

# INSTRUCTIONS – PARTS LIST

## INSTRUCTIONS!

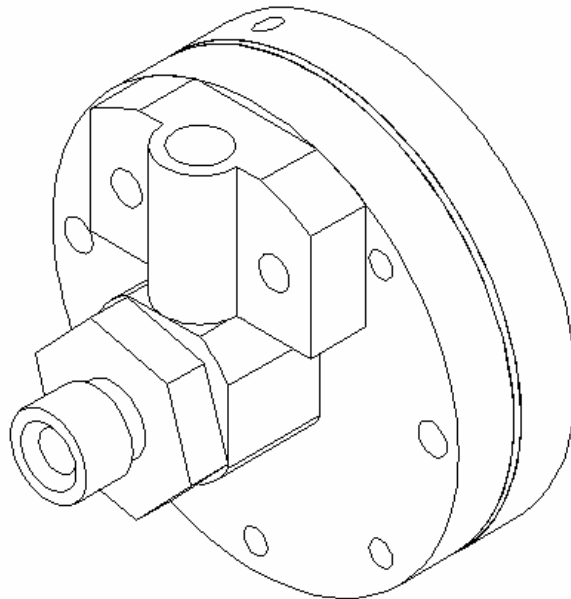
This manual contains important warnings and information.  
**READ AND KEEP FOR REFERENCE.**



**Autoquip, Inc.**

## **AQ – Fluid Regulator**

3286-00-00B



**IMPORTANT:** Before using this equipment, read **SAFETY PRECAUTION**, starting on page 1, and all instructions in this manual. Keep this Service Bulletin for future reference.

**AUTOQUIP, INC. N57 W13430 Reichert Ave. Menomonee Falls, WI 53051**

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## Symbols

### Warning Symbol



This symbol alerts you to the possibility of serious injury or death if you do not follow the instructions.

### Caution Symbol



This symbol alerts you to the possibility of damage to or destruction of equipment if you do not follow the instructions.

### Note



This symbol alerts you to information relevant to the procedure in progress.

### WARNING

#### EQUIPMENT MISUSE HAZARD

Equipment misuse can cause the equipment to rupture or malfunction and result in serious injury.

- This equipment is for professional use only.
- Read all instruction manuals, tags, and labels before operating the equipment.
- Use the equipment only for its intended purpose. If you are not sure, call your Autoquip distributor.
- Do not alter or modify this equipment. Use only genuine Autoquip parts.
- Check equipment daily. Repair or replace worn or damaged parts immediately.
- Use fluids and solvents that are compatible with the equipment wetted parts. Refer to the **Technical Data** section of all equipment manuals. Read the fluid and solvent manufacturer's warnings.
- Always wear protective eyewear, gloves, clothing, and respirator as recommended by the fluid and solvent manufacturer.
- Comply with all applicable local, state, and national fire, electrical, and safety regulations.

# Safety

## SAFETY PRECAUTIONS

Before operating, maintaining or servicing any Autoquip, Inc. coating system, read and understand all of the technical and safety literature for your Autoquip Inc. products. This manual contains information that is important for you to know and understand. This information relates to **USER SAFETY** and **PREVENTING EQUIPMENT PROBLEMS**. To help you recognize this information, we use the preceding symbols. Please pay particular attention to these sections.

While this manual lists standard specifications and service procedures, some minor deviations may be found between this literature and your equipment. Differences in local codes and plant requirements, material delivery requirements, etc., make such variations inevitable. Compare this manual with your system installation drawings and appropriate Autoquip Inc. equipment manuals to reconcile such differences.


Careful study and continued use of this manual will provide a better understanding of the equipment and process, resulting in more efficient operation, longer trouble-free service and faster, easier troubleshooting. If you do not have the manuals and safety literature for you Autoquip Inc. system, contact your local Autoquip, Inc. representative or Autoquip, Inc. directly.



