

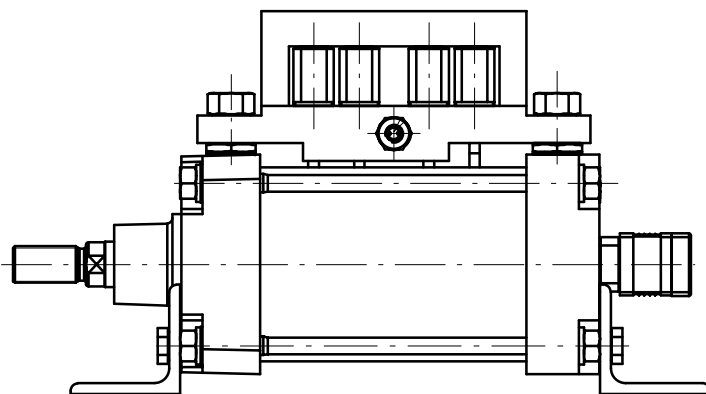
Service Bulletin

RTA-54

18.07.2001

Technical Information to all Owners / Operators
of Sulzer RTA Engines with electronic VIT

Electronic Variable Injection Timing Troubles and Remedies



Contents:

Page

1. Introduction	1
2. Improvements to Components	1
3. New Positioning Unit Complete and Valve Rail	1
4. Remedies and Additional Measures	2
5. Service Bulletins Published for Large Bore RTA-Type Engines	5

1. INTRODUCTION

On some installations trouble has been reported with the electronic Variable Injection Timing (VIT). Also certain irregularities have been found in the environment of the VIT. Investigations were carried out and improvements were made to the solenoid valves and the feedback transmitter of the positioning unit.

This Service Bulletin should be kept in a separate file on board or in the control room of a power plant and the respective pages or tables of the Service Bulletin with modifications to the Operating Manual, Maintenance Manual or Code Book should be copied and filed in the respective Manual or Book.

2. IMPROVEMENTS TO COMPONENTS

The investigations showed that the VIT positioning unit is moving in and out with each injection under the forces in the fuel injection pumps. This movement could have an amplitude of up to 1.5mm (peak-to-peak) and results in excessive wear on the positioner's feedback transmitter. In order to make the system robust against these small but frequent movements, that have to be accepted and must be considered normal in the present arrangement, a backlash of 2mm (peak-to-peak) has been introduced between the piston rod and the feedback potentiometer. The resulting loss in positioning accuracy is within the acceptable tolerance for the VIT system. In addition the solenoid valves were changed to a rigid design based on experience with sticking valves of the previous design.

However, those internal changes are not absolutely essential on all engine types and trouble-free operation of the original VIT has been experienced in many installations.

Do not open the cylinder (housing) of the positioning unit for any repair. Only authorised personnel are allowed to repair components inside the positioning unit.

3. NEW POSITIONING UNIT COMPLETE AND VALVE RAIL

The above mentioned improvements to the pneumatic positioning valves and the feedback transmitters have been developed in close co-operation with the manufacturer of the positioning unit and were integrated into the new product.

The new positioning unit is now also available for engines already in service.

The following parts can be ordered through our Network Companies or directly from Wärtsilä Switzerland Ltd, Fax No. +41 52 262 07 22:

- Positioning unit complete Code No. please see table below

Engine Type	Code No.	Engine Type	Code No.
RTA 52, RTA 52U RTA 62, RTA 62U RTA 72, RTA 72U	Z58310	RTA 48T RTA 58T RTA 84T	W58183
RTA 84M	Z58310	RTA 48T-B RTA 58T-B RTA 68T-B	Q58183
RTA 62U-B RTA 72U-B	A58183		
RTA 84C, RTA 84C-U	C58310	RTA 84T-B RTA 84T-D	B58183
RTA 96C	D58183		

- Valve rail

When ordering a valve rail only please specify engine type, engine manufacturer and manufacturing date.

In all cases some additional measures have to be taken as described in the following section.

