

NOTICE OF  
CANCELLATION

MIL-S-20708/64B(OS)  
NOTICE 1  
29 February 1988

MILITARY SPECIFICATION SHEET

SYNCHRO TORQUE DIFFERENTIAL TRANSMITTER,  
TYPE 31TDX4C

MIL-S-20708/64B, dated 3 March 1969, is hereby canceled without replacement.

Preparing Activity:  
Navy - OS  
(Project No. 5990-N345)

AMSC N/A  
DISTRIBUTION STATEMENT A. Approved for public release; distribution is unlimited. FSC 5990



MILITARY SPECIFICATION SHEET  
SYNCHRO TORQUE DIFFERENTIAL TRANSMITTER, TYPE 31TDX4c

This amendment forms a part of Military Specification MIL-S-20708/64B(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-N060

FSC 5990



MIL-S-20708/64B (OS)  
3 MARCH 1969

SUPERSEDING  
MIL-S-20708/64A(Wep)  
1 APRIL 1960

MILITARY SPECIFICATION SHEET  
SYNCHRO TORQUE DIFFERENTIAL TRANSMITTER, TYPE 3ITDX4c

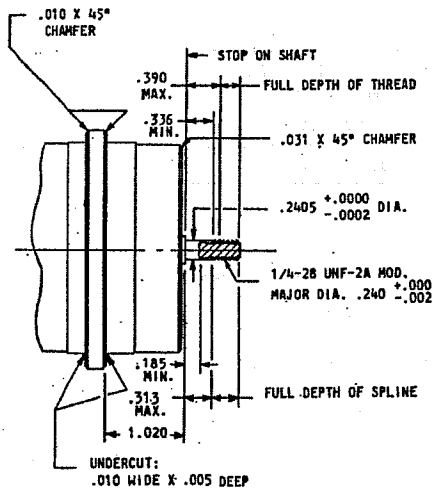
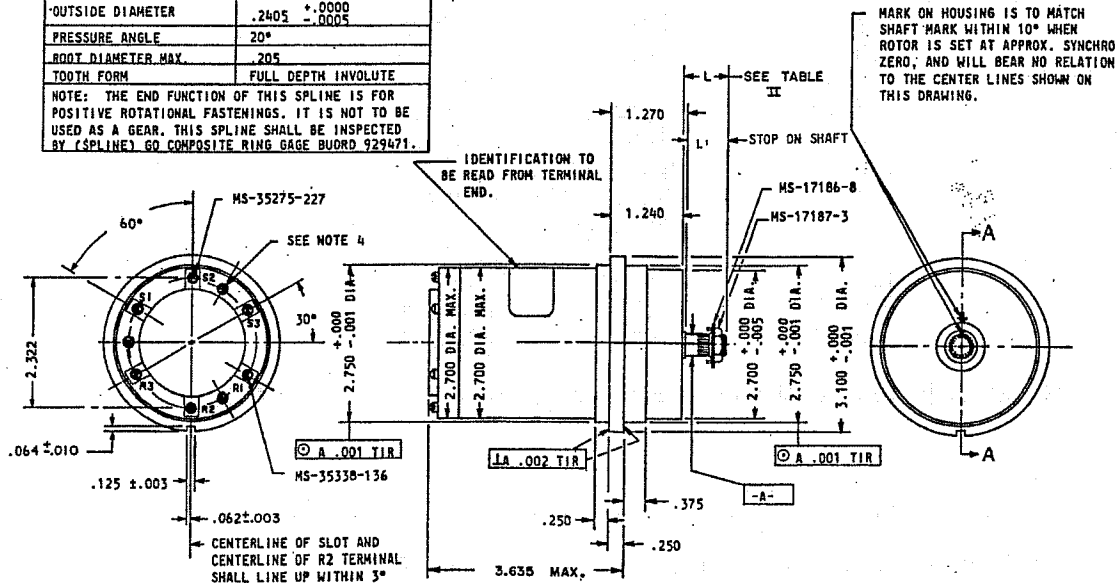
This Specification has been Approved by the Ordnance Systems Command, Department of the Navy.

