REDLINE CRANES

MOBILE CRANE MAJOR INSPECTION AND MECHANICAL REPAIRS

OWNER DETAILS: Redline Cranes
CRANE TYPE: Franna AT20 SN 3569
HOURS: 15306hrs
ODOMETER: 22456km
MAJOR INSPECTION CERTIFICATE # AC A179781-13
COMPLETION DATE 27/07/2023

Description of Inspection/Repairs

Complete major inspection on Carried out Major 10yr inspection & Mechanical Repairs.

Crane Safe Compliance, Engineering assessment and NDT crack testing by 3rd Party as required for major inspection.

References for inspection/Repairs

Australian standard AS1418.1 Cranes, hoists and winches – General Requirements

Australian standard AS1418.5 Cranes, hoists, and winches – Mobile Cranes

Australian standard AS2550.1 Cranes, hoists, and winches – Safe use - General Requirements

Australian standard AS1554.1 Structural Steel Welding – Welding of steel structures

Australian standard AS1554.4 Structural Steel Welding – Welding of high strength Quenched and Tempered Steels

10 Year Major Inspection		
Carry out CraneSafe inspection by 3rd Party, registered Cranesafe inspector	Replacement of Critical Hoses inc. Steering, Luff cyl, Extension Cylinder, Winch, Pump Suction and Return Hoses	
Inspect Winch and prep for NDT Inspection	Test winch brake, Winch Gearbox Inspected. Winch line Pull tested	
Prepare Boom sections for NDT inspection	Winch Mounts NDT Inspected, as per requirements	
Remove wheels for NDT inspection of all suspension mounting points.	Boom Welds NDT Inspected, as per requirements	
Inspect Brakes.	Visual Inspection of Boom Sections using new wear pads as required.	
Steering Joints inspected and fitted with new Pins Bearings and Seals.	Boom Pivots Inspected found Very warn on LH Side, Lineboring to LHS and replacement Pin and Bearings installed to both sides.	
NDT inspection of Steering Cylinder mounts.	Refit wheels with new Westlake tyres installed on front, Spare Wheel in good condition fitted to OEM Spare Wheel Carrier. Best tyres put on rear	
NDT inspection of Steering Cylinder Clevises	Refit winch rope.	
Steering Cylinders were inspected, and pressure tested	Carry Out full function testing including Line pull as per OEM Specs.	
Refit Steering Cylinders		
NDT Inspection of Rims.		

Repairs Carried Out

CABIN	BOOM	ELECTRICAL
Replaced Floor Matts	Replace Boom Pivot Bearings	Boom Work Lights Replace
Replace Door Struts	Repair Rear Wear Pads	Boom Marker Lights
Replace Inside Drivers Door Handle	Replace Retaining Pin at Divertor Sheave	Replace Indicator Stalk
Replace Window Door Handle	Repair Stauff Clamps on Boom	Install Christmas Tree Lights for LMI
Repair Rust around Operation Levers	Repair Locking Plate RH Boom Pivot retainer	Fit LED Taillight
Repair Drivers Seat Suspension	Replace Damaged Hook Latch	Replace Damaged interior Light
Resecure Engine Computer in cabin	Replace Divertor Sheave Bearing	Replace Side Markers with LED
Replace Emergency Park Brake Release Valve		Service Battery Box, new Constant Duty Solenoid, Circuit Breakers, and Fuses, Reterminate all connections
Replace Heater Cable		
Replace Centre Console Lid		
HYDRAULICS	**BODY**	**ENGINE**
Luff Cylinders Replace	Replace Exhaust Tip	Replace Air Pre-Cleaner
Replace Transfer Case Cooler Hose	Repair Exhaust Surround	Repair Low Range Selector Spool in Transfer Case
	Repair Rust under Rotary Light	Fit new Starter Motor
	Repair Air Leaks	Replace 3 x Damaged Exhaust Studs
	Refit Grab Body Handles	
	Fit New Mudflaps	
	Replace Air Tank Drains	
	Repair Spreader Bar Mounts	
	Reseal Front Diff	

Manufacturers Specifications

Initial Inspection:

The machine underwent a major inspection and repairs, at the Redline Cranes yard in with Cranesafe inspection completed by Training & Inspection Services #AC A 179781-13, further inspection including Hook and Line Pull testing was carried out by Training & Inspection Services at Bellevue, to assess the current conditions following rebuild of the machine and rebuilt winch.

