

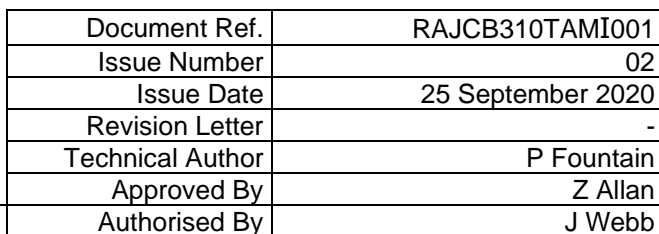


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RAIL-ABILITY JCB 310_{RR}
TRACKED ROAD/RAIL EXCAVATOR
APPROVED MAINTENANCE INSTRUCTION



ISSUE AND AMENDMENT RECORD

Page 2 of 158



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CONTENTS PAGE

Item	Page
Issue and Amendment Record	2
Contents Page	4
1.0 MAINTENANCE INSTRUCTION	6
1.1 Preparation	6
1.2 Approval	6
1.3 Review	6
1.4 Update	6
1.5 Defined Words	7
1.6 Abbreviations	7
1.7 Authority	8
2.0 RECORDS	8
3.0 HOST MACHINE MAINTENANCE DOCUMENTATION	8
3.1 JCB Tracked Excavator	8
3.2 BMAIR Cab Filter Pressurisation System	8
3.3 Rockinger Jost Coupling	9
3.4 RCI	9
3.5 Rail Wheel Disc Brakes	9
3.6 Auto Lube Greasing System	9
3.7 S60 Quick Hitch User Manual	9
4.0 REQUIREMENTS	9
4.1 Safety	9
4.2 Competencies	9
4.3 Facilities	10
4.4 Equipment	10
4.5 Spare Parts	10
4.6 Consumables	11
5.0 MAINTENANCE TASKS	11
5.1 General	11
5.2 Periodicity Codes	11
5.3 Labour Codes	12
5.4 Preparing the Machine for Maintenance	12
5.5 Safety Critical Items	12
5.6 Limits to be applied during Maintenance	13
5.7 Activities and Intervals	14
6.0 MAINTENANCE SCHEDULES AND CHECK SHEETS	17
6.1 Pre Use Safety Exam Check	17
6.2 Maintenance Following Hire Period	18
6.3 After 50 hours Operation	18
6.4 After 100 hours Operation	18
6.5 After 250 hours Operation	19
6.6 After 500 hours Operation	19
6.7 After 1000 hours Operation	20
6.8 After 2000 hours Operation	20
6.9 After 3000 hours Operation	21
6.10 After 20,000 hours Operation	21
6.11 Monthly Maintenance	21
6.12 Three Monthly Maintenance	21
6.13 Six Monthly Maintenance	21
6.14 Twelve Monthly Maintenance	21
6.15 Twenty Four Monthly Maintenance	22
6.16 Twenty Yearly Maintenance	22



Document Ref.	RAJCB310TAMI001
Issue Number	02
Issue Date	25 September 2020
Revision Letter	-
Technical Author	P Fountain
Approved By	Z Allan
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UNCONTROLLED WHEN PRINTED

7.0	JOB SHEETS	22
7.1	Brakes	23
7.2	Cab and Superstructure	43
7.3	Engine	68
7.4	Electrics	79
7.5	Lubrication and Fuel	93
7.6	Alternators and Air Conditioning	100
7.7	Hydraulic System	106
7.8	Recovery	115
7.09	Underframe	117
7.10	Wheels and Tracks	129
7.11	Fire Protection System	141
7.12	Statutory Examinations	144
Appendix 1	– Brake Distance Test Form	149
Appendix 2	– Decals	150
Appendix 3	– Rail Wheel Defects	154
Appendix 4	– Rail Wheel Examination Record Sheet	157
Appendix 5	– Rail Wheel Gauge	158



Document Ref.	RAJCB310TAMI001
Issue Number	02
Issue Date	25 September 2020
Revision Letter	-
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UNCONTROLLED WHEN PRINTED	

1.0 MAINTENANCE INSTRUCTION

1.1 Preparation

This maintenance instruction has been assembled using data from the manufacturer, and supplementary information added to ensure that a satisfactory maintenance regime is in place. It conforms to the requirements of RIS-1530-PLT Issue 6, dated December 2015 and details the maintenance requirements, in particular for the rail specific items.

This maintenance instruction addresses those items which have a direct bearing on the machine's use on Network Rail Infrastructure, or which are necessary to meet Mandatory Requirements. For other maintenance items relating to specific components, refer to manufacturer's documentation.

This maintenance instruction has been compiled with care. However, if you notice any errors, omissions or would like to recommend any improvements, submit your comments via email to mail@railability.co.uk where it will be reviewed as appropriate.

1.2 Approval

This maintenance instruction has been assessed and approved by a Machine Acceptance Body as part of the Engineering Acceptance for the machine.

1.3 Review

This maintenance instruction shall be reviewed every 12 months by a competent engineer.

A record shall be kept of decisions taken at each review, that shall include:

- A review of the potential to improve its effectiveness.
- In process reviews of maintenance activities.
- Performance of the machines and components covered by this maintenance instruction including relevant national incident reports.
- Changes in the pattern of use and operating environment.
- Manufacturer's advice.
- Directives from Network Rail.
- The input from each machine's seven-year review.
- The frequency and content of each job description.
- Assessment of component failures - each component failure should be assessed to identify if there was a failure of maintenance that either caused or contributed to the failure. This maintenance instruction should then be amended to reflect the lessons learnt.

1.4 Update

This maintenance instruction will be updated following any changes required as a result of a scheduled review, an audit or when other ad-hoc contributions arise. The update will be carried out without undue delay to ensure that the document is as up-to-date as possible. Changes will be captured on the Issue and Amendment Record.

When a new machine or engineering change occurs, this maintenance instruction will be reissued, dated and the issue number increased. Other changes will result in this maintenance instruction being reissued and the revision letter increased appropriately.



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Revision Letter	-
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1.5 Defined Words

Term	Action required
Adjust	Correct to defined limits
Change	Remove the original and fit a new or overhauled part or assembly in its place
Check	Determine a particular nominated condition before, during or after repair, for example completeness, security, position
Clean	Remove all dirt and deposits
Defective	Any fault or faults in a component or assembly, for example structural fractures or weld fractures, which may prevent the component or assembly from fulfilling its designed purpose
Dismantle	Take to pieces
Examine	Determine general condition before repair, for example wear, cracks, splits, leaks, scoring, erosion, breaks, distortion, looseness
Gauge	Determine a nominated dimension by using suitable measuring equipment, for example ruler, micrometer, callipers, feeler gauges or Profile Gauge
Inspect	Determine general condition after repair and attention, that is, conformity to required standards
Lubricate	Apply lubricant
Overhaul	Do what is necessary to make an assembly or sub-assembly reusable, that is to say, dismantle, strip, clean, examine, fit new parts, repair, reassemble, test and inspect as required
Paint	To impart colour to a surface
Re-assemble	Put together
Record	Put down in writing a finding from examination, test, inspection or special checks
Rectify	To set right
Refit	Put back and reconnect
Remove	Disconnect and take off
Renew	Remove, scrap the original part and put a new part in its place
Repair	Restore an original part to the required condition by hand tooling, machining, build-up, welding, patching, bending, setting, heat-treating, re-securing etc
Strip	Remove covering, that is to say, paint, polish, fabric
Test	Prove correct operation by trial

1.6 Abbreviations

Item	Description
CITB	Construction Industry Training Board
CTA	Certificate of Training Achievement
D.C.	Direct Current
dBA	Decibel (human range)
dia.	Diameter
Drg	Drawing
DRV	Driver/Operative
ENG	Engineer
FIT	Maintenance Fitter
kg	Kilogram
km/h	Kilometres per hour
LOLER	Lifting Operations and Lifting Equipment Regulations
m	Metre
Max	Maximum
MEWP	Mobile Elevated Work Platform
Min	Minimum



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Item	Description
mm	Millimetre
mph	Miles per hour
MTH	Months
NDT	Non Destructive Testing
NGL	Next-Generation Lithography
Nm	Newton Metres
No.	Number
NVQ	National Vocational Qualification
OEM	Original Equipment Manufacturer
OLE	Overhead Line Equipment
ORR	Office of Rail Regulator
psi	Pounds per square inch
PU	Pre Use Safety Exam Check
PUWER	Provision and Use of Work Equipment Regulations
Ref	Reference
RET	Maintenance Following Hire Period
ROGS	Railways and Other Guided Transport Systems (Safety)
RPA	Rail Plant Association
RRV	Road Rail Vehicle
Std	Standard
Ω	Ohms

1.7 Authority

Where the requirements in this document differ from OEM specified requirements, this document takes priority.

2.0 RECORDS

All records of maintenance or repair work carried out and any measurements taken (brake tests, rail wheel dimensions, tyre pressure/condition etc) must be maintained in accordance with the Rail Industry Standard document RIS-1530-PLT - Technical Requirements for On-Track Plant and Their Associated Equipment and Trolleys.

The machine log book must be updated with the date and examination type of the last maintenance carried out.

3.0 HOST MACHINE MAINTENANCE DOCUMENTATION

3.1 JCB Tracked Excavator

The maintenance procedures for the JCB JZ140HD Crawler Excavator are contained in the JCB Service inspection check list: 11/477_468342 and Service manual: 9813/6300_371816

3.2 BMAIR Cab Filter Pressurisation System

Maintenance instructions for the BMAIR Cab Filter Pressurisation System are provided by the OEM manual BMAIR Filter Pressurisation System Manual - General Instructions. The Test instructions of the BMAIR Cab Filter Pressurisation System are contained in the BMAIR Filter Pressurisation System TAC(S) Instruction Card ITACEN3.



	Document Ref.	RAJCB310TAMI001
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3.3 Rockinger Jost Coupling

Maintenance instructions for the Rockinger Jost Coupling are provided by the OEM manual RO*460 Fully automatic trailer coupling KE 0699 II 1247-GB as at 0699. The repair instructions of the Rockinger Couplings are contained in the Rockinger Repair RO*400/RO*460 data sheet KE 0501 I 1269-GB as at 0501.

3.4 RCI

The maintenance instructions for the Rated Capacity Indicator fitted to the excavator are contained in the Rail-Ability RCI+MLD Display Operation Manual, RACD-10000141 Issue 2.0 and RCI checks in Rail-Ability procedure RACD10000524 and MLD checks in accordance with Rail-Ability procedure RACD10000523

3.5 Rail Wheel Disc Brakes

The maintenance procedures for the Rail Wheel Floating Calliper Disc Brakes are contained in the Rail-Ability Floating Calliper Disc Brakes Maintenance Procedures, reference RAFCDB001, v1, dated 13/05/2011.

3.6 Auto Lube Greasing System

Lincoln Quicklub pump and distributors Operating Instructions 203DC 810-55168-1J & 810-55174-1J.

3.7 S60 Quick Hitch User Manual

Steel Wrist User and Installation Manual, Symmetrical Quick Couplers with Front pin lock S40-S70 Doc No: 700277ENA.

4.0 REQUIREMENTS

4.1 Safety

All maintenance activities must be carried out with regard to current Health and Safety Legislation and relevant safety measures as dictated in referenced documents, approved training and workshop practice.

4.2 Competencies

For all activities, the person leading the task must be able to follow and carry out the instructions detailed in this maintenance instruction.

For maintenance of the machine/equipment, and in order to carry out this maintenance instruction in a manner that will achieve the required safety and quality, staff undertaking this work must have been trained and/or hold as a minimum relevant certificates of competency, such as:

- Be a time served apprentice trained Craftsman;
- An appropriate NVQ level in Plant Maintenance;
- Certificate issued by a CITB/CTA approved body (excavators used as cranes only);
- Be competence assessed in accordance with the appropriate RPA Standards or (where no specific RPA standard exists) in accordance with the maintenance requirements of the relevant Operating and Maintenance manual requirements;
- Be specifically trained in maintenance of the equipment/machine.



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All work of a safety critical nature must be carried out by persons assessed as competent in accordance with ORR Railway Safety Publication 1 “Developing and Maintaining Staff Competence” March 2007.

The Non Destructive Testing of safety critical components (including axle testing) shall be carried out by a suitable qualified fitter or Rail-Ability Limited.

All work relating to PUWER and LOLER requires the use of specifically authorised, trained and competent personnel.

Statutory examinations shall be carried out by an external body and maintenance/re-calibration of ASLIs/RCIs will be carried out by Rail-Ability Ltd.

4.3 Facilities

In order to carry out this maintenance instruction, the following minimum levels of facilities are required, appropriate to the jobs being undertaken:

- Clean, dry, covered accommodation for dealing with wheelsets, bearings, mechanical hydraulic and electrical components etc.
- Adequate illumination for inspection of components, bogies and underframes.
- Cleaning facilities which will not cause damage to the components.
- Handling facilities for removal and refitting of heavy components.
- Protection from the weather of vulnerable areas of the machine and its components.
- A suitable length of straight level rail track for carrying out brake tests.

Any specific requirements additional to those listed are identified in the applicable job description.

4.4 Equipment

The following equipment is required in order to carry out maintenance on this machine:

- Workshop Tool Kit
- Grease Gun
- 30m Tape
- NDT crack detection spray
- Noise Meter
- Wheel Profile Gauge
- Rail wheel back-to-back gauge
- Calibrated load cell
- Flange thickness and height gauge (BR Cat 39/29839)
- Low Resistance Meter (4 terminal, capable of delivering at least 2 amps D.C. with a minimum resolution of 0.1Ω).

4.5 Spare Parts

All rail component parts used in the repair and maintenance of the machine must be OEM approved parts.

All suspect bearings must be replaced.



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4.6 Consumables

The following fluids and lubricants are used on this machine:

Location	Reference	Capacity
Fuel		260.0 litres
Cooling System	See JCB manual	20.0 litres
Engine Oil	See JCB manual	15.0 litres
Powershift Transmission Oil	API-CD /-CE /-CF: <ul style="list-style-type: none"> -20 °C to +40 °C: SAE 10 W-30 /-402) -15 °C to +40 °C: SAE 15 W-402) -10 °C to +40 °C: SAE 20 W-202) 0 °C to +50 °C: SAE 302) 	4.0 litres
Hydraulic Oil	ISO46 hydraulic oil	300.0 litres
Rail Axle Hubs – Hydrostatic	ISO VG 150 SAE 80W/90	1.8 litres
Slew ring	Special grease 3620153	N/A
Excavator Grease Points	Multi-purpose grease with MoS ₂ - DIN 51818, NLGI-2 (lithium soap grease)	N/A
Other lubrication points	Multi-purpose grease with MoS ₂ - DIN 51818, NLGI-2 (lithium soap grease)	N/A

5.0 MAINTENANCE TASKS

5.1 General

The front of the machine is the end where the covered drive sprockets are.

Machines are to be examined at frequencies no greater than the limits set.

Where a check shows a defect, this is to be reported to the maintenance department.

Rectify any reported faults, defects or leaks.

Where a task spans more than one sheet, each sheet is referenced in brackets after the task number e.g. (1 of 3). These sheets must be carried out in the order stated, starting at sheet 1.

All tasks have been presented under two sections, SCHEDULED WORK and then REMEDIAL ACTION. To aid cross referencing, the step numbers in REMEDIAL ACTION correspond to the step numbers in the SCHEDULED WORK.

5.2 Periodicity Codes

The tasks are listed below with a code applied to the periodicity of the action. These periodicities and their associated codes are as follows:

Pre-Use Safety Exam Check - Must be repeated every 24 hours if in continuous use	PU
Maintenance Following Hire Period	RET
Number of hours of operation, number required is stated in the task	HOURLY
Number of months of operation, number required is stated in the task	MTH

All Pre-Use Safety Exam Checks must be repeated every 24 hours if in continuous use.



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5.3 Labour Codes

A code has been assigned to the person who is to carry out the action. Those with more expertise than the person stated can carry out the action – these are minimum levels of competence. These codes are as follows:

Driver/Operative	DRV
Maintenance Fitter	FIT
Engineer	ENG

5.4 Preparing the Machine for Maintenance

The machine must be made safe before any maintenance procedure is carried out, as follows:

- Park correctly on firm level ground and engage the park brake
- Stop the engine and remove the starter key (if appropriate)
- Disconnect/isolate the battery if appropriate.

Before accessing underneath the machine, as well as the items above, carry out the following:

- Lower supported structures to the ground as appropriate
- Prevent the machine from uncontrolled movement/travelling.

5.5 Safety Critical Items

Items requiring maintenance that are safety critical, in terms of compliance with Mandatory Requirements, are identified with an asterisk next to their Task Reference.



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5.6 Limits to be applied during Maintenance

Item	Limit
Wheel Cracks and Fractures	Not Allowed
Tolerance between wheels on same axle	1.0mm
False Flange (tread surface at outside of wheel versus running surface)	2.00mm
Rail wheel Back to Back Dimension	1358 to 1363mm
Flange Height	30mm new, 36.5mm maximum worn. (use Gauge BR No: 39/29839)
Flange Thickness (new)	28mm
Flange Thickness (worn)	24mm
Tread run-out	0.4mm
Flange Profile Step	1.5mm
General Pin Wear	1.0mm
General Hole Wear	0.5mm
Wheel Bearing end Float	0.05mm
Braking Stopping distances	Brake tests to include approved trailing load as applicable:
- 5 mph	6m
- 10 mph	18m
- 15mph	36m
Grease for Wheel Bearings	NGL1 Class 1(Lithium MoS2)

Rail Wheel Part numbers	Wheel Diameter (new)	Limit	Action
A5552	700mm	If flat length is 50mm or more	Re – Profile or Renew
		If rail wheel diameter is less than 696mm	Consult Rail-Ability.



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5.7 Activities and Intervals

Job Ref	Component Asterisked (*) Job Ref is Safety Critical	Activity	Who	Periodicity			
				PU	RET	HOURL	MTH

BRAKES

*B01	Rail park brakes	Check	DRV	*			
*B02	Rail service brakes	Check	DRV	*			
*B03	Rail park brakes	Check	FIT		*		
*B04	Rail service brakes	Examine	FIT		*		6
*B05	Rail brake torque test	Test	FIT			1000	12
*B06	Rail brake gradient/pull test	Test	FIT			1000	12
*B07	Rail service braking performance	Test	FIT			1000	12
*B08	Rail emergency braking performance	Test	FIT			1000	12
*B09	Road brake gradient/pull test	Test	FIT			1000	12
*B10	Machine trailer pneumatic park brake system	Check	DRV	*			
*B11	Machine trailer pneumatic park brake system	Check	FIT			250	
*B12	Machine trailer pneumatic service brake system	Check	DRV	*			
*B13	Machine trailer pneumatic service brake system	Check	FIT			250	
*B14	Hydraulic system, pipework and valves	Check	DRV	*			
*B15	Hydraulic system, pipework and valves	Check	FIT			1000	
*B16	Pneumatic system, pipework and valves	Check	DRV	*			
*B17	Pneumatic system, pipework and valves	Check	FIT			1000	

CAB AND SUPERSTRUCTURE

*C01	Loose, missing or damaged parts	Check	DRV	*			
*C02	Loose, missing or damaged parts	Check	FIT			500	
C03	Cab glass and wipers	Check	DRV	*	*		
C04	Cab glass and wipers	Examine	FIT			250	
*C05	Seat belt	Check	FIT				12
C06	Combination cooler	Check	DRV	*			
*C07	Machine functions correctly	Check	DRV	*	*		
C08	Fresh air filter	Clean	FIT			100	
*C09	Labels	Check	DRV	*	*		
C10	Machine	Clean	DRV		*		
C11	Superstructure	Check	FIT			500	
*C12	Boom	Examine	FIT				6
*C13	Slew locking system	Check	DRV	*			
*C14	Slew locking system	Check	FIT		*		
*C15	Slew ring bolted connection	Check	FIT			250	
*C16	Slew transmission oil level	Check	FIT			250	
*C17	Slew transmission oil	Renew	FIT			1000	
*C18	Counterweight mounting bolts	Examine	FIT			250	
*C19	Auxiliary weight mounting bolts	Examine	FIT			250	
*C20	Rated Capacity Indicator (RCI)	Check	DRV	*			
*C21	Rated Capacity Indicator (RCI)	Check	FIT			50	
*C22	Rated Capacity Indicator (RCI)	Examine	FIT				6
*C23	BMAIR TAC(S)	Check	DRV	*			
*C24	BMAIR System	Check	FIT			100	

ENGINE

D01	Engine oil	Check	DRV	*			
D02	Engine oil and filter	Renew	FIT			500	12
D03	Engine cooling	Check	DRV	*			



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Job Ref	Component Asterisked (*) Job Ref is Safety Critical	Activity	Who	Periodicity			
				PU	RET	HOURL	MTH
D04	Engine cooling fan and cowling	Check	FIT			250	
D05	Engine coolant	Renew	FIT			2000	24
D06	Air intake grilles	Check	FIT			250	
D07	Air filters	Renew	FIT			1000	24
D08	Fuel filters	Renew	FIT			500	12
D09	Fuel pre-filter separator	Drain	FIT			50	
*DY01	Engine and alternator mountings	Check	FIT			250	

ELECTRICS

*E01	Warning horn	Check	DRV	*	*		
*E02	Horn sound level	Check	FIT				12
E03	Fuses and breakers	Check	DRV	*	*		
*E04	Limit and rail gear proximity switches	Check	DRV	*	*		
*E05	Limit and rail gear proximity switches	Check	FIT		*	50	
E06	Battery security and condition	Check	DRV	*	*		
E07	Battery condition and charge	Check	FIT		*	500	
E08	Condition and security of all electrical cables, conduits and components	Check	FIT			500	
E09	Warning lights	Check	DRV	*	*		
*EL01	Rail and work lights	Check	DRV	*	*		
*EL02	Rail and work lights	Check	FIT				12
*EW01	Bonding straps	Check	DRV	*	*		
*EW02	Bonding impedance	Check	FIT			500	

