

OPERATING INSTRUCTIONS FOR COLUMBUS ELECTRIC WHEEL NUT RUNNER FOR HEAVY VEHICLES MODEL WNR-EC2 (Electric controlled)

To ensure safe and efficient use, please read through the entire instruction before using the product.

COLUMBUS wheel nutrunner is a special machine designed primarily for loosening and tightening wheel nuts on heavy vehicles - trucks, buses, construction machinery etc.

The numbers in brackets () correspond to the numbers in the attached spare parts list.

SECURITY

Important! Never run the electric motor in the blocked position for more than 3 seconds, as it can overheat and cause damage to the motor.

The left and right switches (2350) (2050) should always be released after every impact you make with the machine, otherwise the motor and the pulling solenoid for switching on the impact mechanism may overheat and damage.

Never push the left-hand handle (the lift handle) if the nut puller is not in the working position (horizontal position). If you accidentally push the elevator handle when the machine is on the side, for example should be transported or repaired, the wheel posture is released and protrudes with force and can damage any body part.

Always relieve pretension of the lift spring when working with it or near it.

The nutrunner is provided with a rotating flywheel and a 230/400-volt electric motor.

The electric motor must always be switched off when the machine is left unattended. The machine is also provided with a heavily pretensioned torsion spring (the elevator spring 210).

Only use the machine on a flat surface. Not when it is on a table or similar stands.

The vehicle to work with may only be lifted on a level surface. If the brakes are not applied on the vehicle, it must be secured by blocks at the wheels.

When transporting, the machine body should be lowered to its lowest position and locked there with a strap or rope.

ELECTRICAL CONNECTION

Connection to the electric grid and any electrical repairs must be made by a qualified electrician.

The electrical protection class is - IP45

The machine and its equipment operate at high voltage – 400 Volt.

Important: The machine must be connected with a 5-wire cable to a 5-pole power socket.

Due to high starting current, the machine should be connected to a separate group with no other load. Fuse minimum 16 Amp.

GENERALLY

As a power source, the nutrunner has an electric motor (900) of 1.1 kW. It works with 3-phase AC 400 volts. The machine receives its current via a two-position rotary main switch (2010) mounted on the junction box.

To start - turn the switch (2010) to position (on).

The pull solenoid for switching on the impact mechanism is provided with a thermal contact (2421) which breaks the current if the magnet becomes overheated. The contact closes when the magnet has cooled down and the machine can be started again.

All controls are located on the handles of the machine.

Start, stop and change of direction of rotation are done with a 3-position rocker switch (2050) on the right shaft.

The working height is regulated with the handle on the left side.

With the left switch (2350) - the impact mechanism is switched on via a pull solenoid. The energy of the flywheel is then transferred to the socket wrench holder tube (300) in the form of an impact.

The flywheel (500) is driven by the electric motor via two drive belts (1020).

HEIGHT ADJUSTMENT OF THE NUTRUNNER

For height control, the machine must be in a horizontal position. Press the left handle, lift or push the machine body to the desired position.

Tip! There are different ways to adjust the working height:

I) For example, place one of your foot against one of the rubber wheel of the nutrunner and pull obliquely upwards or push obliquely downwards in the shafts. A quick method - but it requires some practice and technique.

II) You can also adjust the working height by letting the socket wrench support the nut and lift or push the handles up or down.

III) Another method for adjusting the height is to lift or lower the machine body with the plastic ball placed on the top of the machine body. However, this method is slower than previous described methods.

UNDOING WHEEL NUTS

Vehicles with deactivated parking brake should be secured by wedges at the wheels.
Lift the vehicle to a suitable height and make it safe using stands or similar.
Put a suitable socket on the wrench holder (300).

Align the wrench holder tube (300) and insert the socket on the nut.

Tip! This is facilitated by allowing the wrench holder tube to rotate slowly while inserting the socket on the nut.
When the socket is brand new or if the nut has layers of dirt or paint on it, you may have to turn the wrench holder tube by hand to more easily get on the socket. Clean the nut if necessary.

