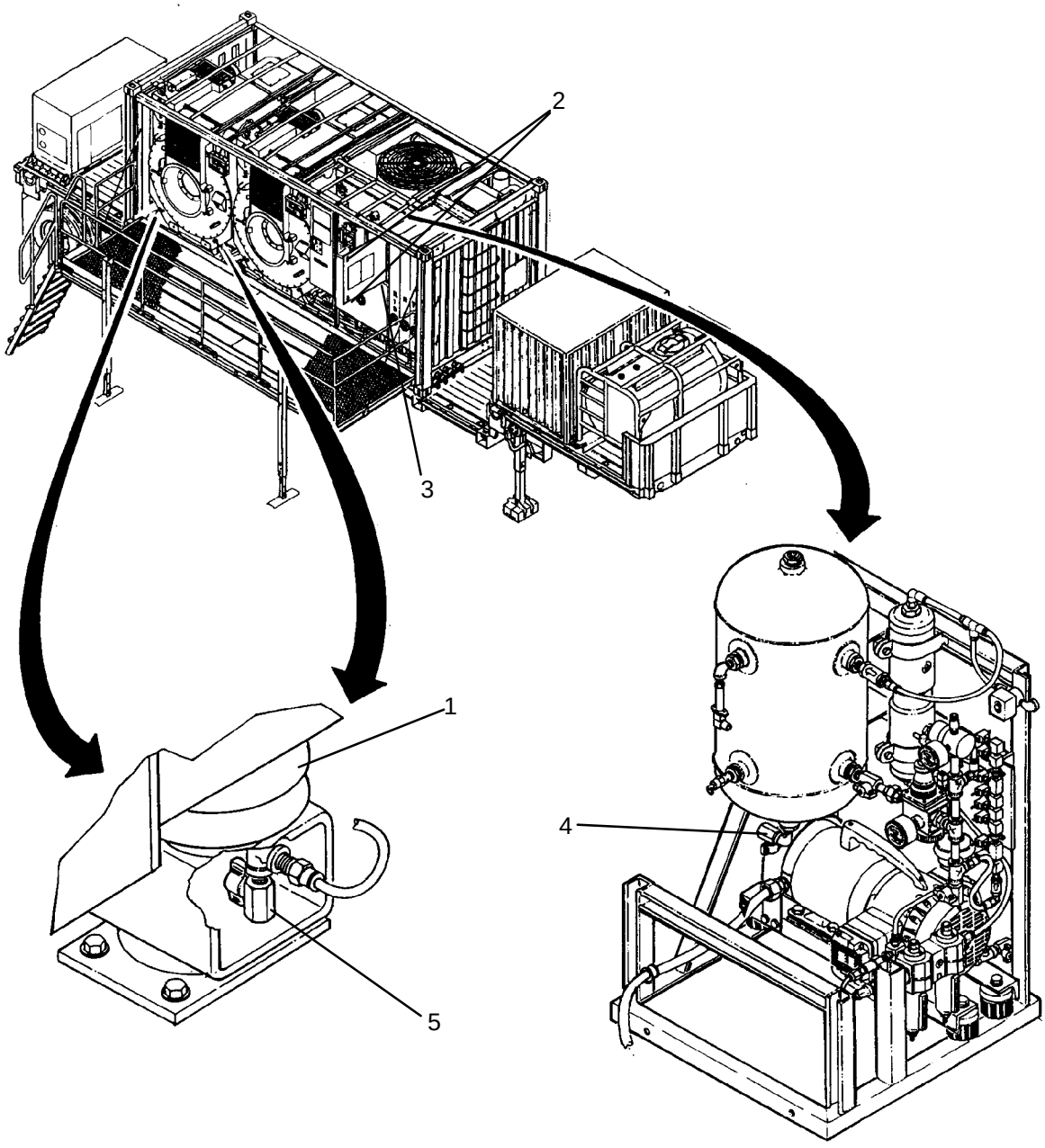
1. Vent air pressure from air bags (1) as follows:
   a. Disengage two latches (2), then open access door (3).
   b. Open valve (4).
   c. Open valves (5) on front air bags (1).
   d. Allow air pressure to vent from air bags (1) then close valves (4 and 5).
   e. Close access door (3) then engage two latches (2).

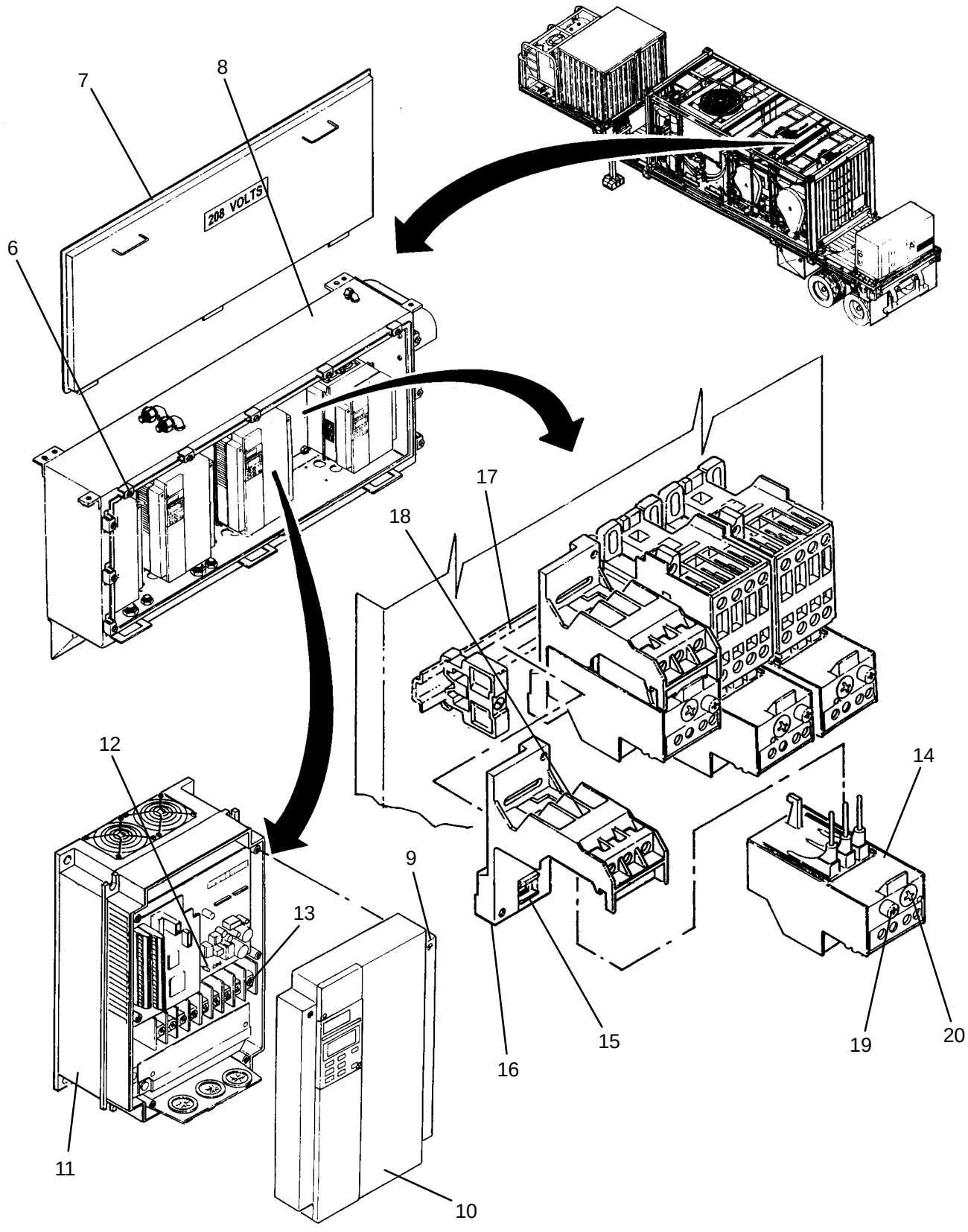
REMOVAL – Continued

NOTE

This procedure is for replacing overload relay OL200 or OL300. To replace overload relay OL104A or B, use WP 0253 00.

2. Loosen eleven latches (6), then lift door (7) off of inverter enclosure (8).
3. Loosen two captive screws (9), then remove cover (10) from inverter drive (11).
4. Wait for CRG indicator (12) to go off, then use a multimeter to verify voltage is not present at output bus (13).
5. Install cover (10) onto inverter drive (11), then secure with two captive screws (9).
6. Tag and disconnect wires from overload relay (14).
7. Pull out on locking tab (15), then remove base adapter (16) from mounting rail (17).
8. Loosen three screw terminals (18), then remove overload relay (14) from base adapter (16).

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INSTALLATION

1. Insert new overload relay (14) into base adapter (16), then secure by tightening three screw terminals (18).
2. Pull out on locking tab (15), then install base adapter (16) onto mounting rail (17).
3. Connect wires to overload relay (14) as tagged.
4. Set reset control (19) to MO.
5. Adjust amperage control (20) to “29.0” for OL200 or “13.3” for OL300.
6. Place door (7) onto inverter enclosure (8), then secure by tightening eleven latches (6).
7. Use maintenance menu control outputs function (WP 0010 00) to verify correct operation of still condenser fan M200 and thermal fluid pump M300.

END OF WORK PACKAGE

UNIT

LAUNDRY ADVANCED SYSTEM

(NSN 3510–01–463–0114)

BLOWN FUSE INDICATOR REPLACEMENT REMOVAL, INSTALLATION

INITIAL SETUP:

Tools
Tool Kit, General Mechanics
(Item 14, WP 0282 00)

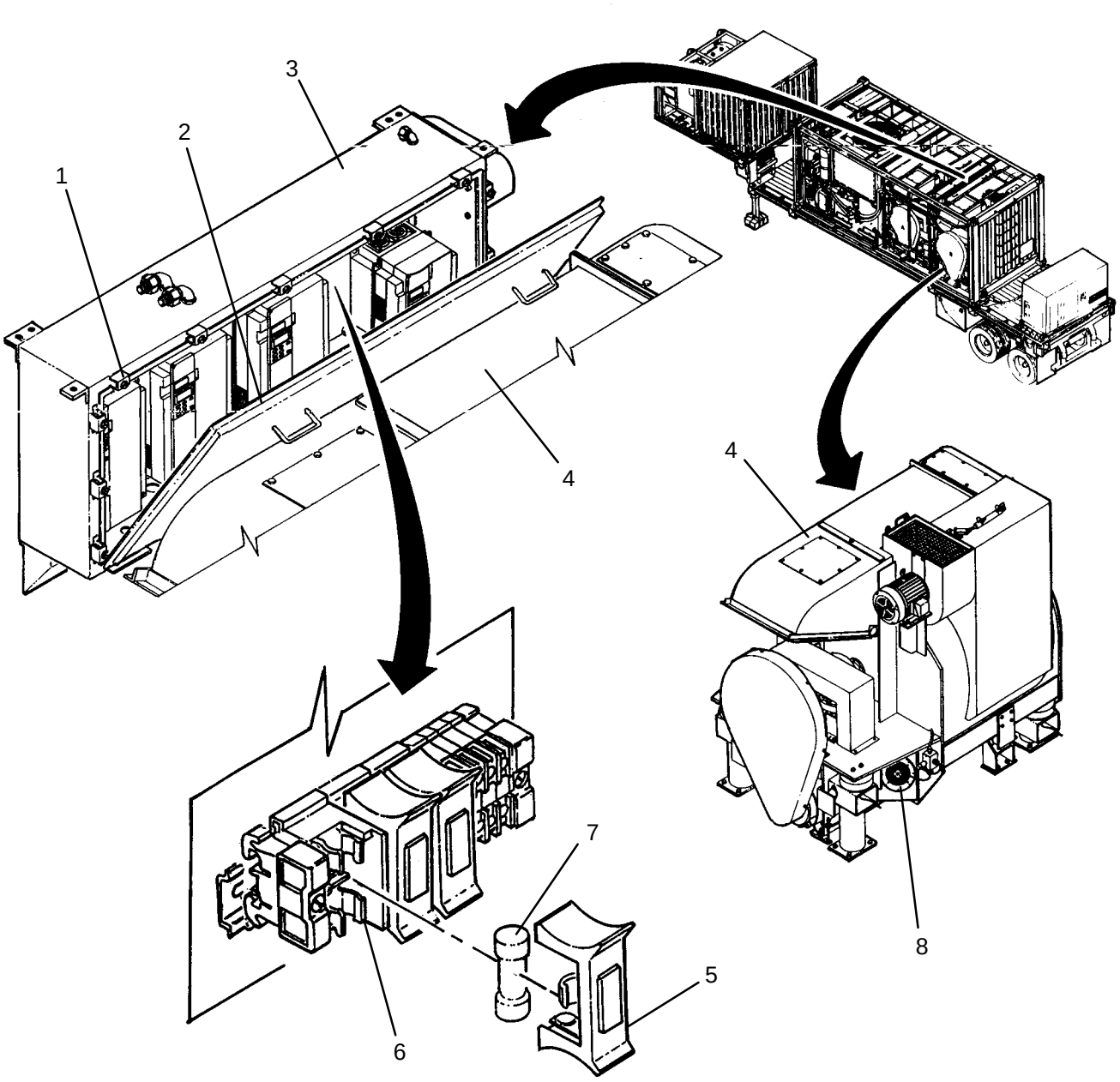
Personnel Required

Materials/Parts

Equipment Conditions
LADS power shut off at main control enclosure (WP 0113 00).

REMOVAL

1. Loosen eleven latches (1), then open door (2) on inverter enclosure (3) and rest against drum (4).
2. Remove blown fuse indicator (5) from fuse block (6).
3. Remove fuse (7) from blown fuse indicator (5).



INSTALLATION

1. Insert fuse (7) into new blown fuse indicator (5).
2. Install blown fuse indicator (5) onto fuse block (6).
3. Close door (2) onto inverter enclosure (3), then secure by tightening eleven latches (1).
4. Position MAIN DISCONNECT switch (WP 0009 00, Figure 1, 1) to ON. Verify cooling fans for inverter enclosure (3) and drum motors (8) are operating.

END OF WORK PACKAGE

UNIT

LAUNDRY ADVANCED SYSTEM

(NSN 3510–01–463–0114)

FUSE (F4, F5, OR F6) REPLACEMENT REMOVAL, INSTALLATION

INITIAL SETUP:

Tools
Tool Kit, General Mechanics
(Item 14, WP 0282 00)

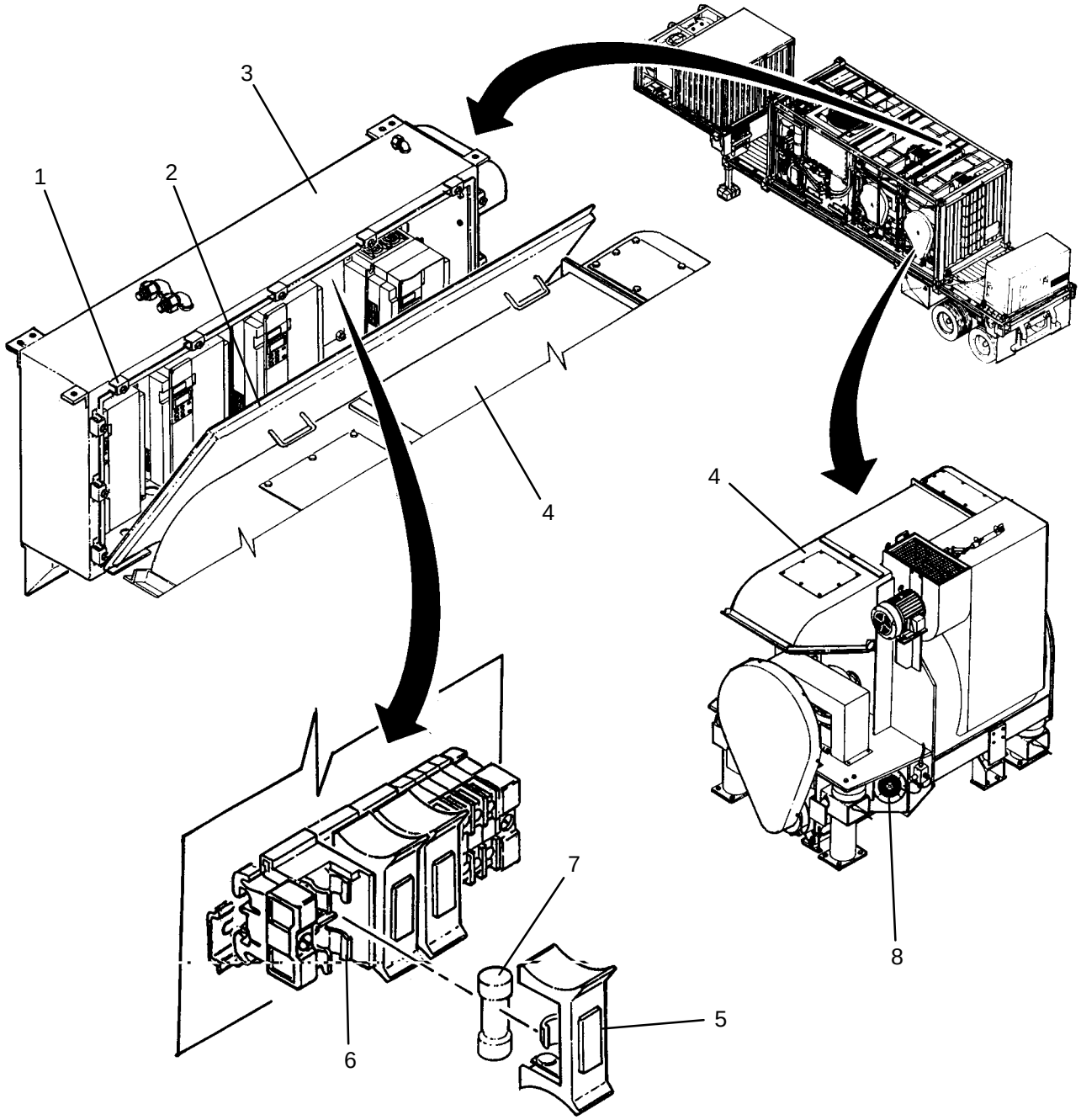
Personnel Required

Materials/Parts

Equipment Conditions
LADS power shut off at main control enclosure (WP 0113 00).

REMOVAL

1. Loosen eleven latches (1), then open door (2) on inverter enclosure (3) and rest against drum (4).
2. Remove blown fuse indicator (5) from fuse block (6).
3. Remove fuse (7) from blown fuse indicator (5).



INSTALLATION

1. Insert new fuse (7) into blown fuse indicator (5).
2. Install blown fuse indicator (5) onto fuse block (6).
3. Close door (2) onto inverter enclosure (3), then secure by tightening eleven latches (1).
4. Position MAIN DISCONNECT switch (WP 0009 00, Figure 1, 1) to ON. Verify cooling fans for inverter enclosure (3) and drum motors (8) are operating.

END OF WORK PACKAGE

UNIT

LAUNDRY ADVANCED SYSTEM

(NSN 3510–01–463–0114)

INVERTER RESET SWITCH (PBS7 – PBS10) REPLACEMENT REMOVAL, INSTALLATION

INITIAL SETUP:

Tools
Tool Kit, General Mechanics
(Item 14, WP 0282 00)

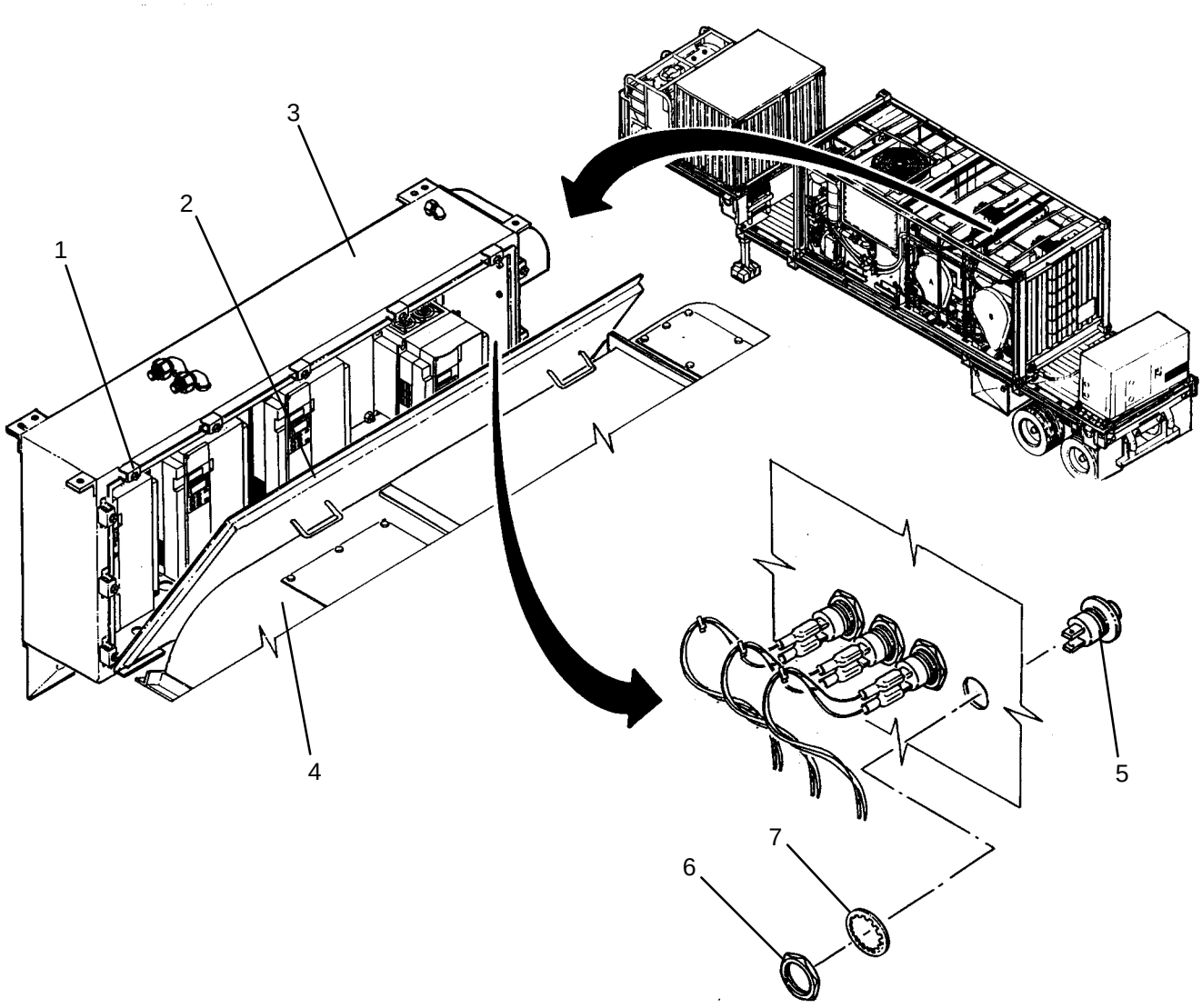
Personnel Required

Materials/Parts

Equipment Conditions
LADS power shut off at main control enclosure (WP 0113 00).

REMOVAL

1. Loosen eleven latches (1), then open door (2) on inverter enclosure (3) and rest against drum (4).
2. Tag and disconnect wires from pushbutton switch (5).
3. Remove nut (6) and lock washer (7), then remove pushbutton switch (5) from enclosure (3).



INSTALLATION

1. Remove nut (6) and lock washer (7) from new pushbutton switch (5).
2. Install pushbutton switch (5) onto enclosure (3) then secure with nut (6) and lock washer (7).
3. Connect wires to pushbutton switch (5) as tagged.
4. Close door (2) onto inverter enclosure (3), then secure by tightening eleven latches (1).

END OF WORK PACKAGE

UNIT

LAUNDRY ADVANCED SYSTEM

(NSN 3510–01–463–0114)

EXTERNAL RECEPTACLE REPLACEMENT REMOVAL, INSTALLATION

INITIAL SETUP:

Tools
Tool Kit, General Mechanics
(Item 14, WP 0282 00)

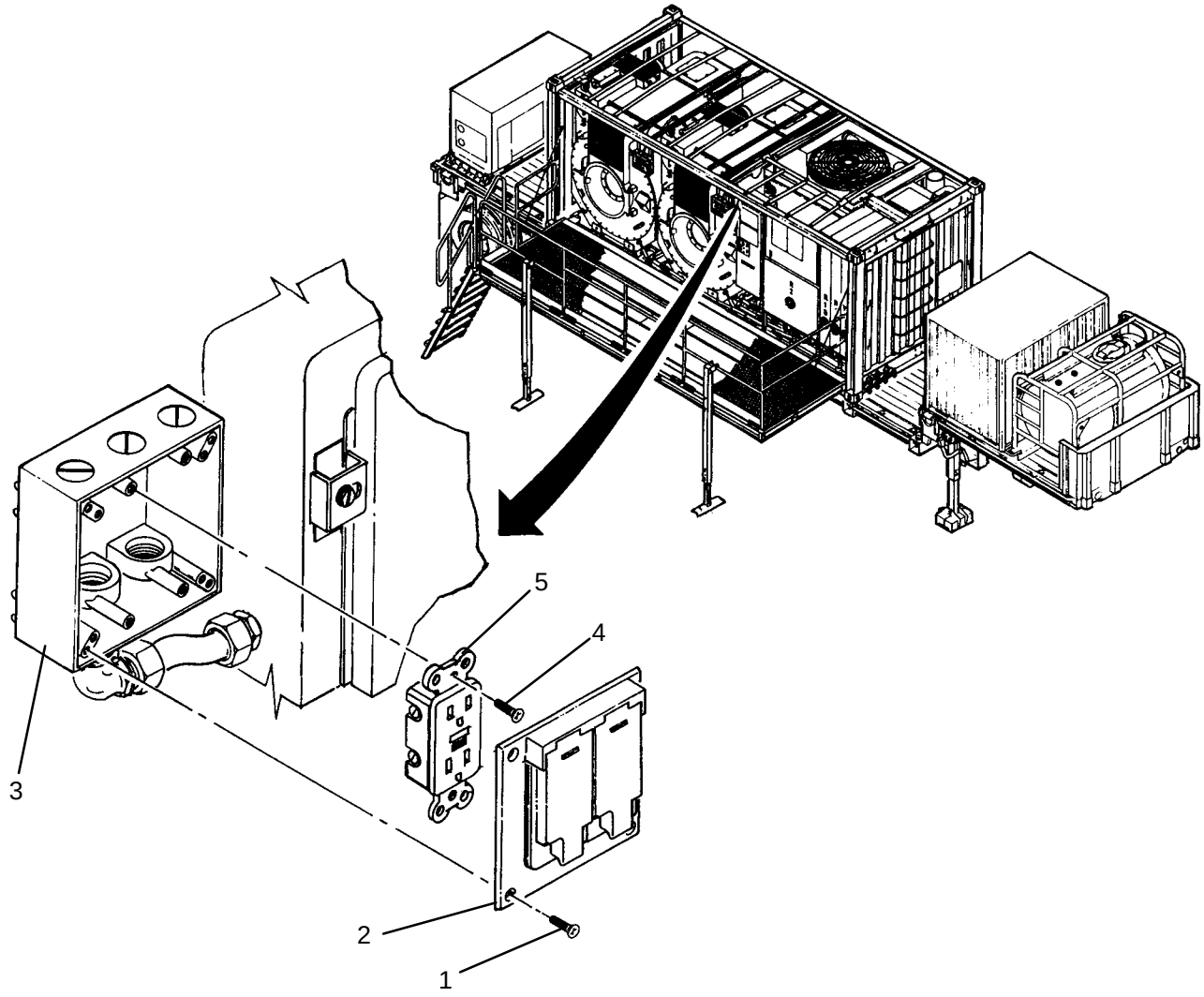
Personnel Required

Materials/Parts
Tags, (Item 9, WP 0281 00)

Equipment Conditions
LADS power shut off at main control enclosure (WP 0113 00).

REMOVAL

1. Remove four screws (1) securing cover plate (2) to outlet box (3).
2. Remove two screws (4) securing receptacle (5) to outlet box (3).
3. Pull receptacle (5) out of outlet box (3), then tag and disconnect wiring from receptacle.



INSTALLATION

1. Connect wiring to new receptacle (5) as tagged.
2. Insert receptacle (5) into outlet box (3) and secure with two screws (4).
3. Install cover plate (2) onto outlet box (3) then secure with four screws (1).
4. Position MAIN DISCONNECT switch (WP 0009 00, Figure 1, 1) to ON. Verify external lighting is operable.

END OF WORK PACKAGE

UNIT

LAUNDRY ADVANCED SYSTEM

(NSN 3510–01–463–0114)

SUPPORT LEG ASSEMBLY REPLACEMENT REMOVAL, INSTALLATION

INITIAL SETUP:

Tools
Tool Kit, General Mechanics
(Item 14, WP 0282 00)

Personnel Required

Materials/Parts
Washer, Lock (Item 20, WP 0283 00)

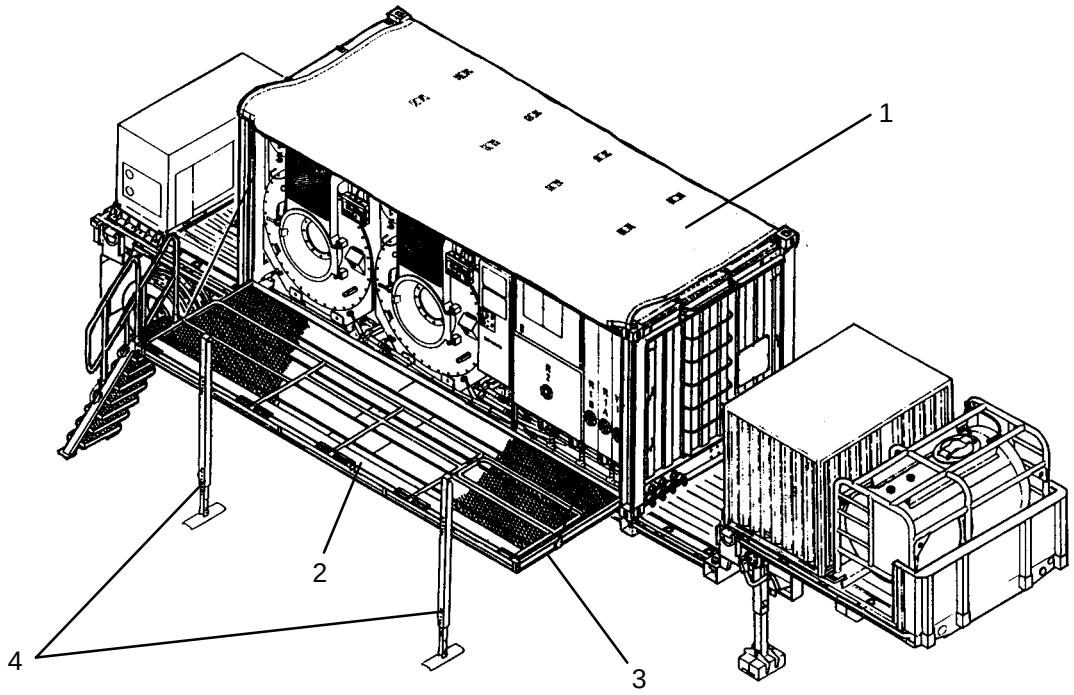
Equipment Conditions
LADS power shut off at main control enclosure (WP 0113 00).

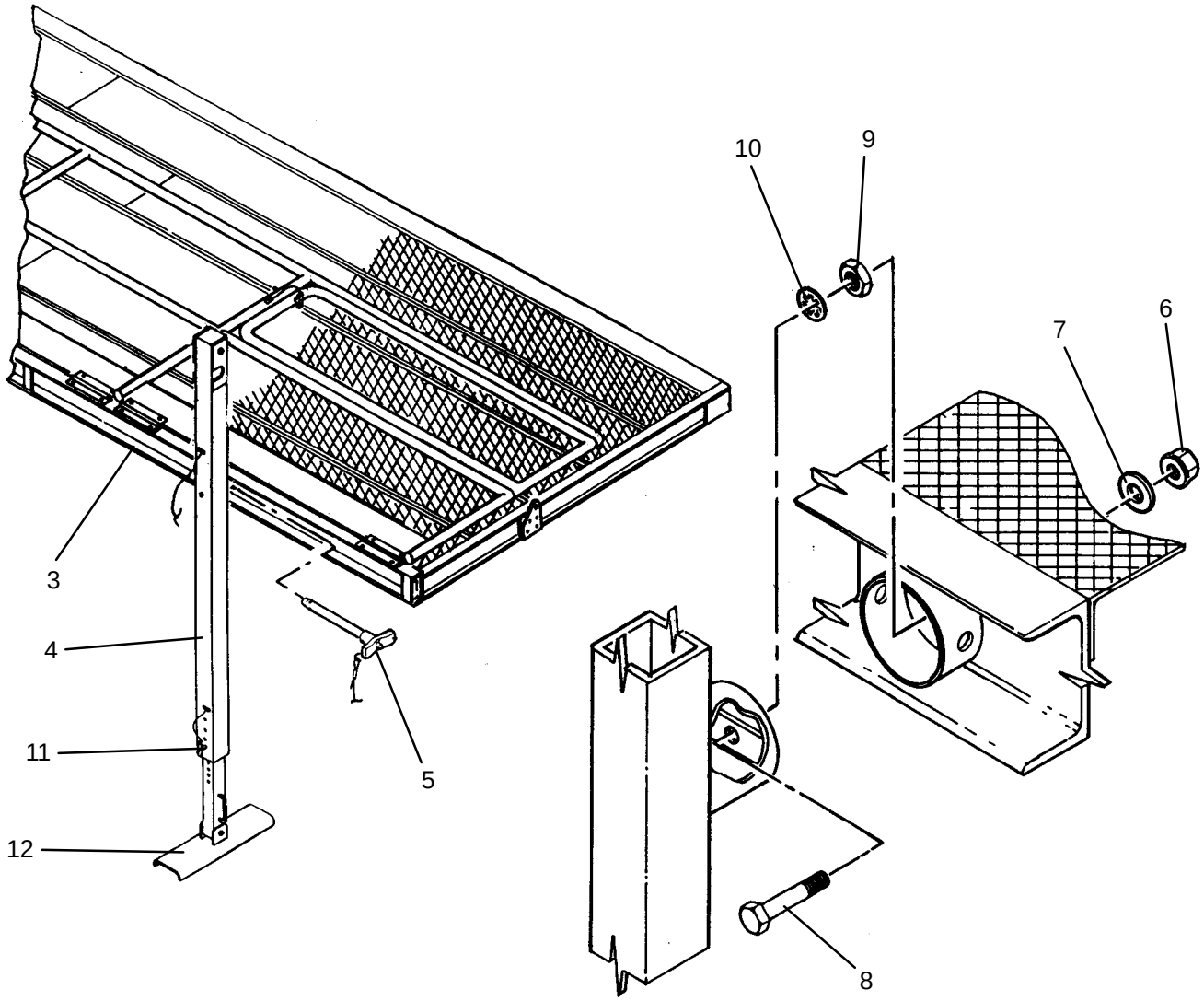
REMOVAL

WARNING

Platform assembly must be properly supported prior to removing support leg. Never stand or walk on platform when support legs are not set up and touching the ground. Failure to follow these precautions could result in serious personnel injury or equipment damage.

