

Secoroc Rock Drilling Tools

Secoroc 76 Series Rock Drill

Secoroc 7655/7655D Pusher Leg Rock Drill

Operator's instructions / Spare parts list

Foreword

Thank you for selecting the Secoroc pusher leg rock drill 7655/7655D.

These instructions were developed to help you get the best performance and productivity from the use of your new rock drill.

Please refer to them also for the correct maintenance of the rock drill.

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Scope of application

Model 7655 is a highly efficient rock drill. It is mainly used in either rock drilling work such as mining and tunneling, or in railway, water conservancy construction projects and stone work. It is suitable for wet drilling on hard and medium hard rock, or for drilling horizontal or inclined blast holes. 7655 can be equipped with pusher leg FT160A and FY200A lubricator.

Model 7655D is a low energy consumption rock drill based on model 7655. It has good performance at low air pressure, with long air lines or powered by small sized air compressor. 7655D is mainly used in the same applications as the 7655. It can be equipped with pusher leg FT160A and FY200A lubricator.

Specification

Pneumatic rock drills 7655 and 7655D			
	7655	7655D	
Weight	24	24	kg
Dimension (L x W x H)	628 x 232 x 207	668 x 232 x 202	mm
Cylinder diameter	76	70	mm
Piston stroke	55	70	mm
Minimum working pressure	3	3	bar(e)
Impact energy (at 6.3 bar (e))	≥65	≥65	J
Impact energy (at 5.0 bar (e))	≥59	≥57	J
Impact energy (at 4.0 bar (e))	≥42	≥44	J
Air consumption (at 6.3 bar (e))	≤80	≤80	l/s
Air consumption (at 5.0 bar (e))	≤54	≤52	l/s
Air consumption (at 4.0 bar (e))	≤50	≤45	l/s
Impact frequency (at 6.3 bar (e))	≥37	≥32	Hz
Impact frequency (at 5.0 bar (e))	≥36	≥31	Hz
Impact frequency (at 4.0 bar (e))	≥34	≥30	Hz
Torque (at 6.3 bar (e))	≥18	≥18	Nm
Torque (at 5.0 bar (e))	≥15	≥15	Nm
Torque (at 4.0 bar (e))	≥12	≥12	Nm
Water pressure	working pressure -1	working pressure -1	bar(e)
Air hose inner diameter	25	19	mm
Water hose inner diameter	13	13	mm
Drilling diameter	34-42	34-42	mm
Max drilling depth	5	5	m
Working temperature	-30 to +50	-30 to +50	°C
Shank size	H22x108±1	H22x108±1	mm
Noise level	≤125		dB(A)
Lubricator FY200A			
Weight	1.2		kg
Capacity	0.2		litre

Safety instructions

To reduce the risk of serious injury or death to yourself or others, carefully read through this instruction booklet before putting the rock drill to use. Always follow the instructions given in this manual.

- Always wear a safety helmet, impact resistant eye protection with side protection and ear protectors with CE mark during drilling. Any local regulations that exist must also be observed.
- When drilling in certain minerals, there is a risk of spark generation. Before starting work, check that the machine is approved (in accordance with local regulations) for work under such conditions.
- Always take great care when using the machine. The drill steel is subjected to heavy loading and can break, with a risk of injury to personnel.
- Check that the hoses used are of the right quality, and that all hose connections are in good condition and properly tightened.
- Before starting work on any of the systems, make sure that the air and water systems are without pressure.
- Make sure that there are no concealed wires or other sources of electricity. Never drill near any electric wires or other sources of electricity.
- Exposure to crystalline silica (sometimes called 'silica dust') as a result of drilling in rock may cause silicosis, cancer or death. Never operate the rock drill without water flushing.
- A compressed air hose that comes loose can lash around and cause personal injury or death. Check that the compressed air connections are not damaged and that they are properly attached.

Operation

Using the rock drill for the first time

When the rock drill arrives from the factory, the inside of the machine is coated with heavy oil to prevent corrosion.

After unpacking and installing the machine, pour a small amount of lubrication oil into the air connection and operate the machine on partial throttle to clean the interior. Follow this immediately with a liberal amount of air tool oil.

The rock drill and pusher leg are lubricated with oil mixed with compressed air, which is taken to the parts that need continuous lubrication. Oil is metered into the compressed air using the FY200A lubricator connected to the air line.

Preparations before starting

1. Check the drilling equipment

- Check that all of the drilling equipment is in good working order.
- Check that the impact surface of the drill steel shank is flat with no signs of wear.
- Make sure that the air inlet and exhaust ports are free from obstructions.
- Check that the flushing holes in the drill steel and drill bit are not blocked and that the flushing air/water flows through without obstruction.
- Ensure that the fittings are tight and leak-proof.

