



Operating Instruction Booklet

- Translation of the original instructions -

Pneumatic Screwdriver MINIMAT

Motor Size 3

346-237U

400373 B

346-737U

400373 C

346-337U

400373 D

346-437U

400373 E



NOTICE ALL DOCUMENTATIONS !

Before beginning work **this operating instruction booklet and the enclosed safety instructions** (no. 016000, pink-colored booklet) have to be read through carefully. Always follow the instructions during operation. Give this operating instruction booklet and the appropriate safety instructions to the operator.

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1 Signal Word and Symbol Definition

The signal words and symbols used in the technical documentation (safety instructions, operating instruction booklet, etc.) have the following meaning:



DANGER

Indicates an **immediate danger** which causes serious injuries or even death if not avoided.



WARNING

Indicates a **threatening danger** which can cause serious injuries or even death if not avoided.



CAUTION

Indicates a **danger or unsafe procedure** which can cause injuries to a person or material damages if not avoided.



NOTICE

Indicates a **potentially dangerous situation** which can cause damage to the product or its surroundings if not avoided.



IMPORTANT

Indicates tips and other useful information.

In each case the symbol used does not replace the safety text. The text must always be read fully. In some cases other symbols will be used with the signal words.

2 Safety Instructions



WARNING

Serious injuries or even death possible!

Disconnect screwdriver from air/power supply when adjusting the clutch or changing/mounting the screwdriver tool (bit, socket) or accessory.



CAUTION

Risk of injury to persons or damage to the tool/work piece.

Avoid pressure to fall below the minimum allowable air pressure, because the clutch cannot shut-off safely anymore.



CAUTION

Fingers may be crushed by the rotating clutch in the adjustment slot.

Keep fingers away from the clutch adjustment slot.



CAUTION

Risk of crushing hands between holding bracket and work piece or modification parts in confined spaces.

Make sure that any bracket used is correctly installed.

Keep hands away from holding fixture (if used). This applies especially when unscrewing.



CAUTION

Rotating drive, rotating bit/socket or drive extension.

Injuries to fingers or even broken fingers.

When wearing gloves (e.g. rubber coated or metal reinforced) make sure that they not become entangled.

Do not wear loose fitting gloves or gloves with cut or frayed fingers.

- Never hold the drive, screwdriver tool or drive extension with your hands.
- If you cannot support the reaction torque of the machine independently then use a torque support (e.g. linear stand, telescopic arm, holding fixture/holder-on, support grip).
It generally applies that: In any case use a torque support to absorb the reaction torque above: for straight screwdrivers 4 Nm; for pistol grip screwdrivers 10 Nm and for angle nutrunners 60 Nm.
- If it is not possible to use a torque support, use side handles for straight and pistol grip screwdrivers. Side handles are recommended for straight screwdrivers at a torque setting over 4 Nm and for pistol grip screwdrivers at torque settings over 10 Nm.
- Use a finder/sleeve fitting where practicable.
- When using sockets or adapters (e.g. magnet holder) make sure that they are in good condition and suitable for use with this machine.
- To prevent sockets breakage use only sockets (e.g. for impact or impulse screwdrivers) which are suitable for use with this machine.

3 Intended Use

DEPRAG MINIMAT Screwdrivers with pistol grip are intended to be used only for manual, torque-controlled assemblies, preferably for horizontal applications. Reversible screwdriver models are also suitable to loosen screw connections.

4 Delivery Capacity

Check that the shipment is complete and that there have been no damages in transit.

Quantity	Name	Order No.
1	Operating Instruction Booklet	013126en
1	Safety Instruction Booklet	016000
1	Screwdriver	400373 B / C / D / E
1	Key	326240 (TYPE 346-2/737U)
		337691 (TYPE 346-3/437U)
1	Spanner AF 11	805491 (TYPE 346-3/437U)
1	Spanner AF 19	800408 (TYPE 346-3/437U)
1	Quick release coupling NW7.2	804251
1 set of	Clutch spring	→ chapter <i>Range and Exchange of Clutch Spring</i>

5 Installation

- Before connecting the air supply line to the screwdriver, clean the air pipe and the air hose by slightly blowing air into the pipe/hose in order to remove any dirt particles. Wear safety goggles!
- Make sure, that all air lines have a sufficient cross-section (→ chapter *Technical Data*) and that there are no throttle areas, bends or kinks.
- If the air supply line is longer than 2 meters, the next larger hose I.D. should be installed in order to avoid a loss of power.
- This pneumatic screwdriver may be operated either with or without lubricated air. The best performance is achieved by adding 1 – 2 drops of oil per 1 m³ of air consumption. When operating with oil-free air, a performance reduction of up to 20% occurs and maintenance requirements increases.
- The air supply to the screwdriver has to be filtered.
- The maintenance unit, the valves and the silencers have to be selected according to the air consumption of the screwdriver (→ chapter *Technical Data*). Install components, which have a measurement that will limit the pressure drop – when measured from the maintenance unit to the screwdriver – to less than 0.5 bar (7.25 PSI).
- Use only lubricants approved by the manufacturer. We recommend: special oil „DEPRAGOL“, order no. 790081 E (250 cm³ = 8.45 fl. oz).
- Check flow-pressure at directly on the machine. The pressure regulator needs to be adjusted to an airflow between 5.0 (71 PSI) and 6.3 bar (90 PSI). A higher pressure leads to increased wear and tear. A lower pressure may lead to clutch not being able to correctly shut-off the motor i.e. the preset torque will not be reached.
- Connect the screwdriver as follows:
 - a) For standard operation, connect to a maintenance unit consisting of filter with water separator, pressure regulator and oiler.

Air Consumption	Thread Size	Order No.
0,05 - 0,5 m ³ /min	G 1/4	820454 A
0,15 – 1,5 m ³ /min	G 1/2	820455 A
0,8 – 6,0 m ³ /min	G 3/4	821608 A

- b) For the use with minimal lubrication, connect to a filter-regulator consisting of filter with water separator and pressure regulator, in connection with a point-of-use oiler (order no. 378077 A, 1-fold)

Air Consumption	Thread Size	Order No.
0,05 - 0,5 m ³ /min	G 1/4	822408 A
0,15 – 0,9 m ³ /min	G 3/8	826981 A
0,15 – 1,5 m ³ /min	G 1/2	822409 A
0,8 – 6,0 m ³ /min	G 3/4	826982 A

- c) For oil-free operation, connect to a filter-regulator consisting of filter with water separator and pressure regulator.

Air Consumption	Thread Size	Order No.
0,05 - 0,5 m ³ /min	G 1/4	822408 A
0,15 – 0,9 m ³ /min	G 3/8	826981 A
0,15 – 1,5 m ³ /min	G 1/2	822409 A
0,8 – 6,0 m ³ /min	G 3/4	826982 A

Recommendation: The preferred lubricating method for screwdrivers mounted in fixtures, brackets, machines etc. (in connection with controller) is method b) with point-of-use oiler.

We recommend attaching the screwdriver to a balancer (→ *Recommended Equipment*).

With regard to air quality according to ISO 8573-1 we recommend:

	Class	Residual Oil	Residual Dust		Residual Water	
		content mg/m ³	particle size µm	max. concentration mg/m ³	pressure dew-point °C	max. concentration g/m ³
Lubricated air	4	5	15	8	+3	6
Oil-free air	3	1	5	5	-20	0.88

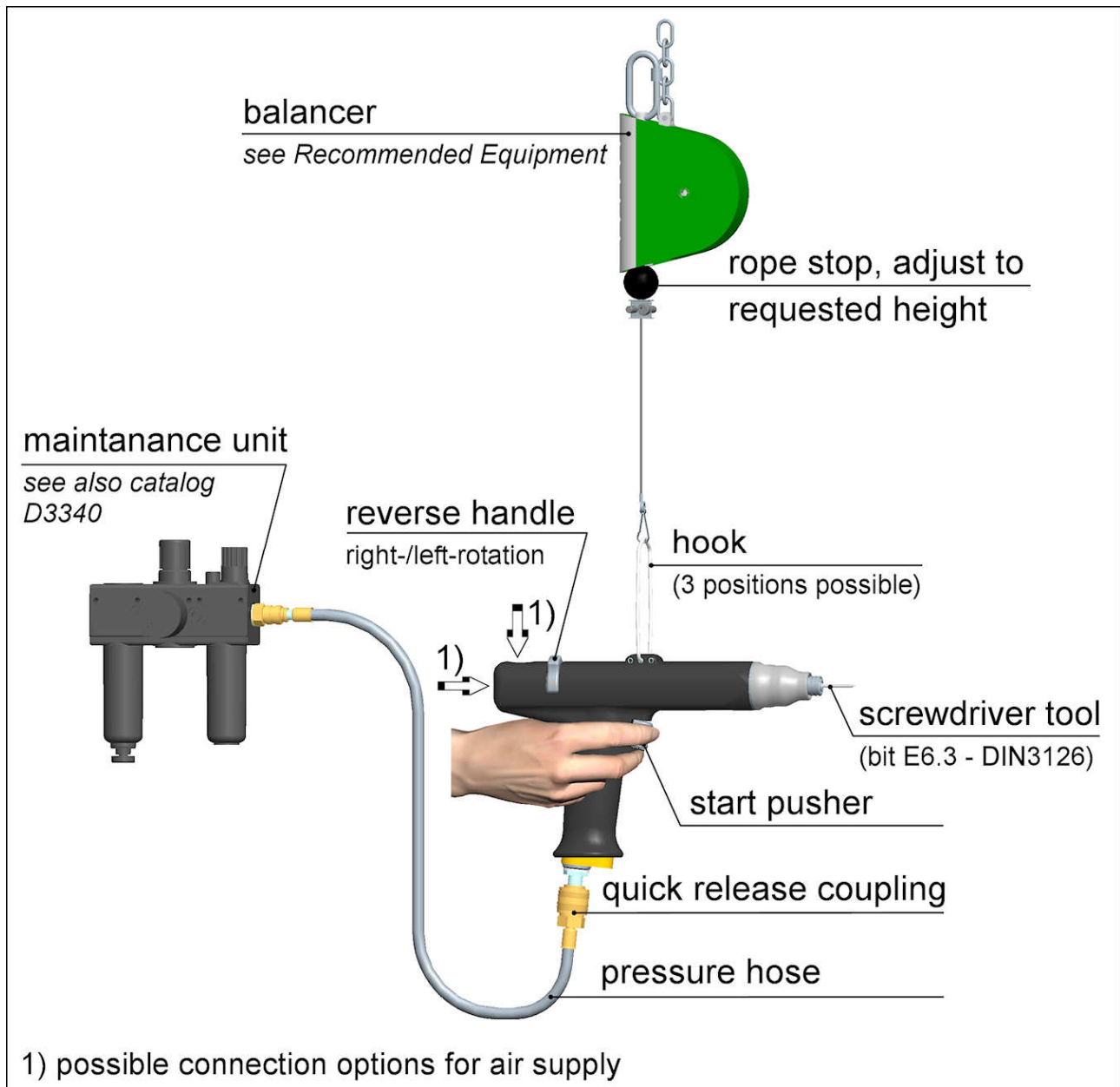


Illustration 1 - Installation

5.1. Recommended Equipment

Balancer (without vacuum interruption)

Load Range (kg / lbs.)	max. Cable Travel (m / ft.)	Weight (kg / lbs.)	Order No.
0.0 – 0.5 / 0.0 – 1.1	1.6 / 5.2	0.4 / 0.9	833320 A
0.3 – 1.5 / 0.7 – 3.3	1.6 / 5.2	0.5 / 1.1	833320 B
1.2 – 2.5 / 2.6 – 5.5	1.6 / 5.2	0.6 / 1.3	833320 C
1.5 – 3.0 / 3.3 – 6.6	2.5 / 8.2	0.8 / 1.8	833390 B

Balancer (with vacuum interruption for screwdrivers with screw suction*)

