



EMB145 - EMB135

AIRCRAFT
MAINTENANCE MANUAL

TORQ-SET SCREWS - MAINTENANCE PRACTICES

EFFECTIVITY: ALL

1. General

- A. This section gives technical specifications of TORQ-SET screws (basic P/N PE21101), which are alternative to TRI-WING screws (basic P/N PE21088) and used in structural regions of the aircraft. A table of special tools for installation/removal of TORQ-SET screws is also included (Tables 207 and 208).



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2. TRI-WING and TORQ-SET Screws Specification

A. TRI-WING Screws - basic P/N PE21088, as shown in Figure 201 and Tables 201 and 202.

(1) MATERIAL:

Steel alloy 4340, specification MIL-S-5000 or 8740 specification AMS6322 (alternative: steel 3ONCDI6, specification AIR 9160). Corrosion-resistant steel A286, specification AMS5731 or AMS5737. Titanium alloy 6A1-4V specification AMS4928 or AMS4967.

(2) FINISH:

Passivated screws - passivate to obey NAS4003 requirements. Cadmium-plated screws - plate to obey QQ-P-416, type II, class 2. Brittleness test (QQ-P-416) is not necessary. Aluminized screws - aluminize to obey MIL-C-83488, class 2.

(3) HEAT TREATMENT:

Minimum tensile strength of 1103 MPa (160 ksi). Minimum shear strength of 655 MPa (95 ksi).

Table 201 - TRI-WING SCREWS-BASIC P/N PE21088

BASIC DIMENSIONS					
SCREW THREAD	ØC	ØD	E (MAX)	F (MAX)	M (MAX)
#10-32UNF-3A	0.430 0.417	0.189 0186	0.056	0.010	0.031
14-28UNF-3A	0.540 0.527	0.249 0.246	0.068	0.012	0.031

Table 202 - TRI-WING SCREWS-BASIC P/N PE21088

DASH NUMBER	LENGTH	# 10-32UNF-3A			DASH NUMBER	LENGTH	1/4-28UNF-3A	
		A	B	TOL			A	B
-47	11/32	3/32	+ 1/32 0			11/32		
-49	15/32	1/8				15/32		
-51	19/32	5/32		-96	19/32	3/16	+1/32 0	
-52	21/32	7/32				21/32		
-57	31/32	17/32			1 5/32	31/32		
	1 5/32	-105				19/32	± 1/64	

NOTE: Unless specified differently, all dimensions are given in inches.

(4) CODING:

Basic P/N - PE21088. Add "S" after the dash number to show screw in steel alloy. Add "C" after the dash number to show screw in corrosion-resistant steel. Add "T" after the dash number to show screw in titanium alloy. Add "P" after the material code letter to show passivated screws (corrosion-resistant steel). Add "D" after the material code letter to show

cadmium-plated screws (steel alloy or corrosion-resistant steel). Add "A" after the material code letter to show aluminized screw (titanium alloy). No letter after the material code letter shows unfinished screw (for titanium alloy only).

Example of Part Number:

Table 203

PE21088 - 105 T A (Screw, titanium alloy, aluminized, screw thread 1/4 - 28 UNF - 3a, 1 5/32 long), where:	
PE21088	Correspond to an basic P/N.
105	Corresponds to length, grip, screw thread, and nominal diameter (See Tables 201 and 202).
T	Correspond to material code (See items (1) and (4)).
A	Correspond to finish code (See items (2) and (4)).

- B. TORQ-SET Screws, Basic P/N PE21101, as shown in Figure 202 and Tables 203, 204, 205 and 206.

Example of Part Number:

Table 204

PE21101 - 3 - 1 C D (Screw, corrosion-resistant steel, cadmium-plated, screw thread 10-32UNF - 3A, 13/32 long), where:	
PE21101	Correspond to an basic P/N
3	Correspond to screw thread and nominal diameter (See Table 203 and Table 204)
1	Correspond to length and grip (See Table 201 and Table 202)
C	Correspond to material code (See Table 205 and Table 206)
D	Correspond to finish code (See Table 205 and Table 206)

3. TORQ-SET Screws, alternative to TRI-WING screws

- A. TORQ-SET screws, alternative to TRI-WING screws, with the related tools, are given in Tables 207 and 208.

Table 205 - TORQ-SET SCREWS - BASIC P/N PE21101

BASIC DIMENSIONS							
1st DASH NUMBER	SCREW THREAD	ØC	ØD	E	F (REF)	M (MAX)	RECESS SIZE PER MS14191
-3	#10-32UNF-3A	0.385 0.371	0.189 0.186	0.051 0.048	0.010	0.031	8
-4	1/4-28UNF-3A	0.514 0.488	0.249 0.246	0.069 0.062	0.012	0.031	10

Table 206 - TORQ-SET SCREWS - BASIC P/N PE21101

LENGTH AND GRIP		
2 nd DASH NUMBER	B GRIP ± 0.010	A $+ 0.015$ 0
-1	1/16	13/32
-2	1/8	15/32
-3	3/16	17/32
-4	1/4	19/32
-5	5/16	21/32
-6	3/8	23/32
-7	7/16	25/32
-8	1/2	27/32
-9	9/16	29/32
-10	5/8	31/32
-11	11/16	1. 1/32
-12	3/4	1. 3/32
-13	13/16	1. 5/32
-14	7/8	1. 7/32
-15	15/16	1. 9/32

NOTE: Unless otherwise specified, all dimensions are given in inches.

