

Product	<b>T-L-S antisnag systems</b>
Release date	<b>29 May 2002</b>
Drawings	<b>TUV REPORT</b>
Pages	<b>8</b>



**NEVER WORRY ABOUT SNAG  
WITH RIMA ANTI SNAG SYSTEM**

**T-L-S - ANTISNAG SYSTEMS**

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## T-L-S ANTISNAG SYSTEMS

### EQUIPMENT DESCRIPTION

The equipment is made with nr 4 suitable cylinders that act on the fixed point (or on return pulleys) of hoist ropes of spreader. The possible arrangements are indicated in fig land 2. The double acting cylinders usually work in median position, so as they can pull or release the ropes. These cylinders carry out the following spreader positioning functions:

**TRIM**=trimming around the horizontal transverse axis

**LIST** = listing around the horizontal longitudinal axis

**SKEW** = skewing around the vertical axis

These functions are obtained by acting on the cylinder two by two. Two cylinders pull while other two release the ropes. Changing the cylinder combination the three movements are obtained. The cylinders move themselves in a synchronous way during each phase.



In addition to this function, the same cylinders have the antisnag function. it means they absorb the possible bumps of spreader into hold of ship owing to wrong manoeuvres.

In this situation the cylinders work as a hydraulic shock absorber of the bump energy by expulsion of pressurised oil through a calibrated relief valve that is assembled directly on the cylinders

### DATA OF PLANT

The plant is composed of:

- N. 1 Hydraulic package with pump group and control valves
- N. 4 Hydraulic cylinders with chromed inox piston rods or nicheled and chromed piston rods with linear position transducers.

Relief valves and antisnag valves are directly connected to cylinders



## T-L-S ANTISNAG SYSTEMS

### TYPICAL DATA GRU

*(valid for cylinders put on the fixed end of ropes)*

#### **For spreader positioning:**

Force	120kN
Pressure	150 bar
Speed	adjustable from 0 to 28 mm/s

#### **For antisnag:**

Force	150 kN
Pressure	180 bar
Initial speed	4 m/



### POSSIBLE EXECUTIONS

#### *Hydraulic Unit*

- Open
- Closed with cover
- Closed with hinged doors
- Closed-packed execution in which the cylinders are already connected to hydraulic unit and ready to work

#### *Speed:*

- Fixed
- Double
- **Adjustable continuously (with or without feed back retroaction)**

#### *Pump:*

- Single with fixed flow
- Single with variable flow
- Double (one for stand-by) with variable flow

#### *Antisnag valves:*

- With loss: they are more ready if snag happens but a continuously position check is required
- Without loss

### OPERATING

#### *TLS movement:*

They are driven by operator. The stroke indicators assembled inside the cylinders act as reference for stop position of cylinders. The movement speed can be fixed or variable according to required solution. It is possible to memorise and to find again automatically some positions of stability by stroke indicators.

#### *Antisnag movement:*

If the spreader bumps into hold of ship or into other obstacle, the pressure into cylinder increases. When pressure value exceeds a settled value (usually 25% more than max working value) the antisnag valve opens itself very quickly (opening time as not to be major than 50 mms) allowing oil to flow in pressure and bump energy to be absorbed. At the same time suitable load cells stop the lifting motor.

### ROPES TENSIONING CYLINDERS

The a.m. hydraulic unit can often feed other cylinders (usually two cylinders) that keep in tension the trolley translation ropes at a force fixed value.





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### TEST REPORT/BERICHT/RELAZIONE

**About Antisnag valve/Über die Prüfung von Antisnagsventil/Prove condotte su valvola antisnag**

Customer/Auftraggeber Cliente	RIMA s.r.l. Via E.Fermi, 255 21042 Caronno Pertusella (VA)
Producer/Hersteller Produttore	RIMA s.r.l. Via E.Fermi, 255 21042 Caronno Pertusella (VA)
Object/Prüfgegenstand Oggetto in prova	Antisnag valve / Antisnagsventil Valvola antisnag
Date/Datum Data	01/10/01
No. of order/Auftragsnummer Numero di prova	116295
Test site/Prüfart der Zugversuche Luogo di esecuzione prove	RIMA workshop, bei dem Werkstatt des Herstellers presso l'officina del costruttore
Date of test/Datum der Durchführung der Versuche Data di esecuzione delle prove	06/06/01
Documentation/Prüfunterlagen Documentazione di riferimento	Drawings/Zeichnungen Nr. Fig.1, Fig.2, SCI 9000-500 vom 05/09/01, Graphic Antisnag test, Rapporto di taratura 3.1.B Wika 0436-01

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ITALIA

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### Test description/Prüfumfang/Descrizione delle verifiche

See attachment „Antisnag test“  
 Siehe Anlage „Antisnag test“  
 Vedere allegato „Antisnag test“

### Test results/Ergebnis der Versuche/Esito delle prove

Calibration pressure Kalibr.Druck Pressione di calibrazione	Initial flow Durchfluss Flusso iniziale	Max pressure Max Druck Pressione massima	Opening time Öffnungszeit Tempo di apertura
170 bar	1900 l/min	310 bar	4.3 mS.

