

SORIANI srl

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45037 Melera (Rovigo) ITALY
Phone: 011 39 0425 89777

Bulletin No: 2004 TF02

Release Date: September 14, 2004

Effective Date: September 14, 2004

Supersedes: N/A

Completion Date: As soon as possible
within the next 10 operating days

Page: 1 of 5

SERVICE BULLETIN

Ride Manufacturer: Soriani SRL

Affected Production Dates: All manufactured before date of issue

Ride Name: Turbo Force and Stratosphere

Affected Serial Nos.: GTF08R00317US
GTF08R00444US GTF08R00445US GTF08R01158US

Model Number:

Abstract Of Issue:

Soriani has learned of failures of tie rods while rides were in operation. This bulletin provides required method to strengthen tie rods.

Reason For Release:

Soriani has learned of failures of tie rod assemblies while rides were in operation. Such a failure poses risk of serious injury. While the failures were caused by improper use, torquing and maintenance of the tie rod system, Soriani is issuing this mandatory Service Bulletin in order to provide additional robustness to the system. This retrofit is not a substitution for the proper assembly, torquing, inspection and NDT of the tie rods, all of which must still be performed.

Action To Be Taken:

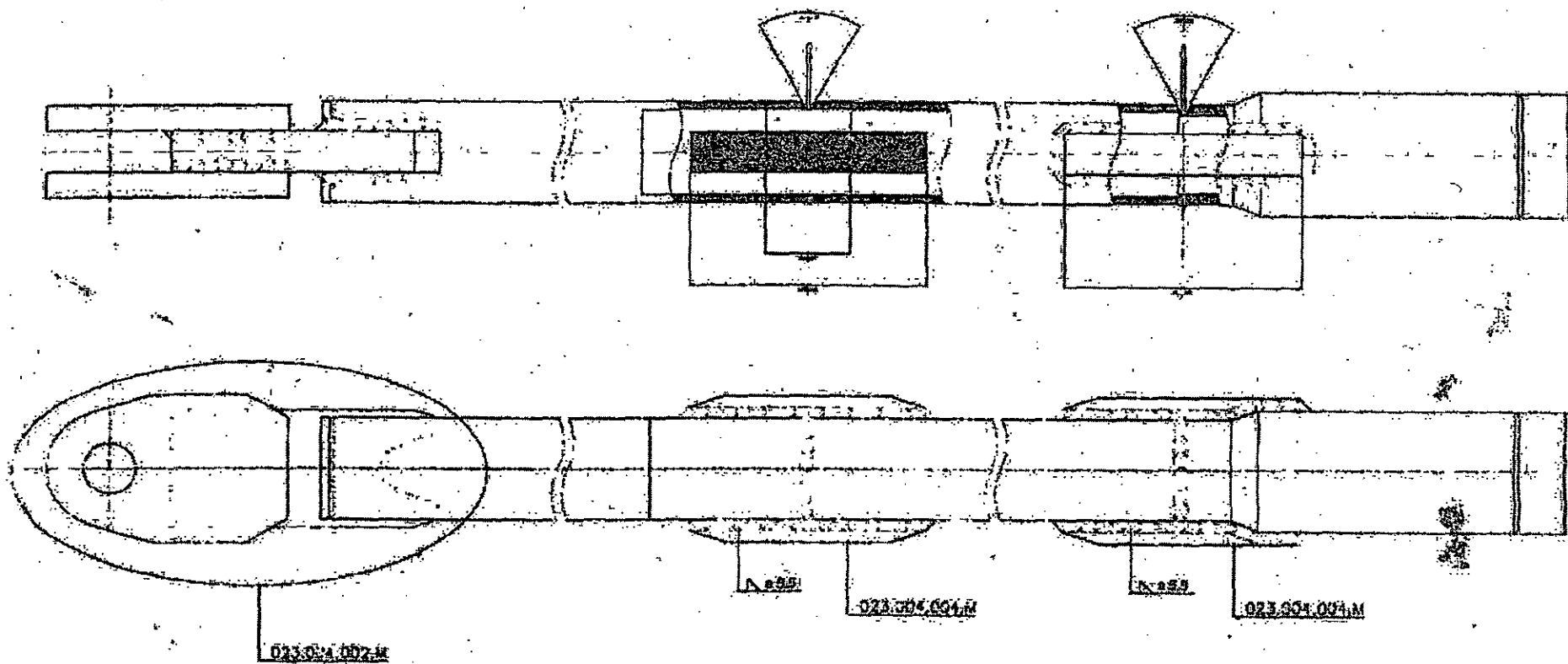
Install the new components on the support tubes as indicated on the attached drawings.

Detail Of Issue:

Drawings number:
023.004.000.N.dwg / 0023.004.001.N.dwg / 023.004.003.N.dwg
023.004.004.N.dwg

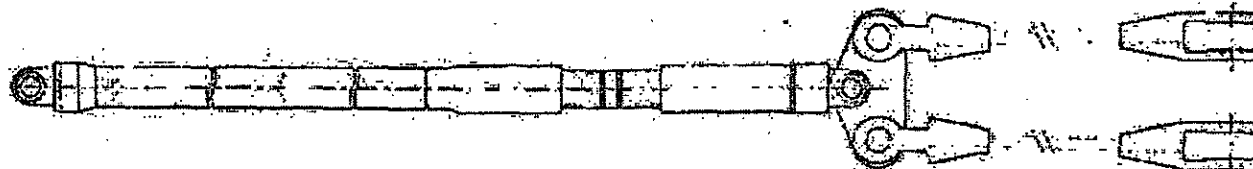
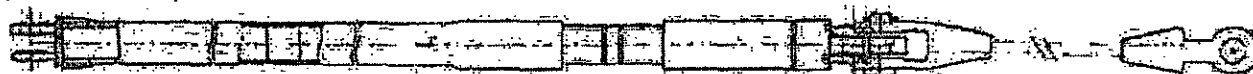
Future Action To Be Taken:

Ensure that the tie rods are properly used, set up and torqued in a sequential manner on each assembly. Follow inspection and NDT requirements previously supplied.

