TM 55-6610-293-40

DEPARTMENT OF THE ARMY TECHNICAL MANUAL

GS MAINTENANCE MANUAL

INCLUDING REPAIR PARTS AND SPECIAL TOOLS LIST

ATTITUDE INDICATOR
MODEL NUMBER 4005AB
PART NUMBER 141400-01-01

HEADQUARTERS, DEPARTMENT OF THE ARMY

SEPTEMBER 1967

WARNING

PRECAUTIONARY DATA

Personnel performing instructions involving operations, procedures, and practices which are included or implied in this manual shall observe the following instructions. Disregardof these warnings and precautionary information can cause serious injury, death, or an aborted mission.

CONNECTION OF POWER TO TEST SETUPS.

To prevent electrical shock when connecting the test setups to power sources, be certain power is shut off.

USE OF METHYL-ETHYL-KETONE AND FREON PCA.

When using methyl-ethyl-ketone and Freon PCA, wear rubber gloves to prevent prolonged contact with skin. Methyl-ethyl-ketone is flammable. Avoid using near flame or other igniting source.

CHANGE
No. 2

HEADQUARTERS
DEPARCTMENT OF THE ARMY
WASHINGTON, D. C., *8 March 1971*

GS Maintenance Manual
Including Repair Parts and Special Tools List

ATTITUDE INDICATOR

MODEL NUMBER 4005AB

PART NUMBER 141400-01-01

TM 55-6610-293-40, 7 September 1967, is changed as follows:

Page 23, *paragraph 18d(2).* Change second sentence to read, "Indicator shall indicate 8 degrees to 20 degrees left roll."

By Order of the Secretary of the Army:

W. C. WESTMORELAND,
General, *UnitedStates Army,*
Chief of Staff.

Official:
KENNETH G. WICKHAM,
Major General, UnitedStates Army,
The Adjutant General.

DISTRIBUTION:
To be distributed in accordance with DA Form 12-31 (qty rqr blocks no. 337, 344, 35, and 354, cumulative for all blocks) requirements for Direct and General Support Maintenance Instructions for UH-1A, UH-1B, UH-1C, UH-1D and 1H Aircraft.

CHANGE
No. 1

HEADQUARTERS
DEPARTMENT OF THE ARMY
WASHINGTON, D. C., *9 November 1970*

GS Maintenance Manual
Including Repair Parts and Special Tools List

ATTITUDE INDICATOR
MODEL NUMBER 4005AB
PART NUMBER 141400-01-01

TM 55-6610-293-40, 7 September 1967, is changed as follows:

Cover and Page 1. Title is changed as shown above.

Page 1. Add to Table of Contents: "APPENDIX B REPAIR PARTS AND SPECIAL TOOLS LIST Page 28."

Page 28. "APPENDIX B" is added as follows:

APPENDIX B

REPAIR PARTS AND SPECIAL TOOLS LIST
(Current as of 30 March 1970)

Section I. INTRODUCTION

B-1. Scope.

This appendix lists repair parts, special tools, test and support equipment, and maintenance supplies required for the performance of general support maintenance of the attitude, indicator.

B-2. General.

This Repair Parts and Special Tools Listing is divided into the following sections:

a. Repair Parts - Section II. A list of repair parts authorized for the performance of maintenance at the general support level in figure and item number sequence. Maintenance supplies (MSUP) are listed within the section in ascending Federal stock number sequence.

b. Special Tools, Test and Support Equipment - Section III. Not applicable.

c. Federal Stock Number and Reference Number Index - Section IV. This section is divided as follows:

(1) A list of Federal stock numbers in ascending numerical sequence cross-referenced to the illustration figure and item number.

(2) A list of reference numbers in ascending alphanumerical sequence cross-referenced to the manufacturer's Federal supply code, illustration figure and item number.

B-3. Explanation of Columns.

The following provides an explanation of columns in the tabular lists in Sections II and III:

a. Source, Maintenance and Recoverability Codes (SMR), Column 1:

(1) Source code indicates the selection status and source for the listed item. Source codes used are:

CODE	EXPLANATION
P	Repair Parts, Special Tools and Test Equipment supplied from the GSA/DSA, or Army supply system, and authorized for use at indicated maintenance categories.
P2	Repair Parts, Special Tools and Test Equipment which are procured and stocked for insurance purposes because the combat or military essentiality of the end item dictates that a minimum quantity be available in the supply system.
P9	Assigned to items which are NSA design controlled: unique repair parts, special tools, test, measuring and diagnostic equipment, which are stocked and supplied by the Army COMSEC Logistic System and which are not subject to the provisions of AR 380-41.
P10	Assigned to items which are NSA design controlled: special tools, test, measuring and diagnostic equipment for COMSEC support, which are accountable under the provisions of AR 380-41, and which are stocked and supplied by the Army COMSEC Logistic System.
M	Repair Parts, Special Tools and Test Equipment which are not procured or stocked, as such, in the supply system but are to be manufactured at indicated maintenance levels.

CODE	EXPLANATION
A	Assemblies which are not procured or stocked as such, but are made up of two or more units. Such component units carry individual stock numbers and descriptions, are procured and stocked separately and can be assembled to form the required assembly at indicated maintenance categories.
X	Parts and assemblies that are not procured or stocked because the failure rate is normally below that of the applicable end item of component. The failure of such part or assembly should result in retirement of the end item from the supply system.
X1	Repair Parts which are not procured or stocked. The requirement for such items will be filled by the next higher assembly or component.
X2	Repair Parts, Special Tools, and Test Equipment which are not stocked and have no foreseen mortality. The indicated maintenance category requiring such repair parts will attempt to obtain the parts through cannibalization or salvage. The item may be requisitioned with exception data, from the end item manager, for immediate use.
G	Major assemblies that are procured with PEMA funds for initial issue only as exchange assemblies at DSU and GSU level. These assemblies will not be stocked above the DS and GS level or returned to depot supply level.

NOTE: Cannibalization or salvage may be used as a source of supply for any items source coded above except those coded X1 and aircraft support items as restricted by AR 700-42.

(2) Maintenance code indicates the lowest category of maintenance authorized to install the listed item. The maintenance level codes are:

CODE	EXPLANATION
C	Crew or operator maintenance
O	Organizational maintenance
F	Direct support maintenance
H	General support maintenance

(3) Recoverability code indicates whether unserviceable items should be returned for recovery or salvage. Items not coded are expendable. Recoverability codes used are:

CODE	EXPLANATION
R	Applied to repair parts (assemblies and components), special tools and test equipment which are considered economically reparable at direct and general support maintenance levels. When the item is no longer economically reparable, it is normally disposed of at the GS level. When supply considerations dictate, some of these repair parts may be listed for automatic return to supply for depot level repair as set forth in AR 710-50. When so listed, they will be replaced by supply on an exchange basis.
S	Repair Parts, Special Tools, Test Equipment and assemblies which are economically reparable at DSU and GSU activities and which normally are furnished by supply on an exchange basis. When items are determined by a GSU to be uneconomically reparable, they will be evacuated to a depot for evaluation and analysis before final disposition.
T	Higher dollar value recoverable repair parts, special tools and test equipment which are subject to special handling and are issued on an exchange basis. Such items will be repaired or overhauled at depot maintenance activities only. No repair may be accomplished at lower levels.
U	Repair Parts, Special Tools and Test Equipment specifically selected for salvage by reclamation units because of precious metal content, critical materiels, high dollar value or reusable casings or castings.

b. Federal Stock Number, Column 2. Indicates the Federal stock number assigned to the item and will be used for requisitioning purposes. Items source coded A, M, or X1 are not assigned a Federal stock number.

c. Description, Column 3. Indicates the Federal item name and any additional description of the item required. The description column contains the following subcolumns:

(1) *Reference number and manufacturer's code.* Indicates a part number or other reference number for the listed item followed by the applicable five-digit Federal supply code for manufacturers in parentheses.

(2) *Usable on code.* Not applicable.

d. Unit of Measure (U/M), Column 4. A two-character alphabetic abbreviation indicating the amount or quantity of the item upon which the allowances are based, e.g., ft, ea, pr, etc.

e. Quantity Incorporated in Unit, Column 5. Indicates the quantity of the item used in the assembly. A "V" appearing in this column in lieu of a quantity indicates that a definite quantity cannot be indicated.

f. Thirty-day GS Maintenance Allowances, Column 6.

(1) The allowance column is divided into three subcolumns. Indicated in each subcolumn, opposite the first appearance of each item, is the total quantity of items authorized for the number of equipments supported. Subsequent appearances of the same item will have the letters "REF" in this column. Items authorized for use as required, but not for initial stockage, are identified with an asterisk (*) in the allowance column.

(2) The quantitative allowance for GS level of maintenance will represent initial stockage for a 30-day period for the number of equipments supported.

(3) Determination of the total quantity of parts required for maintenance of more than 100 of these equipments can be accomplished by converting the equipment quantity to a decimal factor by placing a decimal point before the next to last digit of the number to indicate hundredths, and multiplying the decimal factor by the parts quantity authorized in the 51-100 allowance column. Example: authorized allowance for 51-100 equipments is 40; for 150 equipments, multiply 40 by 1.50, or 60 parts required.

(4) The basis of issue for authorized special tools, test and support equipment is the number of end items of equipment supported.

g. One-year Allowances per 100 Equipments/Contingency Planning Purposes, Column 7. Indicates opposite the first appearance of each item, the total quantity required for distribution and contingency planning purposes. The range of items indicates total quantities of all authorized items required to provide for adequate support of 100 equipments for one year.

h. Depot Maintenance Allowance per 100 Equipments, Column 8. Not applicable.

i. Illustration, Column 9. Illustrations appear in the narrative portion of this manual. This column is divided as follows:

(1) *Figure number, column 9a.* Indicates the figure number of the illustration in which the item is shown. Appearances of the letters "MSUP" in this column indicate maintenance supplies located in Section II.

(2) *Item number, column 9b.* Indicates the callout number used to reference the item in the illustration.

B-4. Special Information.

Oversize and undersize parts, such as studs, bushings, etc., are listed following the standard size part and in the same indent. The degree of oversize or undersize is stated in the description.

B-5. How to Locate Repair Parts.

a. When Federal stock number or reference number is unknown:

(1) *First.* Find the exploded view illustration of the assembly or subassembly to which the repair part belongs.

(2) *Second.* Identify the repair part on the illustration and note the illustration figure and item number of the repair part.

(3) *Third.* Using the Repair Parts Listing, find the figure and item number listed in the illustration column.

b. When Federal stock number or reference number is known:

(1) *First.* Using the Index of Federal Stock Numbers and Reference Numbers, find the pertinent Federal stock number or reference number. This index is in ascending Federal stock number sequence followed by a list of reference numbers in ascending alphanumeric sequence, cross-referenced to the illustration figure number and item number.

(2) *Second.* Using the Repair Parts Listing, find the figure and item number listed in the illustration column referenced in the Index of Federal Stock Numbers and Reference Numbers.

B-6. Federal Supply Codes for Manufacturers.

CODE	MANUFACTURER
04347	Hysol Corp 1100 Seneca Ave Olean NY 14760
35351	Lear Siegler Inc Instrument Div 4141 Eastern Ave SE Grand Rapids MI 49508
80798	Cabot Corp 242 Beacon Boston MA 02116
81348	Federal Specifications Promulgated by General Services Administration
81349	Military Specifications Promulgated by Standardization Div Directorate of Logistic Services DSA
82110	Gudebrod Bros Silk Co Inc 12 S 12th St Philadelphia PA 19107
88044	Aeronautical Standards Group Dept of Navy and Air Force
96906	Military Standards Promulgated by Standardization Div Directorate of Logistic Services DSA

(1) SMR CODE	(2) FEDERAL STOCK NUMBER	(3) DESCRIPTION REFERENCE NUMBER & MFR CODE			USABLE ON CODE	(4) UNIT OF MEAS	(5) QTY INC IN UNIT	(6) 30-DAY MAINT ALW (a) 1-20	(b) 21-50	(c) 51-100	(7) 1-YR ALWPER 100 EQUIP CNTGCY	(8) DEPOT MAINT ALWPER 100 EQUIP	(9) ILLUSTRATION (a) FIG NO	(b) ITEM NO
	6610-758-2385	141400-01-01	(35351)	ATTITUDE,INDICATOR.....		EA							1	
				SECTION II REPAIR PARTS										
				ATTITUDE INDICATOR										
P--H--	6610-069-3434	143006-01	(35351)	BEZEL ASSEMBLY.....		EA	1	*	*	*			2	1
P--H--	5307-865-4159	107245-80	(35351)	STUD,EXTENSION.....		EA	4	*	*	*			2	2
				YOKE AND SPHERE ASSEMBLY.....			1						2	3
P--H--	6610-837-4488	143015-01	(35351)	GEAR CLUSTER,SPUR.....		EA	1	*	*	*			2	4
P--H--	6610-069-3433	143014-01	(35351)	GEAR CLUSTER,SPUR.....		EA	1	*	*	*			2	5
P--H--	6610-861-2178	143219-01	(35351)	PLATE ASSEMBLY.....		EA	1	*	*	*			2	6
P--H--	5307-869-1489	107245-83	(35351)	STUD,EXTENSION.....		EA	2	*	*	*			2	8
		143332-01-01	(35351)	INDICATOR SUBASSEMBLY.....		EA	1						2	9
P--H--	5310-901-7726	137302-14	(35351)	WASHER,NONMETALLIC.....		EA	1	*	*	*			2	10
P--H--	5305-054-6652	MS51957-28	(96906)	SCREW,MACHINE.....		EA	1	*	*	*			2	11
P--H--	5305-054-5637	MS51957-3	(96906)	SCREW,MACHINE.....		EA	1	*	*	*			2	12
P--H--	5330-831-6653	137302-21	(35351)	WASHER,NONMETALLIC.....		EA	1	*	*	*			2	13
P--H--	5977-879-0226	142930-01	(35351)	BRUSH ASSEMBLY.....		EA	1	*	*	*			2	14
P--H--	5307-865-4160	107245-81	(35351)	STUD,EXTENSION.....		EA	2	*	*	*			2	15
P--H--	5310-928-2690	MS35338-77	(96906)	WASHER,LOCK.....		EA	2	*	*	*			2	16
P--H--	5305-054-5637	MS51957-3	(96906)	SCREW,MACHINE.....		EA	2	*	*	*			2	17
P--H--	3110-849-6597	142978-01	(35351)	BEARING,BALL,ANNULAR.....		EA	1	*	*	*			2	18
P--H--	5950-879-6862	143335-01	(35351)	TRANSFORMER.....		EA	1	*	*	*			2	19
P--H--	5330-831-6652	136378-07	(35351)	SEALING STRIP.....		EA	1	*	*	*			2	20
P--H--	6610-066-5448	142972-01	(35351)	COVER ASSEMBLY,INDICATOR.....		EA	1	*	*	*			2	21
P--H--	6615-068-2683	139288-01	(35351)	.PLATE,IDENTIFICATION.....		EA	1	*	*	*			2	22
P--H--	6615-716-1111	131357-01	(35351)	.VENT,EVACUATING.....		EA	1	*	*	*			2	24
P--H--	6610-911-6490	110380-01	(35351)	.LATCH AND BRACKET.....		EA	1	*	*	*			2	25
P--H--	6610-879-6853	143288-01	(35351)	PRINTED WIRING BOARD.....		EA	1	*	*	*			2	26
P--H--	5305-054-6657	MS51957-33	(96906)	SCREW,MACHINE.....		EA	2	*	*	*			2	27
P--H--	5940-156-7345	MS77076-2	(96906)	TERMINAL,LUG.....		EA	1	*	*	*			2	28
P--H--	5340-864-5072	143232-01	(35351)	CLAMP,TRANSFORMER.....		EA	2	*	*	*			2	29
P--H--	5340-263-3830	MS16628-25	(96906)	RING,RETAINING.....		EA	1	*	*	*			2	30
P--H--	5310-017-1665	34AA51A21-16	(35351)	SHIM-0.025 IN.THK.....		EA	V	*	*	*			2	31
P--H--	5340-882-0319	34AA48A21-16	(35351)	SHIM-0.010 IN.THK.....		EA	V	*	*	*			2	32
P--H--	5340-882-0317	34AA46A21-16	(35351)	SHIM-0.005 IN.THK.....		EA	V	*	*	*			2	33
P--H--	6610-073-5298	143233-01	(35351)	BRACKET,BRUSH MOUNT.....		EA	1	*	*	*			2	35
P--H--	6105-842-2470	142913-01	(35351)	MOTOR TACHOMETER.....		EA	1	*	*	*			2	36
P--H--	5305-074-2673	Q5513-02-05	(35351)	SCREW,MACHINE.....		EA	3	*	*	*			2	37
P--H--	5340-891-9382	139300-06	(35351)	CLAMP,SYNCHRO.....		EA	3	*	*	*			2	38
P--H--	5305-054-6652	MS51957-28	(96906)	SCREW,MACHINE.....		EA	1	*	*	*			2	39
P--H--	5305-054-6653	MS51957-29	(96906)	SCREW,MACHINE.....		EA	1	*	*	*			2	40
P--H--	5310-901-7726	137302-14	(35351)	WASHER,NONMETALLIC.....		EA	1	*	*	*			2	41

