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

ISSUE AND AMENDMENT RECORD

Issue number or revision letter	Issue or revision Date	Comments	Revised by	Incorporated by	Incorporated Date
01	4 May 2020	Original document RAJCB310TAMI001	-		
A	12 June 2020	Expected service brake performance added	JPW		

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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.

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

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.

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+L Display Operation Manual, RACD-10000141 Issue 1.0.

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 distributers 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.

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.

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: • –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	HOUR
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.

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.

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) Flange Thickness (worn)	28mm 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 - 5 mph - 10 mph - 15mph	Brake tests to include approved trailing load as applicable: 6m 18m 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.

5.7 Activities and Intervals

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

Job Ref	Component Asterisked (*) Job Ref is Safety Critical	Activity	Who	Periodicity			
				PU	RET	HOUR	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	
UNDERFRAME							
***U01**	Bogie structures	**Examine**	**FIT**			500	12
U02	Draw bar couplings - manual	**Check**	**DRV**	*	*		
U03	Draw bar couplings - manual	**Examine**	**FIT**				6

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

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
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**	

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**	

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

6.5 After 250 hours Operation

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

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**	
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
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**	
ENGINE				
D07	Air filters	**Renew**	**FIT**	

6.8 After 2000 hours Operation

Job Ref	Component Asterisked (*) Job Ref is Safety Critical	Action	Who	Tick
ENGINE				
D05	Engine coolant	**Renew**	**FIT**	
WHEELS AND TRACKS				
***UW11**	Wheel hub planetaries oil	**Renew**	**FIT**	

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**	

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**	
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**	
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
ENGINE				
D05	Engine coolant	**Renew**	**FIT**	
D07	Air filters	**Renew**	**FIT**	
ALTERNATORS AND AIR CONDITIONING				
M05	Air conditioning system	**Check**	**FIT**	
HYDRAULIC SYSTEM				
Q03	Oil	**Renew**	**FIT**	

6.16 Twenty Yearly Maintenance

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

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.

Brakes Section

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.

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.

Component Asterisked (*) Job Ref is Safety Critical	Activity	Who	Periodicity				Job Ref
			PU	RET	HOUR	MTH	
Rail park brakes	**Check**	**FIT**		*			***B03**

SCHEDULED WORK:

1. Cary out B01.

REMEDIAL ACTION:

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

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.

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. Reinstate 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.

Component Asterisked (*) Job Ref is Safety Critical	Activity	Who	Periodicity				Job Ref
			PU	RET	HOUR	MTH	*B06
Rail brake gradient/pull test	**Test**	**FIT**			1000	12	**(1 of 2)**

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.

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

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:
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 three times 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 3mph / 5km/h on the machine rail speedo. Check the speedo reading against a hand held GPS speedo.
6. When the braking point is reached, disengage drive and apply the foot brake.
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. Repeat steps 4 to 8 from 7mph / 11km/h.
10. Repeat steps 4 to 8 from 10mph / 16km/h.
11. 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:

5 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.

Component Asterisked (*) 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.

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

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.

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

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.

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.

Component Asterisked (*) Job Ref is Safety Critical	Activity	Who	Periodicity				Job Ref
			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.

Component Asterisked (*) Job Ref is Safety Critical	Activity	Who	Periodicity				Job Ref
			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.

Component Asterisked (*) Job Ref is Safety Critical	Activity	Who	Periodicity				Job Ref
			PU	RET	HOUR	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.

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

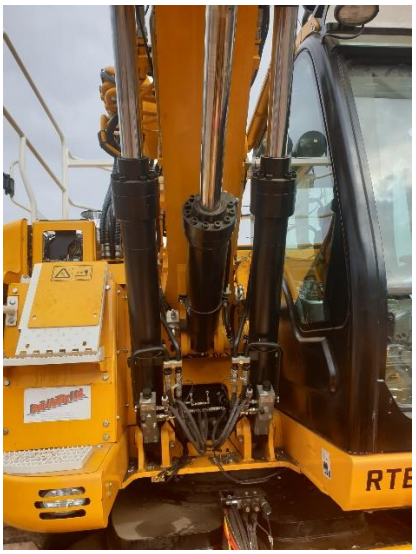
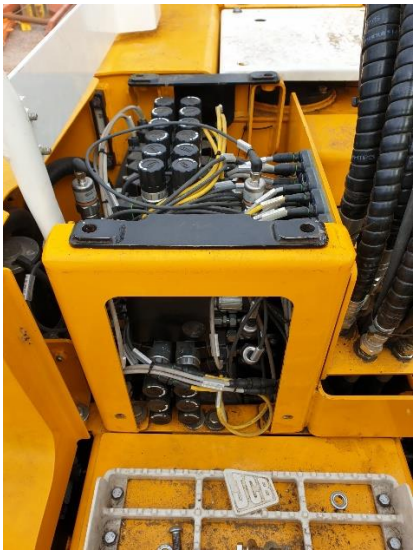
SCHEDULED WORK:

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

REMEDIAL ACTION:

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



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**

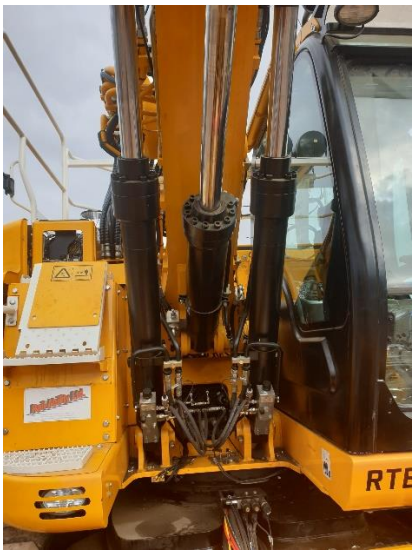
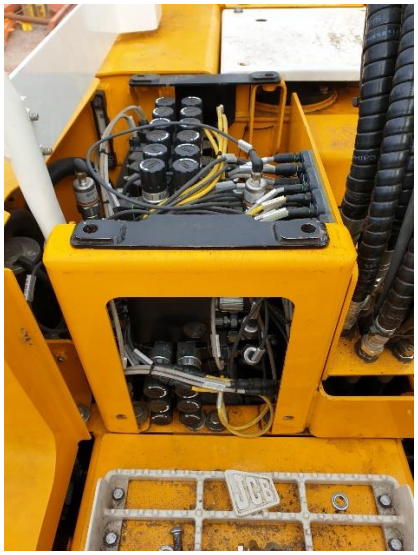
SCHEDULED WORK:

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

REMEDIAL ACTION:

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



Component Asterisked (*) 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.

Component Asterisked (*) Job Ref is Safety Critical	Activity	Who	Periodicity				Job Ref
			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.

Cab and Superstructure Section

Component Asterisked (*) 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.

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.

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

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

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.

Component Asterisked (*) 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.

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.

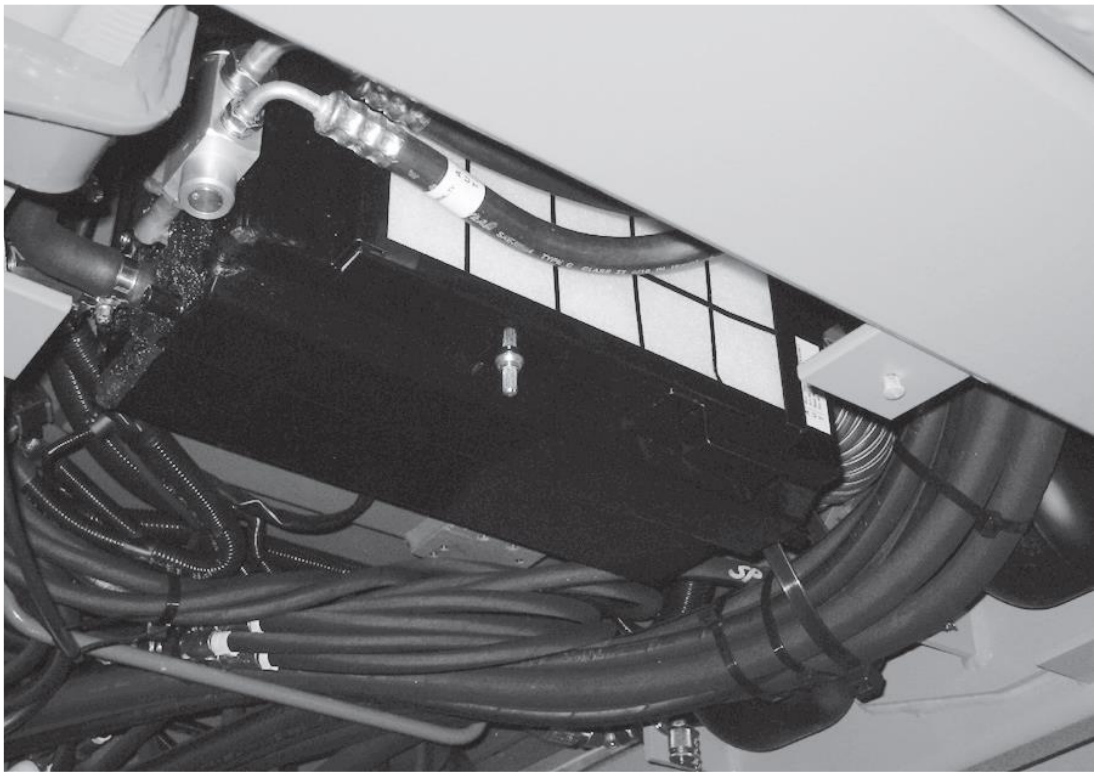
Component Asterisked (*) Job Ref is Safety Critical	Activity	Who	Periodicity				Job Ref
			PU	RET	HOUR	MTH	
Fresh air filter	**Clean**	**FIT**			100		**C08**

SCHEDULED WORK:

1. Clean the fresh air filter.

REMEDIAL ACTION:

1. Replace if necessary.



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.

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.

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.

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.

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.

Component Asterisked (*) Job Ref is Safety Critical	Activity	Who	Periodicity				Job Ref
			PU	RET	HOUR	MTH	
Slew locking system	**Check**	**FIT**		*			***C14**

SCHEDULED WORK:

1. Carry out C13.

REMEDIAL ACTION:

1. Adjust/repair/replace as required.

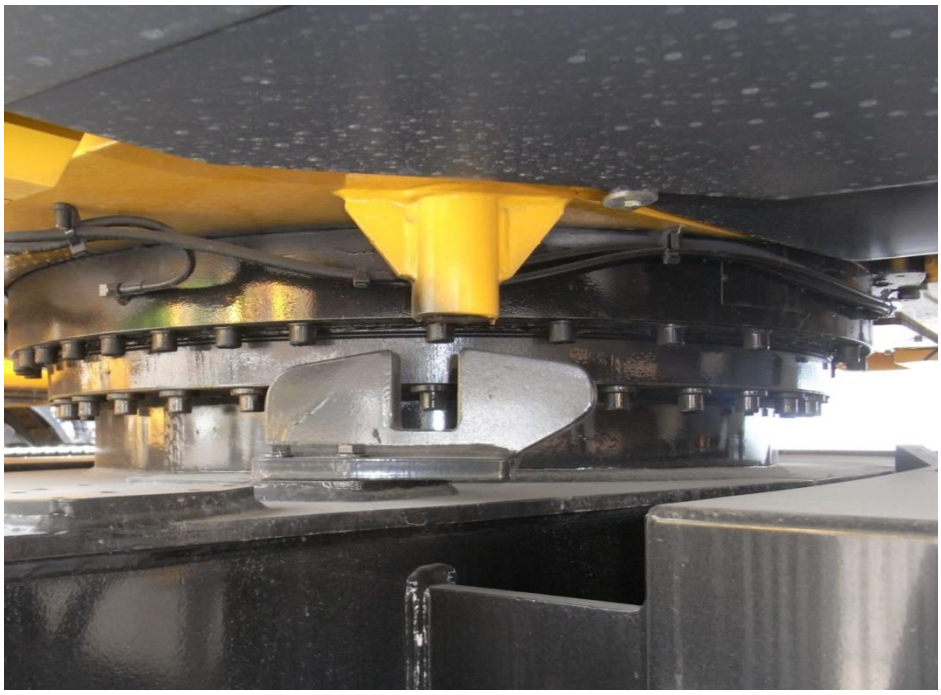
Component Asterisked (*) Job Ref is Safety Critical	Activity	Who	Periodicity				Job Ref
			PU	RET	HOUR	MTH	
Slew ring bolted connection	**Examine**	**FIT**			250		***C15**

SCHEDULED WORK:

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

REMEDIAL ACTION:

1. Replace missing components and tighten loose bolts.



Component Asterisked (*) Job Ref is Safety Critical	Activity	Who	Periodicity				Job Ref
			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.