1. Stow awning (1) and lower railing (2) (TM 10–3510–221–10).
2. Raise platform (3) until support legs (4) are slightly off of ground (TM 10–3510–221–10).
3. At support leg (4) to be replaced, pull quick–connect pin (5) securing support leg to platform (3).
4. Remove nut (6) and flat washer (7) then pull support leg (4) off of platform (3).
5. Remove screw (8), nut (9), and lock washer (10) from support leg (4).





INSTALLATION

1. Install screw (8), nut (9), and lock washer (10) onto new support leg (4).
2. Pull quick–connect pin (5) out of new support leg (4).
3. Position support leg (4) onto platform (3) then secure with nut (6) and flat washer (7).
4. Secure support leg (4) as follows:
   a. Install quick–connect pin (5) to secure support leg (4) to platform (3).
   b. Pull quick–connect pin (11) out of support leg (4).
   c. Adjust height of support leg (4) so that foot (12) is slightly above ground then install quick–connect pin (11).
5. Lower platform (3), raise railing (2), and set up awning (1) (TM 10–3510–221–10).

END OF WORK PACKAGE

UNIT

LAUNDRY ADVANCED SYSTEM

(NSN 3510–01–463–0114)

WINCH CABLE REPLACEMENT
REMOVAL, INSTALLATION

INITIAL SETUP:

Tools
Tool Kit, General Mechanics
(Item 14, WP 0282 00)
Handle, Winch (TM 10–3510–221–10)

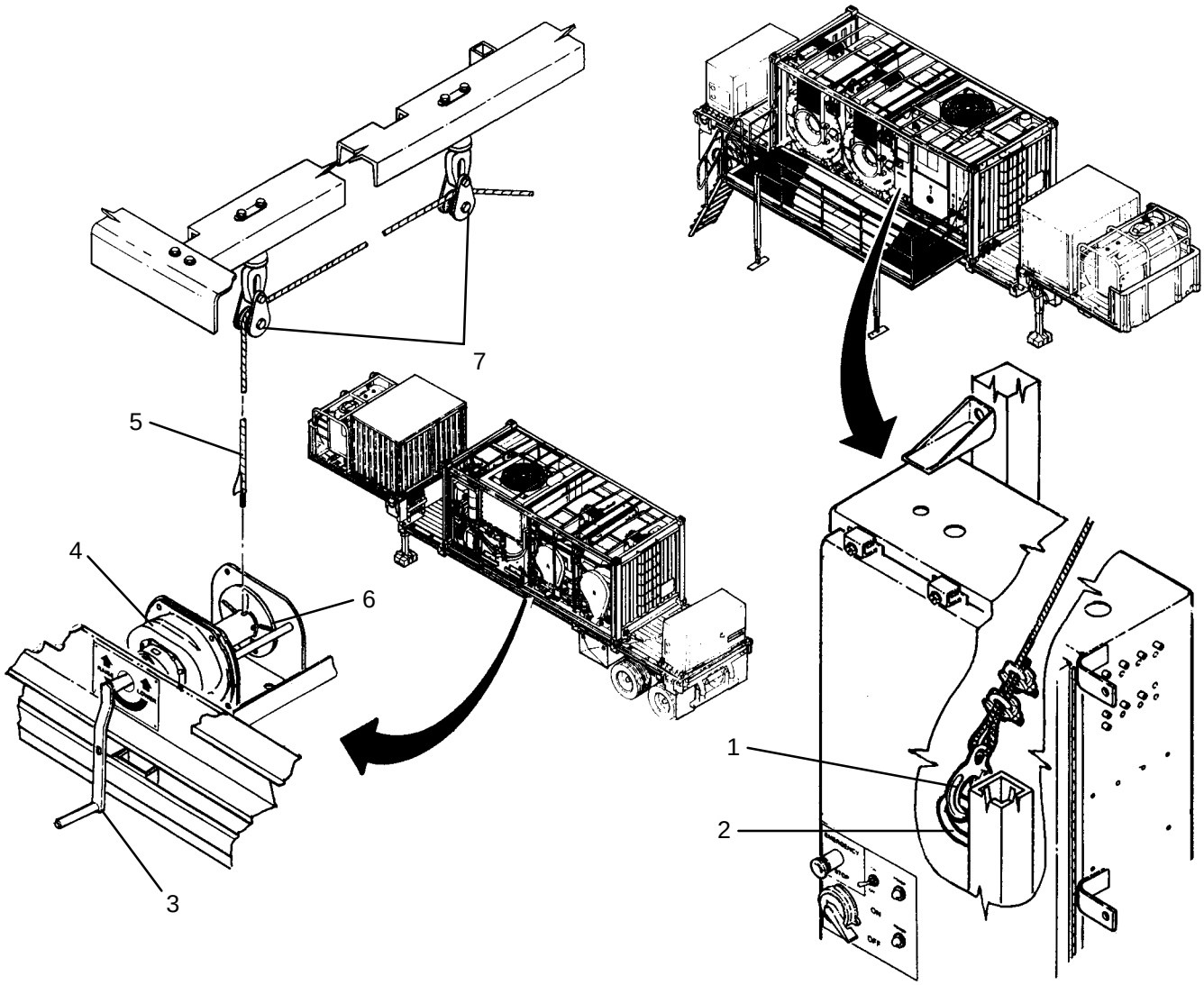
Personnel Required

Materials/Parts

Equipment Conditions
LADS power shut off at main control enclosure (WP 0113 00).
Platform and railings must be set–up (TM 10–3510–221–10).

REMOVAL

1. Unhook shackle (1) from u–bolt (2).
2. Install winch handle (3) onto winch (4).
3. Note direction that cable (5) is wrapped onto winch (4).
4. Use winch handle (3) to rotate winch (4) and completely pay out cable (5).
5. Loosen set screw (6) then remove cable (5) from winch (4).
6. Pull cable (5) out of two pulleys (7).



INSTALLATION

1. Thread cable (5) through two pulleys (7) and down to winch (4).
2. Insert cable (5) into hole on winch (4) then tighten setscrew (6).
3. Pull on cable (5) and ensure it is properly secured and does not slip out of setscrew (6).

CAUTION

Maintain a slight tension when winding up cable on winch. Also ensure cable is evenly distributed across winch. Failure to follow these precautions may result in sudden drops of platform during platform raising and lowering operations.

4. Use winch handle (3) to rotate winch (4) clockwise and tighten cable (5) until shackle (1) can be hooked to u–bolt (2).
5. Hook shackle (1) to u–bolt (2).
6. Remove winch handle (3) from winch (4). Stow winch handle.

END OF WORK PACKAGE

UNIT

LAUNDRY ADVANCED SYSTEM

(NSN 3510–01–463–0114)

WINCH REPLACEMENT REMOVAL, INSTALLATION

INITIAL SETUP:

Tools
Tool Kit, General Mechanics
(Item 14, WP 0282 00)
Handle, Winch (TM 10–3510–221–10)

Personnel Required

Materials/Parts

Equipment Conditions
LADS power shut off at main control enclosure (WP 0113 00).
Platform and railings must be set–up (TM 10–3510–221–10).

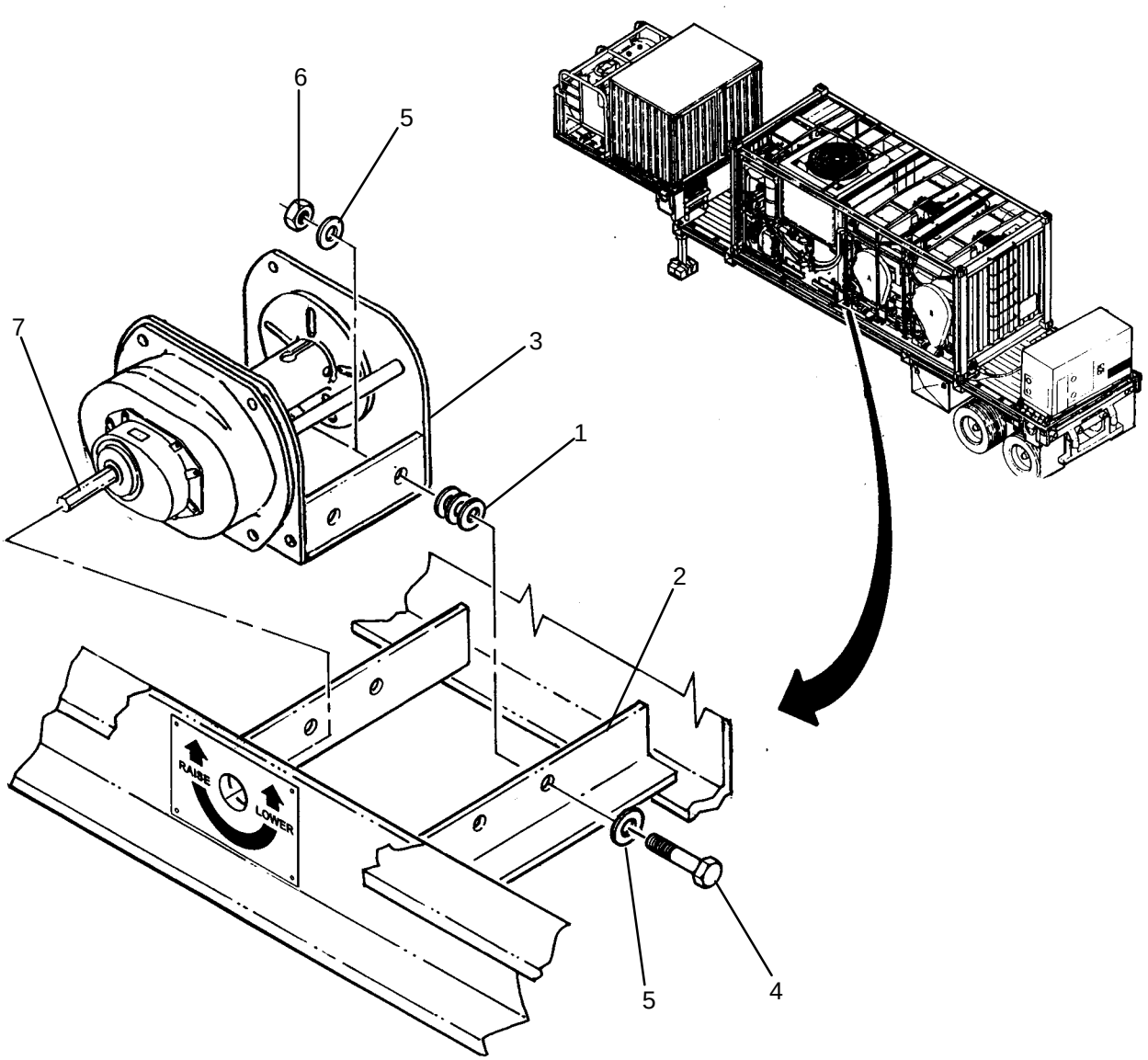
REMOVAL

1. Remove system A drum outlet valve (WP 147 00) and leave attached to piping.
2. Remove winch cable (WP 260 00).

NOTE

Winch must be properly centered within opening in ISO frame to ensure proper rotation during operation.

3. Record the location(s) and number of shims (1) between ISO frame (2) and winch (3).
4. Remove four screws (4), flat washers (5), shims (1) and nuts (6) then remove winch (3) from ISO frame (2).



INSTALLATION

1. Position new winch (3) into ISO frame (2). Install shims (1) at previously recorded locations, then secure with four screws (4) flat washers (5) and nuts (6).
2. Ensure winch handle adapter (7) is centered in ISO frame (2) and can be rotated without contacting ISO frame. If winch handle adapter is not centered or can not be rotated without contacting ISO frame, proceed to step 3; otherwise, proceed to step 4.
3. Loosen four screws (4) adjust winch handle adapter (7) until centered in ISO frame (2) then tighten four screws. Repeat step 2.
4. Install winch cable (WP 260 00).
5. Install drum outlet valve (WP 147 00)

END OF WORK PACKAGE

UNIT

LAUNDRY ADVANCED SYSTEM

(NSN 3510–01–463–0114)

TARP REPLACEMENT
REMOVAL, INSTALLATION

INITIAL SETUP:

Tools
Tool Kit, General Mechanics
(Item 14, WP 0282 00)

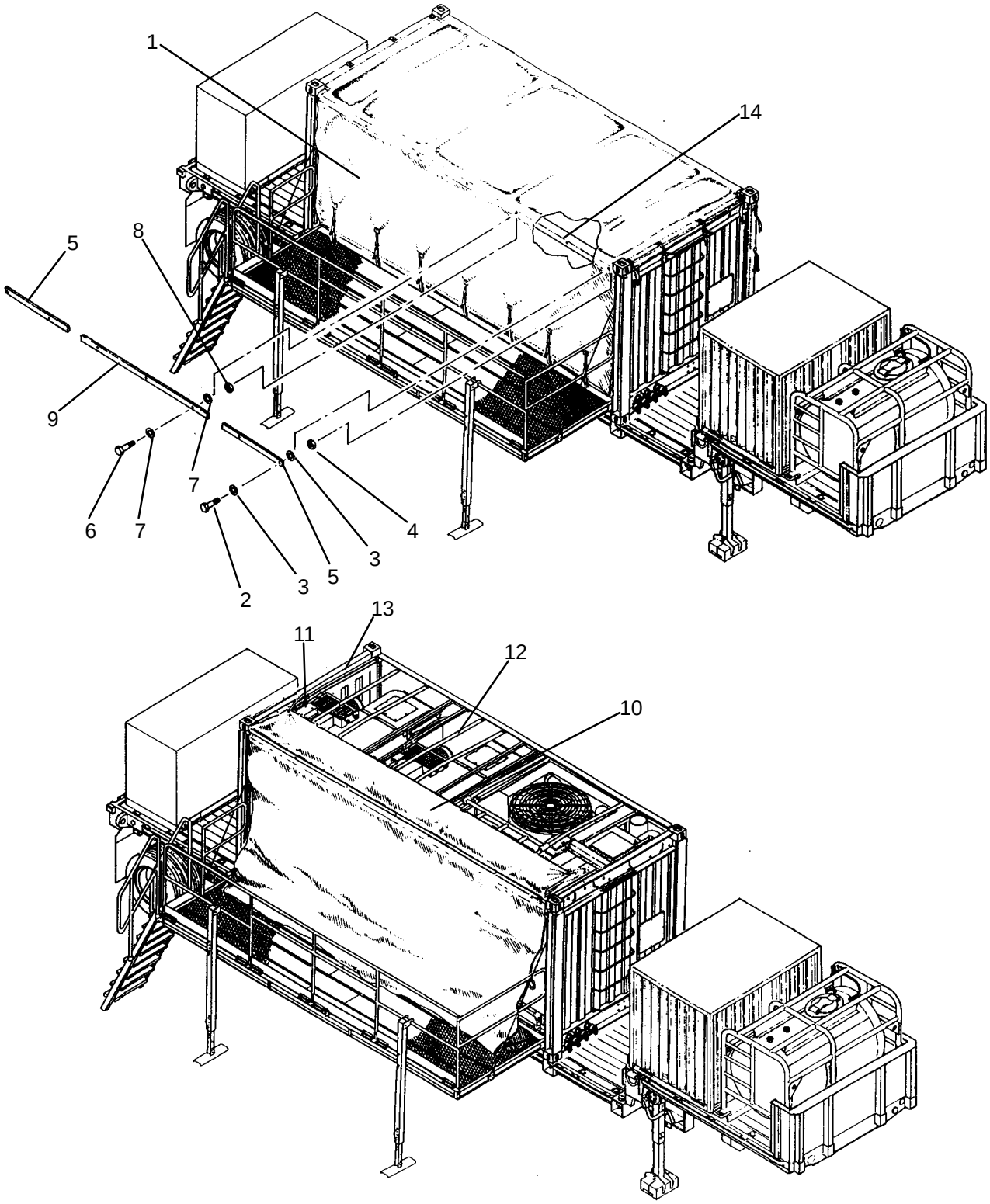
Personnel Required

Materials/Parts

Equipment Conditions
LADS power shut off at main control enclosure (WP 0113 00).

REMOVAL

1. Determine current configuration of LADS. If LADS is set up for operation, proceed to step 3. If LADS is in transport configuration, continue to step 2.
2. Set up platform and railings (TM 10–3510–221–10, ASSEMBLY AND PREPARATION FOR USE, procedure steps LOOSEN TARP through INSTALL MAIN AND SIDE RAILINGS), then proceed to step 4.
3. Stow awning and remove awning supports (TM 10–3510–221–10, PREPARATION FOR MOVEMENT procedure TEAR DOWN AWNING) then proceed to step 4.
4. Flip front section of tarp (1) over front of LADS.
5. Remove four screws (2), flat washers (3), and nuts (4), then remove outer retaining plates (5).
6. Remove three screws (6), flat washers (7), and nuts (8), then remove center retaining plate (9).
7. Flip back section of tarp (1) over front of LADS to expose awning extension (10).
8. Loosen six straps (11) securing awning extension (10) to tarp supports (12) and ISO frame (13).
9. Pull tarp (1) off of LADS.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INSTALLATION

1. Place new tarp (1) over LADS.
2. Align holes in tarp (1) with mounting holes in front support (14).
3. Position center retaining plate (9) on tarp (1), then secure to front support (14) with three screws (6), flat washers (7), and nuts (8).
4. Position outer retaining plates (5) on tarp (1), then secure to front support (14) with four screws (2), flat washers (3), and nuts (4).
5. Flip back section of tarp (1) over front of LADS to expose awning extension (10).
6. Lay awning extension (10) over top front section of LADS.
7. Install and tighten six straps (11) to secure awning extension (10) to tarp supports (12) and ISO frame (13).
8. Determine required configuration of LADS. If LADS is to be returned to operation, proceed to step 10. If LADS is to be returned to transport configuration, continue to step 9.
9. Stow railing, raise platform, and secure tarp (TM 10–3510–221–10, PREPARATION FOR MOVEMENT procedures STOW RAILING through SECURE TARP).
10. Set up awning supports and awning (TM 10–3510–221–10, ASSEMBLY AND PREPARATION FOR USE procedure SETUP AWNING)

END OF WORK PACKAGE

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UNIT

LAUNDRY ADVANCED SYSTEM

(NSN 3510–01–463–0114)

FUEL/WATER SEPARATOR REPLACEMENT REMOVAL, INSTALLATION

INITIAL SETUP:

Tools
Tool Kit, General Mechanics
(Item 14, WP 0282 00)

Personnel Required

Materials/Parts
Rag, Wiping (Item 4, WP 0281 00)

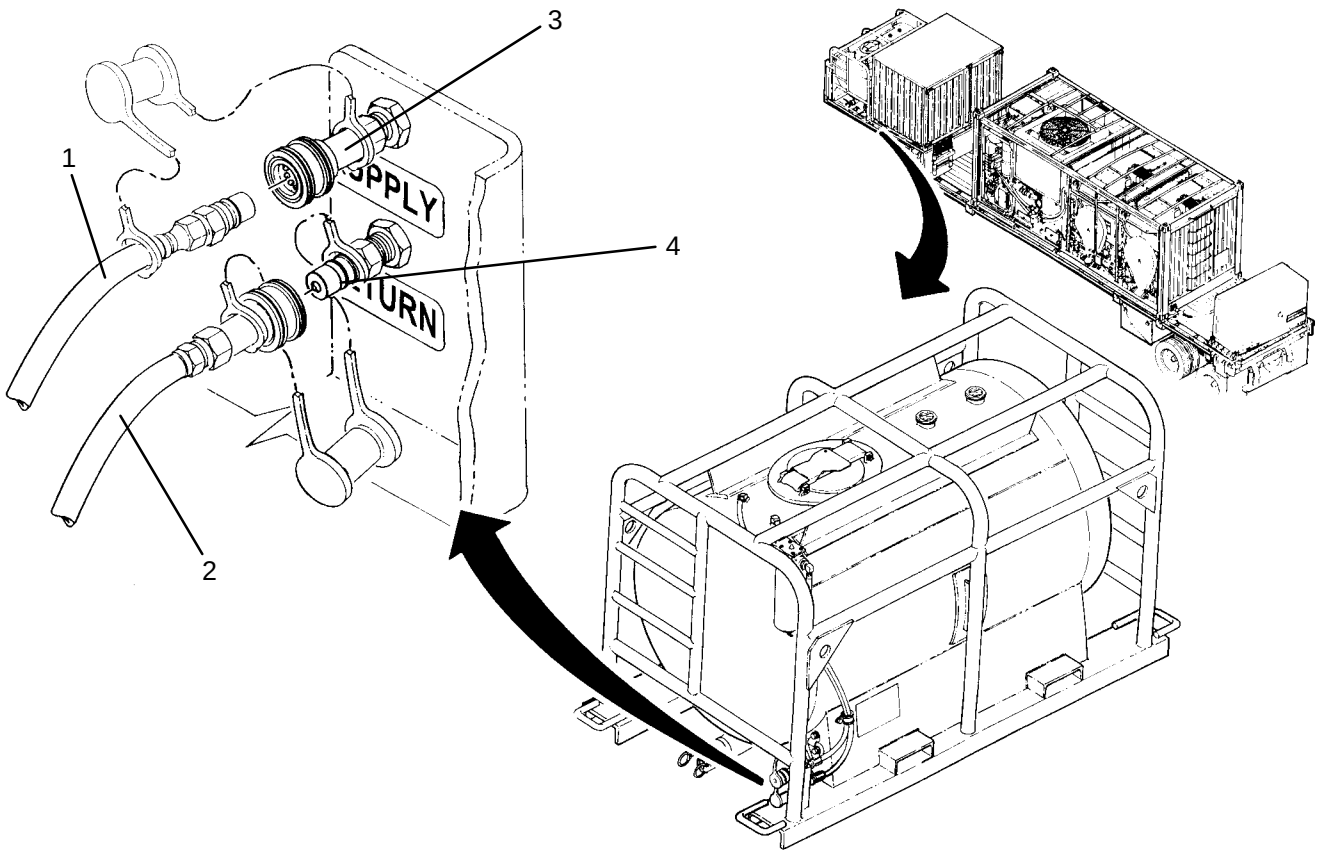
Equipment Conditions
LADS power shut off at main control enclosure (WP 0113 00).

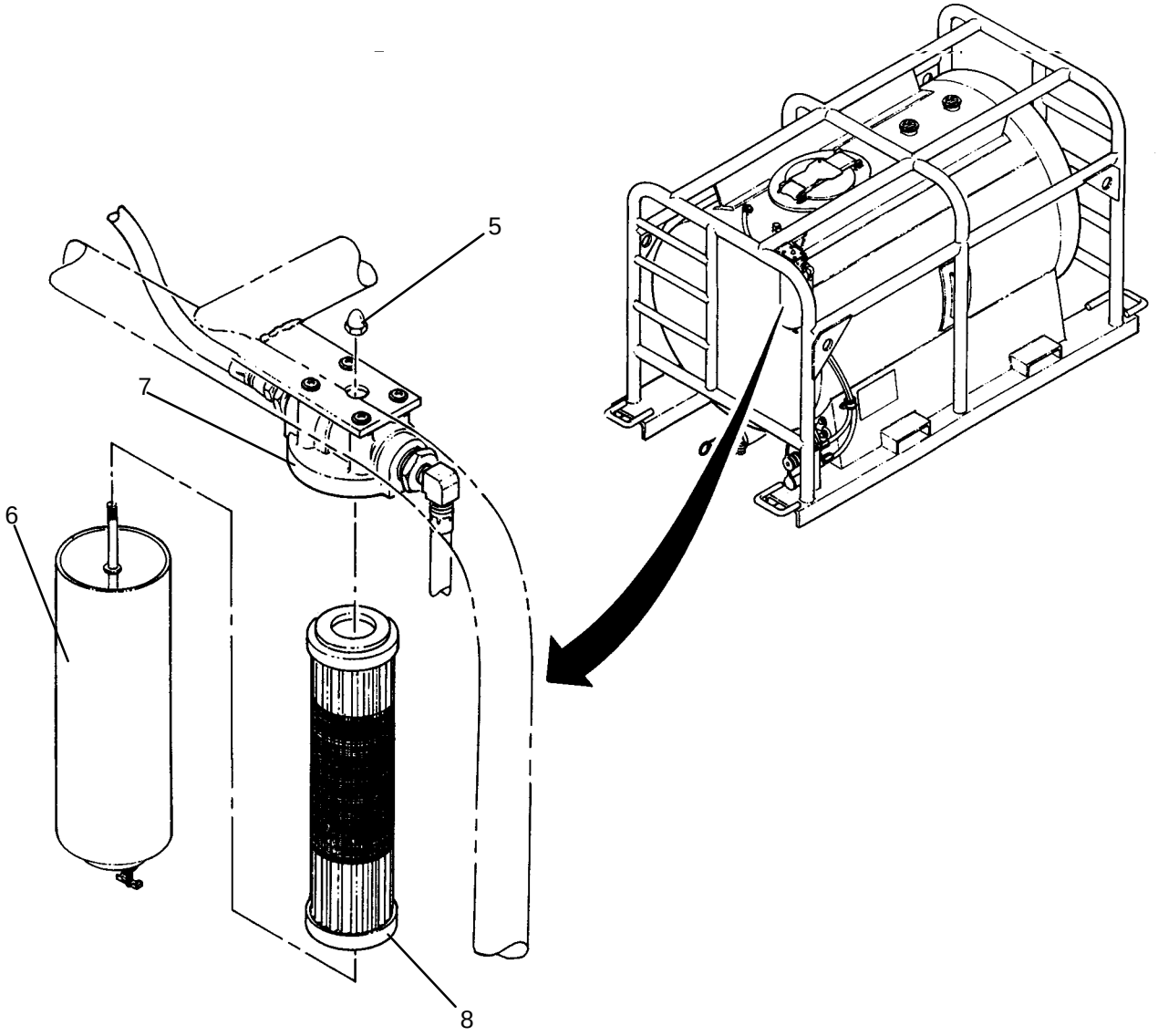
REMOVAL

WARNING

The fuels used on the heating system are highly explosive. DO NOT smoke or use open flame when performing maintenance. Flames and explosion could occur resulting in severe personal injury or death.

1. Disconnect fuel hoses (1) and (2) from quick–connect fittings (3) and (4).
2. Remove captive nut (5), then filter bowl (6) from filter housing (7).
3. Remove filter element (8) from filter bowl (6).
4. Wipe inside of filter bowl (6) and filter housing (7) with a clean rag.





INSTALLATION

1. Install new filter element (8) into filter bowl (6).
2. Place filter bowl (6) under filter housing (7).
3. Mate filter bowl (6) with filter housing (7) ensuring filter element (8) is properly inserted into center of filter housing
4. Install captive nut (5) to secure filter bowl (6) to filter housing (7).
5. Connect fuel hoses (1) and (2) to quick–connect fittings (3) and (4).
6. Use maintenance menu to test heating system (WP 0010 00). While heating system is operating visually check for fuel leaks.
7. Allow heater to stay on until heater shuts off automatically.
8. Stop heating system. Perform cooling thermal fluid (WP 0010 00) until TE 300 is 200 degrees F or less.

END OF WORK PACKAGE

CHAPTER 4

DIRECT SUPPORT MAINTENANCE INSTRUCTIONS FOR LAUNDRY ADVANCED SYSTEM

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DIRECT SUPPORT

LAUNDRY ADVANCED SYSTEM

(NSN 3510–01–463–0114)

DRUM MOTOR (M100) REPLACEMENT REMOVAL, INSTALLATION

INITIAL SETUP:

Tools
Multimeter (Item 8, WP 0282 00)
Bearing Puller (Item 9, WP 0282 00)
Tool Kit, General Mechanics
(Item 14, WP 0282 00)
Forklift, 5,000 lbs

Personnel Required

Materials/Parts
Tags, (Item 9, WP 0281 00)
Washer, Lock (Item 14, WP 0283 00)
Washer, Lock, (Item 17, WP 0283 00)
Strap, Tiedown, 14” LG (Item 33, WP 0283 00)
Strap, Tiedown, 8” LG (Item 35, WP 0283 00)

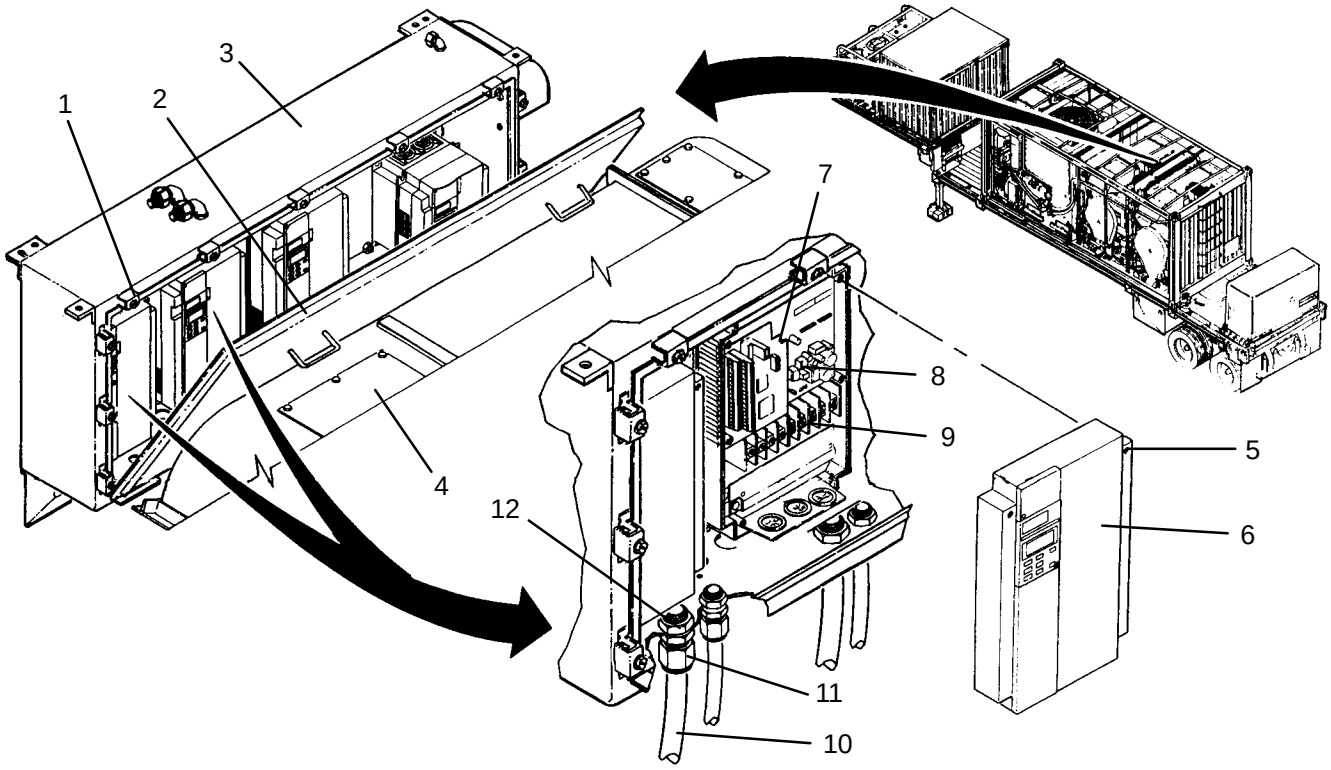
Equipment Conditions
LADS power shut off at main control enclosure (WP 0113 00).

REMOVAL

WARNING

The inverter drive must discharge before it is safe to disconnect wire connections. DEATH ON CONTACT may result if personnel fail to observe this safety precaution.

