

MIL-S-20708/68C(NAVY)
2 March 1988

SUPERSEDING
MIL-S-20708/68B(OS)
3 March 1969

MILITARY SPECIFICATION SHEET

SYNCHRO, TORQUE DIFFERENTIAL TRANSMITTER, TYPE 31TDX6C

This specification is approved for use within the Department of the Navy and is available for use by all Departments and Agencies of the Department of Defense.

The requirements for acquiring the Synchro described herein shall consist of this specification and the latest issue of MIL-S-20708.

TABLE I. Requirements.

Requirement	Value	Unit	Tolerance
Frequency	60	Hz	nominal
Primary Voltage	90	volts	nominal
Primary Current	725	milliamps	maximum
Primary Power	7.7	watts	maximum
Impedance: Zrs	44	ohms	maximum
Impedance Angle: Zrs	27	degrees	minimum
DC Resistance (Line to Line): Rotor	24	ohms	reference
Stator	19	ohms	reference
Transformation Ratio	1.154	-----	+2%
Phase Shift	6.5(lead)	degrees	maximum
Electrical Error	10	minutes	maximum
Friction Torque	0.5	ounce-inches	maximum
Torque Gradient	0.3	ounce-inches per degree	minimum
Temperature Rise	18	degrees (C)	maximum
Weight	126	ounces	nominal
Radial Play	0.0008	inches	maximum
End Play	0.0030	inches	+ 0.0020

This unit shall not be subjected to the altitude requirements of MIL-S-20708.

AMSC N/A

DISTRIBUTION STATEMENT A.

MIL-S-20708/68C(NAVY)

TABLE II. Military part number variant characteristics.

Military Part No. <u>1/</u>	A ± .010	B ± .010	G Maximum	Shaft Style	Terminal End	U + .0000
M20708/68-01C	.700	.730	3.635	Splined	Terminal Board	.2405

1/ Military part number M20708/68-01C shall be the NATO standard.

Note: The suffix letter following the numerical dash number corresponds to the latest modification letter in the type designation.

TABLE III. Military part number cross-references.

SUPERSEDED MILITARY PART NUMBER	NEW MILITARY PART NUMBER
M20708/68B-001	M20708/68-01C

NOTE: All line items shown in Table III refer to equivalent and interchangeable synchros of the same type designation modification. Part number changes do not affect form, fit, or function of the synchros listed therein.

Custodians:
Navy - OS

Preparing Activity:
Navy - OS
(Project No. 5990-N346)

Review Activities:
Navy - SH, AS

User Activities:
Navy - MC, CG

MILITARY SPECIFICATION SHEET
SYNCHRO TORQUE DIFFERENTIAL TRANSMITTER, TYPE 31TDX6c

This amendment forms a part of Military Specification MIL-S-20708/68B(OS) of 3 March 1969, and is approved for use by all Departments and Agencies of the Department of Defense.

Page 1, Change 1

Delete the preamble in its entirety and substitute the following:

"This specification is approved for use by all Departments and Agencies of the Department of Defense."

Page 1, Change 2

Outline drawing, flange diameter designation 3.100 (+.000 -.001): Delete the tolerance "(+.000 -.001)" and substitute the tolerance "(+.000 -.005)".

Page 2

Table 1: Change the "tolerance" values for the requirement "DC Resistance (Line-to-Line) Rotor/Stator" as follows: For both Rotor and Stator delete the tolerance "maximum" and substitute the word "reference".