Component Asterisked (*) Job Ref is Safety Critical	Activity	Who	Periodicity				Job Ref
			PU	RET	HOUR	MTH	
Slew transmission oil	**Renew**	**FIT**			1000		***C17**

SCHEDULED WORK:

1. Renew oil.

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.

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.

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.
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.

Component Asterisked (*) Job Ref is Safety Critical	Activity	Who	Periodicity				Job Ref
			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 slew position heading sensing is indicating accurate slew revolver location.
6. Check slew speed limit reduces with above 80% SWL load on hook.
7. Physically check that motion cut solenoid overrides are not fitted.
8. Test Gauge Lock accuracy and boom and slew function interlocks.

REMEDIAL ACTION:

2. Renew cables.
3. Renew.
4. Renew cables.
7. Deactivate and remove overrides. Fit standard coil caps 'M type' 375025.

1-8. Report any failure to operate properly. Quarantine machine.

Component Asterisked (*) Job Ref is Safety Critical	Activity	Who	Periodicity				Job Ref
			PU	RET	HOUR	MTH	
Rated Capacity Indicator (RCI)	**Examine**	**FIT**				6	***C22**

SCHEDULED WORK:

1. Perform RCI maintenance checks in accordance with Rail-Ability RCI+L Display Operation Manual (see paragraph 3).
2. Perform load checks in accordance with Rail-Ability Load Charts RACD10000524.

REMEDIAL ACTION:

1&2. Report any failure to operate properly. Quarantine machine. Consult Rail-Ability.

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.

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.

Engine Section

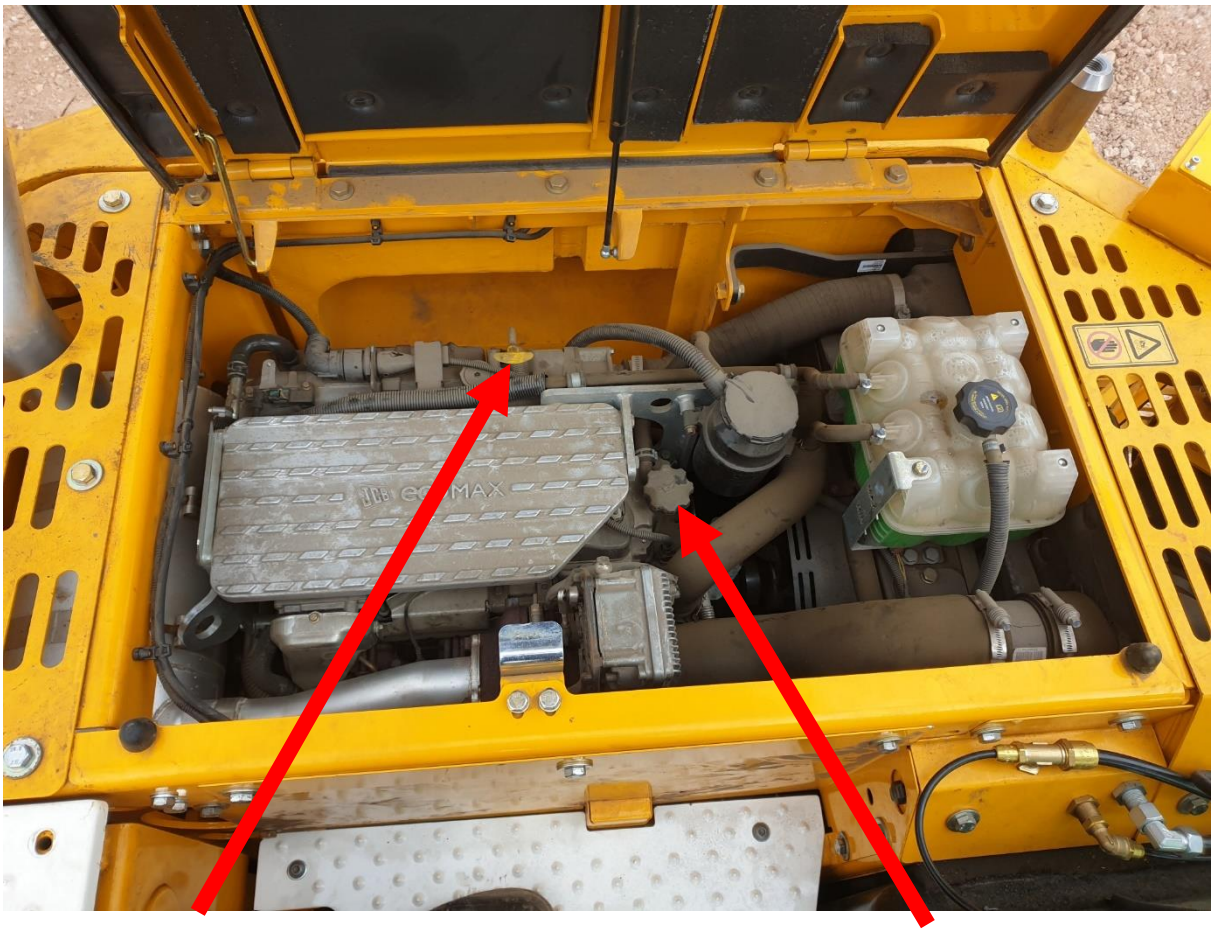
Component Asterisked (*) Job Ref is Safety Critical	Activity	Who	Periodicity				Job Ref
			PU	RET	HOUR	MTH	
Engine oil	**Check**	**DRV**	*				**D01**

SCHEDULED WORK:

1. Check oil level.

REMEDIAL ACTION:

1. Top up as required.



Oil filler dip stick

Oil level cap

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.

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.

Component Asterisked (*) Job Ref is Safety Critical	Activity	Who	Periodicity				Job Ref
			PU	RET	HOUR	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.

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.

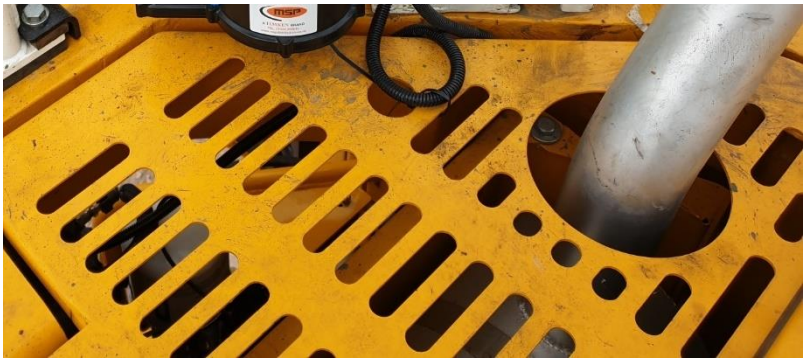
Component Asterisked (*) Job Ref is Safety Critical	Activity	Who	Periodicity				Job Ref
			PU	RET	HOUR	MTH	
Air intake grilles	**Check**	**FIT**			250		**D06**

SCHEDULED WORK:

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

REMEDIAL ACTION:

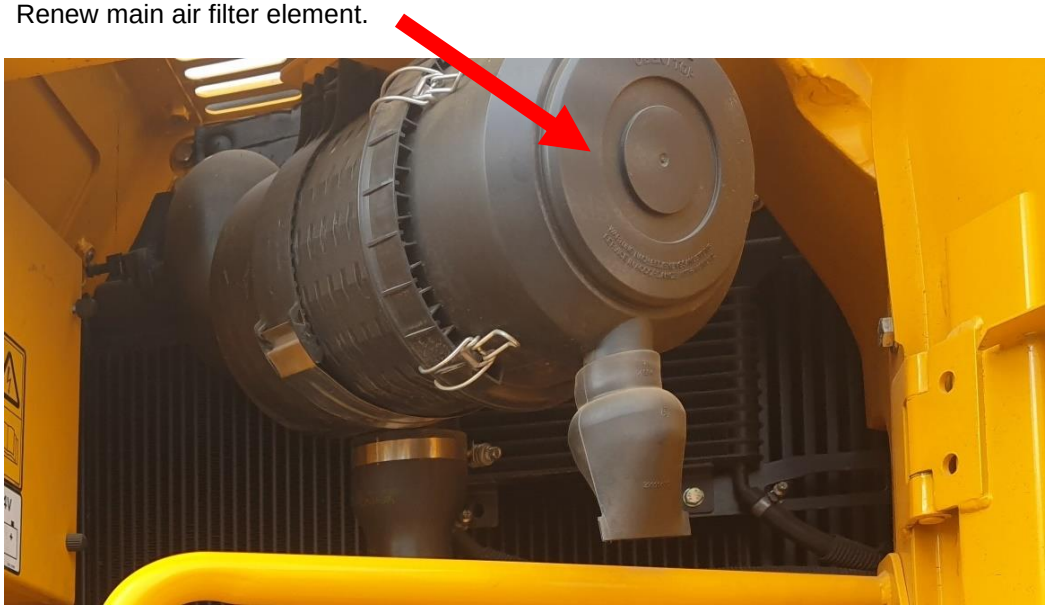
1. Clear away obstructions, and repair damage or renew grilles as appropriate.



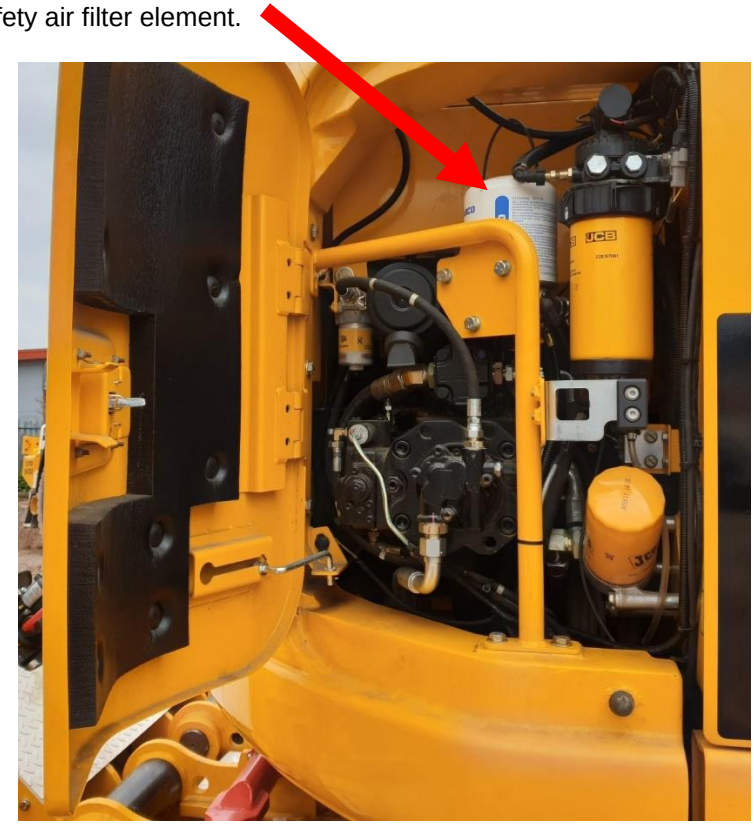
Component Asterisked (*) Job Ref is Safety Critical	Activity	Who	Periodicity				Job Ref
			PU	RET	HOUR	MTH	
Air filters	**Renew**	**FIT**			1000	24	**D07**

SCHEDULED WORK:

1. Renew main air filter element.



2. Renew safety air filter element.



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

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

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.

Electrics Section

Component Asterisked (*) 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.

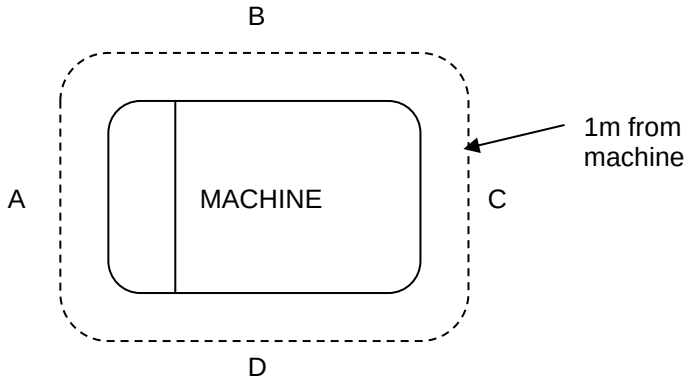
Component Asterisked (*) Job Ref is Safety Critical	Activity	Who	Periodicity				Job Ref
			PU	RET	HOUR	MTH	
Horn sound level	**Check**	**FIT**				12	***E02**

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.