WARNING

A compressed air hose that comes loose can lash around and cause personal injury or death. Check that the compressed air connections are not damaged and that they are properly attached.

2. Blow out the air hose

Every day before using the drill, blow out the air hose to clear it from accumulated dirt and moisture.

3. Check the lubrication oil level

- Fill the lubricator with oil if necessary.
- Always use a recommended lubricant.

Lubricant recommendation	
Use a mineral-based air tool oil	
Ambient temperature °C	Viscosity grade (ISO 3448)
-30 to 0	ISO VG 32-68
-10 to +20	ISO VG 68-100
+10 to +50	ISO VG 100-150

4. Air/water pressure and hose dimensions

Air pressure

Ensure that the compressor can deliver the required air pressure of 5 bar at the machine.

- High pressure (>6.3 bar) causes rough operation and damage.
- Low pressure (<4 bar) results in a slow drilling speed.

Water pressure

Set the water pressure to around 3 bar. Maximum water pressure is 1 bar less than the working pressure. For example if the air pressure is 5 bar, the water pressure must be below 4 bar to prevent water entering the impact mechanism.

Air hose dimensions

The air hose diameter for model 7655 must be no less than 25 mm and no less than 19 mm for model 7655D. The inner diameter of connection nipples and hoses must be no less than 19 mm. The ideal overall air hose length is less than 15m.

Water hose dimensions

The water hose inner diameter for model 7655 and 7655D must be no less than 1/2".

5. Prevent freezing

In low ambient temperatures, ice can form in the machine. This can be avoided if the water in the compressed air is removed. This can be done by equipping the air lines with water separators and drainage points for water condensate.

If the rock drill ices up, it must not be heated to melt the ice. Let the ice thaw at room temperature.

Do not pour methylated spirits or similar substances into the rock drill, as they will interfere with the lubrication and lead to increased wear.

Fitting and removing the drill steel

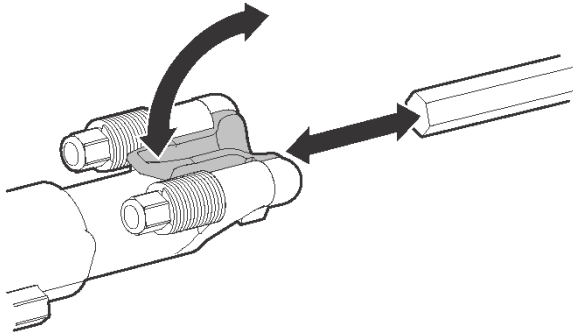
Before fitting the drill steel

- Check that the drill steel shank is of the correct size and length for the chuck used.
- The shank must be clean and the drill steel must be in good condition.
- The suitable quenching hardness of the shank is HRC48-53. A harder end face will cause piston damage and breakage of the end face of the piston. If the shank face is too soft it will be easily deformed by the piston which will result in difficulty in removing the drill steel.
- The shank end face shall be flat and perpendicular to the axis.
- Remove sharp edges from the shank's end face. A rough shank surface will cause premature piston failure.
- Inspect the drill steel: A dull drill steel will slow down the drilling speed and overstrain the drill mechanism. When changing drill steel make sure that the new one is the correct size to follow your previous bore.

- Before drilling check that the flushing hole in the drill steel is not blocked.

Fitting the drill steel

1. Push the retainer outwards in the direction of the arrow (see picture below), until the front portion of the retainer is able to accommodate the drill steel collar.
2. Insert the drill in the chuck.
3. When the drill bottoms, push back the retainer to lock it.

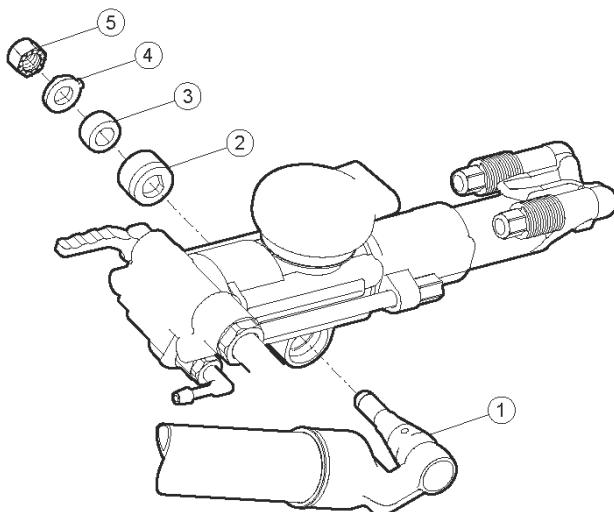


Removing the drill steel

1. Push the retainer outwards in the direction of the arrow until the drill steel collar disengages from the front of the retainer.
2. Pull the drill steel out.
3. Push back the retainer.

