



Street Smart

AutoReach
SOFT-STOP
SYSTEM

BUY ONCE. BUY RIGHT. BUY SMART.

McNeilus[®]

An Oshkosh Corporation Company



AutoReach Soft-Stop System

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AutoReach Soft-Stop System

FOREWORD

Purpose of Manual

This manual provides safety, operation, installation, maintenance, troubleshooting and parts information for the AutoReach Soft-Stop System.

The AutoReach Soft-Stop System was developed and is manufactured by McNeilus[®] Street Smart Parts and Service[™]. The AutoReach Soft-Stop System regulates the air controls during a determined travel position of the AutoReach arm dump function. The travel position is sensed with the use of a linear sensor.

The use of the AutoReach Soft-Stop System cushions the dump functions for smoother operation resulting in lower maintenance costs. The AutoReach Soft-Stop System is intended to be an addition to the original controls.

The information in this manual will be your guide to operation, installation and maintenance for this equipment.

Scope

This manual provides information for use by the equipment operator and service personnel under the following headings:

- **Safety**
- **Packing List**
- **System Installation**
- **Troubleshooting**
- **Preventive Maintenance**
- **Service Procedures**
- **Illustrations and Parts Lists**

To order a replacement manual or safety warning decals, contact one of the regional McNeilus[®] Factory Service/Parts locations.

AutoReach Soft-Stop System



FOREWORD

Branch/Factory Service/Parts Locations

Contact your McNeilus® Factory Service/Parts location to order parts, receive service information, or for other assistance. A listing of locations and phone numbers is given below, sorted alphabetically by state:

State	City	Phone
AZ	Phoenix	602-484-4060
CA	Los Angeles	909-370-2100
CA	Stockton	209-931-4282
CT	Hartford	860-653-5548
FL	Lakeland	863-510-0070
GA	Atlanta	770-459-5151 (Service) 770-459-6005 (Parts)
IL	Chicago	630-466-5100
IN	Fort Wayne	260-489-3031
MN	Dodge Center	507-374-6321
NC	Greensboro	336-887-8740
NV	Las Vegas	702-643-2344
OH	Cincinnati	513-874-2022
OH	Columbus	614-445-9614 (Service)
PA	Philadelphia	610-913-7341 (Service) 610-286-0400 (Parts)
TX	Dallas	972-225-2313
TX	Houston	713-672-9799
UT	Salt Lake City	801-954-8709
WA	Tacoma	253-904-9400
WI	Oshkosh	920-235-8898

Canada	Phone
Ontario and Western Provinces	800-265-1098
Quebec and Maritime Provinces	800-996-4937

Corporate Headquarters

Contact McNeilus® Street Smart Parts and Service™ directly at our corporate headquarters at the following address, phone numbers and website address:

McNeilus® Street Smart Parts and Service™
19 Airport Road North
P.O. Box 70
Dodge Center, MN 55927
Telephone: (507) 374-6321
Toll Free: (888) 686-7278
(888) MTM-PART
Fax: (507) 374-6306
Website: www.mcneiluscompanies.com

Patent Pending

The AutoReach Soft-Stop System has many new and innovative designs for the industry. Several patents have been applied for by McNeilus® Street Smart Parts and Service™ and are **PATENT PENDING**.



AutoReach Soft-Stop System

SAFETY

Important Safety Information

⚠ WARNING

Read and understand this entire manual before operating, repairing, or adjusting your AutoReach Soft-Stop System.

Those who use and maintain this equipment must be thoroughly trained and familiar with the product.

If incorrectly used or maintained, this equipment can cause severe injury or death.

Safety and safe working procedures must be followed at all times.

OSHA LOCKOUT/TAGOUT procedures must be followed during installation or while performing Daily Checks or Scheduled PM on this equipment. If you are not familiar with the OSHA LOCKOUT/TAGOUT procedures or any other safety requirements, please contact McNeilus® Street Smart Parts and Service™.

Always keep this manual in a location where it is readily available for persons who operate or maintain the product. Additional copies of this manual are available from McNeilus® Street Smart Parts and Service™. Please contact your McNeilus® Factory Service/Parts location to order parts, additional manuals or if you have any questions about the information in this manual, this product, or safe operating procedures.

THESE SAFETY PROCEDURES ARE FOR YOUR OWN PROTECTION.

Do not operate this equipment until you have read its contents thoroughly. Please contact McNeilus Truck and Manufacturing, Inc. if you require assistance!

Should operators of this equipment have a reading or learning disability, dyslexia, or other such condition, then they must be assigned a mentor/trainer to read and explain to them the entire contents of this manual as well as the safety guidelines and danger, caution and warning decals on this unit. Such individuals should not be allowed to operate this equipment until they thoroughly understand all of these materials. Failure to do so may result in serious injury or death.

AutoReach Soft-Stop System



SAFETY

LOCKOUT/TAGOUT Procedure

SAFETY NOTICE

LOCKOUT/TAGOUT procedures must be followed when working on this equipment including, but not limited to, cylinders being changed or maintained. Failure to heed these instructions/warnings may result in serious personal injury or death.

Before entering Packer body, or climbing on or getting under truck to perform any work, read and follow OSHA Regulations concerning entry and working in "CONFINED SPACE" OSHA 1910.146 AND "LOCKOUT/TAGOUT" OSHA 1910.147.

Follow OSHA Regulations while performing any work to the Packer.

Follow all safety instructions in this McNeilus® Street Smart Parts and Service™ AutoReach Soft-Stop System manual and the OEM manuals for Packer.

Shut off truck engine, lock cab doors and keep key in your pocket before entering or climbing on, or getting under truck to perform any work to the Packer.

Place magnetic "DANGER" signs on both cab doors (McNeilus® part number 0602477).

Lockout supplies are available from McNeilus® Street Smart Parts and Service™. Call (507) 374-6321 for assistance.



AutoReach Soft-Stop System

SAFETY

Safety Notices

Safety notices are one of the primary ways to call your attention to potential hazards.



THIS SAFETY SYMBOL INDICATES IMPORTANT SAFETY MESSAGES IN THIS MANUAL.

WHEN YOU SEE THIS SYMBOL, CAREFULLY READ THE MESSAGE THAT FOLLOWS.

BE ALERT TO THE POSSIBILITY OF PERSONAL INJURY OR DEATH.

The following safety notices are used throughout this manual.

The “signal words” of DANGER, WARNING, CAUTION and SAFETY NOTICE have specific meanings to alert you to the relative level of hazard.

Take the safety warnings seriously.

If you do not understand them or have questions about them, call McNeilus[®] Street Smart Parts and Service[™].

 DANGER
A hazard that will result in death or serious personal injury.

 WARNING
A hazard which may result in death or serious personal injury.

 CAUTION
A hazard which may result in personal injury or damage to property or equipment.

SAFETY NOTICE
Procedures that must be performed for safe operation and/or maintenance.



AutoReach Soft-Stop System

SAFETY

Product Safety Information

Read, understand, and follow the safety guidelines and heed dangers and warnings listed below and contained in this manual as well as on the AutoReach Soft-Stop System and Packer itself to promote reliable operation and prevent serious personal injury.

Contact McNeilus® Street Smart Parts and Service™ if you require assistance or have questions.

Safety

WARNING

Immediately replace safety decals if damaged, unreadable, or missing. Contact McNeilus® Street Smart Parts and Service™ for no-charge replacement decals when required. Failure to replace decals may result in serious personal injury or death.

WARNING

The Packer must not be modified in any way without authorization from McNeilus Truck and Manufacturing, Inc. Modifications may not comply with safety standards, including ANSI safety standards, and may result in serious personal injury or death.

Operation

DANGER

Never attempt to clear a jammed Packer or container lift, enter a body or open an access door unless power is shut down, LOCKOUT/TAGOUT procedures have been complied with, and the employee is authorized, trained, and competent to perform such activities. Failure to comply may result in serious personal injury or death.

DANGER

Wear the proper protective clothing when operating or maintaining the Packer. Hard hats, safety glasses, gloves, and safety shoes should be worn. Reflective clothing is recommended for drivers and employees while operating during darkness. Serious injury or death will result without proper protective gear.

WARNING

All owners and supervisors should make sure all drivers, operators and maintenance personnel have read and thoroughly understand the decals affixed to this Packer as well as the safety information and instructions in the McNeilus® Operator Manual. Owners and Supervisors must comply with ANSI Z245.1 Regulations.



AutoReach Soft-Stop System

SAFETY

WARNING

Never walk or stand behind Packer while it is backing up.

Failure to heed these instructions/warnings may result in serious personal injury or death.

WARNING

Never operate the hydraulic system if a leak is present. Serious injury or death may result.

WARNING

Always keep hands and feet and other parts of your body clear of revolving or moving parts. Failure to comply may cause serious injury or death.

WARNING

Be sure everyone is clear of the area around the Packer before operating the Packer. Remain attentive at all times when operating the controls. Watch the mirrors for activity. Never back up the Packer unless and until you are completely sure it is safe. Use a spotter/observer and/or get out and check yourself, if necessary, to ensure it is safe to do so. Thoroughly understand the controls before operating the Packer. Failure to heed this warning may result in serious personal injury or death.

WARNING

Before opening the tailgate, be sure you have adequate clearance above the tailgate to prevent contact with buildings, electrical lines, and any other overhead obstructions. Failure to comply may cause damage to the vehicle and serious personal injury or death.



AutoReach Soft-Stop System

SAFETY

Maintenance

DANGER

LOCKOUT/TAGOUT procedures must be followed when working on this equipment, including, but not limited to, cylinders being changed or maintained. Failure to heed these instructions/warnings will result in serious personal injury or death.

WARNING

Never wear watches, rings or jewelry while working with electrical and mechanical equipment. These items can be hazardous and may cause serious and painful injuries or death if they come into contact with electrical wires, moving parts, or hydraulic equipment.

WARNING

When working on the Packer, the wheels must be blocked, the parking brake on, LOCKOUT/TAGOUT procedures in effect, and the key out of the chassis' ignition. Failure to do so may result in serious personal injury or death.

