vacuum technologies

TriScroll™ 300 Series Dry Scroll Vacuum Pump

MODULE REPLACEMENT MANUAL

Manual No. 699904285
Revision E
May 2003

Varian TriScroll™ 300
Dry Scroll Vacuum Pump

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	Compressors and Vacuum pumps Safety Reqmts; Part 2 Vacuum Pumps
EN 1050:1996	Safety of machinery - principles for risk assessment
EN 60204-1	Electrical equipment of industrial machines; general requirements
73/023/EEC, Low Voltage Directive	
EN 60034 part 1	Rotating electrical machines - Part 1: Rating and performance
89/336/EEC, Electromagnetic Compatibility Directive	
EN 61000-4-2	Testing and Measurement Techniques - Electrostatic Discharge Immunity Test

March 2003

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Preface

This manual provides the information you need to successfully perform replacement of the entire module of your Varian TriScroll™ Dry Vacuum Pump. Module replacement is performed as an alternative to performing a complete overhaul and rebuild (Major Maintenance) and is sold as one of the options recommended when the pump base pressure has risen to an unacceptably high level for your application. If you have questions that are not addressed in this manual, please contact the nearest Varian Vacuum Technologies service facility listed on the rear cover of this manual.

Safety Considerations

READ THE FOLLOWING INSTRUCTIONS. TAKE ALL NECESSARY PRECAUTIONS.

The following format is used in this manual to call attention to hazards:

WARNING *The warning messages are for attracting the attention of the operator to a particular procedure or practice which, if not followed correctly, could lead to serious injury.*

CAUTION *The caution messages are displayed before procedures, which if not followed, could cause damage to the equipment.*

NOTE *The notes contain important information taken from the text.*

Maintenance personnel must be aware of all hazards associated with this equipment. They must know how to recognize hazardous and potentially hazardous conditions, and know how to avoid them. The consequences of work performed by unskilled or improperly trained maintenance personnel, or careless operation of the equipment employed in the specified maintenance procedures can be serious. Every maintenance person must read and thoroughly understand the materials discussed and the instructions provided in this manual, as well as any additional information provided by Varian Vacuum Technologies.

All warnings and cautions must be read carefully, fully understood, and strictly observed. Consult local, state/province, and national agencies regarding specific requirements and regulations. Address any safety, operation, and/or maintenance questions to the nearest Varian Vacuum Technologies location.

WARNING

Disconnect power from the TriScroll 300 before performing any maintenance procedure.

Allow the pump to cool before performing any maintenance procedure. Approximate cool-down time is one to two hours.

CAUTION

Wipe all O-rings clean with a lint-free cloth before installation to ensure that no foreign matter is present to impair the seal.

Do not use alcohol, methanol or other solvents on O-rings. To do so causes deterioration and reduces their ability to hold a vacuum.

If applicable, apply a small amount of Krytox® GPL 224 grease and wipe the O-rings "shiny" dry.

NOTE

Varian Vacuum Technologies recommends replacing all O-rings during routine maintenance or during any maintenance procedure requiring that O-rings be removed.

Unless otherwise stated, apply Loctite® 242 or Loctite PST® 567 to the first few threads only. Apply just enough to obtain a seal.

WARNING

The TriScroll 300 weighs 26.4 kg (58 lbs). To avoid injury, use proper lifting techniques when moving the pump.

Related TriScroll Manuals

Manuals related to the installation and operation, tip seal replacement, and major maintenance for the TriScroll 300 series pumps are listed in the following table:

Title	Applicable TriScroll Model	Part Number
Major Maintenance Manual	All TriScroll 300 Series Models	699904260
Tip Seal Replacement Manual	All TriScroll 300 Series Models	699904280
Installation and Operation Manual	All TriScroll 300 Series Models	699904265

Maintenance and Tool Kits

Material and tooling required to perform maintenance on TriScroll pumps is provided in kit form. A description of each kit and ordering information is provided in the following table:

Description	Contents	Applicable TriScroll Model	Part Number
Major Maintenance Kit	All bearings, bearing seals, bearing lubricant, O-rings, and tip seals required to rebuild TriScroll 300 Series pumps.	All TriScroll 300 Series models	PTSS0300MK
Maintenance Tooling Kit	All fixtures and tools required to perform any maintenance on TriScroll 300 Series pumps.	All TriScroll 300 Series models	PTSS0300TK
Replacement Tip Seal Set	Replacement tip seals and static O-rings for TriScroll 300 Series pumps.	All TriScroll 300 Series models	PTSS0300TS
	NOTE: The Maintenance Tool Kit is also required for tip seal replacement.		

