ROTAX
AIRCRAFT ENGINES

SERVICE BULLETIN

CHECKING AND REPLACEMENT OF STATOR ASSY.

MANDATORY

SB-912-026
SB-914-014

Repeating symbols:

Please, pay attention to the following symbols throughout the Service Bulletin emphasizing particular information.

▲ WARNING: Identifies an instruction, which if not followed, may cause serious injury or even death.

■ ATTENTION: Denotes an instruction which if not followed, may cause property damage including severly damaging the engine voiding the warranty.

◆ NOTE: Information useful for better handling.

1) Planning information

1.1) Engines affected

All versions of the engine type:

■ ATTENTION: All engines which have already complied with this Bulletin are not effected by revision 3 unless. Short-comings at the preflight ignition check mandate rework is necessary.

group A)

- none

group B)

- 912 A (Series) from S/N 4,076.071 to S/N 4,410.366
- 912 F (Series) from S/N 4,412.502 to S/N 4,412.791
- 914 F (Series) from S/N 4,420.002 to S/N 4,420.157

group C)

- 912 A (Series) from S/N 3,792.556 to S/N 4,076.063

group D)

- 912 A (Series) from S/N 3,792.541 to S/N 3,792.555

group E)

- 912 A (Series) from S/N 4,076.064 to S/N 4,076.070

1.2) Concurrent SB/SI und SL

- none

1.3) Reason

- Unfavourable influence of chemical reactions, improper maintenance or unsuitable installation could cause damage insulation material of the stator cables.

1.4) Subject

- Checking of the ignition unit and replacement of stator assy.

1.5) Compliance

- before the next flight: check the stator as per the following instructions- section 3.1).
- at the next 100 h-check but at the latest by 01.04.2000: Replace the stator assy. as per the following instructions - section 3.2) and the following.

1.6) Approval

- The technical content of this Service Bulletin has been approved by ACG.

d00847

1.7) Manpower

- estimated man-hours:
  engine installed in the aircraft - - - 2,0 h per unit.

1.8) Mass data

- change of weight - - - none
- moment of inertia - - - unaffected

1.9) Electrical load data

- no change

1.10) Software accomplishment summary

- no change

1.11) References

In addition to this technical information refer to

- current issue of the Operator's Manual (OM)
- engine data sheet
- power, torque and fuel consumption curves
- current issue of the Illustrated Parts Catalog (IPC)
- Installation Manual (IM) and Check List
- all relevant Service Information
- all relevant Technical Bulletins
- Collective Manual (CM)
- Repair Manual (RM)
- Maintenance Manual (MM)

1.12) Other publications affected

- none

1.13) Interchangeability of parts

- At exchange take care of the following:

  The stator assemblies have to be installed in accordance with the group subdivision in the following instruction.
- All redundant parts which cannot be used must be returned at the user`s cost to an authorized Rotax Distributor or Service Center.

2) Material Information

2.1) Material - cost and availability

- Cost and availability will be supplied on request by our authorized distributors.

2.2) Company support information

- This exchange program and cost sharing is valid until 31.07.2000. Up to this date an application for reimbursement of the parts cost may be submitted.
- Shipping cost, down time, loss of income, telephone costs etc. or cost of conversion to other engine versions or additional work, as for instance simultaneous engine overhaul is not covered in this scope and will not be born or reimbursed by ROTAX®.

2.3) Material volume per engine

- parts volume:

Group A

For replacement of the stator assy. the following new parts are required:

item no.	New part no.	Qty.	Description	Old part no.	application
(1)	888.670	1	stator assy.		ROTAX 912 ULS
(2)	851.250	1	cable clamp 15/M5		ignition housing
(3)	240.186	4	Allen screw M5x25		stator
(33)	840.511	1	Allen screw M5x16		ignition housing
(34)	940.881	1	Allen screw M5x30		ignition housing
(4)	945.750	6	lock washer A5		stator
	866.710	4	tie rap		wiring harness
	950.141	1	gasket ring		crankcase