Attaching the pusher leg to the rock drill

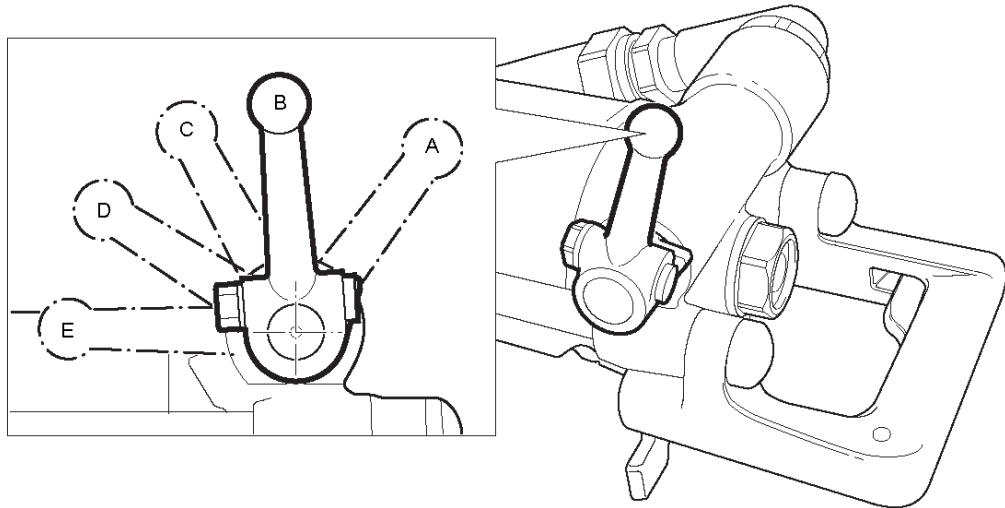
- Mount the pusher leg (1), lock sleeve (2), rubber pad (3), washer (4) and locking nut (5) in the order shown in the picture below.
- Turn the locking nut clockwise with a wrench until you hear a "click".



Controls

Throttle lever

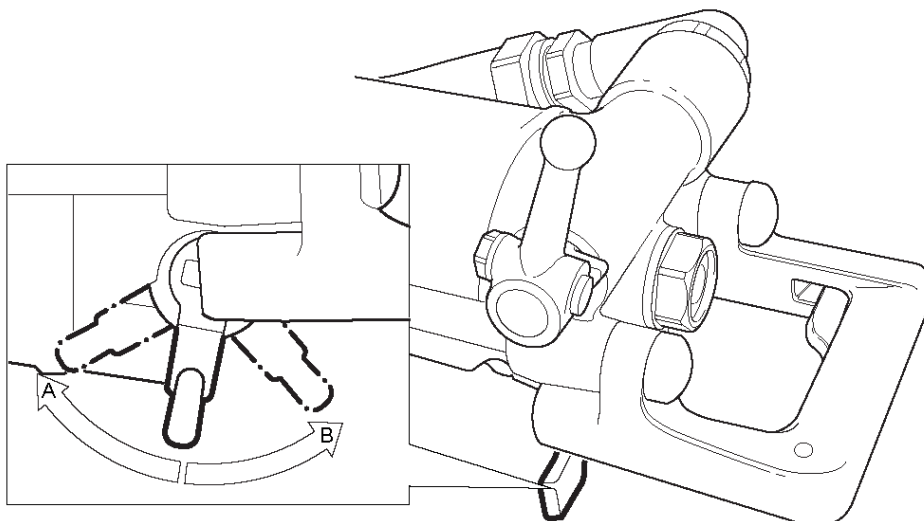
The rock drill is equipped with a throttle lever for regulating both the compressed air to the percussion mechanism and the flushing water.



- A. Extra blowing, water flushing off, impact and rotation off.
- B. Stop position, air and water off
- C. Low throttle, air to pusher leg, water flushing
- D. Medium throttle
- E. Full throttle

