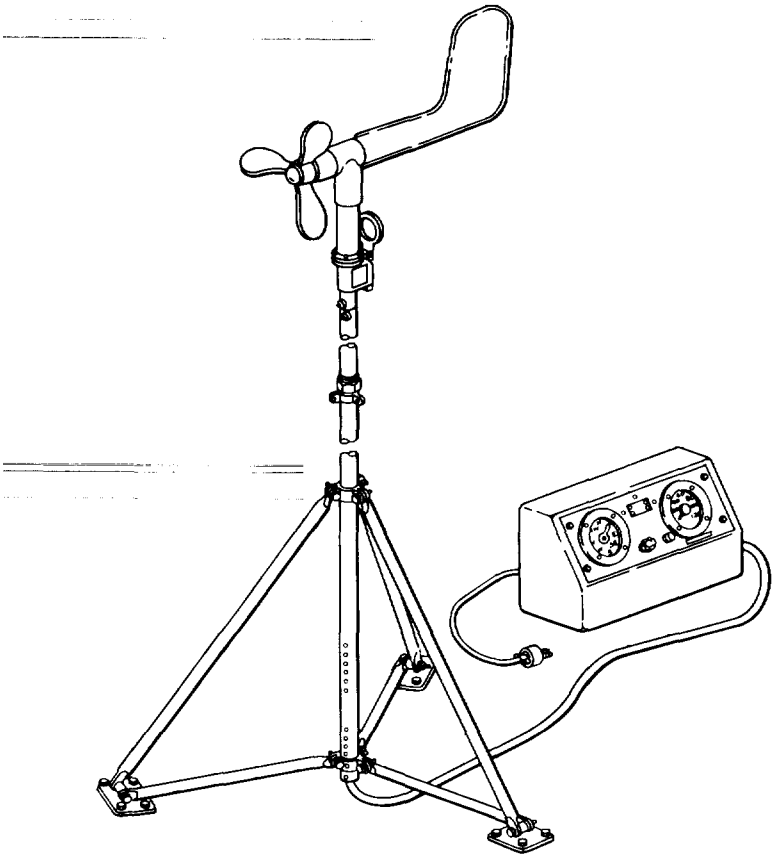
TECHNICAL MANUAL

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



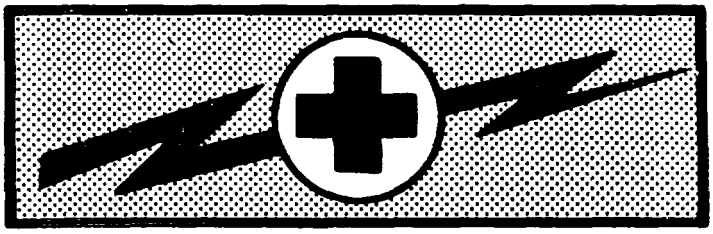
WIND MEASURING SET
AN/GMQ-11
(NSN 6660-00-663-8084)

HEADQUARTERS, DEPARTMENT OF THE ARMY
30 JULY 1984

5 SAFETY STEPS TO FOLLOW IF SOMEONE IS THE VICTIM OF ELECTRICAL SHOCK

1. DO NOT TRY TO PULL OR GRAB THE INDIVIDUAL
2. IF POSSIBLE, TURN OFF THE ELECTRICAL POWER
3. IF YOU CANNOT TURN OFF THE ELECTRICAL POWER, PULL, PUSH OR LIFT THE PERSON TO SAFETY USING A DRY WOODEN POLE OR A DRY ROPE OR SOME OTHER INSULATING MATERIAL
4. SEND FOR HELP AS SOON AS POSSIBLE
5. AFTER THE INJURED PERSON IS FREE OF CONTACT WITH THE SOURCE OF ELECTRICAL SHOCK, MOVE THE PERSON A SHORT DISTANCE AWAY AND IMMEDIATELY START ARTIFICIAL RESUSCITATION

WARNING



WARNING

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 electronic 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. When the technician is aided by operators, he must warn them about dangerous areas.

Whenever possible, the power supply to the equipment must be shut off before beginning work on the equipment. Take particular care to ground every capacitor likely to hold a dangerous potential. When working Inside the equipment, after the power has been turned off, always ground every part before touching it.

Be careful not to contact high-voltage connections of 115 volt ac Input connections when installing or operating this equipment. Whenever the nature of the operation permits, keep one hand away from the equipment to reduce the hazard of current flowing through vital organs of the body.

WARNING Do not be misled by the term "low voltage". Potentials as low as 50 volts may cause death under adverse conditions.

For Artificial Respiration, refer to FM 21-11.

Technical Manual

No. 11-6660-200-14

HEADQUARTERS
DEPARTMENT OF THE ARMY
Washington, DC, 30 July 1984

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

WIND MEASURING SET ANIGMQ-11 (NSN 6660-00-663-8084)

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 direct to: Commander, US Army Communications-Electronics Command and Fort Monmouth, ATTN: DRSEL-ME-MP, Fort Monmouth, New Jersey, 07703-5007. A reply will be furnished to you.

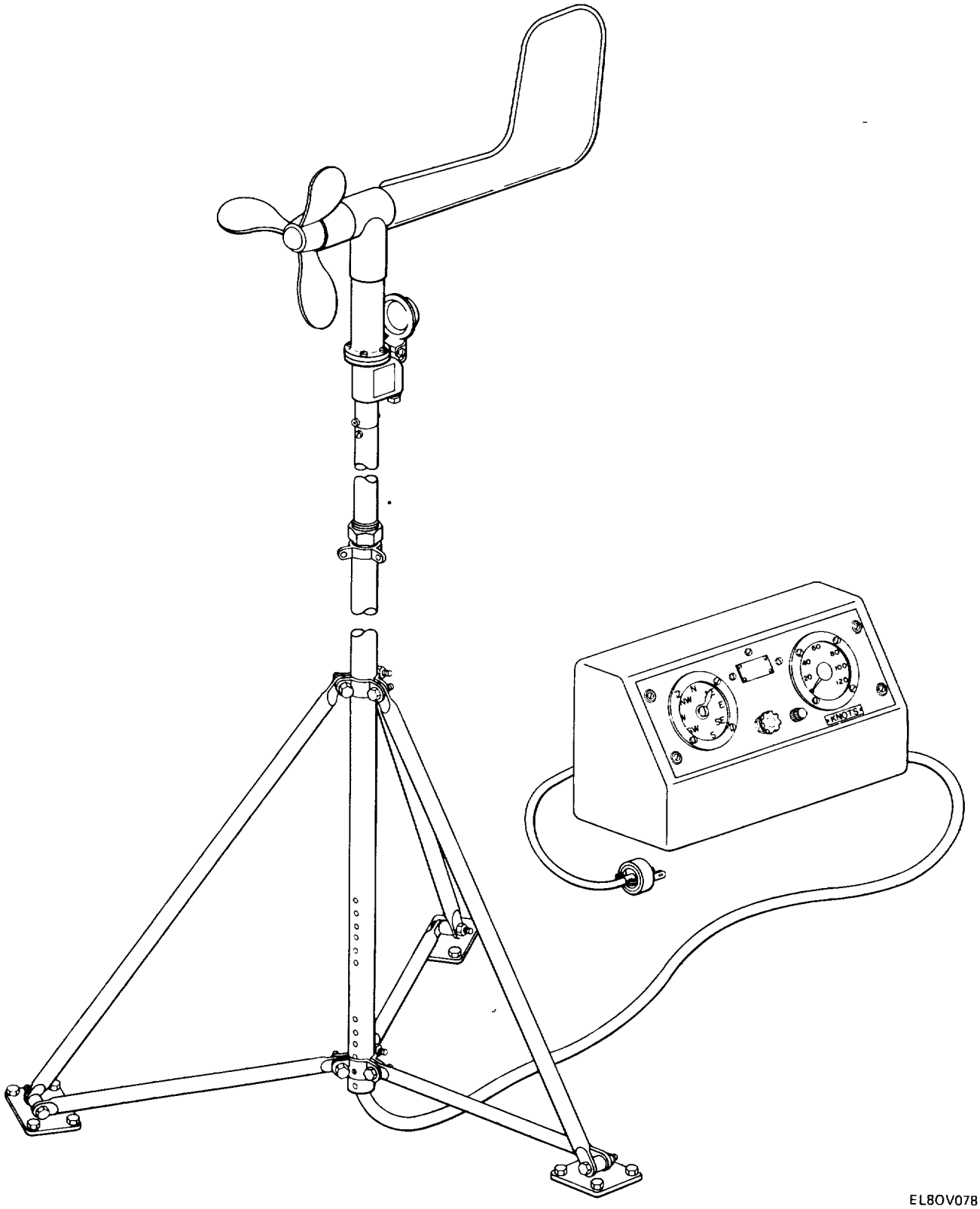
*This manual supersedes TM 11-6660-200-10, 6 August 1963, TM 11-6660-200-20, 6 August 1963, and TM 11-6660-200-35, 7 November 1958, including all changes.

HOW TO USE THIS MANUAL

This manual is designed to help you operate and maintain the Wind Measuring Set AN/GMQ-11. The front cover table of contents is provided for quick reference to important information. There is also an index located in the final pages for use in locating specific items of information.

Warning pages are located in the front of this manual. You should learn the warnings before operating or doing maintenance on the equipment.

Paragraphs in this manual are numbered by chapter and order of appearance within a chapter. A subject index appears at the beginning of each chapter listing sections that are included in that chapter. A more specific subject index is located at the beginning of each section to help you find the exact paragraph you are looking for.



Wind Measuring Set AN/GMQ-11

CHAPTER 1

INTRODUCTION

Section I GENERAL INFORMATION

1-1. SCOPE.

Type of Manual: Operator's, organizational, direct support, and general support maintenance manual.

Equipment Name and Model Number: Wind Measuring Set AN/GMQ-11. Equipment configurations may vary according to manufacturer.

Purpose of Equipment: To measure windspeed and indicate wind direction.

1-2. CONSOLIDATED INDEX OF ARMY PUBLICATIONS AND BLANK FORMS.

Refer to the latest issue of DA Pam 310-1 to determine whether there are new editions, changes, or additional publications pertaining to the equipment.

1-3. MAINTENANCE FORMS, RECORDS, AND REPORTS.

REPORTS OF MAINTENANCE AND UNSATISFACTORY EQUIPMENT

Department of the Army forms and procedures used for equipment maintenance will be those prescribed by DA Pam 738-750 as contained in Maintenance Management Update.

REPORT OF PACKAGING AND HANDLING DEFICIENCIES

Fill out and forward SF 364 (Report of Discrepancy (ROD)) as prescribed in AR 735-11-2/DLAR 4140.55/NAVMATINST 4355.73A/AFR 400-54/MCO 4430.3F.

DISCREPANCY IN SHIPMENT REPORT (DISREP) (SF 361)

Fill out and forward Discrepancy in Shipment Report (DISREP) (SF 361) as prescribed in AR 55-38/NAVSUPINST 4610.33C/AFR 75-18/MCO P4610.19D/DLAR 4500.15.

1-4. REPORTING EOUIPMENT IMPROVEMENT RECOMMENDATIONS (EIR).

If your Wind Measuring Set AN/GMQ-11 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. Put it on an SF 368 (Quality Deficiency Report). Mail it to: Commander, US Army Communications-Electronics Command and Fort Monmouth, ATTN: DRSEL-ME-MP, Fort Monmouth, New Jersey, 07703-5007. A reply will be sent to you.

1-5. DESTRUCTION OF ARMY MATERIEL TO PREVENT ENEMY USE.

Destruction of Army equipment to prevent enemy use shall be in accordance with TM 750-244-2.

1-6. NOMENCLATURE CROSS-REFERENCE LIST.

This list contains common names used in place of official nomenclature in this manual.

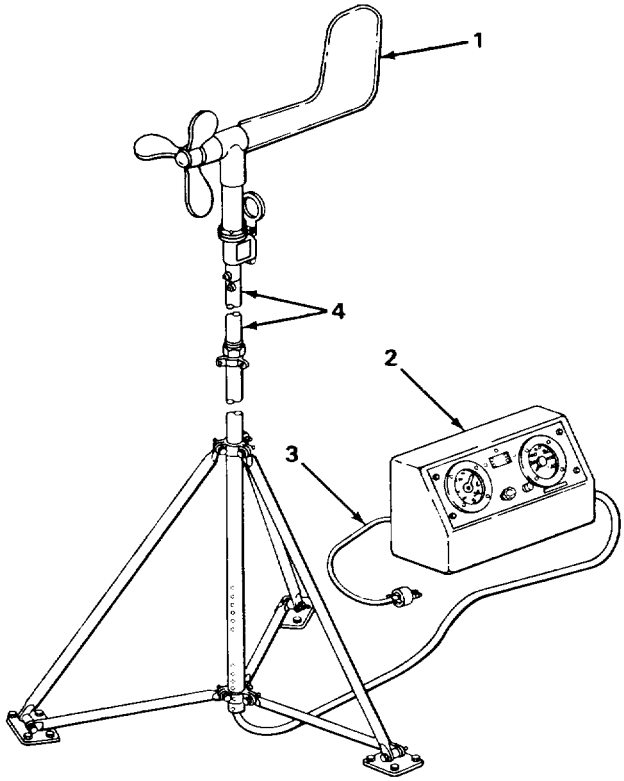
Common Name	Official Nomenclature
indicator	Indicator, Wind Direction and Speed ID-373(*)/GMQ-1 1
transmitter	Transmitter, Wind Direction and Speed T-420(*)/GMQ-11
AN/GMQ-11	Wind Measuring Set AN/GMQ-11
support	Support, Wind Direction and Speed MT-1246/GMQ-11

Section II EQUIPMENT DESCRIPTION

1-7. EQUIPMENT CHARACTERISTICS.

The AN/GMQ-11 is a three-part portable set used to measure windspeed and direction. The transmitter, indicator, and support assembly make up the wind measuring set. It can measure windspeed in knots or mph from 0 to 120. Wind direction indicates a 360-degree range. Windspeed or direction may be read off of the indicator dials or recorded using an auxiliary recorder set. The recorder has a 0- to 240-knot or mph range. The support assembly and transmitter are designed to function outdoors under almost all weather conditions. The indicator is used in a sheltered area.

1-8. LOCATION AND DESCRIPTION OF MAJOR COMPONENTS.



ITEM	DESCRIPTION
1 Transmitter	Detects windspeed and direction and sends information to indicator.
2 Indicator	Displays windspeed and direction information sent by transmitter.
3 Power cable	Provides a means of supplying power to wind measuring set.
4 Support	Holds and raises transmitter above ground.

1-9. DIFFERENCES BETWEEN MODELS.

The indicators, transmitters, and supports are interchangeable between models. Differences between indicator models are shown in table below.

LOCATION OF ITEMS

ITEM	ID-3731GMQ-1 1	ID-373A/GMQ-1 1	ID-373B/GMQ-11	ID-373C/GMQ-11	NOTES
Transmitter Wiring	Internal Connection	External Connectors J402 and J403	Internal Connection	External Connectors J402 and J403	
Power Cable	Internal Connection	External Connector J401	Internal Connection J401	External Connector	a
Cable Entrance Hole	Rear Lower Left Corner	None Left Corner Right Side	Rear Lower Corner of	Lower Right	
Wall Mounting Holes	None	None	Top Rear	Top Rear	
Indicator Zero Adjustment, Type	Lever	Screw	Lever	Lever	b

NOTES:

a. Power cable on Indicator ID-373C/GMQ-11 may be shipped either way. If receptacle connectors J401, J402, and J403 are not being used and if cable is not internally wired, a higher level of maintenance must make connections.

b. Zero adjustment at operator's level can be performed only on Indicator ID-373A/GMQ-11. All others must be performed at a higher level of maintenance.

Equipment configuration may vary according to manufacturers.

1-10. EQUIPMENT DATA.

WEIGHTS AND DIMENSIONS

ITEM	HEIGHT		WIDTH		DEPTH		WEIGHT	
	IN.	CM	IN.	CM	IN.	CM	LB	KG
Indicator (except ID-373C/GMQ-11)	10.875	27.60	21.00	53.30	8.0625	20.50	17	7.72
Indicator (ID-373C/GMQ-1 1)	10.875	27.60	21.00	53.30	9.125	23.20	18	8.17
Transmitter	30.00	76.00	33.00	83.80	15.50	39.40	10	4.54
Support	156.00	396.20	48.00	121.90	48.00	121.90	30	13.62

PERFORMANCE

Power consumption	0.60 watts
Voltage requirement	105 to 125 vac 60 Hz Single phase
Indicator range:	
Windspeed	0 to 120 knots or0 to 120 mph
Wind direction	360 degrees
Accuracy:	
Wind direction	$\pm$ 2 degrees
Windspeed:	
0 to 60 knots or 0 to 60 mph	$\pm$ 2 knots or $\pm$ 2 mph
61 to 120 knots or 61 to 120 mph	+ 3 or -2 knots, or + 3 or -2 mph
Operating range:	
Altitude	0 to 10,000 ft above sea level
Temperature	-40° F(-40° C) to 150° F(66° C)
Relative humidity	0 to 100 percent

1-11. SAFETY, CARE, AND HANDLING.

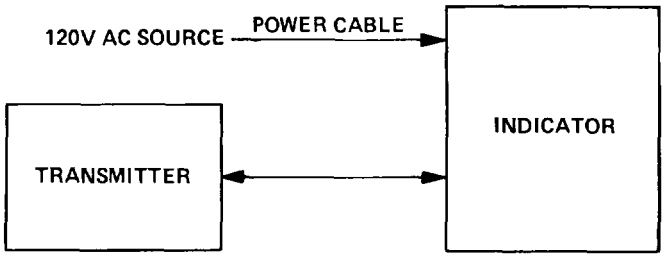
Observe all warnings, cautions, and notes in this manual. This equipment can be dangerous if these instructions are not followed.

Section III PRINCIPLES OF OPERATION

1.12. SIMPLIFIED BLOCK DIAGRAMS.

The following block diagrams show the different modes of operation in which the AN/GMQ-11 may be used. The recorder and additional indicator are optional components used with Wind Measuring Set AN/GMQ-11.

TRANSMITTER-INDICATOR MODE



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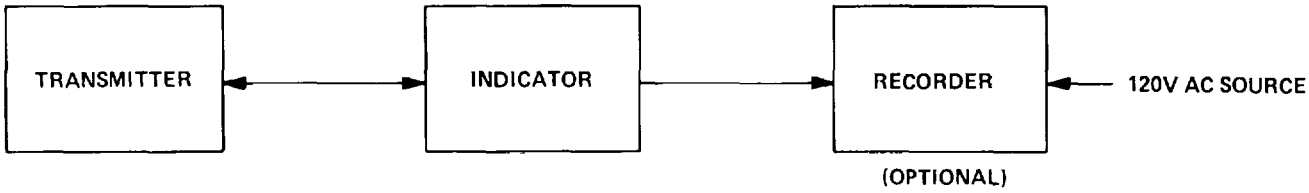
TRANSMITTER-INDICATOR-RECORDER MODE



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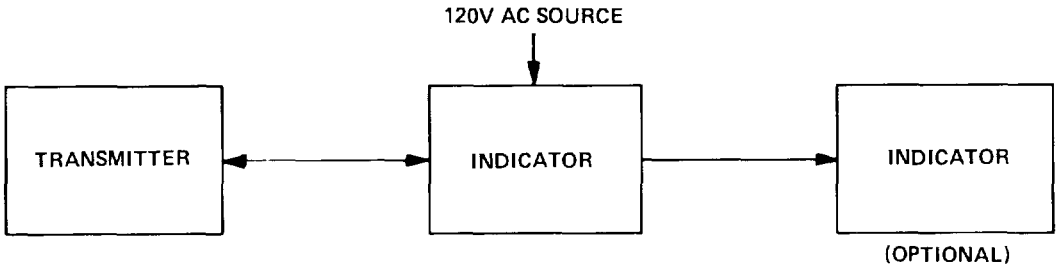
1-12. SIMPLIFIED BLOCK DIAGRAMS. (CONT)

TRANSMITTER-INDICATOR-INDICATOR MODE



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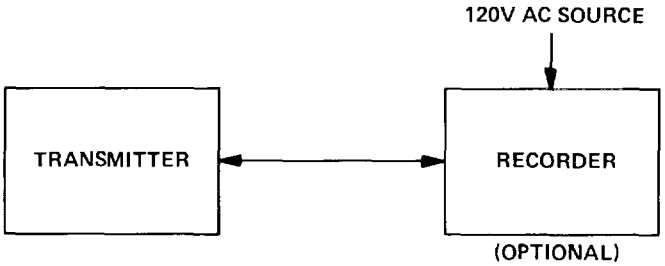
TRANSMITTER-RECORDER MODE



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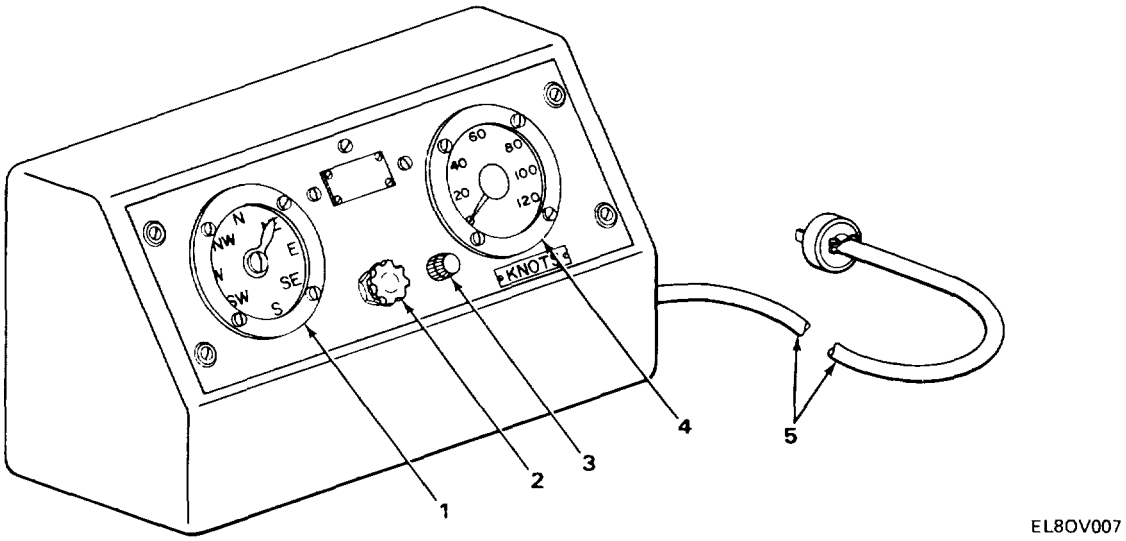
CHAPTER 2

OPERATING INSTRUCTIONS

Section I DESCRIPTION AND USE OF OPERATOR'S CONTROLS AND INDICATORS

2-1. DESCRIPTION OF CONTROLS AND INDICATORS.



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1 Wind Direction Indicator. Shows wind direction.

2 Light Switch. Controls brightness of indicator panel lights from full off to full bright.

3 Fuse. Protects wind measuring set from excessive current draw.

4 Wind Speed Indicator. Shows windspeed in either knots or mph.

5 Power Cable. Supplies 120 vac power to wind measuring set from 120 vac power source.

Section II OPERATOR PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS)

2-2. GENERAL.

To be sure that the wind measuring set is always ready for use, it must be inspected at definite intervals so that defects may be found and corrected before they result in serious damage or failure.

The Preventive Maintenance Checks and Services (PMCS) procedures are required to keep your equipment in good operating condition. They include (B) before operation and (W) weekly checks.

Perform both the (B) and (W) checks if you are the assigned operator and have not operated the equipment since the last weekly check, or if you are operating the equipment for the first time. Do not assume they have been done.

If the equipment fails to operate, refer to the operator's troubleshooting procedures (para 3-2). Refer to DA Pam 738-750 as a guide to forms and procedures used for reporting problems.

If the equipment must be kept in service continuously, check and service only the things that can be checked and serviced without disturbing operation.

Routine checks like equipment inventory; cleaning components; checking for frayed and damaged cables; storing items not in use; checking for loose hardware, nuts, bolts, and screws; and checking for corrosion on receptacles and connectors, are not listed in the PMCS table. You should do these things any time you see they need to be done as a matter of good preventive maintenance. If you find a routine check in the PMCS, it was listed because other operators reported problems with this item.

The ITEM NO. column in the PMCS table is to be used as a source number for the TM number column on DA Form 2404, Equipment Inspection and Maintenance Worksheet, for recording PMCS results.

The ITEM TO BE INSPECTED/PROCEDURE column lists the portion of the equipment to be inspected and contains a brief description of procedures to be followed to check equipment.

The EQUIPMENT IS NOT READY/AVAILABLE IF: column contains criteria that will cause the inspected portion of the equipment to be classified as not ready or available for use because of its inability to perform its assigned mission.

NOTE

Always keep in mind the warnings and cautions while performing the PMCS procedure or any routine checks.

OPERATOR PREVENTIVE MAINTENANCE CHECKS AND SERVICES

B-BEFORE W-WEEKLY

ITEM NO.	INTERVAL B	INTERVAL W	ITEM TO BE INSPECTED/ PROCEDURE	EQUIPMENT IS NOT READY/AVAILABLE IF:
1			WIND DIRECTION INDICATOR	
	•		a. Rotate transmitter 360 degrees and, using compass, verify that actual azimuth of transmitter always corresponds to direction shown on indicator.	Readings do not correspond.
		•	b. Rotate transmitter several turns and check for sluggish movement.	Transmitter does not move freely.
2			WINDSPEED INDICATOR	
	•		a. Turn transmitter impeller in normal directional rotation. Pointer on indicator must move clockwise away from zero. When impeller is stationary, pointer should indicate zero.	Pointer on indicator does not move or pointer is off zero when impeller is stationary.
		•	b. Rotate transmitter impeller in normal directional rotation and check for sluggish movement or binding.	Impeller does not move freely.
3			CABLES AND CONNECTORS	
	•		Inspect for kinks, cuts, or frays on cables and grommets. Check tightness of all connectors.	Cables are defective.
4			LIGHT SWITCH	
	•		Rotate light switch from full off, extreme counterclockwise position, to full bright, extreme clockwise position. Lights must progressively increase in intensity as light switch is turned clockwise without signs of binding.	

OPERATOR PREVENTIVE MAINTENANCE CHECKS AND SERVICES (CONT)

B-BEFORE W-WEEKLY

ITEM NO.	INTERVAL B	INTERVAL W	ITEM TO BE INSPECTED/ PROCEDURE	EQUIPMENT IS NOT READY/AVAILABLE IF:
5			SUPPORT	
	•		a. If guys are used, check for tightness and that support is held in vertical position.	Guys are loose or support is not vertical.
		•	b. Check for loose mounting hardware or corrosion.	
6			TRANSMITTER	
		•	Check transmitter for corrosion or damage to impeller or generator cover. Check for tightness of mounting hardware to support.	Impeller or vane is damaged.

Section III OPERATION UNDER USUAL CONDITIONS

2-3. SITING.

TRANSMITTER AND SUPPORT

The transmitter and support must be set up in an open area free of an obstructed windflow from all directions.

Objects that can block wind or create eddies of wind (such as buildings, trees, or any high structure) must be avoided.

Keep a safe distance from major roadways to avoid exhaust gases or excessive smoke.

The mounting surface is to be of concrete, wood, or a material sturdy enough to support the weight of the transmitter, support, and a serviceman, and, in the event of high winds, the force of tightened guy wires. The support requires an area of 4 1/2 square feet to allow for proper spacing of the three support legs and must also be fairly level.

INDICATOR

The indicator must be set up in a sheltered area no more than 6 feet from a source of 105 - 125 vac, 60 Hz, single phase. It must be mounted on a flat level surface or hung on a wall where it can be easily read by the operator.

The distance between the transmitter and indicator will be determined by the length of the interconnection cable used.

Cables are listed in order of desirability. See appendix E, Expendable Supplies and Materials List.

2-4. ASSEMBLY AND PREPARATION FOR USE.

ASSEMBLY

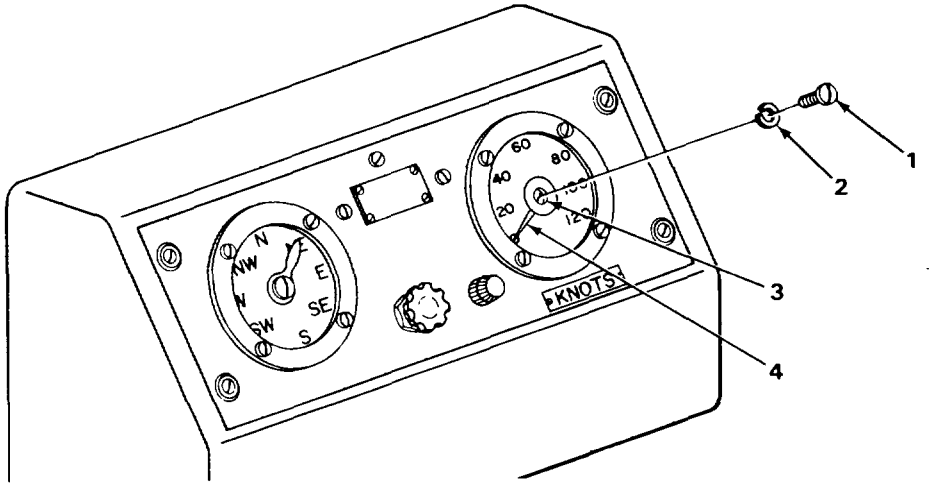
There are no assembly instructions at operator category.

PREPARATION FOR USE

The only preparation for use at the operator level is to connect power cable to suitable power source.

2-5. INITIAL ADJUSTMENTS AND CHECKS.

WINDSPEED INDICATOR ZERO ADJUSTMENT, ID-373A/GMQ-1 1



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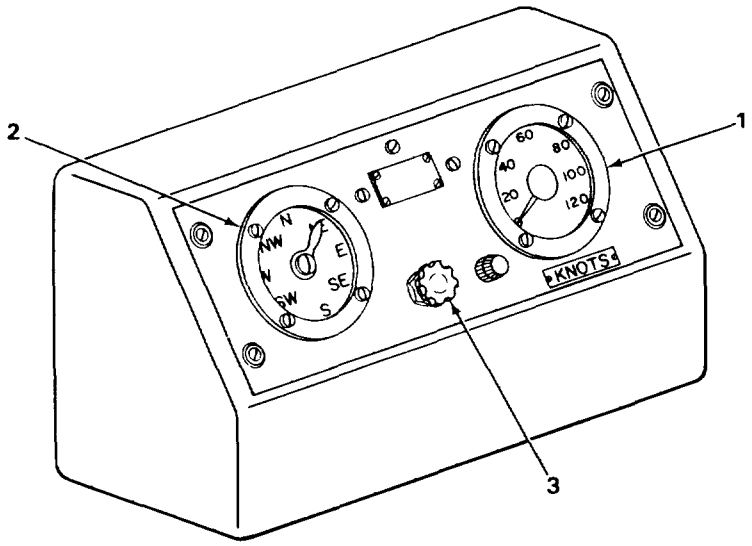
NOTE

Windspeed indicator zero adjustments at the operator level are limited to Indicator ID-*373A/GMQ*-11 only. For adjustments on Indicators ID-373/GMQ-11, ID-373B/GMQ-11, a*nd ID-373C/GMQ-1*1, refer to organizational maintenance.

1. Disconnect power cable from power source.
2. Remove zero adjustment access screw (1) and lockwasher (2).
3. Turn zero adjustment screw (3) until pointer (4) points to 0.
4. Install zero adjustment access screw (1) and lockwasher (2).
5. Reconnect power cable to power source.

2-6. OPERATING PROCEDURE.

BASIC WIND MEASURING SET AN/GMQ-11



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2-6. OPERATING PROCEDURE. (CONT)

1. Plug power cable into power source.
2. Observe windspeed indicator (1) and wind direction indicator (2), and record information as required by local procedure.
3. If indicator lights are needed, turn light switch (3) clockwise for brightness.

2-7. AUXILIARY EQUIPMENT.

The basic wind measuring set can be operated with an auxiliary indicator. This auxiliary indicator is operated in the same manner as the basic indicator.

An auxiliary recorder can also be used. The recorder can be used in place of or together with one or more indicators, and records information for further study.

Operation of recorder can be found in TM 11-6660-231-12.

Section IV OPERATION UNDER UNUSUAL CONDITIONS

2-8. OPERATION UNDER HIGH WINDS.

In the event of a threat of hurricane-force winds, hailstorms, or snowstorms, the transmitter and connector housing attaching hardware should be checked for tightness, support assembly must be firmly attached to its mounting base, and guy wires installed. If guy wires were previously installed, check for even tightness of all guy wires, that there are no frays or breaks in wires, or looseness of guy stakes. If guy wires were not installed, refer to organizational maintenance for installation of guy wires.

CHAPTER 3

OPERATOR MAINTENANCE

Section I LUBRICATION INSTRUCTIONS

3-1. LUBRICATION INSTRUCTIONS.

There is no lubrication required for the AN/GMQ-11.

Section II OPERATOR TROUBLESHOOTING PROCEDURES

3-2. GENERAL.

The troubleshooting table lists common problems you may find during operation or when performing operator's PMCS on the ANIGMQ-11 or its components.

The troubleshooting table does not list all of the problems you may find. If your problem is not listed, or if the troubleshooting steps do not solve your problem, report your problem to a higher level of maintenance.

When working on any problem, be sure to report your work on the forms prescribed by DA Pam 738-750.

To use the troubleshooting table, first find your problem in the symptom index. The index will give you a page number on which you will find your problem and possible corrective action. Turn to that page, find your problem, and use the procedures to correct it.

SYMPTOM INDEX

OPERATOR TROUBLESHOOTING

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

1. Dial lamps do not light.

   Step 1. Check that power cable is properly connected to power source.

   Reconnect power cable.

   Step 2. Check for defective indicator fuse.

   Replace fuse (para 3-4).

   Step 3. Check for defective dial lamps.

   Replace dial lamps (para 3-5).

   Step 4. Turn light switch and observe operation for binding or extreme looseness.

   Refer to higher category of maintenance.

2. Wind speed indicator pointer does not move from zero when impeller is turning.

   Check for improper connection of interconnection cable.

   Refer to higher category of maintenance.

3. Wind speed indicator pointer shows erratic reading.

   Step 1. Check for improper connection of interconnection cable.

   Refer to higher category of maintenance.

   Step 2. Check for broken or binding transmitter impeller.

   Refer to higher category of maintenance.

OPERATOR TROUBLESHOOTING (CONT)

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION
4. Wind direction indicator pointer shows erratic or no reading.
Step 1. Check for defective indicator fuse.
Replace fuse (para 3-4).
Step 2. Check for damage to transmitter vane.
Refer to higher category of maintenance.
Step 3. Check for improper connection of interconnection cable.
Refer to higher category of maintenance.

Section III OPERATOR MAINTENANCE PROCEDURES

3-3. GENERAL.

This section provides instructions for operator maintenance of the AN/GMQ-11. The following initial setup information applies to all procedures.

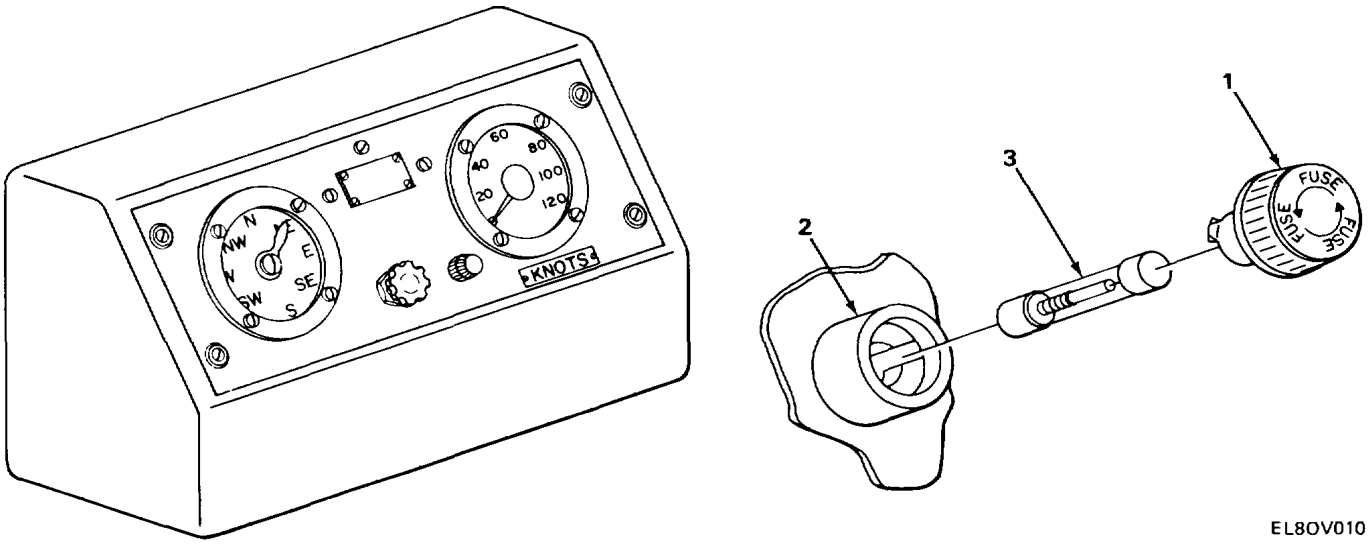
Resources required are not listed unless they apply to the procedure.

Personnel are listed only if the task requires more than one technician. If personnel are not listed, the operator can perform the task himself.

The normal standard equipment condition to start a maintenance task is power cable unplugged. Equipment condition is not listed unless some other condition is required.

3-4. INDICATOR FUSE REPLACEMENT.

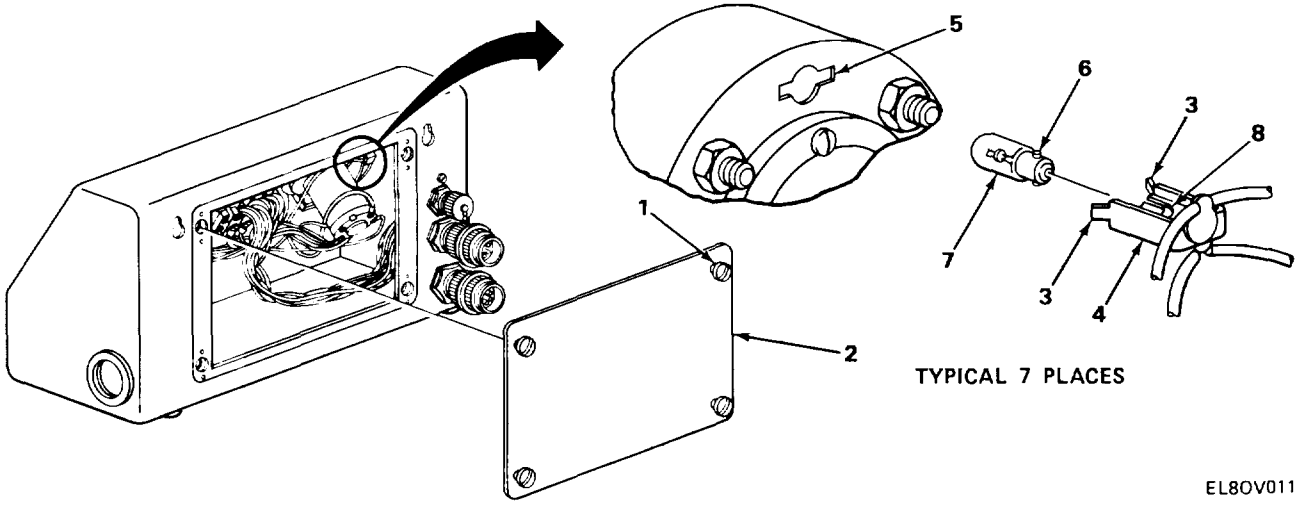
MATERIALS/PARTS: Fuse, NSN 5920-00-199-9498



1. Press in fuse cap (1) and turn cap counterclockwise.
2. Remove cap (1) from fuse holder (2).
3. Pull defective fuse (3) out of cap (1).
4. Push replacement fuse into cap (1).
5. Place fuse and fuse cap (1) into fuse holder (2).
6. Press in fuse cap (1) and turn clockwise to lock.

3-5. DIAL LAMP REPLACEMENT.

MATERIALS/PARTS: Lamp, incandescent, NSN 6240-00-155-8706



3-5. DIAL LAMP REPLACEMENT. (CONT)

NOTE

There are seven dial lamps. Steps given are typical for all seven.

REMOVAL

1. Loosen four turn-lock fasteners (1) on rear cover (2) of indicator and remove rear cover.
2. Squeeze both lamp holder spring tabs (3) together and pull lamp holder (4) out of dial socket (5).
3. Press in on lamp (6), turn counterclockwise, and pull lamp out of lamp holder (4).