Table 207 - CODING

MATERIAL CODE	MATERIAL
-S	STEEL ALLOY 4340 PER MIL-S-5000, OR 8740 PER AMS 6322, OR AN ALLOY INTERCHANGEABLE WITH STEEL ALLOY, 30 NCD16 PER AIR 9160
-C	CORROSION RESISTANT STEEL A 286 PER AMS 5731 OR AMS 5737
-T	TITANIUM ALLOY 6AI-4V PER AMS 4928 OR AMS 4967

NOTE: HEAT TREATMENT

Tensile strength minimum, 1103 MPa (160 ksi).

Shear strength minimum, 655 MPa (95 ksi).

Table 208 - CODING

FINISH CODE	FINISH
P	PASSIVATED, CORROSION RESISTANT STEEL PER NAS 4003
D	CADMIUM PLATED STEEL ALLOY OR CORROSION RESISTANT STEEL PER QQ-P-416, TYPE II, CLASS 2 NOTE BRITTLENESS TEST PER QQ-P-416 IS NOT REQUIRED
A	ALUMINIZED TITANIUM PER MIL-C-83488, CLASS 2

Table 209 - ALTERNATIVE SCREWS FOR TORQ-SET SCREWS

SCREW	
TRI-WING	TORQ-SET (ALTERNATIVE)
NAS4503-4	NAS1993C5PT
NAS4503U()	NAS2833C()PT
NAS4306A()	NAS2833T() PT
NAS4604A()	NAS2834T()PT
NAS4703-()	NAS1993-()T
NAS4703D()	NAS1993-()DT
NAS4704-()	NAS1994-()T
NAS4803A()	NAS1993C()PT
PE21088-()()	PE21101-()()()

Table 210 - ALTERNATIVE TOOLS FOR TORQ-SET SCREWS

TORQ-SET SCREWS	SPECIAL TOOL USED FOR TORQ-SET SCREW	P/N PHILIPS SCREW CO
SPECIFICATION	SPECIFICATION	
NAS1993C5PT	NASM14191 No.8	170-8-ACR
NAS2833C()PT	NASM14191 No.8	170-8-ACR
NAS2833T()PT	NASM14191 No.8	170-8-ACR
NAS2834T()PT	NASM14191 No.10	170-10-ACR
NAS1993-()T	NASM14191 No.8	170-8-ACR
NAS1993-()DT	NASM14191 No.8	170-8-ACR
NAS1994-()T	NASM14191 No.10	170-10-ACR
NAS1993C()PT	NASM14191 No.8	170-8-ACR
PE21101-3-()()	NASM14191 No.8	170-8-ACR
PE21101-4-()()	NASM14191 No.10	170-10-ACR

- B. To find the alternative TORQ-SET P/N (basic P/N PE21101), the example below is applicable:
- (1) Example of alternative Torq-Set P/N (basic P/N PE21101).

Used PE21088-105TA

Alternative PE21101 - 4 - (*) (*) (*), where:

PE21101 - Correspond to an Basic P/N.

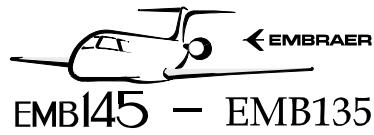
4 - Correspond to screw thread and nominal diameter (See [Table 203](#) and [Table 204](#)).

(*) - Correspond to length and grip (See [Table 203](#) and [Table 204](#)).

(*) - Correspond to material code (See [Table 205](#) and [Table 206](#)).

(*) - Correspond to finish code (See [Table 205](#) and [Table 206](#)).

(*)(*)(*) - These dash numbers must be determined as per the Tables 203, 204, 205 and 206.



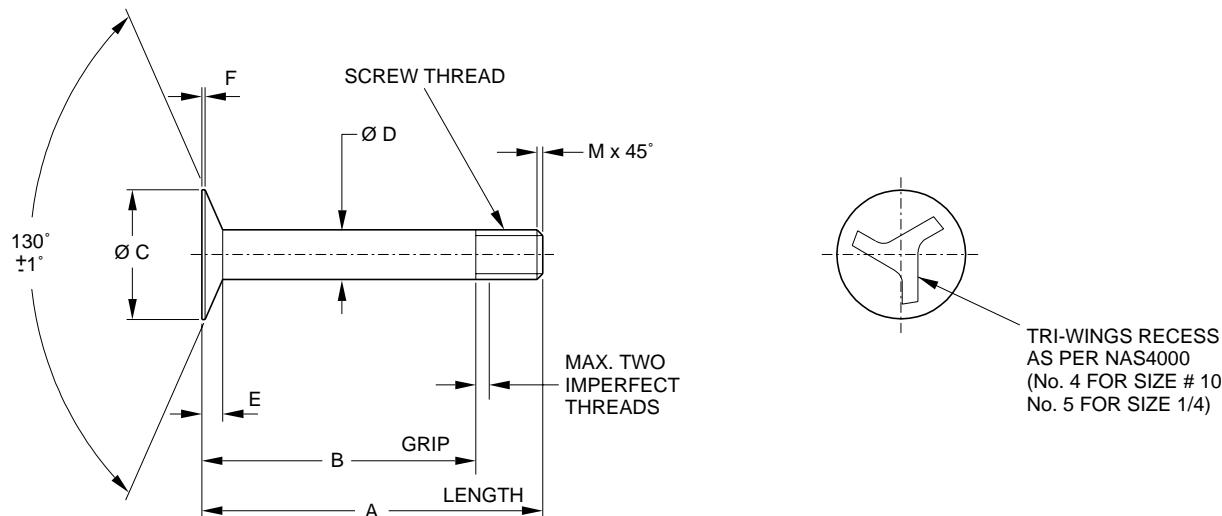
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NOTE: For installation of Torq-Set screws, refer to section 20-10-01 as to general torquing information.

EFFECTIVITY: ALL

Tri-Wing Screws-Basic P/N PE21088

Figure 201



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EFFECTIVITY: ALL
Torq-Set Screws-Basic P/N PE21101
Figure 202
