DIGITAL OIL CONTROL VALVE

OWNER'S MANUAL

WARNING: Read carefully and understand all INSTRUCTIONS before operating. Failure to follow the safety rules and other basic safety precautions may result in serious personal injury.

Item # 28481

Thank you very much for choosing a Roughneck™ Product! For future reference, please complete the owner's record below:

Model: _____ Purchase Date: _____

Save the receipt, warranty and these instructions. It is important that you read the entire manual to become familiar with this product before you begin using it.

This machine is designed for certain applications only. The distributor cannot be responsible for issues arising from modification. We strongly recommend this machine is not modified and/or used for any application other than that for which it was designed. If you have any questions relative to a particular application, DO NOT use the machine until you have first contacted distributor to determine if it can or should be performed on the product.

For technical questions, please call **1-800-222-5381**.

⚠ **WARNING: Read carefully and understand all INSTRUCTIONS before operating. Failure to follow the safety rules and other basic safety precautions may result in serious personal injury.**
Save these instructions in a safe place and on hand so that they can be read when required. Keep these instructions to assist in future servicing.

TECHNICAL SPECIFICATIONS

Model	28481
Inlet connection	1/2in.
Flow rate	0.3-9.2 GPM
Operating pressure range	7–1500 PSI
Max. operation temperature	140℉
Precision	±0.5%
Power source	one 3.6V ER14250 battery

GENERAL SAFETY REGULATIONS

⚠**WARNING: Read and understand all instructions.**

⚠**WARNING: The warnings, cautions, and instructions discussed in this instruction manual cannot cover all possible conditions or situations that could occur.** It must be understood by the operator that common sense and caution are factors that cannot be built into this product but must be supplied by the operator.

1. Keep the work area clean and dry. Damp or wet work areas can result in injury.

2. Keep children away from work area. Do not allow children to handle this product.

3. Store idle equipment. When not in use, tools and equipment should be stored in a dry location to inhibit rust. Always lock up tools and equipment and keep out of reach of children.

4. Use the right tool for the job. Do not attempt to force small equipment to do the work of larger industrial equipment. There are certain applications for which this equipment was designed. It will do the job better and more safely at the capacity for which it was intended. Do not modify this equipment, and do not use this equipment for a purpose for which it was not intended.

5. Check for damaged parts. Before using this product, carefully check that it will operate properly and perform its intended function. Check for damaged parts and any other conditions that may affect the operation of this product. Replace damaged or worn parts immediately.

6. Do not overreach. Keep proper footing and balance at all times to prevent tripping, falling, back injury, etc.

7. DO NOT use the equipment when tired or under the influence of drugs, alcohol, or medication. A moment of inattention while operating this equipment may result in serious personal injury.

8. Industrial applications must follow OSHA requirements.

SPECIFIC OPERATION WARNINGS

⚠**WARNING: To prevent personal injury, perform the Pressure Relief Procedure before and after operating the control valve and before performing any disassembly or assembly.**

⚠**WARNING: Failure to comply with the following information could result in injury that could cause severe injury or death.**

1. EQUIPMENT MISUSE HAZARD: Equipment misuse can cause the equipment to rupture or malfunction and result in serious injury.