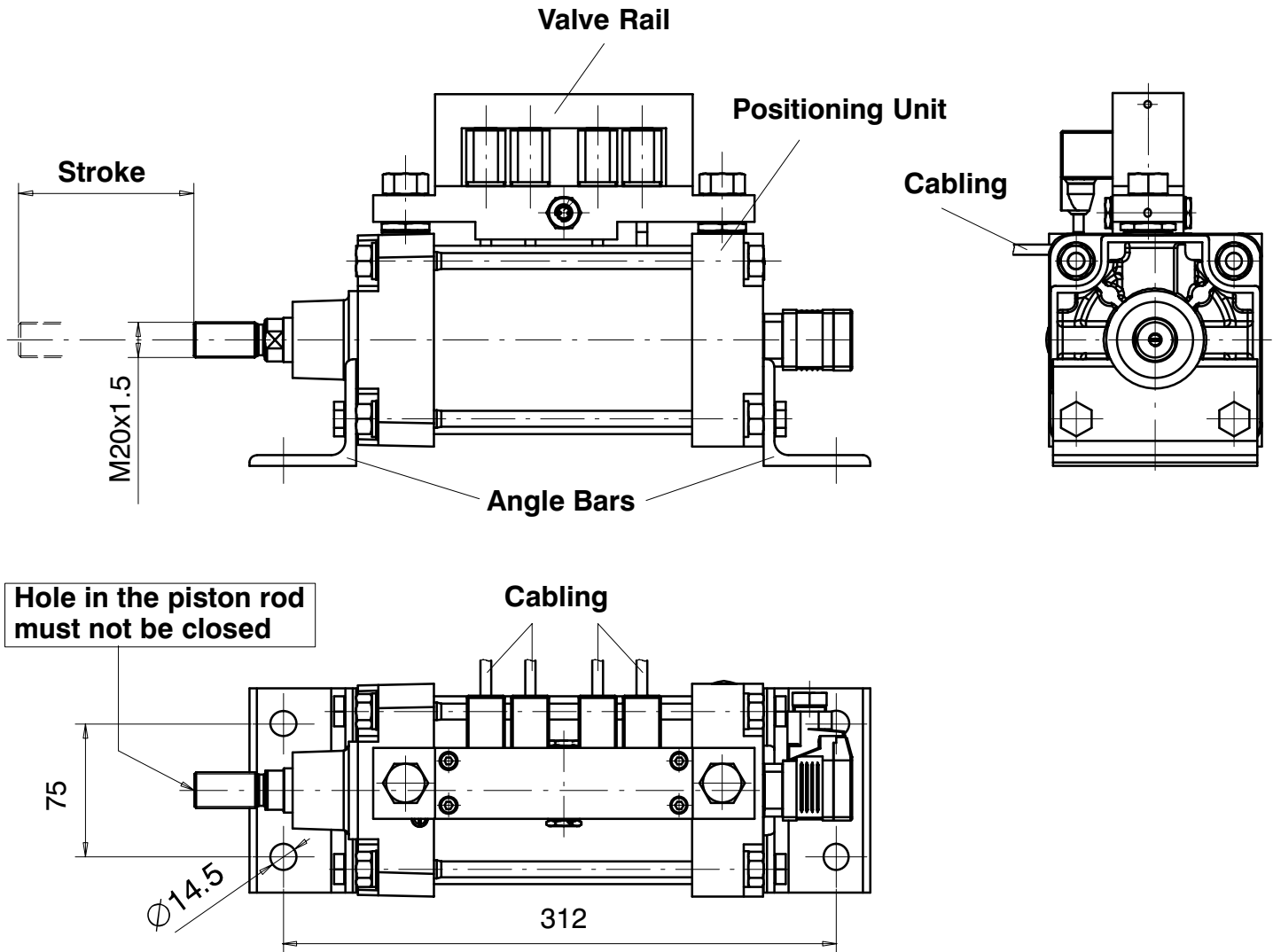


Fig. 1 Positioning Unit of the Electronic VIT

4. REMEDIES AND ADDITIONAL MEASURES

In order to avoid inconvenience and or malfunction during operations or after fitting a new or used positioning unit of the electronic VIT, the following points **must** be checked, observed and if necessary corrected.

This list in conjunction with our Maintenance and Operating Manual should help to ensure trouble-free operation of the positioning unit.

Remark: All drawings in the attached [Service Bulletin Enclosures RTA-54/1](#) and [RTA-54/2](#) are drawn for RTA 84C and RTA 84CU engines with old pneumatic positioning valves and are only given as examples. All remarks are also valid for the new pneumatic positioning valves and all other engines and their corresponding drawings accordingly.