Tip! When working with vehicle wheels with deactivated parking brake one should work in position at nine o'clock when unscrewing the nut and in position at three o'clock when tightening. Otherwise, the torque wrench tends to rotate the vehicle wheel and lift the nut wrench.

NOTE! It is important that the wrench holder tube forms as straight line as possible to the nut both vertically and laterally, otherwise power is lost at the stroke. The machine can also cause damage by oblique load. A right angle also makes it easier to get the socket on the nut.

Press the right-hand switch (2050). Make sure the flywheel rotates in the right direction. Let the flywheel (500) accelerate to full speed. Release the right-hand switch and press the left-hand switch (2350) simultaneously. The right-hand switch must be released just when you start to push the left-hand switch - this operation must be done simultaneously.

Important! Never run the electric motor in blocked position for more than 3 seconds, as this can cause damage to the electric motor by overheating.

The left- and right-hand switches (2050) (2350) should always be released after every impact you make with the machine otherwise the motor and the solenoid may overheat and damage.

Note! The left switch (2350) **must always be pressed long enough to produce a clean and correct impact - i.e., full connection between the angle pawl and the shoulder of the wrench holder. Only this produces a clean and powerful impact and a complete stop of the flywheel after the impact. If the pressure on the impact switch is not long enough, the angle pawl (620) may slide off the shoulder of the wrench holder (300) and damage the impact mechanism.**

Important! Except when transporting completely loose nut, the nutrunner must never be operated with the left- and right-hand switch pressed simultaneously - the motor and the solenoid can then overheat and cause damage. In addition, the machine can cause several impure and powerless blows that seriously damage the impact mechanism. The nutrunner should only give a clean and powerful stroke at a time so that the flywheel stops completely.

Note! You will damage the impact mechanism of the wheel nut runner if you make too many impacts on a nut which doesn't move or come loose. If the wheel nut doesn't move after approx. five impacts, check what is wrong with the screw joint and take necessary steps to remove the nut. After too many impacts on a nut that does not move, the wheel bolt will crack and must be replaced.

Note! If the left-hand switch is not released it may happen that the angle pawl (620) jams.

If it happens, reverse the electric motor and run the motor in the opposite direction of rotation to release the angle pawl.

Then accelerate the flywheel again and press the left-hand switch for a new stroke.

Repeat this until the nut is loosened.

To transport the nut to its outermost position, keep the left- and right-hand switches pressed simultaneously until the nut is fully unscrewed.

TIGHTENING OF WHEEL NUTS

Before you fit the wheel and nuts, make sure that the contact surfaces between the wheel and hub are free from rust and dirt, and that the rest surfaces are okay.

Carefully clean and lubricate the nuts, washers and studs.

NOTE! Damaged nuts and bolts must always be replaced in order to obtain the exact prescribed press force of the screw joint. The wheel nuts must be tightened accordingly to the sequence prescribed by the manufacturer of the vehicle.

Screw on the nuts a couple of turns by hand.

Proceed as above: "UNDOING WHEEL NUTS" but in the reverse order.

When the nut has come into its bottom position (end of the run-up phase) the flywheel stops, immediately release the left- and right-hand switches - declutching the electric motor.

Always release the left- and right-hand switches at each blow, otherwise the electric motor and the solenoid may overheat and get damaged.

For each following impact, the tightening force increases according to the figures below.

MEAN TIGHTENING TORQUE

Run-up phase approx	370 Nm	37 kpm
1 st impact	"	520 Nm 52 kpm
2 nd impact	"	640 Nm 64 kpm
3 rd impact	"	710 Nm 71 kpm

Note: every following impact increases the torque. Hence, too many impacts may damage the screw joint as well as the rim and hub.

The above figures are obtained from a test carried out by the Chalmers Testing Institute in Gothenburg. These figures must only be used as a guide line.

Note! - To get the exact prescribed torque at the final tightening phase a manual torque wrench should be used. The wheel nuts must always be tightened and retightened accordingly to the prescription of the vehicle manufacturer.

