

Melara July 8 2005

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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
issueRide Name: Turbo Force and
StratosphereAffected 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. 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.

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:

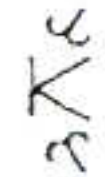
Ensure that the tie rods are properly used, set up and torqued in a sequential manner on each assembly. Follow periodic inspections and NDT as required in the Service Manual and attached chart.

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 28

Table 31. Notch case K 3 (strong notch effect) (continued)

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

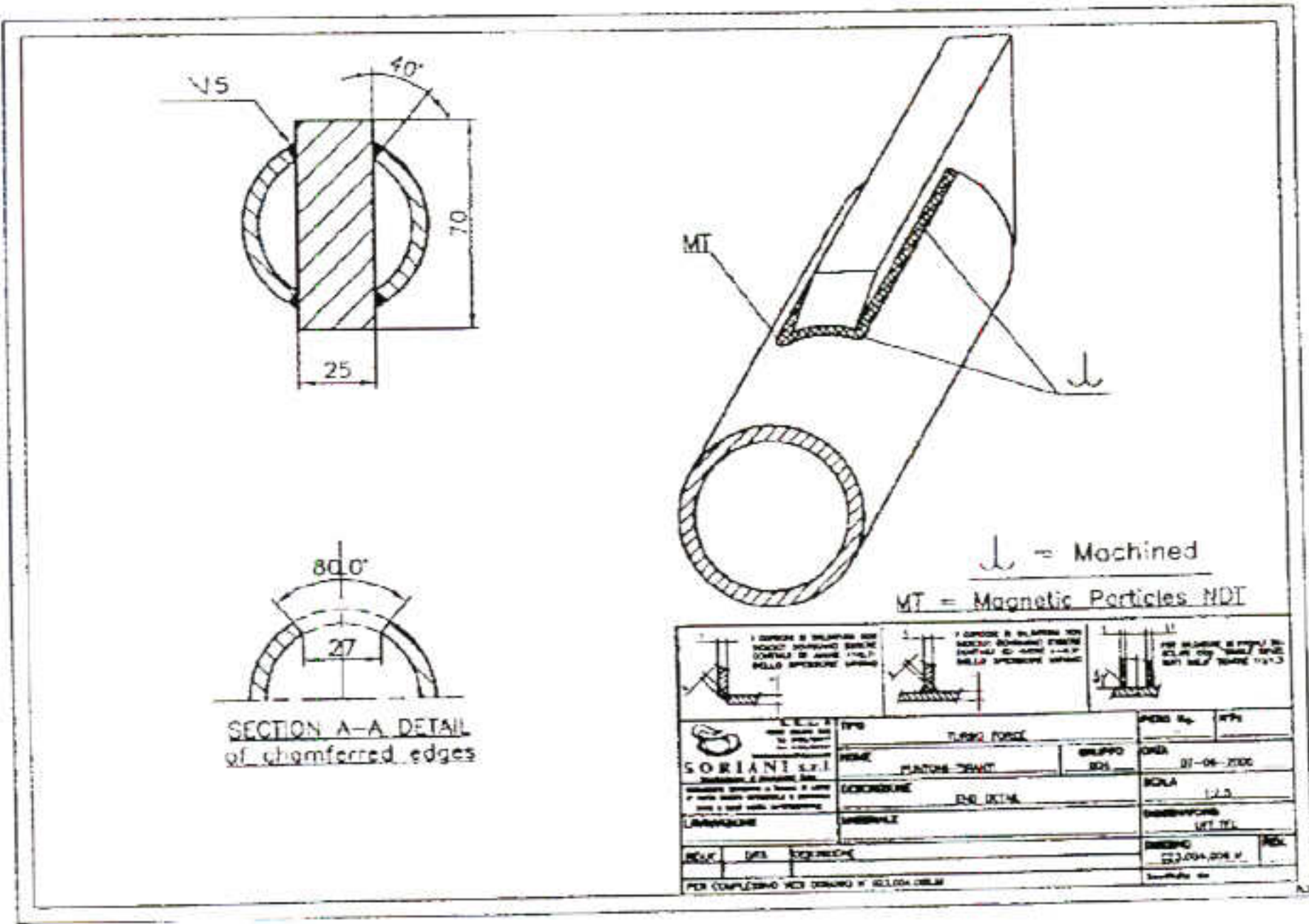
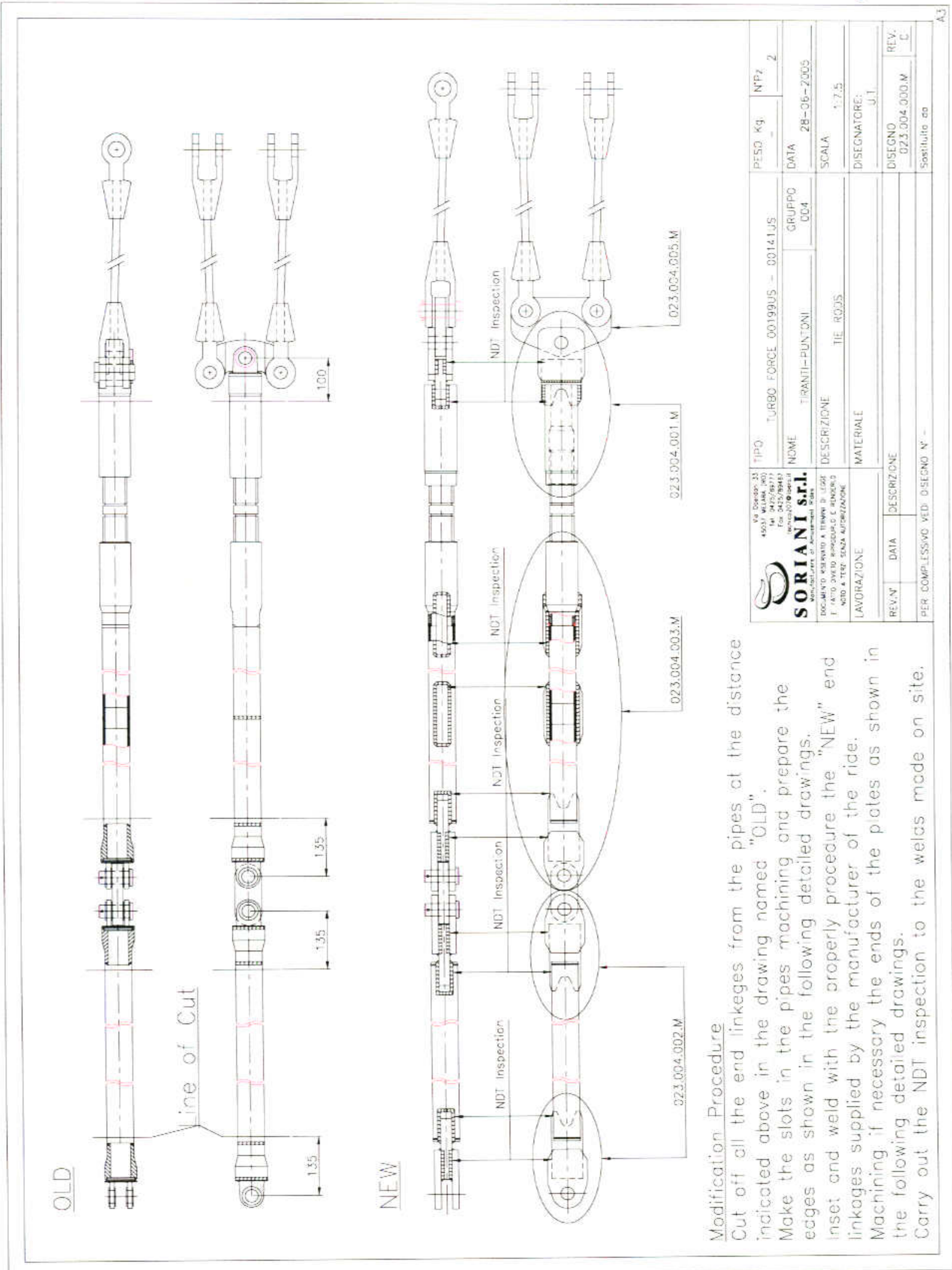
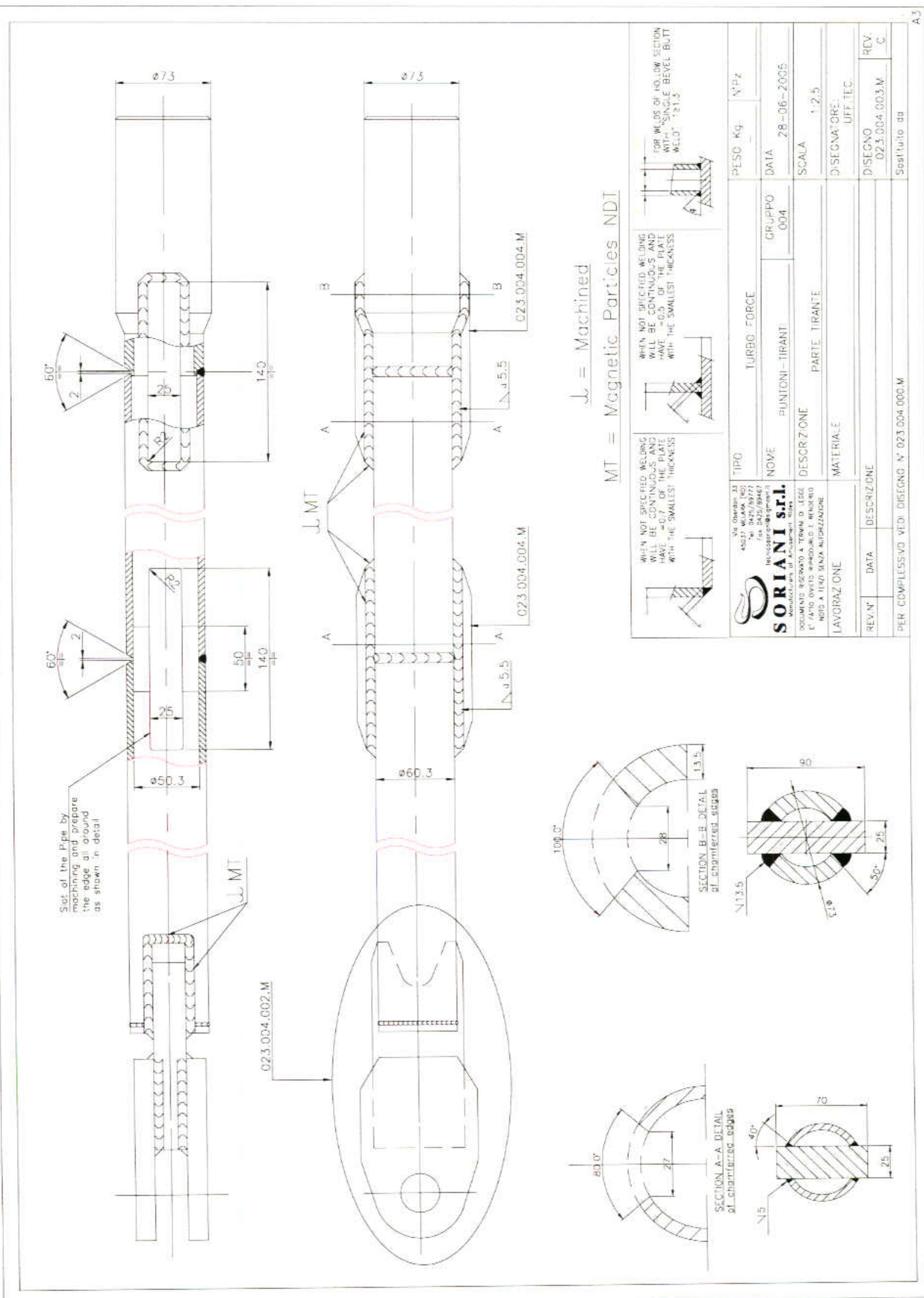