(1) SMR CODE	(2) FEDERAL STOCK NUMBER	(3) DESCRIPTION REFERENCE NUMBER & MFR CODE			USABLE ON CODE	(4) UNIT OF MEAS	(5) QTY INC IN UNIT	(6) 30-DAY GS MAINT ALW (a) 1-20	(b) 21-50	(c) 51-100	(7) 1-YR ALWPER 100 EQUIP CNTGCY	(8) DEPOT MAINT ALWPER 100 EQUIP	(9) ILLUSTRATION (a) FIG NO	(b) ITEM NO
P--H--	5307-865-4161	107245-82	(35351)	STUD,EXTENSION.....		EA	3	*	*	*			2	42
P--H--	5305-054-5637	MS51957-3	(96906)	SCREW,MACHINE.....		EA	1	*	*	*			2	43
P--H--	5340-070-8369	139300-01	(35351)	CLAMP.....		EA	3	*	*	*			2	44
P--H--	6610-064-4741	143002-01	(35351)	HOUSING AND STATOR ASSEMBLY.....		EA	1	*	*	*			2	45
P--H--	3110-061-6154	142968-01	(35351)	BEARING,BALL.....		EA	1	*	*	*			2	46
P--H--	5340-764-3155	137300-75	(35351)	SHIM-0.002 IN.THK.....		EA	2	*	*	*			2	47
P--H--	6615-074-9527	137300-25	(35351)	SHIM-0.010 IN.THK.....		EA	2	*	*	*			2	48
P--H--	5340-831-6678	139424-04	(35351)	RING,RETAINING.....		EA	2	*	*	*			2	49
				BEZEL ASSEMBLY										
P--H--	6610-069-3434	143006-01	(35351)	BEZEL ASSEMBLY.....		EA	1	*	*	*			3	
P--H--	5355-850-8010	142973-01	(35351)	.KNOB.....		EA	1	*	*	*			3	1
P--H--	5355-865-4166	142975-02	(35351)	.DIAL,SCALE.....		EA	1	*	*	*			3	2
P--H--	5305-579-2138	MS35265-2	(96906)	.SCREW,MACHINE.....		EA	4	*	*	*			3	3
P--H--	5355-850-8010	142973-01	(35351)	.KNOB.....		EA	1	*	*	*			3	4
P--H--	5355-867-4743	142975-01	(35351)	.DIAL,SCALE.....		EA	1	*	*	*			3	5
P--H--	6210-879-2449	142884-01	(35351)	.SHIELD,LIGHT.....		EA	1	*	*	*			3	9
P--H--	6210-879-2448	142883-01	(35351)	.WEDGE,LIGHT.....		EA	1	*	*	*			3	10
P--H--	9320-866-7212	143289-01	(35351)	.RUBBER STRIP.....		EA	1	*	*	*			3	11
P--H--	6210-879-2447	143266-01	(35351)	.LIGHT ASSEMBLY,POTTED.....		EA	1	*	*	*			3	12
P--H--	5999-102-6196	143290-01	(35351)	.PAD,RUBBER.....		EA	1	*	*	*			3	13
P--H--	5305-941-3538	MS35275-201	(96906)	.SCREW,MACHINE.....		EA	1	*	*	*			3	14
P--H--	5355-780-4518	143217-01	(35351)	.AIRPLANE,MINIATURE.....		EA	1	*	*	*			3	15
P--H--	5355-865-4165	142885-01	(35351)	.DIAL,SCALE.....		EA	1	*	*	*			3	16
P--H--	5999-102-6196	143290-01	(35351)	.PAD,RUBBER.....		EA	1	*	*	*			3	17
P--H--	5999-102-6195	142970-01	(35351)	.INDICATOR,POWER OFF.....		EA	1	*	*	*			3	18
P--H--	5305-054-5637	MS51957-3	(96906)	.SCREW,MACHINE.....		EA	1	*	*	*			3	19
P--H--	5340-891-9381	139300-04	(35351)	.CLAMP,SYNCHRO.....		EA	2	*	*	*			3	20
				YOKE AND SPHERE ASSEMBLY										
				YOKE AND SPHERE ASSEMBLY.....			1						4	
P--H--	5910-879-6942	132500-72	(35351)	.CAPACITOR,FIXED,METALLIZED.....		EA	1	*	*	*			4	1
P--H--	5305-054-5647	MS51957-13	(96906)	.SCREW,MACHINE.....		EA	2	*	*	*			4	2
P--H--	5340-073-8380	137304-02	(35351)	.CLAMP,LOOP.....		EA	1	*	*	*			4	3
P--H--	5940-884-5467	143273-01	(35351)	.TERMINAL,BOARD.....		EA	1	*	*	*			4	4
P--H--	5340-867-3037	107244-73	(35351)	.POST,ELECTRICAL.....		EA	2	*	*	*			4	5
P--H--	5340-831-6678	139424-04	(35351)	.RING,RETAINING.....		EA	2	*	*	*			4	6
P--H--	6615-074-9527	137300-25	(35351)	.SHIM-0.010 IN.THK.....		EA	2	*	*	*			4	7
P--H--	6620-905-4654	140331-04	(35351)	.COLLAR,SHAFT.....		EA	1	*	*	*			4	8
P--H--	5305-639-4345	AN565AC2L2	(88044)	.SETSCREW.....		EA	2	*	*	*			4	9
P--H--	6610-075-0141	143012-01	(35351)	.GEAR CLUSTER,SPUR.....		EA	1	*	*	*			4	10

(1) SMR CODE	(2) FEDERAL STOCK NUMBER	(3) DESCRIPTION REFERENCE NUMBER & MFR CODE			USABLE ON CODE	(4) UNIT OF MEAS	(5) QTY INC IN UNIT	(6) 30-DAY GS MAINT ALW (a) 1-20	(b) 21-50	(c) 51-100	(7) 1-YR ALWPER 100 EQUIP CNTGCY	(8) DEPOT MAINT ALWPER 100 EQUIP	(9) ILLUSTRATION (a) FIG NO	(b) ITEM NO
P--H--	6610-869-6959	143018-01	(35351)	.GEAR SET		EA	1	*	*	*			4	11
P--H--	5340-866-0041	105475-04	(35351)	.SPRING,HELICAL,TORSION		EA	1	*	*	*			4	12
P--H--	6610-070-1176	143013-01	(35351)	.GEAR CLUSTER,SPUR		EA	1	*	*	*			4	13
P--H--	5340-764-3155	137300-75	(35351)	.SHIM-0.002 IN.THK		EA	2	*	*	*			4	14
P--H--	5305-054-6652	MS351957-28	(96906)	.SCREW,MACHINE		EA	2	*	*	*			4	15
P--H--	6610-063-8488	145215-01	(35351)	.COUNTER BALANCE		EA	1	*	*	*			4	16
P--H--	6610-070-1178	142971-01	(35351)	.GIMBAL,INDICATOR		EA	1	*	*	*			4	17
P--H--	5305-054-5651	MS51957-17	(96906)	.SCREW,MACHINE		EA	4	*	*	*			4	18
P--H--	6610-869-6958	143019-01	(35351)	.GEAR SET		EA	1	*	*	*			4	19
P--H--	5340-866-0042	105475-16	(35351)	.SPRING,HELICAL,TORSION		EA	1	*	*	*			4	20
P--H--	6610-063-8489	143001-03	(35351)	.ROTOR AND SHAFT ASSEMBLY		EA	1	*	*	*			4	21
P--H--	5310-924-1547	36412-253	(35351)	.WASHER,FLAT		EA	1	*	*	*			4	22
P--H--	6610-079-8961	142899-01	(35351)	.SLIP RING ASSEMBLY		EA	1	*	*	*			4	23
P--H--	5305-054-5635	MS51957-1	(96906)	.SCREW,MACHINE		EA	2	*	*	*			4	24
P--H--	3120-834-3503	143016-01	(35351)	.BEARING,SLEEVING		EA	1	*	*	*			4	25
P--H--	5305-090-2158	Q5431-02-03	(35351)	.SCREW,MACHINE		EA	3	*	*	*			4	26
P--H--	6610-070-1179	143020-01	(35351)	.SPACER,PLATE		EA	1	*	*	*			4	27
P--H--	6610-066-5450	142960-01	(35351)	.SPHERE,INDICATOR		EA	1	*	*	*			4	28
P--H--	6620-066-5273	140331-13	(35351)	.COLLAR,SHAFT		EA	1	*	*	*			4	29
P--H--	5305-639-4345	AN565AC2L2	(88044)	.SETSCREW		EA	2	*	*	*			4	30
P--H--	6610-070-1177	143017-01	(35351)	.PLATE,RETAINING,SHAFT		EA	1	*	*	*			4	31
P--H--	5990-880-1299	143030-01	(35351)	.SYNCHRO,CONTROL TRANSFORMER		EA	1	*	*	*			4	32
P--H--	5305-270-2882	AN500A2-4	(88044)	.SCREW,MACHINE		EA	3	*	*	*			4	33
P--H--	5340-831-6675	139300-05	(35351)	.CLAMP,SYNCHRO		EA	3	*	*	*			4	34
P--H--	5305-978-9354	MS16997-44	(96906)	.SCREW,CAP,SOCKET HEAD		EA	2	*	*	*			4	35
P--H--	6105-842-2470	142913-01	(35351)	.MOTOR TACHOMETER		EA	1	*	*	*			4	36
P--H--	5305-074-2673	Q5513-02-05	(35351)	.SCREW,MACHINE		EA	3	*	*	*			4	37
P--H--	5340-070-8369	139300-01	(35351)	.CLAMP,SYNCHRO		EA	4	*	*	*			4	38
P--H--	6610-063-8487	143218-01	(35351)	.PLATE ASSEMBLY,PITCH		EA	1	*	*	*			4	39
P--H--	5305-282-4497	Q5431-02-02	(35351)	.SCREW,MACHINE		EA	4	*	*	*			4	40
P--H--	6610-066-5451	143209-01	(35351)	.MASK MECHANISM,INDICATOR		EA	1	*	*	*			4	41
P--H--	5355-867-4850	143210-01	(35351)	.POINTER BANK		EA	1	*	*	*			4	42
				INDICATOR SUBASSEMBLY										
		143332-01-01	(35351)	INDICATOR SUBASSEMBLY			1						5	
P--H--	5905-279-1296	RC42GF241J	(81349)	.RESISTOR,FIXED,COMPOSITION		EA	1	*	*	*			5	1
P--H--	5905-681-8818	RC07GF153J	(81349)	.RESISTOR,FIXED,COMPOSITION		EA	1	*	*	*			5	2
P--H--	5905-686-3368	RC07GF203J	(81349)	.RESISTOR,FIXED,COMPOSITION		EA	1	*	*	*			5	3
P--H--	5905-069-3910	RN60D1470F	(81349)	.RESISTOR,FIXED,FILM		EA	1	*	*	*			5	4
P--H--	5905-779-2466	RN60D2673F	(81349)	.RESISTOR,FIXED,FILM		EA	1	*	*	*			5	5
P--H--	5905-069-1753	RN60D1302F	(81349)	.RESISTOR,FIXED,FILM		EA	1	*	*	*			5	6
P--H--	5905-983-6914	RN60D1002F	(81349)	.RESISTOR,FIXED,FILM		EA	1	*	*	*			5	7
P--H--	5905-279-3837	RC32F272J	(81349)	.RESISTOR,FIXED,COMPOSITION		EA	1	*	*	*			5	8
P--H--	5905-779-2466	RN60D2673F	(81349)	.RESISTOR,FIXED,FILM		EA	1	*	*	*			5	9
P--H--	5905-682-4099	RC07GF432J	(81349)	.RESISTOR,FIXED,COMPOSITION		EA	1	*	*	*			5	10
P--H--	5905-686-9994	RC07GF122J	(81349)	.RESISTOR,FIXED,COMPOSITION		EA	1	*	*	*			5	11

(1) SMR CODE	(2) FEDERAL STOCK NUMBER	(3) DESCRIPTION REFERENCE NUMBER & MFR CODE			USABLE ON CODE	(4) UNIT OF MEAS	(5) QTY INC IN UNIT	(6) 30-DAY GS MAINT ALW (a) 1-20	(b) 21-50	(c) 51-100	(7) 1-YR ALWPER 100 EQUIP CNTGCY	(8) DEPOT MAINT ALWPER 100 EQUIP	(9) ILLUSTRATION (a) FIG NO	(b) ITEM NO
P--H--	5905-683-7724	RC07GF242J	(81349)	.RESISTOR,FIXED,COMPOSITION.....		EA	1	*	*	*			5	12
P--H--	5905-190-8881	RC20GF182J	(81349)	.RESISTOR,FIXED,COMPOSITION.....		EA	1	*	*	*			5	13
P--H--	5905-681-9969	RC07GF332J	(81349)	.RESISTOR,FIXED,COMPOSITION.....		EA	1	*	*	*			5	14
P--H--	5905-984-7681	RN60D2002F	(81349)	.RESISTOR,FIXED,FILM.....		EA	1	*	*	*			5	15
P--H--	5905-079-3564	RN60D2431F	(81349)	.RESISTOR,FIXED,FILM.....		EA	1	*	*	*			5	16
P--H--	5905-984-7681	RN60D2002F	(81349)	.RESISTOR,FIXED,FILM.....		EA	1	*	*	*			5	17
P--H--	5905-952-2146	RN60D5111F	(81349)	.RESISTOR,FIXED,FILM.....		EA	1	*	*	*			5	18
P--H--	5905-952-2146	RN60D5111F	(81349)	.RESISTOR,FIXED,FILM.....		EA	1	*	*	*			5	19
P--H--	5905-983-6914	RN60D1002F	(81349)	.RESISTOR,FIXED,FILM.....		EA	1	*	*	*			5	20
P--H--	5905-952-2146	RN60D5111F	(81349)	.RESISTOR,FIXED,FILM.....		EA	1	*	*	*			5	21
P--H--	5905-983-6914	RN60D1002F	(81349)	.RESISTOR,FIXED,FILM.....		EA	1	*	*	*			5	22
P--H--	5905-983-6914	RN60D1002F	(81349)	.RESISTOR,FIXED,FILM.....		EA	1	*	*	*			5	23
P--H--	5905-969-5846	RN60D3921F	(81349)	.RESISTOR,FIXED,FILM.....		EA	1	*	*	*			5	24
P--H--	5905-279-1751	RC20GF302J	(81349)	.RESISTOR,FIXED,COMPOSITION.....		EA	1	*	*	*			5	25
P--H--	5905-279-1687	RC32GF620J	(81349)	.RESISTOR,FIXED,COMPOSITION.....		EA	1	*	*	*			5	26
P--H--	5905-683-2239	RC07GF201J	(81349)	.RESISTOR,FIXED,COMPOSITION.....		EA	1	*	*	*			5	27
				INDICATOR SUBASSEMBLY										
		143332-01-01	(35351)	INDICATOR,SUBASSEMBLY.....			1						6	
P--H--	5910-993-2201	CS12BE476M	(81349)	.CAPACITOR,FIXED,ELECTROLYTIC.....		EA	1	*	*	*			6	1
P--H--	5961-954-3087	138741-01	(35351)	.TRANSISTOR.....		EA	1	*	*	*			6	2
P--H--	5910-926-8219	CS12BB476M	(81349)	.CAPACITOR,FIXED,ELECTROLYTIC.....		EA	1	*	*	*			6	3
P--H--	5961-954-3087	138741-01	(35351)	.TRANSISTOR.....		EA	1	*	*	*			6	4
P--H--	5961-879-6855	143323-01	(35351)	.HEAT SINK.....		EA	1	*	*	*			6	5
P--H--	5910-983-9462	CL65GJ470MP3	(81349)	.CAPACITOR,FIXED.....		EA	1	*	*	*			6	6
P--H--	5961-087-6047	1N645	(81349)	.DIODE,SEMICONDUCTOR DEVICE.....		EA	1	*	*	*			6	7
P--H--	5961-087-6047	1N645	(81349)	.DIODE,SEMICONDUCTOR DEVICE.....		EA	1	*	*	*			6	8
P--H--	5961-880-4779	2N2905	(81349)	.TRANSISTOR.....		EA	1	*	*	*			6	9
P--H--	5910-934-2865	CS12BE156M	(81349)	.CAPACITOR,FIXED.....		EA	1	*	*	*			6	10
P--H--	5961-087-6047	1N645	(81349)	.DIODE,SEMICONDUCTOR DEVICE.....		EA	1	*	*	*			6	11
P--H--	5961-951-2143	1N758A	(81349)	.DIODE,SEMICONDUCTOR DEVICE.....		EA	1	*	*	*			6	12
P--H--	5910-934-2865	CS12BE156M	(81349)	.CAPACITOR,FIXED.....		EA	1	*	*	*			6	13
P--H--	5961-813-9360	2N1613	(81349)	.TRANSISTOR.....		EA	1	*	*	*			6	14
P--H--	5961-054-0046	2N1711	(81349)	.TRANSISTOR.....		EA	1	*	*	*			6	15
P--H--	5910-835-2726	CTM473VAK	(81349)	.CAPACITOR,FIXED.....		EA	1	*	*	*			6	16
P--H--	5910-835-2718	CTM223VAJ	(81349)	.CAPACITOR,FIXED,PLASTIC.....		EA	1	*	*	*			6	17
P--H--	5910-936-1525	CS12BG226M	(81349)	.CAPACITOR,FIXED,ELECTROLYTIC.....		EA	1	*	*	*			6	18
P--H--	5910-936-1525	CS12BG226M	(81349)	.CAPACITOR,FIXED,ELECTROLYTIC.....		EA	1	*	*	*			6	19
P--H--	5910-105-1910	CL65CP250SP3	(81349)	.CAPACITOR,FIXED.....		EA	1	*	*	*			6	20
P--H--	5961-087-6047	1N645	(81349)	.DIODE,SEMICONDUCTOR DEVICE.....		EA	1	*	*	*			6	21
P--H--	5961-087-6047	1N645	(81349)	.DIODE,SEMICONDUCTOR DEVICE.....		EA	1	*	*	*			6	22
P--H--	5961-087-6047	1N645	(81349)	.DIODE,SEMICONDUCTOR DEVICE.....		EA	1	*	*	*			6	23
P--H--	5910-993-2201	CS12BE476M	(81349)	.CAPACITOR,FIXED,ELECTROLYTIC.....		EA	1	*	*	*			6	24
P--H--	5910-847-7288	CK06CW103K	(81349)	.CAPACITOR,FIXED,CERAMIC.....		EA	1	*	*	*			6	25
P--H--	5961-954-3087	138741-01	(35351)	.TRANSISTOR.....		EA	1	*	*	*			6	26
P--H--	5961-879-6861	143324-01	(35351)	.HEAT SINK.....		EA	1	*	*	*			6	27