Group B

For replacement of the stator assy. the following new parts are required:

item no.	New part no.	Qty.	Description	Old part no.	application
(1)	996.539	1	stator assy.		ROTAX 912/914
(2)	851.250	1	cable clamp15/M5		ignition housing
(3)	240.186	4	Allen screw M5x25		stator
(4)	945.750	6	lock washer A5		stator
(33)	840.511	1	Allen screw M5x16		ignition housing
(34)	940.881	1	Allen screw M5x30		ignition housing
	866.710	4	tie rap		wiring harness
	950.141	1	gasket ring		crankcase

Group C

For replacement of the stator assy. the following new parts are required:

item no.	New part no.	Qty.	Description	Old part no.	application
(1)	996.534	1	stator assy.		ROTAX 912 Serie
(2)	851.250	1	cable clamp15/M5		ignition housing
(3)	240.186	4	Allen screw M5x25		stator
(4)	945.750	6	lock washer A5		stator
(35)	840.880	1	Allen screw M6x30		grounding cable
(36)	945.751	1	lock washer A6		grounding cable
(33)	840.511	1	Allen screw M5x16		ignition housing
(34)	940.881	1	Allen screw M5x30		ignition housing
	866.710	4	tie rap		wiring harness
	950.141	1	gasket ring		crankcase

Group D

For replacement of the stator assy. the following new parts are required:

item no.	New part no.	Qty.	Description	Old part no.	application
(1)	888.705	1	stator assy.		ROTAX 912 Serie
(2)	851.250	1	cable clamp15/M5		ignition housing
(3)	240.186	4	Allen screw M5x25		stator
(4)	945.750	6	lock washer		stator
(35)	840.880	1	Allen screw M6x30		grounding cable
(36)	945.751	1	lock washer		grounding cable
(33)	840.511	1	Allen screw M5x16		ignition housing
(34)	940.881	1	Allen screw M5x30		ignition housing
	866.710	4	tie rap		wiring harness
	950.141	1	gasket ring		crankcase

Group E

For replacement of the stator assy. the following new parts are required:

item no.	New part no.	Qty.	Description	Old part no.	application
(1)	888.707	1	stator assy.		ROTAX 912 Serie
(2)	851.250	1	cable clamp15/M5		ignition housing
(3)	240.186	4	Allen screw M5x25		stator
(4)	945.750	6	lock washer		stator
(33)	840.511	1	Allen screw M5x16		ignition housing
(34)	940.881	1	Allen screw M5x30		ignition housing
	866.710	4	tie rap		wiring harness
	950.141	1	gasket ring		crankcase

2.4) Material volume per spare part

- none

2.5) Rework of parts

- Proper cleaning and preparation of all associated components as per section 3.2.6).

2.6) Special tooling - Price and availability

- Price and availability will be supplied on request by our Authorized Distributors or their Service Center.
- parts volume:

item no.	New part no.	Qty.	Description	Old part no.	application
(5)	240.880	1	thread bolt		crankshaft locking
(6)	877.417	1	protection piece		crankshaft
(7)	877.375	1*)	puller assy.		magneto hub
(8)	877.377	1*)	puller assy.		magneto hub

*) Depending on the installation situation 2 variations of the puller assy. of different length are available:
Puller assy. (part no. 877.375) of 105 mm (4,1339 in.)
Puller assy. (part no. 877.377) of 38 mm (1,4961 in.)

3) Accomplishment / Instructions (applicable for all groups)

Accomplishment

All the measures must be taken and confirmed by the following persons or facilities:

- ROTAX® -Distributors or their Service Center
- Persons with the respective Aviation Authority permission.

▲ WARNING: Proceed with this work only in a non-smoking area and not close to sparks or open flames. Switch off ignition and secure engine against unintentional operation.

- Secure aircraft against unintentional operation.
- Disconnect negative pole of aircraft battery.

▲ WARNING: Carry out work on a cold engine only.

▲ WARNING: Should removal of a locking device (e.g. lock tabs, self-locking fasteners, etc.) be required when undergoing disassembly/assembly, always replace with a new one.

3.1) Check the ignition unit for mechanical, thermal and chemical damage

See fig. 2 and 5.

- Check all cable connectors, all ground connections, charging and shorting cables and grounding cables for tight fit, good contact, corrosion and security, repair as required.
- Verify shielding of cable assemblies for damage, for ground contact and security.
- Inspect all 8 ignition cables to spark plug connector for damage and tight fit. Check resistor plug connector for tight fit on spark plug. Repair or replace as necessary.