LUBRICATION AND FUEL

L01	Lubrication	Lubricate	DRV	*			
L02	Lubrication	Lubricate	FIT			50	
L03	Lubrication	Lubricate	FIT			100	
L04	Slew ring grease	Lubricate	FIT			100	
*L05	Fuel system	Check	DRV	*			
*L06	Fuel system	Examine	FIT			250	

ALTERNATORS AND AIR CONDITIONING

M01	Alternator and V belts	Check	DRV	*			
M02	Alternator and V belts	Examine	FIT			250	
M03	Air conditioning refrigerant	Check	FIT			100	
M04	Air conditioning V belts	Check	FIT			500	
M05	Air conditioning system	Check	FIT				24

HYDRAULIC SYSTEM

Q01	Oil level	Check	DRV	*			
Q02	Oil level	Check	FIT			250	
Q03	Oil	Renew	FIT			3000	24
Q04	Oil cooler	Check	FIT			250	
Q05	Cylinders and their fittings	Examine	FIT			250	
Q06	Hydraulic filter	Renew	FIT			500	
*QV01	System, pipework, valves and hoses	Check	DRV	*			
*QV02	System, pipework, valves and hoses	Check	FIT			500	

RECOVERY

R01	Operation of recovery system	Check	FIT			250	
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UNDERFRAME

*U01	Bogie structures	Examine	FIT			500	12
U02	Draw bar couplings - manual	Check	DRV	*	*		
U03	Draw bar couplings - manual	Examine	FIT				6



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Job Ref	Component Asterisked (*) Job Ref is Safety Critical	Activity	Who	Periodicity			
				PU	RET	HOUR	MTH
U04	Draw bar couplings - automatic	Check	DRV	*	*		
U05	Draw bar couplings - automatic	Examine	FIT				6
U06	Underframe	Check	FIT			500	
*UC01	Tow Bar	Check	DRV	*			
*UC02	Tow Bar	Examine	FIT			500	
*UF01	Rail guidance equipment	Check	FIT				12
*UF02	Handrails and footsteps	Check	DRV	*			
*UF03	Handrails and footsteps	Check	FIT			250	

WHEELS AND TRACKS

*UW01	Rail wheel bolts	Check	FIT			250	
*UW02	Rail wheels, treads and flanges	Check	DRV	*			
*UW03	Rail wheels, treads and flanges	Examine	FIT			500	
*UW04	Rail wheel final drive bearings	Check	FIT			500	
*UW05	Rail wheel back-to-back measurement	Check	FIT			250	
*UW06	Rail wheel back-to-back measurement	Check	FIT				12
*UW07	Hydrostatic drive motor mounting bolts	Check	FIT				12
*UW08	Tracks	Check	DRV	*			
*UW09	Tracks	Examine	FIT			500	
*UW10	Wheel hub planetaries oil level	Check	FIT			100	1
*UW11	Wheel hub planetaries oil	Renew	FIT			2000	12

FIRE PROTECTION SYSTEM

*Z01	Fire extinguisher	Check	DRV	*			
*Z02	Fire extinguisher	Check	FIT				12

STATUTORY EXAMINATIONS

*ZS01	PUWER	Examine	ENG				12
*ZS02	LOLER	Examine	ENG				12
*ZS03	Respiratory air quality test	Examine	ENG				3
*ZS04	EN13849	Examine	ENG			20,000	240



Document Ref.	RAJCB310TAMI001
Issue Number	02
Issue Date	25 September 2020
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6.0 MAINTENANCE SCHEDULES AND CHECK SHEETS

6.1 Pre Use Safety Exam Check

Job Ref	Component Asterisked (*) Job Ref is Safety Critical	Action	Who	Tick
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BRAKES

*B01	Rail park brakes	Check	DRV	
*B02	Rail service brakes	Check	DRV	
*B10	Machine trailer pneumatic park brake system	Check	DRV	
*B12	Machine trailer pneumatic service brake system	Check	DRV	
*B14	Hydraulic system, pipework and valves	Check	DRV	
*B16	Pneumatic system, pipework and valves	Check	DRV	

CAB AND SUPERSTRUCTURE

*C01	Loose, missing or damaged parts	Check	DRV	
C03	Cab glass and wipers	Check	DRV	
C06	Combination cooler	Check	DRV	
*C07	Machine functions correctly	Check	DRV	
*C09	Labels	Check	DRV	
*C13	Slew locking system	Check	DRV	
*C20	Rated Capacity Indicator (RCI)	Check	DRV	
*C23	BMAIR TAC(S)	Check	DRV	

ENGINE

D01	Engine oil	Check	DRV	
D03	Engine cooling	Check	DRV	

ELECTRICS

*E01	Warning horn	Check	DRV	
E03	Fuses and breakers	Check	DRV	
*E04	Limit and rail gear proximity switches	Check	DRV	
E06	Battery security and condition	Check	DRV	
E09	Warning lights	Check	DRV	
*EL01	Rail and work lights	Check	DRV	
*EW01	Bonding straps	Check	DRV	

LUBRICATION AND FUEL

*L01	Lubrication	Check	DRV	
*L05	Fuel system	Check	DRV	

ALTERNATORS AND AIR CONDITIONING

M01	Alternator and V belts	Check	DRV	
-----	------------------------	-------	-----	--

HYDRAULIC SYSTEM

Q01	Oil level	Check	DRV	
*QV01	System, pipework, valves and hoses	Check	DRV	

UNDERFRAME

U02	Draw bar couplings - manual	Check	DRV	
U04	Draw bar couplings - automatic	Check	DRV	
*UC01	Tow Bar	Check	DRV	
*UF02	Handrails and footsteps	Check	DRV	

WHEELS AND TRACKS

*UW02	Rail wheels, treads and flanges	Check	DRV	
*UW08	Tracks	Check	DRV	

FIRE PROTECTION SYSTEM

*Z01	Fire extinguisher	Check	DRV	
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Document Ref.	RAJCB310TAMI001
Issue Number	02
Issue Date	25 September 2020
Revision Letter	-
Technical Author	P Fountain
Approved By	Z Allan
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6.2 Maintenance Following Hire Period

Job Ref	Component Asterisked (*) Job Ref is Safety Critical	Action	Who	Tick
BRAKES				
*B03	Rail park brakes	Check	FIT	
*B04	Rail service brakes	Examine	FIT	
CAB AND SUPERSTRUCTURE				
C03	Cab glass and wipers	Check	DRV	
*C07	Machine functions correctly	Check	DRV	
*C09	Labels	Check	DRV	
C10	Machine	Clean	DRV	
*C14	Slew locking system	Check	FIT	
ELECTRICS				
*E01	Warning horn	Check	DRV	
E03	Fuses and breakers	Check	DRV	
*E05	Limit and rail gear proximity switches	Check	FIT	
E07	Battery condition and charge	Check	FIT	
*EL01	Rail and work lights	Check	DRV	
*EW01	Bonding straps	Check	DRV	
UNDERFRAME				
U02	Draw bar couplings - manual	Check	DRV	
U04	Draw bar couplings - automatic	Check	DRV	

6.3 After 50 hours Operation

Job Ref	Component Asterisked (*) Job Ref is Safety Critical	Action	Who	Tick
CAB AND SUPERSTRUCTURE				
*C21	Rated Capacity Indicator (RCI)	Check	FIT	
ENGINE				
D09	Fuel pre-filter separator	Drain	FIT	
ELECTRICS				
*E05	Limit and rail gear proximity switches	Check	FIT	
LUBRICATION AND FUEL				
L02	Lubrication	Lubricate	FIT	

6.4 After 100 hours Operation

Job Ref	Component Asterisked (*) Job Ref is Safety Critical	Action	Who	Tick
CAB AND SUPERSTRUCTURE				
C08	Fresh air filter	Clean	FIT	
*C24	BMAIR System	Check	FIT	
LUBRICATION AND FUEL				
L03	Lubrication	Lubricate	FIT	
L04	Slew ring grease	Lubricate	FIT	
ALTERNATORS AND AIR CONDITIONING				
M03	Air conditioning refrigerant	Check	FIT	



Document Ref.	RAJCB310TAMI001
Issue Number	02
Issue Date	25 September 2020
Revision Letter	-
Technical Author	P Fountain
Approved By	Z Allan
Authorised By	J Webb

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Job Ref	Component Asterisked (*) Job Ref is Safety Critical	Action	Who	Tick
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WHEELS AND TRACKS

*UW10	Wheel hub planetaries oil level	Check	FIT	
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6.5 After 250 hours Operation

Job Ref	Component Asterisked (*) Job Ref is Safety Critical	Action	Who	Tick
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BRAKES

*B11	Machine trailer pneumatic park brake system	Check	FIT	
*B13	Machine trailer pneumatic service brake system	Check	FIT	

CAB AND SUPERSTRUCTURE

C04	Cab glass and wipers	Examine	FIT	
*C15	Slew ring bolted connection	Check	FIT	
*C16	Slew transmission oil level	Check	FIT	
*C18	Counterweight mounting bolts	Examine	FIT	
*C19	Auxiliary weight mounting bolts	Examine	FIT	

ENGINE

D04	Engine cooling fan and cowling	Check	FIT	
D06	Air intake grilles	Check	FIT	
*DY01	Engine and alternator mountings	Check	FIT	

LUBRICATION AND FUEL

*L06	Fuel system	Examine	FIT	
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ALTERNATORS AND AIR CONDITIONING

M02	Alternator and V belts	Examine	FIT	
-----	------------------------	---------	-----	--

HYDRAULIC SYSTEM

Q02	Oil level	Check	FIT	
Q04	Oil cooler	Check	FIT	
Q05	Cylinders and their fittings	Examine	FIT	

RECOVERY

R01	Operation of recovery system	Check	FIT	
-----	------------------------------	-------	-----	--

UNDERFRAME

*UF03	Handrails and footsteps	Check	FIT	
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WHEELS AND TRACKS

*UW01	Rail wheel bolts	Check	FIT	
*UW05	Rail wheel back-to-back measurement	Check	FIT	

6.6 After 500 hours Operation

Job Ref	Component Asterisked (*) Job Ref is Safety Critical	Action	Who	Tick
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CAB AND SUPERSTRUCTURE

*C02	Loose, missing or damaged parts	Check	FIT	
C11	Superstructure	Check	FIT	

ENGINE

D02	Engine oil and filter	Renew	FIT	
D08	Fuel filters	Renew	FIT	

ELECTRICS

E07	Battery condition and charge	Check	FIT	
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Document Ref.	RAJCB310TAMI001
Issue Number	02
Issue Date	25 September 2020
Revision Letter	-
Technical Author	P Fountain
Approved By	Z Allan
Authorised By	J Webb

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Job Ref	Component Asterisked (*) Job Ref is Safety Critical	Action	Who	Tick
E08	Condition and security of all electrical cables, conduits and components	Check	FIT	
*EW02	Bonding impedance	Check	FIT	

ALTERNATORS AND AIR CONDITIONING

M04	Air conditioning V belts	Check	FIT	
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HYDRAULIC SYSTEM

Q06	Hydraulic filter	Renew	FIT	
*QV02	System, pipework, valves and hoses	Check	FIT	

UNDERFRAME

*U01	Bogie structures	Examine	FIT	
U06	Underframe	Check	FIT	
*UC02	Tow Bar	Examine	FIT	

WHEELS AND TRACKS

*UW03	Rail wheels, treads and flanges	Examine	FIT	
*UW04	Rail wheel final drive bearings	Check	FIT	
*UW09	Tracks	Examine	FIT	

6.7 After 1000 hours Operation

Job Ref	Component Asterisked (*) Job Ref is Safety Critical	Action	Who	Tick
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BRAKES

*B05	Rail brake torque test	Test	FIT	
*B06	Rail brake gradient/pull test	Test	FIT	
*B07	Rail service braking performance	Test	FIT	
*B08	Rail emergency braking performance	Test	FIT	
*B09	Road brake gradient/pull test	Test	FIT	
*B15	Hydraulic system, pipework and valves	Check	FIT	
*B17	Pneumatic system, pipework and valves	Check	FIT	

CAB AND SUPERSTRUCTURE

*C17	Slew transmission oil	Renew	FIT	
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ENGINE

D07	Air filters	Renew	FIT	
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6.8 After 2000 hours Operation

Job Ref	Component Asterisked (*) Job Ref is Safety Critical	Action	Who	Tick
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ENGINE

D05	Engine coolant	Renew	FIT	
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WHEELS AND TRACKS

*UW11	Wheel hub planetaries oil	Renew	FIT	
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Document Ref.	RAJCB310TAMI001
Issue Number	02
Issue Date	25 September 2020
Revision Letter	-
Technical Author	P Fountain
Approved By	Z Allan
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6.9 After 3000 hours Operation

Job Ref	Component Asterisked (*) Job Ref is Safety Critical	Action	Who	Tick
HYDRAULIC SYSTEM				
Q03	Oil	Renew	FIT	

6.10 After 20,000 hours Operation

Job Ref	Component Asterisked (*) Job Ref is Safety Critical	Action	Who	Tick
HYDRAULIC SYSTEM				
*ZS04	EN13849	Examine	ENG	

6.11 Monthly Maintenance

Job Ref	Component Asterisked (*) Job Ref is Safety Critical	Action	Who	Tick
WHEELS AND TRACKS				
*UW10	Wheel hub planetaries oil level	Check	FIT	

6.12 Three Monthly Maintenance

Job Ref	Component Asterisked (*) Job Ref is Safety Critical	Action	Who	Tick
STATUTORY EXAMINATIONS				
*ZS03	Respiratory air quality test	Examine	ENG	

6.13 Six Monthly Maintenance

Job Ref	Component Asterisked (*) Job Ref is Safety Critical	Action	Who	Tick
BRAKES				
*B04	Rail service brakes	Examine	FIT	
CAB AND SUPERSTRUCTURE				
*C12	Boom	Examine	FIT	
*C22	Rated Capacity Indicator (RCI)	Examine	FIT	
UNDERFRAME				
U03	Draw bar couplings - manual	Examine	FIT	
U05	Draw bar couplings - automatic	Examine	FIT	

6.14 Twelve Monthly Maintenance

Job Ref	Component Asterisked (*) Job Ref is Safety Critical	Action	Who	Tick
BRAKES				
*B05	Rail brake torque test	Test	FIT	
*B06	Rail brake gradient/pull test	Test	FIT	
*B07	Rail service braking performance	Test	FIT	



Document Ref.	RAJCB310TAMI001
Issue Number	02
Issue Date	25 September 2020
Revision Letter	-
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Approved By	Z Allan
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Job Ref	Component Asterisked (*) Job Ref is Safety Critical	Action	Who	Tick
*B08	Rail emergency braking performance	Test	FIT	
*B09	Road brake gradient/pull test	Test	FIT	

CAB AND SUPERSTRUCTURE

*C05	Seat belt	Check	FIT	
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ENGINE

D02	Engine oil and filter	Renew	FIT	
D08	Fuel filters	Renew	FIT	

ELECTRICS

*E02	Horn sound level	Check	FIT	
*EL02	Rail and work lights	Check	FIT	

UNDERFRAME

*U01	Bogie structures	Examine	FIT	
*UF01	Rail guidance equipment	Check	FIT	

WHEELS AND TRACKS

*UW06	Rail wheel back-to-back measurement	Check	FIT	
*UW07	Hydrostatic drive motor mounting bolts	Check	FIT	
*UW11	Wheel hub planetaries oil	Renew	FIT	

FIRE PROTECTION SYSTEM

*Z02	Fire extinguisher	Check	FIT	
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STATUTORY EXAMINATIONS

*ZS01	PUWER	Examine	ENG	
*ZS02	LOLER	Examine	ENG	

6.15 Twenty Four Monthly Maintenance

Job Ref	Component Asterisked (*) Job Ref is Safety Critical	Action	Who	Tick
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ENGINE

D05	Engine coolant	Renew	FIT	
D07	Air filters	Renew	FIT	

ALTERNATORS AND AIR CONDITIONING

M05	Air conditioning system	Check	FIT	
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HYDRAULIC SYSTEM

Q03	Oil	Renew	FIT	
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6.16 Twenty Yearly Maintenance

Job Ref	Component Asterisked (*) Job Ref is Safety Critical	Action	Who	Tick
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STATUTORY EXAMINATIONS

*ZS04	EN13849	Examine	ENG	
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7.0 JOB SHEETS

The job sheets referred to in this document appear as individual sheets in the following pages. They have been grouped by the Job Reference type, such as Brakes, Electrics, etc.



Document Ref.	RAJCB310TAMI001
Issue Number	02
Issue Date	25 September 2020
Revision Letter	-
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7.1 Brakes

Brakes Section



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Issue Number	02
Issue Date	25 September 2020
Revision Letter	-
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Component Asterisked (*) Job Ref is Safety Critical	Activity	Who	Periodicity				Job Ref
			PU	RET	HOUR	MTH	
Rail park brakes	Check	DRV	*				*B01

SCHEDULED WORK:

1. Ensure that the rail axles are fully raised into the retracted position and that the rail park brake is applied.
2. Try to rotate each rail wheel by hand. The braked wheels should not turn.

REMEDIAL ACTION:

2. If any of the wheels turn, report immediately and do not use the machine on rail.
2. Repeat check after any repairs or adjustments have been completed.



Document Ref.	RAJCB310TAMI001
Issue Number	02
Issue Date	25 September 2020
Revision Letter	-
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Approved By	Z Allan
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Component Asterisked (*) Job Ref is Safety Critical	Activity	Who	Periodicity				Job Ref
			PU	RET	HOUR	MTH	
Rail service brakes	Check	DRV	*				*B02

SCHEDULED WORK:

1. Fully raise the rail axles into the retracted position.
2. Depress and latch the foot brake.
3. Release the park brake.
4. Attempt to turn the rail wheels by hand

REMEDIAL ACTION:

4. If any of the wheels turn, report immediately and do not use the machine on rail.



Document Ref.	RAJCB310TAMI001
Issue Number	02
Issue Date	25 September 2020
Revision Letter	-
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Component Asterisk (*) Job Ref is Safety Critical	Activity	Who	Periodicity				Job Ref
			PU	RET	HOUR	MTH	
Rail park brakes	Check	FIT		*			*B03

SCHEDULED WORK:

1. Carry out B01.

REMEDIAL ACTION:

1. Rectify any faults.
1. Repeat check after any repairs or adjustments have been completed.



Document Ref.	RAJCB310TAMI001
Issue Number	02
Issue Date	25 September 2020
Revision Letter	-
Technical Author	P Fountain
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Component Asterisked (*) Job Ref is Safety Critical	Activity	Who	Periodicity				Job Ref
			PU	RET	HOUR	MTH	
Rail service brakes	Examine	FIT		*		6	*B04

NOTE: This check is required if rail brakes are fitted.

SCHEDULED WORK:

1. Carry out B02.
2. Check operation of park brake (uses the internal negative brake).
3. Check each brake lining is at least 5mm on all rail wheel service brakes.
4. Check operation of service operation (uses one external calliper per wheel).

REMEDIAL ACTION:

- 2&4 Repair or replace parts as required, as detailed in the documents listed in paragraph 3 of this manual.
- 2&4 Repeat check after any repairs or adjustments have been completed.
3. Replace if required, as detailed in the documents listed in paragraph 3 of this manual.



Document Ref.	RAJCB310TAMI001
Issue Number	02
Issue Date	25 September 2020
Revision Letter	-
Technical Author	P Fountain
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Component Asterisked (*) Job Ref is Safety Critical	Activity	Who	Periodicity				Job Ref
			PU	RET	HOUR	MTH	
Rail brake torque test	Test	FIT			1000	12	*B05

These tests are preferred because they are more thorough, but under circumstances that can be justified by risk assessment Rail brake gradient/pull test B06 may be undertaken instead.

Service Brake Test

NOTE: This check is required if rail wheel service brake callipers are fitted.

SCHEDULED WORK:

With the engine running:

1. Ensure the machine park brake is engaged.
2. Ensure that the rail axles are fully raised into the retracted position.
3. Reverse the hub cap plate to detent the gear box drive dog on each gearbox.
4. Ensure the rail wheels rotate freely.
5. Depress the brake pedal to apply the rail wheel service brakes.
6. Using the male 1" square drive adapter in the centre of rail each wheel, apply 4200Nm force to each rail wheel.
7. Check that each rail wheel of the machine does not move.
8. Record results in accordance with RIS-1530-PLT.
9. Reinstall the hub cap plate to reengage the gear box drive dog.
10. Ensure the rail wheel does not rotate freely.

REMEDIAL ACTION:

7. Investigate faults and repair, as detailed in the documents listed in paragraph 3 of this manual.
7. Repeat test after any repairs or adjustments have been completed.

Park/Emergency Brake Test

NOTE: This check is required if rail wheel park brakes are fitted.

SCHEDULED WORK:

1. Ensure the machine park brake is engaged.
2. Ensure that the rail axles are fully raised into the retracted position.
3. Ensure that the gear box drive dog is engaged.
4. Ensure the rail wheels do not rotate freely.
5. Release the brake pedal to deactivate the rail service brakes.
6. Using the male 1" square drive in the centre of each wheel, apply 3000Nm force to each rail wheel.
7. Check that each rail wheel of the machine does not move.
8. Record results in accordance with RIS-1530-PLT.

REMEDIAL ACTION:

7. Investigate faults and repair, as detailed in the documents listed in paragraph 3 of this manual.
7. Repeat test after any repairs or adjustments have been completed.



