

NTO-200

Operation Manual



MAHLE

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PICTOGRAMS

The following symbols will be used in this manual and found on the equipment:

 WARNING	Warning: Hazard that can cause death or serious injury. Follow the instructions.
 CAUTION	Caution: Danger that can cause damage to the equipment. Follow the instructions.
	Warning: Risk of death due to suffocation.
	Risk of fire: Oxygen-enriched air leads to an increased risk of fire in the event of contact with flammable products.
	High pressure risk: Follow the instructions with respect to compressed gasses.
	Instructions with respect to the environment.

SAFETY INFORMATION

GENERAL SAFETY

Correct use of the NTO-200 Nitrogen TopOFF is important for your personal safety and for trouble-free functioning. Incorrect use can cause damage to the NTO-200 or can lead to incorrect gas supply to the customer's process.



Warning: Read this manual before you start operating the NTO-200 to prevent accidents and damage. If you detect a problem that you cannot solve with this manual, contact MSS Technical Support at 1-(800)-468-2321 x 1.

SAFETY INFORMATION (Continued)

COMPRESSED AIR



Warning: Ensure that the feed air pressure does not exceed 160 psig.



The user is ultimately responsible for selecting the correct air supply system and components. They are also responsible for maintaining the system so it does not cause damage to the NTO-200.

NITROGEN AND OXYGEN

The NTO-200 generates nitrogen as a product. Oxygen enriched air is released as waste.



Warning



Nitrogen can cause suffocation. Oxygen enriched air leads to increased risk of fire in the event of contact with flammable products. Make sure that there is adequate ventilation at all times!



Do not install the NTO-200 in an area where explosive substances may be present.

OTHER IMPORTANT SAFETY INFORMATION



Warning: There are no user maintainable parts on the NTO-200. The grip is part of the pressure chamber and so it should not be disassembled. Failure to follow these warnings could result in an unexpected release of pressure, causing serious injury or damage.

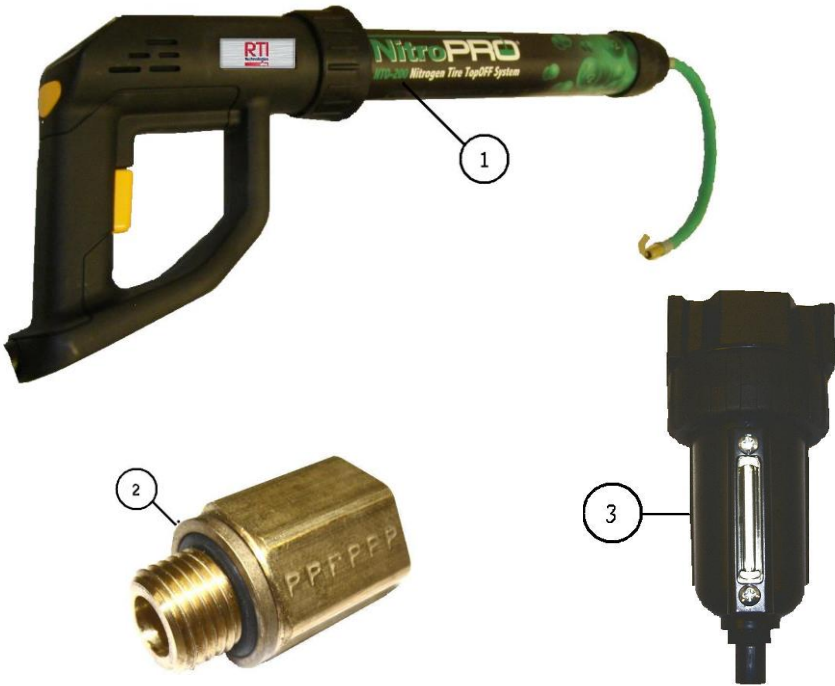


Use of the NTO-200 in any other way than specified in this manual could result in an unexpected release of pressure, causing serious injury or damage.



Warning: When handling, installing, or operating the NTO-200, user must use safe engineering practices and observe all related rules and health/safety information.