▲ WARNING: At any damage of stator and/or wiring renew the affected components according section 3.2 and following.An internal repair of stator assy. (1) is not possible! The stator has to be replaced according to the following instructions and returned to an authorized ROTAX®-Distributor.

3.2) Stator removal or installation (applicable for all groups)

3.2.1) Remove ignition cover (if fitted)

See fig. 5.

- Remove 3x Allen screw (**14**) M6x16.
- Remove ignition cover (15).

3.2.2) Locking of the crankshaft

See fig. 3 and 4.

- To lock the crankshaft remove the plug screw (**1**) M8x20 and sealing ring from the crankcase half (cyl. 2/4) (**9)**. Turn crankshaft until the pistons of cyl. no. 1 and no. 2 are in T.D.C. and lock crankshaft in this position with the crankshaft locking screw (**5**) (part no. 240.880).

◆ NOTE: The crankshaft locking screw is part of the standard tool kit supplied with each engine.

- For easy location finding of the correct crankshaft position, turn crankshaft so that the impressed 4-digit number (**10**) on the flywheel hub (**11**) aligns with the edge (**12**) of the ignition housing.
- The required crankshaft recess position (**13**) can be additionally verified with a flashlight through the hole in the crankcase (**9**).
- Turn-in crankshaft locking screw and rotate crankshaft slightly to-and-fro until the screw engages noticeably in the recess (**13**) of the crankshaft and tighten locking screw to 10 Nm (90 in.lb).

3.2.3) Removal of magneto hub

See fig. 1 und 5.

- Remove hex. screw M16x1,5 x 40 (**16**) together withlock washer (**17**) and washer (**18**).
- Apply some grease on protection piece (part no. 877.417) and place it onto the crankshaft, screw puller (part no. 877.375)(**7**) or screw puller (part no. 877.377) (8) fully home on thread (**19**) and pull off flywheel assy. (**20**).
- Lay flywheel assy. aside so that no particles can collect on the magnets.

◆ NOTE: To remove the stator there is no need to remove the ignition housing.

3.2.4) Removal of stator assy.

See fig. 5, 8, 9 and 11.

- Remove the 4 Allen screws M5x25 (**3**) along with lock washer.
- **Group A/B and E:** To detach the cable harness (**21**) remove the Allen screw (33) M5x16 and Allen screw (34) M5x30 along with lock washer. Remove the cable clamp (part no. 851.110) (**24**) and cable clamp (part no. 851.250) (**2**). Mark the plug connections (**63**) for convenience at reassembly, disconnect plug and detach plastic clamps (**62**) and cable clamp (**64**).
- **Group C and D:** To detach the cable harness (**21**) and grounding cable (72) remove the Allen screw (22) M5x20 and Allen screw (35) M6x30 along with lock washer. Remove both cable clamps (part no. 851.110) (**24**). Open the screening box (**49**) and mark the plug (**50**) of charging cable for convenience at reassembly and disconnect the plug. Detach clip plate and remove the cable harness from the clip plate (**51**).
- Remove the stator ass'y (**1**) from the centering (**25**) of the ignition housing.

3.2.5) General procedure prior to installation of the components

- Inspect all components of the ignition unit for damage and wear.
- Check the complete wiring and connections for damage.
- Check all electrical connections for security and evidence of corrosion. Repair or replace as required.
- Before re-assembly clean all contact surfaces (grounding contact) of the removed screws and apply Lithium grease to assure lasting contact.

▲ WARNING: If damged renew the affected components without fail.

- Clean crankshaft taper (**30**) and magneto hub (**31**), remove all traces of LOCTITE and degrease these parts.

3.2.6) Installation of the new stator assy.

See fig. 1.1, 5, 8, 9 and 11.

- Carry out a visual inspection on the support surface of the stator and of the ignition housing. Make sure that these mating faces are clean and free of corrosion and any deposits of sealing and transparant insulation compound, to warrant a proper seat of the stator. Remove any deposits carefully with a suitable tool, as required.

▲ WARNING: Renew the stator if the coils are damaged.