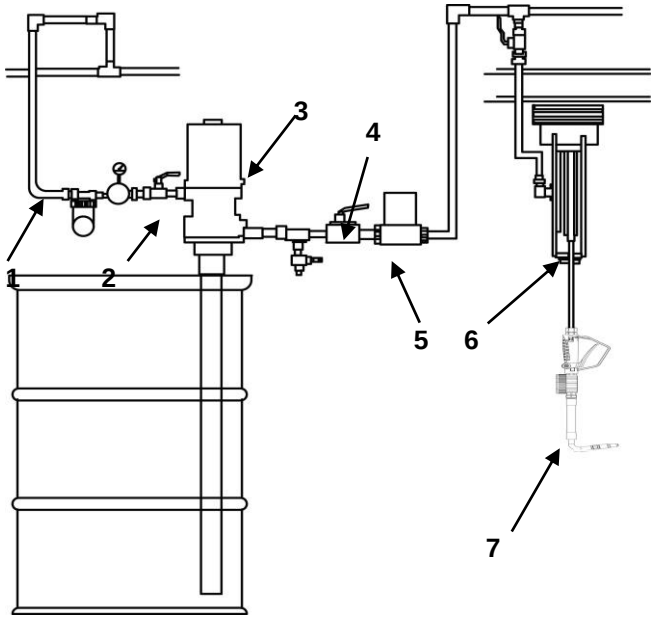
- Only trained or authorized people should operate this equipment.
- Read all instruction manuals, tags, and labels before you operate this equipment.
- Use the equipment only for its intended purpose. If you are not sure, call the distributor.
- Do not modify this equipment. If you need to replace the parts, use the standard parts or components.
- Check equipment daily. Repair or replace worn or damaged parts immediately.
- Do not exceed the maximum working pressure of the lowest rated system component. This equipment has a 1500 PSI maximum working pressure.
- Make sure all applications comply with local, state, and national fire, electrical, and safety regulations.
- Use fluids and solvents that are compatible with the equipment. Refer to the Technical Data section of all equipment manuals. Read the fluid and solvent manufacturer's warnings.
- Do not move or lift the equipment when the control valve is in use.
- The operating environment must be fireproof, safe for electrical use and other with security assured.

2. SKIN INJECTION HAZARD: Fluid from the control valve, leaks, or ruptured components can splash into your body, eyes or skin, which may cause extremely serious injury. If this happens, ask for medical help immediately.

- Do not point the dispensing valve at anyone or at any part of the body.
- Do not stop or deflect leaks with your hand, body, glove or rag.
- Do not use oil that has been polluted.
- Do not put your hand or fingers over the fitting coupler.
- Follow the **Pressure Relief Procedure** in the **OPERATION INSTRUCTIONS** section if the grease fitting coupler clogs and before you clean or service this equipment.
- Before each use, make sure that all connections are properly installed. Tighten all fluid connections before operating the equipment.
- Check the hoses, tubes, and couplings daily. Replace worn or damaged parts immediately. Do not repair high-pressure couplings. You must replace the entire hose.

INSTALLATION

Typical installation refers to Fig.1 (typical installation).



1 Air inlet

2 Air shut-off valve

3 Oil pump 4 Fluid shut-off valve

5 Meter

6 Hose reel

7 Control valve

NOTE: The above typical installation is only for reference. It may be different from your actual system design.

⚠**WARNING:** If this is a new installation, or if the oil in the lines is contaminated, flush the lines before you install the control valve.

1. PRE-INSTALLATION PROCESS

⚠**WARNING:** To reduce the risk of serious injury, pay attention to the pressure release. Follow the **Pressure Relief Procedure** in the **OPERATION INSTRUCTIONS** section for the release process.

(1) Close the fluid shut-off valve 4 as shown in Fig. 1.

(2) Ground the hose and reel or console.

⚠**WARNING:** To reduce the risk of static sparking, effectively ground all equipment.

- **Control valve:** Use proper grounding wire to connect it to the pump. Always keep the metal part of the control valve connected with the grounding equipment.
- **Pump:** Follow the manufacturer's instructions for grounding.
- **Air and fluid hoses:** Make sure they are effectively grounded.
- **Air compressor:** Follow the manufacturer's instruction to ground it.
- **Oil barrel:** Use a barrel that meets the local standard and ground it properly. A metal barrel can be put directly on a surface of an electrical conductor which is well grounded.
- **Staying grounded during the working and oil release process:** Make sure that the metal units are effectively grounded before operating the control valve.

2. INSTALLATION PROCESS

⚠**WARNING:** To reduce the risk of serious injury, the pressure release procedure should be followed very carefully. Follow the **PRESSURE RELIEF PROCEDURE** in **OPERATION INSTRUCTIONS** section.

⚠**WARNING:** Make sure the whole system is clean before installing/replacing a new control valve. No impurities or contaminants should enter the control valve.

Follow steps① – ⑤ to clean the oil supplying system before a new control valve is installed. (The system also needs cleaning when the oil in the system is polluted.)

①. Close the fluid shut-off valve at each dispensing point in the system.

②. Make sure the main fluid outlet valve at the pump is closed, the air pressure to the pump motor is lowered, and the air valve is open. Slowly open main fluid valve.