WARNING

Hydraulic systems operate under high pressure. Only qualified, experienced people properly trained in hydraulic system maintenance should attempt repairs or troubleshoot hydraulic systems. Use the proper tools and equipment when servicing the hydraulic system. Failure to comply may cause serious injury or death.

WARNING

All hydraulic pressure must be relieved from the hydraulic system prior to removing any components from the system. To relieve the hydraulic pressure from the hydraulic system, turn the chassis engine OFF and operate the Packer controls with the key in the ON position. This will allow the spools to shift and relieve the hydraulic pressure. Failure to comply may result in serious injury or death.

WARNING

Anytime the tailgate is raised in the shop, the tailgate must be supported to prevent it from lowering unexpectedly. Never allow anyone to work around or enter the tailgate area unless the tailgate is raised! Failure to follow this procedure may result in serious injury or death.



AutoReach Soft-Stop System

SAFETY

WARNING

The hydraulic cylinders can be holding a function in a certain position when the engine is OFF. An example of this would be a function being held in the lift or partial lift position by the cylinders. If a hydraulic line is removed or the hydraulic circuits or controls are being worked on, gravity may allow the function being held in position to drop. All workers and personnel must remain clear of these areas when working on or operating the McNeilus® equipment. Block and secure all applicable devices and functions before beginning work or operation. Failure to comply with this may result in serious injury or death.

CAUTION

Disconnect battery before welding on body.
Failure to do so might result in personal injury or damage to property or equipment.

Hydraulics

DANGER

Hydraulic systems operate under very high pressure. Hydraulic fluid escaping from a pressurized system can penetrate unprotected body tissue. Never inspect for hydraulic leaks with bare hands or other exposed body parts. As a minimum, wear leather gloves and use cardboard or wood to inspect for leaks. If leaks are present, relieve pressure and allow system to cool prior to servicing. If injured by escaping hydraulic oil, contact a physician immediately. Serious complications may arise if not treated immediately.

WARNING

Hydraulic hoses, fittings, tubes and pipes must be inspected on a daily basis for leaks, cuts, abrasions, damage, aging, improper clearance, and along the frame for hidden damage. If you find any with these adverse conditions or damage, they must be replaced before the Packer is returned to service! In any event, all hydraulic hoses must be replaced every three years or 7500 hours. Failure to properly inspect and maintain your Packer may result in serious personal injury or death.



AutoReach Soft-Stop System

SAFETY

WARNING

Hydraulic systems are hot. **DO NOT TOUCH!** Serious personal injury or death may result from hot oil. When you have completed working on the hydraulic systems, thoroughly clean any spilled oil from the equipment. Do not spill any hydraulic fluid on the ground. Clean any hydraulic fluid from your skin as soon as you have completed your maintenance and repairs. Dispose of used oil and filters as required by law.

WARNING

Correct hoses, fittings, and adapters with the correct SAE rating must be used when replacing hoses to prevent possible serious injury or death. Always replace hoses, fittings, and adapters with replacements that have a proper, suitable working pressure rating. Replacement hoses must be of the correct length and must comply with the hose manufacturer's installation guidelines and recommendations. Consult hose and fitting manufacturers for correct specifications.

WARNING

Hydraulic hoses have the SAE ratings marked on the hose to assist in selecting the correct hose. Replacement hydraulic hose and fitting components must be supplied by the same manufacturer to prevent serious injury. As an example: Brand "A" hose and brand "B" fitting will not normally be compatible.

WARNING

Any hydraulic tubing that is replaced must conform to SAE J1065 specifications. If incorrect hydraulic tubing is installed, the hydraulic system may fail and serious injury or death may result. Damage or leaking tubing must be replaced before the Packer is returned to service.

WARNING

Never heat hydraulic tubes or pipes. The carbon content of the steel in the tubes or pipes is such that if heated for bending, and either water or air quenched, the tubes or pipes may lose their ductility and thereby be subject to failure under high pressure or hydraulic shock conditions. Serious injury or death may result. Damaged or leaking tubes or pipes must be replaced before the Packer is returned to service.

WARNING

Increasing hydraulic pressure beyond the recommendations may result in serious damage to the Packer or serious personal injury or death and may void the Packer Warranty.

WARNING

Hydraulic components can be heavy. Use caution while lifting these components. Serious personal injury or death may be avoided with proper handling of the components.



AutoReach Soft-Stop System

SAFETY

WARNING

Do not steam clean or pressure wash hydraulic hoses or components. Failure to comply may result in serious injury or death. Steam cleaning, using extremely hot water, or pressure washing may damage the hoses and components and shorten the life or cause failure of the components.

WARNING

Allow no twist when installing hoses. Remember that 7° of twist per foot decreases hose life by 95%. When installing hydraulic hose, use a wrench to hold the hose in its natural position before tightening the fittings. Failure to comply may result in serious injury or death.

WARNING

When performing hydraulic test procedures, use the proper hydraulic gauges. Installing an incorrect test gauge could result in serious injury or death if the gauge fails. Use properly rated hydraulic hoses with adequate length to allow the test gauge to be used far enough away from moving parts and functions.

WARNING

Many hose coverings are available. Choose the hose manufacturer's covering which is most resistant to acid wash. Failure to comply may result in serious injury or death. Some hose coverings may retain acid wash and cause premature failure of the hose.

WARNING

Anticipate a 4% hose shrinkage factor when determining hose length. When a hose pressurizes, it expands and becomes shorter. Hose style shrinkage rates vary among different size and brand hoses. Allowing 4% will prevent the hose from tugging on the fittings when the hose is pressurized. Failure to comply may result in serious injury or death. Example: a 50" hose would have to be 4% longer or 52" total length.

AutoReach Soft-Stop System



SAFETY

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AutoReach Soft-Stop System

PACKING LIST

Packing List

The AutoReach Soft-Stop System is shipped complete as a kit. The kit includes all components required for installation. Components in the kit include Control Box, Linear Sensor, Harnesses, Air Supply Assembly, Air Actuator Kit, Tools and Supplies.

Refer to the following Packing List for a complete list of all parts required for installation and included in kit.

ITEM	Description	Footnote	Qty.	MTM Part No.
	Soft-Stop Kit, AutoReach		1	1333548
	Control Box		1	1410088
	Power Stub Harness		1	1358681
	Power Extension Harness, 2-pin Weatherpak, 15 Feet, Includes 20 Feet of 3/8" Split Loom		1	1408908
	Linear Sensor, 19" Stroke		1	1333489
	Linear Harness, 3-pin Weatherpak, Includes 10 Feet of 3/8" Split Loom		1	1333492
	Linear Mounting Kit, Includes Cylinder Rod and Barrel Mounts	F1	1	1333490
	Air Supply Assembly, Includes Air Regulator, Water Separator, Fittings and Mounting Bracket		1	1408891
	Air Actuator Kit, VA20, Includes Red Spring		1	1333493
	Seal Kit, VA20 Spool		2	1371160
	Air Line Kit		1	1408892
	Dielectric Grease		1	1408980
	Deutsch Extraction Tool, Blue		1	2FP669
	Wide-Tip Adjustment Bit, 11/16"W x 1-1/8"L		1	1408981
	Loctite® Grade 262 Red		1	1410095
	Loctite® Grade 609 Green		1	1410096
	Magnet Probe		1	1410090
	Air Gauge Kit		1	1371871
F1	Barrel Mount Revised 7/2009 To Accommodate New Style AutoReach Dump Cylinder. Mount ID Increased To 4.13" With A Spacer Included To Retrofit Old Style Dump Cylinder.			

AutoReach Soft-Stop System



PACKING LIST

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AutoReach Soft-Stop System

SYSTEM INSTALLATION

LOCKOUT/TAGOUT Procedures

Installation of the AutoReach Soft-Stop System must be performed by skilled service personnel. Safety and safe working procedures must be followed at all times.

OSHA LOCKOUT/TAGOUT procedures must be followed when performing installation or maintenance on this equipment. If you are unfamiliar with the OSHA LOCKOUT/TAGOUT procedures or any other safety requirements, please contact McNeilus® Street Smart Parts and Service™.

SAFETY NOTICE

Before entering Packer body, or climbing on or getting under truck to perform any work, read and follow OSHA Regulations concerning entry and working in “CONFINED SPACE” OSHA 1910.146 and “LOCKOUT/TAGOUT” OSHA 1910.147.

Follow OSHA Regulations while performing any work to the Packer.

Follow all safety instructions in your AutoReach Soft-Stop System manual and your OEM Packer manual.

Shut off truck engine, lock cab doors and keep key in your pocket before entering or climbing on, or getting under truck to perform any work to the Packer.

Place magnetic “DANGER” signs on both cab doors.

Failure to do so may result in serious personal injury or death.

DANGER

The installation of the AutoReach Soft-Stop System requires working with the AutoReach arm assembly in the dump position. OSHA LOCKOUT/TAGOUT procedures must be followed when working on this equipment including, but not limited to, safely securing the AutoReach arm assembly in the dump position.

Failure to heed this warning will result in personal injury or damage to property or equipment.

Installation Guidelines

Before installing the AutoReach Soft-Stop System, the Packer body must be empty and the chassis parked on a smooth and level surface.

The AutoReach Soft-Stop System is designed for use with units equipped with Parker P365 tandem hydraulic pumps.

AutoReach Soft-Stop System



SYSTEM INSTALLATION

Mounting Control Box

The control box is shipped assembled complete and ready for installation. Several connections must be made after mounting the control box. The control box requires two harness connections for the linear sensor signal and 12V power. The existing air lines for the arm dump functions (raise and lower) are split and installed in the appropriate connectors on the control box.