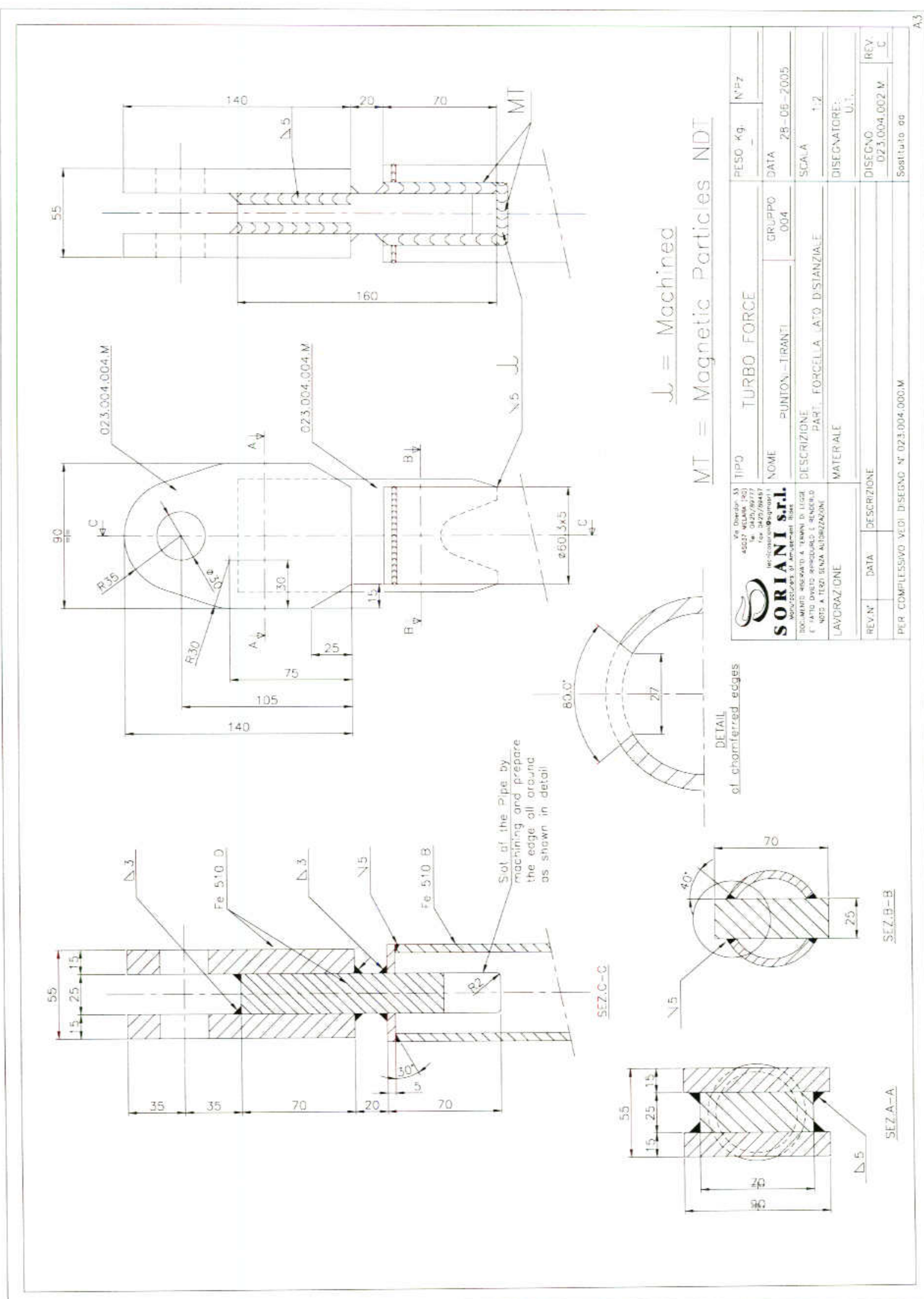
Table NDT (Non Destructive Test) list performed by the owner			
N°	Particular	Check frequency	Kind of test
<i>1</i>	<i>Arms</i>	<i>Weekly</i>	<i>Visual</i>
<i>2</i>	<i>Tie Rods (including modifications)</i>	<i>Weekly</i>	<i>Visual</i>
<i>3</i>	<i>Gondola</i>	<i>Weekly</i>	<i>Visual</i>
<i>4</i>	<i>Column</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>

