

KEEP FOR FUTURE REFERENCE

SERVICE MANUAL



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**INTENDED FOR USE BY SKILLED
TECHNICAL PROFESSIONALS • READ
AND UNDERSTAND BEFORE SERVICING**



**2-SCFM OR 3-SCFM
NOMINAL AIRFLOW
DC-VOLTAGE POWER SYSTEM**

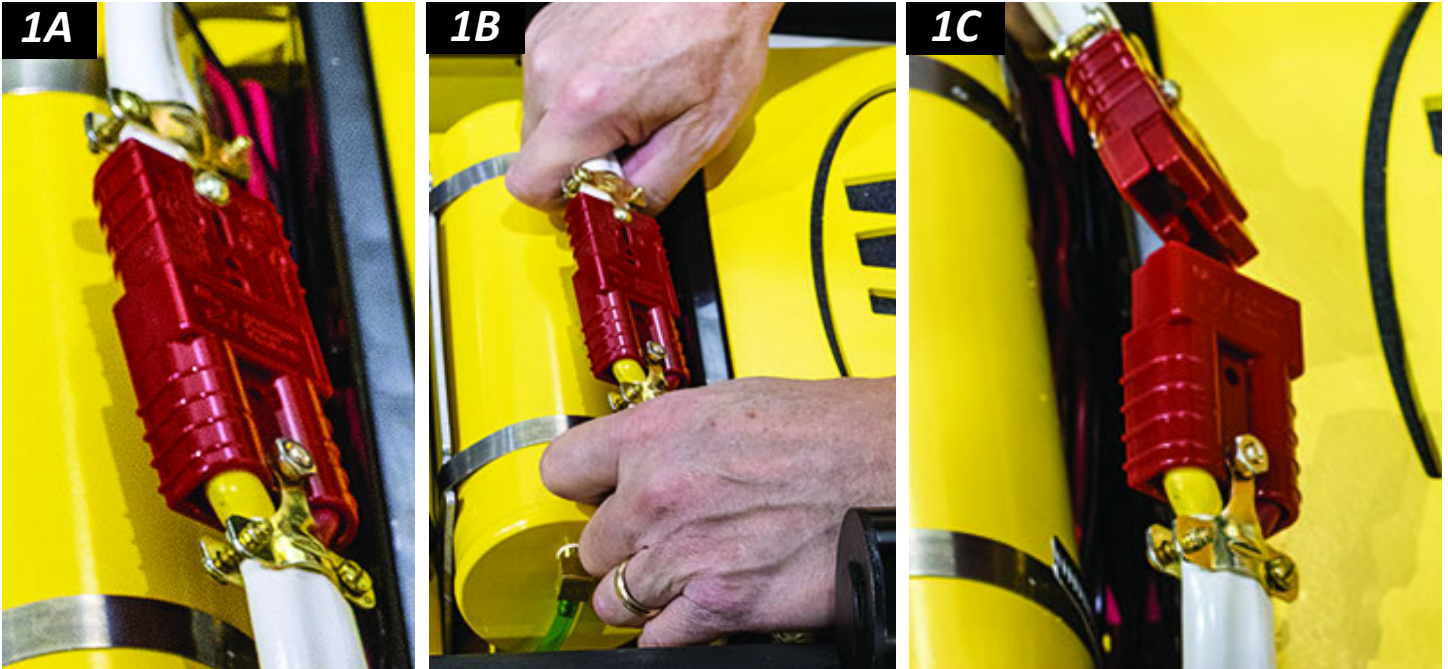
Stock number: 36114



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BEFORE SERVICING LIFTER



Disconnect the electrical connectors (figs. 1A-C).



Disconnect battery before servicing lifter.

Service personnel must read and understand the lifter's *OPERATING INSTRUCTIONS* – especially the “INSPECTIONS AND TESTS” and “MAINTENANCE” sections – before servicing the vacuum lifter. Many of the following discussions assume knowledge of the *OPERATING INSTRUCTIONS*.