COMPONENTS



When the NTO-200 is delivered, check the box to ensure that all items are included. The following is a list of included items:

Item #	DESCRIPTION	QUANTITY
1	NTO-200 Nitrogen TopOFF System	1
2	¼" NPT Adapter	1
3	Filter Assembly	1

If it is found that anything is missing, or appears damaged, please inform delivery company and contact NTO-200 supplier immediately.

INTRODUCTION

The NTO-200 is a hand held, battery powered nitrogen tire inflation system created primarily for tire top-offs and small tire fills such as motorcycle and bicycle tires. It is well-suited for other types of nitrogen inflation of small pneumatic tires found in the industrial, recreational and agricultural industries. The NTO-200 can also be used to nitrogen inflate a wide variety of sporting goods equipment and any other applications that utilize pneumatic pressure for support.

SPECIFICATIONS

Technical Specifications

Lifetime grip*	50,000 tire fills
Lifetime cartridge*	12,000 tire fills
Lifetime cartridge*	55,000 tire top-offs @ 120 PSI
Lifetime cartridge*	40,000 tire top-offs @ 125 PSI
Lifetime cartridge*	30,000 tire top-offs @ 130 PSI
Lifetime cartridge*	19,000 tire top-offs @ 135 PSI
Nitrogen Capacity**	1.8CFM @ 68°F (average) (at 145 psi inlet pressure)
Purity	95% N2 average
Inlet air quality	ISO 8573-1: 2001 Class 3.-.3 It is not allowed to feed liquid/aerosol condensate, water or oil into NTO-200.
Inlet pressure	72-160 psi
Max Tire Pressure***	50% of inlet pressure
Temperature	-4°F to 122°F
Overall Weight	2.6 lbs
Cartridge Weight	1.3 lbs
Overall Dimensions (HxWxD)	9.1 x 3.5 x 25.2 inches
Cartridge Dimensions	17.7 inches long x 3.5 inch diameter
Certification	CE conforming (EMC and PED art.3.3)
Warranty - grip */**	MSS Warranty
Warranty - cartridge */**	MSS Warranty
Maintenance	None
Patent Pending	

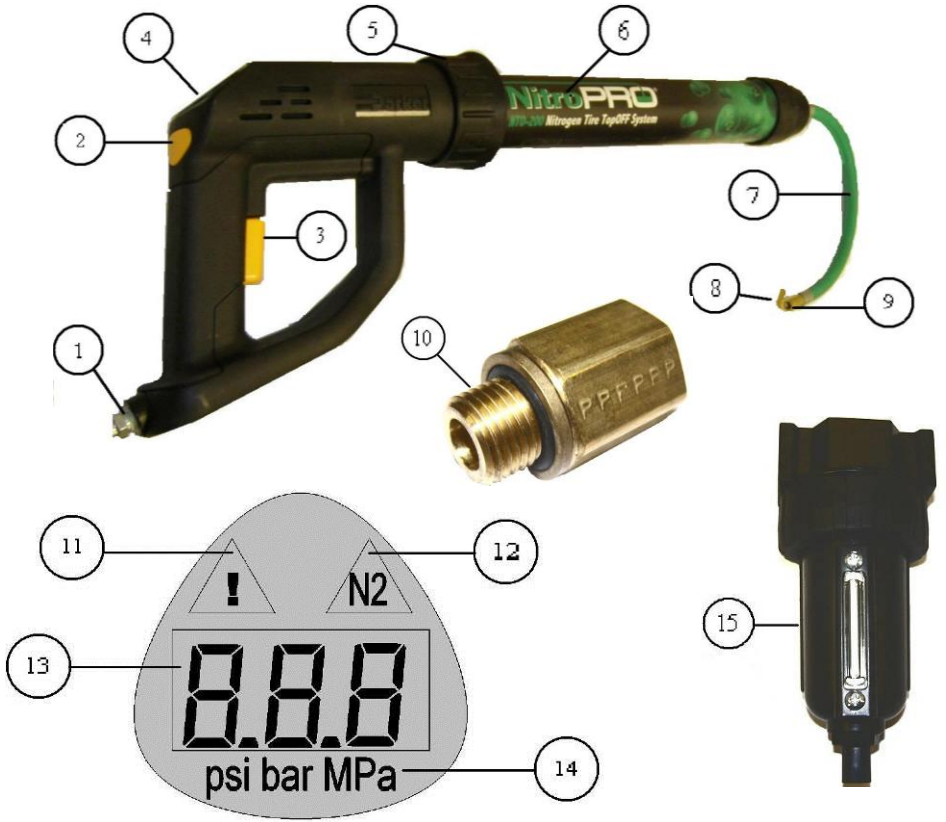
Technical Specs based on:

*205/55R16 Tire Size

**Reference condition at 14.7 PSI and 68°F

***Fill tires up to max 5.5 bar / 80 psi / 0.55 MPa

OVERVIEW



KEY					
1	Compressed Air Inlet	6	Exchangeable cartridge	11	Error Icon
2	ON / OFF and air release button	7	Nitrogen filling hose	12	Filter Icon
3	Nitrogen inflation button	8	Thumb lever	13	Pressure reading/Error Code
4	Digital Display	9	Tire Valve connector	14	Pressure Units
5	Locking ring	10	1/4 BSPP x 1/4 NPT Fitting	15	Filter

CHANGING DISPLAY UNITS



Warning: Ensure the NTO-200 is relieved of pressure before changing units.

The membrane cartridge must be removed from grip before changes can be made to the setup. Unscrew locking ring from the grip and remove the cartridge. (Note: This will create error message E4 when grip is powered up. It will clear itself when the NTO-200 is reassembled.)

Press and hold ON/OFF button until desired units (bar/psi/MPa) are shown on the display. Release button to save the new unit setting and turn off NTO-200. (Note: If you scroll through all the units back to current setting, the NTO-200 will automatically shut down.)

RESETTING ZERO POINT

To reset the zero point of the NTO-200, unscrew locking ring and remove cartridge. Press ON/OFF button, the NTO-200 will power up and will reset the zero point. After this is complete, it will automatically shut down.

SETTING UP AIR SUPPLY

Before performing Nitrogen fills with the NTO-200, customer must first set up the compressor to supply the NTO-200 with clean, dry (oil less and waterless) air. To do this effectively, MSS has supplied a filter with ¼" NPT ports to install in air supply.

When installing the filter, mount so the automatic drain is pointing downwards. This drain will automatically bleed any fluids that collect in the bowl when it detects a certain amount present.

After the filter is installed, the customer should take the ¼ BSPP x ¼ NPT fitting (Item 10 on previous page) and install it on the back side of the NTO-200 grip, (Item 1 on previous page). **NOTE: The customer must also provide the hose that connects the filter to the NTO-200 grip assembly.**

INFLATING TIRES



Warning: The maximum tire pressure capability for the NTO-200 is 5.5bar / 80psi / 0.55MPa. Small tire sizes inflate very quickly. Make sure you do not over-inflate tires during the nitrogen inflation process.

Begin by connecting filtered air supply (Figure 1). Then push down thumb lever on air chuck at end of Nitrogen Fill Hose. While holding in lever, push onto valve stem and then release (Figure 2). Press ON/OFF button to turn on NTO-200. Hold the NTO-200 as shown in Figure 3 below and squeeze the Nitrogen inflation button to fill tires with nitrogen. **Fill tire to pressure specified by manufacturer.**

NOTE: The pressure displayed (when squeezing inflation button) represents the filling pressure; not the tire pressure. To view tire pressure, user must release inflation button.

Continue filling tire and checking tire pressure until desired pressure is achieved. If the tire goes above desired inflation value, press and hold ON/OFF button to release pressure from inside tire. Check tire pressure by releasing ON/OFF button periodically. When desired pressure is achieved, disconnect air chuck from tire by squeezing thumb lever and pulling off valve stem. Replace valve cap (Figure 4).