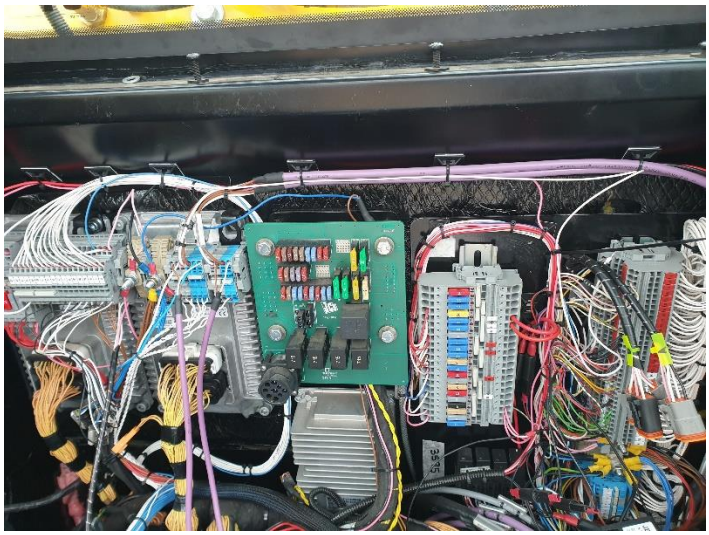
Component Asterisked (*) Job Ref is Safety Critical	Activity	Who	Periodicity				Job Ref
			PU	RET	HOUR	MTH	
Fuses and breakers	**Check**	**DRV**	*	*			**E03**

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.



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

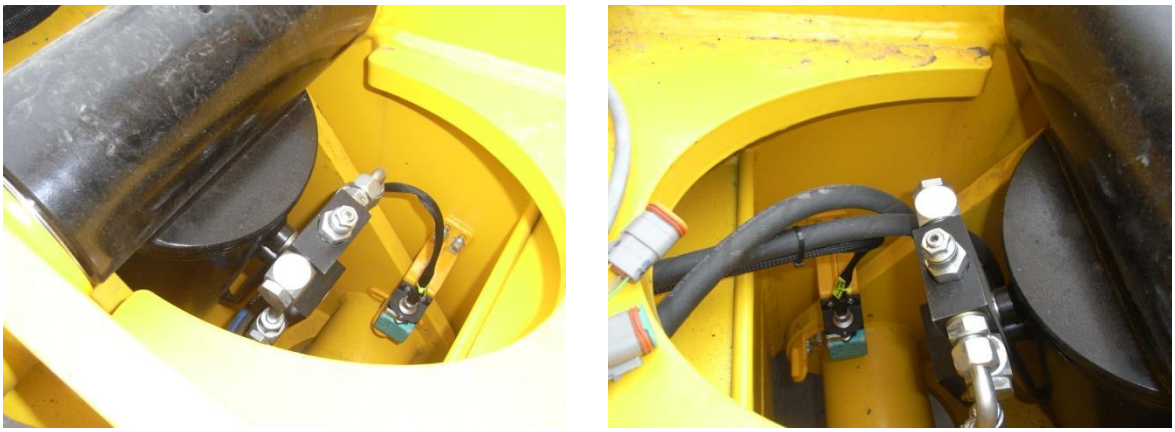
Component Asterisked (*) Job Ref is Safety Critical	Activity	Who	Periodicity				Job Ref
			PU	RET	HOUR	MTH	
Limit and rail gear proximity switches	**Check**	**FIT**		*	50		***E05**

SCHEDULED WORK:

1. Check limit switches for damage and operation.

REMEDIAL ACTION:

1. Adjust or replace switches as required.



Rear switches

Front switches

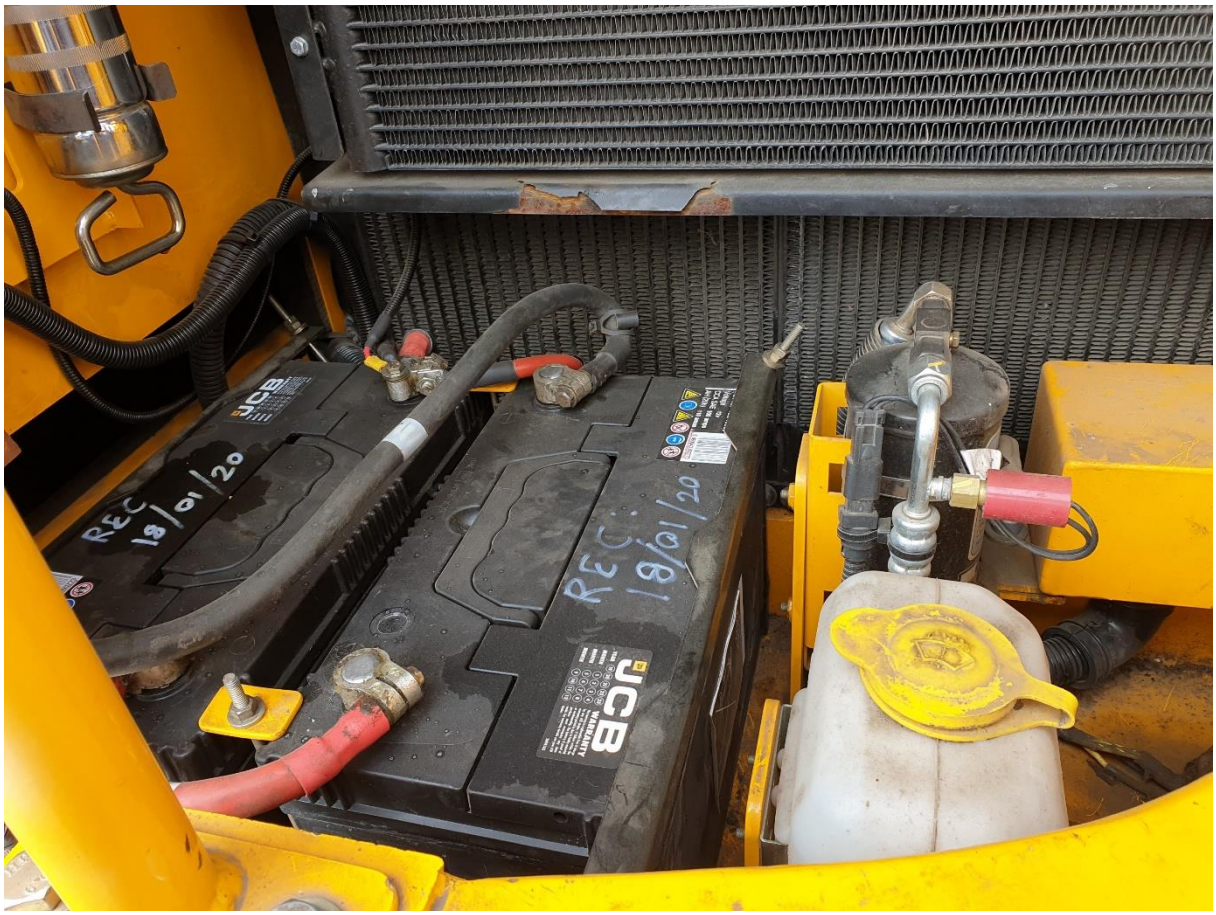
Component Asterisked (*) Job Ref is Safety Critical	Activity	Who	Periodicity				Job Ref
			PU	RET	HOUR	MTH	
Battery security and condition	**Check**	**DRV**	*				**E06**

SCHEDULED WORK:

1. Check battery for security and damage.

REMEDIAL ACTION:

1. Report any issues.



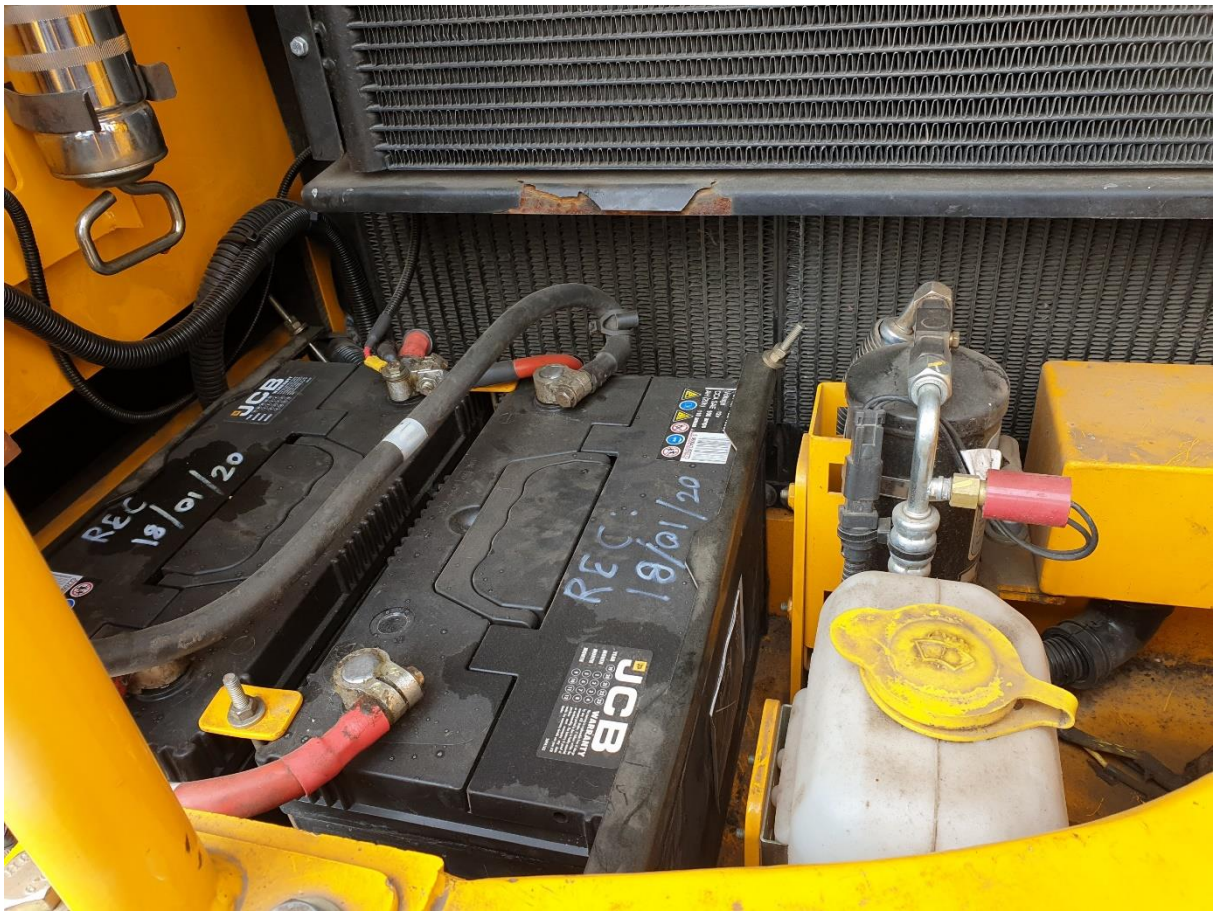
Component Asterisked (*) Job Ref is Safety Critical	Activity	Who	Periodicity				Job Ref
			PU	RET	HOUR	MTH	
Battery condition and charge	**Check**	**FIT**		*	500		**E07**

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.



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.

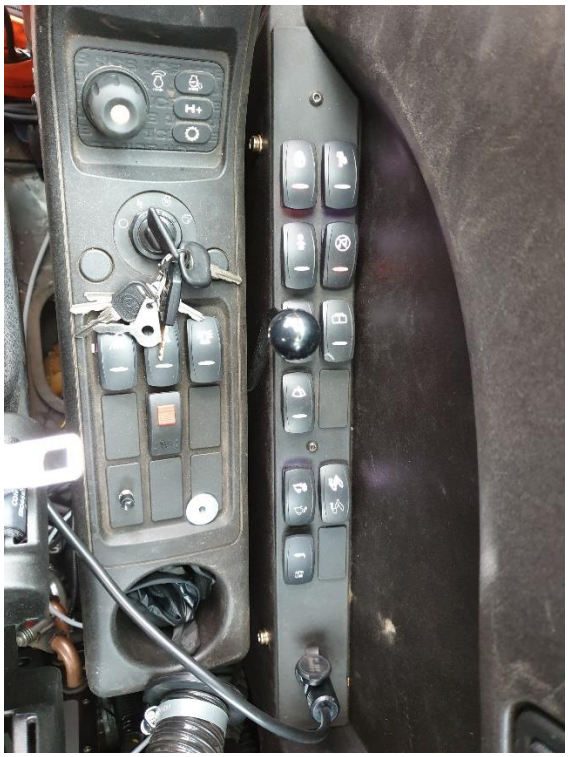
Component Asterisked (*) Job Ref is Safety Critical	Activity	Who	Periodicity				Job Ref
			PU	RET	HOUR	MTH	
Warning lights	**Check**	**DRV**	*				**E09**

SCHEDULED WORK:

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

REMEDIAL ACTION:

1. Report any defects.



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.

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.