(1) SMR CODE	(2) FEDERAL STOCK NUMBER	(3) DESCRIPTION REFERENCE NUMBER & MFR CODE			USABLE ON CODE	(4) UNIT OF MEAS	(5) QTY INC IN UNIT	(6) 30-DAY MAINT ALW GS (a) 1-20	(b) 21-50	(c) 51-100	(7) 1-YR ALWPER 100 EQUIP CNTGCY	(8) DEPOT MAINT ALWPER 100 EQUIP	(9) ILLUSTRATION (a) FIG NO	(b) ITEM NO
P--H--	5961-087-6047	1N645	(81349)	.DIODE,SEMICONDUCTOR DEVICE.....		EA	1	*	*	*			6	28
P--H--	5961-813-9360	2N1613	(81349)	.TRANSISTOR.....		EA	1	*	*	*			6	29
P--H--	5910-883-4781	CK63BX222K	(81349)	.CAPACITOR,FIXED,CERAMIC.....		EA	1	*	*	*			6	30
P--H--	5910-879-6942	132500-72	(35351)	.CAPACITOR,FIXED,PAPER.....		EA	1	*	*	*			6	31
P--H--	5999-879-6811	143287-01	(35351)	.PRINTED WIRING BOARD.....		EA	1	*	*	*			6	32
				MAINTENANCE SUPPLIES										
P--H--	3439-224-3567		(81348)	SOLDER,TIN ALLOY FED QQ-S-571,..... SN60,5 LB SPOOL		LB	V	*	*	*			MSUP	
P--H--	4020-656-1125	GUDELACE18	(82110)	TAPE,LACING AND TYING NYLON,..... 0.090 IN.W,0.012 IN.THK,TYPE 1, FINISH B,SIZE 3,500 YD SPOOL		YD	V	*	*	*			MSUP	
P--H--	6640-224-7758		(81348)	PAPER,LENS-30 IN.LG,20 IN.W,50S,... TYPE 4,FED NNN-P-40		SH	V	*	*	*			MSUP	
P--H--	6810-184-4800		(81348)	TRICHLORETHYLENE,TECHNICAL..... FED O-T-634,TYPE 2,55 GAL,18 GAGE DRUM		GL	V	*	*	*			MSUP	
P--F--	6810-281-2785		(81348)	METHYL ETHYL KETONE,TECHNICAL..... FED TT-M-261,1 GAL CAN		GL	V	*	*	*			MSUP	
P--O--	6810-598-6600		(81348)	XYLENE,TECHNICAL FED TT-X-916,..... GRADE B,1 GAL CAN		GL	V	*	*	*			MSUP	
P--O--	6810-819-1128		(81348)	TETRACHLORETHYLENE,TECHNICAL..... FED O-T-236,5 GAL PL		GL	V	*	*	*			MSUP	
P--H--	6850-984-5853		(81349)	CLEANING COMPOUND,SOLVENT..... MIL-C-81302,TYPE 1,5 GAL DRUM		GL	V	*	*	*			MSUP	
P--H--	7510-145-0062		(81349)	INK,MARKING STENCIL ORANGE,LIQUID,. OPAQUE,MIL-I-43553,1 OZ CAN		OZ	V	*	*	*			MSUP	
P--F--	7510-266-6712		(81348)	TAPE,PRESSURE SENSITIVE ADHESIVE... 1 IN.W,60 YD LG,FED UU-T-106A		YD	V	*	*	*			MSUP	
P--H--	8010-060-3253	CABOSILGDM5	(80798)	PIGMENT,PULVERIZED SILICA-10 LB BAG		LB	V	*	*	*			MSUP	
P--O--	8010-515-2258		(81348)	REMOVER,PAINT-ORGANIC SOLVENT TYPE, LIQUID,FED TT-R-248A,5 GAL PAIL		GL	V	*	*	*			MSUP	
P--H--	8010-664-4966		(81349)	PRIMER COATING,MIL-C-15328,5 GAL... BOX		GL	V	*	*	*			MSUP	
P--F--	8010-687-3636		(81349)	ENAMEL-BLACK,COLOR NO.37038,..... LUSTERLESS,MIL-E-5556,1 QT CAN		QT	V	*	*	*			MSUP	
P--F--	8030-081-2326		(81349)	SEALING COMPOUND LIQUID,..... MIL-S-22473A,GRADE H,10CC BOTTLE		CC	V	*	*	*			MSUP	
P--F--	8030-285-1570		(81349)	CORROSION PREVENTIVE COMPOUND..... PETROLATUM BASE,MIL-C-11796, CLASS 3,35 LB PAIL		LB	V	*	*	*			MSUP	
P--O--	8040-262-9011		(81349)	ADHESIVE-RUBBER,LIQUID,MIL-A-5092,. TYPE 3,1 PT CAN		PT	V	*	*	*			MSUP	
P--O--	8040-691-1322		(81349)	ADHESIVE-EPOXY RESIN BASE,1 PT CAN. PASTE AND 2 OZ BOTTLE OF CURING AGENT,LIQUID FORM,MIL-A-8623, TYPE 2		OZ	V	*	*	*			MSUP	

(1) SMR CODE	(2) FEDERAL STOCK NUMBER	(3) DESCRIPTION REFERENCE NUMBER & MFR CODE			USABLE ON CODE	(4) UNIT OF MEAS	(5) QTY INC IN UNIT	(6) 30-DAY MAINT ALW GS (a) 1-20	(b) 21-50	(c) 51-100	(7) 1-YR ALWPER 100 EQUIP CNTGCY	(8) DEPOT MAINT ALWPER 100 EQUIP	(9) ILLUSTRATION (a) FIG NO	(b) ITEM NO
P--F--	8040-701-9514	H2-3475	(04347)	HARDENER-1 QT CAN.....		QT	V	*	*	*			MSUP	
P--F--	8040-935-4012	R8-2038	(04347)	ADHESIVE-1 QT KIT.....		QT	V	*	*	*			MSUP	
P--O--	9150-223-4129		(81349)	LUBRICATING OIL,INSTRUMENT..... MIL-L-6085,1 QT CAN		QT	V	*	*	*			MSUP	
P--O--	9150-985-7246		(81349)	GREASE,AIRCRAFT AND INSTRUMENT..... GELLING AGENT,MIL-G-23827, 1 LB CAN		LB	V	*	*	*			MSUP	

SECTION III
SPECIAL TOOLS, TEST,
AND SUPPORT EQUIPMENT
(NOT APPLICABLE)

SECTION IV
FEDERAL STOCK NUMBER AND REFERENCE NUMBER INDEX

STOCK NUMBER	FIGURE NUMBER	ITEM NUMBER	STOCK NUMBER	FIGURE NUMBER	ITEM NUMBER
3110-061-6154	2	46	5905-681-9969	5	14
3110-849-6597	2	18	5905-682-4099	5	10
3120-834-3503	4	25	5905-683-2239	5	27
3439-224-3567	MSUP		5905-683-7724	5	12
4020-656-1125	MSUP		5905-686-3368	5	3
5305-054-5635	4	24	5905-686-9994	5	11
5305-054-5637	2	12	5905-779-2466	5	5
5305-054-5637	2	17	5905-779-2466	5	9
5305-054-5637	2	43	5905-952-2146	5	18
5305-054-5637	3	19	5905-952-2146	5	19
5305-054-5647	4	2	5905-952-2146	5	21
5305-054-5651	4	18	5905-969-5846	5	24
5305-054-6652	2	11	5905-983-6914	5	7
5305-054-6652	2	39	5905-983-6914	5	20
5305-054-6652	4	15	5905-983-6914	5	22
5305-054-6653	2	40	5905-983-6914	5	23
5305-054-6657	2	27	5905-984-7681	5	15
5305-074-2673	2	37	5905-984-7681	5	17
5305-074-2673	4	37	5910-105-1910	6	20
5305-090-2158	4	26	5910-835-2718	6	17
5305-270-2882	4	33	5910-835-2726	6	16
5305-282-4497	4	40	5910-847-7288	6	25
5305-579-2138	3	3	5910-879-6942	4	1
5305-639-4345	4	9	5910-879-6942	6	31
5305-639-4345	4	30	5910-883-4781	6	30
5305-941-3538	3	14	5910-926-8219	6	3
5305-978-9354	4	35	5910-934-2865	6	10
5307-865-4159	2	2	5910-934-2865	6	13
5307-865-4160	2	15	5910-936-1525	6	18
5307-865-4161	2	42	5910-936-1525	6	19
5307-869-1489	2	8	5910-983-9462	6	6
5310-017-1665	2	31	5910-993-2201	6	1
5310-901-7726	2	10	5910-993-2201	6	24
5310-901-7726	2	41	5940-156-7345	2	28
5310-924-1547	4	22	5940-884-5467	4	4
5310-928-2690	2	16	5950-879-6862	2	19
5330-831-6652	2	20	5961-054-0046	6	15
5330-831-6653	2	13	5961-087-6047	6	7
5340-070-8369	2	44	5961-087-6047	6	8
5340-070-8369	4	38	5961-087-6047	6	11
5340-073-8380	4	3	5961-087-6047	6	21
5340-263-3830	2	30	5961-087-6047	6	22
5340-764-3155	2	47	5961-087-6047	6	23
5340-764-3155	4	14	5961-087-6047	6	28
5340-831-6675	4	34	5961-813-9360	6	14
5340-831-6678	2	49	5961-813-9360	6	29
5340-831-6678	4	6	5961-879-6855	6	5
5340-864-5072	2	29	5961-879-6861	6	27
5340-866-0041	4	12	5961-880-4779	6	9
5340-866-0042	4	20	5961-951-2143	6	12
5340-867-3037	4	5	5961-954-3087	6	2
5340-882-0317	2	33	5961-954-3087	6	4
5340-882-0319	2	32	5961-954-3087	6	26
5340-891-9381	3	20	5977-879-0226	2	14
5340-891-9382	2	38	5990-880-1299	4	32
5355-780-4518	3	15	5999-102-6195	3	18
5355-850-8010	3	1	5999-102-6196	3	13
5355-850-8010	3	4	5999-102-6196	3	17
5355-865-4165	3	16	5999-879-6811	6	32
5355-865-4166	3	2	6105-842-2470	2	36
5355-867-4743	3	5	6105-842-2470	4	36
5355-867-4850	4	42	6210-879-2447	3	12
5905-069-1753	5	6	6210-879-2448	3	10
5905-069-3910	5	4	6210-879-2449	3	9
5905-079-3564	5	16	6610-063-8487	4	39
5905-190-8881	5	13	6610-063-8488	4	16
5905-279-1296	5	1	6610-063-8489	4	21
5905-279-1687	5	26	6610-064-4741	2	45
5905-279-1751	5	25	6610-066-5448	2	21
5905-279-3837	5	8	6610-066-5450	4	28
5905-681-8818	5	2	6610-066-5451	4	41

SECTION IV (Cont)

STOCK NUMBER	FIGURE NUMBER	ITEM NUMBER	STOCK NUMBER	FIGURE NUMBER	ITEM NUMBER
6610-069-3433	2	5	6620-905-4654	4	8
6610-069-3434	2	1	6640-224-7758	MSUP	
6610-069-3434	3		6810-184-4800	MSUP	
6610-070-1176	4	13	6810-281-2785	MSUP	
6610-070-1177	4	31	6810-598-6600	MSUP	
6610-070-1178	4	17	6810-819-1128	MSUP	
6610-070-1179	4	27	6850-984-5853	MSUP	
6610-073-5298	2	35	7510-145-0062	MSUP	
6610-075-0141	4	10	7510-266-6712	MSUP	
6610-079-8961	4	23	8010-060-3253	MSUP	
6610-758-2385	1		8010-515-2258	MSUP	
6610-837-4488	2	4	8010-664-4966	MSUP	
6610-861-2178	2	6	8010-687-3636	MSUP	
6610-869-6958	4	19	8030-081-2326	MSUP	
6610-869-6959	4	11	8030-285-1570	MSUP	
6610-879-6853	2	26	8040-262-9011	MSUP	
6610-911-6490	2	25	8040-691-1322	MSUP	
6615-068-2683	2	22	8040-701-9514	MSUP	
6615-074-9527	2	48	8040-935-4012	MSUP	
6615-074-9527	4	7	9150-223-4129	MSUP	
6615-716-1111	2	24	9150-985-7246	MSUP	
6620-066-5273	4	29	9320-866-7212	3	11