NOTE: If tire has been filled with compressed air, fully deflate using appropriate valve release tool. Then inflate to target pressure using the NTO-200, deflate to 50% of target pressure and refill to target pressure. This technique increases nitrogen purity in the tires.



Figure 1

Figure 2

Figure 3

Figure 4

REPLACING MEMBRANE CARTRIDGE

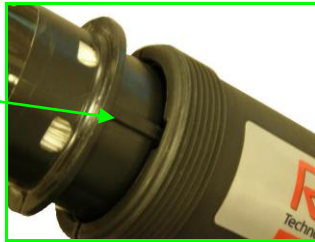
When the cartridge's usable life is diminished, (code E6 will be on the display) it will need to be replaced.

Disconnect air supply from NTO-200 (Figure 5) and remove Nitrogen fill hose from end of cartridge. Next, unscrew locking ring from grip (Figure 6) and remove cartridge from grip cautiously (Figure 7). Use caution when removing the cartridge as to not damage electrical contacts.

Remove gasket from grip and insert replacement. Make certain gasket is correctly placed in the profile of the grip to obtain best seal (Figure 8).

When installing replacement cartridge, ensure that key on side of cartridge is aligned with groove inside grip.

Confirm the key is aligned with groove inside grip before tightening lock ring.



Carefully push cartridge into grip and use lock ring to hold in place. The lock ring must be fully engaged before continuing use of product. **Make sure the lock ring is completely tightened to ensure proper nitrogen purity. Insufficient tightening will lead to a reduction in nitrogen purity.**

Remove nitrogen fill hose from old membrane and reconnect to new membrane. Torque fitting to 15 ft-lbs.



Figure 5



Figure 6



Figure 7




Figure 8


MAINTENANCE


There are no serviceable parts on the NTO-200.


The NTO-200 should be wiped down with a damp cloth only. Keep excessive moisture from the area around the display. A mild detergent may be used for heavy dirt. Do not use abrasives/solvents as they may damage the NTO-200. **NOTE: Keep clothes away from exhaust holes and fibers located under locking ring.**

SPARE PARTS

1		Ref	Description	Part Number
		1	NTO-200 Complete	455 80025 00





2		Ref	Description	Part Number
		2	NTO-200 Cartridge & Gasket	026 80615 00







3		Ref	Description	Part Number
		3	NTO-200 Filter Replacement	026 80617 00

4		Ref	Description	Part Number
		4	Tire Filling Hose Replacement (12 inch)	026 80616 00

ERROR MESSAGES

The warnings below will appear on the display when NTO-200 is operated outside the limits specified in the technical specifications section of the manual. The warnings will automatically clear themselves when the NTO-200 is back to normal operating parameters.

Indication	Condition
	If error icon is flashing, the pressure sensor is no longer in calibration. Check that membrane cartridge is installed correctly (See section - "Replacing Membrane Cartridge"). Contact NTO-200 Supplier if problem persists.
	If filter icon is flashing, membrane cartridge has exceeded 90% of lifetime.
	Pressure reading will flash when tire pressure exceeds 95 psi (6.5 bar / 0.65 MPa). Press and hold ON/OFF button to release pressure.
	Pressure reading will change to P and error indicator will flash when tire pressure rises above 102 PSI (7 bar / 0.7 MPa). Press and hold ON/OFF button to release pressure.

Error Code	Condition
	The NTO-200 is at end of its life. Contact NTO-200 supplier if problem continues.
	The measurement is out of range (negative). Calibrate measurement as described in manual. Contact NTO-200 supplier if error does not reset itself.
	The measurement is out of range (positive). Calibrate measurement as described in manual. Contact NTO-200 supplier if error does not reset itself.
	No membrane cartridge or non-genuine MSS cartridge detected. Remove cartridge from grip and check if metallic contact on cartridge is clean. Reinstall cartridge into grip correctly. See section - "Replacing Membrane Cartridge" .
	Cartridge became corrupted or cartridge installed is a non-genuine MSS cartridge. Replace cartridge.
	The membrane cartridge has exceeded lifetime. Replace cartridge.