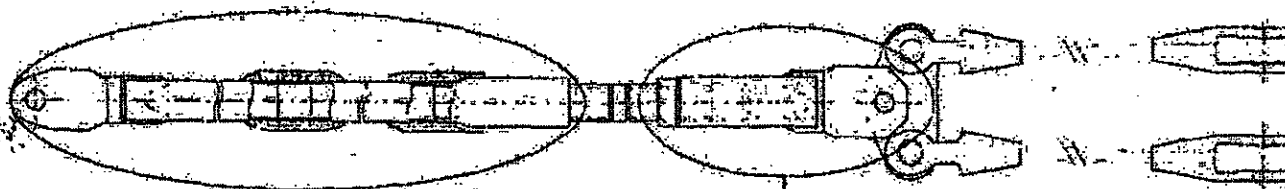


		TIPO: TURBO FORCE		RESO Kg. / h.p.	
NOME: FUNTONI-TIRANTI		GRUPPO: 004		DATA: 09-09-2004	
DESCRIZIONE: PARTE TIRANTE		MATERIALE:		SCALA: 1:2.5	
LAVORAZIONE:		DISEGNATORE: UFF.TEC.		DISEGNO: 023.004.003.M	
REV.1	DATA	DESCRIZIONE		REV.	
PER COMPLESSO VEDI INSEMO 1-023.004.000.M				Sealed:	

OLD




NEW

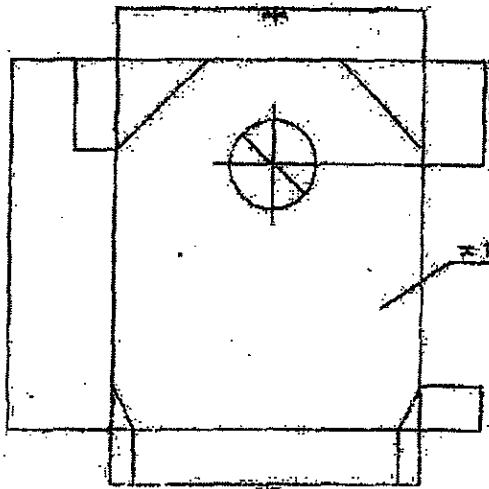


023.004.003.M

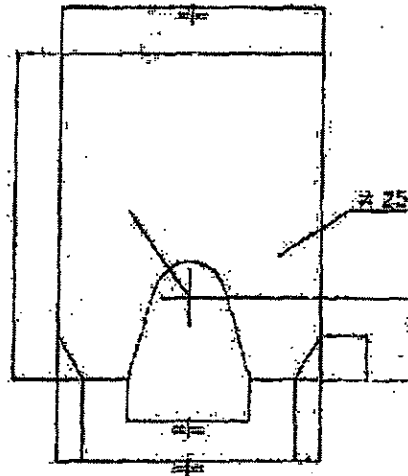
023.004.001.M

VALID FOR TURBO-FORCE 00317
 TURBO-FORCE 00444
 TURBO-FORCE 00445
 TURBO-FORCE 01150

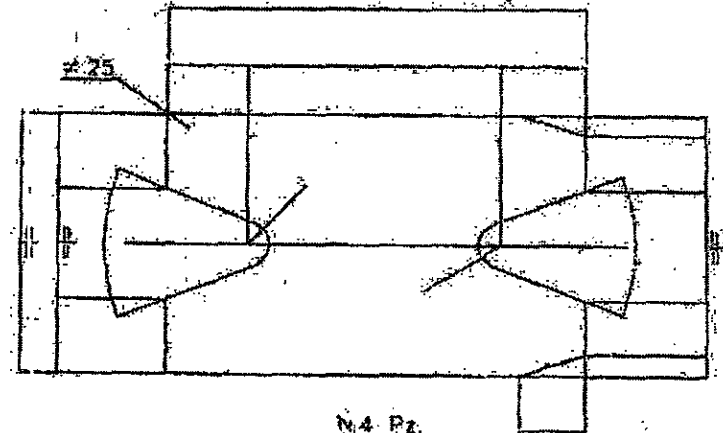
 <p>SORIANI S.p.A. SORIANI S.p.A. SORIANI S.p.A. SORIANI S.p.A.</p>	TIPO:	TURBO-FORCE N°3-4-5-6	PESO KG. A	N° PZ
	NOME:	TRANTI-PIANTONE	GRUPPO:	DATA
	DESCRIZIONE:	TRANTE	004	09-09-2004
	LAVORAZIONE:	MATERIALE:	SCALA	
			1:12,5	
			DISEGNATORE:	
			V.L.	
REV. N°	DATA	DESCRIZIONE	DISEGNO:	REV.
			023.004.003-N	
PER COMPLESSIVO VEDI DISEGNO N°			Scalato da	



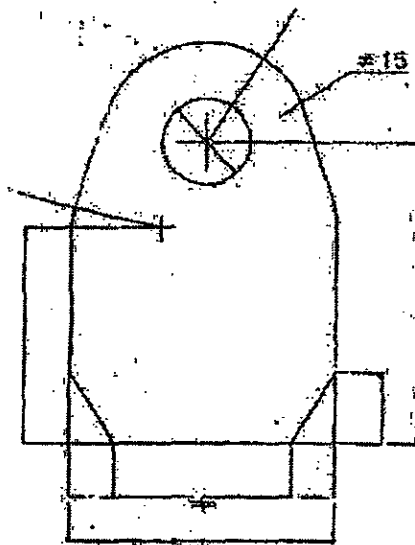
N.8 Pz.



