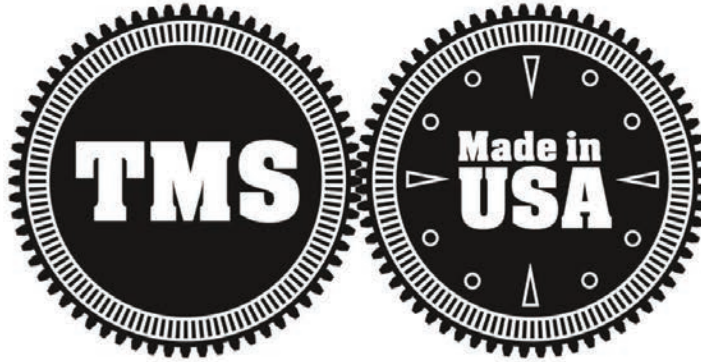


Total Maintenance Solutions



ROTARY LOBE VACUUM BOOSTER OPERATOR'S MANUAL & MAINTENANCE GUIDE

TMSRL Series
Models 500, 1000 & 1500, 2000
Rotary Lobe Vacuum Pumps

July 2025 Edition

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Rotary Lobe Vacuum Booster

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NOTE: As a supplement to this maintenance manual, please take advantage of the "how-to" preventative maintenance videos available at <https://www.tmsvacuum.com/how-to-pm>



GENERAL

Vacuum Booster Identification & Equipment Description

This manual is provided for owners of one or more TMS RL series vacuum booster models **500, 1000, 1500 or 2000**. For model identification, see the nameplate mounted on the side of the vacuum booster.

The proper reference to these models is typically in the following text and numeric format:

TMS RL500, TMS RL1000, TMS RL1500 or TMS RL2000

Reference numbers published in this manual correspond to the part drawings and lists at the end of this document.

This manual is provided to help optimize booster performance and eliminate downtime with preventative maintenance.

TMSRL Series boosters are positive displacement, air-cooled, roots-style vacuum equipment built to be used in concert with mechanical backing pumps. They are engineered and built for vertical flow. Standard flow is top-to-bottom, with upward vertical flow as a variable option.

During high-pressure operation, the integral bypass valve prevents over loading the booster and motor. Timing gears and bearings maintain positive lubrication via the splash lubrication system located at the booster's two ends. To prevent oil from contaminating the chamber, each rotor shafts is multiple sealed from the compression chamber.

Water-Cooled Boosters (optional)

Contact TMS to discuss a TMSRL Series water cooled option. The flow rate of the booster's cooling water supply will be by the plant's water source pressure.

1.0 INSTALLATION

1.1 Receiving & Unpacking

Inspect the shipping container and booster closely for evidence of damage incurred in transit. All damage incurred during transit is the carrier's sole responsibility and should be reported immediately. Review the packing list and ensure all shipment items are received. Be sure to document any damaged or missing equipment immediately on the carrier's delivery receipt and make a copy of same document for your records.

After removing the nuts or straps that secure the booster to the shipping container lift the booster out of the container with a crane or fork lift. To prevent foreign material or dirt from contaminating the booster, the inlet and

outlet are covered during shipment. Only remove these covers when the booster is properly placed, secured and ready for connecting to the system.

1.2 Placing Your Booster

With the mounting feet evenly supporting its weight, ensure the booster (especially for standard vertical gas flow) is secured in a level position. For optimal performance ensure that at no time do the mounting surface and the inlet or outlet piping disrupt the booster housing.

1.3 Booster Piping

Using same or larger nominal pipe diameter as the inlet or discharge, ensure the piping is independently supported while connected to the inlet and discharge ports with a flexible coupling. Because internal clearances are small, housing disruption can cause operational interference.

1.4 Oil Filling

Most boosters are shipped with oil. If your booster is shipped without oil, and after level installation, and the correct rotation has been established, fill the booster with the recommended vacuum oil through the oil filling port, (Ref. 90 - 3/8" plug), observing the "MAX" and "MIN" position at the oil sight glass (Ref 220), located on the pump's gear side, opposite the motor end. See Photo 1.4 below.



Photo 1.4

It is recommended that only TMSRL Series vacuum booster ISO 100, 30 wt. synthetic food grade oil be used to optimize the vacuum booster's top performance. TMSRL Series oil is a long life, low vapor pressure oil that will protect your equipment from wear and corrosion, and generate longer running periods between oil changes. Using TMSRL vacuum oil also provides optimal lubrication at high operating temperatures. This oil can be obtained directly from TMS in Rock Island, Illinois.