No Major areas of concern were noted at the follow-up inspection. Assessment found repairs were required to replace steering cross over hoses, Boom luffing hoses, Boom Extension, and winch hoses were replaced as critical Hydraulic Hoses. Crack Testing all key areas through 3rd party inspectors AMAP Engineering on report #23PE174ET01, 23PE174MT01, 23PE174UT01 via – Eddy Current, NDT, and Ultrasonics.
Overall monitoring of the inspection was carried out by, Mechanical Engineer Sword (Eng# ASC 02126-11) and 3738705 registered with Engineers Australia.

Inspection and Repairs

Mechanical/ Operational Inspection:

A full mechanical visual and structural inspection were conducted on the AT20, all Load points of the crane structure were inspected.

ENGINE:
Alternator tested, Engine Idler Bearings replaced, New Engine Drive belt fitted.
Full Service Carried out. Intercooler pipe joining hoses found soft so were replaced.
Exhaust repaired at Flexi pipe. Chrome exhaust tip replaced.



BOOM:

The boom was striped by Redline for inspection and rebuilt. All boom sections, mounting points and anchor points were visually examined for any evidence / signs of camber, sweep deformation, excessive wearing, or prior structural repairs.

From Mechanical Inspection of the Boom, it was identified that the boom is in good condition, no cracks were found. We needed to carry out wear pad adjustments to adjust alignment and any worn wear pads replaced. All extension and retract ropes were inspected and found in good condition.

Full inspection was carried out on boom sections for straightness and distortion. All sections had a string line run across them and all measurements were recorded all boom sections were determined to be within OEM Franna specifications and limits. Base section no distortion, 1st section 3mm vertical and no lateral distortion, 2nd section 4.5mm vertical 1mm lateral 3rd section 4.5mm vertical no lateral.

Boom was considered satisfactory for continued use with fatigue checks at a minimal allowing for an additional 10 years before major reassessment is required. Regular routine servicing and annual checks should still be considered in accordance with AS2550. Inspection of critical welds on the boom section was undertaken with full ultrasonic testing being carried out on welds and pins. Please refer to NDT inspection report by independent AMAP Engineering on report #23PE174ET01, 23PE174MT01, 23PE174UT01. Results indicated satisfactory from this report.

WIRE ROPES:

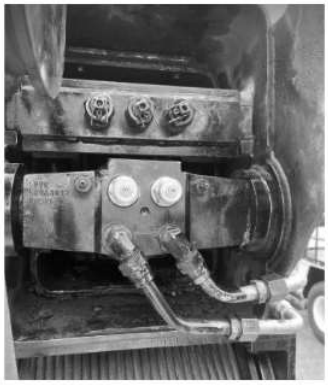
Main winch rope was inspected and found to be in good condition, reinstalled during reassembly of the boom.

Retract rope was inspected and found in good condition. The 3 extension ropes were also inspected and found in good condition. These Ropes were Originally fitted in 2021 so therefore not required at the time.

Refer to Bullivants inspection certificates.


HYDRAULIC SYSTEM:
Hydraulic Tank was topped up with 68 grade Mineral Based Hydraulic fluid.
Hydraulic hoses were inspected for damage and wear, any brittle hoses, were found and replaced.
Steering Crossover hoses were replaced. **Winch hoses** and **Extension Cylinder hoses** were also replaced.
Luff Cylinders were replaced, and Steering cylinders were pressure tested and Chrome inspected and found to be in satisfactory condition.
All function pressures were checked, and counterbalance valves tested and replaced tellie C/B valves.





WINCH:

The main winch is an internal friction disc type braking system. The winch was assessed and was upgraded to a 2600 series Brevini Winch with Drive Motor being replaced; all components were inspected as per Australian standards AS2550.5.

