

HILTI

DX 351

Bedienungsanleitung

de

Operating instructions

en

Mode d'emploi

fr

Istruzioni d'uso

it

Manual de instruções

pt

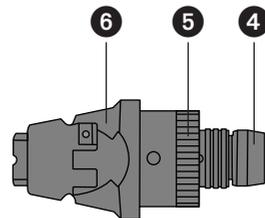
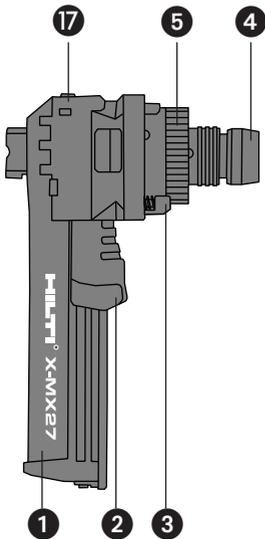
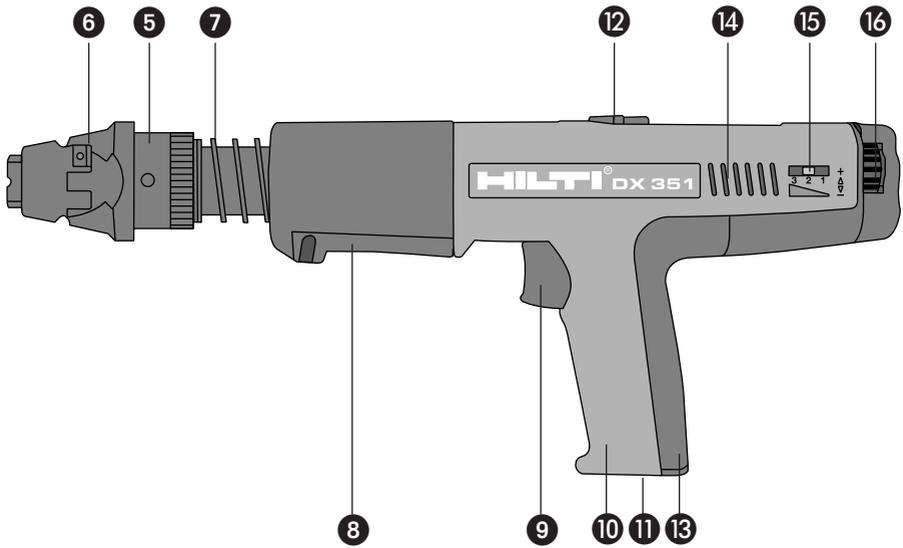
Manual de instrucciones