The strict use of TMS provided oils and parts from the day of purchase can extend the Limited Standard Warranty. Contact TMS in Rock Island, Illinois for details.

For general applications, use OIL in all models covered by this manual.

The **TECHNICAL DATA** chart on page 8 provides the approximate oil quantities each booster series size requires.

The oil capacity amounts should be used only as a guide, because oil capacity could be slightly lower, depending on whether the booster was previously filled. For proper level readings, use only the sight glass. **Never overfill the vacuum booster with oil.** Replace the oil fill plug (Ref. 90), making sure that the o-ring viton or gasket (Ref. 91) is in place and properly seated and secured.

1.5 Motor Connections



Photo 1.5

Clockwise is the booster's proper rotation, and viewed from the fan end, is indicated by the arrow's direction cast into the motor mounting housing.

Ensure the booster's rotation by:

- (a) Momentarily switch the motor to "on" and then "off" in order to jog the motor and view the motor fan's rotation direction.
- (b) If the motor fan is not rotating clockwise, then reverse any two leads at the inbound power source to reverse the rotation.

2.0 OPERATION

2.1 Start-up

Confirm the motor's proper rotation direction to ensure it is turning "clockwise" when viewed from the rear of the motor. Refer to the arrow direction displayed for proper rotation direction. See Photo 1.5.

Fill the booster with oil as described in Section 1.4 - Oil Filling.

Operate the booster for five minutes, then shut the booster off and check the oil level again. With the booster not operating, the oil level should be visible in the oil sight glass (Ref. 220), between the "MIN" and "MAX" mark.

Add oil when necessary, but only when the booster has been turned off and the circulating oil has had adequate time to return to the oil sump.

Ensure there are no particles or welding scale interfering with the interstage or suction lines.

Ensure the lobes are moving freely by rotating each by hand.

Ensure the gear housing and outlet gas do not have abnormally high temperatures. The maximum allowable exhaust gas temperature is 285°F.

Ensure the booster is not generating any abnormal noise.

Compare the specified amperage draw listed on the motor's nameplate with the booster's amperage draw.

3.0 ROUTINE PREVENTATIVE MAINTENANCE

NOTE: TMSRL Series vacuum boosters are fitted with Baldor motors that have sealed bearings eliminating the need for outside lubrication.

Daily: Visually examine the vacuum booster's oil level (see Photo 1.4).

Weekly: Examine oil sample for contamination.

Every three (3) or four (4) months, 500 to 750 hours of operation, or as necessary: Drain and discard oil from the hot booster, and replace with new TMSRL booster oil.



4.0 TROUBLE SHOOTING

4.1 Problem: The booster fails to start.

Possible Cause: Overloaded motor or motor has insufficient supply voltage; too low or wrong settings for the motor starter overload settings; burned out fuses; insufficient size or too long wire, generating booster voltage drop.

Remedy: Ensure proper supply voltage; inspect the overload settings in the motor starter for size and proper setting stated on the motor's nameplate data; inspect and replace burned fuses; replace improper sized wire. For high ambient temperature, utilize the next largest size overloads or modify the setting 5% beyond the nominal value stated on the motor nameplate.

Possible Cause: Seized motor or booster.

Remedy: Power booster off. After removing the fan cover, rotate the motor and booster by hand. If immovable, extract the motor from the booster and individually inspect the motor and booster. If the booster remains frozen, **contact your TMS support team.**

4.2 Problem: Booster will start, but is laboring and drawing a current that is too high.

Possible Cause: Booster is operating in the incorrect rotation.

Remedy: When viewing the motor from the motor fan side, inspect for accurate rotation which is **clockwise**.

Possible Cause: Improper oil type being used, or excessive oil filling.

Remedy: Adjust to proper oil level and ensure TMSRL Vacuum oil is being used.

4.3 Problem: Booster running noisy

Possible Cause: Worn out coupling insert.

Remedy: Replace coupling insert and/or the motor/booster coupling.

4.4 Problem: Booster is running too hot. .

Note: With a closed inlet, optimal oil temperature is approximately 185-225°F and can vary depending on booster type. These temperature values are sampled while operating at 68°F ambient temperature. 100°F is the recommended maximum ambient temperature while operating continuously. When operating a booster in

ambient temperatures beyond this recommendation it is necessary to maintain careful oil monitoring and/or fit the vacuum booster with a water cooling options. Contact TMS for more details.