③. Place the hose end (with no control valve connected) into a container to drain waste oil. Secure the hose in the container so it will not come out during draining.

④. Slowly open the shut-off valve at the dispensing position. Drain out a sufficient amount of oil to ensure that the entire system is clean and close the valve.

⑤. If there are several dispensing points, you need to drain the oil at each point, one by one, starting with the furthest one from the pump, and ending with the nearest one to the pump.

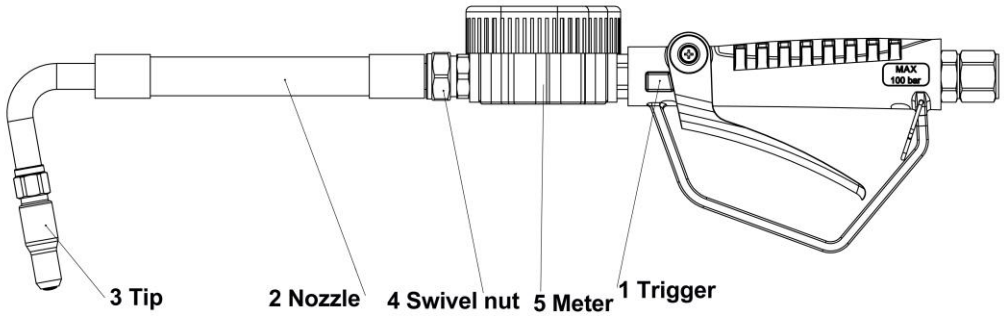


Fig. 2 Oil Control Valve

How to adjust the angle of the nozzle: Loosen the #4 swivel nut, turn the nozzle to the desired position, and tighten the nut.

NOTE: Use oil resistant pipe sealant or Teflon® Tape on all fitting threads.

(1) Installing a new oil control valve

①. When installing a new control valve, first apply appropriate thread sealant around the male thread of the oil supplying system, then connect the male thread into the female thread of the oil inlet of the control valve and attach them together.

②. Turn on all check valves of oil system.

③. Press the trigger to drain enough oil to make sure the oil system is completely cleaned. See "OPERATION INSTRUCTIONS" section for the control valve operation.

④. Repeat steps ① to ③ for other oil control valves to be installed at each dispensing point in the system.

NOTE: To ensure the meter accuracy, purge all air out from the fluid lines and control valve before using them.

(2) Replacing oil control valve

①. Disconnect and take the oil control valve off the system.

②. Follow the steps① to ④ in "**(1) Installing the new oil control valve**" section above.

OPERATION INSTRUCTIONS

⚠**WARNING:**

- **Never operate the meter with the plastic cover removed.** The cover protects the meter from damage due to impact. Meters are sealed in the factory to keep moisture and dirt away.
- Flush the lines before you install this equipment in the system to prevent line contamination or it can cause equipment malfunction or damaged.
- To reduce the risk of a serious bodily injury, including fluid injection, never exceed the maximum working

pressure of the control valve you are using or of the lowest rated component in your system.

1. PRESSURE RELIEF PROCEDURE

⚠**WARNING: Skin injection hazard:** The equipment stays pressurized until pressure is manually relieved. To reduce the risk of serious injury from pressurized fluid, fluid from the valve or splashing fluid, follow this procedure whenever you:

- Are instructed to relieve pressure
- Check, clean or service any system equipment
- Install or clean dispensing devices

(1) Pressure relief procedure:

①. Turn off the power supply to the pump.
②. Hold a metal part of the control valve firmly to a grounded metal waste container and point the valve outlet toward the waste container, then trigger the control valve to relieve the fluid pressure.
③. Open any bleed-type master air valves and fluid drain valves in the system.
④. Leave the drain valve open until you are ready to pressurize the system.

(2) Clean the obstruction in the oil system, when any of the following cases occurs:

①. Problem on control valve, flexible hose, rigid tube or manual/auto tip.
②. Pressure cannot be relieved completely after above procedures are done.
③. It takes more than 5 seconds to relieve the pressure thoroughly.

2. LCD DISPLAY

INDICATIONS: See the following display illustrating the LCD panel.

