

*Lloyd's Register Verification*

**EC CERTIFICATE OF CONFORMITY**

*This is to certify that Lloyd's Register Verification, a Notified Body under the terms of:  
The Pressure Equipment Directive 97/23/EC;  
The Pressure Equipment Regulations 1999, UK Statutory Instrument 1999 No. 2001 and 2002 N. 1267,  
did (in accordance with Module F of the Directive) undertake an EC Product Verification on the stated  
pressure equipment to ensure its conformity with the requirements of the Directive which apply to it. The  
equipment identified below was shown to comply.*

*This certificate is issued to:*

**APPLICANT:**

**Faber Industrie S.p.A.  
Cividale del Friuli  
Udine  
Italy**

**PRODUCT DESCRIPTION:**

**Hydropneumatic Accumulator Body  
Drawing No.: D-AI-T-220-515-850/2B REV.0**

Quantity	Capacity (L)	Batch & Serial No.	Manufacture date
103	50.0	2011/8864/001÷105	11/11

*The above batch of Pressure Equipment, has been manufactured in accordance with EC Type Examination  
Certificate (Module B1) No:*

**0420211310300916**

issued by RWTüV-Essen, Notified Body No. 0044, on 02 December 2003

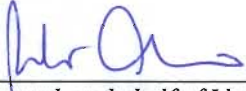
*As verified in the Manufacturer's Inspection and Test Certificate No: 2011/8864 dated 11 November 2011  
and manufacturing/production record endorsed by our Trieste Surveyors Ref: VR-TRI 1190010/184, the  
final inspection and proof test in accordance with the requirements of Section 3.2 of the essential safety  
requirements was carried out on the above equipment.*

Certificate No: 0038/PED/TRI 1190010/184

Date of Issue: 14 November 2011

Certificate Issue: 1

LRV Notified Body Number 0038

  
R. Costantino for and on behalf of Lloyd's Register Verification

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Registration number 4929226 and registered office is at 71 Fenchurch Street London EC3M 4BS, England.

The Company Faber Industrie s.p.a. – Via dell'Industria, 23 - XI Zona Industriale Cividale del Friuli (UD) – ITALY,  
La società Faber Industrie s.p.a. – con sede in Via dell'Industria, 23 - XI Zona Industriale Cividale del Friuli (UD) – ITALIA,

**DECLARES**  
DICHIARA

that the manufactured pressure equipment:  
che l'attrezzatura a pressione costruita:

Definition: **ACCUMULATOR SHELL**  
Definizione: *CORPO ACCUMULATORE*

Drawing N°: **D-AI-T-220-515-850/2B REV.0**  
N° disegno:

Water capacity V **50** litre/ litri  
Capacità

Min. e max. allowable temperatures: **-40 ÷ +80 °C**  
Temperatura min. e max. ammissibili:

Operating fluid: **1002 AIR**  
Fluido contenuto:

Max. allowable pressure: **360** bar  
Pressione max. ammissibile:

Manufacturer N°/ N° di fabbrica  
from/ dal **11/8864/001** to/ al **11/8864/105**

No. of cylinders / numero di bombole  
**103**

**MEETS THE REQUIREMENTS OF DIRECTIVE 97/23/CE**  
**E' CONFORME AI REQUISITI DELLA DIRETTIVA 97/23/CE**

1. Conformity assessment procedures used: Module **B+F** (Category **IV**) (Reference to Annex II and III of Directive 97/23/CE)  
*Procedura/e di valutazione di conformità utilizzata: Modulo **B+F** (Categoria **IV**) (Riferimento allegati II e III della Direttiva 97/23/CE)*
2. Notified Body charged of the conformity assessment: N° **0038 LLOYD'S REGISTER**  
*Organismo Notificato incaricato della valutazione di conformità: N°*
3. Registration number of "CE Type Examination Certificate": **0420211310300916**  
*Estremi dell' "Attestato dell'esame CE del tipo":*
4. Not harmonized standards applied to designing and manufacture: **AD-TRB**  
*Norme non armonizzate applicate alla progettazione ed alla costruzione:*
5. Harmonized standards applied to designing and manufacture: **None**  
*Norme armonizzate applicate alla progettazione ed alla costruzione: **Nessuna***
6. Others European Directives applied to the equipment: **None**  
*Eventuali altre Direttive europee applicate all'attrezzatura: **Nessuna***
7. Registration number of Conformity Certificate issued by the Notified Body charged of assessment procedure "Module F": **0038/PED/TRI 1190010/184**  
*Estremi dell'Attestato di Conformità rilasciato dall'Organismo Notificato incaricato della procedura di valutazione "Modulo F":*

It is declared that the equipment has been hydraulic tested with favourable result at the pressure of: (PT) **515** bar, it is marked CE 0038 and with identification data and the working parameters upside reported.