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 $\begin{smallmatrix} +.000 \\ -.002 \end{smallmatrix}$
OUTSIDE DIAMETER	.2405 $\begin{smallmatrix} +.0000 \\ -.0005 \end{smallmatrix}$
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  $\pm 1/64$   
DECIMALS  $\pm .005$  ANGLES  $\pm 2^\circ$



PARTIAL SECTION  
A - A

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-17183.
- 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.

FSC 5990

SHEET 1 OF 2

TABLE I

Requirements	Value	Unit	Tolerance
<b>Electrical:</b>			
Excitation Winding	Stator	----	-----
Frequency	400	Hz	nominal
Primary Voltage	90	volts	nominal
Primary Current	190	milliamps	maximum
Primary Power	10.2	watts	maximum
<b>Impedance:</b>			
Zrs	4.8	ohms	maximum
<b>Impedance Angle:</b>			
Zrs	44	degrees	minimum
<b>DC Resistance (Line-to-Line)</b>			
Rotor	1.2	ohms	maximum
Stator	1.0	ohms	maximum
Transformation Ratio	1.154	----	+2%
Phase Shift	1.5(lead)	degrees	maximum
Electrical Error	8.0	minutes	maximum
Friction Torque	0.5	ounce-inches	maximum
Torque Gradient	0.6	ounce-inches per degree	minimum
Temperature Rise	20	degrees (C)	maximum
Weight	124	ounces	nominal
Radial Play	0.0008	inch	maximum
End Play	0.0030	inch	+0.0020

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

Part number: M20708/64B plus applicable dash number 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.

Review Activities: Navy-SH,OS  
 User Activities: Marine Corp. MC  
 U.S. Coast Guard-CG  
 Preparing Activity: Navy-OS  
 Project No. 5990-N-036

**SPECIFICATION ANALYSIS SHEET**

Form Approved  
Budget Bureau No. 119-R004

**INSTRUCTIONS**

This sheet is to be filled out by personnel either Government or contractor, involved in the use of the specification in procurement of products for ultimate use by the Department of Defense. This sheet is provided for obtaining information on the use of this specification which will insure that suitable products can be procured with a minimum amount of delay and at the least cost. Comments and the return of this form will be appreciated. Fold on lines on reverse side, staple in corner, and send to preparing activity (as indicated on reverse hereof).

**SPECIFICATION**

MIL-S-20708/64B(OS) SYNCHRO TORQUE DIFFERENTIAL TRANSMITTER, TYPE 31TDX4c

ORGANIZATION (Of submitter)

CITY AND STATE

CONTRACT NO.

QUANTITY OF ITEMS PROCURED

DOLLAR AMOUNT

\$

**MATERIAL PROCURED UNDER A**

DIRECT GOVERNMENT CONTRACT

SUBCONTRACT

1. HAS ANY PART OF THE SPECIFICATION CREATED PROBLEMS OR REQUIRED INTERPRETATION IN PROCUREMENT USE?  
A. GIVE PARAGRAPH NUMBER AND WORDING.

B. RECOMMENDATIONS FOR CORRECTING THE DEFICIENCIES.

2. COMMENTS ON ANY SPECIFICATION REQUIREMENT CONSIDERED TOO RIGID

3. IS THE SPECIFICATION RESTRICTIVE?

YES  NO IF "YES", IN WHAT WAY?

4. REMARKS (Attach any pertinent data which may be of use in improving this specification. If there are additional papers, attach to form and place both in an envelope addressed to preparing activity)

SUBMITTED BY (Printed or typed name and activity)

DATE

FOLD

---

DEPARTMENT OF THE NAVY  
Naval Ordnance Systems Command  
Washington, D.C. 20360

POSTAGE AND FEES PAID  
NAVY DEPARTMENT

OFFICIAL BUSINESS

NAVAL ORDNANCE SYSTEMS COMMAND (ORD 9343)  
DEPARTMENT OF THE NAVY  
WASHINGTON, D. C. 20360

---

FOLD