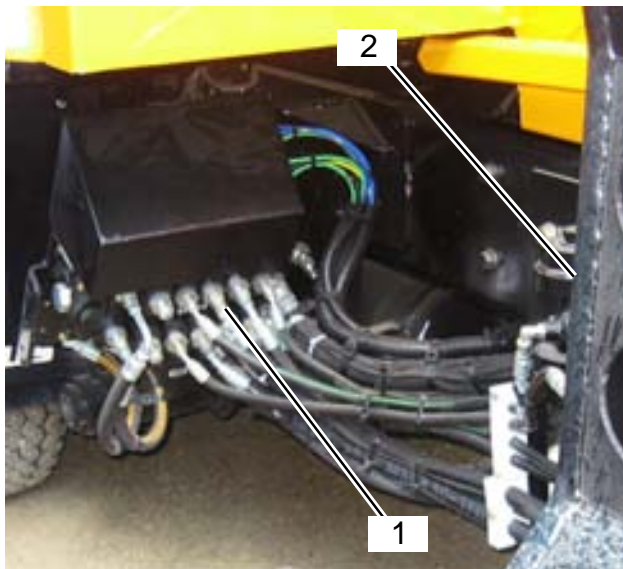


Figure 1

- Apply LOCKOUT/TAGOUT procedure to the Packer. Observe all conditions of the Safety Notice concerning "LOCKOUT/TAGOUT Procedures" on page 15.
- Determine the mounting location for the control box. The control box must be located near the VA20 control valve that controls the AutoReach arm assembly.
- On the McNeilus AutoReach, the VA20 control valve (**Figure 1, 1**) is located to the rear of the arm assembly (**Figure 1, 2**) mounted on the curb side of the Packer body.
- Securely mount the control box. Orientate the control box so that the connectors on the box are accessible and the cover can be easily opened for service.

IMPORTANT

The control box must be located as close as possible to the VA20 control valve for the arm assembly. If the control box is located too far away from the VA20 control valve, the AutoReach Soft-Stop System will not operate properly.

SYSTEM INSTALLATION

Connecting Control Box Power

The control box is supplied with an external 2-pin Weatherpak ready for input power. A power extension harness with mating 2-pin Weatherpak connectors on each end is provided to route from the control box to the MAC solenoid valve stack for the AutoReach arm assembly. A power stub harness is provided to interface the power extension harness with the Packer harness at MAC solenoid valve stack connection to provide a 12V power source to the Soft-Stop control box.

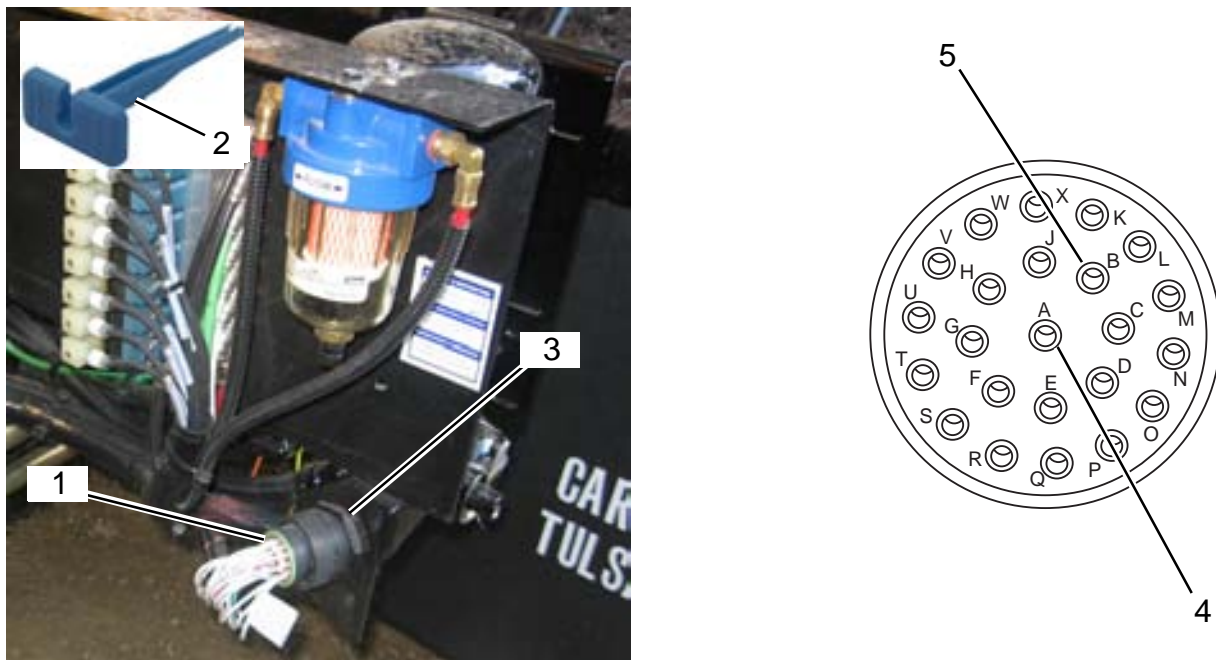


Figure 2

- Locate the 23-pin Deutsch connector (**Figure 2, 1**) for the MAC solenoid valve stack. The MAC solenoid stack can be located in several locations. The most common locations are behind the chassis front fender on the curb side of the Packer body, behind the chassis cab or on the front head of the Packer body.
- Disconnect the Deutsch connector for the MAC solenoid stack from the harness connection.
- Use the blue Deutsch removal tool (**Figure 2, 2**) provided in the kit, remove pins "A" and "B" from the mating Packer harness connector (**Figure 2, 3**) mounted in the bracket. Pin "A" (**Figure 2, 4**) corresponds with the pink wire (Pump Power). Pin "B" (**Figure 2, 5**) corresponds with the black wire (Ground).
- Before removing pins "A" and "B" from the 23-pin Deutsch connector of the Packer harness, verify the wire colors used for each pin location. If the wire colors are different, label each wire to identify the pin location it is removed from.

AutoReach Soft-Stop System



SYSTEM INSTALLATION

CAUTION

Before removing pins "A" and "B" from the 23-pin Deutsch connector of the Packer harness, verify the wire colors used for each pin location. If the wire colors are different, label each wire to identify the pin location it is removed from.

Failure to heed this warning may result in personal injury or damage to property or equipment.

Installation of Power Stub Harness

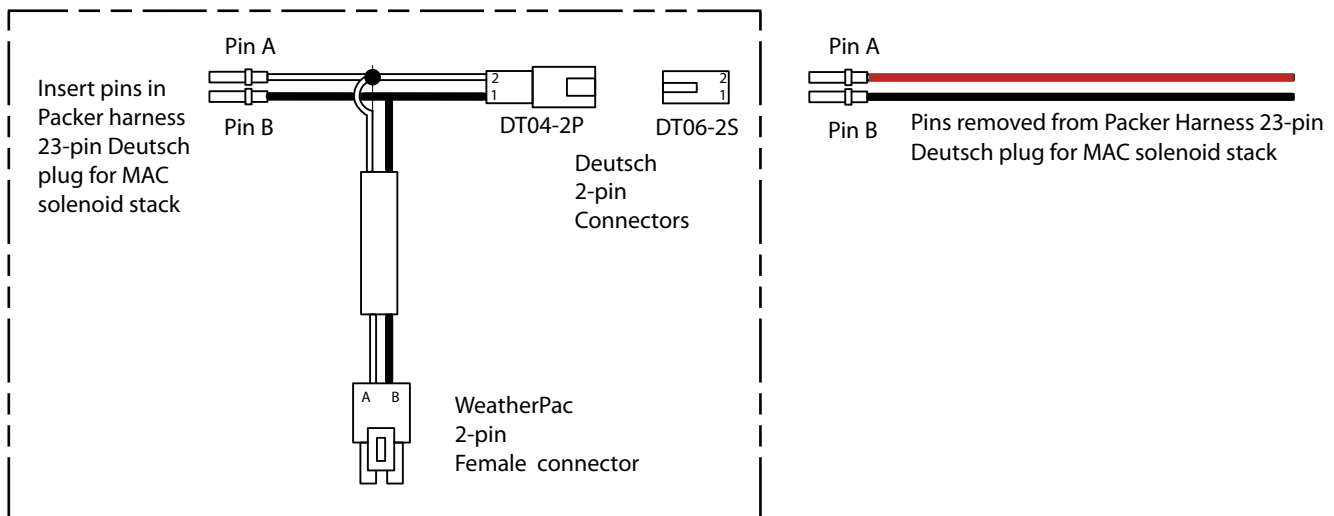


Figure 3

- Identify pin "A" of the power stub harness. Pin "A" is identified by the white wire in the harness.
- Insert pin "A" into location "A" of the Deutsch connector where the pink wire from the Packer harness was previously removed.
- Identify pin "B" of the power stub harness. Pin "B" is identified by the black wire in the harness.
- Insert pin "B" into location "B" of the Deutsch connector where the black wire from the Packer harness was previously removed.
- Next identify the DT04-2P Deutsch male connector on the power stub harness. Inserted in the connector is a DT06-2S Deutsch female connector.
- Remove the DT06-2S Deutsch female connector.
- Identify the Packer harness wires removed from pins "A" and "B" of the Deutsch connector.



AutoReach Soft-Stop System

SYSTEM INSTALLATION

- Identify the pink wire removed from pin location "A" of the Packer harness connector.
- Insert the pink wire into location 2 of the DT06-2S Deutsch female connector.
- Identify the black wire removed from pin location "B" of the Packer harness connector.
- Insert the black wire into location 1 of the DT06-2S Deutsch female connector.
- Install the locking wedge into the Deutsch connector.
- Reconnect the DT06-2S connector into the DT04-2S connector of the power stub harness.
- Apply dielectric grease to the pins before making connection.

Power Stub Harness Test

- After installing power stub harness, it must be checked to verify that it has been installed correctly.
- Remove LOCKOUT/TAGOUT and turn BATTERY switch ON.
- Turn the chassis ignition ON without starting the chassis engine.
- Turn E-STOP and LOCKOUT toggle switches ON.
- Turn PUMP rocker switch on cab control box ON.

WARNING

Do not start and run chassis engine when performing the following procedures. Follow the previous procedure when performing power stub harness test.

Failure to heed this warning may result in personal injury or damage to property or equipment.

- Using a multimeter, check for polarity across pins "A" and "B" of the Packer harness Deutsch connector. Verify that pin location "A" has 12V DC. Use pin location "B" for the ground.
- If the polarity across pins "A" and "B" of the Packer harness Deutsch connector cannot be verified, return to previous section "Installation of Power Stub Harness" on page 18 and repeat steps.
- If the correct polarity is confirmed on pins "A" and "B", the remaining installation can be completed.