Possible Cause: Insufficient oil within oil reservoir.

Remedy: Replace or fill oil to sufficient levels with TMSRL synthetic Vacuum oil.

Possible Cause: Hoses to booster leaking or gaskets or seals for hosing are leaking.

Remedy: Check all hoses and hose connections for leaking air. Replace worn or damaged hoses, gaskets and seals.

4.5 Problem: Seized booster.

Possible Cause: No oil while booster was operating.

Remedy: Contact your TMS support team.

Possible Cause: Improper rotation while booster is operating for an extended period of time.

Remedy: Contact your TMS support team.



TOTAL MAINTENANCE SOLUTIONS, LLC

LIMITED WARRANTY

Total Maintenance Solutions, LLC (“TMS”) offers the following limited warranties to the original purchaser (a “Customer”) of new TMS Vacuum Pumps or Booster Equipment (“New Equipment”) and used Vacuum Pumps and Booster Equipment reconditioned by TMS (“Reconditioned Equipment”):

1. **New Equipment Limited Warranty.** Except for the Exclusions (as described below), New Equipment is warranted to be free from defects in material and/or workmanship during the Warranty Period, all in accordance with the Terms and Conditions of the Limited Warranty.
2. **Reconditioned Equipment Limited Warranty.** Except for the Exclusions (as described below), Reconditioned Equipment provided by TMS is warranted to be free of defects in workmanship and materials provided by TMS during the Warranty Period, all in accordance with the Terms and Conditions of the Limited Warranty.
3. **Terms and Conditions of each Limited Warranty.** The following Terms and Conditions apply to each Limited Warranty hereby provided:

(a) **Warranty Period.** The “Warranty Period” shall be the period of 24 months from the date of invoice by TMS to the Customer for the New Equipment or the Reconditioned Equipment.

(b) **Timely Notice.** In order to obtain a Limited Warranty, a claim under the warranty must be submitted to TMS in writing within thirty (30) days from the date of failure. Information about the warranty claim requested by TMS shall be provided in a timely manner.

(c) **Remedy--Option to Repair or Replace.** TMS shall have the option to repair or replace the part or component acknowledged by TMS to be defective. Any such repair or replacement shall occur within a reasonable period of time. A customer’s primary remedy for breach of warranty is the repair or replacement of the defective component or part. If TMS is unable to provide a replacement component or part, Customer’s alternate remedy shall be, at the option of TMS, the replacement of the particular product or refund of Customer’s purchase price. These remedies are a Customer’s sole and exclusive remedies for breach of warranty.

(d) **Return of Defective Part.** If requested by TMS, the alleged defective part or component shall be shipped to TMS at its manufacturing facility, with freight PRE-PAID by the claimant, to allow TMS to inspect the part.

Claims that fail to comply with any of the above terms and conditions shall be denied.

4. **No Modifications of Limited Warranty.** Unless approved in writing by the General Manager of TMS, no salesperson or other representative of TMS or any other person, firm or corporation is authorized to modify the Limited Warranty provided herein or make any other representation, guarantee or warranty on behalf of TMS.

5. **Exclusions.** The following shall constitute “exclusions” not covered by any limited warranty:



- (a) Any vacuum pump or booster that is damaged as a result of improper installation by a person or firm other than TMS. Installation must follow TMS/manufacturer specifications.
- (b) Any vacuum pump or booster that is damaged as a result of a failure to service the pump or booster in accordance with the service instructions and recommendations of TMS and/or the manufacturer.
- (c) Any vacuum pump or booster that is damaged as a result of: (i) misuse or abuse; (ii) accident; (iii) improper electrical supply and/or wiring; or (iv) an electrical surge.
- (d) Any vacuum pump or booster that is damaged as a result of excessive foreign material (e.g. dirt, dust, metal, plastic, water, other fluids, etc.) infiltrating the pump or booster.
- (e) Any vacuum pump or booster that is modified or altered by any party, regardless of whether TMS has knowledge or is aware of such modification or alteration.
- (f) Any reconditioned vacuum pump or booster that fails or is damaged as the result of the failure of a part not provided by TMS that was not visibly damaged at the time of reconditioning.
- (g) Any vacuum pump or booster that is damaged or fails as the result of the failure of a part or component (e.g. motors, electrical components) supplied by a third party manufacturer, in which event the warranty, if any, of the third-party manufacturer shall apply.
- (h) Any vacuum pump or booster that is damaged or fails as the result of use for a purpose other than as intended or for which the pump or booster was designed (Le. a pump or booster too small for the actual work load).
- (i) Any normal wear parts, including but not limited to coupling discs, vanes, oil and air filters elements, etc.

