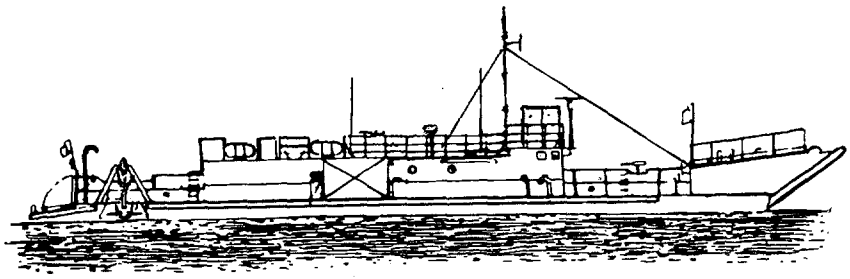
TECHNICAL MANUAL

OPERATOR'S, ORGANIZATIONAL, DIRECT SUPPORT AND GENERAL SUPPORT MAINTENANCE MANUAL

OPERATOR MAINTENANCE INSTRUCTIONS FOR AUXILIARY EQUIPMENT

LANDING CRAFT UTILITY
LCU 1671-1679
NSN 1905-01-009-1056



This manual supersedes TM 55-1905-220-14-9, 8 September 1980

HEADQUARTERS, DEPARTMENT OF THE ARMY
17 JULY 1984

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CHANGE

NO. 1

HEADQUARTERS
DEPARTMENT OF THE ARMY
Washington, D.C., 15 JANUARY 1992

Operator's, Organizational,
Direct Support and General Support
Maintenance Manual

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TM 55-1905-220-14-9, 17 July 1984, is changed as follows:

1. Remove and insert pages as indicated below. New or changed text material is indicated by a vertical bar in the margin. An illustration change is indicated by a miniature pointing hand.

Remove pages	Insert pages
4-995/4-996	4-995/4-996
4-1009 and 4-1010	4-1009 and 4-1010
4-1059 through 4-1113/4-1114	4-1059 through 4-1114
----	4-1114.1 through 4-1114.3/4-1114.4
4-1147 through 4-1170	4-1147 through 4-1170
4-1171 through 4-1180	----
4-1277 through 4-1279/4-1280	4-1277 through 4-1279/4-1280
4-1283 through 4-1285/4-1286	4-1283 through 4-1285/4-1286
4-1311 and 4-1312	4-1311 and 4-1312
4-1329 through 4-1332	4-1329 through 4-1332
4-1367 and 4-1368	4-1367 and 4-1368
----	4-1368.1 through 4-1368.12
4-1371 and 4-1372	4-1371 and 4-1372
4-1375 through 4-1378	4-1375 through 4-1378
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4-1463 and 4-1464	4-1463 and 4-1464
----	4-1464.1/4-1464.2
4-1467 through 4-1470	4-1467 through 4-1470
4-1473 and 4-1474	4-1473 and 4-1474
4-1479 and 4-1480	4-1479 and 4-1480
----	4-1498.1 through 4-1498.16
4-1499 through 4-1510	4-1499 through 4-1510
4-1521 through 4-1551/4-1552	4-1521 through 4-1552
----	4-1552.1 through 4-1552.9/4-1552.10
Index-1 and Index-2	Index-1 and Index-2

2. Retain this sheet in front of manual for reference purposes.

By Order of the Secretary of the Army:

GORDON R. SULLIVAN
General, United States Army

Official:

Chief of Staff

MILTON H. HAMILTON
Administrative Assistant to the
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00393

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WARNING

DEATH

OR SEVERE INJURY MAY RESULT IF PERSONNEL FAIL TO OBSERVE THE GENERAL SAFETY PRECAUTIONS BELOW, AND THE SPECIFIC PRECAUTIONS CONTAINED IN THE TEXT.

Wear safety glasses, safety shoes, and a hard hat to provide adequate protection.