1. Loosen eleven latches (1), then open door (2) on inverter enclosure (3) and rest against drum (4).
2. Loosen two captive screws (5), then remove cover (6) from inverter drive (7).
3. Wait for CRG indicator (8) to go off, then use a multimeter to verify voltage is not present at output bus (9).
4. Tag and disconnect motor cable (10) from output bus (9).
5. Loosen nut (11), then pull motor cable (10) out of cord grip (12).



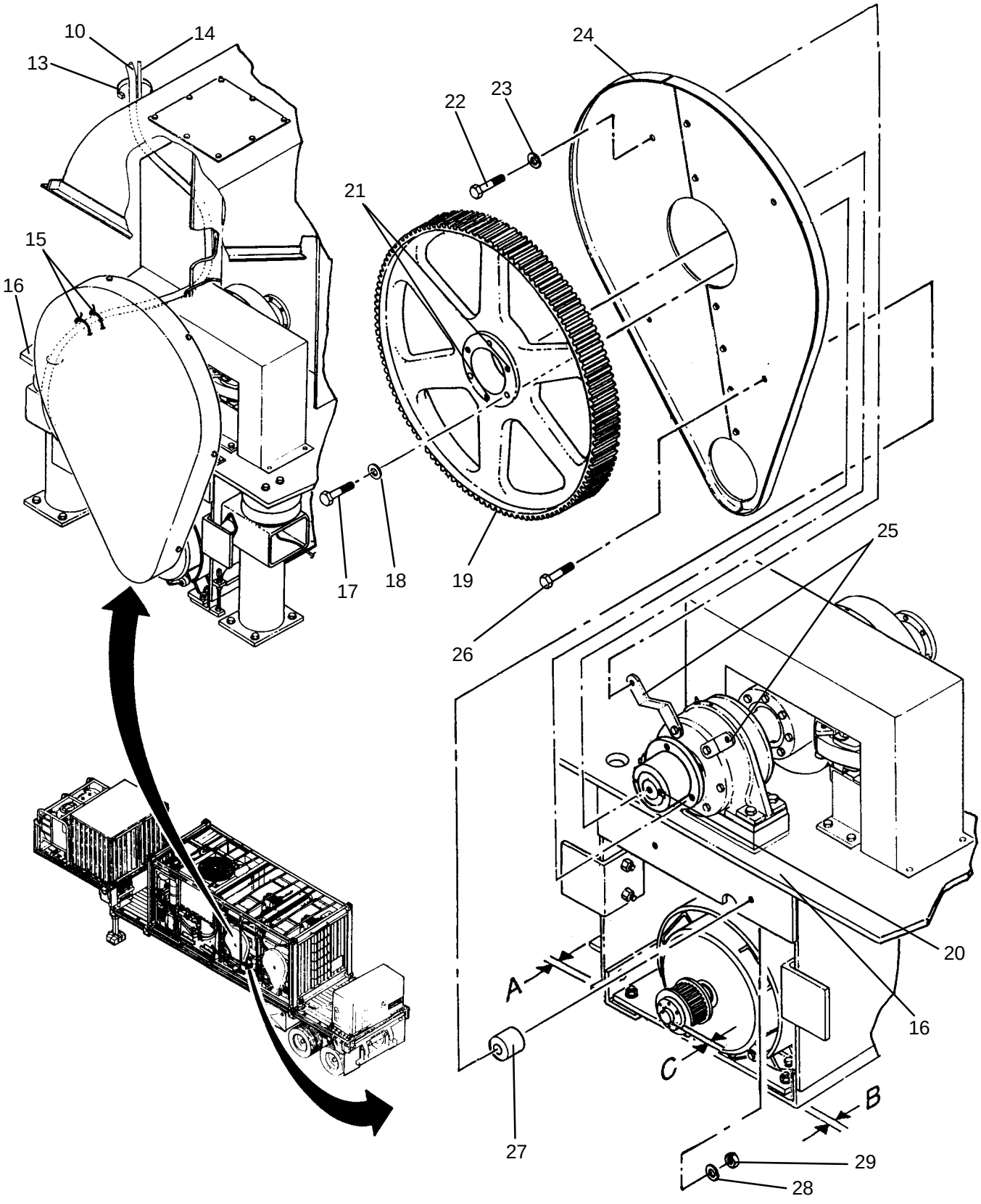
REMOVAL – Continued

6. Cut tiedown straps (13) securing cooling fan cable (14) to motor cable (10).
7. Cut tiedown straps (15) securing motor cable (10) to bearing support frame (16), then pull motor cable out from bottom of bearing support frame.
8. Remove water pump (WP 0145 00).
9. Remove drum rotation sensor (WP 0119 00).
10. Remove drive belt (WP 0118 00).

WARNING

Drum sheave is heavy and hard to handle. Provide adequate support under sheave before removing. Failure to follow this precaution could result in serious personnel injury or equipment damage.

11. Remove three screws (17) and lock washers (18) securing drum sheave (19) to tapered bushing (20).
12. Thread three screws (17) and lock washers (18) into jacking holes (21) then evenly tighten screws until drum sheave (19) breaks loose from tapered bushing (20).
13. Remove three screws (17) and lock washers (18) from jacking holes (21).
14. Lift drum sheave (19) off of tapered bushing (20).
15. Remove two screws (22), lock washers (23), securing rear belt guard (24) to mounting brackets (25).
16. Remove two screws (26), spacers (27), lock washers (28) and nuts (29), then remove rear belt guard (24) from bearing support frame (16).
17. Measure distance from rear edge mounting plate (30) to rear edge of mounting angles (31). Record measurement as dimensions A and B.
18. Remove six screws (32), lock washers (33), and nuts (34) securing mounting plate (30) to mounting angles (31).
19. Remove two screws (35), lock washers (36), and nuts (37) securing right side of motor (38) to mounting plate (30).
20. Remove motor (38) and attached mounting plate (30) from bearing support frame (16) as follows:
    a. Lift mounting plate (30) up off of mounting angles (31).
    b. Ensure lifting eye (39) is clear of notches (40) in bearing support frame (16).
    c. Slide mounting plate (30) out of bearing support frame (16).
21. Measure distance from edge of tapered bushing (41) to end of shaft (42). Record measurement as dimension C.
22. Remove three screws (43) securing sheave (44) to tapered bushing (41).
23. Thread three screws (43) into jacking holes (45), then evenly tighten until sheave (44) separates from tapered bushing (41).
24. Remove three screws (43) from jacking holes (45).
25. Loosen set screw (46) then remove tapered bushing (41) and key (47) using a bearing puller.
26. Remove four screws (48), then remove cover (49) and gasket (50) from junction box (51).
27. Tag and disconnect motor cable (10) at junction box (51).
28. Remove conduit nut (52), then pull cord grip (53) and motor cable (10) out of junction box (51).
29. Remove two screws (54), lock washers (55), and nuts (56) securing left side of motor (38) to mounting plate (30), then lift motor off of mounting plate.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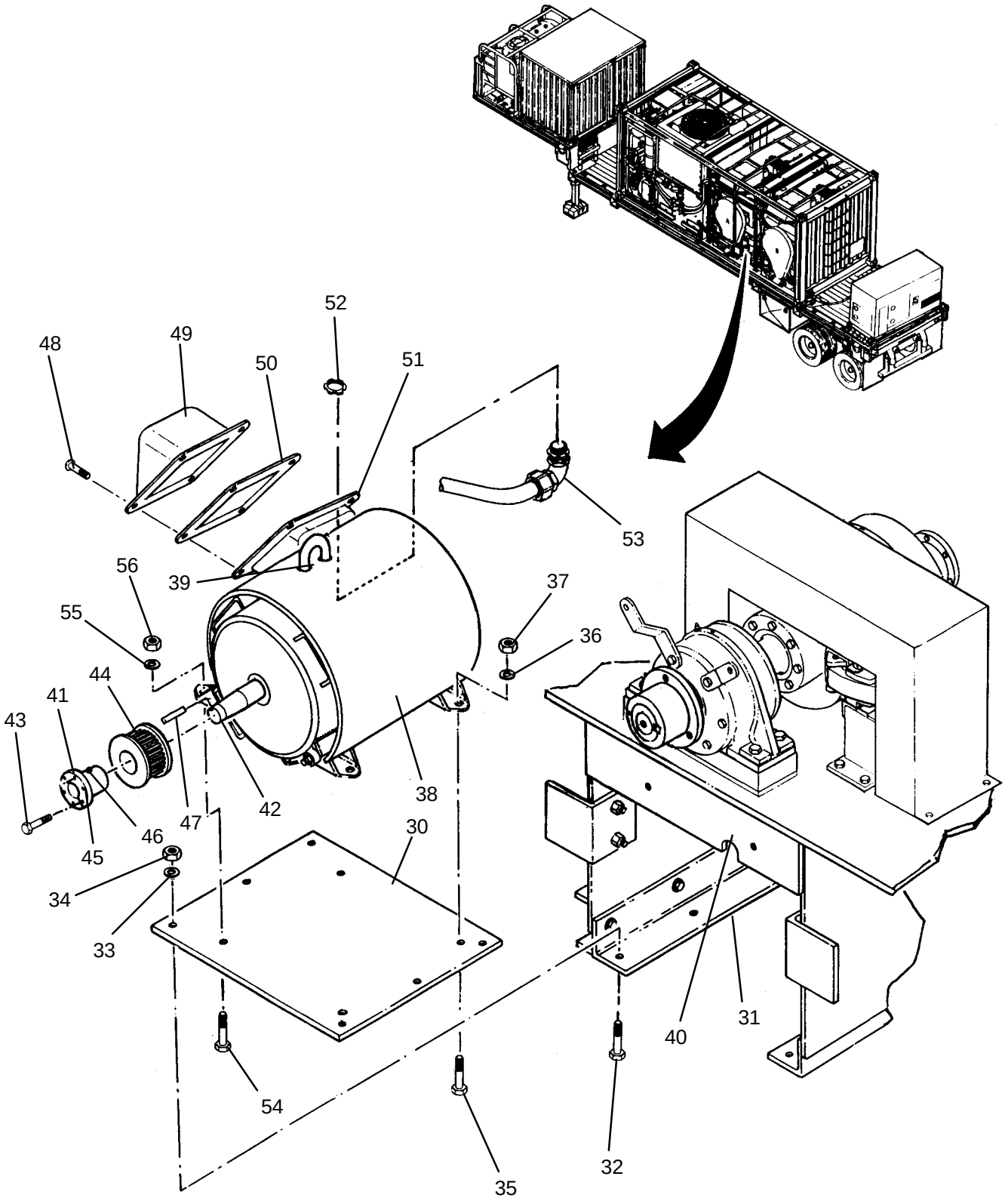
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INSTALLATION

1. Position new motor (38) onto mounting plate (30), then secure left side of motor to motor mounting plate with two screws (54), lock washers (55), and nuts (56).
2. Remove four screws (48), then remove cover (49) and gasket (50) from junction box (51).
3. Insert cord grip (53) and motor cable (10) into junction box (51), then secure with conduit nut (52).
4. Connect motor cable (10) at junction box (51) as tagged.
5. Install cover (49) and gasket (50) onto junction box (51), then secure with four screws (48).
6. Place sheave (44) on shaft (42).
7. Position tapered bushing (41) and key (47) on shaft (42) at dimension C.
8. Tighten set screw (46) to secure tapered bushing (41).
9. Mate sheave (44) with tapered bushing (41), then secure with three screws (43).
10. Install motor (38) and attached mounting plate (30) into bearing support frame (16) as follows:
    a. Ensure lifting eye (39) is clear of notches (40) in bearing support frame (16).
    b. Slide mounting plate (30) into bearing support frame (16).
    c. Lower mounting plate (30) onto mounting angles (31).
11. Align motor mounting plate (30) to mounting angles (31) to achieve dimensions A and B.
12. Install two screws (35), lock washers (36), and nuts (37) to secure right side of motor (38) to motor mounting plate (30).
13. Secure mounting plate (30) to mounting angles (31) with six screws (32), lock washers (33), and nuts (34).
14. Position rear belt guard (24) onto bearing support frame (16), then secure with two screws (26), spacers (27), lock washers (28) and nuts (29).
15. Secure rear belt guard (24) to mounting brackets (25) with two screws (22) and lock washers (23).
16. Install drum sheave (19) onto tapered bushing (20), then secure with three screws (17) and lock washers (18).
17. Install drive belt (WP 0118 00).
18. Install drum rotation sensor (WP 0119 00).
19. Install water pump (WP 0145 00).
20. Pull motor cable (10) through bearing support frame (16).
21. Insert motor cable (10) through cord grip (12).
22. Connect motor cable (10) at output bus (9) as tagged.
23. Tighten nut (11) on cord grip (12).
24. Secure motor cable to bearing support frame (16) with tiedown straps (15).
25. Install cover (6) onto inverter drive (7), then secure with two captive screws (5).
26. Close door (2) onto inverter enclosure (3), then secure by tightening eleven latches (1).
27. Install tiedown straps (13) to securing cooling fan cable (14) to motor cable (10).
28. Use maintenance menu to rotate drum motor at all speeds and directions (WP 0010 00). Ensure drum rotates freely and smoothly.
29. Perform a test laundry cycle (TM 10–3510–221–10). Verify normal operation.

END OF WORK PACKAGE

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DIRECT SUPPORT

LAUNDRY ADVANCED SYSTEM

(NSN 3510–01–463–0114)

REAR DRUM BEARING REPLACEMENT REMOVAL, INSTALLATION

INITIAL SETUP:

Tools
Bearing Puller (Item 9, WP 0282 00)
Removal Tool, Bearing (Item 11, WP 0282 00)
Socket Set, (Item 13, WP 0282 00)
Tool Kit, General Mechanics
(Item 14, WP 0282 00)
Wrench, Torque, (Item 16, WP 0282 00)
Forklift, 5,000 lbs

Personnel Required

Materials/Parts
Grease, General Purpose (Item 3,WP 0281 00)
Rag, Wiping (Item 4, WP 0281 00)
Sealant, Multi–Purpose, (Item 5, WP 0281 00)
Washer, Lock (Item 14, WP 0283 00)
Washer, Lock, (Item 19, WP 0283 00)

Equipment Conditions
LADS power shut off at main control enclosure (WP 0113 00).

REMOVAL

1. Remove drum rotation sensor (WP 0119 00).
2. Remove drive belt (WP 0118 00).

CAUTION

Prior to removing bearing(s), the front of the drum basket must be supported. Failure to support drum basket may cause drum drive shaft to bend.

3. Remove plugs (1) from two jacking bosses (2).
4. Loosen jam nuts (3) then remove jacking screws (4) from drum frame (5).
5. Thread jacking screws (4) into jacking bosses (2) until they contact bottom of drum basket (6).
6. Tighten jam nuts (3) while maintaining position of jacking screws (4).

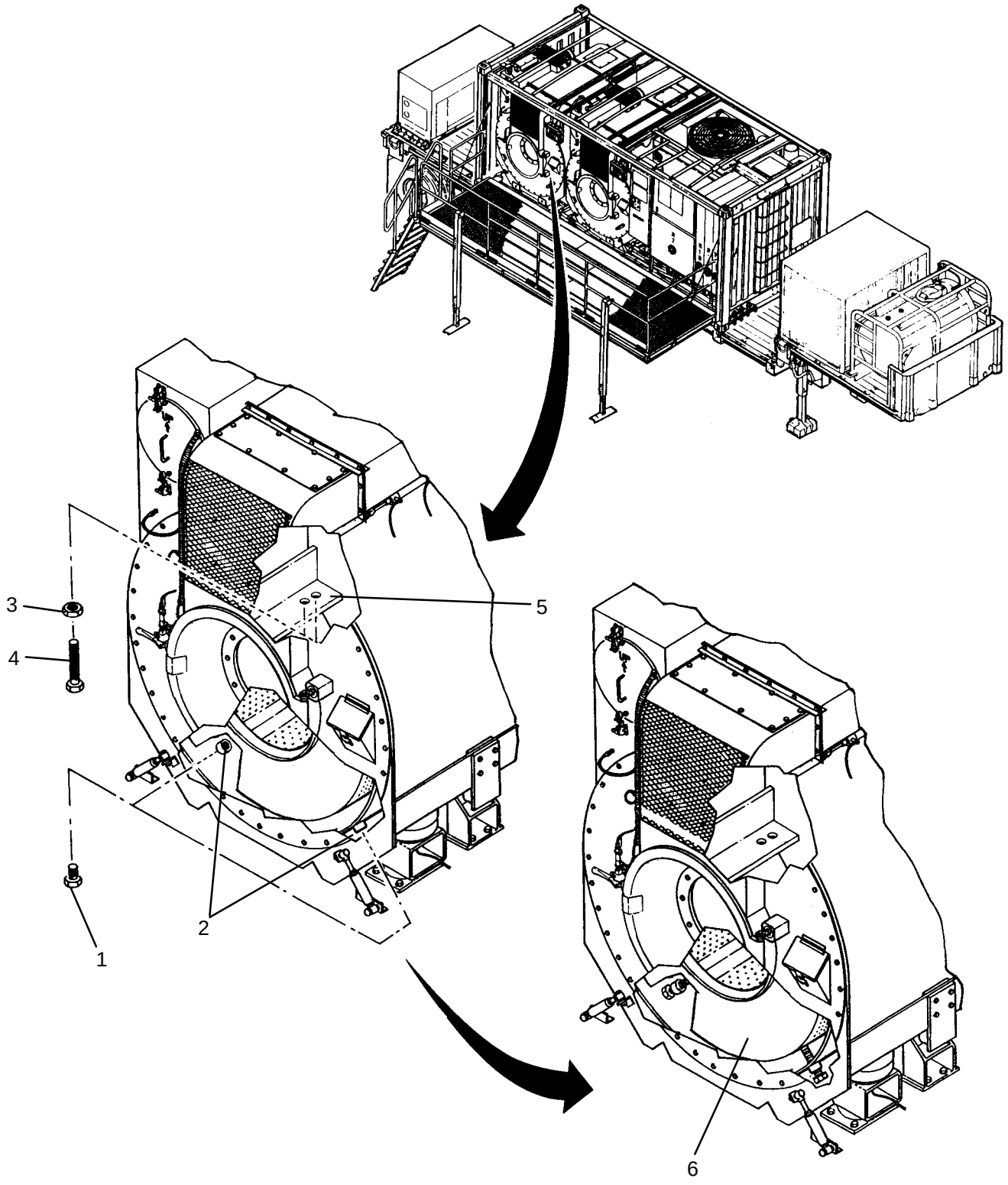
WARNING

Drum sheave and bearing are heavy and hard to handle. Provide adequate support when removing. Failure to follow this precaution could result in serious personnel injury or equipment damage.

7. Remove three screws (7) and lock washers (8) securing drum sheave (9) to tapered bushing (10).
8. Thread three screws (7) and lock washers (8) into jacking holes (11) then evenly tighten screws until drum sheave (9) breaks loose from tapered bushing (10).
9. Remove three screws (7) and lock washers (8) from jacking holes (11).
10. Lift drum sheave (9) off of tapered bushing (10).
11. Remove two screws (12) and lock washers (13) securing rear belt guard (14) to mounting brackets (15).
12. Remove two screws (16), spacers (17), lock washers (18) and nuts (19), then remove rear belt guard (14) from bearing support frame (20).

REMOVAL – Continued

13. Measure and record distance from rear face of tapered bushing (10) to end of drive shaft (21).
14. Loosen set screw (22) on tapered bushing (10), then remove bushing from drive shaft (21) using bearing puller.
15. Remove machine key (23) from drive shaft (21).
16. Remove two screws (24) and lock washers (25), then remove brackets (15) from cover (26).
17. Remove four remaining screws (24) and lock washers (25) securing cover (26) to housing (27).
18. Slide dust seal (28) and cover (26) off of drive shaft (21).
19. Remove four screws (29), spacers (30), lock washers (31), and nuts (32) securing housing (27) to bearing support frame (20).
20. Straighten tab (33) on retainer (34).
21. Unthread spanner nut (35) from drive shaft (21) using bearing removal tool.
22. Slide bearing removal tool onto drive shaft (21) then drive bearing (36) forward until it is free from inner race (37).
23. Slide inner race (37) off of drive shaft (21).
24. Slide housing (27) and bearing (36) off of drive shaft (21).
25. Slide dust seal (38) off of drive shaft (21).
26. Remove bearing (36) from housing (27).
27. Remove six screws (39) and lock washers (40) securing cover (41) to housing (27).
28. Wipe residual dirt and grease off of drive shaft (21), covers (26 and 41), housing (27), dust seals (28 and 38), retainer (34), spanner nut (35), and inner race (37).
29. Inspect dust seals (28 and 38) for cuts or cracks; replace if damaged.
30. Inspect spanner nut (35) for damage to threads; replace if damaged.
31. Inspect inner race (37) for scratches or defects on surface where bearing rides; replace if damaged.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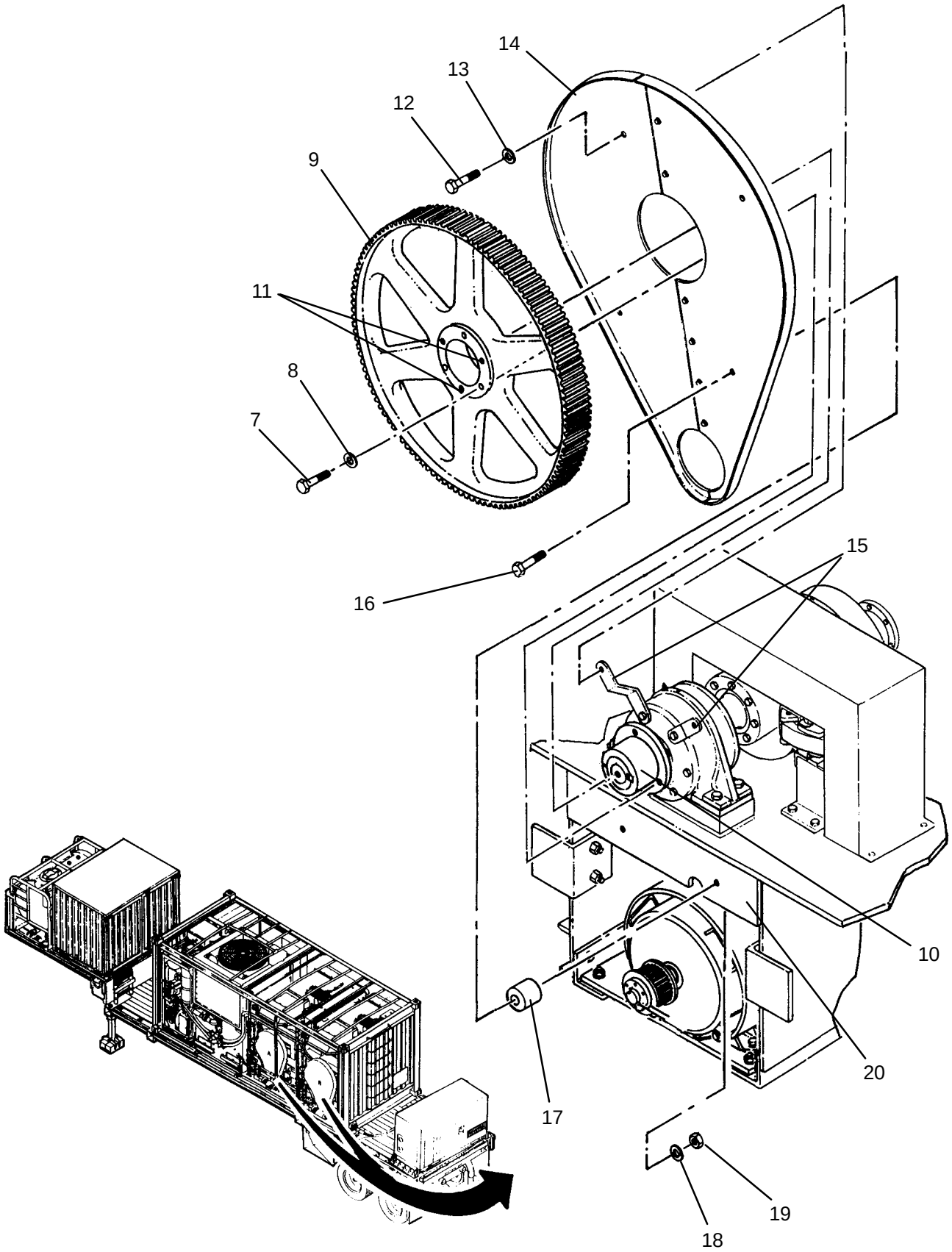
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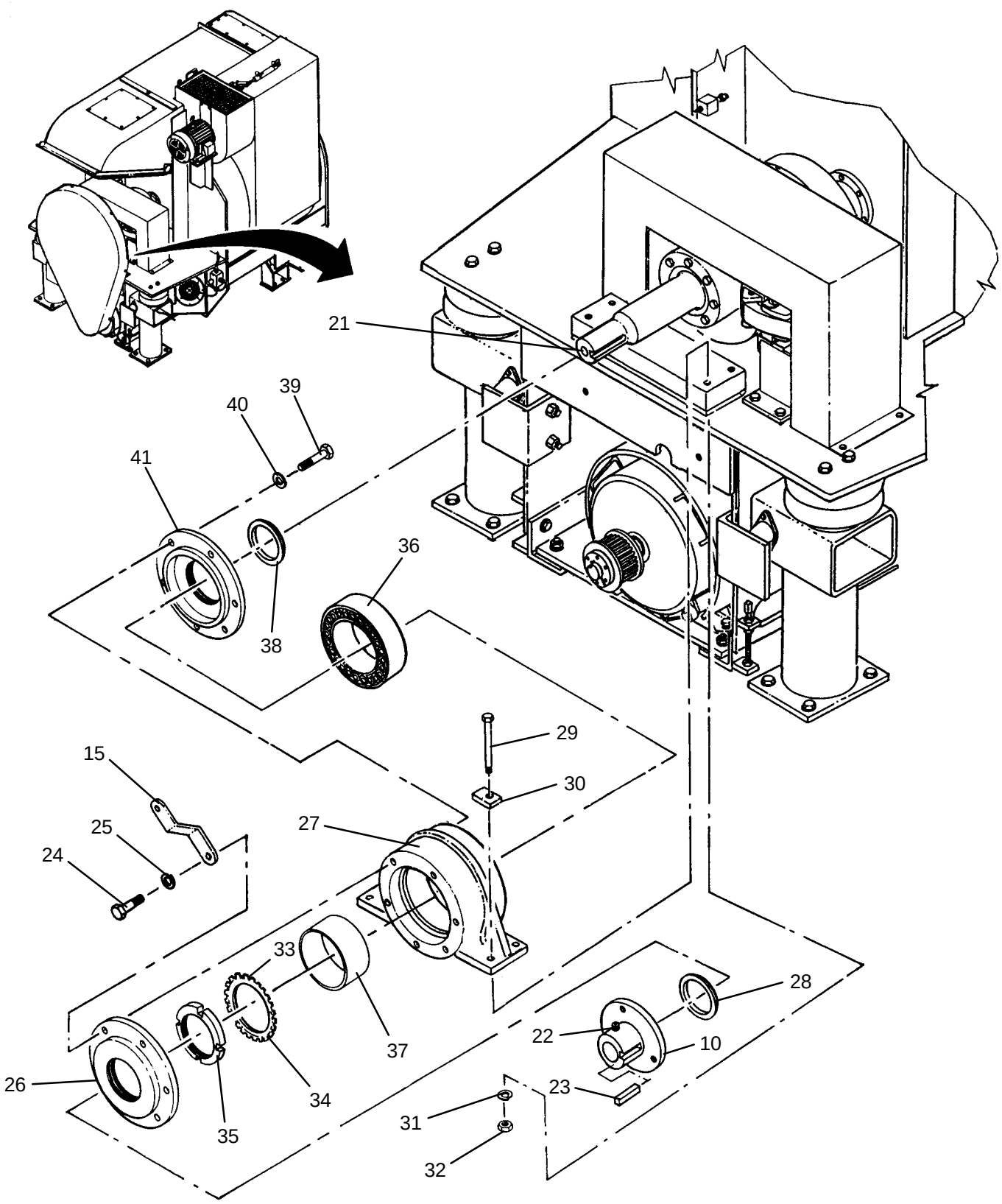
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INSTALLATION

1. Mate cover (41) with housing (27), then secure with six screws (39) and lock washers (40).
2. Install new bearing (36) into housing (27).
3. Measure and record clearance between top surface or rollers (42) and inside surface of outer race (43).
4. Slide dust seal (38) onto drive shaft (21).
5. Slide housing (27) with bearing (36) onto drive shaft (21).
6. Install retainer (34) on bearing (36).
7. Slide inner race (37) onto drive shaft (21).
8. Apply a generous coat of grease to surface of inner race (37) where bearing rides.
9. Thread spanner nut (35) onto drive shaft (21) until it contacts bearing.
10. Secure housing (27) to bearing support frame (20) with four screws (29), spacers (30), lock washers (31), and nuts (32). Torque nuts to 550 ft lbs in a crisscross manner.
11. Tighten spanner nut (35) until clearance has been reduced from dimension recorded in step 3 by 0.002 to 0.003 inches.
12. Tighten spanner nut (35) slightly to align notch (44) with tab (33) then bend tab over to secure spanner nut.
13. Pack bearing (36) with grease.
14. Slide cover (26) onto drive shaft (21).
15. Mate cover (26) with housing (27), then secure with four screws (24) and lock washers (25) .
16. Mate brackets (15) to cover (26), then install, but do not tighten, two screws (24) and lock washers (25).
17. Slide dust seal (28) onto drive shaft (21).
18. Position rear belt guard (14) onto bearing support frame (20), then secure with two screws (16), spacers (17), lock washers (18) and nuts (19).
19. Secure rear belt guard (14) to mounting brackets (15) with two screws (12) and lock washers (13).
20. Tighten screws (24) to secure brackets (15) to cover (26).
21. Install machine key (23) onto drive shaft (21).
22. Slide tapered bushing (10) onto drive shaft (21) and position at previously recorded dimension.
23. Install drum sheave (9) onto tapered bushing (10), then secure with three screws (7) and lock washers (8).
24. Tighten set screw (22) to secure tapered bushing (10) to drive shaft (21).
25. Loosen jam nuts (3), then unthread jacking screws (4) from jacking bosses (2).
26. Thread jacking screws (4) into drum frame (5), then tighten jam nuts (3).
27. Apply a bead of sealant to threads of plugs (1), then thread plugs into jacking bosses (2).
28. Install drive belt (WP 0118 00).
29. Install drum rotation sensor (WP 0119 00).
30. Lubricate rear bearing (TM 10–3510–221–10).
31. Use maintenance menu to test drum rotation (WP 0010 00). Ensure drum rotates freely and smoothly.
32. Perform a test laundry cycle (TM 10–3510–221–10). Verify normal operation.

END OF WORK PACKAGE

DIRECT SUPPORT

LAUNDRY ADVANCED SYSTEM

(NSN 3510–01–463–0114)

FRONT DRUM BEARING REPLACEMENT REMOVAL, INSTALLATION

INITIAL SETUP:

Tools
Bearing Puller (Item 9, WP 0282 00)
Removal Tool, Bearing (Item 10, WP 0282 00)
Socket Set, (Item 13, WP 0282 00)
Tool Kit, General Mechanics
(Item 14, WP 0282 00)
Wrench, Torque, (Item 16, WP 0282 00)
Forklift, 5,000 lbs

Personnel Required

Materials/Parts
Grease, General Purpose (Item 3,WP 0281 00)
Rag, Wiping (Item 4, WP 0281 00)
Sealant, Multi–Purpose, (Item 5, WP 0281 00)
Washer, Lock (Item 20, WP 0283 00)

Equipment Conditions
LADS power shut off at main control enclosure (WP 0113 00).

REMOVAL

1. Remove brake rotor (WP 0268 00).
2. Loosen two set screws (1) on brake hub (2), then remove brake hub and machine key (3) from drive shaft (4).