Feed control

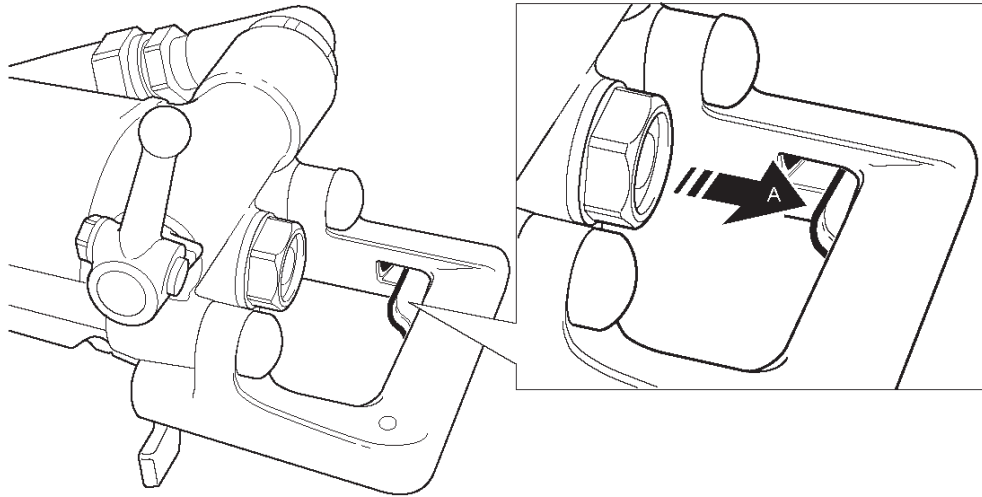
Adjust the feed force using the feed control lever.



- A. Pushing the lever in this direction will increase feed force.
- B. Pulling the lever in this direction will decrease feed force

Trigger

When the trigger (A) is pushed in, the feed force stops abruptly and the setting on the feed control lever is overridden. The piston rod in the pusher leg retracts automatically. This function is used for example to adjust the height of the rock drill, when rigging up the pusher leg, or when there is a tendency to jam. When the trigger is released, the feed control setting is activated again.



Oil regulating valve

Oil dosing is controlled using a screwdriver. Tighten the nut after regulation.

Check that sufficient lubrication is obtained by putting your hand in front of the exhaust port while adjusting the regulating valve. If the hand is covered by a thin film of oil after a few seconds, the lubricator has been correctly adjusted. Too much oil will have negative effects on the operation whilst too little will result in damage to parts as the temperature rises during operation.

The amount of oil going into the rock drill increases when turning the valve counter clockwise, and it decreases when turning the valve clockwise. Oil consumption is 2.5–6 ml/minute.

Drilling

Starting the rock drill

1. Open the main valve for compressed air.
2. Open the cock for the flushing water.
3. Adjust the feed control lever to give a suitable feed force for collaring the hole.
4. Align the rock drill so that the drill steel touches the desired collaring point.
5. Move the throttle lever forward a little, which will start water flushing, percussion and rotation.
6. Collar the hole with reduced feed force.
7. Move the throttle lever fully forward once the drill steel has gained a secure footing in the rock.
8. Adjust the feed force using the control lever so that the maximum penetration rate is obtained.

Note! Do not bend the drill steel as this will increase wear of the shank bushing and piston. It can also affect drilling efficiency and increase the risk of drill steel breakage.

Stopping the rock drill

Pull the throttle lever backwards, which will stop percussion, rotation and flushing water.

Checking the lubrication

The chuck and drill steel shank must always be covered by a film of oil.

Re-positioning the pusher leg

1. Switch off the rock-drill percussion and flushing using the throttle lever.
2. Press the trigger, whereupon the piston rod is pulled back into the pusher-leg cylinder automatically.
3. Re-position the pusher leg.
4. Release the trigger, whereupon the piston rod will move outwards again.
5. Move the throttle lever forward into the working position.

Note! The feed control lever does not need to be touched throughout this operation.

Blow-cleaning the drill hole

CAUTION

When blow-cleaning, particles and dirty flushing water can emerge at speed from the drill hole.

- Move to the side and cover your eyes before starting to blow-clean the drill hole.
- Always wear impact resistant eye protection with side protection to avoid injury.
- Make sure that no co-workers are in range when blow-cleaning.

If powerful blow-cleaning of the drill hole is required, turn the throttle lever fully backwards beyond the stop position for extra blowing whereupon the rock drill

stops. This can be done during drilling. When the drill hole is clean, turn the throttle lever forwards again to re-start the rock drill.

When you have finished drilling

Run the rock drill at medium speed when retracting the drill steel from the drilled hole.

Lay down the rock drill on a stone, wooden plank or similar object, so as to prevent drill cuttings and other foreign matter from entering the chuck.

Turn off the water pressure before the air pressure. Run the rock drill for a few seconds to clean out water and moisture after the water has been shut off.

Maintenance

Regular maintenance is a prerequisite for machine safety. Replace damaged and worn components in good time.

Check the machine and drill steel for wear and damage at regular intervals. Do not use a very worn or damaged drill steel.

When cleaning mechanical parts with a solvent, make sure that you comply with current health and safety regulations and ensure that there is sufficient ventilation.