AutoReach Soft-Stop System



SYSTEM INSTALLATION

CAUTION

Before the remaining installation can be completed, the polarity across pins "A" and "B" of the Packer harness Deutsch connector must be verified.

Failure to heed this warning may result in personal injury or damage to property or equipment.

- Reconnect the Deutsch connector for the MAC solenoid stack from the harness connection.
- Apply dielectric grease to the pins before making connection.
- Check the LED lights in the MAC solenoid stack to confirm their operation is normal.

Installation of Power Extension Harness

- Apply LOCKOUT/TAGOUT procedure to the Packer. Observe all conditions of the Safety Notice concerning "LOCKOUT/TAGOUT Procedures" on page 15.
- On the power stub harness there is a remaining 2-pin Weatherpak female connector.
- Locate the power extension harness. The harness is 15' long with 3/8" split loom. The harness has mating 2-pin Weatherpak connectors.
- Connect the 2-pin Weatherpak male connector end of the power extension harness to the female connector on power stub harness.
- Apply dielectric grease to the pins before making connection.
- Route the power extension harness along the chassis frame rail back to the control box.
- Fasten the harness so that it is secure and will not be damaged during operation.

SYSTEM INSTALLATION



Figure 4

- Connect the 2-pin Weatherpak female connector end of the power extension harness to the 2-pin Weatherpak male connector (**Figure 4, 1**) on control box.
- Apply dielectric grease to the pins before making connection.

Connection of Linear Sensor

For the AutoReach Soft-Stop System to function properly, the position and travel direction of the arm dump function must be known. To provide this information, a linear sensor is mounted to the dump cylinder of the AutoReach arm assembly. When the arm assembly is in the stored position, the cylinder is located between the second and primary arm assemblies.

DANGER

The installation of the linear sensor requires working with the AutoReach arm assembly in the dump position. OSHA LOCKOUT/TAGOUT procedures must be followed when working on this equipment including, but not limited to, safely securing the AutoReach arm assembly in the dump position.

Failure to heed this warning will result in personal injury or damage to property or equipment.

AutoReach Soft-Stop System



SYSTEM INSTALLATION

Installation of Linear Sensor

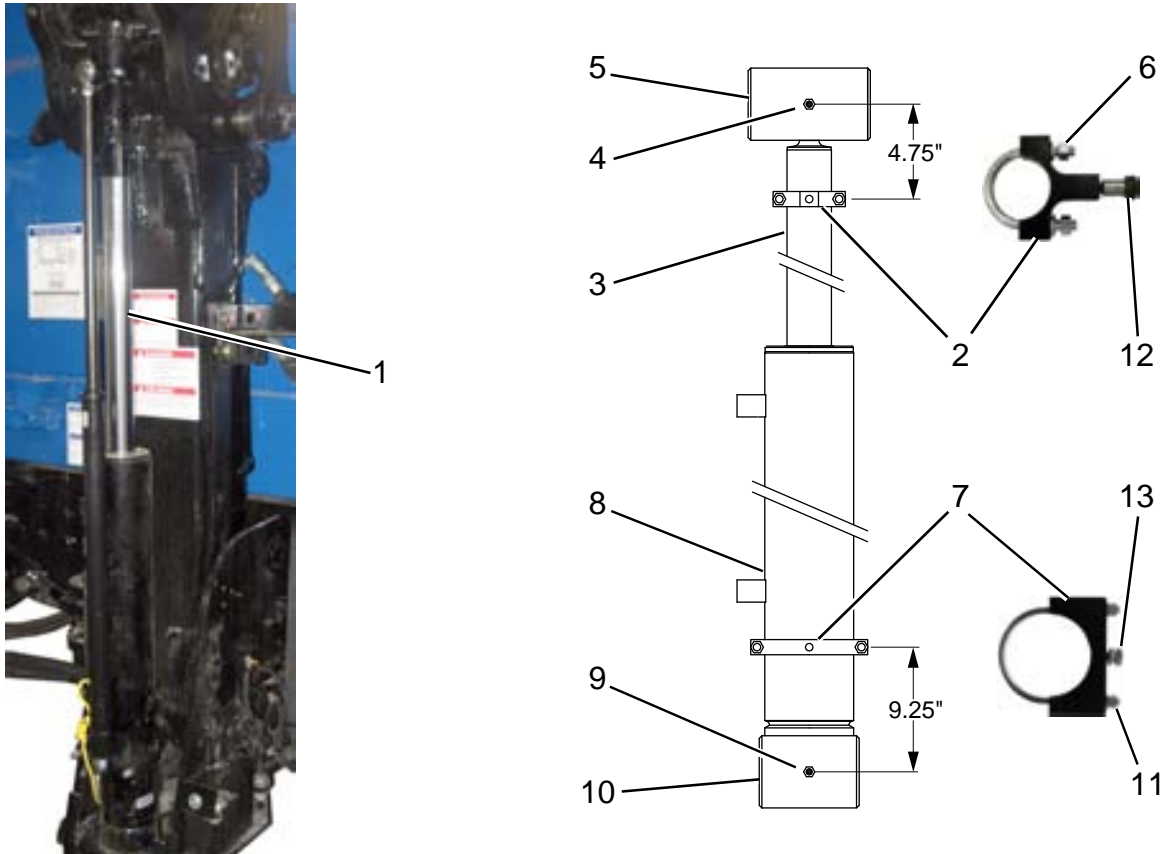


Figure 5

- Remove LOCKOUT/TAGOUT and turn BATTERY switch ON.
- Turn the chassis ignition ON and start the chassis engine.
- Turn E-STOP and LOCKOUT toggle switches ON.
- Turn PUMP rocker switch on cab control box ON.
- Fully extend the dump cylinder (**Figure 5, 1**) rod by raising the AutoReach arm to the DUMP position.
- Apply LOCKOUT/TAGOUT procedure to the Packer. Observe all conditions of the Safety Notice concerning "LOCKOUT/TAGOUT Procedures" on page 15, including, but not limited to, safely securing the AutoReach arm assembly in the DUMP position.
- Install the smaller linear sensor mount (**Figure 5, 2**) on the dump cylinder rod (**Figure 5, 3**). Locate the center of mount 4.75" from the center of grease fitting (**Figure 5, 4**) located in cylinder rod end (**Figure 5, 5**). Evenly torque both nuts (**Figure 5, 6**) on the U-bolt to 25 ft-lb (300 in-lb).



AutoReach Soft-Stop System

SYSTEM INSTALLATION

- Install the larger linear sensor mount (**Figure 5, 7**) on the dump cylinder barrel (**Figure 5, 8**). Locate the center of mount 9-1/4" from the center of grease fitting (**Figure 5, 9**) located in cylinder base end (**Figure 5, 10**). Evenly torque both nuts (**Figure 5, 11**) on U-bolt to 25 ft-lb (300 in-lb).

IMPORTANT

The outside diameter for AutoReach dump cylinder barrel was increased effective 7/2009. The linear mount supplied in the kit will accommodate both dump cylinder barrel sizes. A spacer is supplied to be used when installing on the smaller barrel.

- Install the linear sensor with the rod end up and the connector power lead to the rear of the vehicle. Apply Loctite® Grade 609 Green to the mounting bolts. The upper shoulder bolt (**Figure 5, 12**) is 1.5" long, and lower bolt (**Figure 5, 13**) is 1" long. Torque both bolts to 25 ft-lb (300 in-lb).

IMPORTANT

Use Loctite® Grade 609 Green on all fasteners except hydraulic connections and those with Nylok nuts.

AutoReach Soft-Stop System



SYSTEM INSTALLATION

Installation of Linear Harness

- Locate the linear harness. The harness is 10' long with 3/8" split loom. The harness has a DIN connector with a mating 3-pin Weatherpak connector on the opposite end.

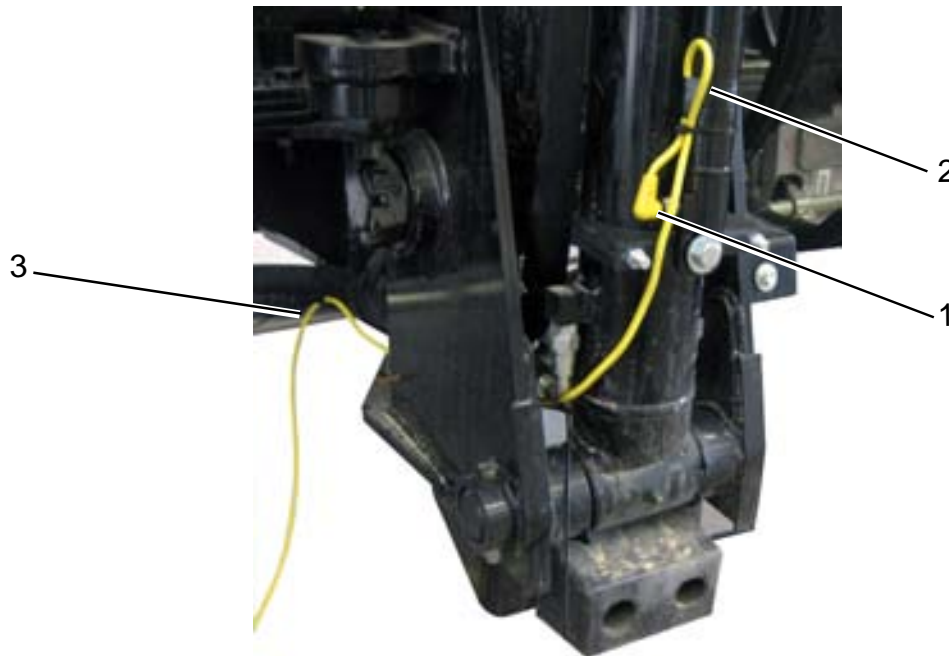


Figure 6

- The linear harness should be connected to the linear sensor. If not, apply dielectric grease to the DIN connector (**Figure 6, 1**) of the linear harness. Connect the DIN connector directly into the connector on the linear sensor. Orientate the harness connector so that the harness is vertical and aligned with the linear sensor. Tighten the screw in the harness connector to secure in place.
- Loop (**Figure 6, 2**) the linear harness and route (**Figure 6, 3**) along the hydraulic hose and through the base mount of the AutoReach arm assembly.