Load Range (kg / lbs.)	max. Cable Travel (m / ft.)	Weight (kg / lbs.)	Order No.
0.0 – 0.5 / 0.0 – 1.1	1.6 / 5.2	0.6 / 1.3	391366 A
0.3 – 1.2 / 0.7 – 2.6	1.6 / 5.2	0.6 / 1.3	391366 B
1.0 – 2.0 / 2.2 – 4.4	1.6 / 5.2	0.6 / 1.3	391366 C

* Injector is optional equipment

Hose Balancer

Load Range (kg / lbs.)	max. Hose Length (m / ft.)	Hose I.D. (mm / in.)	Air Connection	Weight (kg / lbs.)	Order No.
0.4 – 1.2 / 0.9 – 2.6	0.8 / 2.6	5 / ¹³ / ₆₄	G ¹ / ₄	1.2 / 2.6	824069 A
1.2 – 2.2 / 2.2 – 4.8				1.3 / 2.8	824069 B
2.2 – 3.0 / 4.8 – 6.6				1.4 / 3.0	824069 C

Spiral Hose

Air Consumption (m³/min / cfm)	Hose I.D. (mm / in.)	Work Length (m / ft.)	Order No.
0.0 – 0.1 / 0.0 – 3.5	4 / ⁵ / ₃₂	0.8 – 2 / 2.6 – 6.6	346697 D
> 0.1 – 0.3 / 3.5 – 11	6 / ¹ / ₄	1 – 2.5 / 3.3 – 8.2	346697 E
> 0.3 – 0.5 / 11 – 18	6 / ¹ / ₄	1 – 2.5 / 3.3 – 8.2	346697 F

Injector, Vacuum Pump (for screw suction)

Name	Suction Volume (l/min / cfm)	Vacuum (bar / PSI)	Noise Level (dB(A))	Air Consumption (l/min / cfm)	Motor (kW/V/Hz)	Order No.
Injector	23 / 0.8	0.8 / 11	52	50 / 1.8	-	326813 A
Double Injector	46 / 1.6	0.8 / 11	52	100 / 3.6	-	354987 A
Vacuum Pump (oil free)	100 / 3.5	0.85 / 12	62	-	0.25/230/50	360832 A

Use injector always in connection with vacuum interruption.

For more equipment such as spiral hoses for balancers with vacuum interruption, please see catalog D3340.

5.2. Optional Equipment

Name	Order No.
Spring sleeve cpl. (without screw suction – in connection with finder)	364672 A
Spring sleeve cpl. (with screw suction – in connection with finder)	364672 C
Handle (torque support, clamping range → <i>Dimension Sheet</i>)	410971
Exhaust hose (0.75 m / 2.5 ft.) with air hose (2 m / 6.6 ft.)	413417 A

Pressure hoses, connecting components etc. → catalog D 3340

All catalogs are available for download from our web site: www.deprag.com

Operating Screwdriver with a Finder:

Installation of the finder (optional equipment):

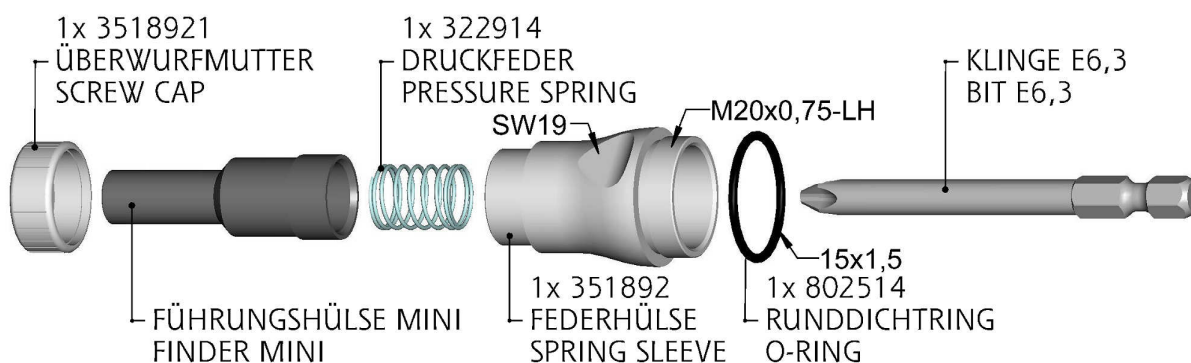
- Remove screw cap (left-hand thread) from spring sleeve.
- Insert finder and pressure spring into spring sleeve.
- Re-attach screw cap onto spring sleeve (left-hand thread).
- Assemble complete spring sleeve package to screwdriver (left-hand thread).



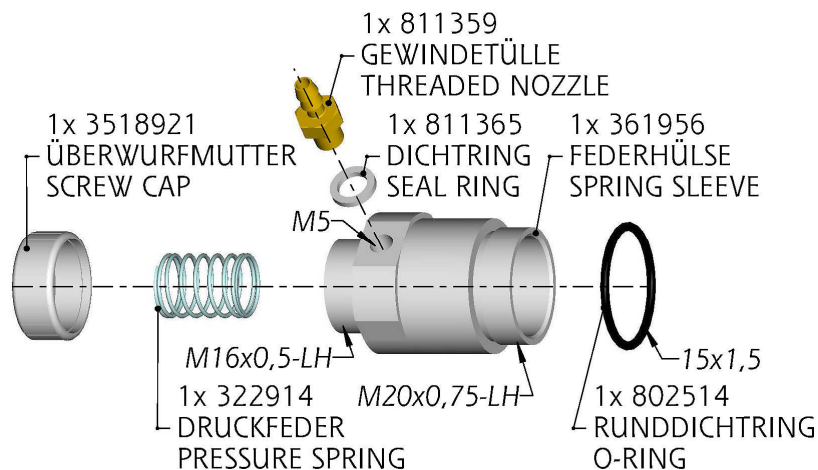
Finder and bit are not included in the delivery capacity of the spring sleeve. You will find suitable inserting tools

- in our catalog D3320 or
- on the internet as follows: www.deprag.com
→ Screwdriving Technology → Selection program: Inserting tools

Assembly- and Spare Parts Drawing SPRING SLEEVE CPL. 364672 A



Assembly- and Spare Parts Drawing SPRING SLEEVE CPL. 364672 C

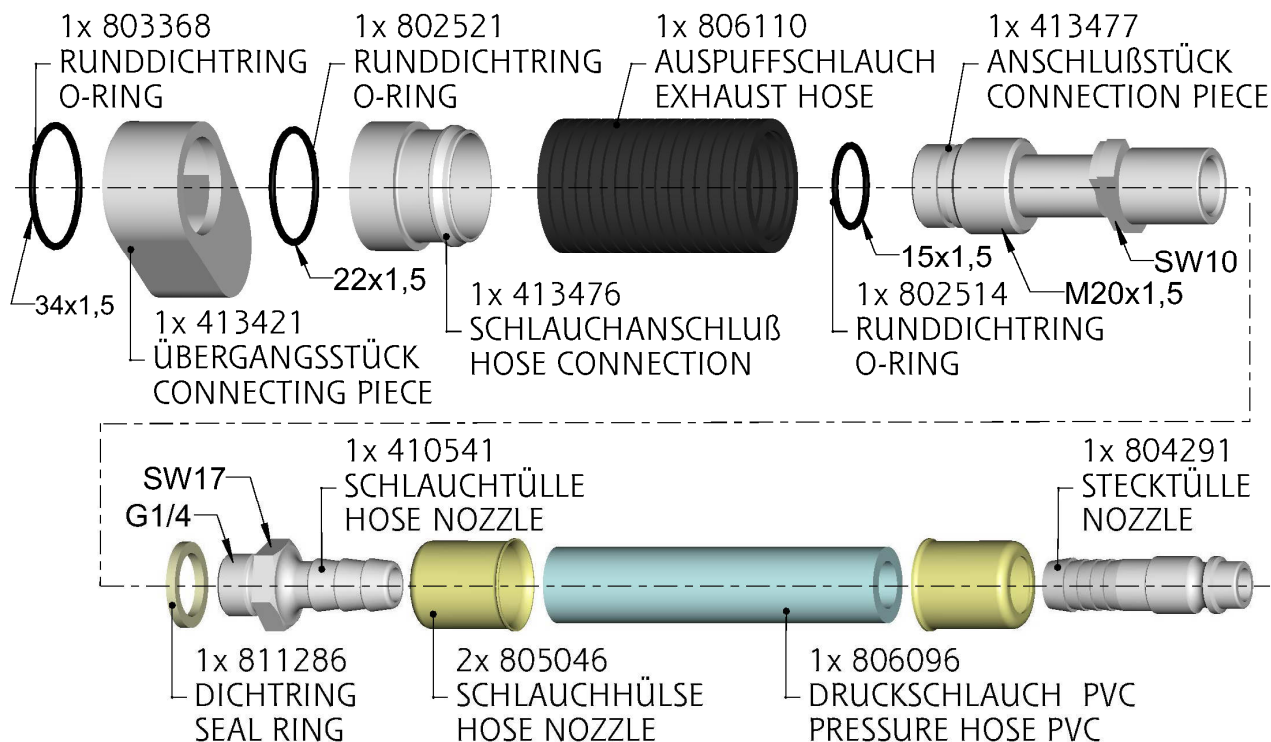


5.2.1 Assembly of Exhaust Hose 413417 A

Mount the exhaust hose as follows:

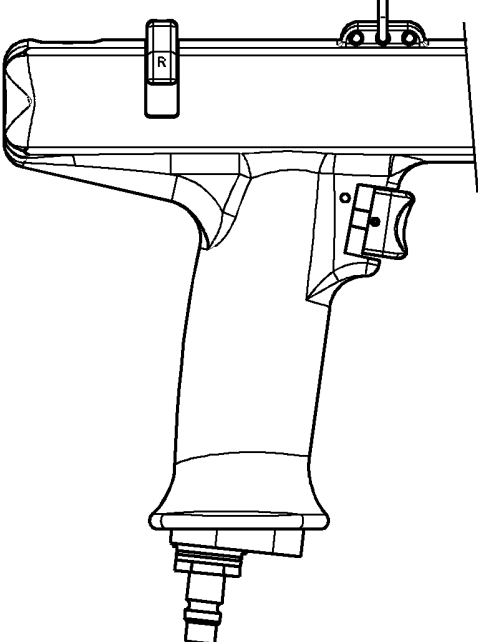
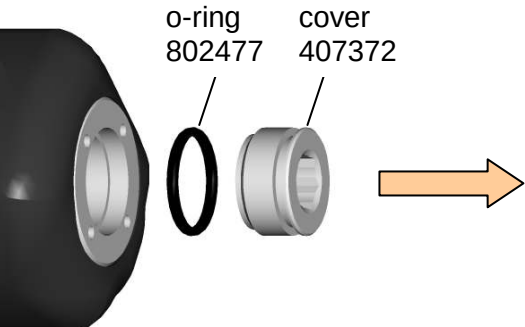
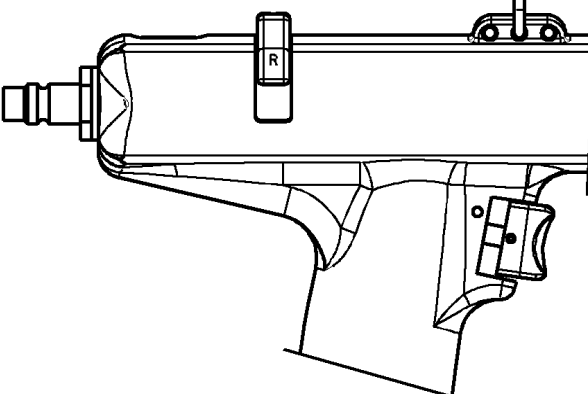
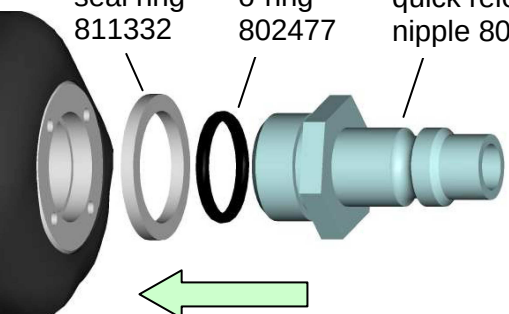
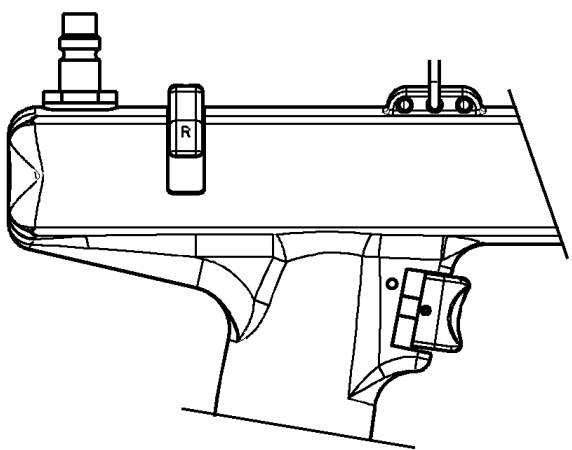
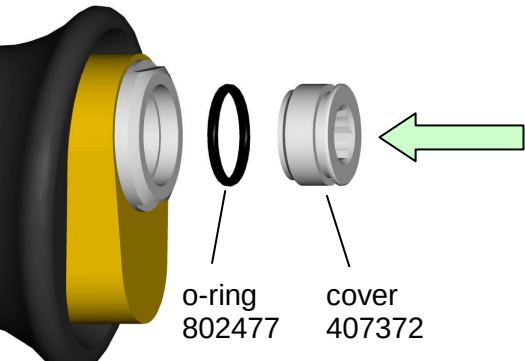
1. Disconnect screwdriver from air supply.
2. Clamp screwdriver on its pistol grip into a vice.
3. Unscrew the quick release nipple 804289 (AF 19, right-hand thread) and the connection piece 407465 (internal hex. AF 10, right-hand thread) from the pistol grip.
4. Remove the silencer 408258 from the pistol grip.
5. Mount the supplied o-ring 803368 (34x1.5) onto the connecting piece 413421.
If necessary: Place the o-ring 802521 (22x1.5) into the hose connection 413476 and the o-ring 802514 (15x1.5) onto the connection piece 413477.
6. Insert the connecting piece 413421 into the pistol grip, position the hose connection 413476 onto the connecting piece and tighten both items by means of the connection piece 413477 (internal hex. AF 8, right-hand thread).
7. Assemble the hose nozzle 410541 (AF 17, right-hand thread) complete with the mounted parts onto the connection piece.
8. Slide the exhaust hose over the hose connection 413476.

