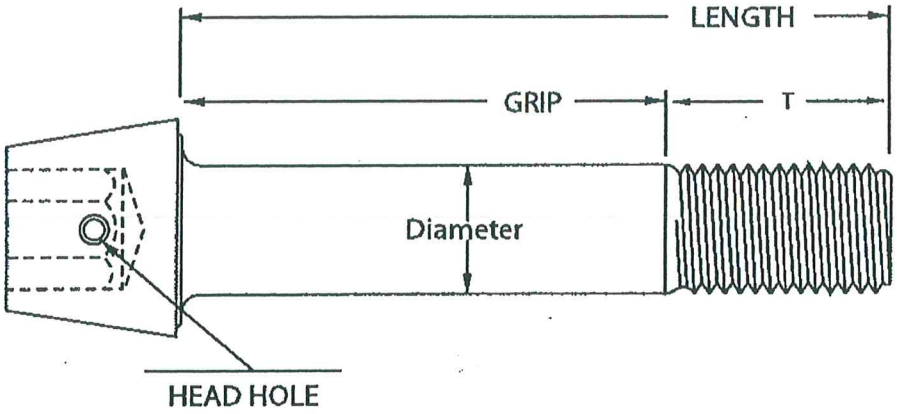
Genuine Aircraft Hardware Co.

MS20004 thru MS20024

Diameter / Head Size / Thread Lengths



HELP WITH THE SELECTION OF PART NUMBERS

The first three numbers after "MS" designates the Design of the bolt. Alloy Steel 160 Ksi. Tensile, 96 Ksi shear; CAD II Plated.
The two numbers after MS200 designate the diameter of the bolt.

ADD (-) After the first five numbers for no safety wire holes in the head..
ADD (H) After the first five numbers for safety wire holes in the head.
NOTE: THIS SERIES BOLT IS NOT AVAILABLE WITH HOLES IN THE SHANK. Supersedes NAS144 thru 158.

The last numerals ( ) ( ) in the part # designate (GRIP) length in 1/16ths of an inch. ADD the "T" dimension to get (OVERALL) length.
Grip length of bolts shall be measured from the underside of the head to the end of the full cylindrical portion of the shank.

Examples of part numbers:

MS20007-16 7/16 DIAMETER, 20 THREADS PER INCH, 1.00 INCHES GRIP LENGTH, 1.812 OVERALL, NO HOLES IN HEAD.
MS20007H16 7/16 DIAMETER, 20 THREADS PER INCH, 1.00 INCHES GRIP LENGTH, 1.812 OVERALL, HOLES IN HEAD.

NOTE: all dimensions in inches

MS200( )( )	THREAD DIA/PITCH	DIA. MAX	DIA. MIN	WRENCH SIZE	" T " DIMENSION	HEAD DIA. + 0R - .005	REC. WASHER UNDER HEAD	REC. WASHER UNDER NUT
04	1/4-28	.2492	.2477	3/16	0.437	0.433	MS20002C4	MS20002-4
05	5/16-24	.3117	..3102	7/32	0.537	0.526	MS20002C5	MS20002-5
06	3/8-24	.3742	.3727	5/16	0.662	0.645	MS20002C6	MS20002-6
07	7/16-20	.4367	.4347	5/16	0.787	0.730	MS20002C7	MS20002-7
08	1/2-20	.4991	.4971	3/8	0.787	0.823	MS20002C8	MS20002-8
09	9/16-18	.5616	.5596	7/16	0.850	0.933	MS20002C9	MS20002-9
10	5/8-18	.6240	.6220	1/2	0.912	1.045	MS20002C10	MS20002-10
12	3/4-16	.7488	.7468	9/16	1.037	1.225	MS20002C12	MS20002-12
14	7/8-14	.8737	.8707	5/8	1.162	1.443	MS20002C14	MS20002-14
16 *	1 "-14	.9985	.9955	3/4	1.287	1.620	MS20002C16	MS20002-16
17	1 "-12	.9985	.9955	3/4	1.287	1.620	MS20002C16	MS20002-16
18	1 1/8"-12	1.124	1.121	3/4	1.475	1.870	MS20002C18	MS20002-18
20	1 1/4"-12	1.249	1.246	1 "	1.600	2.120	MS20002C20	MS20002-20
22	1 3/8"-12	1.374	1.370	1 1/8	1.725	2.308	MS20002C22	MS20002-22
24	1 1/2"-12	1.499	1.495	1 1/4	1.850	2.495	MS20002C24	MS20002-24

* 1"-14 thread pitch inactive for new design.