TROUBLESHOOTING

Fault	Probable Cause	Solution
NTO-200 will only power up for 5 seconds.	An error occurred during operation	Power up generator and note error codes on display. Refer to previous page for more details
No flow of nitrogen from NTO-200	No pressure at inlet	Check the following: 1.) NTO-200 is connected to compressed air supply. 2.) Compressed air supply pressure meets required specification. 3.) Hoses for any damage.
	Internal leak	Ensure cartridge is correctly installed in grip and lock ring is secure. Contact NTO-200 supplier.
	Internal blockage	Check cartridge. Refer to "Reduced flow of nitrogen from NTO-200."
	An error has occurred	Refer to error codes for more details.
Reduced flow of nitrogen from NTO-200	Internal blockage	Check cartridge.
	Cartridge is incorrectly installed.	Disconnect NTO-200 from compressed air supply and check that cartridge correctly connected.
	Gasket damaged or incorrectly installed.	Remove cartridge and check that gasket is correctly installed.
	Inlet pressure too low	Check the following: 1.) Hoses for any damage. 2.) Check compressor.
	Internal leak	Ensure cartridge correctly installed in grip. Contact NTO-200 supplier.
	Outlet pressure exceeded 50% of inlet pressure.	Check inlet pressure falls within range specified in Tech Specifications. Check tire pressure. If pressure too high, press and hold ON/OFF button to reduce pressure.

TROUBLESHOOTING (Continued)

Fault	Probable Cause	Solution
Reduced Purity of nitrogen	Compressed air supply does not meet specified requirements of ISO 8573-1: 2001 Class 3.-.3 It is not allowed to feed liquid/aerosol/condensate water or oil into NTO-200.	Check the following: 1.) Compressor operating correctly and fully maintained. 2.) No contaminants near compressor's intake. 3.) Compressed air system has suitable filtration and is correctly maintained.
	Inlet pressure too low or too high.	Ensure inlet pressure is within limits specified under "Technical Specification" section.
	Cartridge nearing end of life.	Replace cartridge
Tire pressure does not fall when ON/OFF button held in.	Internal blockage	Contact NTO-200 supplier.
	Cartridge not installed correctly.	Ensure cartridge correctly fitted in grip
	Internal fault	Contact NTO-200 supplier.
Pressure continually high.	Cartridge not installed correctly.	Ensure cartridge correctly fitted in grip
	There is internal component fault	Contact NTO-200 supplier.

MSS ONE-YEAR NTO-200 LIMITED WARRANTY

(Applies only to equipment owned and operated in North America)

During the One-Year Warranty period, MAHLE Service Solutions (MSS) is solely responsible for costs associated with parts and labor for repairs needed due to defects in material and/or workmanship. MSS is not responsible for the costs associated with repairs needed due to improper use, damage due to physical or chemical abuse or a lack of normal maintenance. MSS's goal is to provide a timely turn-around of any NTO-200 requiring warranty repair.

The Customer is responsible to ASSIST AND PARTICIPATE with MSS Technical Support in the over-the-phone diagnosis process of:

- a) Determining that a legitimate failure has occurred and that the complaint is not just the result of inadequate training and/or improper use that could be easily remedied by over-the-phone instructions.
- b) Determining the nature of the failure and that it is reasonable for MSS Technical Support to judge over the phone that the failure is warrantable.

During the One Year Warranty period for failures that are deemed by MSS to be warrantable, MSS is solely responsible for providing Service and/or Replacement Product when appropriate within a reasonable period of time after a warrantable failure is reported.

MSS shall make the repairs at MSS's factory location and shall be responsible for the cost of transportation to and from the factory. It is the customer's responsibility to package the NTO-200 in its original packaging or in packaging sufficient to ensure safe transit for shipment to the factory.

It is the Customer's responsibility to maintain the NTO-200 according to instructions in MSS's Operation Manual as well as to operate the equipment in a commercially reasonable manner as generally described in the MSS Operation Manual.