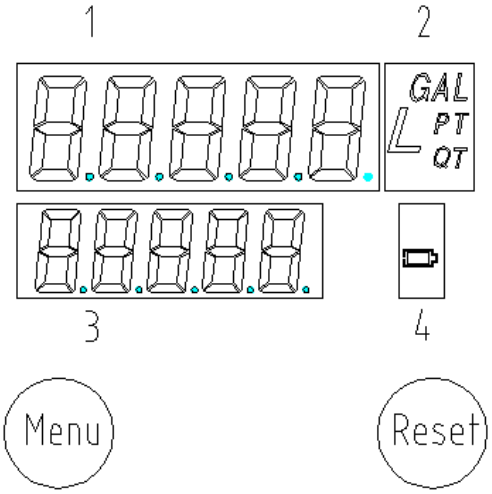


Fig. 3 LCD panel displays region

①. Partial register measurement exceeds the maximum value will become zero and re-measure.
②. Indication of unit of measurement (L, GAL, PT, QT).
③. Accumulated total.
④. Battery condition (low-power alarm device is built in).

3. OPERATIONAL FUNCTIONS

The control valve features two keys (MENU and RESET).

(1) Setting measurement unit
Solution 1

①. Press “MENU” and “RESET” simultaneously and hold for about 5 seconds to enter the unit set mode.
②. Press "RESET" to select the unit.

③. When desired measurement unit is displayed, press “MENU” and hold about 1second or the digit stops blink to quit the setting mode.

Solution 2

①. Move the flashing display to Zone② by pressing “MENU”, then press “RESET” to choose measurement unit.

②. Press “MENU” over 3 seconds to exit the setting mode.

(2) Resetting the accumulated total

Press “MENU” for 10 seconds, the accumulated total will be reset to be “0”.

(3) Displaying current correction factor

Press “MENU” and “RESET” simultaneously and hold for 2 seconds. The display shows the correction factor.

4. CALIBRATION PROCEDURE

(1) Procedure for entering the correction factor directly

①. Wait for the control valve to go to standby.

②. Press the “MENU” key. Keep it pressed until the digit flashes in Zone①. Press the “RESET” key to choose the right digit from 0 to 9. Press the “MENU” key to go the next digit so that the Actual Value can be input.

③. Make sure the correction factor is right and then press the “MENU” key. Keep it pressed until calibration is finished and the factor is saved. The control valve will then return to standby.

(2) Modify the correction factor in field

①. Press the “RESET” for 1 second, zone ⊖ displays “0.00”.

②. Start dispensing into a measuring glass.

③. Stop dispensing when over 5 liters of volume is reached, then check the actual dispensed value. The volume that is displayed on the LCD is the Display Value, not the Actual Value.

④. Press the “MENU” key. Keep it pressed until the digit flashes in Zone①. Then press the RESET key to choose the right digit from 0 to 9. Press the “MENU” key to go the next digit so that the Actual Value can be input.

⑤. Make sure the Actual Value is input correctly and then press the “MENU” key. Keep it pressed until calibration is finished and the factor is saved. The meter will then return to standby.

5 OPERATION

⚠**WARNING:** Follow the instructions in **PRESSURE RELIEF PROCEDURE before each operation.**

⚠**WARNING:**

- To ensure the proper amount of fluid is dispensed, always use the same measurement unit for a particular fluid.
- Use a clean, calibrated container. If using a single container, clean it after each dispense.
- Always keep air pressure of pump at the lowest possible setting of the system for dispensing fluid.
- Ensure liquid enters the container from the bottom.
- Trigger the control valve gently.

①. Grab the trigger (part# 1-4) gently, and then the control valve starts to work.

②. Keep the trigger lock (part# 1-3) squeezed and depresses the trigger lock (part# 1-3) to keep the control valve on.

③. Disengage the trigger lock (part# 1-3) and release the trigger lock (part# 1-3) to stop dispensing.

6. BATTERY REPLACEMENT

If voltage is too low, low-power alarm device will be activated and light will flash in Zone④. When the LCD panel displays nothing or the light flashes in Zone④, the battery should be replaced. Follow the steps below to replace new battery.

①. Open the battery cover (part# 3-11) with a flat screwdriver.

②. Remove the old battery. Discard the battery in accordance with local laws and ordinances.

