494.

Zamperla Mini Jet NDT and replacement schedules

A service bulletin relating to Zamperla Mini Jet rides has been received by NAFLIC.

Issued in November 2019, the bulletin has been provided to align the NDT and replacement schedule of the Mini Jet with the current schedule being released in the manuals of the new model year Mini Jet.

The information contained within is that of the manufacturer and not NAFLIC. When following the advice from the manufacturer, you are reminded of your duties and responsibilities under HSG175 regarding modifications.

	Bulletin No: 2019 MJ01
	Release Date: November 01, 2019
	Effective Date: January 01, 2020
	Supersedes:
	Completion Date: Before 2020 Opening Season
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SERVICE BULLETIN

Ride Manufacturer: A. Zamperla S.p.A	Affected Production Dates: 2018 and earlier
Ride Name: Mini Jet	Affected Serial Nos.: All Fabricated 2018 and earlier excluding the following Serial Numbers:
Model Number: Mini Jet - All	GMJ06F15185AE,GMJ06F16138DE, G29617106,G29617254,G59918163,G59918205,G32818226

Abstract Of Issue:

Align older rides with most current non-destructive testing (NDT) and replacement schedule.

Reason For Release:

The purpose of this service bulletin is to align the NDT schedule of the Mini Jet with the current NDT being released in the manuals of the newer Model Year Mini Jet.

Action To Be Taken:

Perform NDT as per the attached schedule before the 2020 operating season.
Replace parts as per attached schedule.
The Items reported on the NDT AND REPLACEMENT SCHEDULE may be used for the 2020 operating season only if the NDT defined for that part is performed and passes.
The items reported on the REPLACEMENT SCHEDULE that are 12 years or older must be replaced for the 2020 season regardless of testing performed.

Detail Of Issue:

Attached document
MINI JET – NDT AND REPLACEMENT SCHEDULE
MJ-01-2019 NDT TEST ACCEPTANCE CRITERIA

Future Action To Be Taken:

Perform NDT as per the attached schedule and attached acceptance criteria.
Replace parts as per attached schedule.
Include this bulletin with all maintenance documents.

MINI JET – NDT AND REPLACEMENT SCHEDULE

NDT SCHEDULE

Item	Part Number	Component and Location	Image #	Test method code	Test every (Time Code)	Remarks
1		Vehicle Support	1	VT	M6	Check welds. Check for cracks, corrosion.
				MT	Y4	
2		Tie-Rod Pin	2	MT	Y4	Check for cracks, corrosion.
				UT	Y4	
3		Arm Pin	2	MT	Y4	Check for cracks, corrosion.
				UT	Y4	
4		Tie-Rod	3	VT	M6	Check welds. Check for cracks, corrosion.
				MT	Y4	
5		Arm	4	VT	M6	Check welds. Check for cracks, corrosion.
				MT	Y4	
6		Cylinder-Arm Pin	5	MT	Y4	Check for cracks, corrosion.
				UT	Y4	
7		Cylinder-Center Pin	5	MT	Y4	Check for cracks, corrosion.
				UT	Y4	
8		Rotating Center	6	VT	M6	Check welds. Check for cracks, corrosion.
				MT	Y4	
9		Base Frame	7	VT	M6	Check welds. Check for cracks, corrosion.
				MT	Y4	

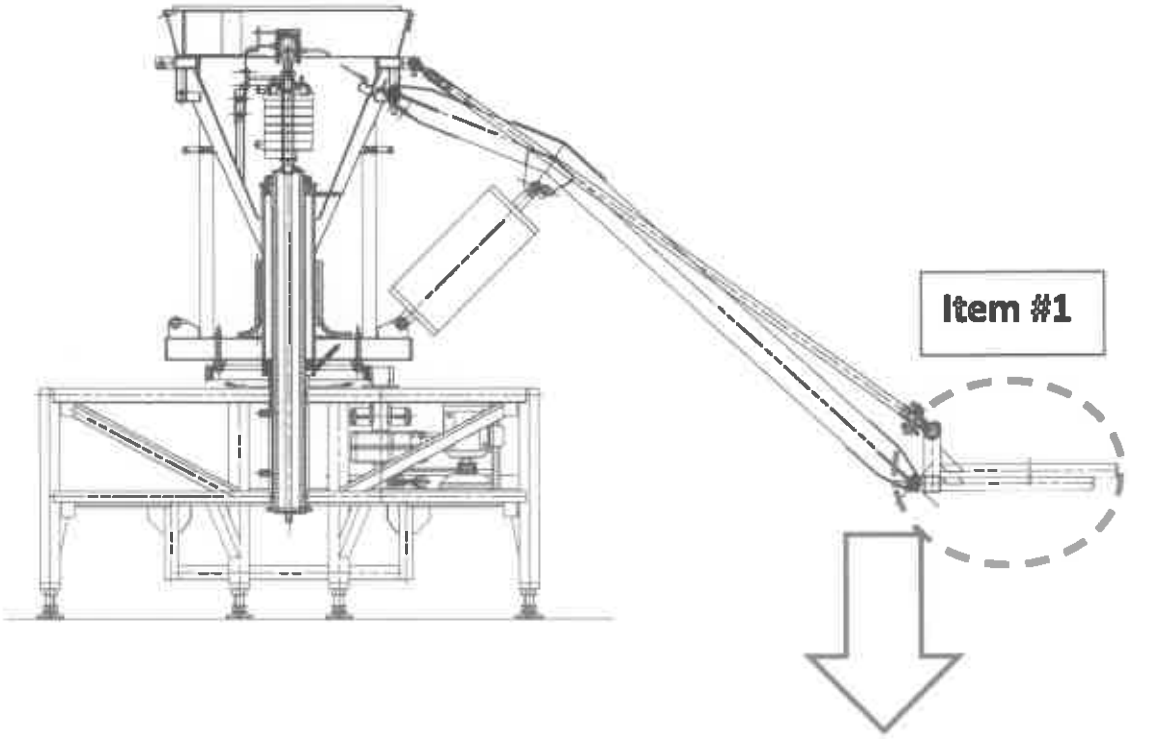
Time Code M6 = every 6 months Y4 = every 4 years	Test method Code VT = visual inspection (by certified inspector or maintenance mechanic). MT = magnetic particle testing procedure per (UNI EN ISO 17638 (2010)-23278 (2015) lev. 2X or ASTM E709. Acceptance per MJ-01-2019 ZAMPERLA NDT TEST ACCEPTANCE CRITERIA. PT = dye penetrant testing procedure per (EN 571-1 / EN 1289-2X) or ASTM E165. Acceptance per MJ-01-2019 ZAMPERLA NDT TEST ACCEPTANCE CRITERIA. UT = ultrasonic testing procedure per (EN 10308 (2004) CLASS 4) or per AWS D1.1 section 6.14.3. Acceptance per MJ-01-2019 ZAMPERLA NDT TEST ACCEPTANCE CRITERIA.