Documents in this book for REFERENCE ONLY, not intended for design. Not guaranteed for accuracy.

Genuine Aircraft Hardware Co.

Cross Reference Chart

NAS144-148 TO MS20004-MS20008

ORDER BY MS2000(x) NUMBERS

SEE PREVIOUS PAGES FOR PART NUMBER BREAKDOWN

Measure this NAS series by O.A.L. Under the head					MS by Grip in 1/16"	
MS20004-(X)	MS20005-(X)	MS20006-(X)	MS20007-(X)	MS20008-(X)	Replace (x) for dia. in prefix, for grip suffix	
OLD NAS144 DASH NUMBER	OLD NAS145 DASH NUMBER	OLD NAS146 DASH NUMBER	OLD NAS147 DASH NUMBER	OLD NAS148 DASH NUMBER	NEW MS2000(x)-(x) Dash Number	DECIMAL GRIP LENGTH
NAS144-9	NAS145-10	NAS146-12	NAS147-14	NAS148-14	1	0.063
NAS144-10	NAS145-11	NAS146-13	NAS147-15	NAS148-15	2	0.125
NAS144-11	NAS145-12	NAS146-14	NAS147-16	NAS148-16	3	0.188
NAS144-12	NAS145-13	NAS146-15	NAS147-17	NAS148-17	4	0.250
NAS144-13	NAS145-14	NAS146-16	NAS147-18	NAS148-18	5	0.313
NAS144-14	NAS145-15	NAS146-17	NAS147-19	NAS148-19	6	0.375
NAS144-15	NAS145-16	NAS146-18	NAS147-20	NAS148-20	7	0.438
NAS144-16	NAS145-17	NAS146-19	NAS147-21	NAS148-21	8	0.500
NAS144-17	NAS145-18	NAS146-20	NAS147-22	NAS148-22	9	0.563
NAS144-18	NAS145-19	NAS146-21	NAS147-23	NAS148-23	10	0.625
NAS144-19	NAS145-20	NAS146-22	NAS147-24	NAS148-24	11	0.688
NAS144-20	NAS145-21	NAS146-23	NAS147-25	NAS148-25	12	0.750
NAS144-21	NAS145-22	NAS146-24	NAS147-26	NAS148-26	13	0.813
NAS144-22	NAS145-23	NAS146-25	NAS147-27	NAS148-27	14	0.875
NAS144-23	NAS145-24	NAS146-26	NAS147-28	NAS148-28	15	0.938
NAS144-24	NAS145-25	NAS146-27	NAS147-29	NAS148-29	16	1.000
NAS144-25	NAS145-26	NAS146-28	NAS147-30	NAS148-30	17	1.063
NAS144-26	NAS145-27	NAS146-29	NAS147-31	NAS148-31	18	1.125
NAS144-27	NAS145-28	NAS146-30	NAS147-32	NAS148-32	19	1.188
NAS144-28	NAS145-29	NAS146-31	NAS147-33	NAS148-33	20	1.250
NAS144-29	NAS145-30	NAS146-32	NAS147-34	NAS148-34	21	1.313
NAS144-30	NAS145-31	NAS146-33	NAS147-35	NAS148-35	22	1.375
NAS144-31	NAS145-32	NAS146-34	NAS147-36	NAS148-36	23	1.438
NAS144-32	NAS145-33	NAS146-35	NAS147-37	NAS148-37	24	1.500
NAS144-33	NAS145-34	NAS146-36	NAS147-38	NAS148-38	25	1.563
NAS144-34	NAS145-35	NAS146-37	NAS147-39	NAS148-39	26	1.625
NAS144-35	NAS145-36	NAS146-38	NAS147-40	NAS148-40	27	1.688
NAS144-36	NAS145-37	NAS146-39	NAS147-41	NAS148-41	28	1.750
NAS144-37	NAS145-38	NAS146-40	NAS147-42	NAS148-42	29	1.813
NAS144-38	NAS145-39	NAS146-41	NAS147-43	NAS148-43	30	1.875
NAS144-39	NAS145-40	NAS146-42	NAS147-44	NAS148-44	31	1.938
NAS144-40	NAS145-41	NAS146-43	NAS147-45	NAS148-45	32	2.000
NAS144-41	NAS145-42	NAS146-44	NAS147-46	NAS148-46	33	2.063
NAS144-42	NAS145-43	NAS146-45	NAS147-47	NAS148-47	34	2.125
NAS144-43	NAS145-44	NAS146-46	NAS147-48	NAS148-48	35	2.188
NAS144-44	NAS145-45	NAS146-47	NAS147-49	NAS148-49	36	2.250
NAS144-45	NAS145-46	NAS146-48	NAS147-50	NAS148-50	37	2.313
NAS144-46	NAS145-47	NAS146-49	NAS147-51	NAS148-51	38	2.375
NAS144-47	NAS145-48	NAS146-50	NAS147-52	NAS148-52	39	2.438
NAS144-48	NAS145-49	NAS146-51	NAS147-53	NAS148-53	40	2.500
NAS144-49	NAS145-50	NAS146-52	NAS147-54	NAS148-54	41	2.563
NAS144-50	NAS145-51	NAS146-53	NAS147-55	NAS148-55	42	2.625
NAS144-51	NAS145-52	NAS146-54	NAS147-56	NAS148-56	43	2.688
NAS144-52	NAS145-53	NAS146-55	NAS147-57	NAS148-57	44	2.750
NAS144-53	NAS145-54	NAS146-56	NAS147-58	NAS148-58	45	2.813
NAS144-54	NAS145-55	NAS146-57	NAS147-59	NAS148-59	46	2.875
NAS144-55	NAS145-56	NAS146-58	NAS147-60	NAS148-60	47	2.938
NAS144-56	NAS145-57	NAS146-59	NAS147-61	NAS148-61	48	3.000
NAS144-57	NAS145-58	NAS146-60	NAS147-62	NAS148-62	49	3.063
NAS144-58	NAS145-59	NAS146-61	NAS147-63	NAS148-63	50	3.125

