

# CK36-CK50 Excavators

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# Section 1001

## SAFETY INSTRUCTIONS, GENERAL INFORMATION AND TORQUE SPECIFICATIONS

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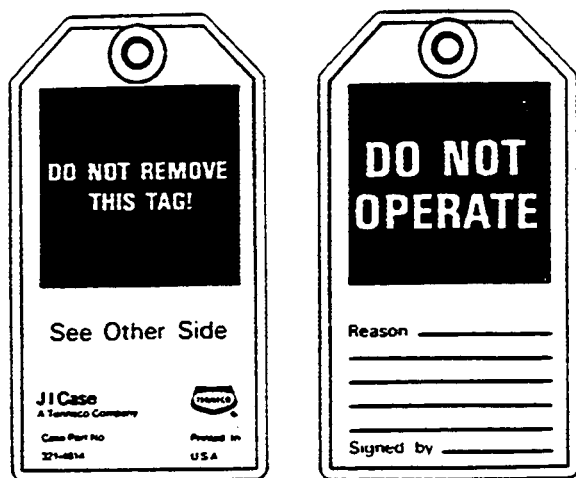
## SAFETY



**This symbol means ATTENTION ! BECOME ALERT ! YOUR SAFETY IS INVOLVED. The message that follows the symbol contains important information about safety. Carefully read the message, Make sure you fully understand the causes of possible injury or death.**

To prevent injury always follow the Warning, Caution and Danger notes in this section and throughout the manual.

Put the warning tag shown below on the key for the keyswitch when servicing or repairing the machine. One warning tag is supplied with each machine. Additional tags Part Number 331-4614 are available from your service parts supplier.



B004



**Read the operator's manual to familiarize yourself with the correct control functions.**



**Operate the machine and equipment controls from the seat position only. Any other method could result in serious injury.**



**This is a one man machine, no riders allowed.**



**Before starting engine, study Operator's Manual safety messages. Read all safety signs on machine. Clear the area of other persons. Learn and practise safe use of controls before operating.**

**It is your responsibility to understand and follow manufacturers instructions on machine operation, service, and to observe pertinent laws and regulations. Operator's and Service Manuals may be obtained from your J.I. CASE dealer.**



**If you wear clothing that is too loose or do not use the correct safety equipment for your job, you can be injured. Always wear clothing that will not catch on objects. Extra safety equipment that can be required includes hard hat, safety shoes, ear protection, eye or face protection, heavy gloves and reflector clothing.**



**When working in the area of the fan belt with the engine running, avoid loose clothing if possible, and use extreme caution.**



**When doing checks and tests on the equipment hydraulics, follow the procedures as they are written. DO NOT change the procedure.**



**When putting the hydraulic cylinders on this machine through the necessary cycles to check operation or to remove air from a circuit, make sure all people are out of the way.**



*Use insulated gloves or mittens when working with hot parts.*



*Lower all attachments to the ground or use stands to safely support the attachments before you do any maintenance or service.*



*Pin sized and smaller streams of hydraulic oil under pressure can penetrate the skin and result in serious infection. If hydraulic oil under pressure does penetrate the skin, seek medical treatment immediately. Maintain all hoses and tubes in good condition. Make sure all connections are tight. Make a replacement of any tube or hose that is damaged or thought to be damaged. DO NOT use your hand to check for leaks, use a piece of cardboard or wood.*



*When removing hardened pins such as a pivot pin, or a hardened shaft, use a soft head (brass or bronze) hammer or use a driver made from brass or bronze and a steel head hammer.*



*When using a hammer to remove and install pivot pins or separate parts using compressed air or using a grinder, wear eye protection that completely encloses the eyes (approved goggles or other approved eye protectors).*



*Use suitable floor (service) jacks or chain hoist to raise wheels or tracks off the floor. Always block machine in place with suitable safety stands.*



*When servicing or repairing the machine. Keep the shop floor and operator's compartment and steps free of oil, water, grease, tools, etc. Use an oil absorbing material and or shop cloths as required. Use safe practices at all times.*



*Some components of this machine are very heavy. Use suitable lifting equipment or additional help as instructed in this Service Manual.*



*Engine exhaust fumes can cause death. If it is necessary to start the engine in a closed place, remove the exhaust fumes from the area with an exhaust pipe extension. Open the doors and get outside air into the area.*



*When the battery electrolyte is frozen, the battery can explode if (1), you try to charge the battery, or (2), you try to jump start and run the engine. To prevent the battery electrolyte from freezing, try to keep the battery at full charge. If you do not follow these instructions, you or others in the area can be injured.*



*Batteries contain acid and explosive gas. Explosions can result from sparks, flames or wrong cable connections. To connect the jumper cables correctly to the battery of this machine see the Operator's Manual. Failure to follow these instructions can cause serious injury or death.*

## GENERAL INFORMATION

### CLEANING

Clean all metal components, except bearings, with steam or white spirit. Do not use caustic soda when steam-cleaning. After cleaning, dry and oil the components. Clean oil lines with compressed air. Clean bearings in kerosene, dry them completely and oil them.