Assembly- and Spare Parts Drawing EXHAUST HOSE 413417 A



5.3. Connection Options for the Pressure Hose

There are 3 options to connect the pressure hose (hose i.d. 6 mm / ¼") onto the screw-driver by means of the supplied quick release coupling 804251.

Lower air-inlet (Standard)	Installation steps
	i Always lightly grease the o-rings. 1. Disassemble the cover 407372 (internal hex. AF 8, right-hand thread) with the o-ring 802477 
Rear air-inlet	
	2. Assemble the quick release nipple 804289 (AF 19, right-hand thread) with the o-ring 802477 and the seal ring 811332 as needed (behind or above) onto the pistol grip. 
Upper air-inlet	
	3. Seal off the unused air-inlet of the pistol grip with the cover 407372 (internal hex. AF 8, right-hand thread) and the o-ring 802477. 

6 Operation

On delivery, the screwdriver is preset to the maximum or customer-specific torque value.

For start-up perform the following steps:

1. If needed, adjust clutch to the required torque value. → chapter *Torque Adjustment*



The required torque adjustment can be checked using a torque wrench or measuring platform (see DEPRAG catalogs D3020 and D3022). This equipment can also be used to re-adjust the torque of the screwdriver.

2. If necessary, exchange clutch spring. → chapter *Range and Exchange of Clutch Spring*



IMPORTANT

To operate the clutch, using a clutch spring which either surpasses or falls below its specified torque range, leads to a reduction of the torque accuracy.

3. Mount inserting tool, e.g. bit or socket. → chapter *Insert or Change Inserting Tool*
4. If required, clamp screwdriver into a fixture/bracket/clamping device (clamping area → *Dimensional Drawing*).
5. Connect main air hose (hose diameter → chapter *Technical Data*).
The flow pressure must not drop below 5 bar/71 PSI – reduced output!

6.1. Function Description / Driver Start

Direction of Rotation:

The screwdriver is equipped with a reversible motor and a clutch with right shut-off, i.e. when assembling screws/nuts with right-hand thread the screwdriver will shut-off after reaching the preset torque. By reversing the screwdriver to left rotation, screws/nuts can be loosened. Thereby the maximum torque is available.

Start:

The screwdriver starts by pressing the pusher.

6.2. Torque Adjustment

For an external torque adjustment use the following steps:

1. Disconnect screwdriver from air supply.
2. **For screwdriver type 346-237U/737U:** Insert the supplied key 326240 through the slot on the pistol grip into the half-round bore of the lock ring.
For screwdriver type 346-337U/437U: Push the supplied key 337691 through the slot on the pistol grip into the bore of the adjustment nut.
3. If necessary, manually turn clutch by means of inserted tool.



IMPORTANT

By turning the key clockwise (-), the torque is reduced and if turned counter-clockwise (+), the torque is increased.

Screwdriver type 346-237U/737U	Screwdriver type 346-337U/437U
Half-round bore for torque adjustment	Bore for torque adjustment

Illustration 2 - Torque Adjustment

6.3. Range and Exchange of Clutch Spring

The torque range of the screwdriver is adjustable. The torque ranges of the color-coded springs are shown in the table below.



IMPORTANT

You can only use those clutch springs, which are possible for the respective torque range of the screwdriver.

TYPE 346-237U and 346-737U

Torque Range of the individual clutch spring:

Part No.	Wire Ø	Color	Torque "min."	Torque "max."
353796	4.0 mm	Black	appx. 3.5 Nm / 31 in.lbs	appx. 8/9 Nm / 71/80 in.lbs
353795	3.2 mm	Blue	appx. 2.0 Nm / 18 in.lbs	appx. 4.4 Nm / 39 in.lbs

All torque values are based on 90-PSI (6.3 bar) air pressure. Torque values are estimated data which may differ – depending on the type of screw joint.

TYPE 346-337U and 346-437U

Torque Range of the individual clutch spring:

Part No.	Wire Ø	Color	Torque "min."	Torque "max."
328562	5.6 mm	White	appx. 10.0 Nm / 89 in.lbs	appx. 24.0 Nm / 212 in.lbs
328024	5.0 mm	Black	appx. 6.0 Nm / 53 in.lbs	appx. 18.0 Nm / 159 in.lbs
328025	3.2 mm	Blue	appx. 3.0 Nm / 27 in.lbs	appx. 6.0 Nm / 53 in.lbs
328026	2.5 mm	Green	appx. 2.0 Nm / 18 in.lbs	appx. 4.0 Nm / 35 in.lbs

All torque values are based on 90-PSI (6.3 bar) air pressure. Torque values are estimated data which may differ – depending on the type of screw joint.

Exchange of Clutch Spring (→ *Illustration 3*)



IMPORTANT

To avoid losing parts, disassemble the machine only on top of a flat work surface.

1. Disconnect screwdriver from air supply.
2. Unscrew the clutch bearing 400362 A/B (left-hand thread) complete with the spring sleeve (Optional Equipment).
3. Take out the clutch complete.
4. **For screwdriver type 346-237U/737U:** Insert the supplied key 326240 into the half-round bore of the lock ring and turn the key clockwise, until the adjustment nut comes off.
For screwdriver type 346-337U/437U: Slide the supplied spanner 805491 (AF 11) over the hex of the clutch shaft and unscrew the adjustment nut by means of the key 800408 (AF 19) (right-hand thread).
5. Pull off the lock ring.
6. Remove the clutch spring, replace with new clutch spring and reassemble the clutch in reverse order.
7. Insert the clutch into the clutch bearing.
8. Tighten the clutch bearing complete with the spring sleeve onto the screwdriver (left-hand thread).



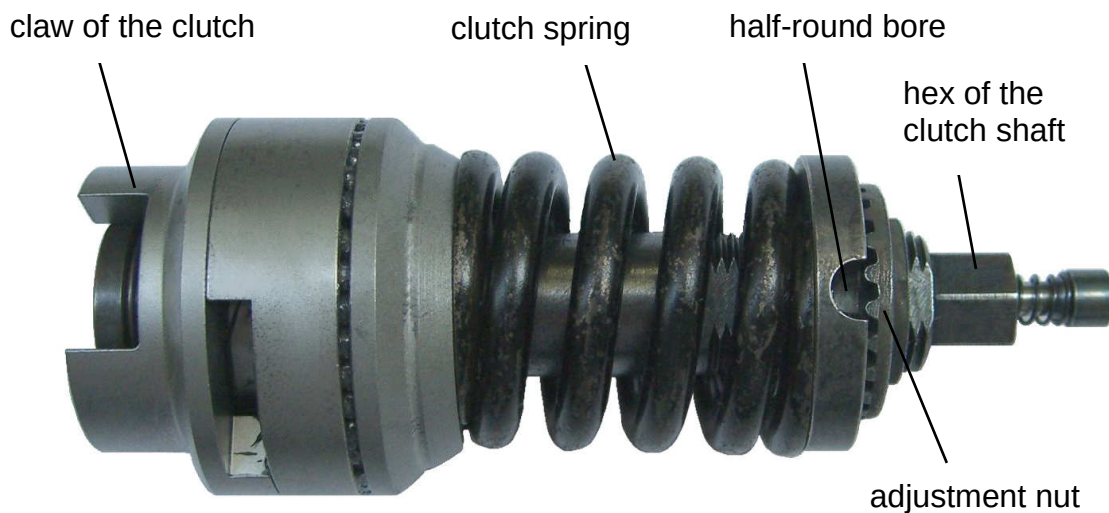
NOTICE

The claw of the clutch must engage with the claw of the spindle (located in clutch bearing).

The hex of the clutch shaft must engage with the hex of the spindle (located in gearing).

Screwdriver type 346-237U and 346-737U

Clutch 389748 I



Screwdriver type 346-337U and 346-437U

Clutch 396030 A

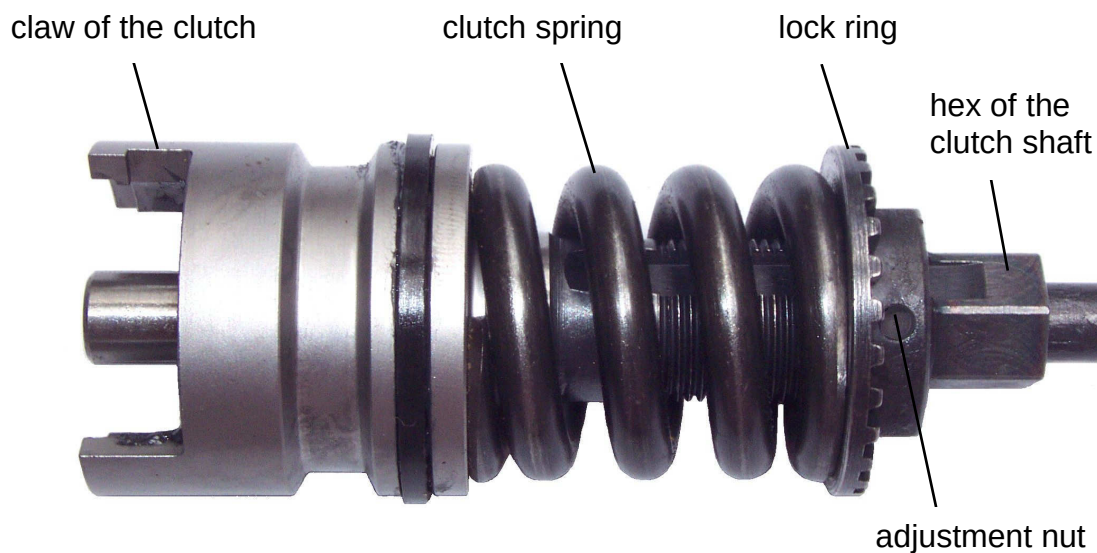


Illustration 3 - Exchange of Clutch Spring



IMPORTANT

Screw adjustment nut onto clutch shaft until minimum one line of the thread is visible.

