

DIRECTOR GENERAL BORDER ROADS

GENERAL MAINTENANCE INSTRUCTION NO. 242

ON OPERATION AND MAINTENANCE OF

WHEEL LOADER MAKE JCB MODEL 430Z

INTRODUCTION:

(a) The Wheel Loader make JCB model 430Z fitted with 2.00 cum bucket, having lifting capacity of 3300 kgs and full turn tipping load of 6600 kgs, with four forward and three reverse gears ZF electrical shift transmission, powered by Ashok Leyland make ALU 411 TC 2/1 model, turbocharged, 6 cylinder, 4 stroke, water cooled direct injection diesel engine developing 130 HP.

(b) This GMI gives the technical specification and know how on the operation, maintenance and repair procedure of Wheel Loader JCB 430Z to ensure maximum performance and safe/satisfactory operation. Compliance with procedures given in this GMI will enable to get desired maximum service from the equipment.

(c) Maintenance of Wheel Loader JCB 430Z will lead to long life, trouble free operation and less frequent break downs and also to reduce maintenance cost. The periodic maintenance must be carried out according to the '**Periodic Maintenance Schedule**' described in this GMI. Daily care, inspection and Periodic Maintenance is essential for preventing troubles and accidents to ensure satisfaction and safe operation for prolonging the operating life of the equipment. All information and instructions given in this GMI is based on the latest Operator's manual and service booklet provided by the firm.

AIM:

The instructions are issued as guidelines for general, preventive maintenance schedule and lubrication of Wheel Loader JCB 430Z manufactured by M/s JCB (India) Ltd for regular attention to keep the equipment in good mechanical condition which must be strictly followed.

ACTION BY:

- (a) User unit: To carryout periodic inspection and monitor regular/periodical maintenance as laid down in this instruction and record the tasks done in log book.
- (b) Field Workshop :
- (i) To carryout and monitor maintenance schedule and oil changes as per periodical maintenance laid down in the maintenance instructions and to check the record of maintenance including lubrication.
 - (ii) To advise the user unit in respect of any lapse noticed.

- (c) Mobile Maintenance Team: To ensure that proper maintenance is carried out and submit report accordingly to Task Force Commander and OC Wksp for their necessary action.

DETAILS:

This instruction includes the following aspects:-

- | | | |
|----|---|----------------|
| a) | Operating Procedure | - Appendix 'A' |
| b) | Periodic Maintenance schedule | - Appendix 'B' |
| c) | Technical Specification | - Appendix 'C' |
| d) | Recommended Lubricants with filling capacity and periodicity for change | - Appendix 'D' |

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OPERATING PROCEDURE

1. **STARTING**

- (a) Ensure Eng oil level is correct
- (b) Ensure Coolant level in radiator is full
- (c) Ensure gear lever is in neutral position
- (d) Ensure parking brake is on.
- (e) Slightly depress accelerator pedal and turn starting key full clock wise to start engine and release starting key as soon as engine fires
- (f) Watch for audible alarm, engine oil pressure and no charge warning lights should go out once the engine is started.

2. **STOPPING**

- (a) Ensure machine is in correct parking position.
- (b) Apply parking brake and select neutral.
- (b) Run engine at idling speed for 1 to 2 minutes before stopping engine
- (c) When engine is stopped return starting key to the off position.

3. **MOVING OFF**

- (a) Ensure forward/reverse lever is in neutral position.
- (b) Start engine and ensure bucket is in travelling position.
- (c) Select parking brake, accelerate engine till air pressure gauge indicate 7 bar and audio/visual warning for low pressure disappears.
- (d) Select gear for forward or reverse and release parking brake for moving machine after accelerating engine.
- (e) When travelling on road, raise loader arm 210 mm above road surface with bucket fully rolled back.

Do's

- 1. Always use correct grade of Engine oil & other Lubricants.
- 2. Always use clean diesel and before filling diesel to tank, filter it with fine cloth.
- 3. Check lifting equipments before using.
- 4. Always face machine when descending from cabin.
- 5. Secure all moving parts of the machine when not in use.
- 6. Always ensure electrics are switched off before leaving machine.