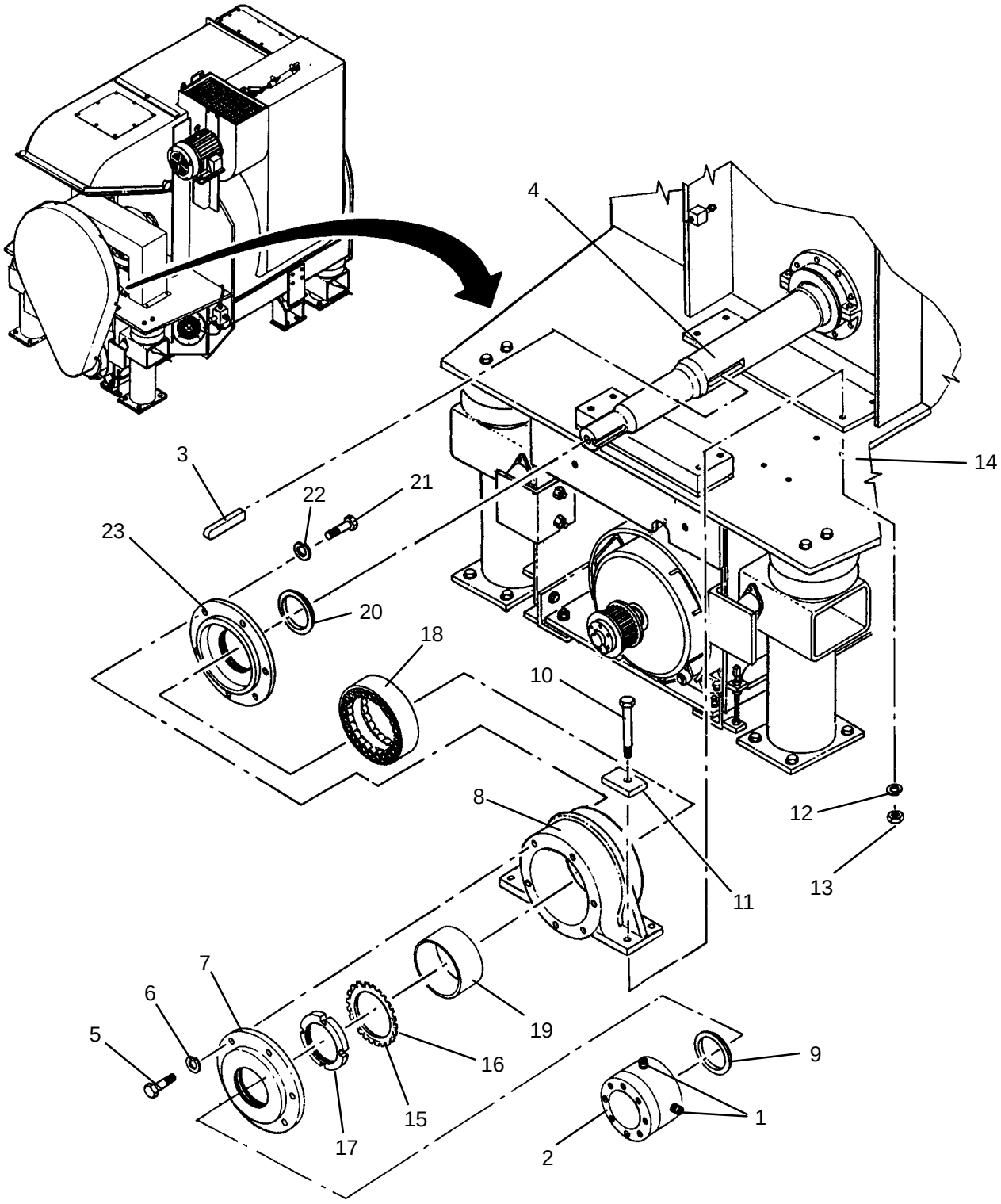
WARNING

Front bearing is heavy and hard to handle. Provide adequate support while removing. Failure to follow this precaution could result in serious personnel injury or equipment damage.

3. Remove six screws (5) and lock washers (6) securing cover (7) to housing (8).
4. Slide dust seal (9) and cover (7) off of drive shaft (4).
5. Remove four screws (10), spacers (11), lock washers (12), and nuts (13) securing housing (8) to bearing support frame (14).
6. Straighten tab (15) on retainer (16).
7. Unthread spanner nut (17) from drive shaft (4) using bearing removal tool.
8. Slide bearing removal tool onto drive shaft (4) then drive bearing (18) forward until it is free from inner race (19).
9. Slide inner race (19) off of drive shaft (4).
10. Slide housing (8) and bearing (18) off of drive shaft (4).
11. Slide dust seal (20) off of drive shaft (4).
12. Remove bearing (18) from housing (8).
13. Remove six screws (21) and lock washers (22) securing cover (23) to housing (8).
14. Wipe residual dirt and grease off of drive shaft (4), covers (7 and 23), housing (8), dust seals (9 and 20), retainer (16), spanner nut (17), and inner race (19).

REMOVAL – Continued

15. Inspect dust seals (9 and 20) for cuts or cracks; replace if damaged.
16. Inspect spanner nut (17) for damage to threads; replace if damaged.
17. Inspect inner race (19) for scratches or defects on surface where bearing rides; replace if damaged.



INSTALLATION

1. Mate cover (23) with housing (8) then secure with six screws (21) and lock washers (22).
2. Install bearing (18) into housing (8).
3. Measure and record clearance between top surface or rollers (24) and inside surface of outer race (25).
4. Slide dust seal (20) onto drive shaft (4).
5. Slide housing (8) with bearing (18) onto drive shaft (4).
6. Install retainer (16) on bearing (18).
7. Slide inner race (19) onto drive shaft (4).
8. Apply a generous coat of grease to surface of inner race (19) where bearing rides.
9. Thread spanner nut (17) onto drive shaft (4) until it contacts bearing.
10. Secure housing (8) to bearing support frame (14) with four screws (10), spacers (11), lock washers (12), and nuts (13). Torque nuts to 750 ft lbs in a crisscross manner.
11. Tighten spanner nut (17) until clearance has been reduced from dimension recorded in step 3 by 0.003 to 0.004 inches.
12. Tighten spanner nut (17) slightly to align notch (26) with tab (15), then bend tab over to secure spanner nut.
13. Pack bearing (18) with grease.
14. Slide cover (7) onto drive shaft (4).
15. Mate cover (7) with housing (8), then secure with six screws (5) and lock washers (6) .
16. Slide dust seal (9) onto drive shaft (4).
17. Install machine key (3) and brake hub (2) onto drive shaft (4), then secure with two set screws (1).
18. Install brake rotor (WP 0261 00).
19. Lubricate front bearing (TM 10–3510–221–10).
20. Use maintenance menu to test drum rotation (WP 0010 00). Ensure drum rotates freely and smoothly.
21. Perform a test laundry cycle (TM 10–3510–221–10). Verify normal operation.

END OF WORK PACKAGE

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DIRECT SUPPORT

LAUNDRY ADVANCED SYSTEM

(NSN 3510–01–463–0114)

DRUM SHAFT SEAL REPLACEMENT REMOVAL, INSTALLATION

INITIAL SETUP:

Tools
Tool Kit, General Mechanics
(Item 14, WP 0282 00)

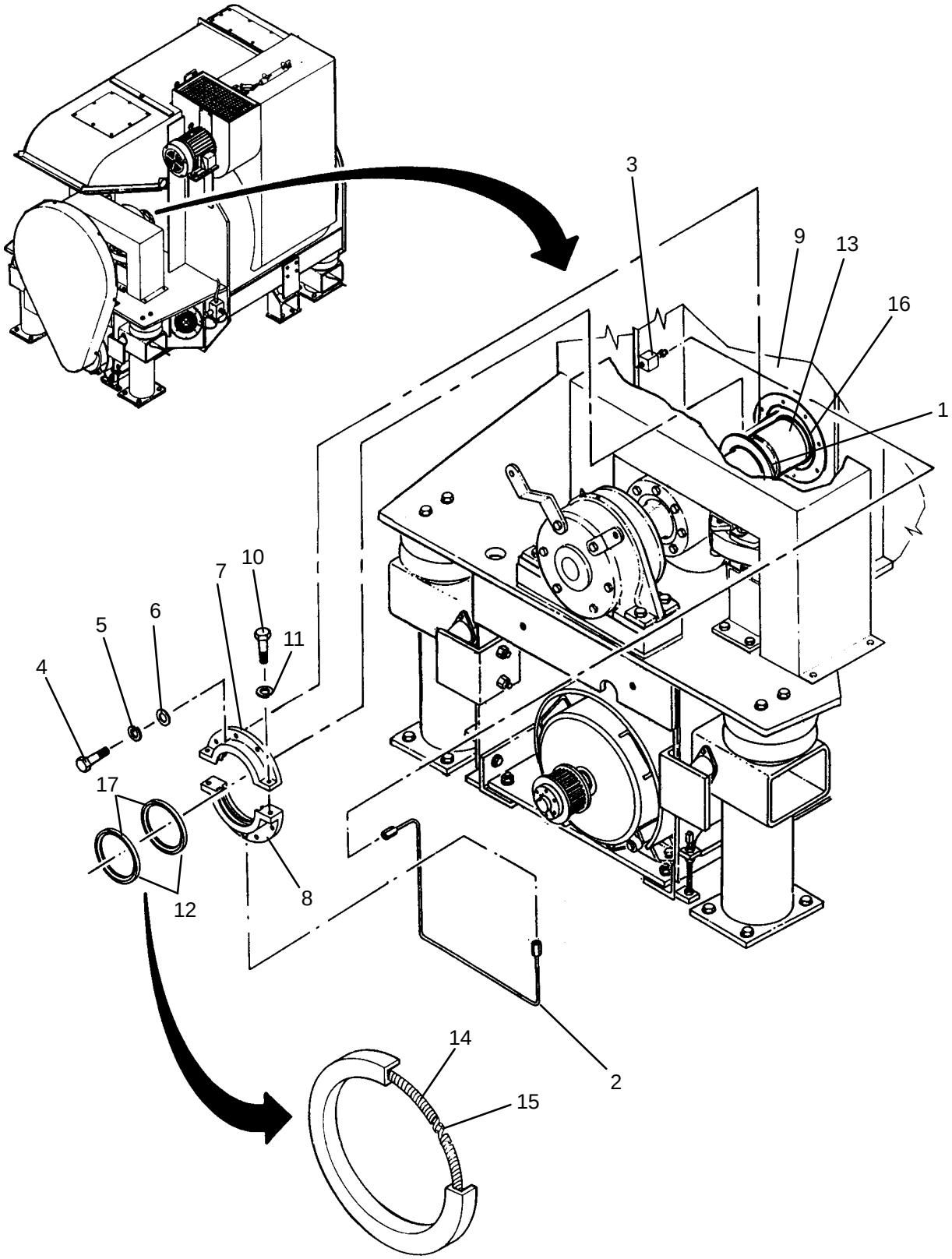
Personnel Required

Materials/Parts
Grease, General Purpose (Item 3,WP 0281 00)
Rag, Wiping (Item 4, WP 0281 00)
Washer, Lock (Item 11, WP 0283 00)

Equipment Conditions
LADS power shut off at main control enclosure (WP 0113 00).

REMOVAL

1. Slide slinger ring (1) rearward.
2. Disconnect grease tube (2) at fitting block (3).
3. Remove eight screws (4), lock washers (5), and flat washers (6) securing seal housings (7) and (8) to back plate (9).
4. Remove two screws (10) and lock washers (11), then remove seal housing (7).
5. Rotate seal housing (8) CW, then disconnect grease tube (2) from seal housing.
6. Remove seal housing (8).
7. Remove two shaft seals (12) from shaft sleeve (13) as follows:
   a. Pull spring (14) out of shaft seal (12) to expose threaded joint (15).
   b. Unthread spring (14) and remove from shaft seal (12).
   c. Remove shaft seal (12) from shaft sleeve (13).
8. Wipe residual dirt and grease off of slinger ring (1), seal housings (7) and (8), back plate (9), shaft sleeve (13), and gasket (16).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INSTALLATION

1. Ensure gasket (16) is positioned flat against back plate (9).
2. Apply a generous coat of grease to shaft sleeve (13) and inside surface of sealing housings (7) and (8) and new shaft seals (12).
3. Install two shaft seals (12) as follows:
   a. Ensure shaft seals (12) are oriented with open end facing towards back plate (9).
   b. Slide first seal (12) over shaft sleeve (13) until seal is contacting gasket (16).
   c. Wrap spring (14) around shaft sleeve (13), then thread ends of spring together.
   d. Insert spring (14) into shaft seal (12).
   e. Slide second seal (12) over shaft sleeve (13) until seal is 0.20 inches away from first seal.
   f. Wrap spring (14) around shaft sleeve (13), then thread ends of spring together.
   g. Insert spring (14) into shaft seal (12).
   h. Rotate second shaft seal (12) so that splits (17) are about 90 degrees apart.
4. Install seal housings (7) and (8) as follows:
   a. Place seal housing (8) over shaft seals (12) with grease port (16) at nine o'clock position.
   b. Connect grease tube (2) to seal housing (8) then rotate seal housing CCW into position.
   c. Place seal housing (7) over shaft seals (12) then align mounting holes of seal housings (7) and (8) with each other.
   d. Install two screws (10) and lock washers (11) to secure seal housings (7) and (8) together.
   e. Align mounting holes in seal housings (7) and (8) with gasket (14) and back plate (9) then secure with eight screws (4), lock washers (5), and flat washers (6).
5. Connect grease tube (2) at fitting block (3).
6. Install slinger ring (1).
7. Lubricate shaft seal (TM 10–3510–221–10).
8. Perform a test laundry cycle (TM 10–3510–221–10). Ensure drum rotates freely and smoothly. Check for water leaks around seal housings (7) and (8).

END OF WORK PACKAGE

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DIRECT SUPPORT

LAUNDRY ADVANCED SYSTEM

(NSN 3510–01–463–0114)

BRAKE ROTOR REPLACEMENT REMOVAL, INSTALLATION

INITIAL SETUP:

Tools
Tool Kit, General Mechanics
(Item 14, WP 0282 00)

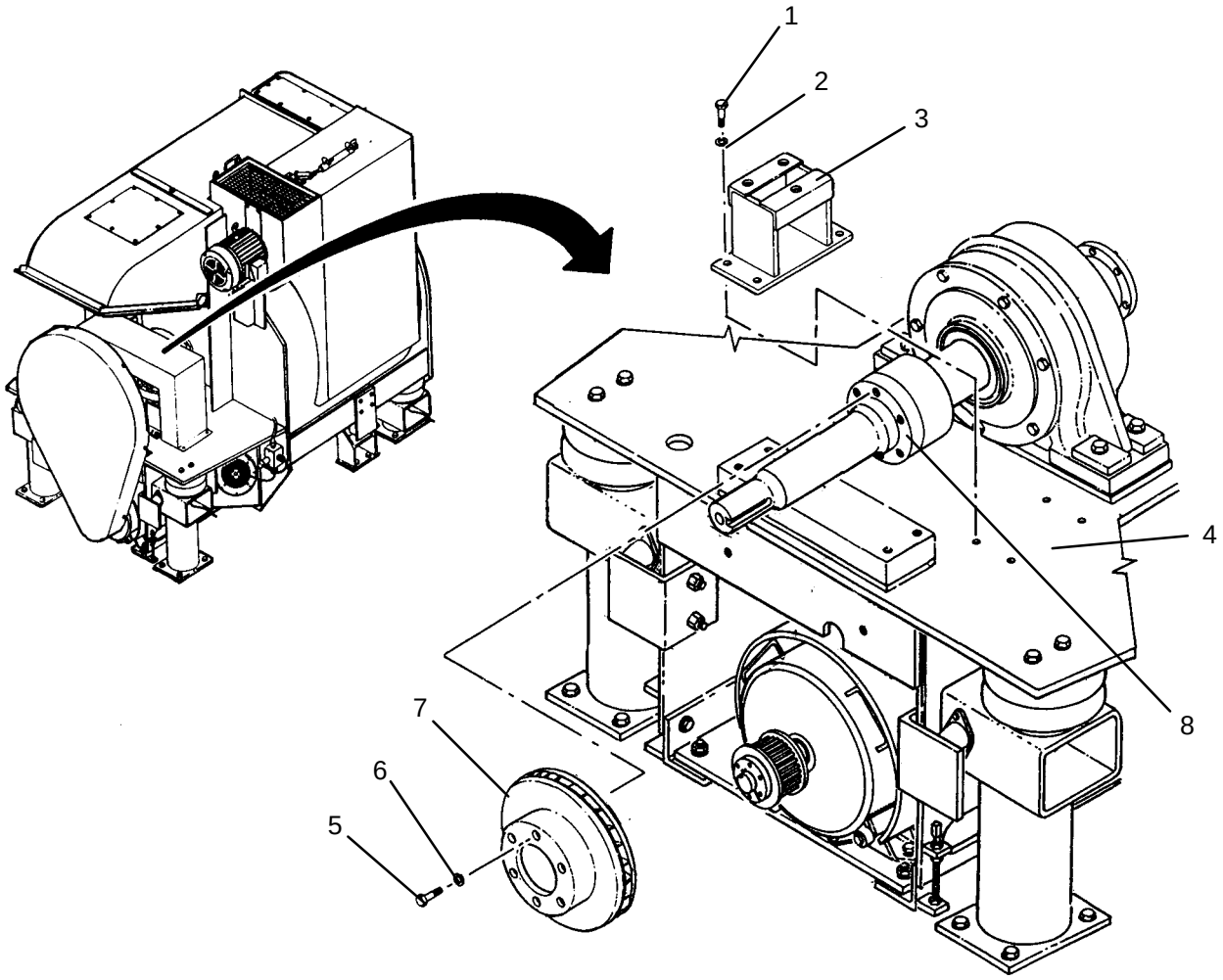
Personnel Required

Materials/Parts
Washer, Lock (Item 18, WP 0283 00)

Equipment Conditions
LADS power shut off at main control enclosure (WP 0113 00).

REMOVAL

1. Remove rear bearing (WP 0265 00).
2. Remove brake caliper (WP 0123 00).
3. Remove four screws (1) and lock washers (2), then remove brake mounting bracket (3) from bearing support frame (4).
4. Remove six screws (5) and lock washers (6), then remove brake rotor (7) from brake hub (8).



INSTALLATION

1. Position new brake rotor (7) onto brake hub (8), then secure with six screws (5) and lock washers (6).
2. Position brake mounting bracket (3) onto bearing support frame (4), then secure with four screws (1) and lock washers (2).
3. Install brake caliper (WP 0123 00).
4. Install rear bearing (WP 0265 00).
5. Use maintenance menu to test drum rotation at all directions and speeds (WP 0010 00). Ensure drum rotates freely and smoothly.
6. Use maintenance menu to test drum braking (WP 0010 00). Ensure drum stops when brake is applied.

END OF WORK PACKAGE

DIRECT SUPPORT

LAUNDRY ADVANCED SYSTEM

(NSN 3510–01–463–0114)

DRYER HEAT EXCHANGER REPLACEMENT
REMOVAL, INSTALLATION

INITIAL SETUP:

Tools
Container, 15–Gallon, (Qty 2)
(Item 4, WP 0282 00)
Funnel, W/Filter (Item 5, WP 0282 00)
Tool Kit, General Mechanics
(Item 14, WP 0282 00)
Wrench, Torque, (Item 17, WP 0282 00)

Personnel Required

Materials/Parts
Rag, Wiping (Item 4, WP 0281 00)
Gasket, Sanitary, (Qty 4)
(Item 27, WP 0283 00)
Strap, Tiedown, Heat– Resistant, 14” LG
(Item 30, WP 0283 00)

Equipment Conditions
LADS power shut off at main control enclosure (WP 0113 00).

REMOVAL

WARNING

Thermal fluid can reach temperatures near 400 degrees F when the heating system is operating. Allow thermal fluid and heating system piping to cool prior to performing maintenance. Always wear gloves and eye protection. Failure to follow this precaution could result in severe personal burn injuries.

1. Place clean funnel and container under drain valves (1), (2), and (3).
2. Close isolation valves (4 through 9).
3. Cut tiedown straps (10) securing thermal fluid hoses (11) and (12) together.
4. Measure and record distance from ISO frame (13) to bottom edges of heater piping (14).
5. Loosen six clamps (15), then drop heater piping (14) down until it rests on brackets (16).
6. Open drain valves (1), (2), and (3). Allow thermal fluid to drain then close drain valves.
7. Place second container under inlet hose (17) and outlet hose (18).
8. Disconnect inlet hose (17) from heater piping (14) as follows:
   a. Remove two screws (19), lock washers (20), and nuts (21) then remove clamp (22).
   b. Pull inlet hose (17) off of heater piping (14) then position to allow thermal fluid to drain through funnel into container.
9. Disconnect outlet hose (18) from heater piping (14) as follows:
   a. Remove two screws (23), lock washers (24), and nuts (25) then remove clamp (26).
   b. Pull outlet hose (18) off of heater piping (14) then position to allow thermal fluid to drain through funnel into container.
10. Remove and discard gaskets (27) from inlet hose (17) and outlet hose (18).

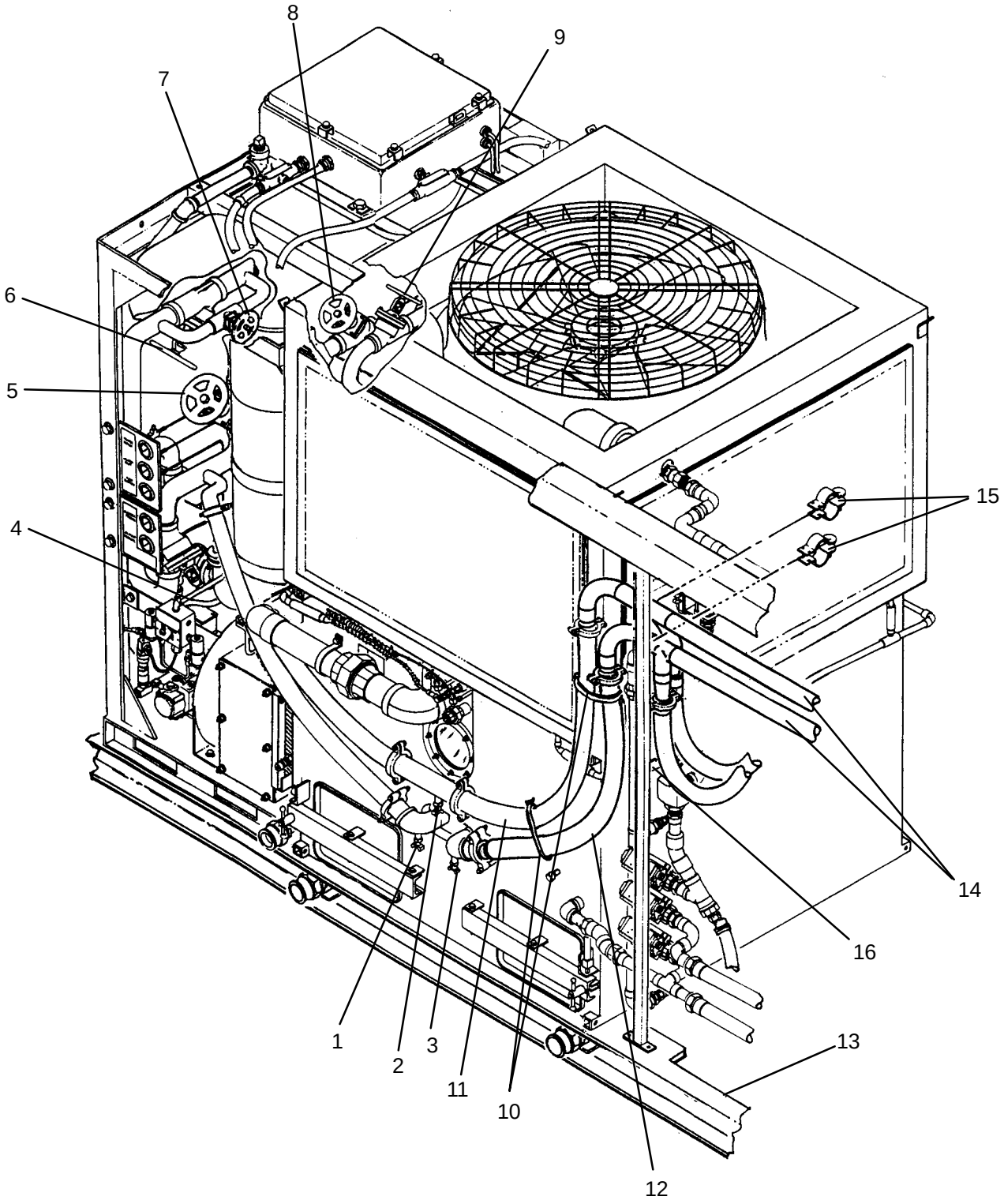
REMOVAL – Continued

11. Remove dryer inlet screen (28).

WARNING

Heat exchanger is heavy and hard to handle. Provide adequate support under heat exchanger before removing. Failure to follow this precaution could result in serious personnel injury or equipment damage.

12. Loosen eight screws (29) then slide screen retainers (30) from between screws and heat exchanger (31).
13. Remove eight screws (29), flat washers (32), and nuts (33) then lower heat exchanger (31) with attached hoses (17) and (18) out of inlet duct (34).
14. Clean up any residual thermal fluid on surrounding equipment.
15. Disconnect inlet hose (17) and outlet hose (18) from heat exchanger (31) as follows:
    a. Remove two screws (35), lock washers (36), and nuts (37) then remove clamp (38).
    b. Pull inlet hose (17) off of heat exchanger (31).
    c. Remove two screws (39), lock washers (40), and nuts (41) then remove clamp (42).
    d. Pull outlet hose (18) off of heat exchanger (31).
16. Remove and discard gaskets (27) from inlet hose (17) and outlet hose (18).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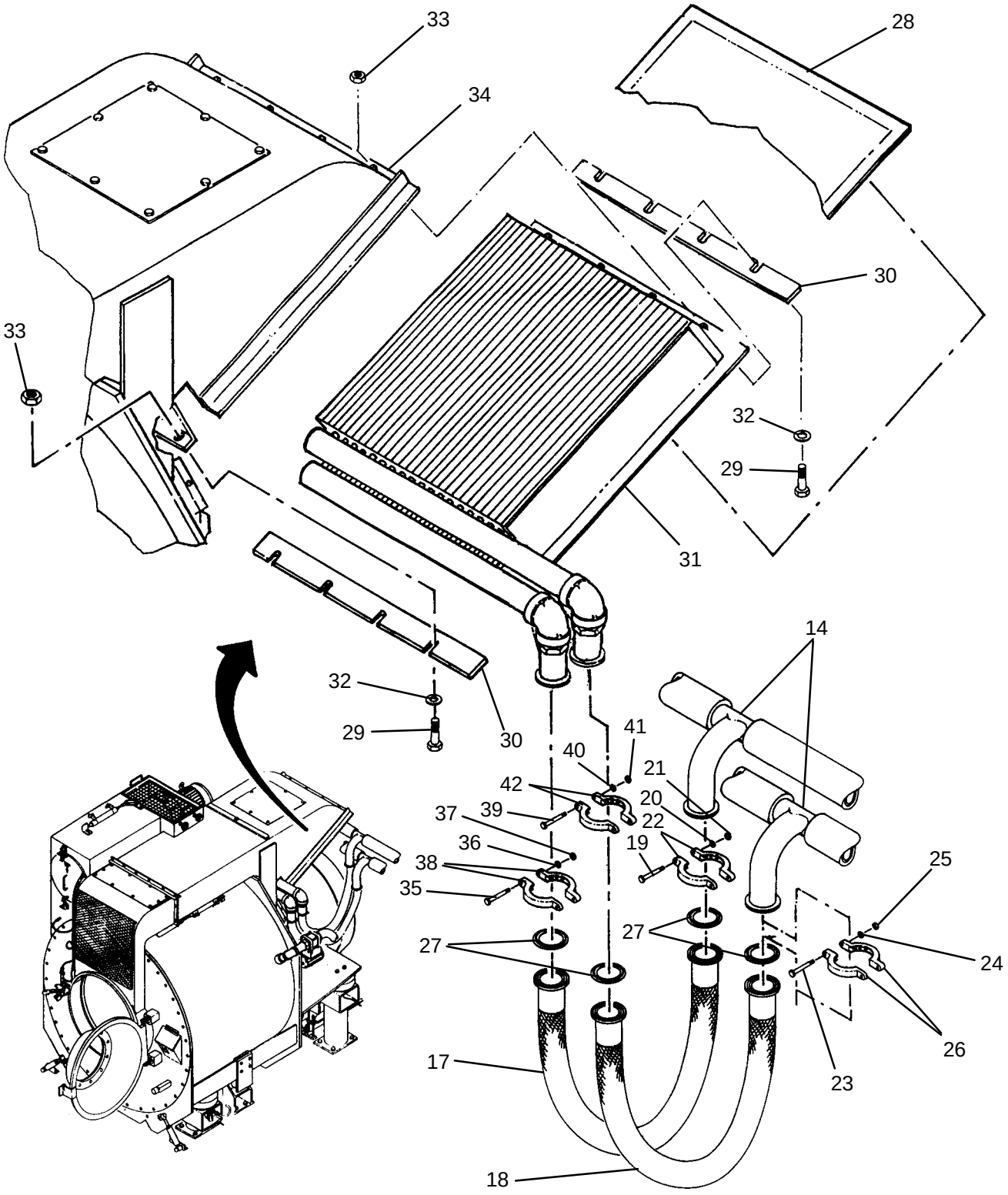
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INSTALLATION

CAUTION

Use caution when installing heat exchanger not to damage fins. Bent fins will reduce the heating efficiency of the heat exchanger.

1. Apply a light coat of clean thermal fluid to new gaskets (27).
2. Connect inlet hose (17) and outlet hose (18) to new heat exchanger (31) as follows:
   a. Install new gasket (27) on outlet hose (18), then mate hose with heat exchanger (31).
   b. Install clamp (42), then secure with two screws (39), lock washers (40), and nuts (41).
   c. Install new gasket (27) on inlet hose (17), then mate hose with heat exchanger (31).
   d. Install clamp (38), then secure with two screws (35), lock washers (36), and nuts (37).
3. Insert heat exchanger (31) into inlet duct (34). Install, but do not tighten, eight screws (29), flat washers (32), and nuts (33).
4. Slide screen retainers (30) between screws (29) and heat exchanger (31), then tighten eight screws (29).
5. Install dryer inlet screen (28).
6. Connect outlet hose (18) as follows:
   a. Install new gasket (27) on outlet hose (18), then mate hose with heater piping (14).
   b. Install clamp (26) then secure with two screws (23), lock washers (24), and nuts (25).
7. Connect inlet hose (17) as follows:
   a. Install new gasket (27) on inlet hose (17), then mate hose with heater piping (14).
   b. Install clamp (22), then secure with two screws (19), lock washers (20), and nuts (21).
8. Position heater piping (14) at previously recorded dimension.
9. Clean up any residual thermal fluid on surrounding equipment.
10. Replenish thermal fluid supply and leak check connections (WP 0168 00).

END OF WORK PACKAGE

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DIRECT SUPPORT

LAUNDRY ADVANCED SYSTEM

(NSN 3510–01–463–0114)

STILL CONDENSER FAN MOTOR (M200) REPLACEMENT REMOVAL, INSTALLATION

INITIAL SETUP:

Tools
Tool Kit, General Mechanics
(Item 14, WP 0282 00)

Personnel Required

Materials/Parts
Tags, (Item 9, WP 0281 00)
Washer, Lock, (Item 17, WP 0283 00)

Equipment Conditions
LADS power shut off at main control enclosure (WP 0113 00).

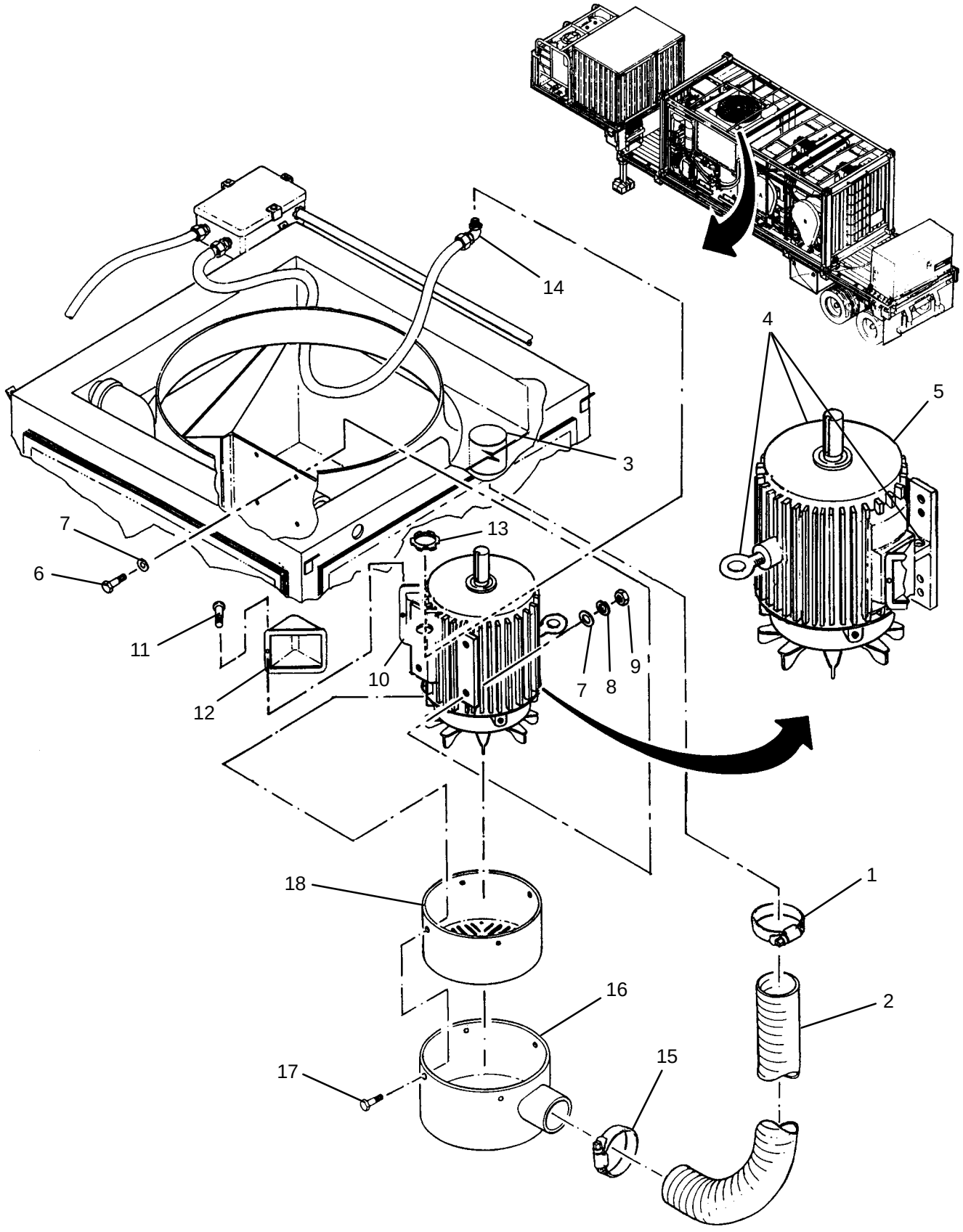
REMOVAL

1. Remove fan blade (WP 0161 00).
2. Loosen clamp (1), then slide flexible duct (2) off of fan shroud (3).
3. Attach a lifting device to three lifting points (4) on motor (5) and allow sling to support weight of motor.