6.4. Insert or Change Inserting Tool



IMPORTANT

Use perfect inserting tool (e.g. bits) with DIN 3126 – E6.3 (1/4“) external hexagon end only.

The screwdriver is equipped with a quick change chuck.

Mount or change the inserting tool as follows:

1. Disconnect screwdriver from air/power supply.
2. If necessary, unscrew spring sleeve (Optional Equipment) or other components (left-hand thread).
3. Pull the sleeve 351890 forward, the inserting tool can now be inserted or removed.



IMPORTANT

Push the inserting tool into the hex of the spindle until it locks.



Illustration 4 - Insert or Change Inserting Tool

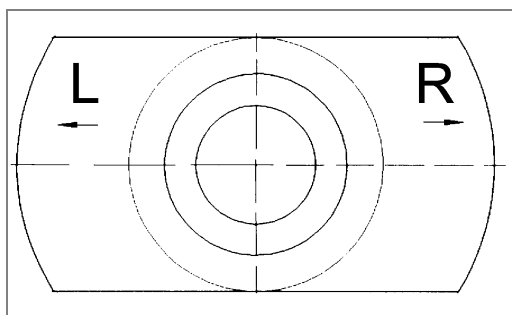
7 Handling

The operation of the screwdriver is very simple

As soon as you put the screwdriver tool (bit, socket) onto the screw/nut and actuate the pusher, the screwdriver will start running.

After reaching the preset torque, the automatic clutch will disengage and turn off the screwdriver. The screwdriver will be ready for the next operation after releasing the pusher.

The operating direction of reversible screwdriver models can be reversed by actuating the reverse handle or the reverse button, in order to loosen tightened screws. The clutch will be locked in the reverse direction. An increased reaction torque may occur in the case of screws are hard to tighten (such as screws with defective thread).



direction of rotation as seen
from operator side!

Illustration 5 - Reversal

8 Maintenance and Upkeep

Incorrect disassembly or assembly can lead to injury of an operator and damage of the machine. Disassembly and assembly work may only be carried out by DEPRAG or qualified personnel.

8.1. Lubricants

Use only lubricants approved by the manufacturer.

Recommended lubricants for...	Air supply-lubrication	Gearing-lubrication
	Name / Order No.	Name / Order No.
Standard applications	Special oil „DEPRAGOL“ (250 cm ³) / 790081 E	DEPRAG-grease (100 g) 807293

8.2. Wear Parts

Part No.	Name	Quantity
326240 (TYPE 346-2/737U)	Key	1
337691 (TYPE 346-3/437U)	Key	1
3269533	Vane	5
801770	O-Ring	1
801942	O-Ring	3
802424	O-Ring	2
802448	O-Ring	1
802476 (TYPE 346-2/737U)	O-Ring	1
802477	O-Ring	5
802478	O-Ring	1
802481 (TYPE 346-3/437U)	O-Ring	1
802514	O-Ring	2
802522	O-Ring	1
803376	O-Ring	1
807647	O-Ring	1
807721	O-Ring	1
811332	Seal ring	1
824940	O-Ring	1
824941	O-Ring	1
828074	O-Ring	1
831856	O-Ring	1

8.3. Maintenance Plan

The first maintenance should be performed after 250,000 cycles with non-lubricated air (dry-running) and after 500,000 cycles with lubricated air (standard operation). In most cases the service interval may be prolonged. However under unfavorable application conditions it may also be necessary to reduce the interval. When re-assembling the screwdriver afterwards, we advise to do about another 30 operating cycles before setting the required torque, in order to allow a possible seating process of the internal clutch parts.



IMPORTANT

Make sure to fix the servicing intervals in accordance with the degree of use of the machine and the respective application.

No.	Work to be carried out	Cycles	Notes
1.	Check screwdriver for external damage	Before starting work	
2.	Check inserting tool for wear and tear and if it is undamaged	Before starting work	Replace worn or damaged inserting tools immediately.
3.	Check the oil level in the oiler and refill oiler as needed; if necessary, re-adjust the oiler	Regularly	Recommended oil → chapter <i>Lubricants</i>
4.	Clean filter of the maintenance unit, bleed water condensation and replace filter if necessary	Regularly	Use cold cleaner e.g. HAKU 1025-810-1
5.	Inspection, testing, cleaning and lubrication (single shift)	Dry-running: After 250,000 cycles / at the latest after 6 months Standard operation: After 500,000 cycles / at the latest after 12 months	Check wear parts such as bearings and vanes and replace parts if necessary Clean and grease motor-, gearing- and clutch parts
5.1	Check the torque setting	For the first time after 50,000 cycles, then at each maintenance	
5.2	Clean and grease motor-, gearing- and clutch parts	Prior to assembly	Use cold cleaner e.g. HAKU 1025-810-1 Recommended grease → chapter <i>Lubricants</i>
6.	Fill approx. 2 - 3 drops of oil into the air inlet	After each cleaning / after assembly	Recommended oil → chapter <i>Lubricants</i>
7.	Check speed and vibration level	After assembly	→ chapter <i>Technical Data</i>

If malfunctioning, we recommend sending the machine to DEPRAG.

9 Disassembly - Assembly

(→ Spare Part Drawing/s)



WARNING

Machine may start. Severe injuries possible.

Disconnect machine from air supply.



CAUTION

Incorrect disassembly/assembly can lead to injury of an operator and damage of the machine.

Disassembly and assembly work may only be carried out by DEPRAG or qualified personnel.



NOTICE

When disassembling, parts could be lost or damaged.

Only disassemble the machine on top of a flat work surface.



NOTICE

Damage to motor housing and internal parts possible.

Always use protective chucking jaws when clamping motor housing (into a vice).

9.1. Service Tools (Optional Equipment)

Name	Order No.
Arbor (to disassemble bearing cover with grooved rotary joint)	462330
Press-in device (for bearing cover and rotor)	462203
Device (to clamp rotor cylinder; disassembly of motor)	4604751
pin (to disassemble/assemble wedge 326946)	460744
Arbor (to assemble circlip 800248)	461292
Pin wrench (for threaded fitting 396582)	462325
Chucking device (to clamp motor housing and valve housing – in order to tighten the motor package with threaded fitting 396582)	463147
Chucking jaws (to clamp motor housing 400336)	460745
Pin wrench (for ring 407371)	409528
Arbor (to assemble silencer 367913)	462156
Arbor (to assemble bearing needle 802332 into clutch shaft 331562)	460405
Arbor (to assemble o-ring 801770 in pistol grip)	413645
Spanner AF 19 (for quick release nipple 804289)	800408
Spanner AF 22 (for connection piece 407465)	800416
Allen key AF 8 (for cover 407372)	800450
Allen key AF 10 (for connection piece 407465)	800451
Speedometer (to check the screwdriver's speed)	830390

9.2. Disassembly

1. Disconnect screwdriver from air supply.
2. Unscrew the clutch bearing 400362 A/B (left-hand thread) complete with the spring sleeve (optional equipment).
3. Take out the clutch 389748 I / 396030 A complete.
4. Pull out the valve pin 402983.
5. Unscrew the screw 400284 (right-hand thread) and remove the reverse handle 400271 and the o-ring 802478.
6. Disassemble the lock ring 800387 by means of a suitable plier and remove the disc 326962 and the o-ring 807647.
7. Take the internal motor package (motor, gearing, valve housing) out of the pistol grip.
8. Remove the 4 balls 802201 from the valve housing 400341.
9. Clamp the motor housing 400336 into a vice by means of the chucking jaws 460475.
10. Unscrew the threaded fitting 396582 by means of the pin wrench 462325 (right-hand thread).
11. Remove both wedges 326946 from the motor housing 400336 by means of the pin 460744. **IMPORTANT:** Make sure that the pressure spring 803438 and the ball 802184 may not be lost while disassembling the wedge 326946 from the valve housing 400341.
12. Push the motor- and gearing parts as well as the valve housing 400341 completely out of the motor housing (in direction of the long hole).
13. Remove the valve housing and the gearing from the motor package.

Disassembly of motor:

- a) Clamp motor on its rotor cylinder into the device (→ *Service Tools*).
- b) Pull off shaft-side bearing cover from rotor.
- c) Remove rotor cylinder.
- d) Take out the vanes and check them thoroughly.



IMPORTANT

Too small or damaged vanes have to be replaced **in sets**.
Basically, use only original vanes from DEPRAG.

- e) Pull off air-connecting side bearing cover from rotor.
- f) Press the two ball bearings from the bearing covers.



IMPORTANT

Minimum vanes width should be 8 mm.

9.3. Assembly



Lubrication prior to assembly

- Fill space areas of the planetary gear with 1/3rd of grease. (recommended grease → chapter *Lubricants*)
- Sufficiently grease the bearings.
- Use only lubricants approved by the manufacturer.

Assembly of motor:

- a) Clean the rotor.
- b) Press the ball bearings into the two bearing covers.
- c) Press the shaft-side bearing cover with the ball bearing onto the rotor.
- d) Insert the new vanes into the rotor.
- e) Put the rotor cylinder over the rotor.



IMPORTANT

After assembly the bearing covers shouldn't have any axial gap.
The rotor must turn freely.

- f) Press the air connecting-side bearing cover with the ball bearing onto the rotor.
1. Push the motor- and gearing package as well as the valve housing 400341 completely into the motor housing 400336. **IMPORTANT:** Make sure that the long-hole in the valve housing overlaps with the long-hole in the motor housing.
 2. Mount the two wedges 326946 into the motor housing 400336 by means of the pin 460744.
 3. Tighten the threaded fitting 396582 by means of the pin wrench 462325 (right-hand thread).
 4. Clamp the motor housing 400336 into a vice on the output side by means of the chucking jaws 460475.
 5. Apply DEPRAG-grease (→ *Lubricants*) to the valve housing 400341 and press the 4 balls 802201 into the appropriate recess.
 6. Check if the o-ring 801770 is in proper condition and replace if necessary (→ illustration „Cross Section Reversal“)
 7. Place the interior motor package (motor, gearing, valve housing) into the pistol grip. **IMPORTANT:** Make sure that the long-hole in the motor housing overlaps with the long-hole in the pistol grip.

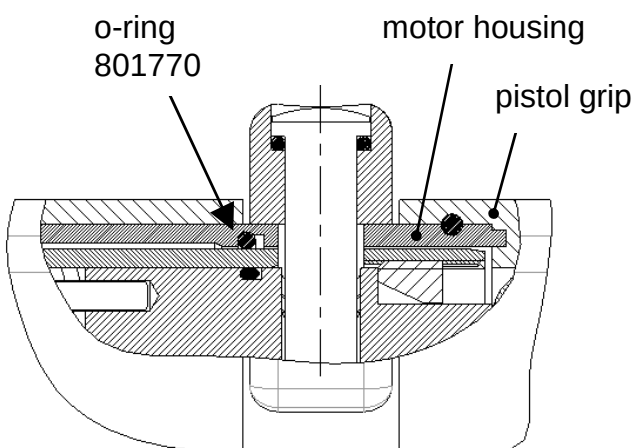


Illustration 6 - Cross Section Reversal

8. Mont the o-ring 807647, the disc 326962 and the lock ring 800387 (service tool: suitable plier) onto the interior motor package.
9. Attach the reverse handle 400271 (with o-ring 802478) onto the pistol grip by means of the screw 400284 (right-hand thread).



CAUTION

The screw 400284 may become loose and cause injuries.
Glue in the screw (e.g. with Loctite 222) !