7. Always drive carefully and avoid any sudden stops and changes of direction.
8. On leaving the machine always stop the machine.
9. When parking always rest machine bucket on the ground and apply Hand brake.
10. Avoid parking on slopes if it is necessary ensure parking brake is on and wheels are chocked.
11. Avoid high speed operation.
12. Before towing the machine, it is advisable to disconnect front and rear propeller shafts to avoid damage to the transmission.
13. Keep bucket about 457mm (18 inch) above the ground when travelling with a full bucket, reversing up a gradient and travelling across a gradient.
14. Always de-pressurize the system before removing any hoses or pipes.
15. When transporting the machine and also for carry out maintenance, always ensure that articulation safety lock is fitted.
16. Always make sure that wheels are chocked when the machine is jacked up.
17. Engage safety strut on Lift arm before carrying out any repair work below loader arm.
18. Never search for any leakage with the hand.
19. Operate the steering wheel with left hand, leaving right hand free to operate services.
20. When nearing discharge point, raise loader arms.
21. Discharge bucket when arms are at required height.
22. Reverse machine after lowering bucket to travel position.
23. Always operate machine and services smoothly.

Don'ts

1. Do not operate controls from outside cab.
2. Do not operate/travel with the engine bonnet raised.
3. Do not carry passengers.
4. Do not drive near the edge of a hole or trench.
5. Do not work under machine when on soft ground.
6. Do not fill system with engine running.
7. Do not run engine when hyd oil level is low.
8. Do not touch hot hyd hoses.
9. Do not over tighten hose clamps.
10. Do not wear loose clothing that can get caught up in moving machine.

PERIODIC MAINTENANCE SCHEDULE

Maintenance work	Service intervals in hours							Remarks
	Daily	50	100	200	400	800	1200	
<u>CHECK</u>								
<u>AXLE</u>								
Axle oil level		*	*	*	*	*	*	
Tyre pressure and condition		*	*	*	*	*	*	
Tightness of wheel nuts	*	*	*	*	*	*	*	
<u>BRAKES</u>								
Air pressure	*	*	*	*	*	*	*	
Brake fluid level	*	*	*	*	*	*	*	
Air leakage	*	*	*	*	*	*	*	
Drain reservoir	*	*	*	*	*	*	*	
Foot brake operation	*	*	*	*	*	*	*	
<u>ENGINE</u>								
Engine oil level and condition	*	*	*	*	*	*	*	
Coolant/Water level in radiator	*	*	*	*	*	*	*	
Exhaust (excessive smoke)	*	*	*	*	*	*	*	
Fuel system for leaks/contamination	*	*	*	*	*	*	*	
Fan belt for tension		*	*	*	*	*	*	
Exhaust system security					*	*	*	
Radiator and hose condition	*	*	*	*	*	*	*	
Air cleaner hose security	*	*	*	*	*	*	*	
<u>ELECTRICAL</u>								
Battery electrolyte level		*	*	*	*	*	*	
Operation of electrical eqpt	*	*	*	*	*	*	*	
<u>HYDRAULICS</u>								
Hydraulic Oil level	*	*	*	*	*	*	*	
Hydraulic System for leakage	*	*	*	*	*	*	*	
Condition of ramp piston rods			*	*	*	*	*	
Hoses and pipe work	*	*	*	*	*	*	*	
<u>MISCELLANEOUS</u>								
Operation of all services	*	*	*	*	*	*	*	
All pivot pin grease seals	*	*	*	*	*	*	*	
<u>TRANSMISSION</u>								
Transmission oil level and pressure	*	*	*	*	*	*	*	
Operation of clutch cut off while applying brake			*	*	*	*	*	

Maintenance work	Service intervals in hours							Remarks
	Daily	50	100	200	400	800	1200	
<u>CHANGE/REPLACE</u>								
AXLE								
Axle oil			*			*	*	
BRAKES								
Brake system fluid						*	*	
ENGINE								
Engine oil (Every 200 Hrs)				*	*	*	*	
Engine oil filter element (Every 200 Hrs)				*	*	*	*	
Fuel filter element (Every 200 Hrs)				*	*	*	*	
Air Cleaner element-Outer *						*	*	* Depends on site conditions
Air Cleaner element-Inner *					*		*	
HYDRAULICS								
Hyd Filter element (Every 400 hrs)					*	*	*	
Hyd fluid & Suction strainer							*	
TRANSMISSION								
Transmission oil			*		*	*	*	
Transmission filter element (Every 400 hrs)				*	*	*	*	
CLEAN								
Drain fuel filters			*	*	*	*	*	
Battery terminals		*	*	*	*	*	*	
GREASE								
All pivot pins (loader)	*	*	*	*	*	*	*	
Prop shafts universal joints		*	*	*	*	*	*	
Centre pivot		*	*	*	*	*	*	
Steer ram pins		*	*	*	*	*	*	