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COSTRUZIONI AERONAUTICHE TECNAM

BOLLETTINO DI SERVIZIO
SERVICE BULLETIN

N°**23-UL**

Data/Date: Edition 1 of 12th September 2011

Rev. 2 of 13th September 2011 / Rev. 3 of 29th December 2011

Informazione ❑ ***Information***	**Raccomandazione** ☒ ***Recommendation***	**Prescrizione** ❑ ***Mandatory***

VELIVOLI INTERESSATI	• **P92 serie fino al sn 1400 (incluso) esclusi sn*1368, 1370, 1376, 1377,1392, 1394,1396,1399*** • **P2002 serie fino al sn 482(incluso) esclusi *sn397, 462, 469, 471, 472*** • **P2004 tutti i sn** • ***P2008* serie fino al sn *033* (incluso) esclusi *sn028, 031, 032*** **Questo Bollettino di Servizio è applicabile a tutti i suddetti velivoli il cui carrello principale è collegato con dati tipo MS21042-5 e MS21042-L6, fatta eccezione per collegamenti di tipo metrico.**
A/C AFFECTED	*-P92 series up to sn1400(included) excluded sn1368, 1370, 1376, 1377,1392, 1394,1396,1399* *-P2002 series up to sn482(included) excluded sn397, 462, 469, 471, 472* *-P2004 All sn* *-P2008 series up to sn033(included) excluded sn028, 031, 032* *This Service Bulletin is applicable to all above aircrafts equipped with main landing gear nuts type MS21042-5 and MS21042-L6, except for metric fittings.*
TERMINI DI ESECUZIONE ***TIME OF COMPLIANCE***	A scelta del cliente. *At Customer's choice*
LUOGO DI ESECUZIONE ***WORKING PLACE***	Sul posto. *On place.*

OGGETTO: Sostituzione dei dadi attacco carrello principale;
Subject: *Main landing gear nuts substitution;*

SCOPO: Al fine di migliorare il collegamento tra le gambe del carrello principale e la fusoliera è possibile installare un nuovo kit di dadi tipo MS. Per i dadi di tipo metrico non si raccomanda la sostituzione, a tal fine si richiede un'ispezione delle parti interessate per valutare la tipologia dei dadi installati.
Scope: *In order to improve the connection between the main landing gear legs and the fuselage is possible to install a new kit of MS nuts. For metric nuts is not recommended a substitution, for this reason is required a inspection of interested parts to evaluate the type of nuts installed.*