- Carry out a visual inspection on the contact surface on the stator charging coils grounding cable for deposits of sealing and transparant insulation compound to warrant a proper seat and electric contact of the stator and ground cable. Remove any deposits carefully as required with a suitable tool e.g. spot miller (**73**).

▲ WARNING: Renew the stator if the coils etc. are damaged

- Carry out a visual inspection on the eyelet connectors of the charging coils grounding cable on both sides for deposits of sealing and transparant insulation compound. Remove any deposits carefully, without applying any tension on the cables with a suitable tool e.g. scraper.

▲ WARNING: Renew the stator if the cables, coils etc. are damaged.

▲ WARNING: At the installation of the stator ensure proper grounding of the grounding cables (eyelet connector) via the screw head/thread to the ignition housing. Also ensure proper contact of the fixation screw to the ignition housing, which is achieved by careful examination and cleaning of all contact surfaces. Failures to do so may result in engine failures or stoppage.

- At replacement or re-installation of the stator take care for correct routing of cable assembly and not to damage the stator.

▲ WARNING: Do not squeeze the cable harness. Damage to cable harness can result in ignition failures.

- At installation apply Lithium grease to the contact faces (**27**) of the stator and the screw heads.
- Install stator ass'y on the centering of ignition housing. Fit the 4 Allen screws (**3**) M5x25 and tighten to 6 Nm (53 in.lb).

■ ATTENTION: One each charging coil grounding cable (**28**) has to be connected with stator attachment screw.

- **Group A/B and E:** To install the cable harness (**21**) fit the cable clamp (part no. 851.250) (**24**) with Allen screw (**33**) M5x16 and cable clamp (part no. 851.250) (**2**) with Allen screw (**34**) M5x30 and lock washer. Attach cable harness with cable clamp (**64**). Re-establish plug connection corresponding with marking. Secure with plastic clamps.
- **Group C and D:** Attach grounding cables (**72**) with Allen screw (**35**) M6x30 and lock washer. To attach the cable harness (**21**) use the cable clamp (part no. 851.250) (**24**) and Allen screw (**33**). Fit cable harness on clip plate **(51)** and attach. Reconnect plug **(50)** corresponding to marking. Close the screening box **(49)**, secure cables with new plastic clamps.

3.2.7) Installation of flywheel assy.

See fig. 5, 6, 7 and 10.

- Inspect magneto inner side (**32**) for any foreign particles and the taper surface (**31**). Under normal circumstances it is not necessary to take the flywheel apart.
- Check Woodruff key (**29**) in crankshaft for tight fit and degrease taper of crankshaft (**30**) and flywheel hub (**31**). Apply LOCTITE 221 sparingly, but well spread into the taper of magneto hub.
- Fit flywheel hub ass'y, washer 17/36/5 (**18**), lock washer (**17**) and hex. screw M16x1,5 x 40 (**16**) and tighten to 120 Nm (1060 in.lb).

▲ WARNING: Make sure that the Woodruf key remains in the keyway. A loose or a loss of Woodruf key can create failures including no-starting or advanced ignition timing.

3.2.8) Release locking of crankshaft

See fig. 3.

- Remove crankshaft locking screw (part no. 240 880)
- Install the plug screw M8x20 and new gasket (part no. 950 141) on crankcase half (2/4). Tightening torque 22 Nm (195 in.lb.).
- Check or adjust the air gap of the external triggers with feeler gauge to dimension ① .

3.2.9) Installation of ignition cover (if existing)

See fig. 5.

- Fix ignition cover (**15**) with 3x Allen Screw (**14**) M6x16 using LOCTITE 221.

- Connect negative pole of battery.

3.3) Test run:

- Start the engine. Conduct testrun inclusive magneto check and leakage test in accordance with the current Maintenance Manual of the engine type .

3.4) Summary

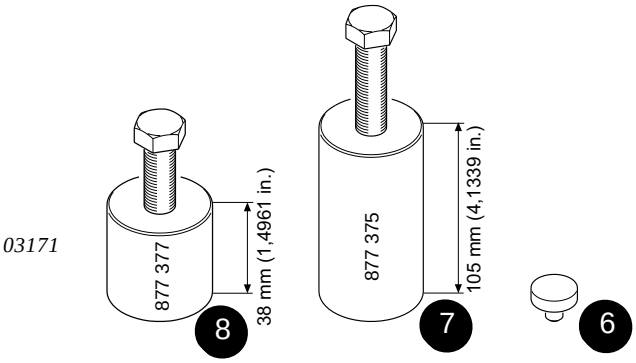
These instructions (section 3) have to be conducted in accordance with compliance in section 1.5.