6. **Disclaimers and Limitations.**

(a) EACH LIMITED WARRANTY IS IN LIEU OF ALL OTHER REPRESENTATIONS AND WARRANTIES, EXPRESS OR IMPLIED, WHICH ARE HEREBY EXPRESSLY DISCLAIMED, INCLUDING ANY WARRANTY OF: (i) MERCHANTABILITY, (ii) FITNESS FOR A PARTICULAR PURPOSE, (iii) COURSE OF DEALING OR USAGE OF TRADE AND (iv) NON-INFRINGEMENT OF THIRD PARTY INTELLECTUAL PROPERTY RIGHTS.

(b) NO OTHER REPRESENTATIONS, GUARANTEES OR WARRANTIES, EXPRESS OR IMPLIED, ARE MADE BY TMS.

(c) TMS shall have no responsibility for any particular application or use made of the TMS New or Reconditioned Equipment.

(d) In no event shall TMS be liable for any loss or claim other than the repair or replacement of the defective part or component, or, at the option of TMS, the replacement of the particular product or the refund of the purchase price.



(e) In no event shall TMS be liable for any direct, indirect, general, special, consequential, punitive, incidental or other damages, or for Customer's or any third party's attorneys' fees, resulting from or arising out of, or alleged to arise out of, the purchase or use of the TMS new or reconditioned equipment.

(f) In no event shall TMS be liable under any theory of liability for damages in excess of Customer's purchase price.

(g) TMS specifically does not warrant parts and components purchased by TMS from third party suppliers, including, but not limited to, such parts and components as motors, bearings and electrical components. Customer shall be limited in recourse for such parts and components to the terms of the warranty, if any, of that particular manufacturer.

(h) This limitation of liability applies irrespective of whether the claim is based on breach of contract, breach of warranty, negligence or other cause and whether the alleged defect is discoverable or latent.

(i) By accepting the new equipment and/or reconditioned equipment, Customer accepts the terms, conditions and limitations of the above limited warranty and waives any and all other or additional claims against TMS.

7. **Time For And Place Of Bringing Suit.** A Customer shall bring any action relating to any alleged breach of the Limited Warranty provided by TMS with respect to any New or Reconditioned Equipment sold by TMS **not later than two (2) years after the date of shipment by TMS.** Buyer agrees that any action brought after such date shall be barred as being untimely. Any action relating to the goods sold by TMS pursuant to this Sales Order or Invoice shall be brought in the Iowa District Court in and for Scott County, Iowa.

8. **Applicable Law.** The Limited Warranty provided herein, including matters of construction, validity and performance, shall be governed by the laws of the State of Iowa, without regard to any Iowa choice of law or other conflict-of-laws rules.

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TMS Rotary Lobe Vacuum Booster Technical Data

TMSRL Series Model #	Units	500	1000	1500	2000
Free Air Displacement	CFM	350	765	1060	1520
RPM (Synchronous)	RPM	3600	3600	3600	3600
Maximum Leak Rate (torr-CFM)	torr	2.8×10^{-2}	2.8×10^{-2}	2.8×10^{-2}	2.8×10^{-2}
Maximum Differential Pressure (torr)	torr	40	32	32	32
Inlet Flange	"ASA	3"	4"	6"	6"
Outlet Flange	"ASA	3"	4"	4"	4"
Motor Size for 3 Phase	HP	3	5	7.5	10
Oil Capacity	Qt.	1.25	3.20	3.20	5.00
Approximate Weight	lbs.	315	520	634	1200