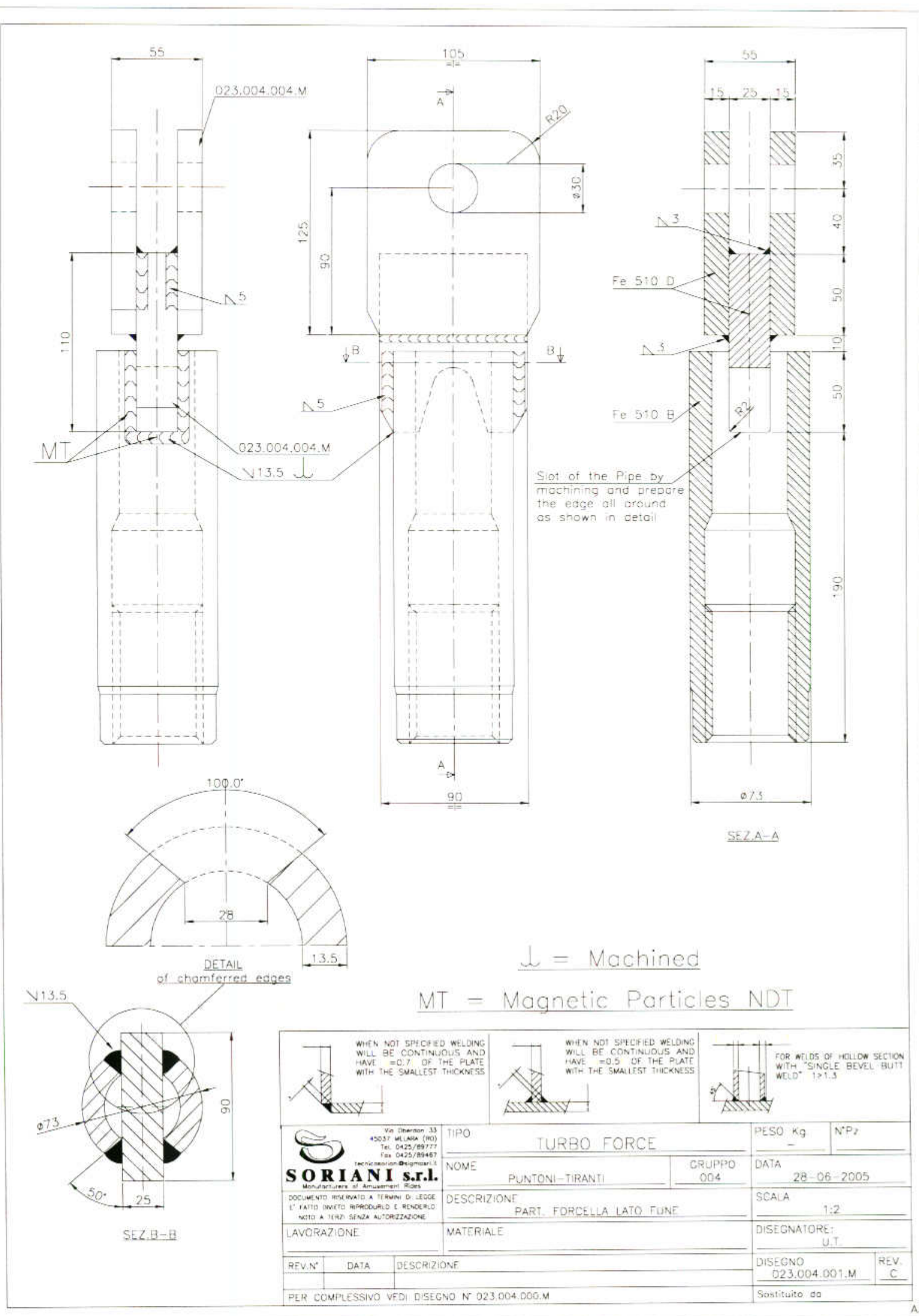
Table NDT (Non Destructive Test) welding list Performed by licensed inspection body			
N°	Welding of the particular:	Check frequency	Kind of test
<i>1</i>	<i>Arms</i>	<i>Yearly</i>	<i>Magnetic</i>
<i>2</i>	<i>Tie Rods (including modifications)</i>	<i>Yearly</i>	<i>Magnetic</i>
<i>3</i>	<i>Gondola</i>	<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.









