

DEPRAG

Operating instructions

Pneumatic screwdriver

346-220-31
346-320-31
346-520-31

353657 A
353657 B
353657 C

DEPRAG

DEPRAG SCHULZ GMBH u. CO.

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CERTIFIED AS PER DIN EN ISO 9001

Nov-02 Technical alterations reserved

MINIMAT-ULTRA

Dear Customer:

Congratulations, you chose the enclosed tool from an extensive DEPRAG product line. This tool is the result of more than 60 years experience in the design and manufacturing of pneumatic tools for the industrial market. We offer a complete program of pneumatic tools, such as Drills, Tappers, Grinders, Screwdrivers, Impact Wrenches, Metal Working Tools and Hammers.

Please call us for all of your needs, from individual hand tools to the complete automated screwdriving cell. Our products offer solutions to any and all requirements, which are needed in the screwdriving sector.

We kindly ask, that you read these operating instructions carefully, so that you will be able to use this tool safely and for many years to come. If you need additional information, please contact your DEPRAG Representative or contact us direct at DEPRAG. We will be happy to answer any questions.

We hope you will be pleased with your new tool!

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6. Technical Data/Specifications

Technical Data:

Manufacturer: DEPRAG-SCHULZ GMBH & CO.
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Subsidiary: DEPRAG INC.
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Model:	346-220-31	346-320-31	346-520-31
Order no.:	353657 A	353657 B	353657 C
Length:	218 mm = 8 19/32 inches		
Diameter:	27 mm = 1.06 inches		
Drive:	1/4" female hex		
Weight:	0,9 kg = 2,0 lbs.		
Air Pressure Requirement	6,3 bar = 90 PSI		
Hose I.D. Requirement:	6 mm I.D. = ¼" I.D.		
Torque min. (Nm/in.lbs.)	0,5 / 5	0,4 / 4	0,3 / 3
Soft pull-up max. (Nm/in.lbs.)	1,4 / 12	2,7 / 24	5,0 / 44
Hard pull-up max. (Nm/in.lbs.)	3,0 / 26	3,5 / 31	5,0 / 44
Speed (rpm):	3800	1400	620
Noise Level:	68 dB(A)		
Air Consumption:	0,3 m ³ /min		

5. CE-Declaration of Manufacturer

EC-Declaration of Manufacturer in accordance with the CE-Machine-Guideline 98/37/EG, appendix II B

DEPRAG SCHULZ GMBH u. CO.
P.O. Box 1352

92203 Amberg, Germany

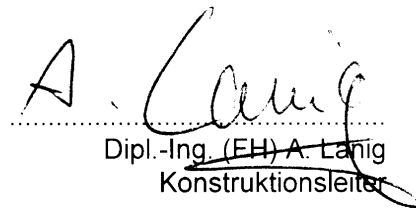
declares, that the construction of

346-220-31
346-320-31
346-520-31

zum Zusammenbau mit einer anderen Maschine bestimmt ist und dass ihre Inbetriebnahme solange untersagt ist, bis festgestellt wurde, dass die Maschine, in die o.g. eingebaut werden soll, den Bestimmungen der EG-Richtlinie Maschinen i.d.F.98/37/EG entspricht.

Angewendete Normen
- EN 292

Amberg, den 08.01. 2004


Dipl.-Ing. (FH) A. Lanig
Konstruktionsleiter



Before starting operation of tool make sure to carefully read and follow operating instruction.

General Information:

All DEPRAG MINIMAT-ULTRA screwdrivers can be used with or without lubrication. (Please refer to 3.2 Testing and Maintenance)

1. Operating Instruction

1.1 Safety Tips

- The tool is not insulated to protect an electrical power surge.
- It is not recommended to use this tool in explosive hazardous environments.
- The driver is activated immediately when air is connected, this may possibly cause an injury. (provide valve)
- Injury is possible, if the driver reacts with an unexpected motion or is damaged.
- During any maintenance or repair work, or when changing bits, the tool must be disconnected from the air supply.
- During any maintenance or repair work, a clean working surface is recommended. Also, it is not recommended to either eat or smoke during repair or maintenance.