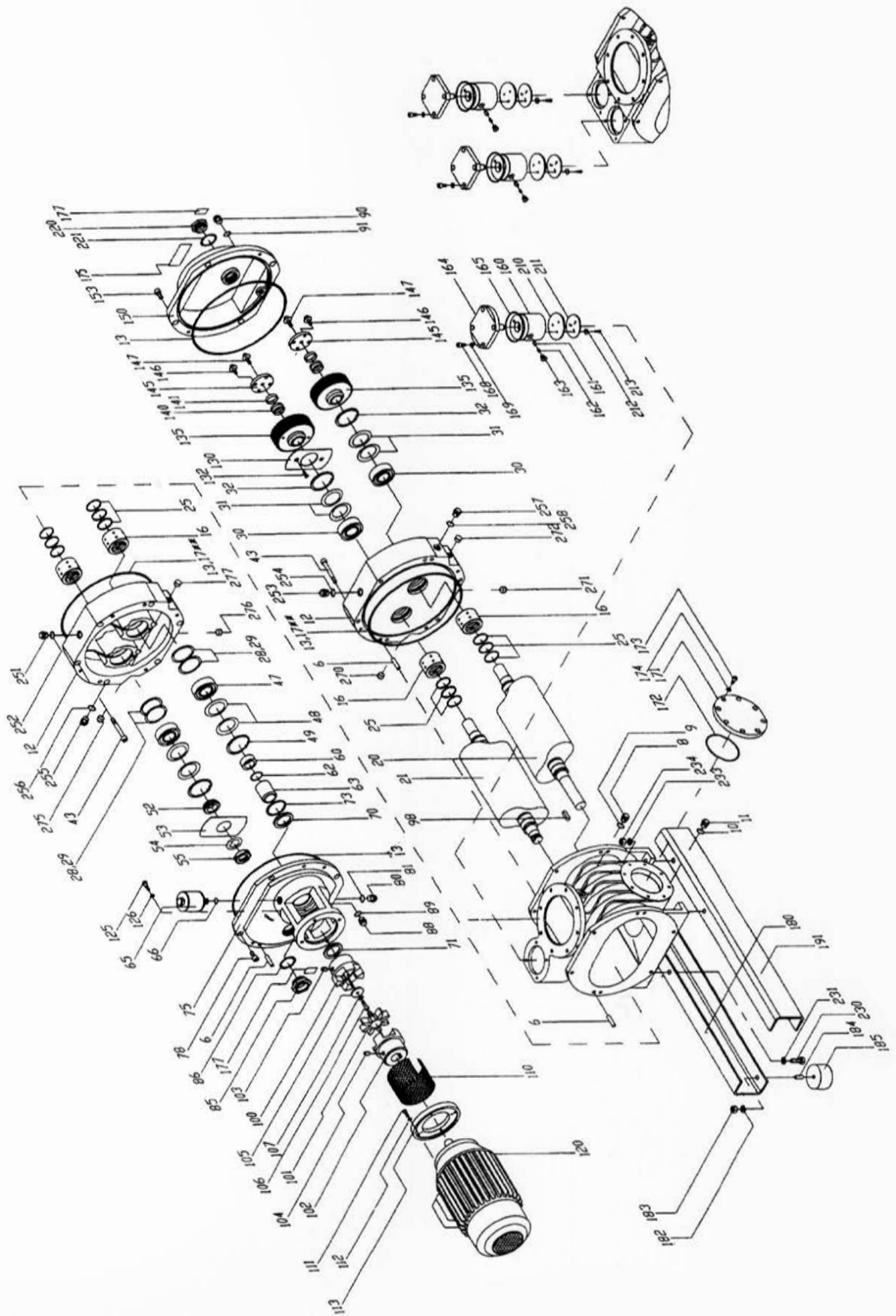


Fig. 1 - Parts Map for the TMS RL500, 1000 & 1500 Series Vacuum Booster

Parts List Reference Numbers & Descriptions for Fig. 1 TMSRL 500, 1000 & 1500 Series Vacuum Booster