TURBO FORCE

Tie Rods – Safety Ropes

Introduction

The following information Supplements 2005 TF 02 :

Safety Device description

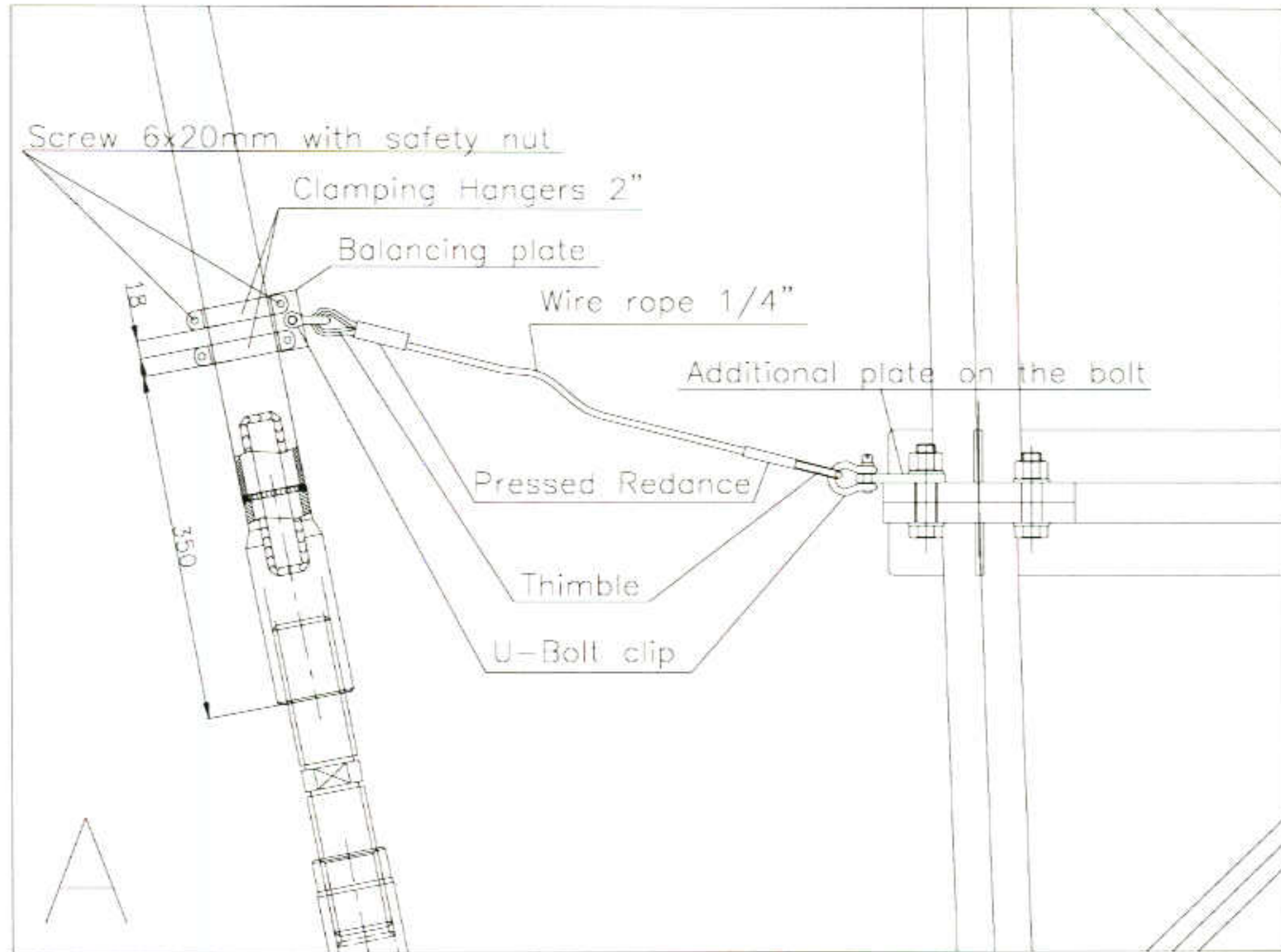
To restrain tie rods in case of failure during operation, Soriani is providing safety cables that will secure the tie rods in case of separation of the parts. The safety devices for the Tie Rods system consist of 8 cables that secure each of the 4 tie rod pipe ends to the arms, in case of failure of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