REPLACEMENT SCHEDULE

Item	Part Number	Component and Location	Image #	Replacement every [no. of years]
2		Tie-Rod Pin	2	12 years
3		Arm Pin	2	12 years
6		Cylinder-Arm Pin	5	12 years
7		Cylinder-Center Pin	5	12 years
10		Central Shaft	8	12 years

Please, contact Zamperla Spare Parts Department with ride serial number to get correct part number.

IMAGE 1 - VEHICLE SUPPORT



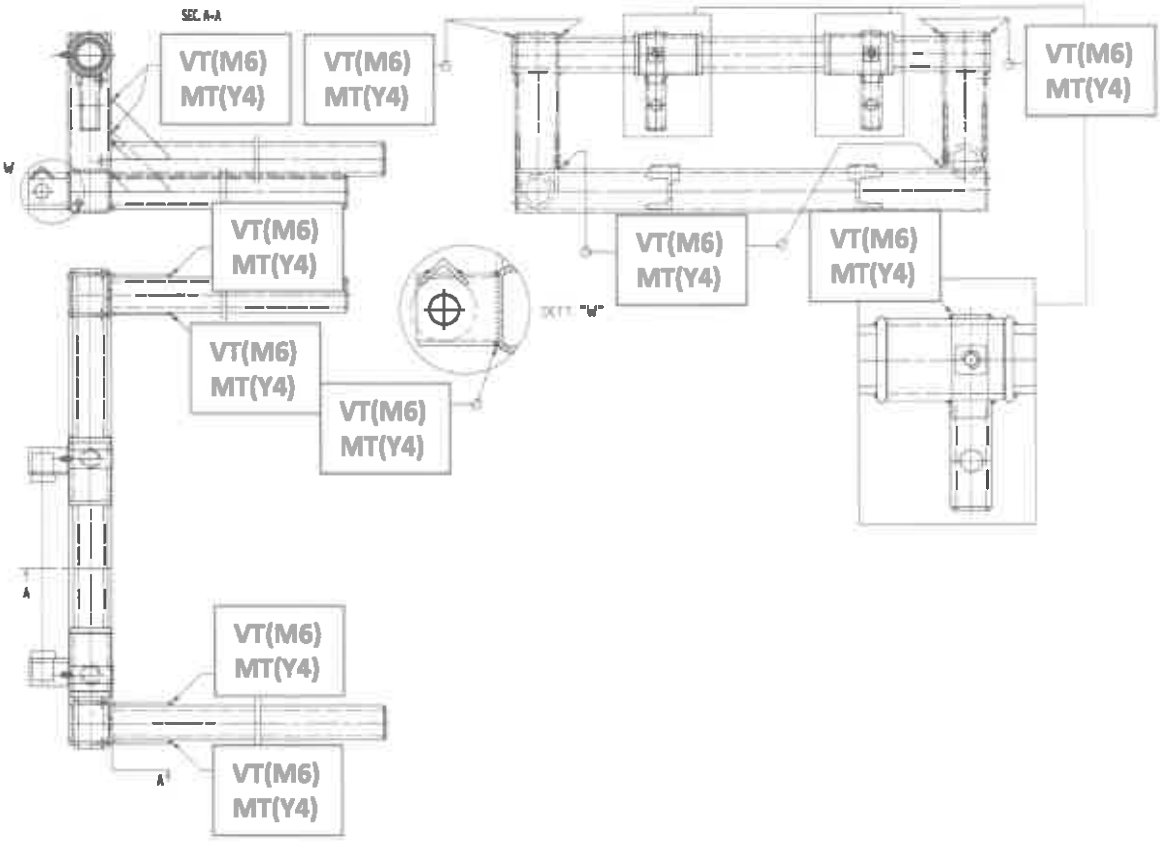


IMAGE 2 - TIE-ROD AND ARM PINS

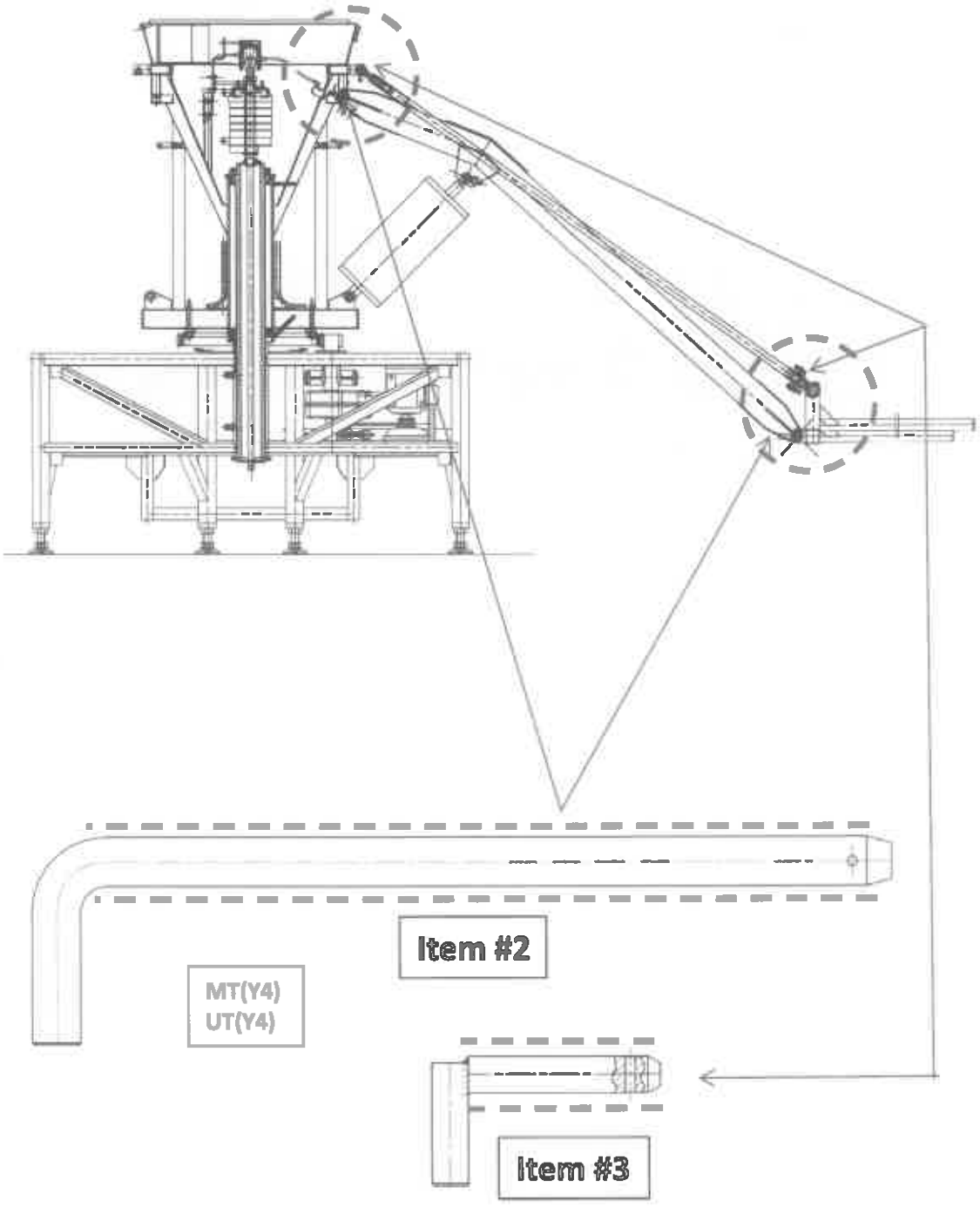
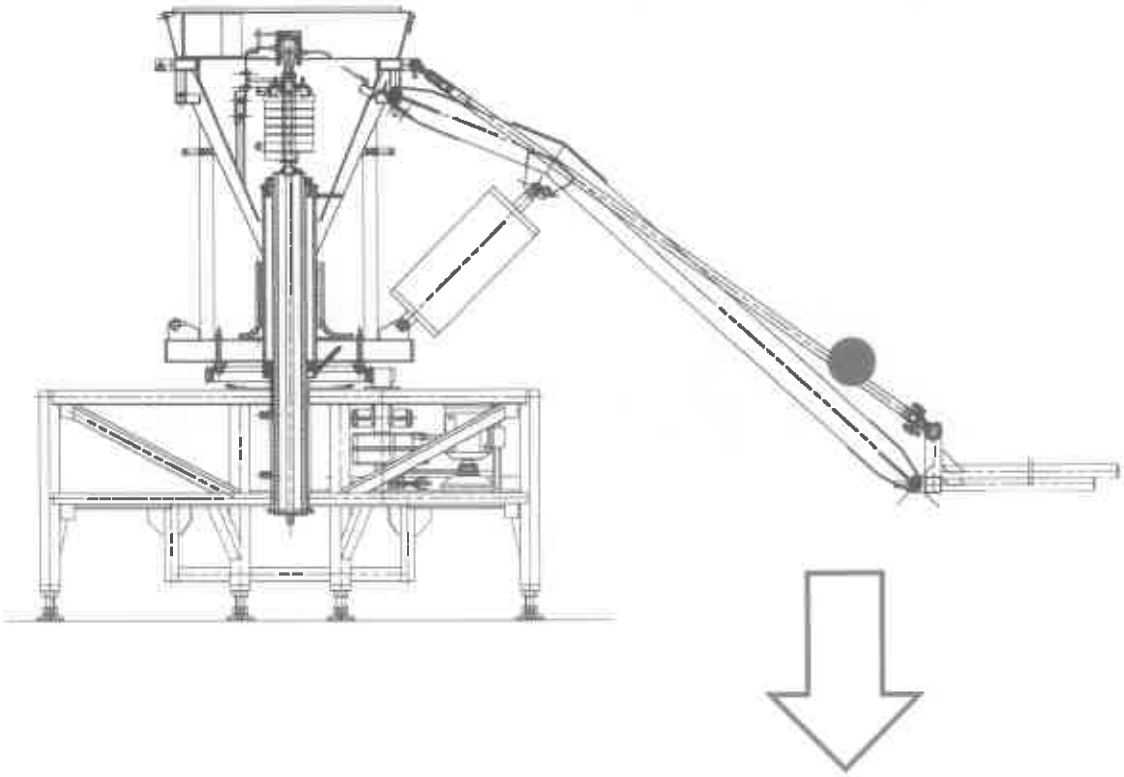