INSTALLATION

1. Put lamp (6) into lamp holder (4), alining pins (7) on lamp with slots (8) on lamp holder.
2. Push lamp (6) into lamp holder (4) and turn lamp clockwise to lock in place.
3. Squeeze both lamp holder spring tabs (3) together, push lam holder (4) into dial socket (5), and release lamp holder spring tabs.
4. Position rear cover (2) on rear of indicator and turn four turn-lock fasteners (1) to lock in place.

3-6. CLEANING.

MATERIALS/PARTS: Cleaning compound (item 2, app E)
Cloth (item 4, app E)
Detergent (item 1, app E)

WARNING

Cleaning compound is flammable and fumes are toxic. Make sure there are no open flames and room has sufficient ventilation.

CAUTION

To prevent scratching dial glass, never use a dry cloth to remove dirt.

1. Using cloth dampened in cleaning compound, remove any dirt, grease, and fungus from indicator case, transmitter, and support assembly.
2. Using cloth, soap, and water, remove all traces of residue left by cleaning compound.

CHAPTER 4

ORGANIZATIONAL MAINTENANCE

Section I REPAIR PARTS, SPECIAL TOOLS, TMDE, AND SUPPORT EQUIPMENT

4-1. COMMON TOOLS AND EQUIPMENT.

A complete listing of common tools and equipment is given in the Maintenance Allocation Chart (MAC), appendix B.

4-2. SPECIAL TOOLS, TMDE, AND SUPPORT EQUIPMENT.

There are no special tools or equipment needed to maintain the AN/GMQ-11.

4-3. REPAIR PARTS.

Repair parts for organizational maintenance of the AN/GMQ-11 are listed and illustrated in the Repair Parts and Special Tools List (RPSTL) in TM 11-6660-200-24P.

Section II SERVICE UPON RECEIPT

4-4. GENERAL.

This section explains what must be done upon initial receipt of equipment. Procedures appear in the order in which they must be performed.

Contents are first removed from crates and packing cartons and checked against packing list for any discrepancies. Contents are also checked for damage that might prevent equipment from performing its mission. If minor discrepancy or damage is found that will not effect the operation of the equipment, put equipment into service. Report your findings on SF Form 361, Discrepancy in Shipment Report (DISREP) and forward as prescribed by AR 55-38, Reporting of Transportation Discrepancies in Shipments. If no discrepancies or damages are found, proceed with component assembly.

Resources required are not listed unless they apply to the procedure.

Personnel are listed only if the task requires more than one technician.

Radio Repair Tool Kit TK-17/FMQ-1 is used for all procedures.

Procedures apply to all models unless otherwise specified.

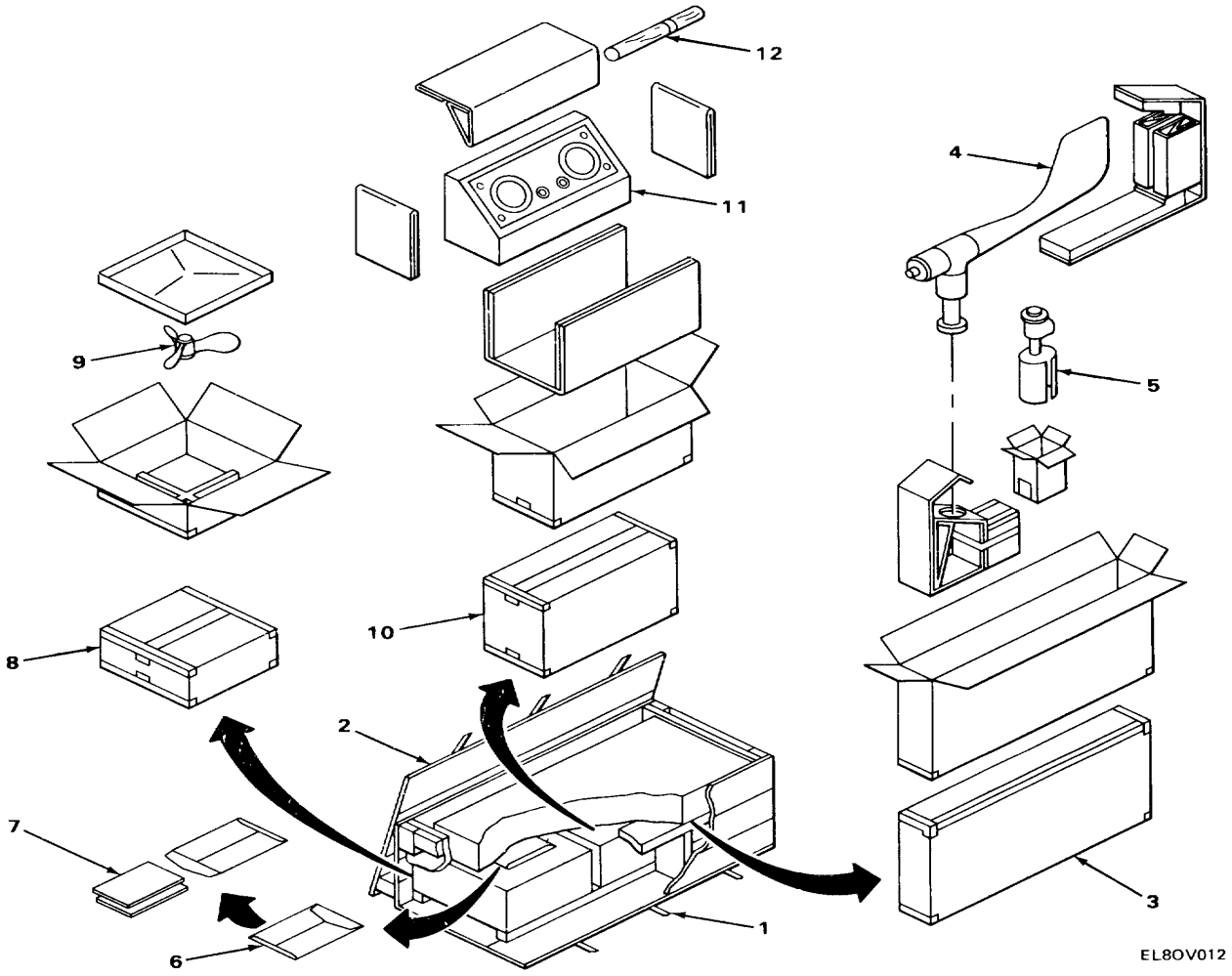
4-5. UNPACKING.

WARNING

Wear heavy gloves, protective eye wear, and stand to side when cutting metal straps. Do not handle packing cartons using metal straps.

4.5. UNPACKING. (CONT)

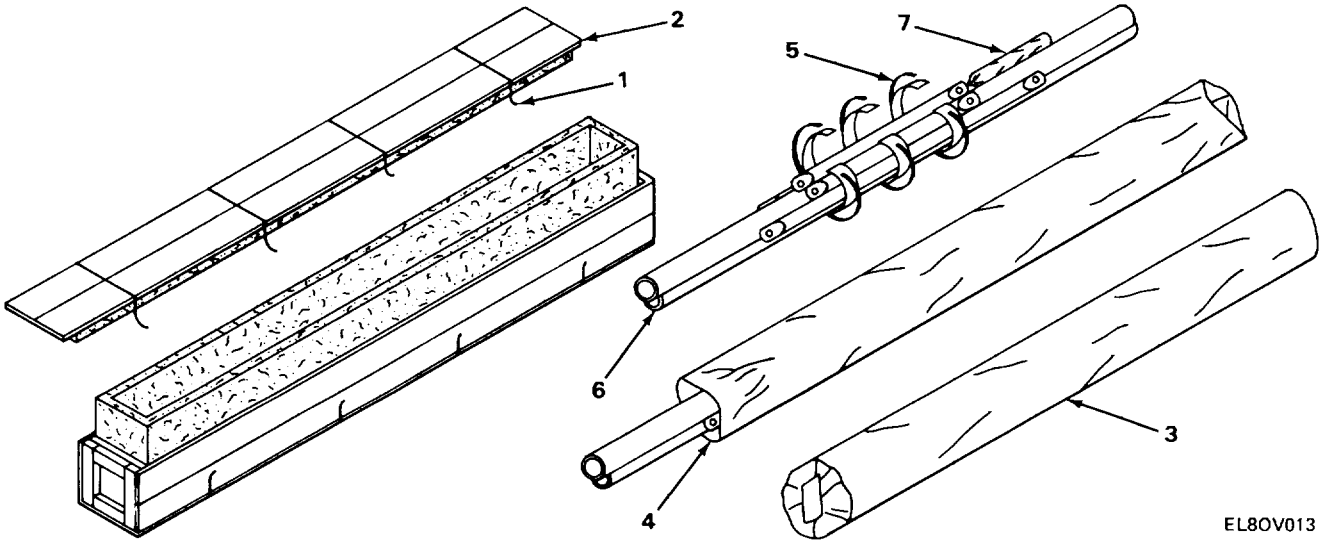
UNPACKING INDICATOR AND VANE



1. Cut metal straps (1) and remove from crate.
2. Pry crate cover (2) up and remove.
3. Remove vane and connector housing carton (3) and cut open.
4. Remove vane (4) and connector housing (5) from cartons.
5. Remove waterproof envelope (6) and enclosed technical manuals (7).
6. Remove impeller carton (8) and cut open.
7. Remove impeller (9) from carton.
8. Remove indicator carton (10) and cut open.
9. Remove indicator (11), tools, and running spares (12) from carton.

4-5. UNPACKING. (CONT)

UNPACKING OF SUPPORT



1. Cut metal straps (1) and remove from crate.
2. Pry crate cover (2) up and remove.
3. Remove packaged support (3) from crate.
4. Remove packaging (4) from support.
5. Cut metal straps (5) and remove support (6) and hardware (7).

4-6. CHECKING UNPACKED MATERIEL.

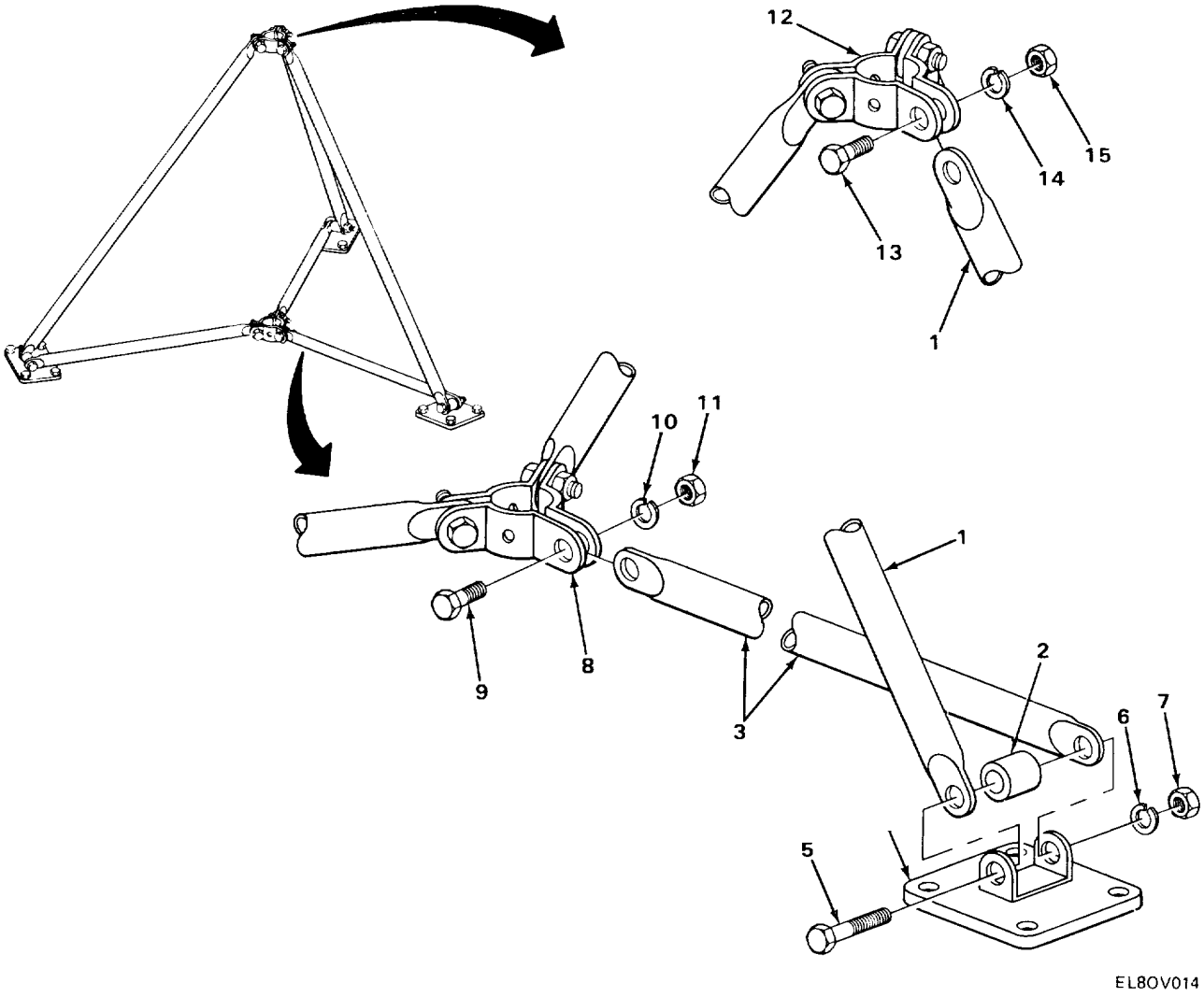
Check the AN/GMQ-11 for damages from shipment. If it has been damaged, report the damage on SF 364 (Report of Discrepancy (ROD)).

Check all parts against the packing list. If the packing list is not available, refer to the Basic Issue Items (Bll) List in appendix C. If there are any discrepancies, see Maintenance Forms, Records, and Reports (para 1-3).

Check to see if equipment has been reconditioned or modified. If modified, the Modification Work Order (MWO) number will be on or near nomenclature plate.

4-7. ASSEMBLY OF SUPPORT AND MAST.

ASSEMBLING SUPPORT LEGS



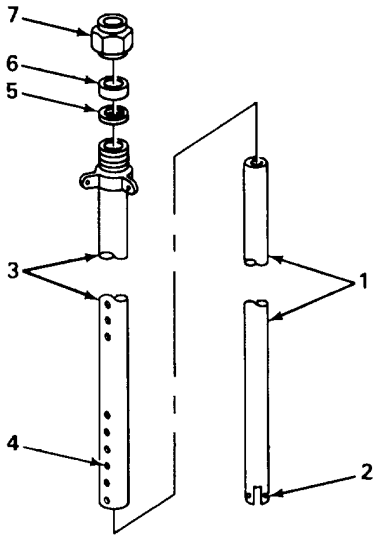
NOTE

There are three support legs. Steps given are typical for all three.

1. Position long brace (1), spacer (2), and short brace (3) in mast base (4), and install screw (5), lockwasher (6), and nut (7). Hand tighten.
2. Repeat step 1 for two remaining mast bases.
3. Position other end of short brace (3) between two clamps (8), and install screw (9), lockwasher (10), and nut (11). Hand tighten.
4. Repeat step 3 for two remaining short braces.
5. Position other end of long brace (1) between two clamps (12), and install screw (13), lockwasher (14), and nut (15). Hand tighten.
6. Repeat step 5 for two remaining long braces (1).

4-7 ASSEMBLY OF SUPPORT AND MAST. (CONT)

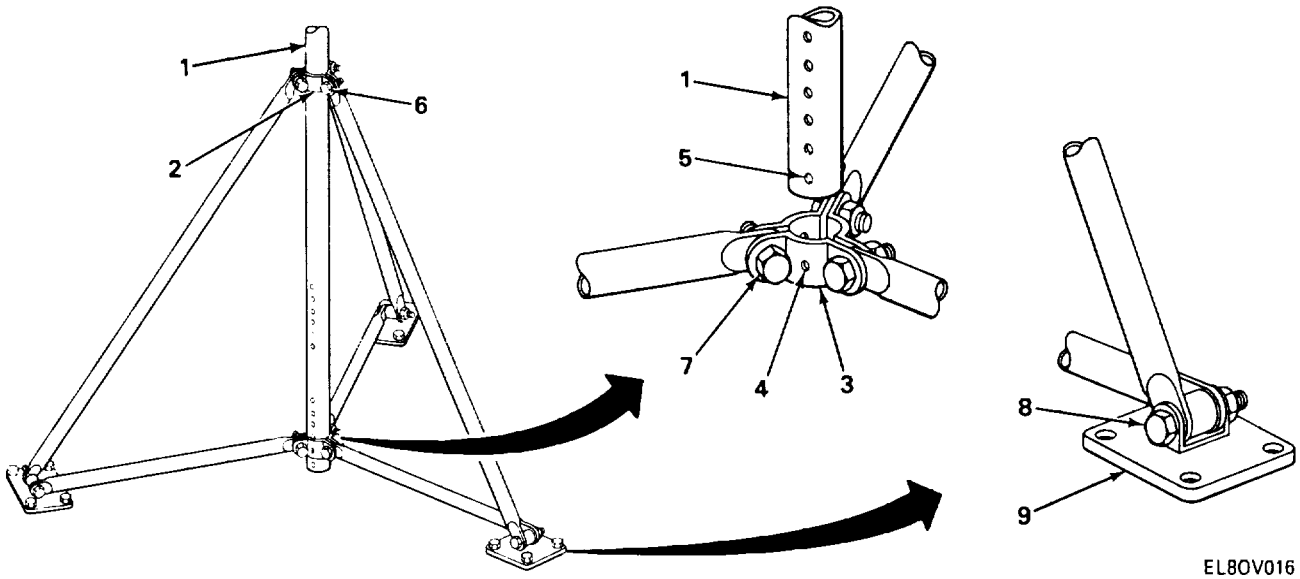
ASSEMBLING MAST SECTIONS MT-1246A/GMQ-11



EL8OV015

1. Position upper mast section (1) with buttons (2) on bottom.
2. Install upper mast section (1) through bottom of lower mast section (3), alining buttons (2) with holes (4) in lower mast section. Allow at least 1 foot of upper mast section (1) to protrude from top of lower mast section (3).
3. Install brass washer (5), rubber bushing (6), and compression nut (7).
4. Tighten compression nut (7) enough to hold upper mast section (1) in place.

ASSEMBLING MAST SECTIONS TO SUPPORT LEGS



EL8OV016

4-7. ASSEMBLY OF SUPPORT AND MAST. (CONT)

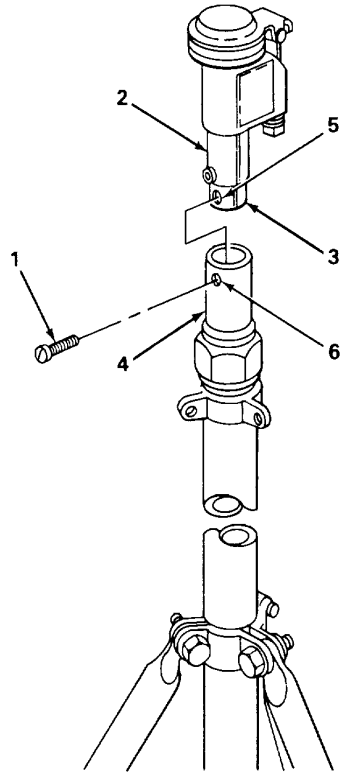
NOTE

Upper and lower mast sections must be assembled before performing this procedure. If lower mast does not fit between clamps, loosen hardware.

1. Slide lower mast section (1) through upper clamps (2) and lower clamps (3). Allow lower mast section to touch ground.
2. Turn lower mast section (1) to aline pins (4) in lower clamps (3) with hole (5) in lower mast section.
3. Tighten three upper clamp screws (6) and three lower clamp screws (7).
4. Tighten screw (8) on all three mast bases (9).

4-8 TRANSMITTER ASSEMBLY.

ASSEMBLY OF CONNECTOR HOUSING TO SUPPORT ASSEMBLY, T-420A/GMQ-1 1



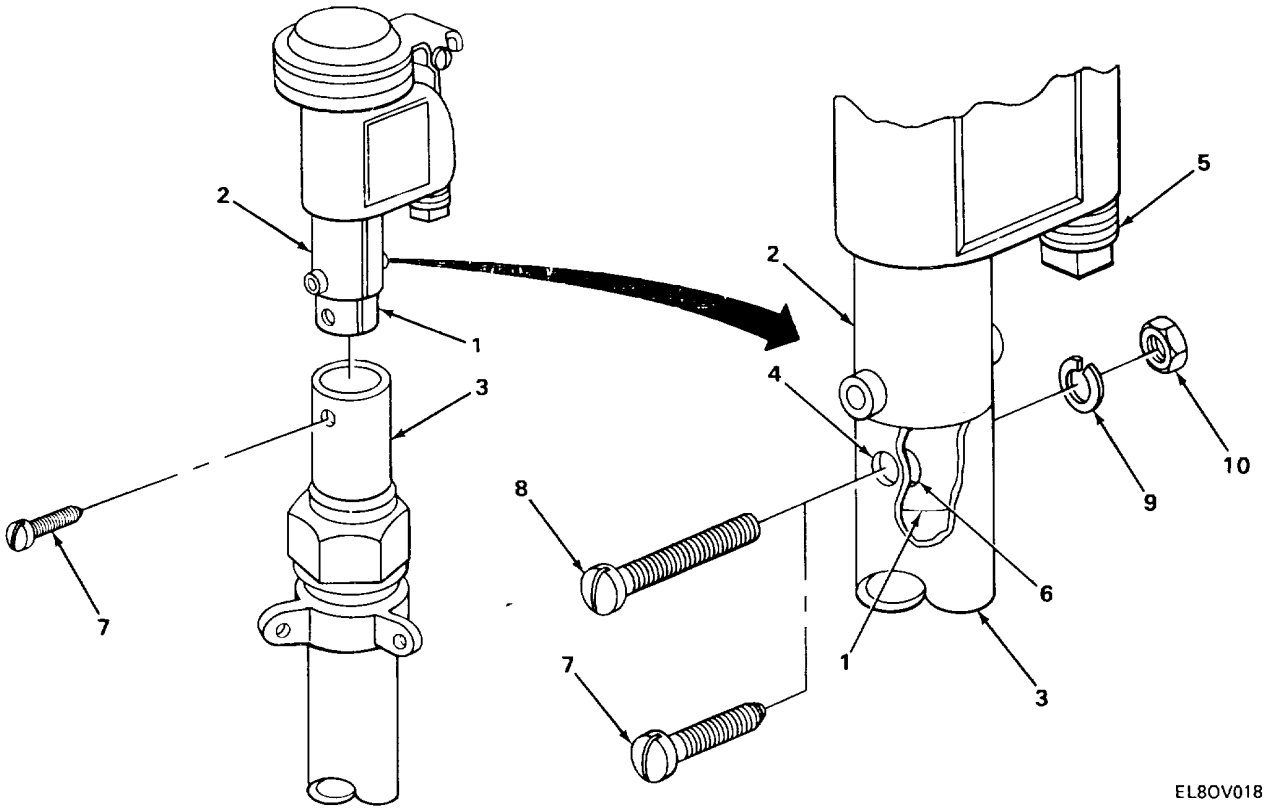
EL8OV017

1. Remove securing screw (1) from connector housing (2).
2. Place shaft (3) of connector housing into top of upper mast section (4).
3. Aline threaded hole (5) on connector housing (2) with hole (6) on upper mast section (4).
4. Install securing screw (1) through hole (6), screw into threaded hole (5), and tighten.

4-8. TRANSMITTER ASSEMBLY. (CONT)

ASSEMBLING CONNECTOR HOUSING TO SUPPORT ASSEMBLY, T-420/GMQ-11 OR T-420B/GMQ-11

TOOLS: Bit, drill, 13/64-inch
Bit, drill no. 7
Bit, drill, 1/4-inch
Drill, electric
Tap, 1/4 - 20 NC



1. Place shaft (1) of connector housing (2) as far as possible into upper mast section (3) with hole (4) directly opposite pipe plug (5).
2. Put a mark on shaft (1) through center of hole (4) in upper mast section (3).

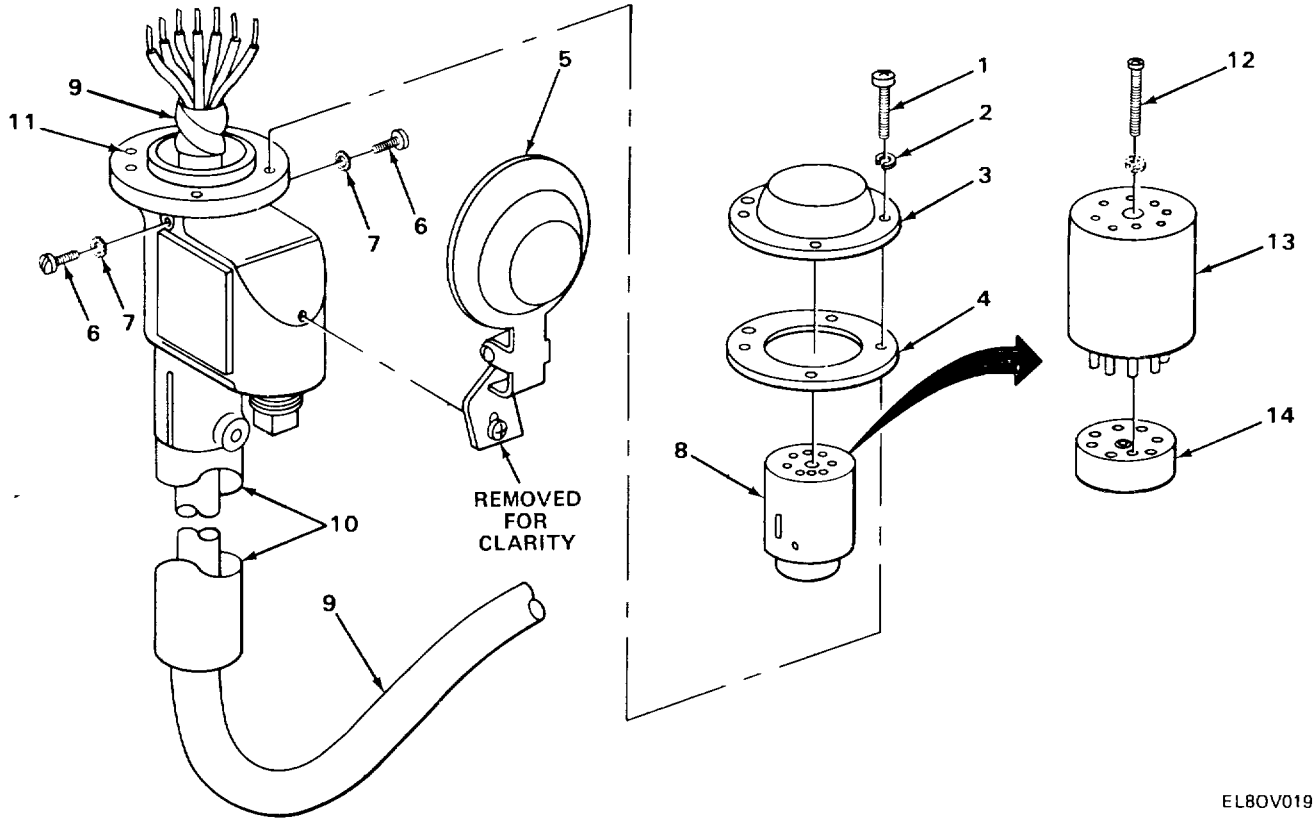
NOTE

A 1/4 - 20 NC tap and a no. 7 or 13/64-inch drill bit will be required to perform steps 3, 4, and 5. If the above items are not available, use a 1/4-inch drill bit and perform steps 6 and 7.

3. Using either a 13/64-inch or no. 7 drill bit, drill a hole through one side of shaft (1).
4. Using 1/4 - 20 NC tap, thread hole (6).
5. Install 1/4-inch screw (7).
6. Using a 1/4-inch drill bit, drill a hole straight through shaft (1) and out other side of upper mast section (3).
7. Install one 114-inch by 1 3/4-inch long screw (8), lock washer (9), and nut (10) through shaft (1) and upper mast section (3).

4-8. TRANSMITTER ASSEMBLY. (CONT)

FLEXIBLE INTERCONNECTION CABLE TO CONNECTOR HOUSING INSTALLATION



NOTE

For T-420/GMQ-11 and T-420B/GMQ-11, perform step 1. For T-420A/GMQ-11, perform step 2.

1. Remove four screws (1) and lock washers (2), and remove connector housing cover (3) and gasket (4). Go to step 3.
2. Tilt hinged connector housing cover (5) upward and remove gasket (4).
3. Remove two screws (6) and lock washers (7).
4. Remove connector J1 (8) from connector housing.
5. Remove 12 inches (30.48 cm) of outer insulation from cable (9).
6. Remove enough insulation from each wire to solder to connector J1 (8).
7. Put prepared end of cable (9) into bottom of lower mast section (10).
8. Push cable (9) up through lower mast section (10) and out opening on top of connector housing (11).
9. Loosen screw (12) on connector J1 (8) and separate case (13) from retainer (14).

NOTE

For correct soldering methods, refer to TB SIG 222.

10. Solder wires from cable (9) to proper terminals on connector J1 (8) as shown in following table.

4.8. TRANSMITTER ASSEMBLY. (CONT)

FLEXIBLE INTERCONNECTION CABLE TO CONNECTOR HOUSING INSTALLATION (CONT)

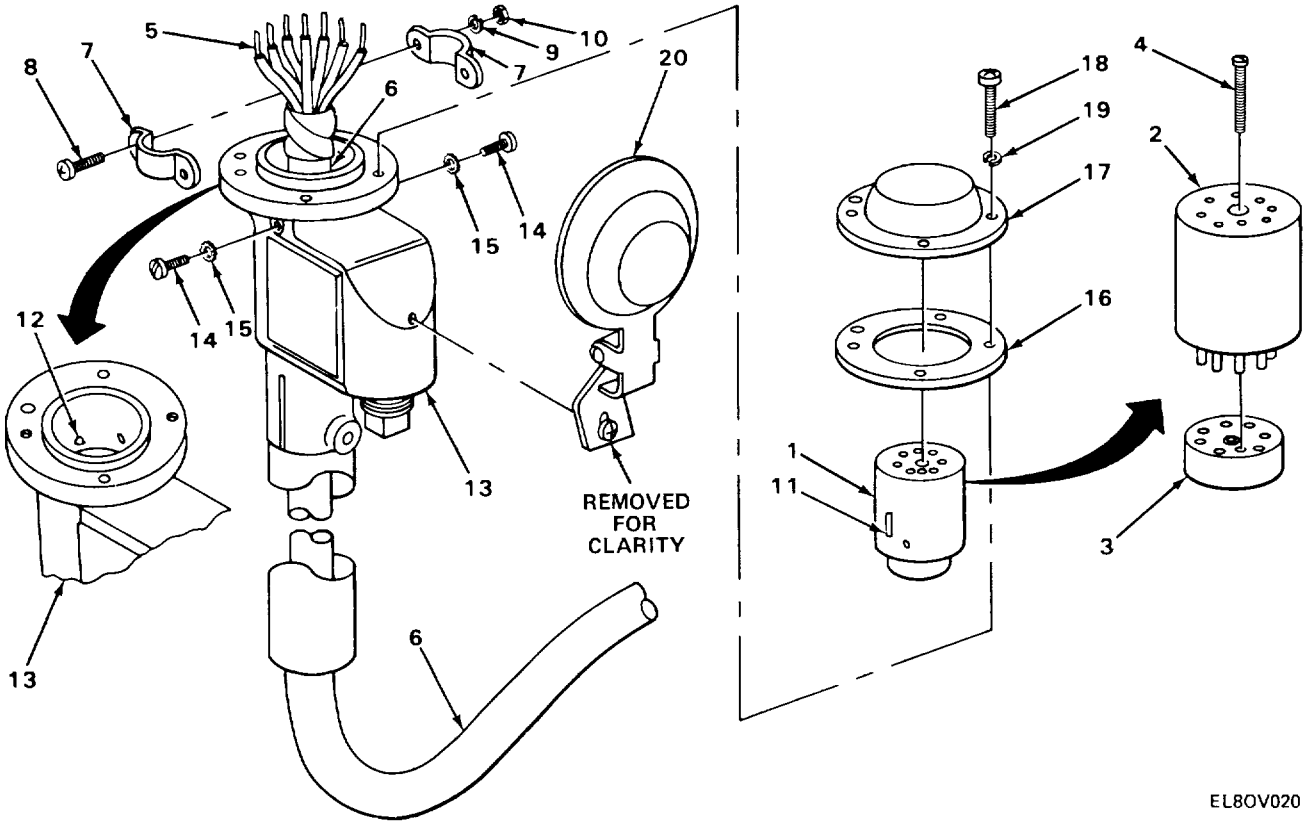
WIRING TABLE - FOR CABLE WM-76/U ONLY

WIRE COLOR	TERMINALS ON J1	WIRE GAGE
Blue	1	16
Red with black tracer	2	16
Green	3	14
Red	4	14
Yellow	5	14
White	6	10
Black	7	10

NOTE

Terminal 8 of connector J1 and black wire with white tracer on cable WM-76/U are not used.

If a substitute cable is used, connect two of the largest wires to terminals 6 and 7 of connector J1 and make a table to identify wires connected to terminals on connector J1.



4-8. TRANSMITTER ASSEMBLY. (CONT)

11. Assemble connector J1 (1) by pushing case (2) and retainer (3) together and securing with screw (4).
12. Wrap electrical tape around wires (5) and cable (6) from bottom of connector J1 (1) down 3 inches (7.62 cm).
13. Install cable clamps (7), two screws (8), lock washers (9), and nuts (10) on cable (6) in area where electrical tape is wrapped.
14. Aline notch (11) in connector J1 (1) with pin (12) in connector housing (13) and push connector J1 into place.

NOTE

Allow for slack in wires between connector J1 and cable clamp. Move cable clamp if necessary to increase or reduce slack.

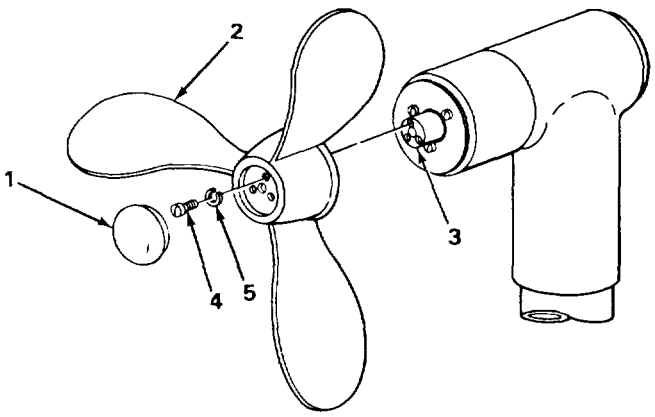
15. Install two screws (14) and lock washers (15).

NOTE

For T-4201GMQ-11 and T-420B/GMQ-11, perform step 16. For T-420A/GMQ-11, perform step 17.

16. Install gasket (16), connector housing cover (17), four screws (18), and lock washers (19).
17. Install gasket (16) and close hinged connector housing cover (20).

TRANSMITTER ASSEMBLY, T-420/GMQ-1 1 OR T-420AIGMQ-1 1

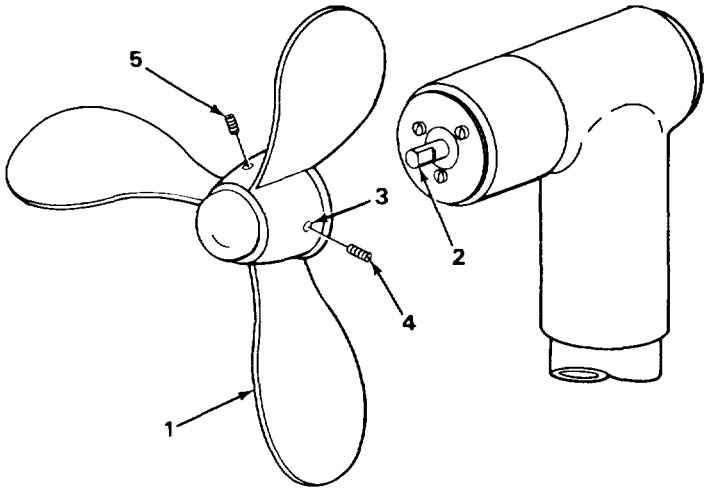


EL8OV021

1. Remove nose cap (1) from impeller (2).
2. Put impeller (2) on generator hub (3).
3. Install three screws (4) and lock washers (5) through impeller (2) into hub (3).
4. Press nose cap (1) into impeller (2) recess.

4-8. TRANSMITTER ASSEMBLY. (CONT)

TRANSMITTER ASSEMBLY, T-420B/GMQ-11



EL8OV022

1. Slide impeller (1) on generator hub (2).
2. Aline setscrew hole (3) with flat surface on generator hub (2).
3. Install setscrew (4) and tighten.
4. Install and tighten other setscrew (5).

4-9 INDICATOR ASSEMBLY.

INDICATOR CABLE CONNECTION, ID-373/GMQ-11 OR ID-373B/GMQ-11

NOTE

Steps given are for models where interconnection cables are hard wired directly to TB201 inside indicator when being prepared for use.

1. Remove 3 inches of outer insulation from cable end.
2 Remove enough insulation from wires to solder on terminal ends.

NOTE

For correct soldering methods, refer to TB SIG 222.

3. Solder a terminal lug to each wire of cable end.

4.9. INDICATOR ASSEMBLY. (CONT)

INDICATOR CABLE CONNECTION, ID-373A/GMQ-11 OR ID-373C/GMQ-11

NOTE

Steps given are for models with connectors P402 and P403 that are connected to receptacles on indicator.

If cable WM-76/U is used, see color-code table below.

If substitute cable is used, use color code generated when wiring was connected to transmitter connector J1 (para 4-8).

Power cable on some models may come already hard wired to terminals 1 and 9 on TB201 or may have a plug that connects to receptacle J401.

COLOR CODE FOR WM-76/U	P402 TO INDICATOR	WIRE GAGE
Blue	A	16
Red with black tracer	B	16
Green	C	14
Red	D	14
Yellow	E	14
White	F	10
Black	G	10

Section III PREPARATION FOR USE

4-10. GENERAL.

This section explains what must be done when equipment is ready to be put in use. It consists of installation instructions for components and interconnection wiring necessary to make equipment fully operable. Alinement and adjustment procedures are also included to give a starting point for proper operation of the equipment.

Resources required are not listed unless they apply to the procedure.

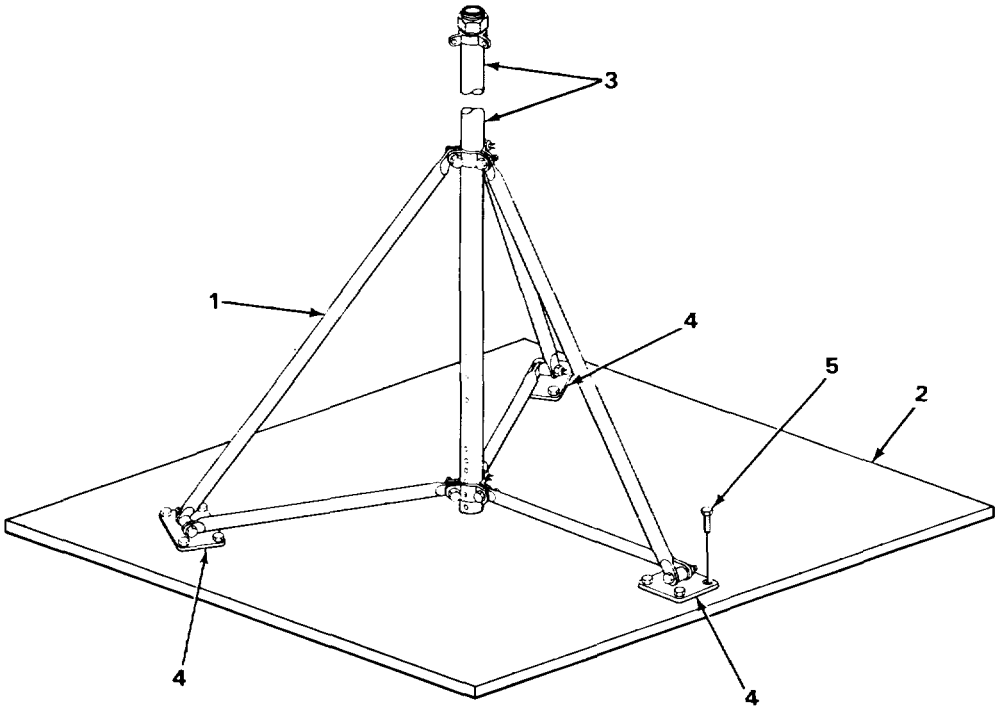
Personnel are listed only if the task requires more than one technician.

Radio Repair Tool Kit TK-17/FMQ-1 is used for all procedures.