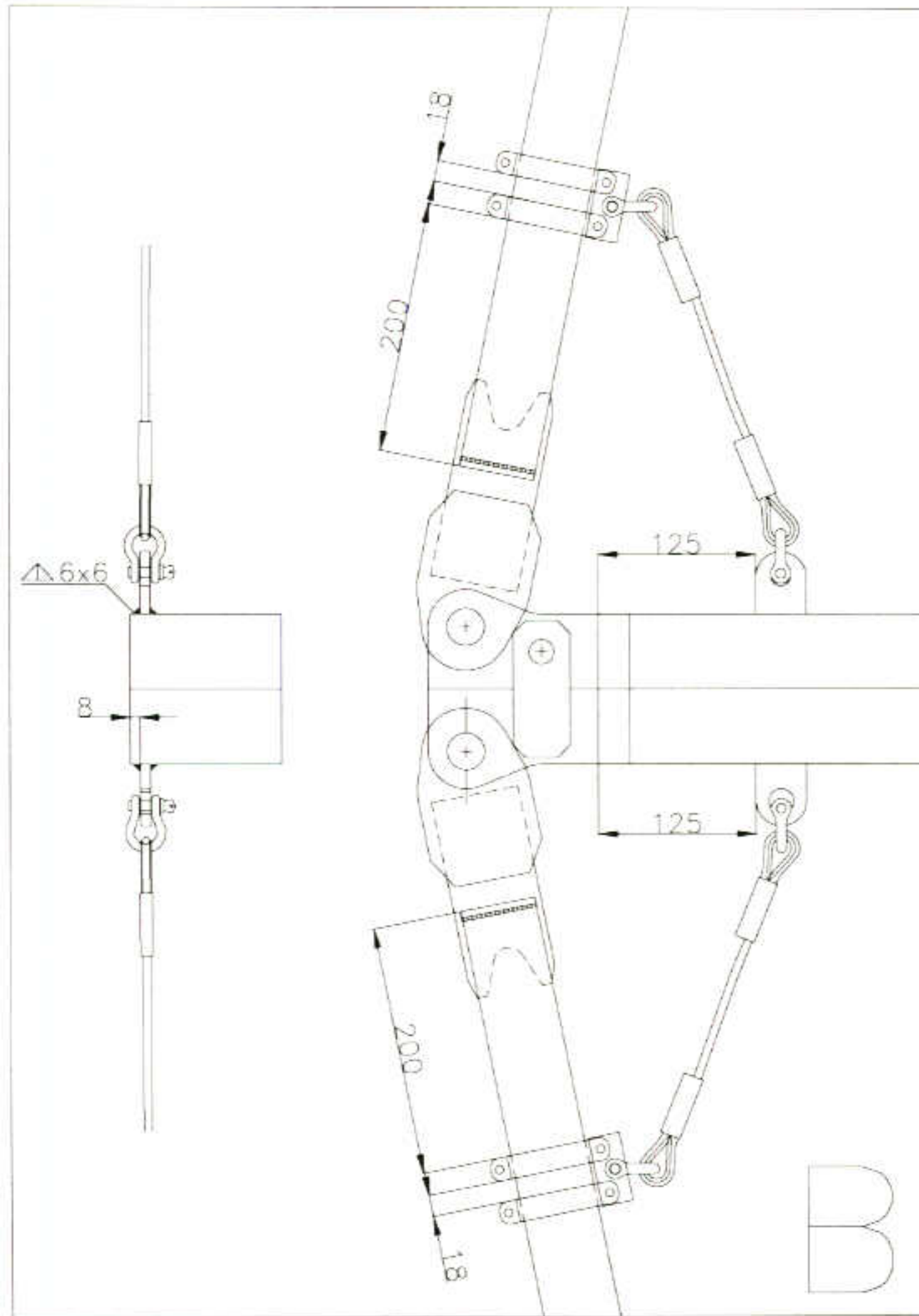
- 4 Wire cables 1/4" with the exact length for position "A" complete with the end thimble.
- Wire cables 1/4" with the exact length for position "B" complete with the end thimble.
- 8 U 1/4" clips for position "A" and 8 for position "B".
- 4 Balancing plates on the tie rod and 4 additional plates on 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.