*Dichiara inoltre che l'attrezzatura è stata sottoposta con esito favorevole a prova di pressione idraulica di : (PT) **515** bar, che è stata marcata CE 0038 e con i dati identificativi e le caratteristiche di esercizio sopra riportati.*

The assembly must be subjected to a global conformity assessment procedure described in the directive PED 97/23/CE.  
*L'insieme deve essere sottoposto ad una procedura globale di valutazione di conformità così come previsto dalla direttiva PED 97/23/CE.*

Cividale del Friuli 11/11/2011

Faber Industrie S.p.A.

Manufactured by: **FABER INDUSTRIE SPA**

Located at: **CIVIDALE DEL FRIULI - UDINE - ITALY**

Inspection: **LLOYD'S REGISTER**

Specification: **AD-TRB (PED)**

Customer: **Aerotecnica Coltri S.p.A.**

Owner stamping: **COLTRI SUB**

Manufacturer serial No. :

From **2011/8864/001** to **2011/8864/105**

Gas: **1002 AIR**

Total accumulators: **103**

Customer's order No. : **RIC/2.28620110915**

Working pressure: **360 bar**

Working temperatures: **-40° ÷ +80° C**

**Nominal data**

Drawing no.	Test Pressure (bar)	Minimum Wall Thickness (mm)	Nominal Diameter (mm)	Nominal Length without valve (mm)	Nominal Water Capacity ( l )	Nominal Weight (Kg)
<b>D-AI-T-220-515-850/2B REV.0</b>	<b>515</b>	<b>9.7</b>	<b>220</b>	<b>1750</b>	<b>50</b>	<b>103</b>

Identification marks stamped on accumulators shoulder according to drawing: **P-AI-19 5**

**We hereby certify that all the accumulators of the batch no. 2011/8864 comply with the following requirements:**

**Heat treatment:**

All accumulators have been heat treated at the following temperatures:

Quench at: from **900°C ± 20°C**

Temper at: **580 ± 30°C**

**Hardness range:**

All accumulators have been controlled within the following hardness values: Min **306 HB**, Max **345 HB**

**Dimensional check:**

All accumulators have been dimensional checked with satisfactory result.

**Visual inspection:**

All accumulators have been internally and externally visually inspected. No defects were found on the surfaces.

Date: <b>11/11/2011</b>	For and on behalf of the manufacturer:	For and on behalf of A.I.A.
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**Faber**  
INDUSTRIE S.p.A.  
Cividale del Friuli



**Chemical analysis:**

Material: **34CRMO4**


The accumulators in batch **2011/8864** were manufactured from the following cast(s) of steel:

Cast Numb.	Code (*)	C (%)	Si (%)	Mn (%)	P (%)	S (%)	Cr (%)	Mo (%)	S+P (%)
<b>955454</b>	<b>D3</b>	<b>0.34</b>	<b>0.24</b>	<b>0.75</b>	<b>0.012</b>	<b>0.005</b>	<b>1.07</b>	<b>0.19</b>	<b>0.017</b>

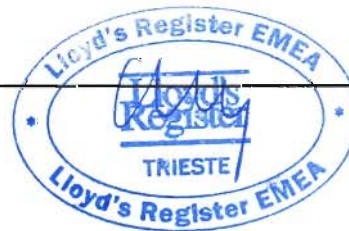
(\*) marked on outer bottom surface


**Mechanical tests carried out on sample accumulators:**

Accumulator Serial Number	Code (*)	Test piece dimension Ø (mm)	Temp. (°C)	Test piece direction	Yield strength (N/mm <sup>2</sup> )	Tensile strength (N/mm <sup>2</sup> )	Elongation (%)	Impact test -40 °C Mean (J/cm <sup>2</sup> )
<b>2011/8864/104</b>	<b>D3</b>	<b>10</b>	<b>80</b>		<b>932</b>	<b>1034</b>		<b>/</b>
<b>2011/8864/104-A</b>	<b>D3</b>	<b>10</b>	<b>20</b>	<b>0</b>	<b>981</b>	<b>1085</b>	<b>16.4</b>	<b>48</b>
<b>2011/8864/104-B</b>	<b>D3</b>	<b>10</b>	<b>20</b>	<b>180</b>	<b>968</b>	<b>1070</b>	<b>16.4</b>	<b>45</b>
<b>2011/8864/105-A</b>	<b>D3</b>	<b>10</b>	<b>20</b>	<b>0</b>	<b>978</b>	<b>1078</b>	<b>16.4</b>	<b>46</b>
<b>2011/8864/105-B</b>	<b>D3</b>	<b>10</b>	<b>20</b>	<b>180</b>	<b>981</b>	<b>1075</b>	<b>16.4</b>	<b>45</b>
Minimum values specified					<b>850</b>	<b>960</b>	<b>16</b>	<b>34</b>