WARNING

Still condenser fan is heavy and hard to handle. Provide an adequate lifting device to support still condenser fan before removing. Failure to follow this precaution could result in serious personnel injury or equipment damage.

4. Remove four screws (6), flat washers (7), lock washers (8), and nuts (9) securing motor (5) to fan shroud (3).
5. Lift motor (5) out of fan shroud (3) high enough to access junction box (10).
6. Remove screw (11), then remove cover (12) from junction box (10).
7. Tag and disconnect wires at junction box (10).
8. Remove conduit nut (13), then pull conduit (14) out of junction box (10).
9. Lift motor (5) completely out of fan shroud (3). Lower motor near, but not on ground.
10. Loosen clamp (15), then slide flexible duct (2) off of cooling air duct (16).
11. Remove four screws (17), then remove cooling air duct (16) from rear cover (18).
12. Reinstall rear cover (18) onto motor (5), then secure with four screws (17).
13. Lower motor (5) to ground and remove lifting device.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INSTALLATION

1. Attach lifting device to three lifting points (4) on new motor (5). Raise motor to access rear cover (18).
2. Remove four screws (17) then remove rear cover (18) from motor (5).
3. Install cooling air duct (16) onto rear cover (18), then secure both to motor with four screws (17).
4. Slide flexible duct (2) onto cooling air duct (16), then secure with clamp (15).
5. Lift motor (5) and position in fan shroud (3) high enough to access junction box (10).
6. Remove screw (11) then remove cover (12) from junction box (10).
7. Insert conduit (14) into junction box (10), then secure with conduit nut (13).
8. Connect wires at junction box (10) as tagged.
9. Install cover (12) onto junction box (10), then secure with screw (11).
10. Lower motor (5) into fan shroud (3), then align mounting holes.
11. Secure motor (5) to fan shroud (3) with four screws (6), flat washers (7), lock washers (8), and nuts (9).
12. Remove lifting device from motor (5).
13. Slide flexible duct (2) onto fan shroud (3), then secure with clamp (1).
14. Install fan blade (WP 0161 00).

END OF WORK PACKAGE

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DIRECT SUPPORT

LAUNDRY ADVANCED SYSTEM

(NSN 3510–01–463–0114)

HEATER ASSEMBLY REPLACEMENT
REMOVAL, INSTALLATION

INITIAL SETUP:

Tools
Container, 15–Gallon, (Qty 2)
(Item 4, WP 0282 00)
Funnel, W/Filter (Item 5, WP 0282 00)
Tool Kit, General Mechanics
(Item 14, WP 0282 00)
Wrench, Torque, (Item 17, WP 0282 00)
Forklift, 5,000 lbs

Personnel Required

Materials/Parts
Rag, Wiping (Item 4, WP 0281 00)
Tags, (Item 9, WP 0281 00)
Washer, Lock, (Item 17, WP 0283 00)
Gasket, Sanitary (Qty 4),
(Item 28, WP 0283 00)
Strap, Tiedown, (Item 30, WP 0283 00)
Strap, Tiedown, (Item 33, WP 0283 00)

Equipment Conditions
LADS power shut off at main control enclosure (WP 0113 00).

REMOVAL

WARNING

Thermal fluid can reach temperatures near 400 degrees F when the heating system is operating. Allow thermal fluid and heating system piping to cool prior to performing maintenance. Always wear gloves and eye protection. Failure to follow this precaution could result in severe personal burn injuries.

WARNING

The fuels used on the heating system are highly explosive. DO NOT smoke or use open flame when performing maintenance. Flames and explosion could occur resulting in severe personal injury or death.

1. Disconnect fuel hoses (1) and (2) from quick–connect fittings (3) and (4).
2. Place clean funnel and container under drain valves (5), (6), and (7).
3. Close isolation valves (8 through 16).
4. Open drain valves (5), (6), (7). Allow thermal fluid to drain, then close drain valves.

NOTE

When disconnecting inlet and outlet hoses at heater and still, a clean funnel and container should be placed under connection to catch residual thermal fluid.

5. Cut tiedown straps (17) securing thermal fluid hoses (18) and (19) together.
6. At connections for inlet hose (18) and outlet hose (19) perform the following, one connection at a time:

   a. Remove two screws (20), lock washers (21), and nuts (22) then remove clamp (23).

   b. Separate hose connection then position to allow thermal fluid to drain through funnel into container.

   c. Remove and discard gasket (24) from hose connection.

REMOVAL – Continued

7. Remove inlet hose (18) and outlet hose (19) from heater (25). Cap connections on hoses and at connections on heater and still (26).
8. Loosen screws (27) then disconnect connectors (28) from three pressure sensors (29).
9. Disconnect electrical connector (30) from temperature sensor (31).
10. Remove tiedown straps (32) securing sensor cable (33) to conduit (34), then pull wiring back away from heater (25).
11. Remove tiedown straps (35) securing door sensor cable (36) and air tubing (37) to heater (25).
12. Loosen four latches (38), then open door (39) on heater enclosure (40).
13. Tag and disconnect external wiring at the following components:

TABLE 1. Heater Wiring.

COMPONENT	WIRE NUMBER	TERMINAL NUMBER
FLAME PROGRAMMER (FP300)	503	3
FLAME PROGRAMMER (FP300	498	7
AIR INLET PRESSURE SWITCH (PS300)	500	NC
AIR INLET PRESSURE SWITCH (PS300)	501	COMMON
TEMPERATURE LIMIT SWITCH (TS300)	499	20
HEATER CONTROL RELAY (CR300)	141	2
TB7	152	H
TB7	153	N
OVERLOAD RELAY (OL301)	316	97
OVERLOAD RELAY (OL301)	328	98
OVERLOAD RELAY (OL302)	377	97
OVERLOAD RELAY (OL302)	376	98

14. Remove two screws (41) then remove cover (42) and gasket (43) from outlet body (44).
15. Pull disconnected wiring out of heater enclosure (40).
16. Loosen conduit nut (45) then pull wiring and conduit (46) out of outlet body (44).
17. Close door (39) and secure to heater enclosure (40) by tightening four latches (38).
18. Install cover (42) and gasket (43) onto outlet body (44) then secure with two screws (41).
19. Loosen four latches (47), then remove cover (48) from junction box (49).
20. Tag and disconnect heater wiring at terminal block TB9 (50).
21. Remove insulating bushing (51) and conduit nut (52) then pull wiring and conduit (53) out of junction box (49).
22. Loosen clamp (54), then remove hose (55) from trough (56).
23. Remove exhaust extension (57) from exhaust stack (58).
24. Remove two screws (59), flat washers (60), and nuts (61), then remove tarp support (62) from front support (63) and left/rear support (64).
25. Remove four screws (65), flat washers (66), lock washers (67) and nuts (68) securing left/rear support (64) to ISO frame (69).
26. Remove four screws (70), flat washers (71), lock washers (72) and nuts (73), then remove left/rear support (64) from right/rear support (74).
27. Remove four screws (75), flat washers (76), and nuts (77) securing top of heater (25) to ISO frame (69).

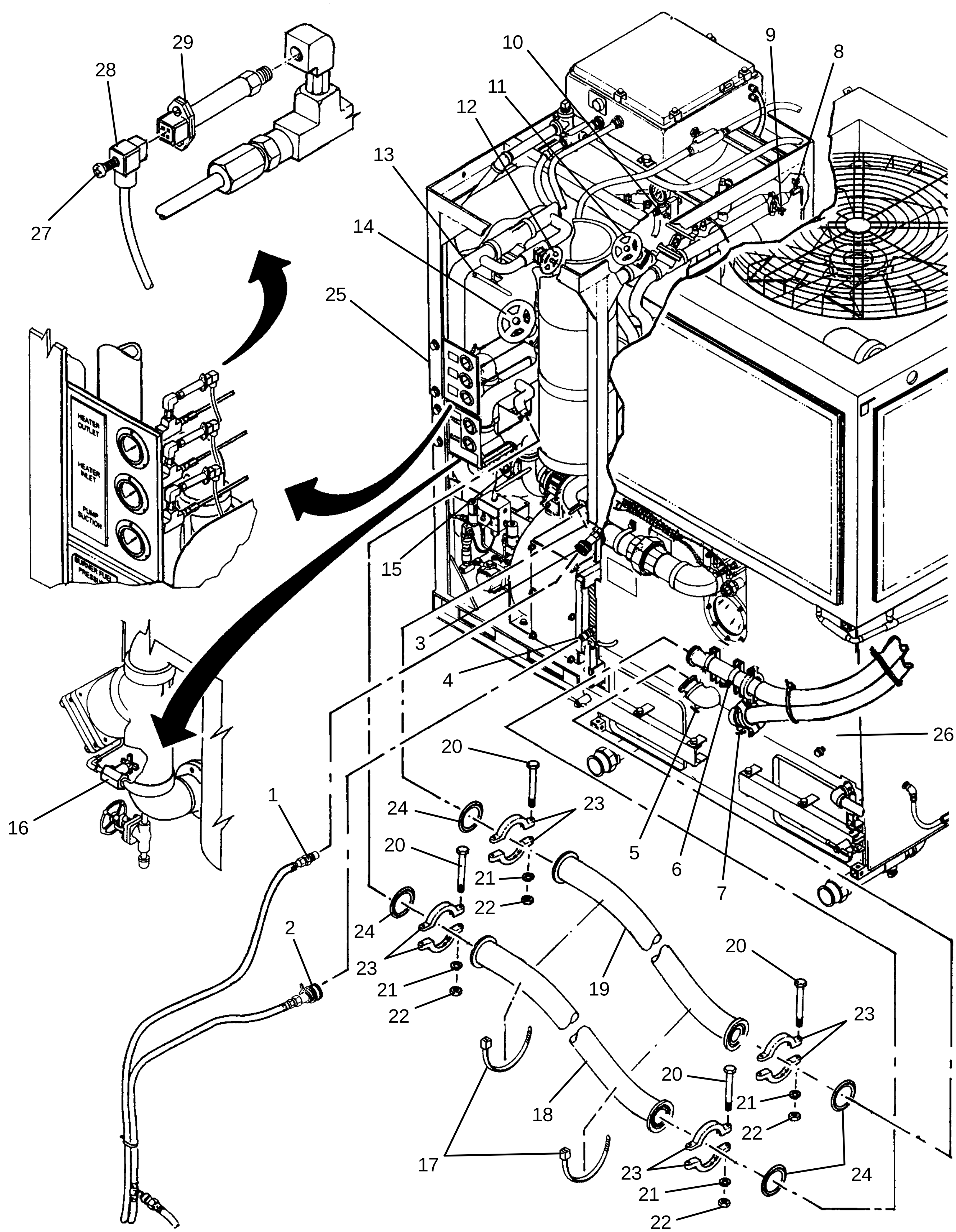
REMOVAL – Continued

28. Remove four screws (78), lock washers (79), and flat washers (80) securing bottom of heater (25) to ISO frame (69).
29. Remove screw (81), flat washers (82), tapered washer (83), and nut (84) securing bottom of heater (25) to ISO frame (69).

CAUTION

When lifting heater out of ISO frame, be careful not to damage equipment installed in front of and to the right of heater.

30. Using fork lift pockets (85), slowly remove heater (25) from ISO frame (69) as follows:
    a. Lift heater (25) up approximately 1/2 inch.
    b. Shift heater (25) until left corner of heater clears inside wall of ISO frame (69) by approximately 1/2 inch.
    c. Pull heater rearward until clear of ISO frame (69).
31. Clean up any residual thermal fluid on ISO frame (69) or surrounding equipment.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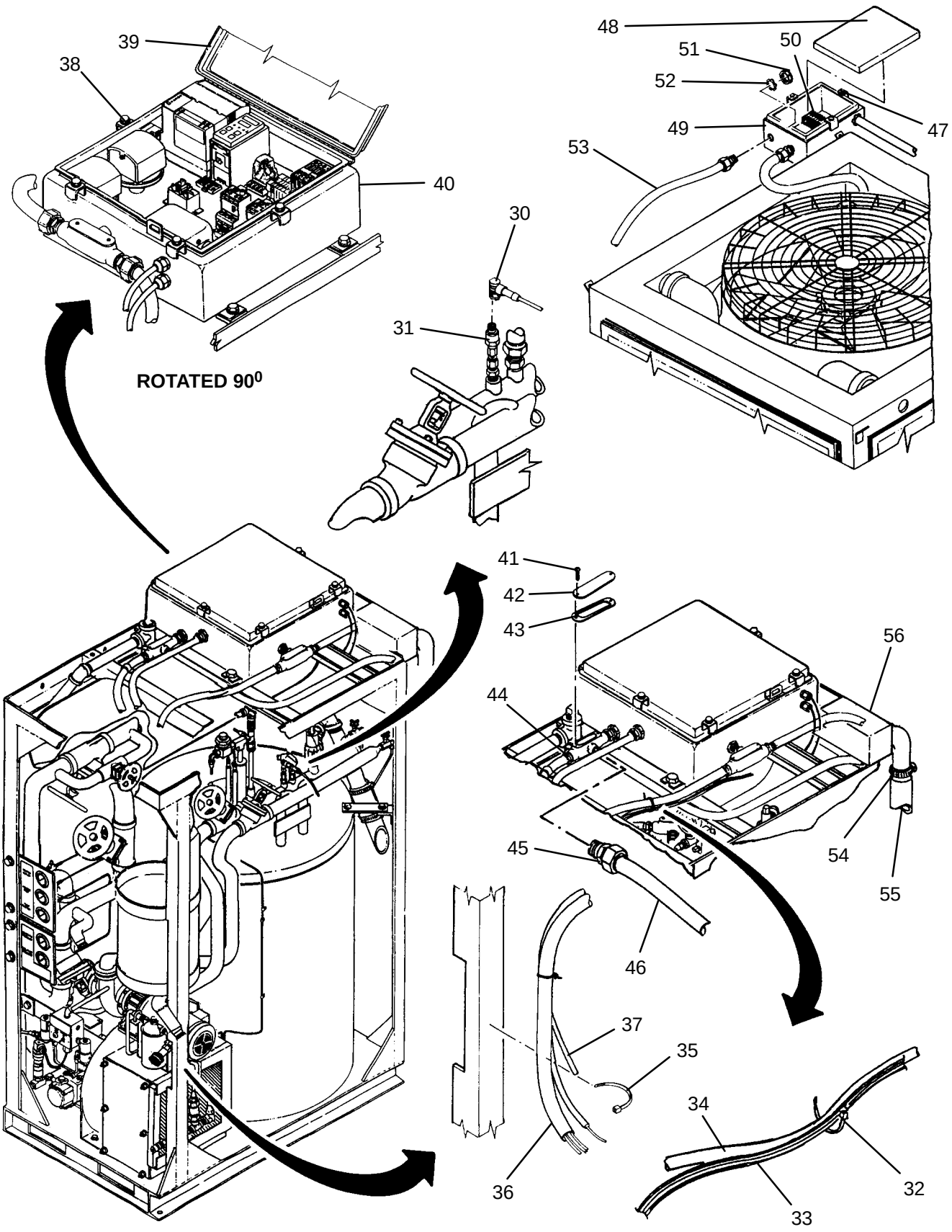
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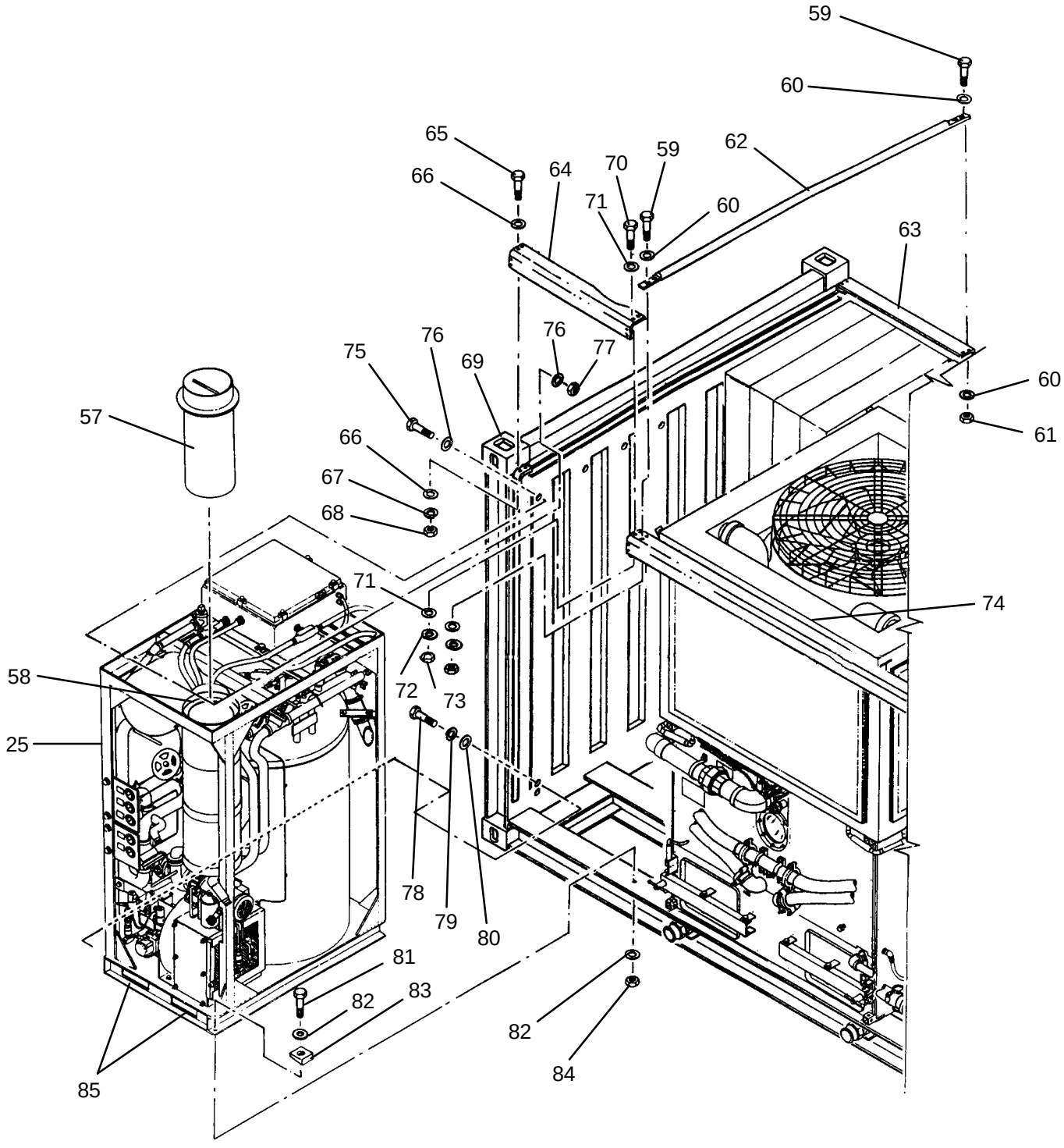
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INSTALLATION

CAUTION

When positioning heater onto ISO frame, be careful not to damage equipment installed in front of and to the right of heater.

1. Using fork lift pockets (85), slowly position heater (25) onto ISO frame (69) as follows:
   a. Lift heater (25) up approximately 1/2 inch above mounting surface on ISO frame (69).
   b. Align left side of heater (25) to clear inside wall of ISO frame (69) by 1/2 inch.
   c. Move heater (25) inward until rear left corner of heater can be shifted left, then shift heater flush against wall of ISO frame (69).
   d. Lower heater (25) onto ISO frame (69) and align mounting holes.
2. Install, but do not tighten, four screws (75), flat washers (76), and nuts (77) securing top of heater (25) to ISO frame (69).
3. Install, but do not tighten, four screws (78), lock washers (79), and flat washers (80) securing bottom of heater (25) to ISO frame (69).
4. Install, but do not tighten, screw (81), flat washers (82), tapered washer (83), and nut (84) securing bottom of heater (25) to ISO frame (69).
5. Tighten screws (75), (78), and (81).
6. Install, but do not tighten, four screws (65), flat washers (66), lock washers (67) and nuts (68) securing left/rear support (64) to ISO frame (69).
7. Install, but do not tighten, four screws (70), flat washers (71), lock washers (72) and nuts (73), securing left/rear support (64) to right/rear support (74).
8. Install, but do not tighten, two screws (59), flat washers (60), and nuts (61), securing tarp support (62) to front support (63) to left/rear support (64).
9. Tighten screws (59), (65), and (70).
10. Insert exhaust extension (58) into exhaust stack (55).
11. Install hose (55) onto trough (56), then tighten clamp (54).
12. Insert wiring and conduit (53) into junction box (49), then install conduit lock nut (52) and insulating bushing (51) to secure conduit.
13. Connect heater wiring at terminal block TB9 (50) as tagged.
14. Install and secure cover (48) onto junction box (49) by tightening four latches (47).
15. Loosen four latches (38), then open door (39) on heater enclosure (40).
16. Remove two screws (41), then remove cover (42) and gasket (43) from outlet body (44).
17. Insert wiring and conduit (46) into outlet body (44), then tighten conduit nut (45).
18. Insert wiring into heater enclosure (40), then connect as identified in Table 1.
19. Close door (39) and secure to heater enclosure (40) by tightening four latches (38).
20. Install cover (42) and gasket (43) onto outlet body (44), then secure with two screws (41).
21. Connect electrical connector (30) to temperature sensor (31).

INSTALLATION – Continued

22. Mate connectors (28) to three pressure sensors (29), then tighten screws (27).
23. Install tiedown straps (32) as necessary to secure sensor cable (33) to conduit (34).
24. Install tiedown straps (35) as necessary to secure door sensor cable (36) and air tubing (37) to heater (25).
25. At connections for inlet hose (18) and outlet hose (19) perform the following, one connection at a time:
    a. Apply a light coat of thermal fluid to a new gasket (24), then install gasket at hose connection.
    b. Mate hose connection and install halves of clamp (23).
    c. Install, but do not tighten two screws (20), lock washers (21), and nuts (22).
    d. Evenly tighten two screws (20) to 40 inch–pounds.
26. Install tiedown straps (17) to secure inlet hose (18) and outlet hose (19) together.
27. Connect fuel hoses (1) and (2) to quick–connect fittings (3) and (4).
28. Clean up any residual thermal fluid on heater (25) and surrounding equipment.
29. Replenish thermal fluid supply and leak check connections (WP 0168 00).

END OF WORK PACKAGE

DIRECT SUPPORT

LAUNDRY ADVANCED SYSTEM

(NSN 3510–01–463–0114)

HEATER ASSEMBLY SERVICING DISASSEMBLY, CLEANING, ASSEMBLY

INITIAL SETUP:

Tools
Wire Brush (Item 2, WP 0282 00)
Tool Kit, General Mechanics (Item 14, WP 0282 00)

Personnel Required

Materials/Parts
Rag, Wiping (Item 4, WP 0281 00)

Equipment Conditions
Heater assembly removed (WP 0271 00)

DISASSEMBLY

1. Remove burner assembly (WP 0183 00).
2. Loosen clamp (1), then remove exhaust duct (2) from flue stack (3).
3. Remove eight screws (4) and flat washers (5), then remove flue stack (3) from outer chamber (6).
4. Remove twelve screws (7), then remove access panel (8) from outer chamber (6).
5. Remove ten screws (9), then remove access panel (10) from middle chamber (11).
6. Remove twelve nuts (12) and flat washers (13), then remove access panel (14) from burner chamber (15).

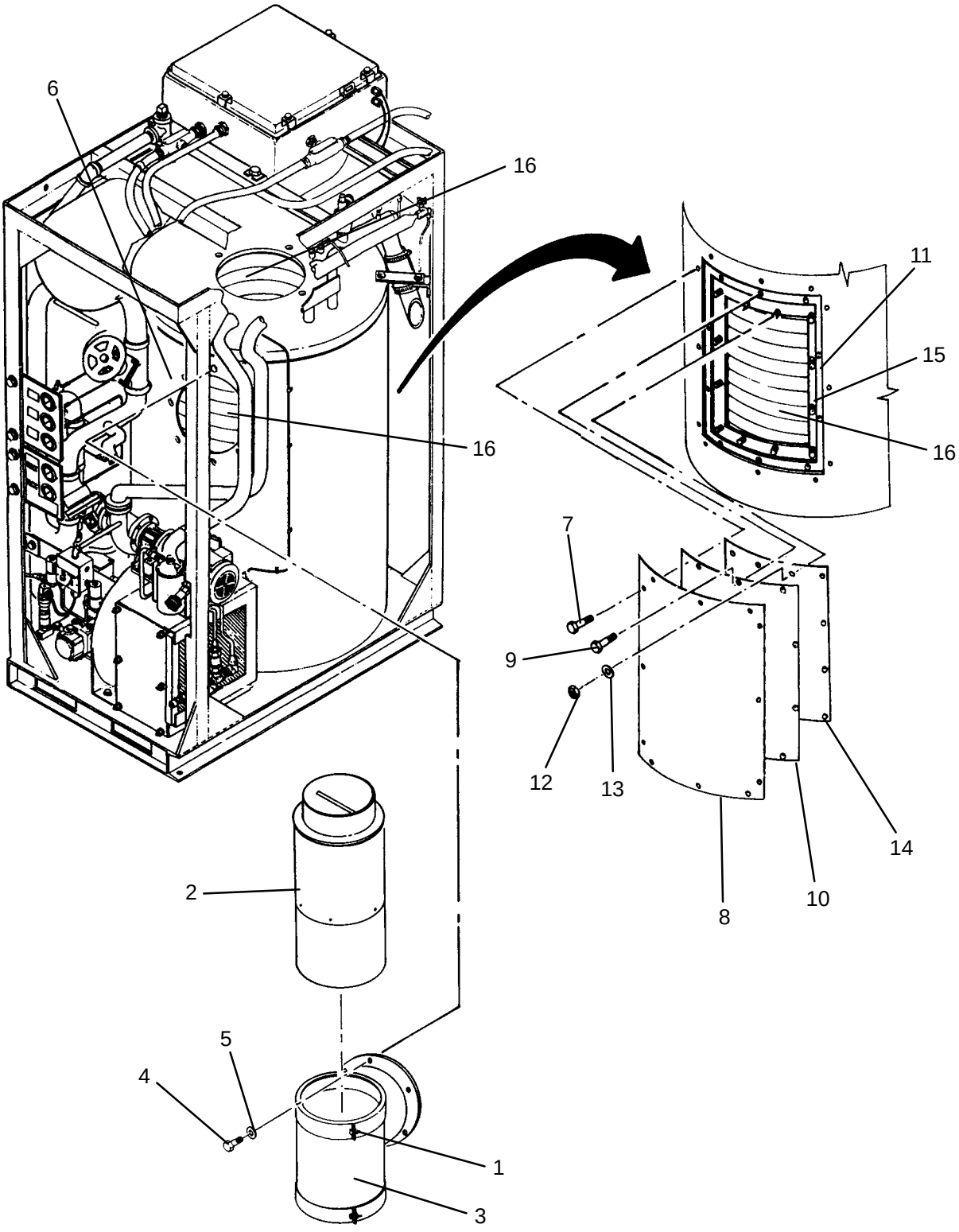
CLEANING

1. Thoroughly brush coils (16) to remove soot deposits.

WARNING

Compressed air used for cleaning or drying, or for clearing restrictions, should never exceed 30 psi (207 kPa). Always wear gloves and eye protection. Use caution to avoid injury to personnel.

2. Used compressed air to blow loose deposits towards bottom of burner chamber (15).
3. Vacuum out bottom of middle chamber (11) and burner chamber (12) to remove all loose soot and debris.
4. Inspect coils (16) for cleanliness. If soot deposits cannot be removed replace heater.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ASSEMBLY

1. Install access panel (14) onto burner chamber (15), then secure with twelve nuts (12) and flat washers (13).
2. Position access panel (10) onto middle chamber (11), then secure with ten screws (9).
3. Position access panel (8) onto outer chamber (6,) then secure with twelve screws (7).
4. Position flue stack (3) onto outer chamber (6), then secure with eight screws (4) and flat washers (5).
5. Insert exhaust duct (2) into flue stack (3), then tighten clamp (1).
6. Install burner assembly (WP 0183 00).

END OF WORK PACKAGE

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DIRECT SUPPORT

LAUNDRY ADVANCED SYSTEM

(NSN 3510–01–463–0114)

THERMAL FLUID PUMP (M300) REPLACEMENT REMOVAL, INSTALLATION

INITIAL SETUP:

Tools
Container, 5–Gallon (Item 3, WP 0282 00)
Multimeter (Item 8, WP 0282 00)
Tool Kit, General Mechanics (Item 14, WP 0282 00)

Personnel Required

Materials/Parts
Rag, Wiping (Item 4, WP 0281 00)
Tags, (Item 9, WP 0281 00)
Washer, Lock, (Item 15, WP 0283 00)
Washer, Lock, (Item 17, WP 0283 00)
Gasket, Flange (Item 25, WP 0283 00)
Gasket, Flange (Item 26, WP 0283 00)

Equipment Conditions
LADS power shut off at main control enclosure (WP 0113 00).

REMOVAL

WARNING

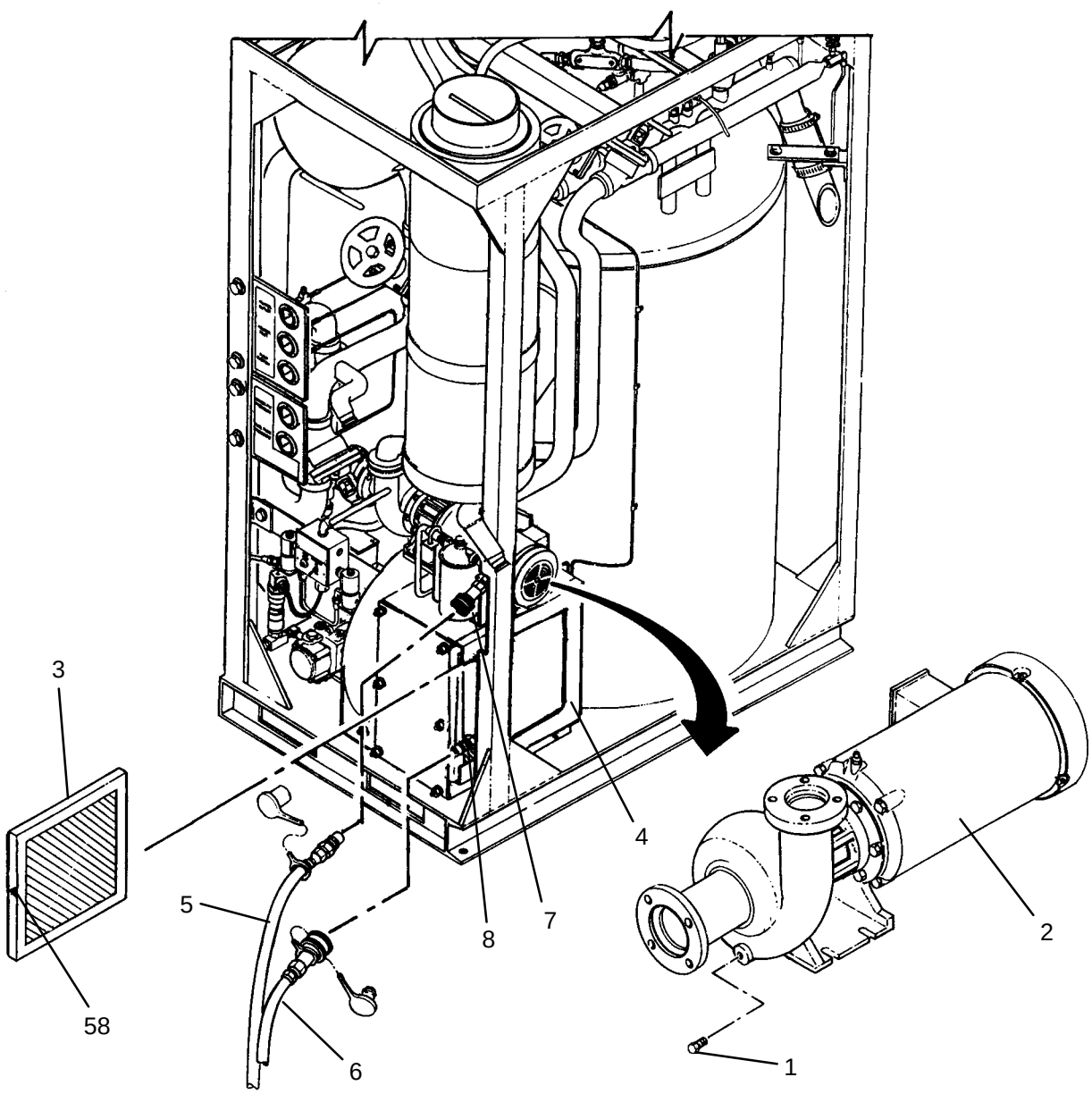
Thermal fluid can reach temperatures near 400 degrees F when the heating system is operating. Allow thermal fluid and heating system piping to cool prior to performing maintenance. Always wear gloves and eye protection. Failure to follow this precaution could result in severe personal burn injuries.