▲ WARNING: Non-compliance with these instructions could result in engine damage, personal injury or death!

Approval of translation to best knowledge and judgement - in any case the original text in German language and the metric units (SI-system) are authoritative.

4) Appendix

- the following drawings should convey additional information:



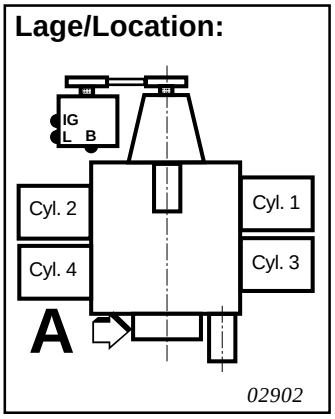


Bild / Fig. 1

A

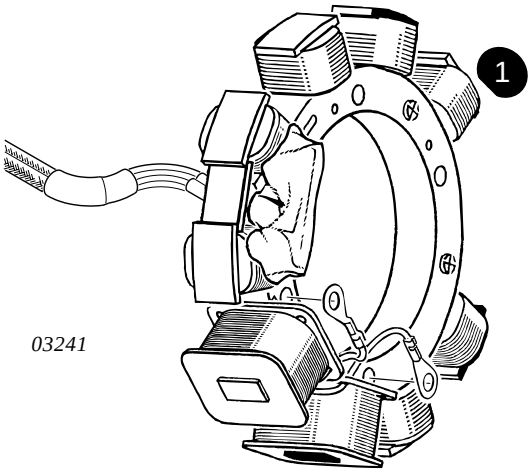


Bild / Fig. 2

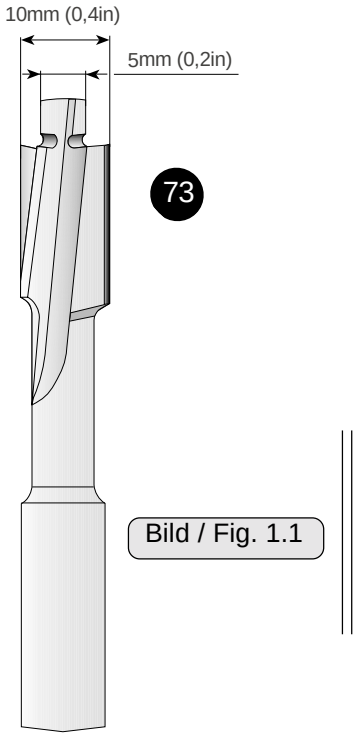
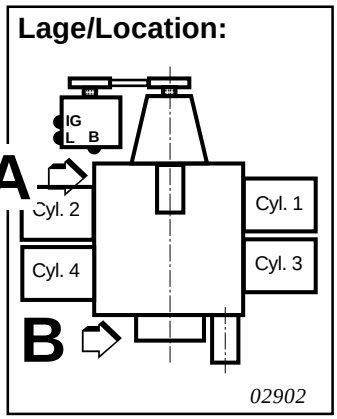