Document Ref.	RAJCB310TAMI001
Issue Number	02
Issue Date	25 September 2020
Revision Letter	-
Technical Author	P Fountain
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Component Asterisked (*) Job Ref is Safety Critical	Activity	Who	Periodicity				Job Ref *B06 (1 of 2)
			PU	RET	HOUR	MTH	
Rail brake gradient/pull test	Test	FIT			1000	12	

None of the tests detailed on either of these B06 sheets are required if B05 was undertaken instead.

Where the tests have not been performed using B05, these tests may be performed using either the Gradient Method 'A' on this sheet 1 of 2, or the Drawbar Method 'B' on sheet 2 of 2.

NOTE: Perform tests without trailer. If a trailer is to be used, perform tests again with a suitable trailer loaded with 100% of machine weight.

Service Brake Test

SCHEDULED WORK METHOD A (1:25 Gradient Method):

1. Position the machine on a 1:25 gradient track.
2. Apply the rail park brakes.
3. With the engine running, ensure that the rail service brake pedal is depressed.
4. Load the machine to its Fully Laden Weight. There is no need for any trailers to be attached e.g. an excavator should be tested full of all fluids whilst lifting its maximum capable load.
5. Release the rail park brakes.
6. Check that the machine does not move.
7. Record results in accordance with RIS-1530-PLT.

REMEDIAL ACTION METHOD A (1:25 Gradient Method):

6. Investigate faults and repair.
6. Repeat test after any repairs or adjustments have been completed.

Park/Emergency Brake Test

SCHEDULED WORK METHOD A (1:25 Gradient Method):

1. Position the machine on a 1:25 gradient track.
2. Apply the rail park brakes.
3. Ensure that the rail service brake pedal is released so that the rail service brakes are not applied.
4. Load the machine to its Fully Laden Weight. There is no need for any trailers to be attached e.g. an excavator should be tested full of all fluids whilst lifting its maximum capable load.
5. Check that the machine does not move.
6. Record results in accordance with RIS-1530-PLT.

REMEDIAL ACTION METHOD A (1:25 Gradient Method):

5. Investigate faults and repair.
5. Repeat test after any repairs or adjustments have been completed.



Document Ref.	RAJCB310TAMI001
Issue Number	02
Issue Date	25 September 2020
Revision Letter	-
Technical Author	P Fountain
Approved By	Z Allan
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UNCONTROLLED WHEN PRINTED

Component Asterisked (*) Job Ref is Safety Critical	Activity	Who	Periodicity				Job Ref *B06 (2 of 2)
			PU	RET	HOUR	MTH	
Rail brake gradient/pull test	Test	FIT			1000	12	

NOTE: Perform tests without trailer. If a trailer is to be used, perform tests again with a suitable trailer loaded with 100% of machine weight.

Service Brake Test

SCHEDULED WORK METHOD B (Drawbar Pull Test Method):

1. Position the machine on track.
2. Apply the rail park brakes.
3. Connect a compatible RRV to the machine with a calibrated load cell in line with the drawbar.
4. With the engine running, ensure that the rail service brake pedal is depressed.
5. Release the rail park brakes.
6. Slowly drive the RRV away from the machine being tested.
7. The load cell should register at least 7% (2170kg) of the gross machine weight (31 Tonnes) before the machine begins to move. During the test, the rail wheels shall not turn or slide.
8. Record results in accordance with RIS-1530-PLT.

REMEDIAL ACTION METHOD B (Drawbar Pull Test Method):

7. If the required draw bar tension cannot be achieved, examine the brake system in accordance with the manufacturers guidelines.
7. If force required is reduced by more than 10% since last test, investigate reason even if the machine meets RIS-1530-PLT requirements.
7. If any repairs are carried out, carry out a full re-test covering all steps in items 1 to 8. If no fault can be found, contact the OEM for advice.

Park/Emergency Brake Test

SCHEDULED WORK METHOD B (Drawbar Pull Test Method):

1. Position the machine on track.
2. Apply the rail park brakes.
3. Connect a compatible RRV to the machine with a calibrated load cell in line with the drawbar.
4. Ensure that the rail service brake pedal is released so that the rail service brakes are not applied.
5. Slowly drive the RRV away from the machine being tested.
6. The load cell should register at least 6% (1860kg) of the gross machine weight (31 Tonnes) before the machine begins to move. During the test, the rail wheels shall not turn or slide.
7. Record results in accordance with RIS-1530-PLT.

REMEDIAL ACTION METHOD B (Drawbar Pull Test Method):

6. If the required draw bar tension cannot be achieved, examine the brake system in accordance with the manufacturers guidelines.
6. If force required is reduced by more than 10% since last test, investigate reason even if the machine meets RIS-1530-PLT requirements.
6. If any repairs are carried out, carry out a full re-test covering all steps in items 1 to 7. If no fault can be found, contact the OEM for advice.



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Issue Number	02
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Revision Letter	-
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Component Asterisked (*) Job Ref is Safety Critical	Activity	Who	Periodicity				Job Ref
			PU	RET	HOUR	MTH	
Rail service braking performance	TEST	FIT			1000	12	*B07

SCHEDULED WORK:

NOTES:

- The test must be carried out on clean, dry level rail.
- The Machine being tested must be 'fully laden', i.e. all consumables are full.
- The test must be performed three times in each direction and the stopping distances recorded, and records retained in accordance with RIS-1530-PLT.

- Perform job B05 (or B06).
- Mark the position where the brakes are to be applied.
- Start the engine and allow to warm up for one minute.
- Move the machine to give room to get up to speed.
- Accelerate to 3mph / 5km/h on the machine rail speedo. Check the speedo reading against a hand held GPS speedo.
- When the braking point is reached, disengage drive and apply the foot brake.
- Measure the distance taken to stop and record, and whenever possible, compare the result with previous tests.
- Compare results with the Maximum Stopping Distance (metres) required by RIS-1530-PLT as shown on Appendix 1.
- Repeat steps 4 to 8 from 7mph / 11km/h.
- Repeat steps 4 to 8 from 10mph / 16km/h.
- Record results on Brake Distance Test Form (Appendix 1) in accordance with RIS-1530-PLT.

Expected Stopping Distances with Bucket and Auxiliary Counterweight fitted in dry conditions on flat level rail:

Speed (mph)	Distance (m)
3	< 2
7	< 5.5
9	< 8
10	< 10

REMEDIAL ACTION:

- If rail speedo is inaccurate investigate fault and repair.
- 8 to 10 If stopping distance exceeds expected value investigate fault and repair.
- 8 to 10 If stopping distances have increased by more than 10% since last test, investigate reason even if the machine meets RIS-1530-PLT requirements.
- 8 to 10 Repeat test after any repairs or adjustments have been completed.



Document Ref.	RAJCB310TAMI001
Issue Number	02
Issue Date	25 September 2020
Revision Letter	-
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UNCONTROLLED WHEN PRINTED

Component Asterisk (*) Job Ref is Safety Critical	Activity	Who	Periodicity				Job Ref
			PU	RET	HOUR	MTH	
Rail emergency braking performance	TEST	FIT			1000	12	*B08

SCHEDULED WORK:

NOTES:

- A. The test must be carried out on clean, dry level rail.
- B. The Machine being tested must be 'fully laden', i.e. all consumables are full.
- C. The test must be performed once in each direction and the stopping distances recorded, and records retained in accordance with RIS-1530-PLT.

1. Perform job B05 (or B06).
2. Mark the position where the brakes are to be applied.
3. Start the engine and allow to warm up for one minute.
4. Move the machine to give room to get up to speed.
5. Accelerate to 2mph / 3km/h.
6. When the braking point is reached, disengage drive and press the emergency stop button.
7. Measure the distance taken to stop and record, and whenever possible, compare the result with previous tests.
8. Compare results with the Maximum Stopping Distance (metres) required by RIS-1530-PLT as shown on Appendix 1.
9. Record results on Brake Distance Test Form (Appendix 1) in accordance with RIS-1530-PLT.

REMEDIAL ACTION:

- 8 If stopping distance exceeds expected value investigate fault and repair.
- 8 If stopping distances have increased by more than 10% since last test, investigate reason even if the machine meets RIS-1530-PLT requirements.
- 8 Repeat test after any repairs or adjustments have been completed.



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Issue Number	02
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Component Asterisked (*) Job Ref is Safety Critical	Activity	Who	Periodicity				Job Ref *B09 (1 of 2)
			PU	RET	HOUR	MTH	
Road brake gradient/pull test	Test	FIT			1000	12	

These tests may be performed using either the Gradient Method 'A' on this sheet 1 of 2, or the Drawbar Method 'B' on sheet 2 of 2.

NOTE: Perform tests without trailer.

SCHEDULED WORK METHOD A (1:25 Gradient Method):

1. Position the machine on the maximum gradient that the machine is able to climb.
2. Apply the park brakes
3. Ensure that the service brake pedal is released so that the service brakes are not applied.
4. Load the machine to its Fully Laden Weight. There is no need for any trailers to be attached e.g. an excavator should be tested full of all fluids whilst lifting its maximum capable load.
5. Check that the machine does not move.
6. Record results in accordance with RIS-1530-PLT.

REMEDIAL ACTION METHOD A (1:25 Gradient Method):

5. Investigate faults and repair.
5. Repeat test after any repairs or adjustments have been completed.



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Component Asterisked (*) Job Ref is Safety Critical	Activity	Who	Periodicity				Job Ref *B09 (2 of 2)
			PU	RET	HOUR	MTH	
Road brake gradient/pull test	Test	FIT			1000	12	

NOTE: Perform tests without trailer.

SCHEDULED WORK METHOD B (Drawbar Pull Test Method):

1. Position the machine on a flat level yard area.
2. Apply the park brakes.
3. Connect a compatible RRV to the machine with a calibrated load cell in line with the drawbar.
4. Ensure that the service brake pedal is released so that the service brakes are not applied.
5. Slowly drive the RRV away from the machine being tested.
6. The load cell should register at least 40% (12,400kg) of the gross machine weight (31 Tonnes) before the machine begins to move. During the test, the tracks shall not turn or slide.
7. Record results in accordance with RIS-1530-PLT.

REMEDIAL ACTION METHOD B (Drawbar Pull Test Method):

6. If the required draw bar tension cannot be achieved, examine the brake system in accordance with the manufacturers guidelines.
6. If force required is reduced by more than 10% since last test, investigate reason even if the machine meets RIS-1530-PLT requirements.
6. If any repairs are carried out, carry out a full re-test covering all steps in items 1 to 7. If no fault can be found, contact the OEM for advice.



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Component Asterisked (*) Job Ref is Safety Critical	Activity	Who	Periodicity				Job Ref
			PU	RET	HOUR	MTH	
Machine trailer pneumatic park brake system	Check	DRV	*				*B10

Note: This test is required if a trailer is to be used and braking is to be operated by pneumatics.

SCHEDULED WORK:

1. Check the park brake blanking plugs are present.
2. Ensure the park brake system is depressurised.
3. Remove one blanking plug.
4. Charge the park brake system by switching compressor on.
5. Check that as the system charges, air flows out of the port that had the blanking plug removed from it and that trailer breakaway is detected.
6. Depressurise the system.
7. Refit the blanking plug.
8. Repeat 1 to 7 for the other end of the machine.

REMEDIAL ACTION:

1. Replace plugs.
2. Drain condensate from air reservoirs
2. Depressurise.
5. Report any issues.



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			PU	RET	HOUR	MTH	
Machine trailer pneumatic park brake system	Check	FIT			250		*B11

SCHEDULED WORK:

1. Carry out B10.
2. Carry out Compressor maintenance
3. Check with pressure gauge that system pressure is 5½ to 8½ bar.

REMEDIAL ACTION:

1. Repair as required.
2. Clean Compressor cooling fins and fan guard
2. Replace Air Filter
3. Investigate fault and repair.



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			PU	RET	HOUR	MTH	
Machine trailer pneumatic service brake system	Check	DRV	*				*B12

Note: This test is required if a trailer is to be used and braking is to be operated by pneumatics.

SCHEDULED WORK:

1. Press brake pedal and check for evidence of air leaks.

REMEDIAL ACTION:

1. Report if evidence of air escaping.



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			PU	RET	HOURL	MTH	
Machine trailer pneumatic service brake system	Check	FIT			250		*B13

SCHEDULED WORK:

1. Insert pressure gauge into service brake line.
2. Press brake pedal.
3. Check that pressure proportionately changes with increase in brake pedal pressure, that pressure goes from 0 to 6½ and 8½ bar and that there is no evidence of air leaks.
4. Check that when brake pedal is released that the pressure drops swiftly to zero.

REMEDIAL ACTION:

- 3&4. Investigate fault and repair.



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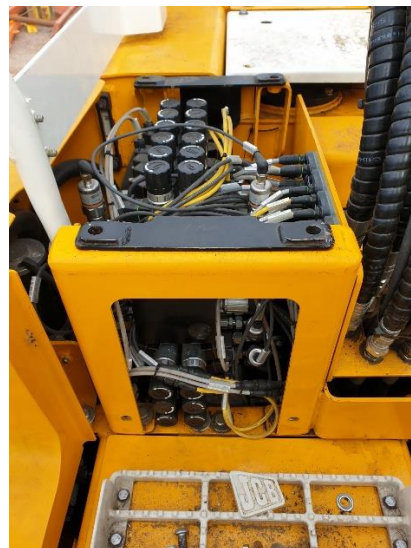
Component Asterisked (*) Job Ref is Safety Critical	Activity	Who	Periodicity				Job Ref
			PU	RET	HOURL	MTH	
Hydraulic system, pipework and valves	Check	DRV	*				*B14

SCHEDULED WORK:

1. Check brake system, pipework and hydraulic valves.
2. Check for leaks.

REMEDIAL ACTION:

1. Report any defective parts.
2. Report any leaks.





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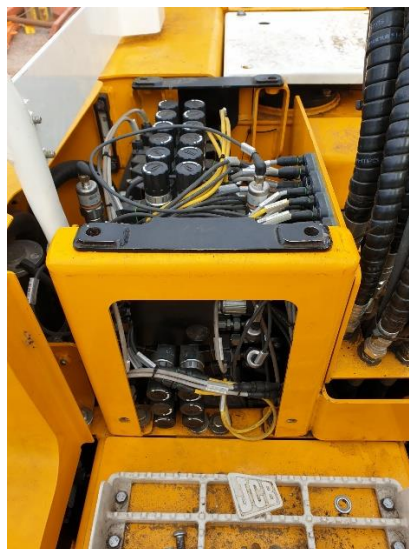
Component Asterisked (*) Job Ref is Safety Critical	Activity	Who	Periodicity				Job Ref
			PU	RET	HOUR	MTH	
Hydraulic system, pipework and valves	Check	FIT			1000		*B15

SCHEDULED WORK:

1. Check brake system, pipework and hydraulic valves.
2. Check for leaks.

REMEDIAL ACTION:

1. Renew any defective parts.
2. Repair if necessary.





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Component Asterisk (*) Job Ref is Safety Critical	Activity	Who	Periodicity				Job Ref
			PU	RET	HOUR	MTH	
Pneumatic system, pipework and valves	Check	DRV	*				*B16

SCHEDULED WORK:

1. Check brake system, pipework and pneumatic valves.
2. Check for leaks.

REMEDIAL ACTION:

1. Report any defective parts.
2. Report any leaks.



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			PU	RET	HOUR	MTH	
Pneumatic system, pipework and valves	Check	FIT			1000		*B17

SCHEDULED WORK:

1. Check brake system, pipework and pneumatic valves.
2. Check for leaks.

REMEDIAL ACTION:

1. Renew any defective parts.
2. Repair if necessary.



Document Ref.	RAJCB310TAMI001
Issue Number	02
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7.2 Cab and Superstructure

Cab and Superstructure Section



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Component Asterisk (*) Job Ref is Safety Critical	Activity	Who	Periodicity				Job Ref
			PU	RET	HOUR	MTH	
Loose, missing or damaged parts	Check	DRV	*				*C01

SCHEDULED WORK:

1. Check machine for loose, missing or damaged parts, and loose/misplaced/displaced covers/guards/life guard track sweepers.

REMEDIAL ACTION:

1. Report as appropriate.





Document Ref.	RAJCB310TAMI001
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Component Asterisked (*) Job Ref is Safety Critical	Activity	Who	Periodicity				Job Ref
			PU	RET	HOUR	MTH	
Loose, missing or damaged parts	Check	FIT			500		*C02

SCHEDULED WORK:

1. Carry out C01.

REMEDIAL ACTION:

1. Investigate/repair/renew as appropriate.





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Revision Letter	-
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Component Asterisked (*) Job Ref is Safety Critical	Activity	Who	Periodicity				Job Ref
			PU	RET	HOURL	MTH	
Cab glass and wipers	Check	DRV	*	*			C03

SCHEDULED WORK:

1. Check all glass for cleanliness.
2. Check windscreen washer fluid level.
3. Check wipers.
4. Check fixing bolts.
5. Check wiper motor operates.
6. Check windscreen for cracks or chips.

REMEDIAL ACTION:

1. Clean glass if required.
2. Top up.
- 3-6 Report damaged or faulty parts.



Washer bottle



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Component Asterisked (*) Job Ref is Safety Critical	Activity	Who	Periodicity				Job Ref
			PU	RET	HOUR	MTH	
Cab glass and wipers	Examine	FIT			250		C04

SCHEDULED WORK:

1. Check windscreen washer fluid level.
2. Check wipers.
3. Check fixing bolts.
4. Check wiper motor operates.
5. Check windscreen for cracks or chips.

REMEDIAL ACTION:

1. Top up.
2. Replace damaged or faulty parts.
3. Tighten fixing bolts.
4. Renew wiper fuse.
5. Replace if cracked or chipped.



Washer bottle



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Component Asterisked (*) Job Ref is Safety Critical	Activity	Who	Periodicity				Job Ref
			PU	RET	HOUR	MTH	
Seat belt	Check	FIT				12	*C05

SCHEDULED WORK:

1. Check that the seat belt stays locked in position when tugged and look for damage to the fabric or other components.

REMEDIAL ACTION:

1. Replace defective seat belt or other components.



Document Ref.	RAJCB310TAMI001
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Component Asterisk (*) Job Ref is Safety Critical	Activity	Who	Periodicity				Job Ref
			PU	RET	HOUR	MTH	
Combination cooler	Check	DRV	*				C06

SCHEDULED WORK:

1. Check condition of the combination cooler.

REMEDIAL ACTION:

1. Report to fitter if it is very dirty or appears to be clogged.





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Component Asterisked (*) Job Ref is Safety Critical	Activity	Who	Periodicity				Job Ref
			PU	RET	HOUR	MTH	
Machine functions correctly	Check	DRV	*	*			*C07

SCHEDULED WORK:

1. Check that machine functions correctly and safely by performing the safety checks detailed in the documents detailed in paragraph 3 of this maintenance instruction.

REMEDIAL ACTION:

1. Refer to manufacturer.





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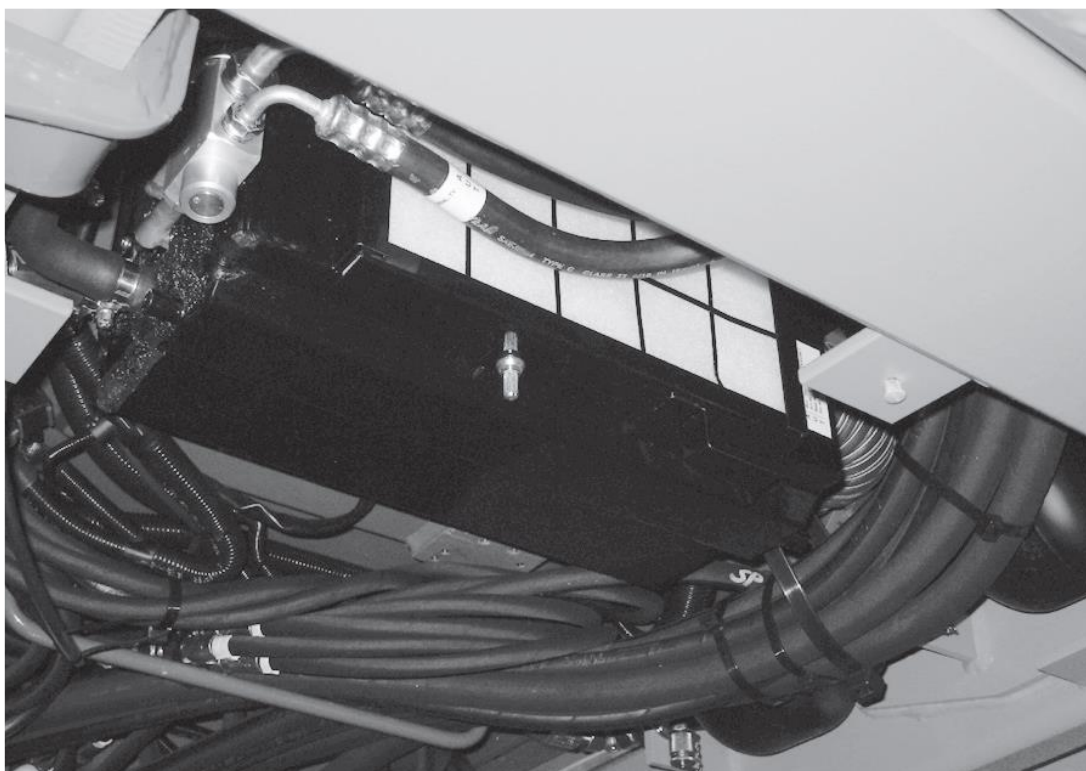
Component Asterisk (*) Job Ref is Safety Critical	Activity	Who	Periodicity				Job Ref
			PU	RET	HOUR	MTH	
Fresh air filter	Clean	FIT			100		C08

SCHEDULED WORK:

1. Clean the fresh air filter.

REMEDIAL ACTION:

1. Replace if necessary.





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Component Asterisked (*) Job Ref is Safety Critical	Activity	Who	Periodicity				Job Ref
			PU	RET	HOUR	MTH	
Labels	Check	DRV	*	*			*C09

SCHEDULED WORK:

1. Check that all labels are fitted, in good condition and are clearly legible, including the following as shown in Appendix 2:

Part number	Description	Quantity
-	Data panel	2
-	25mm wide OLE Warning line	4
28161C	Crushing hazard	4
28164	Hazardous materials	1
28171E	No smoking	1
52475C	Tie down	4
A0617	Danger overhead live wires	11
A1719	Pressurised vessel	3
A2236	No access under live O.L.E.	1
A2896	Tow bar recovery	1
A2897	Keep off vinyl sticker	1
A3778	Trailer park brake	1
A3779	Trailer service brake	1
A3973	Engineering acceptance certificate	2
A4281	3 point contact	2

2. Check that all OEM labels are fitted, in good condition and are clearly legible, in accordance with the OEM Manuals detailed in paragraph 3.