A 3rd Party testing of the winch was carried out by Training & Inspection Services #AC A 179781-13**.** All mounts were crack tested by NDT Testing; see individual report AMAP Engineering on report #23PE174ET0123, PE174MT01, 23PE174UT01.

A line pull test at 110% of rated capacity was conducted winch. Load was suspected for 10 minutes and checked for any visual signs of creeping or stress.

OEM, Brevini has a rebuild requirement at 25000hrs with Crane hrs 16448hrs therefore a further 8552hrs before replacement is due.

Main winch line pull, 4200Kg. Test load @ 110% = 4620 KG Result: Comply

UNDERCARRIAGE SYSTEMS:

Drivelines were inspected, with Universal and Centre Bearing Replaced, All Brake Shoes and Brakes Drums were inspected, found to be above the minimum standard. Brake Chambers and hoses were inspected, and diaphragms replaced, Dump Valves replaced and entire Air System Lubricated.

Inspection of Suspension was undertaken Front and Rear Springs were in good condition with no visible cracks and maintenance of Brakes, boosters and air valves carried out.

STEERING SYSTEMS:

Steering cross over hoses were replaced, all steering bosses were inspected for wear, all welds were inspected and tested via NDT Testing, see individual report AMAP Engineering on report #22PE017ET01, 22P017MT01 22P017UT01.

Centre Artic Joint wear was checked by Training & Inspection Services AC A 179781-13 via and adjusted to meet OEM specifications. Centre Artic welds were inspected by AMAP Engineering on Report #22PE017ET01 2PE017UT01 22PE017MT01.

All Tyres across Front were replaced with new Westlake tyres. Rear tyres found in good condition.

CABIN:

In the Cabin all Switches, Valves and Interior Components were inspected switches were repaired. New seatbelts installed. Washer bottle replaced. All air leaks in the cab were rectified.

A Pioneer Blue Tooth Head Unit. Full cabin carpet was replaced with addition to the roof area. A replacement VDO Speedo and Tachometer was installed and calibrated.



ELECTRICAL SYSTEMS:

Alternator was tested for efficiency, engine belt and idler bearings replaced.

All dash lights were tested and replaced as required, Headlights replaced with DOT approved LED replacement, Rear Taillight and Indicators were also repaired. Boom Work Lights were replaced with LED.

Air Conditioning Evaporator in the Cabin was replaced with upgraded Aftermarket unit, Air Conditioner Compressor, TX valve and Receiver Drier was replaced, and the system was serviced with new R134A Air Conditioning gas and tested.

Reverse Camera was replaced with wiring checked. Battery isolator has been replaced and Battery Box upgraded.




HOOK BLOCKS:

The 20t Main Hook was inspected via NDT AMAP Engineering on report #23PE174ET01, 23PE174MT01, 23PE174UT01.

Hook Block has appropriate decals for Main roads compliance in WA.

All Serial / machine numbers are present on Hook blocks with SWL capacity and hook block weight visible.

Third party inspections were also carried out by 3rd party in accordance with AS2550.1 section 8. Training & Inspection Services #AC A 179781-13

BODY:

The body was rubbed back to a level that was acceptable to paint dent were filled or panel repaired, any rust was treated filled and then body given full respray in 2 pak Paint and Red Chevrons in Red 2pak. Stickers were replaced as per OEM and Main Roads WA specification. Cabin Stickers added to Cranesafe requirements.

TESTING:

Testing of the LMI was confirmed by Training & Inspection Services on report # AC A 179781-13 to be in accordance with the manufacturer's specifications.

A Winch brake overload test has been performed in accordance with AS1418.

Static strength test, line pull, and stability has been successfully undertaken.

CERTIFICATES

1. **Rope Certificates**
2. **LMI Certificate- Crane Safe report #AC A 179781-13**
3. **NDT Test Certificate- AMAP Engineering report #23PE174ET0123PE174MT01, 23PE174UT01**
4. **Certificate of Inspection & Testing report #AC A 179781-13**
5. **Rhino hook Bullivants**
6. **20t hook Bullivants**

Engineering Inspection:

An Engineering review of works conducted and completed by Redline Cranes was undertaken by independent Sword Engineering. Refer to Certificate of Compliance.