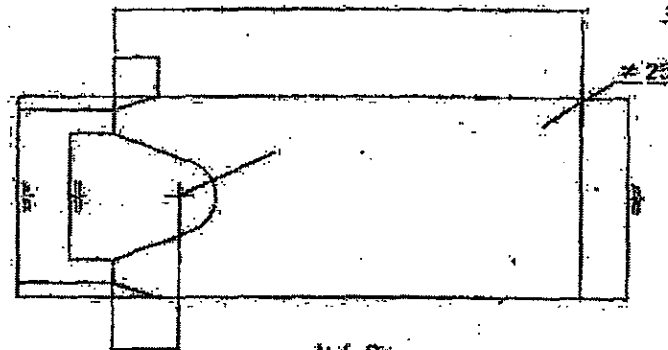
N.4 Pz.



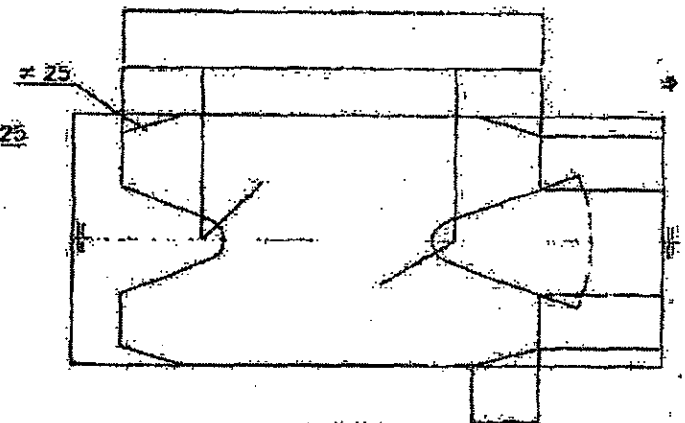
N.4 Pz.



N.8 Pz.




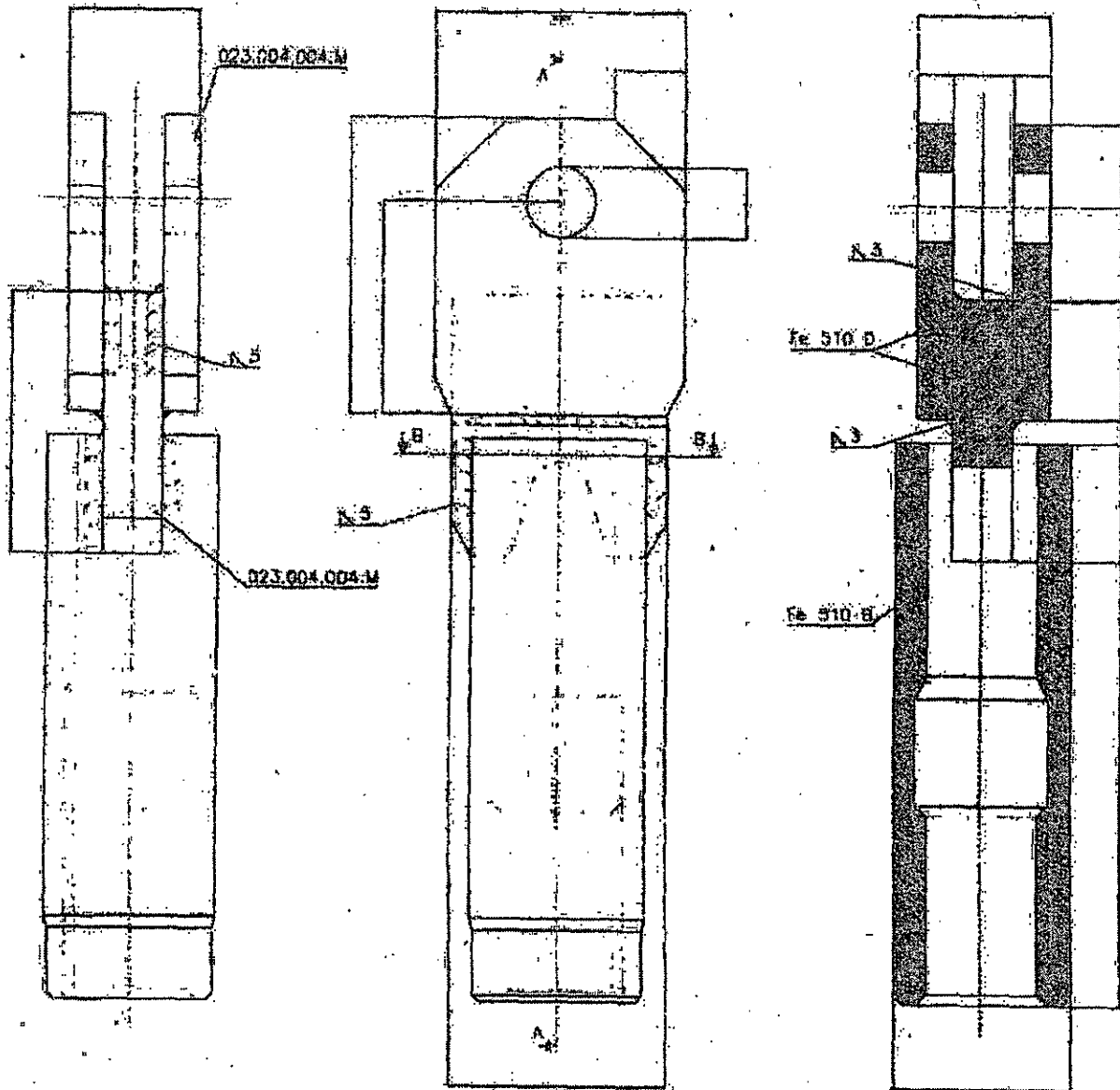
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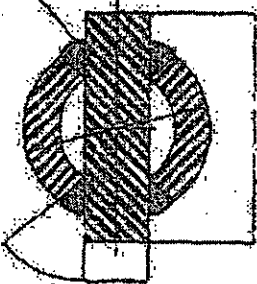
N.4 Pz.