REMEDIAL ACTION:

- 1&2. Renew or clean as required.



Document Ref.	RAJCB310TAMI001
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Component Asterisked (*) Job Ref is Safety Critical	Activity	Who	Periodicity				Job Ref
			PU	RET	HOUR	MTH	
Machine	Clean	DRV		*			C10

SCHEDULED WORK:

1. Clean machine with GIC General Cleaner or equivalent biodegradable detergent. Pay particular attention to and rear ends (visibility), rail gear and underframes.

REMEDIAL ACTION:

1. Power wash as required.





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Component Asterisked (*) Job Ref is Safety Critical	Activity	Who	Periodicity				Job Ref
			PU	RET	HOUR	MTH	
Superstructure	Check	FIT			500		C11

SCHEDULED WORK:

1. Check machine superstructure for defects, cracks etc.
2. Check condition and tightness of nuts and bolts.

REMEDIAL ACTION:

1. Consult manufacturer.
2. Replace nuts and bolts.
2. Tighten nuts and bolts.





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Component Asterisked (*) Job Ref is Safety Critical	Activity	Who	Periodicity				Job Ref
			PU	RET	HOUR	MTH	
Boom	Examine	FIT				6	*C12

SCHEDULED WORK:

1. Manoeuvre the machine into the best possible position to safely gain access to the boom.
2. Examine all sections of the boom for distortion, cracks or other signs of damage.
3. Examine all pivot points to ensure all fixings are present and secure.
4. Check condition of and wipe clean all grease pivots (see OEM manuals detailed in paragraph 3 for locations).
5. Ensure auto lube system is applying a suitable amount of grease to each grease point (unless directed otherwise by OEM instructions).
6. Wipe clear any excess grease from all grease points.

REMEDIAL ACTION:

2. Report any damage to supervisor/manager. Renew any damaged component, or repair in accordance with procedure produced by a competent body.
3. Renew any damaged or missing components. If fixings are found to be loose, renew all in group.
4. Renew any damaged grease lines.
5. Refill the Central Grease Pump Canister with grease.





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Component Asterisked (*) Job Ref is Safety Critical	Activity	Who	Periodicity				Job Ref
			PU	RET	HOUR	MTH	
Slew locking system	Check	DRV	*				*C13

SCHEDULED WORK:

1. Check that slew locking system operates correctly.

REMEDIAL ACTION:

1. Report if pin does not fit freely.



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			PU	RET	HOUR	MTH	
Slew locking system	Check	FIT		*			*C14

SCHEDULED WORK:

1. Carry out C13.

REMEDIAL ACTION:

1. Adjust/repair/replace as required.



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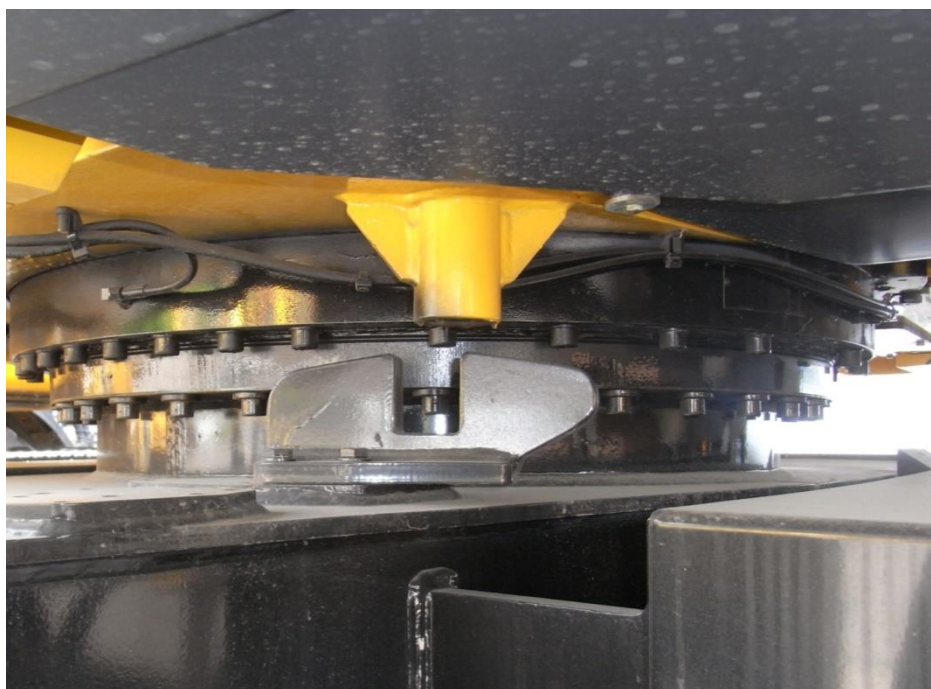
Component Asterisked (*) Job Ref is Safety Critical	Activity	Who	Periodicity				Job Ref
			PU	RET	HOUR	MTH	
Slew ring bolted connection	Examine	FIT			250		*C15

SCHEDULED WORK:

1. Inspect the slew ring bolts and nuts for presence and tightness.

REMEDIAL ACTION:

1. Replace missing components and tighten loose bolts.





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			PU	RET	HOUR	MTH	
Slew transmission oil level	Check	FIT			250		*C16

SCHEDULED WORK:

1. Check slew transmission oil level.

REMEDIAL ACTION:

1. Top up.



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			PU	RET	HOUR	MTH	
Slew transmission oil	Renew	FIT			1000		*C17

SCHEDULED WORK:

1. Renew oil.



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Component Asterisked (*) Job Ref is Safety Critical	Activity	Who	Periodicity				Job Ref
			PU	RET	HOUR	MTH	
Counterweight mounting bolts	Examine	FIT			250		*C18

SCHEDULED WORK:

1. Examine the counterweight mounting bolts.

REMEDIAL ACTION:

1. Tighten to 650 to 700Nm or replace the bolts as required.



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Component Asterisked (*) Job Ref is Safety Critical	Activity	Who	Periodicity				Job Ref
			PU	RET	HOUR	MTH	
Auxiliary weight mounting bolts	Examine	FIT			250		*C19

SCHEDULED WORK:

1. Examine the auxiliary weight mounting bolts.

REMEDIAL ACTION:

1. Tighten to 350 to 400Nm or replace the bolts as required.



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Component Asterisked (*) Job Ref is Safety Critical	Activity	Who	Periodicity				Job Ref
			PU	RET	HOUR	MTH	
Rated Capacity Indicator (RCI)	Check	DRV	*				*C20

SCHEDULED WORK:

1. Check the RCI data logger memory is not full and ensure that the SMS data send service is active.
2. Deactivate all overrides.
3. Test the motion cuts in accordance with the on-screen instructions.
4. On level ground position the boom with the dipper nose on the ground, ensure that RCI height reads approximately zero (+/- 250mm).
5. Position boom height readout to 2 metres.
6. With axles locked and then unlocked, in road mode, reference load chart and compare RCI readout capacity with load chart at the following 4 points:
 - 3 metres, 0 degrees
 - 3 metres, 90 degrees
 - 6 metres, 180 degrees
 - 6 metres, 270 degrees.
7. Check that the RCI changes to rail duties when in rail mode with bogies down.

REMEDIAL ACTION:

1. Download the datalogger files to memory stick.
- 2 to 7. Report any failure to operate properly. Quarantine machine.





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			PU	RET	HOUR	MTH	
Rated Capacity Indicator (RCI)	Check	FIT			50		*C21

SCHEDULED WORK:

1. Carry out C19
2. Check CanBus wiring harnesses for chaffing or abrasion
3. Check Boom cylinder transducers and hoses for damage
4. Visually check all boom M12 connections for signs of damage
5. Check the cab roof pink led strip flashes with an ALO virtual wall limit set
6. Check slew speed limit reduces with a virtual wall limit set
7. Physically check that motion cut solenoid overrides are not fitted.
8. Test Gauge Lock accuracy and boom and slew function interlocks
9. Test slew speed monitoring and overspeed interlocks
10. Test slew left hand Virtual Wall Lateral Limits accuracy and interlocks on 40mm Cant
11. Test slew right hand Virtual Wall Lateral Limits accuracy and interlocks on -130mm Cant
12. Test arm Virtual Wall Lateral Limit accuracy and interlocks

REMEDIAL ACTION:

1. Report any failure to operate properly. Quarantine machine.
 2. Renew cables
 3. Renew
 4. Renew cables
 5. Renew
 7. Deactivate and remove overrides. Fit standard coil caps 'M type' 375025
 9. Ensure slew motion cuts if speed limit is exceeded
 10. and 11. Ensure yellow limit is not exceeded (Red and orange is unacceptable)
 12. Ensure orange limit is not exceeded (Red is unacceptable)
- 1 to 12. Report any failure to operate properly. Quarantine machine.



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			PU	RET	HOUR	MTH	
Rated Capacity Indicator (RCI)	Examine	FIT				6	*C22

SCHEDULED WORK:

1. Perform RCI checks in accordance with Rail-Ability procedure (paragraph 3).
2. Perform RCI checks in accordance with Rail-Ability procedure RACD10000524
3. Perform MLD checks in accordance with Rail-Ability procedure RACD10000523
(Excluding Live OLE Height Limiter Virtual Ceiling Checks – Feature is disabled)

REMEDIAL ACTION:

1 and 2,

Report any failure to operate properly. Quarantine machine. Consult Rail-Ability.





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Component Asterisked (*) Job Ref is Safety Critical	Activity	Who	Periodicity				Job Ref
			PU	RET	HOUR	MTH	
BMAIR TAC(S)	Check	DRV	*				*C23

SCHEDULED WORK:

1. Check the operation of the BMAIR Filter Pressurisation System TAC(S) Control Panel in the Cab in accordance with the manufacturer's instructions card.

REMEDIAL ACTION:

1. Report if necessary.



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Component Asterisked (*) Job Ref is Safety Critical	Activity	Who	Periodicity				Job Ref
			PU	RET	HOUR	MTH	
BMAIR System	Clean	FIT			100		*C24

SCHEDULED WORK:

1. Check the operation of the BMAIR Filter Pressurisation System in accordance with the manufacturer's Manual - General Instructions.

REMEDIAL ACTION:

1. Rectify.
1. Replace Filters if necessary.

WARNING:

THE USED FILTERS MAY CONTAIN HAZARDOUS SUBSTANCES. – CONSULT THE OEM DOCUMENTATION BEFORE OPENING THE BMAIR CANOPY.



Document Ref.	RAJCB310TAMI001
Issue Number	02
Issue Date	25 September 2020
Revision Letter	-
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7.3 Engine

Engine Section



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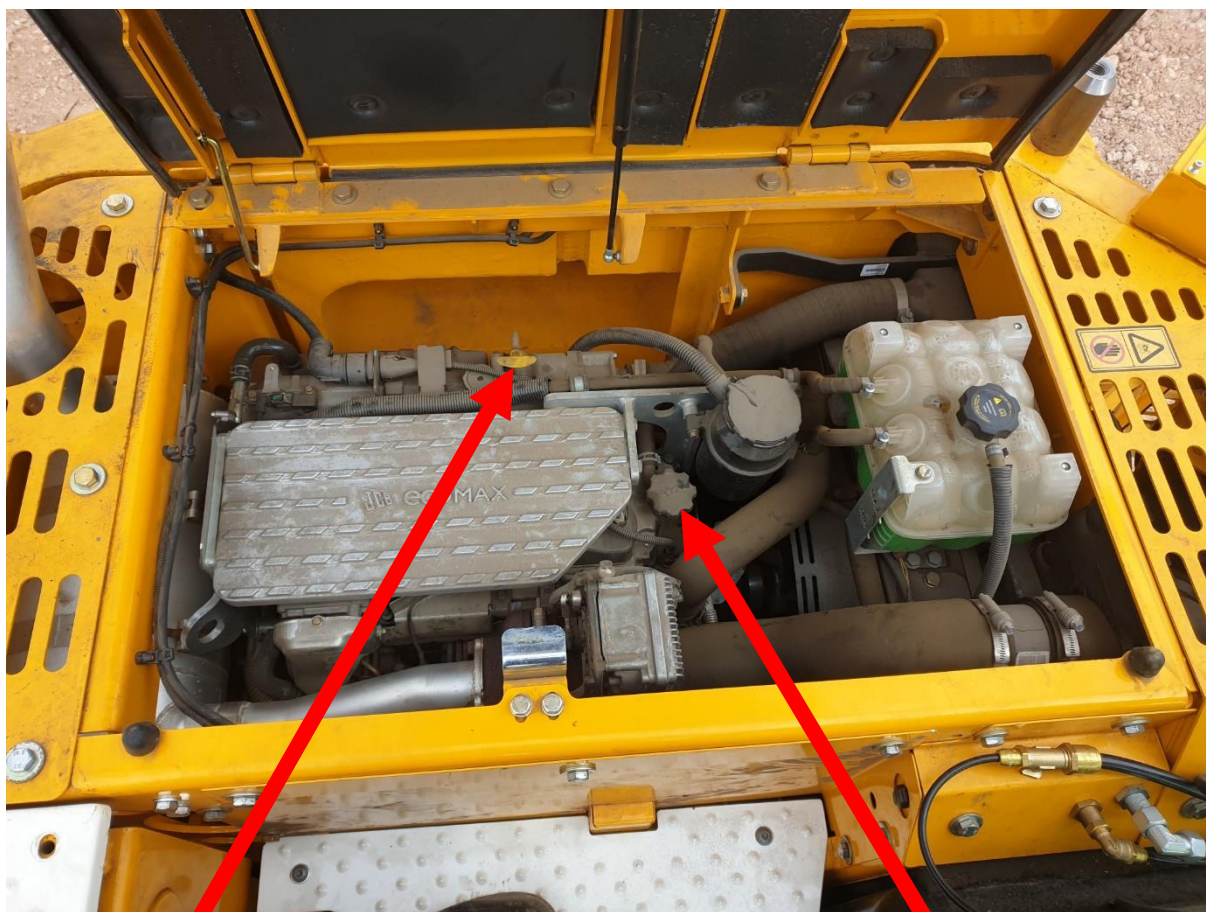
Component Asterisked (*) Job Ref is Safety Critical	Activity	Who	Periodicity				Job Ref
			PU	RET	HOUR	MTH	
Engine oil	Check	DRV	*				D01

SCHEDULED WORK:

1. Check oil level.

REMEDIAL ACTION:

1. Top up as required.



Oil filler dip stick

Oil level cap



Document Ref.	RAJCB310TAMI001
Issue Number	02
Issue Date	25 September 2020
Revision Letter	-
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Component Asterisked (*) Job Ref is Safety Critical	Activity	Who	Periodicity				Job Ref
			PU	RET	HOUR	MTH	
Engine oil and filter	Renew	FIT			500	12	D02

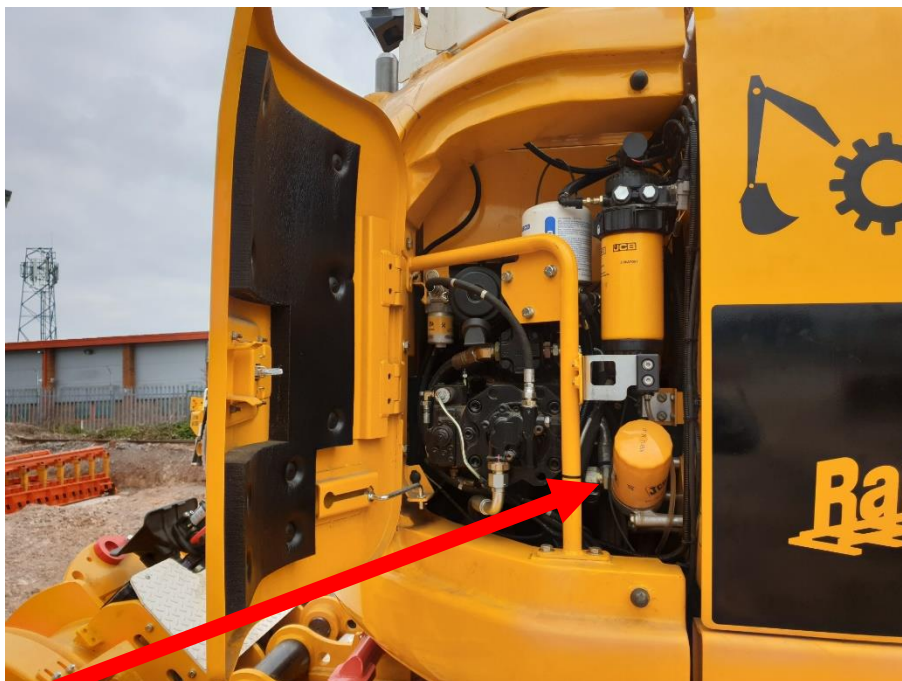
SCHEDULED WORK:

1. Renew oil and change filter.



Oil filler cap

Oil level dip stick



Oil filter



Document Ref.	RAJCB310TAMI001
Issue Number	02
Issue Date	25 September 2020
Revision Letter	-
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Component Asterisked (*) Job Ref is Safety Critical	Activity	Who	Periodicity				Job Ref
			PU	RET	HOUR	MTH	
Engine cooling	Check	DRV	*				D03

SCHEDULED WORK:

1. Check integrity of intake fan belts and screens.
2. Check engine temperature is normal when engine has warmed up.

REMEDIAL ACTION:

- 1&2 Report any issues.





Document Ref.	RAJCB310TAMI001
Issue Number	02
Issue Date	25 September 2020
Revision Letter	-
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Component Asterisked (*) Job Ref is Safety Critical	Activity	Who	Periodicity				Job Ref
			PU	RET	HOURL	MTH	
Engine cooling fan and cowling	Check	FIT			250		D04

SCHEDULED WORK:

1. Check integrity of intake fan, belts and screen.
2. Check engine cowling for efficiency.
3. Check engine temperature is normal when engine has warmed up.