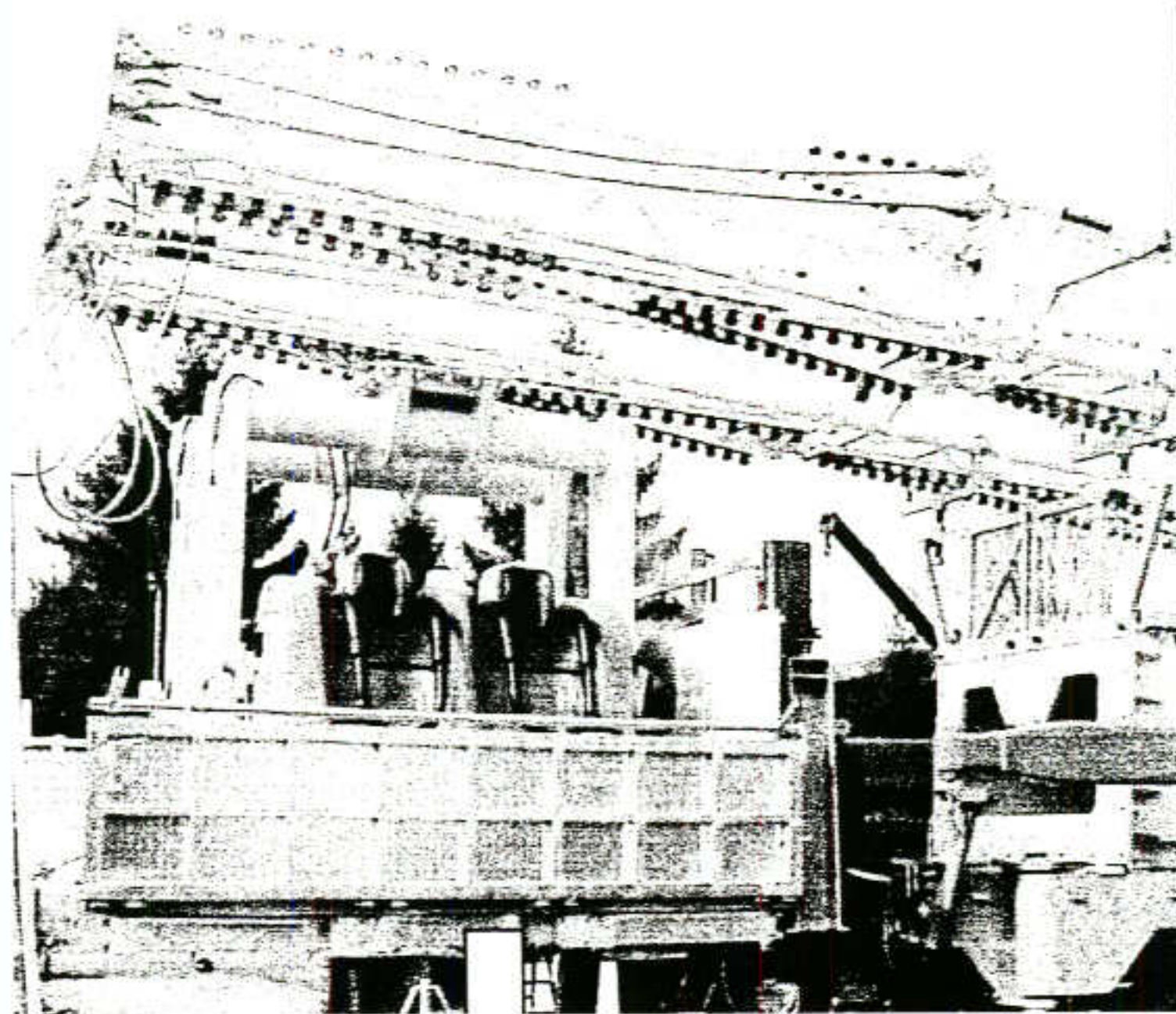
In the event of tie rod failure, the arms are strong enough to safely operate the ride while until it is safely brought to a stop. A short period of operation, while ride is being safely shut down, with a loose tie rod is acceptable to allow patrons to exit the ride. The ride must not be operated until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

Safety Ropes Strength

The 1/4" 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.