IMAGE 3 - TIE-ROD



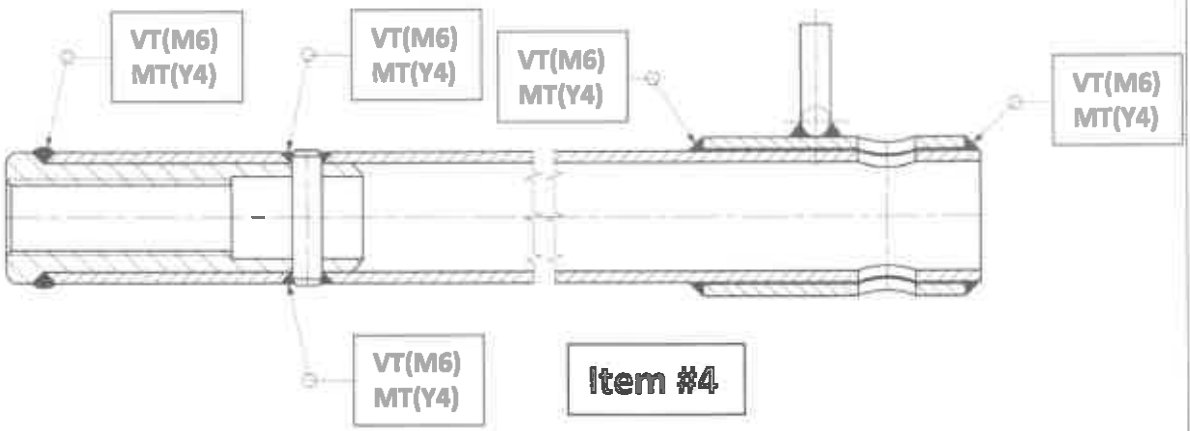
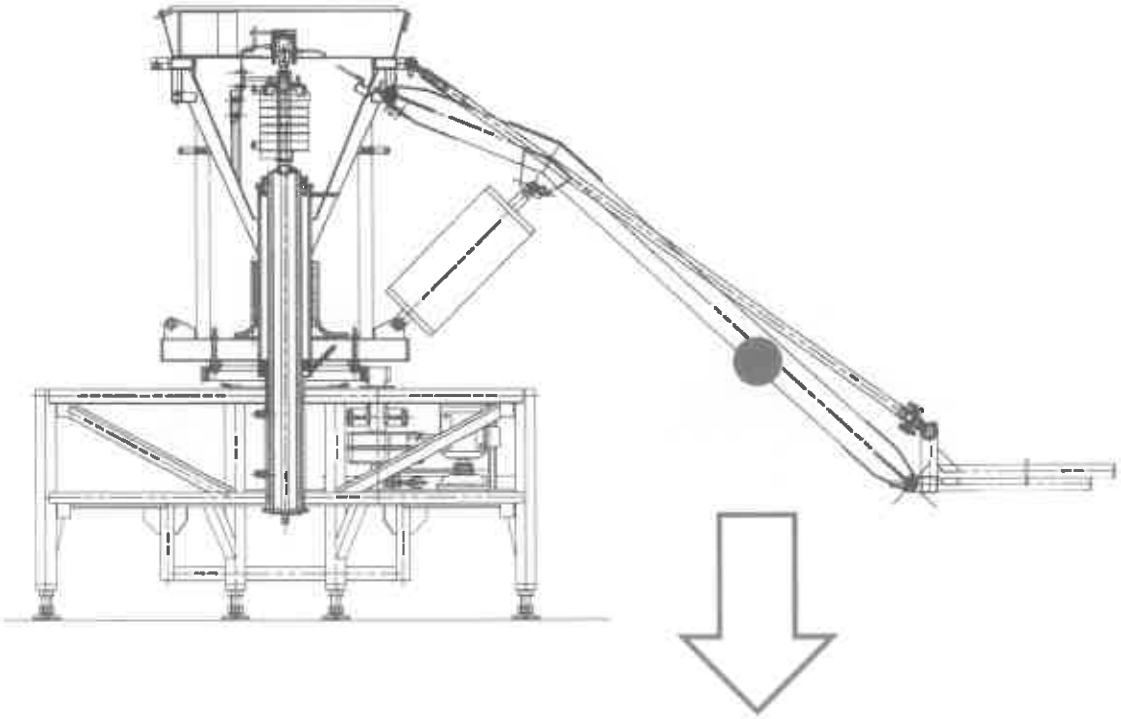