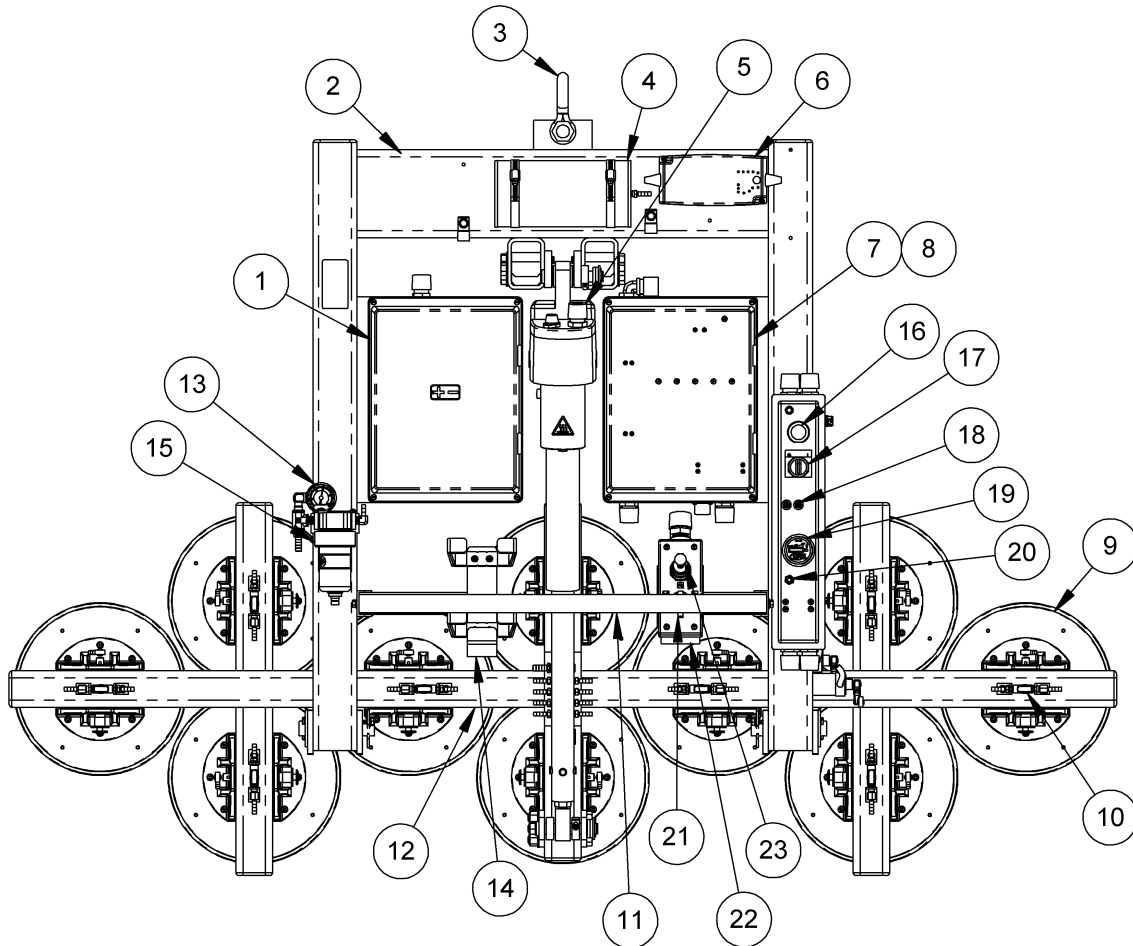
Note: The relevant wiring diagrams are included in the lifter's OPERATING INSTRUCTIONS booklet, for reference when servicing or troubleshooting the lifter.

SERVICE SCHEDULE

Service must be performed whenever a deficiency is indicated by routine inspections or tests. Follow the “INSPECTIONS AND TESTS” section of the *OPERATING INSTRUCTIONS*. Any service warranted must be performed before resuming normal operation of the lifter.

SERVICE FEATURES

Components shown here are underlined> on their first appearance in each section to follow.



- | | | | | | |
|----|------------------------------------|----|-------------------------------------|----|-----------------------|
| 1 | Enclosure with <u>BATTERY</u> | 2 | LIFT BAR | 3 | LIFT POINT |
| 4 | VACUUM RESERVE TANK | 5 | TILT ACTUATOR | 6 | BATTERY CHARGER |
| 7 | Enclosure with <u>VACUUM PUMPS</u> | 8 | Enclosure with <u>VACUUM SWITCH</u> | 9 | VACUUM PAD |
| 10 | PAD SHUTOFF | 11 | CONTROL HANDLE | 12 | PAD FRAME |
| 13 | VACUUM GAUGE | 14 | HOIST PENDANT HOLDER | 15 | AIR FILTER |
| 16 | VACUUM LIFT LIGHT ¹ | 17 | POWER SWITCH | 18 | CIRCUIT BREAKER |
| 19 | BATTERY GAUGE | 20 | BATTERY TEST BUTTON | 21 | ATTACH/RELEASE SWITCH |
| 22 | CONTROL PENDANT | 23 | TILT TOGGLE SWITCH | | |

1..... The FLEXR(L)-DC and MT1010TDC have a low vacuum warning light instead.

Note: A model PT1010TDC is shown.¹

1..... Some components may not be relevant or they may have a different location, depending on the lifter in question.

SERVICE PROCEDURES

AIR FILTER MAINTENANCE – 1 OZ BOWL SIZE



Inspect each air filter regularly, and service when necessary.

Immediately remove liquid or other contaminants found in the filter bowl (A in fig. 1A), to prevent contact with the filter element (C in fig. 2A).