ULTRASUONARE

 Via Genova 33 20037 MELANO (MI) Tel. 0425/80727 Fax 0425/80487 telefax 02/7698060		TIPO	TURBO FORCE	PESO Kg.	N.Pz
		NOME	PUNTONI - TIRANTI	GRUPPO	004
DOCUMENTO RISERVATO A TERZO DI LEGGE E' FATTO OMETO RIPRODURRE E GERERLO MOTO A TERZO SENZA AUTORIZZAZIONE		DESCRIZIONE	PARTICOLARI TIRANTI	DATA	09-09-2004
LAVORAZIONE PANTOGRAFATO		MATERIALE	S355J2G3 (Fe510D) - S275JO (Fe430C)	SCALA	1:2.5
REV.N	DATA	DESCRIZIONE	DISEGNATORE:		REV.
			DISEGNO		
PER COMPLESSIVO VEDI DISEGNO N. 023.004.001.M/003.M			023.004.004.N		
			Sostituito da		



N.135



SEZ. B-B

		TURBO FORCE		PECO No. N Pz.	
NOME PISTONI-TIRANTI		GRUPPO 504		DATA 09-09-2004	
DESCRIZIONE PART. FORCELLA LATO FUSE		MATERIALI		SCALA 1:2	
LAVORAZIONE		MATERIALI		DISEGNATORE U.T.	
REV. N	DATA	DESCRIZIONE		DISEGNO	REV.
				023.004.001.N	
PER COMPLESSIVO VEDI INSEGN. N. 023.004.000.M					
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Melara July 8 2005 SORIANI srl Via Oberdan 23 45037 Melera (Rovigo) ITALY Phone: 011 39 0425 89777	Bulletin No: 2005 TF03
	Release Date: July 8 2005
	Effective Date: July 8 2005
	Supersedes: 2005 TF01 and 2005 TF01 Amended, supplements 2005 TF02
	Completion Date: Before next operation
Pages: 1 of 11	

SERVICE BULLETIN

Ride Manufacturer: Soriani SRL	Affected Production Dates: All manufactured before date of issue
Ride Name: Turbo Force and Stratosphere	Affected Serial Nos.: GTF08R001US99 GTF08R00141US GTF08R00317US GTF08R00444US GTF08R00445US GTF08R01158US
Model Number: All	
Abstract Of Issue: This Bulletin is being issued to clarify and supersede the information which was set out in Bulletin 2005 TF01 Amended.	
Reason For Release: Due to poor execution of the repair, Soriani srl has learned of a failure of a tie rod after modification. <i>This amended Bulletin provides updated drawings and details concerning the proper repair and inspection procedures of the area to be modified. It also provides additional information concerning safety rope installation.</i>	
Action To Be Taken: Ensure that the repairs have been accomplished in accordance with the approved repair procedure by a certified welder and that the safety ropes previously supplied are properly installed. Thereafter: a magnetic particle inspection is to be performed by a Level II (ASNT) licensed inspector before restarting operation of the ride to detect any welding cracks or any other welding imperfection. (See pages 3 – 6 detailing area to be inspected.)	
Detail Of Issue: See attached chart and drawings	
Future Action To Be Taken: Ensure that the tie rods are properly used, set up and torqued in a sequential manner on each assembly. Follow periodic inspections and NDT as required in the Service Manual and attached chart.	

Verify that the welding done in accordance with Bulletin 2005 TF 01 was properly performed:

The notch in the pipe to for the 25 mm steel plates must be machined and have a chamfer along its sides and ends to accommodate the weld bead. The steel plate must be welded to the pipe all around, which is recommended by the DIN Standard 15018, on table 31, notch case K3, code 342 and code 343. The slot in the pipe will accommodate a plate with angled ends, which is welded with a single bevel butt weld with fillet weld. The weld is then machined across the end and 125mm back along each side, starting at the end to avoid notch effect. (DIN 15018 is the reference standard for the design and calculation of the Turbo Force). After welding and machining the weld is to be inspected by magnetic particle. See following diagram and drawing:

DIN 15018 Part 1 Page 20

Table 31. Notch case K3 (strong notch effect) (continued)

Code	Description and illustration	Symbol
343	Continuous component slotted to accommodate a plate with chamfered or radiused ends, which is welded on. The end welds in the zone not less than 5 x t in width are made in the form of double bevel butt weld with double fillet welds and machined to avoid notch effect.	See detail drawing 023.004.006M below End weld only.