Preparing Activity:

Navy - OS

Project Number 5990-N061

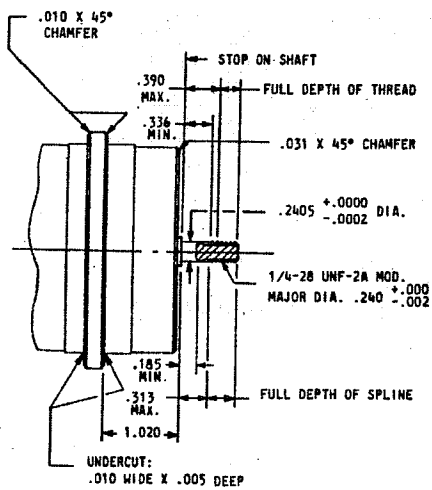
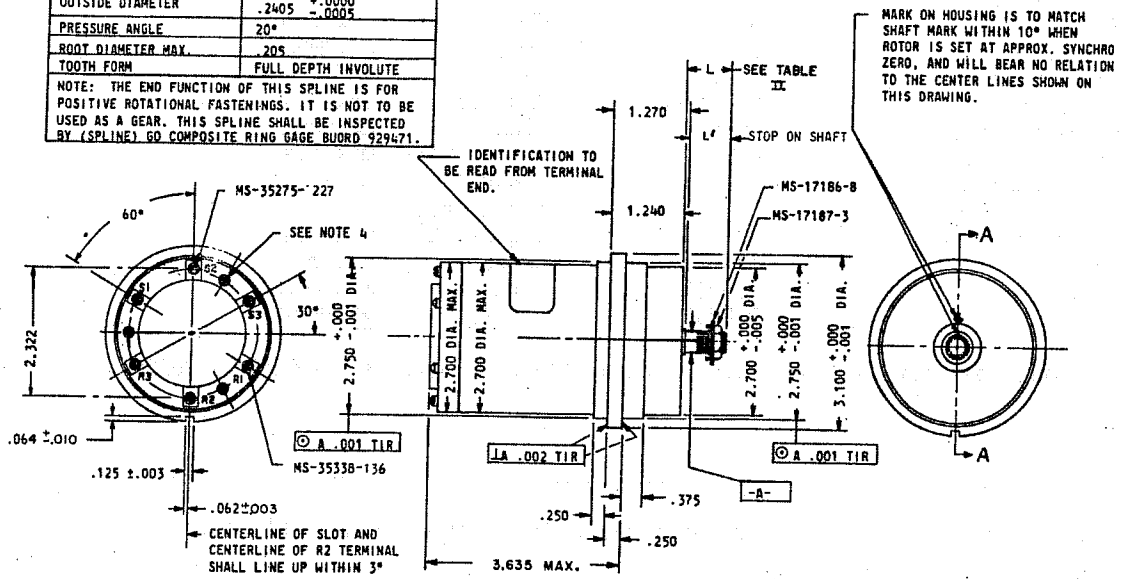
MILITARY SPECIFICATION SHEET
 SYNCHRO TORQUE DIFFERENTIAL TRANSMITTER, TYPE 31TDX6c

This Specification has been Approved by the Ordnance Systems Command, Department of the Navy.
 THE COMPLETE REQUIREMENTS FOR PROCURING THE SYNCHRO DESCRIBED HEREIN SHALL CONSIST OF THIS DOCUMENT AND THE ISSUE IN EFFECT OF SPECIFICATION MIL-S-20708.

SPLINE DATA	
TEETH	22
PITCH	96
PITCH DIAMETER	.2291 +.000 -.002
OUTSIDE DIAMETER	.2405 +.0000 -.0005
PRESSURE ANGLE	20°
ROOT DIAMETER MAX.	.205
TOOTH FORM	FULL DEPTH INVOLUTE

NOTE: THE END FUNCTION OF THIS SPLINE IS FOR POSITIVE ROTATIONAL FASTENINGS. IT IS NOT TO BE USED AS A GEAR. THIS SPLINE SHALL BE INSPECTED BY (SPLINE) GO COMPOSITE RING GAGE BUORD 929471.