1.2 Application

Screwdriver Spindles are constructed for the stationary use in:

- Lever Operated Single Spindle Screwdriving Stations
- Construction Units
- Multi-Spindle Screwdriving Stations
- Robot End-Of-Arm Tooling
- X-Y-Z Screw-Assembly Stations

These Spindles assemble screws to torque and measure that torque more accurately than any subsequent testing method. They tighten and test the assembly in one operation.

1.3 Range- and Exchange of Clutch Spring

The torque range of the DEPRAG MINIMAT-ULTRA Screwdriver is adjustable. Please see a listing for the ranges of the color coded springs below.

Torque range of individual Screwdriver Spindle:

Model	346-220-31	346-320-31	346-520-31
Torque Capacity: min.:	0,5 Nm = 5 in.lbs.	0,4 Nm = 4 in.lbs.	0,3 Nm = 3 in.lbs.
max. soft pull-up:	1,4 Nm = 12 in.lbs.	2,7 Nm = 24 in.lbs.	5,0 Nm = 44 in.lbs.
max. hard pull-up:	3,0 Nm = 26 in.lbs.	3,5 Nm = 31 in.lbs.	5,0 Nm = 44 in.lbs.

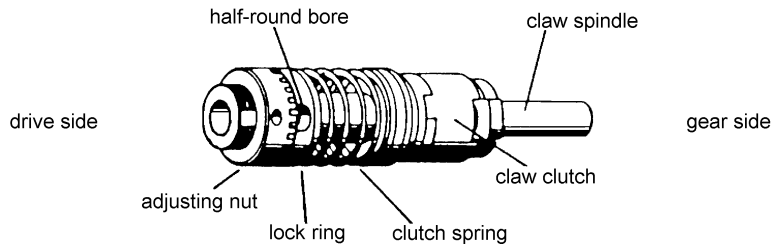
Torque Range of individual clutch springs: (appx.)

Part	WireÆ	Color	Torque minimum	Torque maximum
326417	3,4 mm	black	1,5 Nm = 13 in.lbs.	5,0 Nm = 44 in.lbs.
323034	3,2 mm	violet	2,0 Nm = 18 in.lbs.	4,5 Nm = 40 in.lbs.
323035	2,8 mm	green	1,4 Nm = 12 in.lbs.	2,4 Nm = 21 in.lbs.
323036	2,25 mm	red	0,5 Nm = 4,4 in.lbs.	1,5 Nm = 13 in.lbs.
323037	1,6 mm	yellow	0,2 Nm = 1,8 in.lbs.	0,6 Nm = 5,3 in.lbs.

All torque values are based on 90 PSI (6,3bar) air pressure.

Change of Clutch Spring (Picture 1)

1. Disconnect driver from air supply.
2. Unscrew Clutch Bearing 352276 D together with Spring Sleeve 364672 A and Quick Change Chuck (left hand thread) by using wrench AF (24 mm).
3. Take out clutch 352257 L/K/H complete.
4. Press torque setting screwdriver 326240 into the half-round bore of the lock ring 326110/1 and turn in clockwise direction, until the adjustment nut 326111 is unscrewed. (see also Picture 3)
5. Pull off lock ring 326110/1.



Picture 1: Change of clutch Spring

6. Remove clutch spring, replace with new clutch spring and re-assemble clutch in reverse order.
7. Push clutch into the clutch bearing and tighten clutch bearing to the motor housing of the screwdriver. (left hand thread)

Attention:

The claw of the clutch must engage with the claw of the spindle.