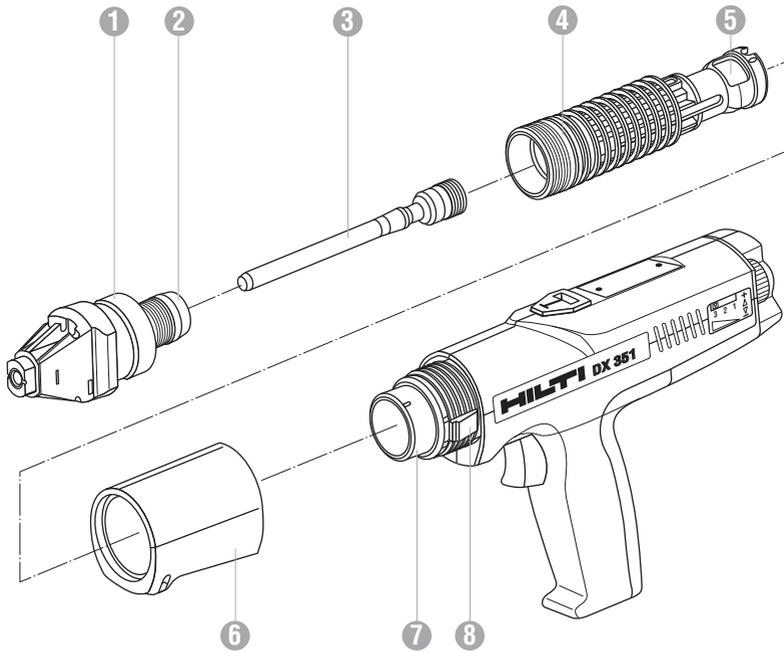
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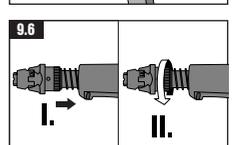
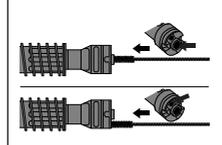
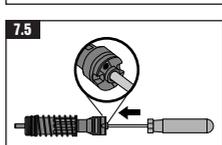
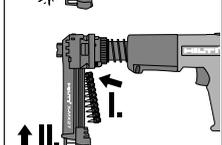
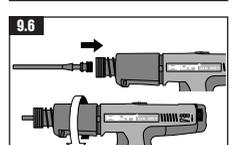
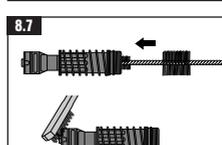
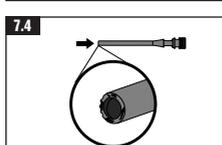
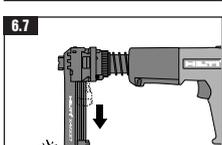
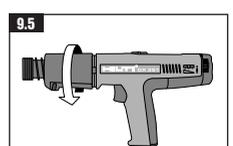
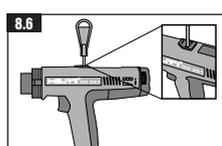
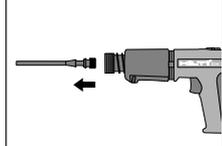
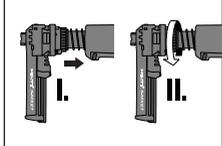
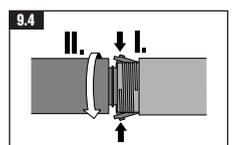
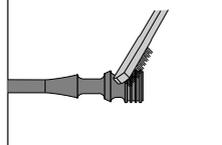
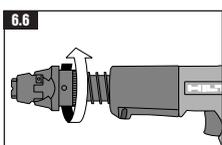
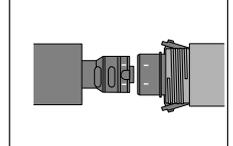
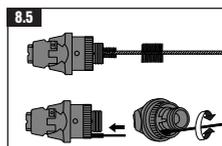
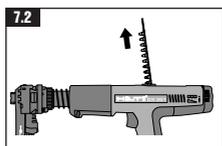
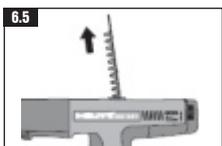
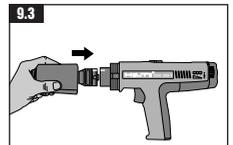
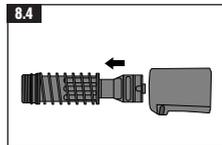
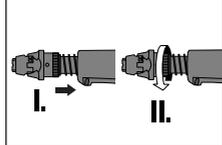
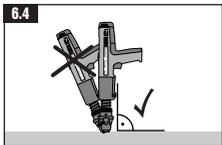
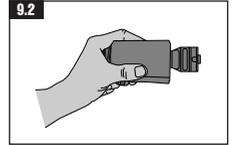
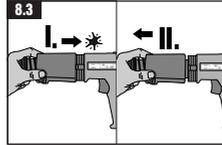
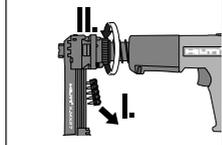
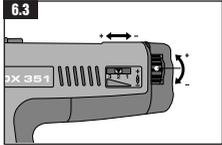
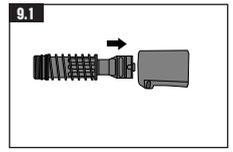
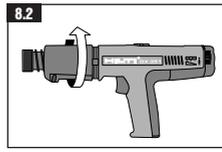
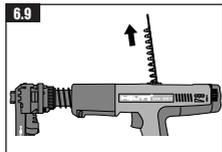
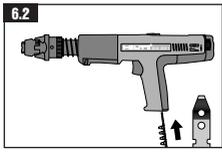
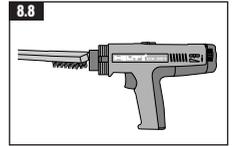
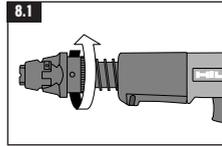
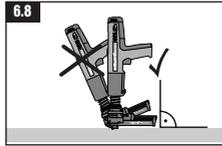
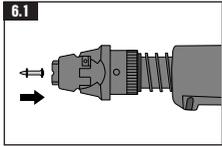
Οδηγίες χρήσεως

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ORIGINAL OPERATING INSTRUCTIONS

DX 351 powder-actuated tool

It is essential that the operating instructions are read before the tool is operated for the first time.

Always keep these operating instructions together with the tool.

Ensure that the operating instructions are with the tool when it is given to other persons.

Description of main parts 1

- 1 Magazine housing
- 2 Nail pusher
- 3 Fastener feed delay device
- 4 Piston brake (part of fastener guide)
- 5 Threaded sleeve
- 6 Fastener guide
- 7 Piston return spring
- 8 Black housing
- 9 Trigger
- 10 Handle
- 11 Cartridge feeding
- 12 Cartridge ejection
- 13 Grip
- 14 Aeration slots
- 15 Power regulation indicator
- 16 Power regulation wheel
- 17 Nail detectorassy

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Tool components 2

	Item no.
1 Fastener guide*	
2 Piston brake (part of fastener guide)	
3 Piston*	
4 Piston return spring	331010
5 Piston guide	331203
6 Black housing	331027
7 Piston stopper right	331158
8 Piston stopper left	331045

* These parts may be replaced by the user/operator

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1. Safety precautions

1.1 Basic safety instructions

In addition to the safety precautions listed in the individual sections of these operating instructions, the following points must be strictly observed at all times.

1.2 Only use Hilti cartridges or cartridges of equivalent quality

The use of cartridges of inferior quality in Hilti tools may lead to build-up of unburned powder, which may explode and cause severe injuries to operators and bystanders. At a minimum, cartridges must either:

a) Be confirmed by their supplier to have been successfully tested in accordance with EU standard EN 16264

NOTE:

- All Hilti cartridges for powder-actuated tools have been tested successfully in accordance with EN 16264.
- The tests defined in the EN 16264 standard are system tests carried out by the certification authority using specific combinations of cartridges and tools.

The tool designation, the name of the certification authority and the system test number are printed on the cartridge packaging.

or

b) Carry the CE conformity mark (mandatory in the EU as of July 2013).

See packaging sample at:
www.hilti.com/dx-cartridges

1.3 Use as intended

The tool is designed for professional use in fastening applications in construction where specially-designed nails, threaded studs and composite fasteners are driven into concrete, steel and sand-lime block masonry.