Ref.	Description	RL500	RL1000	RL1500
1	Cylinder	1	1	1
6	Alignment pin	6	6	6
8	Plug, 3/8"	1	1	1
9	O-ring, Viton	1	1	1
10	O-ring, Viton	1	1	1
11	Plug, 3/8"	1	1	1
12	Endplate	2	2	2
13	O-ring, Viton	4	4	2
16	Labyrinth sleeve	4	4	4
17	O-ring, Viton	-	-	2
20	Drive rotor	1	1	1
21	Driven rotor	1	1	1
25	Labyrinth seal	12	12	12
28	Tolerance shim	varies	varies	varies
29	Tolerance shim	varies	varies	varies
30	Roller bearing	2	2	2
31	Belleville washer	4	4	4
32	Retaining ring	2	2	2
43	Socket head cap screw	12	12	12
47	Self aligning ball bearing	2	2	2
48	Belleville washer	4	4	4
49	Retaining ring	2	2	2
52	Distance spacer	1	1	1
53	Splash plate	1	1	1
54	Locking plate	1	1	1
55	Locking collar	1	1	1
60	Spacer ring	1	1	1
62	O-ring, Viton	1	1	1
63	Shaft seal race	1	1	1
65	Oil sealing cup, R-3/8"	1	1	1
66	O-ring, Viton	1	1	1
70	Shaft seal, Viton	1	1	1
71	Shaft seal, Viton	1	1	1
73	Retaining ring	1	1	1
75	Motor mounting bracket	1	1	1
78	Socket head cap screw	4	4	4
80	Plug, 3/8"	1	1	1
81	O-ring, Viton	1	1	1
85	Oil sight glass, R-1 1/4"	1	1	1
86	Oil sight glass gasket	1	1	1
88	Plug, 3/8"	1	1	1
89	O-ring, Viton	1	1	1
90	Plug, 3/8"	1	1	1
91	O-ring, Viton	1	1	1
98	Shaft key	-	1	1
100	Pump side cplg. half, Rotex 24	1	-	-
100	Pump side cplg. half, Rotex 38	-	1	1
101	Coupling insert, for Rotex 24	1	-	-
101	Coupling insert, for Rotex 38	-	1	1
102	M.S. cplg. half, Rotex 24x1 - 1/8"	1	-	-
102	M.S. cplg. half, Rotex 38x1 - 1/8"	-	1	-
102	M.S. cplg. half, Rotex 38x1 - 3/8"	-	-	1
103	Set screw	1	1	1
104	Set screw	1	1	1
105	Retaining disk	1	1	1
106	Socket head cap screw	1	1	1
107	Lock washer, A8	1	1	1
110	Coupling protection screen	1	1	1
111	Hex head screw	4	4	4
112	Lock washer 1/2"	4	4	4
113	Motor C-face adapter	1	1	1

Ref.	Description	RL500	RL1000	RL1500
120	Motor, 3 HP	1	-	-
120	Motor, 5 HP	-	1	-
120	Motor, 7.5 HP	-	-	1
125	Socket head cap screw	4	4	4
126	Lock washer, A8	4	4	4
130	Splash plate	1	1	1
132	Fillet head machine screw	2	2	2
135	Helical gear, sets of 2	1	1	1
140	Gear tension element	4	4	4
141	Distance ring	2	2	2
145	Pressure plate	2	2	2
146	Socket head cap screw	8	8	8
147	Socket head cap screw	2	2	2
150	Cover plate	1	1	1
153	Socket head cap screw	4	4	4
160	Bypass valve	1	1	2
161	Bypass friction guide	3	3	6
162	Bypass pressure spring	3	3	6
163	Bypass spring pressure screw	3	3	6
164	Bypass valve cover plate	1	1	2
165	Bypass O-ring, Viton	1	1	2
168	Socket head cap screw	4	4	8
169	Lock washer, A8	4	4	8
171	Blind cover	1	1	1
172	O-ring	1	1	1
173	Socket head cap screw	8	8	8
174	Washer, A8	8	8	8
175	Nameplate	1	1	1
177	Oil level label	2	2	2
180	Left channel bracket	1	1	1
182	Lock washer, A12	4	4	4
183	Hexagon nut, M12	4	4	4
184	Threaded pin	4	4	4
185	Rubber foot	4	4	4
191	Right channel bracket	1	1	1
210	Disk	1	1	2
211	Disk	1	1	2
212	Securing ring	3	3	6
213	Hex head cap screw	3	3	6
220	Oil sight glass	1	1	1
221	Oil sight glass O-ring	1	1	1
230	Hex head cap screw	4	4	4
231	Lock washer, A10	4	4	4
233	Lock washer, A12	4	4	4
234	Hexagon nut	4	4	4
251	Plug, 3/8"	1	1	1
252	O-ring, Viton	1	1	1
253	Plug, 3/8"	1	1	1
254	O-ring, Viton	1	1	1
255	Plug, 3/8"	1	1	1
256	O-ring, Viton	1	1	1
257	Plug, 3/8"	1	1	1
258	O-ring, Viton	1	1	1
270	Plastic plug	1	1	1
271	Plastic plug	1	1	1
272	Plastic plug	1	1	1
275	Plastic plug	1	1	1
276	Plastic plug	1	1	1
277	Plastic plug	1	1	1