Component Asterisked (*) Job Ref is Safety Critical	Activity	Who	Periodicity				Job Ref
			PU	RET	HOUR	MTH	
Bonding straps	**Check**	**DRV**	*	*			***EW01**

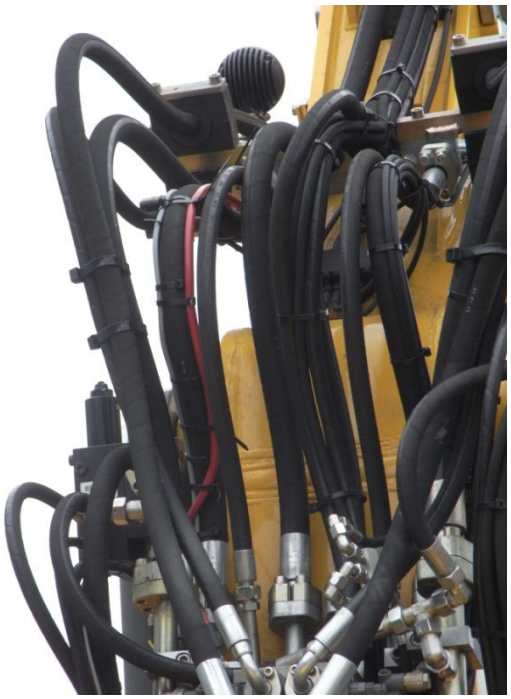
SCHEDULED WORK:

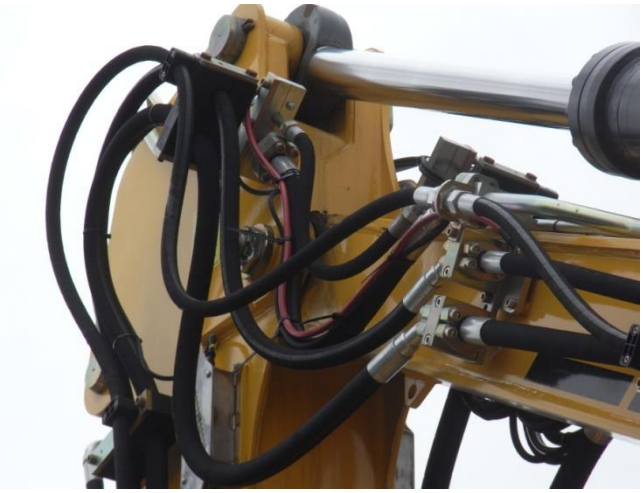
1. Check bonding straps are securely fastened. Check straps are in good condition (no burning or fraying).

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

REMEDIAL ACTION:

1. Report if required.





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.

Lubrication and Fuel Section

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.

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.

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.

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.

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.

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:

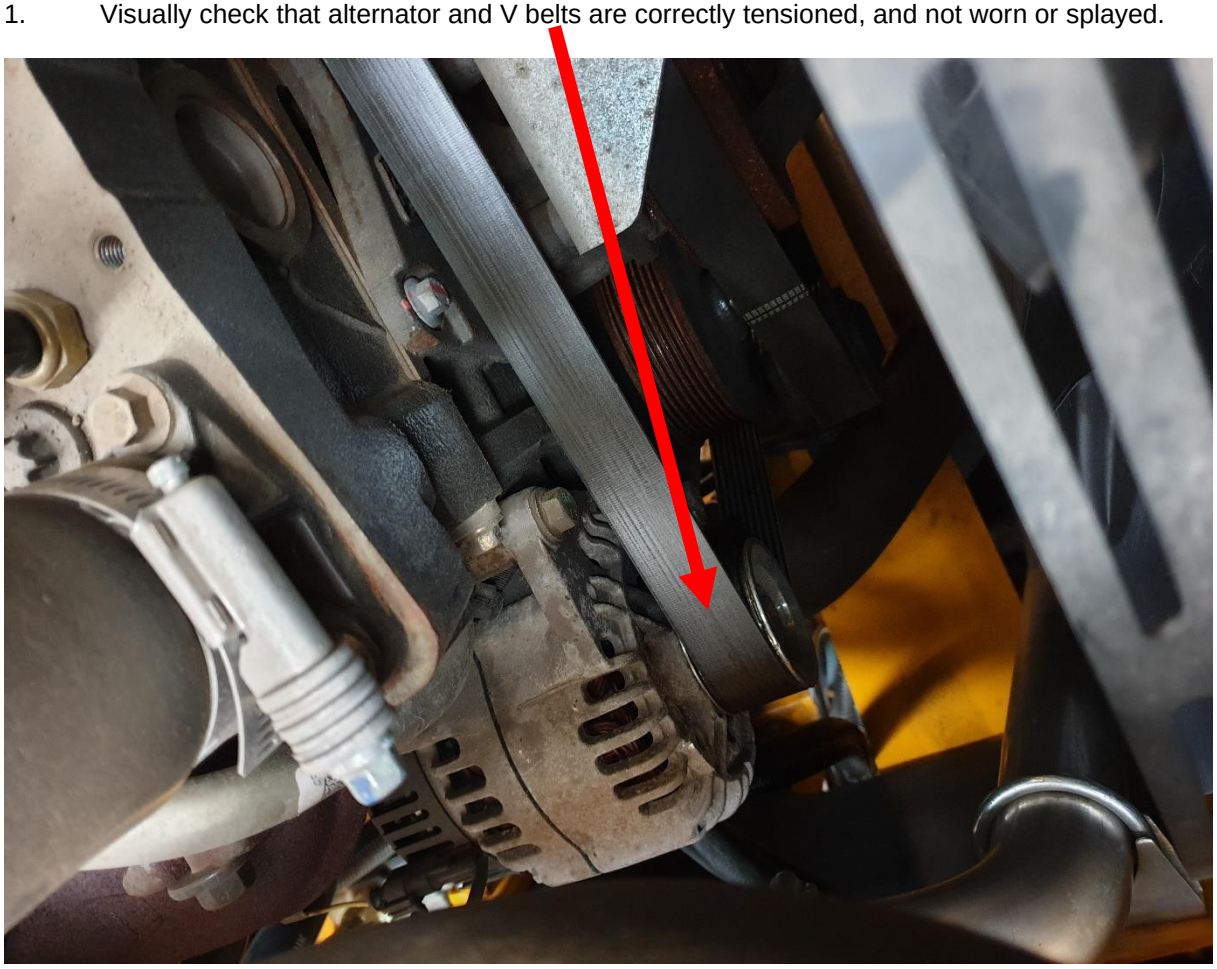
1. Renew gaskets and defective parts if required. Operate the system to check that any leak has been repaired.
2. Repair or replace valve if defective and repair or renew pipework as required.
4. Adjust, repair or renew as required.
5. If fuel pre-filter separator contains sediment:
   - Clamp the fuel 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.

Alternators and Air Conditioning Section

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.

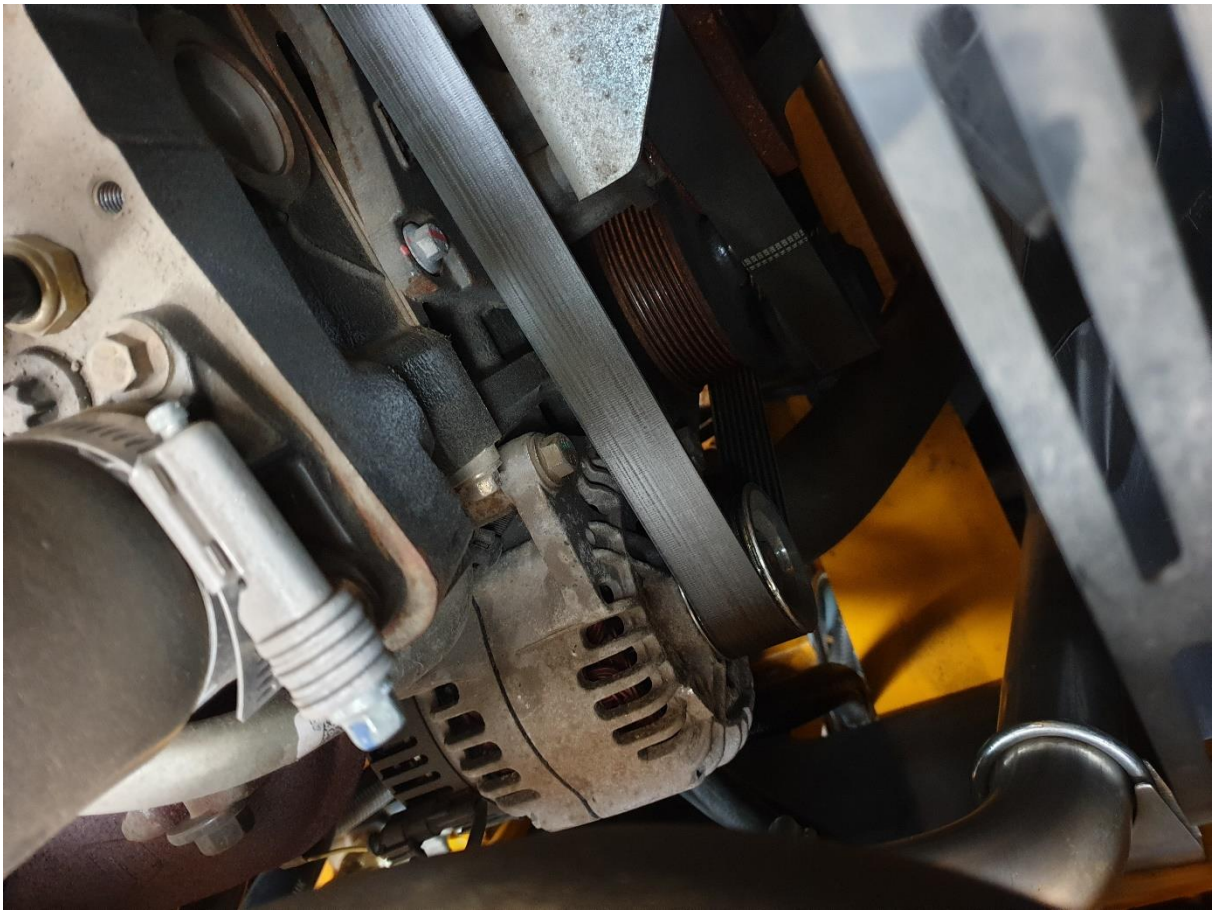
Component Asterisked (*) Job Ref is Safety Critical	Activity	Who	Periodicity				Job Ref
			PU	RET	HOUR	MTH	
Alternator and V belts	**Examine**	**FIT**			250		**M02**

SCHEDULED WORK:

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

REMEDIAL ACTION:

1&2 Renew or adjust as required.



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.

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.

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.

Hydraulic System Section

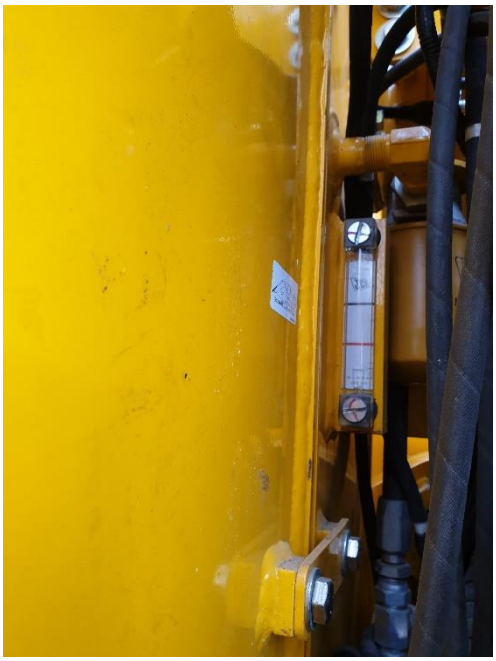
Component Asterisked (*) Job Ref is Safety Critical	Activity	Who	Periodicity				Job Ref
			PU	RET	HOUR	MTH	
Oil level	**Check**	**DRV**	*				**Q01**

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.



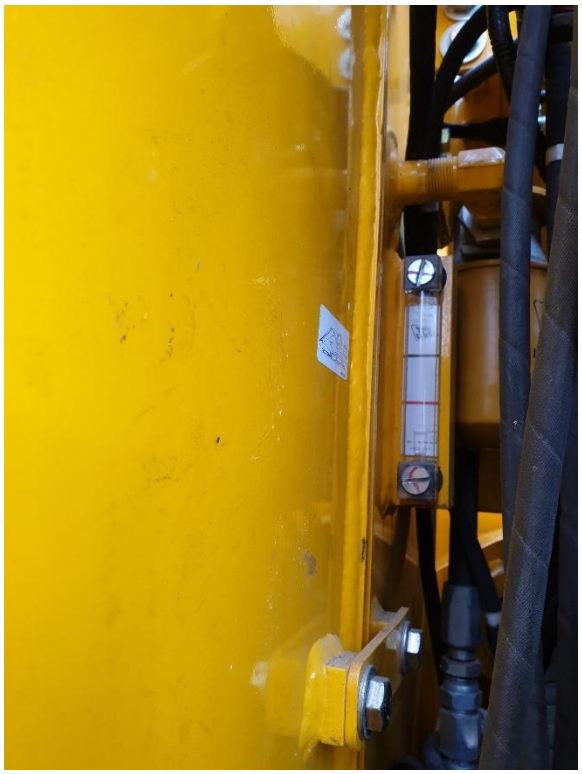
Component Asterisked (*) Job Ref is Safety Critical	Activity	Who	Periodicity				Job Ref
			PU	RET	HOUR	MTH	
Oil level	**Check**	**FIT**			250		**Q02**

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.