1. Fuel regulating linkage must be free of excessive play. Please refer in this context to our separate Service Bulletin “[Fuel Injection Pump Regulating Linkage](#)”.
2. Eccentric shaft couplings (Fuel injection pump) as example shown in [Figure 2](#) in the Service Bulletin Enclosure RTA–54/1 must be checked for tightness and the key must fit tightly in the keyway.
3. The torsional spring on the eccentric shaft must be repositioned from position 1 (Hole 1) in many cases to position 5 as shown in [Figure 3](#) in the Service Bulletin Enclosure RTA–54/1. If the governor performance is influenced by this, position 4 should then be selected.
4. When fitting or refitting the VIT positioning unit the clearances and alignment shown for example in [Figure 4](#) and [5](#) in the Service Bulletin Enclosure RTA–54/2 must be checked and if necessary corrected.
If there is no clearance between the minimum stop plate and the linkage with the cylinder in the fully retracted position, then the stop plate must be ground until clearance is achieved.
5. Electrical connections to be carefully checked as shown for example on [Figure 4](#) in the Service Bulletin Enclosure RTA–54/2.
Cases of open circuit have been found, particularly on rather stiff cabling and cable shoes used between the connecting box and VIT terminal box.
6. The following parameter settings should be adjusted:

	DENIS-1 VIT=f(LI)	DENIS-1 VIT=f(n, p _{ch})	DENIS-5	DENIS-6 IMO valid from 1999	DENIS-6 valid until 1998	
Wärtsilä Switzerland Ltd Parameter No.						
Failure threshold, small	43.161D	43.61D	26.161C	26.261C	26.61C	1.0 mm (previously 0.5mm)
Failure threshold, large	43.161C	43.61C	26.161D	26.261D	26.61D	1.5 mm (previously 1.0mm)
Pulse modulation, Period	43.161B	43.61B	26.161B	26.261B	26.61B	10 sec. (previously 3.0 sec.)

7. For small bore engines the protecting plates have to be modified, as the new pneumatic positioning valves are slightly bigger than the old ones.
8. On some installations the maximum allowable engine load has been set by limiting the fuel rack positioner with the mechanical screw on the fuel linkage.
Although this condition is acceptable for short periods, rudder movements etc. it should not be a permanent condition, i.e. the engine should primarily run on the speed governor and not on a blocked maximum fuel limiter. If the prevailing weather or load conditions request a load higher than the load which some owners impose on daily engine operation then the governor speed setting signal should be reduced until the governor can actually regulate again.
Continuous operation with a locked load indicator should be avoided.

If further problems with the VIT system still persist, please contact Wärtsilä Switzerland Ltd, Fax. No. +41 52 262 07 31 to obtain a detailed check list.

With this check list, which should be carefully completed by the Chief Engineer, we are able to investigate each individual case deeper.

Enclosure: [Service Bulletin Enclosure RTA-54/1](#)
[Service Bulletin Enclosure RTA-54/2](#)

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Changes of any nature to the form and or to the content of this or any other Service Bulletin as published by Wärtsilä Switzerland Ltd, are not permitted.

5. SERVICE BULLETINS PUBLISHED FOR LARGE BORE RTA-TYPE ENGINES

We have so far published the following Service Bulletins which are valid for Large Bore RTA-Type Engines (RTA 48T to RTA 96C):