Materiale richiesto: Nuovo kit di dadi (KIT n° SB023UL) con le istruzioni di installazione in allegato;
Required material: *New kit nuts (KIT n° SB023UL) is available with installation instructions attached;*

Ore lavoro richieste: 1 ora;
Manpower: *1 man-hour;*

Peso e centraggio: Nil;
WEIGHT AND BALANCE: *Nil;*

Attrezzature speciali: Non sono richieste attrezzature speciali;
Special tooling: *No special tools are required;*

Riferimenti: AMM e AFM;
Reference: *AMM and AFM;*

WARNING

For P92 and P2004 nuts installation refer to instructions furnished from page 3 to page 5 of this Service Bulletin.
Per il P92 e il P2004 le istruzioni di installazione dei dadi sono riportate dalla pagina 3 alla pagina 5 del presente Bollettino di Servizio.

For P2002 nuts installation refer to instructions furnished from page 6 to page 8 of this Service Bulletin.
Per il P2002 le istruzioni di installazione dei dadi sono riportate dalla pagina 6 alla pagina 8 del presente Bollettino di Servizio.

For P2008 nuts installation refer to instructions furnished from page 9 to page 11 of this Service Bulletin.
Per il P2008 le istruzioni di installazione dei dadi sono riportate dalla pagina 9 alla pagina 11 del presente Bollettino di Servizio.

INSTRUCTIONS

The followings instructions are applicable to P92 and P2004 series:
Le istruzioni sono in riferimento alla serie P92 e P2004:

1. Aircraft preparation

1. Preparazione velivolo

1) Park the aircraft in a closed hangar;
- Parcheggiare il velivolo in un hangar chiuso

2) MASTER SWITCH: OFF;
- Interruttore generale: OFF

3) Parking brake: ON;
- Freno di parcheggio: ON

3) Make the aircraft in safety position;
- Assicurarsi che il velivolo sia in una posizione di sicurezza

4) Prepare the KIT n°023UL composed by the followings items:
- Preparare il KIT n°023UL composto da:

Description	*Part number*	*QTY*
Stop nut for lateral bolts	AN365-524A	4
Stop nut for central bolts	AN365-624A	2

2. MLG (Main Landing Gear) preparation

2. Preparazione carrello principale

1) Remove the following covers (See figure 1, LH side showed) from the LH and RH side (Note: this operation is not necessary for P92 Echo Classic version):
- Rimuovere le seguenti coperture (Figura 1 – lato SX mostrato) dai lati DX e SX (Nota: questa operazione non è necessaria per il P92 vs. Echo Classic):
  1. *Strut fairing lower LH and RH – P/N 92-1-402-1/2;*
  - Carenatura inferiore lato SX/DX - P/N 92-1-402-1/2;
  2. *Cover skin MLG leg attachment LH and RH – P/N 21-2-646-1/2;*
  - Copertura attacco carello principale-fusoliera lato DX/SX - *P/N 21-2-646-1/2*;
  3. *MLG central bolt inspection cup – P/N 22-2-523-1;*
  - Tappo di ispezione – P/N 22-2-523-1;

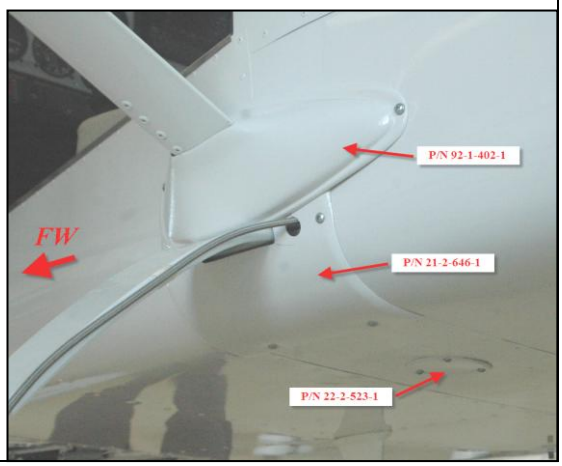


Figure 1. Covers removing (Left Side)

4. *Remove the pilot and co-pilot seats;*
- Rimuovere i sedili pilota e co-pilota;
5. *Remove (if presents) two plane LH and RH (P/N 24-12-126-3/4) located under the seats;*
- Rimuovere (se presente) i due pannelli DX/SX (P/N 24-12-126-3/4) situati sotto i sedili;
6. *Jack aircraft according to AMM;*
- Effettuare l'operazione di sospensione come indicato nel AMM