Procedures apply to all models unless otherwise specified.

Equipment configurations may vary according to manufacturer.

4-11. MOUNTING SUPPORT ASSEMBLY.



EL8OV023

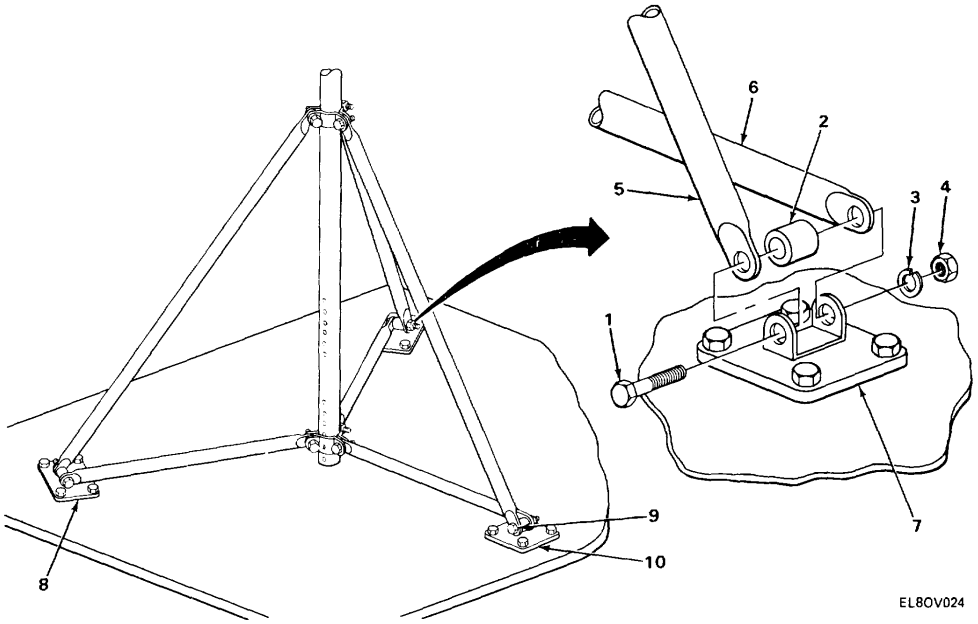
NOTE

For siting of equipment, see paragraph 2-3.

1. Set support (1) on mounting platform (2) and, using level or plumbline, make sure support mast (3) is vertical.
2. If support mast (3) is not vertical, place shims of proper thickness under lowest mast base (a to make support mast vertical.
3. Using four lag bolts (5) for each of the three mast bases (4), secure mast bases to platform (2).
4. Recheck that support mast (3) is still vertical. If not, perform step 2 until support mast is vertical.

4-12. TILTING SUPPORT ASSEMBLY.

PERSONNEL REQUIRED: Two technicians



NOTE

To gain access to top of mast for transmitter installation or service, support must be lowered to a horizontal position.

1. Remove screw (1), spacer (2), lockwasher (3), and nut (4), and move short brace (5) and long brace (6) from mast base (7).
2. Repeat step 1 for mast base (8).
3. Loosen screw (9) on mast base (10) and tilt support downward to a horizontal position, using mast base (10) as a pivot point.

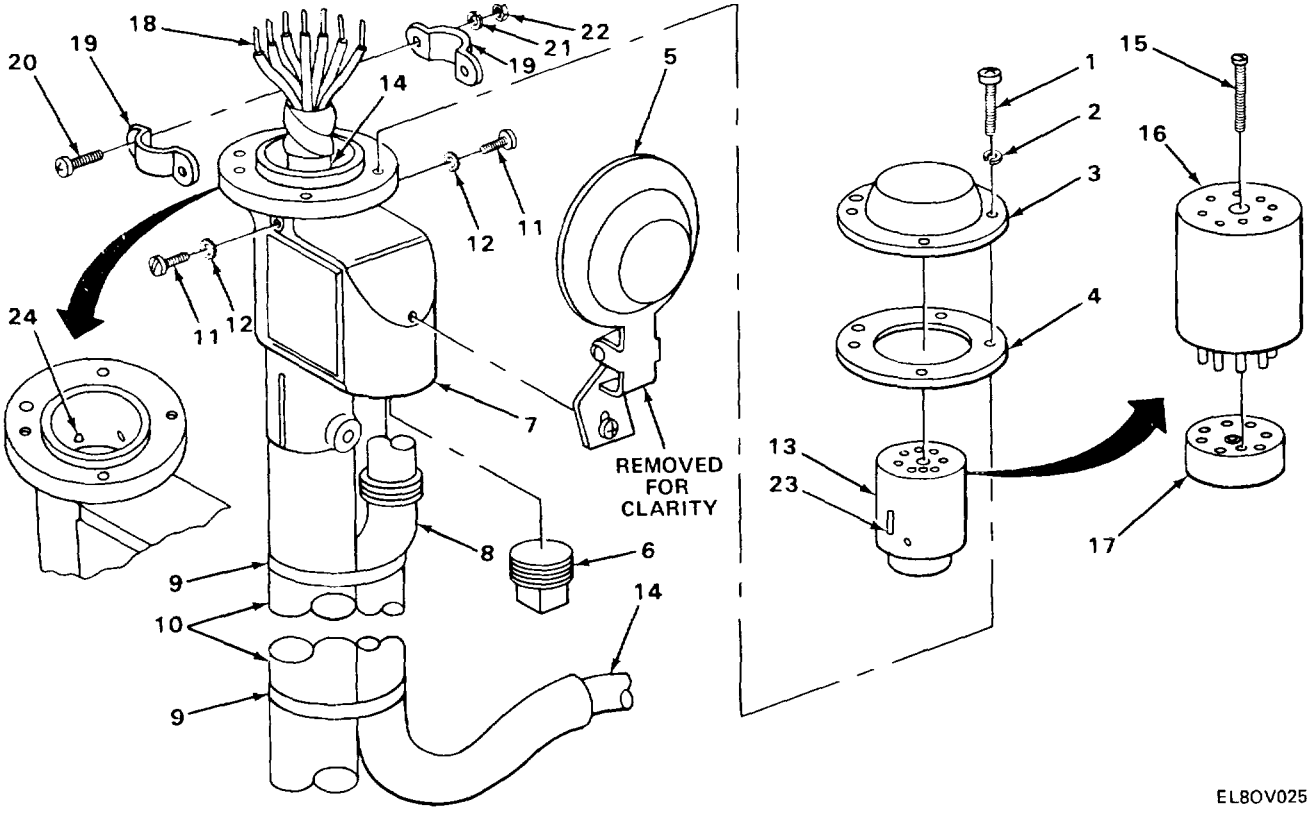
CAUTION

Reinforce support when tilted to prevent bending or breaking support braces.

RIGHTING SUPPORT ASSEMBLY

1. Stand support assembly upright on mounting base, positioning short brace (5) and long brace (6) in mounting base (7).
2. Install screw (1), spacer (2), lockwasher (3), and nut (4).
3. Tighten all three screws (1) in mounting bases (7), (8), and (10).

4-13. CONDUIT INTERCONNECTION CABLE TO CONNECTOR HOUSING INSTALLATION.



NOTE

For T-420/GMQ-11 and T-420B/GMQ-11, perform step 1. For T-420A/GMQ-11, perform step 2.

1. Remove four screws (1) and lockwashers (2), and remove connector housing cover (3) and gasket (4). Go to step 3.
2. Tilt hinged connector housing cover (5) upward and remove gasket (4).
3. Remove pipe plug (6) from connector housing (7). Retain for shipping.
4. Connect conduit (8) to connector housing (7).
5. Using clamps (9), secure conduit (8) to support mast (10).
6. Remove two screws (11) and lockwashers (12).
7. Remove connector J1 (13) from connector housing (7).

NOTE

A substitute cable (app D) must be used for installation with conduit. Cable WM-76/U will not fit through conduit.

8. Remove 4 inches (10.16 cm) of outer insulation from cable (14).
9. Remove enough insulation from wires to solder to connector J1 (13).
10. Put prepared end of cable (14) into bottom of conduit (8).
11. Push cable (14) through conduit (8) and out opening on top of connector housing (7).
12. Loosen screw (15) on connector J1 (13) and separate case (16) and retainer (17).

4-13. CONDUIT INTERCONNECTION CABLE TO CONNECTOR HOUSING INSTALLATION. (CONT)

NOTE

For correct soldering methods, refer to TB SIG 222.

When using substitute cables, you must establish your own color coding to determine which color wires are connected to specific terminals on connector J1. The two largest wires must be connected to terminals 6 and 7 on connector J1.

Make a table to identify wires connected to terminals of connector J1 for later use in connection to indicator.

13. Solder wires from cable (14) to pins on connector J1 (13).

NOTE

Terminal 8 of connector J1 is not used. Note pin pattern for assembly of connector J1 (13).

14. Assemble connector J1 (13) by pushing case (16) and retainer (17) together, and secure with screw (15).
15. Wrap electrical tape around wires (18) and cable (14) from bottom of connector J1 (13) down 3 inches (7.62 cm).
16. Install clamps (19), two screws (20), lockwashers (21), and nuts (22) on cable (14) in area where electrical tape is wrapped.
17. Aline notch (23) in connector J1 (13) with pin (24) in connector housing (7) and push connector J1 into place.

NOTE

Allow for slack in wires between connector J1 and cable clamp. Move cable clamp if necessary to increase or reduce slack.

18. Install two screws (11) and lockwashers (12).

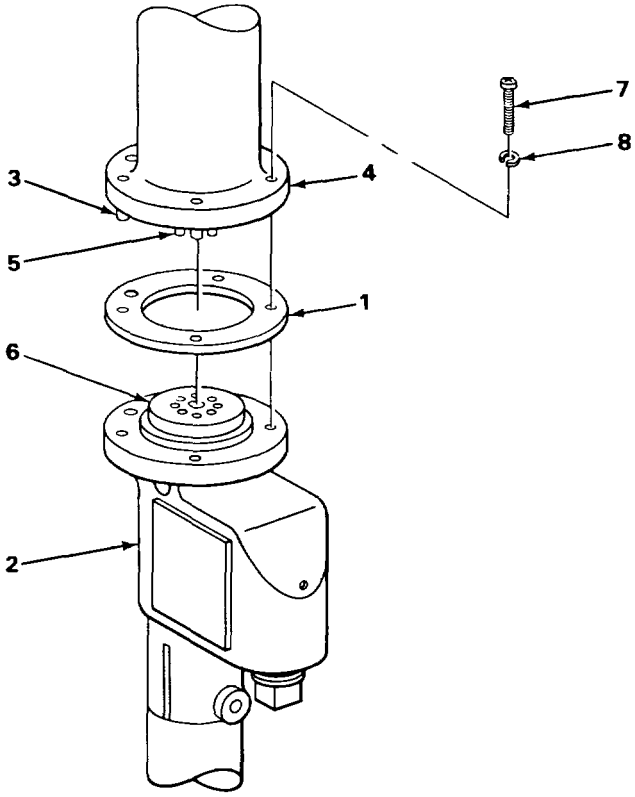
NOTE

For T-420/GMQ-11 and T-420B/GMQ-11, perform step 19. For T-420A/GMQ-11, perform step 20.

19. Install gasket (4), connector housing cover (3), four screws (1), and lockwashers (2).
20. Install gasket (4) and close hinged connector housing cover (5).

4-14. TRANSMITTER TO CONNECTOR HOUSING INSTALLATION.

PRELIMINARY PROCEDURE: Tilt support assembly (para 4-12).



EL8OV026

1. Position gasket (1) on connector housing (2).

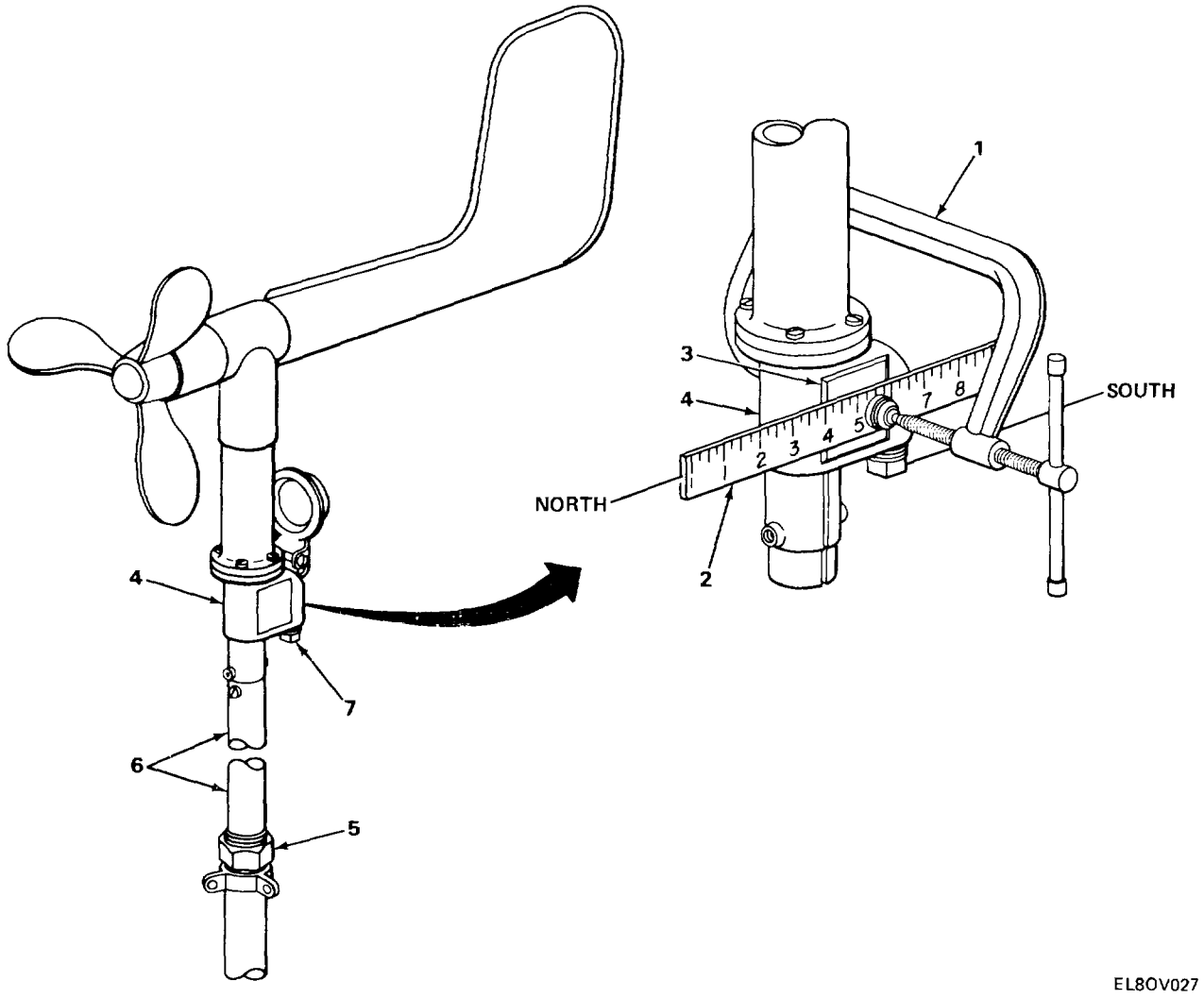
CAUTION

Do not lift transmitter by vane tail or impeller; lift transmitter by center section only.

2. Aline positioning pin (3) on transmitter (4) with hole in connector housing (2).
3. Aline pins (5) on transmitter (4) with holes on connector J1 (6) and push into place.
4. Install four screws (7) and lockwashers (8) and draw down evenly.

FOLLOW-ON MAINTENANCE: Set support assembly upright (para 4-12).

4-15. TRANSMITTER ALINEMENT.



1. Using clamp (1), secure a straightedge (2) on machined surface (3) of connector housing (4).

NOTE

If wind direction is to be indicated to true north (instead of magnetic north), refer to station reference data for local declination (angle between true and magnetic north at a particular site). Use compass to establish magnetic north.

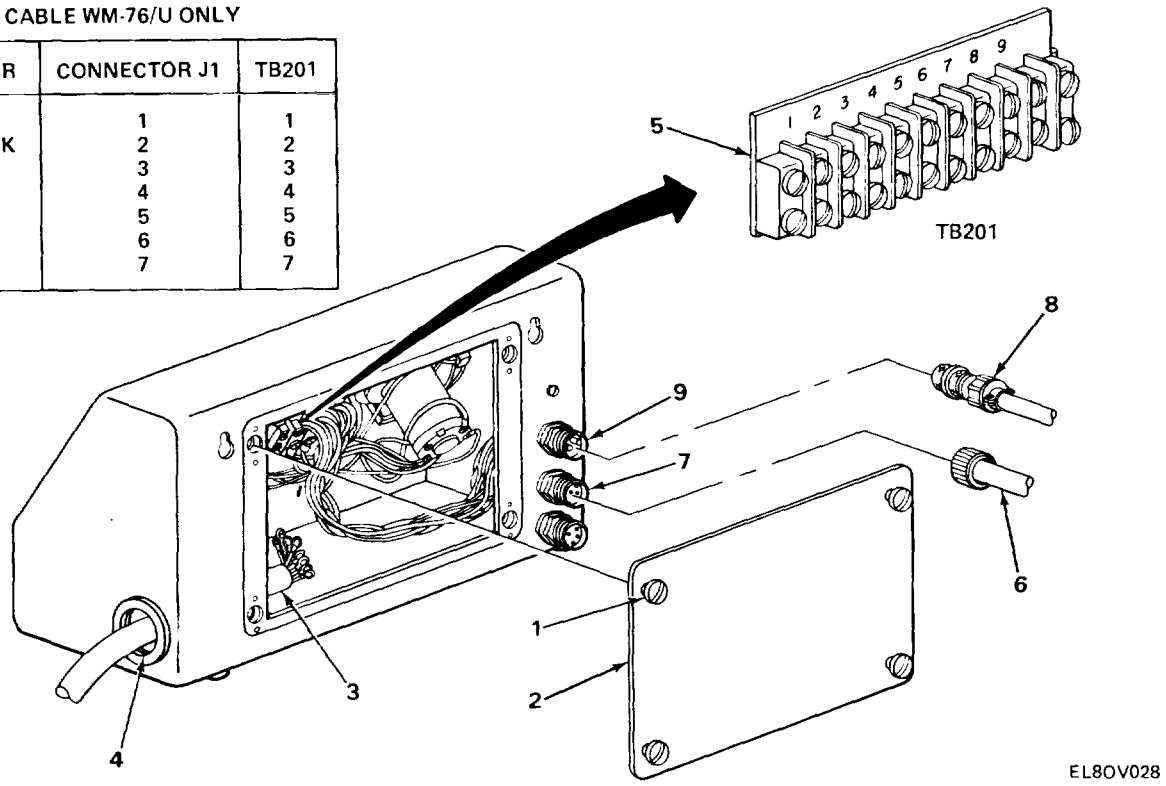
2. Loosen compression nut (5) and turn upper mast section (6) so straightedge is in line with north reference selected and pipe plug (7) (or conduit cable connection) is facing south.
3. Tighten compression nut (5) to hold upper mast section (6) in place.

4-16. INDICATOR CABLING INSTALLATION.

PRELIMINARY PROCEDURE: Assemble indicator (para 4-9).

FOR CABLE WM-76/U ONLY

WIRE COLOR	CONNECTOR J1	TB201
BLUE	1	1
RED/BLACK	2	2
GREEN	3	3
RED	4	4
YELLOW	5	5
WHITE	6	6
BLACK	7	7



NOTE

Steps given are typical for both flexible and conduit interconnection cables.

When using cable WM-76/U, use color-code diagram shown.

When using substitute cable, use color-code diagram generated when wiring connector J1 to transmitter.

For indicators with internal wiring, perform steps 1 through 4.

For indicators with external plugs, perform steps 5 and 6.

1. Loosen four turn-lock fasteners (1) and remove rear cover (2).
2. Install prepared cable (3) through hole (4) on side of indicator.
3. Connect wires as shown in diagram for cable *WM-76/U* or diagram generated for substitute cable to TB201 (5).
4. Install rear cover (2) and tighten four turn-lock fasteners (1). Perform step 6.
5. Connect interconnection cable plug P402 (6) to receptacle J402 (7).

4-16. INDICATOR CABLING INSTALLATION. (CONT)

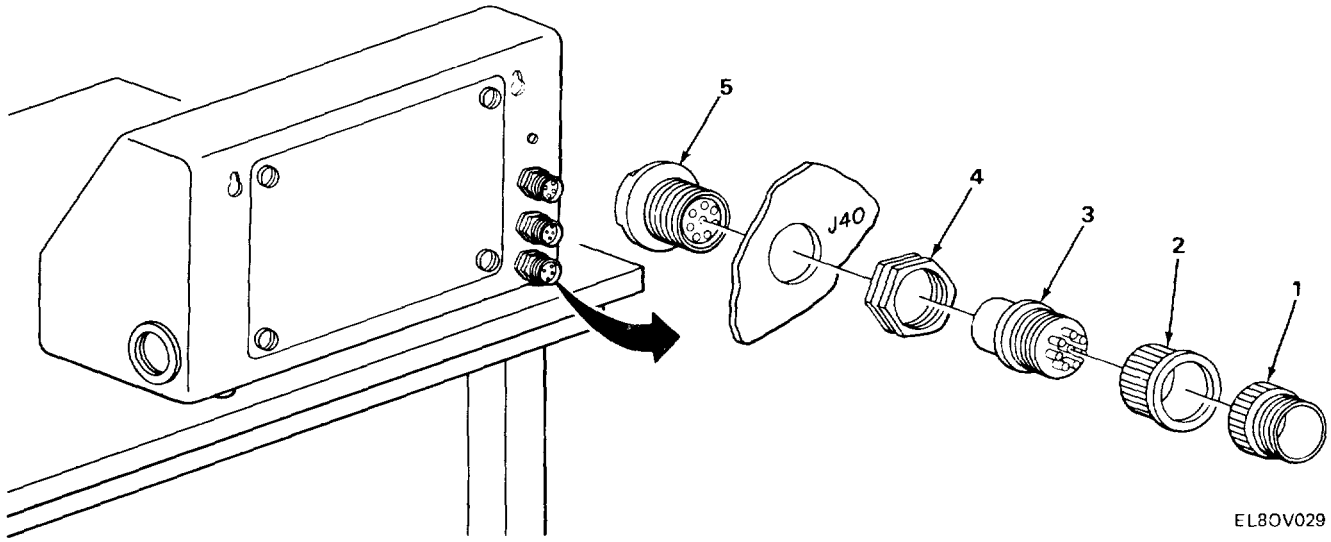
NOTE

Power cable comes either hard wired to terminals 1 and 9 on TB201 or has plug P401 (8) that connects to receptacle J401 (9).

6. Connect power cable plug P401 (8) to receptacle J401 (9).

4-17. INDICATOR INSTALLATION.

MATERIALSIPARTS: Nails, #3D (two required)
Wood screws, 1-inch (two required)



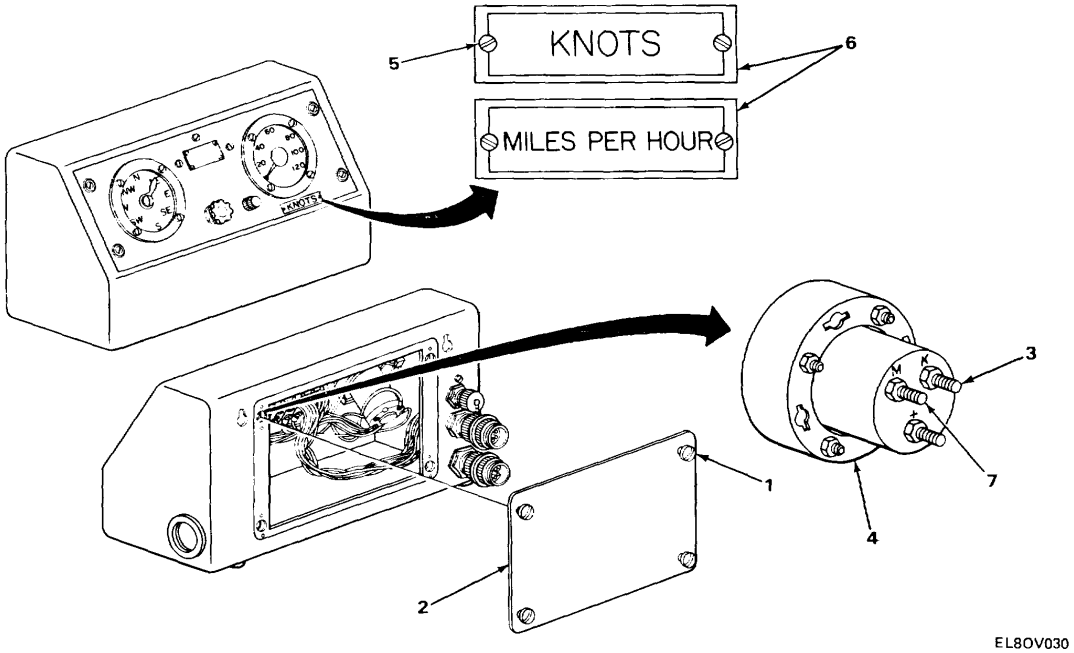
The indicator can be mounted on either a flat level surface or secured to a wall.

When mounting indicator on flat level surface, make sure there is enough room left all around indicator for ease of maintenance and connection of cables.

When mounting indicator on wall, receptacles J401, J402, and J403 must be recessed into indicator case. Perform steps 1 and 2 to recess receptacles.

1. Remove knurled reducer (1), retainer collar (2), and adapter plug (3), and loosen nut (4). Store items (1), (2), and (3) for future use.
2. Push receptacle (5) into indicator case enough to allow last few threads of receptacle to hold nut (4).
3. Perform steps 1 and 2 for all three receptacles.
4. Install two nails or screws in wall and hang indicator by two slotted holes on rear of indicator case.

4-18. WINDSPEED INDICATOR ADJUSTMENT FOR KNOTS OR MPH.



1. Loosen four turn-lock fasteners (1) and remove rear cover (2).

NOTE

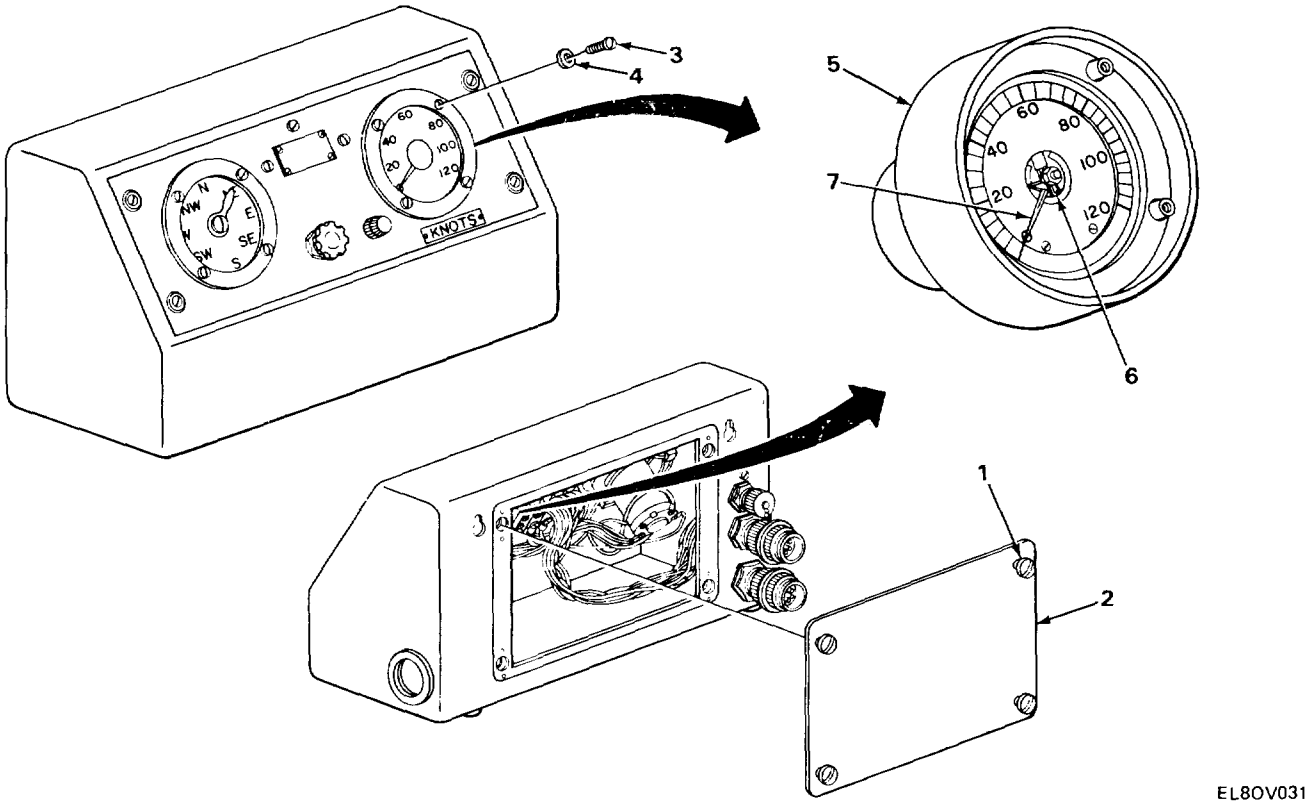
For indication of knots, perform steps 2, 3, and 4. For indication of miles per hour, perform steps 5 through 7.

2. Connect orange wire (white wire numbered 4-14 on some indicators) to terminal K (3) on windspeed indicator (4).
3. Remove two screws (5) and position identification plate (6) to indicate knots.
4. Install two screws (5). Perform step 8.
5. Connect orange wire (white wire numbered 4-14 on some indicators) to terminal M (7) on windspeed indicator (4).
6. Remove two screws (5) and position identification plate (6) to indicate miles per hour.
7. Install two screws (5).
8. Install rear cover (2) and tighten four turn-lock fasteners (1).

NOTE

Some models of indicator include a dial mask mounted behind window. Mask is marked either KNOTS or MILES PER HOUR. If mask does not reflect display selected, carefully remove indicator from front panel (para 4-19). Remove indicator window and mask and turn mask over to indicate proper display. Replace mask and indicator window and install indicator to front panel.

4-19. WINDSPEED INDICATOR ZERO ADJUSTMENT, ID-373*1G*MQ-11, ID-373B/GMQ-11, OR ID-37*3CG* MQ -11.



NOTE

For windspeed indicator zero adjustment on ID-373A/GMQ-11, see paragraph 2-5.

1. Loosen four turn-lock fasteners (1) and remove rear cover (2).

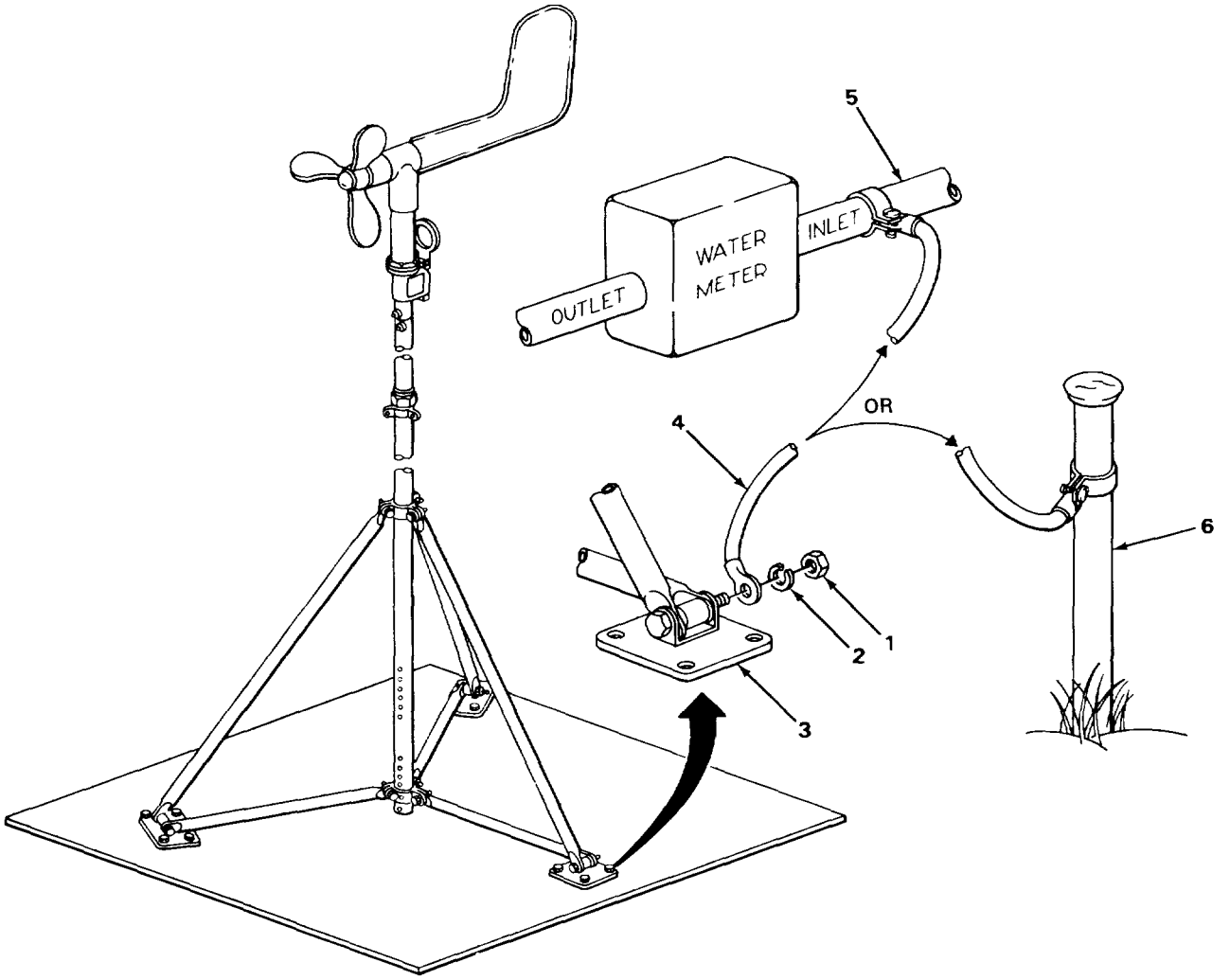
CAUTION

Hold indicator firmly against front panel when removing screws to prevent dropping.

2. While holding indicator firmly against front panel, remove four screws (3) and lockwashers (4) and carefully turn indicator (5) to face outward.
3. Carefully move lever (6) to face pointer (7) at zero.
4. Position indicator (5) on inside of front panel and install four screws (3) and lockwashers (4). Tighten screws evenly.
5. Install rear cover (2) and tighten four turn-lock fasteners (1).

4-20. PROTECTIVE GROUND CONNECTION.

MATERIALSIPARTS: 10-gage wire or larger (length to be determined)



1. Remove nut (1) and lockwasher (2) from nearest mast base (3) to ground point.
2. Install ground wire (4), lockwasher (2), and nut (1) to mast base (3).

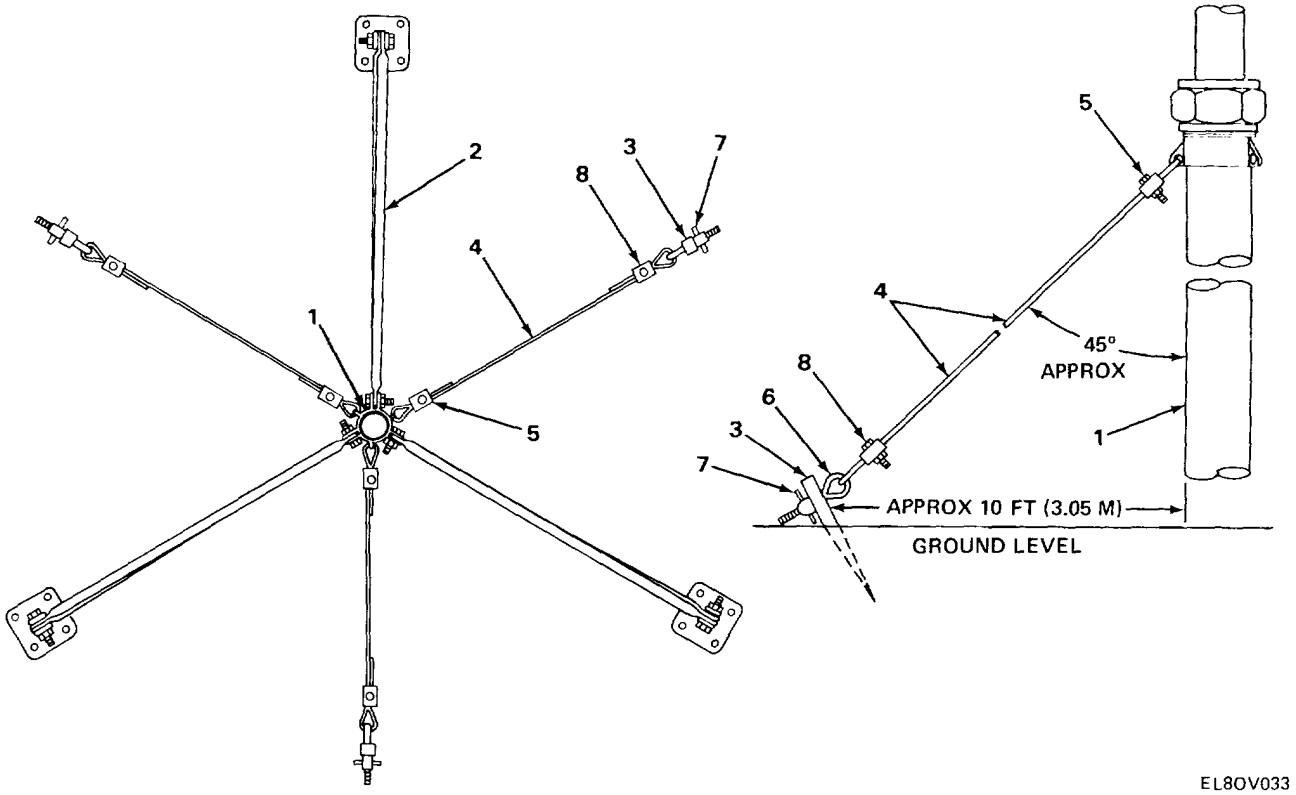
NOTE

Connection of ground wire depends on availability of good ground connection such as a water pipe (5) or a driven ground rod (6). For a more detailed description of grounding requirements, refer to TB 43-0125.

If ground wire is to be connected to a water pipe with a meter, ground wire must be connected to inlet side. If inlet side is not readily accessible, connect ground wire to outlet side and connect a jumper wire from outlet to inlet side. Failure to use a jumper wire may cause damage to meter.

4-21. SUPPORT MAST GUYING.

SECURED AT GROUND LEVEL

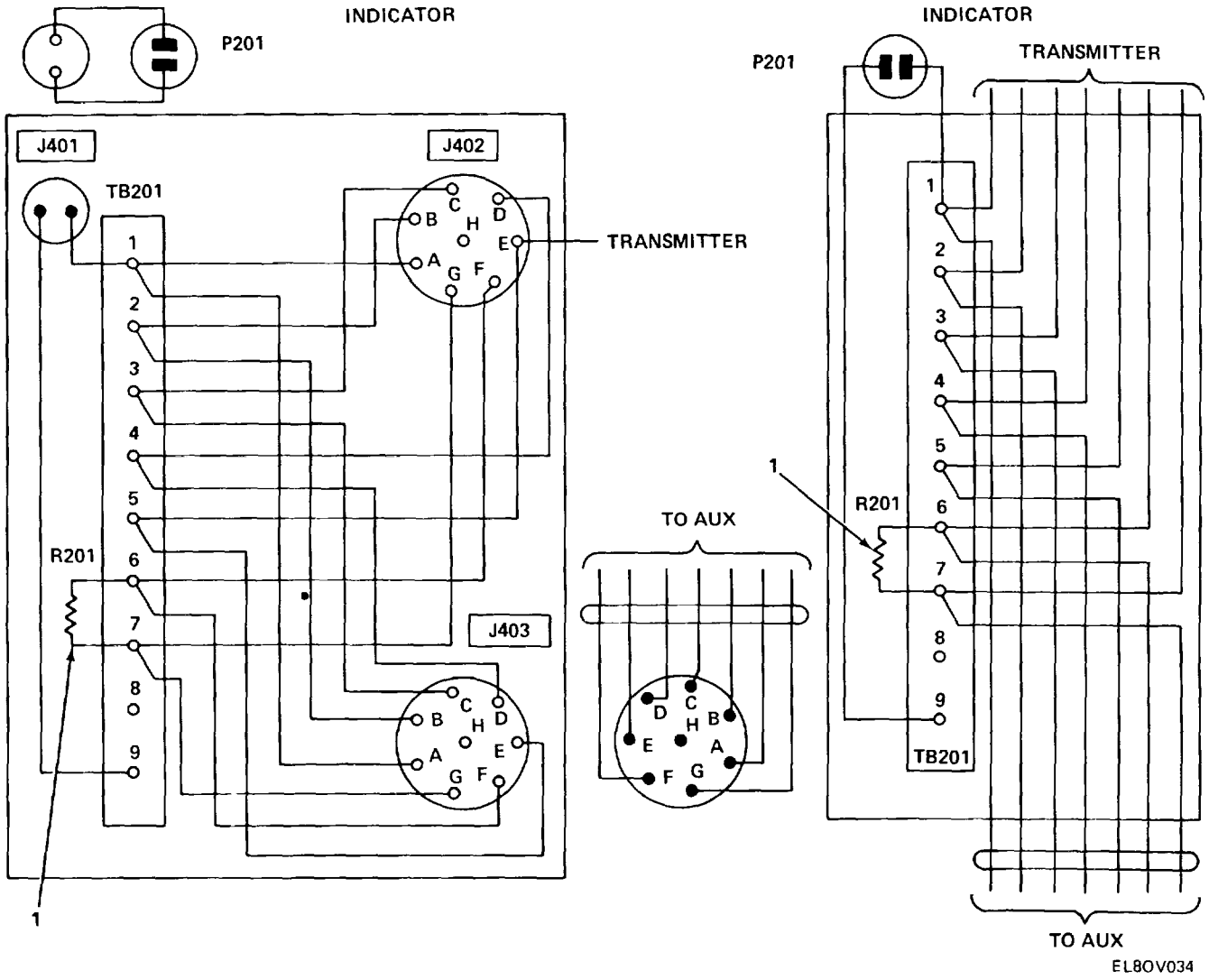


NOTE

If ground is level, perform steps 1 and 2. If ground is not level, perform steps 3 through 9.