RTA-1	dated 01.03.88	Recommendation Concerning Piston Running Behaviour
RTA-2	dated 05.10.88	Water Drain from Charge Air Receiver and Charge Air Temperature
RTA-3.4	dated 30.03.98	Fuel Injection Nozzles
RTA-4	dated 20.11.89	Oil Damping for Short Tie Rods
RTA-8	dated 15.06.92	RTA-Cylinder Liners and Reinforced Water Guide Jackets
RTA-9	dated 20.07.92	Cylinder Cover with Erosion / Corrosion Resistant Cladding
RTA-10	dated 28.10.92	RTA "-8 Series" Engines / Piston Skirt in Two Parts
RTA-11.2	dated 11.05.2001	Fuel Injection Pump Regulating Linkage
RTA-14	dated 30.11.93	System Oil Care and Maintenance
RTA-15	dated 10.02.94	Elastic Studs on RTA-Type Engines
RTA-16.1	dated 20.02.98	Retrofit for Piston Rod Stuffing Boxes for RTA "-8 Series" Engines
RTA-17.1	dated 28.02.95	Circulation Valve to Fuel Injection Valve
RTA-18.1	dated 27.08.98	Running-in of Cylinder Liners and Piston Rings
RTA-19	dated 28.10.94	Oil Supply Monitoring for Geislinger Torsional Vibration Damper
RTA-20	dated 30.11.94	Rotational Safety Studs for Roller Guide of Fuel Pump and Exhaust Valve Actuator
RTA-21	dated 10.04.95	Improvement of Starting Behaviour (For engines with DENIS-1 and DENIS-5 Control Systems only!)
RTA-22.1	dated 28.11.96	Waisted Bolts for Piston Crown Spraying Plate of RTA 84C, 84CU, 84M and 84T Type Engines
RTA-24.2	dated 18.05.99	VTR..4 Turbochargers After Sales Service Information issued by ABB
RTA-26	dated 03.01.96	Loss of Material on Piston Crowns due to High Temperature Corrosion and Erosion (Watercooled Pistons)
RTA-27	dated 26.04.96	Plastic Water Separator
RTA-28	dated 31.05.96	Improvement of the Engine Control System
RTA-29	dated 21.10.96	Improved Oil Supply to the Integrated Axial Detuner equipped with Internal Oil Supply Line
RTA-30	dated 27.11.96	Improvement of starting behaviour on RTA engines equipped with Type PGA200 and PGA EG200 Woodward Governors
RTA-31	dated 23.01.97	Alphabetical Index of Topics of Service Bulletins
RTA-33	dated 11.04.97	Crank Pin Bearing Shell
RTA-34	dated 28.11.97	Fuel Injection System Modification and Maintenance
RTA-35.1	dated 07.06.2001	Retrofit for Piston Rod Stuffing Boxes for RTA "-2 and -2U Series" Engines
RTA-36.1	dated 08.06.2001	Reconditioning of Piston Rods of RTA "-2 Series" Engines
RTA-37.1	dated 11.06.2001	Reconditioning of Piston Rods of RTA "-8 Series" Engines
RTA-38	dated 26.02.98	Piston Crown Loss of Material on Combustion Side
RTA-39	dated 31.03.98	Overhaul and Reconditioning of Pistons
RTA-42	dated 25.09.98	Templates for Exhaust Valve Seat and Spindle
RTA-43	dated 20.01.99	Piston Rings
RTA-44	dated 26.02.99	Tightening Instructions for the Plunger Guide Nipple
RTA-45	dated 03.06.99	Tightening Instructions for Screws and Waisted Studs
RTA-46	dated 17.06.99	Cracks in Columns
RTA-47	dated 28.06.99	Draining of Fuel Oil Pipes; Modification to Shut-off Valves of Fuel Pipes and Drain Plug of Fuel Pump Block
RTA-48	dated 20.09.99	Instruction for Replacement of NO_x Relevant Components on IMO Compliant Sulzer RTA Engines
RTA-49	dated 08.10.99	Gearing for Auxiliary Drives Z 42800
RTA-50	dated 10.01.2000	Leakage Oil Collector in Air Spring System
RTA-51	dated 21.08.2000	Deflagration in Engine Scavenge System and Exhaust Manifold
RTA-52	dated 22.09.2000	Water Separator on RTA - Type Engines
RTA-53	dated 12.06.2001	Variable Injection Timing and Fuel Quality Setting
RTA-54	dated 18.07.2001	Electronic Variable Injection Timing Troubles and Remedies

Should you not be in possession of the above mentioned documentation suitable for your plant, kindly contact your local Wärtsilä representative for your copy.