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.

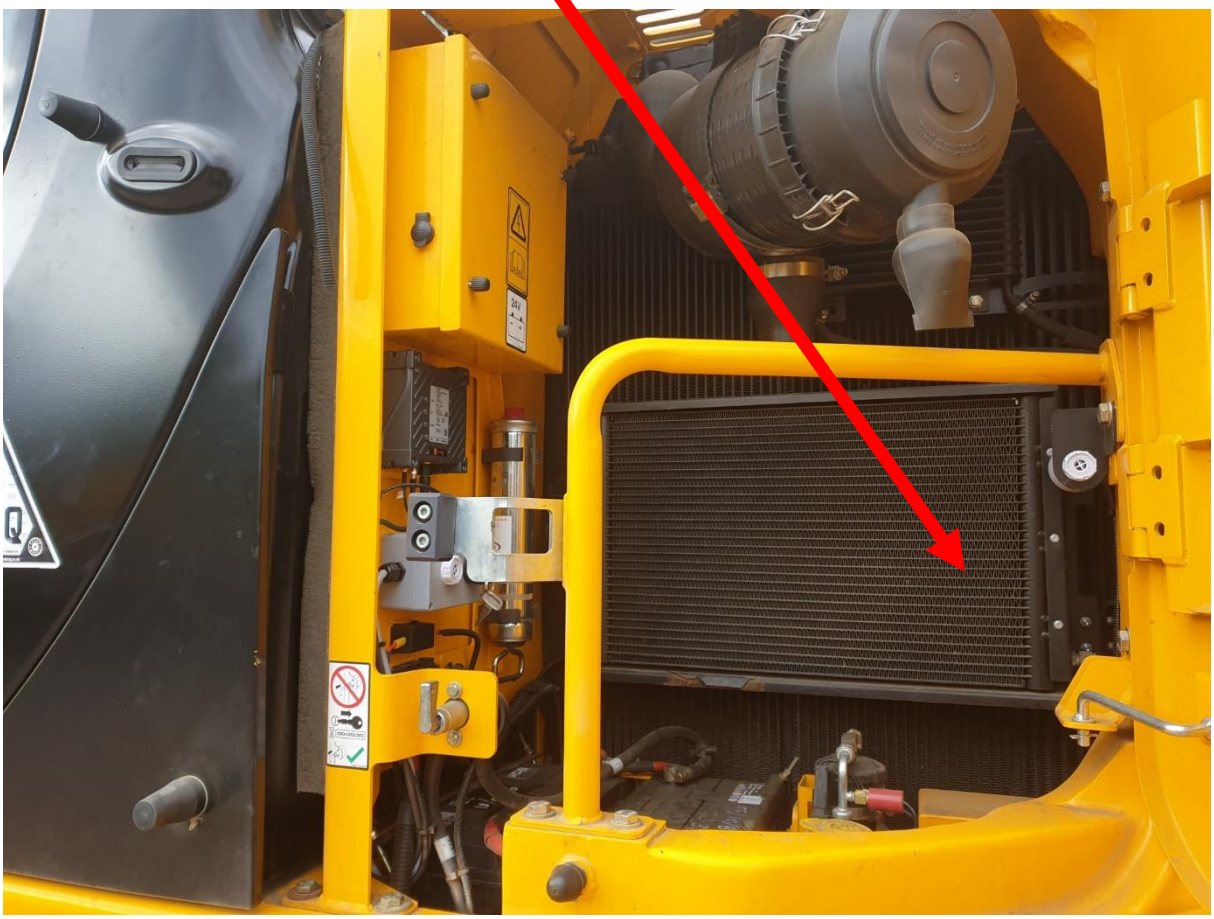
Component Asterisked (*) Job Ref is Safety Critical	Activity	Who	Periodicity				Job Ref
			PU	RET	HOUR	MTH	
Oil cooler	**Check**	**FIT**			250		**Q04**

SCHEDULED WORK:

1. Check and clean the oil cooler.

REMEDIAL ACTION:

1. Repair or renew if required.



Component Asterisked (*) Job Ref is Safety Critical	Activity	Who	Periodicity				Job Ref
			PU	RET	HOUR	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.

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.

Component Asterisked (*) 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.

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.

Recovery Section

Component Asterisked (*) 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.

Underframe Section

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:

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

REMEDIAL ACTION:

1. 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

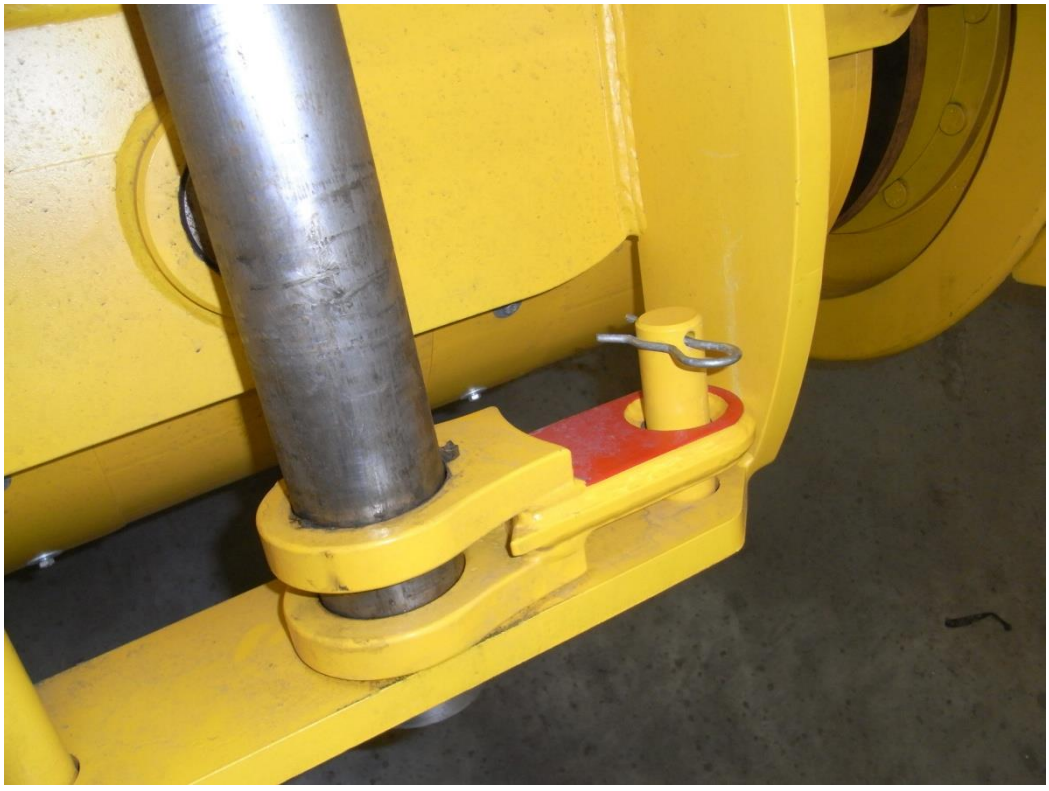
Component Asterisked (*) Job Ref is Safety Critical	Activity	Who	Periodicity				Job Ref
			PU	RET	HOUR	MTH	
Draw bar couplings - manual	**Check**	**DRV**	*	*			**U02**

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



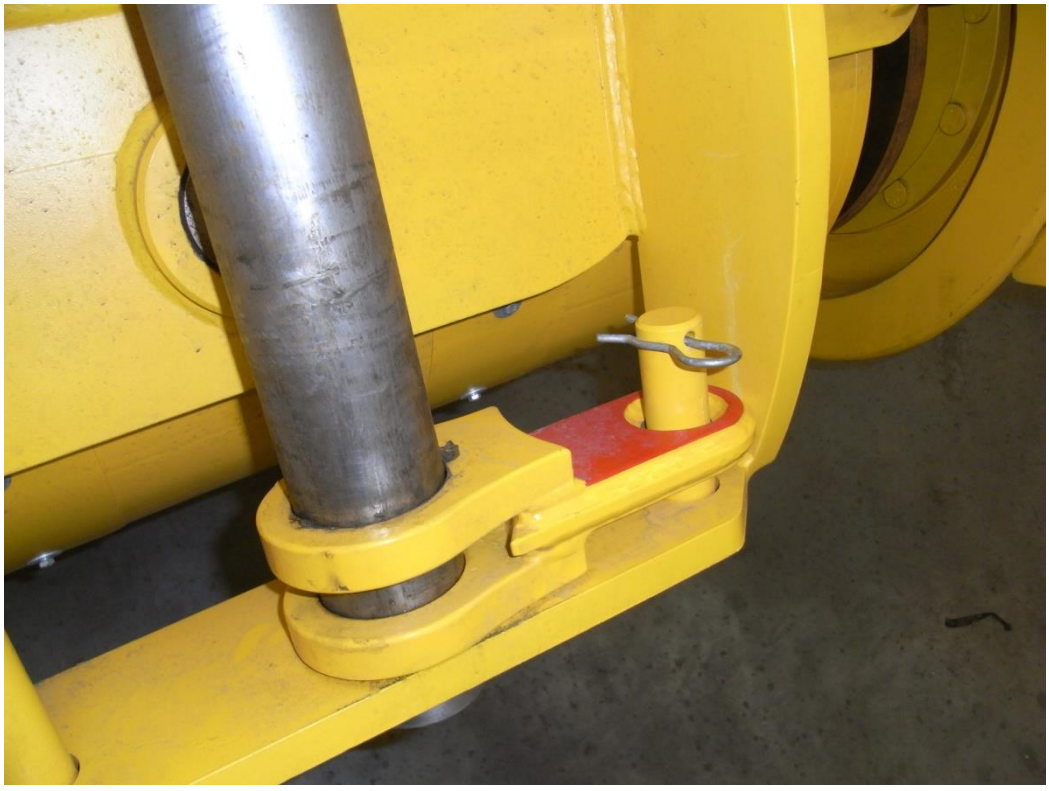
Component Asterisked (*) Job Ref is Safety Critical	Activity	Who	Periodicity				Job Ref
			PU	RET	HOUR	MTH	
Draw bar couplings - manual	**Examine**	**FIT**				6	**U03**

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.



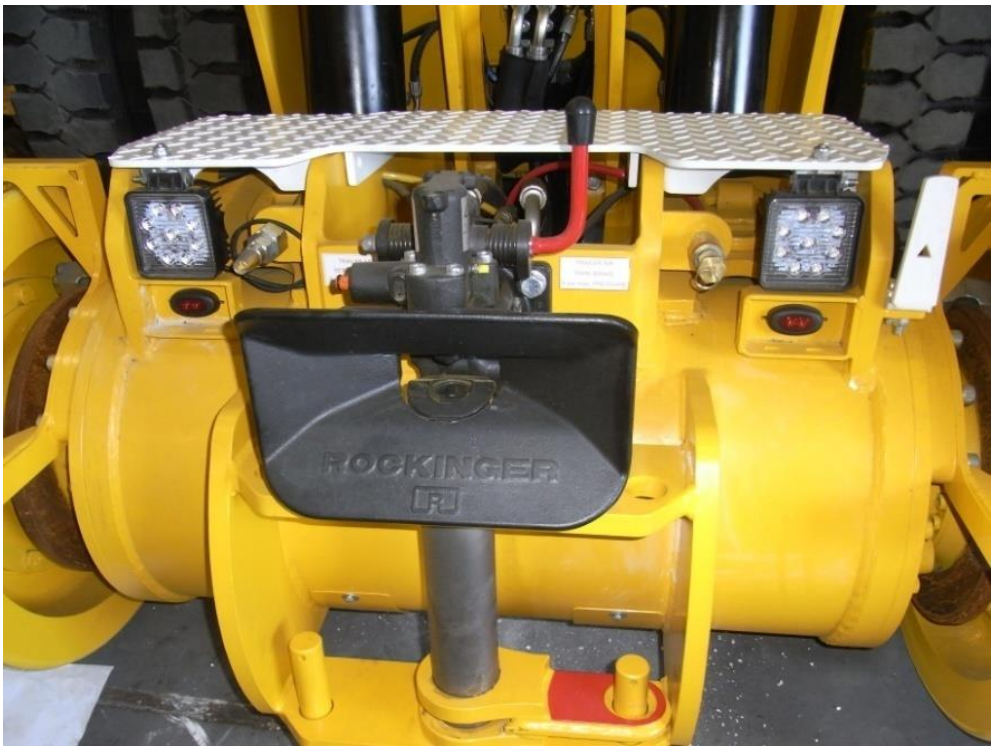
Component Asterisked (*) Job Ref is Safety Critical	Activity	Who	Periodicity				Job Ref
			PU	RET	HOUR	MTH	
Draw bar couplings - automatic	**Check**	**DRV**	*	*			**U04**

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.