1. Measure 10 feet (3.05 m) from center of support (1) between each set of long support braces (2).
2. Drive guy stake (3) into ground with top of stake angled away from support (1). Go to step 4.
3. Measure 10 feet (3.05 m) from center of support (1), then position guy stakes (3) so angle of guy wires (4) are approximately 45 degrees.
4. Loop guy wire (4) through loops in top of support (1).
5. Secure guy wire (4) with clamps (5).
6. Install eyebolt (6) and hand nut (7) through guy stakes (3). Leave hand nuts loose.
7. Pull wire to guy stake (3) and cut guy wire (4), allowing 1 foot (30.48 cm) to pass guy stake.
8. Install guy wire (4) through eyebolt (6) and secure with clamp (8).
9. Tighten all hand nuts (7) to apply even tension on all guy wires (4). Support must remain vertical.

4-22. AUXILIARY EQUIPMENT INSTALLATION.



NOTE

Steps given are typical for installation of both auxiliary indicator or recorder.

For more detailed instructions on installing recorder, refer to TM 11-6660-231-12.

When auxiliary indicator is used, the indicator with the highest letter modification will be used as the set indicator.

1. Loosen four turn-lock fasteners and remove indicator rear cover.
2. Remove R201 (1) and tape to inside bottom of indicator case to prevent loss.
3. If auxiliary indicator power cable is wired to TB201, disconnect from terminals 1 and 9.
4. If auxiliary indicator power cable is connected to J401, disconnect plug P401 and install protective cap.
5. Adjust both windspeed indicators for knots or miles per hour (para 4-18).

4-22. AUXILIARY EQUIPMENT INSTALLATION. (CONT)

6. Adjust both windspeed indicators for zero adjustment (para 4-19 for ID-373/GMQ-11, ID-373B/GMQ-11, or ID-373C/GMQ-1 1, or para 2-5 for ID-373A/GMQ-11).
7. If plugs to J403 are used to interconnect indicators, connect wires from terminal on one plug to same terminal on other plug.
8. If direct wiring to TB201 is used to interconnect indicators, connect wires from terminal of one TB201 to same terminal on other TB201.
9. If one plug and wiring to TB201 is used to interconnect indicators, connect wires as shown in following chart for cable WM-76/U. If substitute cable is used, use chart generated when wiring to transmitter (para 4-8).

CABLE WM-76/U

TB201	J403
1	A
2	B
3	C
4	D
5	E
6	F
7	G

Section IV ORGANIZATIONAL PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS)

4-23. GENERAL.

The organizational PMCS procedures for the AN/GMQ-11 are to be done quarterly, unless directed otherwise by the commanding officer

The routine covering of unused receptacles and checks such as equipment inventory; cleaning components; checking for frayed or broken cables; replacing items not in use; and checking for loose hardware, nuts, bolts, and screws, are not listed in the PMCS table. You should do these things as a matter of good preventive maintenance. If you find a routine check in the PMCS, it was listed because other technicians reported problems with this item.

You must check for technical publications and current MWO's. Requisition replacements for any missing or unusable maintenance manuals. Check that current MWO's have been applied and that the MWO number is stamped as required.

If the equipment must be kept in service, check and service only those things that can be checked and serviced without disturbing operation. Make complete checks and services when equipment can be shut down.

If the equipment fails to operate, see the organizational troubleshooting steps in this manual. Refer to DA Pam 738-750 as a guide to forms and procedures used for reporting problems. For recording PMCS results, use DA Form 2404, Equipment Inspection and Maintenance Worksheet.

4-23. GENERAL. (CONT)

NOTE

Always keep in mind the warnings and cautions while performing the PMCS procedure or any routine checks.

ORGANIZATIONAL PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS)

QUARTERLY SCHEDULE

Item No.	ITEM TO BE INSPECTED	: PROCEDURES
1	TRANSMITTER	Turn transmitter vane and check for excessive friction or binding. Visually check generator cover for chips, cracks, dents, or corrosion. Turn impeller and check for excessive friction, binding, or wobble. Visually check vane tail for dents or opening of seams. Visually check connector housing for chips, cracks, dents, or corrosion.
2	CENTER SECTION O-RINGS	Visually check for defective or missing O-rings which will allow moisture to enter transmitter.
		WARNING
	Unplug indicator before performing following checks on indicator.	
3	INDICATOR	Check for frayed wires or loose connections on indicators or TB201, especially terminals 1 and 9 on TB201. Check fuse holder F201 for cracks or frayed wires.
4	PUBLICATIONS	Requisition any operator and organizational maintenance manuals covering the AN/GMQ-11 and its components if missing or in unusable condition.
5	MODIFICATION WORK ORDERS (MWO's)	Check DA Pam 310-1 for MWO's required for the AN/GMQ-11 and its components. Check equipment to see if current MWO's have been complied with and the MWO number is stamped as required. Perform or request modification as applicable.

Section V ORGANIZATIONAL TROUBLESHOOTING PROCEDURES

4-24. GENERAL.

The troubleshooting table lists malfunctions that may be found while performing PMCS or when equipment is being operated.

The troubleshooting table does not list all problems that may occur. If your problem is not listed, or if the procedures given do not correct the problem, report it to a higher level of maintenance.

When working on any problem, be sure to report your work on the forms prescribed by DA Pam 738-750.

First check the symptom index for symptom, then check troubleshooting table or possible solution or corrective action.

WARNING

When making static continuity checks, unplug power cable from power source.

SYMPTOM INDEX

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

1. Dial lamps and wind direction indicator inoperative, windspeed indicator functioning properly.

   Step 1. Check for 105 - 125 vac at receptacle.

   Restore power.

   Step 2. Check for 105 - 125 vac at terminals 1 and 9 on TB201 or at J401. (See FO-1.)

   Repair, tighten, or replace wires.

   Step 3. Check TB201 for broken terminal jumper straps.

   Refer to higher category of maintenance.

   Step 4. Check white wire 4-6 and purple wire 4-12 from ac power source or plug J401 to TB201 for continuity. (See FO-1.)

   Tighten, repair, or replace wires.

   Step 5. Check black wire 4-11 and purple wire 4-12 from fuse F201 to TB201 for continuity. (See FO-1.)

   Tighten, repair, or replace wires.

2. Dial lamps inoperative, wind direction indicator functioning properly.

   Step 1. Check transformer output from red wire terminal to green wire terminal for 6.3 vac.

   Refer to higher category of maintenance.

   Step 2. Check red wire 4-9 from transformer to light switch for continuity.

   Tighten, repair, or replace wire.

   Step 3. Turn light switch clockwise and check output (white wire) for erratic or no readings.

   Refer to higher category of maintenance.

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

3. Windspeed and direction indications erratic or incorrect.

Step 1. Check P402 and J402 or direct wiring to TB201 for defective connections.

Solder or tighten all connections.

Step 2. Check wires and connections at transmitter connector J1 for looseness, corrosion, or breaks.

Solder, clean, or replace wires (para 4-8 or 4-13).

Step 3. Check each wire of interconnection cable from transmitter to indicator for continuity.

Repair or replace (para 4-8, 4-9, 4-13, or 4-16).

4. Windspeed indicator shows lower readings than actual windspeed, wind direction indicator functioning properly.

Check for excessive friction caused by a bent, chipped, or corroded generator cover or bearing.

a. Replace generator cover (para 4-30).

b. Refer to higher category of maintenance.

5. Windspeed indicator shows higher readings than actual windspeed, wind direction indicator functioning properly.

Check for defective R201, 2300 resistor.

Refer to higher category of maintenance.

6. Windspeed indicator shows erratic or no readings, wind direction indicator functioning properly.

Step 1. Check P402 and J402 or direct wiring to TB201 for defective connections,

Solder or tighten all connections.

Step 2. Check blue jumper wire 4-15 from terminal 7 to terminal 8 on TB201 for looseness or frays.

Tighten or replace wire.

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

6. Windspeed indicator shows erratic or no readings, wind direction indicator functioning properly. (Cont)

Step 3. Check orange wire 4-14 and brown wire 4-7 on indicator for defective connections.

Tighten or replace wires.

Step 4. Check for chips or warpage on transmitter impeller.

Replace impeller (para 4-29).

7. Wind direction indicator reacts slowly.

Turn vane and check for binding.

Refer to higher category of maintenance.

8. Wind direction indicator shows erratic or no readings, other functions normal.

Step 1. Check continuity of wires from TB201 to indicator.

White wire 4-6 from terminal 1.
Black wire 4-1 from terminal 2.
Green wire 4-2 from terminal 3.
Red wire 4-4 from terminal 4.
Yellow wire 4-5 from terminal 5.

Tighten, repair, or replace wire.

Step 2. Check transmitter connector J1 for cracks or loose or broken wires.

Tighten, repair, or replace wires or connector (para 4-8 or 4-13).

9. Wind direction indicator pointer points 180 degrees from correct direction.

Step 1. Check for reversed wires at indicator.

Correct wiring. (See FO-3.)

Step 2. Check for reversed wires at transmitter connector J1.

Correct wiring (para 4-8 or 4-13).

Section VI ORGANIZATIONAL MAINTENANCE PROCEDURES

4-25. GENERAL.

This section provides instructions for organizational maintenance of the AN/GMQ-11. The following initial setup information applies to all procedures.

Resources required are not listed unless they apply to the particular procedure.

Personnel are listed only if the task requires more than one technician.

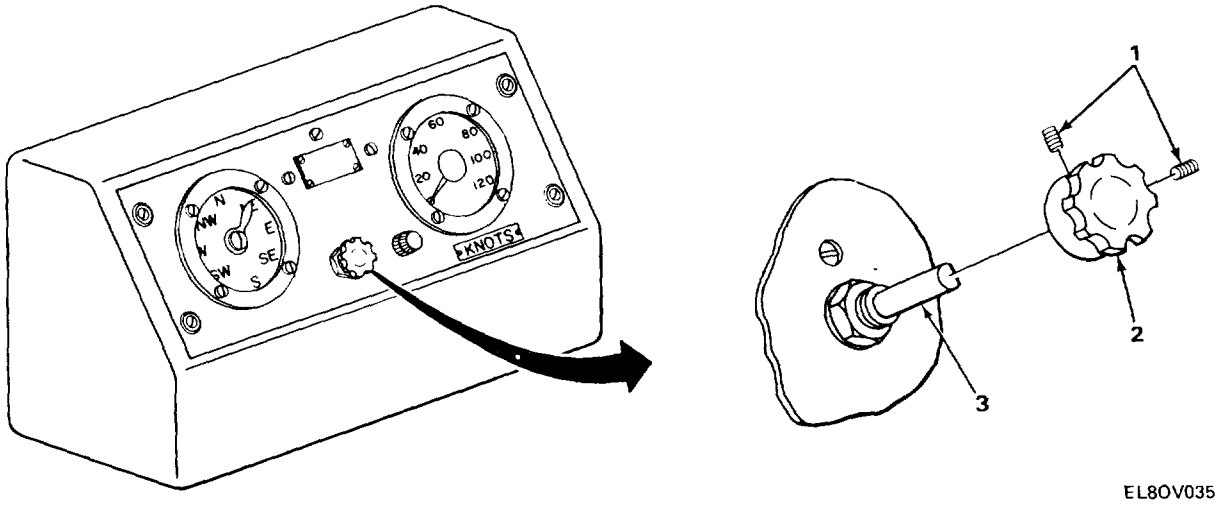
The normal standard equipment condition to start a maintenance task is power cable unplugged. Equipment condition is not listed unless some other condition is required.

Radio Repair Tool Kit TK-17/FMQ-1 is used for all procedures.

Procedures given apply to all models unless otherwise specified.

4-26. LIGHT SWITCH KNOB REPLACEMENT.

MATERIALS/PARTS: Knob (ID-373/GMQ-11, ID-373AIGMQ-11, and ID-373C/GMQ-11) NSN 5355-00-519-9203
Knob (ID-373BIGMQ-11 order no. 51014-P-57) NSN 5355-00-543-7183
Knob (ID-373B/GMQ-11) NSN 5355-00-844-2309



REMOVAL

1. Using 3/32-inch hex wrench, loosen two setscrews (1).
2. Pull knob (2) off switch stem (3).

INSTALLATION

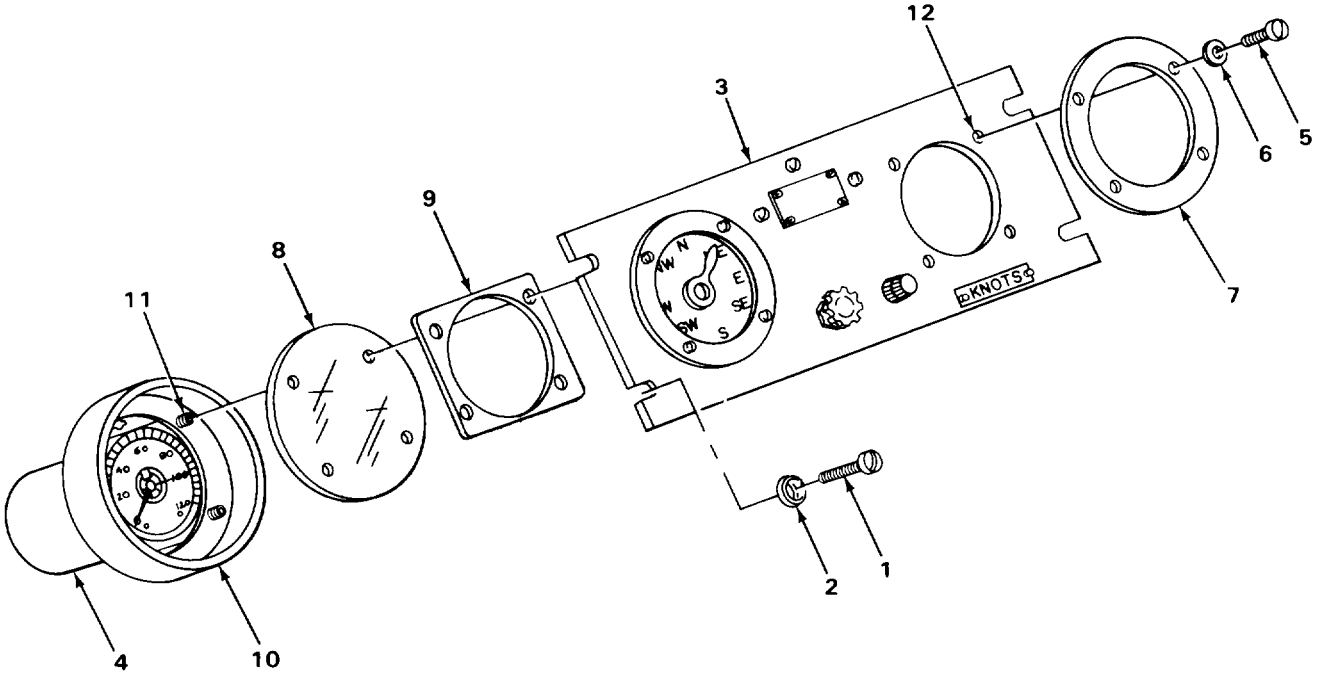
1. Install knob (2) on switch stem (3) alining two setscrews (1) with flat surfaces on switch stem.
2. Using 3/32-inch hex wrench, tighten two setscrews (1).

4-27. DIAL WINDOW REPLACEMENT.

MATERIALS/PARTS: Dial window (ID-373B/GMQ-11) NSN 6660-00-844-5254
Dial window (ID-373B/GMQ-11, order no. 51014-P-57) NSN 6660-00-460-3964
Gasket, NSN 6660-00-582-7149 (if needed)
Windspeed and direction indicator, NSN 6660-00-752-7793

4-27. DIAL WINDOW REPLACEMENT. (CONT)

WINDSPEED INDICATOR



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REMOVAL

1. Remove four screws (1) and washers (2), and remover front panel (3) from indicator case.
2. While holding indicator (4) against front panel (3), remove four screws (5), lockwashers (6), and ring(7).
3. While holding front panel (3) face up, remove indicator (4).
4. Remove dial window (8).

NOTE

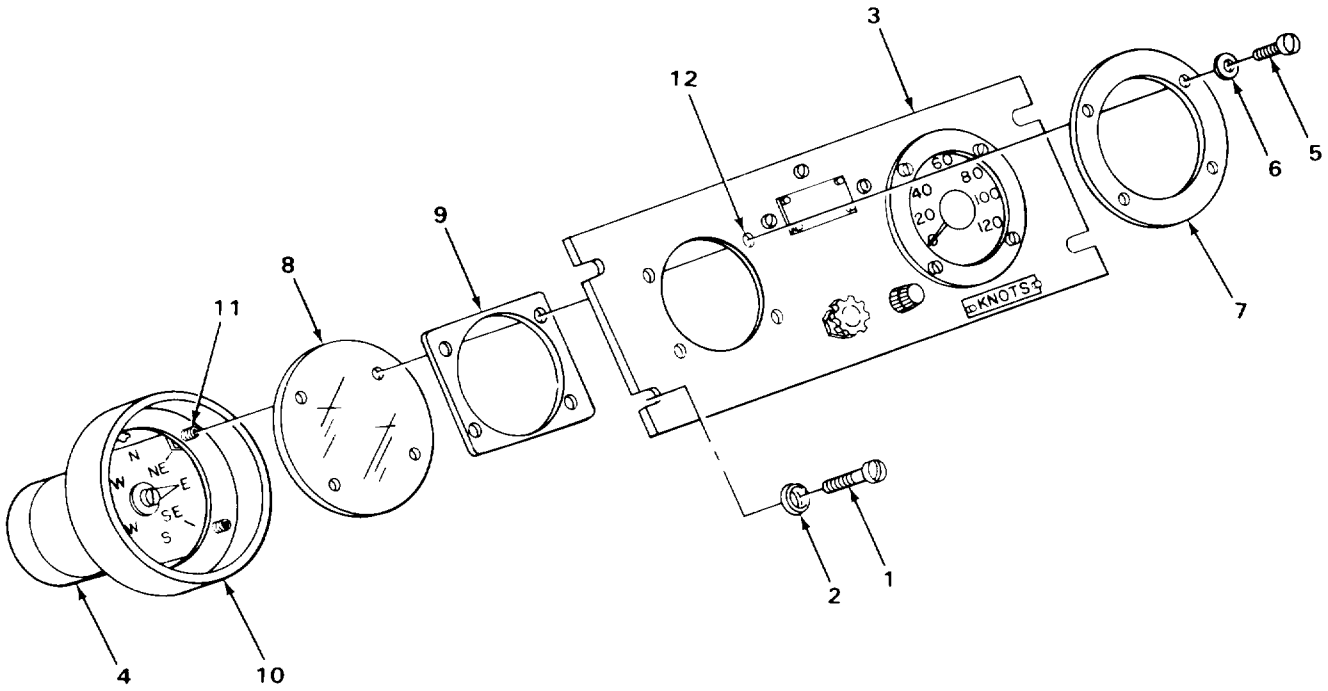
Dial window gasket (9) is secured to front panel; replace dial window gasket only if damaged.

INSTALLATION

1. Place new dial window (8) in light shield (10) and aline indicator studs (11) with holes (12) on front panel (3).
2. Install ring (7), four screws (5), and lockwashers (6). Tighten evenly.
3. Install front panel (3) on indicator case.
4. Install four screws (1) washers (2).

4-27. DIAL WINDOW REPLACEMENT. (CONT)

WIND DIRECTION INDICATOR



NOTE

Steps given are typical for all models.

REMOVAL

1. Remove four screws (1) and washers (2) and remove front panel (3) from indicator case.
2. While holding indicator (4) against front panel (3), remove four screws (5), lockwashers (6), and ring (7).
3. While holding front panel (3) face up, remove indicator (4).
4. Remove dial window (8).

NOTE

Dial window gasket (9) is secured to front panel; replace dial window gasket only if damaged.

INSTALLATION

1. Place new dial window (8) in light shield (10) and aline indicator studs (11) with holes (12) on front panel (3).
2. Install ring (7), four screws (5), and lockwashers (6). Tighten evenly.
3. Install front panel (3) on indicator case.
4. Install four screws (1) and washers(2).

4-28. POWER CABLE REPLACEMENT.

MATERIALS/PARTS: Electrical power cable, NSN 6145-00-548-1258

NOTE

On some models, power cable comes either connected directly to terminal board TB201 or connected to plug P401 for connection to jack J401. Both procedures are covered here.

PREPARATION OF NEW CABLE

For direct wiring to TB201:

1. Remove 4 inches (10.16 cm) of outer insulation from end of cable.
2. Remove enough insulation from each wire to solder on terminal lug.

NOTE

For correct soldering methods, refer to TB SIG 222.

3. Solder a terminal lug to both wires.

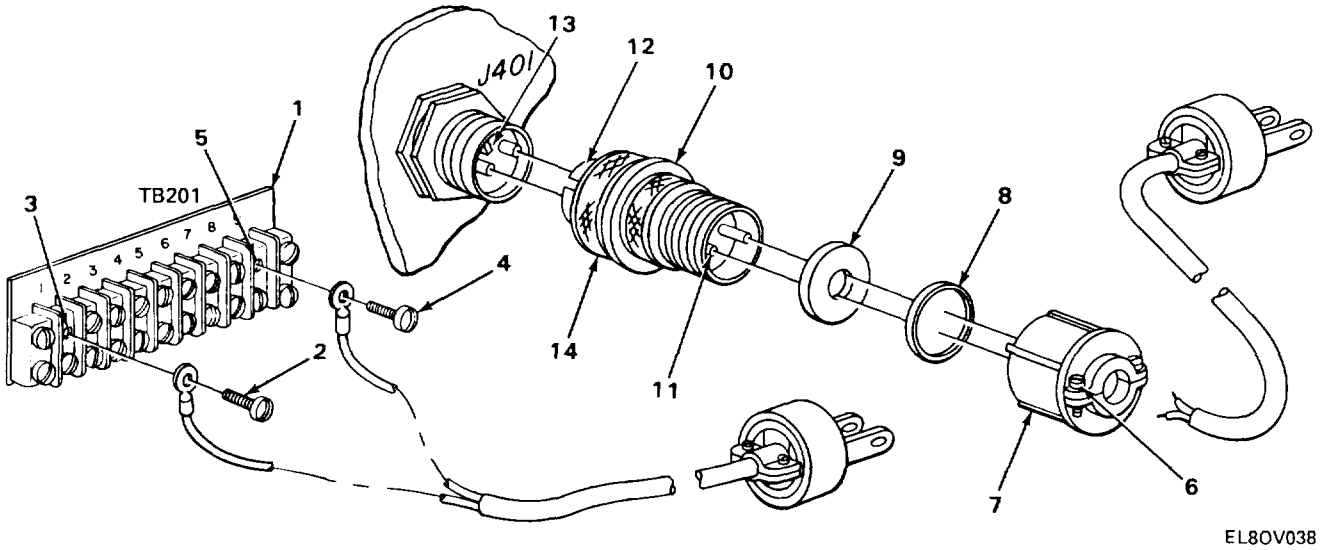
For connection to J401:

1. Remove 1 inch (2.54 cm) of outer insulation from end of cable.
2. Remove enough insulation from each wire to solder to connector pins.

WARNING

Unplug power cable from power source before attempting replacement procedures.

4-28. POWER CABLE REPLACEMENT. (CONT)



DIRECT WIRING TO TB201

REMOVAL

1. Loosen four turn-lock fasteners on rear of indicator and remove rear cover.
2. On TB201 (1), remove screw (2) from terminal 1 (3) and screw (4) from terminal 9 (5) and remove cable from indicator.

INSTALLATION

1. Install cable into indicator.
2. Connect one wire to terminal 1 (3) with screw (2) and other wire to terminal 9 (5) with screw (4).
3. Install rear cover of indicator and tighten four turn-lock fasteners.

CONNECTION TO J401

REMOVAL

1. Unscrew plug P401 and pull free from jack J401.
2. Loosen two screws (6) and unscrew wire retainer (7).
3. Pull wire retainer (7), washer (8), and rubber bushing (9) up wire and away from connector body (10).

NOTE

For correct soldering methods, refer to TB SIG 222.

4. Unsolder two wires from connector body pins (11).
5. Remove rubber bushing (9), washer (8), and wire retainer (7) from cable.

4-28. POWER CABLE REPLACEMENT. (CONT)

INSTALLATION

1. Install wire retainer (7), washer (8), and rubber bushing (9) on wire. Leave about 5 inches of cable protruding.

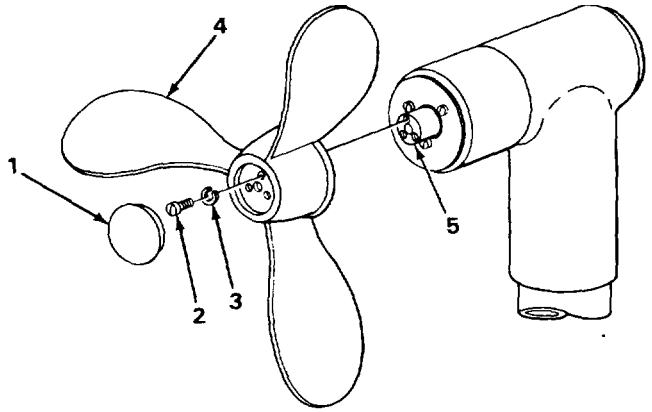
NOTE

For correct soldering methods, refer to TB SIG 222.

2. Solder each wire to two connector body pins (11).
3. Slide rubber bushing (9), washer (8), and wire retainer (7) down cable and screw wire retainer to connector body (10).
4. Tighten two screws (6) on wire retainer (7).
5. Aline notch (12) on connector body (10) with key (13) on J401 and push connector into place.
6. Tighten knurled collar (14).

4-29. IMPELLER REPLACEMENT.

MATERIALS/PARTS: Impeller assembly (T-420A/GMQ-11) NSN 6660-00-505-4781
PRELIMINARY PROCEDURE: Tilt support assembly (para 4-12).



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REMOVAL

1. Remove rubber nose cap (1).
2. Remove three screws (2) and lockwashers (3) and remove impeller (4) from hub (5).

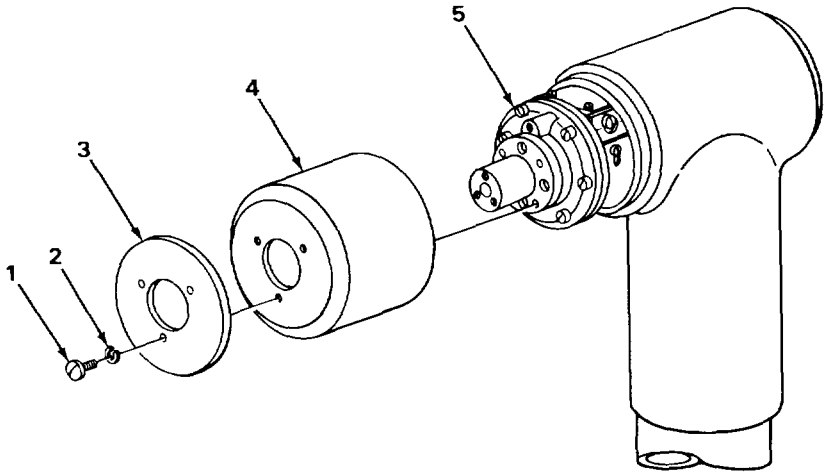
INSTALLATION

1. Install impeller (4) on hub (5) and aline three screw holes.
2. Install three screws (2) and lockwashers (3).
3. Install rubber nose cap (1).

FOLLOW-ON MAINTENANCE: Set support assembly upright (para 4-12).

4-30. GENERATOR COVER REPLACEMENT.

MATERIALS/PARTS: Wind direction and speed cover, NSN 6660-00-469-6681
PRELIMINARY PROCEDURE: Remove impeller (para 4-29).



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NOTE

Steps given are typical for all models.

REMOVAL

1. Remove three screws (1) and lockwashers (2).
2. Remove shield (3).
3. Remove generator cover (4) by pulling straight off generator (5).

INSTALLATION

1. Place generator cover (4) over generator (5) and aline holes.
2. Install shield (3) and aline holes.
3. Install three screws (1) and lockwashers (2).

FOLLOW-ON MAINTENANCE: Install impeller (para 4-29).

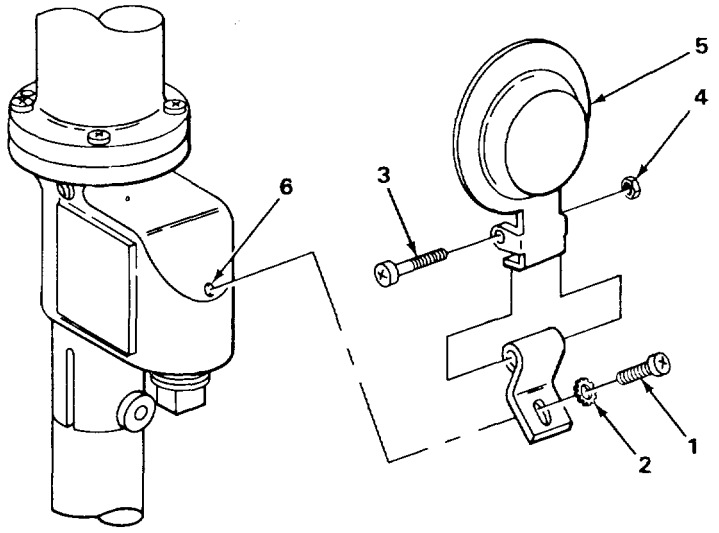
4-31. TRANSMITTER SUPPORT REPLACEMENT.

NOTE

If damage to transmitter support occurs, first determine which component is damaged and needs replacement. If repairs can be done, do the repair only if it will extend the useful life of the equipment. If replacement is necessary, see paragraph 4-7 for a detailed explanation of procedures.

4-32. CONNECTOR HOUSING COVER REPLACEMENT.

MATERIALS/PARTS: Protective cover, NSN 6660-00-612-0028
PRELIMINARY PROCEDURE: Tilt support assembly (para 4-12).



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NOTE

T-420/GMQ-11 and T-420 B/GMQ-11 have a different type of connector housing cover. Replacement procedures are covered in installation of flexible interconnection cable to connector housing (para 4-8).

If bracket is to be removed along with cover, perform steps 1 and 2. If cover is to be removed alone, perform step 2 only.

REMOVAL

1. Remove screw (1) and lockwasher (2) and remove assembly.
2. Remove screw (3) and locknut (4) and remove cover (5).

INSTALLATION

1. Install screw (3), cover (5), and locknut (4). Do not overtighten. Allow cover to move freely.

NOTE

If assembly was removed, perform step 2.

2. Place assembly over hole (6) and install screw (1) and lockwasher (2).

FOLLOW-ON MAINTENANCE: Set support assembly upright (para 4-12).

4-33. CLEANING.

MATERIALS/PARTS: Cloth (item 4, app E)
Thinner (item 3, app E)

WARNING

Thinner is flammable and fumes are toxic. Make sure there are no open flames and room has sufficient ventilation.

Using cleaning cloth dampened with thinner, clean all dirt or grease from surfaces to be painted. Remove residue.

4-34. TOUCHUP PAINTING.

MATERIALS/PARTS: Sandpaper (item 5, app E)
PRELIMINARY PROCEDURE: Clean (para 4-33).

1. Refer to refinishing specification TM 43-0139.
2. Using sandpaper, lightly sand rust and chips to bare metal.
3. Brush or spray two thin coats of paint on bare metal.

4-35. CABLE TESTS, CABLE WM-76/U.

TOOLS: Digital multimeter, Fluke 8600A

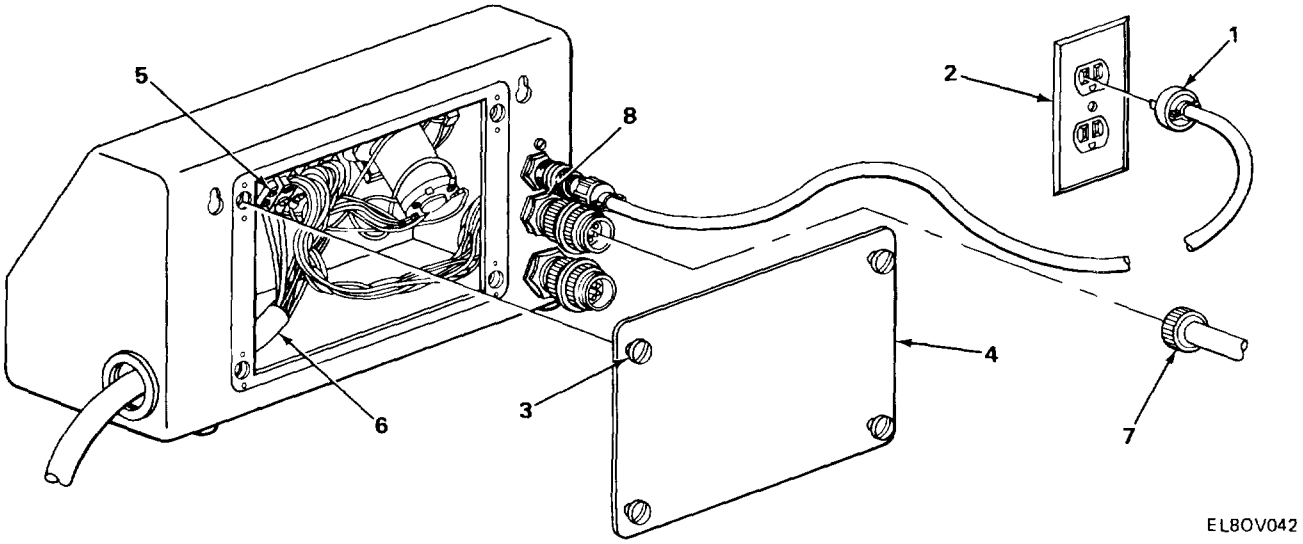
NOTE

Steps given are for the ID-373B/GMQ-11. Steps for other models are similar.

1. Disconnect plug P402 from jack J402 on rear of indicator.
2. Check for continuity of wind direction circuit by jumping from pins A to B and pins C to D and C to E.
3. Check for continuity of windspeed circuit by jumping from pin F to pin G.
4. Reconnect plug P402 to jack J402.

4-36. PREPARATION FOR STORAGE OR SHIPMENT.

DISCONNECTING INDICATOR



NOTE

For proper packaging, refer to SB 38-100. Steps given are typical for both flexible and conduit interconnection cables.

1. Disconnect power cable (1) from power source (2).

NOTE

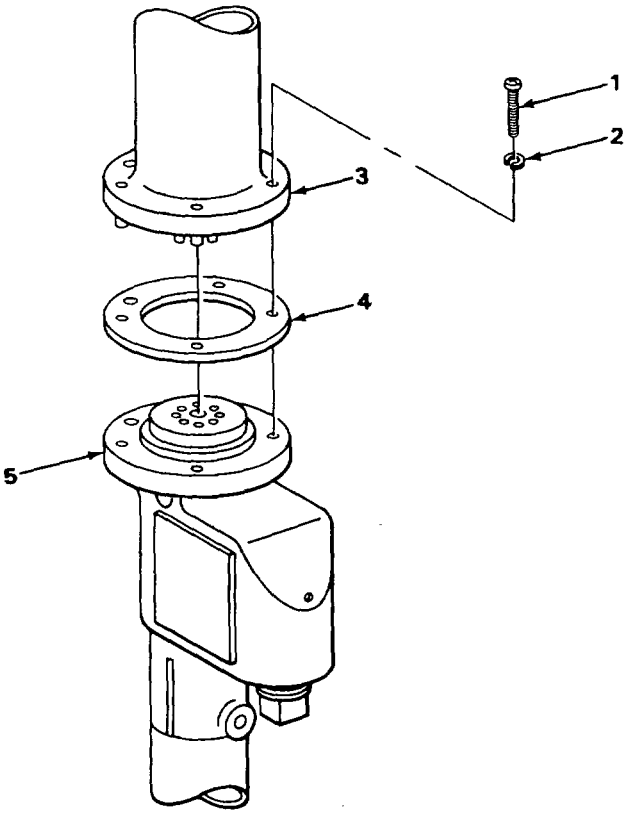
For indicators with internal wiring, perform steps 2, 3, and 4. For indicators with external plugs, perform step 5.

2. Loosen four turn-lock fasteners (3) and remove rear cover (4).
3. Disconnect wires from TB201 (5) and pull cable (6) out of indicator.
4. Install rear cover (4) and tighten four turn-lock fasteners (3).
5. Disconnect interconnection cable plug P402 (7) from receptacle J402 (8).

4-36. PREPARATION FOR STORAGE OR SHIPMENT. (CONT)

REMOVING TRANSMITTER FROM CONNECTOR HOUSING

PERSONNEL REQUIRED: Two technicians
PRELIMINARY PROCEDURE: Tilt support assembly (para 4-12).



CAUTION

Do not lift transmitter by tail or impeller; lift transmitter by center section only.

1. Remove four screws (1) and lockwashers (2).

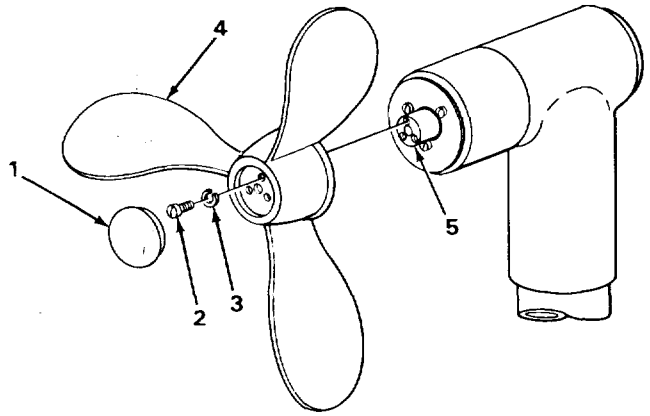
CAUTION

Do not twist transmitter while removing to prevent bending pins on connector P1.

2. Lift transmitter (3) and gasket (4) off of connector housing (5).

4-36. PREPARATION FOR STORAGE OR SHIPMENT. (CONT)

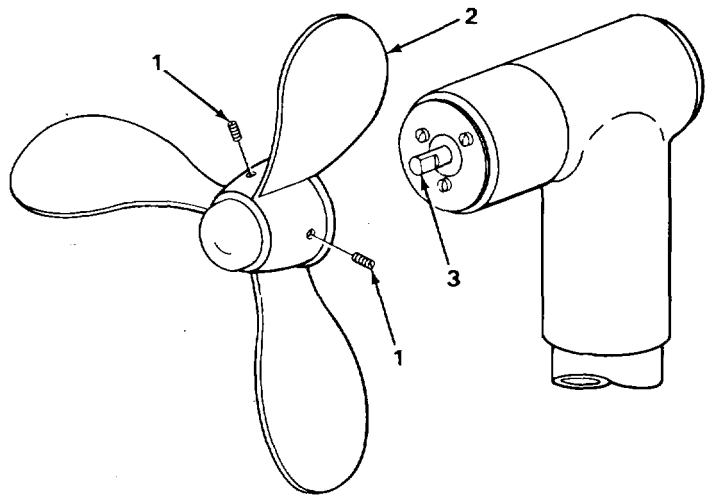
REMOVING TRANSMITTER IMPELLER, T-420/GMQ-11 OR T-420A/GMQ-11



EL8OV039

1. Remove nose cap (1).
2. Remove three screws (2) and lockwashers (3).
3. Remove impeller (4) from hub (5).
4. Install three screws (2) and lockwashers (3) in hub (S5 to prevent loss.