Fig. 2 Eccentric Shaft Coupling (Fuel Injection Pump)

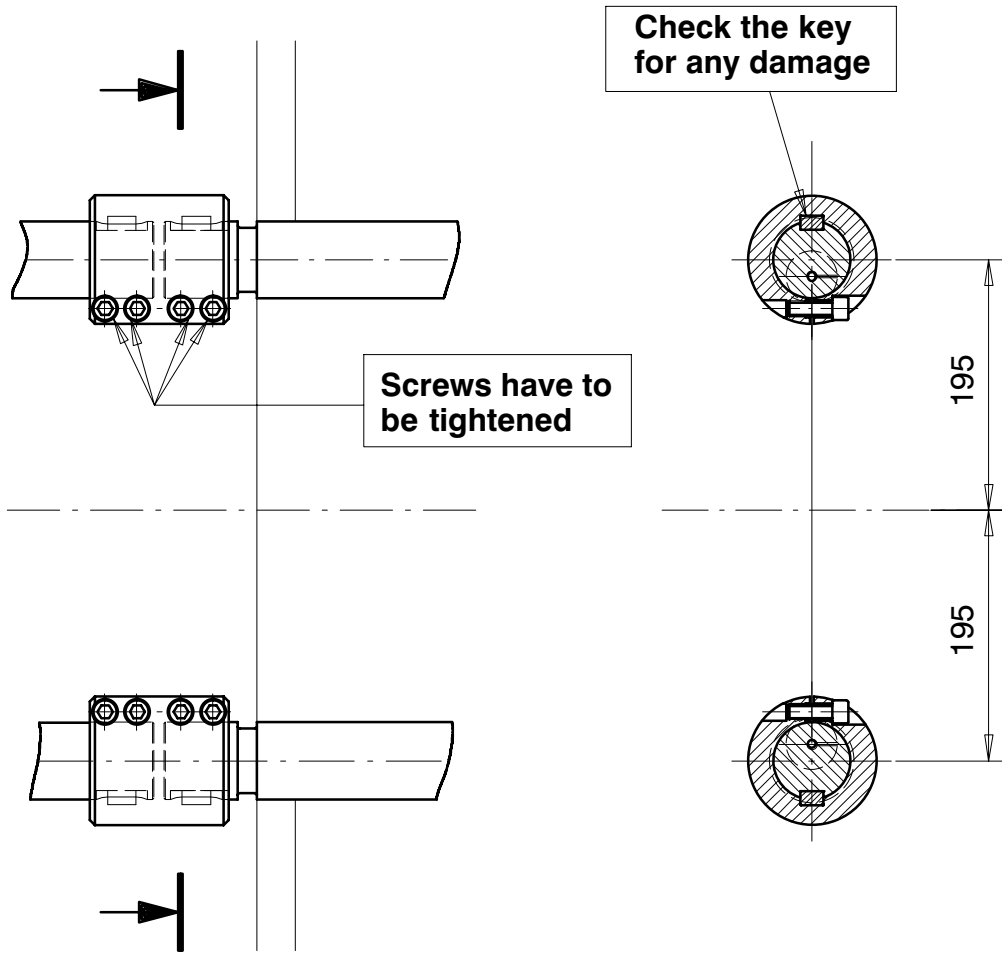


Fig. 3 Torsional Spring on Eccentric Shaft

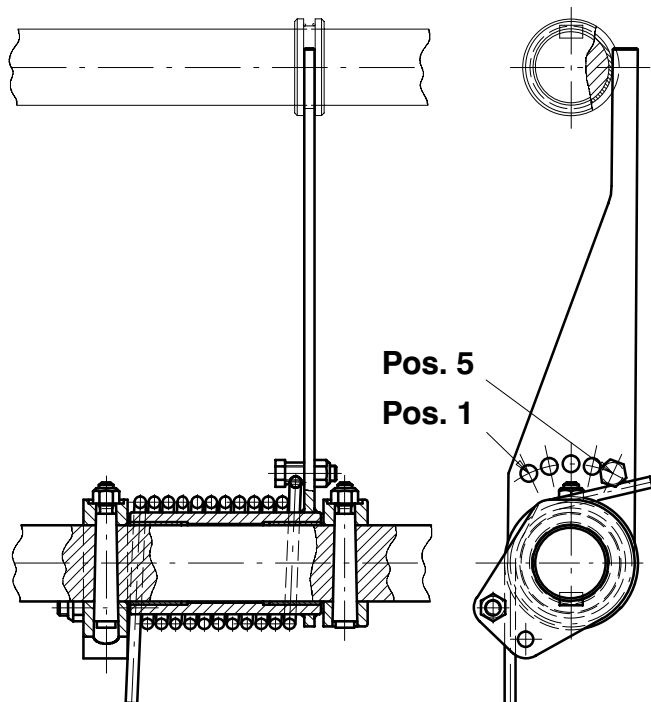