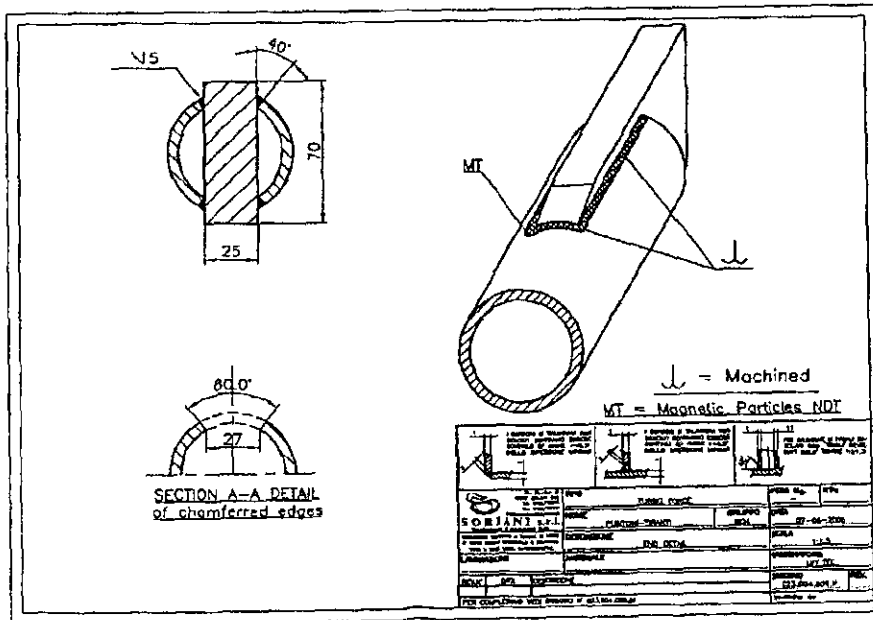
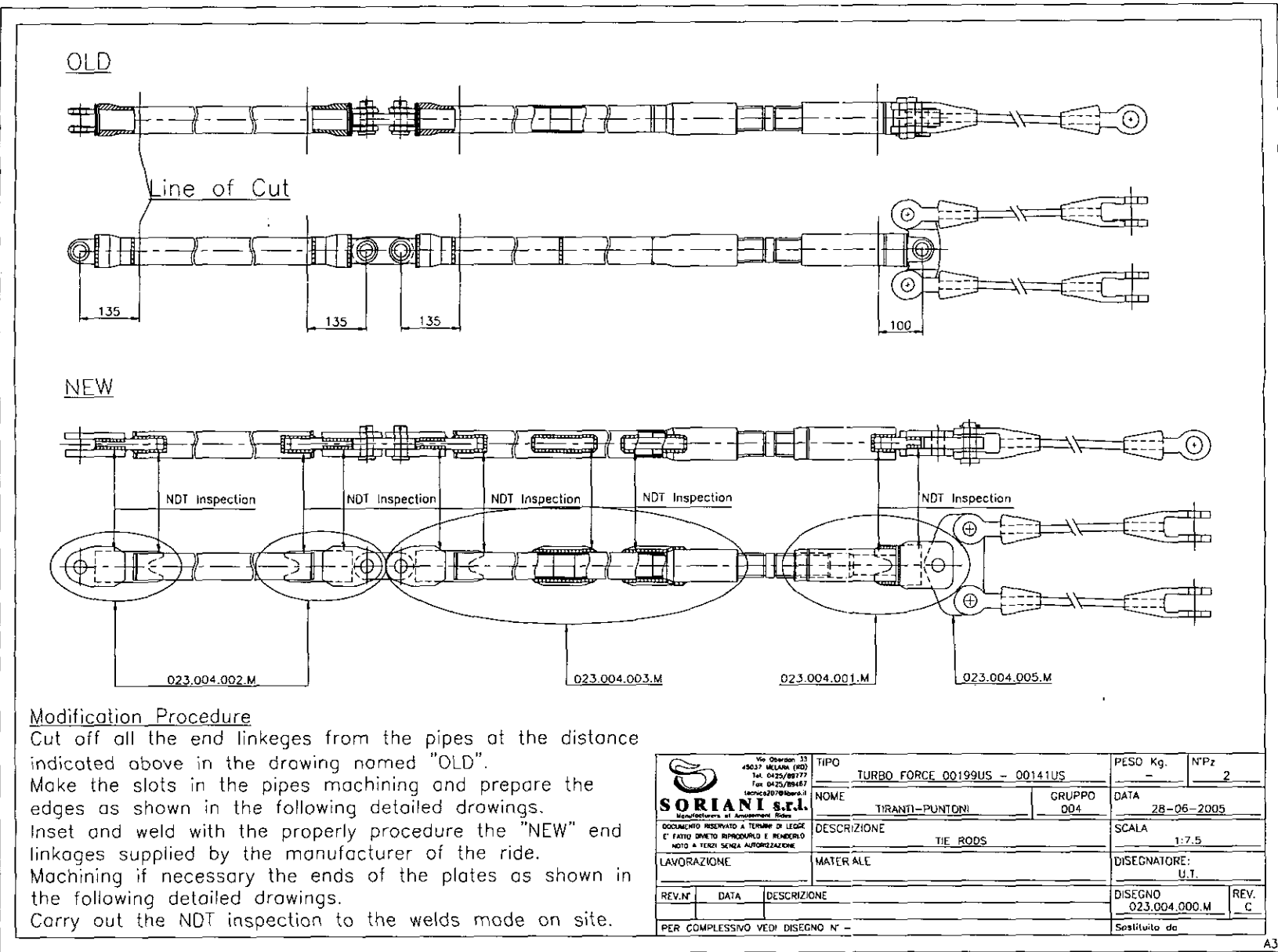