③. Insert a 3.6V ER14250 battery into the battery compartment. Install the battery according to the direction of polarity+"&"-" indicated and insert the end of anode "+" first.
④. Replace the battery cover (part# 3-11).

TROUBLE SHOOTING

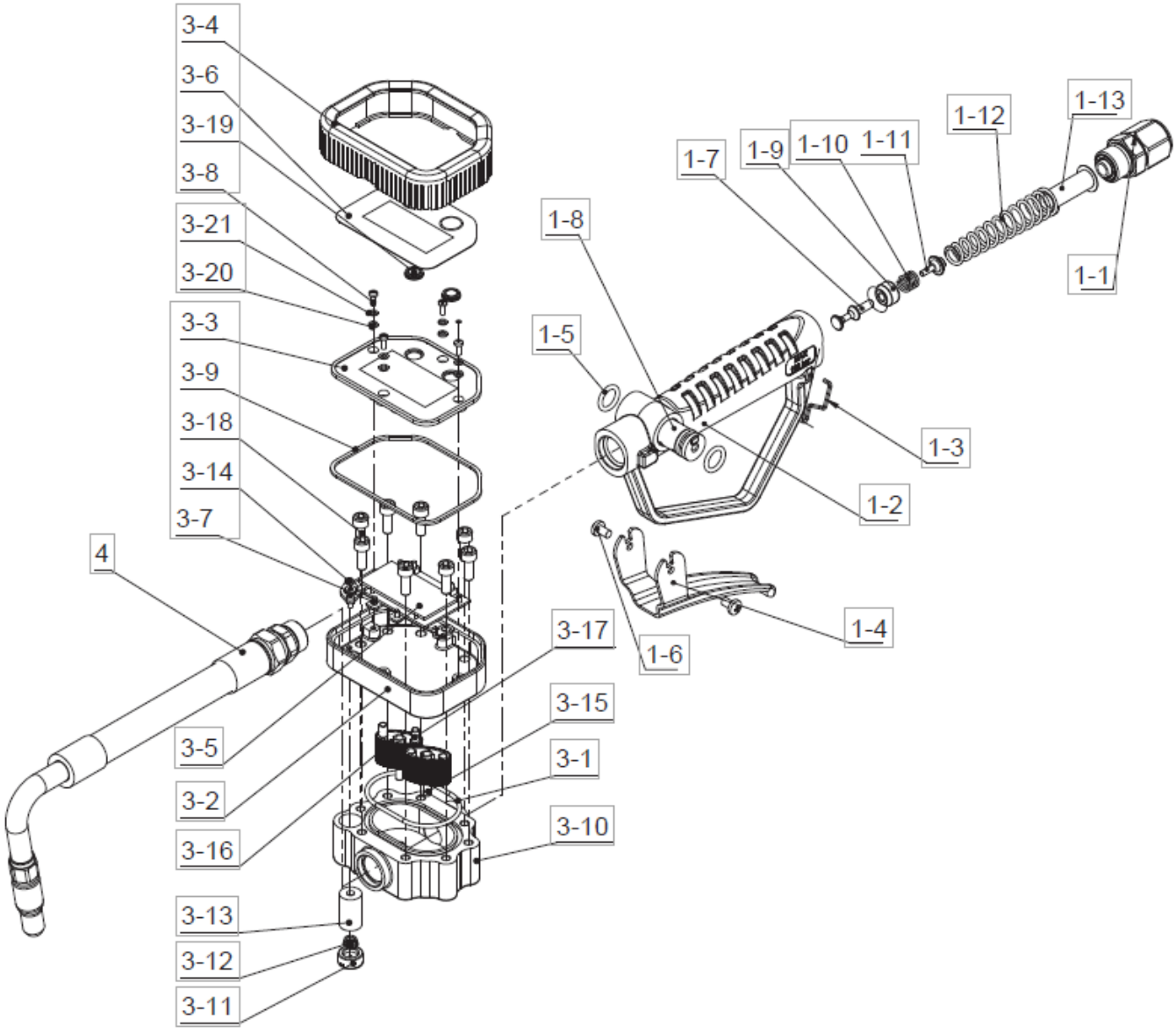
⚠ **WARNING: Relieve pressure before you check or service any system equipment.**