### **WARNING**

- The user **MUST** read and be familiar with the Safety Section in this manual and the Autoquip, Inc. safety illustration therein identified.
- This manual **MUST** be read and thoroughly understood by **ALL** personnel who operate, clean or maintain this equipment! Special care should be taken to ensure that the **WARNINGS** and safety requirements for operating and servicing the equipment are followed. The user should be aware of and adhere to **ALL** local building and fire codes and ordinances as well as **NFPA 33 SAFETY STANDARD, 1995 EDITION**, prior to installing, operating, and/or servicing this equipment

### **WARNING**

- The hazards shown on the following page may occur during the normal use of this equipment. Please read the hazard chart beginning on page 4.

<b>AREA</b> Tells where Hazards may occur.	<b>HAZARD</b> Tells what the hazard is	<b>SAFEGUARDS</b> Tells how to avoid the hazard
<p><b>Spray Area</b></p> 	<p>Fire Hazard</p> <p>Improper or inadequate operating and maintenance procedures will cause a fire hazard</p>	<p>Fire extinguishing equipment must be present in the spray booth area and tested periodically</p> <p>Spray areas must be kept clean to prevent the accumulation of combustible residues.</p> <p>Smoking must never be allowed in the spray area</p> <p>When using solvents for cleaning:</p> <p>Those used for equipment flushing should have flash points equal to or higher than those of the coating material.</p> <p>Those used for general cleaning must have flash points above 100°F (37.8°C).</p> <p>Spray booth ventilation must be kept at the rates required by NFPA33, 1995 Edition, OSHA and local codes. In addition, ventilation must be maintained during cleaning operations using flammable or combustible solvents.</p> <p>Test only in areas free of combustible material.</p> <p>Non-factory replacement parts or unauthorized equipment modifications may cause fire or injury.</p> <p>If used, the key switch by-pass is intended for use only during set-up operations. Production should never be done with safety interlocks disabled.</p> <p>Never use equipment intended for use in waterborne installations to spray solvent based materials.</p>
<p><b>General Use and Maintenance</b></p>	<p>Improper operation or maintenance may create a hazard</p> <p>Personnel must be properly trained in the use of this equipment</p>	<p>Personnel must be given training in accordance with the requirements of NFPA-33, Chapter 16, 1995 Edition.</p> <p>Instructions and safety precautions must be read and understood prior to using this equipment</p> <p>Comply with appropriate local, state and national codes governing ventilation, fire protection, operation maintenance, and housekeeping. OSHA references are Sections 1910.94 and 1910.107. Also refer to NFPA-33, 1995 Edition and your insurance company requirements.</p>

<b>AREA</b> Tells where Hazards may occur.	<b>HAZARD</b> Tells what the hazard is	<b>SAFEGUARDS</b> Tells how to avoid the hazard
<b>Explosion Hazard/ Incompatible Materials</b>  	Halogenated hydrocarbon solvents for example: methylene chloride and 1,1,1-Trichloroethane are not chemically compatible with the aluminum that might be used in many system components. The chemical reaction caused by these solvents reacting with aluminum can be violent and lead to an equipment explosion.	Aluminum is widely used in other spray application equipment – such as material pumps, regulators, triggering valves etc. Halogenated hydrocarbon solvents must never be used with aluminum equipment during spraying, flushing or cleaning. Read the label or data sheet for the material you intend to spray. If in doubt as to whether or not a coating or cleaning material is compatible, contact your material supplier. Any other type of solvent may be used with aluminum equipment.
<b>Toxic Substances</b>  	Certain material may be harmful if inhaled, or if there is contact with the skin.	Follow the requirements of the Material Safety Data Sheet supplied by coating material manufacturer.  Adequate exhaust must be provided to keep the air free of accumulations of toxic materials.  Use a mask or respirator whenever there is a chance of inhaling sprayed materials. The mask must be compatible with the material being sprayed and its concentration. Equipment must be as prescribed by an industrial hygienist or safety expert, and by be OSHA approved.