### INSPECTIONS

Carefully examine all disassembled components. Replace all parts showing signs of wear or damage. Light scores and scratches can be removed by honing or with a buffing compound. Fast, abnormal wear of components can be avoided by careful examination and early detection of wear and pitting.

### BEARINGS

Check that bearings run freely. Replace bearings that show signs of too much play or seizing. Clean bearings in a good solvent or kerosene and allow them to dry naturally. **DO NOT DRY BEARINGS WITH COMPRESSED AIR.**

### NEEDLE BEARINGS

Before installing needle bearings in their housing, remove any metal edges inside or around the housing. When installing bearings with a hydraulic press, grease the inside and the outside of the bearing with petroleum jelly.

### GEARS

Check all gears for signs of damage or wear. Replace damaged or worn gears.

### SEAL RINGS, O RINGS AND FLAT SEALS

Always install new seal rings, O-rings and flat seals, if removed. Lubricate seal rings and O-rings with petroleum jelly.

### SHAFTS

Check all shafts showing signs of damage or wear. Check particularly to make sure that any surface of the shaft in contact with bearings or seal rings is not damaged.

### SERVICE PARTS

Always use genuine CASE service parts. To order service parts, see the Spare Parts Catalog and remember to give the correct reference of the necessary CASE part. No warranty claims will be considered for failures involving parts which are not of CASE origin.

### LUBRICATION

Never use oil or grease which is different from that specified in the Operator's Manual or the Service Manual. No warranty claims will be considered for failures due to the use of wrong oil or grease.

## STANDARD FASTENER TORQUE SPECIFICATIONS

Unless otherwise specified, use the following torque specifications. Lubricate the threads with engine oil or ordinary grease.

STANDARD SIZE SCREWS	4	7	9
M6	7.8 to 9.3 Nm (5.75 to 6.86 lb ft)	9.8 to 11.3 Nm (7.23 to 8.33 lb ft)	12.3 to 14.2 Nm (9.07 to 10.47 lb ft)
M8	17.7 to 20.6 Nm (13.0 to 15.2 lb ft)	23.5 to 27.5 Nm (17.34 to 20.29 lb ft)	29.4 to 34.3 Nm (21.6 to 25.31 lb ft)
M10	39.2 to 45.1 Nm (28.9 to 33.28 lb ft)	48.0 to 55.9 Nm (35.42 to 41.25 lb ft)	60.8 to 70.6 Nm (44.8 to 52.10 lb ft)
M12	62.8 to 72.6 Nm (46.3 to 53.5 lb ft)	77.5 to 90.2 Nm (57.19 to 66.56 lb ft)	103.0 to 117.7 Nm (76.0 to 86.86 lb ft)
M14	107.9 to 125.5 Nm (79.6 to 92.6 lb ft)	123.6 to 147.1 Nm (91.2 to 108.5 lb ft)	166.7 to 196.1 Nm (123.0 to 144.7 lb ft)
M16	166.7 to 191.2 Nm (123.0 to 141.0 lb ft)	196.1 to 225.6 Nm (144.7 to 166.49 lb ft)	259.9 to 304.0 Nm (191.8 to 224.3 lb ft)
M18	245.2 to 284.4 Nm (180.9 to 209.88 lb ft)	274.6 to 318.7 Nm (202.6 to 235.2 lb ft)	343.2 to 402.1 Nm (253.2 to 296.74 lb ft)
M20	333.4 to 392.2 Nm (246.0 to 289.44 lb ft)	367.7 to 431.5 Nm (271.36 to 318.44 lb ft)	490.3 to 568.8 Nm (361.8 to 419.77 lb ft)