IMPORTANT

Leave ample excess cable for full arm rotation and operation. The arm is capable of going below grade, and requires excess cable to reach there.

- Continue routing the linear harness along the chassis frame rail back to the control box.
- Fasten the harness every 12" so that it is secure and will not be damaged during operation.

SYSTEM INSTALLATION



Figure 7

- Connect the 3-pin Weatherpak male connector end of the linear harness to the 3-pin Weatherpak female connector (**Figure 7, 1**) on control box.
- Apply dielectric grease to the pins before making connection.

Connection of Air Lines

The AutoReach arm assembly is controlled by a VA20 control valve mounted to the rear of the arm assembly. Each of the valve sections of the valve assembly is controlled by an air actuator. The air actuators are controlled from the MAC air solenoid stack or an air joystick in the chassis cab.

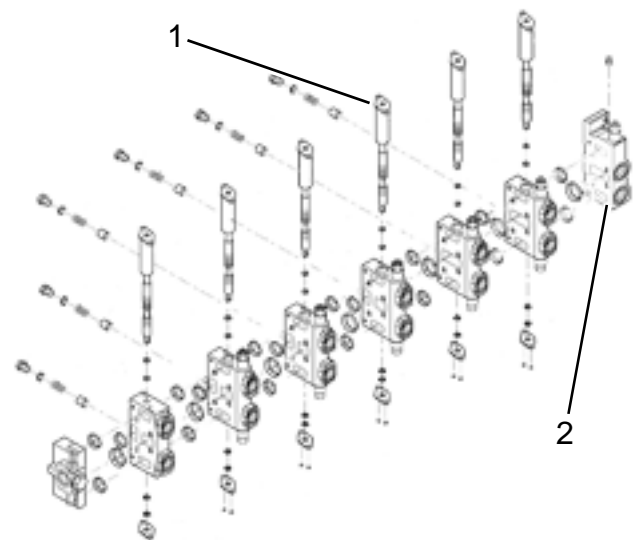
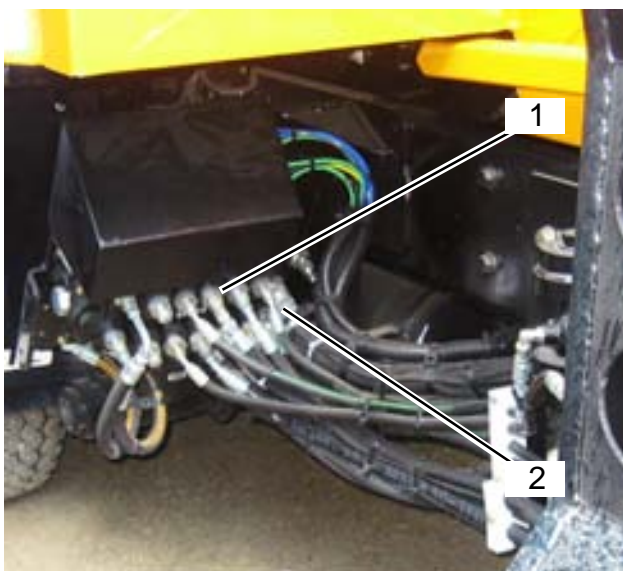


Figure 8

AutoReach Soft-Stop System



SYSTEM INSTALLATION

The AutoReach Soft-Stop System meters the air control of the dump function for the AutoReach arm assembly. The valve section for the dump function is identified as the third working section (**Figure 8, 1**) from the inlet section (**Figure 8, 2**) identified by the main relief valve. The installation of the control box for the AutoReach Soft-Stop System requires that air from joystick to the valve section for the dump function must be split and plumbed through the control box.

To ensure reliable performance of the VA20 control valve, the centering spring on the spool must be replaced with a red spring provided with the kit. When replacing the centering spring, the spool seals on both ends of the valve section must also be replaced. To effectively remove and replace the spool seals, the spool assembly must be removed. For this reason the following procedure removes the spool assembly when replacing the centering spring. When the spool assembly is removed, oil will leak from the spool section. Use an oil pan to collect any oil that drains from the valve section.

Replace the Air Actuator and Centering Spring



Figure 9

- Remove LOCKOUT/TAGOUT and turn BATTERY switch ON.
- Turn the chassis ignition ON and start the chassis engine.
- Turn E-STOP and LOCKOUT toggle switches ON.
- Turn PUMP rocker switch on cab control box ON.
- Fully retract the dump cylinder (**Figure 5, 1**) rod by lowering the AutoReach arm to the HOME position.
- Apply LOCKOUT/TAGOUT procedure to the Packer. Observe all conditions of the Safety Notice concerning “LOCKOUT/TAGOUT Procedures” on page 15.

SYSTEM INSTALLATION

- Locate the VA20 valve assembly mounted to the rear of the AutoReach arm assembly.
- Remove bolts (**Figure 9, 1**) and remove valve shield (**Figure 9, 2**) covering valve assembly. Save valve shield and all mounting hardware for reinstallation.

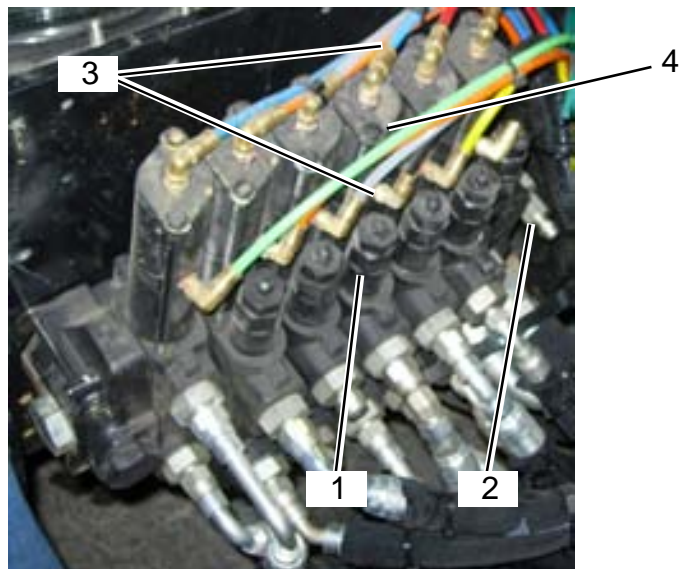


Figure 10

- Clean all debris and dirt away from the top of VA20 valve assembly before disassembling.
- Locate the third section (**Figure 10, 1**) away from the inlet section (**Figure 10, 2**) for the dump function. The inlet section can be identified by the main relief and pressure gauge port.
- Disconnect air lines (**Figure 10, 3**) from air actuator fittings.

AutoReach Soft-Stop System



SYSTEM INSTALLATION

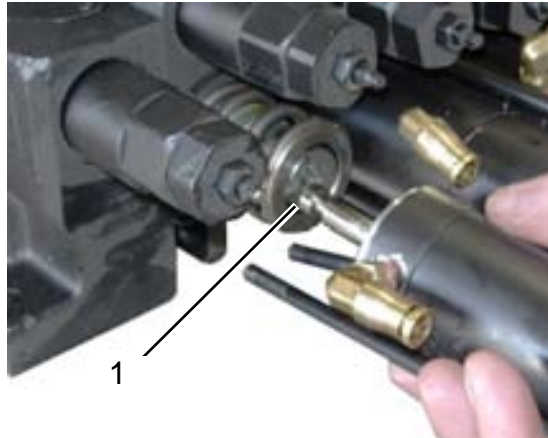


Figure 11

- Loosen two (2) capscrews (**Figure 10, 4**) and remove air actuator. Air actuator must be moved to the side to slide the actuator rod (**Figure 11, 1**) out of the stripper bolt.
- Remove air actuator from valve section. All parts removed will be replaced with a new style air actuator.

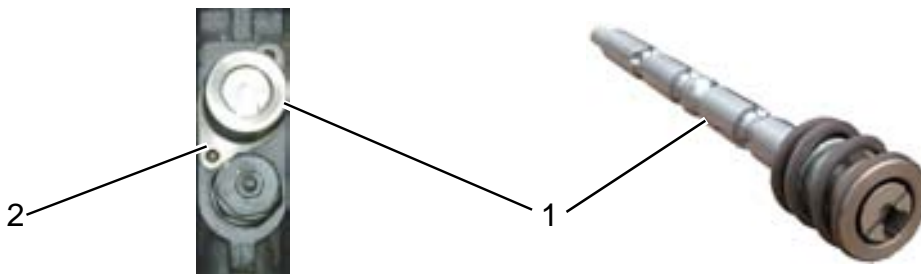


Figure 12

- Hydraulic oil will leak from the valve section body when the spool assembly is removed. Place a container under the valve section to collect the hydraulic oil while the spool assembly is removed.
- Pull the spool assembly (**Figure 12, 1**) up and out of valve section body. Lift the retainer plate (**Figure 12, 2**) under the centering spring assembly when removing the spool assembly.
- After removing spool assembly, slide the retainer plate off the spool assembly and discard.

SYSTEM INSTALLATION

Replace Spool Centering Spring

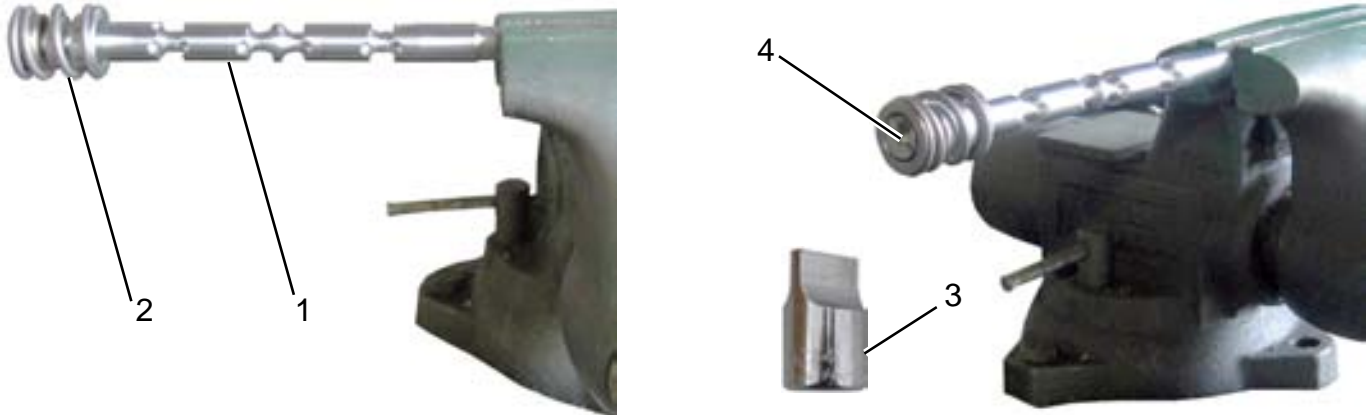


Figure 13

- Clamp the spool assembly (**Figure 13, 1**) in a vise with the centering spring assembly (**Figure 13, 2**) away from the vise.