1.4 Improper use

- Manipulation or modification of the tool is not permissible.
- Do not operate the tool in an explosive or flammable atmosphere, unless the tool is specially approved for such use.
- Use only original Hilti fasteners, cartridges, accessories and spare parts or those of equivalent quality.
- Observe the information printed in the operating instructions concerning operation, care and maintenance.
- Never point the tool at yourself or any bystander.
- Never press the muzzle of the tool against your hand or other part of your body.
- Do not drive nails into excessively hard or brittle materials such as glass, marble, plastic, bronze, brass, copper, natural rock, insulation material, hollow brick, glazed tile, thin-gauge sheet metal (< 4 mm), grey cast iron, spheroidal cast iron and gas concrete.

1.5 Technology

- This tool is designed with the latest available technology.
- The tool and its ancillary equipment may present hazards when used incorrectly by untrained personnel or not as directed.



1.6 Making the workplace safe

- Ensure that the workplace is well lit.
- Operate the tool only in well-ventilated working areas.
- The tool is for hand-held use only.
- Avoid unfavorable body positions. Work from a secure stance and stay in balance at all times
- Keep other persons, children in particular, outside the working area.
- Before using the tool, make sure that no one is standing behind or below the point where fasteners are to be driven.
- Keep the grip dry, clean and free from oil and grease.



1.7 General safety precautions

- Operate the tool only as directed and only when it is in faultless condition.
- If a cartridge misfires or fails to ignite, proceed as follows:
 1. Keep the tool pressed against the working surface for 30 seconds.
 2. If the cartridge still fails to fire, withdraw the tool from the working surface, taking care that it is not pointed towards your body or bystanders.

3. Manually advance the cartridge strip one cartridge. Use up the remaining cartridges on the strip. Remove the used cartridge strip and dispose of it in such a way that it can be neither reused nor misused.

- Never attempt to pry a cartridge from the magazine strip or the tool.
- Keep the arms flexed when the tool is fired (do not straighten the arms).
- Never leave the loaded tool unattended.
- Always unload the tool before beginning cleaning, servicing or changing parts and before storage.
- Unused cartridges and tools not presently in use must be stored in a place where they are not exposed to humidity or excessive heat. The tool should be transported and stored in a toolbox that can be locked or secured to prevent use by unauthorized persons.



1.8 Temperature

- Do not disassemble the tool while it is hot.
- Never exceed the recommended maximum fastener driving rate (number of fastenings per hour). The tool may otherwise overheat.
- Should the plastic cartridge strip begin to melt, stop using the tool immediately and allow it to cool down.

1.9 Requirements to be met by users

- The tool is intended for professional use.
- The tool may be operated, serviced and repaired only by authorised, trained personnel. This personnel must be informed of any special hazards that may be encountered.
- Proceed carefully and do not use the tool if your full attention is not on the job.
- Stop working with the tool if you feel any pain or discomfort.

1.10 Personal protective equipment



- The operator and other persons in the immediate vicinity must always wear approved eye protection, a hard hat and suitable ear protection.

2. General information

2.1 Signal words and their meaning

WARNING: The word WARNING is used to draw attention to a potentially dangerous situation which could lead to severe personal injury or death.

CAUTION: The word CAUTION is used to draw attention to a potentially dangerous situation which could lead to minor personal injury or damage to the equipment or other property.

2.2 Pictograms

Warning signs



General warning



Warning: hot surface

Symbols



Read the operation instructions before use

Obligation signs



Wear eye protection



Wear a safety helmet



Wear ear protection

1 The numbers refer to the illustrations. The illustrations can be found on the fold-out cover pages. Keep these pages open while you read the operating instructions.

In these operating instructions, the designation “the tool” always refers to the DX 351 powder-actuated tool.

Location of identification data on the tool

The type designation and the serial number are printed on the type plate on the tool. Make a note of this information in your operating instructions and always refer to it when making an enquiry to your Hilti representative or service department.

Type: DX351

Serial no.:

3. Technical description

The tool is designed for professional use in fastening applications where specially-designed nails, threaded studs and composite fasteners are driven into concrete, steel and sand-lime block masonry.

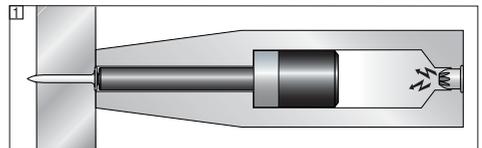
The tool works on the well-proven piston principle and is therefore not related to high-velocity tools. The piston principle provides an optimum of working and fastening safety. The tool works with cartridges of 6.8/11 caliber.

Piston return and cartridge transport is fully automatic. This permits fastenings to be made very quickly and economically with nails and threaded studs. The use of a nail magazine (MX27 or MX32) greatly increases the speed and convenience of fastening with the tool, above all when making large numbers of identical fastenings of all kinds.

As with all powder-actuated tools, the tool, magazine, fastener program and cartridge program form a “technical unit”. This means that optimal fastening with this system can only be achieved if the fasteners and cartridges are specially manufactured for it, or products of equivalent quality, are used. The fastening and application recommendations given by Hilti are only applicable if these conditions are observed.

The tool features 5-way safety – for the safety of the operator and bystanders.

The piston principle



The energy from the propellant charge is transferred to a piston, the accelerated mass of which drives the fastener into the base material. As approximately 95 % of the kinetic energy is absorbed by the piston, the fastener is driven into the base material at much reduced velocity (less than 100 m/sec.) in a controlled manner. The driving process ends when the piston reaches the end of its travel. This makes dangerous through-shots virtually impossible when the tool is used correctly.