UNLESS OTHERWISE SPECIFIED
 DIMENSIONS ARE IN INCHES
 TOLERANCES ON FRACTIONS ±1/64
 DECIMALS ±.005 ANGLES ±2°



NOTES:

- PERPENDICULARITY AND CONCENTRICITY SHALL BE MEASURED WITH THE UNIT IN A VERTICAL POSITION SUPPORTED BY THE SHAFT, THEN THE HOUSING ROTATED.
- RUNOUT OF FEATURE "A" (SMOOTH PORTION) OF SHAFT SHALL NOT EXCEED .0008 TIR.
- END PLAY AND RADIAL PLAY SHALL BE MEASURED DURING THE REVERSAL OF THE FOLLOWING LOADS:
 END PLAY - 1 POUND RADIAL PLAY - 1 POUND
- THE TERMINAL BLOCK SHALL BE SECURED BY SCREWS OTHER THAN THE TERMINAL SCREWS. RECESSES SHALL ALLOW TERMINAL LUG MS-25036-6 TO BE INSTALLED WITH THE BARRELS INBOARD OR OUTBOARD, AND PREVENT THE LUGS FROM TURNING.
- MINOR VARIATIONS OF UNIT CONFIGURATION ARE PERMITTED FOR UNDIMENSIONED DESIGN DETAIL.
- THE FOLLOWING LIST OF HARDWARE, MS-35275-227 MACHINE SCREW (6 REQUIRED), MS-35338-136 LOCK WASHER (6 REQUIRED), MS-17186-8 DRIVE WASHER (1 REQUIRED), MS-17187-3 NUT (1 REQUIRED), SHALL BE PACKAGED IN A VENTILATED ENVELOPE MADE OF MATERIAL HAVING A PH VALUE OF 6-8 THAT IS COMPATIBLE WITH THE WEIGHT OF THE CONTENTS. THEN THE PACKAGED HARDWARE SHALL BE PLACED IN THE UNIT SYNCHRO PACKAGE. FOR INFORMATION ONLY, SEE SYNCHRO CLAMP MS-17185.
- PENDING ISSUANCE OF A QUALIFIED PRODUCTS LIST (QPL) A SAMPLE OF THE SYNCHROS TO BE FURNISHED UNDER THIS SPECIFICATION SHALL BE SUBJECT TO THE PREPRODUCTION TESTS AS SPECIFIED IN MIL-S-20708.

TABLE I

Requirements	Value	Unit	Tolerance
Electrical:			
Excitation Winding	Stator	-----	-----
Frequency	60	Hz	nominal
Primary Voltage	90	volts	nominal
Primary Current	725	milliamps	maximum
Primary Power	7.7	watts	maximum
Impedance:			
Zrs	44	ohms	maximum
Impedance Angle:			
Zrs	27	degrees	minimum
DC Resistance (Line-to-Line)			
Rotor	24	ohms	maximum
Stator	19	ohms	maximum
Transformation Ratio	1.154	----	+2%
Phase Shift	6.5(lead)	degrees	maximum
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Weight	126	ounces	nominal
Radial Play	0.0008	inches	maximum
End Play	0.0030	inches	+0.0020

This unit shall not be subjected to the altitude requirements of MIL-S-20708

Part number: M20708/68B plus applicable dash numbers from Table II.

TABLE II

DASH NO.	SHAFT DIAMETER	SHAFT STYLE	TERMINAL END	L' DIMENSION TO STOP ON SHAFT	L REFERENCE FREE SHAFT LENGTH
*-001	.2405	Splined	Terminal Board	.700 ± .010	.730 ± .010

*Dash number -001 shall be the NATO Standard.

Custodians:	Review Activities:	User Activities:	Preparing Activity:
Navy-AS	Navy-SH,OS	Marine Corp. MC U.S. Coast Guard-CG	Navy-OS Project No. 5990-N-038

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DEPARTMENT OF THE NAVY



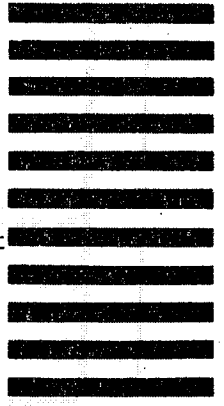
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b. ADDRESS (Street, City, State, ZIP Code)

5. PROBLEM AREAS

a. Paragraph Number and Wording:

b. Recommended Wording:

c. Reason/Rationale for Recommendation:

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7a. NAME OF SUBMITTER (Last, First, MI) - Optional

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