REMOVING TRANSMITTER IMPELLER, T-420B/GMQ-11

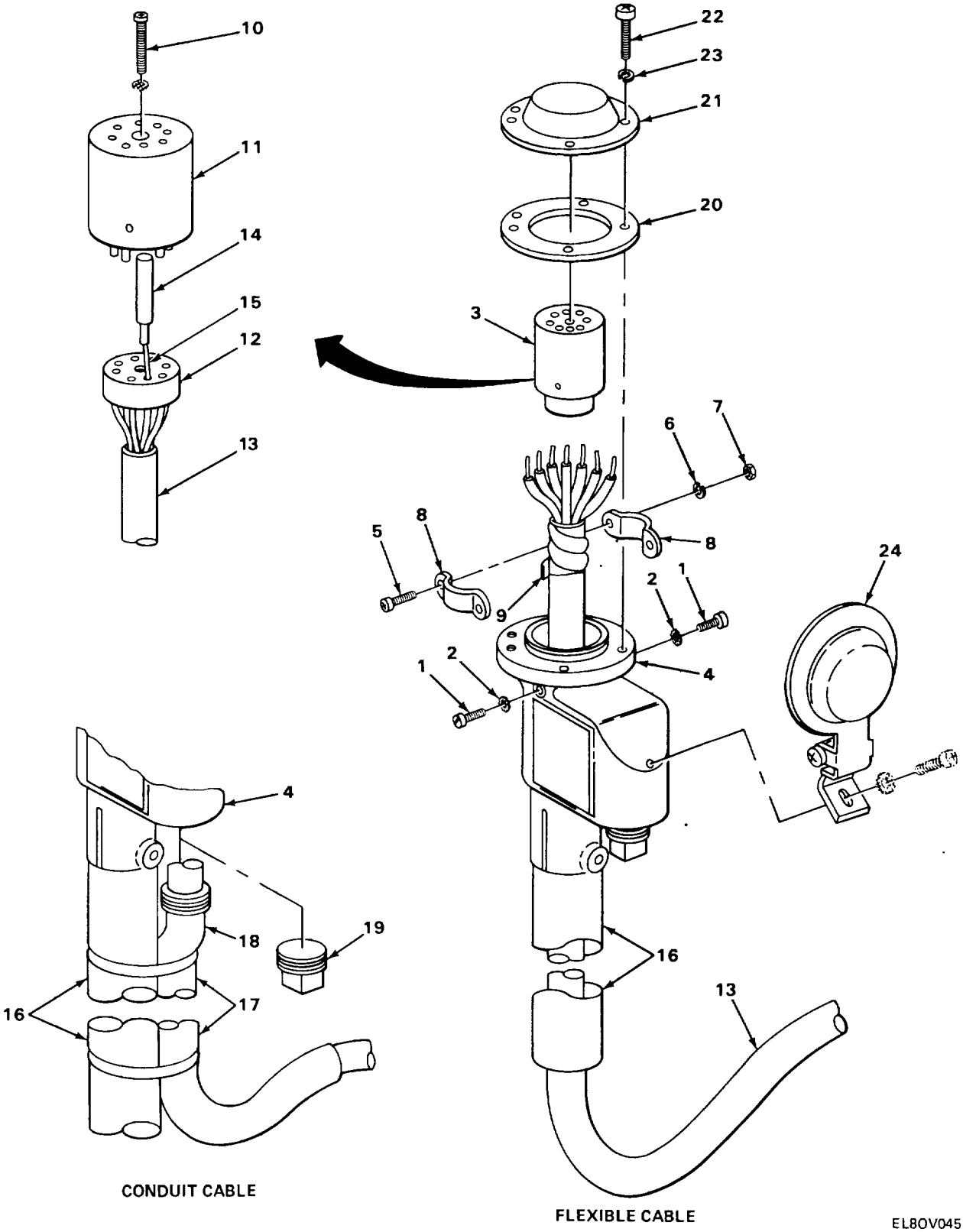


EL8OV044

1. Loosen two setscrews (1).
2. Remove impeller (2) from hub (3).
3. Tighten two setscrews (1) to prevent loss.

4-36. PREPARATION FOR STORAGE OR SHIPMENT. (CONT)

REMOVING INTERCONNECTION CABLE FROM CONNECTOR HOUSING



4-36. PREPARATION FOR STORAGE OR SHIPMENT. (CONT)

NOTE

Steps given are for both flexible and conduit interconnection cables.

1. Remove two screws (1) and lockwashers (2).
2. Pull connector J1 (3) out of connector housing (4).
3. Remove two screws (5), lockwashers (6), nuts (7), and clamps (8).
4. Remove tape (9) from wires.
5. Loosen screw (10) on connector J1 (3) and separate case (11) and retainer (12).
6. Push cable (13) into retainer (12) to gain access to pins (14).

NOTE

For correct soldering methods, refer to TB SIG 222.

7. Using soldering iron, unsolder wires (15) from seven pins (14) used.

NOTE

For flexible cable removal, perform step 8. For conduit cable removal, perform steps 9 and 10.

8. Pull cable (13) out from bottom of lower mast section (16). Roll up cable and tie free ends to coil. Perform step 11.
9. Remove clamps (17) securing conduit (18) to lower mast section (16).
10 Disconnect conduit (18) from connector housing (4) and install pipe plug (19).
11. Install eight pins (14) in case (11) and assemble with retainer (12).
12. Tighten screw (10).
13. Assemble two clamps (8) with two screws (5), lockwashers (6), and nuts (7).
14. Place assembled clamps (8) inside connector housing (4) to prevent loss.
15. Install connector J1 (3) in connector housing (4) alining notch on connector J1 with pin inside connector housing.
16. Install two screws (1) and lockwashers (2).

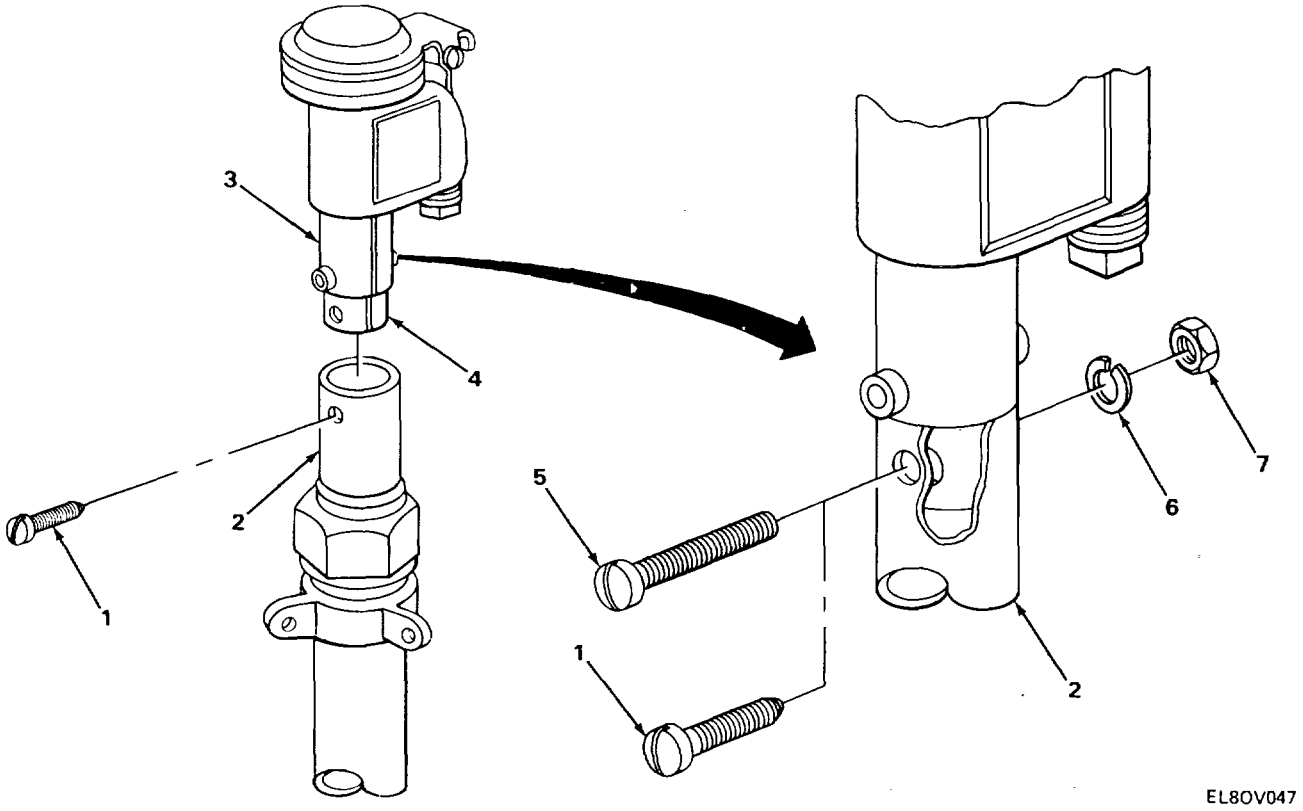
NOTE

For T-4201/GMQ-11 and T-420B/GMQ-11, perform step 17. For T-420A/GMQ-11, perform step 18.

17. Install gasket (20), cover (21), four screws (22), and lockwashers (23).
18. Install four screws (22), lockwashers (23), gasket (20), and close cover (24).

4-36. PREPARATION FOR STORAGE OR SHIPMENT. (CONT)

REMOVING CONNECTOR HOUSING FROM SUPPORT ASSEMBLY



NOTE

Two methods of attaching connector housing to support assembly are used. Removal of both methods are covered here.

Tapped Connector Housing Shaft

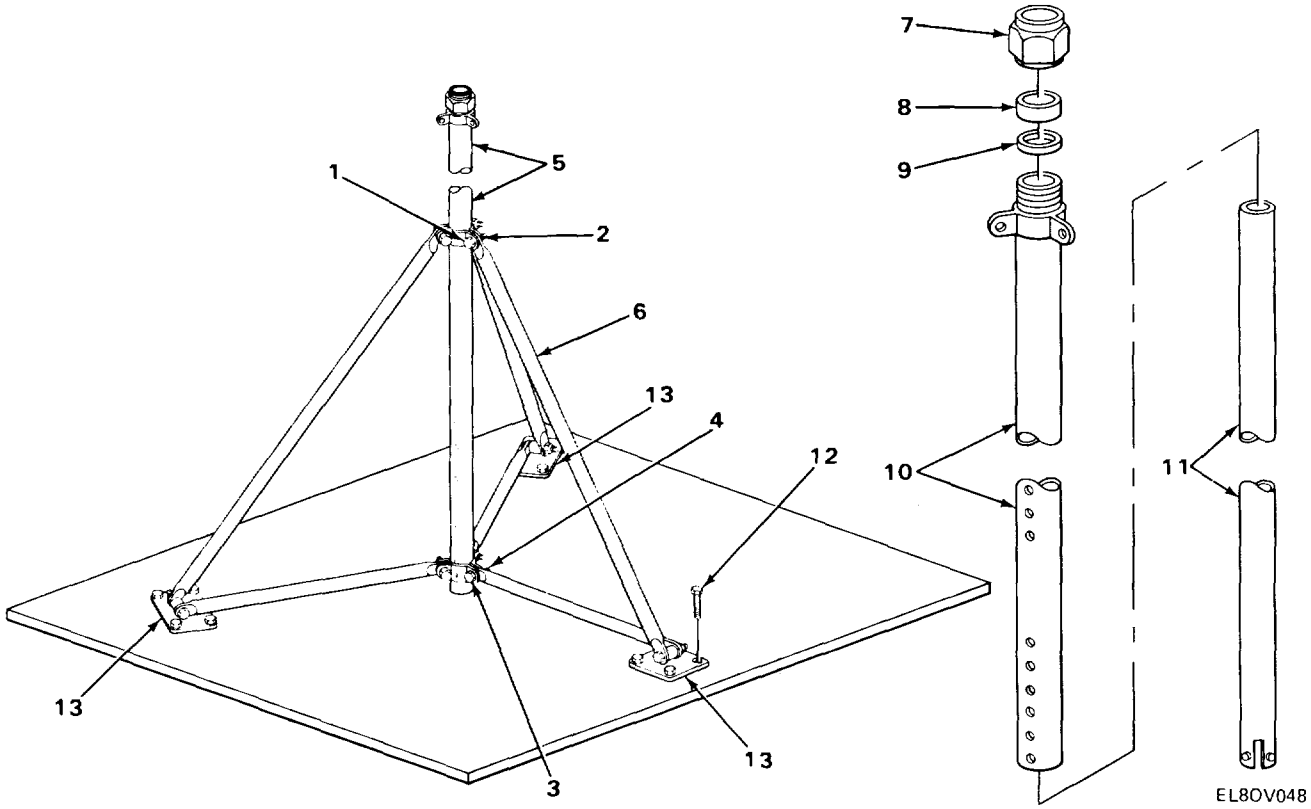
1. Remove screw (1) from upper mast section (2) and lift connector housing (3) off support assembly.
2. Install screw (1) in connector housing shaft (4) to prevent loss.

Through Drilled Connector Housing Shaft

1. Remove screw (5), lockwasher (6), and nut (7) and lift connector housing (3) off upper mast section (2).
2. Place screw (5) through connector housing shaft (4) and install lockwasher (6) and nut (7) to prevent loss.

4-36. PREPARATION FOR STORAGE OR SHIPMENT. (CONT)

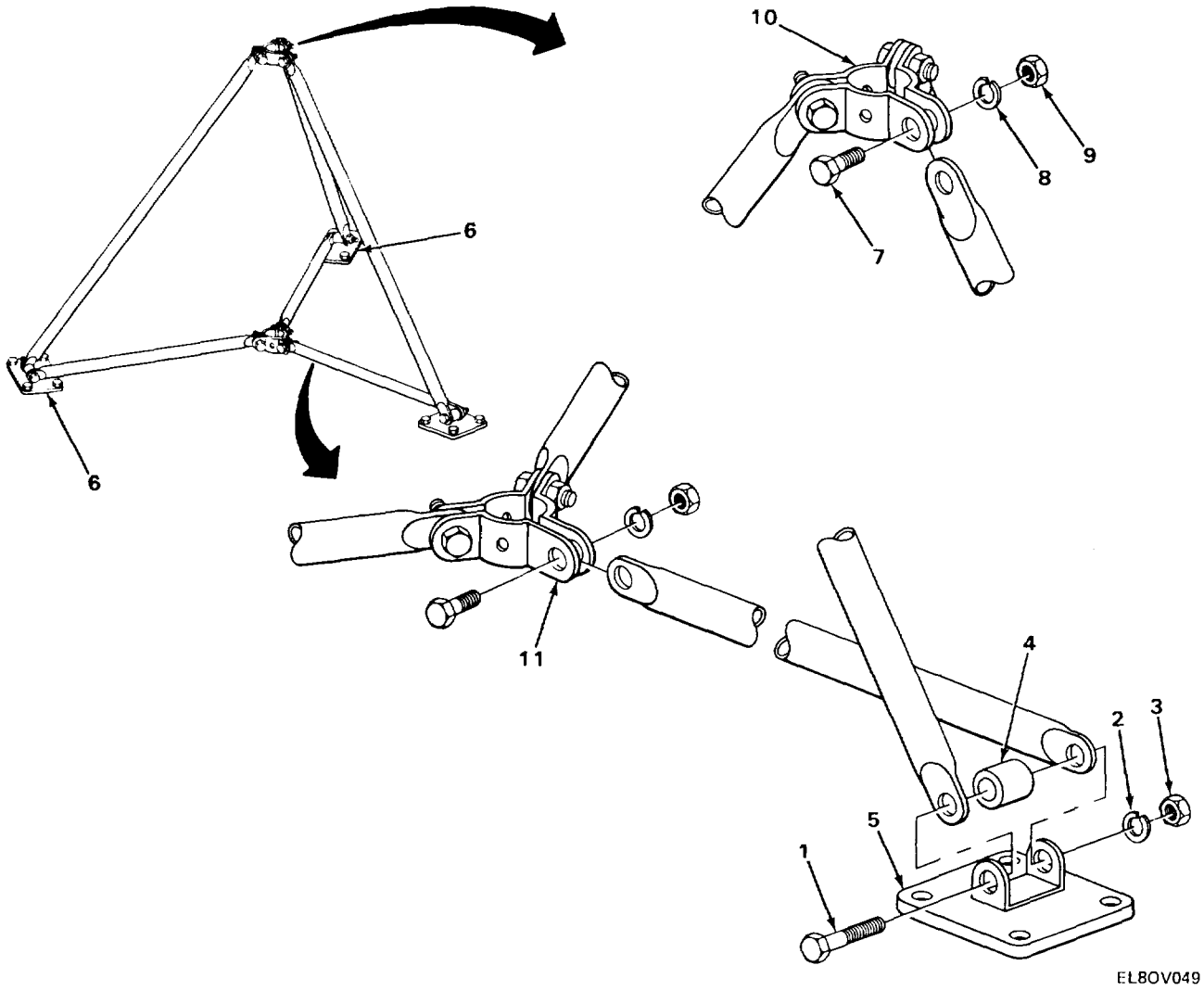
DISASSEMBLING SUPPORT ASSEMBLY



1. Loosen three screws (1) and nuts (2) on upper clamps.
2. Loosen three screws (3) and nuts (4) on lower clamps.
3. Remove mast assembly (5) from support legs (6) by lifting out of top of upper and lower clamps.
4. Remove compression nut (7), rubber bushing (8), and washer (9) from lower mast section (10).
5. Remove upper mast section (11) by pulling out from bottom of lower mast section (10).
6. Install washer (9), rubber bushing (8), and compression nut (7) to prevent loss.
7. Remove four lag bolts (12) from each of the three mast bases (13).

4-36. PREPARATION FOR STORAGE OR SHIPMENT. (CONT)

DISASSEMBLING SUPPORT ASSEMBLY (CONT)



NOTE

There are three support legs. Steps given are typical for all three.

8. Remove screw (1), lockwasher (2), nut (3), and spacer (4) from mast base (5).
9. Repeat step 1 for two remaining mast bases (6).
10. Remove three screws (7), lockwashers (8), and nuts (9) from upper clamps (10).
11. Repeat step 10 for lower clamps (11).
12. Put all hardware in cloth bag.

CHAPTER 5

DIRECT SUPPORT AND GENERAL SUPPORT MAINTENANCE

Section I REPAIR PARTS, SPECIAL TOOLS TMDE, AND SUPPORT EQUIPMENT

5-1. COMMON TOOLS AND EQUIPMENT.

A complete listing of common tools and equipment is given in the Maintenance Allocation Chart (MAC), appendix B.

5-2. SPECIAL TOOLS ,TMDE, AND SUPPORT EQUIPMENT.

There are no special tools or equipment needed to maintain the AN/GMQ-11.

5-3. REPAIR PARTS.

Repair parts for the direct support and general maintenance of the AN/GMQ-11 are listed and illustrated in the Repair Parts and Special Tools List (RPSTL) in TM 11-6660-200-24P.

Section II DIRECT SUPPPORT AND GENERAL SUPPORT TROUBLESHOOTING PROCEDURES

5-4. GENERAL

The troubleshooting procedures listed in this chapter are not complete in themselves. They supplement the procedures normally performed at lower maintenance levels.

To troubleshoot the equipment, first assemble the wind measuring set (para 4-4 through 4-19), then check operation of set (para 2-6). The troubleshooting table does not list all problems that may occur. If your problem is not listed, or if the procedures given do not correct the problems, report it to a higher category of maintenance.

5-4. GENERAL. (CONT)

When working on any problem, be sure to report your work on the forms prescribed by DA Pam 738-750.

First check the symptom index for symptom, then check the troubleshooting table for possible solution or corrective action.

SYMPTOM INDEX

DIRECT SUPPORT AND GENERAL SUPPORT TROUBLESHOOTING

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION

1. Vane tail of transmitter does not respond or responds slowly to changes in wind direction.

   Slowly turn transmitter and check for excessive friction.

   a. Replace transmitter synchro (para 5-21).

   b. Refer to higher category of maintenance

2. Vane tail of transmitter responds to wind direction change, but indicator remains stationary.

   Remove transmitter synchro (para 5-21).

   a. Check for binding

   b. Refer to higher category of maintenance

3. Wind direction indicator pointer points 180 degrees from correct direction.

   Check for reversed wires at transmitter synchro.

   Correct wiring on synchro. (See FO-2).

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION
4. Wind direction indicator pointer either spins or oscillates excessively. Remove all wires from indicator and check for resistance between terminals R1 and R2, S1 and S2, S2 and S3. Check for a short circuit by jumping from all terminals to case ground. Refer to higher category of maintenance.
5. Windspeed indicator shows lower reading than actual windspeed. Perform windspeed generator friction test (para 5-26). Refer to higher category of maintenance.
6. Windspeed indicator shows erratic or no readings, all other functions normal. Check for open or shorted generator. Refer to higher category of maintenance.
7. Wind measuring set emits rf interference. Check for defective filter FL1 or capacitor C1. Replace filter FL1 or capacitor C1 (para 5-12).

Section III DIRECT SUPPORT AND GENERAL SUPPORT MAINTENANCE PROCEDURES

5-5. GENERAL.

This section provides instructions for direct support and general support maintenance of the AN!GMQ-11 components. The following initial setup information applies to all procedures.

Resources required are not listed unless they apply to the particular procedure.

Personnel are listed only if the task requires more than one technician.

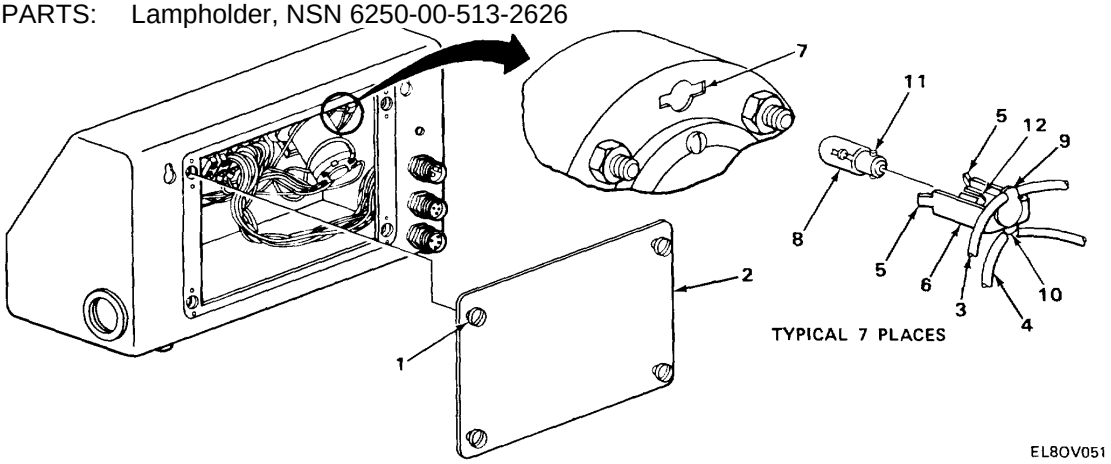
The normal standard equipment condition to start a maintenance task is power cable unplugged. Equipment condition is not listed unless some other condition is required.

Radio Repair Tool Kit TK-17/FMQ is used for all procedures.

Procedures given apply to all models unless otherwise specified.

5-6. DIAL LAMPHOLDER REPLACEMENT.

MATERIALSIPARTS: Lampholder, NSN 6250-00-513-2626



NOTE

There are seven dial lampholders, five have four wires connected and two have two wires connected. Steps given are typical for all seven.

REMOVAL

1. Loosen four turn-lock fasteners (1) and remove rear cover (2).

NOTE

For correct soldering methods, refer to TB SIG 222.

2. Using soldering iron, unsolder green wires (3) and white wires (4).
3. Squeeze both lampholder spring tabs (5) together and pull lampholder (6) out of dial socket (7).
4. Press in on lamp (8), turn counterclockwise, and pull lamp out of lampholder (6).

INSTALLATION

NOTE

For ease of soldering wires, install lampholder in dial socket.

1. Squeeze both lampholder spring tabs (5) together, push lampholder (6) into dial socket (7), and release lampholder spring tabs.

5-6. DIAL LAMPHOLDER REPLACEMENT. (CONT)

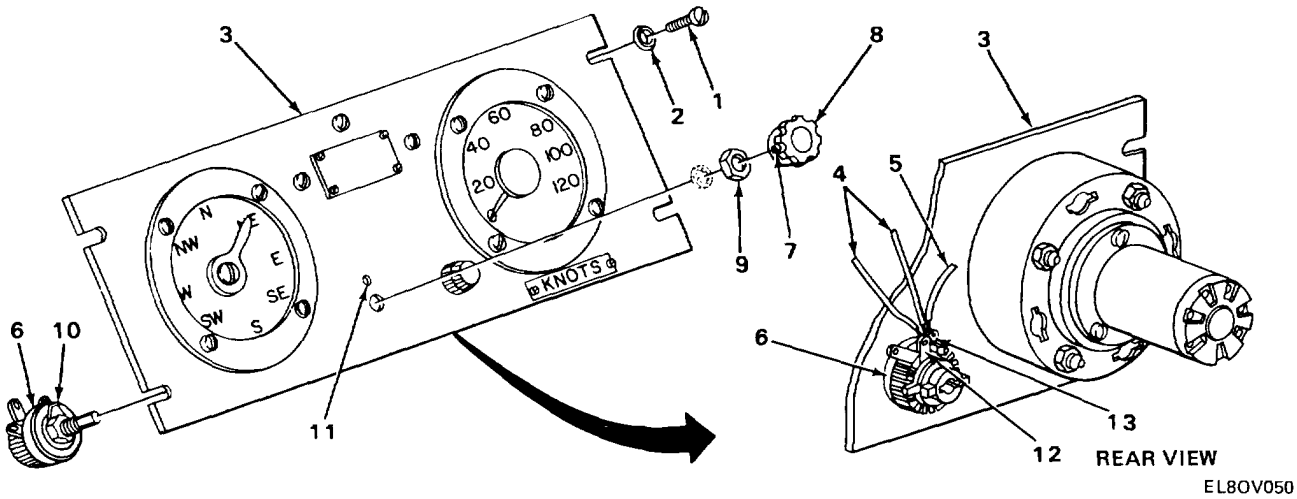
NOTE

For correct soldering methods, refer to TB SIG 222.

2. Using soldering iron, solder green wires (3) to outermost lug (9) and white wires (4) to innermost lug (10).
3. Squeeze both lampholder spring tabs (5) together and pull lampholder (6) out of dial socket (7).
4. Put lamp (8) into lampholder (6), alining pins (11) on lamp with slots (12) on lampholder, and push into place and turn clockwise.
5. Squeeze both lampholder spring tabs (5) together, push lampholder (6) into dial socket (7), and release lampholder spring tabs.
6. Position rear cover (2) on rear of indicator and turn four turn-lock fasteners (1) to lock into place.

5.7. DIAL LAMP SWITCH REPLACEMENT, ID-373BIGMQ-11.

MATERIALSIPARTS: Variable resistor, NSN 5905-00-845-1163



REMOVAL

1. Remove four screws (1) and washers (2) and remove front panel (3) from case.

NOTE

For correct soldering methods, refer to TB SIG 222.

2. Using soldering iron, unsolder two white wires (4) and one red wire (5) from defective switch (6).
3. Using hex wrench, loosen setscrew (7) and remove knob (8).
4. Remove nut (9) and remove defective switch (6) from back of front panel (3).

INSTALLATION

1. Install replacement switch (6) into front panel (3). Place pin (10) in hole (11).
2. Install nut (9) and knob (8). Tighten setscrew (7).

CAUTION

Use heat sink pliers on switch lugs to prevent damage to switch.

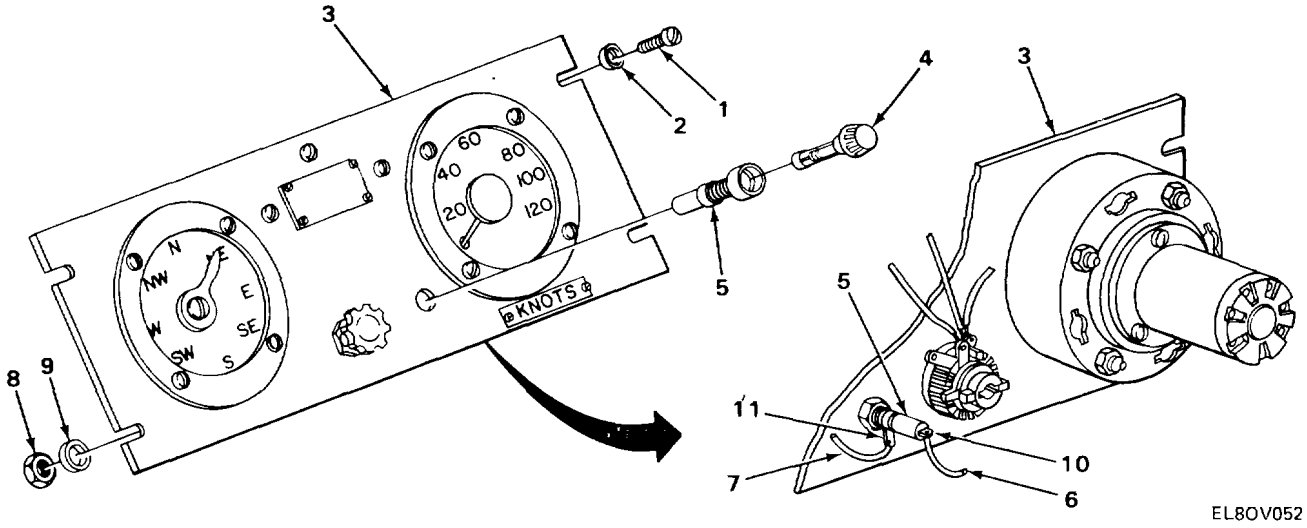
NOTE

For correct soldering methods, refer to TB SIG 222.

3. Using soldering iron, solder two white wires (4) to center lug (12) and one red wire (5) to side lug (13).
4. Install front panel (3) on case and install four screws (1) a Id washers (2).

5-8. FUSE HOLDER REPLACEMENT.

MATERIALS/PARTS: Fuse holder, NSN 5920-00-244-5150



REMOVAL

1. Remove four screws (1) and washers (2) and remove front panel (3) from case.
2. Press in fuse cap (4) and turn counterclockwise.
3. Remove fuse cap (4) with fuse from fuse holder (5).

NOTE

For correct soldering methods, refer to TB SIG 222.

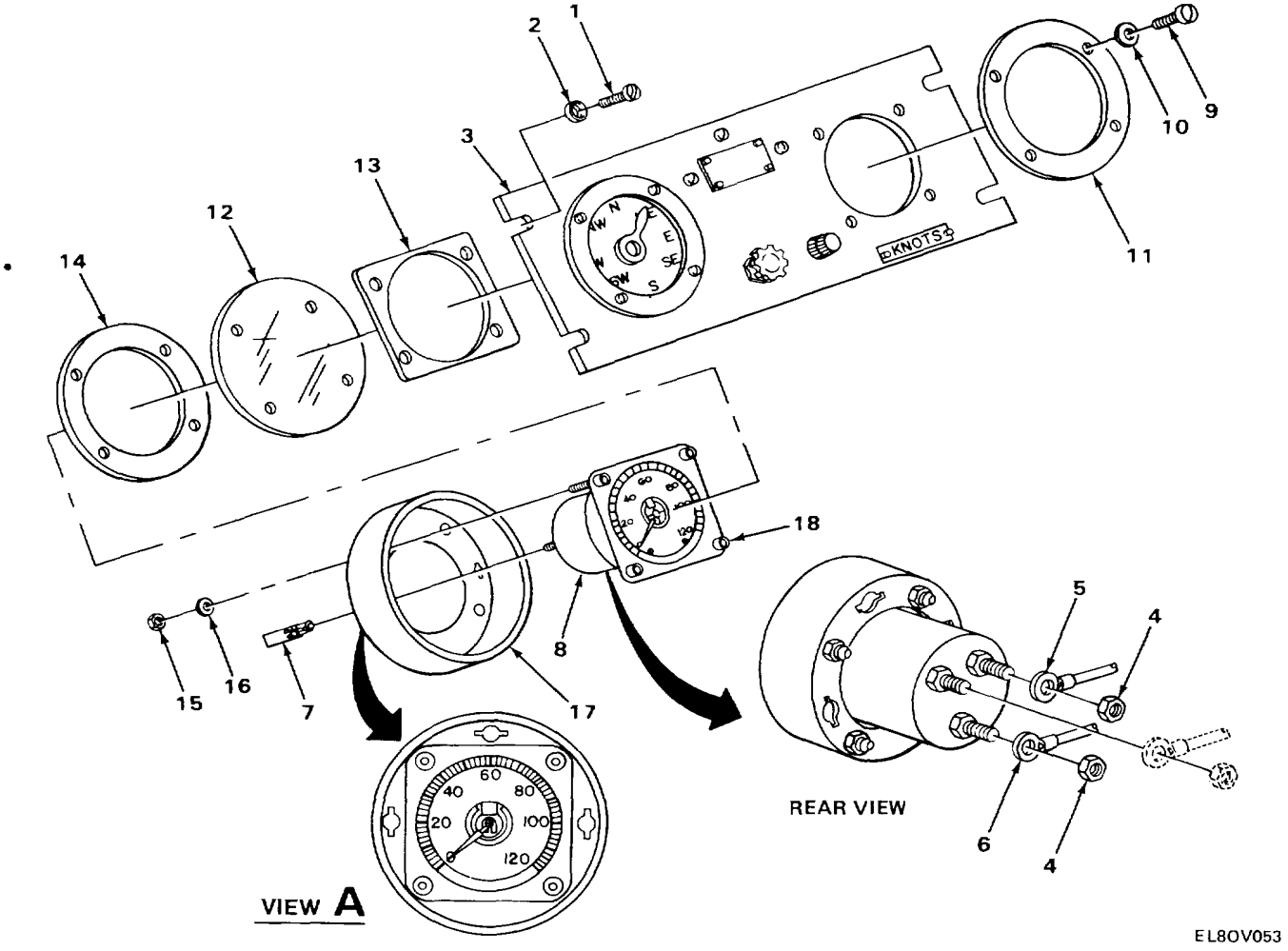
4. Using soldering iron, unsolder purple wire (6) and black wire (7).
5. Remove, nut (8) and washer (9) and remove fuse holder (5) from front panel (3).

INSTALLATION

1. Install fuse holder (5) into front panel (3).
2. Install washer (9) and nut (8).
3. Using soldering iron, solder purple wire (6) to center lug (10) and black wire (7) to side lug (11).
4. Install fuse cap (4) with fuse in fuse holder (5) and turn clockwise.
5. Install front panel (3) on case and install four screws (1) and washers (2).

5-9. WINDSPEED INDICATOR REPLACEMENT.

MATERIALS/PARTS: Gasket, NSN 6660-00-582-7149 (if needed)
Arbitrary scale meter, NSN 6660-00-620-7870



REMOVAL

1. Remove four screws (1) and washers (2) and remove front panel (3) from indicator case.
2. Remove nuts (4) and orange wire (5) from M or K terminal and brown wire (6) from + terminal.

NOTE

There are three dial lampholders. Step 3 is typical for all three.

3. Squeeze both lampholder spring tabs together and pull lampholder (7) out of dial socket.

5-9. WINDSPEED INDICATOR REPLACEMENT. (CONT)

4. While holding indicator (8) against front panel (3), remove four screws (9), lockwashers (10), and ring (11).
5. While holding front panel (3) face up, remove indicator.

NOTE

Removal of dial window (12) and gasket (13) is not necessary unless loose or damaged.

6. Remove light ring (14).
7. Remove four nuts (15), washers (16), and light shield (17).

INSTALLATION

1. Position light shield (17) on indicator (8) (view A) and install four washers (16) and nuts (15).
2. Install light ring (14) on indicator (8).

NOTE

If dial window (12) and gasket (13) were not removed, disregard step 3.

3. Install dial window (12) and gasket (13) in light shield (17).
4. Aline indicator studs (18) with holes in front panel (3).
5. Install ring (11), four screws (9), and lockwashers (10). Tighten evenly.

NOTE

Orange wire (5) is connected to M terminal for miles per hour or K terminal for knots.

6. Connect orange wire (5) to M or K terminal and brown wire (6) to + terminal.

NOTE

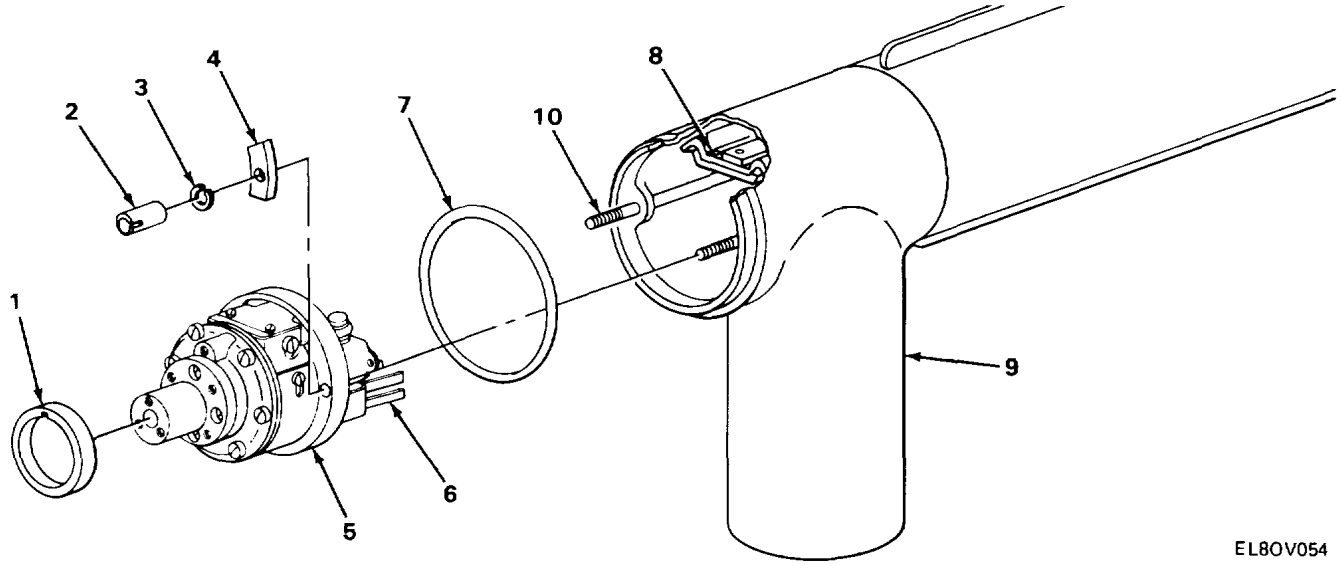
There are three dial lampholders. Step 7 is typical for all three.

7. Squeeze both lampholder spring tabs together, push lampholder (7) into dial socket, and release lampholder spring tabs.
8. Install front panel (3) on indicator case.
9. Install four screws (1) and washers (2).

5-10. WINDSPEED GENERATOR G1 REPLACEMENT.

MATERIALS/PARTS: Detector, windspeed assembly (T-420A/GMQ-11 order no. DAAB05-68-C-1227) NSN 6660-00-460-7355
Generator, direct current (T-420/GMQ-11 and T-420A/GMQ-11) NSN 6660-00-906-1117
Generator, tachometer (T-420B/GMQ-11, order no. 19961-P-60, 19396-P-61, and 40154-P-62) NSN 6660-00-822-2133
Generator, tachometer (T-420B/GMQ-11, order no. 51014-P-57 and 5029-P-61) NSN 6660-00-542-1074

PRELIMINARY PROCEDURE: Remove generator cover (para 4-30).



REMOVAL

NOTE

Item 1 is used for balancing if necessary. if not used, proceed to step 2.

1. Remove counterweight (1).
2. Remove two slotted nuts (2), lockwashers (3), and washers (4).

CAUTION

Pull generator (5) straight out to prevent bending of collector ring brushes (6).