3. MLG nuts substitution
3. Sostituzione dati attacco carello principale-fusoliera

1) *Replace the laterals and central nuts according to following figure 2 and applying the torque values indicated in table 1:*

- Sostituire i tre bulloni come illustrato nella figura 2 applicando i valori di coppia indicati nella tabella 1

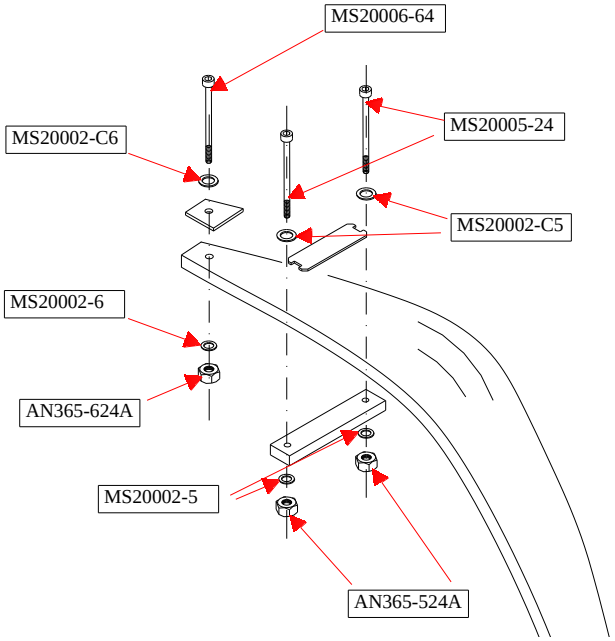


Figure 2. MLG leg attachment

Description	*Part number*	*QTY*	*Torque value*
Central bolts	MS20006-64	2	//
Lateral bolts	MS20005-24	4	//
Stop nut for lateral bolts	AN365-524A	4	15 +/- 1 Nm
Stop nut for central bolts	AN365-624A	2	25 +/- 2 Nm
Washer under Lateral bolts	MS20002C-5	4	//
Washer under Central bolts	MS20002C-6	2	//
Washer under Lateral Stop Nuts	MS20002-5	4	//
Washer under Central Stop Nut	MS20002-6	2	//

Table 1

NOTE

To avoid a main landing leg detachment from the fuselage Tecnam recommend that the nuts must be replaced one at a time and the correct torque value must be applied at end of all nuts installation.

NOTA

Per evitare il distacco della gamba carrello dalla fusoliera *Tecnam* raccomanda di sostituire i dati uno per volta e a di applicare i giusti valori di coppia alla fine dell'istallazione dei dadi.

See old and new nuts shown in figure 3:
-Vedi i vecchi e i nuovi dadi in figura 3:



Figure 3. Nuts MS21042-5/-L6 (ANTE MOD.) and AN365-524/-624 (POST MOD.)

4. MLG Final Operations

4. Operazioni finali

1) Reverse the instructions indicated in the chapter 2;

- Eseguire in senso contrario le istruzioni riportate nel paragrafo 2

2) Record the application of the present Service Bulletin on the aircraft log-book.

- Registrare l'applicazione del Bollettino di Servizio sul *log-book*

The followings instructions are applicable to P2002 series:

Le istruzioni sono in riferimento alla serie P2002:

1. Aircraft preparation

1. Preparazione velivolo

4) Park the aircraft in a closed hangar;

- Parcheggiare il velivolo in un hangar chiuso

5) MASTER SWITCH: OFF;

- Interruttore generale: OFF

6) Parking brake: ON;

- Freno di parcheggio: ON

5) Make the aircraft in safety position;

- Assicurarsi che il velivolo sia in una posizione di sicurezza

6) Prepare the KIT n°023UL composed by the followings items:

- Preparare il KIT n°023UL composto da:

Description	*Part number*	*QTY*
Stop nut for lateral bolts	AN365-524A	4
Stop nut for central bolts	AN365-624A	2

2. MLG (Main Landing Gear) preparation

2. Preparazione carrello principale

1) Remove the following covers (See figure 1, LH side showed) from the LH and RH side:

- Rimuovere le seguenti coperture (Figuara 1, lato SX mostrato) dai lati SX e DX:

1. Cover skin MLG leg attachment LH and RH – P/N 22-2-550-1/2;

- Copertura attacco carello principale-fusoliera lato DX/SX - P/N 22-2-550-1/2;