Problem	Possible Cause	Corrective Action
Slow or no fluid flow	1. Filter is clogged 2. Pump pressure is low 3. Shut-off valve is not fully open 4. Foreign material is jammed in the metering element	1. Relieve the pressure. 2. Loosen the swivel fitting, clean, or replace the filter. 3. If the problem remains, contact your distributor for repair or replacement.
Oil leaks from swivel	1. Swivel is loose	Torque the swivel. If the problem remains, contact your distributor for repair or replacement.
	2. O-ring is worn or damaged	Replace the o-ring. If the problem remains, contact your distributor for repair or replacement.
Oil drips from nozzle	Nozzle is damaged or obstructed	Inspect the nozzle for damage or obstructions and replace if damaged. If the problem remains, contact your distributor for repair or replacement.
Valve leaks	O-rings or valve seat are worn or damaged	Replace the o-rings and/or the valve seat. If the problem remains, contact your distributor for repair or replacement.
Leakage from meter	O-ring damaged	1. Take the meter off the dispense system. 2. Take off the rubber protector (part# 3-4) and front label (part# 3-6). 3. Remove four the socket head cap screws (part# 3-8) on the cover of the meter. 4. Remove eight the hex bolts (part# 3-18) on the bottom of the meter. 5. Take off the seat (part# 3-10). 6. Check the o-ring (part# 3-1), replace the o-ring if it is damaged. 7. After replacing the o-ring, assemble the meter and attach it back to the dispense system.
No display	Battery out of power	1. Take the meter off the dispense system. 2. Take off the protector. 3. Take off the labels sticks on the bottom of the meter. 4. Loosen the five socket head cap screws on the bottom of the meter. 5. Take off the seat. 6. Check the battery, replace the battery if out of power. 7. After replacing the battery, assemble the meter and attach it back of the dispense system.
	Weakening battery	
Wrong reading	Wrong correction factor	Reset the correction factor.

MAINTAINANCE

Transportation
When the control valve is in transit, do not expose the control valves to direct sunlight and avoid rain, falling, corrosive substance, etc.
Storage
①. Store the control valve in a dry place with good ventilation. Do not expose it to excessive heat, humidity, or sunlight. Never let it touch any corrosive substances.
②. Store it out of the reach of children.

DIAGRAMS AND PARTS LIST



Part No.	Description	Qty	Part No.	Description	Qty
1-1	Swivel	1	3-5	Main Circuit Board	1
1-2	Handle	1	3-6	Front Label	1
1-3	Trigger Lock	1	3-7	Screw	4
1-4	Trigger	1	3-8	Screw	4
1-5*	O-ring	2	3-9	O-ring	1
1-6	Screw	2	3-10	Seat	1
1-7	Rod	1	3-11	Battery Cover	11
1-8	Cam	1	3-12	Spring	1
1-9*	Seat	1	3-13*	Battery	1
1-10	Spring	1	3-14	Screw	2
1-11	Seat	1	3-15	Shaft	2
1-12	Spring	1	3-16	Oval Gear	2
1-13*	Filter	1	3-17	Magnetic Rod	2
2	Adapter	1	3-18	Bolt	8
3-1*	O-ring	1	3-19*	Waterproof Protector	2
3-2	Meter Holder	1	3-20*	Seal Washer	4
3-3	Meter Cover	1	3-21	Washer	4
3-4	Rubber Protector	1	4	Nozzle with Tip	1

Item No.4 Description:

Part No.	Description
MH10001	Rigid Nozzle
MH10002	Flexible Nozzle
MH10001	Manual Tip
MT10002	Auto Tip
MT10003	Semi-auto Tip

Wear Parts:

Part No.	Description	Qty
1-5*	O-ring	2
1-9*	Seat	1
1-13*	Filter	1
1-4	Trigger	1
3-1*	O-ring	1
3-9*	O-ring	1
3-19*	Waterproof Protector	1
3-20*	Seal Washer	4

For replacement parts and technical questions, please call **1-800-222-5381**.

WARRANTY

One-Year Limited Warranty

ROUGHNECK™

Distributed by

Northern Tool + Equipment Co., Inc.

Burnsville, MN 55306

NorthernTool.com

Made in China