REFERENCE NUMBER INDEX

REFERENCE NUMBER	MFG CODE	FIG NUMBER	ITEM NUMBER	REFERENCE NUMBER	MFG CODE	FIG NUMBER	ITEM NUMBER
AN500A2-4	88044	4	33	1N645	81349	6	22
AN565AC2L2	88044	4	9	1N645	81349	6	23
AN565AC2L2	88044	4	30	1N645	81349	6	28
CK06CW103K	81349	6	25	1N758A	81349	6	12
CK63BX222K	81349	6	30	105475-04	35351	4	12
CL65CJ470MP3	81349	6	6	105475-16	35351	4	20
CL65CP250SP3	81349	6	20	107244-73	35351	4	5
CS12BB476M	81349	6	3	107245-80	35351	2	2
CS12BE156M	81349	6	10	107245-81	35351	2	15
CS12BE156M	81349	6	13	107245-82	35351	2	42
CS12BE476M	81349	6	1	107245-83	35351	2	8
CS12BE476M	81349	6	24	110380-01	35351	2	25
CS12BG226M	81349	6	18	131357-01	35351	2	24
CS12BG226M	81349	6	19	132500-72	35351	4	1
CTM223VAJ	81349	6	17	132500-72	35351	6	31
CTM473VAK	81349	6	16	136378-07	35351	2	20
H2-3475	04347	MSUP		137300-25	35351	2	48
MS16628-25	96906	2	30	137300-25	35351	4	7
MS16997-44	96906	4	35	137300-75	35351	2	47
MS351957-28	96906	4	15	137300-75	35351	4	14
MS35265-2	96906	3	3	137302-14	35351	2	10
MS35275-201	96906	3	14	137302-14	35351	2	41
MS35338-77	96906	2	16	137302-21	35351	2	13
MS51957-1	96906	4	24	137304-02	35351	4	3
MS51957-13	96906	4	2	138741-01	35351	6	2
MS51957-17	96906	4	18	138741-01	35351	6	4
MS51957-28	96906	2	11	138741-01	35351	6	26
MS51957-28	96906	2	39	139288-01	35351	2	22
MS51957-29	96906	2	40	139300-01	35351	2	44
MS51957-3	96906	2	12	139300-01	35351	4	38
MS51957-3	96906	2	17	139300-04	35351	3	20
MS51957-3	96906	2	43	139300-05	35351	4	34
MS51957-3	96906	3	19	139300-06	35351	2	38
MS51957-33	96906	2	27	139424-04	35351	2	49
MS77076-2	96906	2	28	139424-04	35351	4	6
Q5431-02-02	35351	4	40	140331-04	35351	4	8
Q5431-02-03	35351	4	26	140331-13	35351	4	29
Q5513-02-05	35351	2	37	141400-01-01	35351	1	

REFERENCE NUMBER	MFG CODE	FIG NUMBER	ITEM NUMBER	REFERENCE NUMBER	MFG CODE	FIG NUMBER	ITEM NUMBER
Q5513-02-05	35351	4	37	142883-01	35351	3	10
RC07GF122J	81349	5	11	142884-01	35351	3	9
RC07GF153J	81349	5	2	142885-01	35351	3	16
RC07GF201J	81349	5	27	142899-01	35351	4	23
RC07GF203J	81349	5	3	142913-01	35351	2	36
RC07GF242J	81349	5	12	142913-01	35351	4	36
RC07GF332J	81349	5	14	142930-01	35351	2	14
RC07GF432J	81349	5	10	142960-01	35351	4	28
RC20GF182J	81349	5	13	142968-01	35351	2	46
RC20GF302J	81349	5	25	142970-01	35351	3	18
RC32F272J	81349	5	8	142971-01	35351	4	17
RC326F620J	81349	5	26	142972-01	35351	2	21
RC42GF241J	81349	5	1	142973-01	35351	3	1
RN60D1002F	81349	5	7	142973-01	35351	3	4
RN60D1002F	81349	5	20	142975-01	35351	3	5
RN60D1002F	81349	5	22	142975-02	35351	3	2
RN60D1002F	81349	5	23	142978-01	35351	2	18
RN60D1302F	81349	5	6	143001-03	35351	4	21
RN60D1470F	81349	5	4	143002-01	35351	2	45
RN60D2002F	81349	5	15	143006-01	35351	2	1
RN60D2002F	81349	5	17	143006-01	35351	3	
RN60D2431F	81349	5	16	143012-01	35351	4	10
RN60D2673F	81349	5	5	143013-01	35351	4	13
RN60D2673F	81349	5	9	143014-01	35351	2	5
RN60D3921F	81349	5	24	143015-01	35351	2	4
RN60D5111F	81349	5	18	143016-01	35351	4	25
RN60D5111F	81349	5	19	143017-01	35351	4	31
RN60D5111F	81349	5	21	143018-01	35351	4	11
R8-2038	04347	MSUP		143019-01	35351	4	19
1N645	81349	6	7	143020-01	35351	4	27
1N645	81349	6	8	143030-01	35351	4	32
1N645	81349	6	11	143209-01	35351	4	41
1N645	81349	6	21	143210-01	35351	4	42
143217-01	35351	3	15	143332-01-01	35351	2	9
143218-01	35351	4	39	143332-01-01	35351	5	
143219-01	35351	2	6	143332-01-01	35351	6	
143232-01	35351	2	29	143335-01	35351	2	19
143233-01	35351	2	35	145215-01	35351	4	16
143266-01	35351	3	12	2N1613	81349	6	14
143273-01	35351	4	4	2N1613	81349	6	29
143287-01	35351	6	32	2N1711	81349	6	15
143288-01	35351	2	26	2N2905	81349	6	9
143289-01	35351	3	11	34AA46A21-16	35351	2	33
143290-01	35351	3	13	34AA48A21-16	35351	2	32
143290-01	35351	3	17	34AA51A21-16	35351	2	31
143323-01	35351	6	5	36412-253	35351	4	22
143324-01	35351	6	27				

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TECHNICAL MANUAL
TM 55-6610-293-40

HEADQUARTERS
DEPARTMENT OF THE ARMY
WASHINGTON, D. C., *7 September 1967*

GS Maintenance Manual
Including Repair Parts and Special Tools List as ch 1
ATTITUDE INDICATOR
MODEL NUMBER 4005AB
PART NUMBER 141400-01-01

SECTION I

INTRODUCTION

1. General.

a. This technical manual comprises overhaul instructions for Attitude Indicator, Model Number 4005AB, Part Number 141400-01-01 (see figure 1), manufactured by Lear Siegler/Inc, Federal Code Number 35351, Grand Rapids, Michigan. Sections I through IV of this technical manual contain instructions for this model. Overhaul instructions for additional models will be provided in Section V by the use of difference data sheets.

b. Reporting of Improvements. Direct reporting of errors, omissions, and recommendations for improving this manual by the individual user is authorized and encouraged. DA Form 2028 will be used for reporting these improvements. DA Form 2028 will be completed by the individual using this manual and forwarded directly to: Commanding General, U. S. Army Aviation Materiel Command, ATTN: AMSAV-M, P. O. Box 209, St. Louis, Missouri, 63166.

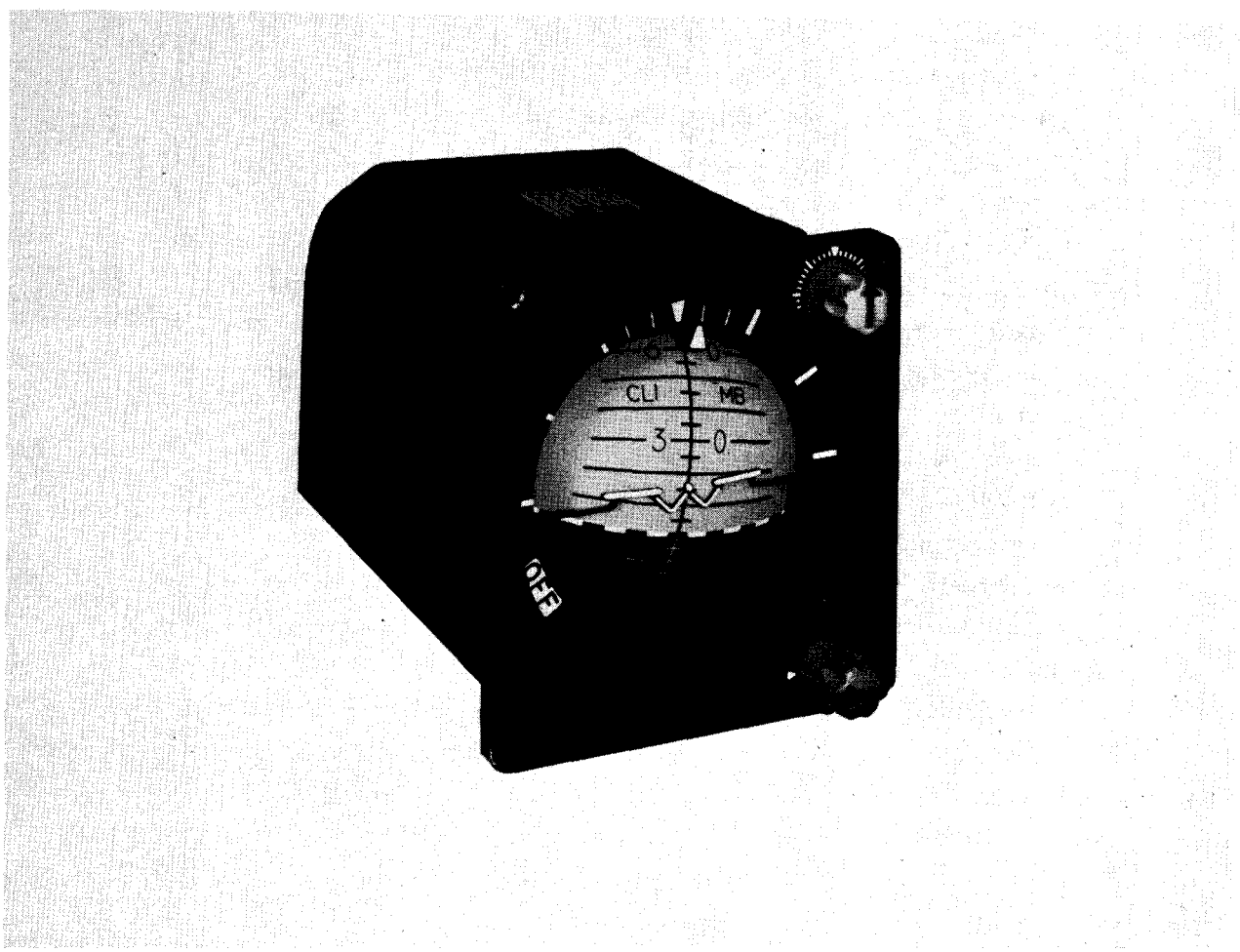


Figure 1. Attitude Indicator, Part Number 141400-01-01

2. Purpose.

The Attitude Indicator (Indicator) is an electro-mechanical unit which provides aircraft roll and pitch attitude information for the pilot. The Indicator pictorially displays attitude relative to straight and level flight. Signals for operation are received from a vertical gyroscope.

3. Equipment Records.

The Army equipment record system and procedures established in TM38–750 apply to the equipment. The applicable forms as required by TM38–750 shall be used.

4. Description.

The Indicator is hermetically sealed and is comprised mainly of pitch and roll servo loop components, a terminal board, and internal lighting assemblies.

5. Leading Particulars.

Refer to table 1.

Table 1. Leading Particulars

Power Requirements
- Indicator----------115 volts, 400 cps
- Lighting ----------28 volts, ac or dc

Input and Output Signals
- Input----------Obtained from vertical gyroscope reference which provides pitch and roll information
- Output----------Visual readout in pitch and roll

Dimensions (maximum overall)
- Height----------5.260 inches
- Width ----------5.010 inches
- Length----------7.386 inches

Electrical Connectors----------Connector, part number 142916–01 mates with connector, Military Standard MS24009

Weight----------5-1/2 pounds

Operating Controls
- Pitch Trim Knob----------Located at lower right hand corner of the front of Indicator; it allows pitch indication to be centered when the aircraft is trimmed within approximately 8 degrees dive and 16 degrees climb.
- Roll Trim Knob----------Located at upper right hand corner of the front of Indicator; it allows roll indication to be centered when the aircraft is trimmed with approximately 8 to 20 degrees of level in either right or left roll.

SECTION II

TEST EQUIPMENT, SPECIAL TOOLS, AND MATERIALS

6. Test Equipment.

The test equipment required for overhaul is listed in table 2.

7. Special Tools.

No special tools are required for overhaul.

8. Consumable Materials Required.

The consumable materials used during overhaul are listed in table 3.

Table 2. Test Equipment Required

Item No.	Model No. And Manufacturer	Nomenclature	Technical Description	Applicable Maintenance Level: Organization	Direct Or General Support	Depot
1	*Model BF-60 Cornell-Dubilier Electric Corporation, Newark, New Jersey (14655)	R/C bridge	Used to check resisters and capacitors.		X	

* Any equivalent may be used.

Table 2. Test Equipment Required--Continued

Item No.	Model No. And Manufacturer	Nomenclature	Technical Description	Applicable Maintenance Level: Organization	Direct Or General Support	Depot
2	*R510-1A Kearfott Divsion of General Precision, Incorporated, Little Falls, New Jersey (88818)	Test transmitter	Standard synchro test trasmitter; for generating synchro error signals (2 required).		X	
3	*PM-6B Bruno-New York Industries Corporation, New York, New York (95325)	Multimeter	For dc resistance measurements.		X	
4	*Model 300 Ballantine Laboratories, Incorporated, Boonton, New Jersey (06635)	Ac vacuum tube voltmeter	For ac voltage measurements.		X	
5	*Model 304H Allen B. Du Mont Laboratories, Incorporated, Clifton, New Jersey (82170)	Oscilloscope	For phase measurements.		X	

* Any equivalent may be used.

Table 3. Consumable Materials Required

Item No.	Material	Type or Grade	Government Specification	Applicable Maintenance Level: Organization	Direct or General Support	Depot
1	Paint Remover	----	Military Specification MIL-R-8633A		X	
2	Tetrachloroethylene	----	Federal Specification O-T-236		X	
3	Methyl-ethyl-ketone	----	Federal Specification TT-M-261		X	
4	Lens tissue paper	IV or V	Federal Specification UU-P-313		X	
5	Solder	Sn60	Federal Specification QQ-S-671		X	
6	Masking tape	----	Federal Specification UU-T-106		X	
7	Wash primer	----	Military Specification MIL-C-15328		X	
8	Black enamel	----	Military Specification MIL-E-5556		X	
9	Xylene thinner	----	Federal Specification TT-X-916		X	

Table 3. Consumable Materials Required--Continued

Item No.	Material	Type or Grade	Government Specification	Applicable Organization	Maintenance Level Direct or General Support	Depot
10	Lubricating oil	----	Military Specification MIL-L-6085A		X	
11	Grease	----	Military Specification MIL-G-G23827		X	
12	Adhesive	H	Military Specification MIL-S-22473		X	
13	Hysol R8-2038 Base Resin, manufactured by Hysol Corporation, Orlean, New York (04347), or equivalent	----	----		X	
14	H2-3475 Hardener, manufactured by Hysol Corporation, Orlean, New York (04347), or equivalent	----	----		X	
15	Cab-O-Sil Filler, manufactured by Godfrey L. Cabot, Incorporated, Boston, Massachusetts (80798), or equivalent	M-5	----		X	
16	Freon PCA, manufactured by E. I. du Pent, de Nemours and Company, Incorporated, Chicago, Illinois (18873), or equivalent		----		X	
17	Stur-D-Lace HL Soft Finish Lacing Tape, manufactured by Gudebrod Brothers Silk Company, Incorporated, New York, New York (01670) or equivalent	----	----		X	
18	Wornow Ink Series “M” White Epoxy Coding Ink, manufactured by Wornow Process Paint Company, Los Angeles, California (79439) or equivalent		----		X	
19	Tetrafluoroethylene Adhesive Tape, manufactured by Chicago Gasket Company, Chicago, Illinois (06644), or equivalent	----	----		X	
20	Epon Adhesive VII Plus Curing Agent A, manufactured by Shell Chemical Corporation, New York, New York (86961), or equivalent	----	----		X	

Table 3. Consumable Materials Required-Continued

Item No.	Material	Type or Grade	Government Specification	Applicable Organization	Maintenance Level Direct or General Support	Depot
21	EC847 Adhesive, manufactured by Minnesota Mining and Manufacturing Company, Detroit, Michigan (88525) or equivalent	----	----		X	

SECTION III

OVERHAUL INSTRUCTIONS

9. Introduction.

The following procedures outline step by step overhaul instructions for the Indicator. The extent of overhaul will seldom require that each step be performed, thus only those steps required to effect the necessary repair need be performed.