8. The clutch can be adjusted again externally (see 1.5).

4. Trouble Shooting

Error	Reason	Solution
Screwdriver does not start	No air, Shut-Off valve is closed	Open Shut-Off valve
	Clutch is not engaged	Mount clutch correctly Refer to: Range- and exchange of clutch spring
Insufficient Power	Air pressure too low	Minimum air pressure should be 90 PSI for maximum performance
	Restriction in air hose	Remove bends or other restrictions
	Valve Pin too short	Check required length of valve pin according to picture 7. If needed, exchange valve pin.
	Hose I.D. is too small	Use required hose I.D.
	Screen Support clogged	Clean screen support or exchange with new one
	Vanes are worn	Exchange vanes
Driver 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 length of valve pin, either shorten or replace valve pin (picture 7)

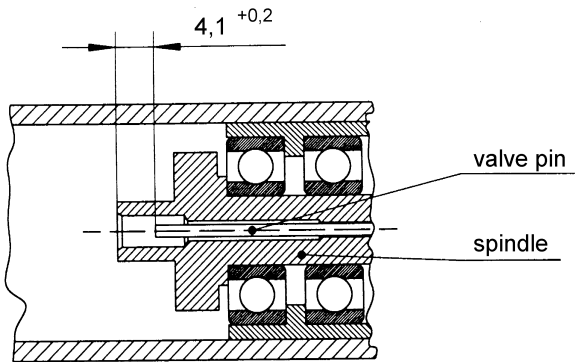
3. Take out clutch 352257 L/K/H complete.
4. Clamp screwdrivers valve housing 346834 in vice and unscrew motor housing 331839 with wrench AF 24 mm (right-hand-thread).
5. Take out valve parts cpl. 379020 A.
6. Clamp mounting tube 460566 in vice and use the to it belonging plunger to push out the motor- and gearing parts in direction to the air inlet side.

Attention:

Motor- and gearing parts could be damaged when falling down. Assemble the tool in reverse order.

3.4 Special Repair Tools

Wrench 7 mm AF	800400	Wrench 24 mm AF	800406
Wrench 8 mm AF	800399	Allen Key 6 mm AF	800449
Wrench 13 mm AF	800404	Mounting Tube	460566
Wrench 17 mm AF	800405		



Picture 7: Actual size of Valve Pin



Attention:

When connecting to compressed air supply valve pin may be catapulted out which may cause serious injuries. When checking the actual size of the valve pin make sure to not hold the screwdriver towards yourself nor any other person.

Check the actual size only with compressed air connected!

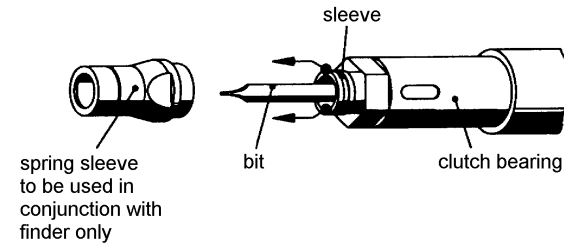
1.4 Change of Bits

Attention:

Before exchange of bits, clutch bearing has to be in place and driver needs to be disconnected from air supply.

To change bits, refer to picture 2:

1. Unscrew the spring sleeve 364672 A (left hand thread). This is only necessary if a finder is mounted.
2. Pull the sleeve 351890 forward, the bit (6,3mm = 1/4" hex drive) can now be removed or inserted.

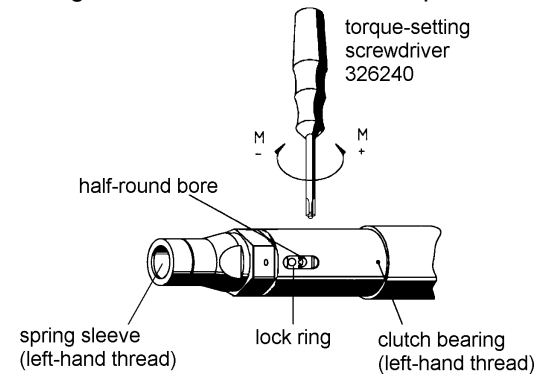


Picture 2: Change of Bits

1.5 Torque Adjustment

The required torque for the driver can be adjusted externally as follows:

1. Disconnect Screwdriver from air supply.
2. Press torque-setting-screwdriver 326240 through one of the three openings of the clutch bearing 355439 into one of the half-round bore. (If necessary, turn Clutch with bit)
3. By turning the screwdriver in clockwise direction, the torque is reduced and by turning it counter-clockwise, the torque is increased.