IMAGE 4 - ARM



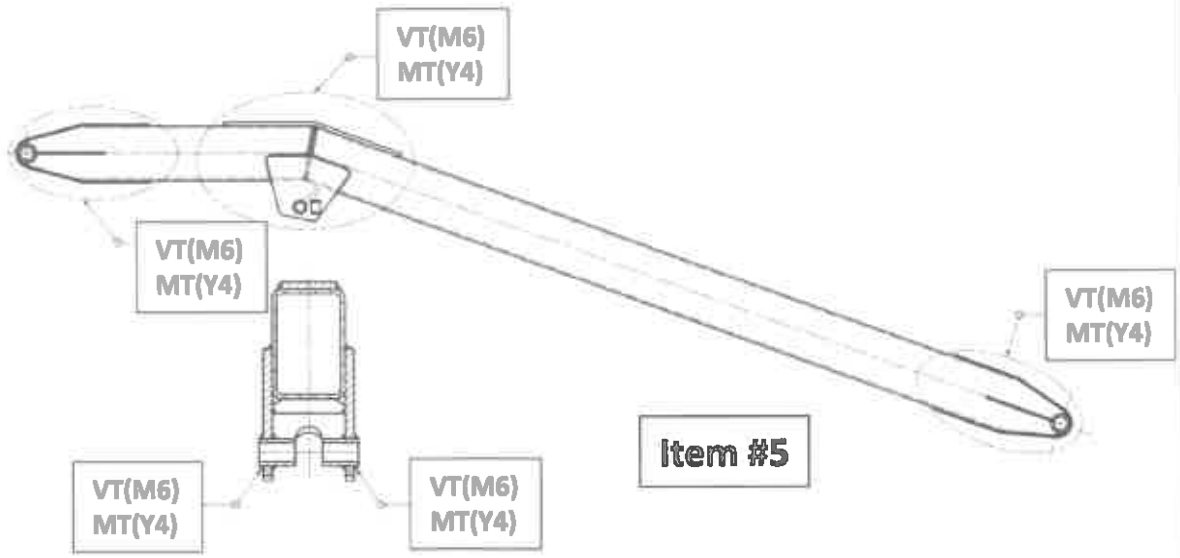


IMAGE 5 - CYLINDER PINS

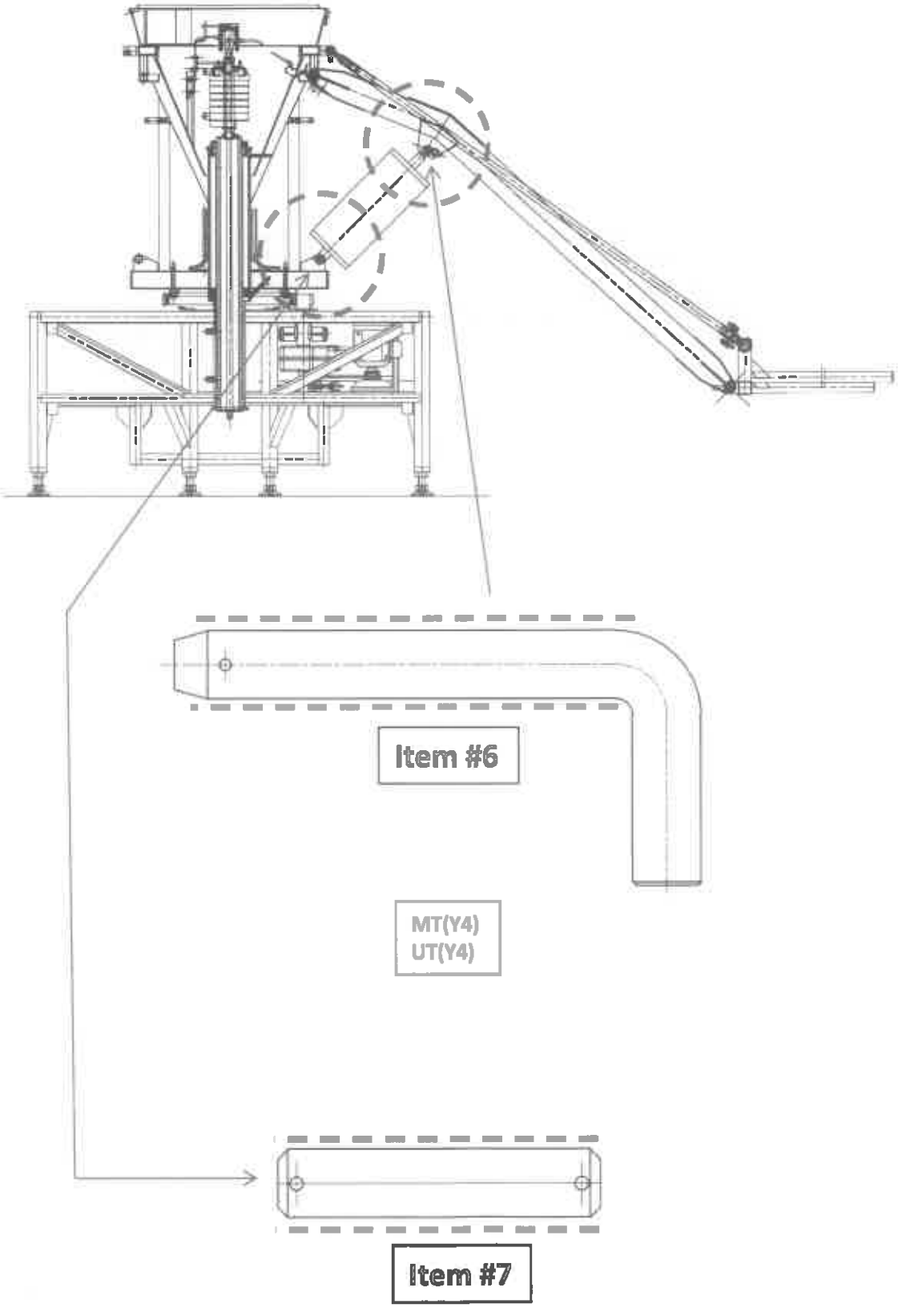