Attached in File

Certificate of Inspections and Certificates (Main Hook and Blocks)

Certificate of Inspection and Certificates (Winch rope)

Non-destructive testing inspection report

Crane safe inspection report

Engineering Certification report

Report prepared by Redline Cranes

Appendix A: Certificate of Inspections (Main Hook Block)

Report Compiled and reviewed by Redline Cranes

Qualified Representative: Simon Bowers

Date: _____27/07/2023____

REDLINE CRANES **Major inspection Verification**

Model	S/N	Manufacture Year
AT20	3584	2005
Cert NO.	Major Insp Date	Next Major Insp Date
AC A 179781-13	JULY 2023	JULY 2033

This compliance plate verifies that this crane has had a Major 10 Year inspection in accordance with Australian standards AS 2550.1 & 5 Mobile Crane Code Of Practice 2006

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Assessment by Engineering AU No. 3738705

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27/07/2023

Mr. Michael Verhulst

Redline Cranes Pty Ltd

59 Helen Street Bellevue

Perth WA 6056

Dear Michael,

Re: Engineers Report on Franna AT20 Mobile Crane S/N 3584

Major Inspection to AS2550.5, AS1418: 1 & 5

General

This is a major inspection report on this Mobile Crane in accordance with Australian Standards AS1418.5 and AS2550.5 to assess the operation, maintenance, and repair of this item of equipment and its suitability for continued operation under the existing conditions and loadings.

This Mobile Crane is required to be an item of Registered Plant as is required by WA Workcover Authority OHS Act and regulations and it is required to be kept and operated in a safe manner to reduce the likelihood of a serious accident occurring.

Visual Inspection

The above unit was inspected on site at the 59 Helen Street, Bellevue Perth WA facility in accordance with AS2550.5 Safe use by competent personnel.

Routine Maintenance

The maintenance of this mobile crane unit was carried out by Redline Cranes P/L and subcontractors as required and all critical items were inspected and replaced where considered necessary.
A full report and photos are available to verify a complete list of items replaced.

Load Charts

These have been checked for compliance with Australian Standard AS1418.1 & 5 requirements.

Non-Destructive Testing:

All high stress welds associated with structural components and main frame were checked and found to have no unacceptable defects.
Refer separate NDT inspection report by AMAP Engineering on report #23PE174ET0123PE174MT01,23PE174UT01 via – Eddy Current, NDT and Ultrasonic

Operational Testing:

Summary:

Based on the information provided in relation to the actual crane loads Vs Design loads and the actual loading frequencies Vs Design frequencies this crane when assessed to AS1418 criteria falls into the C3/M3/S3 category. The light and moderate loads, means fatigue aspects are minimal and crane life can be safely extended for a further 10 years before reassessment by a competent person. Winch to be replaced with new at 20000hrs. **During this period it is expected that the crane will continue to be operated safely in accordance with AS2550 and manufacturers requirements and will be routinely serviced by experienced personnel.**

From the information provided on this crane the Australian Standard AS2550-5 Crane Safe use recommends that routine maintenance be carried out at 3 monthly intervals with an annual periodical inspection.

RECOMMENDED MAXIMUM PERIOD BETWEEN MAINTENANCE / INSPECTION SERVICES

Crane classifications	C1	C2	C3	C4	C5	C6	C7	C8
	M1	M2	M3	M4	M5	M6	M7	M8
Working hours per day	≥0.5	0.5-1	> 1-2	> 2-4	> 4-8	> 8 -16	> 16	> 20
Routine maintenance service weeks	12	12	12	12	8	8	4	4
Periodic inspection, weeks	48	48	48	24	24	16	12	8
Third party inspections, years (optional)	3	3	2	2	2	1	1	1

The above Franna mobile crane is considered satisfactory for continued use to manufacture's specifications and AS 2550.5 safe use until April 2033 the next major inspection assessment.

Records going forward are to be continued to be maintained of all maintenance repairs and replacement parts to enable this information to be used and assessed in the next major inspection in July 2033.

AS2550.1 & 5 provides more details and guidance in relation to inspection periods and records required.

David O'Halloran

Mech. Engineer ASCO 2126-11
Engineering Aust# 3738705