Never use bowl drain (circled in fig. 1A) to remove liquid, because this could cause air leak.

Replace the filter element whenever:

- It has an overall dirty appearance.
- There is a noticeable increase in the time required to attain full vacuum.

Filter Service Procedure

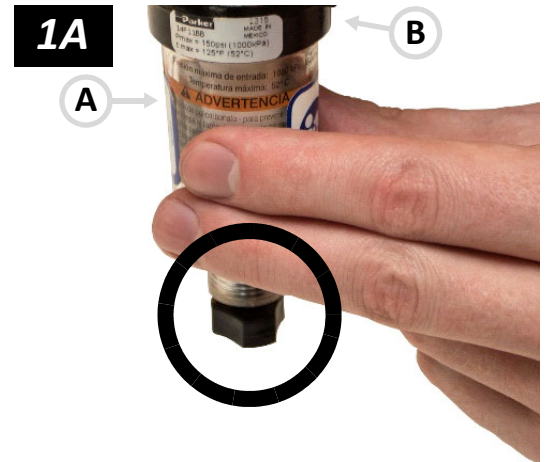
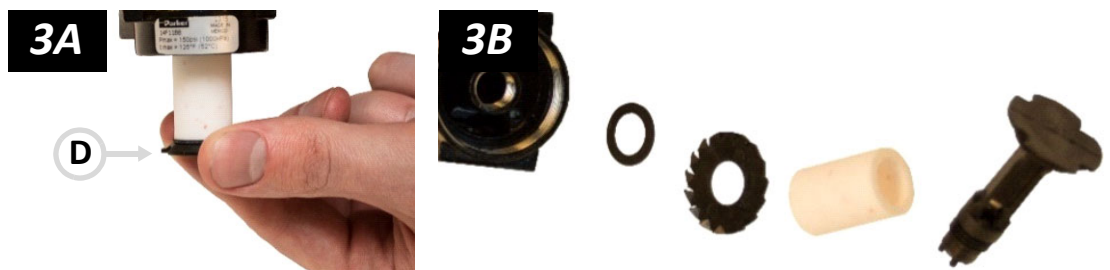
1) Unscrew the bowl (item A in fig. 1A) from the body (item B in fig. 1A) of the air filter.

Note: To protect air-line fittings from damage, hold the body while turning the bowl.

2) Determine whether the filter element (item C in fig. 2A) needs to be replaced (see above).

- *If so*, proceed to step 3.
- *If not*, remove any liquid or contaminants from the bowl; clean the old bowl seal (see step 4 on next page) with mild soap and water; and skip to step 6.

3) Carefully unscrew the element holder (item D in fig. 3A) and remove all internal parts (fig. 3B).



SERVICE PROCEDURES

- 4) Identify the parts in the Filter Element Kit (#16134), including the element (item A in fig. 4A), element holder (B), lubricant (C), deflector (D), element gaskets (E), bowl seal (F). Then dispose of the corresponding old parts.



- 5) Place the new element gaskets, element and deflector on the element holder as shown in fig. 5A. Then screw the assembly back into the filter body.



Note: Tighten gently – finger-tight.

- 6) Clean the bowl, using mild soap and water only.

Caution: Do not use any other cleaning agents.

- 7) Lubricate the new or cleaned bowl seal using a mineral-based oil or grease, such as that provided in the filter element kit.

Caution: Do not use synthetic oils, such as esters, and do not use silicones.

Then place the bowl seal around the rim of the bowl.

- 8) Screw the bowl back into the body. Hand-tighten only.

Caution: Do not contaminate the filter element with lubricant from the bowl seal.

Perform the “Vacuum Test” to be certain the air filter does not leak (see “INSPECTIONS AND TESTS: TESTING” in the lifter's *OPERATING INSTRUCTIONS*).

Note: Repeat this procedure for any other filter of the same type.

SERVICE PROCEDURES

AIR FILTER MAINTENANCE – 4.4 OZ BOWL SIZE



Inspect each air filter regularly, and service when necessary.