Factory Service Options	Part Number
Advance Exchange TriScroll 300 Single Phase	EXPPTS03001
Advance Exchange TriScroll 300 Three Phase	EXPPTS03003
Advance Exchange TriScroll 310 Single Phase	EXPPTS03101
Advance Exchange TriScroll 310 Three Phase	EXPPTS03103
Advance Exchange TriScroll 300 Pump Module Only	EXPTS0300SC
Advance Exchange TriScroll 310 Pump Module Only	EXPTS0310SC
Service/Rebuild TriScroll 300 Pump (Single or Three Phase)	PTS0300KMA
Service/Rebuild TriScroll 310 Pump (Single or Three Phase)	PTS0310KMA
Service/Rebuild TriScroll 300 Pump Module Only	PTS0300SCRP
Service/Rebuild TriScroll 310 Pump Module Only	PTS0310SCRP

General Information

Varian TriScroll 300 series pumps are designed to provide years of trouble-free service if maintenance procedures and intervals are observed. Bearing grease replenishment and tip seal replacement is recommended when the pump base pressure has risen to an unacceptably high level for your application. Bearings, rotary seals and O-rings should also be replaced if the pump exhibits humming or grinding noises from the bearings. Main bearing life may be shortened if your application requires the pumping of high quantities of water vapor. Use of the bearing purge will keep this water from impacting bearing life.

Equipment Required to Install Pump Module

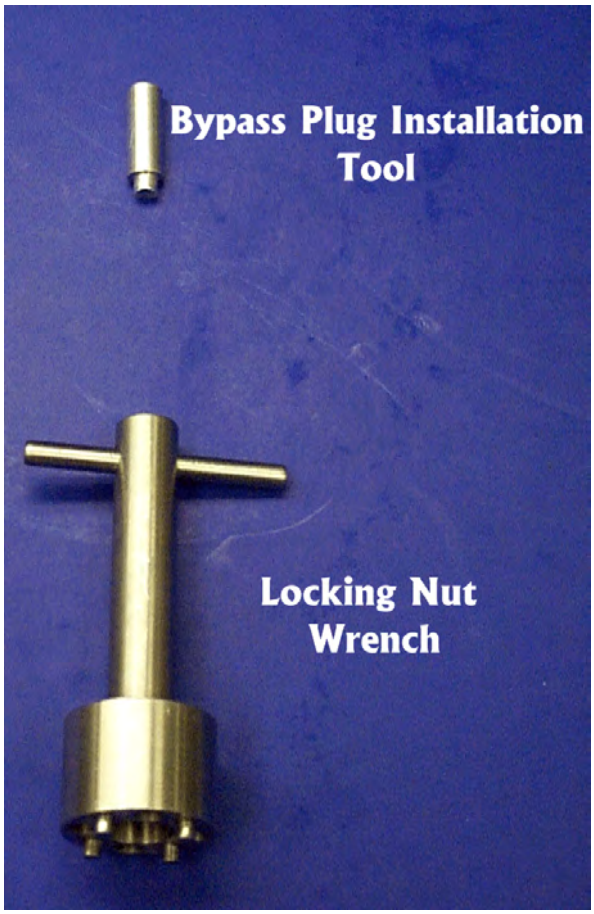
- ❑ **Pump Module**

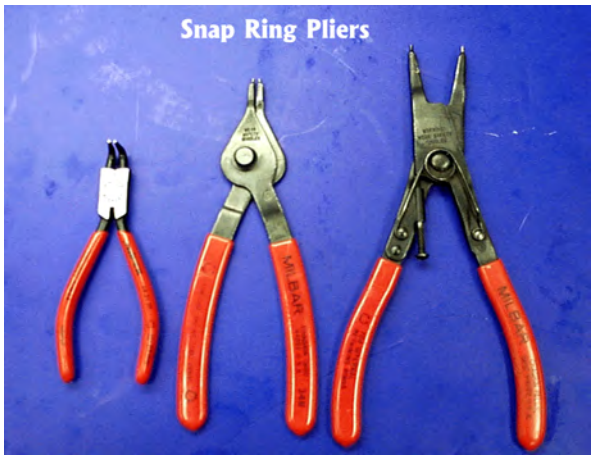
Tools Required to Install Pump Module

- ❑ 4 MM Hex key
- ❑ 5 MM Hex key
- ❑ 6 MM Hex key

Included in **Maintenance Tool Kit:** #PTSS0300TK (page 2)