IMAGE 6 - ROTATING CENTER

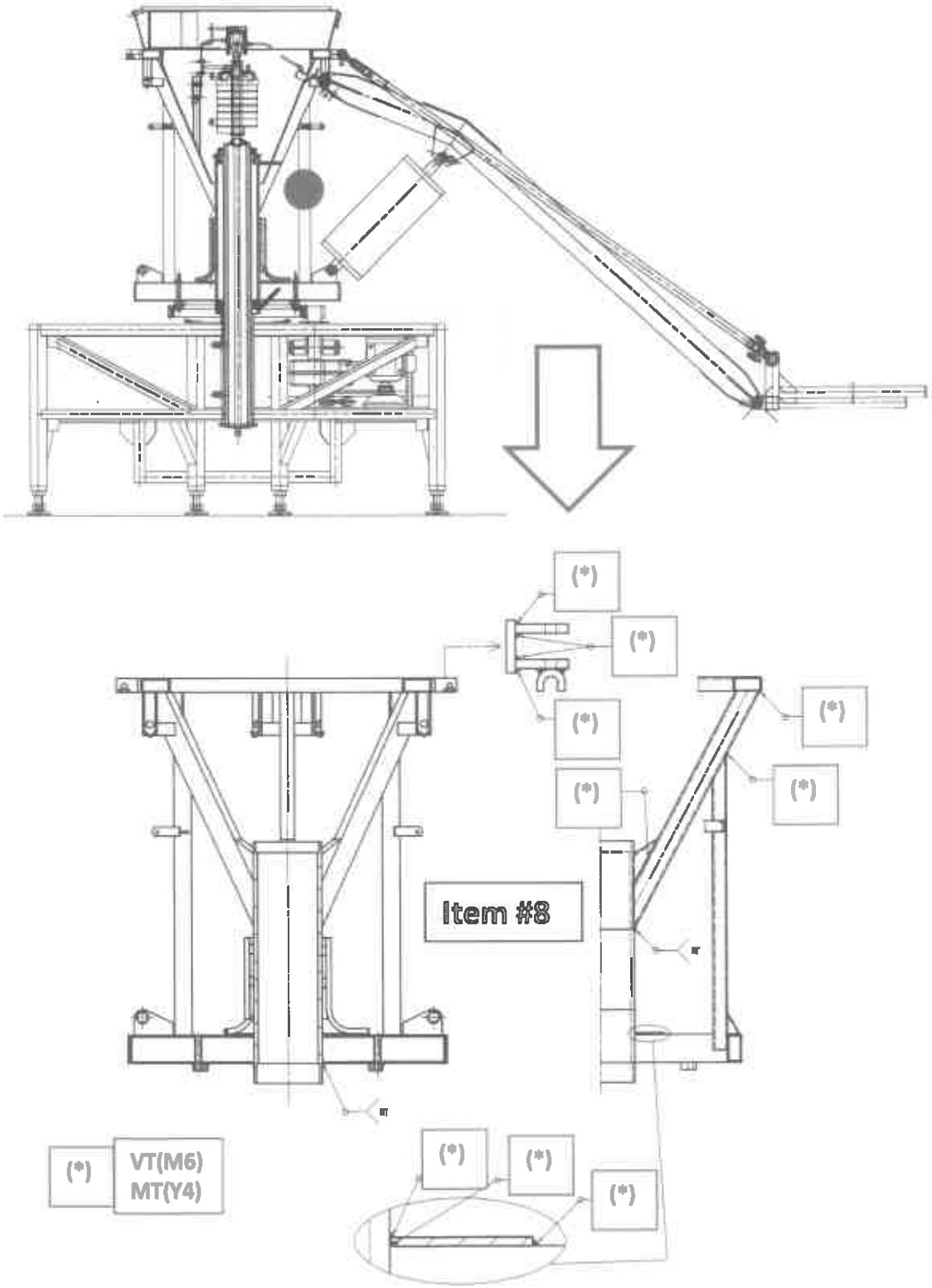
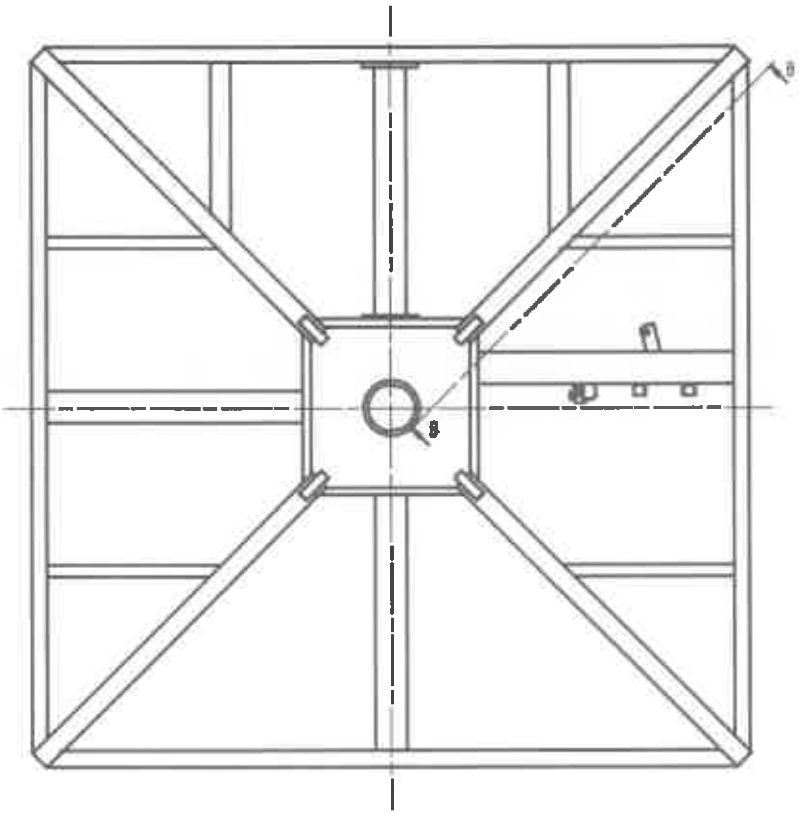


