REFLEX MACHINERY

Reflex 50SC Rebar Cutting Machine

Operation Manual

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Safety Notes

1. Before operating the machine, ensure a Residual Current Device (RCD) is installed (refer to Annex I).
2. Before starting a new machine, fill the gearbox with a sufficient amount of gear oil.
3. At the start of each shift, add approximately 10 mL of No. 10 engine oil to the oil cup on the main side cover.
4. Regularly check the bolts on the main side cover and the cutter clamping assembly to ensure they are secure and have not loosened.
5. Inspect the clearance between the two blades, confirm they are securely installed, and check for any signs of damage or cracking.
6. During operation, ensure all safety guards and protective covers are correctly fitted and in good condition.

Purpose

The Rebar Cutting Machine Series is a horizontal cutting machine designed for cutting ordinary carbon steel and hot-rolled round bars used in construction work.

It is also suitable for cutting flat steel and square steel.

This machine is widely used in the construction and machinery industries and is regarded as reliable and efficient equipment for steel cutting applications.

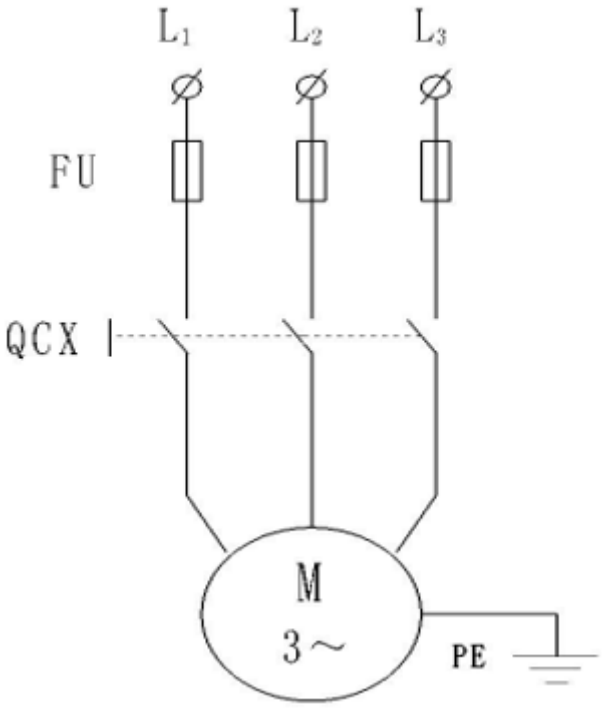
Technical Parameters

Φ mm	R. 45 Kg/mm² 450 N/ mm²			R. 65 Kg/mm² 650 N/ mm²			R. 85 Kg/mm² 850 N/ mm²			Speed r/m	Motor	
Amount of rebar	**1**	**2**	**3**	**1**	**2**	**3**	**1**	**2**	**3**		**HP**	**kW**
35	35	28	20	28	22	18	28	22	16	93	3	2,2
42	45	34	26	36	28	22	34	26	20	48	4	3
55	55	40	30	44	32	24	40	30	22	41	5,5	4

Continuous equivalent noise level: ≤ 75 dB(A), measured as an average at a distance of 1 metre from the machine.

Model	Size (cm) W x D x H	Weight kg
35	94 x 58 x 80	355
42	110 x 50 x90	510
55	127 x 65 x 95	715