3. Remove generator (5) and O-ring (7).

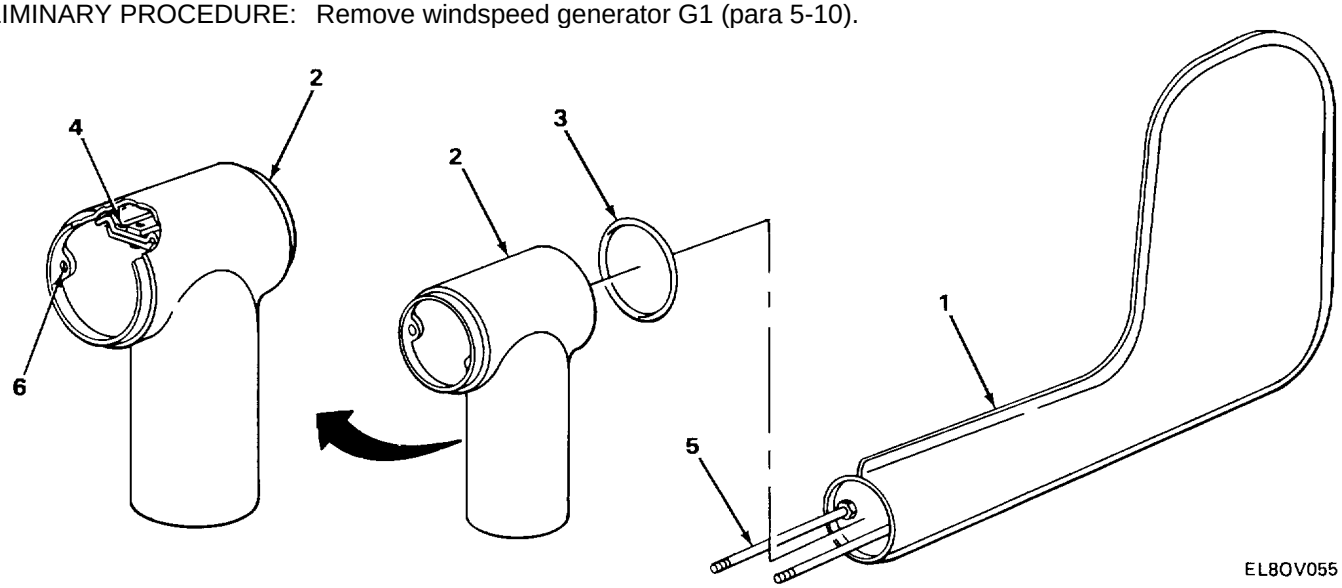
INSTALLATION

1. Position generator on side with positioning hole (8), if vane tail was removed.
2. Install O-ring (7) on center section (9).
3. Install generator (5) with collector ring brushes (6) toward bottom on two studs (10).
4. Install two washers (4), lockwashers (3), and slotted nuts (2).
5. Install counterweight (1), if used.

FOLLOW-ON MAINTENANCE: Install generator cover (para 4-30).

5-11. VANE TAIL REPLACEMENT.

MATERIALS/PARTS: Vane tail assembly, NSN 6660-00-882-2128
PRELIMINARY PROCEDURE: Remove windspeed generator G1 (para 5-10).



NOTE

All attaching hardware is removed when windspeed generator G1 is removed.

REMOVAL

CAUTION

Care must be taken when removing vane tail from center section as not to bend long studs.

1. Remove vane tail (1) from center section (2).
2. Remove O-ring (3).

INSTALLATION

CAUTION

When installing vane tail in center section, care must be taken to prevent bending long studs.

NOTE

Install vane tail on opposite side of positioning hole (4).

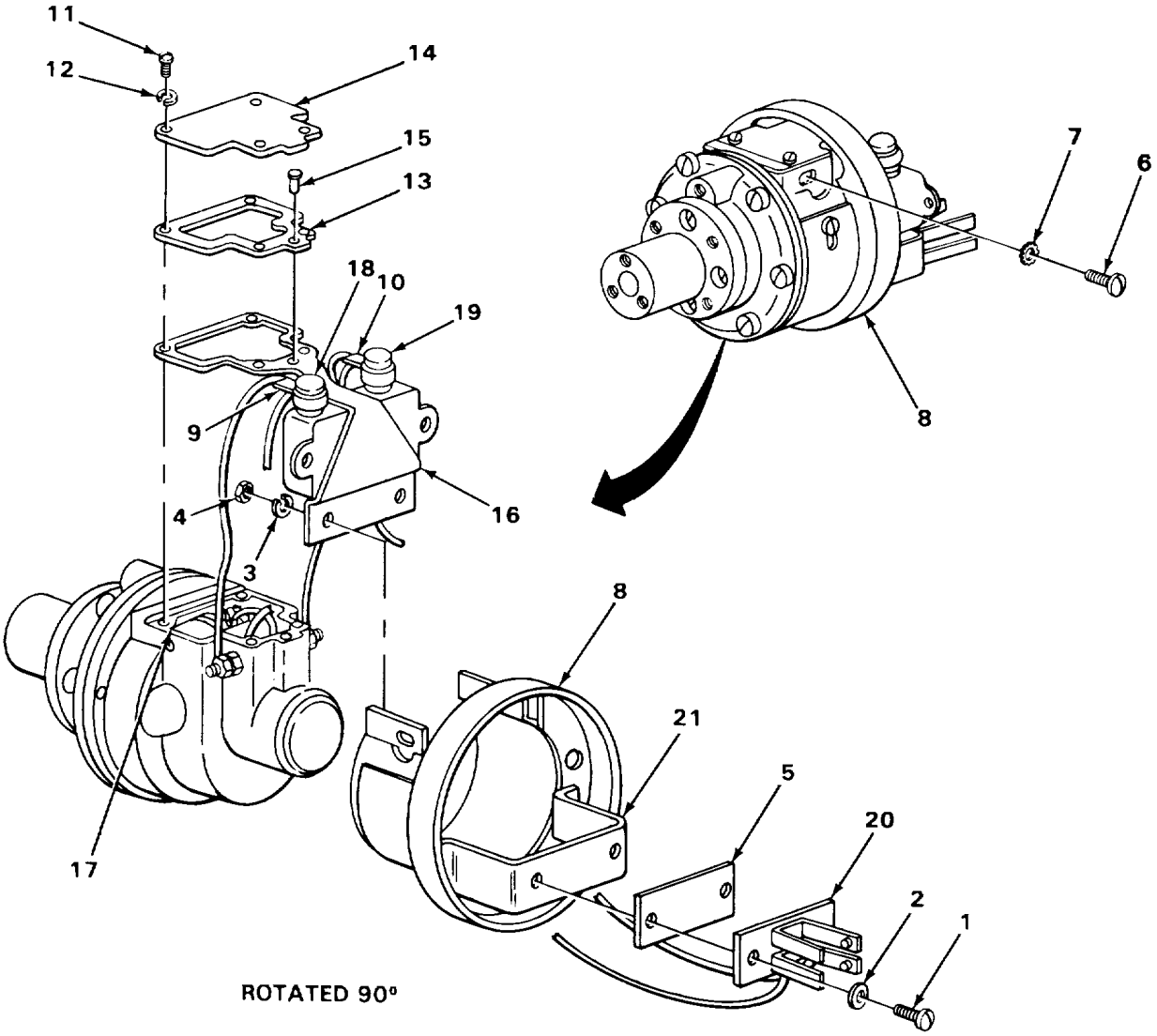
1. Install O-ring (3) on center section (2).
2. Aline two long studs (5) with holes (6) in center section (2) and push into place.

FOLLOW-ON MAINTENANCE: Install windspeed generator G1 (para 5-10).

5-12. WINDSPEED GENERATOR FILTER FL1 OR CAPACITOR Cl REPLACEMENT.

MATERIALS/PARTS: Capacitor, fixed paper dielectric (T-420/GMQ-11 on order nos. 28488-P-55, 21513-P-56, and 40521-P-57) NSN 5910-00-567-2670
Capacitor, fixed paper dielectric (T-420A/GMQ-11 on order nos. 51014-P-57, and 5029-P-61, T-420B/GMQ-11 on order no. 29067-P-58, T-420A/GMQ-11 on order no. DAAB05-68-C-1227) NSN 5910-00-465-8939
Capacitor, fixed paper dielectric (T-420B/GMQ-11 on order nos. 19961-P-60, 19396-P-61, and 40154-P-62) NSN 5910-00-857-9959

PRELIMINARY PROCEDURE: Remove windspeed generator G1 (para 5-10).



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5-12. WINDSPEED GENERATOR FILTER FL1 OR CAPACITOR C1 REPLACEMENT. (CONT)

REMOVAL

1. Remove two screws (1), flat washers (2), lockwashers (3), nuts (4), and insulator (5).
2. Remove two screws (6), lockwashers (7), and generator holder (8).

NOTE

For correct soldering methods, refer to TB SIG 222.

3. Using soldering iron, unsolder two white wires (9) and two black wires (10).
4. Remove four screws (11), lockwashers (12), gasket (13), cover plate (14), and retainer (15).
5. Remove filter (16) from generator (17).

INSTALLATION

1. Place filter (16) bracket on generator (17).
2. Install retainer (15), gasket (13), and cover plate (14).
3. Install four screws (11) and lockwashers (12).

NOTE

For correct soldering methods, refer to TB SIG 222.

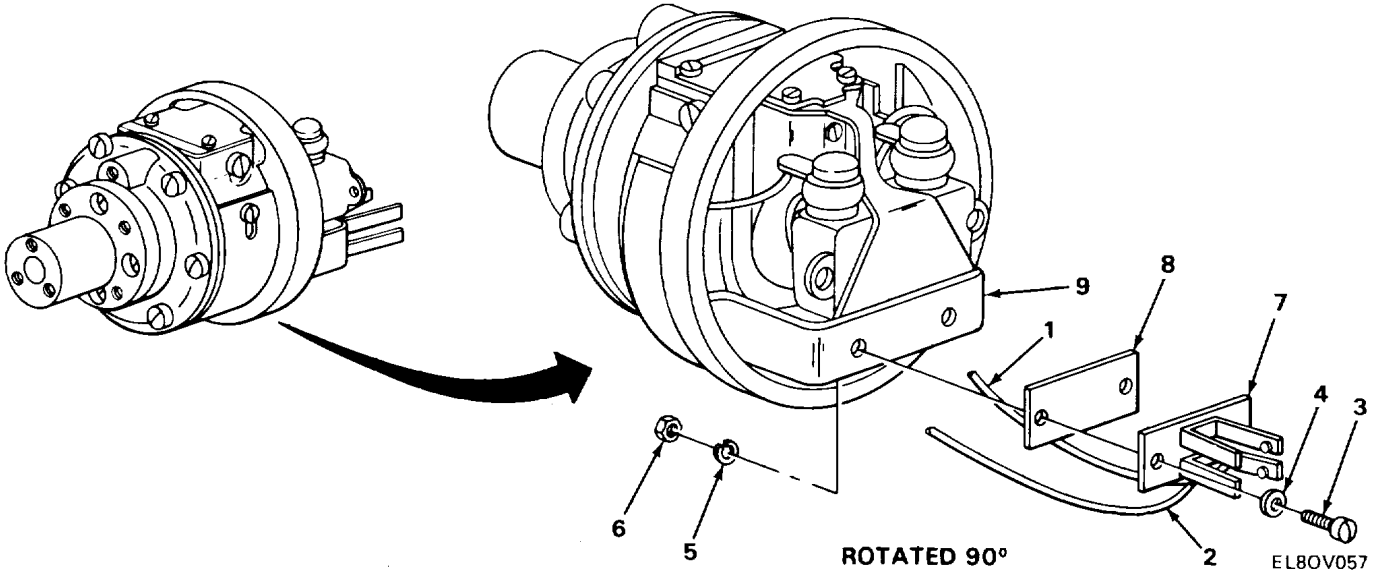
4. Using soldering iron, solder two white wires (9) to lug (18) and two black wires (10) to lug (19).
5. Install generator holder (8) on generator (17).
6. Install two screws (6) and lockwashers (7).
7. Place insulator (5) and brush assembly (20) on bracket (21).
8. Install two screws (1), flat washers (2), lockwashers (3), and nuts (4).

FOLLOW-ON MAINTENANCE: Install windspeed generator G1 (para 5-10).

5-13. WINDSPEED GENERATOR COLLECTOR RING BRUSH REPLACEMENT.

MATERIALS/PARTS: Brush assembly, electrical (T-420/GMQ-11 and T-420B/GMQ-11 on order no. 19961-P-60, 19396-P-61, and 40154-P-62) NSN 6660-00-396-3312
Brush assembly, electrical (T-420A/GMQ-1 1) NSN 5977-00-512-9929
Brush assembly, electrical (T-420A/GMQ-11 on order no. DAAB05-68-C-1227) NSN 6660-00-509-2902
Brush assembly, electrical (T-420B/GMQ-11 on order nos. 19961-P-60, 19396-P-61, and 40154-P-62) NSN 6660-00-345-8091
Brush assembly, electrical (T-420B/GMQ-11 on order nos. 51014-P-57 and 5029-P-61) NSN 5977-00-651-5461

PRELIMINARY PROCEDURE: Remove windspeed generator G1 (para 5-10).



REMOVAL

NOTE

For correct soldering methods, refer to TB SIG 222.

1. Using soldering iron, unsolder black wire (1) and white wire (2).
2. Remove two screws (3), flat washers (4), lockwashers (5), and nuts (6).
3. Remove brush assembly (7) and insulator (8).

INSTALLATION

1. Place insulator (8) and brush assembly (7) on bracket (9).
2. Install two screws (3), flat washers (4), lockwashers (5), and nuts (6).

NOTE

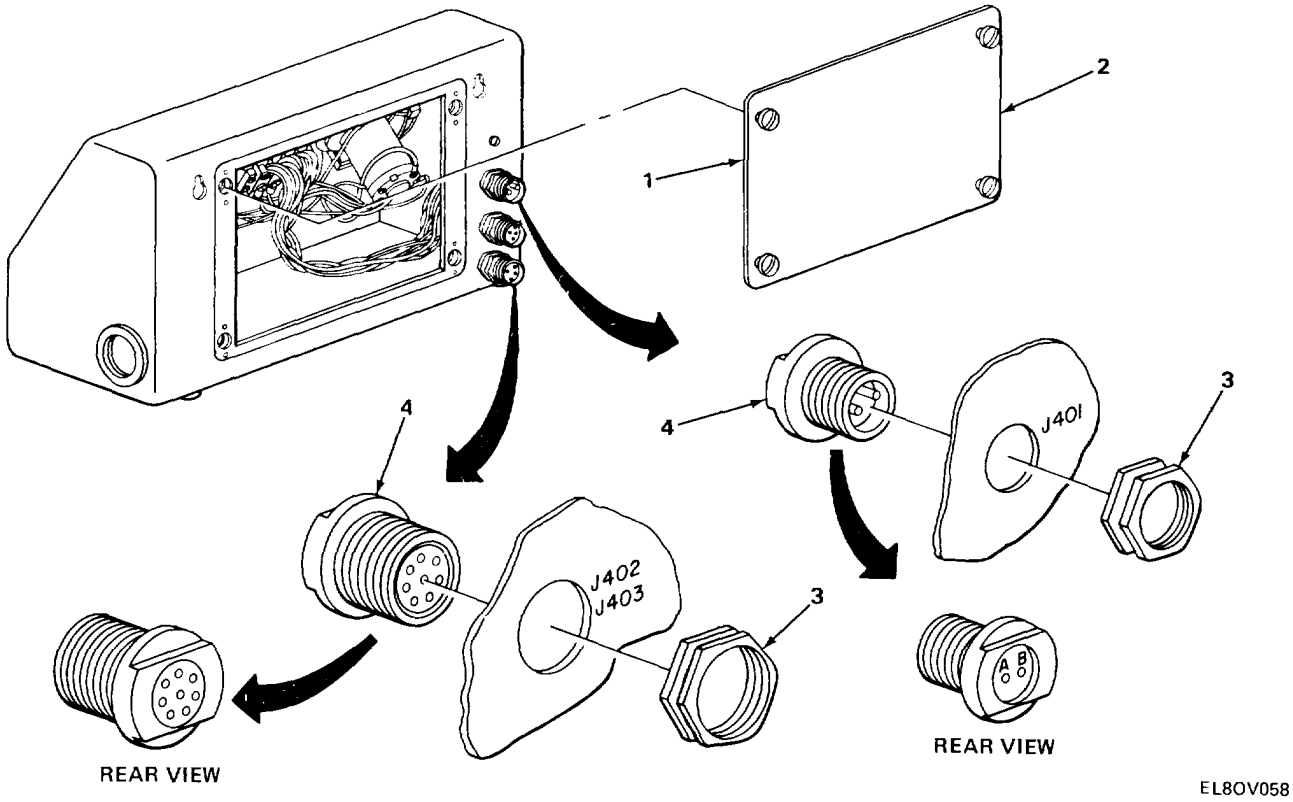
For correct soldering methods, refer to TB SIG 222.

3. Using soldering iron, solder black wire (1) to upper brush and white wire (2) to lower brush.

FOLLOW-ON MAINTENANCE: Install windspeed generator G1 (para 5-10).

5-14. INDICATOR CONNECTOR PLUG REPLACEMENT.

MATERIALS/PARTS: P401-connector, plug, electrical, NSN 5935-00-552-2369
P402 and P403-connector, plug, electrical, NSN 5935-00-227-8423



REMOVAL

NOTE

Steps given are typical for all connector plugs.

1. Loosen four turn-lock fasteners (1) and remove rear cover (2).
2. Remove nut (3) and push connector plug (4) into indicator case.

NOTE

For correct soldering methods, refer to TB SIG 222.

3. Using soldering iron, unsolder wires one at a time from defective connector plug and resolder on replacement connector plug.

INSTALLATION

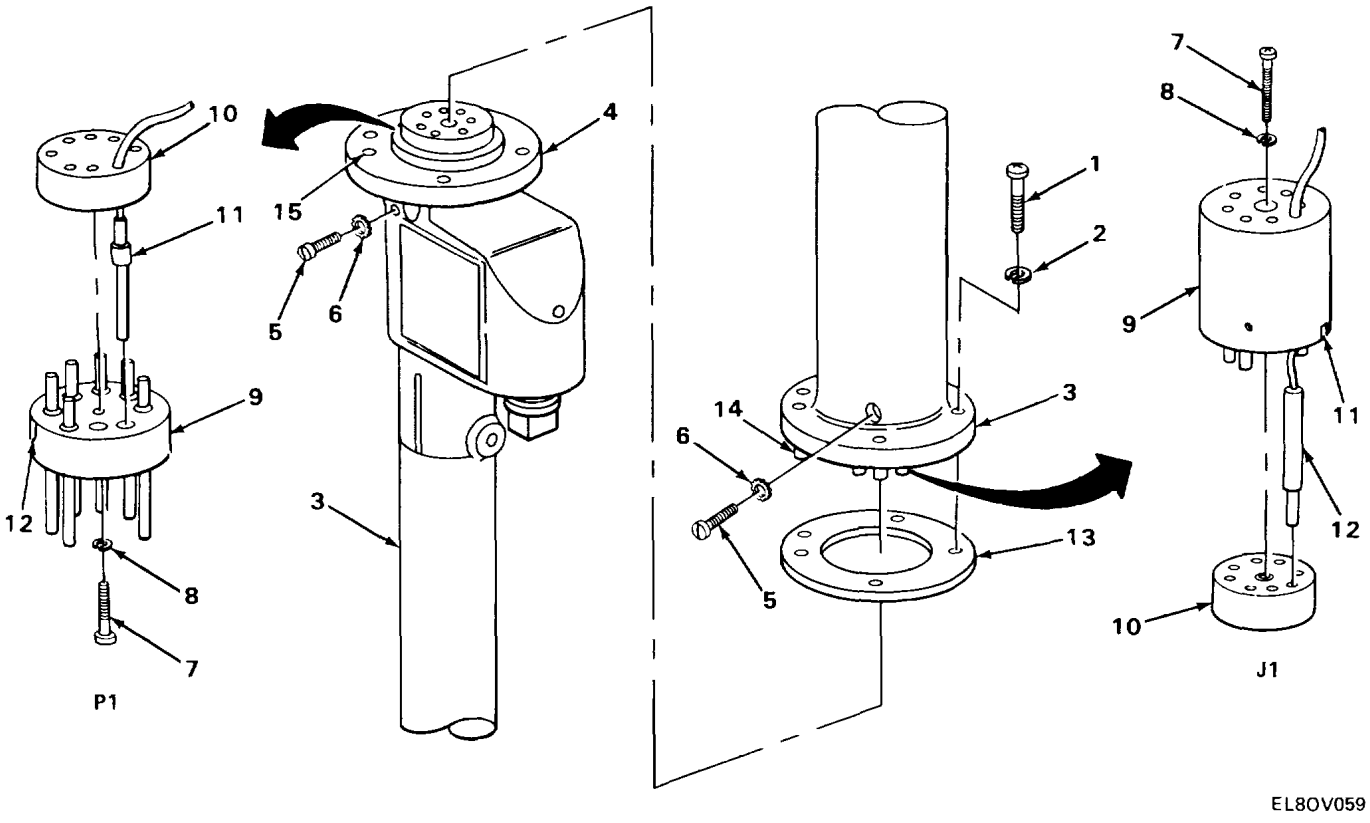
1. Push connector plug out of hole in indicator case and install nut (3).
2. Install rear cover (2) and tighten four turn-lock fasteners (1).

5-15. TRANSMITTER CONNECTOR PLUG REPLACEMENT.

MATERIALS/PARTS: J1: Connector receptacle (T-420/GMQ-11, T-420A/GMQ-11, and T-420B/GMQ-11 on order nos. 51014-P-57 and 5029-P-61) NSN 5935-00-508-7055
Connector receptacle (T-420B/GMQ-11 on order nos. 19961-P60, 19396-P-61 and 40154-P-62) NSN 5935-00-855-8325
Connector receptacle (T-420A/GMQ-11 on order no. DAAB05-68-C-1227) NSN 5935-00-985-3607
P1: Connector plug (T-420/GMQ-11, T-420A/GMQ-11, and T-420B/GMQ-11 on order nos. 51014-P-57 and 5029-P-61) NSN 5935-00-508-6919
Connector plug (T-420B/GMQ-11 on order nos. 19961-P-60, 19396-P-61, and 40154-P-62) NSN 5935-00-892-8972
Connector plug (T-420A/GMQ-11 on order no. DAAB05-68-C-1227) NSN 5935-00-689-6569

PERSONNEL REQUIRED: Two technicians

PRELIMINARY PROCEDURE: Tilt support assembly (para 4-12).



REMOVAL

NOTE

Steps given are typical for both P1 connector and J1 connector.

1. Remove four screws (1) and lockwashers (2).

5-15. TRANSMITTER CONNECTOR PLUG REPLACEMENT. (CONT)

CAUTION

Do not lift transmitter by tail or impeller; lift transmitter by center section only.

2. Lift transmitter (3) off connector housing (4).
3. Remove two screws (5) and lockwashers (6), and pull connector out of transmitter (3).
4. Remove screw (7) and lockwasher (8), and separate case (9) from retainer (10).

NOTE

For correct soldering methods, refer to TB SIG 222.

5. Using soldering iron, unsolder wires from connector pins (11) one at a time, and resolder to replacement connector pins.

INSTALLATION OF P1 CONNECTOR

1. Assemble case (9) and retainer (10), and install screw (7) and lockwasher (8).
2. Install connector into transmitter (3), alining notch (12) with pin inside transmitter.
3. Install two screws (5) and lockwashers (6).
4. Install gasket (13) on connector housing (4).

CAUTION

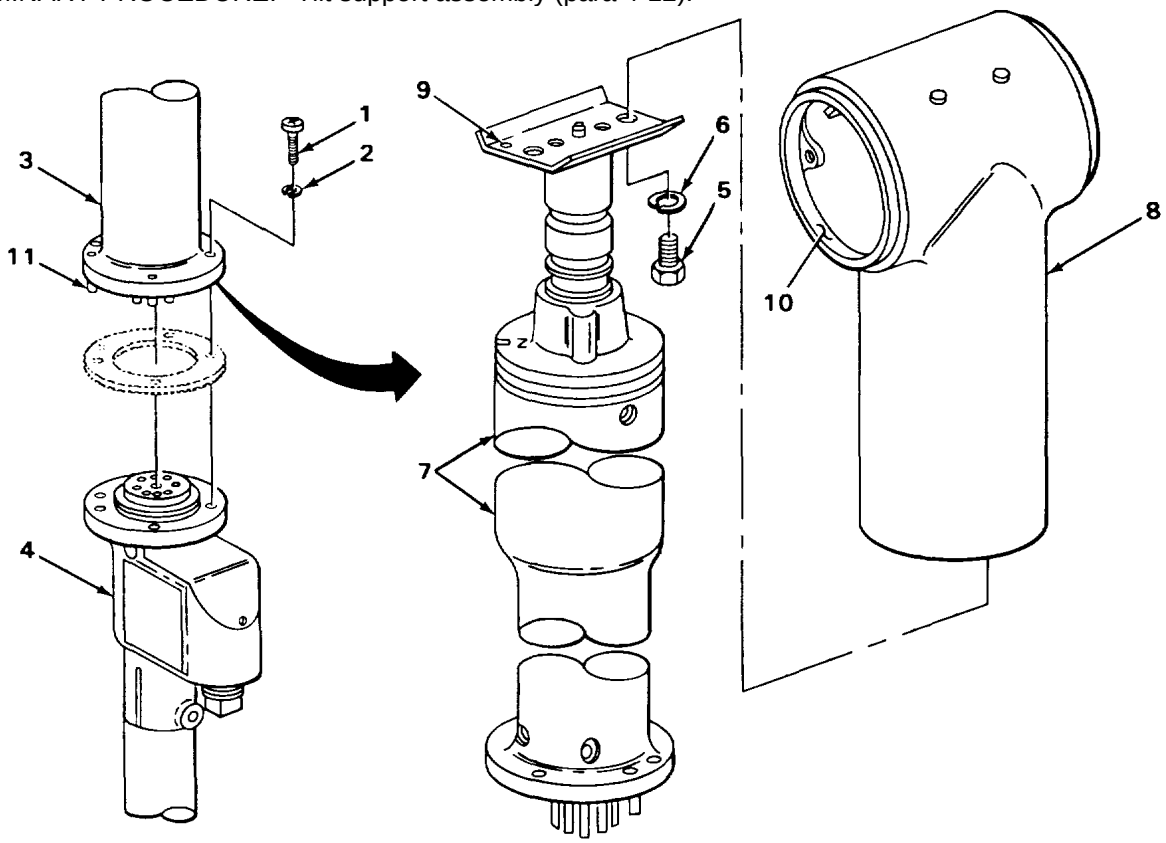
Do not lift transmitter by tail or impeller; lift transmitter by center section only.

5. Install transmitter (3) on connector housing (4), alining pin (14) with hole (15) and push into place.
6. Install four screws (1) and lockwashers (2).

FOLLOW-ON MAINTENANCE: Set support assembly upright (para 4-12).

5-16. TRANSMITTER CENTER SECTION REPLACEMENT.

MATERIALS/PARTS: Housing, mechanical drive (T-420A/GMQ-11 on order no. DAAB05-68-C-1227) NSN 6660-00-460-3969
Housing, vane shaft (T-420B/GMQ-11 on order no. 29067-P-58) NSN 6660-00-631-9418
PERSONNEL REQUIRED: Two technicians
PRELIMINARY PROCEDURE: Tilt support assembly (para 4-12).



REMOVAL

1. Remove four screws (1) and lockwashers (2).

CAUTION

Do not lift transmitter by tail or impeller; lift transmitter by center section only.

2. Lift transmitter (3) off connector housing (4).

5.16. TRANSMITTER CENTER SECTION REPLACEMENT. (CONT)

3. Remove vane tail (para 5-11).
4. Remove two screws (5) and lockwashers (6).
5. Remove support assembly (7) from center section (8).

INSTALLATION

1. Install support assembly (7) in center section (8) with positioning hole (9) facing toward 5/16-inch (0.08-cm) narrow inner lip (10).
2. Install two screws (5) and lockwashers (6).
3. Install vane tail (para 5-11).
4. Install windspeed generator G1 (para 5-10).

CAUTION

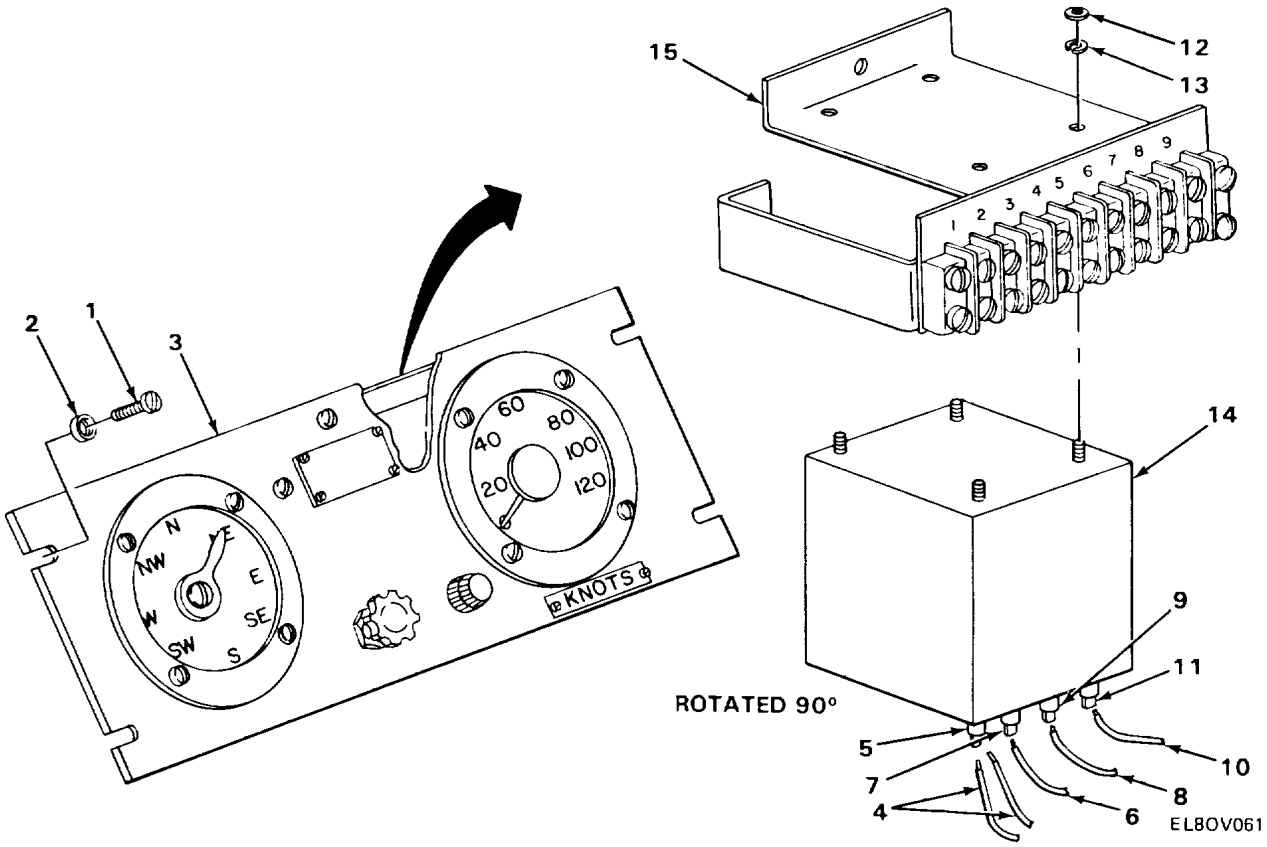
Do not lift transmitter by tail or impeller; lift transmitter by center section only.

5. Install transmitter (3) on connector housing (4), alining pin (11) with alinement hole in connector housing and push into place.
6. Install four screws (1) and lockwashers (2).

FOLLOW-ON MAINTENANCE: Set support assembly upright (para 4-12).

5-17. TRANSFORMER T201 REPLACEMENT.

MATERIALSIPARTS: Transformer, NSN 5950-00-645-3859



REMOVAL

1. Remove four screws (1) and washers (2), and remove front panel (3) from indicator case.

NOTE

For correct soldering methods, refer to TB SIG 222.

2. Using soldering iron, unsolder two green wires (4) from lug (5), red wire (6) from lug (7), brown wire (8) from lug (9), and grey wire (10) from lug (11).
3. Remove four nuts (12) and lockwashers (13).

CAUTION

Care must be taken when removing transformer from front panel to prevent damaging light switch.

4. Remove transformer (14).

5.17. TRANSFORMER T201 REPLACEMENT. (CONT)

INSTALLATION

CAUTION

Care must be taken when installing transformer to prevent damaging light switch.

1. Place transformer (14) under bracket (15) and install four nuts (12) and lockwashers (13).

CAUTION

Use heat sink pliers on lugs when soldering wires.

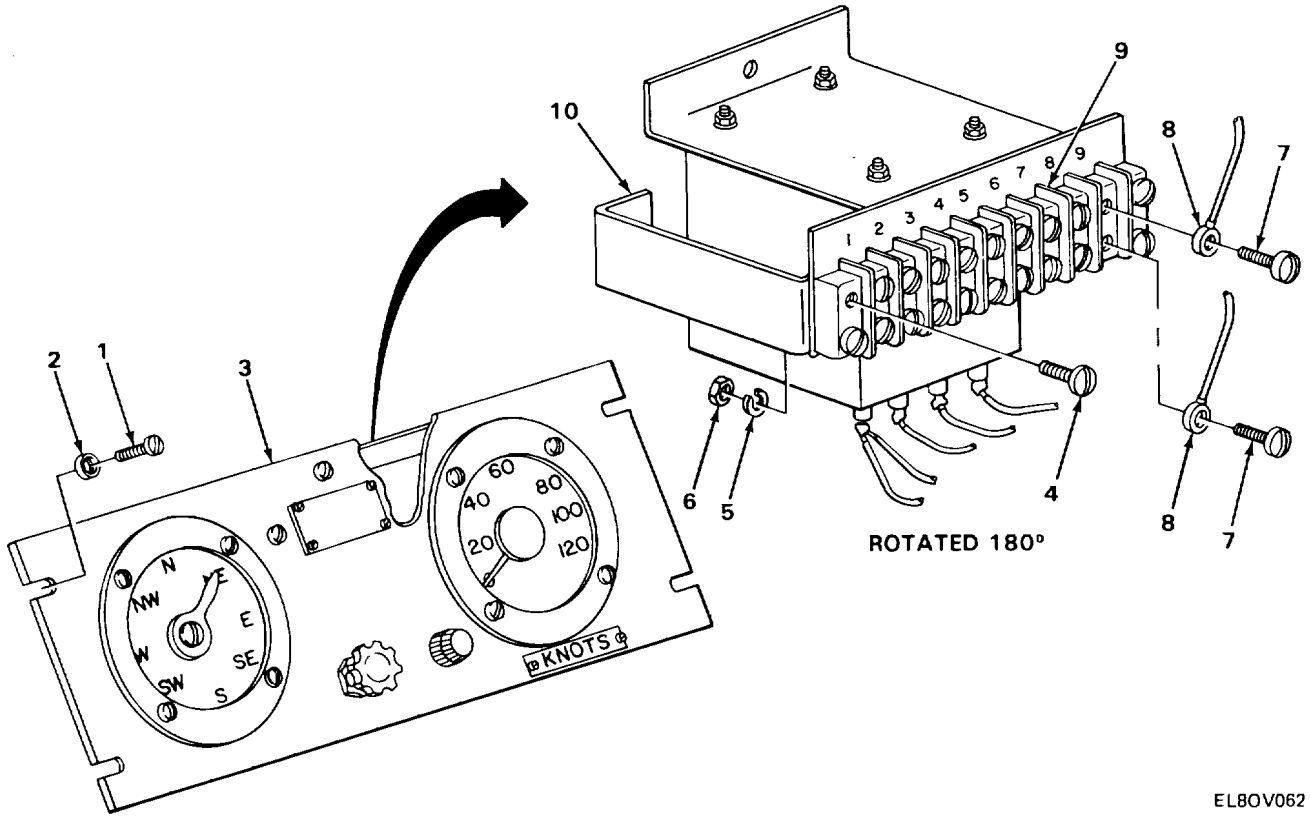
NOTE

For correct soldering, refer to TB SIG 222.

2. Using soldering iron, solder two green wires (4) to lug (5), red wire (6) to lug (7), brown wire (8) to lug (9), and grey wire (10) to lug (11).
3. Install front panel (3) on indicator case.
4. Install four screws (1) and washers (2).

5-18. TERMINAL BOARD TB201 REPLACEMENT.

MATERIALS/PARTS: Terminal board (ID-373B/GMQ-11 on order no. DAAB05-68-C-1227)
NSN 5940-00-984-4538
Terminal board, NSN 5940-00-837-0443



REMOVAL

1. Remove four screws (1) and washers (2), and remove front panel (3) from indicator case.
2. Remove four screws (4), lockwashers (5), and nuts (6).
3. Remove screws (7) and wires (8) one at a time and install on replacement terminal board (9).

NOTE

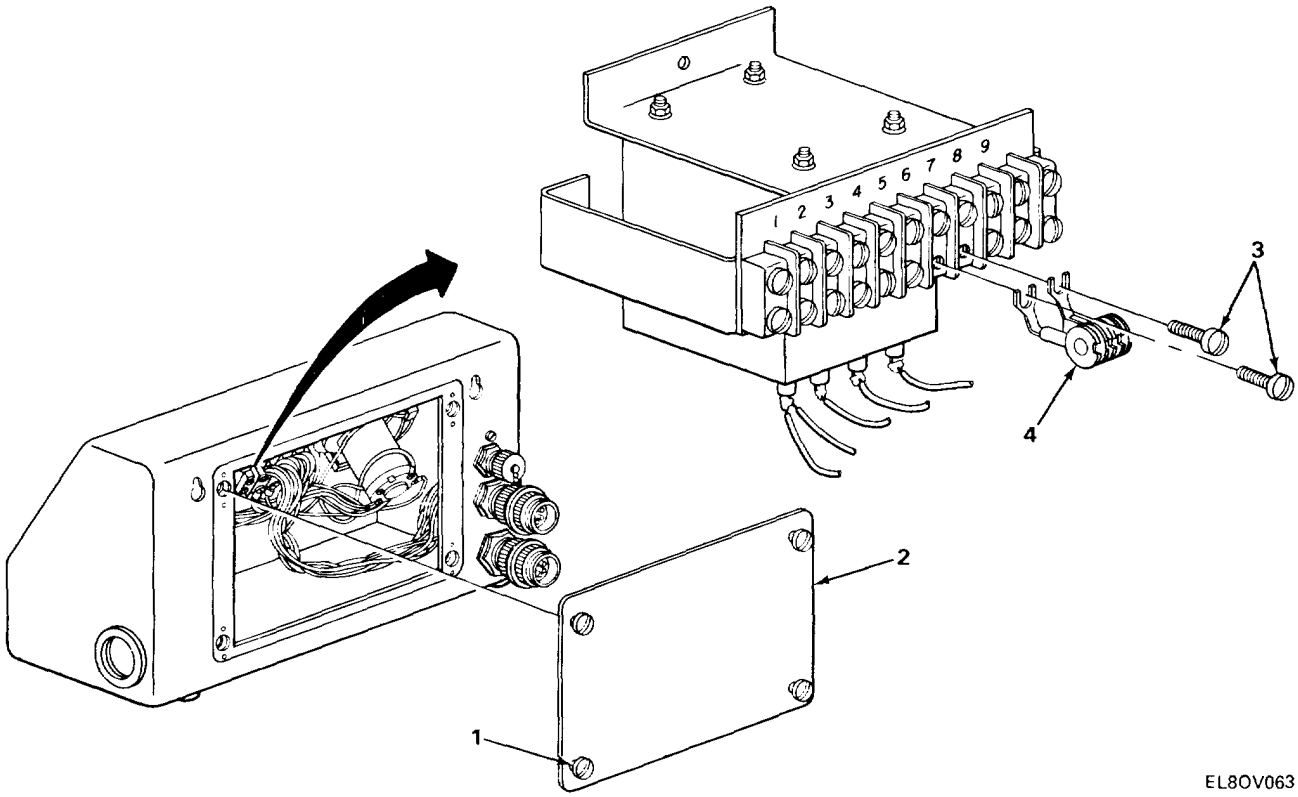
To ensure correct wire transfer, see FO-3. Connect resistor R201 to terminals 6 and 7 (para 5-19).

INSTALLATION

1. Position terminal board (9) on bracket (10) and install four screws (4), lockwashers (5), and nuts (6).
2. Install front panel (3) on indicator case.
3. Install four screws (1) and washers (2).

5-19. RESISTOR R201 REPLACEMENT.