See attached diagrams  
 Siehe Anlagen  
 Vedi diagrammi in allegato

### Conclusions/Prüfergebnis/Conclusioni

The use of the antisnag valve is admitted, since it has met the above tests conditions.  
 Gegen einen bestimmungsgemäßen Einsatz des Antisnagsventils bestehen unsererseits  
 keine Bedenken  
 Contro un uso della valvola antisnag, risultata conforme alle prove in oggetto, non  
 viene posto da parte nostra alcun vincolo.



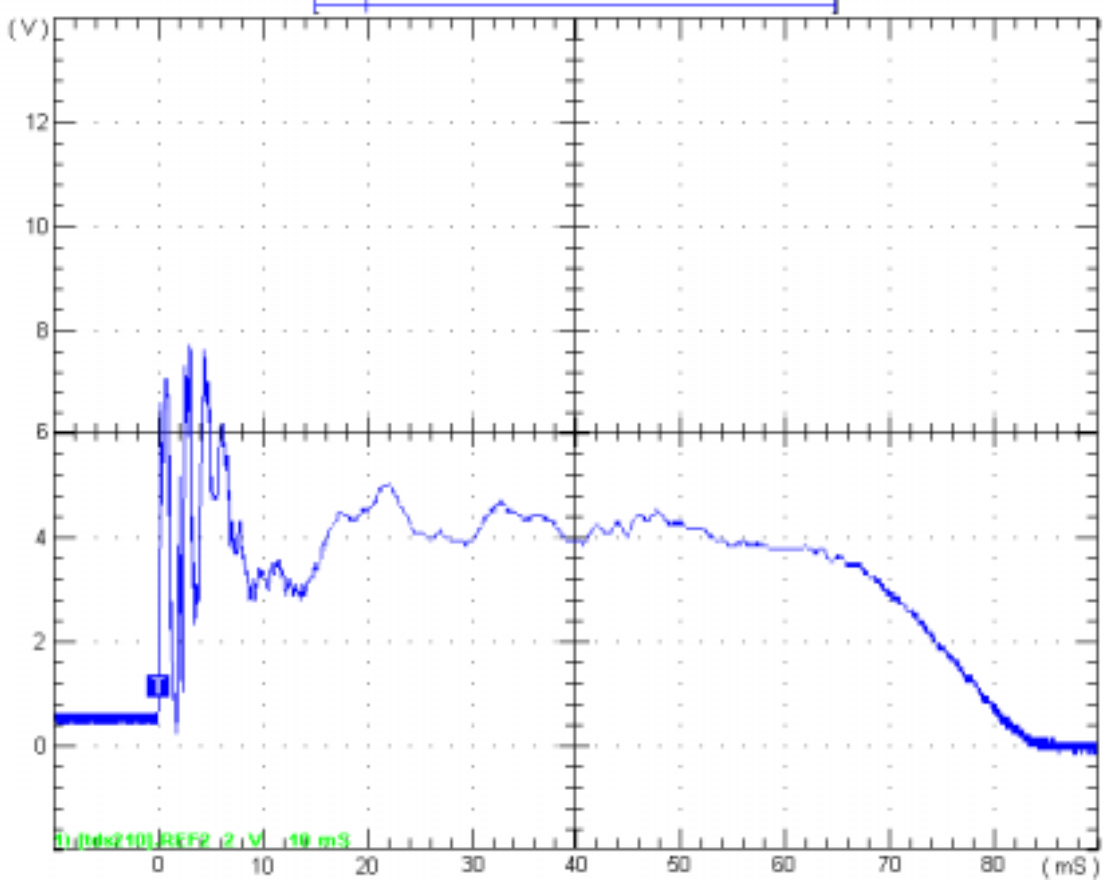
Ing. Paolo Marcone  
 Responsabile Settore Sollevamento

The „Antisnag Test“ report is essential part of this report and only integral copies of it are admitted  
 Diesem Prüfzeugnis liegt der Bericht „Antisnag Test“ zugrunde.  
 Dieser Prüfbericht darf nur im ganzen weitergeben werden.  
 Il rapporto „Antisnag Test“ è parte integrante di questo report  
 Questo report può essere riprodotto solo integralmente.