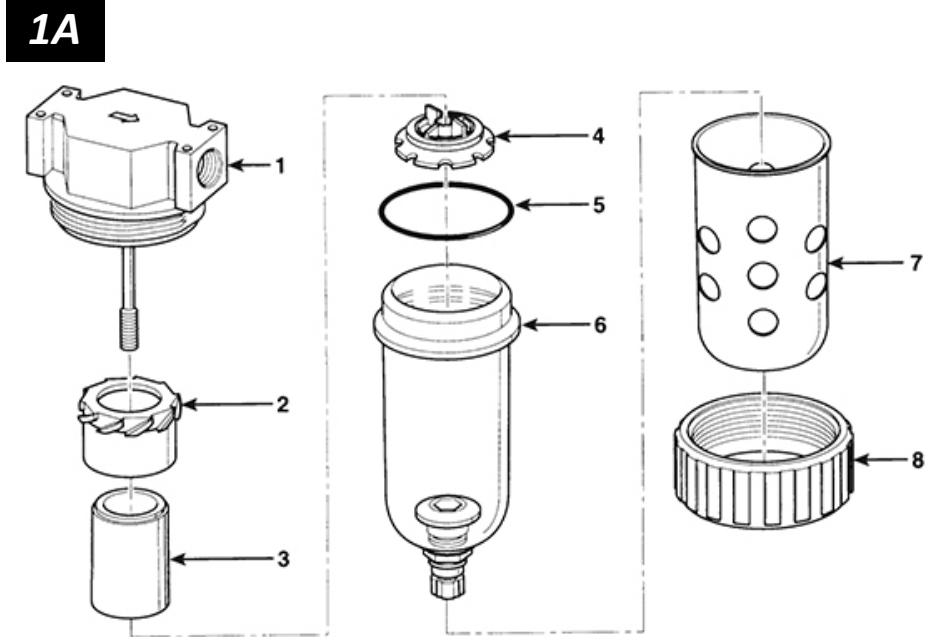
Immediately remove liquid found in the filter bowl, to prevent contact with the filter element.



Never use bowl drain to remove liquid, because this could cause air leak.

Replace the element whenever:

- It has an overall dirty appearance.
- There is a noticeable increase in the time required to attain full vacuum.



Note: The Filter Element Kit (#16132) includes an element (item 3 in fig. 1A), a bowl seal (item 5) and lubricant (not shown).

Filter Service Procedure

1) Unscrew the threaded collar (item 8 in fig. 1A) from the body (item 1) of the air filter.

Note: To protect air-line fittings from damage, hold the body while turning the collar.

2) Remove the bowl guard (item 7) and the bowl (item 6).

3) Determine whether the filter element (item 3) needs to be replaced (see above).

- *If so, proceed to step 4.*
- *If not, remove any liquid or contaminants from the bowl; clean the old bowl seal (item 5) with mild soap and water; and skip to step 8.*

4) Unscrew the baffle (item 4), and remove the element and deflector (item 2).

5) Discard the old element and bowl seal (item 5).

SERVICE PROCEDURES

6) Clean the bowl and all remaining internal parts, using mild soap and water only.

Caution: Do not use any other cleaning agents.

7) Install the deflector and a new filter element. Then screw the baffle back on to hold the element in place.

Note: Tighten gently – finger-tight.

8) Lubricate the new or cleaned bowl seal, using a mineral-based oil or grease, such as that provided in the filter element kit.

Caution: Do not use synthetic oils, such as esters, and do not use silicones.

Then place the bowl seal around the rim of the bowl.

9) Install the bowl back onto the body.

Caution: Do not contaminate the filter element with lubricant from the bowl seal.

10) Install the bowl guard and the collar.

Note: Tighten the collar with 28-32 in-lbs [316-362 N-cm] of torque.

11) Perform the “Vacuum Test” to be certain the air filter does not leak (see “INSPECTIONS AND TESTS: TESTING” in the lifter's *OPERATING INSTRUCTIONS*).

Note: Repeat this procedure for any other filter of the same type.

SERVICE PROCEDURES

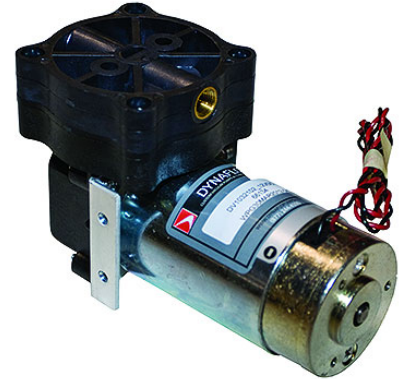
VACUUM PUMP MAINTENANCE – MODEL DV1032102



Disconnect power source before proceeding.

If the vacuum pump takes too long to attain full vacuum, replace the diaphragm or the head assembly as necessary to obtain acceptable pump performance (fig. 1A):

Caution: Do not overtighten the head screws, because this may damage the pump body's threads.