10. Disassembly.

a. Attitude Indicator, Part Number 141400-01-01.

(1) If it is required that identification plate (22, figure 2) be replaced, proceed as follows: Record the information contained on plate, as it will be required during reassembly. Insert a knife or sharp-edged tool under one corner of plate and peel off.

(2) Remove paint as follows: mask off bezel assembly (1) and connector (23). Remove paint from Indicator using paint remover, Military Specification MIL-R-8633A. If complete paint removal is not required remove paint around sealing strip (20) using paint remover.

(3) Snip off end of evacuating vent (24).

(4) Use a heavy duty soldering iron (250 watts) to remove excess solder around sealing strip (20). Grip sealing strip with long nose pliers and carefully pull off. Discard sealing strip.

Note. At this time Indicator should be removed to clean room conforming to Federal Standard No. 209, class 100,000.

Legend for figure 2

1. Bezel Assembly
2. Stud
3. Yoke and Sphere Assembly
4. Gear Cluster
5. Gear Cluster
6. Plate Assembly
7. Screw
8. Stud
9. Indicator Subassembly (TB2)
10. Washer
11. Screw
12. Screw
13. Washer
14. Brush Assembly (E1)
15. Stud
16. Washer
17. Screw
18. Bearing
19. Transformer (T1)
20. Sealing Strip
21. Cover
22. Identification Plate
23. Connector (J1)
24. Vent
25. Latch and Bracket Assembly
26. Printed Wiring
27. Screw
28. Terminal (E2)
29. Clamp
30. Ring
31. Shim, 0.025 inches
32. Shim, 0.010 inches
33. Shim, 0.005 inches
34. Shim, 0.0015 inches
35. Bracket
36. Motor-Tachometer Generator (MG2)
37. Screw
38. Clamp
39. Screw
40. Screw
41. Washer
42. Stud
43. Screw
44. Clamp
45. Housing and Stator Assembly
46. (B2B)
47. Bearing
48. Shim, 0.002 inches
49. Shim, 0.010 inches
50. Ring

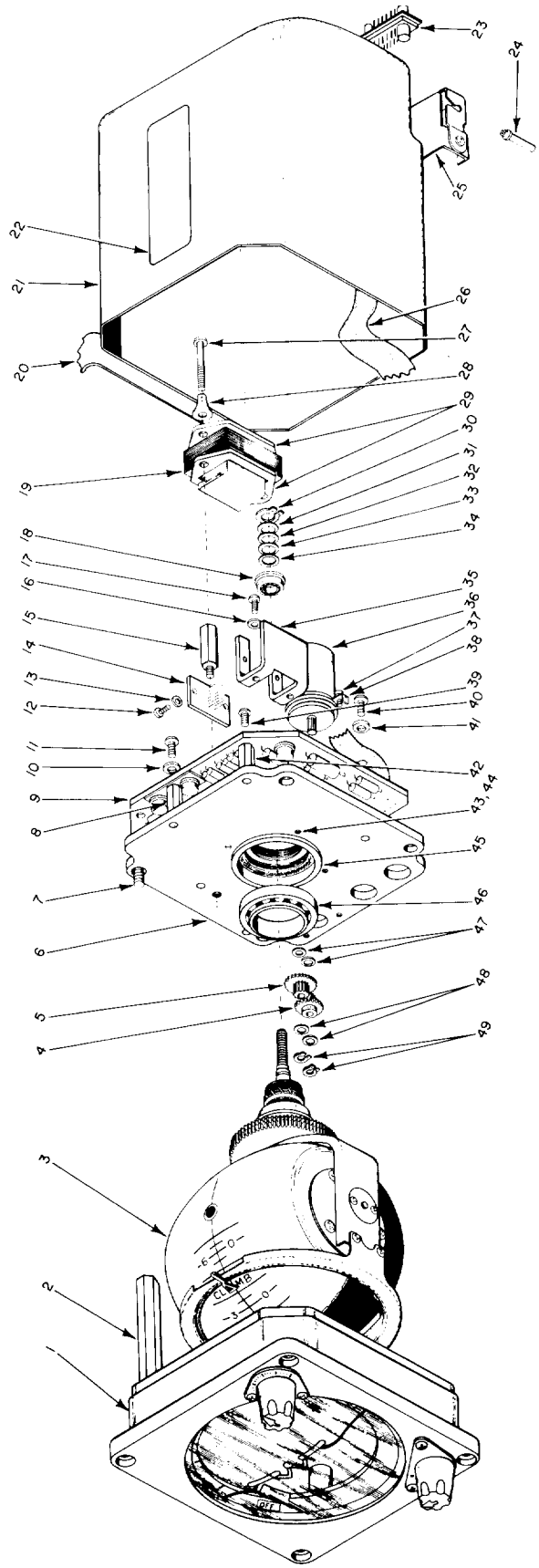


Figure 2. Attitude Indicator, Part Number 141400–01–01

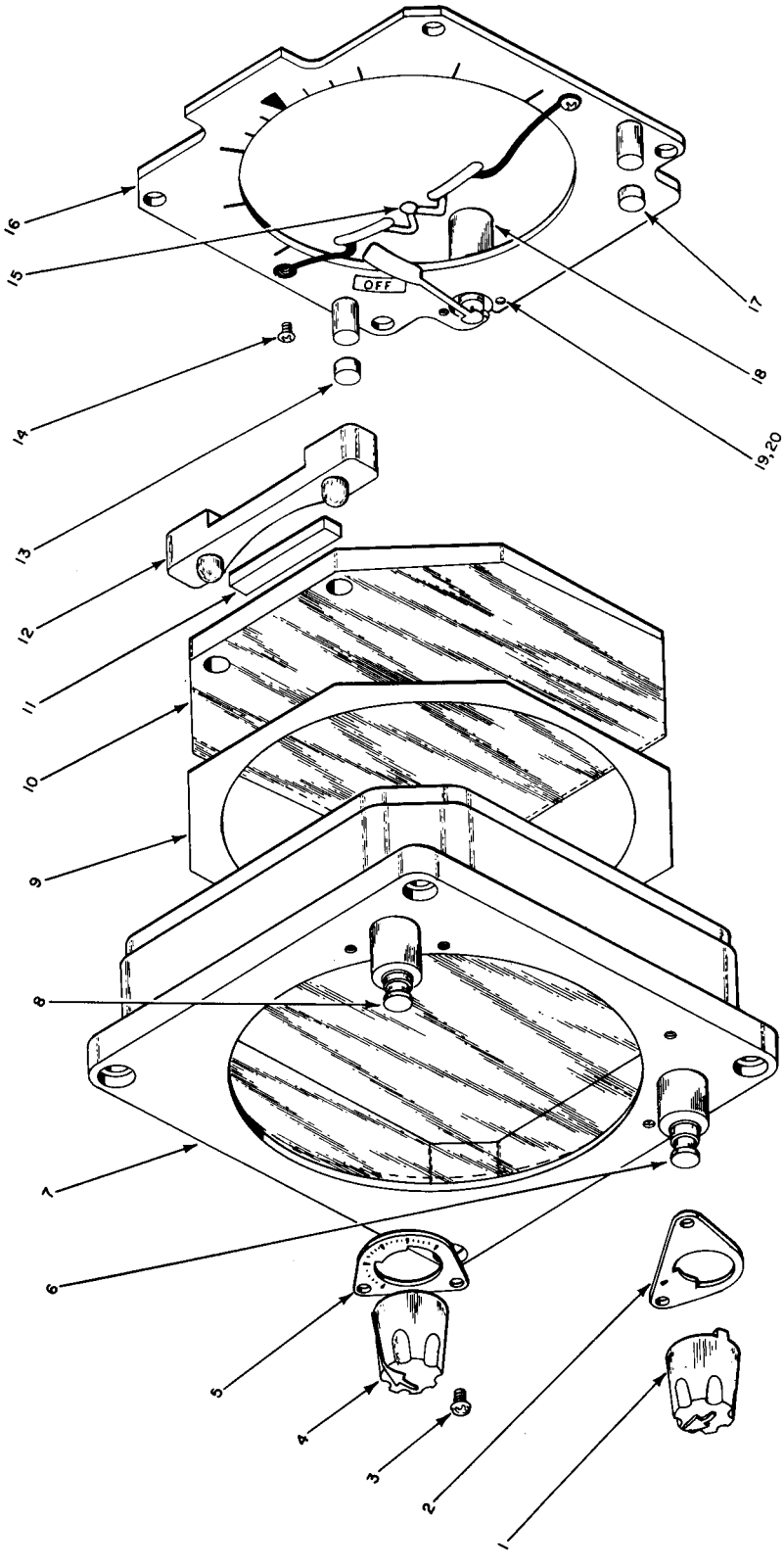


Figure 3. Bezel Assembly

1. Knob
2. Scale Dial
3. Screw
4. Knob
5. Scale Dial
6. Resistor, 4k ± 10%, 1w (R14)
7. Bezel Assembly
8. Resistor, 4k ± 10%, 1w (R17)
9. Light Shield
10. Light Wedge
11. Rubber Pad
12. Light Assembly (DS1)
13. Rubber Pad
14. Screw
15. Miniature Airplane
16. Scale Dial
17. Rubber Pad
18. Power-Off Warning Indicator (M1)
19. Screw
20. Clamp

Figure 3. Bezel Assembly—Continued

(5) Slide cover (21) off Indicator.

Caution: **Printed wiring is attached between internal assembly and connector in cover. Care must be observed so printed wiring is not damaged.**

(6) Do not remove printed wiring (26).

(7) Remove screws (11, 39, and 40) and washers (10 and 41).

(8) Remove screws (27) and terminal (28). Remove transformer (19) and clamps (29).

Note. Cut lacing cord as necessary to gain access to or to remove components. Do not remove wiring unless necessary to replace a component.

(9) Remove screws (17) and washers (16). Slide bracket (35) and brush assembly (14) away from ring assembly (23, figure 4) being careful not to bend brushes.

(10) Carefully remove indicator subassembly (9, figure 2),

(11) Remove screws (37) and clamps (38). Remove motor-tachometer generator (36).

(12) Remove screws (7). Slide yoke and sphere assembly (3) and plate assembly (6) away from bezel assembly (1). Remove studs (2) from bezel assembly (1).

Caution: **Do not break wires leading to bezel assembly. Detail parts of bezel assembly are loose. Use care not to damage parts.**

(13) Remove ring (30), shims (31, 32, 33, and 34), and bearing (18). Slide yoke and sphere assembly (3) away from plate assembly (6). Note number of shims (31, 32, 33, and 34) to aid, in reassembly.

(14) Remove bearing (46) from plate assembly (6). Remove screws (43), clamps (44), and housing and stator assembly (45) from plate assembly (6).

(15) Remove rings (49), shims (47 and 48), and gear clusters (4 and 5) from plate assembly (6).

b. Bezel Assembly.

(1) Remove scale dial (16, figure 3).

(2) Remove screws (14), and miniature airplane (15).

(3) Remove screws (19) and clamps (20). Slide power-off warning indicator (18) away from scale dial (16).

(4) Remove light assembly (12) and rubber pad (11) from bezel assembly.

(5) Remove light wedge (10) and light shield (9) from bezel assembly.

(6) Do not remove knobs (1 and 4) unless knobs or scale dials (2 and 5) are to be replaced.

(7) Do not attempt to remove resistors (6 and 8).

c. Yoke and Sphere Assembly.

(1) Remove bank pointer (42, figure 4) by breaking attaching epoxy seal and sliding bank pointer from mechanism mask (41).

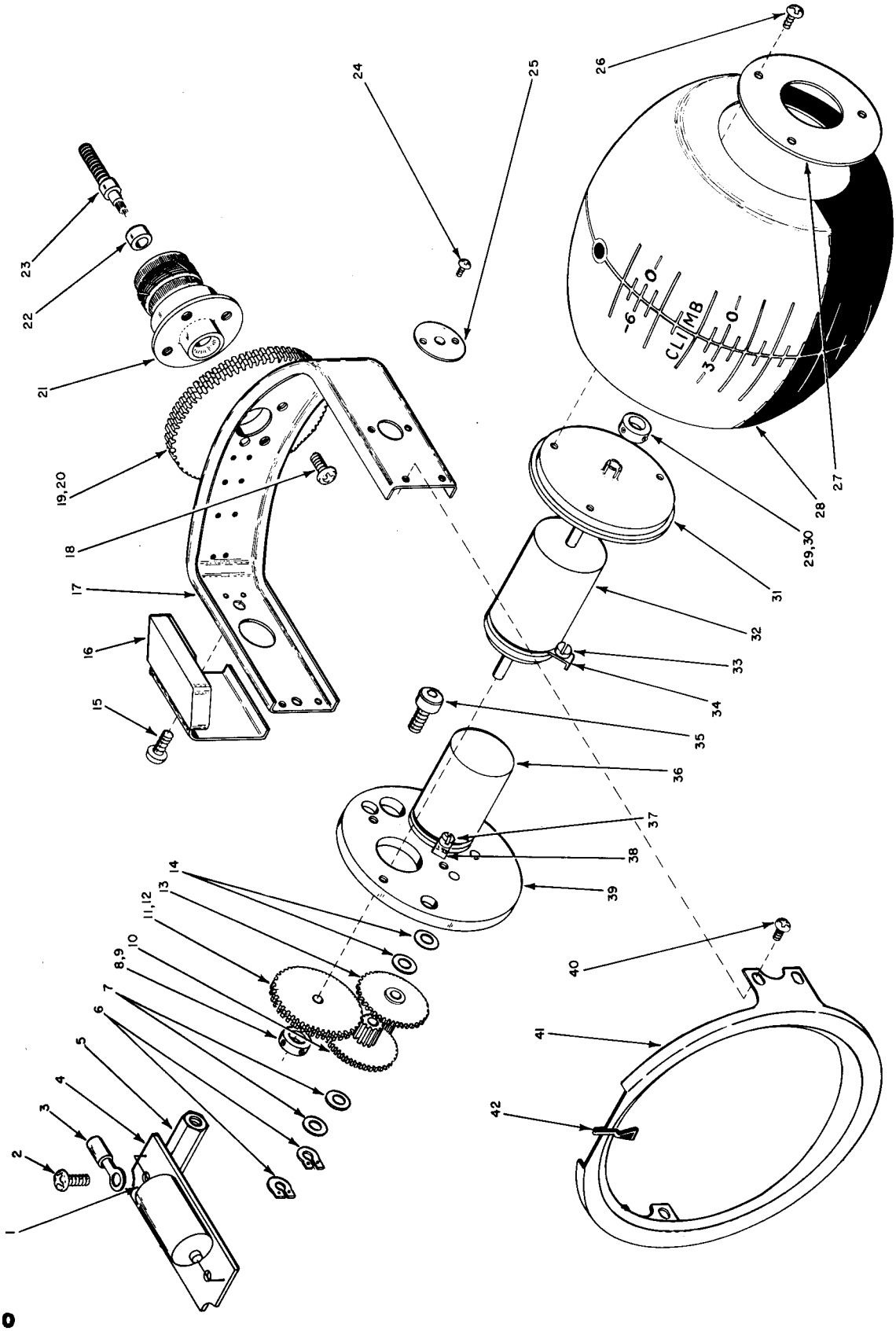


Figure 4. Yoke and Sphere Assembly

1. Capacitor, 1 uf ± 10%, 200 Vdcw (C1)
2. Screw
3. Loop Clamp
4. Printed Wiring Board (TB1)
5. Post
6. Ring
7. Shim, 0.010 inches thick
8. Collar
9. Setscrew
10. Gear Cluster
11. Gear Set
12. Spring
13. Gear Cluster
14. Shim, 0.002 inches thick
15. Screw
16. Counterbalance Assembly
17. Gimbal
18. Screw
19. Gear Set
20. Spring
21. Rotor and Shaft Assembly (B2A)
22. Spacer
23. Ring Assembly (SR1)
24. Screw
25. Sleeve Bearing
26. Screw
27. Clamping Plate
28. Indicator Sphere
29. Shaft Collar
30. Setscrew
31. Mounting Plate
32. Synchro (B1)
33. Screw
34. Synchro Clamp
35. Screw
36. Motor-Tachometer Generator (MG1)
37. Screw
38. Synchro Clamp
39. Pitch Plate Assembly
40. Screw
41. Mechanism Mask
42. Bank Pointer

Figure. 4. Yoke and Sphere Assembly—Continued

(2) Remove screws (40). Slide mechanism mask (41) from yoke and sphere assembly.