2. MLG central bolt inspection cup – P/N 22-2-523-1;

- Tappo di ispezione – P/N 22-2-523-1;

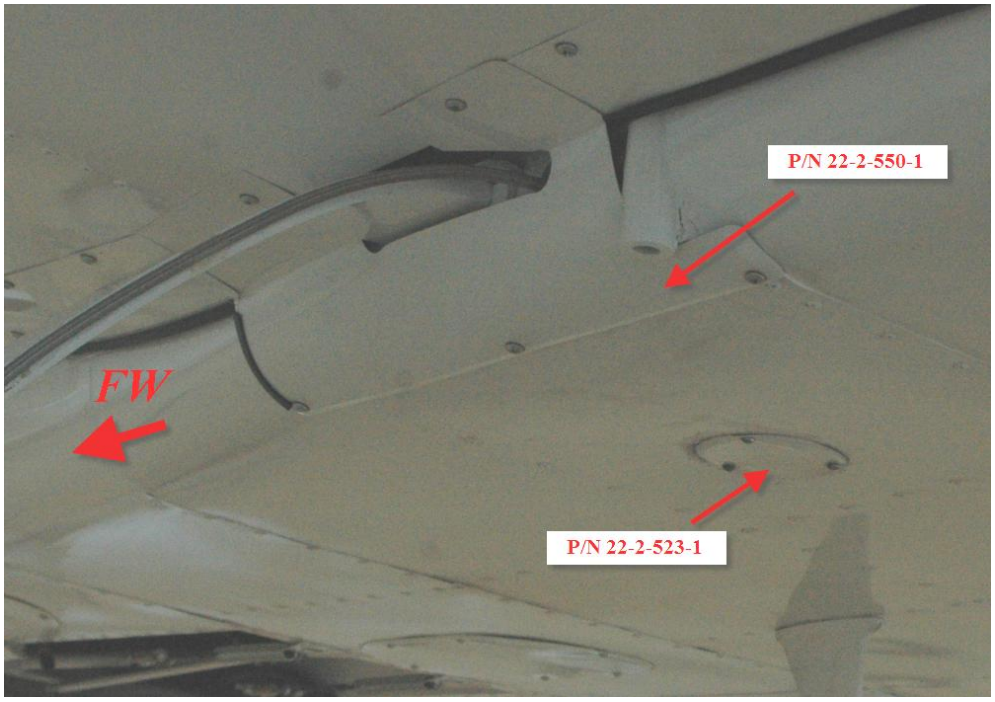


Figure 1. Covers removing

3. *Remove the pilot and co-pilot seats;*
   - Rimuovere i sedili pilota e co-pilota;
4. *Remove two seat trim panel LH and RH (P/N 22-12-180-1/2) located under the seats;*
   - Rimuovere i due pannelli rivestimento dei sedili DX/SX (P/N 22-12-180-1/2) posti sotto i sedili
5. *Jack aircraft according to AMM;*
   - Effettuare l'operazione di sospensione come indicata nel AMM;

3. MLG nuts substitution
3. Sostituzione dati attacco carello principale-fusoliera

1) *Replace the laterals and central nuts according to following figure 2 and applying the torque values indicated in table 1:*

- Sostituire i tre bulloni come illustrato nella figura 2 applicando i valori di coppia indicati nella tabella 1