# INTRODUCTION

## FEATURES

- Stainless steel and Teflon®™ coated wetted parts for decreased color change time.
- No spring in the fluid path for added performance. Patent pending.
- Optional advanced mounting features on back of regulator for easy connection
- Optional outlet fittings for removal of threads in fluid path. Call for options.

## FLOW VS. SIGNAL PRESSURE

## SPECIFICATIONS

### Environmental / Physical

<b>Height:</b>	1-11/16 (45mm)
<b>Height w/Fittings:</b>	2-1/2" (64mm)
<b>Diameter:</b>	2-3/4" (70mm)

### Mechanical

<b>Air Pressures:</b>	Variable by Control Pressure Input
<b>Fluid Input:</b>	100 psi (6.8 bar max) (10 psi minimum output pressure)
<b>Fluid Output:</b>	Command Pressure
<b>Pneumatic/Fluid Connections</b>	
<b>Air Pilot:</b>	#10-32 Thread
<b>Fluid In:</b>	1/4" NPSM Thread
<b>Fluid Out:</b>	1/8" NPT(f) Thread
<b>Volume of Paint Held Within Regulator:</b>	
	5 cc

# OPERATION

The AQ regulator is designed to provide remote control fluid regulation for automatic coating applications.

Pilot signals modulate the regulator's diaphragm to control the amount of paint being delivered from the regulator to the spray applicator. Manually operated or electronically controlled air pressure regulators can control the pilot signal.

The following factors must then be considered when selecting the regulator ratio required for proper fluid control:

- Fluid tubing inside diameter (ID) and length
- Fluid feed tube inside diameter (ID) and length
- Fluid viscosity
- Fluid input pressures

If conditions change after installation that requires a different low flow ratio, replacing the fluid outlet tube or gun tip orifice can easily alter this regulator.

# Maintenance

## TOOLS REQUIRED

- 5/16" socket with ratchet
- 5/16", 7/8" and 15/16" Open End Wrenches
- 1/16", 3/32", 5/32", and 7/64" Allen Head Wrench
- Adjustable Wrench
- Screwdriver
- Repair Kit 3286-50-00A
- Torque Wrench 1/4"

## PRELIMINARY PROCEDURES

Prior to removing the regulator for service or repair, perform the following:

1. If possible, flush the regulator with a suitable cleaning solvent.
2. Turn the fluid and air "OFF" to the regulator. Disconnect and depressurize the air and fluid lines from the regulator.
3. Remove the regulator for service.

### NOTE

Proper preventative maintenance is required for consistent operation of the Autoquip regulator. Proper preventative maintenance will vary with each application.



## Disassembly Procedures

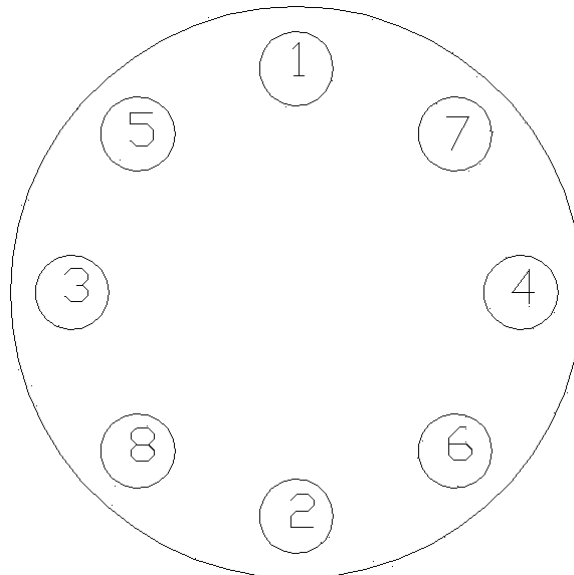
1. Unscrew part 2 (Fluid Fitting) using adjustable wrench
2. Loosen parts 19 (#4-40 x 1/4" BHCS) using 1/16" Allen head wrench
3. Remove part 15 (Air Housing Cap)
4. Unscrew part 12 (Spring Plunger) with Autoquip repair tool
5. Remove parts 12 and 16 (Spring Plunger and Disc Spring)
6. Loosen parts 17 (#10-32 x 3/4" SHCS) with 5/32" Allen head wrench  
IMPORTANT: Do **NOT** loosen in circular pattern, use proper cross pattern pictured below.
7. Remove part 13 (Air Side Housing)
8. Using 5/16" socket and ratchet, loosen part 4 (Needle Seat) to remove part 10 (Air Side Plate) and part 8 (Diaphragm)
9. Unscrew and remove part 9 (Fluid side plate) and part 4 (Needle Seat)
10. Remove part 3 (Fluid Seat) from part 1 (Fluid Housing)
11. Remove parts 20 (#10-32 x 1/2" SHCS) from part 5 (Fluid Outlet) and remove part 5 (Fluid Outlet) revealing part 6 (Fluid Outlet O-Ring)