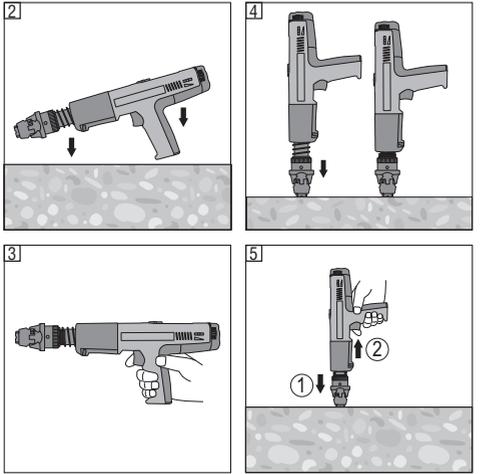
The drop-firing safety device **2** is the result of coupling the firing mechanism with the cocking movement. This is designed to prevent the Hilti DX tool from firing when it is dropped onto a hard surface, no matter at which angle the impact occurs.

The trigger safety device **3** ensures that the cartridge cannot be fired simply by pulling the trigger only. The tool can be fired only when fully depressed.

The contact pressure safety device **4** requires the tool to be fully depressed with a significant force. The tool can be fired only when pressed fully in this way.

In addition, all Hilti DX tools are equipped with an unintentional firing safety device **5**. This prevents the tool from firing if the trigger is pulled and the tool then pressed against the work surface. The tool can be fired only when it is first pressed **1** correctly and **2** the trigger then pulled.

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4. Accessories, cartridges and fasteners

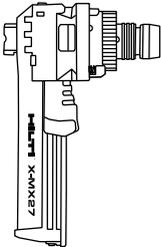
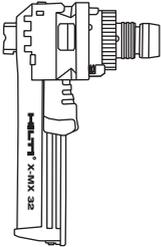
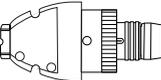
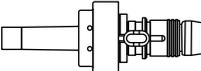
Cartridges



Ordering designation	Colour code	Power level
6.8/11 M white	White	Extra low
6.8/11 M green	Green	Light
6.8/11 M yellow	Yellow	Medium
6.8/11 M red	Red	Heavy

Prevention of misuse:

- When the piston tip is worn or damaged (see 7.), never try to grind the tip in order to re-use the piston. This may cause serious damage to the tool and will adversely affect fastening quality.
- Please refer to the table below for the right fastener guide/piston/fastener combination. Use of the wrong combination may result in damage to the tool.

Fastener guide		Piston type	Elements
Magazine X-MX27	Magazine X-MX32	X-P8S-351  Length: 160 mm Weight: 93 g	X-MX27: X-C20-27MX X-U20-27 X-U15MXSP
			X-MX32: X-C20-32MX X-U20-32MX X-U15MXSP
Standard fastener guide X-FG8S-351		X-P8S-351  Length: 160 mm Weight: 93 g	X-C22-47P8 X-C20THP X-C22-27P8TH X-C27-C52P8S36 X-HS M6/8/10 XU19-32 X-HS W6/8/10, XU19-27 X-FB-C27 X-FB-U22 X-RH ^{1/4} -U27P8 X-M6, X-EM6 / X-F7, X-EF7* * (up to max. 47 mm/1.85") X-M8, X-EM8
ME fastener guide X-FG8ME-351			
Narrow access fastener guide X-FG8L-351		X-P8L-351  Length: 182 mm Weight: 103 g	X-CF20-47P8 X-C20-47P8 X-U16-47P8 X-CC U16-27 X-CC C27-32 X-HS M6/8/10 U19-32 X-HS W6/10 U19-27
			

5. Technical data

DX 351

Weight:	2.2 kg (4.8 lb) 2.4 kg (5.3 lb) with magazine
Tool length:	404 mm (15.9")
Nail length:	Max. 47 mm (1.85")
Cartridge:	6.8/11 M (27 cal. short) white, green, yellow, red
Compression stroke:	59 mm (2.3")
Compression force with magazine:	130 N
Compression force with standard fastener guide:	100 N
4 cartridge power levels, click-stop regulation thumbwheel	

Nail magazine

	MX 27	MX 32
Weight :	0.16 kg (0.35 lb)	0.16 kg (0.35 lb)
Nail length:	27 mm (1")	32 mm (1 ^{1/4} ")
Magazine capacity:	10 nails	10 nails
Recommended max. fastener driving frequency:	700/h with white, green or yellow cartridges 500/h with red cartridges	

6. Operation



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WARNING	
 	<ul style="list-style-type: none"> ■ The base material may splinter when a fastener is driven or fragments of the cartridge strip may fly off. ■ Flying fragments may injure parts of the body or the eyes. ■ Wear approved eye protection and a hard hat (users and bystanders).

CAUTION	
	<ul style="list-style-type: none"> ■ The nail or stud is driven by a cartridge being fired. ■ Excessive noise may damage the hearing. ■ Wear ear protection (users and bystanders).

WARNING	
	<ul style="list-style-type: none"> ■ The tool could be made ready to fire if pressed against a part of the body (e.g. hand).. ■ This could cause a nail or piston to be driven into a part of the body. ■ Never press the muzzle of the tool against parts of the body.

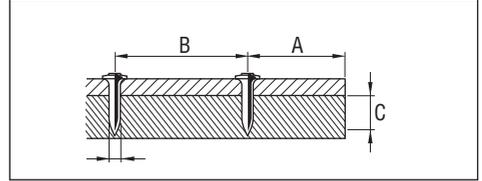
WARNING	
	<ul style="list-style-type: none"> ■ Under certain circumstances, the tool could be made ready to fire by pulling back the magazine, fastener guide or the fastener by hand. ■ When in the "ready to fire" state, a fastener or the piston could be driven into a part of the body. ■ For this reason, never pull back the magazine, fastener guide or fastener by hand.