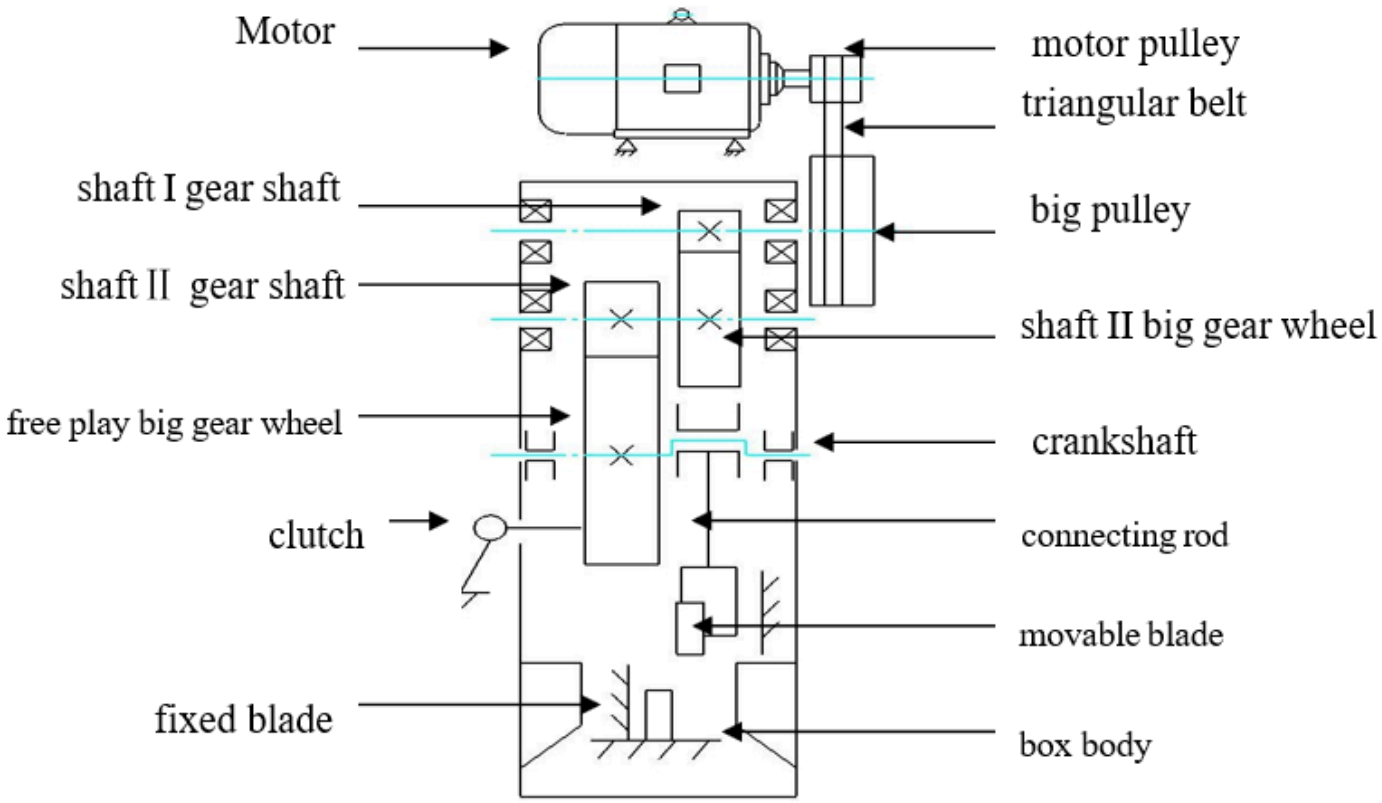
Power Supply



Structural Features

This machine consists of transport wheels, a machine housing, transmission mechanism, clutch assembly, connecting rod components, and electrical equipment (refer to the motion mechanism schematic diagram below.

Schematic diagram of the motion mechanism



Operating Principle of the Motion Mechanism

1. Power Transmission and Cutting Action

As shown in the figure above, the motor drives the large pulley via a V-belt. The large pulley then drives Gear Shaft I, Gear Shaft II, the large gear wheel, and Gear Shaft IV through the gear train.

When engaged, the free-running large gear transmits torque to the crankshaft via the clutch mechanism. The rotating crankshaft converts this rotary motion into linear motion, causing the connecting rod and movable blade to reciprocate.

The movable blade works together with the fixed blade to produce an interleaving shearing action for cutting steel.