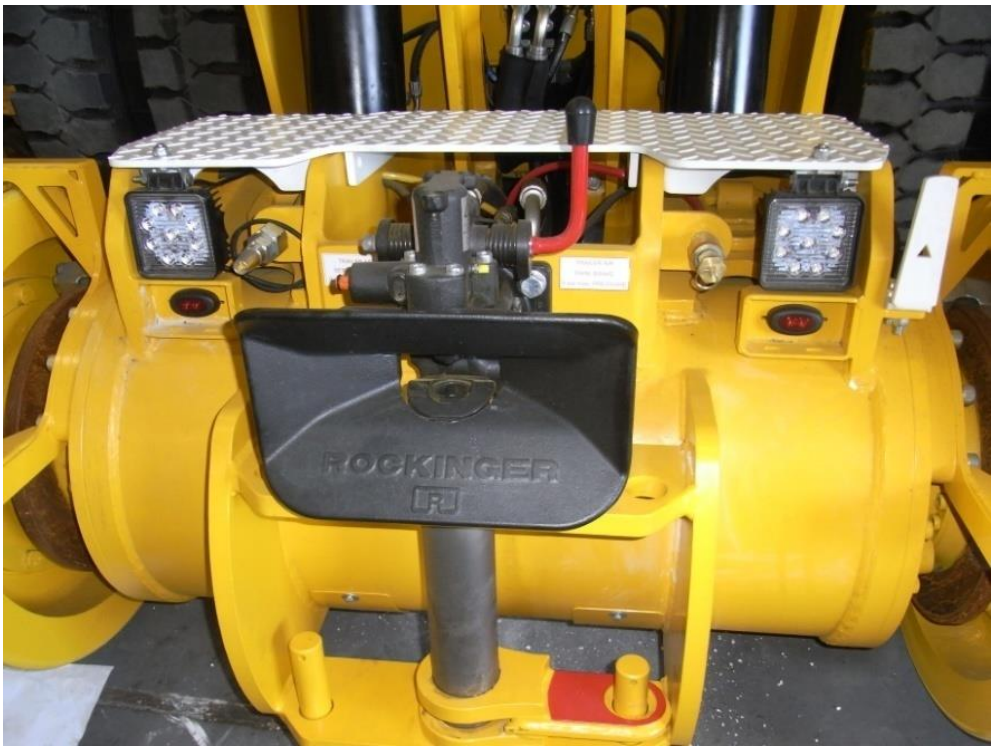
Component Asterisked (*) Job Ref is Safety Critical	Activity	Who	Periodicity				Job Ref
			PU	RET	HOUR	MTH	
Draw bar couplings - automatic	**Examine**	**FIT**				6	**U05**

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..



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.

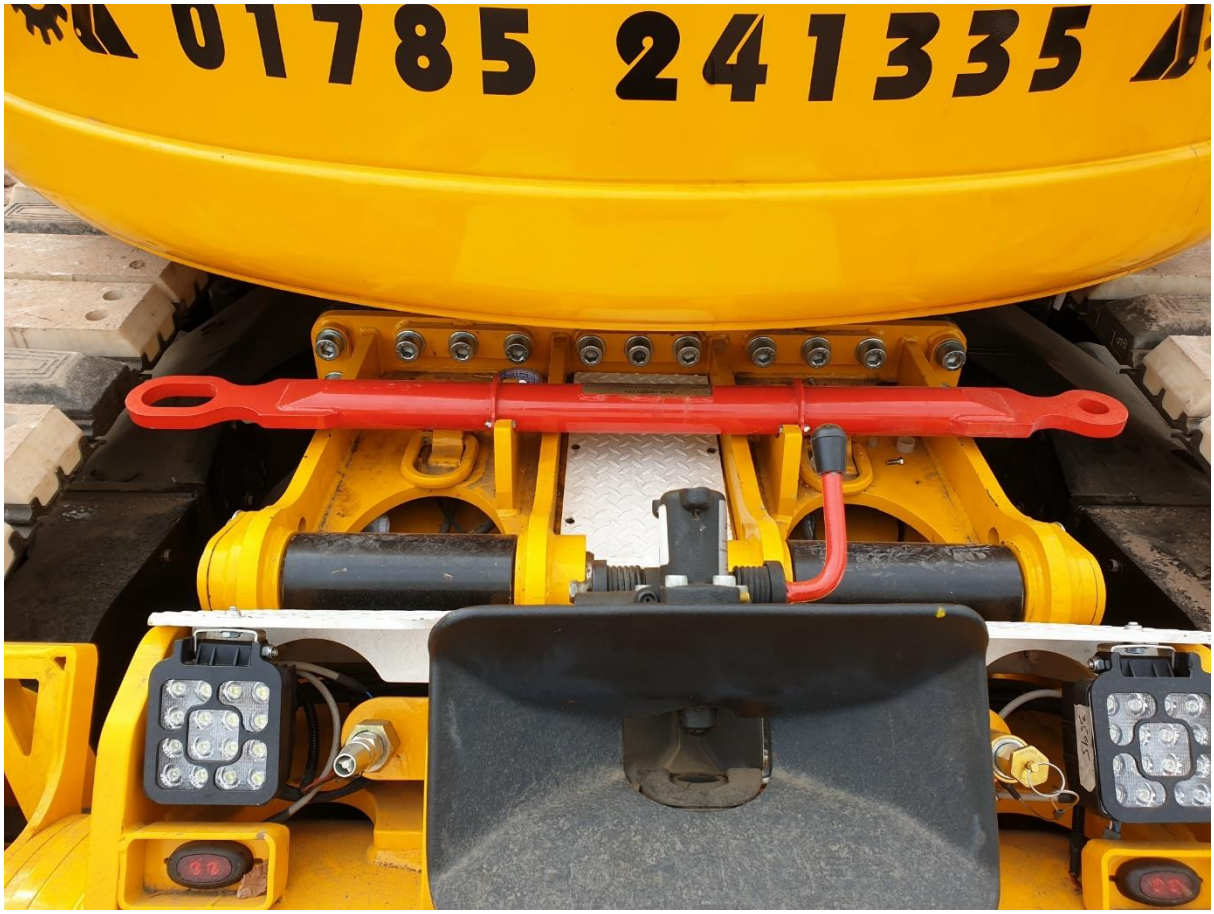
Component Asterisked (*) Job Ref is Safety Critical	Activity	Who	Periodicity				Job Ref
			PU	RET	HOUR	MTH	
Tow Bar	**Check**	**DRV**	*				***UC01**

SCHEDULED WORK:

1. Check tow bar is fitted and secure.

REMEDIAL ACTION:

1. Report any missing, damaged or defective parts.



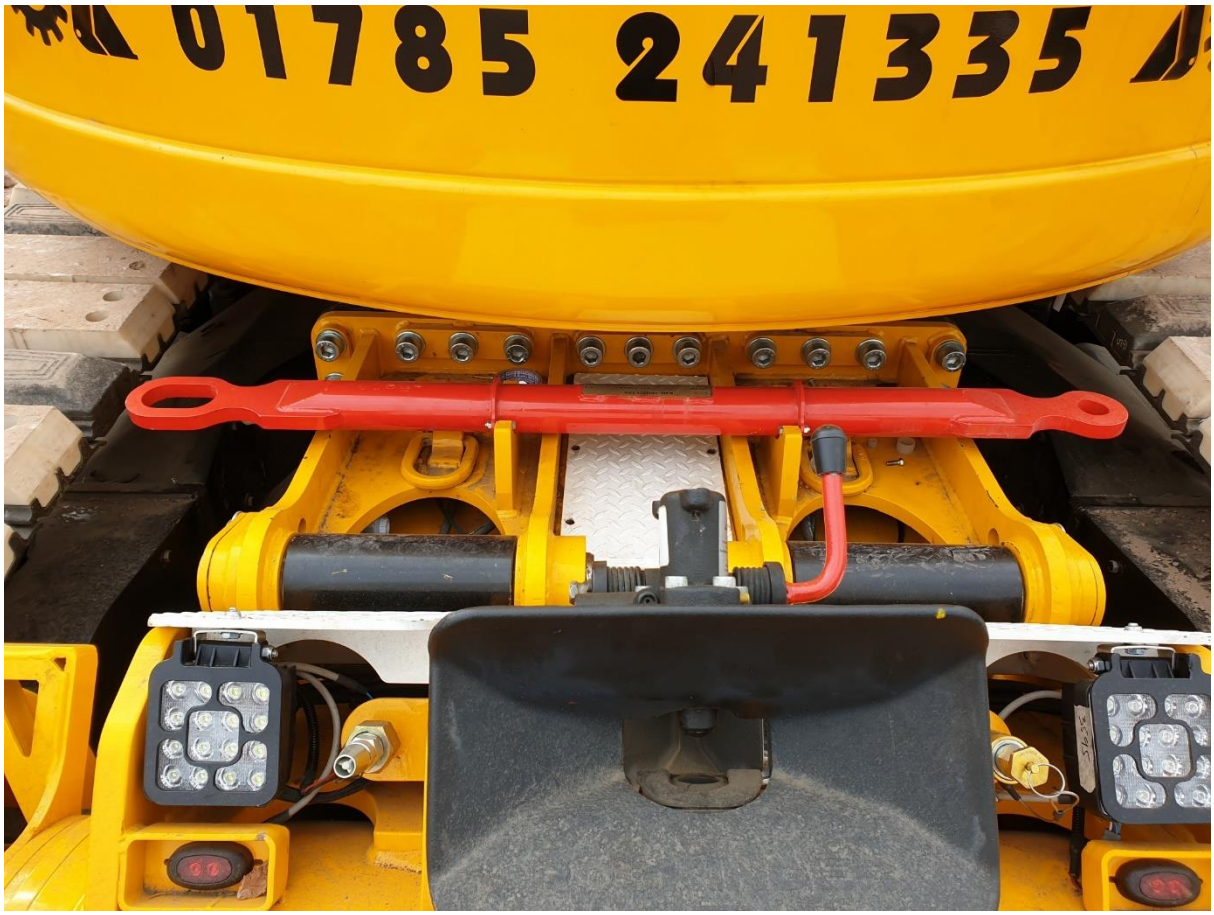
Component Asterisked (*) Job Ref is Safety Critical	Activity	Who	Periodicity				Job Ref
			PU	RET	HOUR	MTH	
Tow Bar	**Examine**	**FIT**			500		***UC02**

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.



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

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.

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.

Wheels and Tracks Section

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%.

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.

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.

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.

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.

Component Asterisked (*) Job Ref is Safety Critical	Activity	Who	Periodicity				Job Ref
			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.