T-L-S ANTISNAG SYSTEMS

GRAPHIC ANTISNAG TEST

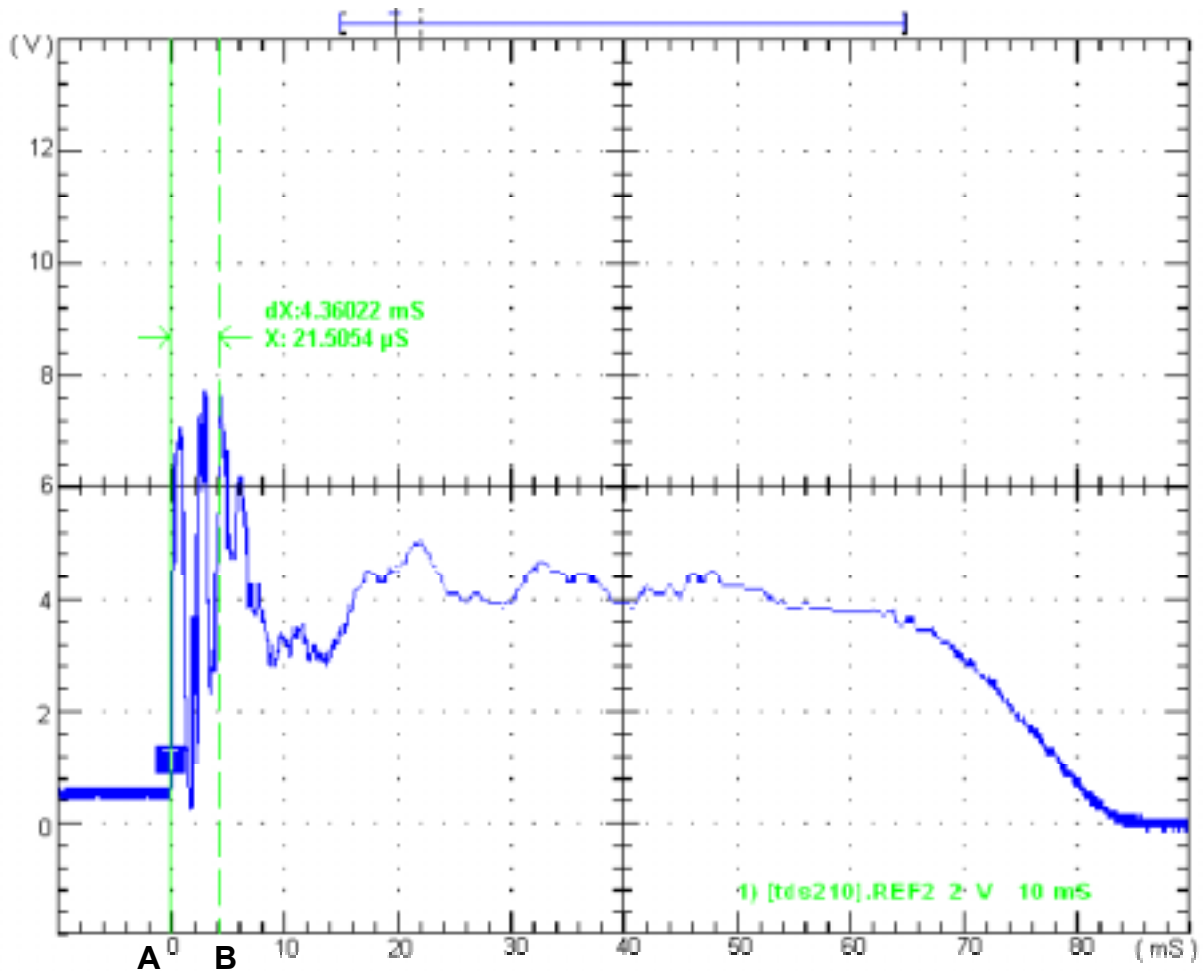


Cylinder:            ø70,ø40, stroke 500;  
 Weight:                497 kg;  
 Pressure relief valve setting: 170 bar;

CONVERSION TENSION (V) TO PRESSURE  
  
 Pressure (bar) = Tension ( V ) \* 40

tds210  Data Waveforms Ref 2		
Measurement Method	Automatic	
Measurement	Value	Units
Frequency	541.68	Hz
Pos. Pulse Width	954.03u	S
Neg. Pulse Width	692.08u	S
Rise Time	736.67u	S
Fall Time	786.80u	S
Pos. Duty Cycle	516.78m	%
Neg. Duty Cycle	483.22m	%
Pos. Overshoot	0.0000	%
Neg. Overshoot	0.0000	%
Peak to Peak	7.9200	V
Amplitude	7.9200	V
High	7.7600	V
Low	-160.00m	V
Maximum	7.7600	V
Minimum	-160.00m	V
Mean	3.0986	V
Cycle Mean	3.7862	V
RMS	3.5241	V
BurstWidth	63.665m	S
Period	1.8461m	S
Energy	1.2414	
CEnergy	38.560m	
ACRMS	1.6775	V
CRMS	4.5703	V