IMAGE 7 - BASE FRAME



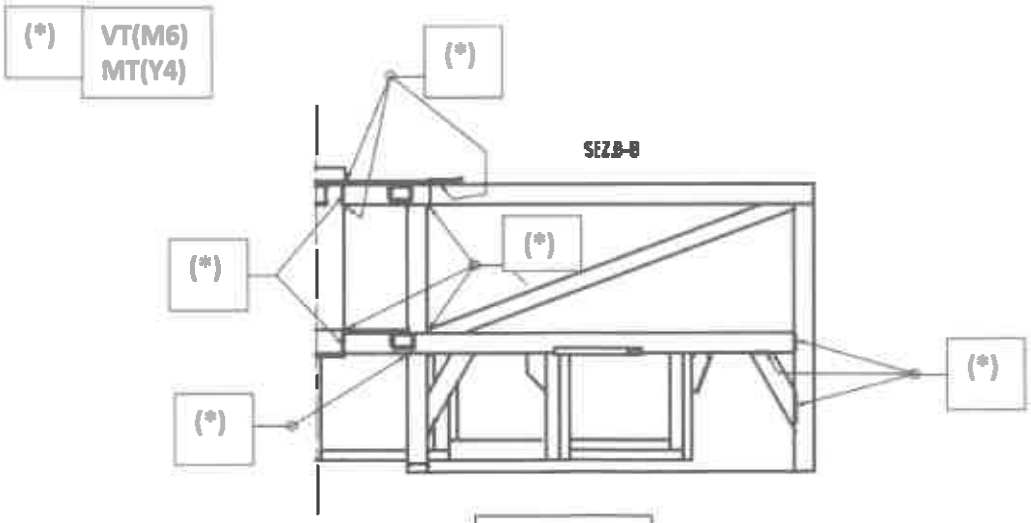


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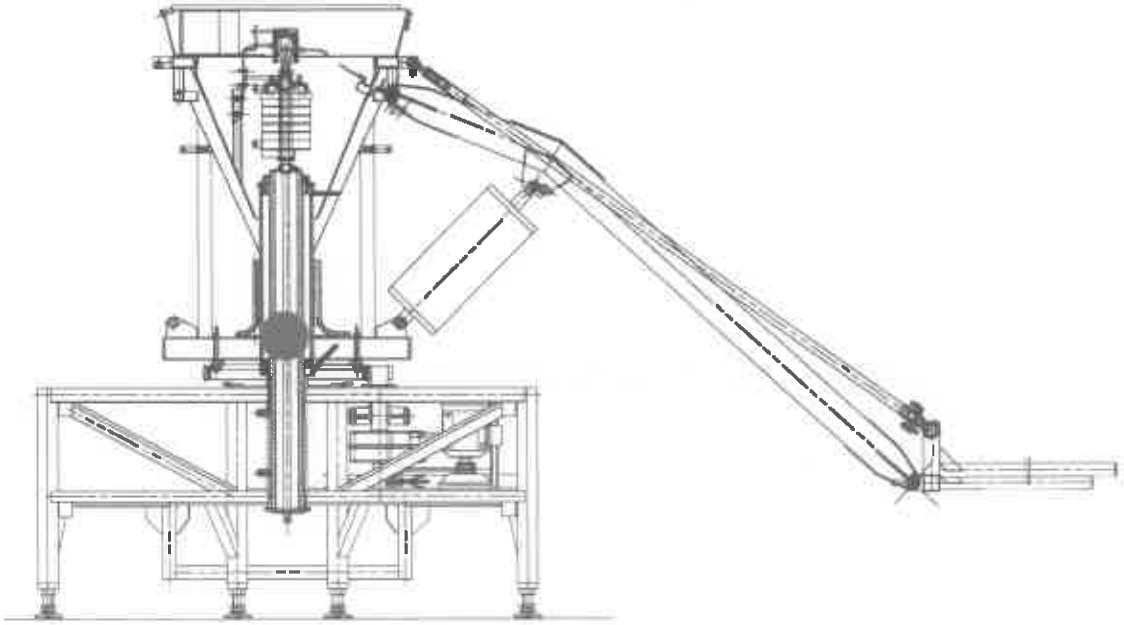
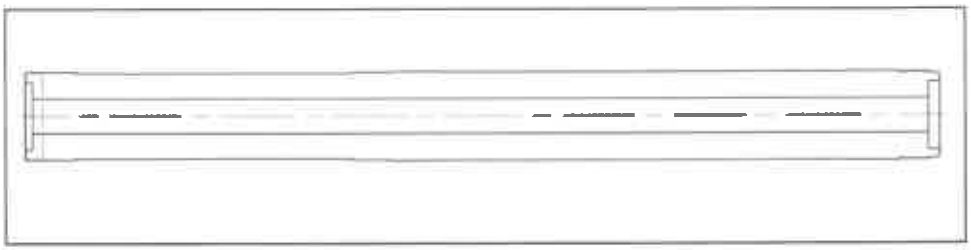
IMAGE 8 - CENTRAL SHAFT