2. Clutch Operation

The clutch core housing is rigidly connected to the crankshaft. Torque from the free-running large gear is transmitted through the clutch key to the clutch core housing and then to the crankshaft.

This causes the connecting rod to move back and forth, driving the cutting action.

3. Free-Running Large Gear and Engagement Mechanism

The bore surface of the free-running large gear (hereafter referred to as the large gear) acts as the bearing surface during rotation. Two symmetrical V-grooves are machined into the side wall of the gear.

The clutch core housing is fixed using two flat keys and contains grooves for the clutch key (also referred to as the turn key). The clutch key sits within the groove, with one end engaged in the clutch core housing and the other end extending beyond the clutch plate and fitted with a contact block.

A tension spring continuously pulls the clutch key towards engagement with the V-groove. However, when the control mechanism hook engages the contact block, the clutch key is forced out of the V-groove, allowing the large gear to rotate freely on the crankshaft (disengaged state).

When the control lever is pulled or the foot pedal is pressed, the hook releases the contact block. Under spring tension, the clutch key engages with the V-groove in the large gear. Torque is then transmitted from the large gear to the clutch core housing and crankshaft, causing the connecting rod to reciprocate (engaged state).

When the control lever or pedal is released, the contact block is re-engaged by the hook, forcing the clutch key out of the V-groove. Torque transmission stops, the crankshaft ceases movement, and the machine returns to its ready-to-cut position.

Installation and Operation

1. Unloading

When unloading the machine, ensure the forklift tines are spread as far apart as possible to maintain stability and prevent damage to the machine or risk of injury.

2. Preparations Prior to Use

2.1 Manual Rotation Check
Manually rotate the mechanism to confirm the gears mesh correctly and that there is no jamming or abnormal resistance.

2.2 Blade Installation and Adjustment
Check that both blades are correctly installed and securely fastened.
Adjust the lateral clearance between the blades to 0.05–0.5 mm, according to the diameter and specification of the steel bar being cut.

2.3 Fastener Inspection
Check that all bolts are securely tightened.
Pay particular attention to the bolts on the large side cover and the cutter pushing assembly, and inspect them regularly to prevent loosening.

2.4 Lubrication (New Machine)

- Fill the gearbox with gear oil to approximately two-thirds of the oil sight window.
- Add approximately 10 mL of No. 10 engine oil to the oil cup on the large side cover (refer to the lubrication system diagram).

2.5 Electrical Inspection
Check that all electrical components are functioning correctly and that insulation is intact.
Use W-type three-phase, four-core flexible cable and ensure proper earthing.

After wiring, jog the machine briefly for a trial run. The rotation direction of the large pulley must match the arrow shown on the pulley guard.

2.6 No-Load Trial Run
Run the machine under no-load conditions for 10 minutes.
If any abnormal noise, vibration, or malfunction is observed, stop the machine immediately and carry out inspection and rectification before use.

3. Operating Precautions

3.1 Steel bars must be cut using the middle or lower section of the blade.
Avoid using the upper blade section unless necessary, as this may cause excessive fatigue to the rear section of the machine frame.

3.2 During operation, regularly check whether the large side cover and blades are loose.
Tighten fasteners promptly if looseness is detected.
Confirm that the blade clearance remains within 0.05–0.5 mm, and adjust as required.

3.3 Regularly inspect the blade cutting edges for dullness, chipping, or tipping.
Each blade has four usable edges. Replace or rotate the blade promptly if wear or damage is detected.
Continued operation with damaged or blunt blades will significantly increase cutting resistance and may cause damage to other components.

4. Use of the Clutch

4.1 Single Cutting Operation
After positioning the steel bar at the cutting point, move the eccentric stop iron so that it presses the steel bar firmly and parallel against the fixed blade.

Pull the control lever or press the foot pedal to perform the cut.
Ensure the blade guard is fitted to prevent injury from flying or broken material.

One pull or pedal action completes one cut.
The engagement time must not exceed 1.3 seconds, otherwise continuous cutting may occur (continuous cutting will not occur on machines configured for non-continuous operation).