### NOTE

All steps may not be needed for specific service.

**Example:** To replace the diaphragm, the technician would only need to complete step 8.

## Proper cross pattern for tightening Housing Screws Torque = 30 in. lb.



## Assembly Procedures

1. Place Part 6 (Fluid Outlet O-Ring) in the fluid outlet O-ring groove on Part 1, secure O-ring in place with part 5 (Fluid Outlet) and parts 20 (#10-32 x ½" SHCS). Tighten screws until part 5 (Fluid Outlet) is flush with part 1 (Fluid Housing).
2. Install part 7 (Teflon<sup>®</sup> Encapsulated O-Ring) in the outside groove on part 3 (Fluid Seat) AVOID DAMAGE TO THE TEFLON<sup>®</sup> COATING
3. Place part 3 (Fluid Seat) into part 1 (Fluid Housing) and press into place keeping seat parallel to bottom surface
4. Install part 7 (Teflon<sup>®</sup> Encapsulated O-Ring) in groove on back side of part 9 (Fluid Side Plate). AVOID DAMAGE TO THE TEFLON<sup>®</sup> COATING.
5. Apply Teflon<sup>®</sup> based thread sealant to the threads on part 4 (Needle Seat) and screw into part 9 (Fluid Side Plate), wiping away excess thread sealant. Unscrew part 4 (Needle Seat) and place through part 1 (Fluid Housing) and tighten part 9 (Fluid Side Plate) to desired specifications with a 5/16" socket
6. Place part 8 (Diaphragm) with the blue (Teflon<sup>®</sup> coated) side towards the fluid housing. AVOID DAMAGE TO THE TEFLON<sup>®</sup> COATING
7. Install part 10 (Air Side Plate) and tighten with a 5/16" socket
8. Place part 13 (Air Side Housing) on part 8 (Diaphragm), lay part 16 (Disc Spring) in place in part 13 (Air Side Housing) and screw in part 12 (Spring Plunger) just flush with part 13 (Air Side Housing) so as to allow free rotation of part 8 (Diaphragm) and Part 13 (Air Side Housing).
9. Rotate part 13 (Air Side Housing) to place fitting in desired orientation and to line up the holes of part 1 (Fluid Housing) part 8 (Diaphragm) and part 13 (Air Side Housing)
10. Place all 8 of parts 17 (#10-32 x ¾" SHCS) in the holes and then proceed to tighten in a cross pattern with 5/32" Allen head wrench. IMPORTANT: Do **NOT** tighten in circular pattern, use only proper cross pattern pictured on previous page. Max torque for part 17 is 15 in. lb.
11. Tighten part 12 (Spring Plunger) with Autoquip repair tool until it bottoms out
12. Replace part 15 (Air Side Cap) and parts 19 (#4-40 x ¼" BHCS) and tighten using 1/16" Allen head wrench
13. Install part 7 (Teflon<sup>®</sup> Encapsulated O-Ring) Screw in part 2 (Fluid Fitting) groove into part 1 (Fluid Housing) and tighten with wrench