Replace every 12 years



Item #10

ZAMPERLA SERVICE BULLETIN MJ-01-2019 NDT TEST ACCEPTANCE CRITERIA

Tab. X.1 MT-W Magnetic Particle test on steel welds	
Type of indication	Acceptance Limit
Linear indication, l= length of indication (mm)	l ≤ 3
Non-linear indication, d=major axis dimension (mm)	d ≤ 3

Tab X.2 PT-W Dye penetrant test on steel welds	
Type of indication	Acceptance Limit
Linear indication, l= length of indication (mm)	l ≤ 4
Non-linear indication, d=major axis dimension (mm)	d ≤ 6

Tab. X.3 Magnetic Test on steel forgings and round bars	
Parameter	Acceptance Limit
Recording level minimum indication length (mm)	2
Maximum allowable length of isolated indications, L, and maximum allowable length of interacting indication, Lg (mm)	4
Maximum allowable cumulative length of indications in the reference surface (mm)	24
Maximum allowable number of indications in the reference surface	7

Tab. X.4 Dye penetrant test on steel forgings and round bars	
Parameter	Acceptance Limit
Recording Level mm (see Note 2)	≥ 3
Maximum allowable length L of isolated linear indications and maximum allowable length Lg of interacting indications mm (see note 2)	4
Maximum allowable cumulative length of linear indications in the reference surface mm (see Note 2)	24
Maximum allowable size of isolated rounded indications in mm (see note 2)	8
Maximum allowable number of recordable indication on reference surface (See Note 3)	7
Note 2 The tabulated values apply to the indication size, not to the surface extent of the flaw. Note 3 Reference surface = 148mm x 105mm (i.e. A6 format)	

Tab. X.5 UT-F Ultrasonic test examination by manual probe on ferritic and martensitic steel forgings	
Parameter	Acceptance limit
Recording Level Equivalent Flat-bottomed holes (EFBH) d_{eq} in mm (See Note 1)	> 3
Ratio R for rapid backwall echo reduction (See notes 2 and 3)	≤ 0.5
Acceptance Criteria	≤ 5
EFBH (Isolated point type discontinuities) d_{eq} in mm (See Note 1)	≤ 3
EFBH (Extended or grouped point type discontinuities) d_{eq} in mm (See Note 1)	
Note 1 d_{eq}= diameter of equivalent flat-bottomed hole. Note 2 $R=F_n/F_{e,n}$ where: n=1 for t ≥ 60mm n=2 for t < 60mm F_n = amplitude (Screen Height) of the n^{th} reduced backwall echo $F_{e,n}$ = amplitude (Screen height) of the n^{th} backwall echo in the nearest discontinuity-free area at the same range as F_n Note 3 If the reduction in backwall echo exceeds the recording level, this shall be further investigated. Ratio R applies only to rapid reduction of backwall echo caused by the presence of a discontinuity.	

Tab. X.6 UT-R Ultrasonic test examination by manual probe on round elements ferritic and martensitic steel bars

Parameter	Acceptance Limit
Recording Level Equivalent Flat-bottomed holes (EFBH) d_{eq} in mm (See Note 1)	**> 3**
Ratio R for rapid backwall echo reduction (See notes 2 and 3)	**≤ 0.5**
Acceptance Criteria	**≤ 5**
EFBH (Isolated point type discontinuities) d_{eq} in mm (See Note 1)	**≤ 3**
EFBH (Extended or grouped point type discontinuities) d_{eq} in mm (See Note 1)	

Note 1 d_{eq}= diameter of equivalent flat-bottomed hole.
Note 2 $R=F_n/F_{o,n}$ where:
n=1 for t ≥ 60mm
n=2 for t < 60mm
F_n = amplitude (Screen Height) of the n^{th} reduced backwall echo
$F_{o,n}$ = amplitude (Screen height) of the n^{th} backwall echo in the nearest discontinuity-free area at the same range as F_n

Note 3 If the reduction in backwall echo exceeds the recording level, this shall be further investigated. Ratio R applies only to rapid reduction of backwall echo caused by the presence of a discontinuity.