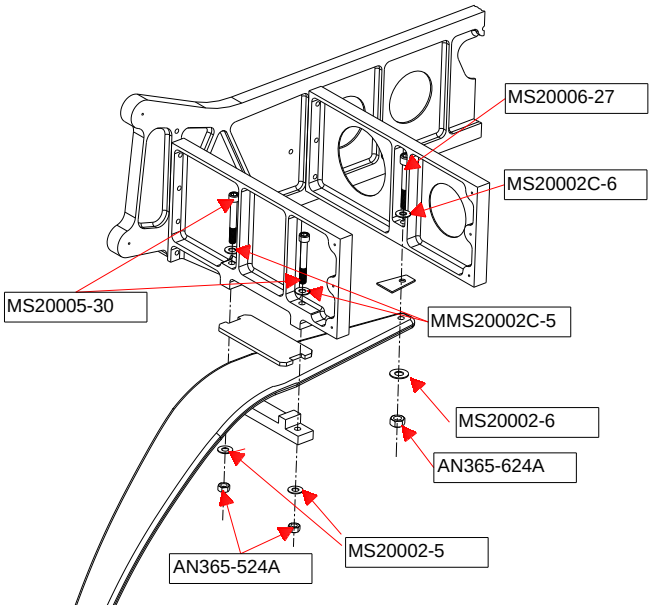


Figure 2. MLG leg attachment

Description	*Part number*	*QTY*	*Torque value*
Central bolts	MS20006-27	2	//
Lateral bolts	MS20005-30	4	//
Stop nut for lateral bolts	AN365-524A	4	15 +/- 1 Nm
Stop nut for central bolts	AN365-624A	2	25 +/- 2 Nm
Washer under Lateral bolts	MS20002C-5	4	//
Washer under Central bolts	MS20002C-6	2	//
Washer under Lateral Stop Nuts	MS20002-5	4	//
Washer under Central Stop Nuts	MS20002-6	2	//

Table 1

NOTE

To avoid a main landing leg detachment from the fuselage Tecnam recommend that the nuts must be replaced one at a time and the correct torque value must be applied at end of all nuts installation.

NOTA

Per evitare il distacco della gamba carrello dalla fusoliera *Tecnam* raccomanda di sostituire i dati uno per volta e a di applicare i giusti valori di coppia alla fine dell'istallazione dei dadi.

See old and new nuts shown in figure 3:
-Vedi i vecchi e i nuovi dadi in figura 3:



Figure 3. Nuts MS21042-5/-L6 (ANTE MOD.) and AN365-524/-624 (POST MOD.)

4. MLG Final Operations
4. Operazioni finali

1) Reverse the instructions indicated in the chapter 2;
- Eseguire in senso contrario le istruzioni riportate nel paragrafo 2

2) Record the application of the present Service Bulletin on the aircraft log-book.
- Registrare l'applicazione del Bollettino di Servizio sul *log-book*

The followings instructions are applicable to P2008 series:

Le istruzioni sono in riferimento alla serie P2008:

1. Aircraft preparation

1. Preparazione velivolo

7) Park the aircraft in a closed hangar;
- Parcheggiare il velivolo in un hangar chiuso

8) MASTER SWITCH: OFF;
- Interruttore generale: OFF

9) Parking brake: ON;
- Freno di parcheggio: ON

7) Make the aircraft in safety position;
- Assicurarsi che il velivolo sia in una posizione di sicurezza

8) Prepare the KIT n°023UL composed by the followings items:
- Preparare il KIT n°023UL composto da:

Description	*Part number*	*QTY*
Stop nut for lateral bolts	AN365-524A	4
Stop nut for central bolts	AN365-624A	2

2. MLG preparation

2. Preparazione carrello principale

1) Remove the inspection panels (P/N 28-2-1363-4) located on the floor of baggage compartment (RH side in figure 1):
- Rimuovere i panelli di ispezione (P/N 28-2-1363-4) posizionati sul pavimento del vano bagagliaio (Figura 1 DX):