Bild / Fig. 1.1

View: **puller assy. / new stator**
Fig.: **1 and 2**

A



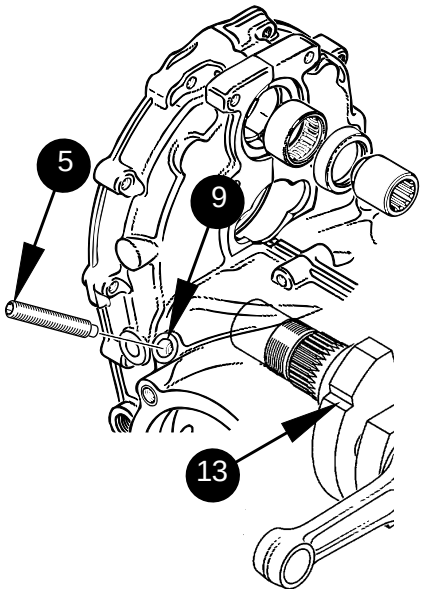


Bild / Fig. 3

B

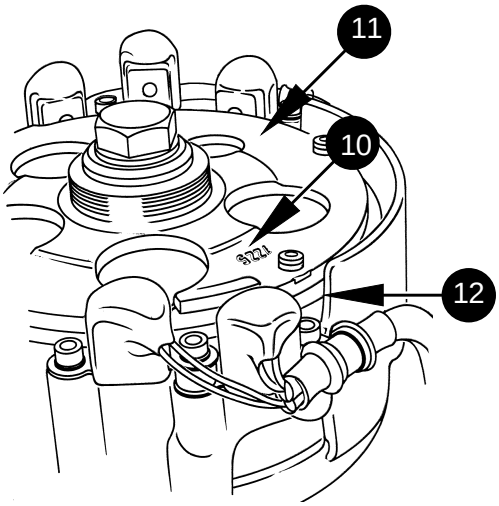
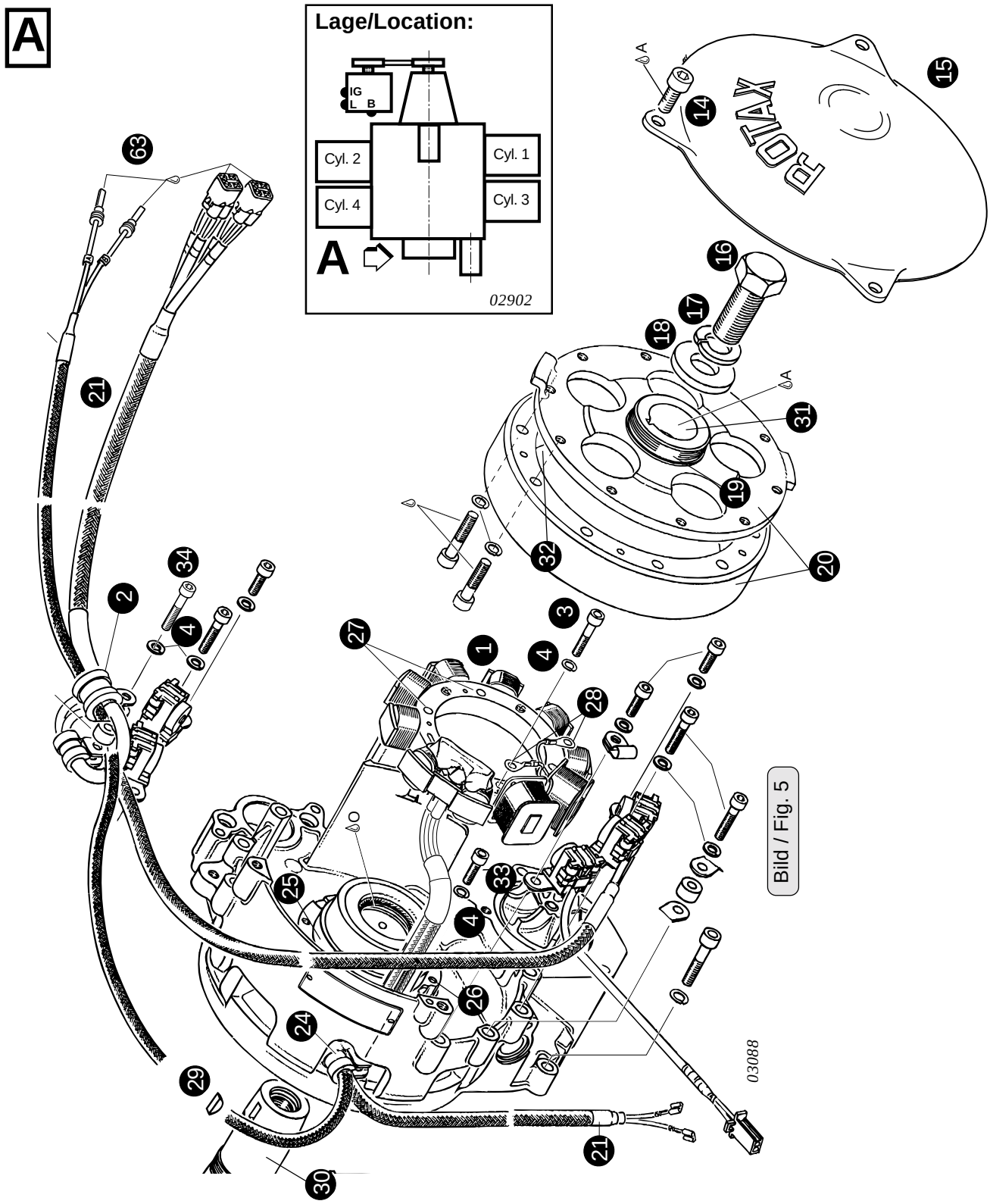