REMEDIAL ACTION:

1. Adjust or repair fan or screen.
1. Adjust or replace belt.
2. Adjust or repair cowling.
3. Rectify fault.





Document Ref.	RAJCB310TAMI001
Issue Number	02
Issue Date	25 September 2020
Revision Letter	-
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Component Asterisked (*) Job Ref is Safety Critical	Activity	Who	Periodicity				Job Ref
			PU	RET	HOUR	MTH	
Engine coolant	Renew	FIT			2000	24	D05

SCHEDULED WORK:

1. Renew the engine coolant.





Document Ref.	RAJCB310TAMI001
Issue Number	02
Issue Date	25 September 2020
Revision Letter	-
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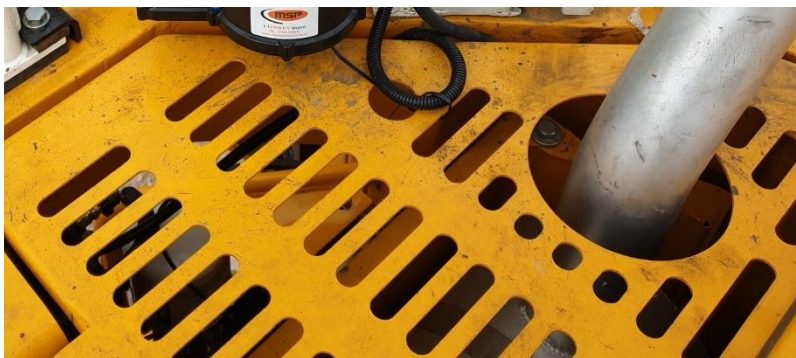
Component Asterisked (*) Job Ref is Safety Critical	Activity	Who	Periodicity				Job Ref
			PU	RET	HOURL	MTH	
Air intake grilles	Check	FIT			250		D06

SCHEDULED WORK:

1. Check the grilles are free from obstructions and damage.

REMEDIAL ACTION:

1. Clear away obstructions, and repair damage or renew grilles as appropriate.



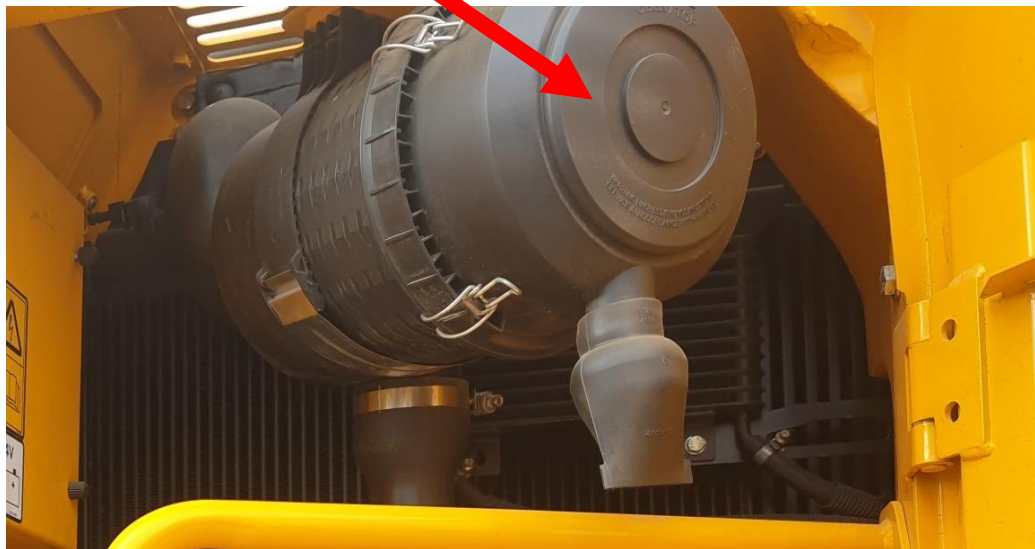
Document Ref.	RAJCB310TAMI001
Issue Number	02
Issue Date	25 September 2020
Revision Letter	-
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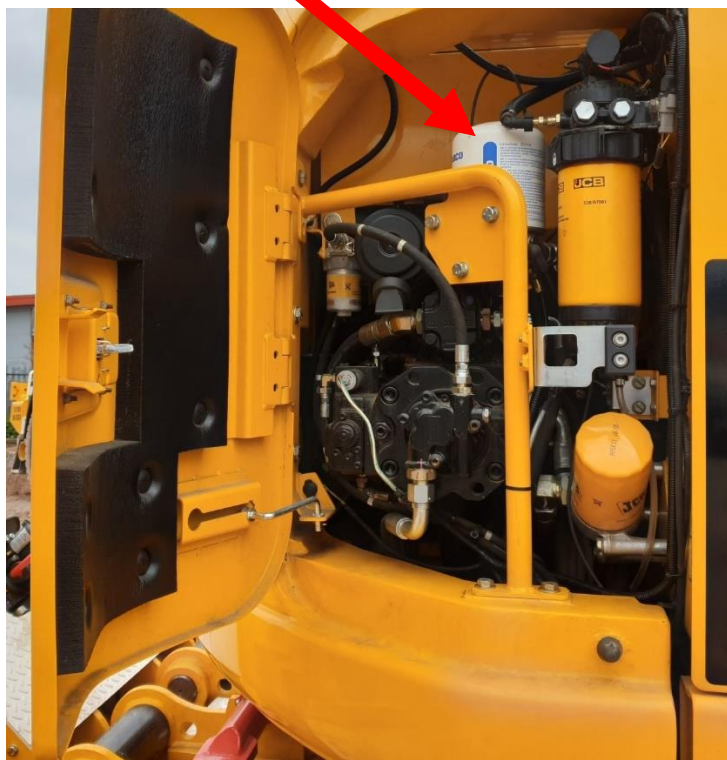
Component Asterisked (*) Job Ref is Safety Critical	Activity	Who	Periodicity				Job Ref
			PU	RET	HOUR	MTH	
Air filters	Renew	FIT			1000	24	D07

SCHEDULED WORK:

1. Renew main air filter element.



2. Renew safety air filter element.





Document Ref.	RAJCB310TAMI001
Issue Number	02
Issue Date	25 September 2020
Revision Letter	-
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Component Asterisked (*) Job Ref is Safety Critical	Activity	Who	Periodicity				Job Ref
			PU	RET	HOUR	MTH	
Fuel filters	Renew	FIT			500	12	D08

SCHEDULED WORK:

1. Renew the fuel pre-filter and the fuel filter.



Fuel pre-filter

Fuel filter



Document Ref.	RAJCB310TAMI001
Issue Number	02
Issue Date	25 September 2020
Revision Letter	-
Technical Author	P Fountain
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Component Asterisked (*) Job Ref is Safety Critical	Activity	Who	Periodicity				Job Ref
			PU	RET	HOUR	MTH	
Fuel pre-filter separator	Drain	FIT			50		D09

SCHEDULED WORK:

1. Drain water from the fuel pre-filter separator.



Fuel pre-filter



Document Ref.	RAJCB310TAMI001
Issue Number	02
Issue Date	25 September 2020
Revision Letter	-
Technical Author	P Fountain
Approved By	Z Allan
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Component Asterisked (*) Job Ref is Safety Critical	Activity	Who	Periodicity				Job Ref
			PU	RET	HOUR	MTH	
Engine and alternator mountings	Check	FIT			250		*DY01

SCHEDULED WORK:

1. Check security and integrity of engine and alternator mountings.

REMEDIAL ACTION:

1. Rectify as required.



Document Ref.	RAJCB310TAMI001
Issue Number	02
Issue Date	25 September 2020
Revision Letter	-
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7.4 Electrics

Electrics Section



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Revision Letter	-
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Component Asterisk (*) Job Ref is Safety Critical	Activity	Who	Periodicity				Job Ref
			PU	RET	HOUR	MTH	
Warning horn	Check	DRV	*	*			*E01

SCHEDULED WORK:

1. Check operation of horn.

REMEDIAL ACTION:

1. Check air pressure and fittings.
1. Renew fuse if blown.
1. Report if changing fuse does not make horn operate.





Document Ref.	RAJCB310TAMI001
Issue Number	02
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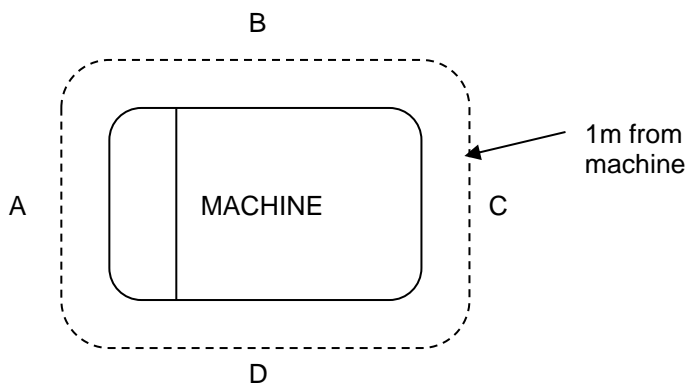
Component Asterisked (*) Job Ref is Safety Critical	Activity	Who	Periodicity				Job Ref
			PU	RET	HOUR	MTH	
Horn sound level	Check	FIT				12	*E02

NOTES:

- 1 This Job will require two people for it to be carried out effectively.
- 2 Measurements to be taken 1.8m above rail level.
- 3 The horn should not be sounded for more than 1 minute of continuous use in every 5 minute period for testing purposes.

SCHEDULED WORK:

1. Accelerate the engine to mid speed.
2. Use a calibrated sound level meter to measure the noise level of the machine at points A, B, C and D, at a distance of one metre from the machine, and record the values.
3. Repeat the four sound level readings at points A, B, C and D while sounding the horn. Compare these readings with those taken in step 2. Each reading should be at least 10dBA greater than the corresponding reading taken at step 2.
4. Stop the machine.
5. While sounding the horn, take a further sound level reading at one metre from the horn. This should be in excess of 80dBA.



REMEDIAL ACTION:

- 3&5 Renew the horn if defective. Retest following steps 1 to 5. If renewing the horn does not rectify the problem, auxiliary horns will need to be fitted at appropriate positions, then retest following steps 1 to 5.



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Issue Number	02
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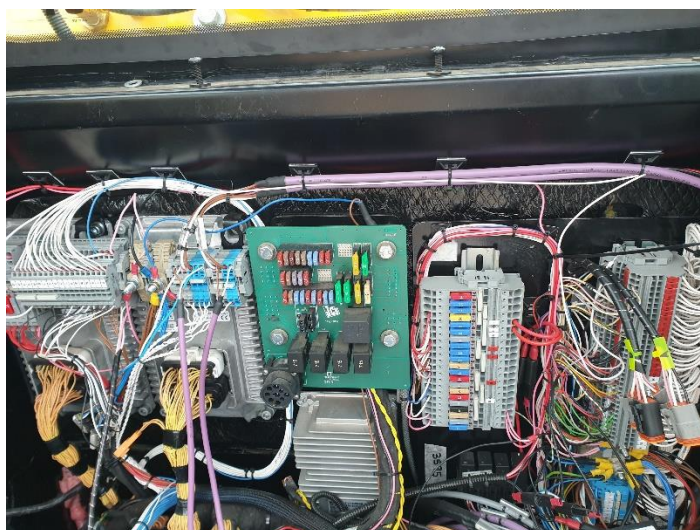
Component Asterisked (*) Job Ref is Safety Critical	Activity	Who	Periodicity				Job Ref
			PU	RET	HOUR	MTH	
Fuses and breakers	Check	DRV	*	*			E03

SCHEDULED WORK:

1. If an electrical item is not working, check the relevant fuse and/or breakers.

REMEDIAL ACTION:

1. Renew fuses and breakers.
1. Report if any of the electrical items are still not working.





Document Ref.	RAJCB310TAMI001
Issue Number	02
Issue Date	25 September 2020
Revision Letter	-
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Component Asterisked (*) Job Ref is Safety Critical	Activity	Who	Periodicity				Job Ref
			PU	RET	HOUR	MTH	
Limit and rail gear proximity switches	Check	DRV	*				*E04

SCHEDULED WORK:

1. Check for damage.

REMEDIAL ACTION:

1. Report if damaged.



Rear switches



Front switches



Document Ref.	RAJCB310TAMI001
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Revision Letter	-
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Component Asterisked (*) Job Ref is Safety Critical	Activity	Who	Periodicity				Job Ref
			PU	RET	HOUR	MTH	
Limit and rail gear proximity switches	Check	FIT		*	50		*E05

SCHEDULED WORK:

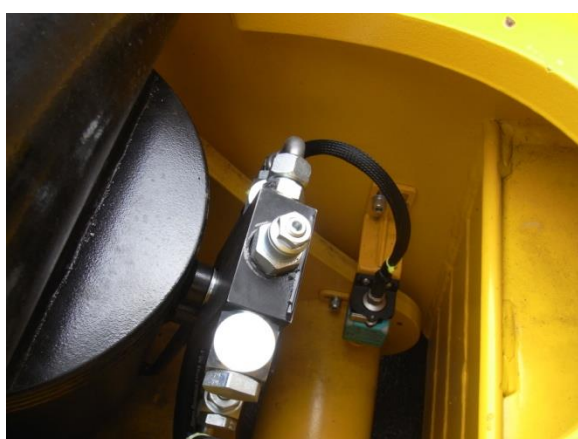
1. Check limit switches for damage and operation.

REMEDIAL ACTION:

1. Adjust or replace switches as required.



Rear switches



Front switches

Document Ref.	RAJCB310TAMI001
Issue Number	02
Issue Date	25 September 2020
Revision Letter	-
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Approved By	Z Allan
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Component Asterisked (*) Job Ref is Safety Critical	Activity	Who	Periodicity				Job Ref
			PU	RET	HOURL	MTH	
Battery security and condition	Check	DRV	*				E06

SCHEDULED WORK:

1. Check battery for security and damage.

REMEDIAL ACTION:

1. Report any issues.



Document Ref.	RAJCB310TAMI001
Issue Number	02
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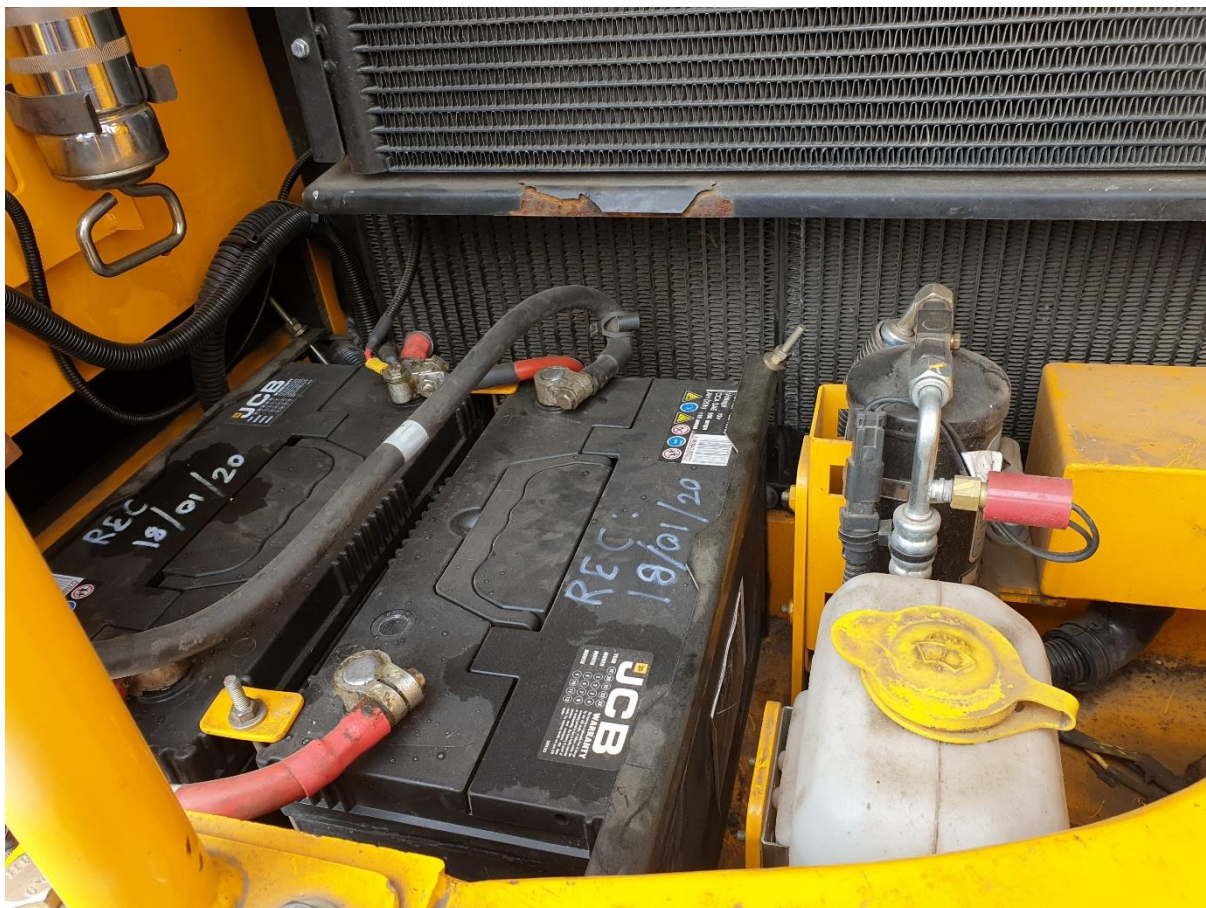
Component Asterisked (*) Job Ref is Safety Critical	Activity	Who	Periodicity				Job Ref
			PU	RET	HOUR	MTH	
Battery condition and charge	Check	FIT		*	500		E07

SCHEDULED WORK:

1. Carry out E06.
2. Check charge level of battery.

REMEDIAL ACTION:

1. Rectify issues.
2. Top up as required with distilled water and charge if required.
2. Renew if battery cannot be charged.





Document Ref.	RAJCB310TAMI001
Issue Number	02
Issue Date	25 September 2020
Revision Letter	-
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Component Asterisked (*) Job Ref is Safety Critical	Activity	Who	Periodicity				Job Ref
			PU	RET	HOUR	MTH	
Condition and security of all electrical cables, conduits and components	Check	FIT			500		E08

SCHEDULED WORK:

1. Check condition and security of all electrical cables, conduits and components.

REMEDIAL ACTION:

1. Renew damaged cables, conduits or components.
1. Secure cables, conduits or components.



Document Ref.	RAJCB310TAMI001
Issue Number	02
Issue Date	25 September 2020
Revision Letter	-
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Component Asterisk (*) Job Ref is Safety Critical	Activity	Who	Periodicity				Job Ref
			PU	RET	HOURL	MTH	
Warning lights	Check	DRV	*				E09

SCHEDULED WORK:

- On start-up, check that display panel illuminates, all icons work and buzzer sounds.

REMEDIAL ACTION:

- Report any defects.





Document Ref.	RAJCB310TAMI001
Issue Number	02
Issue Date	25 September 2020
Revision Letter	-
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Component Asterisked (*) Job Ref is Safety Critical	Activity	Who	Periodicity				Job Ref
			PU	RET	HOUR	MTH	
Rail and work lights	Check	DRV	*	*			*EL01

SCHEDULED WORK:

NOTE:

This Job will require two people for it to be carried out effectively.

1. Check cleanliness of lenses on all rail and work lights.
2. Use the dashboard switches, check the automatic operation of the rail lights as follows.

	Lights	
	Front	Rear
Forward on Rail	White	Red
Backwards on Rail	Red	White
Stationary on Rail after 15 seconds	Red	Red

3. Check the correct operation of all work lights.

REMEDIAL ACTION:

1. Clean.
- 2&3. Report any issues.



Document Ref.	RAJCB310TAMI001
Issue Number	02
Issue Date	25 September 2020
Revision Letter	-
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Component Asterisked (*) Job Ref is Safety Critical	Activity	Who	Periodicity				Job Ref
			PU	RET	HOUR	MTH	
Rail and work lights	Check	FIT				12	*EL02

SCHEDULED WORK:

1. Carry out EL01.

REMEDIAL ACTION:

1. Clean.
1. Renew defective lamp. Check reflector is clean and shiny. Before refitting lens check lens for cracks and damage. Examine rubber seals. Ensure correct screws are refitted. Renew defective items.
1. If any fault not cleared investigate fault in switch, wiring or circuit breaker/fuse.



Document Ref.	RAJCB310TAMI001
Issue Number	02
Issue Date	25 September 2020
Revision Letter	-
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Component Asterisked (*) Job Ref is Safety Critical	Activity	Who	Periodicity				Job Ref
			PU	RET	HOUR	MTH	
Bonding straps	Check	DRV	*	*			*EW01

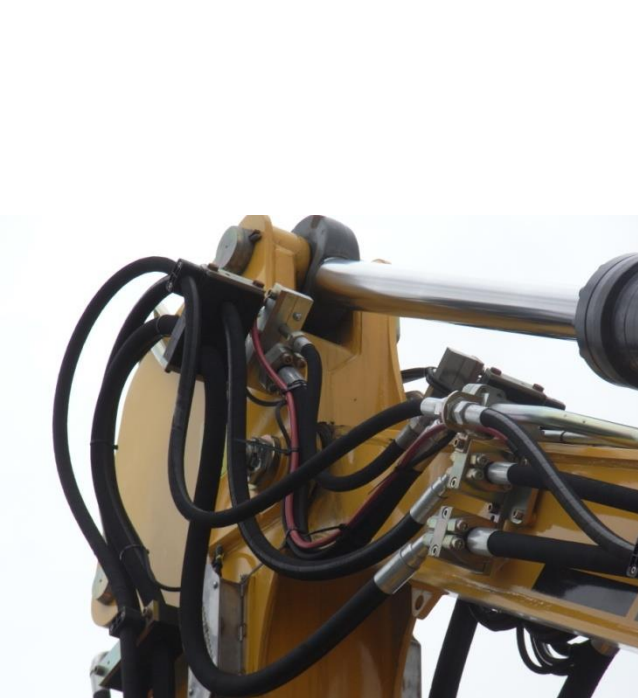
SCHEDULED WORK:

1. Check bonding straps are securely fastened. Check straps are in good condition (no burning or fraying).

Note: Straps should be no less than 35 csa. mm² size cable.

REMEDIAL ACTION:

1. Report if required.





Document Ref.	RAJCB310TAMI001
Issue Number	02
Issue Date	25 September 2020
Revision Letter	-
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Component Asterisked (*) Job Ref is Safety Critical	Activity	Who	Periodicity				Job Ref
			PU	RET	HOUR	MTH	
Bonding impedance	Check	FIT			500		*EW02

SCHEDULED WORK:

1. Carry out EW01.

Note: Straps should be no less than 35 csa. mm² size cable.

2. Check bonding impedance is 0.015 ohms or less by connecting a suitable meter between the boom arm of the machine and the rail wheels.

REMEDIAL ACTION:

1. Renew earth bond strap as required.
2. If impedance is above 0.015 ohms, repeat check on track between the boom arm and the rail head.
2. Clean mating surfaces or renew earth bond strap as required.
- 1&2. Recheck bonding impedance if any repair or replacement has been carried out.



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Issue Number	02
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7.5 Lubrication and Fuel

Lubrication and Fuel Section



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Component Asterisked (*) Job Ref is Safety Critical	Activity	Who	Periodicity				Job Ref
			PU	RET	HOUR	MTH	
Lubrication	Lubricate	DRV	*				L01

SCHEDULED WORK:

1. Check for adequate quantity of grease in the central greasing pump canister.
2. Check condition of grease lines.
3. Grease rail gear, rail drive torque hubs, and grease machine in accordance with OEM manuals detailed in paragraph 3.

REMEDIAL ACTION:

1. Refill / Report.
2. Report damaged points.



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Issue Number	02
Issue Date	25 September 2020
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Component Asterisked (*) Job Ref is Safety Critical	Activity	Who	Periodicity				Job Ref
			PU	RET	HOUR	MTH	
Lubrication	Lubricate	FIT			50		L02

SCHEDULED WORK:

1. Lubricate in accordance with OEM instructions detailed in paragraph 3.

REMEDIAL ACTION:

1. Replace damaged points.



Document Ref.	RAJCB310TAMI001
Issue Number	02
Issue Date	25 September 2020
Revision Letter	-
Technical Author	P Fountain
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Component Asterisked (*) Job Ref is Safety Critical	Activity	Who	Periodicity				Job Ref
			PU	RET	HOUR	MTH	
Lubrication	Lubricate	FIT			100		L03

SCHEDULED WORK:

1. Lubricate in accordance with OEM instructions detailed in paragraph 3.

REMEDIAL ACTION:

1. Replace damaged points.



Document Ref.	RAJCB310TAMI001
Issue Number	02
Issue Date	25 September 2020
Revision Letter	-
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Component Asterisked (*) Job Ref is Safety Critical	Activity	Who	Periodicity				Job Ref
			PU	RET	HOUR	MTH	
Slew ring grease	Lubricate	FIT			100		L04

SCHEDULED WORK:

1. Pack or renew with slew ring grease.

REMEDIAL ACTION:

1. Replace damaged points.



Document Ref.	RAJCB310TAMI001
Issue Number	02
Issue Date	25 September 2020
Revision Letter	-
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Component Asterisked (*) Job Ref is Safety Critical	Activity	Who	Periodicity				Job Ref
			PU	RET	HOUR	MTH	
Fuel system	Check	DRV	*				*L05

SCHEDULED WORK:

1. Check the ground where the machine has been standing for evidence of leaks.
2. Check the underside of the machine for drips of fuel and oil.
3. Check the fuel gauge appears to be working.