MATERIALS/PARTS: Resistor, NSN 5905-00-101-5740



REMOVAL

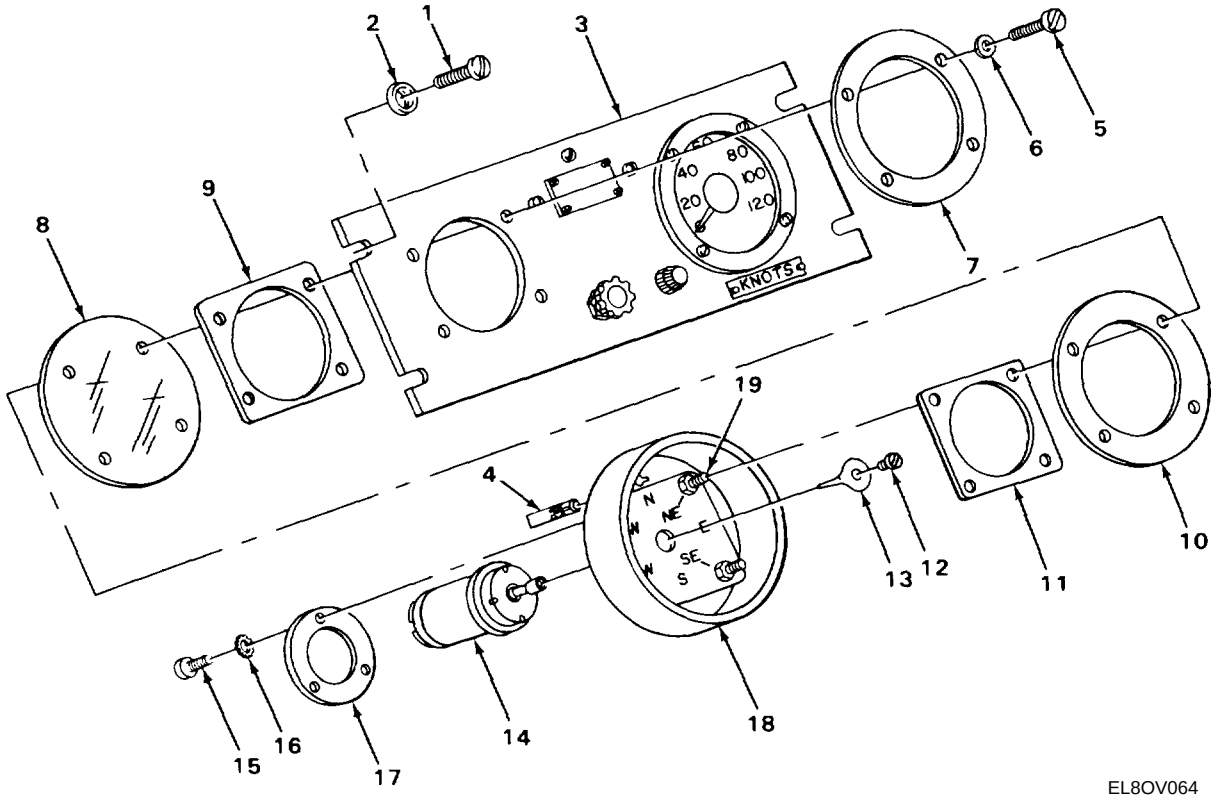
1. Loosen four turn-lock fasteners (1) and remove rear cover (2).
2. Remove two screws (3) and remove resistor R201 (4).

INSTALLATION

1. Position resistor R201 (4) on terminals 6 and 7.
2. Install two screws (3).
3. Install rear cover (2) and tighten four turn-lock fasteners (1).

5-20. WIND DIRECTION INDICATOR SYNCHRO REPLACEMENT.

MATERIALS/PARTS: Synchro, receiver (ID-373A/GMQ-11, ID-373B/GMQ-11, and ID-373C/GMQ-11) NSN 5990-00-984-7894
Synchro, receiver (ID-373B/GMQ-11 on order no. DAAB05-68-C-1227) NSN 5990-00-979-8141



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REMOVAL

1. Remove four screws (1) and washers (2), and remove front panel (3) from indicator case.

NOTE

There are four dial lampholders. Step 2 is typical for all four.

2. Squeeze both lampholder spring tabs together and pull lampholder (4) out of dial socket.
3. While holding indicator against front panel (3), remove four screws (5), lockwashers (6), and ring (7).
4. Remove indicator from front panel (3).

NOTE

It is not necessary to remove dial window (8) or gasket (9) unless loose or damaged.

5-20. WIND DIRECTION INDICATOR SYNCHRO REPLACEMENT. (CONT)

5. Remove light ring (10) and outer dial scale (11).
6. Remove pointer screw (12) and pointer (13).
7. Remove seven screws and wires from synchro (14).
8. Remove three screws (15), lockwashers (16), and clamp (17).
9. Remove synchro (14) from indicator (18).

INSTALLATION

1. Install synchro (14) in indicator (18).
2. Install clamp (17), three screws (15), and lockwashers (16).
3. Install pointer (13) and pointer screw (12).
4. Install outer dial scale (11) and light ring (10) in indicator (18).

NOTE

If dial window (8) or gasket (9) were not removed, disregard step 5.

5. Install gasket (9) and dial window (8).
6. Aline indicator studs (19) with holes on front panel (3) and push indicator (18) into place.
7. Install ring (7), four screws (5), and lockwashers (6). Tighten evenly.

NOTE

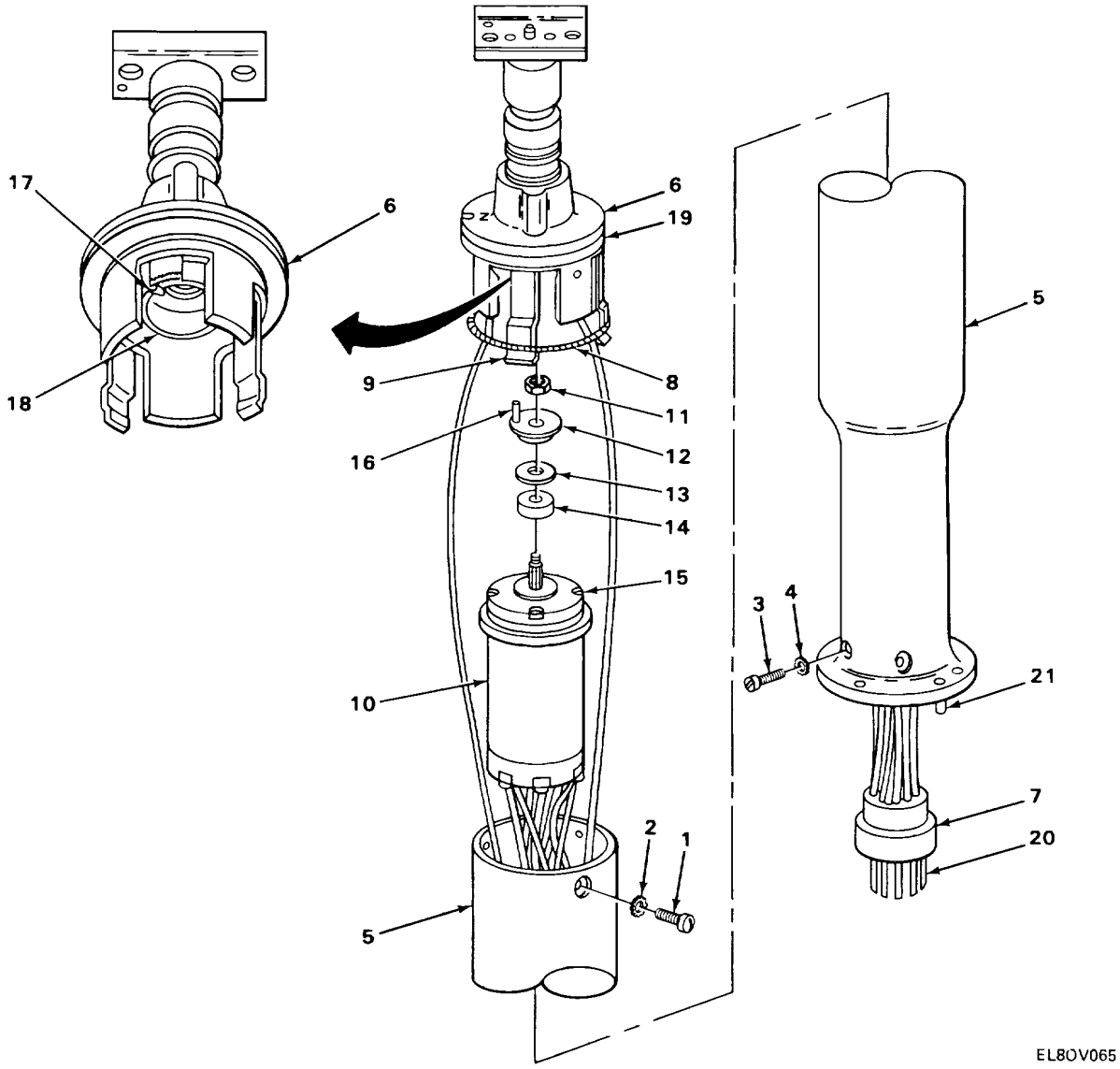
There are four dial lampholders. Step 8 is typical for all four.

8. Squeeze both lampholder spring tabs together, push lampholder (4) into dial socket, and release lampholder spring tabs.
9. Perform zeroing of wind direction indicator synchro (para 5-23).
10. Install front panel (3) on indicator case.
11. Install four screws (1) and washers (2).

5-21. WIND DIRECTION TRANSMITTER SYNCHRO REPLACEMENT.

MATERIALS/PARTS: Synchro, transmitter (T-420/GMQ-11 on order nos. 28488-P-55, 21513-P-56, and 40521-P-57) NSN 5990-00-660-8885
Synchro, transmitter (T-420A/GMQ-11 on order nos. 51014-P-57 and 5029-P-61, and T-420B/GMQ-11 on order no. 29067-P-58) NSN 5990-00-519-3421
Synchro, transmitter (T-420A/GMQ-11 on order no DAAB05-68-C-1227) NSN 5990-00-979-8139
Synchro, transmitter (T-420B/GMQ-11 on order nos. 19961-P-60, 19396-P-61, and 40154-P-62) NSN 5990-00-857-9975

PRELIMINARY PROCEDURE: Remove transmitter center section (para 5-16).



5-21. WIND DIRECTION TRANSMITTER SYNCHRO REPLACEMENT. (CONT)

REMOVAL

1. Remove three screws (1) and lockwashers (2).
2. Remove two screws (3) and lockwashers (4).
3. Mark vertical support (5) in alinement with N on vane shaft housing (6).

CAUTION

Push connector (7) up from bottom of vertical support (5) to prevent breaking wires or damaging connector.

4. Pull vane shaft housing (6) out of vertical support (5) while pushing up on connector (7).
5. Remove spring (8) from around three clips (9).
6. Pull synchro (10) free of three clips (9).
7. Remove nut (11), coupling (12), washer (13), and spacer (14) from synchro shaft (15).
8. Remove five screws and wires from synchro (10).
9. Remove synchro (10).

INSTALLATION

1. Install spacer (14), washer (13), coupling (12), and nut (11) on synchro shaft (15).
2. Install synchro (10) in vane shaft housing (6), positioning pin (16) on coupling (12) in notch (17) of vane shaft coupling (18).
3. Install spring (8) around three clips (9).
4. Perform zeroing of wind direction transmitter synchro (para 5-22).

NOTE

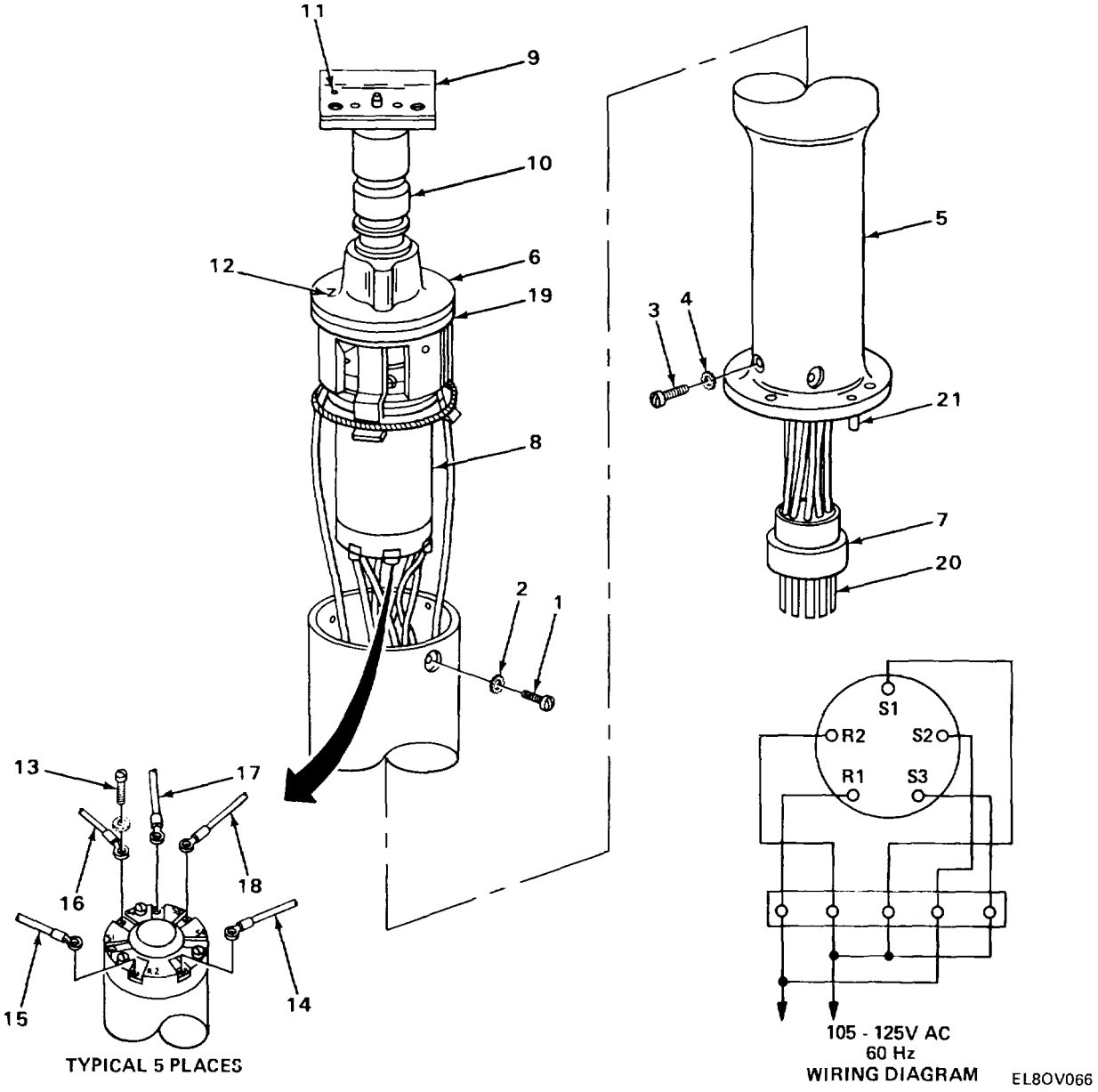
Make sure O-ring (19) is in place on vane shaft housing (6).

5. Install connector (7) through top of vertical support (5) and pull connector out of bottom.
6. Install vane shaft housing (6) into top of vertical support (5).
7. Aline N-stamp on vane shaft housing (6) with mark made on vertical support (5) during disassembly.
8. Install three screws (1) and lockwashers (2).
9. Aline pin 2 (20) on connector (7) with locating pin (21) on vertical support (5).
10. Install two screws (3) and lockwashers (4).

FOLLOW-ON MAINTENANCE: Install transmitter center section (para 5-16).

5-22. WIND DIRECTION TRANSMITTER SYNCHRO ZEROING.

PRELIMINARY PROCEDURE: Remove transmitter center section (para 5-16).



1. Remove three screws (1) and lockwashers (2).
2. Remove two screws (3) and lockwashers (4).
3. Mark vertical support (5) in alinement with N on vane shaft housing (6).

CAUTION

Push connector (7) up from bottom of vertical support (5) to prevent breaking wires or damaging connector.

5-22. WIND DIRECTION TRANSMITTER SYNCHRO ZEROING. (CONT)

4. Pull vane shaft housing (6) out of vertical support (5) while pushing up on connector (7).
5. Remove five screws and wires from synchro (8).
6. Install test connections on synchro (8) as shown in wiring diagram.

CAUTION

Do not apply power to synchro for more than 30 seconds. Application of power for a longer period of time will overheat and damage synchro.

NOTE

When synchro is powered up, plate (9) on top of vane shaft (10) will turn to a true north position. Perform step 7 to bring synchro into alinement.

7. Turn synchro (8) to aline positioning hole (11) side of plate (9) center line with N-stamp (12) on vane shaft housing (6).
8. Disconnect from power source.
9. Remove test connections from synchro (8).
10. Using screws (13), install transmitter wiring as shown in table below.

TERMINAL NO.	WIRE COLOR	INDEX NO.
R1	White	14
R2	Black	15
S1	Green	16
S2	Red	17
S3	Orange	18

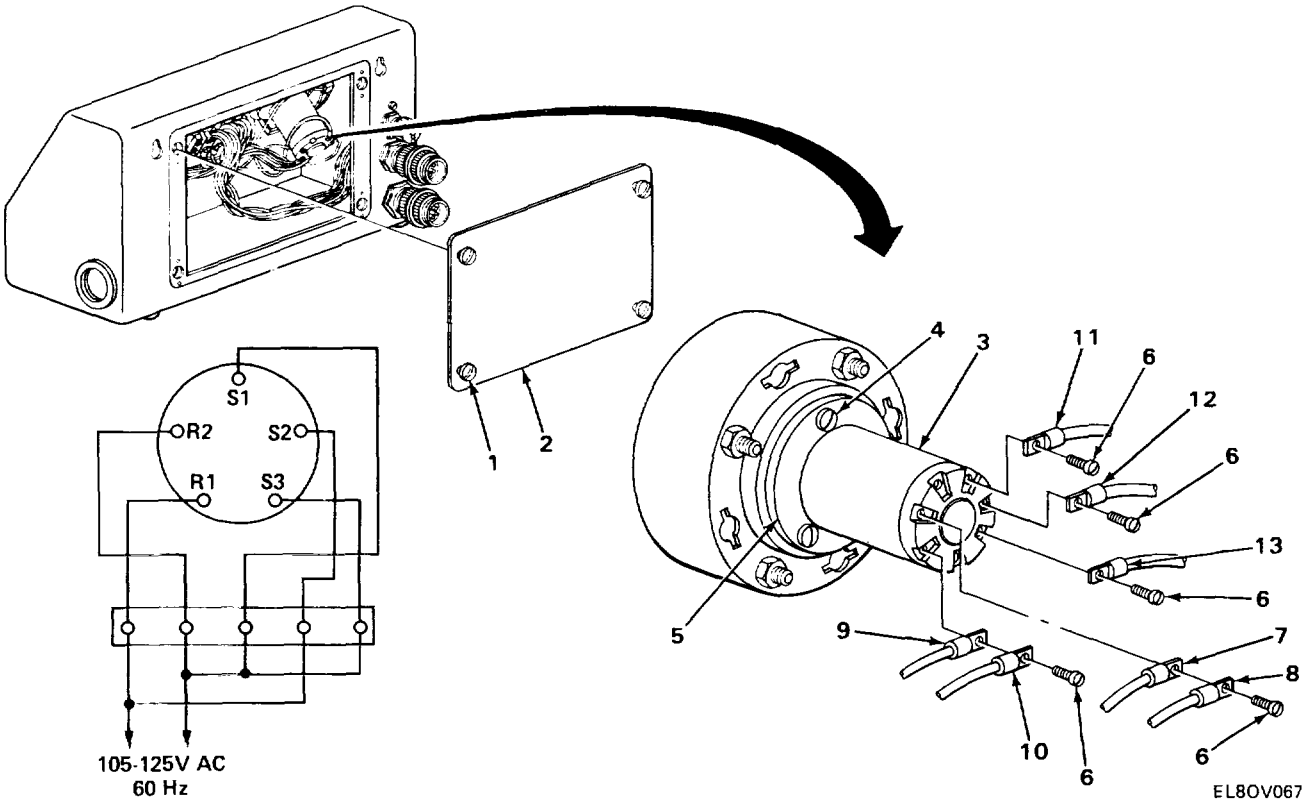
NOTE

Make sure O-ring (19) is in place on vane shaft housing (6).

11. Install connector (7) through top of vertical support (5) and pull connector out of bottom.
12. Install vane shaft housing (6) into top of vertical support (5).
13. Aline N-stamp (12) on vane shaft housing (6) with mark made on vertical support (5) during disassembly.
14. Install three screws (1) and lockwashers (2).
15. Aline pin 2 (20) on connector (7) with locating pin (21) on vertical support (5).
16. Install two screws (3) and lockwashers (4).

FOLLOW-ON MAINTENANCE: Install transmitter center section (para 5-16).

5-23. WIND DIRECTION INDICATOR SYNCHRO ZEROING.



1. Loosen four turn-lock fasteners (1) and remove rear cover (2).
2. Remove seven wires from synchro (3).
3. Loosen three screws (4) on clamp (5).
4. Install test connections on synchro (3) as shown in wiring diagram.

CAUTION

Do not apply power to synchro for more than 30 seconds. Application of power for a longer period of time will overheat and damage synchro.

5. Turn synchro (3) until pointer indicates N (north), and tighten three screws (4).
6. Disconnect from power source.
7. Remove test connections from synchro.
8. Using screws (6), install indicator wiring as shown in table below.

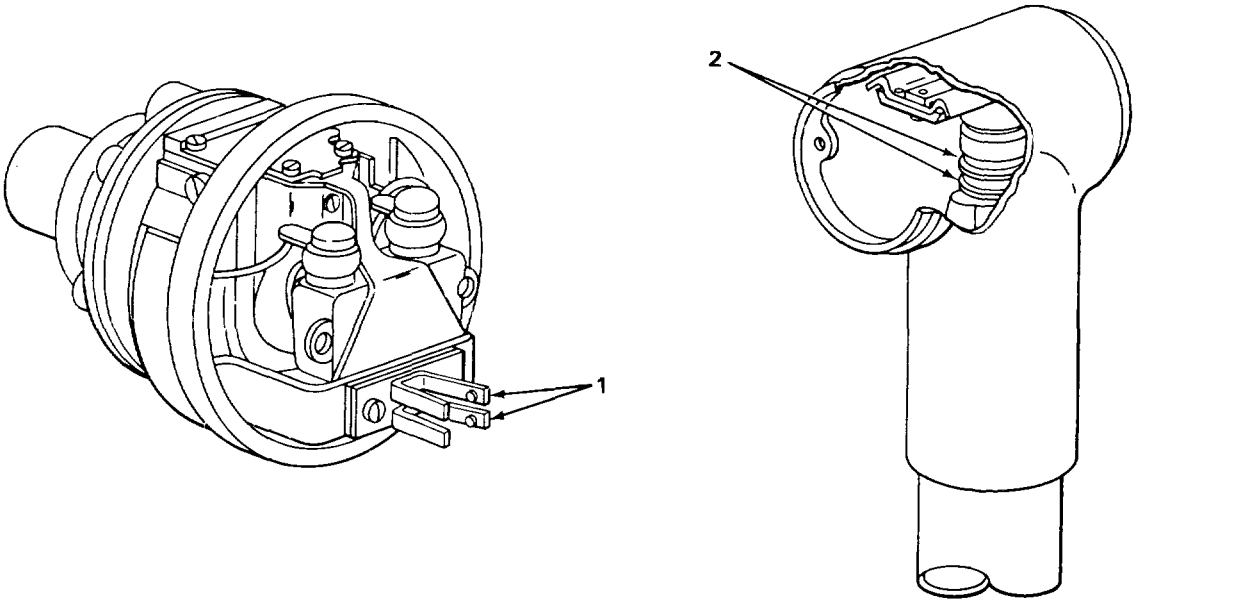
TERMINAL NO.	WIRE COLOR	WIRE NO.	INDEX NO.
R1	White	4-6	7
	Brown	4-16	8
R2	Black	4-1	9
	Grey	4-8	10
S1	Green	4-2	11
S2	Red	4-4	12
S3	Yellow	4-5	13

9. Install rear cover (2) and tighten four turn-lock fasteners (1).

5-24. WINDSPEED GENERATOR COLLECTOR RINGS AND BRUSHES CLEANING.

MATERIALS/PARTS: Cloth (item 4, app E)
Sandpaper (item 5, app E)
Thinner (item 3, app E)

PRELIMINARY PROCEDURE: Remove windspeed generator GI (para 5-10).



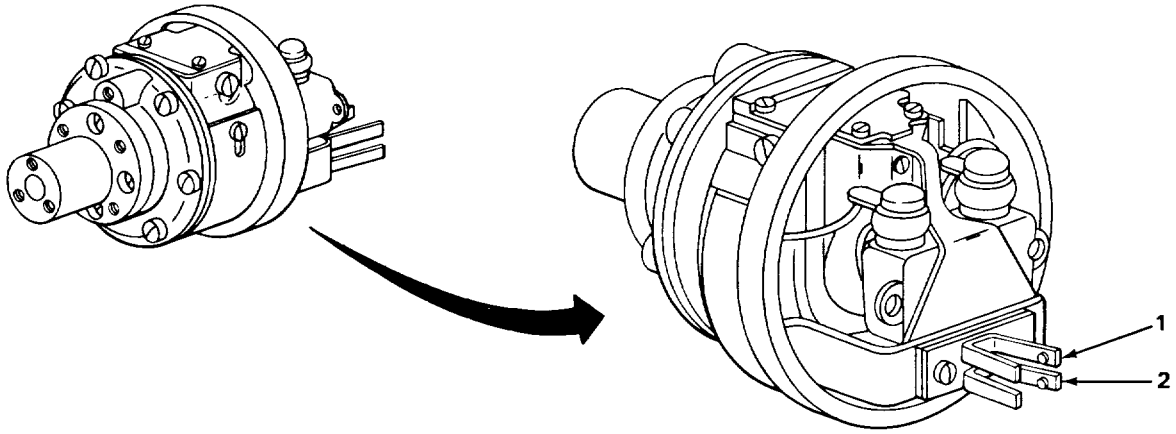
EL8OV068

1. Use a cloth dampened with thinner to remove dirt and gum deposits from collector brushes (1) or collector rings (2).
2. Use sandpaper to remove corrosion or minor pitting from collector brushes (1) and/or collector rings (2).
3. After sanding, use thinner to remove any residue from collector brushes (1) and/or collector rings (2).
4. Replace badly pitted collector brushes (1) (para 5-13).

FOLLOW-ON MAINTENANCE: Install windspeed generator G1 (para 5-10).

5-25. WINDSPEED GENERATOR RESISTANCE TEST.

TOOLS: Digital multimeter, Fluke 8600A
PRELIMINARY PROCEDURE: Remove windspeed generator G1 (para 5-10).



EL8OV069

1. Using digital multimeter, check for 200-ohm resistance (+ 1 ohm) between collector ring brushes (1) and (2).

NOTE

For T-420/GMQ-11 and T-420A/GMQ-11, the resistance measured is the sum of the resistance of the armature, resistance spool R204, and neutralizer R205.

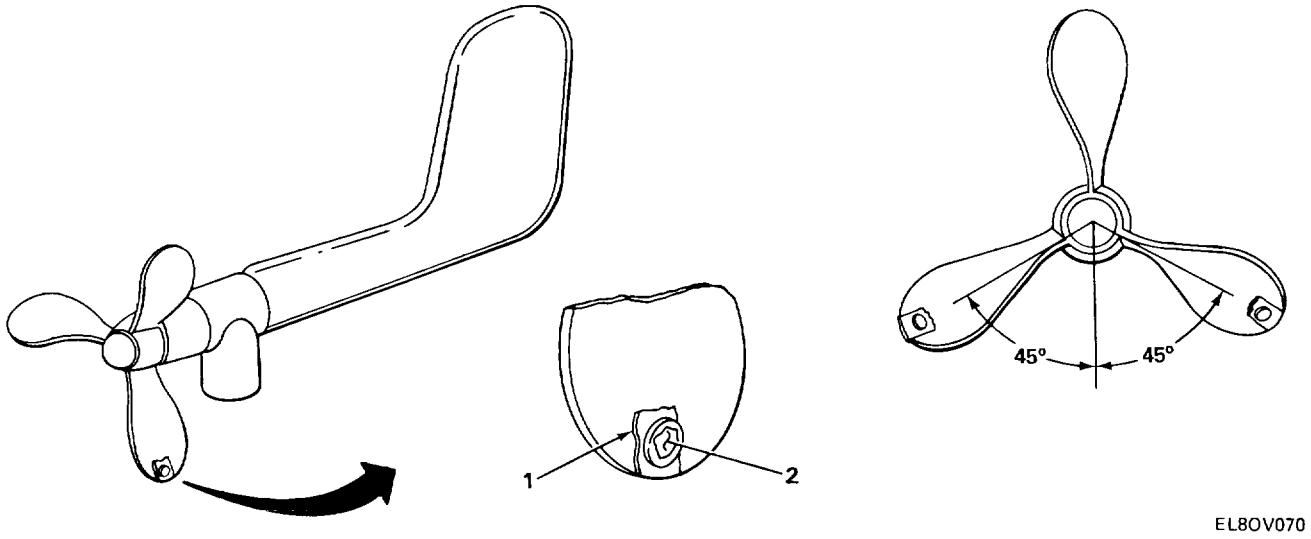
For T-420B/GMQ-11, the resistance measured is the sum of the resistance of the armature and resistor R1.

If readings are insufficient or excessive, refer to higher level of maintenance.

2. Slowly turn armature one-half revolution at a time to test each portion of armature.

5-26. WINDSPEED GENERATOR FRICTION TEST.

TOOLS: Calibrator weight, 3.1-gram
Cellulose tape (item 6, app E)



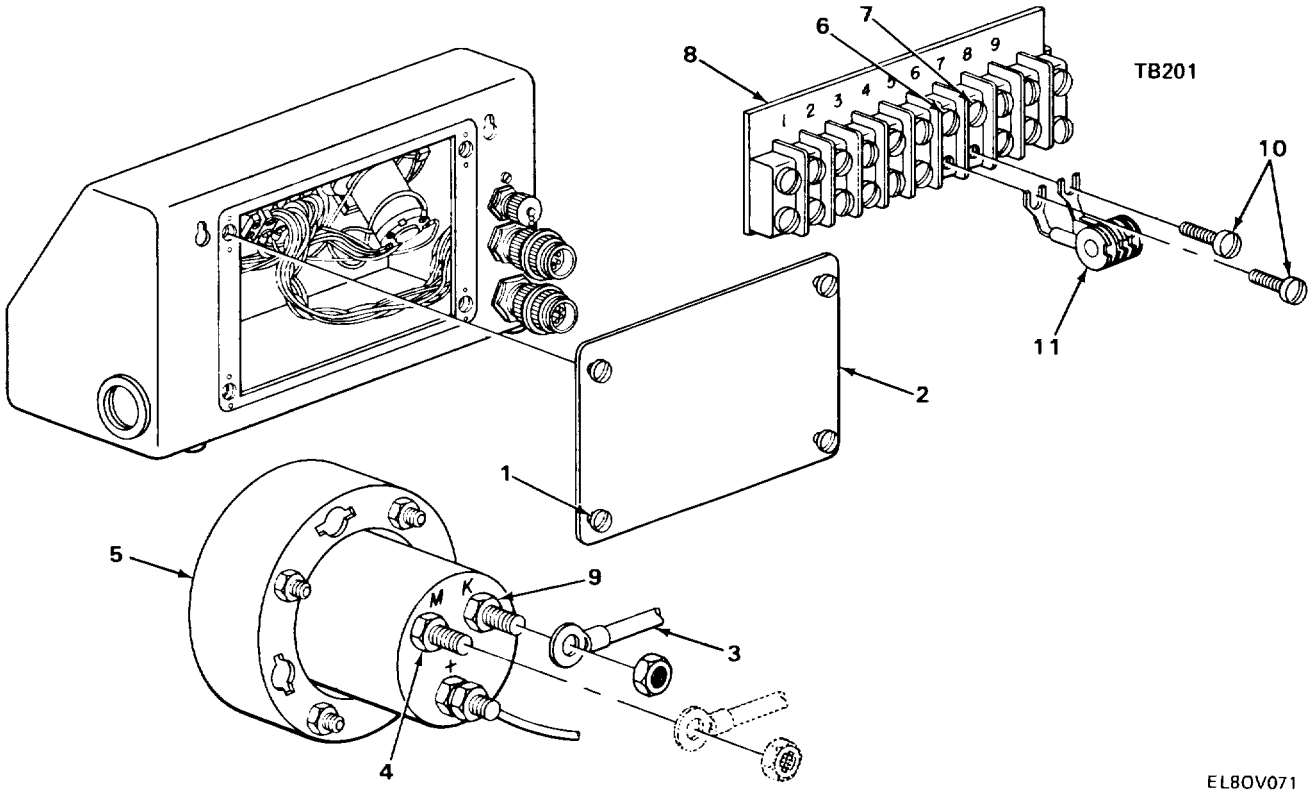
1. Use a piece of cellulose (cellophane) tape (1) and attach a 3.1-gram calibrator weight (2) to tip of one impeller blade.
2. Turn weighted impeller blade to left until it is approximately 45 degrees from vertical, then release it. Weighted impeller blade must fall to vertical position.
3. Turn weighted impeller blade to right until it is approximately 45 degrees from vertical, then release it. Weighted impeller blade must fall to vertical position.

NOTE

To ensure an accurate test, steps 1, 2, and 3 must be performed on all three impeller blades. If requirements are not met, refer to higher category of maintenance.

5-27. WINDSPEED INDICATOR RESISTANCE TEST.

TOOLS: Digital multimeter, Fluke 8600A



1. Loosen four turn-lock fasteners (1) and remove rear cover (2).
2. Connect orange wire 4-14 (3) to terminal M(4) on windspeed indicator (5).
3. Using digital multimeter, check for 1,150 ohms ± 6 ohms resistance between terminals 6 (6) and 7 (7) on terminal board TB201 (8).
4. Remove and reconnect orange wire 4-14 (3) to terminal K (9) on windspeed indicator (5).
5. Using digital multimeter, check for 1,150 ohms ± 6 ohms resistance between terminals 6 (6) and 7 (7) on terminal board TB201 (8).
6. Loosen two screws (10) and resistor R201 (11). Retighten two screws (10).
7. With orange wire 4-14 (3) on terminal K (9), and using digital multimeter, check for 2,300 ohms ± 11.5 ohms resistance between terminals 6 (6) and 7 (7) on terminal board TB201 (8).
8. Remove and reconnect orange wire 4-14 (3) to terminal M (4) on windspeed indicator (5).
9. Using digital multimeter, check for 2,300 ohms, ± 11.5 ohms resistance between terminals 6 (6) and 7 (7) on terminal board TB201 (8).
10. Loosen two screws (10) and install resistor R201 (11). Tighten two screws (10).
11. Install rear cover (2) and tighten four turn-lock fasteners (1).

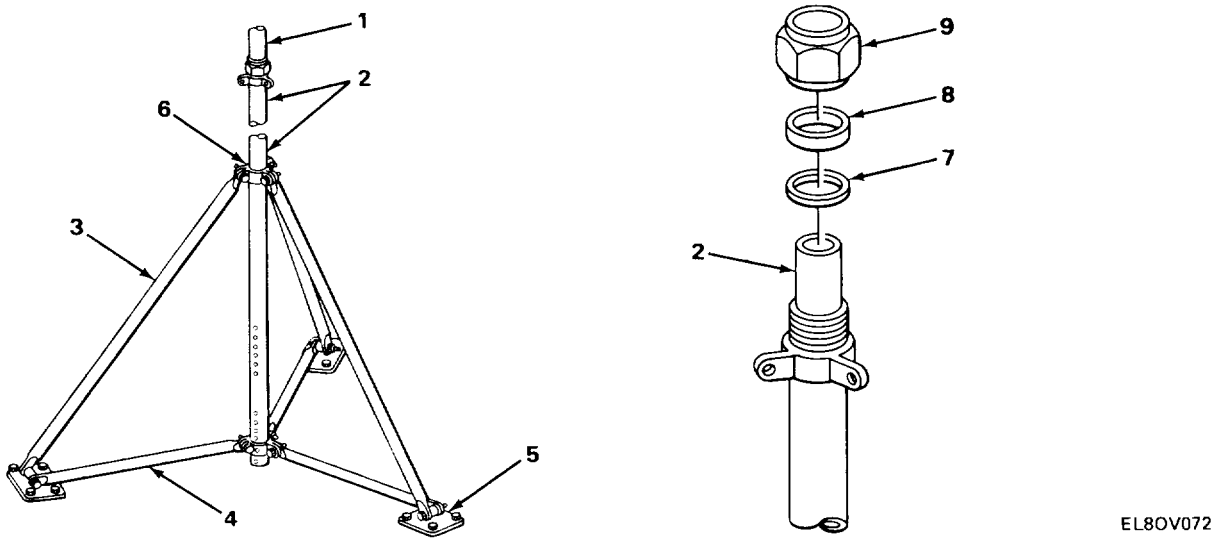
NOTE

If readings are insufficient or excessive, refer to higher category of maintenance.

5-28. TRANSMITTER SUPPORT ASSEMBLY REPAIR AND REPLACEMENT.

MATERIALS/PARTS: Cinch washer, SMB 113726
Long brace, SMB 279846
Lower mast assembly, SMC 113731
Mast base, NSN 6660-00-348-8780
Mast clamp, SMB 279843
Rubber bushing, SMB 113729
Short brace, SMB 279847
Slip-joint nut, SMC 113728
Upper mast assembly, SMC 113732

PRELIMINARY PROCEDURE: Prepare for storage or shipment (para 4-36).



1. Check upper mast (1) and lower mast (2) for cracks or breaks.
2. Check long brace (3), short brace (4), mast base (5), or clamps (6) for cracks or breaks.

NOTE

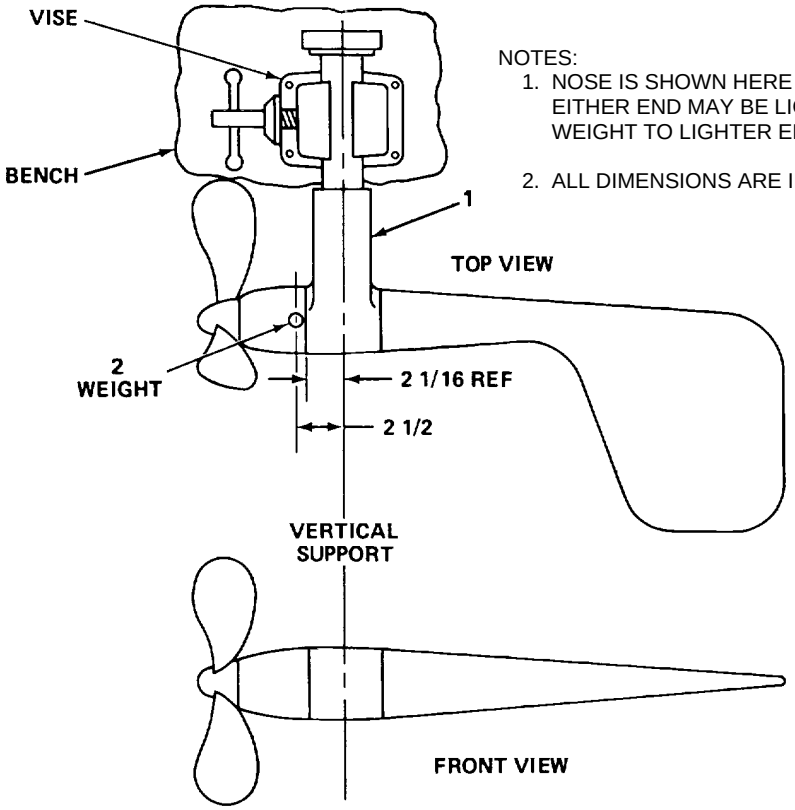
For correct welding procedures, refer to TM 9-237.

3. Weld any cracked or broken parts. Refer to TM 9-237 for correct welding procedures.
4. Replace any worn, rusted, broken, or missing hardware.
5. Replace worn cinch washer (7), cracked or bloated rubber bushing (8), or rusted or worn slip-joint nut (9).
6. Straighten any bent long braces (3) or short braces (4).

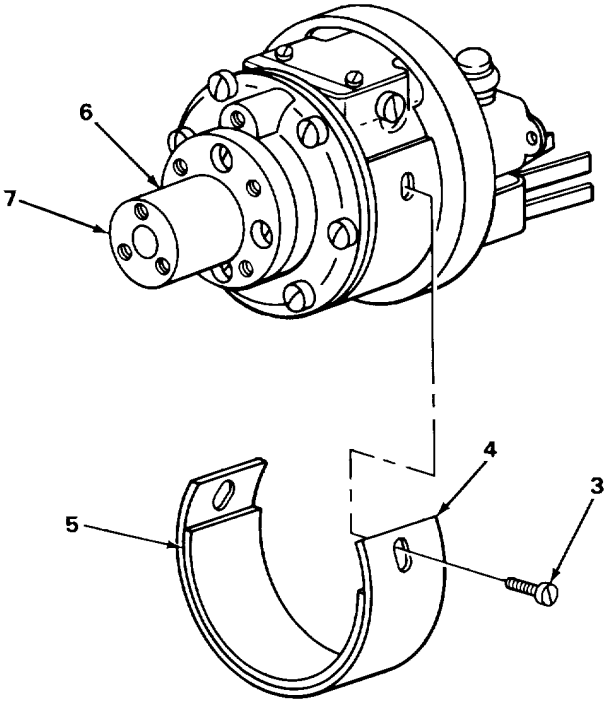
FOLLOW-ON MAINTENANCE: Perform service upon receipt procedures (para 4-4).