IMPORTANT

When clamping spool assembly in vise, make certain not to damage machine surfaces of spool. Only clamp using the opposite end of the centering spring assembly.

- Using the wide-tip adjustment bit (**Figure 13, 3**) provided in the kit, remove the stripper bolt (**Figure 13, 4**) securing the centering spring assembly.
- When removing the stripper bolt, be sure to collect all of the components from the spring assembly for use during reassembly.

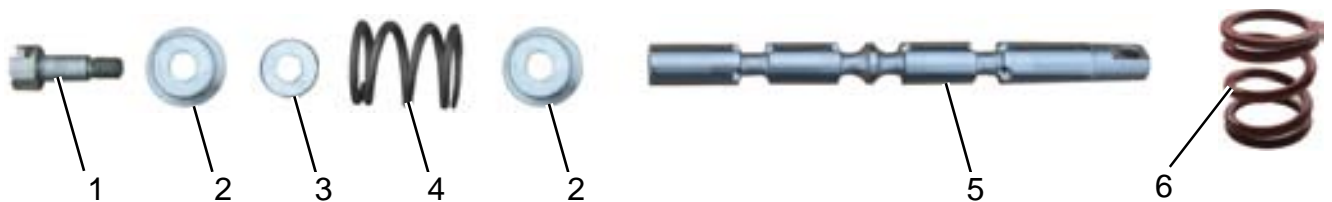


Figure 14

- Discard the spring (**Figure 14, 4**) removed during disassembly.
- Reassemble the centering spring assembly using the red spring (**Figure 14, 6**) supplied with kit.
- Reassemble the centering spring assembly in the order illustrated in (**Figure 14**).

AutoReach Soft-Stop System



SYSTEM INSTALLATION

- The spacer tube (**Figure 14, 3**) is inserted inside the red spring (**Figure 14, 6**) with spring retainers (**Figure 14, 2**) on each end of the spring.
- Slide the stripper bolt (**Figure 14, 1**) through the spring retainers for installation.

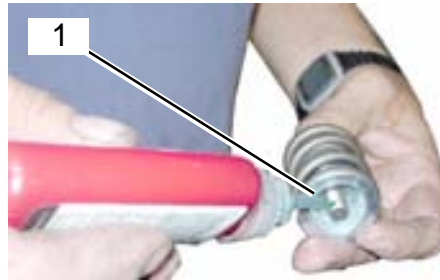


Figure 15

- Thoroughly clean the threads of the stripper bolt (**Figure 15, 1**) and inside spool (**Figure 14, 5**).
- Apply two to three (2-3) drops of Loctite® Grade 262 Red (**Figure 15, 1**) to threads of stripper bolt before installation.

IMPORTANT

Apply two to three (2-3) drops of Loctite® Grade 262 Red (Figure 15, 1) to threads of stripper bolt before installation. Do not over apply Loctite® as it will result in a weaker seal.

- Using the wide-tip adjustment bit (**Figure 13, 3**) provided in the kit, install the centering spring assembly to the spool.
- Torque the stripper bolt to 15 ft-lb (180 in-lb).
- Inspect to make sure the spring retainers on each end of the spring are free and rotate independent of the spool.

IMPORTANT

Inspect to make sure the spring retainers on each end of the spring are free and rotate independent of the spool.

Replace Spool Seals

When installing the AutoReach Soft-Stop System on units that have previously been in service, the spool seals must be replaced before installing the spool subassembly. This will ensure reliable operation after the repair is completed.

SYSTEM INSTALLATION



Figure 16

- First, replace the spool seal and back-up ring in the bottom of the valve section in the AutoReach arm valve assembly.
- Remove the two (2) screws (**Figure 16, 1**) and retainer plate (**Figure 16, 2**).
- Remove the old seal and back-up ring.
- Install the seal (**Figure 16, 4**) first followed by the back-up ring (**Figure 16, 3**).
- Reinstall the retainer plate and two (2) screws.
- Next, remove the old seal and back-up ring from the top of the valve section.
- Install the seal (**Figure 16, 5**) first followed by the back-up ring (**Figure 16, 6**).

AutoReach Soft-Stop System



SYSTEM INSTALLATION

Installation of Air Actuator

The air actuator kit (**Figure 17, 1**) is included with the AutoReach Soft-Stop System.

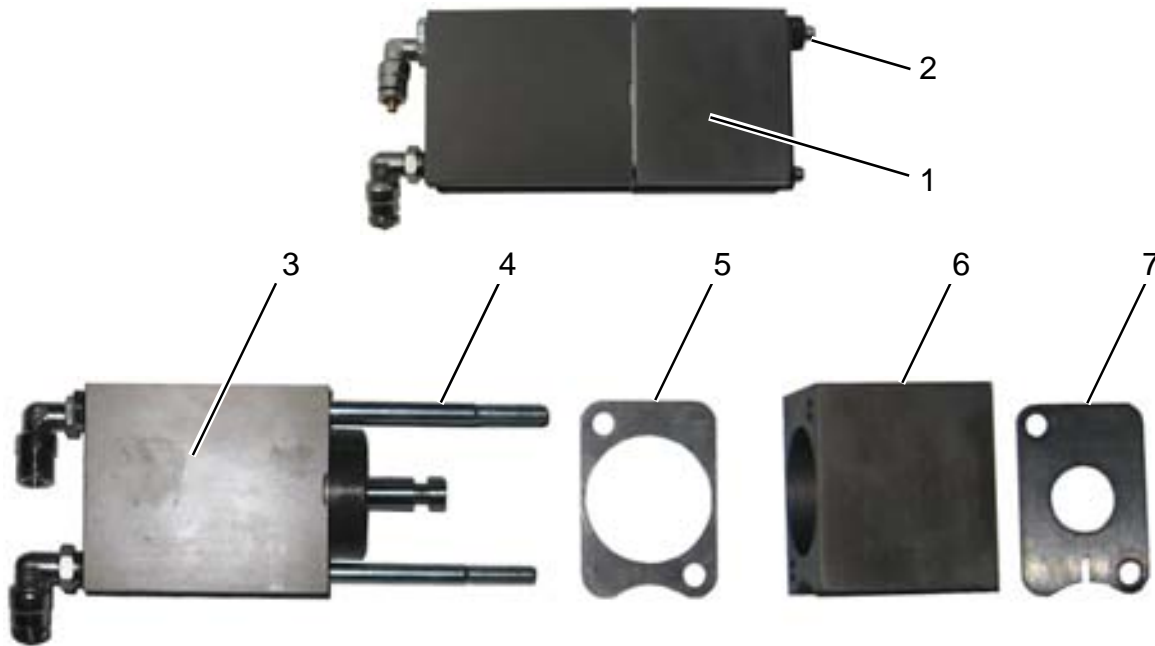


Figure 17

- Remove the nuts (**Figure 17, 2**) from the cap screws to disassemble the kit. Nuts will not be used and can be discarded.

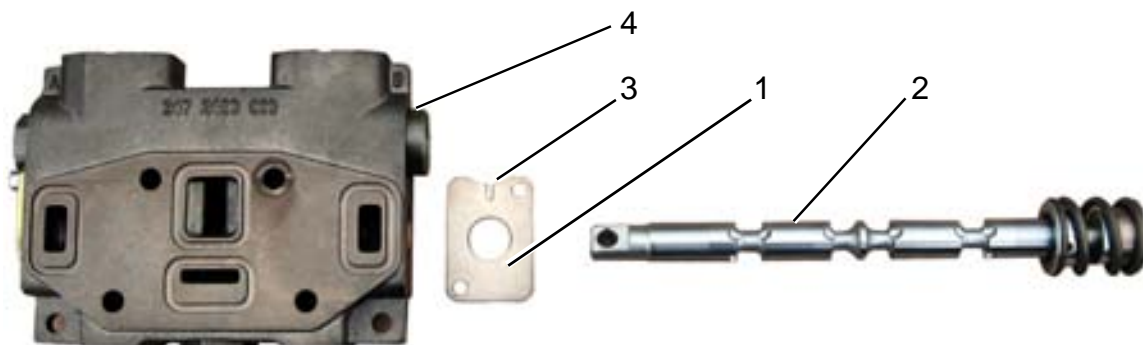


Figure 18

- Slide the retainer plate (**Figure 17, 7**) (**Figure 18, 1**) over the spool assembly (**Figure 18, 2**). Align the curved end with slot (**Figure 18, 3**) on the retainer plate up to fit around relief valve port (**Figure 18, 4**).
- Insert spool assembly with retainer plate into valve section.

SYSTEM INSTALLATION

- Install spacer (**Figure 17, 6**) and spacer plate (**Figure 17, 5**) over centering spring assembly of spool assembly. Install both with the curved side up for clearance with the relief valve port.
- The air actuator (**Figure 17, 3**) also has a curved side. Install the air actuator with the curved side up for clearance with the relief valve port.
- To attach the air actuator, slide the actuator rod into the slot of the stripper bolt. The spool assembly can be pushed up to provide better access when attaching air actuator.



Figure 19

- Apply two to three (2-3) drops of Loctite® Grade 609 Green to the threads of the two (2) cap screws (**Figure 17, 4**).

IMPORTANT

Do not over apply Loctite® Grade 609 Green, as it will result in a weaker seal.

- Install the cap screws through the air actuator assembly and torque to 12 ft-lb (144 in-lb).