REMEDIAL ACTION:

- 1-3. Report any issues.



Document Ref.	RAJCB310TAMI001
Issue Number	02
Issue Date	25 September 2020
Revision Letter	-
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Component Asterisked (*) Job Ref is Safety Critical	Activity	Who	Periodicity				Job Ref
			PU	RET	HOUR	MTH	
Fuel system	Examine	FIT			250		*L06

SCHEDULED WORK:

1. Examine gaskets and damaged parts.
2. Examine fuel valves and pipework.
3. Drain water and sediment from fuel tank.
4. If possible, fill the fuel tank and check that gauge indicates full.
5. Drain any water from the fuel pre-filter separator.

REMEDIAL ACTION:

1. Renew gaskets and defective parts if required. Operate the system to check that any leak has been repaired.
2. Repair or replace valve if defective and repair or renew pipework as required.
4. Adjust, repair or renew as required.
5. If fuel pre-filter separator contains sediment:
 - Clamp the fuel inlet hose, remove the separator bowl and wash thoroughly with clean fuel;
 - Refit the bowl ensuring that any seals are correctly positioned and are in good condition (if not, renew);
 - Remove clamp from fuel inlet hose;
 - Bleed the fuel system. Refer to OEM manual detailed in paragraph 3 for details and instructions.



Document Ref.	RAJCB310TAMI001
Issue Number	02
Issue Date	25 September 2020
Revision Letter	-
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7.6 Alternators and Air Conditioning

Alternators and Air Conditioning Section



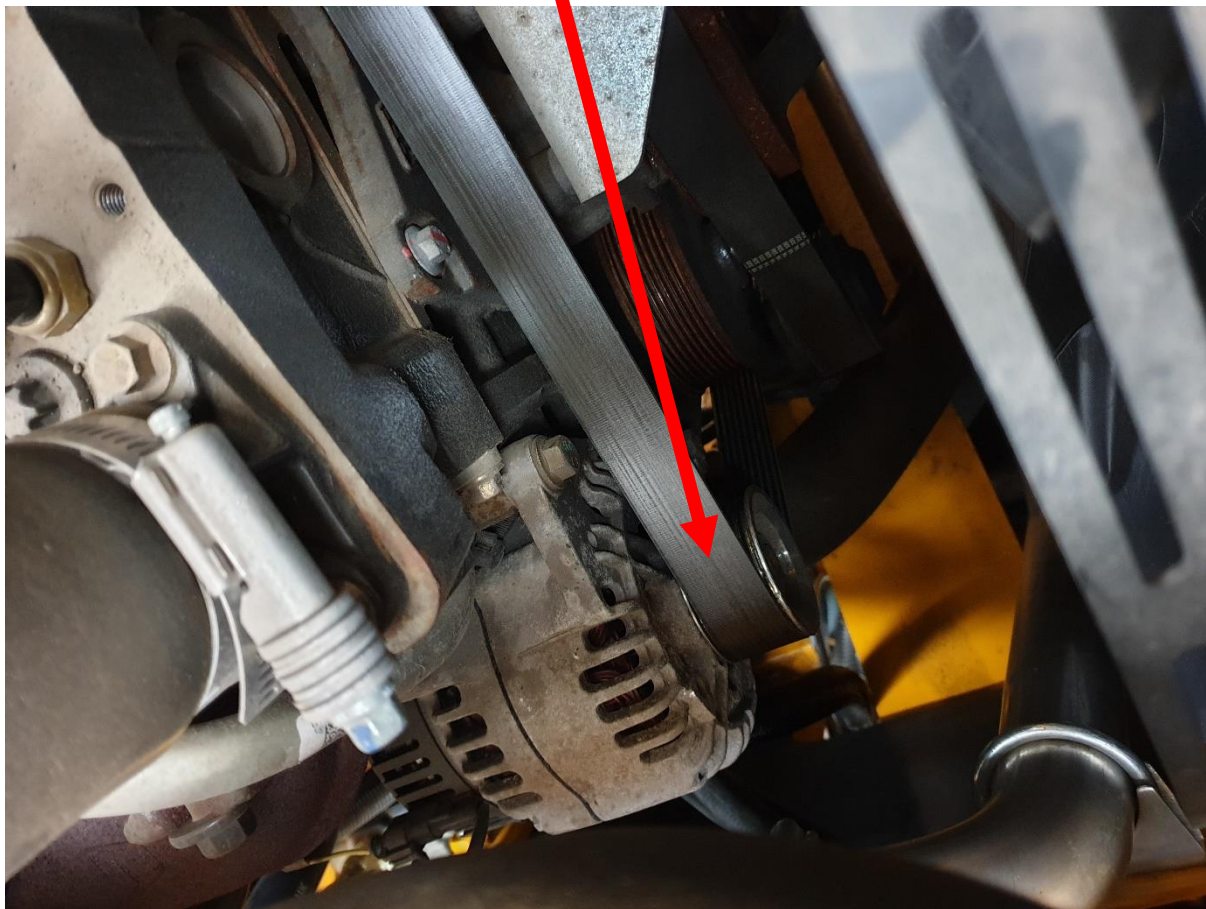
Document Ref.	RAJCB310TAMI001
Issue Number	02
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Component Asterisked (*) Job Ref is Safety Critical	Activity	Who	Periodicity				Job Ref
			PU	RET	HOUR	MTH	
Alternator and V belts	Check	DRV	*				M01

SCHEDULED WORK:

1. Visually check that alternator and V belts are correctly tensioned, and not worn or splayed.



REMEDIAL ACTION:

1. Report if damaged or stretched.



Document Ref.	RAJCB310TAMI001
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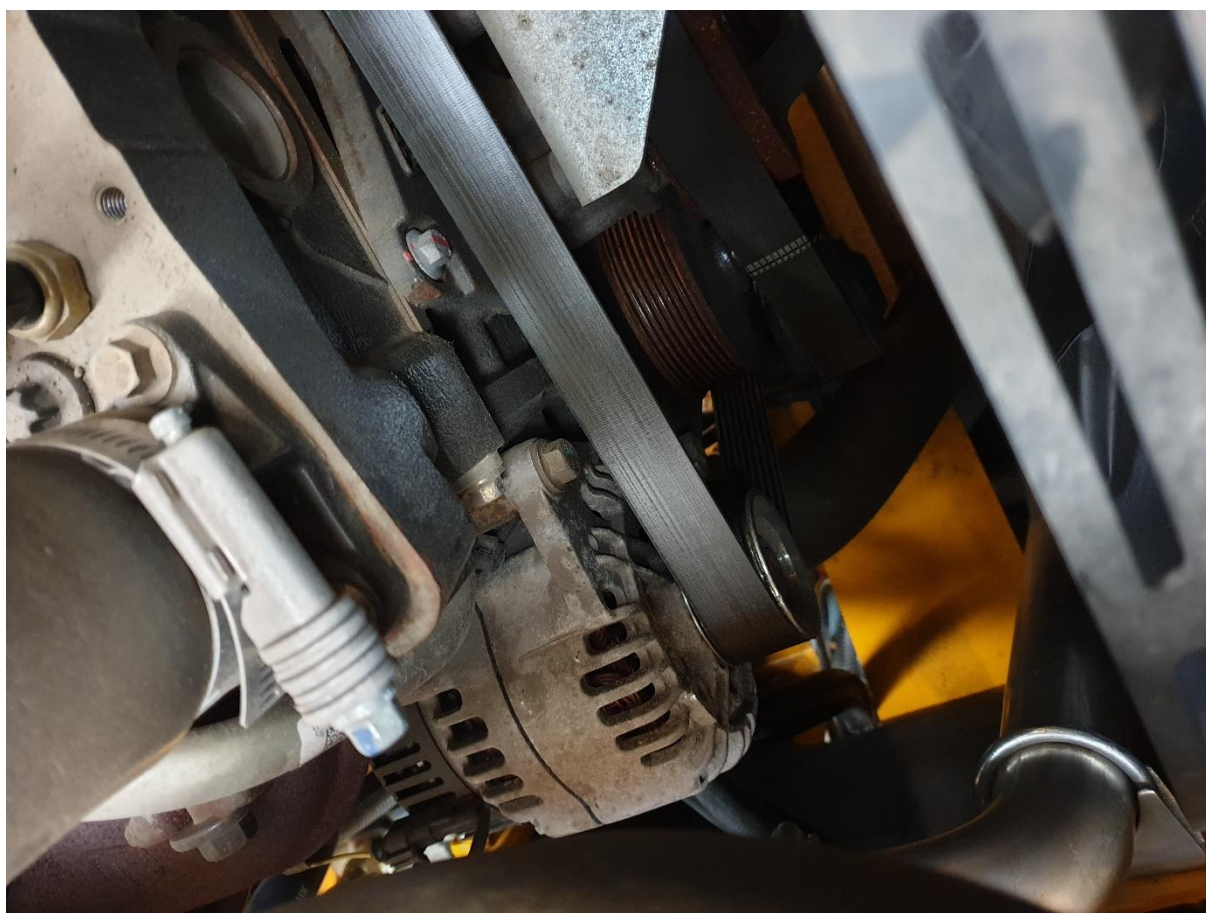
Component Asterisked (*) Job Ref is Safety Critical	Activity	Who	Periodicity				Job Ref
			PU	RET	HOUR	MTH	
Alternator and V belts	Examine	FIT			250		M02

SCHEDULED WORK:

1. Carry out M01.
2. Check mounting bolts.

REMEDIAL ACTION:

- 1&2 Renew or adjust as required.





Document Ref.	RAJCB310TAMI001
Issue Number	02
Issue Date	25 September 2020
Revision Letter	-
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Component Asterisked (*) Job Ref is Safety Critical	Activity	Who	Periodicity				Job Ref
			PU	RET	HOUR	MTH	
Air conditioning refrigerant	Check	FIT			100		M03

SCHEDULED WORK:

1. Check the refrigerant level and that there are no bubbles present.

REMEDIAL ACTION:

1. Replenish or renew as required.



Document Ref.	RAJCB310TAMI001
Issue Number	02
Issue Date	25 September 2020
Revision Letter	-
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Component Asterisked (*) Job Ref is Safety Critical	Activity	Who	Periodicity				Job Ref
			PU	RET	HOUR	MTH	
Air conditioning V belts	Check	FIT			500		M04

SCHEDULED WORK:

1. Check the V belt tension.

REMEDIAL ACTION:

1. Adjust or renew.





Document Ref.	RAJCB310TAMI001
Issue Number	02
Issue Date	25 September 2020
Revision Letter	-
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Component Asterisked (*) Job Ref is Safety Critical	Activity	Who	Periodicity				Job Ref
			PU	RET	HOUR	MTH	
Air conditioning system	Check	FIT				24	M05

SCHEDULED WORK:

1. Check the air conditioning system.

REMEDIAL ACTION:

1. Adjust or renew.



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7.7 Hydraulic System

Hydraulic System Section



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Component Asterisked (*) Job Ref is Safety Critical	Activity	Who	Periodicity				Job Ref
			PU	RET	HOUR	MTH	
Oil level	Check	DRV	*				Q01

SCHEDULED WORK:

1. Check hydraulic fluid level is between the top and bottom markings on the sight glass when the hydraulic cylinders have been brought into their “half-way” position.

REMEDIAL ACTION:

1. Report if oil is required.





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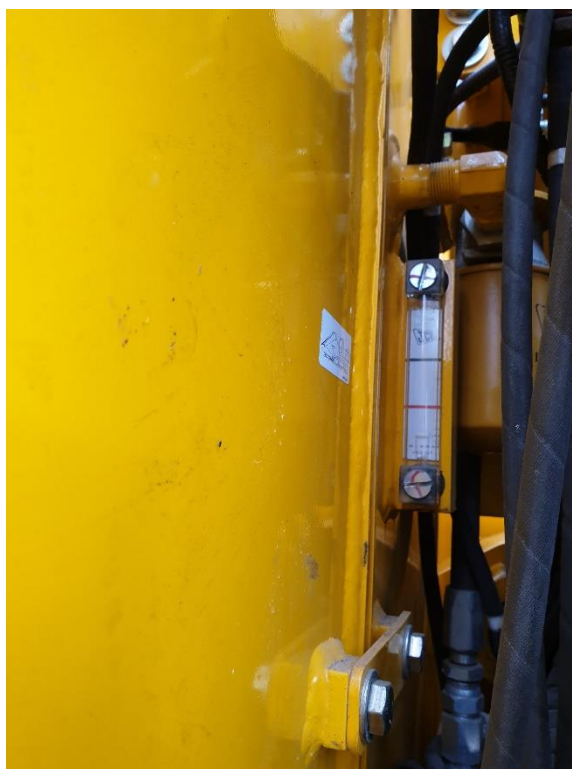
Component Asterisked (*) Job Ref is Safety Critical	Activity	Who	Periodicity				Job Ref
			PU	RET	HOUR	MTH	
Oil level	Check	FIT			250		Q02

SCHEDULED WORK:

1. Check hydraulic fluid level when the hydraulic cylinders have been brought into their "half-way" position.

REMEDIAL ACTION:

1. Top up if required.





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Component Asterisked (*) Job Ref is Safety Critical	Activity	Who	Periodicity				Job Ref
			PU	RET	HOUR	MTH	
Oil	Renew	FIT			3000	24	Q03

SCHEDULED WORK:

1. Renew hydraulic oil.



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Component Asterisked (*) Job Ref is Safety Critical	Activity	Who	Periodicity				Job Ref
			PU	RET	HOUR	MTH	
Oil cooler	Check	FIT			250		Q04

SCHEDULED WORK:

1. Check and clean the oil cooler.

REMEDIAL ACTION:

1. Repair or renew if required.





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Component Asterisked (*) Job Ref is Safety Critical	Activity	Who	Periodicity				Job Ref
			PU	RET	HOURL	MTH	
Cylinders and their fittings	Examine	FIT			250		Q05

SCHEDULED WORK:

1. Examine condition of hydraulic cylinders. Check for leaks or other damage including scoring of cylinder rods and damaged seals. Check condition of check valves where fitted. Ensure fittings are tight.
2. Examine for Ram Creep as follows:
 - With a suitable weight attached, place the outstretched arm in a self-supporting position.
 - Switch off the Engine.
 - Measure from a specific point at the end of the arm to the floor.
 - Leave the Machine in this position for one hour.
 - Re-measure the distance previously measured, as detailed above.
 - Investigate if the measurement has changed by more than 5mm.

REMEDIAL ACTION:

1. Adjust, repair or replace.
2. If any ram creep is present check ram seals and check valves, renew if required and repeat Ram Creep test above after any repairs or replacements.





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Component Asterisked (*) Job Ref is Safety Critical	Activity	Who	Periodicity				Job Ref
			PU	RET	HOUR	MTH	
Hydraulic filter	Renew	FIT			500		Q06

SCHEDULED WORK:

1. Renew Hydraulic System filter.





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Component Asterisk (*) Job Ref is Safety Critical	Activity	Who	Periodicity				Job Ref
			PU	RET	HOUR	MTH	
System, pipework, valves and hoses	Check	DRV	*				*QV01

SCHEDULED WORK:

1. Check hydraulic system, pipework and hydraulic valves.
2. Examine flexible hydraulic hoses for cuts, abrasions or splits.
3. Check for leaks.

REMEDIAL ACTION:

- 1&2. Report any defective parts.
3. Report any leaks.



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Component Asterisked (*) Job Ref is Safety Critical	Activity	Who	Periodicity				Job Ref
			PU	RET	HOUR	MTH	
System, pipework, valves and hoses	Check	FIT			500		*QV02

SCHEDULED WORK:

1. Check hydraulic system, pipework and hydraulic valves.
2. Examine flexible hydraulic hoses for cuts, abrasions or splits.
3. Check for leaks.

REMEDIAL ACTION:

1. Replace any defective parts.
2. Renew if required.
3. Repair any leaks.



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7.8 Recovery

Recovery Section



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Component Asterisk (*) Job Ref is Safety Critical	Activity	Who	Periodicity				Job Ref
			PU	RET	HOUR	MTH	
Operation of recovery system	Check	FIT			250		R01

SCHEDULED WORK:

1. Check operation of the electric recovery system.
2. Check operation of the manual pump recovery system.

REMEDIAL ACTION:

- 1&2 Repair or consult with OEM if recovery is inoperable.





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7.09 Underframe

Underframe Section



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Component Asterisked (*) Job Ref is Safety Critical	Activity	Who	Periodicity				Job Ref
			PU	RET	HOUR	MTH	
Bogie structures	Examine	FIT			500	12	*U01

SCHEDULED WORK:

- Examine bogie structures and all welded joints for cracks or distortion.

REMEDIAL ACTION:

- Check any suspect areas with crack detection spray. NDT inspection and repairs to be carried out in accordance with procedure prepared by competent body.



Front



Rear



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Component Asterisked (*) Job Ref is Safety Critical	Activity	Who	Periodicity				Job Ref
			PU	RET	HOUR	MTH	
Draw bar couplings - manual	Check	DRV	*	*			U02

SCHEDULED WORK:

1. Check front and rear draw bar couplings and retaining clips.
2. Check for free movement of the eye end up and down the shaft.

REMEDIAL ACTION:

1. Report worn, damaged or missing parts.
2. Lubricate shaft with grease





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Component Asterisked (*) Job Ref is Safety Critical	Activity	Who	Periodicity				Job Ref
			PU	RET	HOUR	MTH	
Draw bar couplings - manual	Examine	FIT				6	U03

SCHEDULED WORK:

1. Check mounting bolts are secure and in good condition.
2. Check clevis and pin are free from damage, distortion or excessive wear.
3. Check pin retaining R clip is in good condition and securely attached to the retaining chain.

REMEDIAL ACTION:

1. Re torque coupling mounting bolts.
1. Renew worn, damaged, missing or stretched bolts.
- 2&3 Renew worn, damaged or missing parts.





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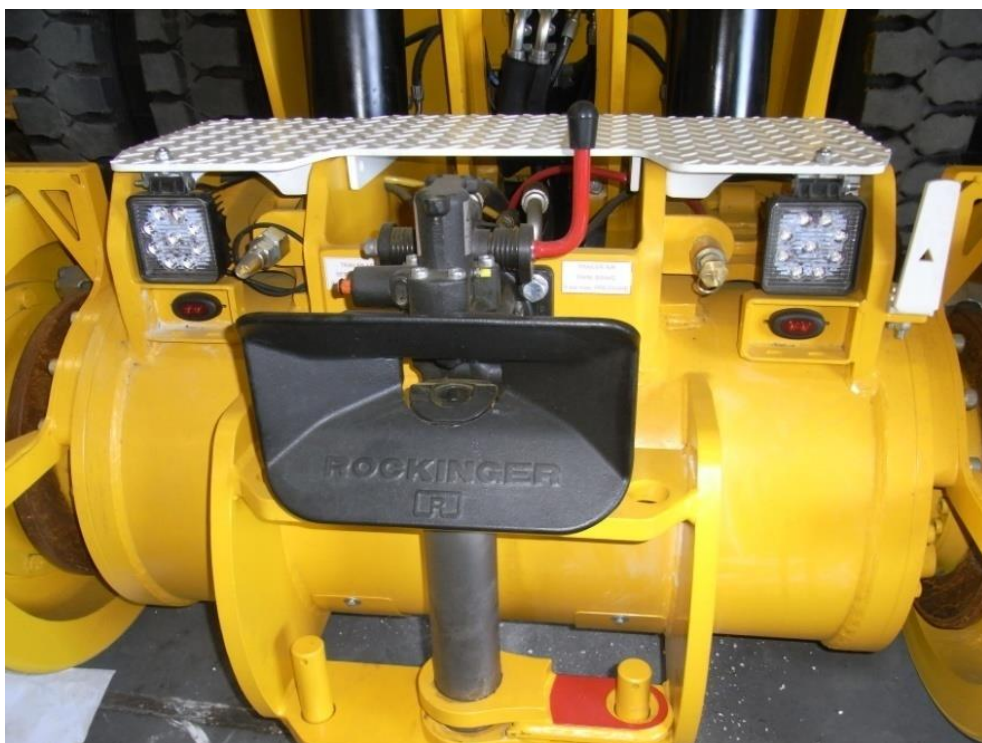
Component Asterisked (*) Job Ref is Safety Critical	Activity	Who	Periodicity				Job Ref
			PU	RET	HOUR	MTH	
Draw bar couplings - automatic	Check	DRV	*	*			U04

SCHEDULED WORK:

1. Check front and rear draw bar coupling mechanism for damage and wear.
2. Check mounting bolts are present and appear secure.

REMEDIAL ACTION:

- 1&2. Report any issues.





