

Synchro, Control Transformer, Type 16CTB4b

FSC 5990

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SAE AS20708/25

1. SCOPE:

- 1.1 This specification covers the detail requirements for control transformer synchro, type 16CTB4b, 90 volt, 400 cycle.

2. APPLICABLE DOCUMENTS:

- 2.1 The following specifications, standards, and drawings of the issue in effect on date of invitation for bids form a part of this specification.

SPECIFICATION

MILITARY

MIL-I-16557 Ink, Marking, quick-drying (for non-porous surfaces)

MIL-S-20708 Synchros, 60 and 400 cycles, General Specifications for

DRAWINGS

BUREAU OF ORDNANCE

643019 Clamp Assembly

643090 Washer, Drive

644594 Nut

LD 255268 Stock Material for Precision Instrument Components

SA 2412503 Gage, Spline

(Copies of specifications, standards, and drawings required by contractors in connection with specific procurement functions should be obtained from the procuring agency or as directed by the contracting officer.)

3. REQUIREMENTS:

3.1 Qualification:

Except as specified in par. 3.1.1, synchros covered by this specification shall be a product which has been tested and qualified in accordance with Specification MIL-S-20708.

- 3.1.1 Preproduction sample: Pending issuance of a Qualified Products List (Q.P.L.), a sample (see 4.1.1.1) of the synchros to be furnished under this specification shall be subjected to the preproduction tests as specified in Specification MIL-S-20708.

3.2 Requirements:

All requirements shall be in accordance with Specification MIL-S-20708 except as otherwise specified herein.

- 3.2.1 Salt spray requirement: Not applicable.

- 3.2.2 Design and construction: The synchro shall be of the design, construction, and physical dimensions specified in Figure 1, and shall be complete, including all hardware shown and identified thereon.

- 3.2.3 Performance requirements: The values applicable to the synchro shall be as specified in Table I.

TABLE I. - Synchro, Control Transformer, Type 16CTB4b

Requirement	Unit	Value
Frequency	Cycles	400
Primary voltage (nominal)	Volts	90
Primary current (maximum)	Milliamps	24
Primary power (maximum)	Watts	0.35
Transformation ratio $\pm 2\%$		0.735
Electrical error (maximum)	Minutes	10
Null voltage total (maximum)	Millivolts	60
Fundamental component of null voltage (maximum)	Millivolts	40
Friction torque (maximum)	Ounce-inches	0.05
Phase shift	Degrees	8.0 (lead)
Primary impedance (Z_p)	Ohms	$\frac{1}{}$
Secondary impedance (Z_s)	Ohms	$\frac{1}{}$

$\frac{1}{}$ As specified by the Bureau of Ordnance (see 6.1).