Maintenance Took Kit

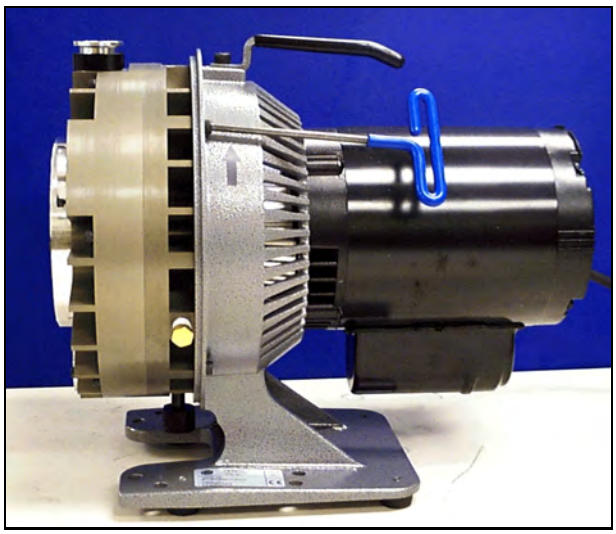




Maintenance Took Kit (continued)

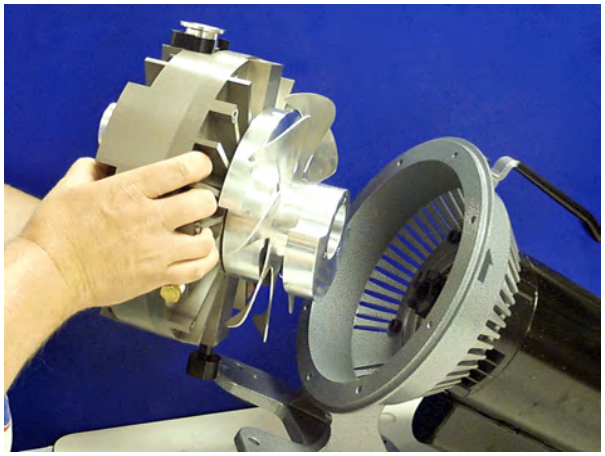
TriScroll Disassembly

1. Remove three M5x16 screws attaching cowling to module.
2. Remove cowling.

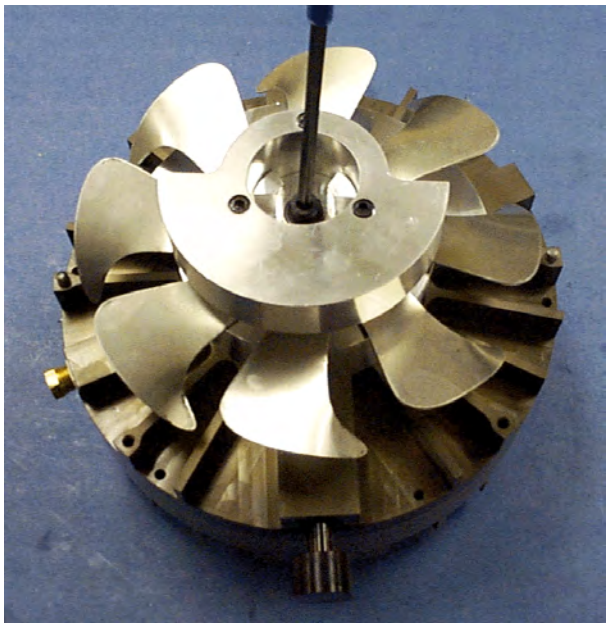


3. Remove the four M6x16 screws attaching pump module to the frame.

TriScroll Disassembly (continued)