## HYDRAULIC CONNECTION TORQUE SPECIFICATIONS

### HOSE FITTINGS

THREAD SIZE	NUTS	FLARED FITTINGS	WRENCH SIZE
1/8"	7.80 to 11.80 Nm (5.75 to 8.7 lb ft)	14.71 to 19.61 Nm (10.85 to 14.47 lb ft)	17 mm
1/4"	24.50 to 29.40 Nm (18.8 to 21.6 lb ft)	36.30 to 44.10 Nm (26.7 to 32.5 lb ft)	19 mm
3/8"	49.00 to 53.90 Nm (36.0 to 39.7 lb ft)	39.20 to 49.00 Nm (28.9 to 36 lb ft)	22 mm
1/2"	58.80 to 63.70 Nm (43.4 to 47.0 lb ft)	49.00 to 68.60 Nm (36.0 to 50.6 lb ft)	27 mm
3/4"	117.70 to 127.50 Nm (86.8 to 94.0 lb ft)	127.50 to 147.10 Nm (94.0 to 108.5 lb ft)	36 mm
1"	137.30 to 147.10 Nm (101.3 to 108.5 lb ft)	147.10 to 166.10 Nm (108.5 to 122.5 lb ft)	41 mm

### CONNECTORS

THREAD SIZE	TAPERED THREAD	STRAIGHT THREAD	WRENCH SIZE
1/8"	19.60 to 29.40 Nm (14.46 to 21.7 lb ft)	—————	17 mm
1/4"	36.30 to 46.10 Nm (26.8 to 34.0 lb ft)	58.80 to 78.50 Nm (43.4 to 57.0 lb ft)	19 mm
3/8"	39.20 to 49.00 Nm (28.9 to 36.2 lb ft)	78.50 to 98.10 Nm (58.0 to 72.4 lb ft)	23 mm
1/2"	49.00 to 68.60 Nm (36.2 to 50.6 lb ft)	117.70 to 137.30 Nm (86.8 to 101.3 lb ft)	26 mm

### LINE NUTS

TUBE SIZE (OUTER DIAMETER)	NUTS	WRENCH SIZE
8 mm	29.40 to 39.20 Nm (21.7 to 29.0 lb ft)	17 mm
10 mm	39.20 to 44.10 Nm (29.0 to 32.5 lb ft)	19 mm
12 mm	53.99 to 63.70 Nm (39.9 to 47.0 lb ft)	21 mm
16 mm	88.30 to 98.10 Nm (65.16 to 72.4 lb ft)	29 mm
18 mm	127.50 to 137.30 Nm (94.0 to 101.3 lb ft)	32 mm
27.20 mm	235.40 to 254.97 Nm (173.7 to 188.2 lb ft)	41 mm



# Section 1002

## GENERAL SPECIFICATIONS

1002

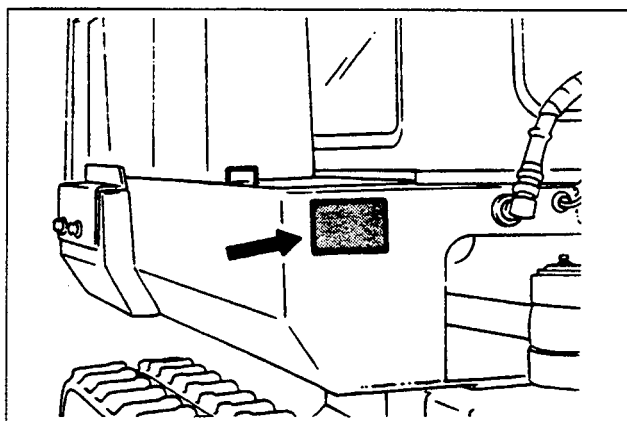
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## PRODUCT IDENTIFICATION AND SERIAL NUMBERS

When ordering parts or when requesting information or assistance always give the model and serial numbers of your machine.

Write the model and serial numbers of your machine on the lines below.



Model \_\_\_\_\_

Product Identification Number (PIN) \_\_\_\_\_

## GENERAL SPECIFICATIONS

### Capacities (CK36)

Engine Oil (without filter change).....	7.5 litres
Radiator.....	7 litres
Fuel Tank.....	57 litres
Hydraulic Oil Reservoir.....	59 litres
Hydraulic Circuit.....	93 litres
Bottom Track Roller.....	0.07 litre
Track Idler Wheel.....	0.04 litre
Travel Motor Reduction.....	0.6 litre

### Capacities (CK50)

Engine Oil (without filter change).....	7.5 litres
Radiator.....	7 litres
Fuel Tank.....	66 litres
Hydraulic Oil Reservoir.....	75 litres
Hydraulic Circuit.....	110 litres
Bottom Track Roller.....	0.07 litre
Track Idler Wheel.....	0.04 litre
Travel Motor Reduction.....	1.2 litre