Daily maintenance, regular checking of wearing parts and carrying out repairs in good time prevents breakdowns and increases the service life of the machine.

- Make sure that no foreign matter enters the machine.
- Always hose down and wipe clean the rock drill and pusher leg after use.

Once a shift (after 8 hours of operation)

- Check the wear in the chuck bushing. If the wear limit has been exceeded, the drill steel shank will wear more quickly, or become deformed. This will lead to stoppages and increased drill steel consumption.
- Check the rock drill's connection to the pusher leg.
- Check the hoses, couplings and controls for leakage and damage.
- Check that the rock drill and pusher leg are receiving enough lubrication. Fill the lubricator as necessary.
- Every day before using the drill, blow out the air hose to clear it from accumulated dirt and moisture.
- Drain the water separator.
- Check the air and water pressure. Make sure that the water pressure is at least 1 bar lower than the air pressure.

Once a week (after 40 hours of operation)

Carry out a basic check of all functions of the drilling equipment.

Once a month (after 200 hours of operation)

- Send the rock drill to a workshop for inspection. The local operating conditions will determine whether or not this is a suitable interval for overhauling the drill.
- Dismantle and clean the lubricator.

- Clean out the water separator.

Selection of spare parts

Use only genuine parts for replacement, to ensure stable performance. Do not use pattern parts, which not only have a short working life but also cause consequential damage to other parts, due to differing measurements and methods of manufacturing.

Storage

- Always oil the rock drill and pusher leg well before you put them into storage.
- Store the rock drill and pusher leg in a clean and dry place.
- In the case of long-term storage, pour a quantity of oil directly into the rock-drill's air intake and then turn on the air briefly. This will protect the machine from corrosion.
- Protect the chuck using a wooden plug or a clean piece of cotton waste.

Scrapping and waste disposal

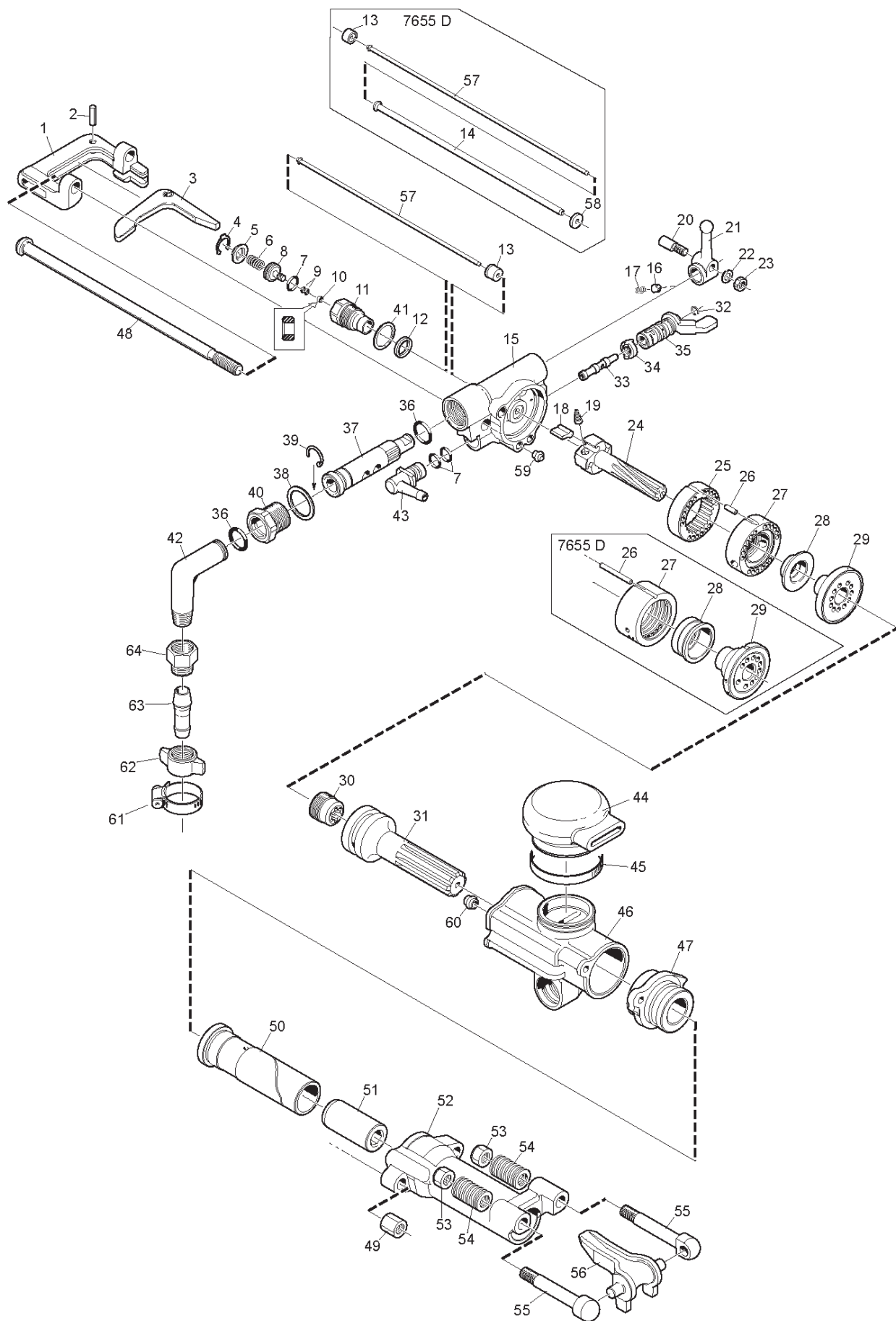
Used and worn-out machines must be disposed of in such a way that as much of the material as possible can be recycled and the impact on the environment is kept to a minimum.