Picture 3: Torque Adjustment

1.6 Connection, Installation and Operation

Attention:

The driver starts by remove-valve. The flow-pressure cannot drop below 5 bar.

Blow out air hose before connecting it to the tool.

Connect the MINIMAT® ULTRA Screwdriver Spindle as follows:

- a) If used with lubrication, connect driver to Maintenance Unit, consisting of Filter, Regulator and Lubricator.
- b) If used without lubrication, connect driver to Maintenance Unit, consisting of Filter and Regulator.

The required I.D. of pressure hose is 6 mm (1/4"). Please make sure, that the pressure hose length does not exceed 2 meters (6,6 ft.)

The air pressure should be 90 PSI (6,3 bar). A pressure below 90 PSI reduces tool performance; a pressure above 90 PSI increases wear and tear on the tool.

In regards to air-quality according to ISO 8573-1, we recommend:

	Class	Residue of Oil Content mg/m ³	Residue of Dust		Residue of Water	
			particle size µm	max. concentration mg/m ³	pressure dewpoint °C	max. concentration g/m ³
Lubricated Air	4	5	15	8	+3	6
Dry Air	3	1	5	5	-20	0,88

Attention:

Make sure the hoses allow unrestricted air flow; avoid bends, nicks, etc.

Installation:

The installation and connection of the Screwdriver Spindle requires the following steps:

1. Adjust clutch to required torque setting (see 1.3/1.5)
2. Install Screwdriver spindle according to picture 4. If several Spindles are being installed, refer to the screwdriver arrangement on construction sheet 353908/1 (if you do not have this construction sheet, please call us)
3. Make sure valve is attached to air supply, in closed position. Then connect main air hose (1/4" I.D. Hose part 806095 - specify length).
4. Connect pneumatic function control hose (3mm I.D. Hose part 806107 specify length). This function control is under pressure of 2,5 bar during actual screw-driving. **If the function control is not needed, the port has to be closed, otherwise there is a loss of power of about 15 %.**

3. Maintenance

3.1 General

Testing and maintenance can be provided by Operator, disassembly and re-assembly of the DEPRAG MINIMAT® ULTRA Screwdriver Spindle should be done by experienced maintenance personnel. Incorrect assembly or disassembly can lead to injury of an operator and damage of the tool.