Guidelines for optimum fastening quality

NOTE

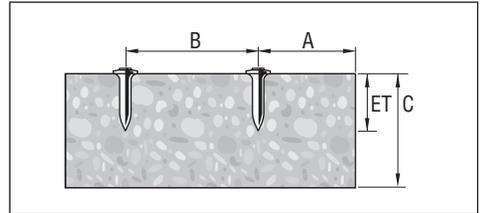
These application recommendations must always be observed. For more specific information, refer to the Hilti Fastening Technology Manual, which is available from your local Hilti organisation.

Minimum requirements



Fastening on steel

A = min. edge distance = 15 mm ($\frac{5}{8}$ "
 B = min. spacing = 20 mm ($\frac{3}{4}$ "
 C = min. base material thickness = 4 mm ($\frac{5}{32}$ "

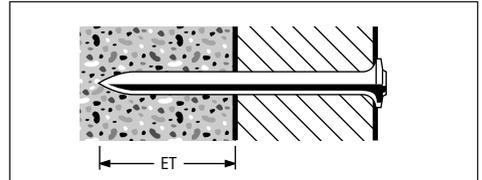


Fastening on concrete

A = min. edge distance = 70 mm ($2\frac{3}{4}$ "
 B = min. spacing = 80 mm ($3\frac{1}{8}$ "
 C = min. base material thickness = 100 mm (4")

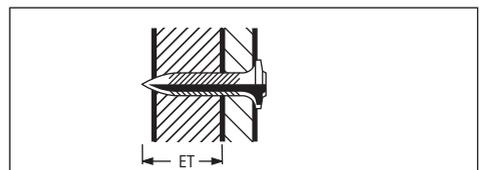
Nail lengths

(These are only examples, find specific information in the Hilti Fastening Technology Manual



Fastening on concrete

Penetration depth (ET): 22–27 mm, ($\frac{7}{8}$ "–1")



Fastening on steel:

Penetration depth (ET): 12 ± 2 mm, ($\frac{1}{2}$ " ± $\frac{1}{16}$ "

6.1 Loading the single-fastener tool

Insert the fastener flat end (head) first until the washer is held in the tool.

6.2 Inserting the cartridge strip

Load the cartridge strip narrow end first by inserting it into the bottom of the toolgrip until flush. If the strip has been partly used, pull it through until a live cartridge is in the chamber.

6.3 Power regulation

Adjust the driving power by turning the regulating wheel.

1= minimum power

2= medium power

3= maximum power

Select the cartridge power level and power regulation setting to suit the application. If you have no previous experience of this application, always begin with the lowest power level.

6.4 Using the single-fastener tool

When fastening, position the tool perpendicular to the work surface, press down and then pull the trigger.

WARNING

– Re-use of fasteners:

If the first attempt to drive a fastener fails, so not use or redrive the same fastener a second time.

– Do not drive fasteners into holes:

Driving fasteners into existing holes is not permissible unless specifically authorized by Hilti.

– Fastener driving rate:

Do not exceed the maximum fastener driving rate.

6.5

Pull the cartridge strip out of the tool.

6.6 Fitting the magazine

1. Unscrew the single fastening fastener guide, threaded sleeve and pull the fastener guide out.

2. Press the nail magazine onto the piston guide, then screw the threaded sleeve on clockwise until it engages.

6.7 Loading the magazine tool

1. Unscrew the single fastening fastener guide, threaded sleeve and pull the fastener guide out.

2. Press the nail magazine onto the piston guide, then screw the threaded sleeve on clockwise until it engages.

6.8 Using the magazine tool

When fastening, position the tool perpendicular to the work surface, press down and then pull the trigger.

Note:

If the nail magazine is empty, the tool cannot be fired.

6.9 Conversion to single-fastening tool (changing the equipment)

1. Pull the cartridge strip out of the tool.

2. Open the magazine by pulling the nail pusher down until it locks, then take out the nail strip. Unscrew the magazine threaded sleeve.

3. Press the single fastener guide onto the piston guide, then screw the threaded sleeve on until it engages.

7. Service (changing the piston and piston brake)

7.1 Check that the tool is not hot.

7.2 Remove the cartridge strip from the tool. Unscrew the fastener guide or magazine.

7.3 Turn the black housing one whole revolution (360° counter clockwise). This will release the piston stoppers so you can remove the piston from the tool.

7.4 Typical wear of piston.

Check if piston is chipped or damaged. Replace if significant chipping or damage has occurred.

7.5 If the piston sticks in the piston guide, the entire piston guide unit must be removed (see section «Care and maintenance»). Push out the piston through the cartridge chamber.

Note:

Do not grind the piston. If the piston is made shorter the tool will be damaged.

8. Care and maintenance

When this type of tool is used under normal operating conditions, dirt and residues build up inside the tool and functionally relevant parts are also subject to wear. Regular inspections and maintenance are thus essential in order to achieve reliable operation. We recommend that the tool is cleaned and the piston and piston brake are checked at least weekly when the tool is subjected to intensive use, and at the latest after driving 8,000 fasteners.

Care of the tool

The outer casing of the tool is manufactured from impact-resistant plastic. The grip comprises a synthetic rubber section. The ventilation slots must be unobstructed and kept clean at all times. Do not permit foreign objects to enter the interior of the tool. Use a slightly damp cloth to clean the outside of the tool at regular intervals. Do not use a spray or steam-cleaning system for cleaning.

Maintenance

Check all external parts of the tool for damage at regular intervals and check that all controls operate properly. Do not operate the tool when parts are damaged or

when the controls do not operate properly. If necessary, have the tool repaired at a Hilti service centre.