10. Mount the valve pin 402983.
11. Insert the clutch into the clutch bearing.
12. Tighten the clutch bearing complete with the spring sleeve (optional equipment) onto the screwdriver (left-hand thread).



NOTICE

The claw of the clutch must engage with the claw of the spindle (located in clutch bearing).
The hex of the clutch shaft must engage with the hex of the spindle (located in gearing).

9.4. Check Length of Valve Pin

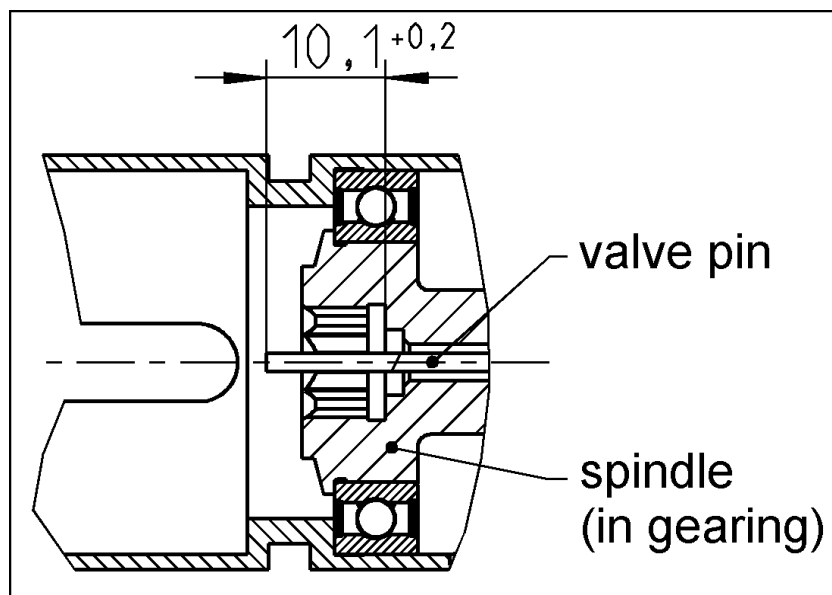


WARNING

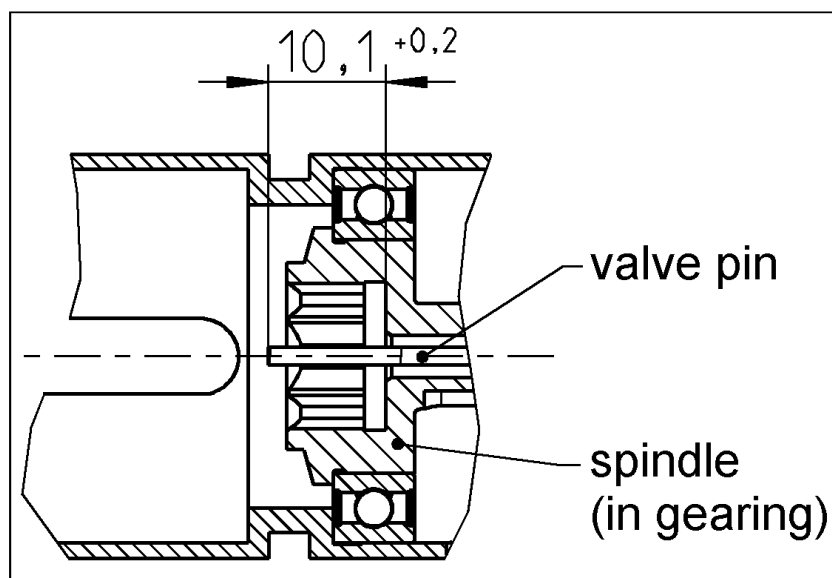
When connecting to compressed air supply valve pin may be catapulted out – this may cause serious injuries.

When verifying the actual size of the valve pin, make sure not to hold the screwdriver directed towards yourself or any other person.

Verify the actual size only with compressed air connected.