- Death or severe injury may result if personnel fail to use a lifting device that is adequate for the item to be lifted.
- Ear protection must be worn when engines or machinery are in operation.
- Use care when using power tools.
- If cleaning agents are used, be sure area is adequately ventilated, and use protective gloves and goggles, or face shield and apron.
- Acids can cause serious burns or blindness. Avoid contact with eyes, skin, or clothing. Do not breathe vapors. Wear rubber gloves, goggles, and a rubber apron when handling them. When diluting acids, do not add water to acid; the acid must be added to the mixture slowly and with constant mix ing. In case of contact with acid, flush the affected area with plenty of water and obtain medical aid immediately.
- Use the recommended air pressure when using compressed air to clean components. Too much air pressure can rupture, or in some way damage a component and create a hazardous situation that can lead to personal injury.
- Before attempting to remove any compressed air system lines or components, relieve air pressure from system. Failure to do so may result in injury or possible death to maintenance personnel.
- Fuel oil and other petroleum products are highly volatile in extreme heat. To minimize the possibility of explosion, wipe up all spills at once, see that fuel lines and valves are not leaking and pump bilges regularly.

WARNING

- When refueling, shut down the electrical system of the LARC. Observe the no smoking rule. Do not permit anyone to operate tools or equipment which may produce sparks near the refueling operation. Sparks or fire may ignite the diesel fuel and produce an explosion.

- Before disconnecting a line in the hydraulic system, bleed the pressure from that portion of the line, Failure to do so may result in injury or possible death to maintenance personnel.

- When working inside the hydraulic oil supply tank, a portable-type circulating blower should be used to prevent vapor accumulation. For extended work periods inside the tank, an air line tube respirator should be worn. Station an observer outside tank in case worker is overcome by fumes.

- When cutting with a torch, or when welding, al- ways station fire watches, ready with fire extinguishers, in the vicinity on both sides of the plate that is being cut or welded.

- Prior to cutting or welding on the ramp, remove drain plugs on both sides of the ramp and check if ramp interior is primer coated. If primer coated, flush thoroughly with steam, carbon dioxide, or water. Do not reinstall drain plugs until the cutting and/or welding operation is completed. Failure to take this precaution may result in explosion of accumulated primer vapors.

- Ramp hinge pins must be replaced one at a time, allowing three remaining pins to support ramp. Removal of two or more hinge pins may result in the weight of the ramp misaligning the remaining hinges, resulting in damage to ramp and possible injury or death to maintenance personnel.

- Use extreme care when near rotating fans, belts, and pulleys.

- During any removal, disassembly, assembly, or installation of an electrical device, make sure all electrical power is disconnected and tagged. (Circuit breaker in the OFF position and tagged).

WARNING

- Personnel should know the location and operation of all equipment for emergency use.
- Before attempting to operate any equipment, read the instructions completely. Then, return to the appropriate section and follow the instructions.
- If the Halon Fire System is activated (horn sounds), leave the compartment immediately. Check that no one is left, and then close and dog the hatch.
- Use extreme care when handling gasoline for the Salvage Pump.
- Store all flammable material in the Flammable Storage Compartment.
- HIGH VOLTAGE is used in the operation of this equipment.
- DEATH ON CONTACT may result if personnel fail to observe safety precautions.
- Never work on electrical equipment unless there is another person nearby who is familiar with the operation and hazards of the equipment and who is competent in administering first aid.
- Whenever possible, the input power supply to the equipment must be shut off before beginning work on the equipment. When working inside the equipment, after power has been turned off, always ground every part before touching it.
- Do not be misled by the term "low voltage". Potentials as low as 50 volts may cause death under adverse conditions.
- Sewage is an inclusive term generally applied to the mixture of all liquid domestic wastes, especially human body wastes. The character of sewage changes from place to place but it always contains very large numbers of bacteria hundreds of millions per milliliter some of which can cause dangerous illness in man. Typhoid and polio viruses are two examples.