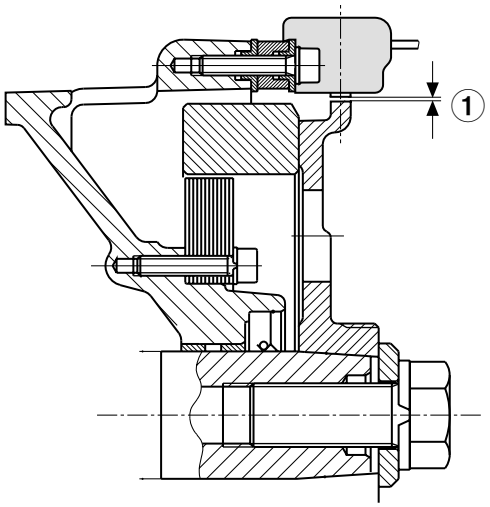
Bild / Fig. 4

View: **crankshaft locking / flywheel position**
Fig.: **3 and 4**



View: **new stator**
Fig.: **5**

A



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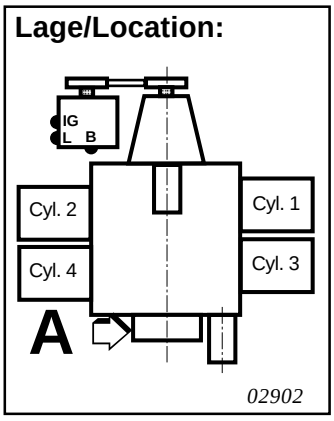
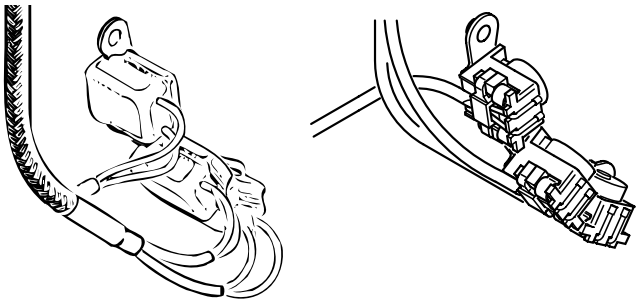


Bild / Fig. 6

Maße/Dimensions	Neu/New	Verschleißgrenze/Wear limit
Geberspalt für "alte" Geber gap for "old type" trigger coil	0,4 ÷ 0,5 mm (0,016 ÷ 0,020 in.)	0,5 mm (0,020 in.)
Geberspalt für Geber mit Klammern gap for trigger coil with clamps	0,3 ÷ 0,4 mm (0,012 ¸ 0,016 in.)	0,4 mm (0,016 in.)

03173

Bild / Fig. 7



Alt (old) Neu (new)