SERVICE AND MAINTENANCE

For optimal function, it is important that the machine is kept clean from dirt and dust and lubricated regularly! The moving parts must be lubricated regularly with motor oil.

For greasing of the bearing (320) of the wrench holder tube (300), remove the flywheel cover (1600): **Lean the machine forward.** Move the flywheel backwards with your hand in order to open the gap between the flywheel and the rear end of the wrench holder tube. Drip a few drops of motor oil into the gap between the flywheel and the rear end of the wrench holder. Let the machine remain tilted for a while, allowing the oil to penetrate into the bearing.

For greasing of the flywheel bushing (520): **lean the machine backwards.** Drip a few drops of motor oil into the lubrication hole indicated "oil" on the wrench holder tube. Let the machine remain tilted for a while so that the oil can penetrate into the bushing.

All moving parts of the machine - lift spring unit, wheel axles, handles, rocker arm bushings, wire attachments shaft trunnions etc. must be lubricated regularly with motor oil.

Keep the shafts of the lift stand clean. This makes the height adjustment easy.

Note! Grease or oil on the lift stand shafts makes dirt and dust fasten easily on the shafts and makes the height adjustment heavy. If necessary, only lubricate the lift stand shafts with WD40 or similar thin lubricants.

Note! When lubricating, make sure that neither grease nor oil gets on the clutch or flywheel brake.

CHANGING AND ADJUSTMENT OF DRIVE BELT

Note! Drive belt wax must not be used. It will damage the clutch brake of the machine and the machine will not work properly.

Remove the cover (1800).

Undo the belt tension screw (1430 left) to slacken the belt tension.

Undo and remove the rear nut of the flywheel shaft (400).

Pull out the flywheel assembly enough to remove the front nut of the flywheel shaft.

Pull out the whole assembly - flywheel and wrench holder tube with shaft (500, 310)

Place the new drive belts around the motor pulley and at the inside of the drive belt cover of the machine body.

Insert the flywheel assembly and lift the clutch brake (700) a little to allow the clutch carrier (550) to enter. Fit the front nut and the locking washer (Nord Lock) to the shaft before guiding the whole unit into its final position. Check that the drive belts are well positioned.

Adjust the **flywheel's axial clearance (axial clearance about 0, 5 mm)** with the front nut of the shaft, and tighten the flywheel shaft with the rear nut. **Check that that the clearance is okay, i.e., the flywheel (500) and wrench holder tube (300) should rotate freely when you move it by hand.**

Make sure that the push rod (1210), between the motor and the adjustment screw is correctly positioned.

Start the electric motor and adjust the belt tension by tightening the adjustment screw (1430). Then check that the electric motor stops at full resistance.

Note! Never run the electric motor more than three seconds in blocked position, otherwise the motor may overheat and get damaged.

Readjust the belt tension if necessary and check again.

Note! A correct belt tension is of most importance to get clean impacts and full power from the machine.

REPLACING AND ADJUSTING THE ELECTRIC SOLENOID.

Remove the protective cover over the solenoid. Mark carefully the position of the plunger in the solenoid. Disconnect the power cables and diode (2420) to the solenoid. Note the direction of the diode. Loosen the pin of the plunger. Release and lift out of solenoid. Fit the thermo switch (2421) to the new solenoid.

Mount and tighten the new solenoid. Connect the power cables. The diode must be mounted so that the circular ring falls towards the plus side - see the symbol in the attached electrical diagram.

Adjust the drawbar so that the plunger fits exactly at the marking made before.

If the end position screw (1332) has been loosened, adjust it as follows: Screw down the screw at the bottom. Loosen the screw so that there is a play of approx. 0.5mm between the end position screw and the control arm - the clutch brake is then released. Lock the screw with the lock nut. Then check that the angle pawl (620) does not move when the flywheel is turned by hand with the solenoid unaffected.