4.2 Control Lever Operation
When operating the control lever or foot pedal, return the lever promptly to its neutral position after each cut.
The control lever position can be adjusted using the two adjusting screws.
Failure to return the lever correctly may cause premature clutch wear or damage.

Fault Diagnosis and Troubleshooting

Fault	Possible Cause	Corrective Action	Remarks
Excessive noise during start-up	Grease or oil contamination on the motor magnetic pole face	Remove oil using compressed air or a soft brush	Do **not** use hard or sharp objects for cleaning
Periodic “ticking” sound	Pedal adjustment screw is loose	Re-adjust and tighten the screw	—
	Clutch spring is weak or damaged	Replace the clutch spring	—
	Internal scuffing or friction within the machine	Inspect internal components and rectify as required	—
	Free-running large gear is worn	Repair or replace the gear	—
Unable to cut steel bars	Motor rotation direction is incorrect	Change the phase sequence of the power supply	Three-phase supply
	Insufficient lubrication at the crankshaft	Add lubricating oil	Refer to lubrication diagram
	Clutch spring is weak or damaged	Replace the clutch spring	—

Fault	Possible Cause	Corrective Action	Remarks
Excessive vibration / jitter	Steel bar not placed smoothly	Reposition and secure the steel bar	—
	Shaft I is bent or deformed	Realign or replace shaft	—
Connecting rod does not extend	Clutch hook is damaged	Repair or replace	—
	Clutch spring is damaged	Replace the spring	—
	Gear damage	Replace the gear	Check lubrication levels before replacement
Motor overheating	Input voltage too low or power cord too long / undersized	Check supply voltage, adjust, or replace power cord	Voltage must be 380 V ±5% (or as specified)

	Continuous cutting of large steel bars	Use intermittent operation	Avoid prolonged continuous cutting
	Poor electrical insulation	Inspect and rectify	—
Machine frame / box heating	Excessive lubrication	Reduce lubricant to **two-thirds of oil sight window**	—
	Bearing damage	Replace bearings	—
V-belt issues	Belt too loose	Adjust tension using adjustment screws	—
	Clutch turn key or free-running large gear worn	Repair or replace	—
	Connecting rod sliding sleeve severely worn	Replace sliding sleeve	—

Maintenance

1. General Machine Maintenance

1. **Cleaning**
   Use a brush regularly to remove debris from the blades and beneath the connecting rod to keep sliding surfaces clean.

2. **Rust Prevention**
   Thoroughly clean dust and rust from the machine. Apply grease to areas prone to rusting.

3. **Fastener Inspection**
   Regularly check the bolts on the large side cover and the cutter clamping assembly. Tighten any loose screws immediately.

4. **Abnormal Sounds**
   If the machine produces unusual noise, stop operation immediately. Inspect, identify the cause, and carry out necessary repairs before resuming use.

5. **Storage**
   When the machine is not in use, remove the motor and store it in a dry, protected location.

2. Lubrication

- Regularly inspect the machine lubrication system. Refer to the lubrication system diagram for details.
- Ensure that lubricating oil is clean and at the correct level at all times.
- Follow the recommended oil types and quantities for gearbox, blades, and other moving components.