TECHNICAL SPECIFICATION

Description	Wheel Loader JCB 430Z
ENGINE	
Model /Type	ALU – 411/ 6 cylinder 4 Stroke water cooled Turbo charged direct injection Diesel engine.
Cylinder bore x stroke	107.18 mm x 120.65 mm
Compression ratio	16 : 1
Piston displacement	6.540 l
Firing Order	1-5-3-6-2-4
Direction of rotation	Anti clock wise from flywheel side
Engine shut off	Fuel cut off by stop lever
Maximum output	155 hp at 2600 rpm
Maximum Torque	41.5 mkg
Engine weight	630 kg
Engine idling speed	500 rpm
Compression Pressure	21 to 23.8 kg/cm ²
Valve Clearance	Inlet/Exhaust 0.50 mm (when cold)
ELECTRICAL SYSTEM	
Battery	12 V 120 AH Qty – 02 Nos
Alternator	Lucas 35 Amp, 24 Volts
HYDRAULICS	
Pump Model	David Brown
Flow rate at 2250 engine rpm	156 lpm
Main relief valve operating pressure	206 bar
Auxiliary relief valve operating pressure	172 bar
TRANSMISSION	
Make	ZF Hydro media Transmission 4WG-120
Power shift- Reversing transmission	4 forward speeds and 3 reverse speeds
Shift control	Electro hydraulic

BRAKES	
Service Brake	Air over hydraulic multi disc, oil immersed built in to both axles, hydraulic actuated
Parking brake	Air over hydraulic, acting on front Axle
HYDRAULIC STEERING	
System type	Full power hydrostatic (pivot steer)
Relief valve operating pressure	175 bar
TYRES	
Front/Rear	Size 14.00 x 25 (20 PR) - 4 Nos
Pressure	Front – 70 LBF/in ² Rear - 60 LBF/in ²
STATIC DIMENSIONS OF EQPT	
Overall length	6440 mm
Axle to Pivot pin	1140 mm
Wheel base	2900 mm
Axle to counter weight face	1370 mm
Minimum ground clearance	430 mm
Pin height (maximum)	3770 mm
Height over Cab	3160 mm
Width over Cab	1175 mm
Width over Tyre	2352 mm
Wheel tack	2002 mm
Height to tow hitch	925 mm
TURNING CIRCLE	
Inside Radius	3035 mm
Maximum radius	5550 mm
Articulation Angle	± 40 deg

Appendix 'D'

RECOMMENDED LUBRICANTS WITH FILLING CAPACITY AND PERIODICITY

S/No	Item	Grade of Lubricant		Filling Capacity	Periodicity for change
		IOC	CASTROL		
a)	Engine ALU 411	Servo pride XL 15W 40	Castrol FleetMax 15W 40	14.5 ltrs	First oil/filter change after 100 hrs and thereafter every 200 hrs
b)	Transmission ZF/4 WG 120	Servo pride XL 15W 40	Castrol FleetMax 15W 40	22 ltrs	First oil/filter change after 100 hrs and thereafter every 400 hrs for oil and element
c)	Front/Rear Axle ZF	Servo Gear Super 140	Castrol Hypoy B	24.5 ltrs each	First oil change after 100 hrs and thereafter every 800 hrs
d)	Hyd System	Servo System HLP 46	Castrol JCB Spl Hyd oil	128 ltrs	Hyd Tank cap – 85 ltrs. First Hyd Filter element change after 100 hrs and thereafter every 400 hrs. Change breather/Strainer after 1600 hrs. Hyd Oil change after every 1200 hrs
e)	Braking System	-	Hyspin AWH 15	-	After every 800 hrs
f)	Centre Pivot (Lower/upper), Loader end, Steer Ram & Prop. Shaft	Servo Gem RR3	Castrol LCG 2 Grease	-	Daily/weekly/fortnightly/monthly as required
g)	Fuel System		-	190 ltrs	
h)	Fuel Filter		-	-	Element change after every 200 hrs
j)	Air Cleaner		-	-	Air Cleaner Inner element change after every 400 hrs and Outer element after every 800 hrs