For and on behalf of the manufacturer:  	For and on behalf of A.I.A.  
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 Cividale del Friuli



	<p style="text-align: center;"><b>INSPECTION CERTIFICATE</b> Type 3.2 (EN 10204:2004)</p> <p style="text-align: center;"><b>ULTRASONIC TEST CERTIFICATE</b></p>	<p style="text-align: center;">PAG. 3 OF 7</p>
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**Testing object:**

Hydropneumatic accumulators according to drawing: **D-AI-T-220-515-850/2B REV.0**

Outside diameter: **220** mm                      Water capacity: **50** l

Min wall thickness: **9.7** mm                      Nominal length: **1750** mm

From accumulator serial no.: **2011/8864/001** to **2011/8864/105**

**Test technical data:**

Examination standard: **AD-MERKBLATT12§4.8,SEP1915,SEP1918**

Inspected part: **cylindrical part and transitional surface area tested according to AD-Merkblatt W12§4.8**

Extention of examination: **100 %**

Fabrication stage: **after haet treatment (quenching and tempering), shot blasting, and before pressure testing**

Probes: **longitudinal, transversal and thickness**



Couplant: **emulsified water**

Scanning direction: **circumferential, axial and radial directions**

Reference reflector: **calibration cylinder according to AD-MERKBLATT12§4.8,SEP1915,SEP1918**

**Examination results:**

All accumulators have been checked giving satisfactory results.

<p>For and on behalf of the manufacturer:</p> 	<p>For and on behalf of A.I.A.</p> 
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LOT No.: 2011/8864                      NUMBER OF ACCUMULATORS    103                      TEST DATE: 11/2011  
ACCORDING TO DWG.:    D-AI-T-220-515-850/2B REV.0

WORKING PRESSURE    360 bar

ACCUMULATOR SIZE: OUTSIDE DIAMETER    220 mm;    LENGTH    1750 mm

REMARKS: M = Mechanical Tests, B = Burst Tests, P = Prototype Tests, S = Accumulator Discarded, C = Cycling Test  
C+B = Cycling + Burst Test.

ACCUMULATOR SERIAL No.	CUSTOMER NUMBER	HEAT CODE AND NUMBER	TEST PRESSURE (bar)	ACCUMULATOR WATER CAPACITY (l)	MASS (Kg)	REMARKS
2011/8864/001		D3 955454	515	50.0	98.2	
2011/8864/002		D3 955454	515	50.0	97.9	
2011/8864/003		D3 955454	515	50.0	98.1	
2011/8864/004		D3 955454	515	50.0	98.2	
2011/8864/005		D3 955454	515	50.0	99.4	
2011/8864/006		D3 955454	515	50.0	98.3	
2011/8864/007		D3 955454	515	50.0	99.0	
2011/8864/008		D3 955454	515	50.0	98.4	
2011/8864/009		D3 955454	515	50.0	99.4	
2011/8864/010		D3 955454	515	50.0	98.0	
2011/8864/011		D3 955454	515	50.0	98.4	
2011/8864/012		D3 955454	515	50.0	99.5	
2011/8864/013		D3 955454	515	50.0	99.7	
2011/8864/014		D3 955454	515	50.0	98.5	
2011/8864/015		D3 955454	515	50.0	99.6	
2011/8864/016		D3 955454	515	50.0	97.9	
2011/8864/017		D3 955454	515	50.0	98.9	
2011/8864/018		D3 955454	515	50.0	99.1	
2011/8864/019		D3 955454	515	50.0	99.3	
2011/8864/020		D3 955454	515	50.0	99.4	
2011/8864/021		D3 955454	515	50.0	99.3	
2011/8864/022		D3 955454	515	50.0	98.9	
2011/8864/023		D3 955454	515	50.0	99.6	
2011/8864/024		D3 955454	515	50.0	99.4	
2011/8864/025		D3 955454	515	50.0	98.9	
2011/8864/026		D3 955454	515	50.0	98.3	
2011/8864/027		D3 955454	515	50.0	98.2	
2011/8864/028		D3 955454	515	50.0	99.1	
2011/8864/029		D3 955454	515	50.0	98.6	
2011/8864/030		D3 955454	515	50.0	98.3	
2011/8864/031		D3 955454	515	50.0	98.4	
2011/8864/032		D3 955454	515	50.0	98.2	
2011/8864/033		D3 955454	515	50.0	98.4	
2011/8864/034		D3 955454	515	50.0	98.5	
2011/8864/035		D3 955454	515	50.0	98.1	
2011/8864/036		D3 955454	515	50.0	98.4	
2011/8864/037		D3 955454	515	50.0	97.9	
2011/8864/038		D3 955454	515	50.0	97.5	
2011/8864/039		D3 955454	515	50.0	98.3	
2011/8864/040		D3 955454	515	50.0	98.9	