Servicing the tool

The tool should be serviced if:

1. Cartridges misfire
2. Fastener driving power is inconsistent
3. If you notice that:
 - contact pressure increases,
 - trigger force increases,
 - power regulation is difficult to adjust (stiff),
 - the cartridge strip is difficult to remove.

CAUTION while cleaning the tool:

- Never use grease for maintenance/lubrication of tool parts. This may strongly affect the functionality of the tool. Use only Hilti spray or such of equivalent quality.
- Dirt from DX tool contains substances that could be endangering your health.
 - Do not breath in the dust from cleaning
 - Keep dust away from food
 - Wash your hands after cleaning the tool

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CAUTION	
	<ul style="list-style-type: none">■ The tool can get hot while operating.■ You could burn your hands.■ Do not disassemble the tool while it is hot. Let the tool cool down.

Warning: The tool must be unloaded before carrying out care and maintenance.

8.1 Remove fastener guide or magazine

8.2 Service

Unscrew the black housing counter clockwise fully.

8.3 Push back the piston guide with the palm of the hand to release the piston stoppers and then remove the complete unit.

8.4 Remove the black housing from the piston guide.

8.5 Clean the fastener guide or magazine and the piston.

8.6 Clean the cartridge transport.

8.7 Clean the piston guide inside and outside (back-side of the piston guide and the spring area.) and lubricate it on the outside.

Clean in the cartridge chamber and the power regulation hole at the end-face of the piston guide..

8.8 Clean the inside of the housing. Slightly lubricate the inside.

9. Assembly

9.1 Put the black housing onto the piston guide.

9.2 Pull up the black housing against the spring and hold it with your hand.

9.3 Insert the complete unit so that the marks on the piston guide and the marks on the metal housing are in alignment.

9.4 Push in the stoppers when the piston guide is in far enough, so that the stoppers fit into the sleeve on the side of the piston guide openings.

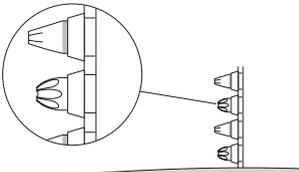
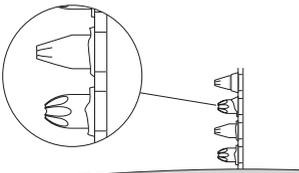
9.5 Release the black housing and screw it on one or two turns.

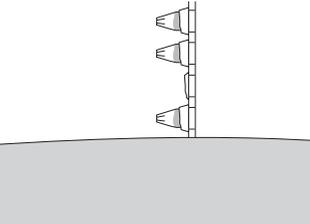
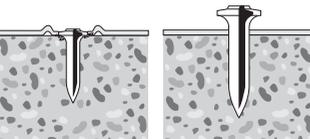
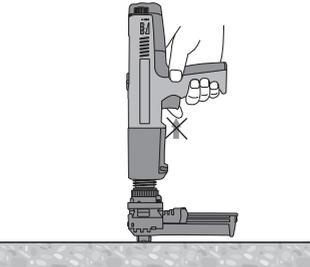
9.6 Insert the piston all the way back (the piston can be inserted anytime before the last whole turn) and finish screwing on the black housing until it engages.

9.7 Press the single fastener guide or magazine into the piston guide, then screw the threaded sleeve on until it engages.

10. Troubleshooting

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Fault	Cause	Possible remedies
<p>Cartridge not transported</p> 	<ul style="list-style-type: none"> ■ Damaged cartridge strip ■ Carbon build up ■ Tool damaged 	<ul style="list-style-type: none"> ■ Change cartridge strip ■ Clean the cartridge strip guide-way (see 8.6) <p>If the problem persists:</p> <ul style="list-style-type: none"> ■ Contact Hilti Repair Centre
<p>Cartridge strip cannot be removed</p> 	<ul style="list-style-type: none"> ■ Tool overheated because of high setting rate ■ Tool damaged <p>WARNING Never attempt to pry a cartridge from the magazine strip or tool.</p>	<ul style="list-style-type: none"> ■ Let the tool cool down and then carefully try to remove the cartridge strip <p>If not possible:</p> <ul style="list-style-type: none"> ■ Contact Hilti Repair Centre
<p>Cartridge cannot be fired</p> 	<ul style="list-style-type: none"> ■ Bad cartridge ■ Carbon build-up <p>WARNING Never attempt to pry a cartridge from the magazine strip or the tool.</p>	<ul style="list-style-type: none"> ■ Manually advance the cartridge strip one cartridge ■ If the problem occurs more often: Clean the tool (see 8.1–8.8) <p>If the problem persists:</p> <ul style="list-style-type: none"> ■ Contact Hilti Repair Centre
<p>Cartridge strip melts</p> 	<ul style="list-style-type: none"> ■ Tool is compressed too long while fastening. ■ Fastening frequency is too high 	<ul style="list-style-type: none"> ■ Compress the tool only while fastening. ■ Remove the cartridge strip ■ Disassemble the tool (see 7.1–7.3) for fast cooling and to avoid possible damage ■ Do not exceed the recommended fastener driving rate <p>If the tool cannot be disassembled:</p> <ul style="list-style-type: none"> ■ Contact Hilti Repair Centre