Trouble shooting

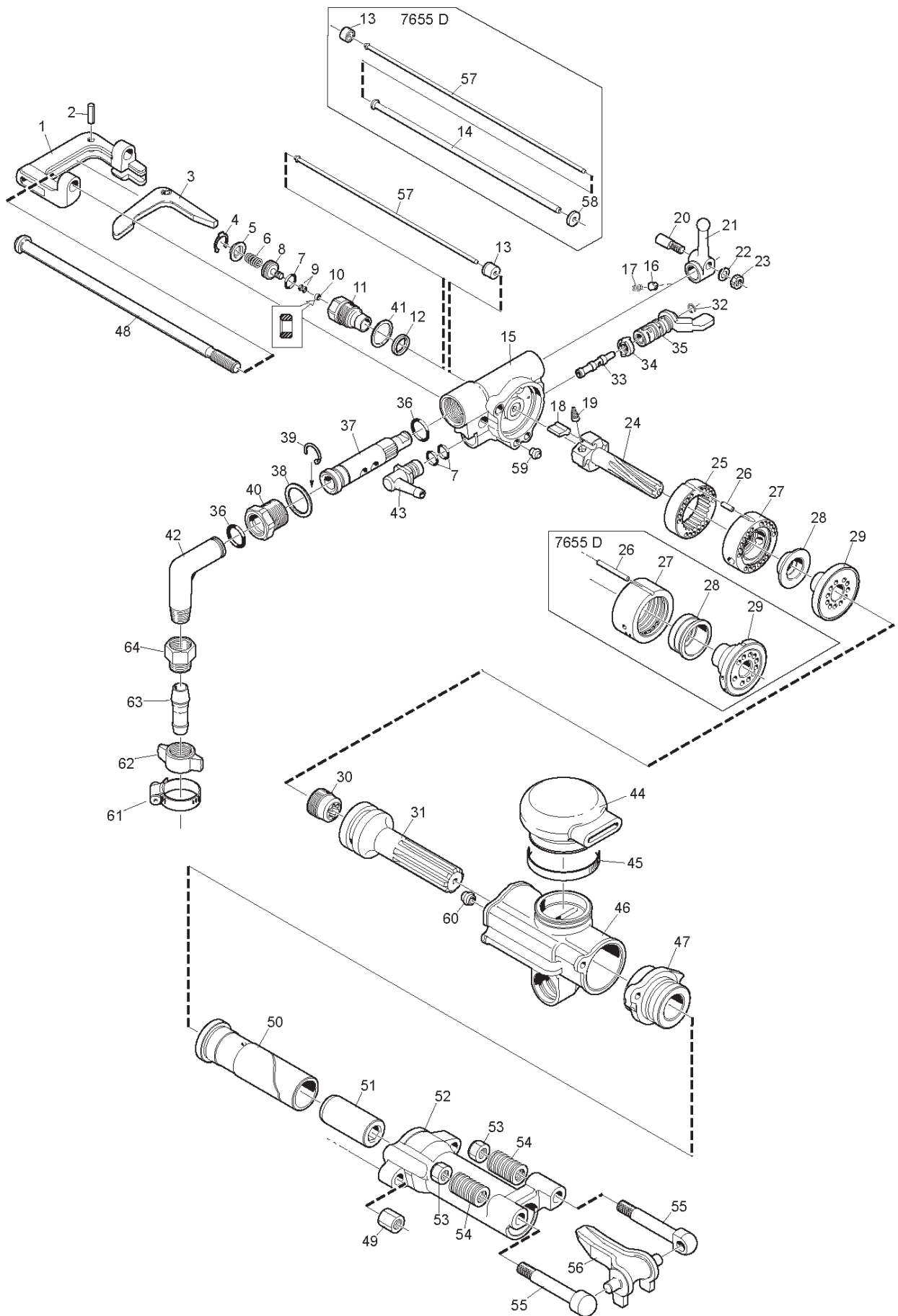
Problem	Cause	Solution
Decreased penetration rate	Air leakage in hoses, couplings	Change packings, and where required, change parts in the throttle valve
	Shank sleeve	Check the shank sleeve for excessive wear. Replace if necessary.
	Air leakage due to worn piston/cylinder	Replace the piston and/or cylinder
	Air leakage due to worn guide sleeve/pilot guide	Change the worn part
Insufficient feed force	Piston rod seal (in pusher leg) worn or deformed	Change the seal
	O-rings on pusher leg coupling worn or deformed	Change the o-ring
Poor rotation	Splines of the rifle nut worn	Replace the rifle nut if the splines are worn
	Splines of the rifle bar worn down	Replace the rifle bar when needed
	Splines on the piston worn down	Replace the piston when needed
	The tothing in the ratchet housing is worn out	Replace the ratchet housing if the tooth housing is so worn that the pawls have difficulty catching
	The tothing in the ratchet wheel is worn out	Replace the ratchet wheel if the tothing is so worn that the pawls have difficulty catching
	Chuck nut worn out	Replace the chuck nut if the splines have been worn to 1/2 of the spline width
	Pawls worn	Replace all pawls, all pawl springs and all pawl pins
Uneven running	Piston has seized in the guide sleeve or the piston guide	Replace the guide sleeve/piston guide. If required, polish the piston. Check the piston for heat damage such as blue colouring and/or fissures. If it is damaged in this way, replace the piston as well
	Dirty or damaged main valve. Caused by impurities or foreign matter entering the drill with the compressed air	Clean and polish the valve so that it seals against the corresponding cylindrical and plane sealing surfaces. If this is not possible because the defects are too serious, the valve must be replaced
	Freezing. Caused by leakage in the flushing system or by excess water in the compressed air or by excessive water pressure	Check the flushing tubes and seals and the water pressure. Drain water from the compressed air system. If the problem continues, fit a water separator in the airline system.