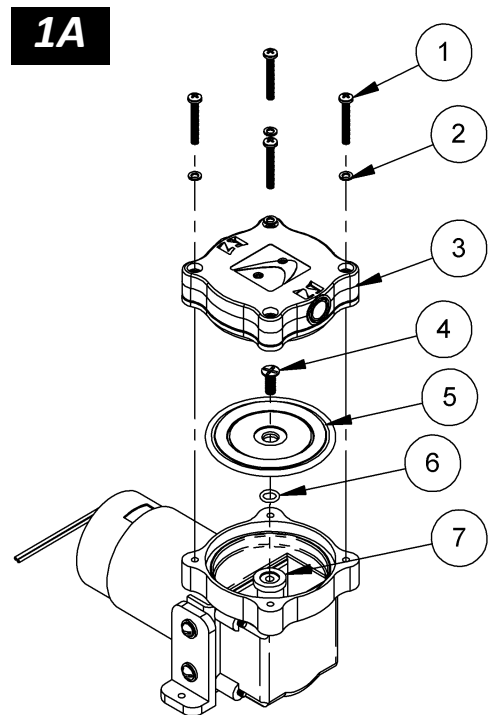


Replacing the Diaphragm

- 1) Remove the four head screws (item 1 in fig. 1A) and lock washers (item 2), and remove the head assembly (item 3).
- 2) Remove the diaphragm retaining screw (item 4), diaphragm (item 5), rubber O-ring (item 6) and flat washer (item 7).
- 3) Replace the flat washer, rubber O-ring, diaphragm and diaphragm retaining screw.
- 4) Reverse these steps to reassemble the pump.

Replacing the Head Assembly¹

- 1) Remove the hose fittings from the head assembly, and carefully clean the threads. Be sure to note the fitting locations for reassembly.
- 2) Remove the four head screws (item 1 in fig. 1A), lock washers (item 2) and head assembly (item 3).
- 3) Replace the head assembly (reverse *step 2*).
- 4) Reinstall the hose fittings, using an appropriate thread sealant.



- 1 HEAD SCREW
- 2 LOCK WASHER
- 3 HEAD ASSEMBLY (#66197AA)
- 4 DIAPHRAGM RETAINING SCREW
- 5 DIAPHRAGM (#66197AM)
- 6 RUBBER O-RING
- 7 FLAT WASHER

1..... **Caution:** Depending on the product, the head assembly (3) may be rotated to an orientation different from the one shown. When removing the head assembly, always take note of its orientation and install it the same way during reassembly.

SERVICE PROCEDURES

VACUUM PUMP MAINTENANCE – MODEL 2907CDC22/12



Disconnect power source before proceeding.

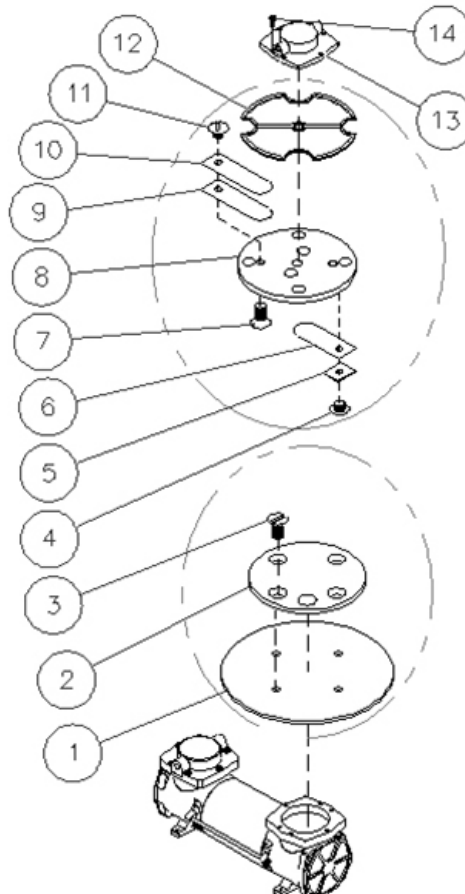


If the vacuum pump takes too long to attain full vacuum, replace the diaphragms, valve flappers or head gaskets as necessary to obtain acceptable pump performance (fig 1A). Perform the following maintenance on both heads of the pump:

Replacing a Diaphragm

- 1) Remove the six head screws (item 14 in fig. 1A) and remove the head (item 13).
- 2) Remove the four diaphragm hold-down screws (item 3) and the diaphragm hold-down plate (item 2).
- 3) Replace the diaphragm (item 1) and reverse the steps above to reassemble the pump.

1A



- 1 DIAPHRAGM (#66183)
- 2 DIAPHRAGM HOLD-DOWN PLATE
- 3 DIAPHRAGM HOLD-DOWN SCREWS
- 4 INTAKE VALVE FLAPPER SCREW
- 5 INTAKE VALVE KEEPER
- 6 INTAKE VALVE FLAPPER – METAL (#66186)
- 7 VALVE PLATE SCREWS
- 8 VALVE PLATE
- 9 EXHAUST VALVE FLAPPER – PLASTIC (#66189)
- 10 EXHAUST VALVE FLAPPER – METAL (#66186)
- 11 EXHAUST VALVE FLAPPER SCREW
- 12 HEAD GASKET (#66191)
- 13 HEAD
- 14 HEAD SCREWS

Replacing an Intake Valve Flapper

- 1) Remove the six head screws (item 14 in fig. 1A) and remove the head (item 13).
- 2) Remove the intake valve flapper screw (item 4) and the intake valve keeper (item 5).