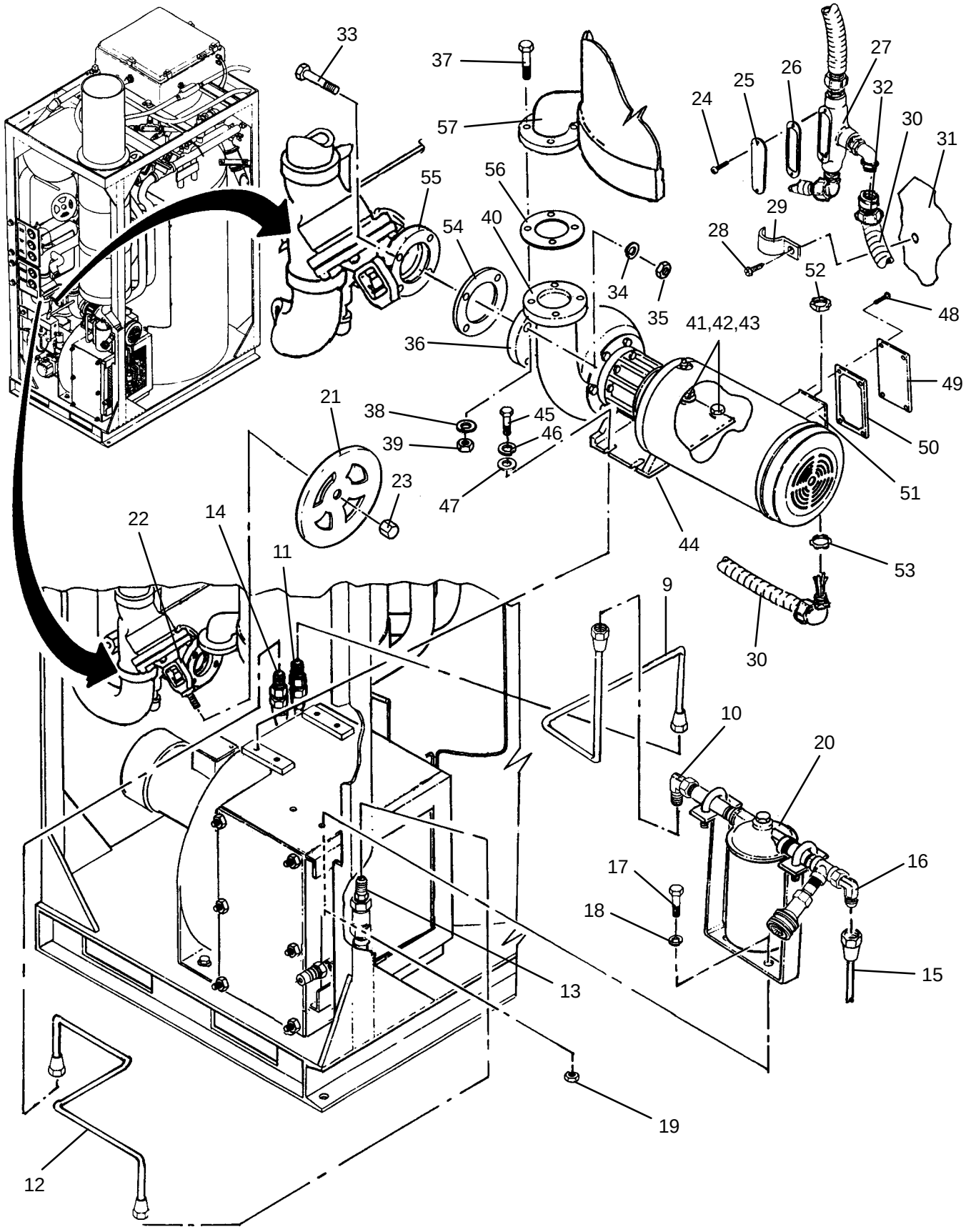
WARNING

The fuels used on the heating system are highly explosive. DO NOT smoke or use open flame when performing maintenance. Flames and explosion could occur resulting in severe personal injury or death.

1. Remove thermal fluid pump strainer (WP 0170 00).
2. Place clean container under drain plug (1) on thermal fluid pump (2).
3. Remove drain plug (1). Allow thermal fluid to drain, then reinstall drain plug.
4. Slide inlet screen (3) out of air box (4).
5. Disconnect fuel hoses (5) and (6) from quick–connect fittings (7) and (8).
6. Disconnect fuel line (9) from elbow (10) and coupling (11), then remove fuel line.
7. Disconnect fuel line (12) from adapter (13) and coupling (14), then remove fuel line.
8. Disconnect fuel line (15) from elbow (16).
9. Remove two screws (17), lock washers (18), and nuts (19), then remove fuel filter (20) from air box (4).
10. Hold handle (21) on isolation valve (22) closed then remove nut (23).
11. Remove handle (21).
12. Remove two screws (24), then remove cover (25) and gasket (26) from outlet body (27).
13. Tag and disconnect wires from thermal fluid pump (2) at outlet body (27).
14. Remove screw (28) and clamp (29) securing conduit (30) to heater shell (31).
15. Loosen conduit nut (32), then pull conduit (30) and wiring out of outlet body (27).

16. Remove four screws (33), lock washers (34), and nuts (35) at pump inlet flange (36).
17. Remove four screws (37) lock washers (38), and nuts (39) at pump outlet flange (40).
18. Loosen two screws (41), lock washers (42), flat washers (43) at back of pump mount (44).
19. Remove two screws (45), lock washers (46), and flat washers (47) at front of pump mount (44).
20. Push back on motor end of thermal fluid pump (2), then slide pump end forward to remove pump from top of air box (4).
21. Remove four screws (48), then remove cover (49) and gasket (50) from motor junction box (51).
22. Tag and disconnect wires at motor junction box (51).
23. Remove insulating bushing (52) and conduit nut (53), then pull conduit (30) out of motor junction box (51).
24. Remove gasket (54) from inlet piping (55) and gasket (56) from outlet piping (57).
25. Wipe flanges on inlet piping (55) and outlet piping (57) with a clean rag. Also clean up any residual thermal fluid.

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INSTALLATION

1. Remove four screws (48), then remove cover (49) and gasket (50) from motor junction box (51) on new thermal fluid pump (2).
2. Insert conduit (30) into motor junction box (51), then install insulating bushing (52) and conduit nut (53).
3. Connect wires at motor junction box (51) as tagged.
4. Reinstall cover (49) and gasket (50) onto motor junction box (51), then secure with four screws (48).
5. Position thermal fluid pump (2) on top of air box (4) ensuring back of pump mount (44) is inserted under two screws (41), lock washers (42), and flat washers (43).
6. Install, but do not tighten two screws (45), lock washers (46), and flat washers (47) at front of pump mount (44).
7. Insert new gasket (56) between outlet piping (57) and pump outlet flange (40). Install, but do not tighten four screws (37), lock washers (38), and nuts (39).
8. Insert new gasket (54) between inlet piping (55) and pump inlet flange (36). Install, but do not tighten four screws (33), lock washers (34), and nuts (35).
9. Tighten screws (41 and 45) to secure pump mount (44) to air box (4).
10. Tighten screws (33) and nuts (35) at pump inlet flange (36).
11. Tighten screws (37) and nuts (39) at pump outlet flange (40).
12. Insert wiring and conduit (30) into outlet body (27), then tighten conduit nut (32).
13. Connect wires at outlet body (27) as tagged.
14. Install cover (25) and gasket (26) onto outlet body (27), then secure with two screws (24).
15. Install clamp (29) and screw (28) to secure conduit (30) to heater shell (31).
16. Install handle (21) onto isolation valve (22), then secure with nut (23).
17. Install fuel filter (20) onto air box (4), then secure with two screws (15), lock washers (16), and nuts (17).
18. Connect fuel line (9) at elbow (10) and coupling (11).
19. Connect fuel line (12) at adapter (13) and coupling (14).
20. Connect fuel line (15) to elbow (16).
21. Connect fuel hoses (5) and (6) to quick–connect fittings (7) and (8).
22. Slide inlet screen (3) into air box (4) with direction arrow (58) pointing towards heater inlet.
23. Clean and reinstall thermal fluid pump strainer (WP 0169 00). Verify no fuel or thermal fluid leaks exist.

END OF WORK PACKAGE

DIRECT SUPPORT

LAUNDRY ADVANCED SYSTEM

(NSN 3510–01–463–0114)

HEATER RELIEF VALVE REPLACEMENT REMOVAL, INSTALLATION

INITIAL SETUP:

Tools
Tool Kit, General Mechanics
(Item 14, WP 0282 00)

Personnel Required

Materials/Parts
Rag, Wiping (Item 4, WP 0281 00)
Sealant, Pipe Thread (Item 8, WP 0281 00)

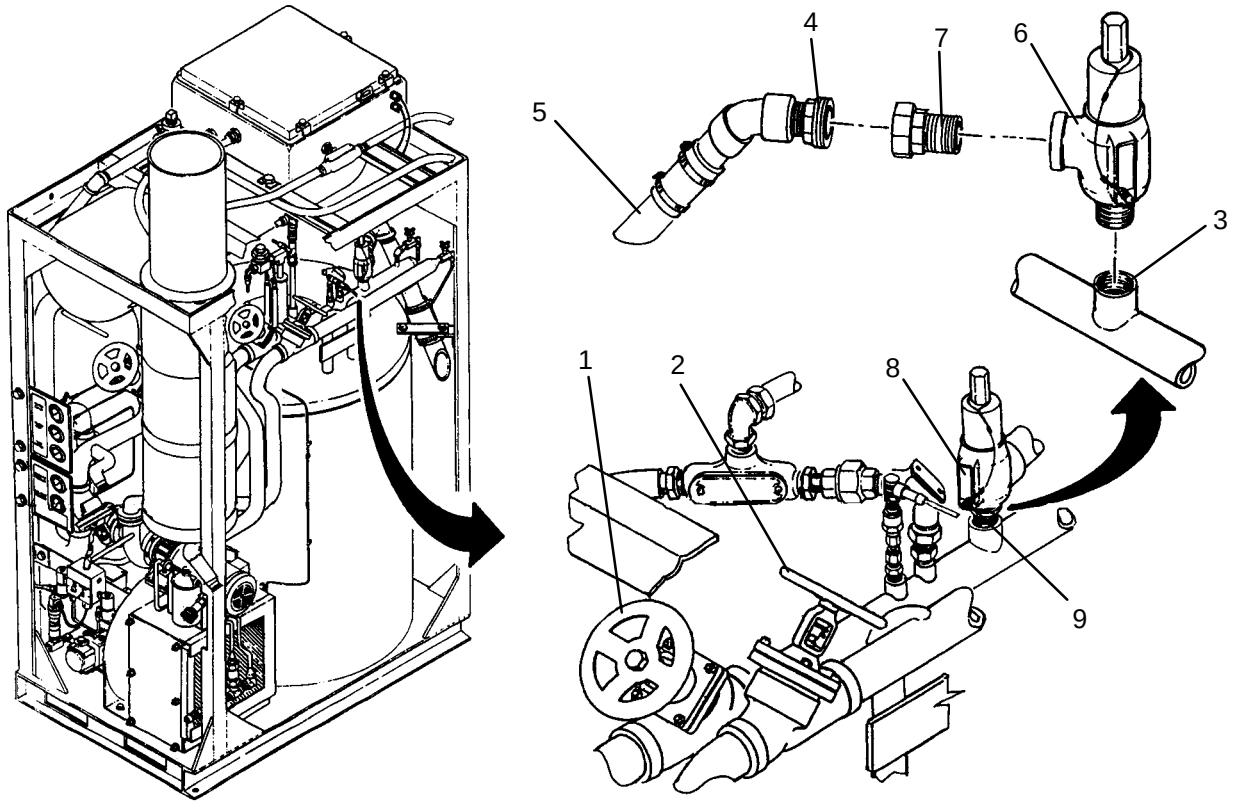
Equipment Conditions
LADS power shut off at main control enclosure (WP 0113 00).

REMOVAL

WARNING

Thermal fluid can reach temperatures near 400 degrees F when the heating system is operating. Allow thermal fluid and heating system piping to cool prior to performing maintenance. Always wear gloves and eye protection. Failure to follow this precaution could result in severe burn injuries.

1. Close isolation valves (1) and (2).
2. Place wiping rag around relief valve port on heater manifold (3).
3. Disconnect union (4) and remove vent piping (5).
4. Unthread relief valve (6) from heater manifold (3).
5. Unthread nipple (7) from relief valve (6).
6. Clean pipe sealant and residual thermal fluid off of threads of heater piping (3) and nipple (7).



INSTALLATION

CAUTION

Relief valve comes preset. Never attempt to adjust cracking pressure. Changing, or improper adjustment of relief valve could allow thermal fluid pressure in heater piping to exceed safe operating pressure, resulting in damage to heating system components.

1. Verify correct setting of new relief valve (6). Obtain a new relief valve if settings are not as stated below:
   a. Ensure data plate (8) shows a cracking pressure of 100 psig.
   b. Ensure safety seal (9) is intact.
2. Apply pipe thread sealant to threads of relief valve (6) and nipple (7).
3. Thread nipple (7) into relief relief valve (6).
4. Thread relief valve (6) into heater manifold (3).
5. Attach vent piping (5) to relief valve (6) and tighten union (4).
6. Open isolation valve (1) and (2).
7. Wipe any residual thermal fluid with a clean rag.
8. Use maintenance menu to test heating system (WP 0010 00). While heating system is operating, visually check for thermal fluid leaks.
9. Allow heater to stay on until heater shuts off automatically.
10. Stop heating system. Perform cooling thermal fluid (WP 0010 00) until TE300 is 200 degrees F or less.

END OF WORK PACKAGE

DIRECT SUPPORT
LAUNDRY ADVANCED SYSTEM
(NSN 3510–01–463–0114)
ILLUSTRATED LIST OF MANUFACTURED ITEMS

INTRODUCTION

SCOPE

This work package includes complete instructions for making items authorized to be manufactured or fabricated at organizational, direct support, and general support maintenance.

How to Use the Index of Manufactured Items

A part number index in alphanumeric order is provided for cross–referencing the part number of the item to be manufactured to the figure which covers fabrication criteria.

Explanations of the Illustrations of Manufactured Items

All instructions needed by maintenance personnel to manufacture the item are included on the illustrations. All bulk materials needed for manufacture of an item are listed by part number or specification number in a tabular list on the illustration.

INDEX OF MANUFACTURED ITEMS

Part Number	Figure Number	Nomenclature
863–110600	1	Removal Tool, Bearing, Rear
863–110610	2	Removal Tool, Bearing, Front
863–410600	3	Adapter, Air Tube
863–730600	4	Hose Assy, Drain, Thermal Fluid

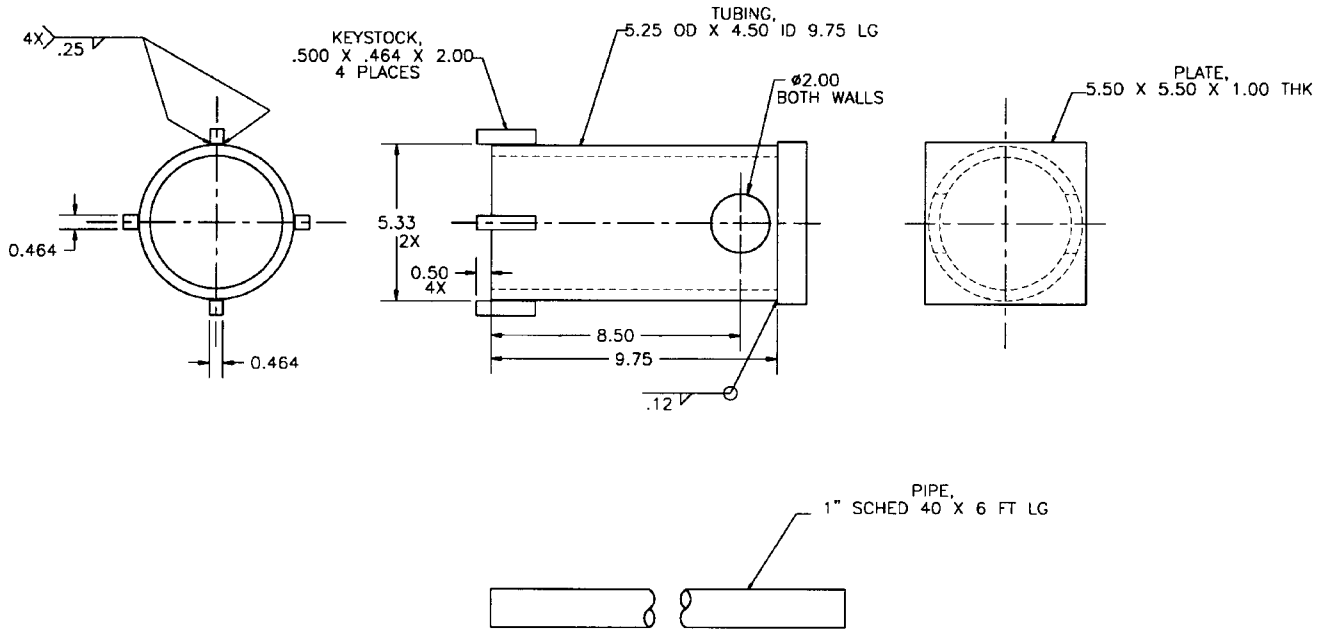


Figure 1.

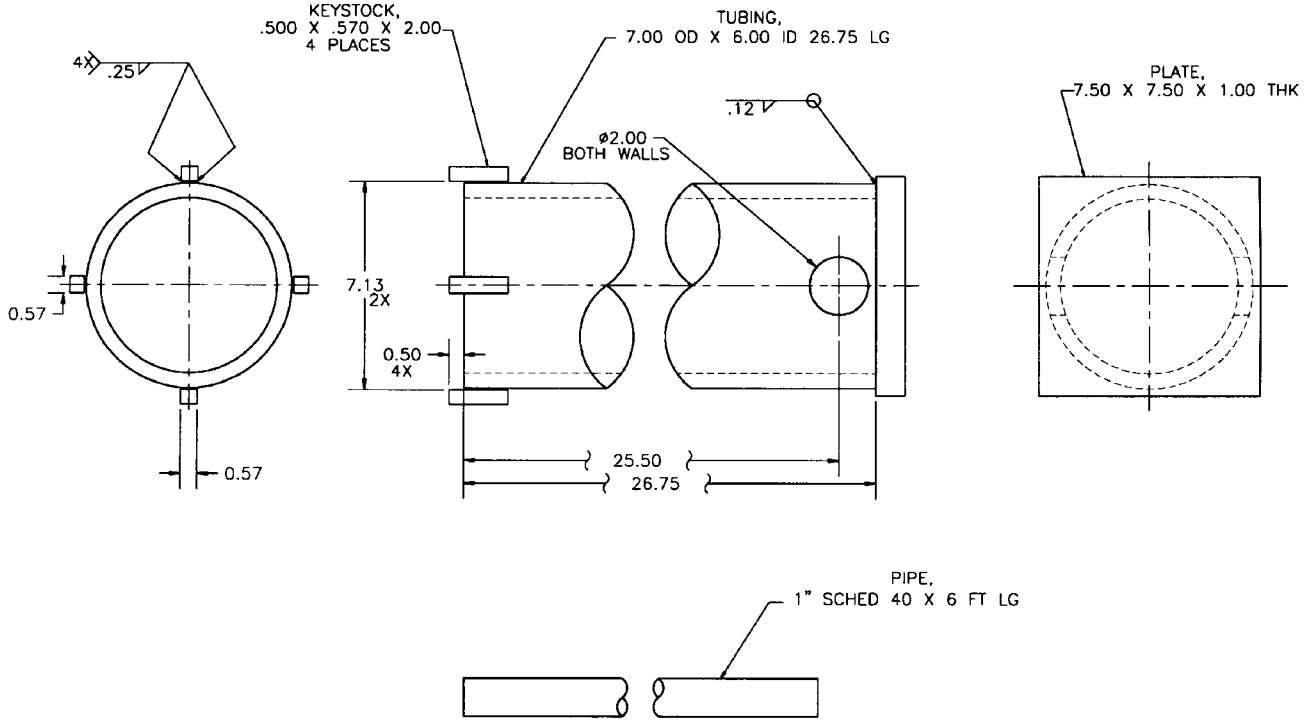
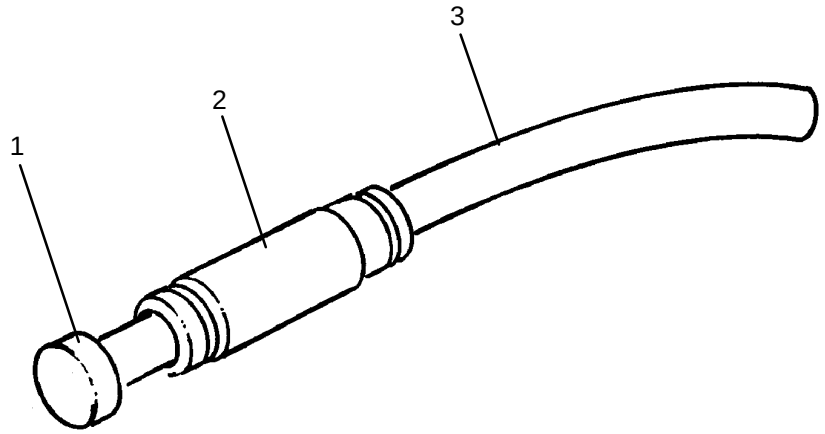
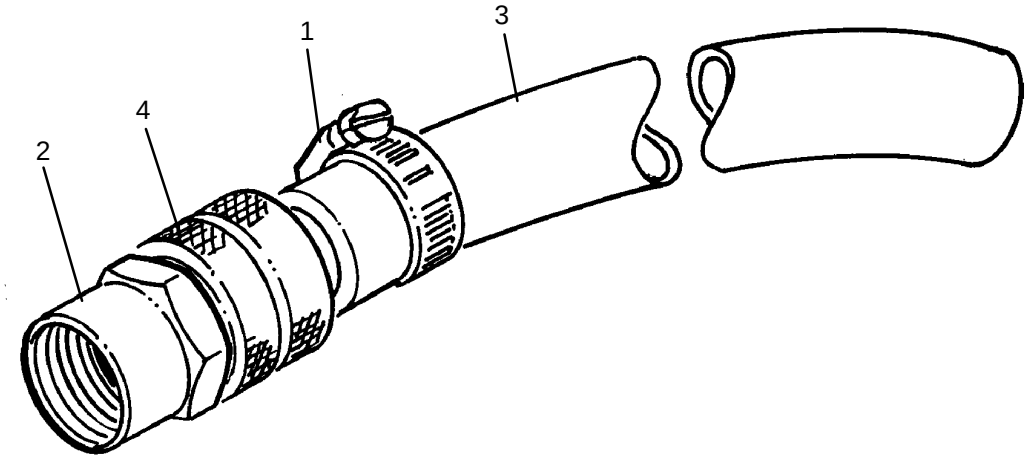


Figure 2.



1. 5102
2. 5149
3. 5156



1. 54195K17, Clamp, Hose
2. 73605T63, Adapter, 3/4” Garden Hose X 3/4” NPTF
3. 7454T22, Hose, Garden, 3/4” ID X 6’ Lg
4. 7461T26, Coupling, Garden Hose, 3/4” ID x Female Coupling

Figure 4.

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DIRECT SUPPORT

LAUNDRY ADVANCED SYSTEM

(NSN 3510–01–463–0114)

TORQUE LIMITS

INITIAL SETUP:

Tools
Tool Kit, General Mechanics
(Item 14, WP 0282 00)
Wrench, Torque, (Item 16, WP 0282 00)
Wrench, Torque, (Item 17, WP 0282 00)

Personnel Required

Materials/Parts

Equipment Conditions

NOTE

When torquing a fastener, select a wrench whose range fits the required torque value. A torque wrench is most accurate from 25% to 75% of its range. A wrench with a stated range of 0 to 100 will be most effective from 25 to 75 ft/lbs. The accuracy of the reading will decrease as you approach the 0 or the 100 mark.

Thermal Fluid Clamp Bolts, 2” – Torque to 40 in/lbs.

Rear Bearing Housing To Bearing Support Frame Bolts – Torque to 550 ft/lbs.

Front Bearing Housing To Bearing Support Frame Bolts – Torque to 750 ft/lbs.

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CHAPTER 5

GENERAL SUPPORT MAINTENANCE

INSTRUCTIONS

FOR

LAUNDRY ADVANCED SYSTEM

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GENERAL SUPPORT
LAUNDRY ADVANCED SYSTEM
(NSN 3510–01–463–0114)
GENERAL SUPPORT MAINTENANCE INSTRUCTIONS

GENERAL SUPPORT MAINTENANCE

General support maintenance is limited to tarp repair and welding.

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CHAPTER 6

SUPPORTING INFORMATION

FOR

LAUNDRY ADVANCED SYSTEM

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UNIT, DIRECT SUPPORT, AND GENERAL SUPPORT
LAUNDRY ADVANCED SYSTEM
(NSN 3510–01–463–0114)
REFERENCES

SCOPE

This work package lists all Forms, Field Manuals, and Technical Manuals referenced in this manual.

FORMS

Recommended Changes to Publications and Blank Forms . . . . . DA Form 2028
Recommended Changes to Equipment Technical Publications . . . . . DA Form 2028–2
Equipment Inspection and Maintenance Worksheet . . . . . DA Form 2404
Product Quality Deficiency Report SF–368

FIELD MANUALS

Operation and Maintenance of Ordinance Material in Cold Weather . . . . . FM 9–207

TECHNICAL MANUALS

Operator's Manual for Laundry Advanced System . . . . . TM 10–3510–221–10
Welding: Design, Procedures and Inspection . . . . . TM 5–805–7
Procedures for Destruction of Equipment to Prevent Enemy Use . . . . . TM 750–244–3
Inspection, Care and Maintenance of Antifriction Bearings . . . . . TM 9–214
Materials Used for Cleaning, Preserving, Abrading and Cementing Ordnance Material and Related Materials Including Chemicals . . . . . TM 9–247

MISCELLANEOUS

The Army Logistics Readiness and Sustainability . . . . . AR 700–138
The Army Maintenance Management System (TAMMS) . . . . . DA PAM 738–750
The Army Maintenance Management System–Aviation (TAMMS–A) . . . . . DA PAM 738–751

END OF WORK PACKAGE

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UNIT, DIRECT SUPPORT, AND GENERAL SUPPORT

LAUNDRY ADVANCED SYSTEM

(NSN 3510–01–463–0114)

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 various maintenance levels under the standard Army 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 will be consistent with the capacities and capabilities of the designated maintenance levels, which are shown on the MAC in column (4) as:

Unit – includes two subcolumns, C (operator/crew) and O (unit) maintenance.

Direct Support – includes an F subcolumn.

General Support – includes an H subcolumn.

Depot – includes a D subcolumn

The tools and test equipment requirements (immediately following the MAC) lists 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 will be 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.

4. Adjust. To maintain or regulate, within prescribed limits, by bringing into proper or exact 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 or 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. 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 of the Source, Maintenance, and Recoverability (SMR) code.

Maintenance Functions – Continued

9. 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.

10. 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.

11. 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 materiel 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 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 (expressed as manhours in whole hours or decimals) in the appropriate subcolumn. This work time figure represents the active time required to perform the maintenance function at the indicated level of maintenance. If the number or complexity of the tasks within the listed maintenance functions varies at different maintenance levels, appropriate figures are to be shown for each level. The work time figure represents the average work time 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:

C – Operator or crew maintenance
O – Unit maintenance
F – Direct support maintenance
L – Specialized repair activity (SRA)
H – General support maintenance
D – Depot maintenance

Explanation of Columns in the MAC – Continued

NOTE

The “L” maintenance level is not included in column (4) of the MAC. Functions to this level of maintenance are identified by a work time in the “H” 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 special support equipment required to perform the designated function. Codes are keyed to entries in the tools and test equipment table.

Column (6) – Remarks Code. When applicable this column shall contain a letter code, in alphabetic order, which is keyed to the remarks table entries.

Explanation of Columns in Tools and Test Equipment Requirements

Column (1) – Tool or Test Equipment Reference Code. The tool and 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, model number, or type number.

Explanation of Columns in the 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.

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UNIT, DIRECT SUPPORT, AND GENERAL SUPPORT

LAUNDRY ADVANCED SYSTEM

(NSN 3510–01–463–0114)

MAINTENANCE ALLOCATION CHART (MAC)

Table 1. MAC for LADS.

(1)	(2)	(3)	(4) MAINTENANCE LEVEL					(5)	(6)
			Unit		DS	GS	Depot		
GROUP NUMBER	COMPONENT/ASSEMBLY	MAINTENANCE FUNCTION	C	O	F	H	D	TOOLS AND EQUIPMENT REF CODE	REMARKS CODE
00	LAUNDRY ADVANCED SYSTEM (LADS)								
01	SKID ASSEMBLY, (LADS)	Inspect	1.00						
0101	ISO Frame Assembly	Repair				2.00		15	A
0102	Drum Assembly	Repair				2.00		15	A
010201	Motor, Drum Drive (M101)	Service Replace	0.25		 6.00			 8,9,14	
010202	Fan, Motor Cooling (M106)	Replace		0.50				8,14	
010203	Capacitor, Fan Motor	Replace		0.50				8,14	
010204	Rear Bearing, Drum Drive	Service Replace	0.25		 8.00			7,10,13,14,17	
010205	Front Bearing, Drum Drive	Service Replace	0.25		 12.00			7,11,13,14,17	
010206	Seal, Drum Shaft	Replace			3.00			14	
010207	Belt, Drum Drive	Inspect Replace		1.00 2.00				14 7,14	
010208	Sensor, Proximity, Drum Rotation (ZS102)	Replace		0.75				8,14	
010209	Switch, Drum Balance (ZS103)	Replace		0.50				8,14	
010210	Brake Rotor	Replace			10.00			7,11,13,14,17	
010211	Brake Thruster	Replace		1.00				14	
010212	Brake Caliper	Replace Repair		1.00 0.75				14 14	
010213	Door Assembly, Drum	Replace Repair		2.00 2.00				14 14	
010214	Lock, Door (DN100)	Replace		0.50				14	
010215	Switch, Door Lock Position (ZS101)	Replace		0.50				8,14	
010216	Switch, Door Position (ZS100)	Replace		0.50				8,14	
010217	Motor, Dryer Blower (M104)	Replace		3.00				8,9,14	
010218	Heat Exchanger, Dryer	Replace			8.00			4,5,6,14	

Table 1. MAC for LADS – Continued.

(1) GROUP NUMBER	(2) COMPONENT/ASSEMBLY	(3) MAINTENANCE FUNCTION	(4) MAINTENANCE LEVEL					(5) TOOLS AND EQUIPMENT REF CODE	(6) REMARKS CODE
			Unit		DS	GS	Depot		
			C	O	F	H	D		
010219	Air Cylinder, Inlet Damper (FV111)	Replace		1.00				14	
010220	Air Cylinder, Outlet Damper (FV110)	Replace		1.00				14	
010221	Valve, Air Flow Control	Replace		0.75				14	
010222	Filter, Lint	Service Repair	0.08	1.00		1.00		14,15	
010223	Screen, Dryer Air Inlet	Service	0.08						
010224	Sensor, Temperature, Ambient Air (TE100)	Replace		0.50				8,14	
010225	Sensor, Temperature, Inlet Air (TE101)	Replace		0.50				8,14	
010226	Sensor, Temperature, Outlet Air (TE102)	Replace		0.50				8,14	
010227	Shock Adsorber, Front	Replace		0.75				14	
010228	Shock Adsorber, Rear	Replace		1.50				14	
010229	Air Bag, Front	Replace		2.00				14	
010230	Air Bag, Rear	Replace		0.75				14	
010231	Leveling Valve	Replace		1.50				14	
010232	Vibration Eliminator, Side–to–Side, Front	Replace		1.00				14	
010233	Vibration Eliminator, Side–to–Side, Rear	Replace		0.50				14	
010234	Vibration Eliminator, Front–to–Back	Replace		0.50				14	
0103	Water Plumbing								
010301	Water Pump (M101)	Service Replace Repair	0.08	3.00			8.00	14	B
010302	Valve, Water In, Drum (FV106)	Replace		1.50				14	
010303	Valve, Water Out, Drum (FV107)	Replace		1.50				14	
010304	Valve, Water Control, (FV108, FV109 or FV114)	Replace		2.00				14	
010305	Valve, Steam Inlet (FV115)	Replace		2.00				14	
010306	Eductor, Steam	Replace		1.00				14	

Table 1. MAC for LADS – Continued.