WARNING

- The ingress of these bacteria to the human body is through the mouth or open sores. It is important therefore to observe certain elementary precautions.

a. No food or drink of any nature should be taken into sewage handling areas.

b. Personnel with open cuts or sores should not work on sewage handling equipment.

c. Any sewage spill should be dealt with immediately, before it dries; by washing down with water and a good quality, non-scented disinfectant. Liquid soaps or scented disinfectants should not be used since they only serve to disguise improper clean-up.

d. All personnel should be encouraged to wash their hands on exit from a sewage handling area or after being in contact with sewage handling equipment.

REFRIGERANT-12.

- Refrigerant-12 is practically odorless and nontoxic. It is not necessary to wear a gas mask when servicing equipment in which it is contained unless the conditions necessary for the decomposition of R-.12 to phosgene gas exist.

- Never use a torch or attempt a repair on a line containing R-12 until it is certain that all gas has been pumped out of the section of pipe to be repaired, the area is well ventilated and the line has been valved off. Refrigerant-12 in contact with an open flame of high temperature (about 1,0000F (557.80°C)) decomposes into phosgene, a highly toxic gas.

- Always wear goggles when handling R-12, or servicing equipment in which it is contained, to avoid the possibility of liquid refrigerant coming in contact with the eyes.

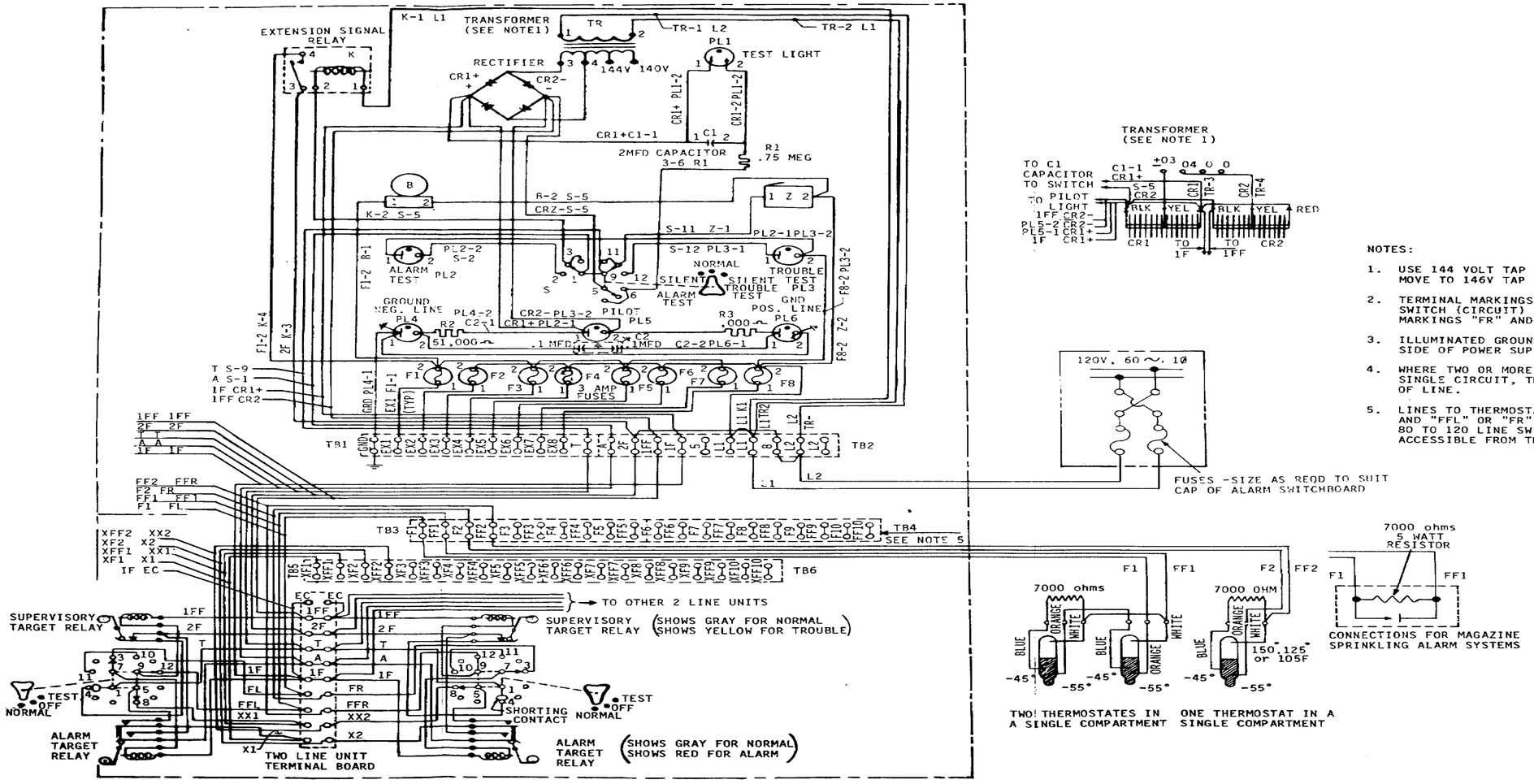
- If liquid R-12 accidentally comes in contact with the eyes, take person suffering the injury to the medical officer at once. Do not rub or irritate the eyes and give the following first aid treatment immediately:

WARNING

a. Introduce drops of sterile mineral oil into the eyes as an irrigant.

b. If irritation continues at all, wash the eyes with a weak boric acid solution, or a sterile salt solution not to exceed 2% sodium chloride.

- Should liquid R-12 come in contact with the skin, treat the injury the same as though the skin had been frost bitten or frozen.
- Do not work in a closed space where R-12 may be leaking unless adequate ventilation is provided.
- Should a person be overcome in a space which lacks oxygen because of high concentrations of R-12 being present, treat such person the same as for suffocation, i.e., through artificial respiration.



NOTES:

1. USE 144 VOLT TAP FOR 10 LINE SWITCHBOARDS WHEN RECTIFIER IS NEW. MOVE TO 146V TAP WHEN RECTIFIER IS FULLY USED.
2. TERMINAL MARKINGS "FL" AND "FFL" REFER TO THE LEFT HAND RELAYS AND SWITCH (CIRCUIT) WHEN SWITCHBOARD IS VIEWED FROM THE FRONT TERMINAL MARKINGS "FR" AND "FFR" REFER TO THE R.H. RELAYS AND SWITCH.
3. ILLUMINATED GROUND POS. OR NEG. LAMP INDICATES GROUND ON + OR - SIDE OF POWER SUPPLY.
4. WHERE TWO OR MORE THERMOSTATIC SWITCHES OR SENSORS ARE USED IN SINGLE CIRCUIT, THE SUPERVISOR RESISTOR SHALL BE PLACED AT END OF LINE.
5. LINES TO THERMOSTATS OR WATER SWITCHES GO DIRECT TO TERMINALS "FL" AND "FFL" OR "FR" AND "FFR" OF EACH 2 LINE UNIT TERMINAL BOARD IN 80 TO 120 LINE SWITCHBOARDS WHERE THESE TERMINAL BOARDS ARE ACCESSIBLE FROM THE BACK OF THE SWITCHBOARD.

FO-1. Alarm Switchboard Wiring Diagram.

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NO. 55-1905-220-14-9

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WASHINGTON, D.C., 17 July 1984

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LANDING CRAFT UTILITY
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NSN 1905-01-009-1056

REPORTING OF 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 direct to: Commander, U.S. Army Troop Support Command, ATTN: DRSTR-MPS, 4300 Goodfellow Blvd., St. Louis, MO 63120. A reply will be furnished to you.