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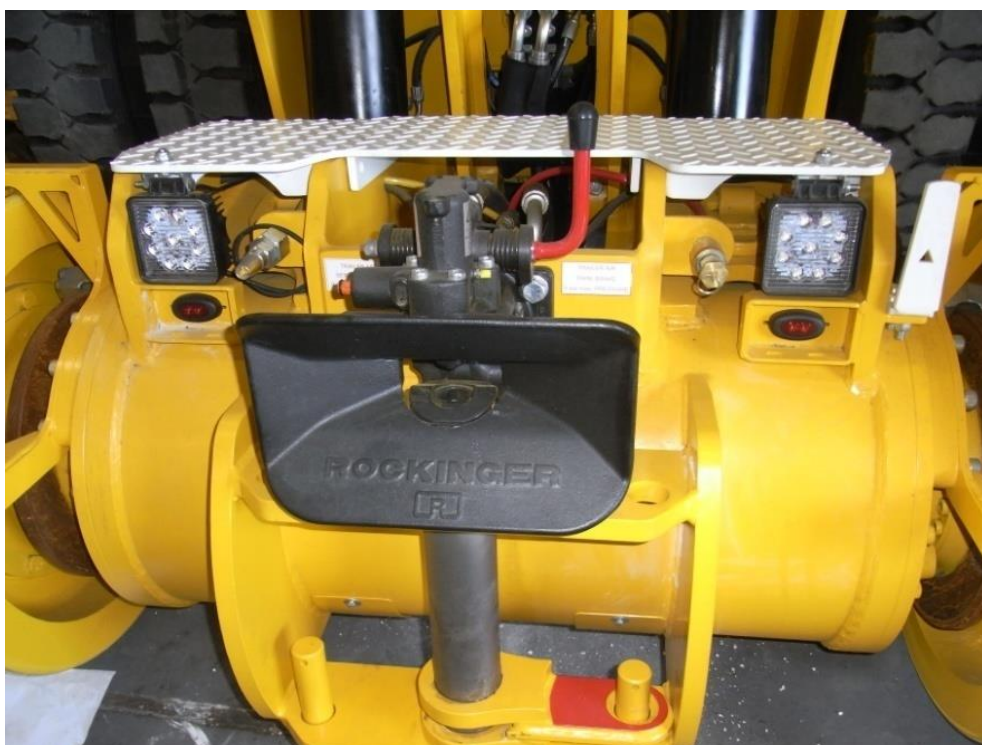
Component Asterisked (*) Job Ref is Safety Critical	Activity	Who	Periodicity				Job Ref
			PU	RET	HOUR	MTH	
Draw bar couplings - automatic	Examine	FIT				6	U05

SCHEDULED WORK:

1. Carry out M08.
2. Examine in accordance with OEM information detailed in paragraph 3.

REMEDIAL ACTION:

1. Re torque coupling mounting bolts to 244Nm.
1. Renew worn, damaged, missing or stretched bolts.
2. Renew worn, damaged or missing parts as per OEM..





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Component Asterisked (*) Job Ref is Safety Critical	Activity	Who	Periodicity				Job Ref
			PU	RET	HOUR	MTH	
Underframe	Check	FIT			500		U06

SCHEDULED WORK:

1. Check machine underframe for defects, cracks etc.
2. Check condition and tightness of nuts and bolts.

REMEDIAL ACTION:

1. Consult manufacturer.
2. Replace nuts and bolts.
2. Tighten nuts and bolts.



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Component Asterisked (*) Job Ref is Safety Critical	Activity	Who	Periodicity				Job Ref
			PU	RET	HOUR	MTH	
Tow Bar	Check	DRV	*				*UC01

SCHEDULED WORK:

1. Check tow bar is fitted and secure.

REMEDIAL ACTION:

1. Report any missing, damaged or defective parts.





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			PU	RET	HOUR	MTH	
Tow Bar	Examine	FIT			500		*UC02

SCHEDULED WORK:

1. Examine Integrity of tow bar for damage or distortion.
2. Examine welds and condition of towing eye.
3. Examine for ease of operation.
4. Examine mounting brackets.

REMEDIAL ACTION:

1. Renew defective parts.
- 2&4 Repair as required.
3. Lubricate and investigate as required.





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Component Asterisked (*) Job Ref is Safety Critical	Activity	Who	Periodicity				Job Ref
			PU	RET	HOUR	MTH	
Rail guidance equipment	Check	FIT				12	*UF01

SCHEDULED WORK:

Note: All actions apply to the front and rear assemblies.

1. Inspect the rail guidance equipment whilst loading and unloading structure, check integrity of structure, and all pins and holes for wear or ovality. Pins should be nominal diameter +0.0mm -1.0mm and should be renewed if worn by 1.0mm. Holes should be nominal diameter +0.5mm -0.0mm and should be re-bushed if wear exceeds 0.5mm.
2. Examine for Ram Creep as follows:
 - Position the Machine in the Rail Travel Position.
 - Switch off the Engine.
 - Measure the length of Ram Shaft Exposed.
 - Leave the Machine in this position for one hour.
 - Re-measure the exposed ram shaft length.
 - If the measurement has changed by more than 5mm investigate.

REMEDIAL ACTION:

1. Consult manufacturer if out of tolerance.
2. If any ram creep is present check ram seals and check valves, renew if required and repeat Ram Creep test above after any repairs or replacements.



Front rail gear mounting points



Rear rail gear mounting points



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Component Asterisked (*) Job Ref is Safety Critical	Activity	Who	Periodicity				Job Ref
			PU	RET	HOUR	MTH	
Handrails and footsteps	Check	DRV	*				*UF02

SCHEDULED WORK:

1. Check all handrails and footsteps are secure and clear.

REMEDIAL ACTION:

1. Report any loose or damaged items.
1. Clear as required.





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Component Asterisked (*) Job Ref is Safety Critical	Activity	Who	Periodicity				Job Ref
			PU	RET	HOUR	MTH	
Handrails and footsteps	Check	FIT			250		*UF03

SCHEDULED WORK:

1. Check all handrails and footsteps are secure and clear.

REMEDIAL ACTION:

1. Secure as required and clear.





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7.10 Wheels and Tracks

Wheels and Tracks Section



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Component Asterisked (*) Job Ref is Safety Critical	Activity	Who	Periodicity				Job Ref
			PU	RET	HOUR	MTH	
Rail wheel bolts	Check	FIT			250		*UW01

SCHEDULED WORK:

1. Check rail wheels and securing bolts are torqued to 600/650Nm.

REMEDIAL ACTION:

1. Tighten if required, to torque above.
1. Replace bolts if torque has decreased by more than 10%.





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Component Asterisked (*) Job Ref is Safety Critical	Activity	Who	Periodicity				Job Ref
			PU	RET	HOUR	MTH	
Rail wheels, treads and flanges	Check	DRV	*				*UW02

SCHEDULED WORK:

1. Check for flats on rail wheels.
2. Check condition of rail wheel treads and flanges for pitting scoring, deformation, or other damage, referring to Limits Data in paragraph 5.6.
3. Check that no cracks or scoring are visible.

REMEDIAL ACTION:

- 1-3 Report any defects.





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Component Asterisked (*) Job Ref is Safety Critical	Activity	Who	Periodicity				Job Ref
			PU	RET	HOUR	MTH	
Rail wheels, treads and flanges	Examine	FIT			500		*UW03

SCHEDULED WORK:

1. Rotate the rail wheel slowly and examine treads and flanges for pitting, scoring, cracks, cavities, migration and flats (see Appendix 3). Maximum length of flat allowed is detailed in paragraph 5.6.
2. Examine rail wheel diameter and ensure maximum of 1mm tolerance in the diameter between rail wheels on the same axle.
3. Gauge flange height and thickness are to be checked at three equal positions around the wheel (A, B and C on Appendix 4) in accordance with the following procedure and results recorded on the form shown in Appendix 4.
 - Gauge flange height using gauge to drawing B-A2-1710 (BR Cat. No.39/29839):
 - With Face B squarely on the flange back, hold the gauge radially to the wheel and draw it onto the profile, see Figure 1 of Appendix 5.
 - If the gauge contacts the flange tip, reprofile the wheel or change the wheel set.
 - Gauge flange thickness using gauge to drawing B/A2-1710 (BR Cat 39/29839):
 - With Face A squarely on the flange back, hold the gauge radially to the wheel and draw into profile, see Figure 2 of Appendix 5.
 - Acceptable profiles are indicated by the gauge contacting the profile only at the flange.

REMEDIAL ACTION:

1. Consult with OEM.
- 2&3 Reprofile or renew wheel or wheels to produce a matched pair.





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Component Asterisked (*) Job Ref is Safety Critical	Activity	Who	Periodicity				Job Ref
			PU	RET	HOUR	MTH	
Rail wheel final drive bearings	Check	FIT			500		*UW04

SCHEDULED WORK:

1. Rotate the rail wheel and check there is no sign of axial or radial play in the bearings, or noises or vibration/harshness. If float is detected then check that it does not exceed 0.05mm.

REMEDIAL ACTION:

1. If the limit is exceeded or noise or harshness or shuddering is detected, replace the unit.



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Component Asterisked (*) Job Ref is Safety Critical	Activity	Who	Periodicity				Job Ref
			PU	RET	HOUR	MTH	
Rail wheel back-to-back measurement	Check	FIT			250		*UW05

SCHEDULED WORK:

Note: Check rail wheels back-to-back measurement using a suitable back to back gauge.

1. Ensure rail wheels are off the ground and clean off all rust and paint etc.
2. Mark off in 120 degree increments, rotating the wheels so that the corresponding marks are directly opposite each other.
3. Lower rail wheels and measure back-to-back wheel measurement of the machine in unloaded condition standing on the track.
4. Measurements must be checked in all of the three places marked in step 2 above ensuring the wheels are within the permitted tolerance (1358 to 1363).
5. Record the measurements.

REMEDIAL ACTION:

4. Investigate cause if outside tolerance.





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			PU	RET	HOUR	MTH	
Rail wheel back-to-back measurement	Check	FIT				12	*UW06

SCHEDULED WORK:

Note: Check rail wheels back-to-back measurement using a suitable back to back gauge.

1. Ensure rail wheels are off the ground and clean off all rust and paint etc.
2. Mark off in 120 degree increments, rotating the wheels so that the corresponding marks are directly opposite each other.
3. Lower rail wheels and measure back-to-back wheel measurement of the machine in maximum loaded condition standing on the track.
4. Measurements must be checked in all of the three places marked in step 2 above ensuring the wheels are within the permitted tolerance (1358 to 1363).
5. Record the measurements.

REMEDIAL ACTION:

4. Investigate cause if outside tolerance.





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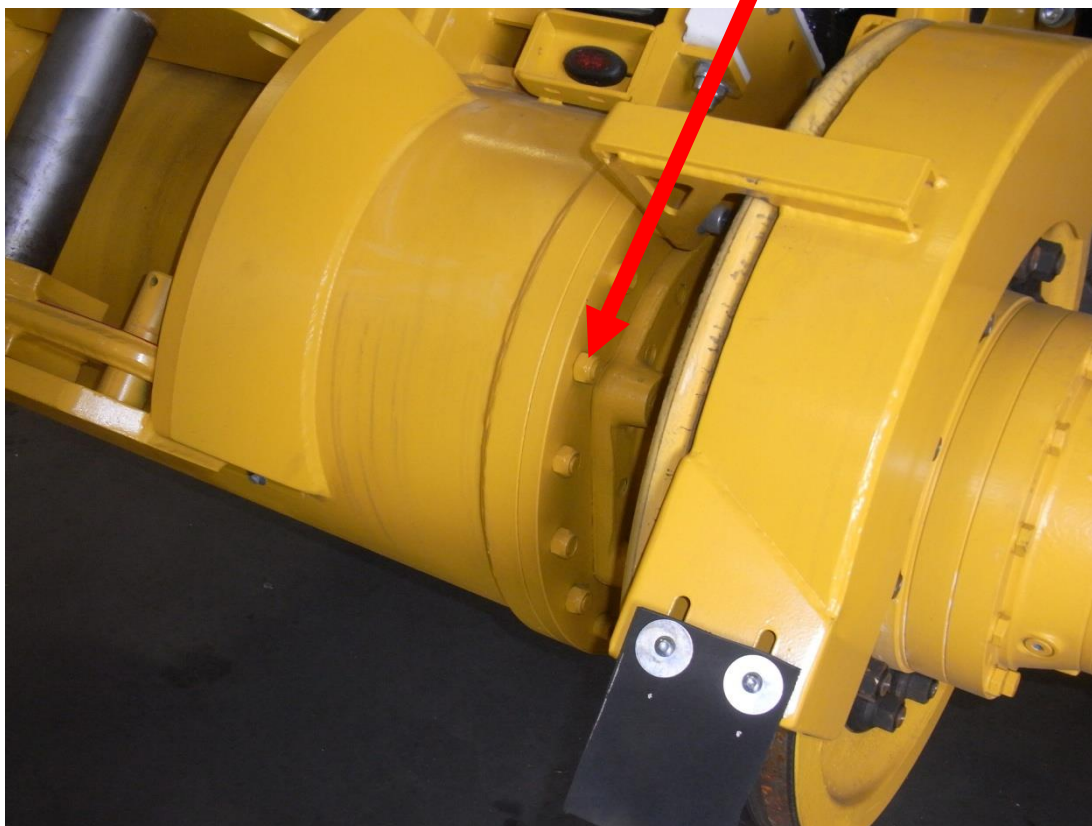
Component Asterisked (*) Job Ref is Safety Critical	Activity	Who	Periodicity				Job Ref
			PU	RET	HOUR	MTH	
Hydrostatic drive motor mounting bolts	Check	FIT				12	*UW07

SCHEDULED WORK:

1. Check security and integrity of hydraulic drive motor mounting bolts.

REMEDIAL ACTION:

1. Tighten or renew as required.





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Component Asterisked (*) Job Ref is Safety Critical	Activity	Who	Periodicity				Job Ref
			PU	RET	HOUR	MTH	
Tracks	Check	DRV	*				*UW08

SCHEDULED WORK:

1. Check track chains are intact and secure.
2. Check track plates and pads for looseness.

REMEDIAL ACTION:

1&2 Report any defects.





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			PU	RET	HOUR	MTH	
Tracks	Examine	FIT			500		*UW09

SCHEDULED WORK:

1. Carry out UW08.
2. Check condition and security of track shoes.
3. Check security of sprocket and gear units.
4. Check smooth running of track rollers.
5. Check track tension. (Track chain sag, measuring from the bottom centre roller, should be set between 40mm min to 60mm max.)

REMEDIAL ACTION:

- 1-5 Adjust, repair or renew as required.





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Component Asterisked (*) Job Ref is Safety Critical	Activity	Who	Periodicity				Job Ref
			PU	RET	HOUR	MTH	
Wheel hub planetaries oil level	Check	FIT			100	1	*UW10

SCHEDULED WORK:

1. Check for oil leaks.
2. Check oil level. Set fill/level plug at 3 (or 9) o'clock for correct level.
3. Check Magnetic Plug for Metallic particles.
4. Lubricate rail drive hub bearings with grease

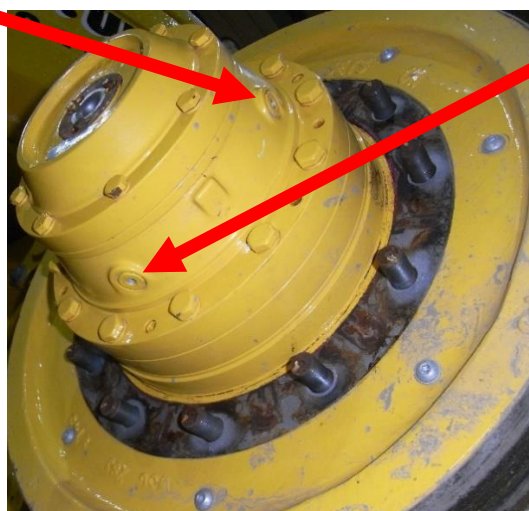
REMEDIAL ACTION:

1. Check gearbox seals and input shaft seals.
2. Top up as required. If level is too high, check input shaft seal.
3. Consult the Manufacturer with sample.
4. Use grease gun on hub back grease nipples



Fill/level plug

Drain Plug





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			PU	RET	HOUR	MTH	
Wheel hub planetaries oil	Renew	FIT			2000	12	*UW11

SCHEDULED WORK:

1. Renew oil.
2. Set drain plug at 6 o'clock to drain and fill/level plug to 3 (or 9) o'clock to fill and check correct level.

REMEDIAL ACTION:



Fill/level plug

Drain Plug





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7.11 Fire Protection System

Fire Protection System Section



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Component Asterisked (*) Job Ref is Safety Critical	Activity	Who	Periodicity				Job Ref
			PU	RET	HOUR	MTH	
Fire extinguisher	Check	DRV	*				*Z01

SCHEDULED WORK:

1. Check presence of fire extinguisher.
2. Check that fire extinguisher is in date.
3. Check seal is intact.
4. Check that the needle of the gauge is in the green section.
5. Check security of attachment.

REMEDIAL ACTION:

1. Report if missing.
2. Report if out of date.
3. Report if seal not intact.
4. Report if needle not as reading.
5. Report if required.





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			PU	RET	HOUR	MTH	
Fire extinguisher	Check	FIT				12	*Z02

SCHEDULED WORK:

1. Carry out Z01.

REMEDIAL ACTION:

1. Renew if required.
1. Send for test if required.





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7.12 Statutory Examinations

Statutory Examinations Section



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Component Asterisked (*) Job Ref is Safety Critical	Activity	Who	Periodicity				Job Ref
			PU	RET	HOUR	MTH	
PUWER	Examine	ENG				12	*ZS01

SCHEDULED WORK:

1. Examine machine to ensure it meets the Provision and Use of Work Equipment Regulations 1998 (PUWER).

REMEDIAL ACTION:

1. Rectify machine as required to ensure it is compliant.



Document Ref.	RAJCB310TAMI001
Issue Number	02
Issue Date	25 September 2020
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Component Asterisked (*) Job Ref is Safety Critical	Activity	Who	Periodicity				Job Ref
			PU	RET	HOUR	MTH	
LOLER	Examine	ENG				12	*ZS02

SCHEDULED WORK:

1. Independent inspect of the machine to ensure it meets the Lifting Operations and Lifting Equipment Regulations 1998 (LOLER).

REMEDIAL ACTION:

1. Rectify machine as required to ensure it is compliant and have re-inspected.



Document Ref.	RAJCB310TAMI001
Issue Number	02
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Component Asterisked (*) Job Ref is Safety Critical	Activity	Who	Periodicity				Job Ref
			PU	RET	HOUR	MTH	
Respiratory air quality test	Examine	ENG				3	*ZS03

SCHEDULED WORK:

1. Independent Inspection of machine to ensure it meets the Respiratory Air Quality requirements to BS4275 / BS12021.

REMEDIAL ACTION:

1. Rectify BM Air System as required to ensure it is compliant and have it re-inspected.

WARNING:

THE USED FILTERS MAY CONTAIN HAZARDOUS SUBSTANCES. – CONSULT THE OEM DOCUMENTATION DETAILED IN PARAGRAPH 3 BEFORE OPENING THE BMAIR CANOPY.



Document Ref.	RAJCB310TAMI001
Issue Number	02
Issue Date	25 September 2020
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			PU	RET	HOUR	MTH	
EN13849	Examine	ENG			20,000	240	*ZS04

SCHEDULED WORK:

1. Refurbish and overhaul or renew all safety devices and safety systems on the machine.
2. Check that the machine life span utilisation has not exceeded 100,000 load cycles.

REMEDIAL ACTION:

1. Rectify machine as required to ensure it is compliant.
2. Replace structural components.



Document Ref.	RAJCB310TAMI001
Issue Number	02
Issue Date	25 September 2020
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APPENDIX 1 – BRAKE DISTANCE TEST FORM

RAIL-ABILITY 310 TRACKED ROAD/RAIL EXCAVATOR BRAKE DISTANCE TEST

Carried out on
(Date)

Machine No.