(1) GROUP NUMBER	(2) COMPONENT/ASSEMBLY	(3) MAINTENANCE FUNCTION	(4) MAINTENANCE LEVEL					(5) TOOLS AND EQUIPMENT REF CODE	(6) REMARKS CODE
			Unit		DS	GS	Depot		
			C	O	F	H	D		
0104	Tank Assembly	Repair				2.00		15	A
010401	Valve, Water, Inlet Manifold B (FV100B, FV102B, or FV104B)	Replace		2.00				14	
010402	Valve, Water, Inlet Manifold A (FV100A, FV102A, or FV104A)	Replace		3.00				14	
010403	Valve, Water, Outlet Manifold B (FV101B, FV103B, or FV105B)	Replace		4.00				14	
010404	Valve, Water, Outlet Manifold A (FV101A, FV103A, or FV105A)	Replace		5.00				14	
010405	Sensor, Temperature, Water (TE103)	Replace		0.50				8,14	
0105	Still Assembly	Repair				2.00		15	A
010501	Valve, Relief	Replace		1.00				14	
010502	Vacuum Breaker	Replace		0.50				14	
010503	Lock, Door (DN200)	Replace		0.75				14	
010504	Switch, Door Position (ZS200)	Replace		0.75				8,14	
010505	Gasket, Door	Replace	0.25						
010506	Sensor, Temperature, Still (TE200)	Replace		0.50				8,14	
0106	Still Condenser Assembly								
010600	Blade, Fan	Replace		1.50				9,14	
010601	Motor, Fan (M200)	Replace			4.00			8,9,14	
010602	Subcooler	Replace		4.00				14	
010604	Screen, Heat Exchanger Inlet	Service	0.08						
0107	Distillate Plumbing								
010701	Coalescer	Service	0.25						
010702	Pre–Filter	Service	0.25						
010703	Pump, Distillate (M201)	Replace		3.00				8,14	
010704	Valve, Solenoid, Subcooler Bypass (FV200)	Replace		1.50				8,14	
010705	Valve, Solenoid, Subcooler Inlet (FV201)	Replace		1.50				8,14	

Table 1. MAC for LADS – Continued.

(1) GROUP NUMBER	(2) COMPONENT/ASSEMBLY	(3) MAINTENANCE FUNCTION	(4) MAINTENANCE LEVEL					(5) TOOLS AND EQUIPMENT REF CODE	(6) REMARKS CODE
			Unit		DS	GS	Depot		
			C	O	F	H	D		
010706	Sensor, Temperature, Condenser Out (TE201)	Replace		0.50				8,14	
010707	Sensor, Temperature, Rinse 2 Tank In (TE202)	Replace		0.50				8,14	
0108	Heater Assembly	Service	0.25	0.75	12.00			4,5,6,14	
		Replace			16.00			4,5,6,8,14	
		Repair					20.00		B
010801	Pump, Thermal Fluid (M300)	Service	0.25						
		Replace			8.00			4,5,6,8,14	
		Repair					12.00		B
010802	Strainer, Thermal Fluid	Service		3.00				4,5,6,14	
010803	Sensor, Pressure, (PT300, PT301, or PT302)	Replace		1.00				8,14	
010804	Gauge, Pressure, Thermal Fluid (PI300, PI301, or PI302)	Replace		1.00				8,14	
010805	Sensor, Temperature, Heater Outlet (TE300)	Replace		1.00				8,14	
010806	Thermocouple	Replace		1.50				8,14	
010807	Valve, Relief	Replace			3.00			14	
010808	Gauge, Pressure, Fuel (PI303 or PI304)	Replace		1.00				8,14,	
010809	Filter, Fuel Inlet	Service		1.00				14	
010810	Switch, Fuel Pressure (PS302)	Replace		1.25				8,14	
010811	Pump, Fuel	Replace		2.00				8,14	
010812	Motor, Fuel Pump (M302)	Replace		3.00				8,14	
010813	Coupling, Fuel Pump	Replace		2.50				14	
010814	Motor, Burner Blower (M301)	Replace		5.00				8,14	
010815	Screen, Air Inlet	Service	0.08						
010816	Valve, Solenoid, Fuel In (FV300 or FV301)	Replace		1.00				8,14	
010817	Burner Assembly	Service		0.75				14	
		Replace		1.00				14	
		Repair		1.00			4.00		B
010818	Switch, PRIME PUMP, (SW4)	Replace		0.75				8,14	
010819	Switch, Pushbutton (PBS302)	Replace		0.75				8,14	

Table 1. MAC for LADS – Continued.

(1) GROUP NUMBER	(2) COMPONENT/ASSEMBLY	(3) MAINTENANCE FUNCTION	(4) MAINTENANCE LEVEL					(5) TOOLS AND EQUIPMENT REF CODE	(6) REMARKS CODE
			Unit		DS	GS	Depot		
			C	O	F	H	D		
010820	Wires, Ignition	Replace		0.75				8,14	
010821	Detector, Flame (UV300)	Replace		1.00				8,14	
0109	Enclosure Assembly, Heater								
010901	Programmer, Flame (FP300)	Replace		1.00				8,14	
010902	Display Module Flame Programmer	Replace		1.00				8,14	
010903	Amplifier, Flame Detector	Replace		0.75				8,14	
010904	Purge Card	Replace		0.75				8,14	
010905	Transformer, Ignition (IT300)	Replace		2.00				8,14	
010906	Switch, Temperature, Limit (TS300)	Replace		2.00				8,14	
010907	Switch, Pressure, Air Inlet (PS300)	Replace		1.50				8,14	
010908	Switch, Pressure, Blower Outlet (PS301)	Replace		1.50				8,14	
010909	Contactor, 3–Phase (MC301)	Replace		1.50				8,14	
010910	Relay, Overload, (OL301 or OL302)	Replace		1.00				8,14	
010911	Relay, Heater Control (CR300)	Replace		0.75				8,14	
010912	Relay, Temperature Switch (CR301)	Replace		1.00				8,14	
0110	Air System Assembly	Repair				2.00		15	A
011001	Filter, Air Inlet	Service	0.25						
011002	Compressor, Air (M500)	Replace Repair		3.00			 8.00	8,14	 B
011003	Valve, Relief	Replace		0.75				14	
011004	Filter, Outlet	Service Replace	0.50	 0.75				 14	
011005	Dehydrator	Replace		1.00				8,14	
011006	Valve, Check	Replace		0.50				14	
011007	Sensor, Tank Pressure (PT500)	Replace		1.00				8,14	
011008	Sensor, Product Pressure (PT501)	Replace		1.00				8,14	

Table 1. MAC for LADS – Continued.

(1) GROUP NUMBER	(2) COMPONENT/ASSEMBLY	(3) MAINTENANCE FUNCTION	(4) MAINTENANCE LEVEL					(5) TOOLS AND EQUIPMENT REF CODE	(6) REMARKS CODE
			Unit		DS	GS	Depot		
			C	O	F	H	D		
011009	Regulator, Product Pressure (PR300)	Replace		1.00				14	
011010	Regulator, Air Bag Pressure (PR301)	Replace		0.75				14	
011011	Manifold Assembly, Orifice	Service Repair	.	0.50 0.75				14 14	
011012	Valve, Dump (FV500)	Replace		1.00				8,14	
0111	Enclosure Assembly, Main Control								
011101	Manifold Assembly, Solenoid Valve (SV100–SV200)	Repair		0.75				8,14	
011102	PCB Assembly, Analog (PCB1)	Replace		2.00				8,14	
011103	PCB Assembly, Discrete Input (PCB2)	Replace		1.50				8,14	
011104	PCB Assembly, Digital I/O (PCB7)	Replace		0.75				8,14	
011105	PCB Assembly, Optically Isolated Input (PCB8)	Replace		0.75				8,14	
011106	PCB Assembly, Analog to Digital Converter (PCB11)	Replace		0.75				8,14	
011107	PCB Assembly, CPU (PCB9)	Replace		0.75				8,14	
011108	Card Cage (CC1)	Replace		2.50				8,14	
011109	Switch, Disconnect (SW1)	Replace		1.50				8,14	
011110	Circuit Breaker, 3–Pole (CB1 – CB6)	Replace		0.75				8,14	
011111	Circuit Breaker, 1–Pole (CB7 or CB8)	Replace		0.75				8,14	
011112	Contactor, 3–Phase	Replace		0.75				8,14	
011113	Relay, Overload	Replace		0.50				8,14	
011114	Inverter Drive, 1 HP	Replace		0.75				8,14	
011115	Indicator, Blown Fuse	Replace		0.08				8,14	
011116	Fuse, Cartridge (F1 – F3 and F7–F10)	Replace		0.08				8,14	
011117	Phase Monitor (PM1)	Replace		0.50				8,14	
011118	Power Supply +12Vdc 50 Watt (PS1)	Replace		0.75				8,14	

Table 1. MAC for LADS – Continued.

(1) GROUP NUMBER	(2) COMPONENT/ASSEMBLY	(3) MAINTENANCE FUNCTION	(4) MAINTENANCE LEVEL					(5) TOOLS AND EQUIPMENT REF CODE	(6) REMARKS CODE
			Unit		DS	GS	Depot		
			C	O	F	H	D		
011119	Socket, Lamp (DS1 or DS2)	Replace		0.50				8,14	
011120	Lamp, LED, White	Replace	0.08						
011121	Switch, Pushbutton, Emergency Stop (PBS6)	Replace		1.00				8,14	
011122	Switch, Toggle, DPST (SW2)	Replace		0.75					
011123	Switch, Pushbutton (PBS12)	Replace		0.75				8,14	
011124	Power Supply +5, +/–12Vdc	Replace Repair	.	1.00 0.75				8,14 8,14	
011125	PCB, Solid–State Relay 24 Channel (PCB3 or PCB4)	Replace		1.50				8,14	
011126	PCB, Solid–State Relay 16 Channel (PCB5 or PCB6)	Replace		1.50				8,14	
011127	Relay Solid State	Replace		0.25				8,14	
011128	Fuse, 5 AMP	Replace		0.33				8,14	
011129	Fuse, 1 AMP	Replace		0.33				8,14	
011130	Sensor, Pressure (LT100 – LT102, LT200, LT201, PT200)	Replace		1.00				8,14	
0112	Operator Panel Assembly								
011200	Alarm (AL1)	Replace		0.75				8,14	
011201	Socket, Lamp (DS3 – DS5)	Replace		0.50				8,14	
011202	Lamp, 12Vdc	Replace	0.08						
011203	Switch, Pushbutton (PBS1 – PBS5)	Replace		0.75				8,14	
011204	Display, Vacuum, Fluorescent (VFD1)	Replace		1.25				8,14	
011205	PCB Assembly, Display Interface (PBS10)	Replace		1.00				8,14	
0113	Enclosure Assembly, Inverter								
011301	Inverter Drive (K100, K104, or K200)	Replace Repair		2.50			8.00	8,14	B
011302	Fan, Tube Axial (M107)	Replace		1.00				8,14	
011303	Contactor, 3–Phase (MC104)	Replace		1.50				8,14	

Table 1. MAC for LADS – Continued.

(1) GROUP NUMBER	(2) COMPONENT/ASSEMBLY	(3) MAINTENANCE FUNCTION	(4) MAINTENANCE LEVEL					(5) TOOLS AND EQUIPMENT REF CODE	(6) REMARKS CODE
			Unit		DS	GS	Depot		
			C	O	F	H	D		
011304	Relay, Overload (OL104)	Replace		1.50				8,14	
011305	Relay, Overload (OL200 or OL300)	Replace		1.50				8,14	
011306	Indicator, Blown Fuse	Replace		0.50				8,14	
011307	Fuse (F4, F5, 0r F6)	Replace		0.50				8,14	
011308	Switch, Pushbutton (PB7 – PBs10)	Replace		1.00				8,14	
0114	Receptacle, Electrical	Replace		0.75				8,14	
02	AUXILIARY EQUIPMENT								
0201	Platform Assembly	Repair				2.00		11	A
020101	Support Leg Assembly	Replace		1.50				1	
0202	Cable, Winch	Replace		1.00				1	
0203	Winch	Replace		3.00				1	
0204	Tarp/Awning	Replace Repair		2.00		 8.00		1	 C
03	ACCESSORIES								
04	PLACARDS								
05	STORAGE LOCKER	Repair				8.00			A
06	FUEL TANK	Service Repair				2.00 8.00		3,14	 A

Table 2. Tool and Test Equipment for the LADS.

Tool or Test Equipment Reference Code	Maintenance Level	Nomenclature	National Stock Number	Tool Number
1	Unit	Adapter, Air Tube		
2	Unit	Brush, Wire	7920–00–282–9246	
3	Unit	Container, 5–Gallon	7240–01–094–4305	
4	DS	Container, 15–Gallon		
5	DS	Funnel, W/Filter		
6	DS	Hose Assy, Drain, Thermal Fluid		
7	Unit	Level, 48 IN	5210–00–727–2081	
8	Unit	Multimeter	6625–01–265–6000	
9	Unit	Puller, Bearing	5120–00–516–3120	
10	DS	Removal Tool, Bearing, Front	863–110610	
11	DS	Removal Tool, Bearing, Rear	863–110600	
12	Unit	Shop Equipment, Automotive Maintenance & Repair; Organizational Level Maintenance, Common NO. 1	4910–00–754–0654	
13	DS	Socket Set, Impact	5130–00–357–5136	
14	Unit	Tool Kit, General Mechanics	5180–00–699–5273	
15	GS	Welding Shop, Trailer Mounted	3431–01–090–1231	
16	DS	Wrench, Torque, 0–1000 Ft. Lbs.	5120–01–555–5021	
17	DS	Wrench, Torque, 30–150 In. Lbs.	5120–01–396–6071	

Table 3. Remarks for the LADS.

REMARKS CODE	REMARKS
A	REPAIR IS LIMITED TO WELDING.
B	RETURN ITEM TO DEPOT FOR REPAIR.
C	TARP CAN BE REPAIRED BY PATCHING OR SEWING TEARS OR REATTACHING OR REPLACING TIEDOWN STRAPS.

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UNIT, DIRECT SUPPORT, AND GENERAL SUPPORT
LAUNDRY ADVANCED SYSTEM
(NSN 3510−01−463−0114)
EXPENDABLE AND DURABLE ITEMS LIST

INTRODUCTION

SCOPE

This work package lists expendable and durable items that you will need to operate and maintain the LADS. This list is for information only and is not authority to requisition the listed items. These items are authorized to you by CTA 50−907, 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 THE EXPENDABLE AND DURABLE ITEMS LIST

Column (1) − Item Number. This number is assigned to the entry in the list and may be referenced in other work packages (e.g., Sealant, Pipe Thread (WP 0281 00, Item 6).

Column (2) − Level. This column indicates the lowest level of maintenance that requires the listed item (O=Unit, F=Direct Support, H=General Support, D=Depot).

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 Measure (U/M). This code shows the physical measurement or count of an item, such as gallon, dozen, gross, etc.

Table 1. Expendable and Durable Items List.

(1) ITEM NUMBER	(2) LEVEL	(3) NATIONAL STOCK NUMBER	(4) DESCRIPTION, CAGEC, AND PART NUMBER	(5) U/M
1	O		Cleaner, Brake	CAN
2	F		Fluid, Thermal, (NONE), PARATHERM–NF	5 GAL
3	O		Grease, General Purpose, NLGI #2, Lithium, Complex EP	TUBE
4	O	7920–00–205–3570	Rag, Wiping, (80244),A–A–2522 GRA/WHIT	EA
5	O	8040–01–481–9565	Sealant, Multi–Purpose, RTV–732, (39428), 7587A32	TUBE
6	O		Sealant, Pipe Thread, (60150), T PLUS 2	CAN
7	O		Sealant, Pipe Thread, (39428), 4592K17	CAN
8	F	8030–01–481–9221	Sealant, Pipe Thread, (05VH4), 51112	TUBE
9	O	9905–00–537–8954	Tags, Marker, (64067)	EA
10	O	8030–00–889–3534	Tape, Anti–Seizing 1/4”, (80244), MIL–T–27730, SZ1	ROLL
11	O	8030–00–889–3535	Tape, Anti–Seizing 1/2”, (81349), MIL–T–27730, SZ2	ROLL

UNIT, DIRECT SUPPORT, AND GENERAL SUPPORT
LAUNDRY ADVANCED SYSTEM
(NSN 3510–01–463–0114)
TOOL IDENTIFICATION LIST

INTRODUCTION

SCOPE

This work package lists all common tools and supplements and special /fixtures needed to maintain the LADS.

EXPLANATION OF COLUMNS IN THE TOOL IDENTIFICATION LIST

Column (1) – Item Number. This number is assigned to the entry in the list and is referenced in the initial setup to identify the item (e.g., Extractor (WP 0090 00, Item 32).

Column (2) – Item Name. This column lists the item by noun nomenclature and other descriptive features (e.g., Gage, belt tension).

Column (3) – National Stock Number. This is the National Stock Number (NSN) assigned to the item; use it to requisition the item.

Column (4) – Part Number/CAGEC. Indicates the primary number used by the manufacturer (individual, company, firm, corporation, or Government activity) which controls the design and characteristics of the item by means of its engineering drawings, specifications, standards, and inspection requirements to identify an item or range of items. The manufacturer’s Commercial and Government Entity Code (CAGEC) is also included.

Column (5) – Reference. This column identifies the authorizing supply catalog or RPSTL for items listed in this work package.

Table 1. Tool Identification List.

(1) ITEM NO.	(2) ITEM NAME	(3) NATIONAL STOCK NUMBER	(4) PART NUMBER/ CAGEC	(5) REFERENCE
1	Adapter, Air Tube		863–410600/4X630	See Item 3, WP 0275 00
2	Brush, Wire	7920–00–282–9246		
3	Container, 5–Gallon	7240–01–094–4305	40014T15/39428	
4	Container, 15–Gallon		4119T5/39428	
5	Funnel, W/Filter		4144T4/39428	
6	Hose Assy, Drain, Thermal Fluid		863–730600/4X630	See Item 4, WP 0275 00
7	Level, 48 in	5210–00–727–2081		
8	Multimeter	6625–01–265–6000		
9	Puller, Bearing	5120–00–516–3120		
10	Removal Tool, Bearing, Front		863–110610/4X630	See Item 2, WP 0275 00
11	Removal Tool, Bearing, Rear		863–110600/4X630	See Item 1, WP 0275 00
12	Shop Equipment, Automotive Maintenance & Repair; Organizational Level Maintenance, Common NO.1	4910–00–754–0654		
13	Socket Set, Impact	5130–00–357–5136		
14	Tool Kit, General Mechanics	5180–00–699–5273		
15	Welding Shop, Trailer Mounted	3431–01–090–1231		
16	Wrench, Torque, 0–1000 Ft. Lbs.	5120–01–555–5021		
17	Wrench, Torque, 30–150 In. Lbs.	5120–01–396–6071		

UNIT, DIRECT SUPPORT, AND GENERAL SUPPORT

LAUNDRY ADVANCED SYSTEM

(NSN 3510–01–463–0114)

MANDATORY REPLACEMENT PARTS

INTRODUCTION

SCOPE

This work package includes a list of all mandatory replacement parts referenced in the tasks initial setups and procedures. These 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.

EXPLANATION OF COLUMNS IN THE MANDATORY REPLACEMENT PARTS LIST

Column (1) – Item Number. This number is assigned to the entry in the list and is referenced in the initial setups and procedures to identify the item (e.g., Gasket, Sanitary (WP 0283 00, Item 7).

Column (2) – Part Number/CAGEC. Indicates the primary number used by the manufacturer (individual, company, firm, corporation, or Government activity) which controls the design and characteristics of the item by means of its engineering drawings, specifications, standards, and inspection requirements to identify an item or range of items. The manufacturer's Commercial and Government Entity Code (CAGEC) is also included.

Column (3) – National Stock Number. This is the National Stock Number (NSN) assigned to the item; use it to requisition the item.

Column (4) – Item Name. This column lists the item by noun nomenclature and other descriptive features (e.g., Washer, Lock, Internal Tooth #4).

Column (5) – Qty, (Quantity). Indicates how many of the item is issued for the number shown in column (1).

Table 1. Mandatory Replacement Parts List.

(1) ITEM NUMBER	(2) PARTNUMBER/CAGEC	(3) NATIONAL STOCK NUMBER	(4) NOMENCLATURE	(5) QTY
1	AD21025/5P055		Element, Fuel/Water Separator	1
2	C40MP–SFY–2/0LU89	5530–01–481–1833	Gasket, Sanitary Fitting, 2 Inch	1
3	MS35333–70/96906	5310–00–550–3715	Washer, Lock, Internal Tooth, #4	1
4	MS35333–71/96906	5310–00–616–3555	Washer, Lock, Internal Tooth, #6	1
5	MS35333–72/96906	5310–00–543–2739	Washer, Lock, Internal Tooth, #8	1
6	MS35333–73/96906	5310–00–543–5933	Washer, Lock, Internal Tooth, #10	1
7	MS35333–74/96906	5310–00–543–2740	Washer, Lock, Internal Tooth, 1/4"	1
8	MS35338–13596906	5310–00–933–8118	Washer, Lock, Spring, #4	1
9	MS35338–139/96906	5310–01–422–3905	Washer, Lock, Spring, 1/4"	1
10	MS35338–140/96906	5310–01–389–7015	Washer, Lock, Spring, 5/16"	1
11	MS35338–141/96906	5310–00–984–7042	Washer, Lock, Spring, 3/8"	1
12	MS35338–143/96906	5310–00–933–8778	Washer, Lock, Spring, 1/2"	1
13	MS35338–43/96906	5310–00–045–3296	Washer, Lock, Spring, #10	1

Table 1. Mandatory Replacement Parts List.

(1) ITEM NUMBER	(2) PARTNUMBER/CAGEC	(3) NATIONAL STOCK NUMBER	(4) NOMENCLATURE	(5) QTY
14	MS35338–44/96906	5310–00–582–5965	Washer, Lock, Spring, 1/4”	1
15	MS35338–45/96906	5310–01–338–7338	Washer, Lock, Spring, 5/16”	1
16	MS35338–46/96906	5130–01–315–3803	Washer, Lock, Spring, 3/8”	1
17	MS35338–48/96906	5130–01–335–4901	Washer, Lock, Spring, 1/2”	1
18	MS35338–50/96906	5310–00–820–6653	Washer, Lock, Spring, 5/8”	1
19	MS35338–51/96906	5310–01–339–6531	Washer, Lock, Spring, 3/4”	1
20	MS35338–53/96906	5310–00–584–7889	Washer, Lock, Spring, 1”	1
21	1X408/25795	3010–01–389–6410	Coupling, Insert	1
22	2A–710/72692	4330–00–844–0413	Element, Fuel Oil Filter	1
23	2F–F4L–5–B/54939	4430–01–481–7643	Filter, In–Line, 5–Micron	1
24	2–12–G00004/66291	5330–01–481–2252	Gasket, Strainer	1
25	2–12–G00408/66291	5330–01–481–2346	Gasket, Flange, 1–1/2 Inch	1
26	2–12–G00410/66291	5330–01–481–2247	Gasket, Flange, 2 Inch	1
27	40MP–SFY–1–1/2/0LU89	5330–01–481–1730	Gasket, Sanitary Fitting, 1–1/2 Inch	1
28	40MP–SFY–2/0LU89	5330–01–481–1833	Gasket, Sanitary Fitting, 2 Inch	1
29	5238713/1Y373	5330–01–481–2240	Gasket, Door	1
30	70215K57/39428	5975–01–481–2424	Strap, Tiedown, Heat–Resistant, 14” LG	100
31	7130K52/39428		Strap, Tiedown, 4” LG	100
32	7130K53/39428	5975–01–437–8377	Strap, Tiedown, 5–1/2” LG	100
33	7130K56/39428	5975–01–481–4977	Strap, Tiedown, 14” LG,	100
34	7134K2/39428		Strap, Tiedown, 6” LG	100
35	80005K51/39428		Strap, Tiedown, 8” LG	100

UNIT, DIRECT SUPPORT, AND GENERAL SUPPORT
LAUNDRY ADVANCED SYSTEM
(NSN 3510–01–463–0114)
WIRING DIAGRAMS

WIRING DIAGRAMS

Wiring diagrams for troubleshooting are provided as foldouts at the end of the manual.

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Subject WP Sequence No. – Page No.

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W

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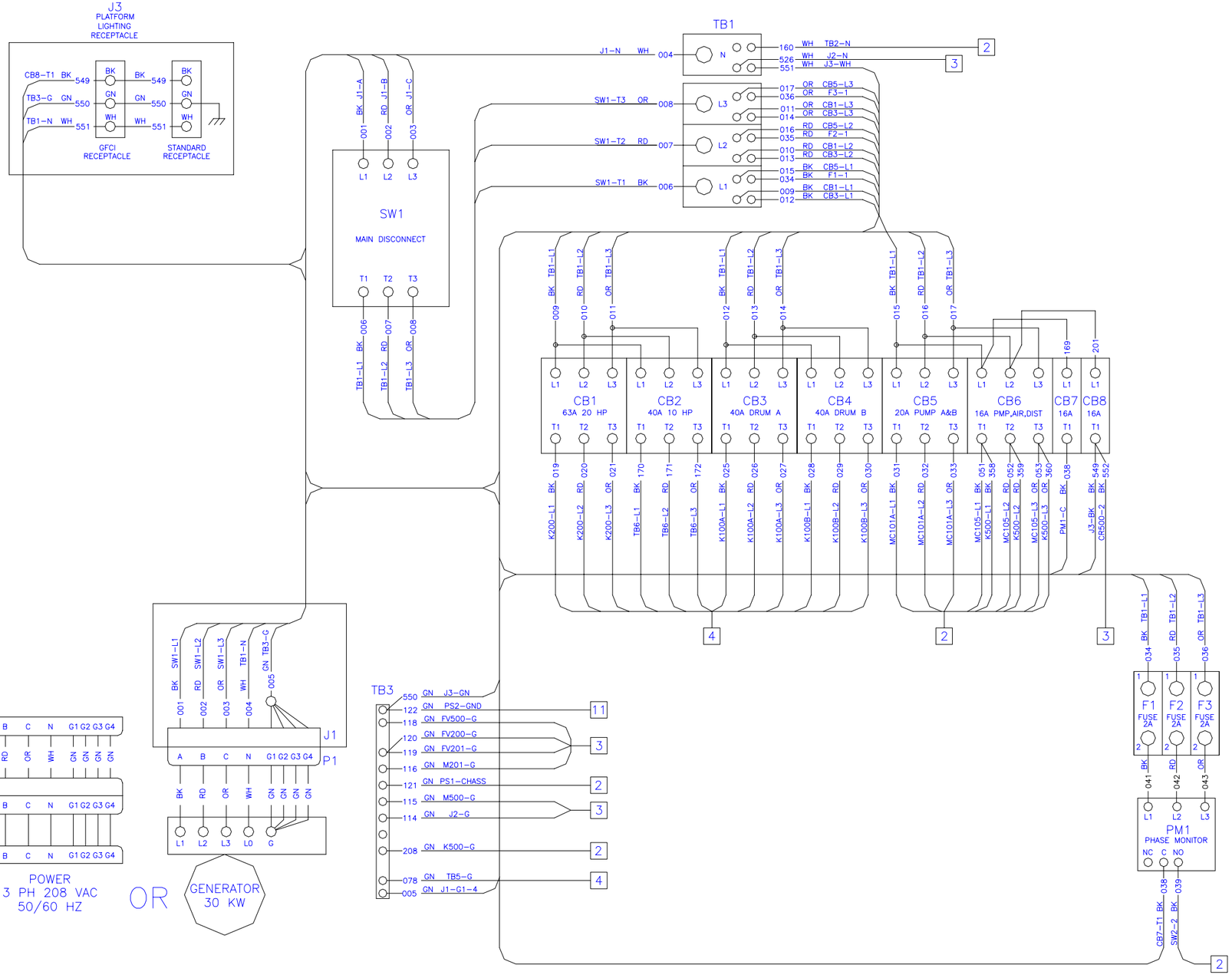

Figure 1. Wiring Diagram (Sheet 1 of 11)

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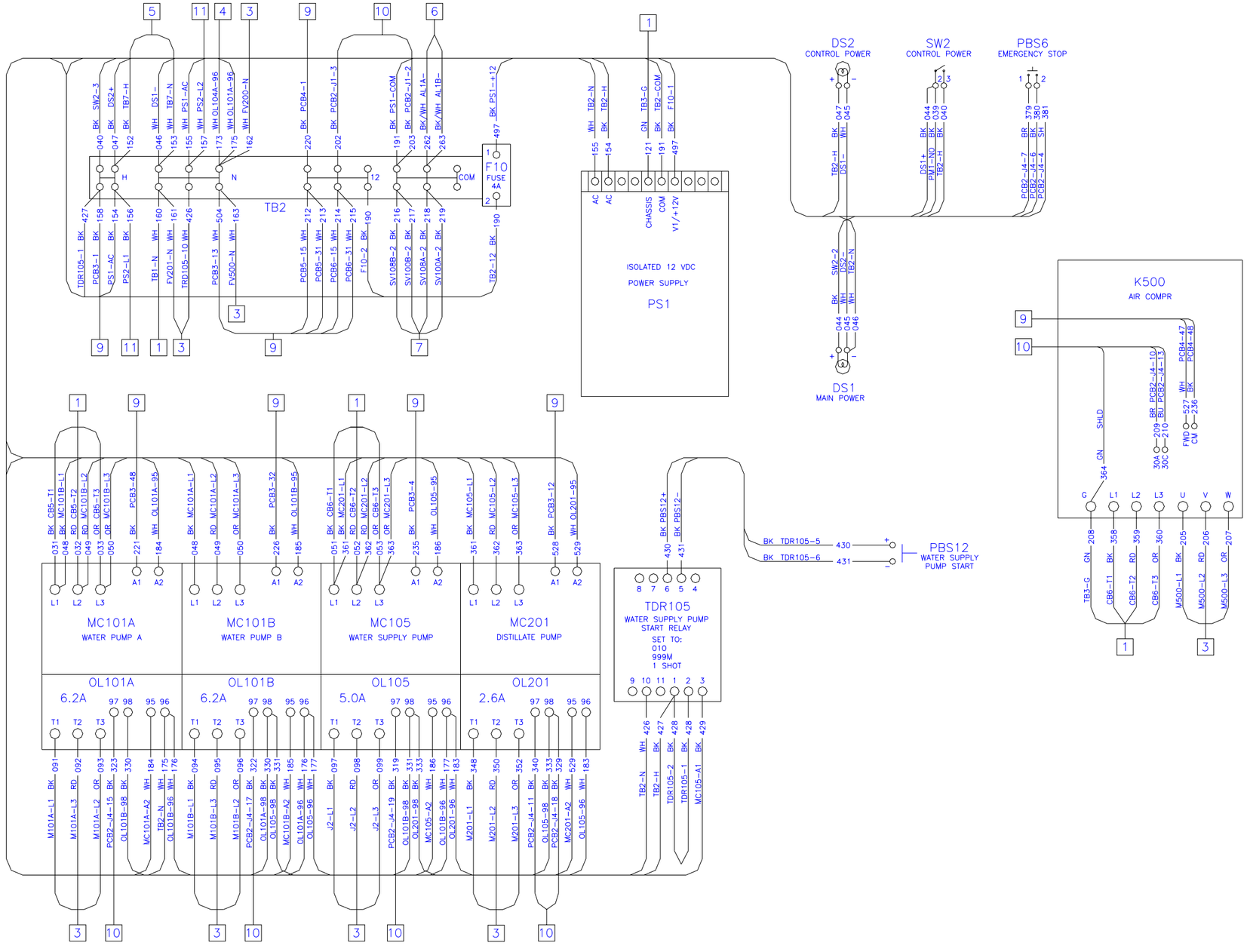

Figure 1. Wiring Diagram (Sheet 2 of 11)

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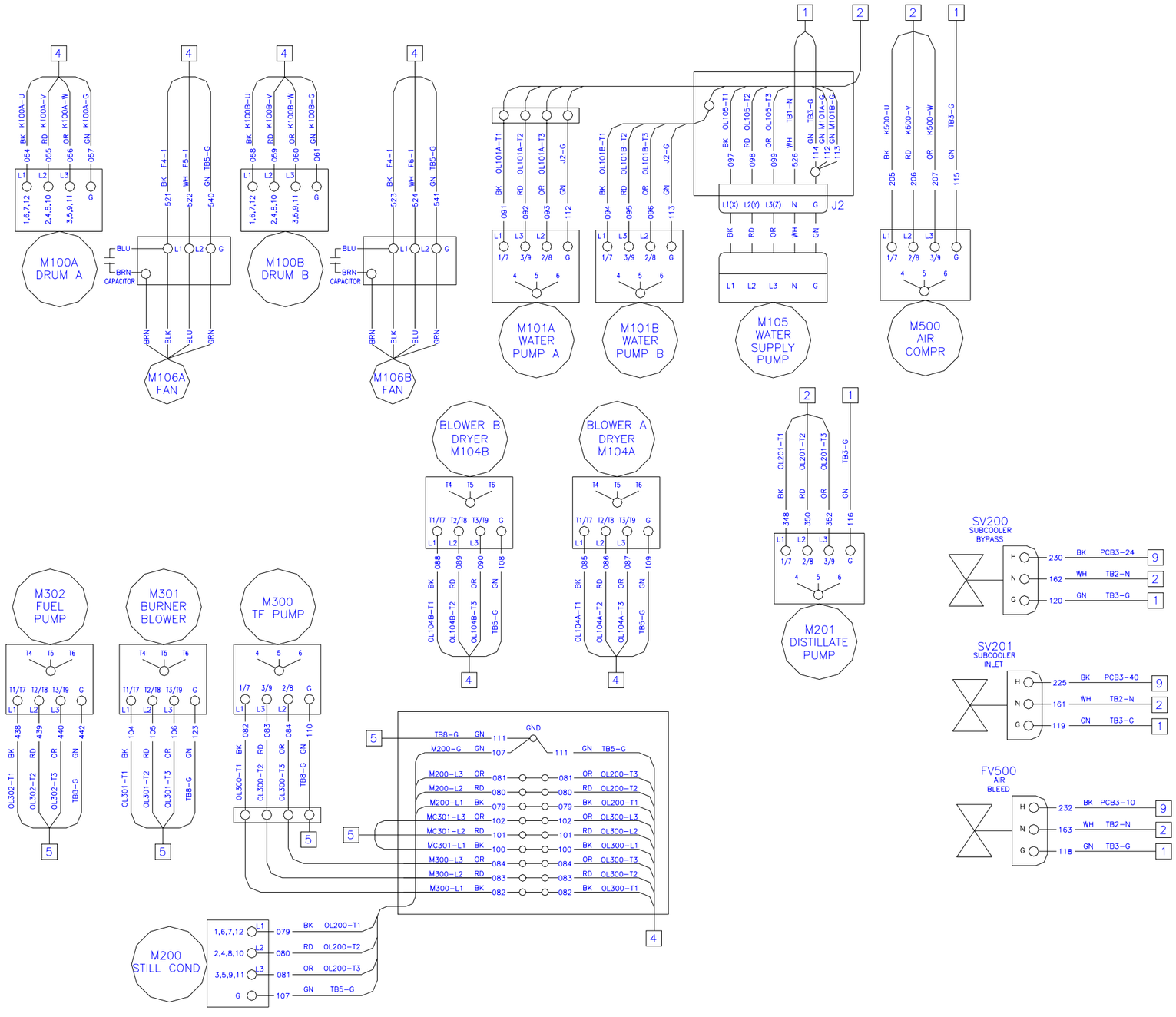