### NOTE

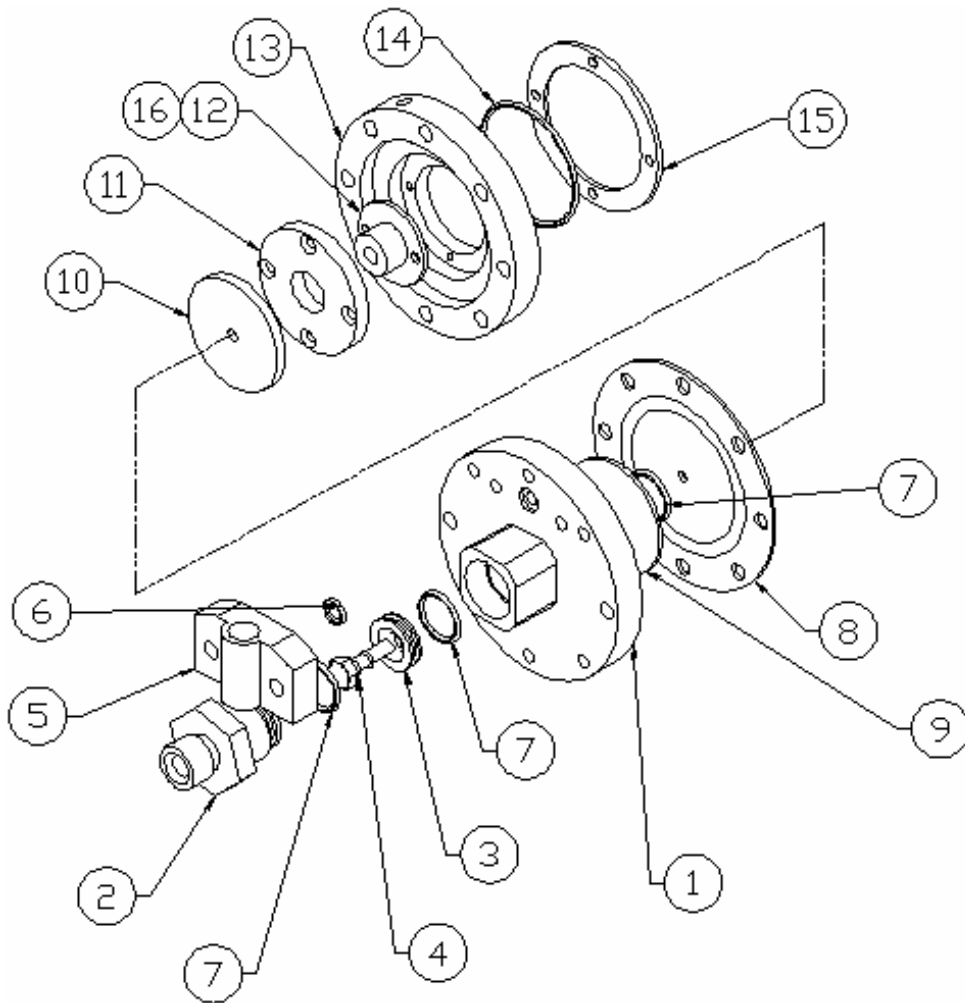
See pages 12-13 for exploded view and parts list