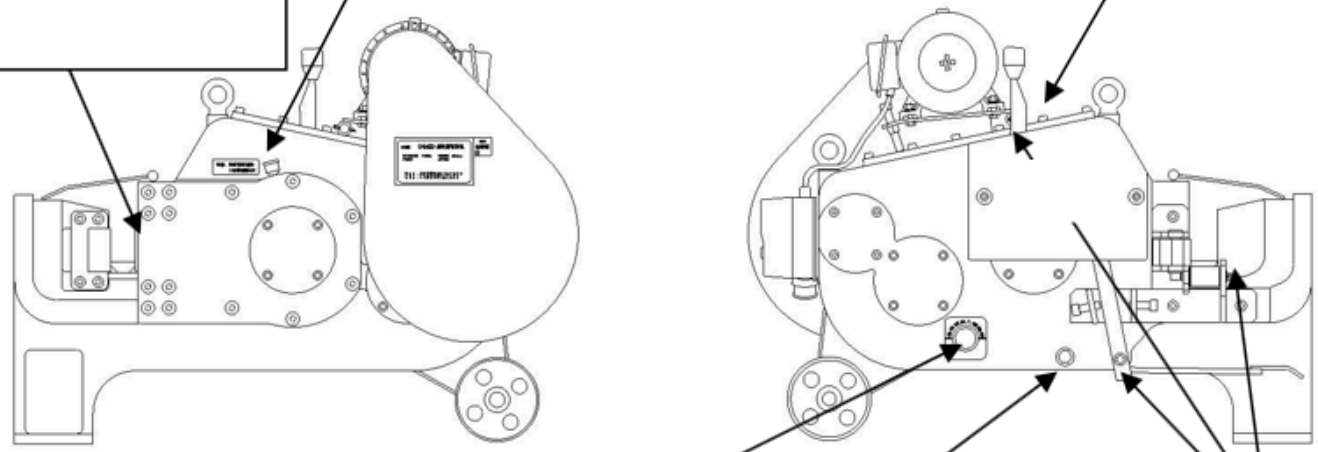
Brand of lubricant	Temperature about 10°C	Temperature about 20°C	Temperature above 30°C
ISO VG	320	460	680
ROL OIL	EP 320	EP 460	EP 680
ESSO	SPARATAN EP 320	SPARATAN EP 460	SPARATAN EP 680
MOBIL	MOBIL GEAR 632	MOBIL GEAR 634	MOBIL GEAR 636
SHELL	OMALA 320	OMALA 460	OMALA 680
AGIP	BLAS1A 320	BLAS1A 460	BLAS1A 680

Model	Oil Mass （L）
35	5
45	8
55	9

smear grease on the side of the connecting rod once a day

refill 10 milliliters of 10 # engine oil into the oil cup per shift

after removing the cover, refill enough gear oil into the new machine;



the oil level shall be maintained at 2 / 3 of the oil window

the first replacement of the lubricating oil is after 80 hours of the effective work of the machine, later on, replace the oil at least once a year according to the actual situation

instill a small amount of engine oil on the sliding surface every week.

System lubrication diagram

Spare Parts List

Description	Material / Model	Qty.	Installed Location
Right sleeve of crankshaft	QT600-2	1	Right end of crankshaft
Left sleeve of crankshaft	QT600-2	1	Left end of crankshaft
Copper sleeve of connecting rod	ZCuAlN13Fe3	1	Connecting rod
Liner plate of connecting rod	ZCuAlN13Fe3	1	Big side cover
Blade	9CrSi	1 per blade	Connecting rod to tiger’s jaw of box body
Deep groove ball bearing	6308	2 per shaft	Shaft I (35, 42)
	6309	4	Shaft I, II (55)
	6310	2 per shaft	Shaft II (35, 45)
	6311	2	Shaft III (55)
V-belt	A1270	2	Pulley (35)
	A1473	2	Pulley (42)
	A1626	2	Pulley (55)
Framework oil seal	56 × 35 × 12	1	Input shaft cover (35)
	62 × 40 × 12	1	Input shaft cover (42)
	72 × 45 × 12	1	Input shaft cover (55)

Annex 1: Use of Residual Current Device (RCD)

- The machine must be protected by a external triple-pole, three-wire residual current device (RCD).
- If a three-pole, four-wire RCD is used:
    - Do not connect the earth wire to the binding post marked “N” on the outgoing side of the RCD.
    - Connecting the earth to this terminal will cause the RCD to trip immediately when switched on.
- Always follow the manufacturer’s wiring instructions and ensure proper earthing according to local electrical standards.