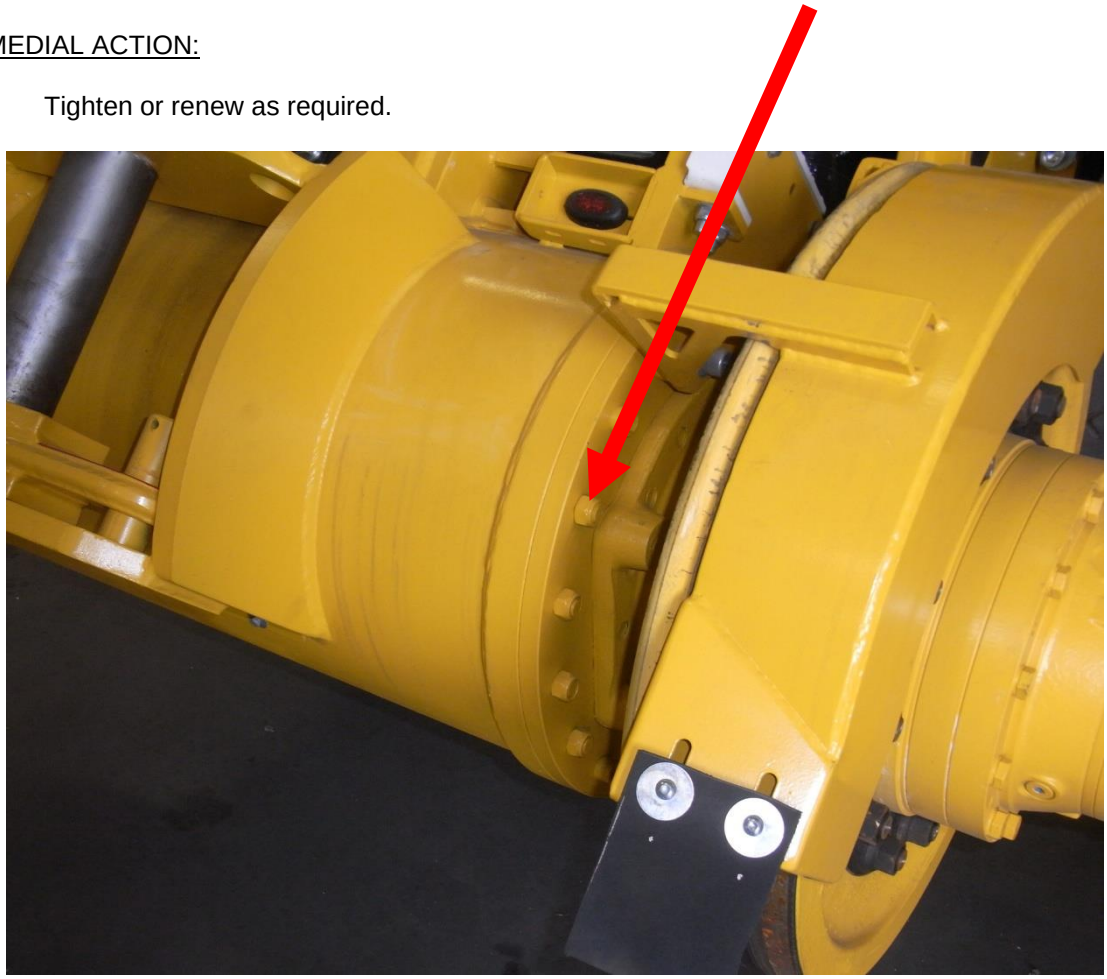
Component Asterisked (*) Job Ref is Safety Critical	Activity	Who	Periodicity				Job Ref
			PU	RET	HOUR	MTH	
Hydrostatic drive motor mounting bolts	**Check**	**FIT**				12	***UW07**

SCHEDULED WORK:

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

REMEDIAL ACTION:

1. Tighten or renew as required.



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.

Component Asterisked (*) Job Ref is Safety Critical	Activity	Who	Periodicity				Job Ref
			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.

REMEDIAL ACTION:

1-5 Adjust, repair or renew as required.

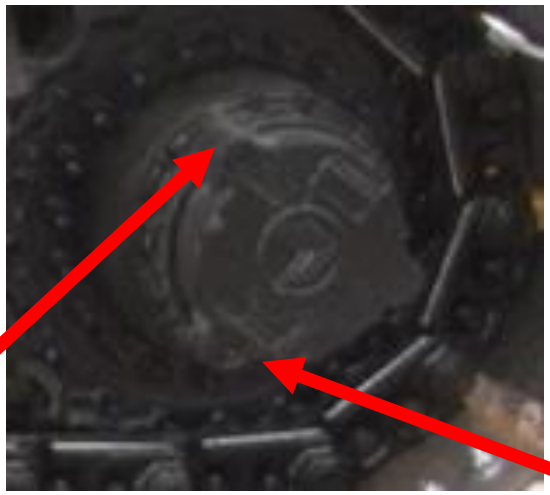
Component Asterisked (*) Job Ref is Safety Critical	Activity	Who	Periodicity				Job Ref
			PU	RET	HOUR	MTH	
Wheel hub planetaries oil level	**Check**	**FIT**			100	1	***UW10**

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

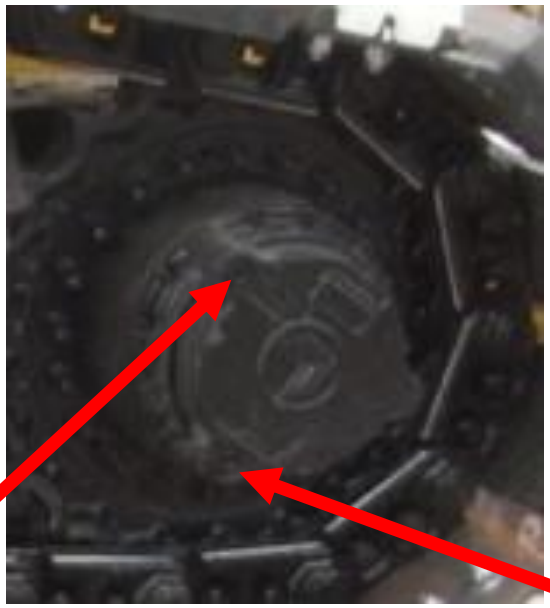
Drain Plug

Component Asterisked (*) Job Ref is Safety Critical	Activity	Who	Periodicity				Job Ref
			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

Fire Protection System Section

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.

Component Asterisked (*) Job Ref is Safety Critical	Activity	Who	Periodicity				Job Ref
			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.

Statutory Examinations Section

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.

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.

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.

Component Asterisked (*) Job Ref is Safety Critical	Activity	Who	Periodicity				Job Ref
			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.

APPENDIX 1 – BRAKE DISTANCE TEST FORM

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

Carried out on ……..……
(Date)

Machine No. ……..

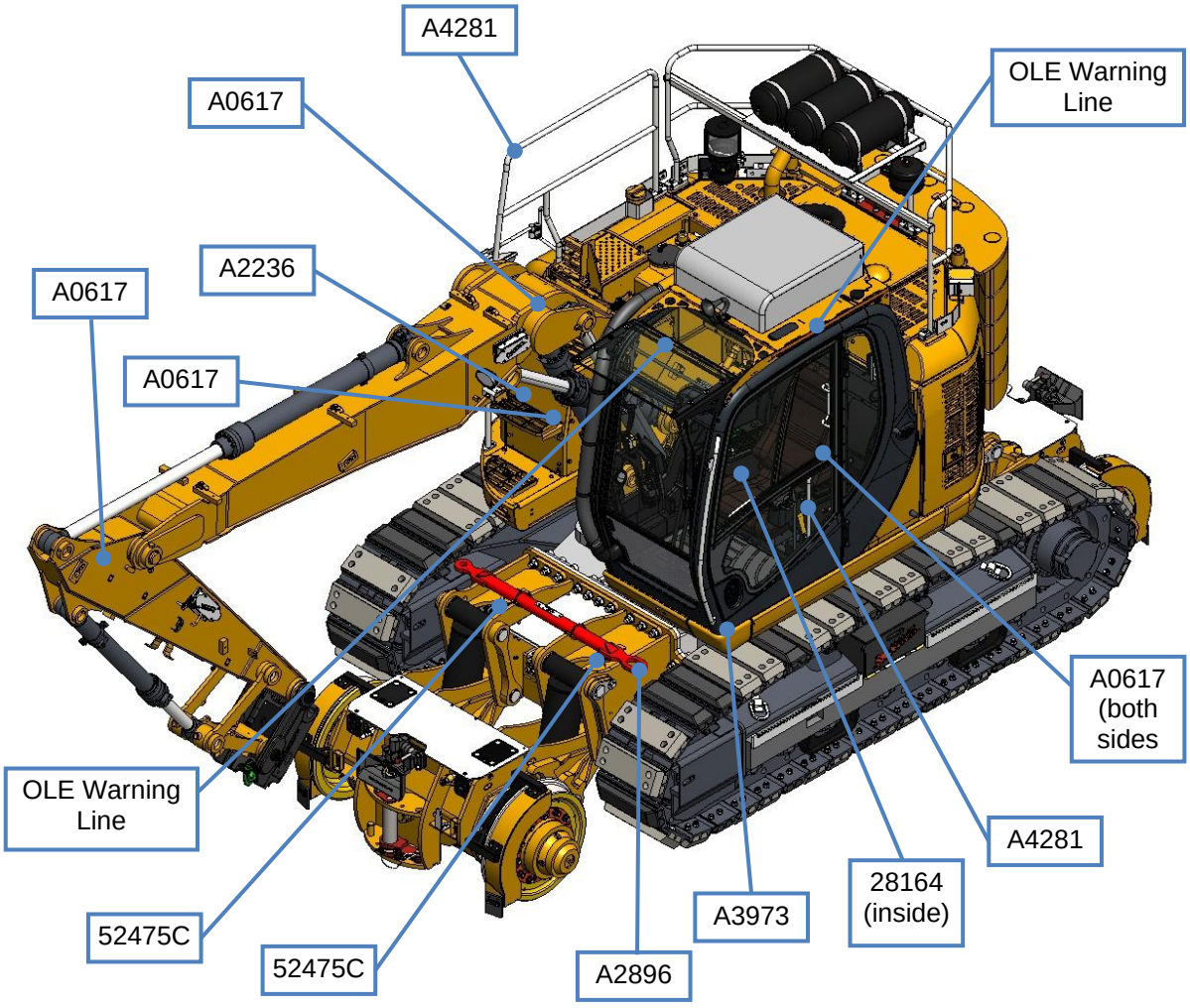
Reason for Test……..
(routine, repair, renew or incident)