Figure 1. Wiring Diagram (Sheet 3 of 11)

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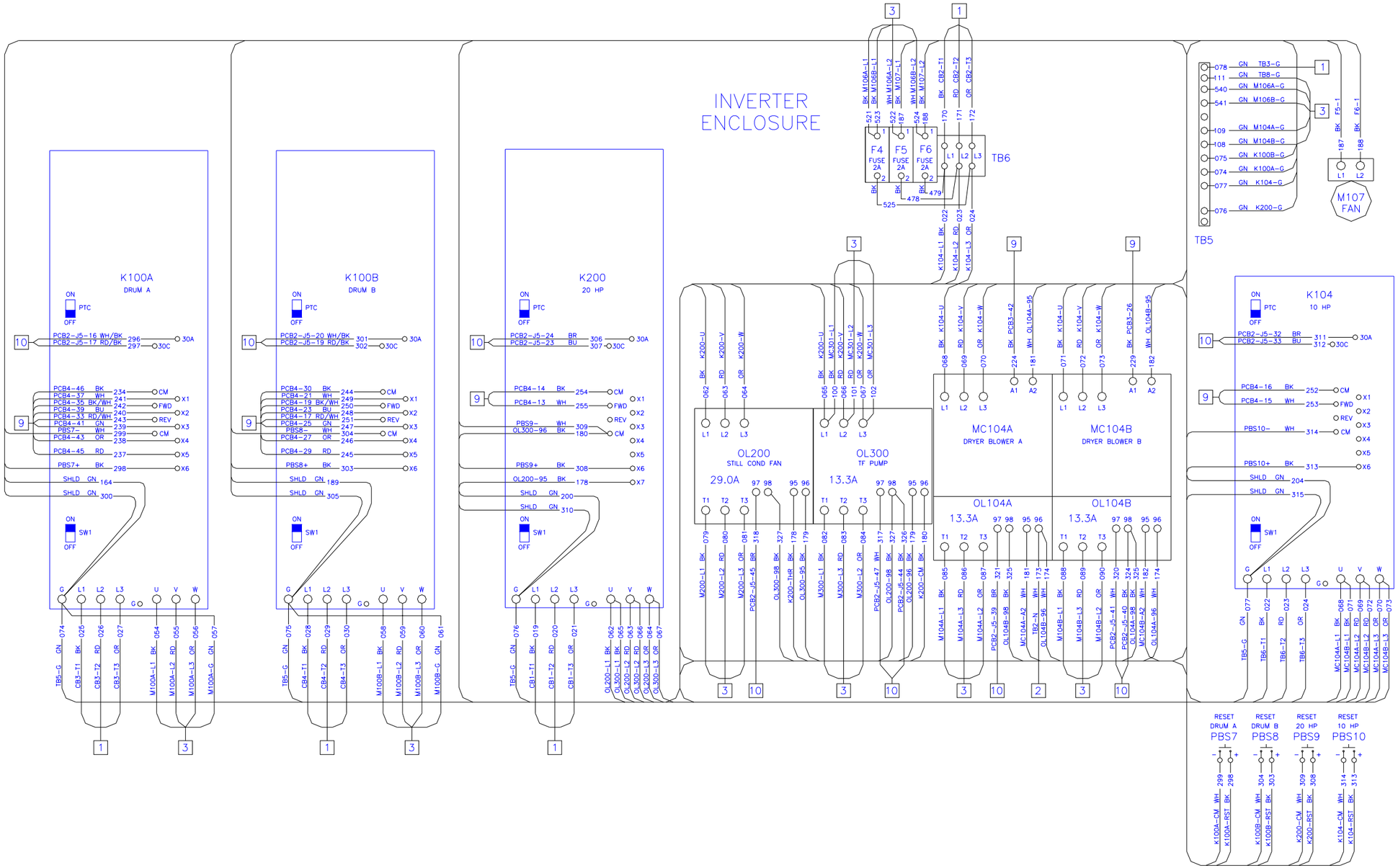

Figure 1. Wiring Diagram (Sheet 4 of 11)

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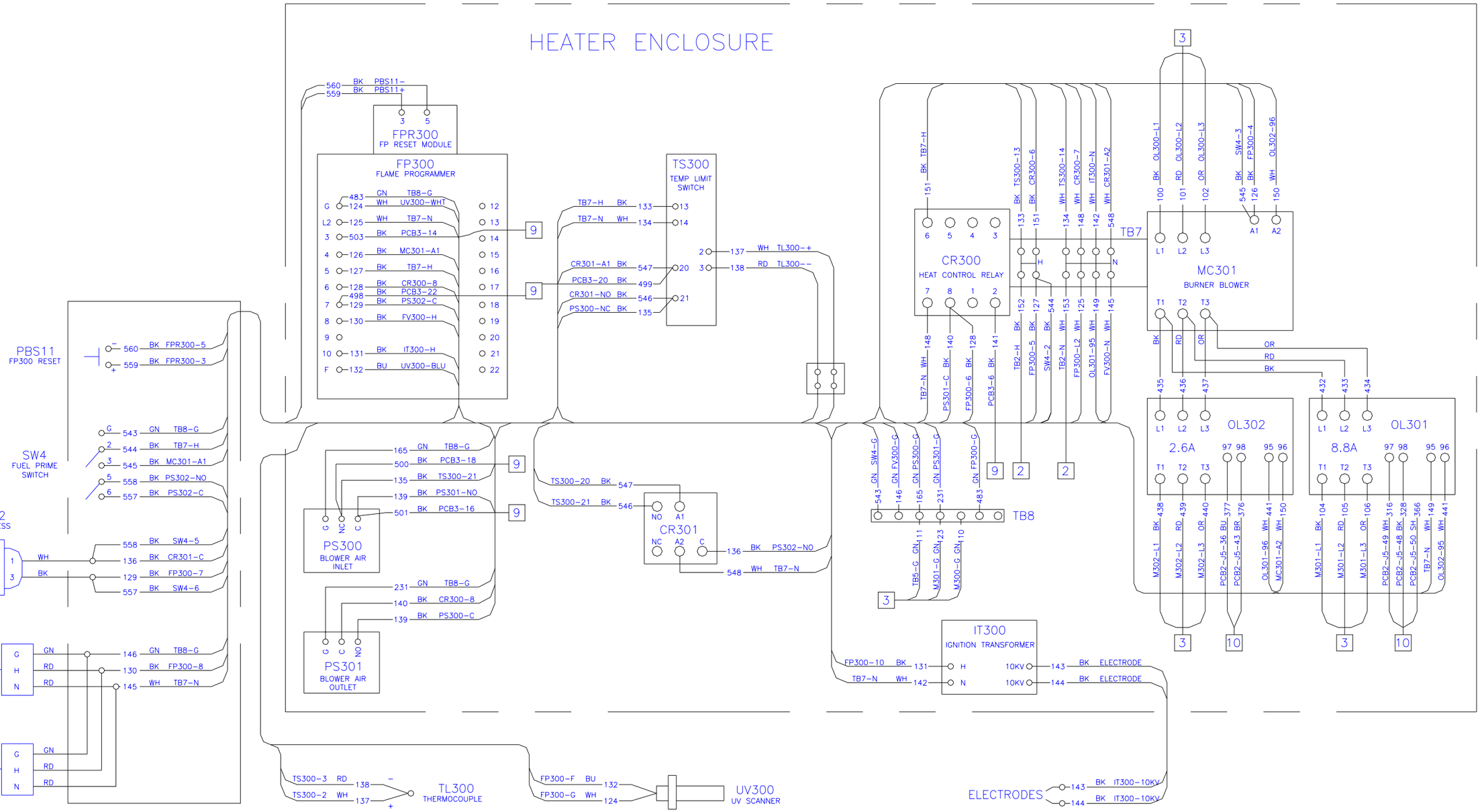

Figure 1. Wiring Diagram (Sheet 5 of 11)

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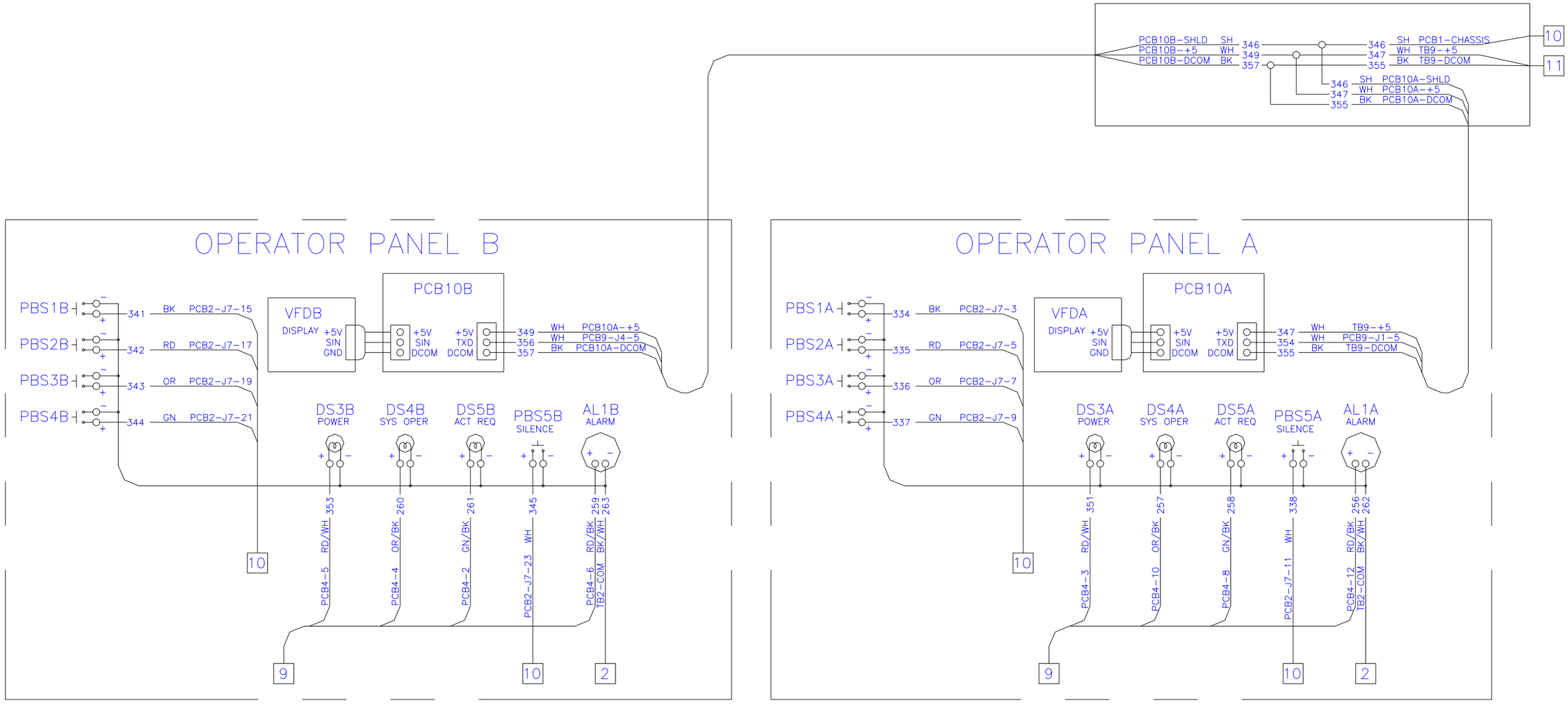

Figure 1. Wiring Diagram (Sheet 6 of 11)

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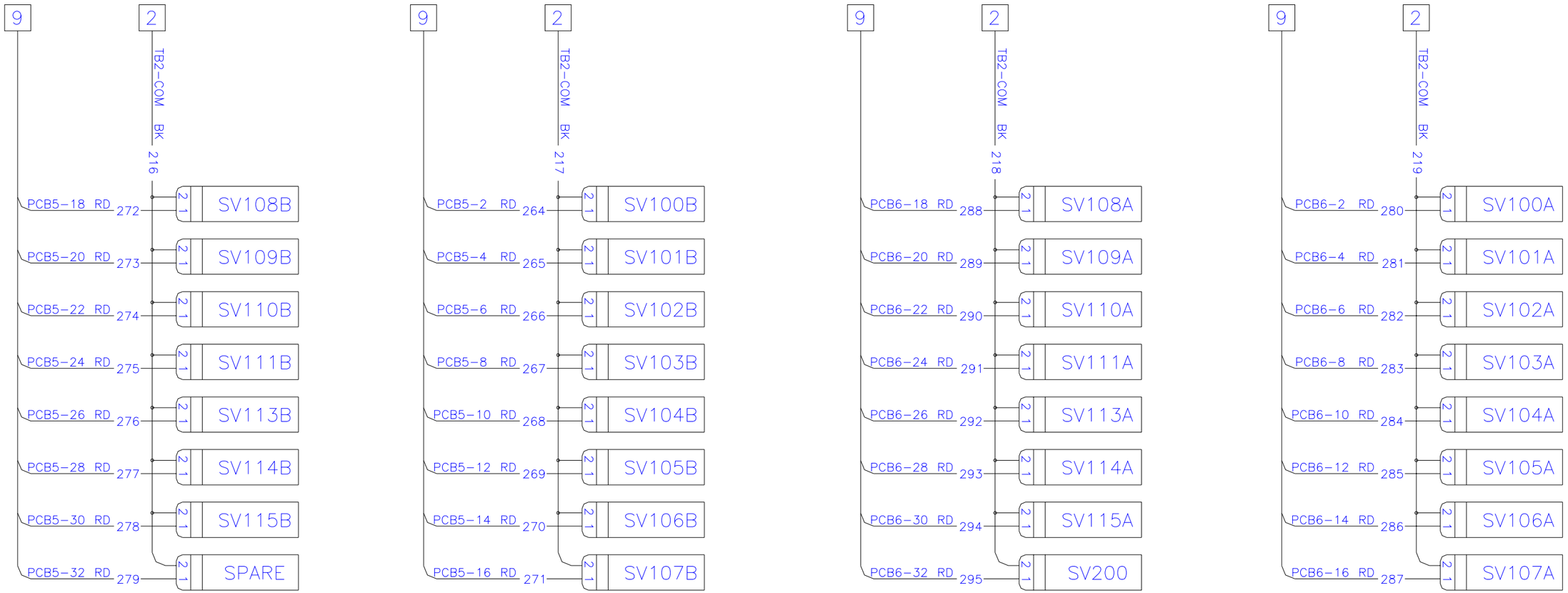

Figure 1. Wiring Diagram (Sheet 7 of 11)

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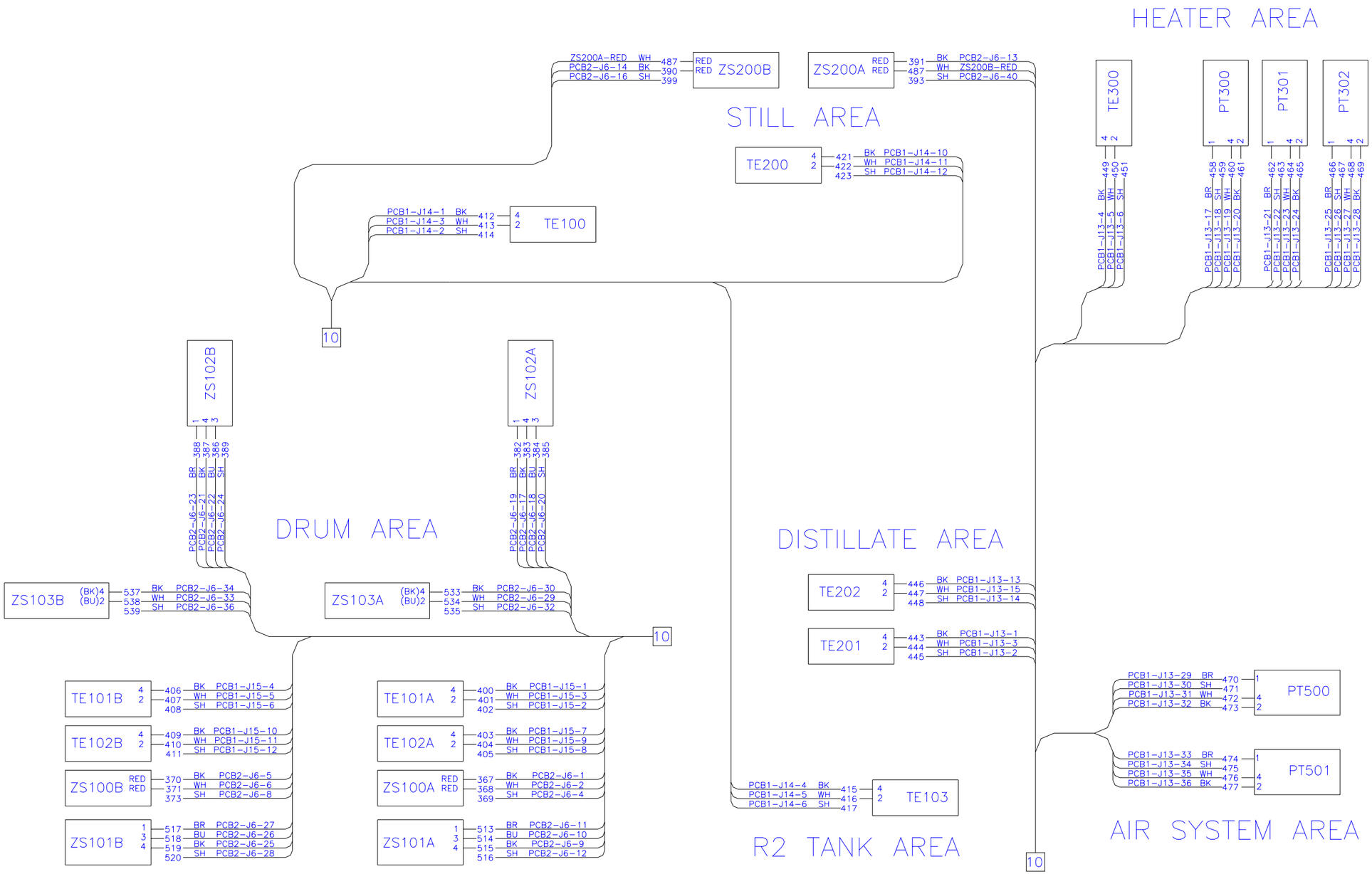

Figure 1. Wiring Diagram (Sheet 8 of 11)

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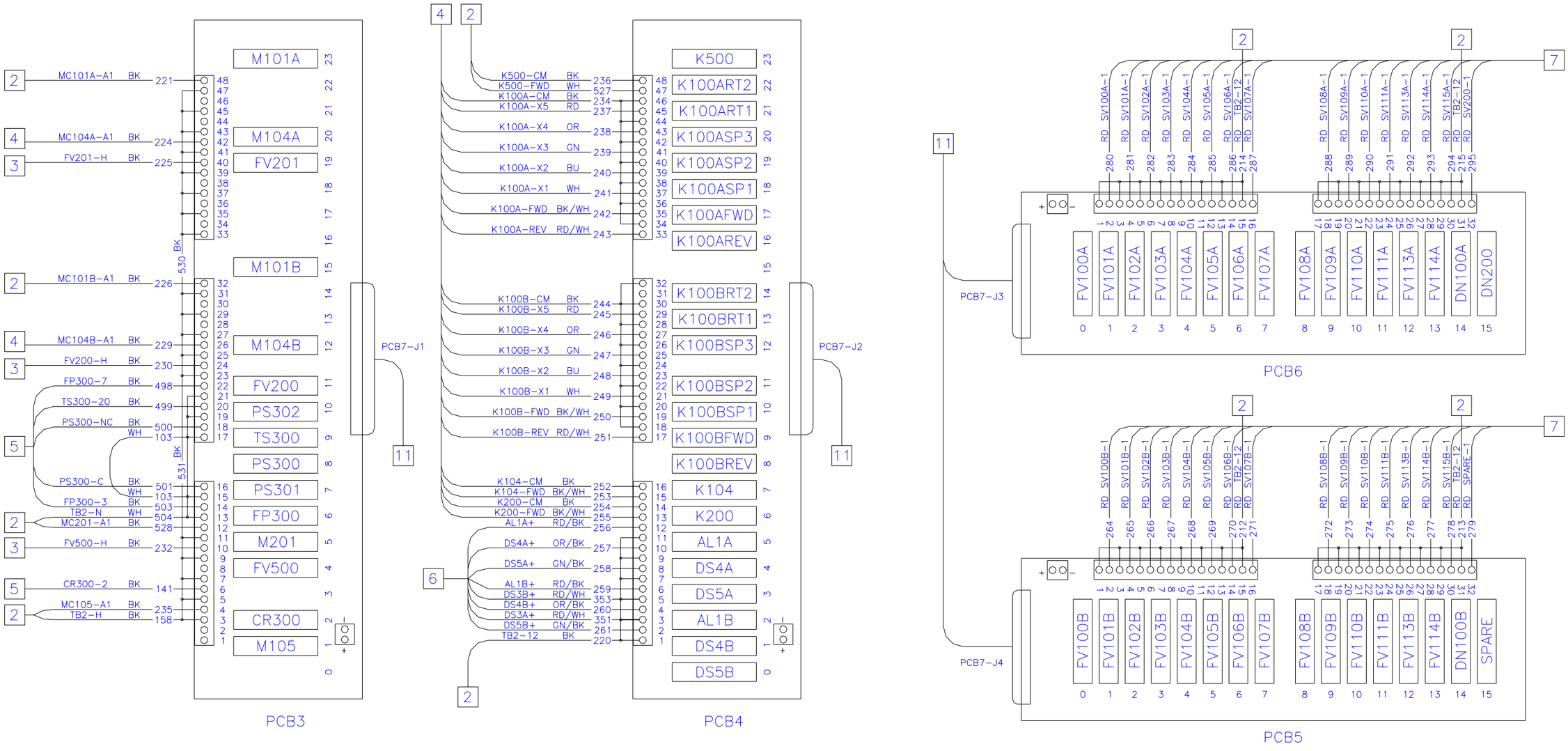

Figure 1. Wiring Diagram (Sheet 9 of 11)

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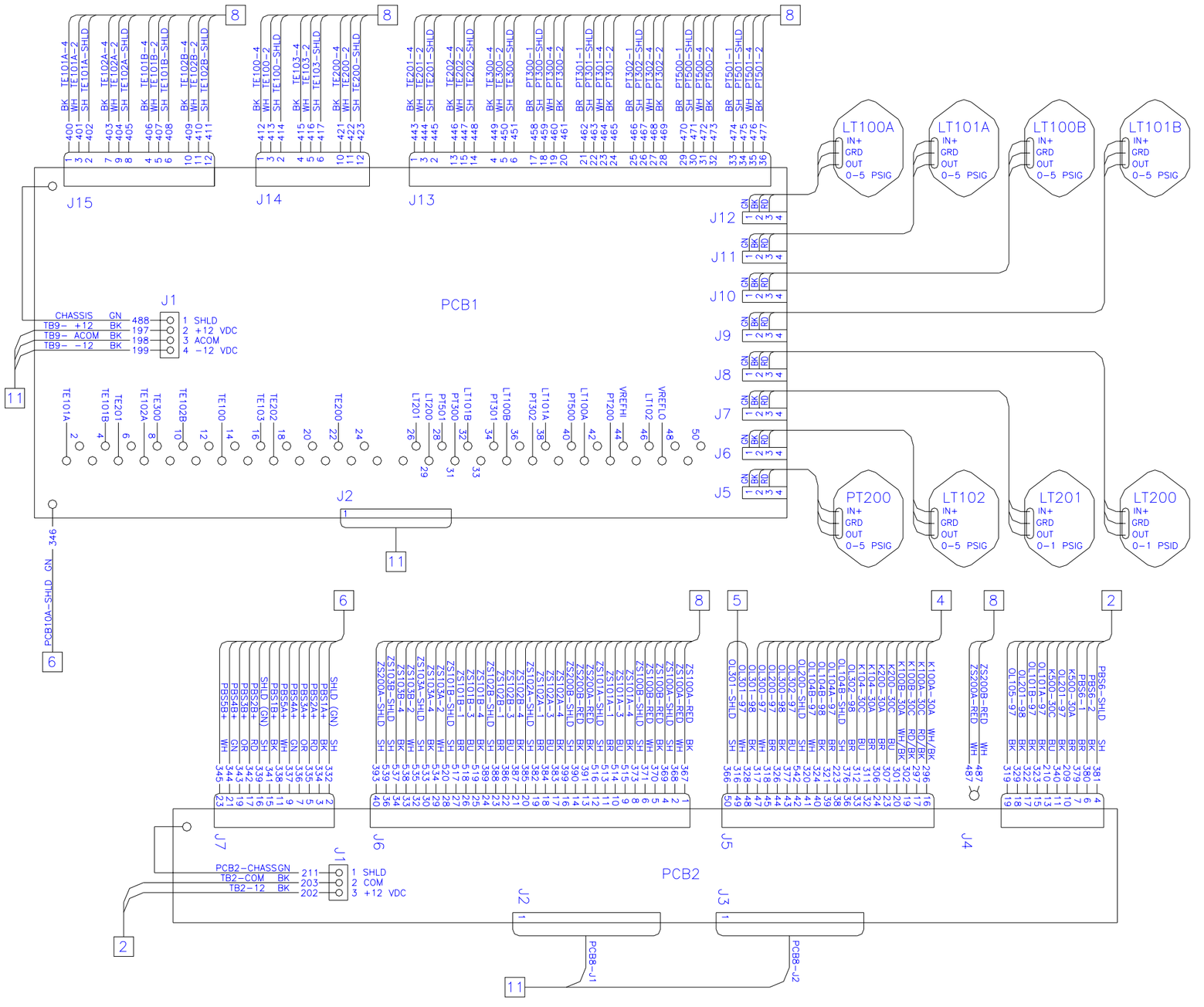

Figure 1. Wiring Diagram (Sheet 10 of 11)

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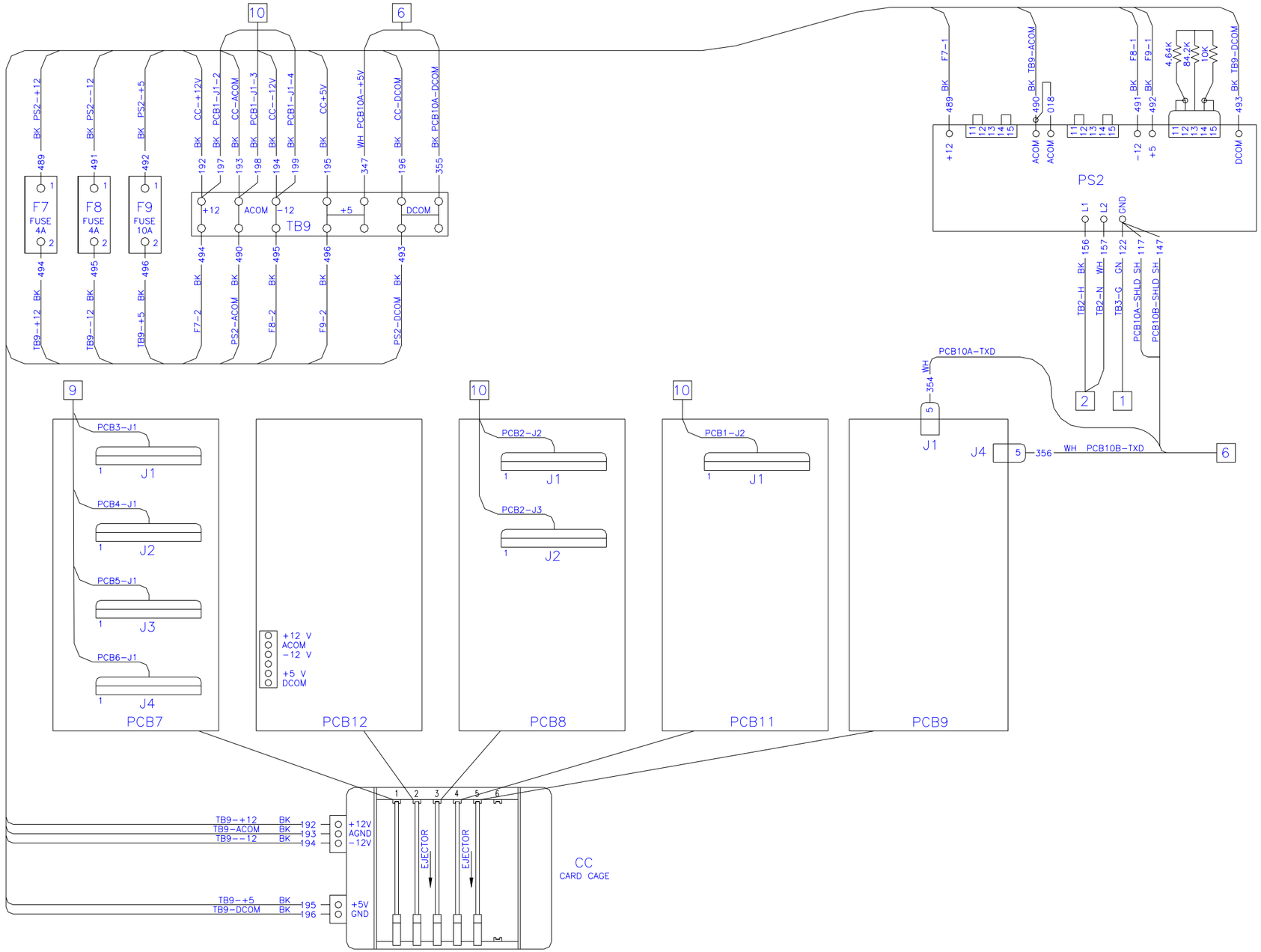

Figure 1. Wiring Diagram (Sheet 11 of 11)

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By Order of the Secretary of the Army:

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

Official:

JOEL B. HUDSON
Administrative Assistant to the Secretary of the Army

0327201

Distribution: To be distributed in accordance with Initial Distribution Number (IDN)256616 requirements for TM 10-3510-221-24

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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.

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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 SOLDIER AND BIOLOGICAL CHEMICAL COMMAND ATTN: AMSSB-RIM-L 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*

DA FORM 2028, FEB 74 REPLACES DA FORM 2028, 1 DEC 68, WHICH WILL BE USED. USAPPC V3.00

TO: (*Forward direct to addressee listed in publication)*	FROM: (*Activity and location) (Include ZIP Code)*	DATE
COMMANDER U.S. ARMY SOLDIER AND BIOLOGICAL CHEMICAL COMMAND ATTN: AMSSB-RIM-L KANSAS STREET NATICK, MA 01760-5052	*PFC Jane Doe* *CO A 3rd Engineer BR* *Ft. Leonardwood, MO 63108*	*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

UASPPC V3.00

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 SOLDIER AND BIOLOGICAL CHEMICAL COMMAND ATTN: AMSSB-RIM-L 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 10-3510-221-24	31 OCTOBER 2003	Laundry Advanced System (LADS)

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.*

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TO: (*Forward direct to addressee listed in publication)*	FROM: (*Activity and location) (Include ZIP Code)*	DATE

PART II – REPAIR PARTS AND SPECIAL TOOL LISTS AND SUPPLY CATALOGS/SUPPLY MANUALS

PUBLICATION NUMBER	DATE	TITLE
TM 10-3510-221-24	31 OCTOBER 2003	Laundry Advanced System (LADS)

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.)*

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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 = 32.8 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 decigram = 10 centigrams = 1.54 grains
1 gram = 10 decigrams = .035 ounce
1 dekagram = 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 = .155 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	liters	.473	milliliters	fluid ounces	.034
quarts	liters	.946	liters	pints	2.113
gallons	liters	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: 078211–000