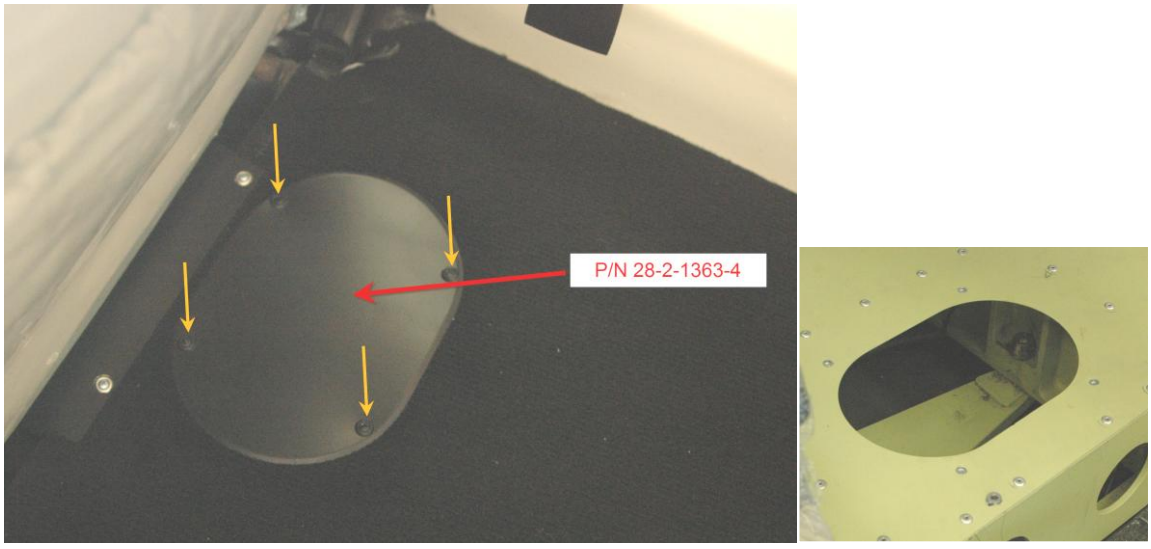


Figure 1. Inspection panel removing

2) Jack aircraft according to AMM;
- Effettuare l'operazione di sospensione come indicata nel AMM;

3. MLG nuts substitution

3. Sostituzione dati attacco carello principale-fusoliera

1) Replace the laterals and central nuts according to following figure 2 and applying the torque values indicated in table 1:

- Sostituire i tre bulloni come illustrato nella figura 2 applicando i valori di coppia indicati nella tabella 1

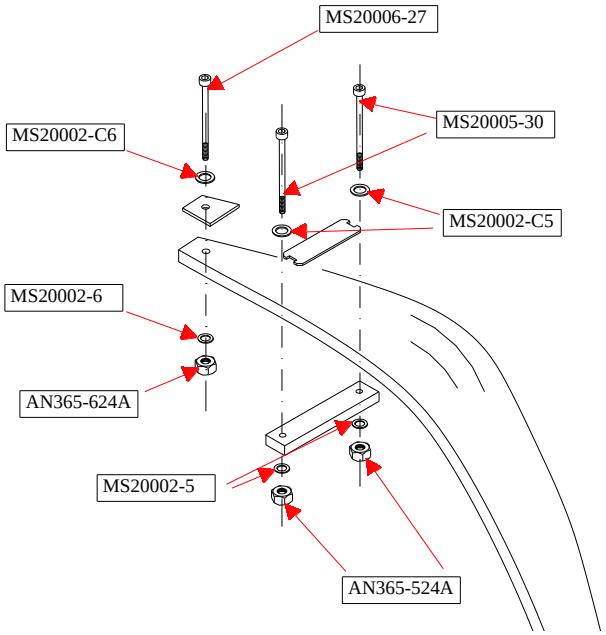


Figure 2. MLG leg attachment

Description	*Part number*	*QTY*	*Torque value*
Central bolts	MS20006-27	2	//
Lateral bolts	MS20005-30	4	//
Stop nut for lateral bolts	AN365-524A	4	15 +/- 1 Nm
Stop nut for central bolts	AN365-624A	2	25 +/- 2 Nm
Washer under Lateral bolts	MS20002C-5	4	//
Washer under Central bolts	MS20002C-6	2	//
Washer under Lateral Stop Nuts	MS20002-5	4	//
Washer under Central Stop Nuts	MS20002-6	2	//

Table 1

NOTE

To avoid a main landing leg detachment from the fuselage Tecnam recommend that the nuts must be replaced one at a time and the correct torque value must be applied at end of all nuts installation.

NOTA

Per evitare il distacco della gamba carrello dalla fusoliera *Tecnam* raccomanda di sostituire i dati uno per volta e a di applicare i giusti valori di coppia alla fine dell'istallazione dei dadi.

See old and new nuts shown in figure 3:
-Vedi i vecchi e i nuovi dadi in figura 3:



Figure 3. Nuts MS21042-5/-L6 (ANTE MOD.) and AN365-524/-624 (POST MOD.)

WARNING

If you don't have adequate facilities to apply the correct torque values to central nuts type AN365-624, please contact Tecnam for informations.

ATTENZIONE

Se non si hanno adeguate attrezzature per applicare le coppie torcenti ai dadi centrali tipo AN365-624A si prega di contattare Tecnam per informazioni.

4. MLG Final Operations

4. Operazioni finali

1) Reverse the instructions indicated in the chapter 2;

- Eseguire in senso contrario le istruzioni riportate nel paragrafo 2

2) Record the application of the present Service Bulletin on the aircraft log-book.

- Registrare l'applicazione del Bollettino di Servizio sul *log-book*

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