Problem	Cause	Solution
Uneven running (continued)	The side bolts are unevenly or insufficiently tightened. Can cause the various parts to lose their alignment, resulting in the seizure of the movable parts. Abnormal strains on the side bolt may result in fracture at the threads.	Check and repair any damage to the contact points and tighten the bolts with the correct tightening torque
The drill gets hot	Lack of oil	Add oil and check that it runs through. It is not sufficient that there is oil in the exhaust air. There must also be an oil coating on the shank of the drill steel.
Freezing	High level of humidity in the compressed air	Use water traps
	Water pressure higher than the air pressure	Lower the water pressure
Water pipe breakage	Misalignment of the shank	Change drill steel or shank sleeve or both
	Damaged flushing hole in the shank	Change drill steel
Chipping of the piston tip	Misalignment of the shank	Change the drill steel or shank sleeve or both
	Excessive wear of the piston tip	Change piston
Spline breakage	Lack of lubrication	Lower the water pressure if it is the same as or greater than the air pressure
		Increase lubrication or change oil
	Dirt intrusion (specially when drilling upwards)	Increase service intervals
Piston breakage	Lack of lubrication	Lower the water pressure if it is the same as or greater than the air pressure
		Increase lubrication or change oil
	Uneven tension in the side bolts	Tighten the bolts correctly
	Worn guide sleeve/piston guide (can be confirmed by the cushion test)	Change the worn part
Side bolt breakage	Uneven tension on the bolts	Tighten the bolts correctly