SERVICE PROCEDURES

3) Replace the intake valve flapper (item 6) and reverse the steps above to reassemble the pump.

Replacing Exhaust Valve Flappers and a Head Gasket

- 1) Remove the six head screws (item 14) and remove the head (item 13). Invert the head and remove the five valve plate screws (item 7).
- 2) Lift out the valve plate (item 8) to access the exhaust valve flappers (items 9 and 10) and head gasket (item 12).¹
- 3) Remove the exhaust valve flapper screw (item 11) and replace the exhaust valve flappers (items 9 and 10).
- 4) Replace the head gasket (item 12) and reverse the steps above to reassemble the pump.

1..... **CAUTION:** Depending on the product, the vacuum system may require the valve plate (8) to be rotated to an orientation different from the one shown. When removing the valve plate, always take note of its orientation in the pump head (13), and install the valve plate the same way during reassembly.

SERVICE PROCEDURES

VACUUM SWITCH ADJUSTMENT (WITH GREEN LIFT LIGHT)

The vacuum switch turns the vacuum pumps on and off as needed to maintain sufficient vacuum for lifting the maximum load weight, as shown on the vacuum gauge (see “Reading the Vacuum Gauge” in *OPERATING INSTRUCTIONS*).

*Note: The green vacuum lift light turns on whenever the vacuum pumps turn off, to indicate that vacuum is sufficient for lifting.*¹

If the switch is adjusted correctly, the pumps turn off only *after* vacuum becomes sufficient for lifting; and turn on again *before* vacuum becomes insufficient for lifting.² Adjust the vacuum switch when necessary:



Lifting capacity decreases whenever vacuum switch is adjusted to maintain lower vacuum level.

- 1) Use the 1/4" open-end wrench provided to turn the adjustment screw (circled in fig. 1A) about 1/6th turn at a time:

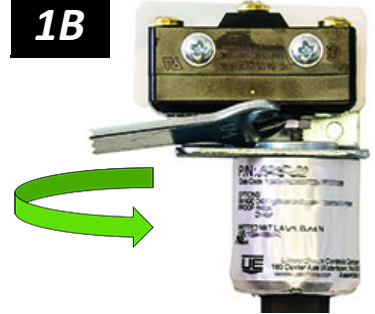
- To *increase* the vacuum level maintained by the lifter, turn the screw *counterclockwise* (fig. 1B).
- To *reduce* the vacuum level maintained by the lifter, turn the screw *clockwise* (fig. 1B).

- 2) Recheck pump activity in relation to the vacuum level.³ Continue to make incremental adjustments until the vacuum switch is functioning correctly.

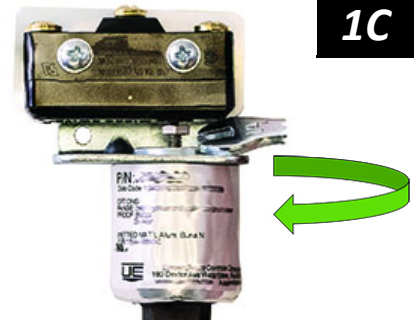
1A



1B



1C



1..... If the lift light does not turn on when the pumps turn off, replace the bulb. If the lift light turns on while the vacuum gauge shows insufficient vacuum, replace the air filter element.

2..... In order to observe lifter functions while vacuum is decreasing, it may be necessary to create a controlled leak in the vacuum system.

3..... In order to test the adjustment accurately, release the vacuum pads completely before reattaching them to a test surface.

SERVICE PROCEDURES

VACUUM SWITCH ADJUSTMENT (WITH RED WARNING LIGHT)

The vacuum switch turns the vacuum pump on and off as needed to maintain sufficient vacuum for lifting the maximum load weight, as shown on the vacuum gauge (see “Reading the Vacuum Gauge” in *OPERATING INSTRUCTIONS*).

*Note: The red low vacuum warning light turns on and off along with the vacuum pump, to signal a vacuum loss.*¹

If the switch is adjusted correctly, the pump turns off only *after* vacuum becomes sufficient for lifting; and turns on again *before* vacuum becomes insufficient for lifting.² Adjust the vacuum switch when necessary:

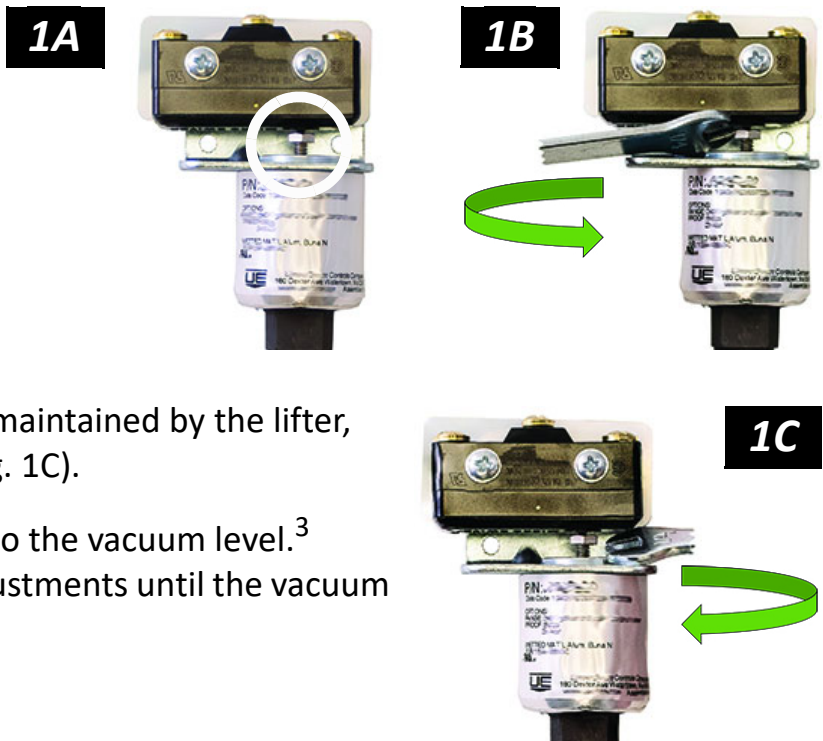


Lifting capacity decreases whenever vacuum switch is adjusted to maintain lower vacuum level.

- 1) Use the 1/4" open-end wrench provided to turn the adjustment screw (circled in fig. 1A) about 1/6th turn at a time:

- To *increase* the vacuum level maintained by the lifter, turn the screw *counterclockwise* (fig. 1B).
- To *reduce* the vacuum level maintained by the lifter, turn the screw *clockwise* (fig. 1C).

- 2) Recheck pump activity in relation to the vacuum level.³ Continue to make incremental adjustments until the vacuum switch is functioning correctly.



1..... If the warning light does not turn on when the pump turns on, replace the bulb.

2..... In order to observe lifter functions while vacuum is decreasing, it may be necessary to create a controlled leak in the vacuum system.

3..... In order to test the adjustment accurately, release the vacuum pads completely before reattaching them to a test surface.

LINEAR TILT ACTUATOR ADJUSTMENT

The tilt actuator is prelubricated and should not require additional lubrication.¹

The actuator has an intermittent-duty type motor. If the actuator is operated more than 20% of the time or runs continuously for more than 5 minutes, a thermal overload relay will break the power circuit. It then takes about 10 minutes before the motor cools sufficiently for the thermal relay to close and restore power.

The brake is preset and should provide consistent braking for the tilt function. However, if the brake friction surfaces become worn (indicated by excessive drift), contact WPG for rebuilding.

The limit switches (fig. 1A), which control the stroke length, also are preset and should not need adjustment. However, if adjustment is required, proceed as follows:

Caution: *Exercise special care when adjusting limit switches because excessive actuator motion can damage lifter components.*

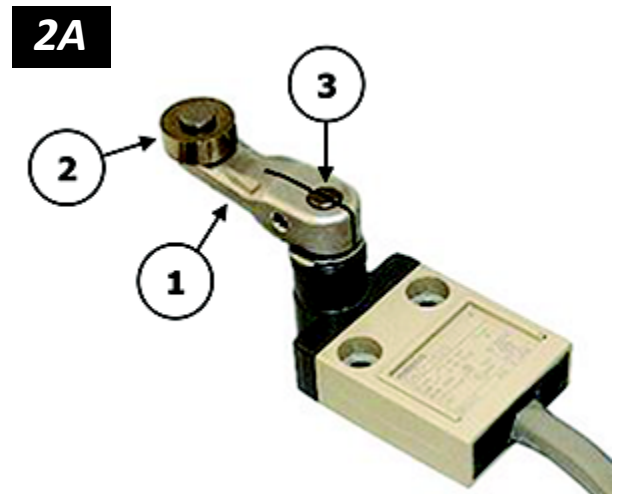
1) Determine which end of the stroke needs to be adjusted, and identify the corresponding limit switch.

2) Determine which way to move the limit switch in order to produce the desired adjustment. Rotating the limit switch's arm on the splined shaft changes the position of the roller in relation to the corresponding contact surface on the lifter's rotation hub:

- To *reduce* stroke length, move the roller of the limit switch *towards* the contact surface.
- To *increase* stroke length, move the roller of the limit switch *away from* the contact surface.

3) Note the current position of the limit switch's arm on the shaft. Then loosen the socket-head screw (item 3 in fig. 2A) on the arm, rotate the arm in the appropriate direction on the shaft, and tighten the socket-head screw to secure the arm.