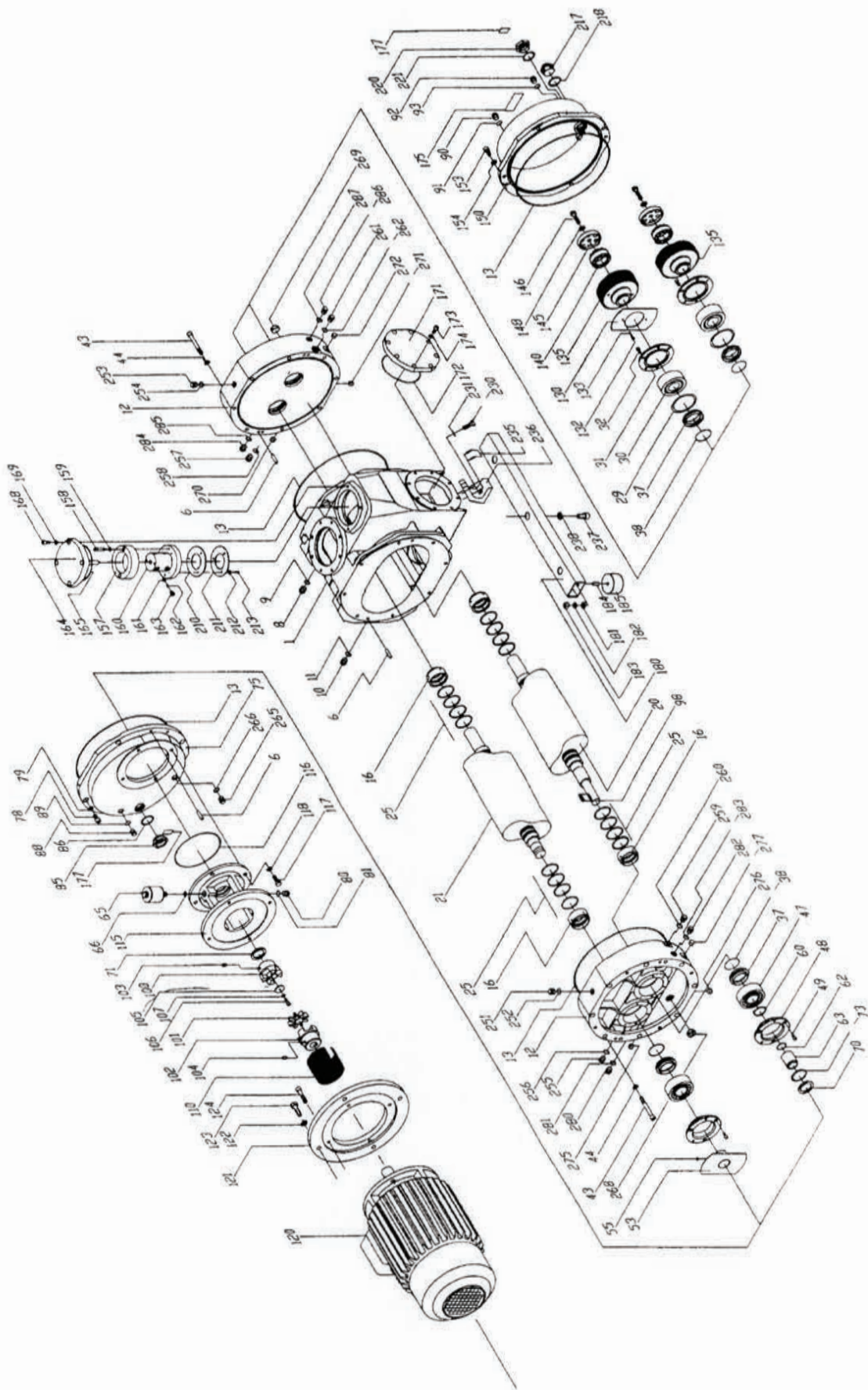
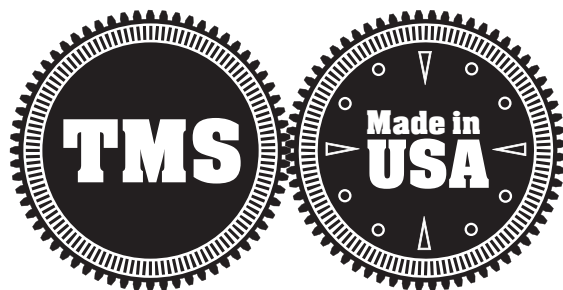


Fig. 2 - Parts Map for the TMS RL2000 Series Vacuum Booster

Parts List Reference Numbers & Descriptions for Fig. 2 TMS RL2000 Series Vacuum Booster