IMPORTANT

Do not over tighten cap screws.

AutoReach Soft-Stop System



SYSTEM INSTALLATION

Connecting Air Lines

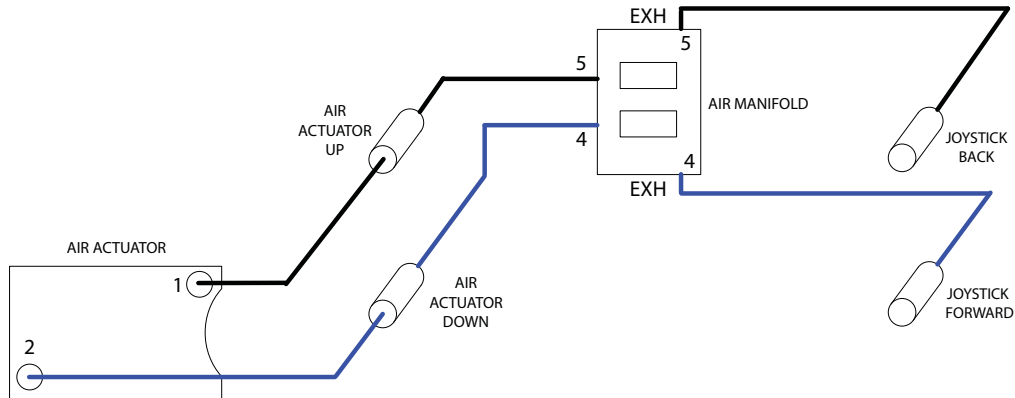


Figure 20

- The simplest and most reliable method to reconnect the air control lines previously removed from the air actuator is to have someone assist with the operation of the joystick in the cab.

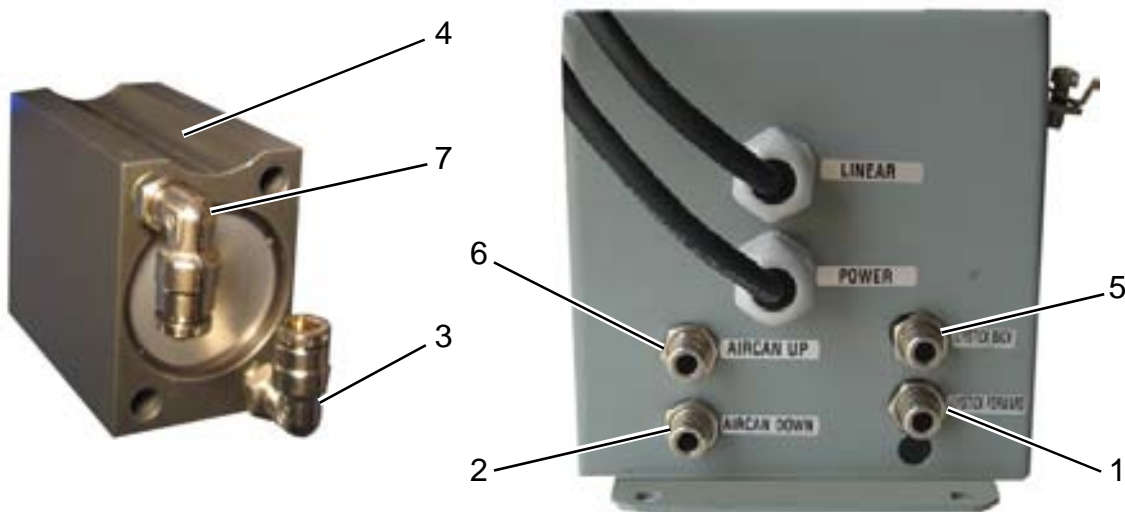


Figure 21

- Remove LOCKOUT/TAGOUT and turn BATTERY switch ON.
- Turn the chassis ignition ON without starting the chassis engine.
- Turn E-STOP and LOCKOUT toggle switches ON.
- Turn PUMP rocker switch on cab control box ON.



AutoReach Soft-Stop System

SYSTEM INSTALLATION

WARNING

Do not start and run chassis engine when performing the following procedures. Follow the previous procedure when performing power stub harness test.

Failure to heed this warning may result in personal injury or damage to property or equipment.

- Move the joystick forward and identify which air line expels air. Connect the identified air line to the "JOYSTICK FORWARD" (**Figure 21, 1**) port on the control box. After connecting air line, air should expel from the connection labeled "AIRCAN DOWN" (**Figure 21, 2**).
- Blue and black air lines are provided with the kit. Use the air line color that corresponds with the color of air line installed previously in the "JOYSTICK FORWARD" port.
- Install the air line into the "AIRCAN DOWN" port on control box.
- Connect the opposite end of the air line in the air actuator fitting located at "Port 2" (**Figure 21, 3**). "Port 2" is located away from the curved side (**Figure 21, 4**) of the air actuator.
- Move the joystick back and identify the other air line that expels air. Connect the identified air line to the "JOYSTICK BACK" (**Figure 21, 5**) port on the control box. After connecting air line, air should expel from the connection labeled "AIRCAN UP" (**Figure 21, 6**).
- Install the remaining air line into the "AIRCAN UP" port on the control box.
- Connect the opposite end of the air line in the air actuator fitting located at "Port 1" (**Figure 21, 7**). "Port 1" is located near the curved side (**Figure 21, 4**) of the air actuator.

Installation of Regulator/Water Separator

The Packer air system must be clean and properly maintained for the AutoReach Soft-Stop System to provide repeatable operation. The air supply for the joystick is controlled from the MAC valve bank (**Figure 22, 1**). An air supply assembly (**Figure 22, 2**) is provided for installation between the air filter (**Figure 22, 3**) and MAC valve stack on the Packer. The air supply assembly includes a water separator (**Figure 22, 4**) and air regulator (**Figure 22, 5**). The air regulator is preset to limit the air supply pressure to the Soft-Stop System between 87-95 psi.

AutoReach Soft-Stop System



SYSTEM INSTALLATION

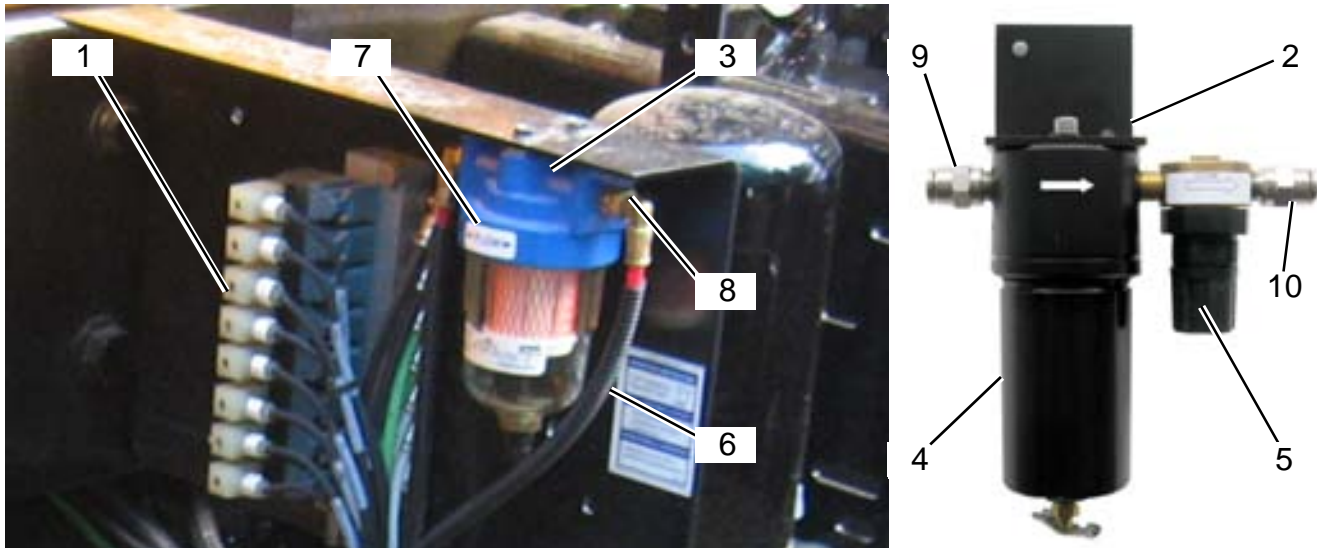


Figure 22

- Apply LOCKOUT/TAGOUT procedure to the Packer. Observe all conditions of the Safety Notice concerning “LOCKOUT/TAGOUT Procedures” on page 15.
- Determine the mounting location for the air supply assembly. The air supply assembly must be located near the air filter for the Packer air controls. The air filter is usually located near the MAC solenoid valve stack.
- Securely mount the air supply assembly. Orientate the assembly so that the connectors are accessible.

IMPORTANT

Mount the air supply assembly as close as possible to the air filter for the packer air controls.

- Identify the air line (**Figure 22, 6**) between the air filter and MAC solenoid valve stack. The air filter should have an arrow (**Figure 22, 7**) on the air filter to identify the direction of air flow.
- Split the identified air line.
- Make connection between air filter outlet (**Figure 22, 8**) and the "IN" port (**Figure 22, 9**) on the water separator.
- Make a second connection between the air regulator outlet (**Figure 22, 10**) and the MAC solenoid valve stack.



AutoReach Soft-Stop System

SYSTEM INSTALLATION

Start-Up Procedure

- System is now ready to start-up. Before starting the vehicle, make certain that the hydraulic reservoir level is checked and hydraulic oil is added if necessary.

CAUTION

Before starting the chassis engine, the hydraulic reservoir must be checked and oil added if necessary.

Failure to heed this warning may result in personal injury or damage to property or equipment.

- Remove LOCKOUT/TAGOUT and turn BATTERY switch ON.
- Start chassis engine.
- Turn E-STOP and LOCKOUT toggle switches ON.
- Turn PUMP rocker switch on cab control box ON.
- Warm up the hydraulics to normal operating temperature by cycling each of the Packer functions several times.

AutoReach Soft-Stop System



SYSTEM INSTALLATION

Setting the End Limits with the Magnet Probe

After the installation of components has been completed, the end limits must be set to tell the AutoReach Soft-Stop System when the arm assembly is in the UP and DOWN positions. The end limits are set by accessing the control box with the use of a magnet probe.