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CHAPTER 4
OPERATOR MAINTENANCE INSTRUCTIONS FOR
AUXILIARY EQUIPMENT (CONTINUED)

SECTION IV. TROUBLESHOOTING - SYMPTOM INDEX (con't)

4-35. THERMAL EXPANSION VALVE - AIR CONDITIONING - MAINTENANCE INSTRUCTIONS (Cont).

a. General.

(1) Thermal expansion valve troubles can usually be traced to dirt or moisture collecting at the valve seat and orifice. Dirt will get between the valve seat and stem, or moisture will freeze at the valve port, and prevent the passage of refrigerant. External frost on the inlet side of the valve indicates an obstruction and the need for cleaning.

(2) To clean, inspect, or repair a thermal expansion valve, pump down the strainer and controls as explained in paragraph b and disassemble the valve.

(3) A new power or cage assembly, or both, can be installed without removing the valve body flange from the line.

NOTE

In an emergency, expansion valve freeze up may be avoided by adding to system not more than 1 cc of anhydrous methyl alcohol per pound of refrigerant charge.

b. Pumping Down.

To replace the thermal expansion valve, proceed as follows:

(1) Close the cut-out valve on the inlet side of the strainer, and operate system to pump down.

(2) As the pressure is reduced, the strainer will become cold and then begin to warm up as soon as liquid refrigerant has been removed.

(3) Close the cut-out valve on the outlet side.

(4) Disassemble valve.

(5) Remove thermal expansion valve in accordance with standard soldering methods. Be careful to retain all the solder in the connections. Refer to paragraph 4-35.6 for soldering procedures.

4-35. THERMAL EXPANSION VALVE - AIR CONDITIONING - MAINTENANCE INSTRUCTIONS (Cont).

(6) Plug openings to exclude air and moisture.

(7) Install and reassemble thermal expansion valve.

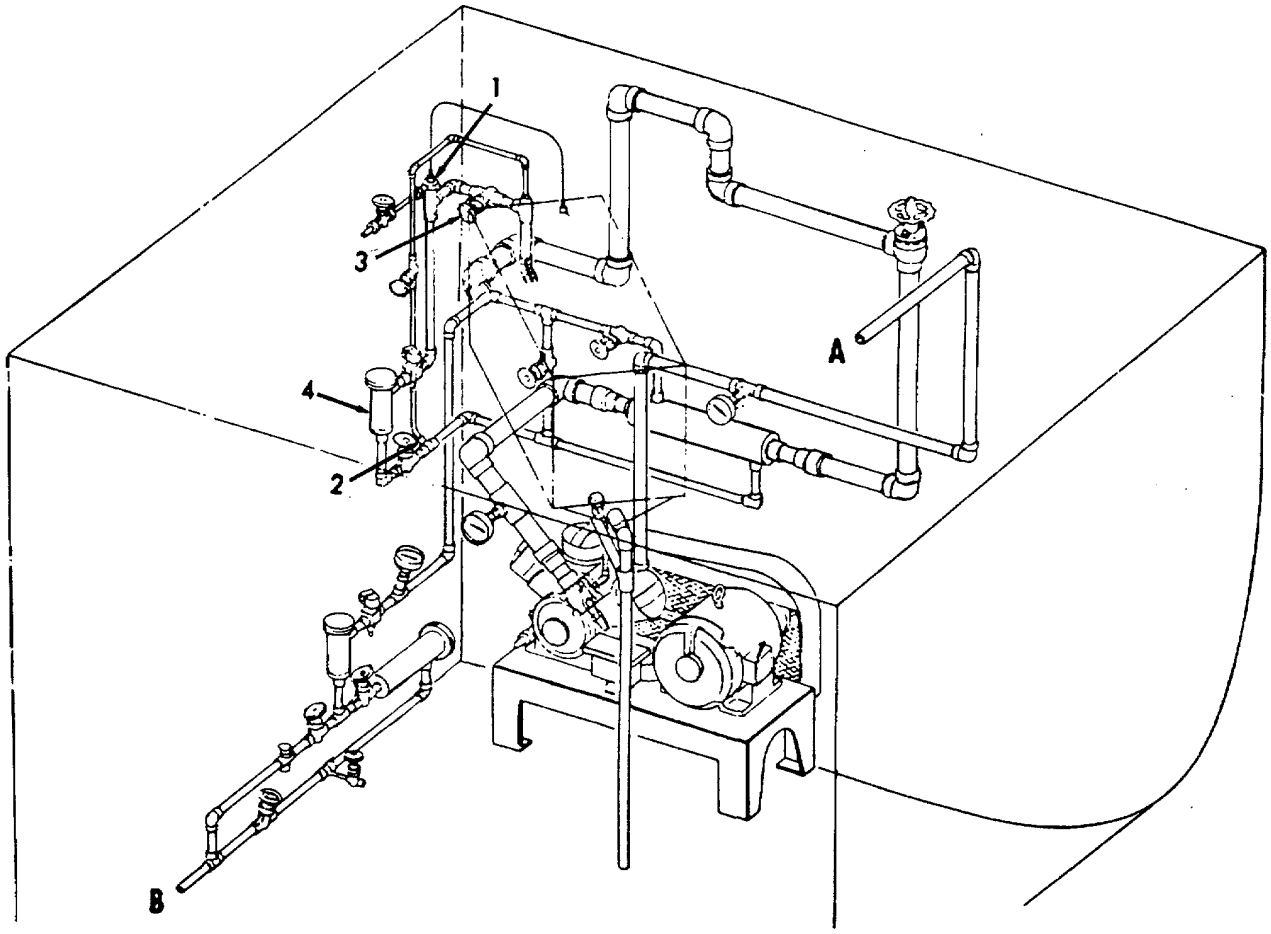
(8) Loosen strainer cover.