### Travel Speed (CK36)

1st Speed.....	1.9 Km/h
2nd Speed.....	3.6 Km/h

### Travel Speed (CK50)

1st Speed.....	1.8 Km/h
2nd Speed.....	3.6 Km/h

## HYDRAULIC SPECIFICATIONS (CK36)

### General

Engine Speed, no load.....2450 rpm  
 Test Temperature of Hydraulic Oil.....45 to 50°C

Value on Pressure  
Setting Pump

Value on Machine

Main Relief Valve, A1.....	157 to 167 bar (2275 to 2417 psi)	155 to 160 bar (2247 to 2318 psi)
Main Relief Valve, A2.....	206 to 216 bar (2986 to 3128 psi)	204 to 209 bar (2958 to 3029 psi)
Main Relief Valve, A3.....	196 to 206 bar (2844 to 2986 psi)	189 to 194 bar (2745 to 2816 psi)
Secondary Relief Valves :		
Boom : Raising b2, Lowering b1.....	240 to 260 bar (3484 to 3768 psi)	237 to 243 bar (3441 to 3527 psi)
Dipper : Extend b3, Retract b4.....	240 to 260 bar (3484 to 3768 psi)	237 to 243 bar (3441 to 3527 psi)
Levelling Blade : Lowering b5.....	240 to 260 bar (3484 to 3768 psi)	237 to 243 bar (3441 to 3527 psi)
Bucket : Closing b6.....	240 to 260 bar (3484 to 3768 psi)	237 to 243 bar (3441 to 3527 psi)
Swing Motor Brake Valve, c1.....	211 to 230 bar (3058 to 3342 psi)	196 to 202 bar (2844 to 2930 psi)
High Pressure Relief Valve, c2.....	274 to 294 bar (3982 to 4266 psi)	240 to 260 bar (3484 to 3768 psi)

### Operating Speeds (in seconds)

		Reference Value	Authorised Limit	Note
Boom Cylinder (Cab)	Raising	2.8 to 2.4	2.9	1
	Lowering	3.3 to 3.9	4.7	1
Boom Cylinder (Canopy)	Raising	2.0 to 2.6	3.1	1
	Lowering	3.8 to 4.3	5.3	1
Dipper Cylinder	Retracting	2.8 to 3.4	4.1	2
	Extending	2.0 to 2.6	3.1	2
Bucket Cylinder	Closing	3.2 to 3.8	4.6	2
	Opening	2.3 to 2.9	3.5	2
Levelling Blade Cylinder	Lowering	2.4 to 3.0	3.6	2
	Raising	1.9 to 2.5	3.0	2
Swivel Speed	Left	17.4 to 21.2	25.4	3
	Right	17.4 to 21.2	25.4	3
Swing Cylinder	Left	5.9 to 6.5	7.8	4
	Right	5.2 to 5.8	7.0	4
Swing Start	Left/Right	1.7 to 2.3	2.8	0 to 90°

- NOTE :**
1. Cylinder to maximum height without end of stroke cushioning
  2. Complete cylinder stroke
  3. Three complete revolutions
  4. Not counting end of stroke cushioning

## Hydraulic Pumps

	P1, P2	P3	P4
Pump Rotation Speed (rpm)	2450	2450	1700
Test Pressure	206 bar (2986 psi)	191 bar (2773 psi)	98 bar (1422 psi)
Theoretical Displacement	13.2 cm <sup>3</sup> (0.81 in <sup>3</sup> )	8.7 cm <sup>3</sup> (0.52 in <sup>3</sup> )	3.07 cm <sup>3</sup> (0.19 in <sup>3</sup> )
Theoretical Output	32.2 l/min (7.1 gal/min)	21.3 l/min (4.7 gal/min)	4.84 l/min (1.06 gal/min)
Maximum Authorised Output for 85 % use	27.5 l/min (6.04 gal/min)	18.1 l/min (3.98 gal/min)	4.11 l/min (0.9 gal/min)
Maximum Authorised Output for 80 % use	25.8 l/min (5.67 gal/min)	17.0 l/min (3.7 gal/min)	3.87 l/min (0.85 gal/min)

*P1 - First body, main pump*

*P2 - Second body, main pump*

*P3 - Swing pump*

*P4 - Pilot controlled pump*

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