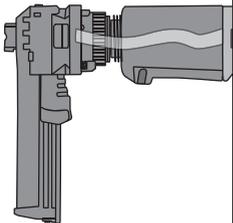
Fault	Cause	Possible remedies
<p>Cartridge falls out of the cartridge strip</p> 	<ul style="list-style-type: none"> ■ Fastening frequency is too high <p>WARNING Never attempt to pry a cartridge from the magazine strip or tool.</p>	<ul style="list-style-type: none"> ■ Immediately discontinue using the tool and let it cool down ■ Remove cartridge strip ■ Let the tool cool down ■ Clean the tool and remove loose cartridge <p>If it is impossible to disassemble the tool:</p> <ul style="list-style-type: none"> ■ Contact Hilti Repair Centre
<p>The operator notices:</p> <ul style="list-style-type: none"> - increased contact pressure - increased trigger force - power regulation stiff to adjust - cartridge strip is difficult to remove 	<ul style="list-style-type: none"> ■ Carbon build-up 	<ul style="list-style-type: none"> ■ Clean the tool (see 8.1–8.8) ■ Check that the correct cartridges are used (see 1.2) and that they are in faultless condition.
<p>Varying depths of penetration</p> 	<ul style="list-style-type: none"> ■ The tool is dirty (carbon build-up) 	<ul style="list-style-type: none"> ■ Clean the tool (see 8.1–8.8) ■ Check piston, replace if necessary
<p>Trigger cannot be pulled</p> 	<ul style="list-style-type: none"> ■ Tool not fully compressed ■ Safety mechanism activated because: <ul style="list-style-type: none"> - Magazine not loaded - Plastic debris inside the magazine - Incorrect piston position - Nail incorrectly positioned in magazine 	<ul style="list-style-type: none"> ■ Release the tool and fully compress it again ■ Load fastener strip ■ Open magazine, remove fastener strip and plastic debris <p>If problem persists:</p> <ul style="list-style-type: none"> ■ Clean the tool (see 8.1–8.8) ■ Check to ensure that the tool is assembled correctly

Fault

Cause

Possible remedies

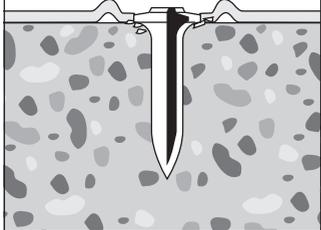
Piston stuck in magazine fastener guide



- Piston damaged
- Plastic debris inside the magazine
- Excess power when fastening on steel
- Tool fired with high power without fastener in place

- Unscrew the magazine
- Unscrew the black part of the housing
- Check piston and replace if necessary (see 7.1–7.5)
- Open magazine, remove fastener strip and plastic debris
- Reduce the power setting
- Avoid firing the tool without a fastener in place

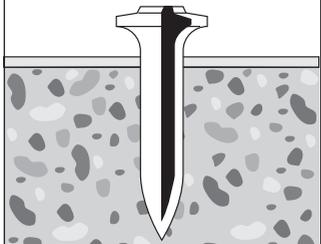
Fastener penetrates too deeply



- Fastener too short
- Driving power too high

- Use longer fastener
- Reduce power setting
- Use lighter cartridge

Fastener does not penetrate deeply enough



- Fastener too long
- Driving power too low

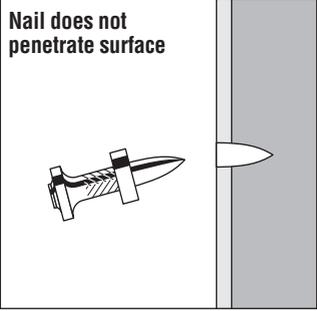
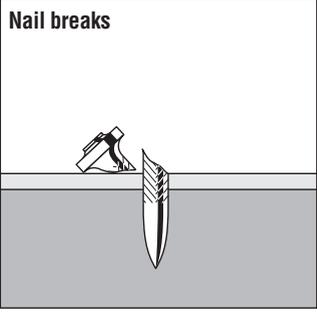
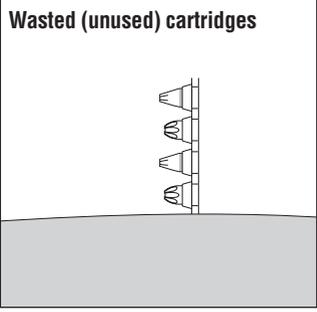
- Use shorter fastener if permissible
- Increase power setting
- Use heavier cartridge
- Use a more powerful system such as the DX 460

Nail bends



- Hard and/or large aggregate in concrete
- Rebar close to surface of concrete
- Hard surface (steel)

- Use shorter fastener if permissible
- Use a nail with a higher application limit
- Change to single fasteners
- Use an alternative system (spall stop or DX-Kwik)

Fault	Cause	Possible remedies
<p>Base material is spalling</p> 	<ul style="list-style-type: none"> ■ High strength concrete ■ Hard and/or large aggregate in concrete ■ Old concrete 	<ul style="list-style-type: none"> ■ Adjust the power setting ■ Use an alternative system (DX460 with spall stop or DX-Kwik)
<p>Nail does not penetrate surface</p> 	<ul style="list-style-type: none"> ■ Driving power too low ■ Application limit exceeded (very hard surface) ■ Unsuitable system 	<ul style="list-style-type: none"> ■ Use a higher power setting or heavier cartridge ■ Use nail with higher application limits ■ Switch to more powerful system e.g. DX 460
<p>Nail breaks</p> 	<ul style="list-style-type: none"> ■ Driving power too low ■ Application limit exceeded (very hard surface) 	<ul style="list-style-type: none"> ■ Try higher power setting or heavier cartridge ■ Use a shorter nail if permissible ■ Use nail with higher application limits ■ Switch to more powerful system e.g. DX 460
<p>Wasted (unused) cartridges</p> 	<ul style="list-style-type: none"> ■ The tool is not pressed fully against the work surface 	<ul style="list-style-type: none"> ■ Press the tool fully against the work surface before pulling the trigger