Type
346-237U and 346-737U

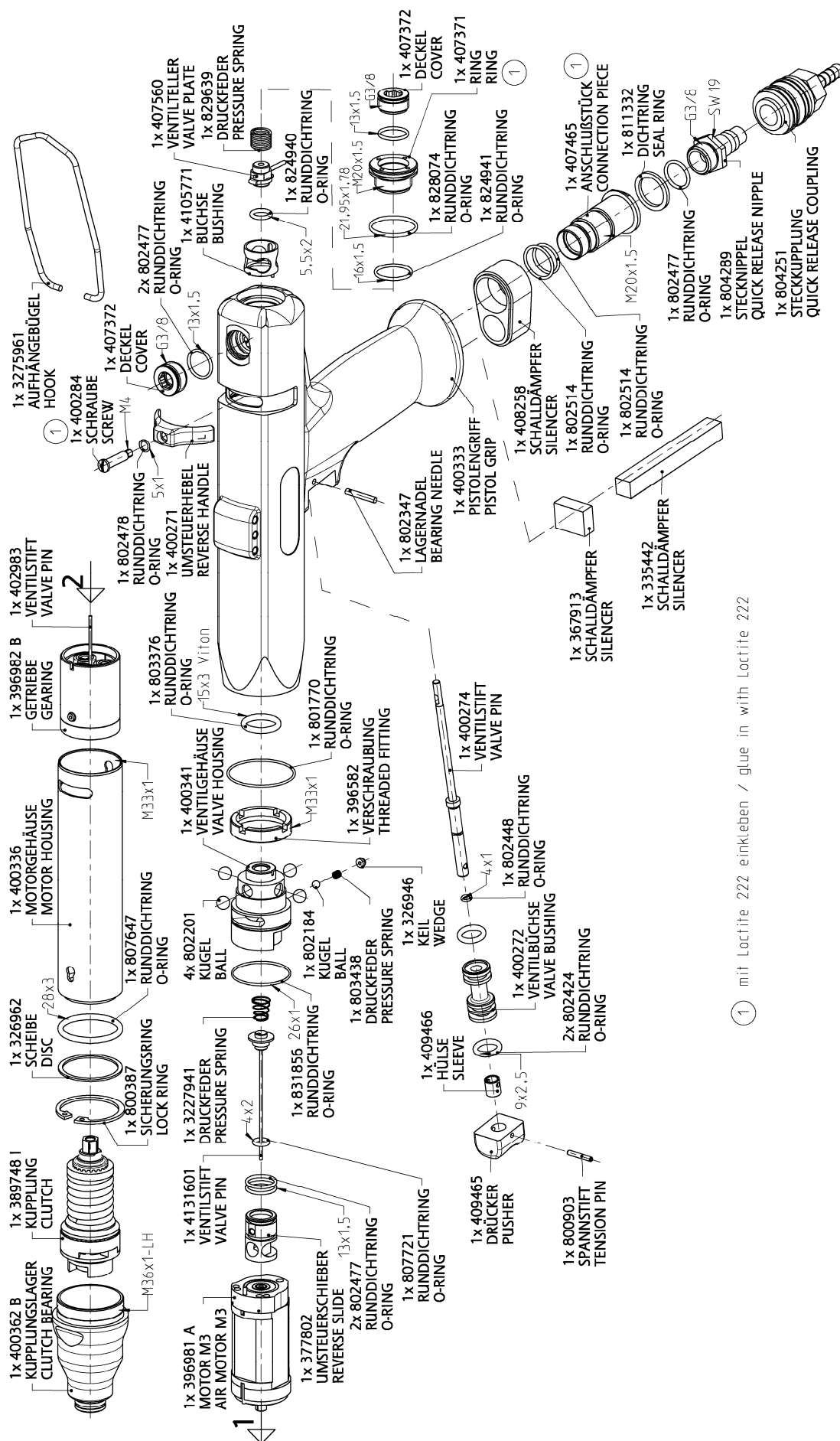


Type
346-337U and 346-437U

Illustration 7 - Required Length of Valve Pin

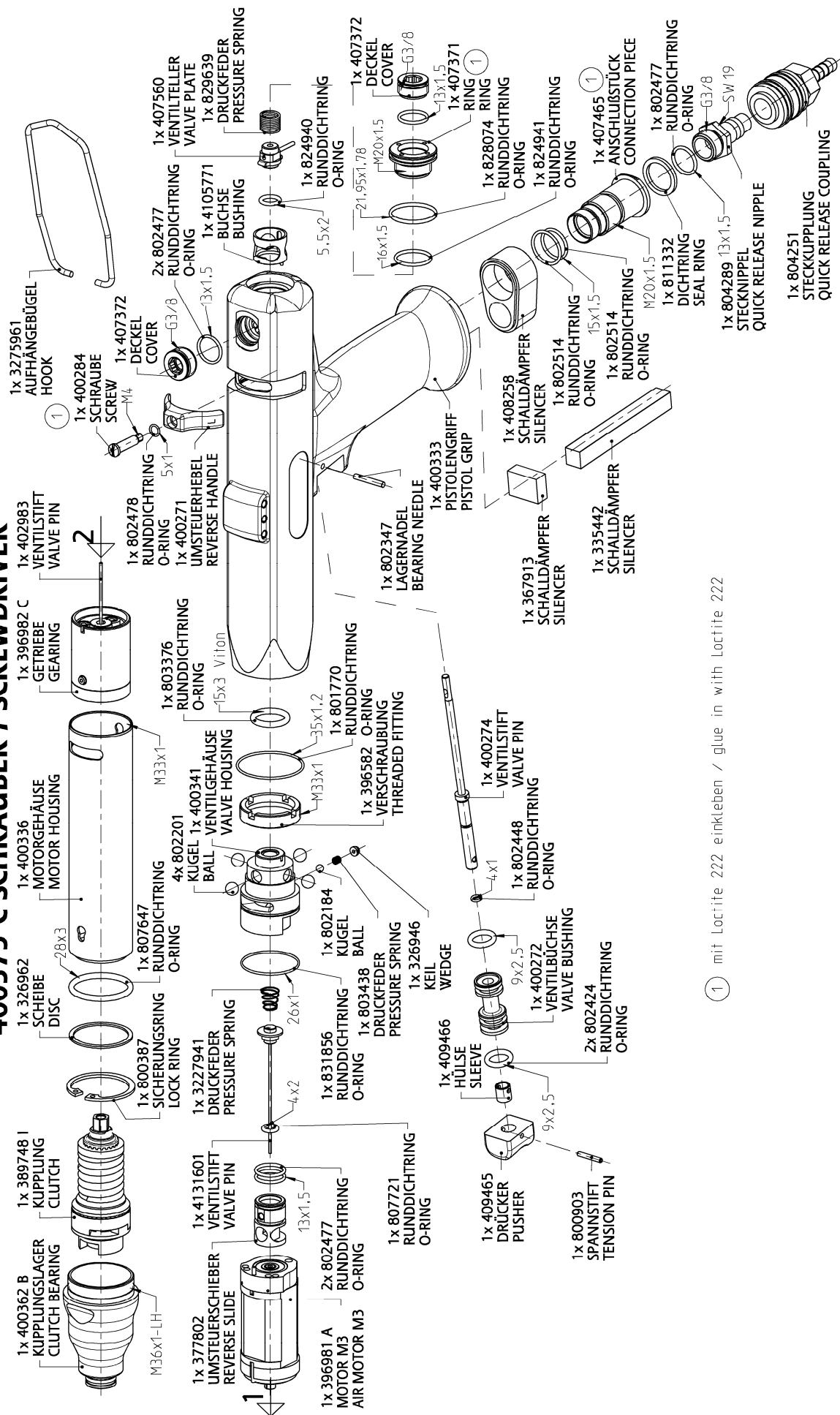
9.5. Spare Part Drawings

346-237U
400373 B SCHRAUBER / SCREWDRIVER



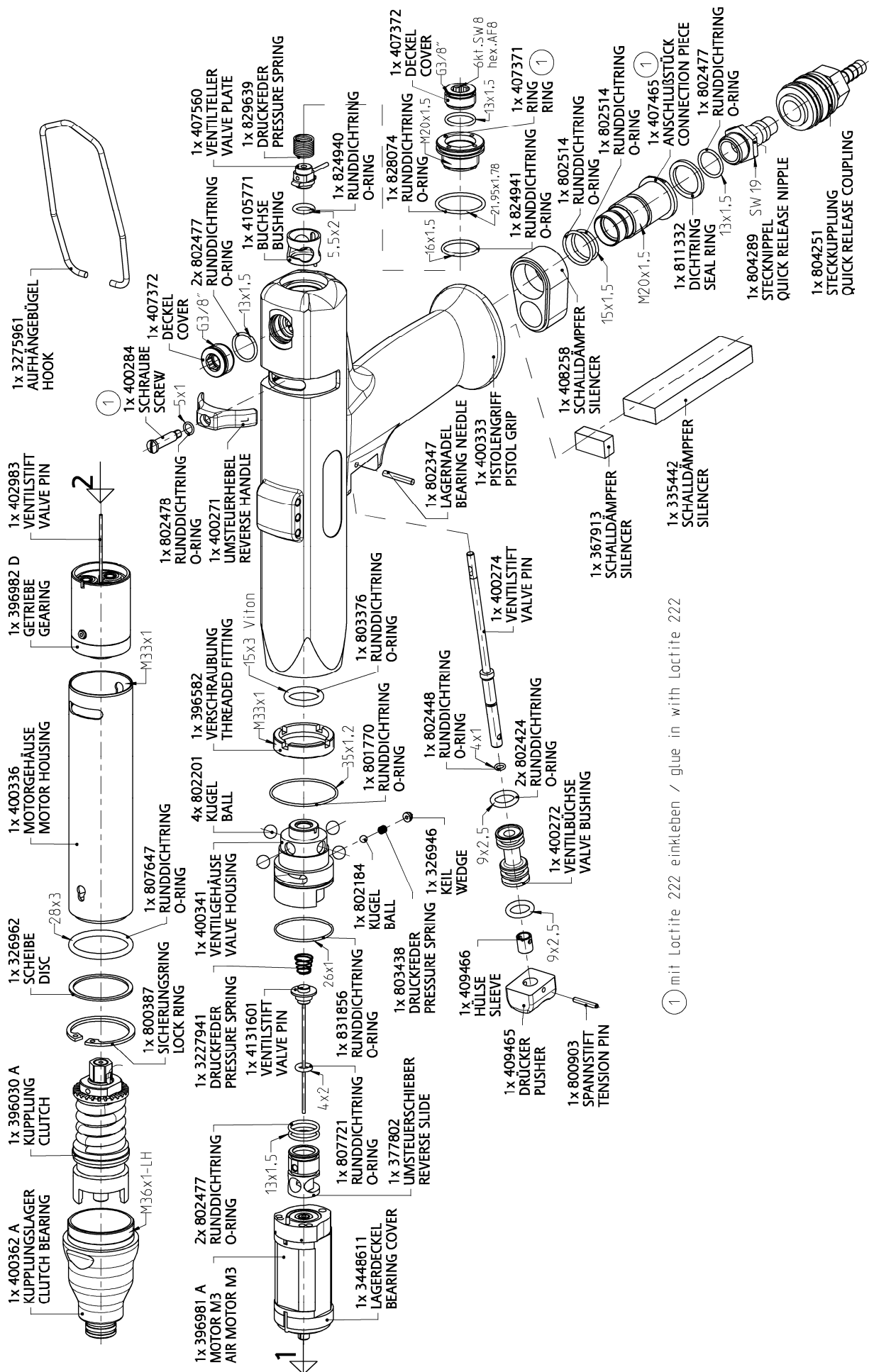
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**346-737U
400373 C SCHRAUBER / SCREWDRIVER**



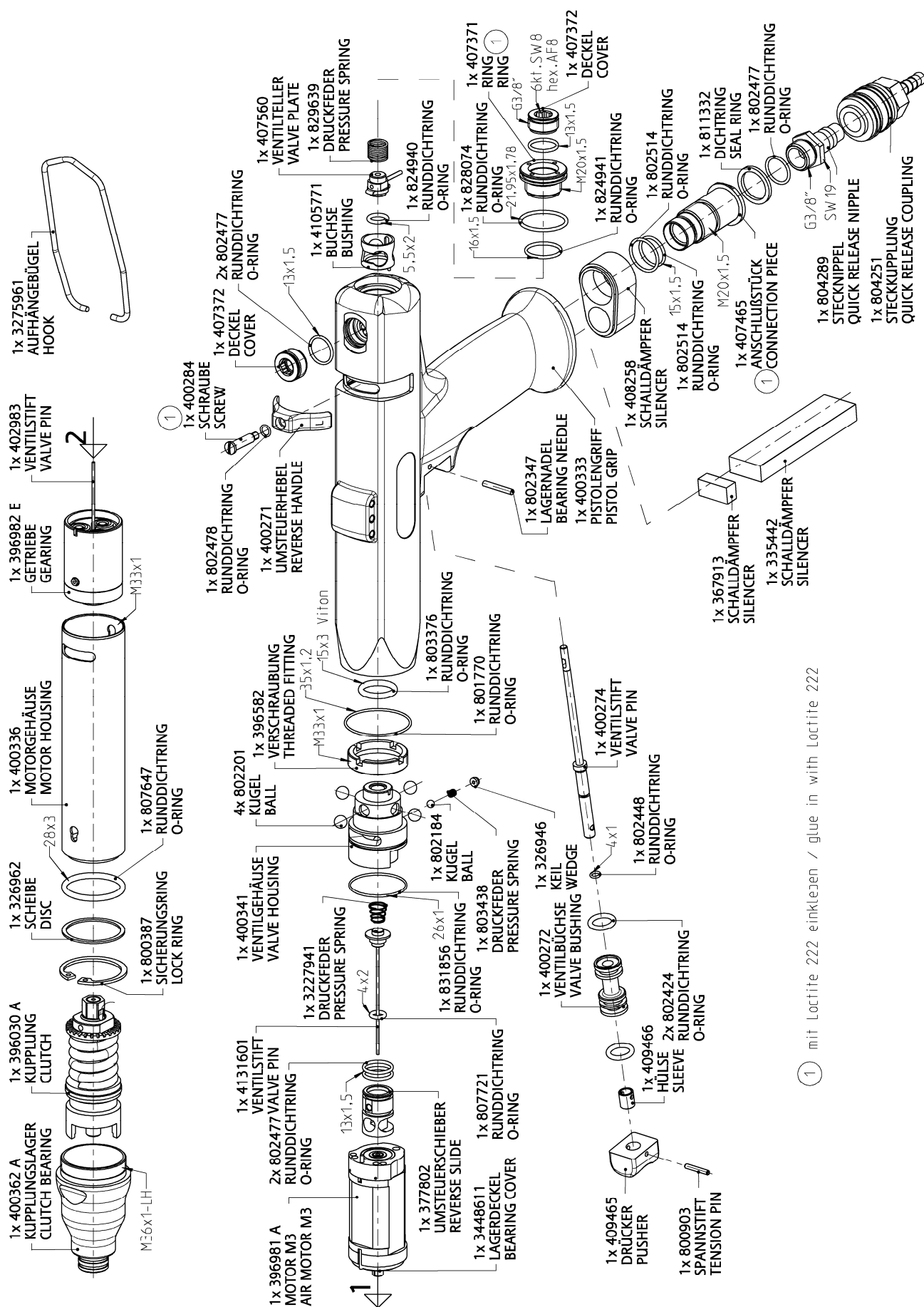
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346-337U
400373 D SCHRAUBER / SCREWDRIVER



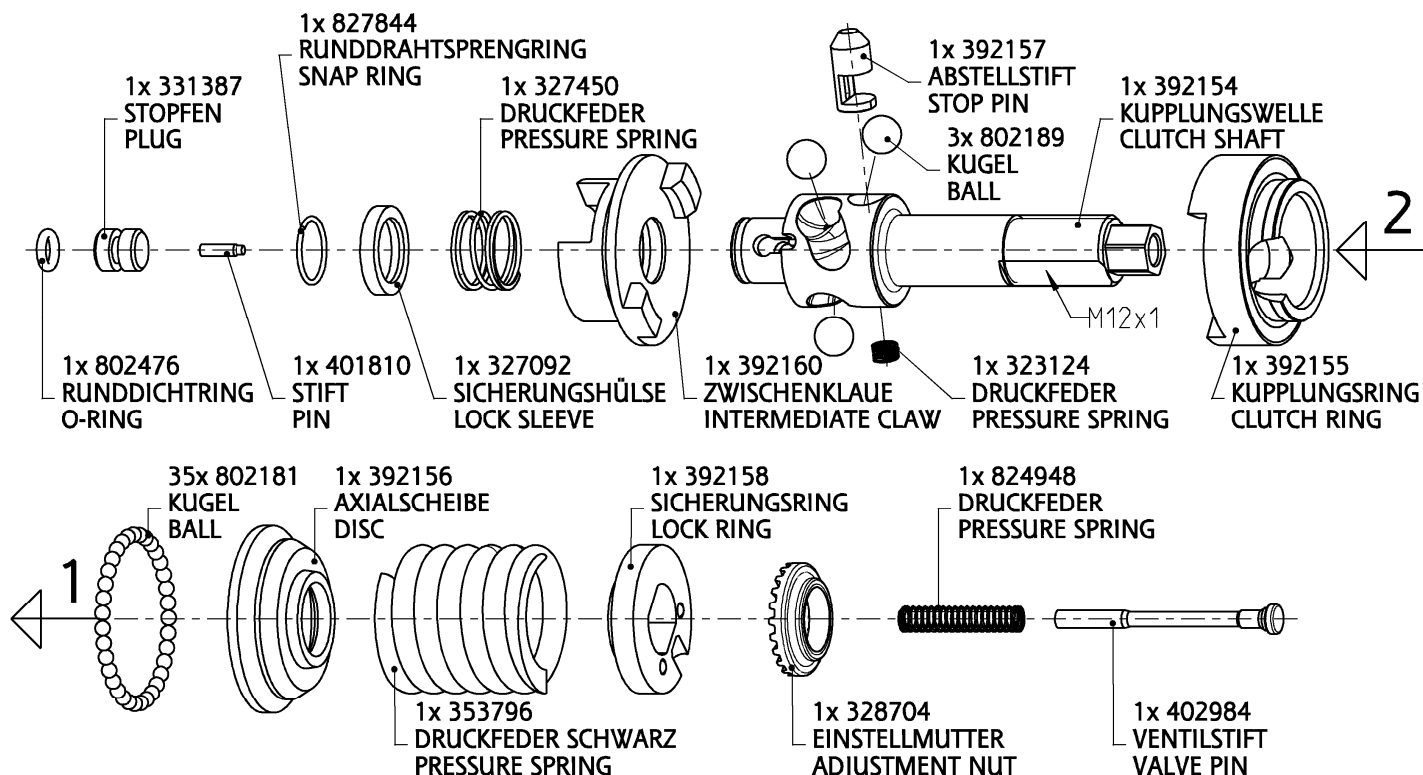
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346-437U
400373 E SCHRAUBER / SCREWDRIVER