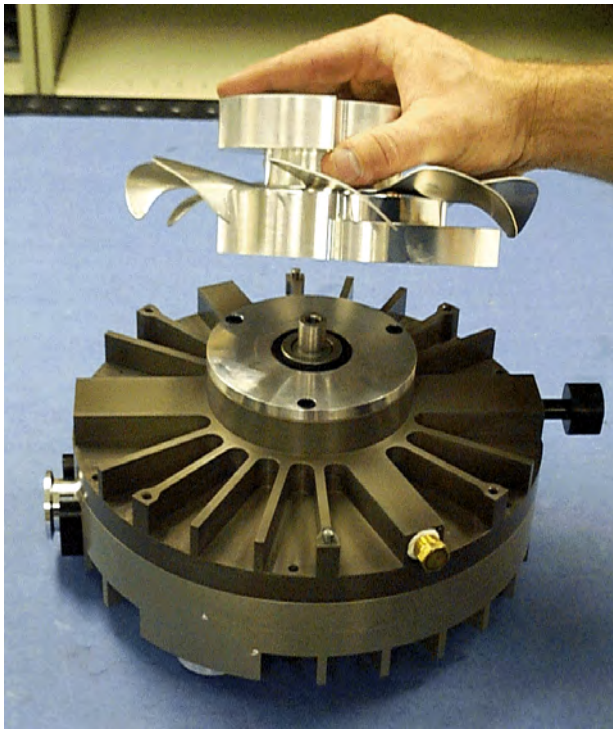


4. Remove pump module from the frame.



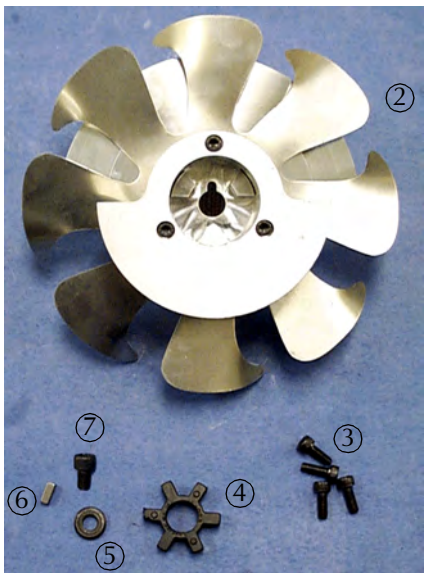
5. Remove M8x12 screw and washer attaching fan assembly to crankshaft.

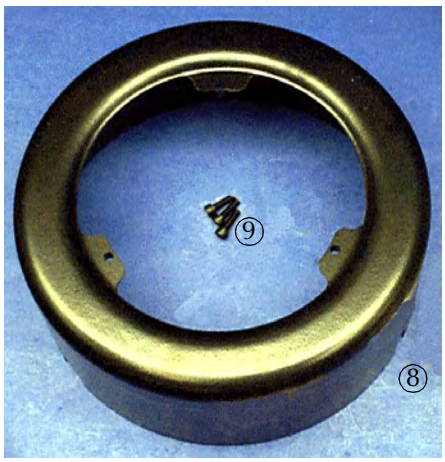
TriScroll Disassembly (continued)



6. Remove fan assembly from crankshaft.
7. Remove key from slot in crankshaft.

TriScroll Reassembly





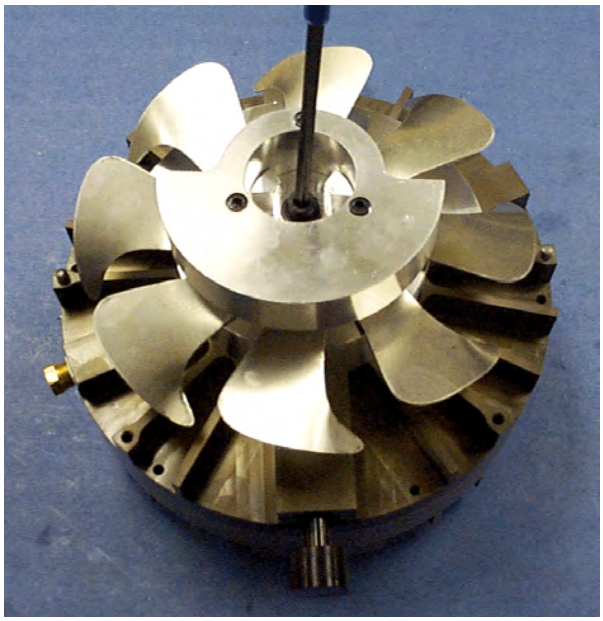
Tool required:

Allen wrench

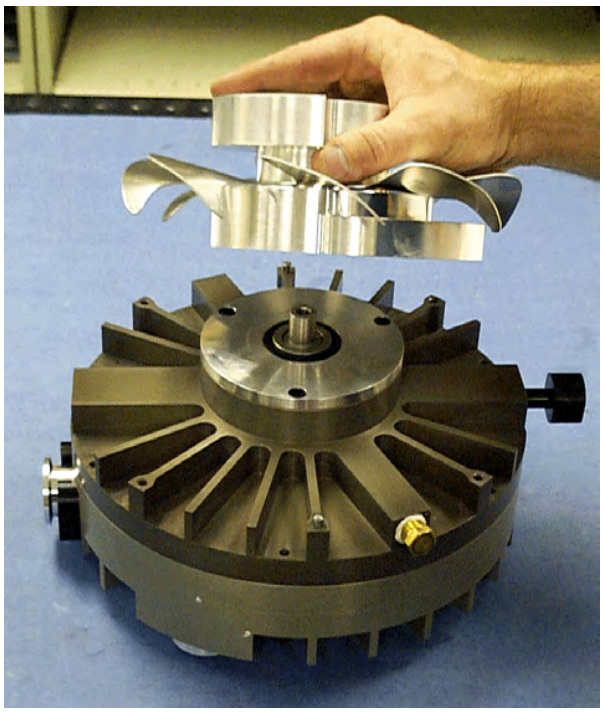
Locate the following items shown in the photos on the left:

① Pump Module Assembly
② Fan Assembly
③ M6x16 screws (4)
④ Spider Coupling
⑤ Washer
⑥ Key
⑦ M8x12 screw
⑧ Cowling
⑨ M5x16 screws (3)

TriScroll Reassembly (continued)



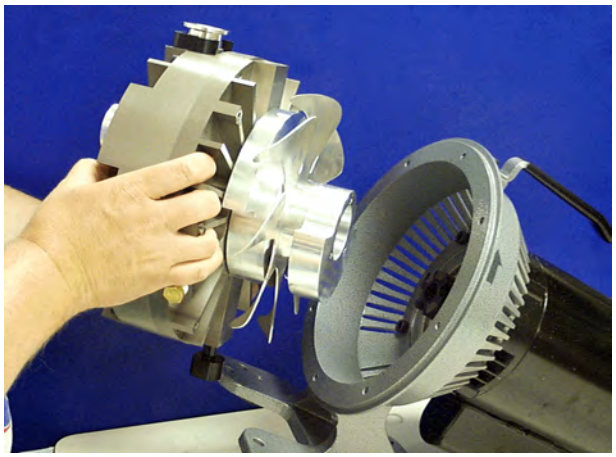
1. Install key in slot on crankshaft.



2. Slide fan assembly onto crankshaft engaging key and against seal spacer.
3. Secure fan assembly to crankshaft with M8x12 screw and washer previously removed in step 5 on page 5.

TriScroll Reassembly (continued)

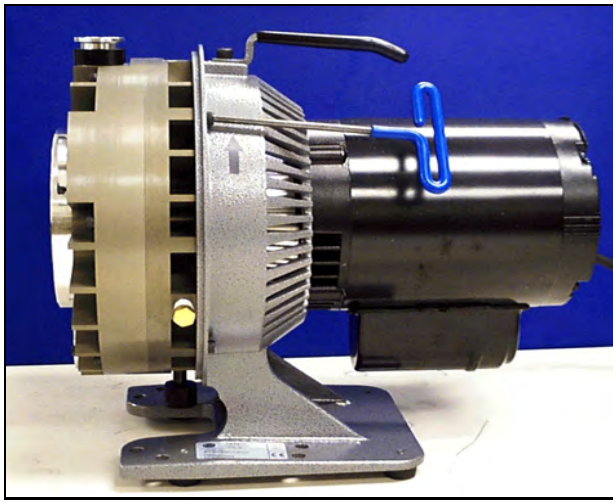
4. Insert spider in motor coupling.



5. Install pump module on frame, aligning fingers on fan assembly with fingers on coupling. Assure proper fit of dowel pins on mating holes in frame.

NOTE *Exhaust fitting in the downward position.*

TriScroll Reassembly (continued)



6. Secure pump module to frame with four M6x16 screws.

7. Install cowling over pump module. Secure with three M5x16 screws.

TriScroll Reassembly (continued)

This figure illustrates a fully reassembled TriScroll 300 Series Pump.

Pump Conditioning and Performance Verification

Pump Module conditioning and performance verification has been performed at Varian Vacuum Technologies factory.

Further conditioning or performance verification is not necessary.