MSS provides free Technical Support over toll-free telephone lines in the USA to assist the customer in this regard for the life of the NTO-200.

The Customer should review the legal Warranty Disclaimer below for more details of coverage and limitations.

Warranty Disclaimer of MAHLE Aftermarket Inc., RTI Division

1. MSS'S WARRANTY

This is to certify that MAHLE Service Solutions (MSS) warrants to the first retail purchaser only, the described new product manufactured by it to be free from defects in materials and workmanship, when properly maintained, **under normal use and service for a period of ONE YEAR OR 12,000 tire fills for the membrane and ONE YEAR OR 50,000 tire fills for the grip (WHICHEVER COMES FIRST)**. All spare parts supplied by MSS will have a 90 day warranty. This warranty includes the reasonable cost of parts and materials as well as non-overtime labor. MSS shall be the sole judge of whether failure is warrantable.

2. PURCHASER'S REMEDY

Purchaser's sole and exclusive remedy under this warranty shall be limited to the repair or replacement, at MSS's option, of any defective part of the product. Purchaser shall call MSS Technical Support who will assist Purchaser in diagnosing the problem and, if deemed necessary, make arrangements to have the NTO-200 returned to MSS for repair.

3. PURCHASER'S DUTIES

- (a) Register the NTO-200 with MSS by returning completed Warranty Registration within 90 days of delivery.
- (b) Transportation Expense: Transportation expenses to and from the MSS's facility for warranty repair are to be borne by MSS.
- (c) Notice of breach: Purchaser shall give written notice to MSS of any alleged refusal or failure of MSS to repair or replace as promised by this warranty no later than fifteen (15) days after the Purchaser learns of such alleged failure or refusal.

Continued Next Page

WARRANTY (Continued)

4. DISCLAIMER

THE EXPRESS WARRANTY HEREIN IS IN LIEU OF ANY AND ALL OTHER WARRANTIES, EXPRESSED OR IMPLIED. NO IMPLIED WARRANTY OF MERCHANTABILITY IS MADE AND THERE ARE NO WARRANTIES WHICH EXTEND BEYOND THE DESCRIPTION ON THE FACE HEREOF.

5. EXCLUSIONS

The warranty and obligations stated here shall not apply to:

- (a) Any product not registered within 90 days of delivery.
- (b) Any product repaired or altered without prior approval of MSS so as to affect adversely its stability or reliability.
- (c) Any product subjected to misuse, abuse or accident as well as products used in a manner contrary to written instructions or normal operating procedures.
- (d) Any damage to product during original shipment or subsequent shipments to and from MSS for service.
- (e) Portions of products which are subject to warranties, if any, given by their manufacturers. MSS does not adopt these warranties.
- (f) Parts, accessories or other items manufactured by others which are used or installed on the product as a result of Purchaser's specifications.
- (g) Used items furnished by the Purchaser for installation on the product.
- (h) Items which are not defective, but must be replaced during the warranty period as a result of fair wear and tear or scheduled maintenance.

6. EXCLUSION OF LOST PROFITS AND OTHER CONSEQUENTIAL DAMAGES

MSS will have no liability for any lost profit, cargo loss, usage loss or other consequential damages alleged to have been caused by any defect in the NTO-200 or any failure of MSS to meet any obligation under this agreement including the obligation to repair and replace set forth in Paragraph 2.

7. LIMITATIONS OF ACTIONS

No action for breach of this warranty shall commence more than one year after the accrual of the cause of action.

8. MERGER

This written warranty is the complete, final and exclusive agreement of the parties with respect to the quality or performance of the goods and any and all warranties and representations, except warranty extensions, if any, in writing as applicable.

9. NO ORAL MODIFICATIONS OR WAIVERS

No modification of this warranty or waiver of its terms shall be binding on either party unless approved in writing by an authorized official of the parties.

10. GOVERNING LAW

This warranty and the rights and duties of the parties under this warranty shall be governed by the law of Pennsylvania, the state of MSS's principle place of business.