Fig. 4 Positioning Unit of the Electronic VIT

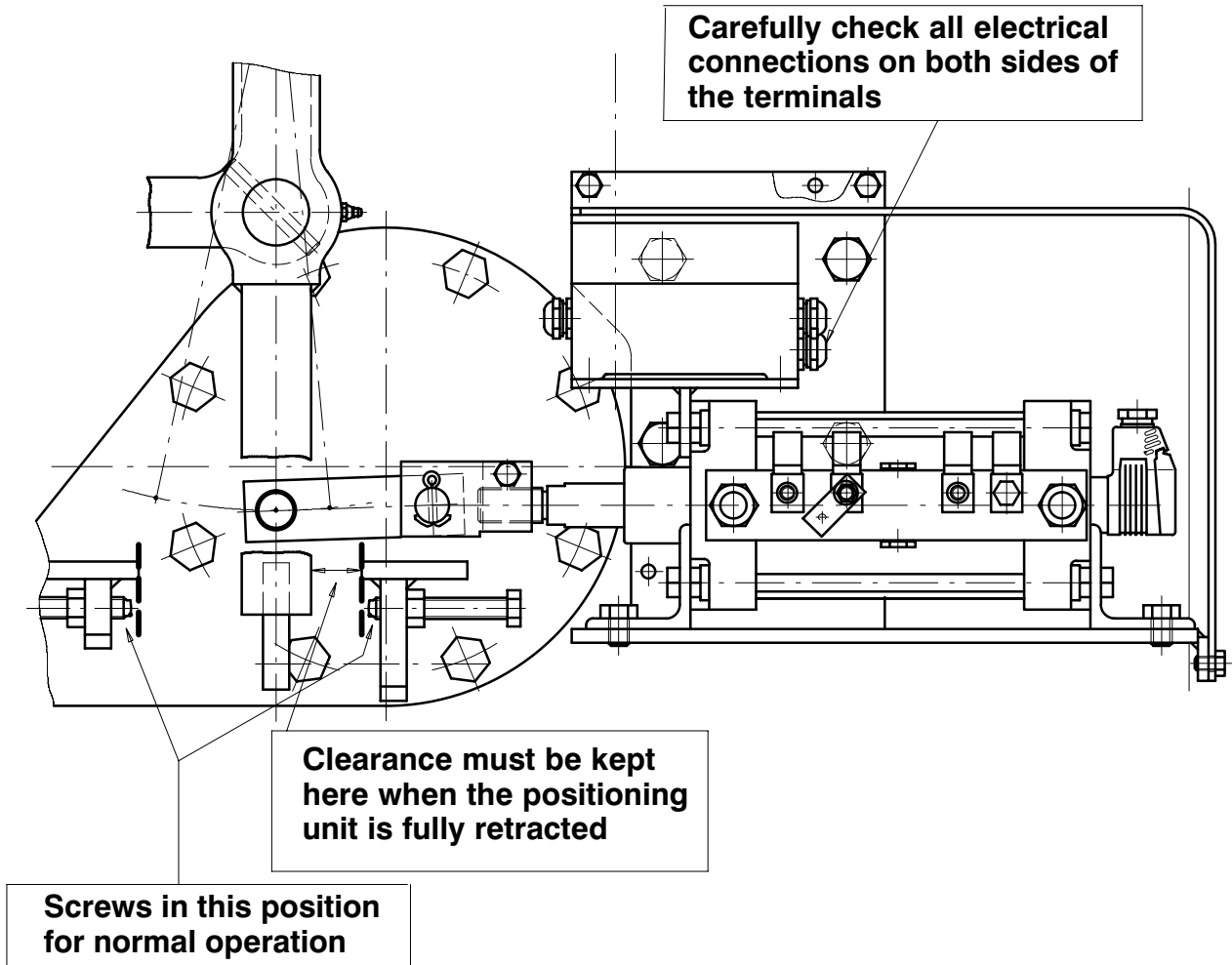


Fig. 5 Alignment / Clearances of the Positioning Unit