Ref.	Description	RL2000	Ref.	Description	RL2000	Ref.	Description	RL2000
1	Cylinder	1	118	Lock washer	4	256	O-ring, Viton	1
6	Alignment pin	4	120	Motor, 10 HP	1	257	Plug, 3/8"	1
8	Plug, 3/8"	1	121	Motor C-face adapter	1	258	O-ring, Viton	1
9	O-ring, Viton	1	122	Lock washer	4	259	Plug, 3/8"	1
10	Plug, 3/8"	1	123	Hex head cap screw	4	260	O-ring, Viton	1
11	O-ring, Viton	1	124	Socket head low shoulder screw	4	261	Plug, 3/8"	1
12	Endplate	2	130	Splash plate	1	262	O-ring, Viton	1
13	O-ring, Viton	4	132	Hex head cap screw	2	265	Plug, 3/8"	1
16	Labyrinth sleeve	4	133	Lock washer	2	266	O-ring, Viton	1
20	Drive rotor	1	135	Helical gear, sets of 2	1	268	Socket head plug, R1"	1
21	Driven rotor	1	140	Gear tension element	2	269	Socket head plug, R1"	1
25	Labyrinth seal	16	145	Retaining disk	2	270	Plastic plug	1
29	Tolerance shim	2	146	Hex head cap screw	2	271	Plastic plug	1
30	Roller bearing	2	148	Flat washer	2	272	Plastic plug	1
31	Bearing retainer plate	2	150	Cover plate	1	275	Plastic plug	1
32	Socket head cap screw	6	153	Hex head cap screw	4	276	Plastic plug	1
37	Oil slinger	4	154	Lock washer	4	2n	Plastic plug	1
38	O-ring, Viton	4	157	Bypass ring	1	280	Plug, 3/8"	1
43	Socket head cap screw	16	158	Socket head cap screw	2	281	Gasket	1
44	Lock washer	16	159	Lock washer	2	282	Plug, 3/8"	1
47	Roller bearing	2	160	Bybass valve	1	283	Copper ring gasket	1
48	Bearing retainer plate	2	161	Bypass friction guide	3	284	Plug, 3/8"	1
49	Socket head cap screw	6	162	Bypass pressure spring	3	285	Copper ring gasket	1
53	Splash plate	1	163	Bypass spring pressure screw	3	286	Plug, 3/8"	1
55	Socket set screw	2	164	Bypass valve cover	1	287	Copper ring gasket	1
60	Retaining ring	1	165	O-ring, Viton	1			
62	O-ring, Viton	1	168	Socket head cap screw	4			
63	Shaft seal sleeve	1	169	Lock washer	4			
65	Oil sealing cup, R-3/8"	1	171	Blind flange	1			
66	O-ring, Viton	1	172	O-ring, Viton	1			
70	Shaft seal, Viton	1	173	Socket head cap screw	8			
71	Shaft seal, Viton	1	174	Lock washer	8			
73	Snap ring	1	175	Nameplate	1			
75	Motor mounting bracket	1	1n	Oil level label	2			
78	Socket head cap screw	4	180	Support frame	2			
79	Lock washer	4	181	Flat washer	4			
80	Plug, 3/8"	1	182	Lock washer	4			
81	O-ring, Viton	1	183	Hex head cap nut	4			
85	Oil sight glass, R-1 1/4"	1	184	Slotted set screw	4			
86	Oil sight glass gasket	1	185	Rubber foot	4			
88	Plug, 3/8"	1	210	Bypass disk	1			
89	O-ring, Viton	1	211	Bypass disk	1			
90	Plug, 3/8"	1	212	Securing ring	3			
91	O-ring, Viton	1	213	Hex head cap screw	3			
92	Plug, 3/8"	1	217	Plug	1			
93	O-ring, Viton	1	218	Oil sight glass gasket	1			
98	Shaft Key	1	220	Oil sight glass	1			
100	Pump side cplg. half, Rotex 38	1	221	Sight glass gasket	1			
101	Coupling insert	1	230	Hex head cap screw	4			
102	M.S. cplg. half, Rotex 38x1 - 1/8"	1	231	Flat washer	4			
103	Motor side coupling set screw	1	235	Roll pin	8			
104	Pump side coupling set screw	1	236	Foot	4			
105	Pump side retaining disk	1	237	Socket head cap screw	4			
106	Socket head cap screw	1	238	Lock washer	4			
107	Lock washer	1	251	Plug, 3/8"	1			
110	Coupling protection screen	1	252	O-ring, Viton	1			
115	Motor mounting bracket	1	253	Plug, 3/8"	1			
116	O-ring, Viton	1	254	O-ring, Viton	1			
117	Hex head cap screw	4	255	Plug, 3/8"	1			





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