# Troubleshooting Guide

General Problem	Cause	Solution
No Flow	<ol style="list-style-type: none"> <li>1. Plugged inlet</li> <li>2. Item 3 &amp; 4 (needle and seat) stuck</li> <li>3. No pilot air</li> </ol>	<ol style="list-style-type: none"> <li>1. Flush clean</li> <li>2. Remove and clean or replace</li> <li>3. Check air pilot</li> </ol>
Will Not Shut Off	<ol style="list-style-type: none"> <li>1. Item 3 &amp; 4 (needle and seat) dirty</li> <li>2. Pilot air not shut off</li> </ol>	<ol style="list-style-type: none"> <li>1. Remove and clean or replace</li> <li>2. Check air supply</li> </ol>
Paint Leakage	<ol style="list-style-type: none"> <li>1. Item 16 (screws) loose</li> <li>2. Ruptured Diaphragm</li> <li>3. Loose fluid fittings</li> <li>4. Pinched item 8 (center diaphragm)</li> </ol>	<ol style="list-style-type: none"> <li>1. Tighten</li> <li>2. Rebuild regulator</li> <li>3. Tighten</li> <li>4. Replace</li> </ol>
Air Leakage	<ol style="list-style-type: none"> <li>1. Loose air fitting</li> <li>2. Item 16 (screws) loose</li> <li>3. Ruptured item 8 (center diaphragm)</li> </ol>	<ol style="list-style-type: none"> <li>1. Tighten</li> <li>2. Tighten per “Assembly Procedure”</li> <li>3. Rebuild regulator</li> </ol>
Inconsistent Flow	<ol style="list-style-type: none"> <li>1. Diaphragm stretched from excessive air pressure</li> <li>2. Inconsistent air pilot supply</li> <li>3. Low inlet fluid pressure</li> </ol>	<ol style="list-style-type: none"> <li>1. Rebuild regulator</li> <li>2. Check air source</li> <li>3. Inlet pressure must be at least 10 psi above outlet pressure, 100 psi maximum</li> <li>4. For thin materials install restrictor. See Accessories.</li> </ol>

Figure 2: Troubleshooting Guide

# PARTS



# PARTS IDENTIFICATION

<u>ITEM NUMBER</u>	<u>PART NUMBER</u>	<u>DESCRIPTION</u>	<u>QTY</u>
1	3286-11-01A	FLUID HOUSING	1
2	3286-11-02A	FLUID FITTING	1
+3	3286-15-03A	FLUID SEAT	1
+4	3286-15-04A	NEEDLE SEAT	1
5	3286-81-05A	FLUID OUTLET	1
*6	3286-81-06A	FLUID OUTLET O-RING (TEFLON® )	1
*7	3286-12-07A	O-RING (TEFLON® /VITON)	3
*8	3286-11-08A	DIAPHRAGM	1
9	3286-11-09A	FLUID SIDE PLATE	1
10	3286-21-10A	AIR SIDE PLATE	1
11	3286-21-11A	RETAINER	1
12	3286-21-12A	SPRING PLUNGER	1
13	3286-21-13A	AIR SIDE HOUSING	1
*14	3286-28-14A	CAP O-RING (VITON)	1
15	3286-21-15A	CAP	1
*16	3286-22-16A	DISC SPRING	1
**17	3286-25-17A	#10-32 X 3/4" SHCS	8
*18	3286-25-18A	#4-40 X 1/4" CSCS	4
*19	3286-25-19A	#6-32 X 5/16" SHCS	4
**20	3286-81-20A	#10-32 X 1/2" SHCS	2
21	3286-00-21A	#10-32 X 1/4" AIR PILOT	1
*22	3286-00-22A	FLUID OUTLET O-RING (TEFLON®) (prior to 6/08)	1
*23	3286-00-23A	#4-40 X 5/16" BHCS (prior to 6/08)	4

\* ITEMS INCLUDED IN REPAIR KIT PART NUMBER 3286-50-00A

+ ITEMS #3 AND #4 SHOULD BE PURCHASED AND INSTALLED TOGETHER AS PART NUMBER 3286-15-00A

\*\* Items #17 and #20 are available in 316 S.S. for corrosive materials. Order part number 3286-50-31A. Always use anti-seize lubricant on these threads.