(9) Open cut-out valves on both sides of strainer one at a time

(10) Quickly tighten strainer cover.

(11) Open cut-out valves.

(12) Resume normal operation.



1. Thermal expansion valve
2. Inlet cut-out valve
3. Outlet cut-out valve
4. Strainer

4-35. THERMAL EXPANSION VALVE - AIR CONDITIONING - MAINTENANCE INSTRUCTIONS (Cont).

This task covers:

a. Inspection **b. Repair**
c. Removal/Installation **d. Adjustment**

INITIAL SETUP:

Test Equipment

NONE

References

Paragraph	
4-29r	Leak Detection
4-36.6	Tubing Maintenance

Special Tools

NONE

Equipment Condition: NONE

Material/Parts

Gasket kit Y13455-1

Special Environmental Conditions

NONE

Personnel Required

1

General Safety Instructions

Observe safety precautions in paragraph 4-29d.

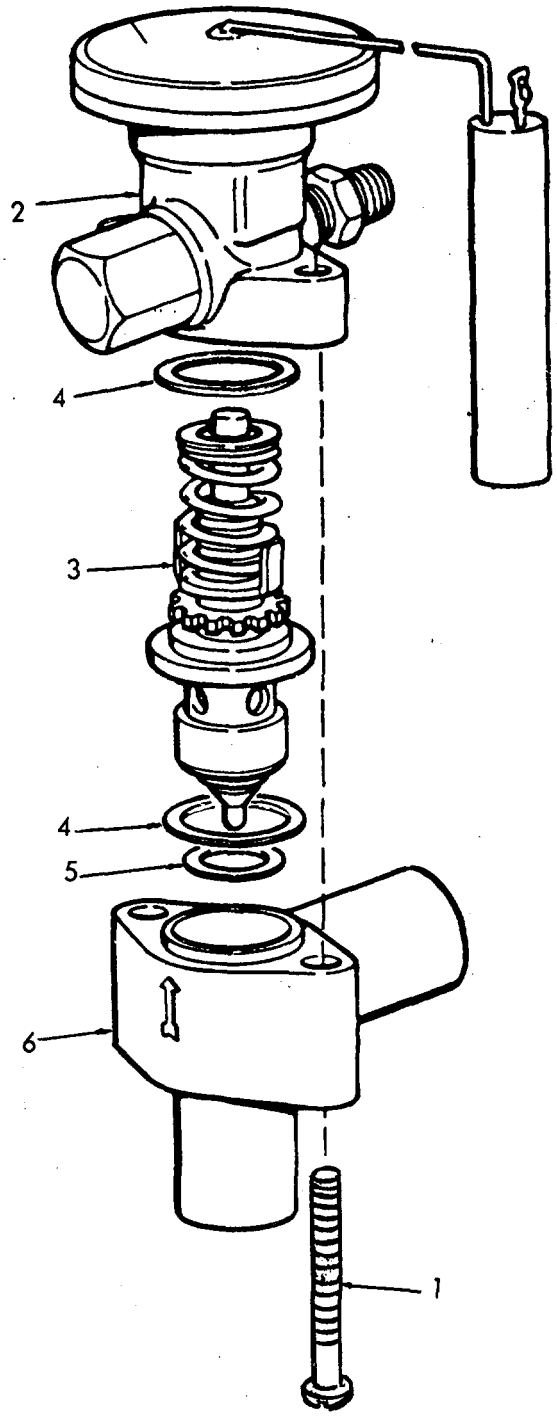
LOCATION	ITEM	ACTION	REMARKS
INSPECTION			
1. Thermal expansion valve	a. Valve	1. Inspect for breaks, cracks and signs of damage.	
		2. Inspect for leaks.	
		3. Inspect for frost.	The valve is obstructed and requires a cleaning.
	b. Bulb	1. Inspect for bends and signs of damage.	
		2. Inspect for proper installation.	

4-35. THERMAL EXPANSION VALVE - AIR CONDITIONING - MAINTENANCE INSTRUCTIONS (Cont).

LOCATION	ITEM	ACTION	REMARKS
REPAIR			
2.	a. Screws (1)	Remove.	
	b. Power assembly (2) and bulb	Remove.	Use care not to damage bulb and tubing.
	c. Cage assembly (3) and gaskets (4 and 5)	Remove.	Discard gaskets.
	d. Cage assembly (3) and gaskets (4 and 5)	Assemble in body (6)	Use new gaskets.