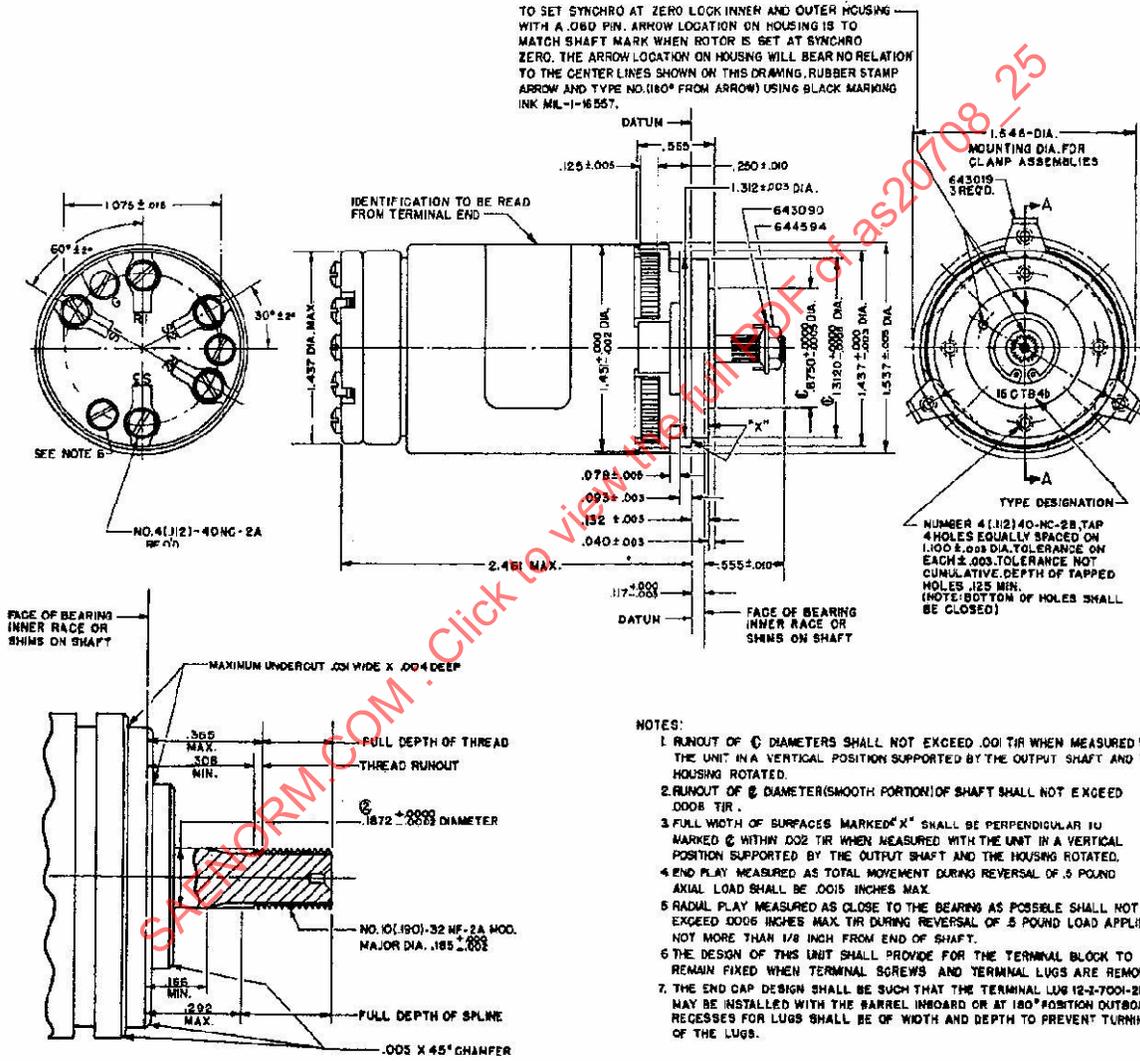
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SPLINE DATA	
TEETH	21
PITCH	120
PITCH DIAMETER	.172 ^{+0.002}
OUTSIDE DIAMETER	.1872 ^{+0.0005}
PRESSURE ANGLE	20°
ROOT DIAMETER MAX.	.155
TOOTH FORM	FULL DEPTH INVOLUTE

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 GO, NO GO SPLINE RING GAGE SAE#15505

GEAR DATA	
TEETH	96
PITCH	72
PITCH DIAMETER	1.3331 ^{+0.0002}
OUTSIDE DIAMETER	1.3811 ^{+0.0005}
PRESSURE ANGLE	20°
ROOT DIAMETER MAX.	1.2958
TOOTH FORM	FULL DEPTH INVOLUTE

NOTE: O.D. OF GEAR TO BE CONCENTRIC TO 1.3120 DIA. COLLAR WITHIN .0015 (SHAFT TO BE LOCKED TO OUTER HOUSING AND SHAFT MARK TO BE IN LINE WITH OUTER HOUSING ARROW).



- NOTES:
1. RUNOUT OF ϕ DIAMETERS SHALL NOT EXCEED .001 TIR WHEN MEASURED WITH THE UNIT IN A VERTICAL POSITION SUPPORTED BY THE OUTPUT SHAFT AND THE HOUSING ROTATED.
 2. RUNOUT OF ϕ DIAMETER (SMOOTH PORTION) OF SHAFT SHALL NOT EXCEED .0008 TIR.
 3. FULL WIDTH OF SURFACES MARKED "X" SHALL BE PERPENDICULAR TO MARKED ϕ WITHIN .002 TIR WHEN MEASURED WITH THE UNIT IN A VERTICAL POSITION SUPPORTED BY THE OUTPUT SHAFT AND THE HOUSING ROTATED.
 4. END PLAY MEASURED AS TOTAL MOVEMENT DURING REVERSAL OF 5 POUND AXIAL LOAD SHALL BE .0015 INCHES MAX.
 5. RADIAL PLAY MEASURED AS CLOSE TO THE BEARING AS POSSIBLE SHALL NOT EXCEED .0005 INCHES MAX. TIR DURING REVERSAL OF 5 POUND LOAD APPLIED NOT MORE THAN 1/8 INCH FROM END OF SHAFT.
 6. THE DESIGN OF THIS UNIT SHALL PROVIDE FOR THE TERMINAL BLOCK TO REMAIN FIXED WHEN TERMINAL SCREWS AND TERMINAL LUGS ARE REMOVED.
 7. THE END CAP DESIGN SHALL BE SUCH THAT THE TERMINAL LUG 12-2-7001-2815 MAY BE INSTALLED WITH THE BARREL INBOARD OR AT 180° POSITION OUTBOARD RECESSES FOR LUGS SHALL BE OF WIDTH AND DEPTH TO PREVENT TURNING OF THE LUGS.

FIGURE 1 - Synchro, Control Transformer Type 16CTB4b