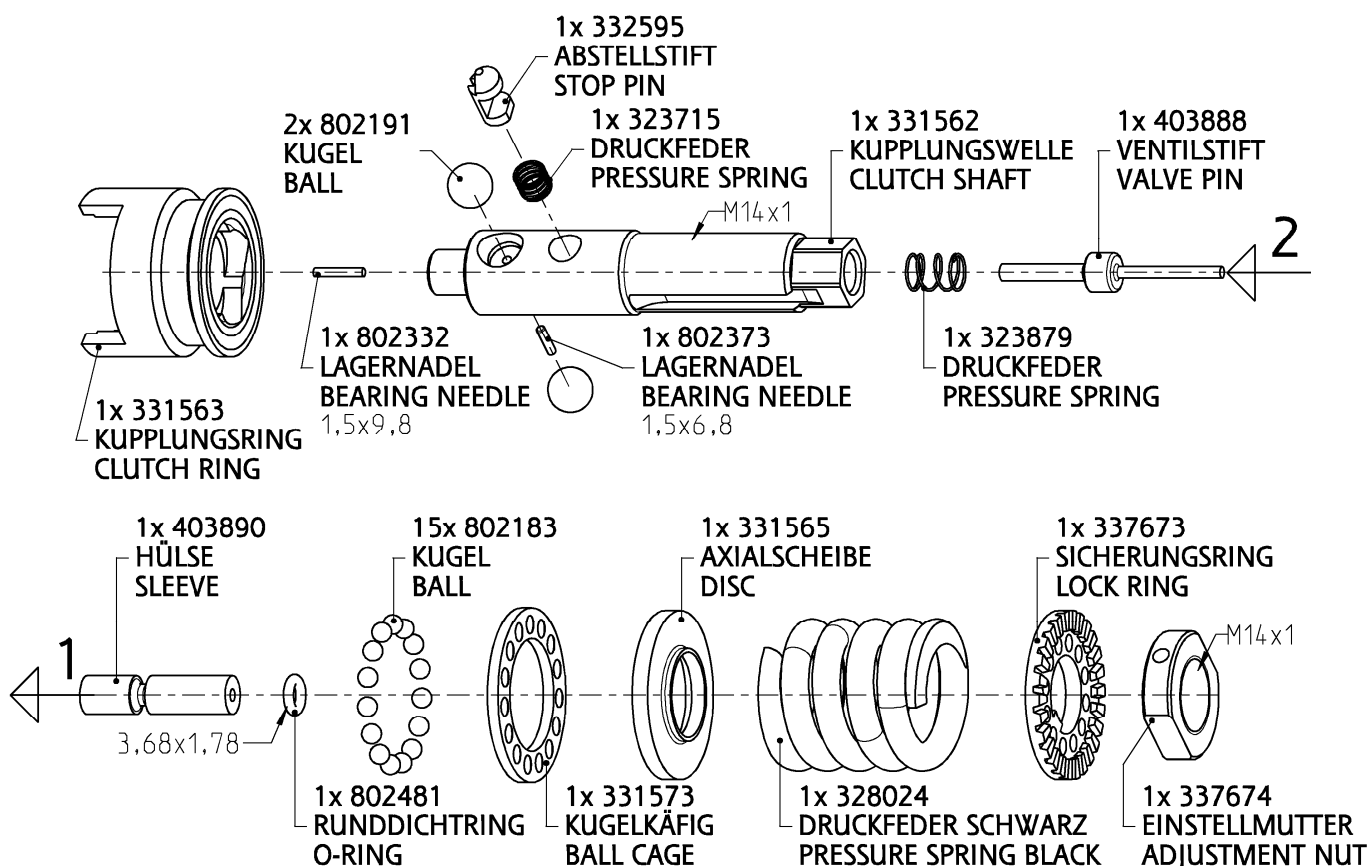


① mit Loctite 222 einkleben / glue in with Loctite 222

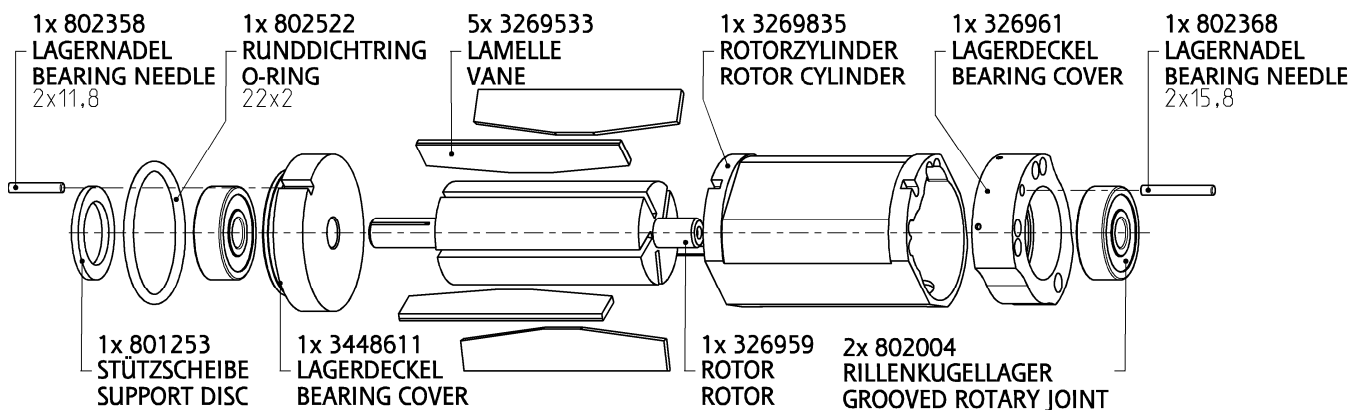
389748 I KUPPLUNG / CLUTCH



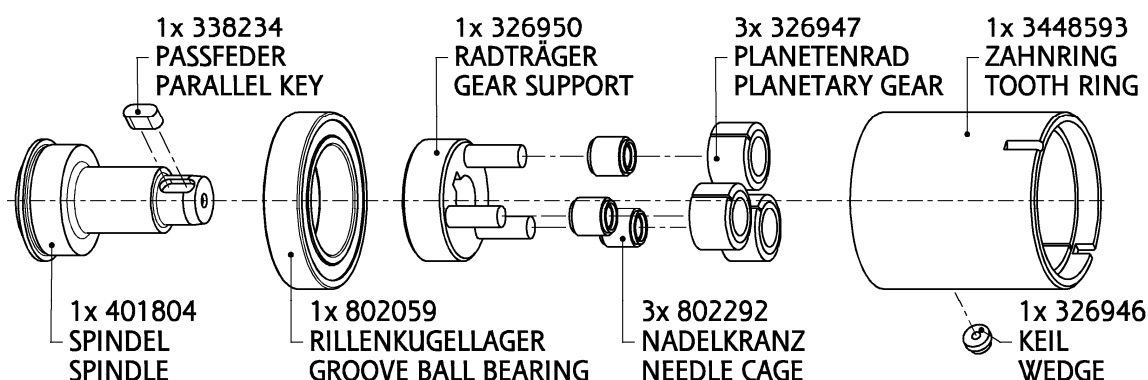
396030 A KUPPLUNG / CLUTCH



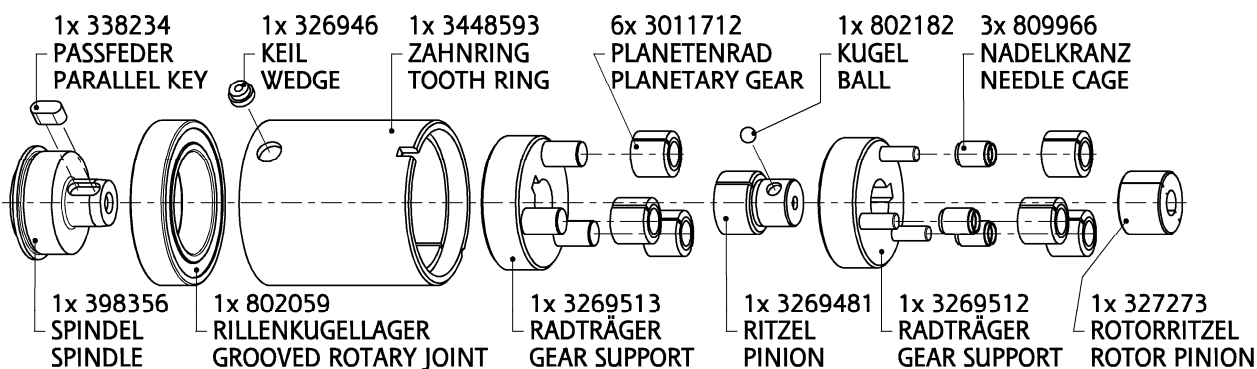
396981 A MOTOR M3 / AIR MOTOR



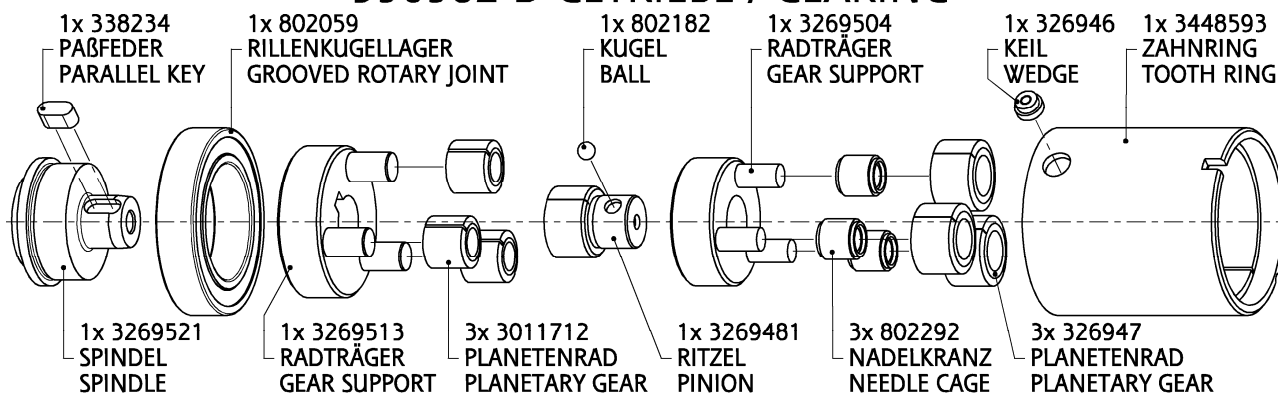
396982 B GETRIEBE / GEARING



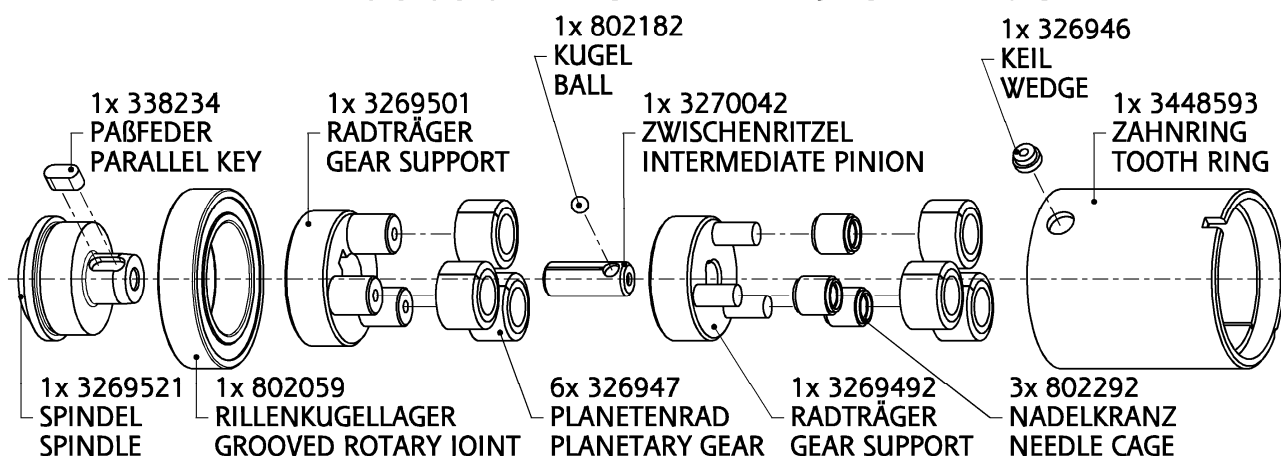
396982 C GETRIEBE / GEARING



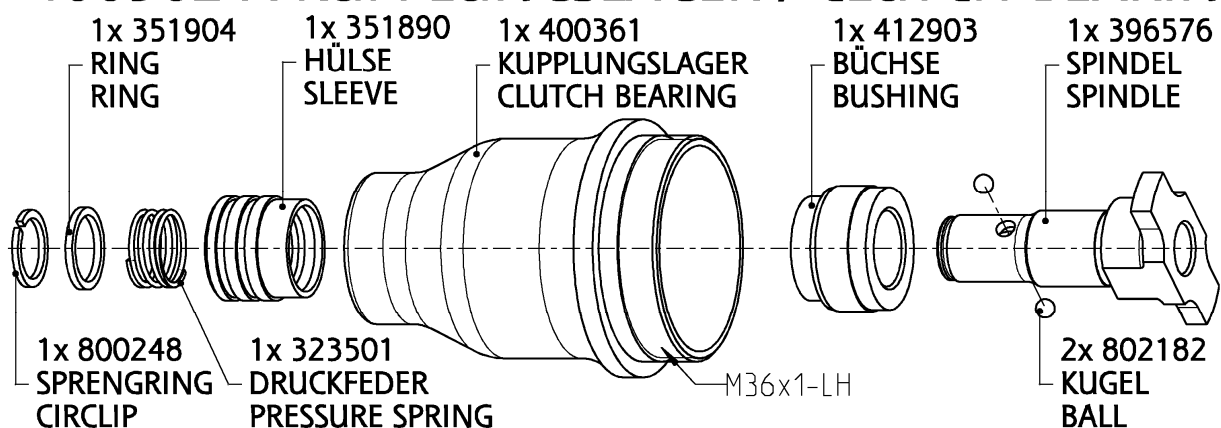
396982 D GETRIEBE / GEARING



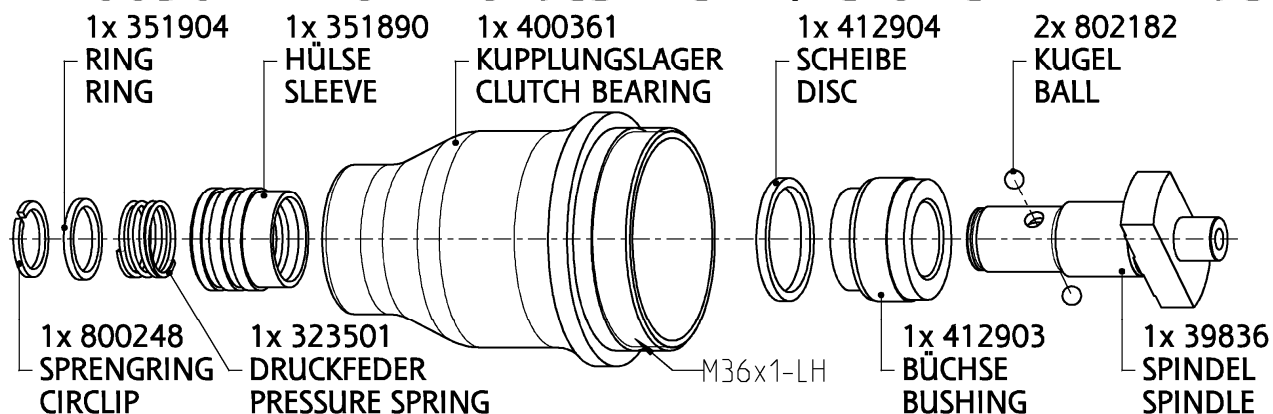
396982 E GETRIEBE / GEARING



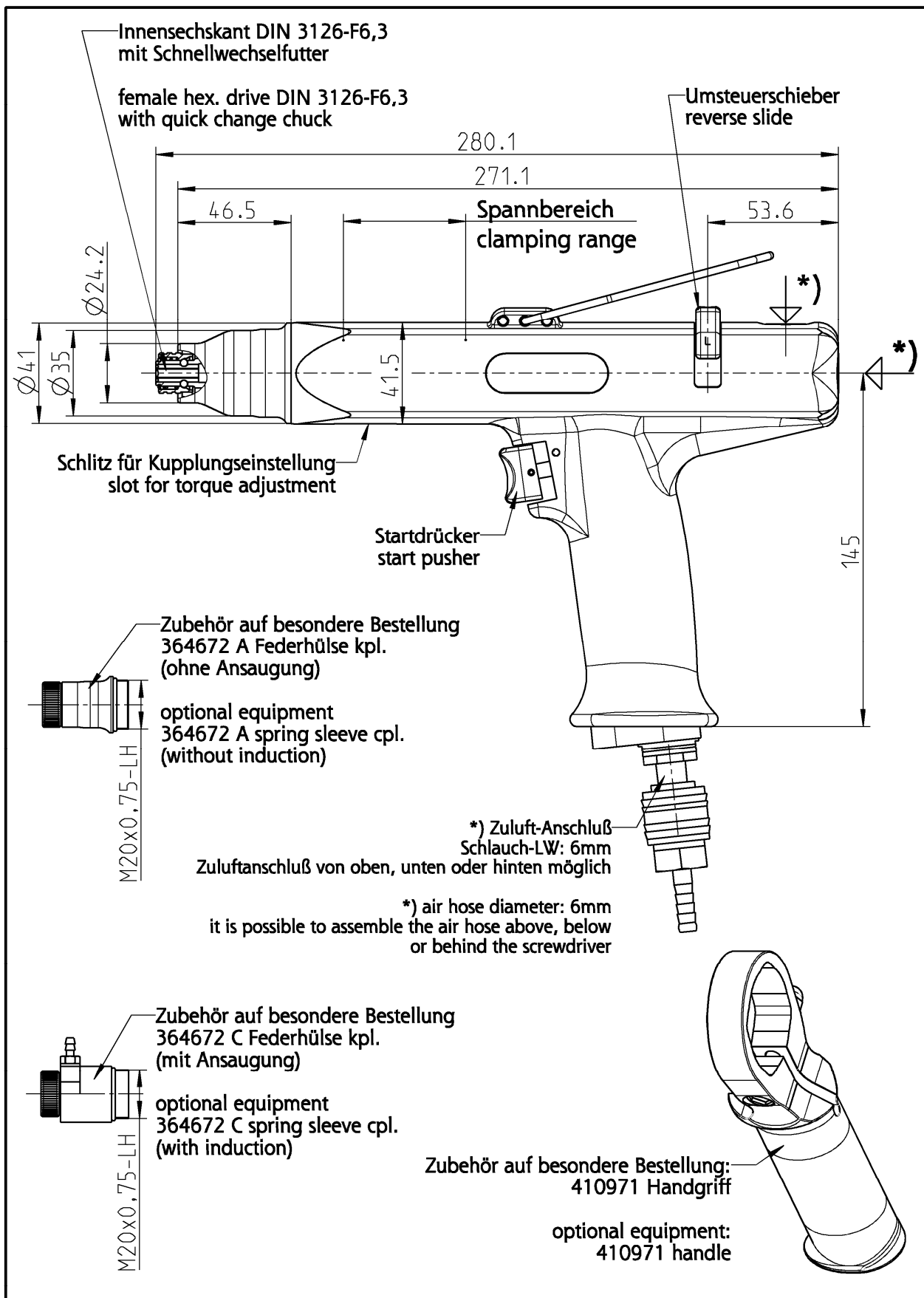
400362 A KUPPLUNGSLAGER / CLUTCH BEARING



400362 B KUPPLUNGSLAGER / CLUTCH BEARING



9.6. Dimension Sheet



Typ / type	DEPRAG	MAßBLATT / DIMENSION SHEET
346-x37U/UL		413167
		Änderungsstand 1

10 Troubleshooting

Possible faults and their causes are shown below:

Fault	Cause	Solution
Screwdriver does not start	No air, shut-off valve is closed	Open shut-off valve
	Valve pin is too short or missing	Check required length of valve pin (→ chapter <i>Check Length of Valve Pin</i>) and replace valve pin if necessary
	Clutch is not engaged	Mount clutch correctly (→ chapter <i>Range and Exchange of Clutch Spring</i>)
Insufficient power	Air pressure too low	Air pressure should be 90 PSI for maximum performance
	Restriction in air hose	Remove bends or other restrictions
	Hose diameter is too small	Use required hose diameter
	Valve pin is too short	Check required length of valve pin (→ chapter <i>Check Length of Valve Pin</i>) and replace valve pin if necessary
	Vanes are worn	Exchange vanes
	Silencer or screen support clogged	Exchange silencer or screen support
Screwdriver does not shut-off or ratchets	Air pressure is too low for required torque value	Maintain air pressure of 90 PSI
	Valve pin is too long	Check required length of valve pin (→ chapter <i>Check Length of Valve Pin</i>) and replace and/or shorten valve pin if necessary

If necessary, please send the tool to DEPRAG for service.

11 Shut Down

For shut-down perform the following steps:

No.	Action
1.	Turn the air supply to "OFF".
2.	Disconnect the pneumatic screwdriver from the air supply.
3.	Drip a couple of oil-drops into the inlet port, reconnect screwdriver to the air supply and let it run for a short time (under low pressure).