When changing to a new clutch brake (700), the stroke of the tie rod must be adjusted so that the plunger of the solenoid is 12 ± 1 mm out from its innermost position. These 12 mm are needed so that the plunger does not go to the bottom when the brake lining is worn out. If the plunger is installed too far in, it catches the bottom of the magnet when the brake lining has worn to a certain level. The force of the solenoid is then not sufficient to engage the angle pawl (620).

If the plunger comes out too far, the pulling force of the solenoid is not enough to fully engage the angle pawl. In both cases, the angle pawl and the heel on the socket wrench tube are damaged. The basic adjustment of 12 ± 1 mm is therefore very important for the machine's function. Continuous adjustment of the drawbar length should normally not be necessary, if the basic setting is done correctly.

CHANGING AND ADJUSTMENT OF LIFT SPRING

Remove the cover (1800) and lift the machine body up to its upper position.

To release the tension of the lift spring (210), use two screw drivers - 6 mm thick and about 200mm long. Insert one of the screw drivers into a hole in the tensioning roller (230). Turn the roller and remove the retaining pin (270). Then release the spring tension, step by step by using the two screw drivers.

Remove the small end-cap for the shaft (250) at the rear panel of the chassis.

Compress the spring unit so you can grip the shaft (250) with a pair of pliers. Protect the shaft from being damaged by the pliers. Push the shaft backwards some millimetres. Grip the shaft in the rear end, and pull out. Remove the spring unit upwards. Replace the damaged parts.

Make sure that there are no damages on the shaft (250), so that the rollers (200) and (230) can rotate freely on the shaft.

When fitting a new lift spring, it is important that the hooks of the lift spring fit well into the holes of the lift drum (200) and the tensioning roller (230). If not - adjust the holes with a drill so that the hooks enter perfectly into the holes, and the ends of the spring touch the rollers.

If the original holes turn out to be too big after the adjustment and the spring risks to slip out of the holes, new holes can be drilled close to the old ones.

The new hole of the lift drum (200) should be drilled approx. 15 mm clockwise from the old hole.

To prevent the end of the spring hook from coming out at the grooves of the lift drum, the new hole of the lift drum should be drilled as close as possible to the peg of the lift drum. Before you drill the holes, put a mark on each roller indicating the direction of the hooks of the lift spring and drill in the direction of the marks.

To get as good position as possible of the new lift spring, the new holes must be drilled in the exact direction of the hooks of the new spring then it will fit and work well.

Notice - never try to adjust the ends of the new spring. This will reduce the strength of the spring.

All details – shaft (250), rollers (200 and 230), guiding sleeve (220) and lift spring (210) – should be greased with grease or motor oil for best function.

Compress the spring unit and fit it into the machine. Line up the holes in the rear end. Insert the lift shaft into the tensioning roller and the lift drum - chamfered end of the shaft backwards. Make sure that the lift shaft fully enters its hole in the front panel of the machine body then lock the wire in the upper wire attachment bar.

Fit the small end-cap for the shaft (250).

Wind up the wire on the lift drum by rotating the spring unit by hand. Keep the wire tensioned so it stays in the grooves of the lift drum. Check that the wire is correctly wound on the lift drum.

Tension the lift spring and lock with the pin (270). Check that the lift and lowering force is well balanced. If not adjust the lift spring until correct balance is achieved.

Always make sure that all parts are greased with grease or motor oil.

TECHNICAL DATA

Weight:	60 kg
Length:	1300 mm
Width:	600 mm
Height:	1000 mm
Motor:	1.1 kW, 230/400 V, 3-phase, 50/60 Hz, protection class – IP54
Socket holder:	Internal mount 1"x1"

The factory warranty becomes void if the machine's design is altered.

We reserve the right to make design changes without prior notice.

Compliance with EU Regulations

Machinery Directive 2006/42/EC

Noise level: EN ISO 3744: EN ISO 11201

Vibration level: ISO 5349: EN ISO 20643

Low Voltage Directive 2014/35/EU

EMC: EN 61000-6-2: EN 61000-6-4

RoHS Directive (2011/65/EU)



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