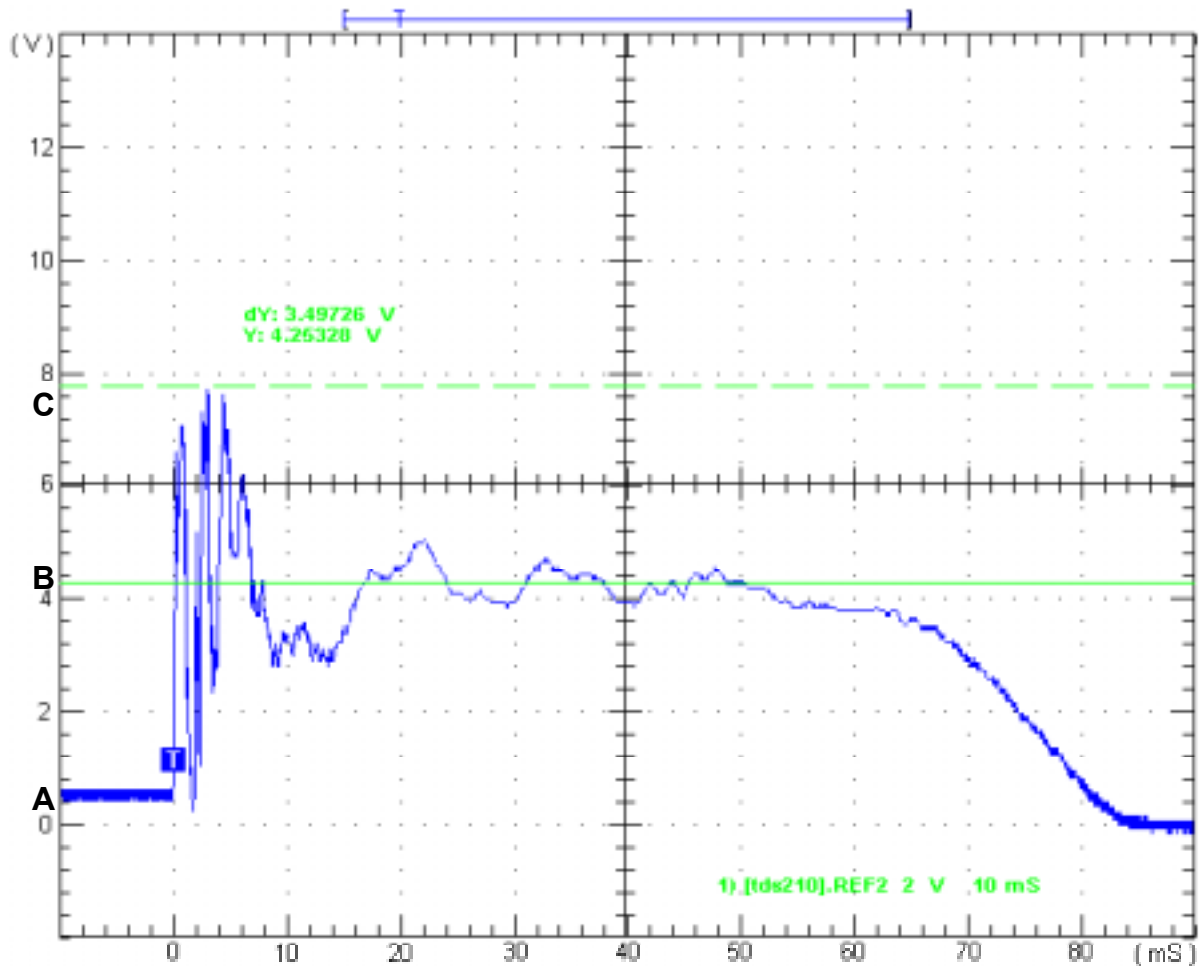
## GRAPHIC ANTISNAG TEST INTERVENTION TIME



- Cylinder  $\varnothing 70, \varnothing 40$ , stroke 500;
- Weight 497 kg;
- Pressure relief valve setting 170 bar;
- A = 0 mS (Initial time);
- B = 4.3 mS (Opening time);

## GRAPHIC ANTISNAG TEST

### VARIATION OF PRESSURE FROM MIDDLE VALUE



- Cylinder  $\varnothing 70$ ,  $\varnothing 40$ , stroke 500;
- Weight 497 kg;
- A = 0 V – 0 bar (Precharge system);
- B = 4.25 V – 170 bar (Pressure relief valve setting);
- C = 7.76 V – 310 bar (Maximum pressure);