(3) Remove epoxy adhesive attaching counterbalance assembly (16) to gimbal (17) by heating adhesive with soldering iron and scraping loose.

(4) Remove screws (24) and sleeve bearing (25).

(5) Hold indicator sphere (28) and remove screws (15). Carefully slide indicator sphere forward from gimbal (17).

Caution: Do not break wires leading from slip rings to assembly in indicator sphere.

(6) Remove screws (18). Remove gear set (19), rotor and shaft assembly (21), spacer (22), and ring assembly (23). Do not attempt to separate ring assembly (23) from rotor and shaft assembly (21) .

(7) Hold assembly located inside of indicator sphere (28), and remove screws (26) and clamping plate (27). Slide indicator sphere (28) away from internal assembly.

(8) Remove screws (35). Separate capacitor (1), printed wiring board (4), and and posts (5) as an assembly from pitch plate assembly (39).

(9) Remove rings (6), shims (7), gear clusters (10 and 13), and shims (14) from their respective shafts.

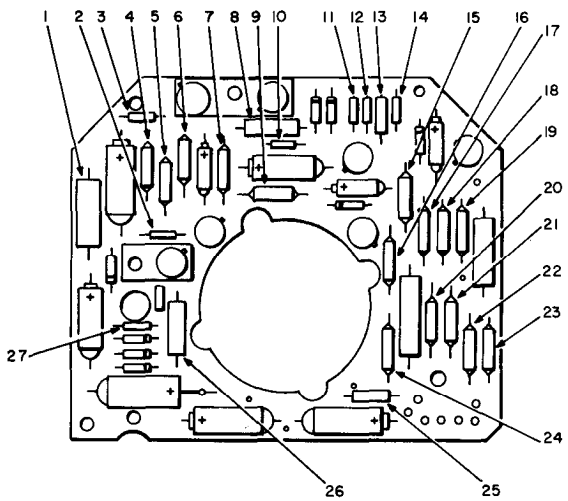
(10) Loosen setscrews (9), remove collar (8), and slide gear set (11) away from pitch plate assembly (39).

(11) Loosen setscrews (30) and remove shaft collar (29), Slide mounting plate (31) from shaft of synchro (32).

(12) Remove screws (33), synchro clamp (34), and synchro (32) from pitch plate assembly (39).

(13) Remove screw (37), synchro clamp (38), and motor tachometer-generator (36) from plate assembly (39).

d. Indicator Subassembly, Part Number 143332-01-01. (See figures 5 and 6.)



1. Resistor, 240 ohms ± 5%, 2w (R6)
2. Resistor, 15k ± 5%, 0.25w (R3)
3. Resistor, 20k ± 5%, 0.25 w (R28)
4. Resistor, 147 ohms ± 1%, 0.25 w (R29)
5. Resistor 267k ± 1%, 0.25w
6. Resistor, 13k ± 1%, 0.25w (R22)
7. Resistor 10k ± 1%, 0.25w
8. Resistor, 2.7k ± 5%, 1w (R16)
9. Resistor; 267k ± 1%, 0.25w (R8)
10. Resistor, 4.3k ± 5%, 0.25w (R27)
11. Resistor, 1.2k ± 5%, 0.25w (R21)
12. Resistor, 2.5k ± 5%, 0.25w (R18)
13. Resistor, 1.8k ± 5%, 0.5w (R26)
14. Resistor, 3.3k ± 5%, 0.25w (R20)
15. Resistor, 20k ± 1% 0.25w (R25)
16. Resistor, 2.43 ± 1%, 0.25w (R 5)
17. Resistor 20k ± 1%, 0.25w (R10)
18. Resistor, 5.11k ± 1%, 0.25w (R11)
19. Resistor, 5.11k ± 1%, 0.25w
20. Resistor, 10k ± 1%, 0.25w (R2)
21. Resistor, 5.11k ± 1%, 0.25w (R1)
22. Resistor, 10k ± 1%, 0.25w
23. Resistor, 10k ± 1%, 0.25w
24. Resistor, 3.9k ± 1%, 0.25w (R4)
25. Resistor, 3k ± 5%, 0.5w (R23)
26. Resistor 62 ohms ± 5%, 1w
27. Resistor, 200 ohms ± 5 %, 0.25w (R13)

Figure 5. Restitor Arrangement for Indicator Subassembly, Part Number 143332-01-01

(1) No disassembly is required. If replacement of a part is necessary, refer to paragraph 13d.

11. Cleaning.

a. Attitude Indicator, Part Number 141400-01-01.

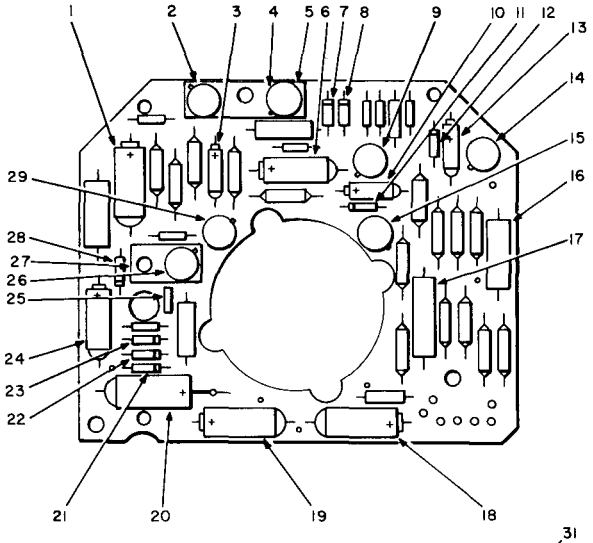
Note. All cleaned parts should be protected in clean plastic boxes and bags until reassembled and should be handled in such a way that contamination from handling is minimized,

(1) Clean bearings (18 and 46, figure 2) gears (4 and 5), and their attaching parts by washing in tetrachloroethylene, Federal Specification O–T-236.

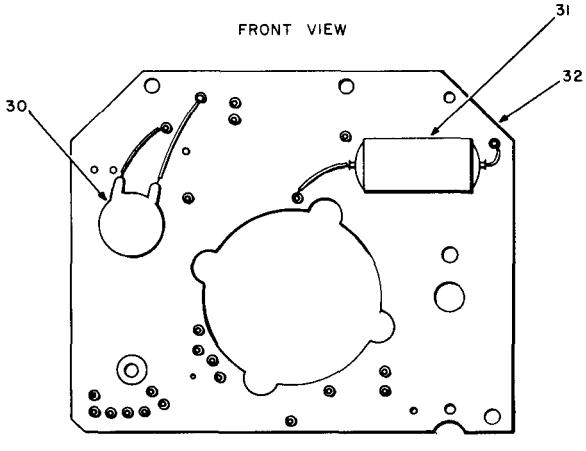
(2) Residue from cement-spot locking of attaching parts should be removed by careful scraping and then by washing in or wiping with methyl-ethyl-ketone, Federal Specification TT-M-261 depending on whether the part is free or still is attached near electrical parts. Repeat the method using tetrachloroethylene and dry with a vacuum source.

(3) Clean transformer (19), motor-ta chometer generator (36), printed wiring (26) and cover (21) using a soft brush and a vacuum source.

(4) Clean plate assembly (6), housing and stator assembfly (45), and bracket



FRONT VIEW



REAR VIEW

1. Capacitor, 47 uf ± 20%, 15 Vdcw (C15)
2. Transistor Semiconductor Device (Q5)
3. Capacitor, 47 uf ± 20% 6 Vdcw (C5)
4. Transistor Semiconductor Device (Q6)
5. Heat Sink
6. Capacitor, 47 uf ± 20%, 50 Vdcw (C9)
7. Diode, Semiconductor Device (CR6)
8. Diode Semiconductor Device (CR7)
9. Transistor Semiconductor Device (A4)
10. Capacitor, 15 uf ± 2%, 20 Vdcw (C2)
11. Diode Semiconductor Device (CR1)
12. Diode Semiconductor Device (CR8)
13. Capacitor, 15 uf ± 20%, 20 Vdcw (C6)
14. Transistor Semiconductor Device (Q7)
15. Transistor Semiconductor Device (Q1)
16. Capacitor, 0.047 uf ± 1070, 50 Vdcw (C8)
17. Capacitor, 0.022 uf ± 10%, 50 Vdcw (C4)
18. Capacitor, 22 uf ± 20%, 50 Vdcw (C13)
19. Capacitor, 22 uf ± 20%, 50 Vdcw (C14)
20. Capacitor, 25 uf –5 +30%, 125 Vdcw (C11)
21. Diode Semiconductor Device (CR5)
22. Diode Semiconductor Devic (CR4)
23. Diode Semiconductor Device (CR3)
24. Capacitor, 47 uf ± 20%, Vdcw (C3)
25. Capacitor, 0.01 uf ± 20%, 2 Vdcw (C7)
26. Transistor Semiconductor Device (Q3)
27. Heat Sink
28. Diode Semiconductor Devic (CR2)
29. Transistor Semiconductor Device (Q2)
30. Capacitor, 0.0022 uf ± 20%,
31. Capacitor, 1.5 uf ± 20%, 2 Vdcw (C10)
32. Printed Wiring Board (C12

Figure 6. Capacitor and semiconductor~ Arrangement for Indicator Subassembly, Part Number 14332-01-01-01

(35) using a clean, lint-free cloth dampened with tetrachloroethylene.

(5) Clean brush assembly (14) by allowing a small amount of Freon PCA to flow over brushes. A suction source should be used to suck Freon PCA through brushes.

b. Bezel Assembly.

(1) Residue from cement-spot locking of attaching parts should be removed by careful scraping and then by washing in or wiping with methyl-ethyl-ketone, depending on whether the part is free or still is attached and near electrical parts. Repeat the method using tetrachloroethylene and dry with a vacuum source.

(2) Clean glass in bezel assembly (7, figure 3) and light wedge (10) with Freon PCA and lens tissue paper, Federal Specification UU-P-313, type IV or V.

(3) Clean face of scale dial (16) using sticky side of pressure-sensitive paper masking tape, Federal Specification UU-T-106 to "dab-off" any dirt or dust. Avoid rubbing face of scale dial (16), as rubbing may produce shiny spots on paint.

c. Yoke and Sphere Assembly.

(1) Clean gear clusters (10 and 13, figure 4) gear sets (11 and 19) and their attaching parts by washing in tetrachloroethylene.

(2) Clean ring assembly (23) by using lens tissue paper dampened in Freon PCA.

(3) Clean indicator sphere (28) and face of mechanism mask by using pressure-sensitive masking tape to "dabot-off" any dirt or dust. 'Avoid rubbing indicator sphere and face of mechnism mask to prevent shiny spots from appearing on paint.

(4) Clean remaining metallic parts and shafts of synchro (32) and motor-tachometer generator (36) with a lint-free cloth dampened with tetrachloroethylene.

(5) Residue from cement-spot locking of attaching parts should be removed by careful scraping and then by washing in or wiping with methyl-ethyl-ketone, depending on whether the part is free or still attached and near electrical parts. Repeat the method using tetrachloroethylene and dry with a vacuum source.

d. Indicator Subassembly, Part Number 143332-01-01.

(1) Clean solder connections on printed wiring board (32, figure 6) with a bristle brush moistened in tetrachloroethylene. Dry with a vacuum source.

(2) Remove any residue of cement-spot locking by scraping and washing, first with methyl-ethyl-ketone, then with tetrachloroethylene. Dry with a vacuum source.

12. Inspection.

a. Attitude Indicator, Part Number 141400-01-01.

(1) Perform a visual and electrical inspection of Attitude Indicator as outlined in tables 4 and 5.

Table 4. Visual Inspection Data For Attitude Indicator

Figure 2 Index No.	Nomenclature	Inspect For
4, 5	Gear cluster	Chipped teeth, burrs, and excessive wear.
23	Connector	Bent or broken pins.
26	Printed wiring	Breaks, cracks, and poor connections.
36	Motor-tachometer generator	Defective teeth on shaft.

Table 5. Electrical Inspection Data For *Attitude Indicator*

Figure 2 Index No.	Nomenclature	Procedure	Required Result
19	Transformer	With multimeter, check dc resistance between windings:	
		1 and 3	15 ohms maximum
		2 and 3	4 ohms maximum
		4 and 5	4 ohms maximum
		6 and 8	3 ohms maximum
		7 and 8	1.3 ohms maximum
		8 and 9	1.3 ohms maximum
36	Motor-tachometer generator	With multimeter, check dc resistance between leads:	
		blue and orange	43 to 63 ohms
		red and black	64 to 96 ohms
		white and yellow	160 to 255 ohms
		green and brown	254 to 384 ohms
45	Housing and stator assembly	Measure dc resistance between leads with multimeter,	370 ± 55.5 ohms

b. Bezel Assembly.

(1) Perform a visual and electrical inspection of bezel assembly as outlined in tables 6 and 7.

Table 6. *Visual Inspection Data For Bezel Assembly*

Figure 3 Index No.	Nomenclature	Inspect For
7	Bezel assembly	Scratches and nicks on glass.
10	Light wedge	Scratches and nicks on glass.
	Parts visible from front windows.	Scratches or shiny spots on paint.

Table 7. Electrical Inspection Data For *Bezel Assembly*

Figure 3 Index No.	Nomenclature	Procedure	Required Result
6 and 8	Variable resistor	With multimeter measure resistance between yellow and green leads.	4k ± 10%
12	Light assembly	Check continuity of each lamp with multimeter.	Continuity indication.

c. Yoke and Sphere Assembly.

(1) Perform a visual and electrical inspection of yoke and sphere assembly as outlined in tables 8 and 9.

Table 8. Visual Inspection Data For Yoke And Sphere Assembly

Figure 4 Index No.	Nomenclature	Inspect For
28	Indicator sphere	Cracks, defective paint, and shiny spots in paint.
10,11, 13,19	Gears	Chipped teeth, burrs, and excessive wear.
--	Screws or nuts	Defective threads.

Table 9. Electrical Inspection Data For Yoke And Sphere Assembly

Figure 4 Index No.	Nomenclature	Procedure	Required Result
21	Rotor and shaft assembly	Use multimeter to measure dc resistance between leads:	
		blue and black	109 ohms ± 1570
		blue and yellow	109 ohms ± 15%
		yellow and black	109 ohms ± 15% (above values shall be within 2 ohms of each other)
32	Synchro	Use multimeter to check dc resistance between all combinations of blue, yellow, and black leads.	60 ohms ± 2%
36	Motor-tachometer generator	Use multimeter to measure dc resistance between leads:	
		red and black	64 to 96 ohms
		white and yellow	160 to 255 ohms
		green and brown	254 to 384 ohms

d. Indicator Subassembly, Part Number 143332-01-01.

(1) Perform a visual inspection of Indicator Subassembly as outlined in table 10.

Table 10. Visual Inspection Data For Indicator Subassembly

Figure & Index No.	Nomenclature	Inspect For
All connections	----	Breaks, cracks, and weak connections.
All connections	----	Burned condition.
32, Figure 6	Printed wiring board	Breaks in wiring.

0(2) Perform an electrical check of resistors and capacitors suspected of being defective using R/C bridge.

13. Repair And Replacement.

a. Attitude Indicator, Part Number 141400-01-01.

(1) Solder a new vent (24, figure 2) into cover (21) each time the Indicator is unsealed. Unsolder old vent and discard. Solder new vent, making sure the solder joint is gas-tight. Use solder, Federal Specification QQ-S–571, comp Sn60.

(2) To replace a part connected to printed wiring (26), use a 37.5-watt soldering iron and a vacuum source to remove solder connection on printed wiring. Slide a flat tool under printed wiring and pry printed wiring away from component.

Caution: Do not hold soldering iron on printed wiring connections any longer than necessary to make solder flow.

(3) If replacement of connector (23) or latch and bracket assembly (25) is necessary, replace connector, latch and bracket assembly, and cover (21) as an assembly.

b. Bezel Assembly.

(1) If replacement of variable resistor (6 or 8, figure 3) is necessary, replace resistors (6 and 8) and bezel assembly (7) as an assembly.

c. Yoke and Sphere Assembly.

(1) If replacement of ring assembly (23, figure 4) is necessary, heat epoxy adhesive as necessary to work ring assembly free. Replace with a new ring assembly.