Spare parts list and exploded drawing



No.	Description	Quantity		Product no.	Product code
		7655	7655D		
1	Handle	1	1	96000819	9600-1-3312310016
2	Roll pin	1	1	96000527	9605-1-3312310708
3	Trigger	1	1	96000820	9600-1-3312310017
4	Circlip	1	1	96000183	9605-1-3312310173
5	Spring cap	1	1	96000169	9605-1-3312310159
6	Spring	1	1	96000170	9605-1-3312310160
7	O-ring	3	3	96000482	9605-1-3312310627
8	Water valve	1	1	96000173	9605-1-3312310163
9	O-ring	2	2	96000489	9605-1-3312310642
10	Rubber pad	1	1	96000175	9605-1-3312310165
11	Water valve body	1	1	96000171	9605-1-3312310161
12	O-ring	1	1	96000181	9605-1-3312310171
13	Water tube sleeve	-	1	96000835	9601-1-3312310035
13	Water tube sleeve	1	-	96000822	9600-1-3312310019
14	Air tube	-	1	96000837	9601-1-3312310037
15	Back head	-	1	96000834	9601-1-3312310034
15	Back head	1	-	96000829	9600-1-3312310026
16	Lock pin	1	1	96000180	9605-1-3312310170
17	Spring	1	1	96000179	9605-1-3312310169
18	Ratchet pawl	4	4	96000166	9605-1-3312310155
19	Conical spring	4	4	96000167	9605-1-3312310156
20	Lock pin	1	1	96000177	9605-1-3312310167
21	Operation handle	1	1	96000178	9605-1-3312310168
22	Standard spring pad	1	1	96000534	9605-1-3312310716
23	Hexagon thin nut	1	1	96000524	9605-1-3312310704
24	Rifle bar	-	1	96000102	9602-1-3312310075
24	Rifle bar	1	-	96000810	9600-1-3312310005
25	Ratchet	1	1	96000805	9600-1-3312310000
26	Lock pin	-	1	96000839	9601-1-3312310039
26	Lock pin	1	-	96000809	9600-1-3312310004
27	Valve chest	-	1	96000840	9601-1-3312310040
27	Valve chest	1	-	96000806	9600-1-3312310001
28	Valve	-	1	96000841	9601-1-3312310041
28	Valve	1	-	96000807	9600-1-3312310002
29	Valve sleeve	-	1	96000842	9601-1-3312310042
29	Valve sleeve	1	-	96000808	9600-1-3312310003
30	Rifle nut	1	1	96000814	9600-1-3312310009
31	Piston	-	1	96000843	9601-1-3312310044
31	Piston	1	-	96000811	9600-1-3312310006



No.	Description	Quantity		Product no.	Product code
		7655	7655D		
32	Spring fixing ring	1	1	96000831	9600-1-3312310028
33	Change valve	1	1	96000827	9600-1-3312310024
34	Expansion ring	1	1	96000830	9600-1-3312310027
35	Pressure regulating valve	1	1	96000828	9600-1-3312310025
36	O-ring	2	2	96000486	9605-1-3312310633
37	Control valve	-	1	96000090	9601-1-3312310048
37	Control valve	1	-	96000824	9600-1-3312310021
38	Pad	1	1	96000174	9605-1-3312310164
39	Check ring	1	1	96000182	9605-1-3312310172
40	Air tube nut	1	1	96000823	9600-1-3312310020
41	Pad	1	1	96000184	9605-1-3312310174
42	Air tube swivel	1	1	96000825	9600-1-3312310022
43	Water tube connector	1	1	96000826	9600-1-3312310023
44	Silencer	1	1	96000137	9603-1-3312310125
45	Hoop	1	1	96000542	9605-1-3312310725
46	Cylinder	-	1	96000838	9601-1-3312310038
46	Cylinder	1	-	96000812	9600-1-3312310007
47	Guide sleeve	-	1	96000844	9601-1-3312310045
47	Guide sleeve	1	-	96000813	9600-1-3312310008
48	Side bolt	-	2	96000151	9603-1-3312310140
48	Side bolt	2	-	96000832	9600-1-3312310029
49	Hexagon thick nut	2	2	96000518	9605-1-3312310697
50	Rotation sleeve	-	1	96000089	9601-1-3312310047
50	Rotation sleeve	1	-	96000816	9600-1-3312310011
51	Shank sleeve	1	1	96000168	9605-1-3312310157
52	Front head	-	1	96000845	9601-1-3312310046
52	Front head	1	-	96000815	9600-1-3312310010
53	Hexagon lock nut	2	2	96000531	9605-1-3312310713
54	Retainer spring	2	2	96000818	9600-1-3312310013
55	Retainer bolt	2	2	96000634	9600-1-3312311820
56	Retainer	1	1	96000635	9600-1-3312311821
57	Water tube	-	1	96000836	9601-1-3312310036
57	Water tube	1	-	96000821	9600-1-3312310018
58	Air tube pad	-	1	96000176	9605-1-3312310166
59	Small seal	2	2	96000543	9605-1-3312310726
60	Large seal	1	1	96000544	9605-1-3312310727
61	Hoop	1	1	96000540	9605-1-3312310723
62	Wing nut	-	1	96000218	964H-1-3312310213
62	Wing nut	1	-	96000185	9605-1-3312310175
63	Conical hose nipple	-	1	96000222	9605-1-3312310219
63	Conical hose nipple	1	-	96000186	9605-1-3312310176
64	Pipe connector	-	1	96000223	9605-1-3312310220
64	Pipe connector	1	-	96000187	9605-1-3312310177



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