4.	Again disconnect the pneumatic screwdriver from the air supply.
5.	Close all connections.

The pneumatic screwdriver may now be stored until needed again.

12 Technical Data

Type	346-237U	346-737U	346-337U	346-437U
Order No.	400373 B	400373 C	400373 D	400373 E
Motor Size	3			
Direction of Rotation	reversible			
Design	trigger start			
Air-Inlet	upper, lower or rear air-inlet			
Screws up to	M5	M6	M6	M8
Torque min. (Nm/in.lbs)	2 / 17.7			
Torque max. soft pull-up (Nm/in.lbs)	4.5 / 39.8	7 / 62	12 / 106.2	20 / 177
Torque max. hard pull-up (Nm/in.lbs)	5.5 / 48.7	8 / 70.8	12 / 106.2	20 / 177
Speed, unloaded (rpm)	2300	1200	650	320
Air Consumption (m ³ /min / cfm)	0.4 / 14			
Weight (kg/lbs)	1.9 / 4.18	1.95 / 4.30	1.96 / 4.32	1.96 / 4.32
Sound Pressure Level LpA according to DIN EN ISO 15744 (dB(A))	72)*			
Hose I.D. for Air Supply (mm/in.)	6 / 1/4"			
Air Pressure (bar/PSI)	6.3 / 90			
Drive Hex. Female (DIN 3126)	F6.3 (1/4")			
Suitable tool inserts and connecting components with a drive as per DIN 3126	E6.3 (1/4")			
Quick Change Chuck, mounted	yes			
Vibration (m/s ²)	< 2.5			

)* Uncertainty of measurement 3 dB

13 EC-Declaration of Conformity

EC-Declaration of Conformity in accordance with the EC Machinery Directive 2006/42/EC

As manufacturer of the machine we declare that the machine specified in the following corresponds to the Directives and Standards listed below.

Manufacturer

DEPRAG

DEPRAG SCHULZ GMBH u. CO.

P.O. Box 1352, D-92203 Amberg

Kurfürstenring 12 – 18, D-92224 Amberg

**Authorized Person
for Documentation**

Mr. Josef Bock, address see manufacturer

Name

PNEUMATIC SCREWDRIVER

Machine Type

please see

Serial Number

original instructions

Year of Manufacture

in German language

Directives

2006/42/EG

Date

2006-06

Standards

DIN EN ISO 12100-1

DIN EN ISO 12100-2

EN 792-6+A1

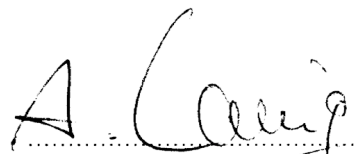
Date

2004-04

2004-04

2009-12

Amberg, 3/25/2011

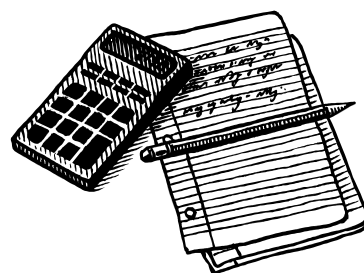

Dipl. Ing. (FH) A. Langig
Mr. Design Dept.

14 Service Locations and Authorized Partners



Contact persons in Germany
as well as
contact persons worldwide
can be found on our web site
www.deprag.com

Notes



DEPRAG

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CERTIFIED AS PER DIN EN ISO 9001