# ACCESSORIES

External Mounting Detail	3286-51-01A
Flat Mounting Bracket	3286-52-01A
Angle Mounting Bracket	3286-52-02A
Fluid Restrictor Fitting	3286-75-**A
Fluid Restrictor Orifice	3286-76-**A

## Orifice Sizes Available:

\*\* = Size  
10 = .010"  
14 = .014"  
20 = .020"  
40 = .040"

# Autoquip Standard Warranty

Autoquip Inc. warrants all equipment manufactured by Autoquip Inc. and bearings its name to be free from defects in material and workmanship on the date of sale by an authorized Autoquip Inc. distributor to the original purchaser for use. With the exception of any special, extended, or limited warranty published by Autoquip Inc., Autoquip Inc. will, for a period of twelve months from the date of sale, repair or replace any part of the equipment determined by Autoquip Inc. to be defective. This warranty only when the equipment is installed, operated, and maintained in accordance with Autoquip Inc.'s written recommendations.

This warranty does not cover, and Autoquip Inc. shall not be liable for general wear and tear, or any malfunction, damage, or wear and tear caused by faulty installation, misapplication, abrasion, corrosion, inadequate or improper maintenance, negligence, accident, tampering, or substitution of non-Autoquip Inc. component parts. Nor shall Autoquip Inc. be liable for malfunction, damage or wear caused by the incompatibility of Autoquip Inc. equipment with structures, accessories, equipment or materials not supplied by Autoquip Inc., or the improper design, manufacture, installation, operation or maintenance of structure, accessories, equipment or materials not supplied by Autoquip Inc.

This warranty is conditioned upon the prepaid return of the equipment claimed to be defective to an authorized Autoquip Inc. distributor for verification of the claimed defect. If the claimed defect is verified, Autoquip Inc. will repair or replace free of charge any defective parts. The equipment will be returned to the original purchaser transportation prepaid. If inspection of the equipment does not disclose any defect in material or workmanship, repairs will be made at a reasonable charge, which charges may include the costs of parts, labor, and transportation.

**THIS WARRANTY IS EXCLUSIVE, AND IS IN LIEU OF ANY OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING BUT NOT LIMITED TO WARRANTY OF MERCHANTABILITY OR WARRANTY OF FITNESS FOR A PARTICULAR PURPOSE.**

Autoquip Inc.'s sole obligation and buyer's sole remedy for any breach of warranty shall be set forth above. The buyer agrees that no other remedy (including, but not limited to incidental or consequential damages for lost profits, lost sales, injury to person or property, or any other incidental or consequential loss) shall be available. Any action for breach of warranty must be brought within two (2) years of the date of sale.

Autoquip Inc. makes no warranty, and disclaims all implied warranties of merchantability and fitness for a particular purpose in connection with accessories, equipment, material or components sold but not manufactured by Autoquip Inc. These items sold, but not manufactured by Autoquip Inc. (such as electric motors, switches, hose, etc.) are subject to the warranty, if any, from their manufacturer. Autoquip Inc. will provide purchaser with reasonable assistance in making any claim for breach of these warranties.

In no event will Autoquip Inc. be liable for indirect, incidental, special or consequential damage resulting from Autoquip Inc. supplying equipment hereunder, or the furnishing, performance, or use of any products or other goods sold hereto, whether due to breach of contract, breach of warranty, the negligence of Autoquip Inc., or otherwise.

## **FOR AUTOQUIP, INC. CANADA CUSTOMERS**

The parties acknowledge that they required that the present document, as well as all documents, notices and legal proceedings entered into, given or instituted pursuant hereto or relating directly or indirectly hereto, be drawn up in English. Les parties reconnaissent avoir convenu que la rédaction du présent document sera en Anglais, ainsi que tous documents, avis et procédures judiciaires exécutés, donnés ou intentés à la suite de ou en rapport, directement ou indirectement, avec les procédures concernées.

## Autoquip Phone Numbers

### TO PLACE AN ORDER :

Contact your Autoquip distributor, or call this number to identify the distributor closest to you :  
(262) 781-6133 Fax (262) 781-6188

*All written and visual data contained in this document reflects the latest product information available at the time of publication.  
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**Sales Offices :** Menomonee Falls, WI (262) 781-6133 Fax (262) 781-6188

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