Fault

Cause

Possible remedies

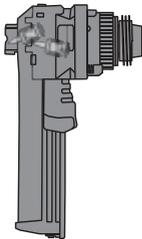
Piston guide sticks



- The piston is damaged
- Remains of plastic strip in magazine
- Driving power too high when driving into steel
- Firing the tool with high power without a fastener in place
- The tool is dirty (carbon build-up)

- Unscrew the magazine
- Unscrew the black housing
- Check the piston and replace if necessary (see 7.1–7.5)
- Open the magazine and remove the nail strip and any plastic remains
- Reduce driving power
- Avoid firing without a fastener in place
- Clean the tool (see 8.1–8.8)

Nail jams in the magazine



- 2 nails are jammed together in the magazine

- Insert the tip of a screwdriver through the furthest forward slot in the magazine and push the nails out

11. Disposal

Most of the materials from which Hilti power actuated tools are manufactured can be recycled. The materials must be correctly separated before they can be recycled. In many countries, Hilti has already made arrangements for taking back your old powder actuated tools for recycling. Please ask your Hilti customer service department or Hilti sales representative for further information.

Should you wish to return the power actuated tool yourself to a disposal facility for recycling, proceed as follows: Dismantle the tools as far as possible without the need for special tools.

Separate the individual parts as follows:

Part / assembly	Main material	Recycling
Toolbox	Plastic	Plastics recycling
Outer casing	Plastic / synthetic rubber	Plastics recycling
Screws, small parts	Steel	Scrap metal
Used cartridge strip	Plastic / steel	According to local regulations

12. Manufacturer's warranty – DX tools

Hilti warrants that the tool supplied is free of defects in material and workmanship. This warranty is valid so long as the tool is operated and handled correctly, cleaned and serviced properly and in accordance with the Hilti Operating Instructions, and the technical system is maintained. This means that only original Hilti consumables, components and spare parts, or other products of equivalent quality, may be used in the tool.

This warranty provides the free-of-charge repair or replacement of defective parts only over the entire lifespan of the tool. Parts requiring repair or replacement as a result of normal wear and tear are not covered by this warranty.

Additional claims are excluded, unless stringent nation-

al rules prohibit such exclusion. In particular, Hilti is not obligated for direct, indirect, incidental or consequential damages, losses or expenses in connection with, or by reason of, the use of, or inability to use the tool for any purpose. Implied warranties of merchantability or fitness for a particular purpose are specifically excluded.

For repair or replacement, send tool or related parts immediately upon discovery of the defect to the address of the local Hilti marketing organization provided.

This constitutes Hilti's entire obligation with regard to warranty and supersedes all prior or contemporaneous comments and oral or written agreements concerning warranties.

13. EC declaration of conformity (original)

Designation:	Powder-actuated tool
Type:	DX 351
Year of design:	2000

We declare, on our sole responsibility, that this product complies with the following directives and standards: 2006/42/EC, 2011/65/EU.

**Hilti Corporation, Feldkircherstrasse 100,
FL-9494 Schaan**



Norbert Wohlwend Head of Quality & Processes Management BU Direct Fastening 08/2012	Tassilo Deinzer Head BU Measuring Systems BU Measuring Systems 08/2012
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Technical documentation filed at:

Hilti Entwicklungsgesellschaft mbH
Zulassung Elektrowerkzeuge
Hiltistrasse 6
86916 Kaufering
Deutschland

14. CIP approval mark

The following applies to C.I.P. member states outside the EU and EFTA judicial area:

The Hilti DX 351 has been system and type tested. As a result, the tool bears the square approval mark showing approval number S 809. Hilti thus guarantees compliance with the approved type.

Unacceptable defects or deficiencies, etc. determined during use of the tool must be reported to the person responsible at the approval authority (PTB, Braunschweig) and to the Office of the Permanent International Commission (C.I.P.) (Permanent International Commission, Avenue de la Renaissance 30, B-1000 Brussels, Belgium).

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15. Health and safety of the user

Noise information

The following table provides noise measurement information:

Powder-actuated tool

Type:	DX 351
Model:	Serial production
Caliber:	6.8/11 red
Power setting:	max
Application:	Fastening 2 mm sheet steel to concrete (C40) using X-U 27/32P8 nail

Declared measured values of noise characteristics according to 2006/42/EC Machinery Directive in conjunction with E DIN EN 15895

Noise (power) level:	$L_{WA, 1s}^1$	107 dB(A)
Emission noise-pressure level in the work station:	$L_{pA, 1s}^2$	101 dB(A)
Peak sound pressure emission level:	$L_{pC, peak}^3$	135 dB(C)

Operation and set-up conditions:

Set-up and operation of the pin driver in accordance with E DIN EN 15895-1 in the semi-anechoic test room of Müller-BBM GmbH. The ambient conditions in the test room conform to DIN EN ISO 3745.

Testing procedure:

Enveloping surface method in anechoic room on reflective surface area in accordance with E DIN EN 15895, DIN EN ISO 3745 and DIN EN ISO 11201.

NOTE: The noise emissions measured and the associated measurement uncertainty represent the upper limit for the noise values to be expected during the measurements.

Variations in operating conditions may cause deviations from these emission values.

¹ ± 2 dB (A)

² ± 2 dB (A)

³ ± 2 dB (C)

Vibration

The declared total vibration value according to 2006/42/EC does not exceed 2.5 m/s².

Further information regarding the health and safety of the user can be found at the Hilti web site: www.hilti.com/hse



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