5-29. TRANSMITTER BALANCE TEST.

TOOLS: Spring tension scale
Tape weight, 2-ounce



NOTES:
1. NOSE IS SHOWN HERE AS LIGHTER END. EITHER END MAY BE LIGHTER. ATTACH WEIGHT TO LIGHTER END AT DISTANCE SHOWN. IOWN.
2. ALL DIMENSIONS ARE IN INCHES.



EL8OV079

5-29. TRANSMITTER BALANCE TEST. (CONT)

1. Mount transmitter vertical support (1) horizontally in a vise.
2. Turn transmitter to a horizontal position.

NOTE

If transmitter remains in a horizontal position, transmitter is in balance and no further testing is necessary.

If either impeller or tail end turns downward, proceed to step 3.

3. Attach 2-ounce weight (2) to the lighter end of transmitter, 2 1/2 inches from center line of transmitter vertical support (1).
4. Using spring tension scale, apply a 0.5-ounce torque to lighter end of transmitter.

NOTE

If transmitter does not move, or end to which the 0.5-ounce torque is applied inclines slightly downward, transmitter is balanced within tolerance.

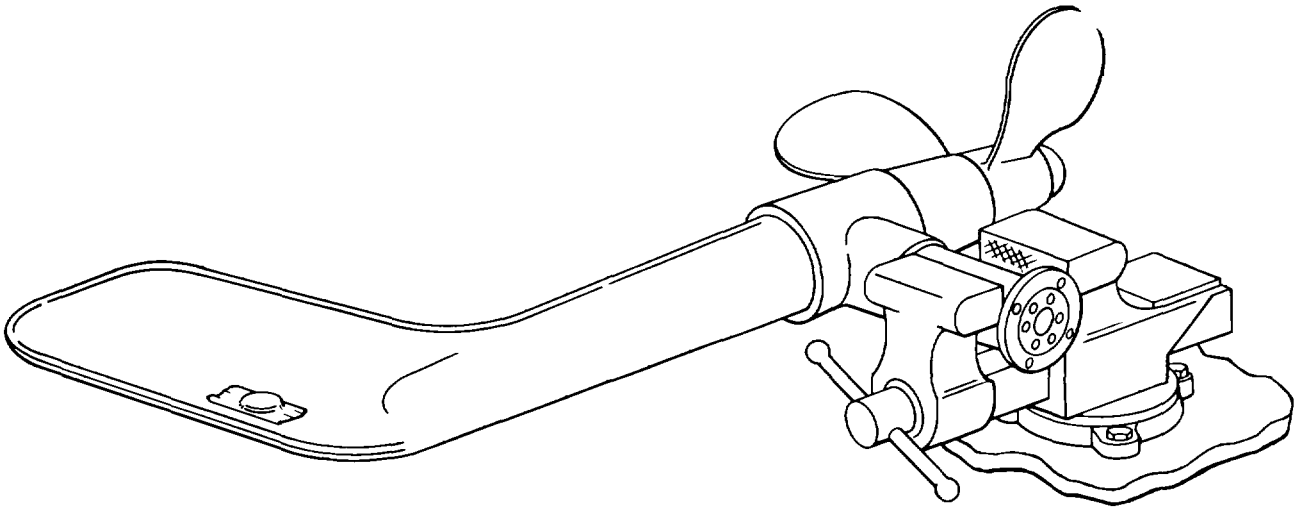
If none of the above requirements are met, proceed to step 5.

Depending on amount of balancing necessary, weights can be added or removed under generator housing, or hub collar can be shifted in or out to bring transmitter into balance.

5. Remove two screws (3) and lower bracket (4) and either add or remove balance weights (5).
6. Replace lower bracket (4) and install two screws (3).
7. Loosen two setscrews (6) and move hub collar (7) in or out to bring transmitter into balance.
8. Tighten two setscrews (6).

5-30. TRANSMITTER VANE FRICTION TEST.

TOOLS: Calibrator weight, 12.3-gram
Cellulose tape (item 6, app E)



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NOTE

Transmitter balance must be ensured before performing this test (para 5-29).

1. Mount transmitter vertical support horizontally in a vise.
2. Using tape, secure 12.3-gram weight to end of vane tail.
3. Turn transmitter vane clockwise until horizontal and release.
4. Turn transmitter vane counterclockwise until horizontal and release.

NOTE

When released, vane tail must fall to bottom of arc for each test.

If transmitter does not meet the above requirements, excessive friction exists. Refer to a higher category of maintenance.

APPENDIX A

REFERENCES

The following is a list of applicable references available to the operator and repair technician of the Wind Measuring Set AN/GMQ-11.

Consolidated Index of Army Publications and Blank Forms	DA Pam 310-1
The Army Maintenance Management System (TAMMS)	DA Pam 738-750
First Aid for Soldiers	FM 21-11
Preservation, Packaging, Packing and Marking Materials, Supplies and Equipment Used in the Army	SB 38-100
Installation of Communications-Electronic Equipment, Hookup of Electrical Cables to Mobile Generator Site on Fielded Equipment to Meet Electrical Safety Standards	TB 43-0125
Solder and Soldering	TB SIG 222
Opertor's Manual for Welding Theory and Application	TM 9-237
Painting Instructions for Field Use	TM 43-0139
Operator's and Organizational Maintenance Manual Recorders, Wind Direction and Speed RO-2/GMQ (NSN 6660-00-663-8075), RO-2A/GMQ (NSN 6660-00-922-8311), RO-2B/GMQ and RO-2C/GMQ	TM 11-6660-231-12
Direct Support and General Support Maintenance Manual for Recorders, Wind Direction and Speed RO-2/GMQ, RO-2A/GMQ, RO-2B/GMQ, and RO-2C/GMQ	TM 11-6660-231-34
Organizational Maintenance Repair Parts and Special Tools List (RPSTL)	TM 11-6660-200-24P
Procedures for Destruction of Electronics Materiel to Prevent Enemy Use (Electronics Command)	TM 750-244-2

APPENDIX B

MAINTENANCE ALLOCATION CHART

Section I INTRODUCTION

B-1. GENERAL.

This appendix provides a summary of maintenance operations for the AN/GMQ-11. It authorizes categories of maintenance for specific maintenance functions on repairable items and components, and the tools and equipment required to perform each function. This appendix may be used as an aid in planning maintenance operations.

B-2. MAINTENANCE FUNCTIONS.

Maintenance functions will be limited to and defined as follows:

a. Inspect. To determine the serviceability of an item by comparing its physical, mechanical, and/or electrical characteristics with established standards through examination.

b. Test. To verify serviceability and to detect incipient failure by measuring the mechanical or electrical characteristics of an item and comparing those characteristics with prescribed standards.

c. Service. Operations required periodically to keep an item in proper operating condition, ie, to clean (decontaminate), preserve, drain, paint, or replenish fuel, lubricants, hydraulic fluids, or compressed air supplies.

d. Adjust. To maintain, within prescribed limits, by bringing into proper or exact position, or by setting the operating characteristics to specified parameters.

e. Aline. To adjust specified variable elements of an item to bring about optimum or desired performance.

f. Calibrate. To determine and cause corrections to be made or 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.

g. Install. The act of emplacing, seating, or fixing into position an item, part, module (component or assembly) in a manner to allow the proper functioning of the equipment or system.

h. Replace. The act of substituting a serviceable like-type part, subassembly, or module (component or assembly) for an unserviceable counterpart.

i. Repair. The application of maintenance services (inspect, test, service, adjust, aline, calibrate, or replace) or other maintenance actions (welding, grinding, riveting, straightening, facing, remachining, or resurfacing) to 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.

B-2. MAINTENANCE FUNCTIONS. (CONT)

j. Overhaul. That maintenance effort (service/action) necessary to restore an item to a completely serviceable/operational condition as prescribed by maintenance standards in appropriate technical publications (ie, DMWR). Overhaul is normally the highest degree of maintenance performed by the Army. Overhaul does not normally return an item to a like-new condition.

k. 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 (hours, miles, etc) considered in classifying Army equipment/components.

B-3. COLUMN ENTRIES.

a. Column 1, Group Number. Column 1 lists group numbers, the purpose of which is to identify components, assemblies, subassemblies, and modules with the next higher assembly.

b. Column 2, Component/Assembly. Column 2 contains the noun names of components, assemblies, subassemblies, and modules for which maintenance is authorized.

c. Column 3, Maintenance Function. Column 3 lists the functions to be performed on the item listed in column 2. When items are listed without maintenance functions, it is solely for the purpose of having group numbers in the MAC and RPSTL coincide.

d. Column 4, Maintenance Category. Column 4 specifies, by the listing of a "worktime" figure in the appropriate subcolumn (s), the lowest level of maintenance authorized to perform the function listed in column 3. This figure represents the active time required to perform that maintenance function at the indicated category of maintenance. If the number or complexity of the tasks within the listed maintenance function varies at different maintenance categories, appropriate "worktime" figures will be shown for each category. The "worktime" figure represents the average time required to restore an item (assembly, subassembly, component, module, end item, or system) to a service-
able condition under typical field operating conditions. This time includes preparation time, troubleshooting time, and quality assurance/quality control time in addition to the time required to perform the specific tasks identified for the maintenance functions authorized in the maintenance allocation chart. Subcolumns of column 4 are as follows:

C - Operator/Crew
O - Organizational
F - Direct Support
H - General Support
D - Depot

e. Column 5, Tools and Equipment. Column 5 specifies, by code, those common tool sets (not individual tools), special tools, TMDE, and support equipment required to perform the designated function.

f. Column 6, Remarks. Column 6 contains an alphabetic code which leads to the remark in section IV. Remarks, which is pertinent to the item opposite the particular code.

B-4. TOOL AND TEST EQUIPMENT REQUIREMENTS (SECTION III).

a Tool or Test Equipment Reference Code. The numbers in this column coincide with the numbers used in the tools and equipment column of the MAC. The numbers indicate the applicable tool or test equipment for the maintenance functions.

b Maintenance Category. The codes in this column indicate the maintenance category allocated the tool or test equipment.

c Nomenclature. This column lists the noun name and nomenclature of the tools and test equipment required to perform the maintenance functions.

d National/NATO Stock Number. This column lists the National/NATO stock number of the specific tool or test equipment.

e Tool Number. This column lists the manufacturer's part number of the tool followed by the (five-digit) Federal Supply Code for Manufacturers (FSCM) in parentheses.

B-5. REMARKS (SECTION IV).

a Reference Code. This code refers to the appropriate item in section II, column 6.

b Remarks. This column provides the required explanatory information necessary to clarify items appearing in section I1.

SECTION II. MAINTENANCE ALLOCATION CHART

(1) GROUP NUMBER	(2) COMPONENT/ASSEMBLY	(3) MAINTENANCE FUNCTION	(4) MAINTENANCE CATEGORY C	O	F	H	D	(5) TOOLS AND EQPT	(6) REMARKS
00	WIND MEASURING SET AN/GMQ-11	Service	0.3					1	
		Inspect	0.1					1	
		Test		0.5				2	
		Replace		1.0				1	
		Repair		2.5				1	
		Rebuild					176.3	1,2,3	
01	INDICATOR, WIND DIRECTION AND SPEED ID-373/GMQ-11, ID-373A/GMQ-11 AND ID-373CIGMQ-11	Test				1.4		2	
		Replace		0.7				1	
		Repair			3.0			1	
		Overhaul				16.0		1	
		Adjust		1.0				1,2	
		Calibrate				1.2		1,2	
02	SUPPORT, WIND DIRECTION AND SPEED TRANSMITTER MT-1246, MT-1246A	Repair		1.3				1	
		Replace		0.5				1	
03	TRANSMITTER, WIND DIRECTION AND SPEED T-420/GMQ-11, T-420A/GMQ-11, T-420B/GMQ-11	Test			0.8			1,2	
		Repair			2.6			1	
		Replace		1.1				1	
		Calibrate				1.5		1,2	
		Overhaul					21.2	1,2,3	

SECTION III TOOL AND TEST EQUIPMENT REQUIREMENTS
WIND MEASURING SET AN/GMQ-11

TOOL OR TEST EQUIPMENT REF CODE	MAINTENANCE CATEGORY	NOMENCLATURE	NATIONAL/ NATO STOCK NUMBER	TOOL NUMBER
1	0	Tool Kit, Radio Repair TK-17/FMQ	5180-00-408-4840	
2	F	Digital Multimeter, Fluke 8600A	6625-01-010-0088	
3	H	Stroboscope TS-805/U	6625-00-223-5150	

APPENDIX C

COMPONENTS OF END ITEM AND BASIC ISSUE ITEMS LISTS

Section I INTRODUCTION

C-1 SCOPE.

This appendix lists components of end item and basic issue items for the AN/GMQ-11 to help you inventory items required for safe and efficient operation.

C-2 GENERAL.

The Components of End Item and Basic Issue Items Lists are divided into the following sections:

a Section II, Components of End Item. This listing is for informational purposes only, and is not authority to requisition replacements. These items are part of the end item, but are removed and separately packaged for transportation or shipment. As part of the end item, these items must be with the end item whenever it is issued or transferred between property accounts. Illustrations are furnished to assist you in identifying items.

b Section Ill, Basic Issue Items (BII). These are the minimum essential items required to place the AN/GMQ-11 in operation, to operate it, and to perform emergency repairs. Although shipped separately packaged, BII must be with the AN/GMQ-11 during operation and whenever it is transferred between property accounts. The illustrations will assist you with hard-to-identify items. This manual is your authority to request/requisition replacement Bll, based on TOE/MTOE authorization of end item.

C-3 EXPLANATION OF COLUMNS.

The following provides an explanation of columns found in the tabular listings.

a Column 1, Illustration Number (Illus No.). Indicates the illustration number in which the item is shown.

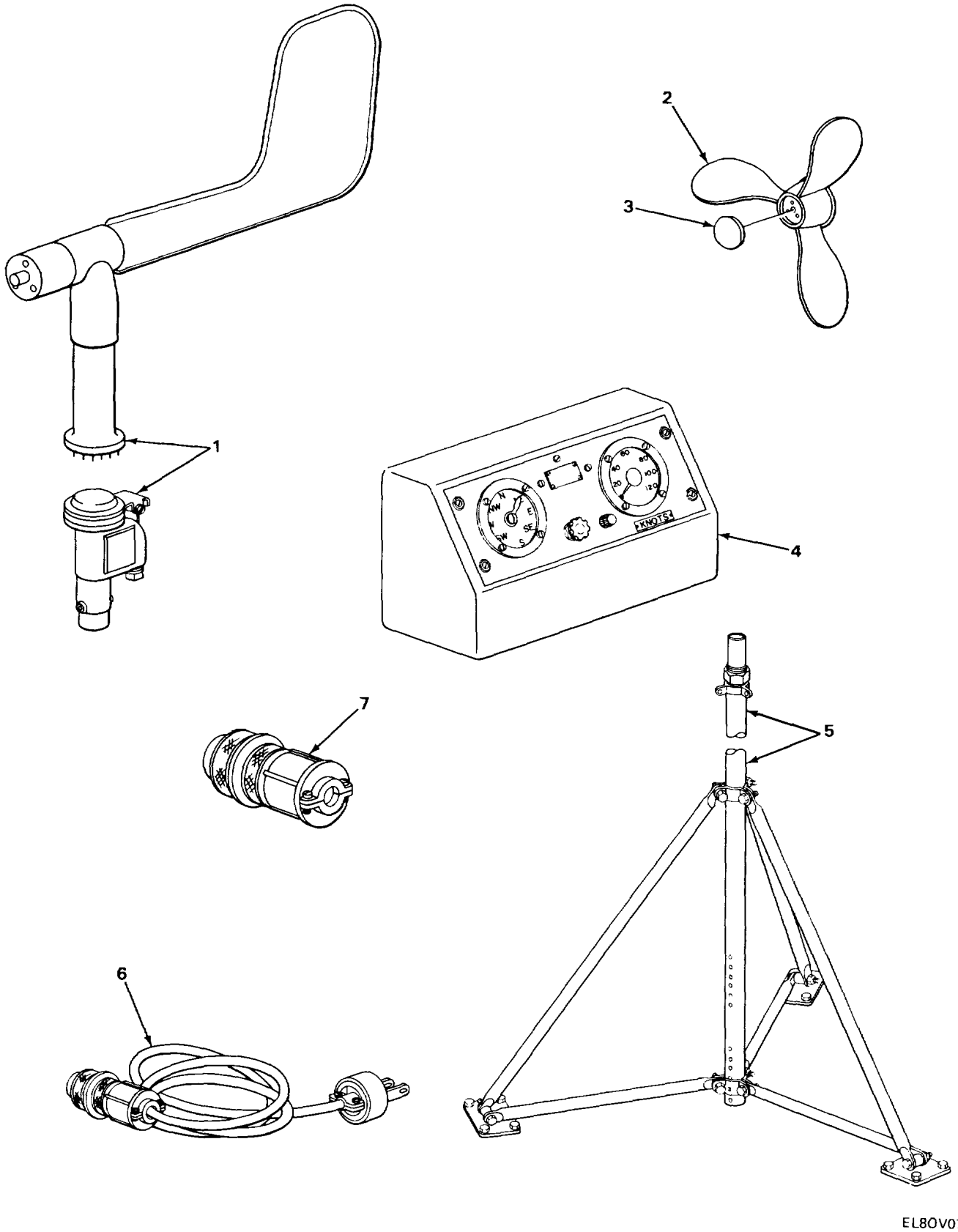
b Column 2, National Stock Number. Indicates the national stock number assigned to the item and will be used for requisitioning purposes.

c Column 3, Description. Indicates the federal item name used to identify and locate the item. The last line for each item indicates the FSCM (in parentheses) followed by the part number.

d Column 4, Unit of Measure (U/M). Indicates the measure used in performing the actual operational/maintenance function. This measure is expressed by a two-character alphabetical abbreviation (eg, ea, in., pr).

e Column 5, Quantity Required (Qty Req'd). Indicates the quantity of the item authorized to be used with/on the equipment.

Section II COMPONENTS OF END ITEM



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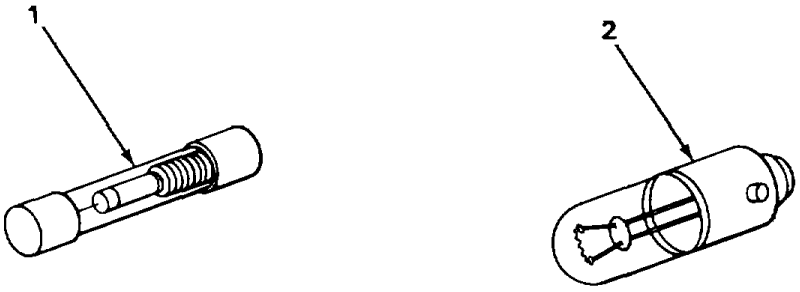
COMPONENTS OF END ITEM (CONT)

(1) ILLUS NUMBER	(2) NATO STOCK NUMBER	(3) DESCRIPTION (FSCM) and Part Number	(4) U/M	(5) QTY REQ'D
1	6660-00-545-8580	TRANSMITTER, WIND DIRECTION AND SPEED T-420B/GMQ-11	ea	1
2	6660-00-822-2146	IMPELLER (74082) MEB-40154-23	ea	1
3	6660-00-500-5888	CAP, IMPELLER, NOSE (80063) SM-B-279799	ea	1
4	6660-00-752-7793	INDICATOR, WIND DIRECTION AND SPEED ID-373C/GMQ-11	ea	1
5	6660-00-804-3585	SUPPORT, WIND DIRECTION AND SPEED, TRANSMITTER MT-1246A/GMQ-11	ea	1
6	6660-00-752-2053	CABLE ASSEMBLY, POWER, ELECTRICAL (80063) SC-C-32974	ea	1
6	6660-00-752-2052	CABLE ASSEMBLY, POWER, ELECTRICAL (80063) SM-C-113736	ea	1
7	5935-00-227-8423	CONNECTOR, PLUG, ELECTRICAL (81350) AN3106A-22-18P	ea	2

Section III BASIC ISSUE ITEMS



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(1) ILLUS NUMBER	(2) NATO STOCK NUMBER	(3) DESCRIPTION (FSCM) and Part Number	(4) U/M	(5) QTY REQ'D
1	5920-00-199-9498	FUSE, CARTRIDGE (96906) FR2GR500B	ea	5
2	6240-00-155-8706	LAMP, INCANDESCENT (98863) 47	ea	3

APPENDIX D

ADDITIONAL AUTHORIZATION LIST

Section I INTRODUCTION

D-1 SCOPE.

This appendix lists additional items you are authorized for the support of the AN/GMQ-11.

D-2 GENERAL.

This list identifies items that do not have to accompany the AN/GMQ-11 and that do not have to be turned in with it. These items are all authorized to you by CTA, MTOE, TDA, and JTA.

D-3 EXPLANATION OF LISTING.

National stock numbers, descriptions, and quantities are provided to help you identify and request the additional items you require to support this equipment. The items are listed in alphabetical sequence by name under the type document (ie, CTA, MTOE, TDA, or JTA) which authorizes the items to you.

Section II ADDITIONAL AUTHORIZATION LIST

(1) NATIONAL STOCK NUMBER	(2) DESCRIPTION FSCM & PART NUMBER	USABLE ON CODE	(3) U/M	(4) QTY AUTH
	MTOE AUTHORIZED ITEMS			
	CABLE, INTERCONNECTION (XXXXX) WM-76/U		ft	5000
	CABLE, INTERCONNECTION (XXXXX) CO-138		ft	3000
	CABLE, INTERCONNECTION (XXXXX) CO-139		ft	2000
	CABLE, INTERCONNECTION (XXXXX) CO-120		ft	500
	CABLE, INTERCONNECTION (XXXXX) 3300-322214-000 (AF) 3E2150 (SIGC)		ft	300
	CABLE, INTERCONNECTION (XXXXX) 8860-428000-211 (AF) IB3016-8.3 (SIGC)		ft	300

ADDITIONAL AUTHORIZATION LIST (CONT)

(1) NATIONAL STOCK NUMBER	(2) DESCRIPTION FSCM & PART NUMBER	USABLE ON CODE	(3) U/M	(4) QTY AUTH
	CABLE, INTERCONNECTION (XXXXX) 8860-426000-211 (AF) IB3020-6.1 (SIGC)		ft	300
	CAP, DRIVING (XXXXX) 7A1743-206A/C1 (SIGC)		ea	1
	CLAMP, CABLE 3116-IN. DIA (XXXXX)		ea	6
	CLAMP (XXXXX)		ea	1
	EYEBOLT, 1/2-IN. THD X 4-IN. LONG (XXXXX)		ea	3
	HANDNUT, 1/2-IN. THD (XXXXX)		ea	3
	LUGS, TERMINAL (XXXXX)		ea	8
	ROD, GROUND 112-IN. DIA X 5-FT LONG (XXXXX)		ea	1
	ROPE, WIRE, 3116-IN. DIA (XXXXX)		ft	50
	STAKE, GUY (XXXXX) 7A1743-206/S1 (SIGC)		ea	3

APPENDIX E

EXPENDABLE SUPPLIES AND MATERIALS LIST

Section I INTRODUCTION

E-1 SCOPE.

This appendix lists expendable supplies and materials you will need to operate and maintain the AN/GMQ-11. These items are authorized to you by CTA-50-970, Expendable Items (except Medical, Class V, Repair Parts, and Heraldic Items).

E-2 EXPLANATION OF COLUMNS.

a Column 1, Item Number. This number is assigned to the entry in the listing and is referenced in the narrative instructions to identify the material (eg, use cleaning compound, item 1, app E).

b Column 2, Level. This column identifies the lowest level of maintenance that requires the listed item.

C - Operator/Crew
O - Organizational
F - Direct Support
H - General Support

c Column 3, National Stock Number. This is the national stock number assigned to the item. Use it to request or requisition the item.

d Column 4, Description. Indicates the federal item name and, if required, a description to identify the item. The last line for each item indicates the Federal Supply Code for Manufacture (FSCM) in parentheses followed by the part number.

e Column 5, Unit of Measure (U/M). Indicates the measure used in performing the actual maintenance function. This measure is expressed by a two-character alphabetical abbreviation (eg, ea, in., pr). If the unit of measure differs from the unit of issue, requisition the lowest unit of issue that will satisfy your requirements.

Section II EXPENDABLE SUPPLIES AND MATERIALS LIST

(1) ITEM NUMBER	(2) LEVEL	(3) NATIONAL STOCK NUMBER	(4) DESCRIPTION	(5) U/M
1	C	7930-01-055-6121	DETERGENT, GP LIQUID	gal
2	C	7930-00-395-9542	COMPOUND, CLEANING	pt
3	C	8010-00-242-2089	THINNER, TPM-1	pt
4	C	8305-00-222-2423	CLOTH, CLEANING (CHEESECLOTH) (CC-C-440E-81348)	yd
5	C		SANDPAPER #0000 ORD STK NO. 42-P-1154-10	sh
6	C		TAPE, CELLULOSE	roll

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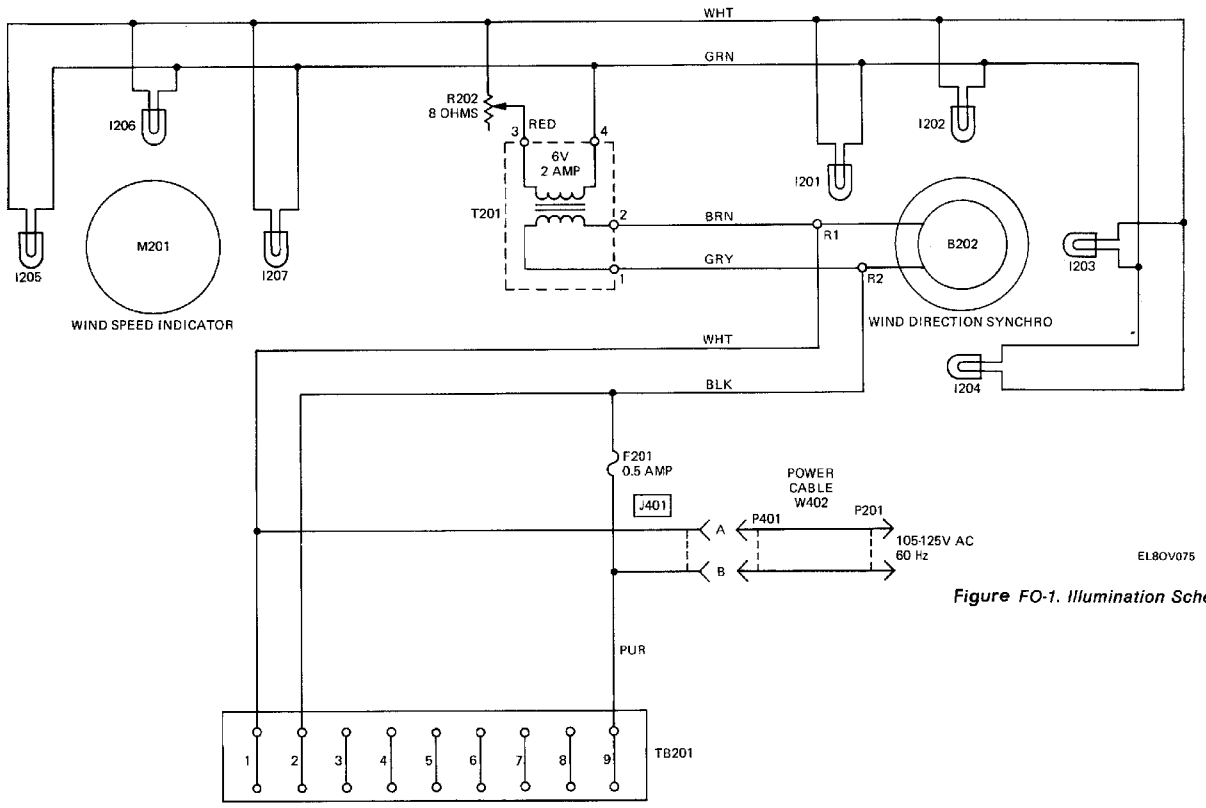


Figure FO-1. *Illumination Schematic*

Figure FO-1. Illumination Schematic

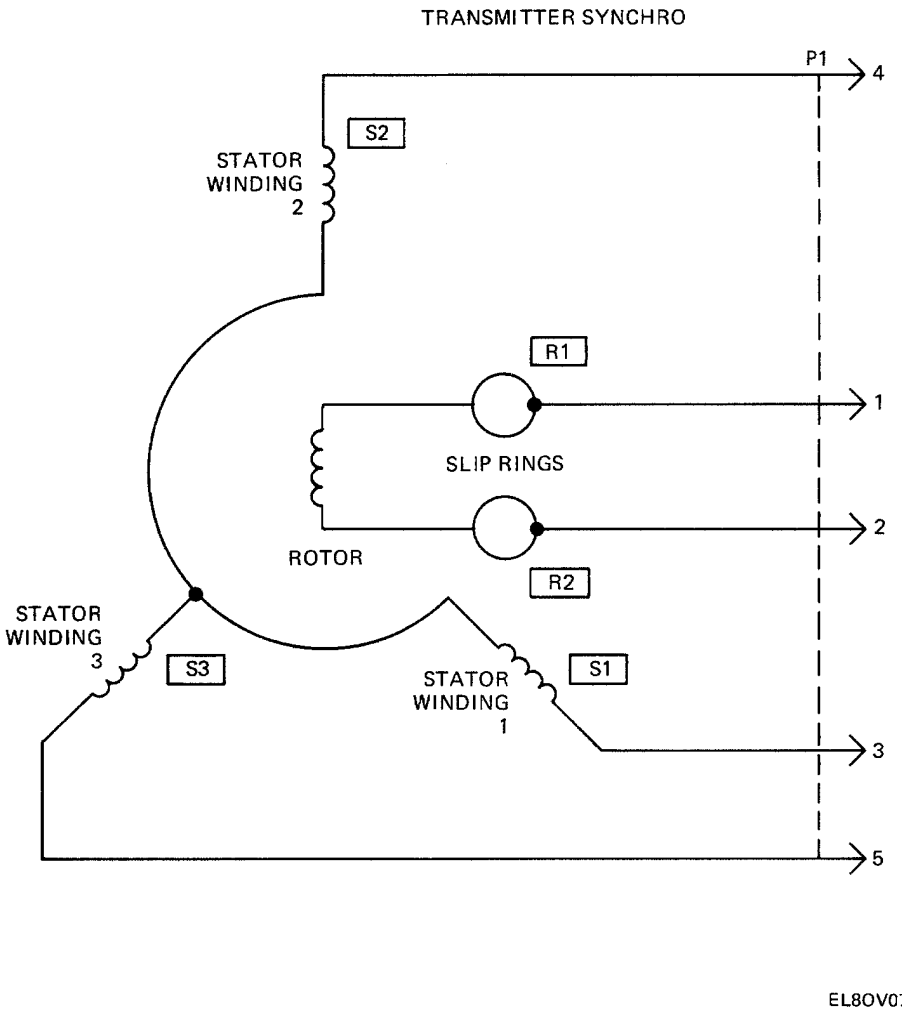
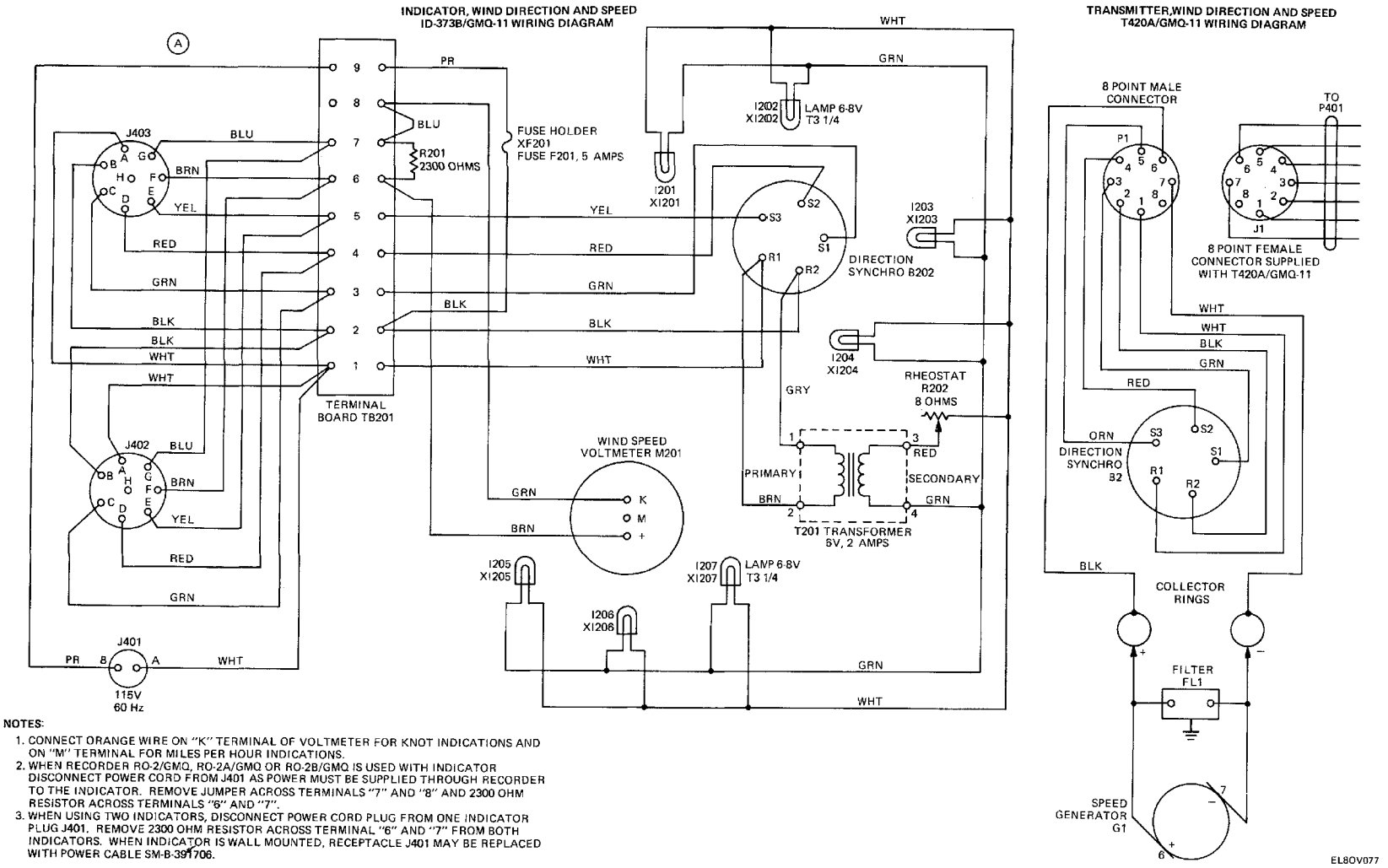


Figure *FO-2. Transmitter Synchro Schematic.*

TM 11-6660-200-14



NOTES:

1. CONNECT ORANGE WIRE ON "K" TERMINAL OF VOLTMETER FOR KNOT INDICATIONS AND ON "M" TERMINAL FOR MILES PER HOUR INDICATIONS.
2. WHEN RECORDER RO-2/GMQ, RO-2A/GMQ OR RO-2B/GMQ IS USED WITH INDICATOR DISCONNECT POWER CORD FROM J401 AS POWER MUST BE SUPPLIED THROUGH RECORDER TO THE INDICATOR. REMOVE JUMPER ACROSS TERMINALS "7" AND "8" AND 2300 OHM RESISTOR ACROSS TERMINALS "6" AND "7".
3. WHEN USING TWO INDICATORS, DISCONNECT POWER CORD PLUG FROM ONE INDICATOR PLUG J401. REMOVE 2300 OHM RESISTOR ACROSS TERMINAL "6" AND "7" FROM BOTH INDICATORS. WHEN INDICATOR IS WALL MOUNTED, RECEPTACLE J401 MAY BE REPLACED WITH POWER CABLE SM-B-391706.

Figure FO-3. Wind Measuring Set AN/GMQ-11 Wiring Schematic

Figure FO-3. Wind Measuring Set AN/GMQ-11 Wiring Schematic

By Order of the Secretary of the Army:

JOHN A. WICKHAM JR.
General, United States Army
Chief of Staff

Official:

ROBERT M. JOYCE
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THE METRIC SYSTEM AND EQUIVALENTS

'NEAR MEASURE

. Centimeter = 10 Millimeters = 0.01 Meters = 0.3937 Inches
1 Meter = 100 Centimeters = 1000 Millimeters = 39.37 Inches
1 Kilometer = 1000 Meters = 0.621 Miles

'VEIGHTS

Gram = 0.001 Kilograms = 1000 Milligrams = 0.035 Ounces
1 Kilogram = 1000 Grams = 2.2 lb.
1 Metric Ton = 1000 Kilograms = 1 Megagram = 1.1 Short Tons

LIQUID MEASURE

1 Milliliter = 0.001 Liters = 0.0338 Fluid Ounces
1 Liter = 1000 Milliliters = 33.82 Fluid Ounces

SQUARE MEASURE

1 Sq. Centimeter = 100 Sq. Millimeters = 0.155 Sq. Inches
1 Sq. Meter = 10,000 Sq. Centimeters = 10.76 Sq. Feet
1 Sq. Kilometer = 1,000,000 Sq. Meters = 0.386 Sq. Miles

CUBIC MEASURE

1 Cu. Centimeter = 1000 Cu. Millimeters = 0.06 Cu. Inches
1 Cu. Meter = 1,000,000 Cu. Centimeters = 35.31 Cu. Feet

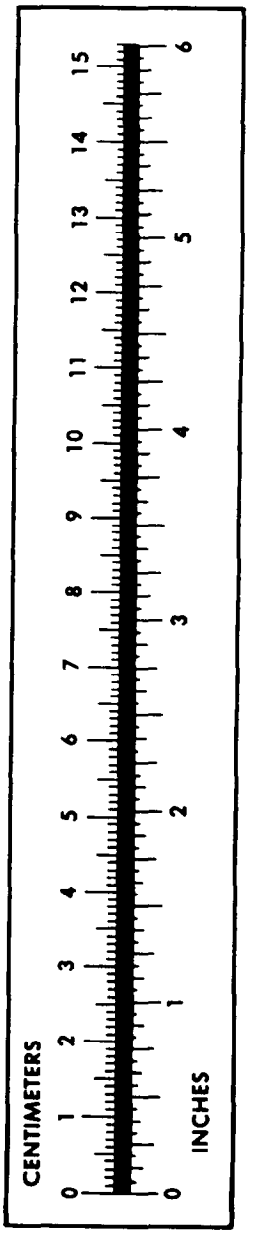
TEMPERATURE

5/9(°F - 32) = °C
212° Fahrenheit is evuivalent to 100° Celsius
90° Fahrenheit is equivalent to 32.2° Celsius
32° Fahrenheit is equivalent to 0° Celsius
9/5C° + 32 =°F

APPROXIMATE CONVERSION FACTORS

TO CHANGE	TO	MULTIPLY BY
Inches	Centimeters	2.540
Feet	Meters	0.305
Yards	Meters	0.914
Miles	Kilometers	1.609
Square Inches	Square Centimeters	6.451
Square Feet	Square Meters	0.093
Square Yards	Square Meters	0.836
Square Miles	Square Kilometers	2.590
Acres	Square Hectometers	0.405
Cubic Feet	Cubic Meters	0.028
Cubic Yards	Cubic Meters	0.765
Fluid Ounces	Milliliters	29.573
ıts	Liters	0.473
arts	Liters	0.946
allons	Liters	3.785
Ounces	Grams	28.349
Pounds	Kilograms	0.454
Short Tons	Metric Tons	0.907
Pound-Feet	Newton-Meters	1.356
Pounds per Square Inch	Kilopascals	6.895
Miles per Gallon	Kilometers per Liter	0.425
Miles per Hour	Kilometers per Hour	1.609

TO CHANGE	TO	MULTIPLY BY
Centimeters	Inches	0.394
Meters	Feet	3.280
Meters	Yards	1.094
Kilometers	Miles	0.621
Square Centimeters	Square Inches	0.155
Square Meters	Square Feet	10.764
Square Meters	Square Yards	1.196
Square Kilometers	Square Miles	0.386
Square Hectometers	Acres	2.471
Cubic Meters	Cubic Feet	35.315
Cubic Meters	Cubic Yards	1.308
Milliliters	Fluid Ounces	0.034
Liters	Pints	2.113
Liters	Quarts	1.057
ers	Gallons	0.264
ms	Ounces	0.035
ograms	Pounds	2.205
Metric Tons	Short Tons	1.102
Newton-Meters	Pounds-Feet	0.738
Kilopascals	Pounds per Square Inch	0.145
lometers per Liter	Miles per Gallon	2.354
meters per Hour	Miles per Hour	0.621



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