Table NDT (Non Destructive Test) list performed by the owner			
N°	Particular	Check frequency	Kind of test
<i>1</i>	<i>Arms</i>	<i>Weekly</i>	<i>Visual</i>
<i>2</i>	<i>Tie Rods (including modifications)</i>	<i>Weekly</i>	<i>Visual</i>
<i>3</i>	<i>Gondola</i>	<i>Weekly</i>	<i>Visual</i>
<i>4</i>	<i>Column</i>	<i>Weekly</i>	<i>Visual</i>
<i>5</i>	<i>Telescopic Column</i>	<i>Weekly</i>	<i>Visual</i>
<i>6</i>	<i>Semi trailer</i>	<i>Weekly</i>	<i>Visual</i>
<i>7</i>	<i>Rotating Center</i>	<i>Weekly</i>	<i>Visual</i>
<i>8</i>	<i>Transmission (Reduction gear, ball bearing, etc)</i>	<i>Weekly</i>	<i>Visual</i>

Table NDT (Non Destructive Test) welding list Performed by licensed inspection body			
N°	Welding of the particular:	Check frequency	Kind of test
<i>1</i>	<i>Arms</i>	<i>Yearly</i>	<i>Magnetic</i>
<i>2</i>	<i>Tie Rods (including modifications)</i>	<i>Yearly</i>	<i>Magnetic</i>
<i>3</i>	<i>Gondola</i>	<i>Yearly</i>	<i>Magnetic</i>
<i>4</i>	<i>Column</i>	<i>Yearly</i>	<i>Visual</i>
<i>5</i>	<i>Telescopic Column</i>	<i>Yearly</i>	<i>Visual</i>
<i>6</i>	<i>Semi trailer</i>	<i>Yearly</i>	<i>Visual</i>
<i>7</i>	<i>Rotating Center</i>	<i>Yearly</i>	<i>Visual</i>
<i>8</i>	<i>Transmission (Reduction gear, ball bearing, etc)</i>	<i>Yearly</i>	<i>Visual</i>

The NDT inspection should be conducted at all five positions listed in this drawing.



Modification Procedure


Cut off all the end linkages from the pipes at the distance indicated above in the drawing named "OLD".

Make the slots in the pipes machining and prepare the edges as shown in the following detailed drawings.

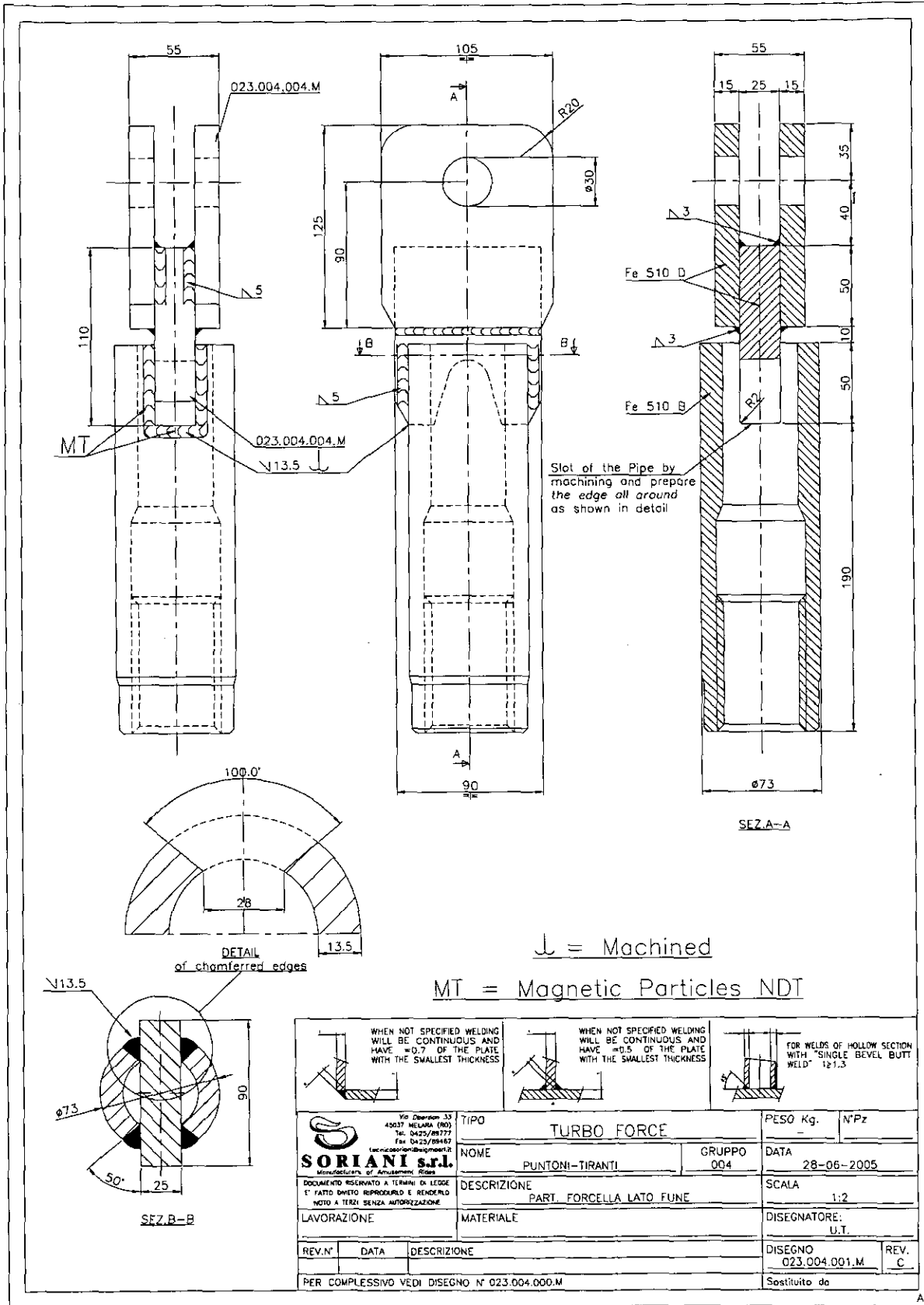
Inset and weld with the properly procedure the "NEW" end linkages supplied by the manufacturer of the ride.