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

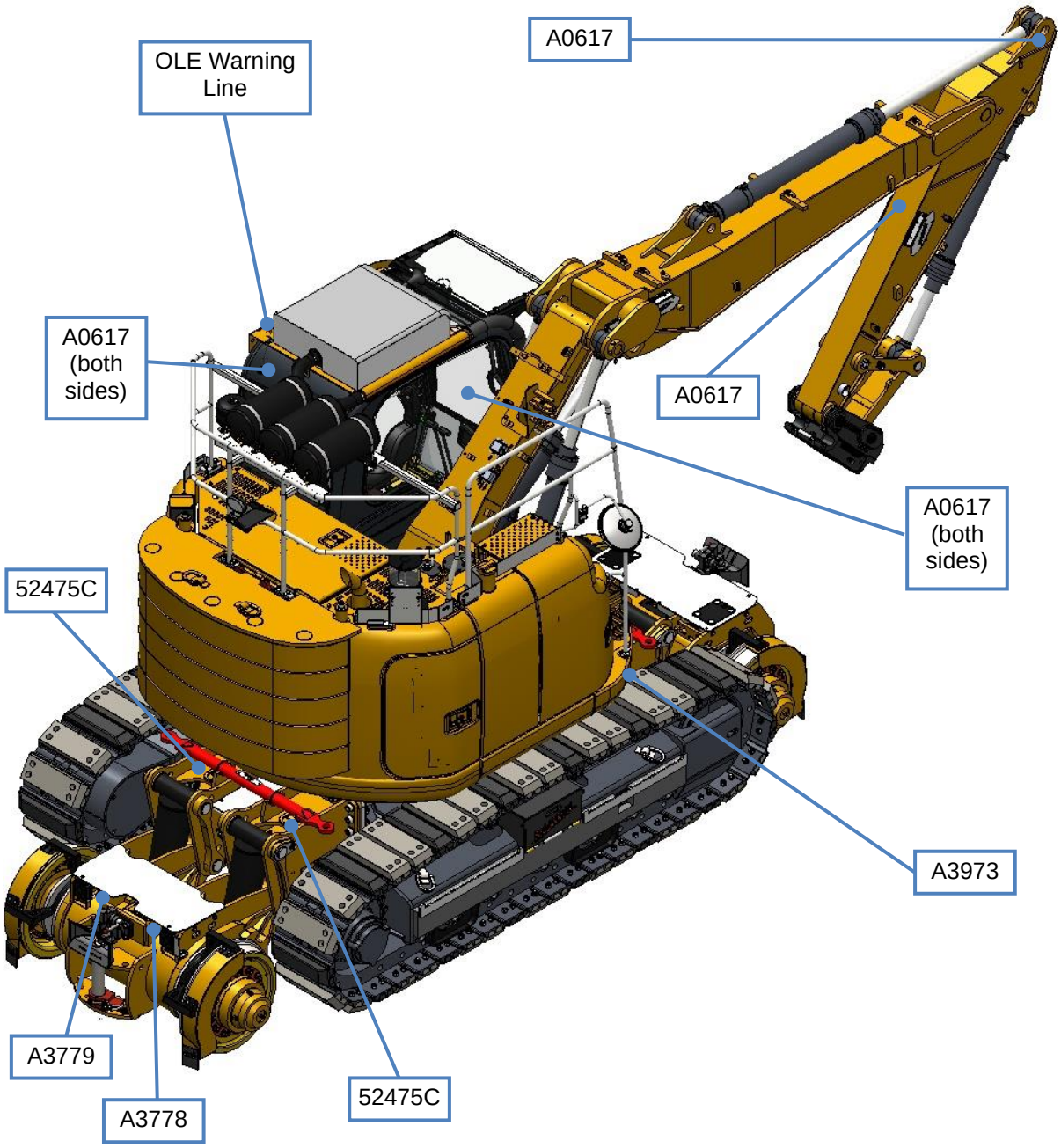
TEST CARRIED OUT BY ……

APPENDIX 2 – DECALS

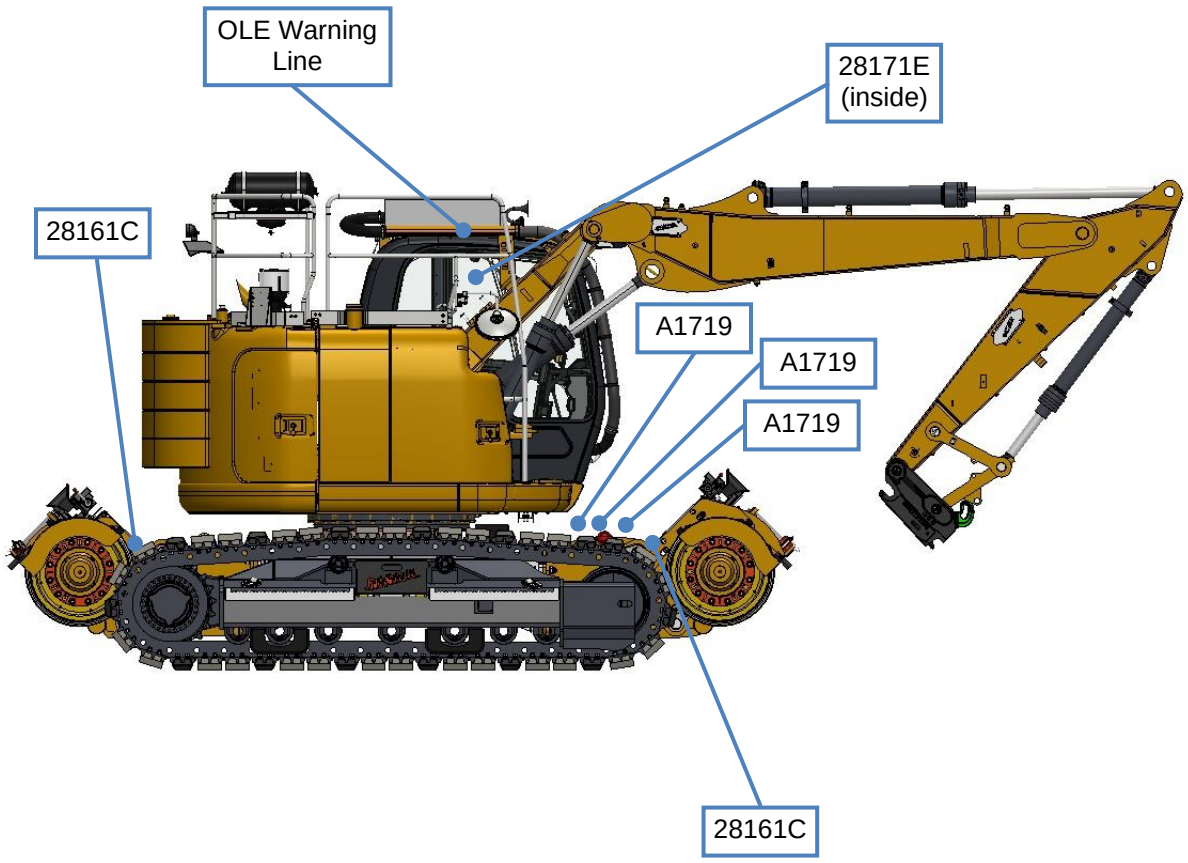
Use the following illustrations to verify that all decals are legible and in place.



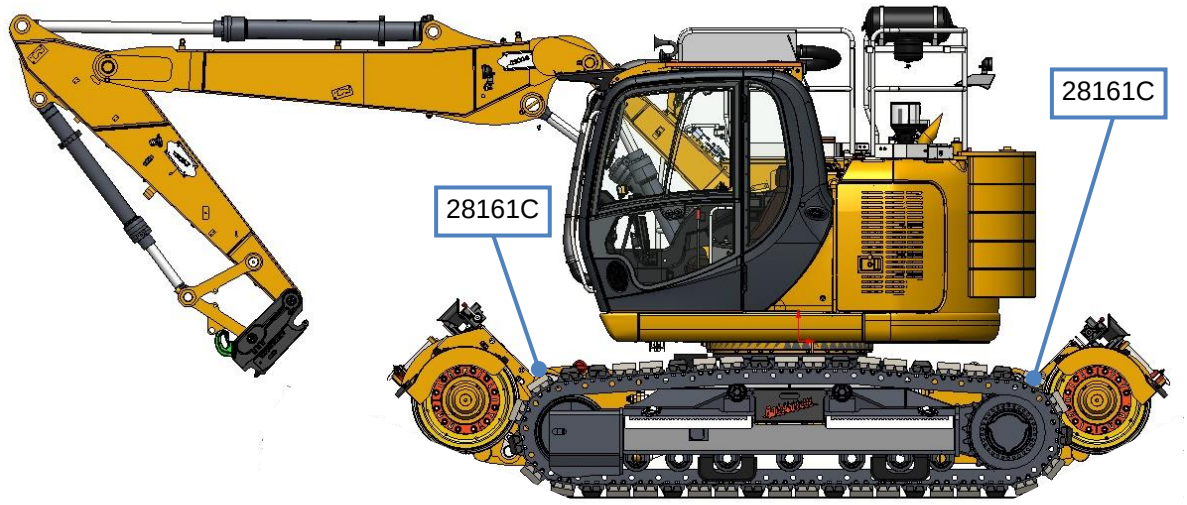
Decals fitted to machine (front nearside)



Decals fitted to machine (rear offside)



Decals fitted to machine (offside)



Decals fitted to machine (nearside)

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.

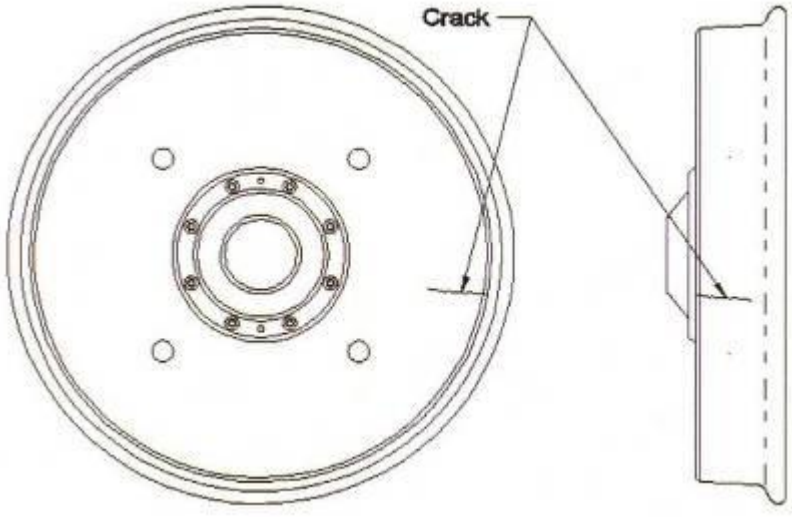
Figure number	Figure	Title
1		**Wheel with Crack**

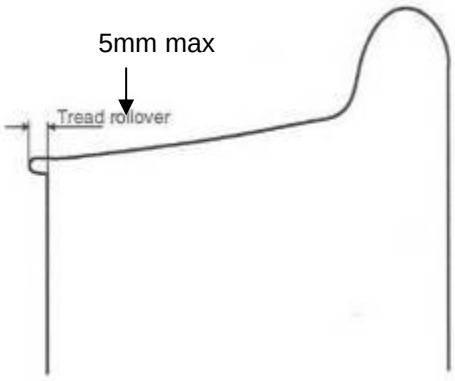
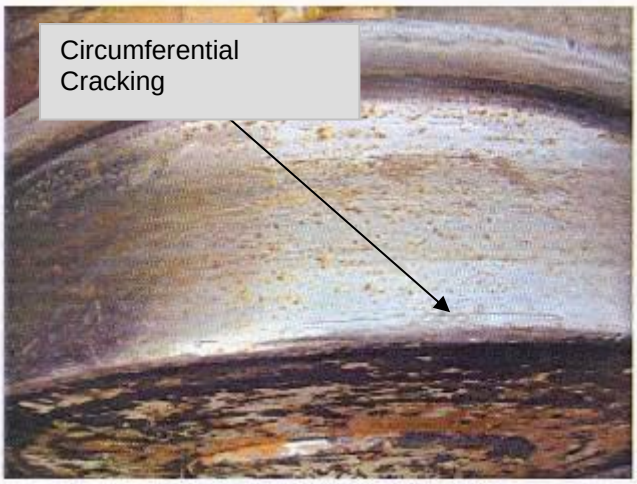
Figure number	Figure	Title
2		**Microscopic Cracks**
3		**Cavities**
4		**Tread Rollover**

Figure number	Figure	Title
5		**Circumferential Cracking Associated with Rollover**
6		**Migration down the Flange**

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	

APPENDIX 5 – RAIL WHEEL GAUGE

RAIL WHEEL PROFILE INSPECTION

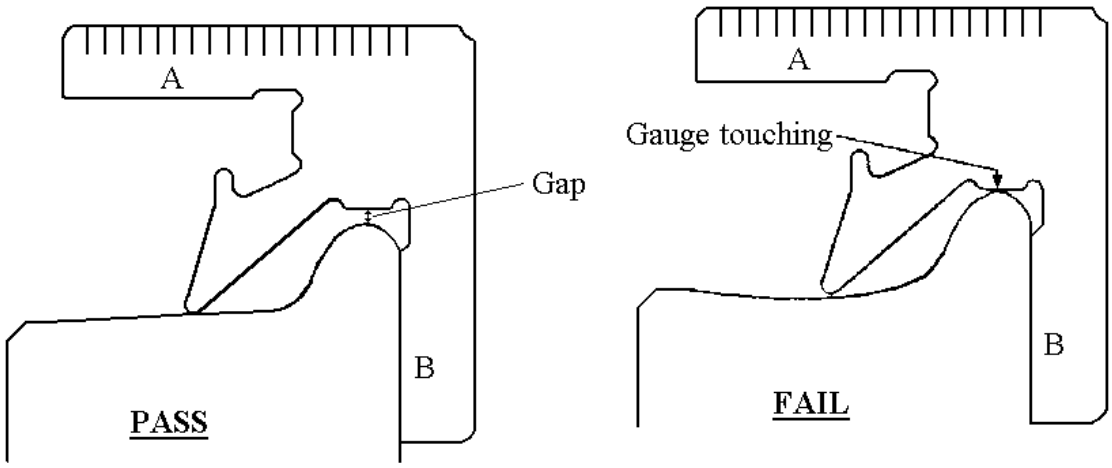


Figure 1 - Use of GO/NO GO Flange Thickness and Height Gauge
(BR Cat. No.39/29839) to measure Flange Height

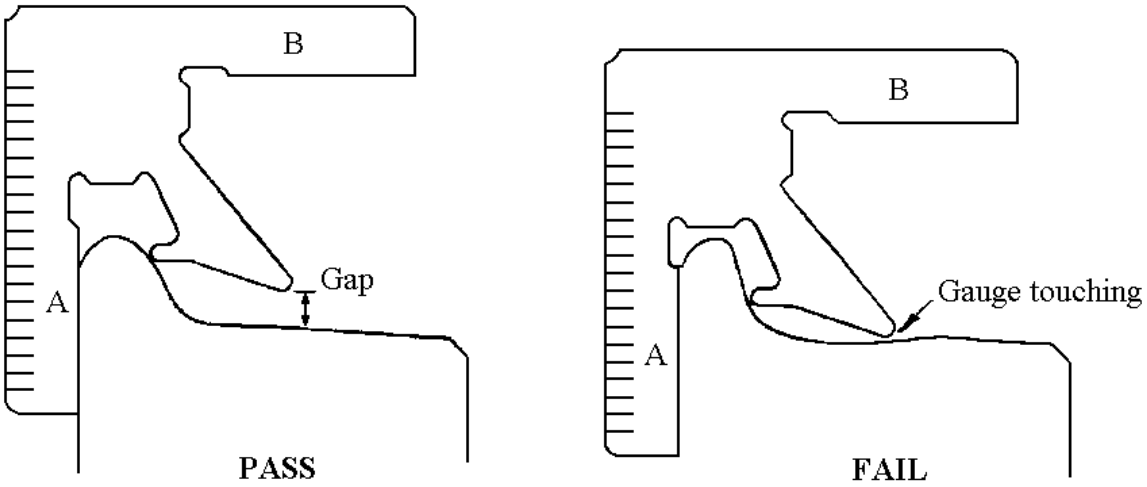


Figure 2 - Use of GO/NO GO Flange Thickness and Height Gauge
(BR Cat. No.39/29839) to measure Flange Thickness