(2) To replace a defective bank pointer (42), remove bank pointer by slightly heating attaching epoxy adhesive with a soldering iron. Remove all traces of epoxy adhesive by scraping. Clean surface with tetrachloroethylene, Federal Specification O-T-236. Place new bank pointer in position, apply epoxy resin, and allow to cure.

Note. Epoxy resin consists of 80 parts of base resin (Hysol R8-2038), 20 parts hardener (HZ-3475), and 3 to 7 parts filler (Cab-O-Sil, Grade M-5). Mix thoroughly, apply to surfaces, and allow the cure 24-48 hours at room temperature.

(3) To replace a defective capacitor (1 unsolder and break loose capacity from printed wiring board (4). (If adhesive seal will not break loose, use a small amount of methyl-ethyl-ketone to soften adhesive.) Scrape adhesive from printed wiring board. Apply adhesive (EC847) between mating surfaces of new capacitor and printed wiring board. Allow to dry for 1 minutes. Solder leads of capacitor in place. Use solder, Federal Specification QQ-S-571, composition Sn60.

d. Indicator Subassembly, Part Number 143332-01-01.

(1) To replace any detail part, unsolder and break loose the part from printed wiring board (32, figure 6). Scrape all old adhesive from printed wiring board. Apply adhesive (Epon Adhe sive VII plus Curing Agent A) to mat ing surfaces of detail part and printed wiring board. Allow to cure for 90 minutes at 200°F (94°C). Solder leads as necessary. Use solder, Federal Specification QQ-S-571, composition Sn60.

e. Replace all other parts found to be defec tive during inspection procedures.

14. Lubrication.

a. Attitude Indicator, Part Number 141400 01-01.

(1) Lubricate bearings (18 and 46, figure 2) with lubricating oil, Military Speci fication MIL-L-6085A.

(2) Apply a film of grease, Military Speci fication MIL-G-23827 to teeth and bores of gears (4 and 5) and to teeth of shaft of motor-tachometer genera tor (36).

b. Bezel Assembly.

(1) No lubrication is required.

c. Yoke and Sphere Assembly.

(1) Lubricate teeth and bores of gears (10, 11, 13, figure 4) with grease, Military Specification MIL-G-23837.

(2) Lubricate shaft of motor-tachometer generator (36) and teeth of gear set (19) with grease, Military Specification MIL-G-23827.

d. Indicator Subassembly, Part Number 143332-01-01,

(1) No lubrication is required.

15. Reassembly And Testing Of Assemblies.

a. Indicator Subassembly, Part Number 143332-01-01.

(1) No reassembly of indicator subassembly is necessary. Refer to paragraph 13d(1).

(2) Testing of indicator subassembly is accomplished by performing the following steps (3) through (11),

(3) Connect test circuit as shown in figure 7. Do not connect load R2-L2 at this time.

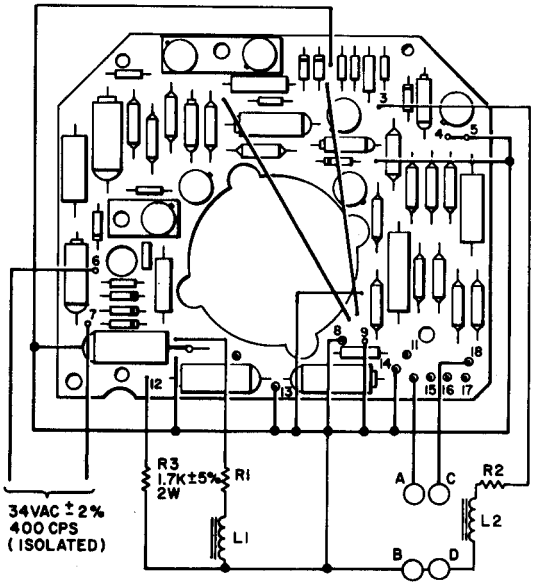


Figure 7. *Test Connections for Indicator Subassembly*

Note. The load combinations of R1-L1 and R2-L2 each shall have an impedance of 205 ohms ±2% +j245 ohms ±2%. (An equivalent resistance can be obtained by using red and black leads of motor-tachometer generator (MG1 or MG2), part number 142913-01.

(4) Connect 0,01 Vac ± 2%, 400 ± 4 cps between A(high) and B (low). This input signal shall have a source impedance of 100 ohms maximum. Connect ac vacuum tube voltmeter across load R1-L1. The voltage shall be 1.30 ± 0.25 Vat. Measure phase shift across load R1-L1 with an oscilloscope, The phase shift shall be 180 ± 10 degrees with respect to the input. Disconnect 0.01 Vac signal.

(5) Connect 0.10 Vac ± 2%, 400 ± 4 cps between A(high) and B (low). This input signal shall have a maximum source impedance of 100 ohms. Connect ac vacuum tube voltmeter across load R1-L1. The voltage shall be 6 Vac minimum. Measure phase shift across load R1-L1 with oscilloscope. The phase shift shall be 180 ± 10 degrees with respect to the input. Disconnect 0.10 Vac signal.

(6) Connect a jumper between A and B. Measure voltage across load R1-L1 using ac vacuum tube voltmeter. The voltage shall be less than 0.15 Vat. Disconnect jumper.

(7) Disconnect power. Remove load R1-L1 and connect load R2-L2 (see figure 7). Reapply power.

(8) Connect 0.07 Vac ± 2%, 400 ± 4 cps between, C (high) and D (low). This input signal shall have a maximum source impedance of 100 ohms. Connect ac vacuum tube voltmeter across load R2-L2. The voltage shall be 5.0 ± 0.5 Vat. Measure phase shift across load R2-L2 with oscilloscope. The phase shift shall be 180 ± 10 degrees with respect to the input. Disconnect 0.07 Vac signal.

(9) Connect 0.185 Vac ± 276, 400 ± 4 cps between C (high) and D (low).

This input signal shall have a maximum source impedance of 100 ohms. Connect ac vacuum tube voltmeter across load R2-L2. The voltage shall be a minimum of 12 Vat. Measure phase shift across load R2-L2 with an oscilloscope. The phase shift shall be 180 ± 10 degrees with respect to the input. Disconnect 0.185 Vac signal.

(10) Connect jumper between C and D. Measure voltage across load R2-L2 using ac vacuum tube voltmeter. The voltage shall be less than 0.15 Vat.

(11) Remove power and all test connections.

b. Yoke and Sphere Assembly.

(1) Place motor-tachometer generator (36, figure 4) onto pitch plate assembly (39) and attach with synchro clamps (38) and screws (37).

(2) Place synchro (32) onto pitch plate assembly (39) and attach with synchro clamps (34) and screws (33).

(3) Slide mounting plate (31) onto synchro (32) shaft and attach with collar (29) and setscrews (30).

Note. Tighten setscrews (30) only enough to keep mounting plate (31) from sliding,

(4) Slide gear set (11 and 12) into place on pitch plate assembly and attach with setscrews and collar (8 and 9).

(5) Slide shims (14), gears (10 and 13), and shims (7) onto pitch plate assembly (39) and attach with rings (6). Check end play of gears (10 and 13). The end play shall be 0.008 to 0.003 inches. Adjust rings (6) to obtain proper end play.

Note. It may be necessary to adjust position of gearset (11 and 12) to allow proper alignment to gear (10).

(6) Connect capacitor (1), printed wiring board (4), and post (5) to pitch plate assembly (39) using screws (35).

(7) Slide pitch plate assembly (39) into indicator sphere (28) and attach into place with screws (26) and clamping plate (27).

(8) Slide rotor and shaft assembly (21) into gear set (19 and 20) and attach to gimbal (17) using screws (18).

(9) Cement-lock screws (2, 15, 18, 33, 35, and 37) using adhesive, Military Specification MIL-S-22473, Grade H.

(10) Slide indicator sphere (28) into gimbal (17), place counterbalance assembly in position and start screws (15) (do not tighten screws). Loosen setscrews (30), tighten screws (15), and then retighten setscrews (30).

(11) Slide mechanism mask (41) into place and attach with screws (40).

(12) Cement-lock screws (15) and (40) using adhesive, Military Specification MIL-S-22473, Grade H.

(13) No. testing of yoke and sphere assembly is required.

c. Bezel Assembly.

(1) Reassemble scale dials (2 and 5, figure 3) and attach with screws (3).

(2) Position knobs (1 and 4) and tighten setscrews in knobs.

(3) Slide light shield (9) and light wedge (10) into bezel assembly (7).

(4) Position rubber pad (11) and light assembly (12).

(5) Slide power-off warning indicator (18) into scale dial (16) and attach with screws (19).

(6) Attach miniature airplane (15) to scale dial (16) with screws (14).

(7) Place scale dial (5) into bezel assembly.

(8) No testing of bezel assembly is required.

16. Final Assembly.

a. Attitude Indicator, Part Number 141400-01-01.

Note. Refer to wire list, table 11 as necessary during reassembly.

Table 11. Wire List for Attitude Indicator, Part Number 141400-01-01

Wire No.	Color	Termination From	Termination To
100	Brown	T1-1	TB2-11
105	Red	T1-2	TB2-10
110	Black	T1-3	TB2-13
111	Black	T1-3	T1-8
112	Bare	T1-3	E2
115	Orange	T1-4	TB2-6
120	Yellow	T1-5	TB2-7
*	White	SR1	TB1-7
*	White/Black	SR1	TB1-2
*	Gray	SR1	TB1-5
*	Violet	SR1	TB1-8
*	Green	SR1	TB1-12
*	Yellow	SR1	TB1-4
*	Orange	SR1	TB1-1
*	Brown	SR1	TB1-6
*	Red	SR1	TB1-11
*	Blue	SR1	TB1-9
*	Black	SR1	TB1-10
*	White	MG2	TB2-10
*	Blue	MG2	TB2-14
*	Green	MG2	TB2-8
*	Yellow	MG2	TB2-8
*	Brown	MG2	TB2-5
*	Black	MG2	TB2-14
*	Orange	MG2	TB2-1
*	Red	MG2	TB2-3
*	White	MG1	TB1-1
*	Blue	MG1	TB1-7
*	Green	MG1	TB1-7
*	Yellow	MG1	TB1-7
*	Brown	MG1	TB1-8
*	Black	MG1	TB1-7
*	Orange	MG1	TB1-13
*	Red	MG1	TB1-12
*	Red	DS1-4	TB2-15
*	Brown	DS1-3	TB2–17
*	Red	DS1-2	TB2-15
*	Brown	DS1-1	TB2-17
*	Green	R17	T1-9
*	Yellow	R17	T1-6
*	Red	R17	TB2-9
*	Green	R14	T1-9
*	Yellow	R14	T1-7
*	Red	R14	TB2-A
*	Yellow	M1	TB2-12
*	Brown	M1	TB2-16
*	Bare	C1	TB1-1
*	Bare	C1	TB1-13
*	Red/White	B1	TB1-6
*	Black/White	B1	TB1-7
*	Black	B1	TB1-2
*	Blue	B1	TB1-5
*	Yellow	B1	TB1-4
*	Yellow	B2	TB1-11
*	Black	B2	TB1-10
*	Blue	B2	TB1-9
*	Black	B2	TB2-18
*	Red	B2	TB2-19

● Leads are part item connected.

(1) Reassemble shims (47, figure 2) gears (4 and 5), and shims (48). Attach with rings (49) and adjust rings until there is 0.003- to 0.008-inch end play on gears (4 and 5).

(2) Reassemble housing and stator assembly (45) onto plate assembly (6) and attach with clamps (44) and screws (43). Slide bearing (46) into plate assembly.

(3) Slide yoke and sphere assembly (3) into plate assembly (6). Using shims (31, 32, 33, and 34), shim yoke and sphere assembly (3) for end play of 0.029 to 0.031 inch, Assemble ring (30).

(4) Reassemble studs (2) onto bezel assembly (1). Assemble screws (7) through plate assembly (6) and into studs (2) .

(5) Position motor-tachometer generator (36) onto plate assembly (6). Attach with clamps (38) and screws (37).

(6) Assemble indicator subassembly (9) to plate assembly (6) using screws (11, 39, and 40) and washers (10 and 41).

(7) Carefully work brush assembly (14) and bracket (35) onto slip ring, Attach bracket (35) to plate assembly (6) using washers (16) and screws (17). Use a small pointed instrument to align brushes on slip ring. The outer-most brushes should contact the outer-most ring.

(8) Assemble transformer (19) and terminal (28) using screws (27), clamps (29), and studs (15).

b. Alignment and Testing.

(1) Refer to Section IV and calibrate two standard test transmitters as outlined

in paragraph 18a. Connect power and standard transmitters to indicator as shown in figure 8.

(2) Set standard transmitter dials to 180 degrees. If the Indicator does not indicate zero (pitch trim and roll trim variable resistors should be set to electrical zero) in pitch and roll, align as follows:

Warning: **The Indicator will be energized during following steps (3) and (4). Avoid contact with electrical connections and do not short out connections with alignment instruments.**

(3) Loosen setscrews (30, figure 4) and manually rotate Indicator to obtain a pitch reading of zero degrees. Retighten setscrews (30).

(4) Loosen screws (43, figure 2). Manually rotate housing and stator assembly (45) as necessary to obtain a roll reading of zero degrees. Retighten screws (43).

(5) Perform all tests outlined in Section IV.

(6) Upon completion of tests of Section IV, cement-lock screws (7, 11, 12, 17, 27, 37, 39, 40, and 43) using adhesive, Military Specification MIL-S-22473, Grade H.

(7) Secure all wires using Stur-D-Lace HL Soft Finish lacing tape.

c. Canning and Painting

(1) Hold cover firmly against bezel and apply tetrafluoroethylene adhesive tape to seam between case and bezel. Press tape firmly against unit with fingers. Tape should be centered over seam.

(2) Place new sealing strip (20, figure 2) over tape and center over seam. Hold sealing strip in place with masking tape, Federal Specification UU-T-106.

(3) Move Indicator to a sealing area and tack solder sealing strip about unit using a heavy-duty soldering iron. Use solder, Federal Specification QQ-S-571, composition Sn60.

(4) Remove masking tape, apply 1/2 psi of filling gas, and flow solder between sealing strip, case and bezel. Use enough solder to fill void caused by raised edge of sealing strip. Solder should form a continuous fillet when soldering is completed. Clean soldered area with a cloth moistened with tetrachloroethylene, Federal Specification O–T–236.

Note. The filling gas shall be composed of an uncontaminated mixture of 5 ± 1 percent carbon dioxide and the remainder helium. The dew point of the mixed gas shall be no higher than —75°F.

The carbon dioxide and helium filling gases used shall be of 99.99 percent minimum purity. Oxygen content shall not be greater than 0.002 percent for helium. This gas shall be used for the remainder of tests requiring gas.

(5) Apply 15 psi pressure of filling gas through vent, immerse in tetrachloroethylene, and examine for leaks. If unit leaks, rework seal.

(6) Bake Indicator in oven for one hour at 170° to 180°F with no vacuum applied.

(7) Vacuum-bake Indicator at minimum of 27 inches of mercury for 2 hours.

(8) Remove Indicator from oven, attach to a dry gas source at a pressure of 1 to 2 psi, and allow to cool.

(9) Cycle unit 3 to 5 times at 5 inches of mercury vacuum and 5 psi pressure of filling gas.

(10) Cut vent (24) and allow pressure to release. Solder seal vent (24).

(11) Clean Indicator with tetrachloroethylene.

(12) Mask window of bezel assembly (1), connector (23), knobs (1 and 4, figure 3) and dials (2 and 5).

(13) Apply one coat of wash primer, Military Specification MIL-C-15328 to Indicator. Allow 30 minutes to dry.

(14) Apply two coats of black enamel, Military Specification MIL-E–5556 to Indicator, allowing 20 minutes of dry-

ing time between coats. Use xylene, Federal Specification TT-X-916 to thin enamel if required.

(15) Allow to air dry for 2 hours. Remove masking tape from connector and window.

(16) Conduct the test procedures of Section IV.

(17) Transfer information from old identification plate (22, figure 2) onto new identification plate. Peel off protective backing on plate. Center plate lengthwise on top of cover (21). Press plate into place using firm pressure.

(18) Stencil following information on right side (as viewed from front) of cover (21), 1-1/2 inches from top and approximately 1-1/2 inches from rear of Indicator. The letters should be 3/32 inch high. Use white epoxy coding ink, Wornow Ink Series "M".