4) Check the stroke length and repeat steps 1-3 as necessary to obtain the desired adjustment.



1..... If the actuator is not used for a week or more at a time, oil may begin to separate from the lubricant and leak out. Although this condition is not detrimental to the actuator, you can avoid it by simply running the actuator for a few cycles each week.

REPLACEMENT PARTS

Stock No.	Description	Qty.
93220	Vacuum Pump – Single Head – Diaphragm Type – 1 SCFM – 12 V DC	2
66197AM	Pump Diaphragm Kit (for pump 93220)	2
66197	Pump Head Assembly (for pump 93220)	2
66191	Pump Head Gasket (for pump 66135)	2
66189	Pump Valve Flapper – Plastic (for exhaust port of pump 66135)	2
66186	Pump Valve Flapper – Metal (for intake & exhaust ports of pump 66135)	4
66183	Pump Diaphragm (for pump 66135)	2
66135	Vacuum Pump – Dual Head – Diaphragm Type – 3 SCFM – 12 V DC	1
65277	Vacuum Control Valve with handle (for FLEX-DC)	1
65263	Air-Piloted Valve (for MR1611LDCO/DVS)	2
65244	Solenoid Valve – 12 V DC – 6 W (for FLEX-DC, MT1010TDC)	1
65212BB	Check Valve – 1/4 NPT – 3-15 psi (for MR1611LDCO/DVS)	1
65212	Check Valve – 1/4 NPT – 1 psi (for FLEX-DC, MT1010TDC)	1
65211AM	Check Valve – 1/8 NPT – 0.15 psi (for FLEX-DC, MR1611LDC, MR1611LDCO/DVS, MT1010TDC, PT-10TDC, VLGG-DC)	1
65211	Check Valve – 1/8 NPT – 0.5 psi (for MR1611LDCO/DVS)	2
64954	Actuator – 1500 lbs – 12" Stroke – 12 V DC (for PT1010TDC)	1
64752	Audio Alarm – 5-15 V DC – Panel Mount (for low vacuum warning buzzer, if applicable)	1
64713AU	Battery Charger – 7 Amp – 220 / 240 V AC – Australian Type	1
64712US	Battery Charger – 7 Amp – 100 / 115 V AC	1
64711EU	Battery Charger – 7 Amp – 220 / 240 V AC	1
64670	Battery – 12 V DC – 35 Amp-Hours (for PT-10TDC)	1
64682	Battery – 1.5 V DC – AA Alkaline (for optional radio transmitter)	4
64667	Battery – 12 V DC – 28 Amp-Hours (for other models)	1
64590	Battery Gauge	1
64464	Circuit Breaker – 30 A	1
64283	Bulb – 13 V – Bayonet (for vacuum lift light; or low vacuum warning light on FLEX-DC, MT1010TDC)	1
64262	Green Lens (for vacuum lift light)	1
64256AM	Blue Indicator Light – 12 V DC	1
64251	Red Indicator Light – 12 V DC (for low vacuum warning light on FLEX-DC, MT1010TDC)	1
64236	Vacuum Switch – 1/4 NPT	1
64213	Push-Button Switch – Chrome (for “attach”, “enable”, and “release” buttons on MR1611LDC)	3
64200	Push-Button Switch (for battery test button)	1
64190	Contact Block (for power switch)	1
58456	Vacuum Control Valve with Lever (for MT1010TDC)	1
58197	Remote Control System Retrofit Kit (optional for MR1611LDC)	1
55820	Solenoid Valve Assembly – 12 V DC (for MR1611LDC, MR1611LDCO/DVS, PT-10TDC, VLGG-DC)	1
20270	1/4" Open-End Wrench (for adjusting vacuum switch)	1
16134	Filter Element Kit (for MR1611LDCO/DVS 1 oz bowl size air filter)	2
16132	Filter Element Kit (for 4.4 oz bowl size air filter)	1/2*
15920	Vacuum Gauge – 2" Diameter – 1/8 NPT – CBM Type – w/Panel Mount Bracket (for PT-10TDC)	1
15911	Vacuum Gauge – 1-1/2" Diameter – 1/8 NPT – CBM Type (for MR1611LDCO/DVS)	2
15910	Vacuum Gauge – 2" Diameter – 1/8 NPT – CBM Type (for all other models)	1
15630	360° Rotating Union – 1/4 NPT (for MR1611LDC, MR1611LDCO/DVS)	1

* Quantity of 2 for MT1010TDC and PT-10TDC

See lifter's **OPERATING INSTRUCTIONS** for additional parts.

**SERVICE ONLY WITH IDENTICAL REPLACEMENT PARTS,
AVAILABLE AT WPG.COM OR THROUGH AN AUTHORIZED WPG DEALER**