Manufacturer stamp and signature:

A.I.A. stamp and signature:



75859



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Cividale del Friuli





**Istruzioni operative dei corpi accumulatori secondo PED 97/23/CE**  
**Accumulators shell operating instructions according to PED 97/23/CE**

1. Il corpo accumulatore deve essere utilizzato solo da personale addestrato ed esperto.  
*The accumulator shell shall be utilized by trained and expert personnel.*
2. Il corpo accumulatore non deve essere sottoposto a pressioni o temperature diverse da PS, TS. Adeguati dispositivi di sicurezza per prevenire sovrappressioni devono essere installati dall'assemblatore finale.  
*The accumulator shell shall not be subjected to pressures and temperatures different from project PS, TS. The final assembler shall mount safety devices to prevent over pressurization.*
3. I limiti ammissibili di PS e TS sono marcati sul corpo accumulatore .  
*The allowable limits of PS and TS are marked on the accumulator shell.*
4. Il corpo accumulatore non deve essere sottoposto a saldatura, foratura o altre lavorazioni che pregiudichino l'integrità strutturale.  
*The accumulator shell shall not be subjected to welding, drilling or other machining that jeopardy the structural integrity.*
5. L'ente di collaudo autorizzato deve fissare gli intervalli di ricollauda in funzione delle norme nazionali.  
*The independent inspection authority shall specify the retest intervals according to national regulations.*
6. Al massimo dopo 3500 cicli tra 0 e PS bar o dopo 2 anni di utilizzo il corpo accumulatore deve essere sottoposto a ispezione interna.  
*At max after 3500 cycles between 0 and PS bar or 2 years of service the accumulator shell shall be subjected to internal inspection.*
7. Le prescrizioni delle norme nazionali devono essere rispettate.  
*The requirements of national regulations shall be respected.*
8. Il corpo accumulatore è progettato per essere utilizzato con aria secca (contenuto d'acqua a pressione atmosferica < 50 mg/m<sup>3</sup> per una PS di 200 bar e < 35mg/m<sup>3</sup> per una PS superiore a 200 bar, secondo EN 12021) e non deve mai essere completamente scaricato in quanto dell'umidità potrebbe essere risucchiata all'interno contaminandolo.  
*The accumulator shell is designed for dry air service ( Water content at atmospheric pressure <50 mg/m<sup>3</sup> for a PS of 200 bar and < 35mg/m<sup>3</sup> for a PS greater than 200 bar, as for EN 12021), and never completely discharged as this can lead to humidity getting back inside and causing contamination.*
9. Il corpo accumulatore deve essere utilizzato in posizione verticale.  
*The accumulator shell shall be utilized in vertical position.*
10. Il numero massimo di cicli ammesso per una variazione di pressione da 0 a PS bar deve essere inferiore a 7000.  
*The maximum allowable number of cycles for a pressure variation between 0 and PS bar have to be minor of 7000.*
11. La variazione di pressione massima sostenibile permanentemente è di 100 bar.  
*The maximum permanent allowable pressure variation is of 100 bar.*
12. Quando al Corpo accumulatore vengono montati degli "Accessori a Pressione" come definiti dall' Art. 1 e 3 della direttiva PED 97/23/CE la valutazione di conformità alla direttiva dell'assieme: Corpo accumulatore e Accessori a Pressione viene demandata all'assemblatore finale.  
*When some "Pressure Accessories" as defined in Art. 1 & 3 of directive PED 97/23/CE will be mounted to the Accumulator Shell the conformity valuation of the assembly: Accumulator Shell & Pressure Accessories is demanded to final assembler.*
13. Non mettere in servizio il corpo accumulatore se presenta segni di fiamma, urto, corrosione, abrasione o fessurazione.  
*Do not put on service the accumulator shell if it bears marks of flame, impact, corrosion, abrasion or flaw.*