"28 VOLT LIGHTING SYSTEM
VOLTAGE NOT TO EXCEED 29.0 VOLTS"

(19) Stencil characters "J1" 1/2 inch above and centered over connector (23) using ink of step (18). The letters should be 1/4 inch high.

(20) Test Indicator in accordance with Section IV.

SECTION IV

FINAL TEST PROCEDURE

17. Introduction.

The following test procedures should be performed before and after overhaul and at such other times as necessary to check the operating characteristics of the Indicator. The test results may be used to provide a basis for localizing faults that may occur in the unit and therefore limit the extent of disassembly necessary for repairs.

18. Testing.

a. Calibration of standard transmitters.

Note. Two transmitters are required.

(1) Designate standard transmitter rotor leads as H and C. Ground C lead.

(2) Designate one standard transmitter stator lead as Z and connect it to lead C.

(3) Apply 26 Vac 400 cps across leads H and C. Monitor ac voltage across two undesignated stator leads with ac voltmeter. Monitor ac voltage across one of undesignated stator leads and H. Turn rotor until ac voltage across H and one undesignated stator lead is approximately maximum (about 35 volts), at the same time ac voltage across the two undesignated stator leads shall be minimum. Lock dial to rotor with dial on zero.

(4) Monitor ac voltage across two undesignated stator leads (each in turn) and stator lead Z. Turn transmitter dial in direction of increasing numbers. Designate as X stator lead in which voltage increases before decreasing. Designate as Y the stator lead in which voltage decreases before increasing.

(5) Disconnect power, external test equipment, and lead C from lead Z.

b. Pitch and Roll Sensing,

(1) Connect Indicator to standard transmitters and power sources as shown in figure 8 and apply power. The OFF indication shall disappear.

(2) Set both standard transmitter dials to a reading of 180 degrees. The Indicator shall drive to within 1/2 degree of zero in pitch and roll (pitch and roll trim knobs shall be set at zero).

(3) Increase and then decrease dial setting on roll standard transmitter. The Indicator shall indicate a right roll and then a left roll.

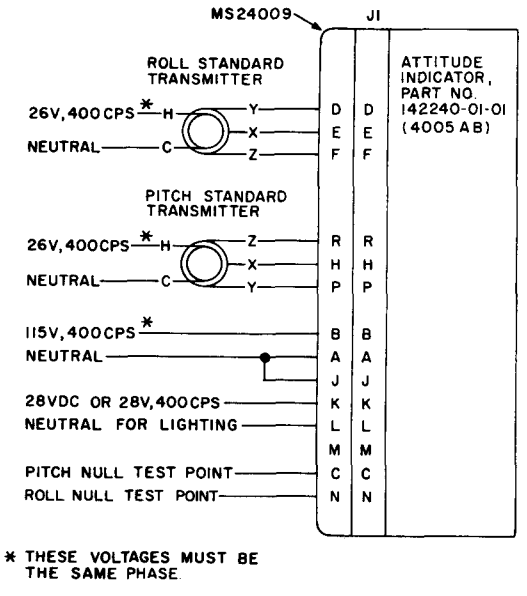


Figure 8. Test Connections

(4) Increase and then decrease dial setting on pitch standard transmitter. The Indicator shall indicate a climb and then a dive.

Note. If roll indications or pitch indications are reversed, recheck connections and standard transmitter calibration. All visual observation shall be made at a distance of two feet unless otherwise specified.

(5) Reset both standard transmitters to 180 degrees.

c. Pitch Trim

(1) Turn pitch trim knob to full clockwise position. Indicator shall indicate a minimum of 8 degrees dive.

(2) Turn pitch trim knob to full counterclockwise position. Indicator shall indicate a minimum of 16 degrees climb.

(3) Turn pitch trim knob to zero position. Indicator shall indicate within 1/2 horizontal line width of zero. Loosen and reset pitch trim knob as necessary.

d. Roll Trim

(1) Turn roll trim knob to full clockwise position. Indicator shall indicate 8 degrees to 20 degrees right roll.

(2) Turn roll trim knob to full counterclockwise position. Indicator shall indicate 8 degrees to 20 degrees ~~right~~ left roll.

(3) Turn roll trim knob to zero.

e. Zeroing Adjustments.

(1) Place pitch standard transmitter to 183 degrees, Adjust Indicator to zero pitch position using pitch trim knob.

(2) Loosen pitch trim knob from shaft and position knob to zero. Retighten pitch trim knob.

(3) Rotate pitch trim knob fully clockwise. The Indicator shall indicate a minimum of 8 degrees dive.

(4) Rotate pitch trim knob fully counterclockwise. The Indicator shall indicate a minimum of 16 degrees climb.

(5) Place pitch standard transmitter to 177 degrees. Adjust Indicator to zero pitch position using pitch trim knob. Repeat steps (2), (3), and (4).

(6) Place pitch standard transmitter to 180 degrees. Adjust pitch trim knob for zero pitch reading on Indicator. Loosen pitch trim knob and place knob on zero. Retighten pitch trim knob.

(7) Place roll standard transmitter to 183 degrees. Adjust Indicator to zero roll position using roll trim knob.

(8) Loosen roll trim knob from shaft and position knob to zero. Retighten roll trim knob.

(9) Rotate roll trim knob fully clockwise. The Indicator shall indicate between 8 degrees and 20 degrees right roll.

(10) Place roll standard transmitter to 177 degrees. Adjust Indicator to zero roll position using roll trim knob.

(11) Loosen roll trim knob from shaft and position knob to zero. Retighten roll trim knob.

(12) Rotate roll trim knob fully counterclockwise, The Indicator shall display between 8 degrees and 20 degrees left roll.

(13) Place roll standard transmitter to 180 degrees. Adjust roll trim knob for zero roll reading cm Indicator. Loosen roll trim knob and place knob on zero. Retighten roll trim knob.

f. Sensitivity.

(1) Rotate pitch standard transmitter 1/4 degree from zero in each direction. The Indicator shall follow with a smooth perceptible movement.

(2) Repeat step (1) with pitch trim knob set in each of its extreme positions and moving the transmitter 1/2 degree instead of 1/4 degree.

(3) Rotate roll standard transmitter 1/4 degree in each direction from zero. The Indicator shall follow with a smooth perceptible movement.

(4) Repeat steps (3) with roll trim knob set in each of its extreme positions and moving transmitter 1/2 degree instead of 1/4 degree.

g. Follow-up Rate.

(1) Rotate roll transmitter at 300 degrees per second minimum. The Indicator shall follow at 300 degrees per second minimum.

(2) Rotate pitch transmitter at 90 degrees per second minimum. The Indicator shall follow at a minimum of 90 degrees per second.

h. Follow-up Accuracy.

(1) Place roll transmitter in each position listed in table 12. The Indicator readings shall be as specified.

Table 12. Roll Follow-Up Accuracy

Roll Transmitter Setting (degrees)	Indicator Roll Presentation (degrees)
270	90 ± 2 right roll
240	60 ± 2 right roll
210	30 ± 1 right roll
150	30 ± 1 left roll
120	60 ± 2 left roll
90	90 ± 2 left roll

(2) Place pitch transmitter in each position listed in table 13. The Indicator readings shall be as specified.

Table 13. Pitch Follow-Up Accuracy

Pitch Transmitter Setting (degrees)	Indicator Roll Presentation (degrees)
270	90 ± 2 climb
240	60 ± 2 climb
210	30 ± 1 climb
150	30 ± 1 dive
120	60 ± 2 dive
90	90 ± 2 dive

i. Gimbal Freedom.

(1) Rotate roll transmitter 360 degrees. Indicator shall follow smoothly without noticeable sticking, overshooting, jumping, or hunting. Return roll transmitter to 180 degrees.

(2) Repeat step (1) using pitch transmitter. Results shall be same.

j. Hunting and Jumping.

(1) Set amplitude of signals of both pitch transmitter and roll transmitter to zero. There shall be no noticeable hunting or jumping of Indicator with transmitter amplitudes set at zero.

(2) Return amplitude of signals of transmitters to 26 Vat, 400 cps.

(3) Rotate pitch transmitter at a rate between O degrees and 20 degrees per second. Hunting and jumping shall not exceed a peak-to-peak amplitude of 1/8 degree.

(4) Repeat step (3) for pitch transmitter rate between 20 degrees and 90 degrees per second. Peak-to-peak amplitude shall not exceed 1/2 degree.

(5) Repeat step (3) for pitch rate between 90 degrees and 300 degrees per second. Peak-to-peak amplitude shall not exceed 1 degree. Return pitch transmitter to 180 degrees.

(6) Repeat steps (3, 4, and 5) using roll transmitter. The results shall be the same.

k. Power Warning Indicator.

(1) Remove power from Indicator. The word OFF shall immediately appear.

(2) Reapply power to Indicator. The word OFF shall immediately disappear.

1. Interaction,
   (1) Connect two indicators to same pitch transmitter.
   (2) Move pitch trim knob on one Indicator through its range. There shall be no more than 1/2 degree change in indication on other Indicator. Remove second Indicator.

m. Fogging.
   (1) Place Indicator in a controlled temperature of 159.8°F (71°C) for one hour.

Note. Power to Indicator shall be left on during this test.

   (2) While still at this temperature, rub an ice cube on Indicator glass face for a period of 1 minute ± 5 seconds.
   (3) Wipe glass dry. There shall be no evidence of water or oil fog.

n. Lighting.
   (1) Apply 28 volts ac or dc between Indicater connector pins K and L.
   (2) Compare lighting to a standard Lighting shall be comparable.

19. Troubleshooting.

Use table 14 in conjunction with schematic diagram figure 9, to help localize and correct trouble conditions found during testing.

Table 14. Trouble Shooting Data

Trouble	Probable Cause	Remedy
POWER FAILURE FLAG DOES NOT DISAPPEAR UPON APPLICATION OF POWER	Defective power-off warning indicator M1.	Replace indicator.
	Defective resistors R23 and R24.	Replace resistors.
	Defective capacitor C11, C13, and C14.	Replace capacitors.
	Defective diodes CR2 thru CR5.	Replace diodes.
	Defective transformer T1.	Replace transformer.
POWER FAILURE FLAG DOES NOT REAPPEAR ON REMOVAL OF POWER	Defective power-off warning indicator M1.	Replace indicator.
INDICATOR DOES NOT FOLLOW IN PITCH OR WILL NOT ZERO IN PITCH	Defective synchro B1.	Replace synchro.
	Defective transistors Q1 thru Q3 and associated resistors and capacitors.	Replace as applicable.
	Defective motor-tachometer generator MG1.	Replace motor-tachometer generator.
INDICATOR DOES NOT FOLLOW IN ROLL OR WILL NOT ZERO IN ROLL	Defective synchro B2.	Replace synchro.
	Defective transistors Q4 thru Q7 and associated resistors and capacitors.	Replace as applicable.
	Defective motor-tachometer generator MG2.	Replace motor-tachometer generator.
PITCH TRIM KNOB DOES NOT DISPLACE INDICATOR TO MINIMUM REQUIRED POSITIONS	Defective variable resistor R17.	Replace resistor.
	Refective resistors R4 and R5.	Replace resistors.
	Defective capacitors C4 and C2.	Replace capacitors.
ROLL TRIM KNOB DOES NOT DISPLACE INDICATOR TO MINIMUM REQUIRED POSITIONS	Defective variable resistor R14.	Redate resistor.
	Defective resistor R10.	Replace resistor.
	Defective capacitor C6.	Replace capacitor.
INDICATOR HUNTS AND JUMPS	Defective gear train or bearings.	Replace or lubricate as required.
	Detective motor-tachometer generator MG1 and MG2.	Replace motor-tachometer *generator.*

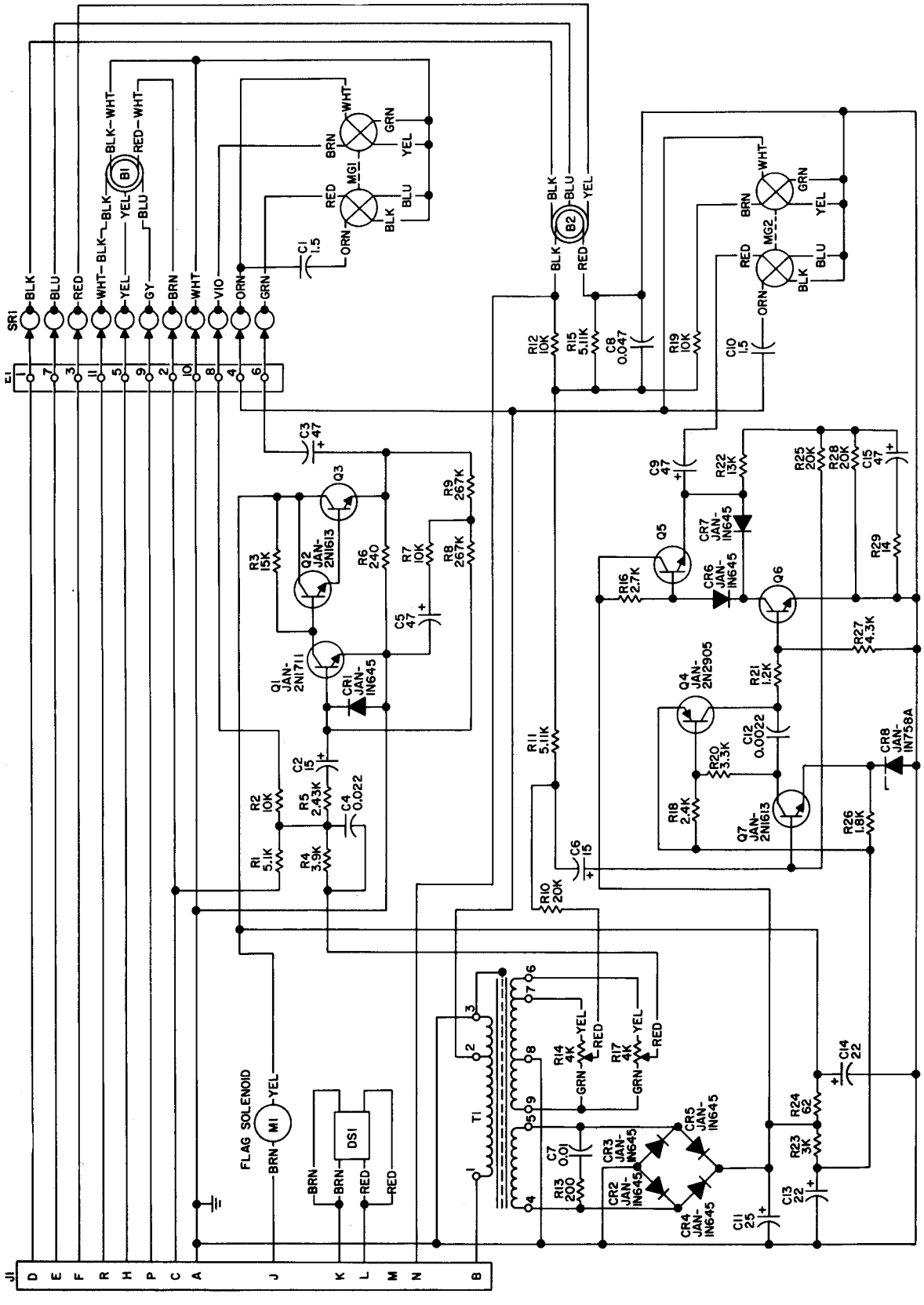


Figure 9. Schematic Diagram for Attitude Indicator, Part Number 141400-01-01

Reference Designation	Figure No.	Index No.
B1	4	32
B2A	4	21
B2B	2	45
C1	4	1
DS1	3	12
E l	2	14
E2	2	28
J1	2	23
Ml	3	18
MG1	4	36
MG2	2	36
R14	3	6
R17	3	8
SR1	4	23
T1	2	19
TB1	4	4
TB2	2	9

Figure 9—Continued

APPENDIX A

REFERENCES

Manual Number	Manual Title
TM 38-750	Army Equipment Records Procedures

By Order of the Secretary of the Army:

HAROLD K. JOHNSON,
General, United States Army,
Chief of Staff.

Official:

KENNETH G. WICKHAM,
Major General, United States Army,
The Adjutant General.

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APPENDIX B (Added) See ch 1

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