	e. Power assembly (2) and bulb	1. Install power assembly.	a. The two lugs on the cage assembly fit into the grooves provided for them in the power assembly. b. The gear wheel on the cage assembly meshes with the adjusting stem gear inside the power assembly. c. Do not force the valve together.

4-35. THERMAL EXPANSION VALVE - AIR CONDITIONING - MAINTENANCE INSTRUCTIONS (Cont).

LOCATION	ITEM	ACTION	REMARKS
REPAIR (Cont)			



4-35. THERMAL EXPANSION VALVE - AIR CONDITIONING - MAINTENANCE INSTRUCTIONS (Cont).

LOCATION	ITEM	ACTION	REMARKS
REPAIR (Cont)			
			d. Make the cage fit properly before tightening body flange.
		2. Install bulb	
	f. Screws (1)	Install	
REMOVAL/INSTALLATION			
3.		Remove valve in accordance with procedure in paragraph 4-35b.	
		NOTE Be sure to install the thermal expansion valve so that the flow of refrigerant is in the direction indicated by the arrow on valve body.	
ADJUSTMENT			
4.		a. The thermal expansion valves are factory set to maintain the suction gas leaving evaporator at 8º to -10°F (13.3 to -23.3°C) superheat.	
		b. To adjust superheat setting remove seal cap on side of valve and turn adjusting stem. Turning stem to right decreases refrigerant flow and raises super-heat.	
		c. Turning stem to left increases refrigerant flow and lowers superheat. Two turns of stem will change superheat about 1°F (-17.2°C). Adjust two turns at a time.	
		d. Adjust each expansion valve separately and wait between adjustments to observe results. Always tighten any loose connections and replace seal cap after adjustments.	