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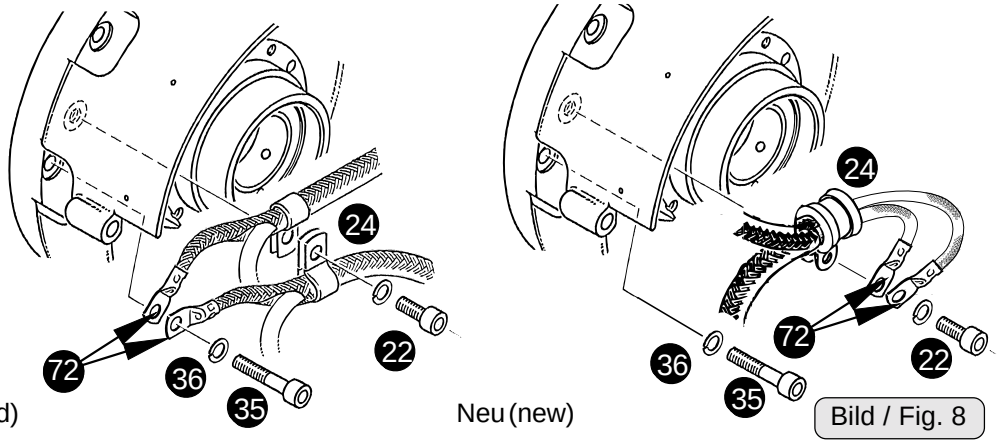
Bild / Fig. 10



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Alt (old) Neu (new)

Bild / Fig. 8

View: **pick-up / grounding cable**
Fig.: **6, 7, 10 and 8**

A

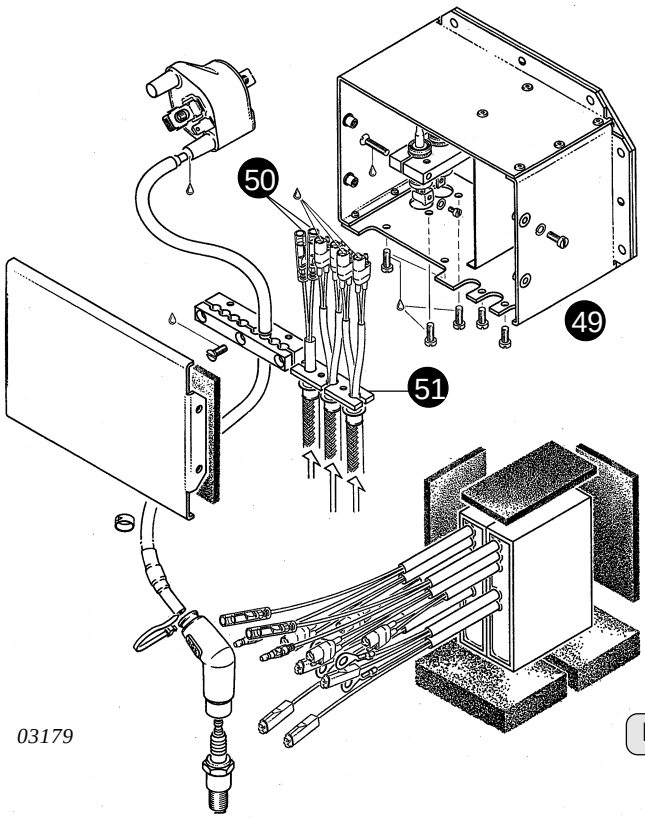

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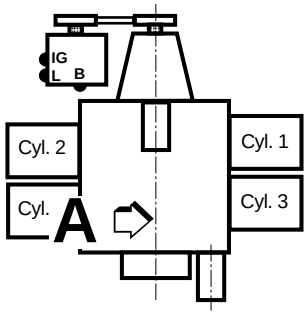
Bild / Fig. 9

Lage/Location:



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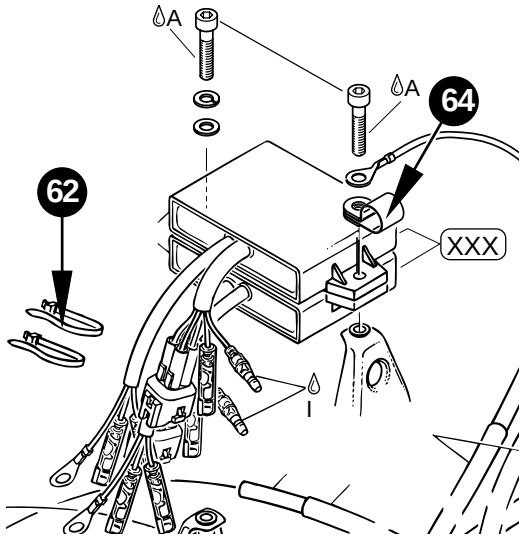

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Bild / Fig. 11

View: **screening box / electronic module**
Fig.: **9 and 11**