Machining if necessary the ends of the plates as shown in the following detailed drawings.

Carry out the NDT inspection to the welds made on site.

 Via Oberdan 33 20137 MILANO (MI) Tel. 0425/89177 Fax 0425/89457 Tecnica 207@SORIANI.IT		TIPO	TURBO FORCE 00199US - 00141US	PESO Kg.	-	N°Pz	2
SORIANI s.r.l. Manifattura di Componenti TIRANTI		NOME	TIRANTI-PUNTONI	GRUPPO	004	DATA	28-06-2005
DOCUMENTO RISERVATO A TERMINI DI LEGGE E' FATTO DIVETO RIPRODURLO E RENDERLO NOTO A TERZI SENZA AUTORIZZAZIONE		DESCRIZIONE	TIE RODS	SCALA	1:7,5	DISEGNATORE: U.T.	
LAVORAZIONE		MATERIALE	DISEGNATORE:		U.T.		
REV.N°	DATA	DESCRIZIONE	DISEGNO		023.004.000.M	REV.	C
PER COMPLESSIVO VEDI DISEGNO N° -						Sostituito da	

The assembly listed as "old" is the original assembly. The assembly listed as "new" is the modified version.



TURBO FORCE

Tie Rods – Safety Ropes

Introduction

The following information Supplements 2005 TF 02 :

Safety Device description

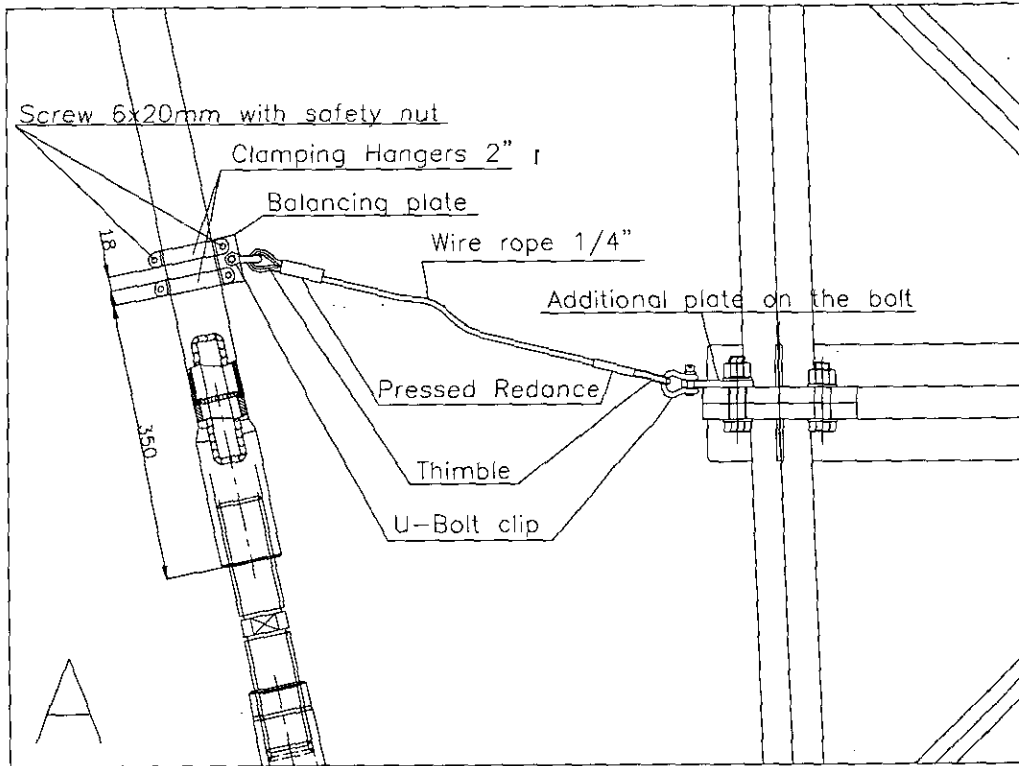
To restrain tie rods in case of failure during operation, Soriani is providing safety cables that will secure the tie rods in case of separation of the parts. The safety devices for the Tie Rods system consist of 8 cables that secure each of the 4 tie rod pipe ends to the arms, in case of failure of the tie rods. Soriani is supplying the whole kit for the safety cables:

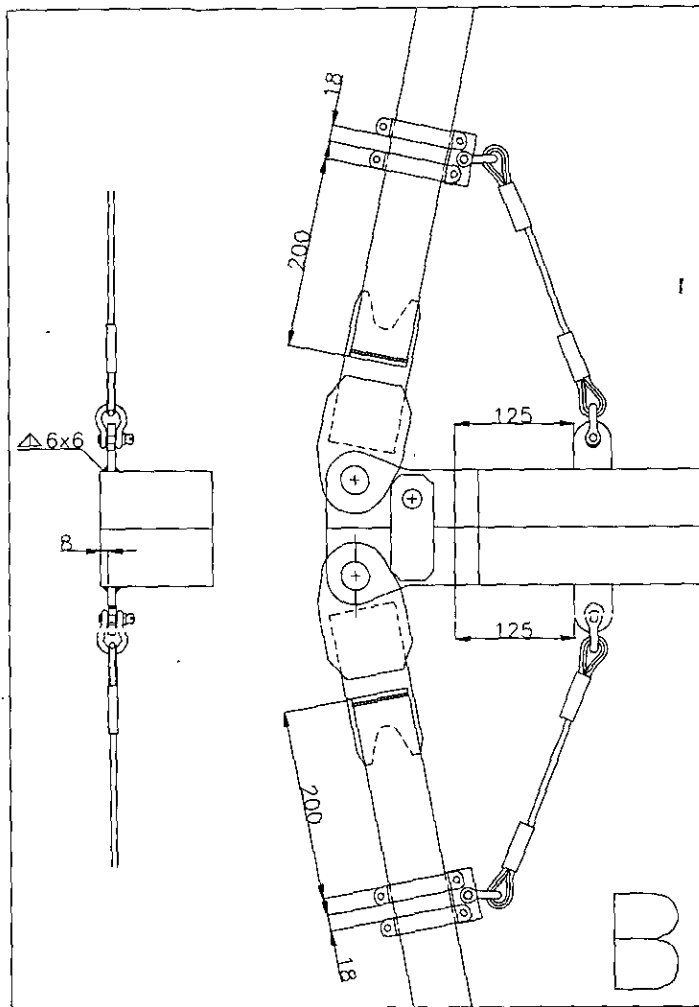
- 4 Wire cables 1/4" with the exact length for position "A" complete with the end thimble.
- Wire cables 1/4" with the exact length for position "B" complete with the end thimble.
- 8 U 1/4" clips for position "A" and 8 for position "B".
- 4 Balancing plates on the tie rod and 4 additional plates on the arm bolt for the position "A".
- 4 Balancing plates on the tie rod and 4 additional lugs to be welded at position "B".
- 8 Clamping hangers 2" for position "A" and 8 for position "B".

The operators are instructed to install the cables and all the accessories, as outlined. Inspectors are to verify proper installation.

Please reference pages 9 and 10 of this bulletin for installation diagrams while conducting this repair.

As you will note, one side of the tie rod must be tightened at the turnbuckle, to the center arm connecting flange, substituting one bolt of the flange and clamping it to the additional plate which will be supplied. On the other side, the tie rod must be tightened to the tie rod struts which connect to the center rotation, welding it to the additional lug which also has been supplied.





Case of Failure

Properly assembled, inspected and maintained tie rods should pose no risk of failure. However, to avoid any potentially dangerous condition should there be a separation, the ends must be secured with redundant safety cable system that will hold it in case of failure. The weight of the tie rod is about 120 kg complete of pipe, end linkages, turnbuckle.

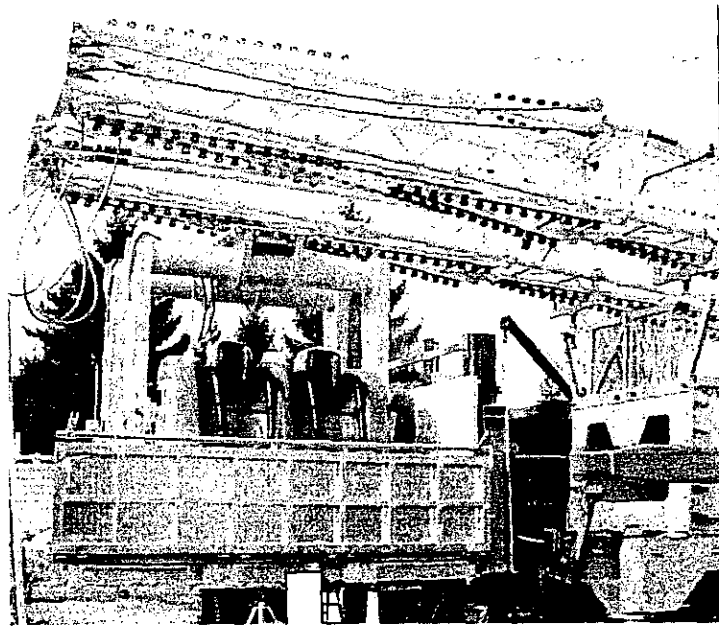
In the event of tie rod failure, the arms are strong enough to safely operate the ride while until it is safely brought to a stop. A short period of operation, while ride is being safely shut down, with a loose tie rod is acceptable to allow patrons to exit the ride. The ride must not be operated until the tie rods are repaired and inspected following the guidelines in this bulletin.

Safety Ropes Strength

The ¼" safety cables have an ultimate strength of 3000 kg, and the same value for the U-bolt clip. Using a safety factor of 6, the permissible load of the cable becomes 500 kg, which is 4 times the dead load of the tie rod. Loading tests on prototype cable components, show some deformation at 1500 kg but not failure.

Transport Bracket

Your ride is equipped with a transport bracket which allows the tie rod to be retained on the lattice main structure during transportation. (See below photo.) Keep the transport bracket in place during operation. Should the tie rod separate on the cable end, the safety ropes will hold the tie rod end. The transport bracket will retain the cable assembly and keep it from swinging loose.



Conclusions

The safety cable system is intended to, and will be suitable, to secure the tie rod in case of a separation. The safety cables will hold the tie rod, in an acceptable position, until the ride has stopped without compromise to the rest of the tie rod system.