Reason for Test
(routine, repair, renew or incident)

Test No.	Speed	Direction	Stopping Distance Actual (m)	Maximum Stopping Distance (metres) required by RIS-1530-PLT
1	5mph / 8km/h	Forwards		6
2	10mph / 16km/h	Forwards		18
3	15mph / 24km/h	Forwards		36
4	5mph / 8km/h	Backwards		6
5	10mph / 16km/h	Backwards		18
6	15mph / 24km/h	Backwards		36
E Stop 1	2mph / 3km/h	Forwards		5
E Stop 2	2mph / 3km/h	Backwards		5

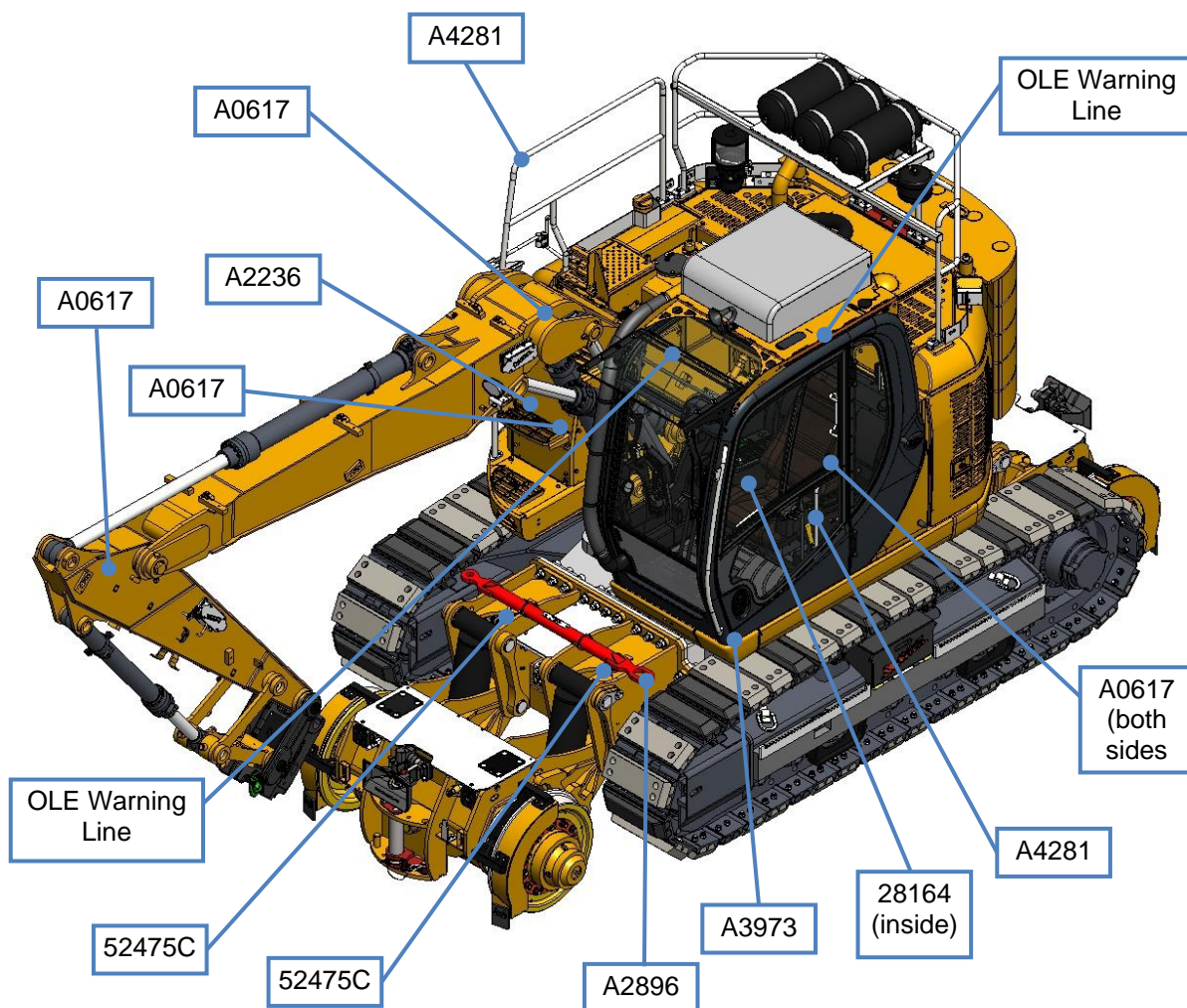
TEST CARRIED OUT BY

Document Ref.	RAJCB310TAMI001
Issue Number	02
Issue Date	25 September 2020
Revision Letter	-
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APPENDIX 2 – DECALS

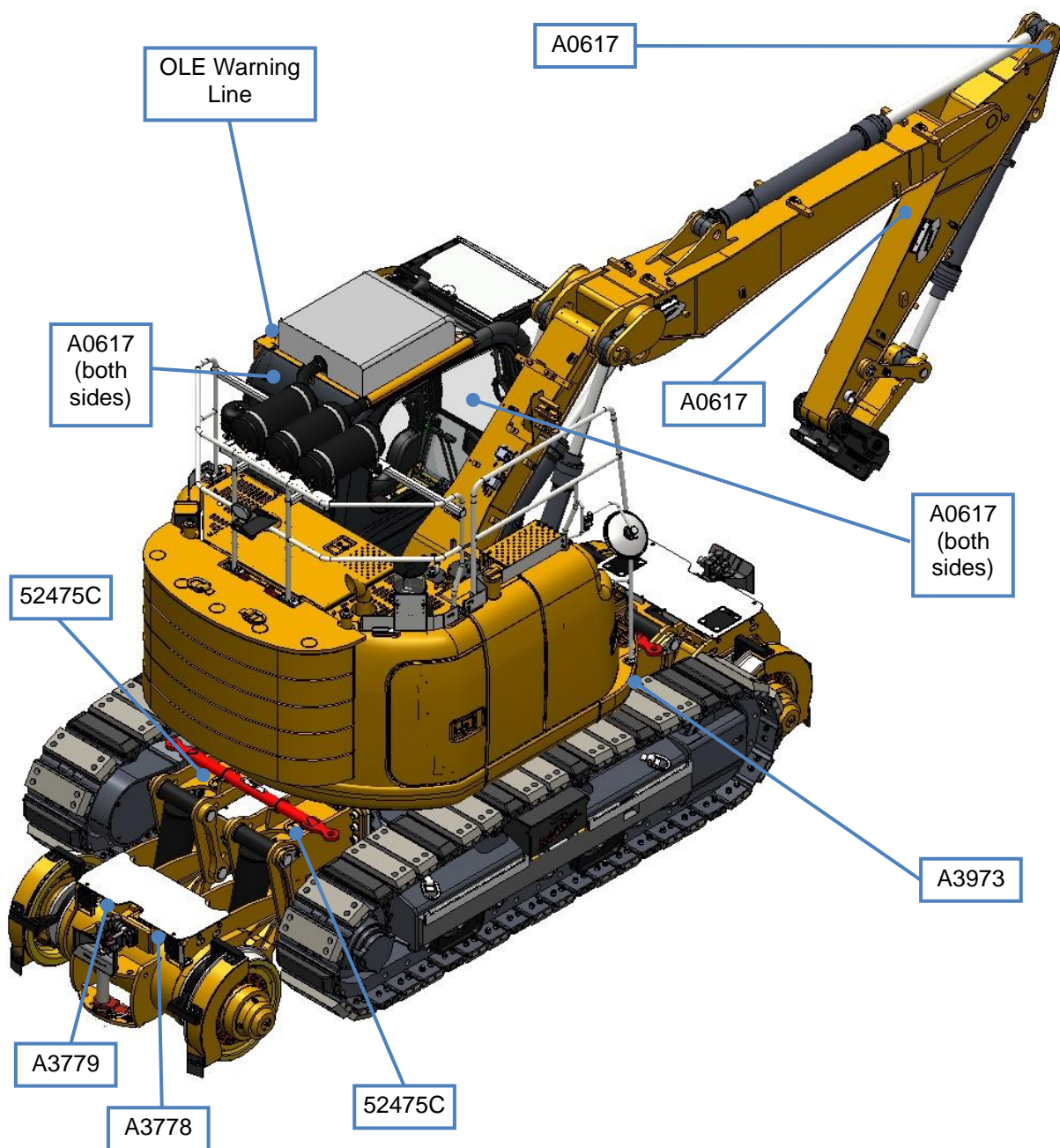
Use the following illustrations to verify that all decals are legible and in place.



Decals fitted to machine (front nearside)

Document Ref.	RAJCB310TAMI001
Issue Number	02
Issue Date	25 September 2020
Revision Letter	-
Technical Author	P Fountain
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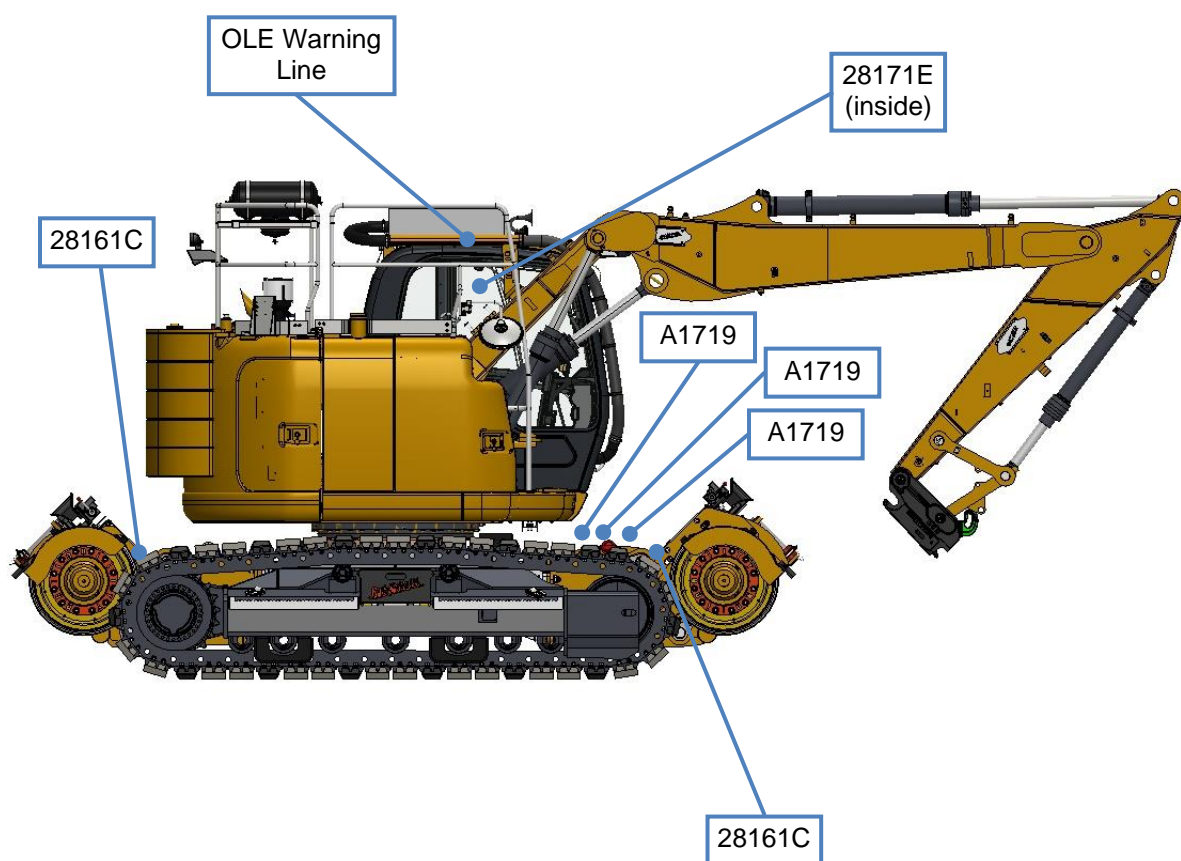
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Decals fitted to machine (rear offside)

Document Ref.	RAJCB310TAMI001
Issue Number	02
Issue Date	25 September 2020
Revision Letter	-
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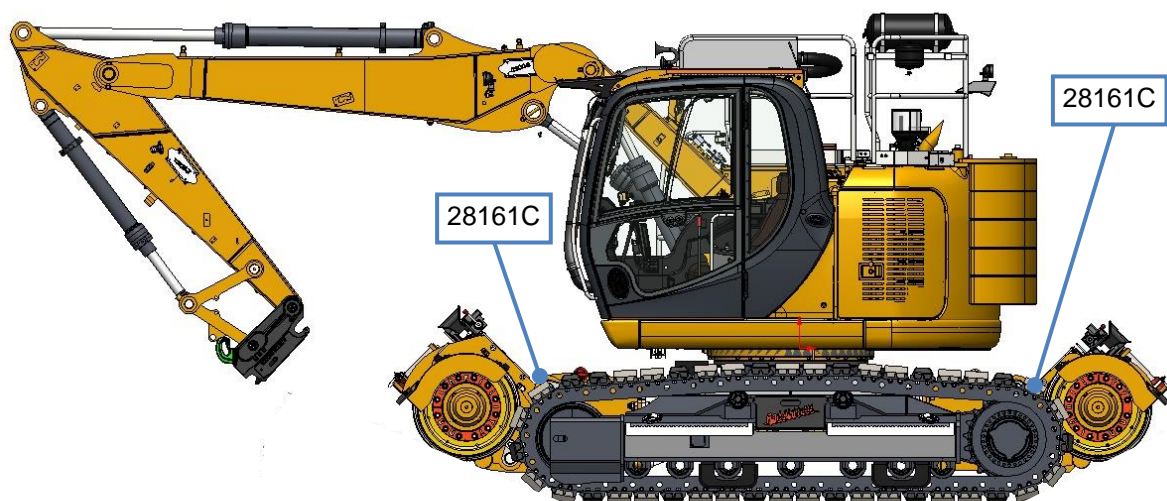
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Decals fitted to machine (offside)

Document Ref.	RAJCB310TAMI001
Issue Number	02
Issue Date	25 September 2020
Revision Letter	-
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Decals fitted to machine (nearside)

Document Ref.	RAJCB310TAMI001
Issue Number	02
Issue Date	25 September 2020
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APPENDIX 3 – RAIL WHEEL DEFECTS

A Cracks

Cracks normally have a jagged saw tooth type of surface profile with sharp edges. Cracks will normally form at the tread chamfer in an axial direction (across the tread) (see Figure 1). No cracks are permitted. Renew wheels unless the cracks can be completely removed by reprofiling.

B Cavities

Rolling contact fatigue causes microscopic subsurface cracks which develop into a localised network (see Figure 2).

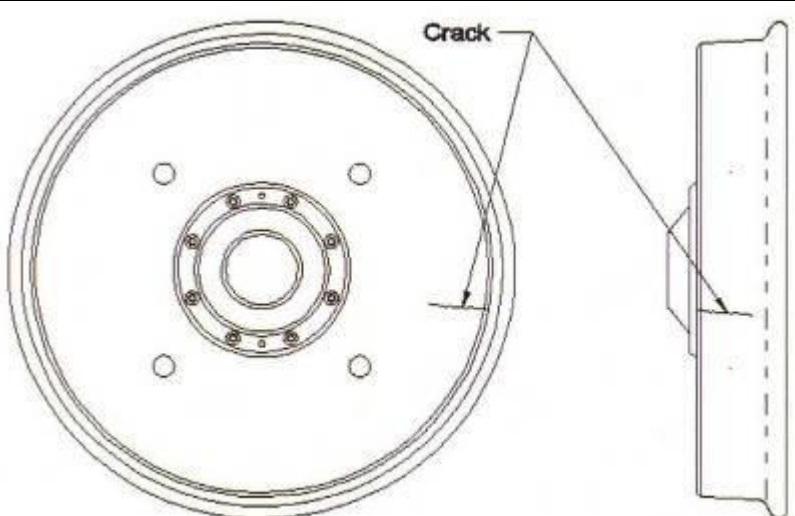
Over a long period small sections or spalls break away leaving cavities (see Figure 3). Record the number and length of the cavities. Take action if the length of any cavity exceeds 15mm, or if two cavities are within 50mm of each other and their combined length exceeds 15mm. Reprofile wheels to remove cavities and cracks, otherwise renew the wheels.

C Migration

Material migration results from a rolling action that forces the surface material sideways. This can occur in two places:



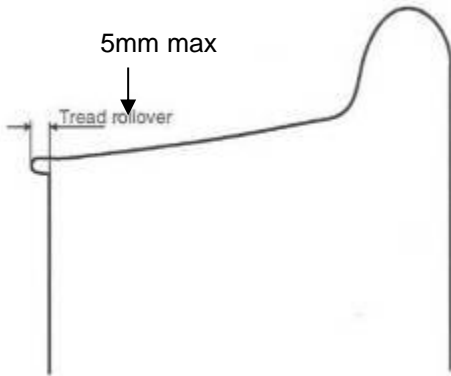
Tread Rollover. This forms on the tread chamfer (see Figure 4). The maximum allowable is 5mm. Associated with this are circumferential cracks (see Figure 5) which do not affect the integrity of the wheel.

Migration down the Flange. As shown in Figure 6 where the extreme edges have flaked off. This does not affect the integrity of the wheel. These defects are removed when reprofiling becomes necessary to restore the wheel profile.

Figure number	Figure	Title
1		Wheel with Crack

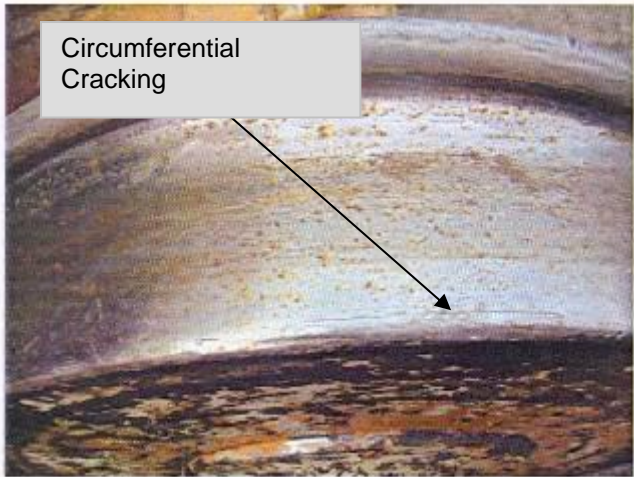

Document Ref.	RAJCB310TAMI001
Issue Number	02
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Revision Letter	-
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Figure number	Figure	Title
2		Microscopic Cracks
3		Cavities
4		Tread Rollover

Document Ref.	RAJCB310TAMI001
Issue Number	02
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Figure number	Figure	Title
5		Circumferential Cracking Associated with Rollover
6		Migration down the Flange



Document Ref.	RAJCB310TAMI001
Issue Number	02
Issue Date	25 September 2020
Revision Letter	-
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APPENDIX 4 – RAIL WHEEL EXAMINATION RECORD SHEET

RAIL WHEEL EXAMINATION RECORD SHEET					
Location:.....			Date:.....		
Make & Model:			Examiner:.....		
Machine No:.....			Hours:.....		
Type of Defect	Allowable Limit	Record Findings Here			
		Tick if None Found	Record Details if Found		
Cracks (see Appendix 3)	None Allowed				
Cavities (see Appendix 3)	15 mm Length				
Migration (see Appendix 3)	5 mm tread roll over, otherwise no limit				
Flats	49 mm				
Tick if wear less than limits, or record measurement (in mm) if over limits					
Wear/ Defect	Limit	Front Axle		Rear Axle	
		LEFT*	RIGHT*	LEFT*	RIGHT*
Flange Thickness	24 mm Min	A			
		B			
		C			
Flange Height	36.5 mm Max	A			
		B			
		C			
Flange Steps	1.5 mm Max				
False Flange	2.0 mm Max				

* Right & Left are defined as standing at the front of machine with ones back to it.
(The front of the machine is the end where the covered drive sprockets are.)

Report any defects as per remedial action.

Print Name		Signature	
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APPENDIX 5 – RAIL WHEEL GAUGE

RAIL WHEEL PROFILE INSPECTION

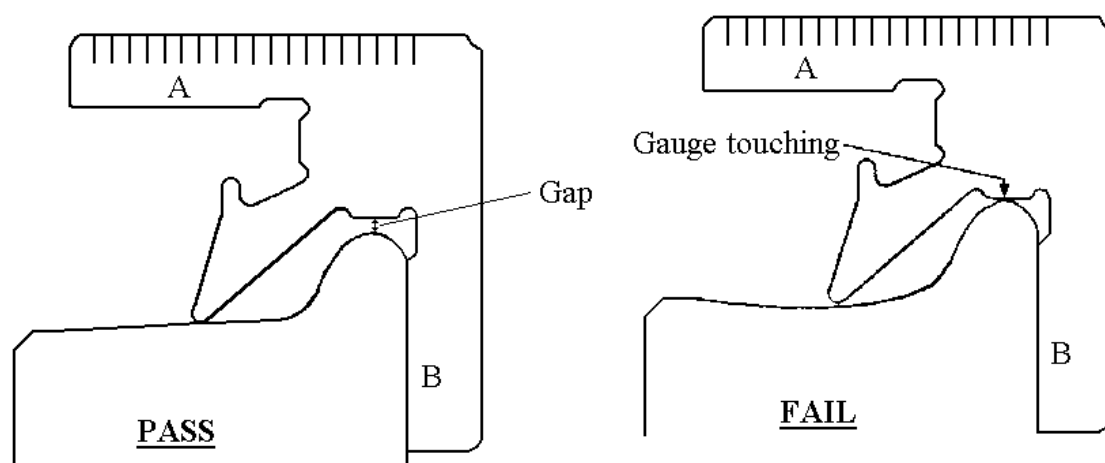


Figure 1 - Use of GO/NO GO Flange Thickness and Height Gauge (BR Cat. No.39/29839) to measure Flange Height

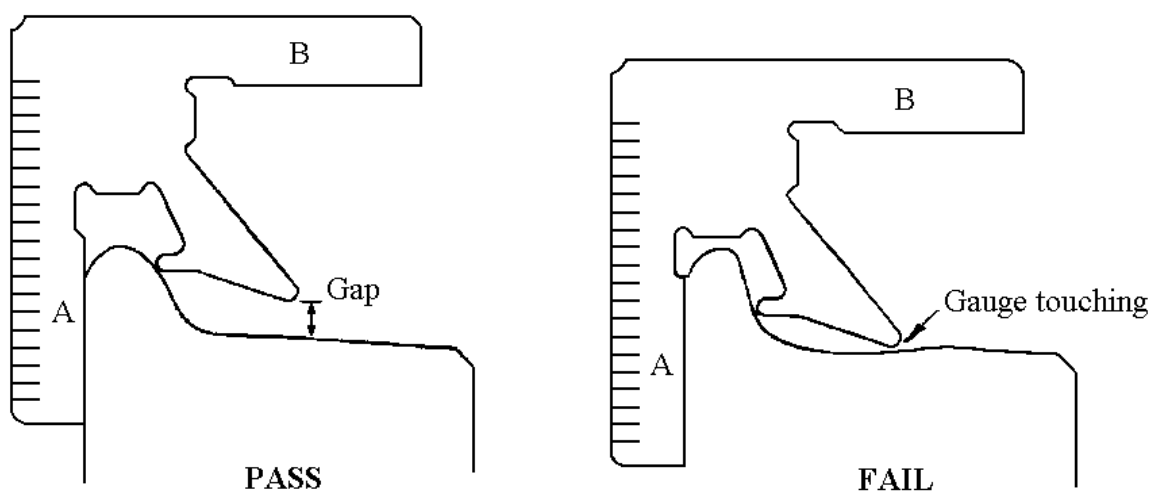


Figure 2 - Use of GO/NO GO Flange Thickness and Height Gauge (BR Cat. No.39/29839) to measure Flange Thickness