3.2 Testing + Maintenance

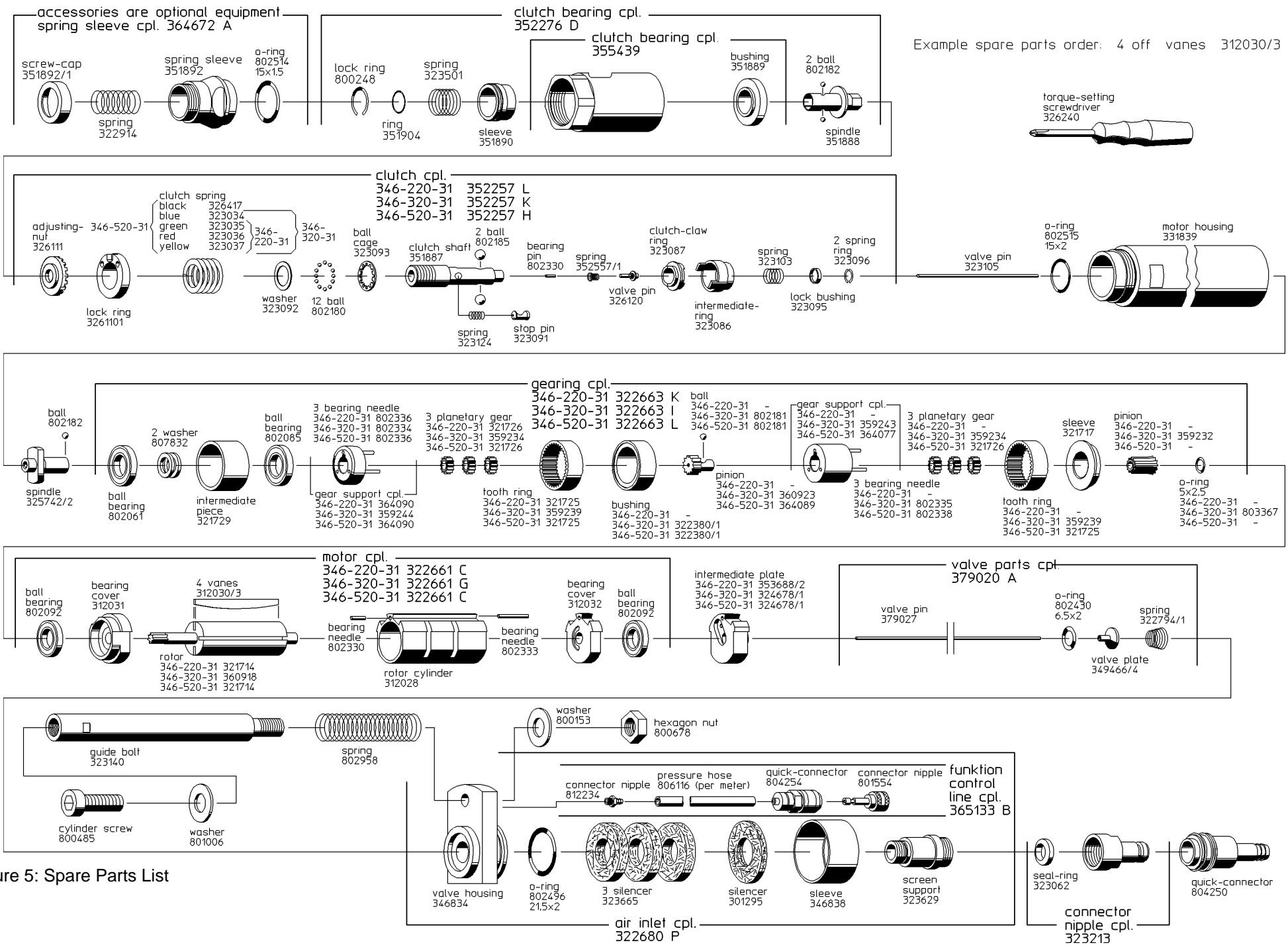
The tool requires little maintenance. If the following service rules are observed, the tool will have a long life expectancy and will remain in a safe condition.

- Check tool on a regular basis for external damage.
- Check your maintenance until on a regular basis, make sure that sufficient oil is in the lubricator (if lubrication is used) and that the adjustment is correct. We recommend for your lubricator DEPRAGOL, part 790081 A. Oiling: approx. 1 - 2 drops per 1 m³ air consumption.
- If tool are being used with lubrication, we recommend to have tools tested and cleaned every 12 months (single shift).
- If tools are being used without lubrication, we recommend to have tools tested and cleaned every 6 months (single shift).
- After cleaning, the gearing parts have to be greased prior to re-assembly, preferably with Grease, part 807293.
- After assembly fill 2 – 3 drops of DEPRAGOL into the air inlet nipple.
- Exchange broken or worn bits and parts immediately, for they can cause injury to the Operator.

Assembly and Disassembly

Disassemble the screwdriver spindle according the following steps.

1. Unscrew nut 800678 with wrench AF 13 mm (right-hand-thread) and take-out guide bolt 323140.
2. Unscrew clutch bearing 352276 D complete with spring sleeve 364672 A and quick change chuck, witch wrench AF 24 mm (left-hand-thread).



Picture 5: Spare Parts List