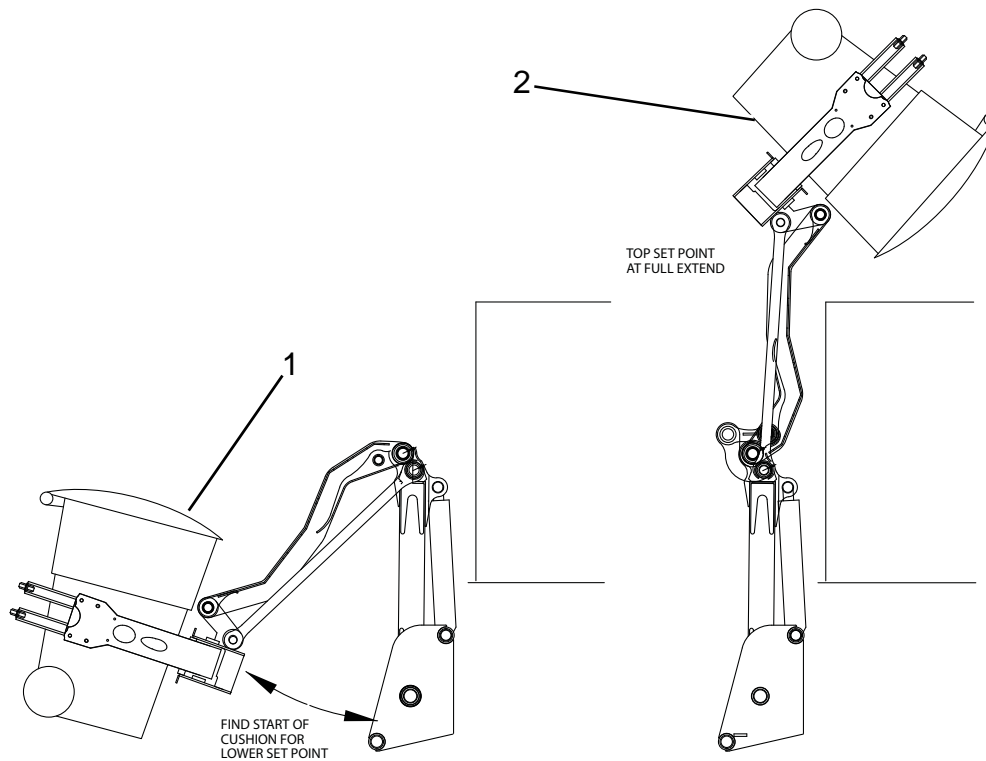


Figure 23

- Fully raise the arm assembly to the dump position.
- Lower the arm assembly and observe when the arm stops quickly from the dump cylinder cushion taking effect. The arm will initially bounce and then a noise will come from the cylinder port while the arm continues to lower.
- Locate the arm assembly just before the position (**Figure 23, 1**) when the cushion of the dump cylinder took effect.

IMPORTANT

Make certain that the arm assembly is positioned just before the start of the dump cylinder cushion.

SYSTEM INSTALLATION

- Identify the controller (**Figure 24, 1**) located in the Soft-Stop control box. The controller has a label indicating the "DOWN" and "UP" positions on the controller of the Soft-Stop control box.
- Touch the magnet probe to the "DOWN" (**Figure 24, 2**) side of the controller to set the down end limit.

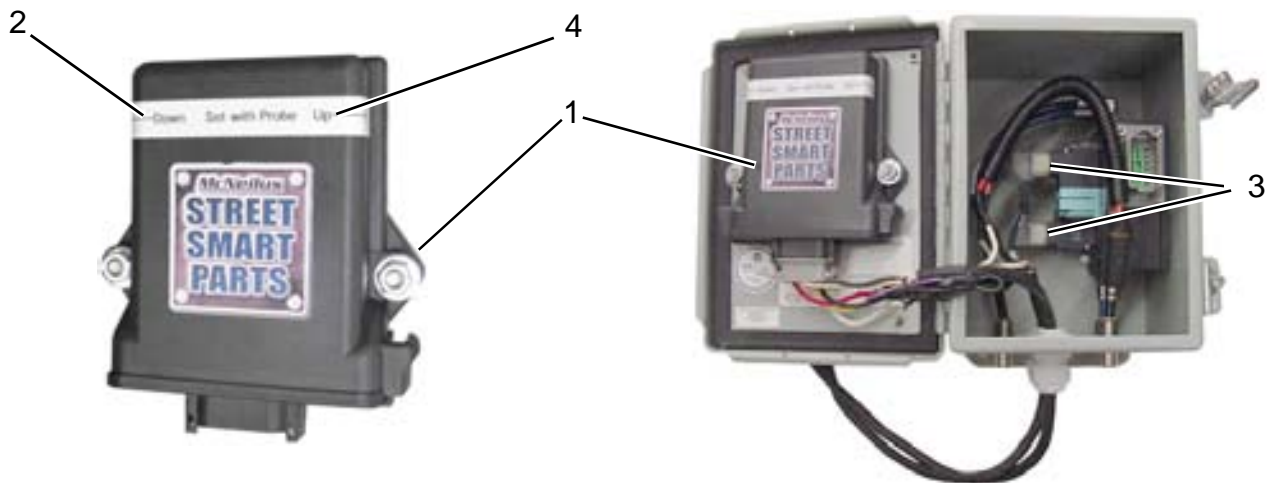


Figure 24

- When the magnet probe touches the controller, the DIN connectors (**Figure 24, 3**) on the air valves should flash two (2) times.

IMPORTANT

The DIN connectors must flash two (2) times to indicate that the DOWN end limit has been set.

If the DIN connectors do not flash two (2) times, the down end limit was not set. Repeat the previous procedures again to set the DOWN end limit.

- Fully raise the arm assembly to the dump position (**Figure 23, 2**).
- Touch the magnet probe to the "UP" (**Figure 24, 4**) side of the controller to set the up end limit.
- When the magnet probe touches the controller, the DIN connectors on the air valves should flash two (2) times.

AutoReach Soft-Stop System



SYSTEM INSTALLATION

IMPORTANT

The DIN connectors must flash two (2) times to indicate that the UP end limit has been set.

If the DIN connectors do not flash two (2) times, the UP end limit was not set. Repeat the previous procedures again to set the UP end limit.

- Recycle the power for AutoReach Soft-Stop System.
- Turn PUMP rocker switch on cab control box OFF.
- Stop the chassis engine.
- Restart the chassis engine.
- Turn E-STOP and LOCKOUT toggle switches ON.
- Turn PUMP rocker switch on cab control box ON.
- Observe the DIN connectors on the air valves in the Soft-Stop control box to observe if they flash.
- If the connectors do not flash when powering up, the end limits have been set.
- Cycle the arm assembly between the UP and DOWN positions to verify that the Soft-Stop system is operational and the end limits are set correctly.
- If the connectors flash four (4) times, the end limits have not been set. Repeat the previous procedures to set the end limits.
- If problems continue while setting end limits, refer to the Troubleshooting section in manual.



AutoReach Soft-Stop System

TROUBLESHOOTING

LOCKOUT/TAGOUT Procedures

All maintenance procedures must be performed by skilled service personnel. Safety and safe working procedures must be followed at all times.

OSHA LOCKOUT/TAGOUT procedures must be followed when performing maintenance on this equipment. If you are unfamiliar with the OSHA LOCKOUT/TAGOUT procedures or any other safety requirements, please contact McNeilus® Street Smart Parts and Service™.

SAFETY NOTICE

Before entering Packer body, or climbing or getting under truck to perform any work, read and follow OSHA Regulations concerning entry and working in “CONFINED SPACE” OSHA 1910.146 and “LOCKOUT/TAGOUT” OSHA 1910.147.

Follow OSHA Regulations while performing any work to the Packer.

Follow all safety instructions in your AutoReach Soft-Stop System manual and your OEM Packer manual.

Shut off truck engine, lock cab doors and keep key in your pocket before entering or climbing on, or getting under truck to perform any work to the Packer.

Place magnetic “DANGER” signs on both cab doors.

Failure to do so can result in serious personal injury or death.

Overview

When a problem or malfunction occurs, follow these steps. The sequence below will help isolate the problem and often permit a quick repair. If further assistance is required, refer to the applicable section of this manual or contact your McNeilus® Street Smart Parts and Service™ location listed in the Foreword of this manual.

IMPORTANT

Isolate the problem before taking any corrective actions.

1. Unless further damage will occur, repeat the steps that caused the problem. Often a simple step in the standard operating procedure has been forgotten.
2. Refer to the following troubleshooting charts. They are designed to help you troubleshoot problems at your location, and are organized in a logical sequence. Look under the appropriate equipment section, and for the specific problem within the chart.
3. Perform the diagnostic procedure and recommendation for how to correct the problem listed within the chart to isolate the problem.

AutoReach Soft-Stop System



TROUBLESHOOTING

4. If your particular problem is not listed, or the remedial actions provided do not resolve the problem, contact your McNeilus® Street Smart Parts and Service™ location for service assistance. A listing of locations and phone numbers sorted alphabetically by state can be found in the Foreword section of this manual.
5. The AutoReach Soft-Stop System controls the air controls for the dump function of the Packer arm assembly. The troubleshooting procedures require three tests. The first test isolates the Packer air controls to verify that they are operating properly. The second test checks the air manifolds in the Soft-Stop control box. The final test troubleshoots the Soft-Stop system.

Packer Air System Test

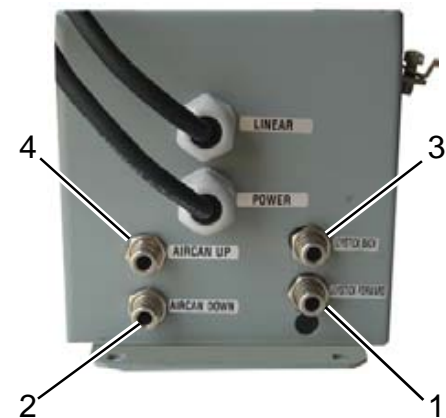
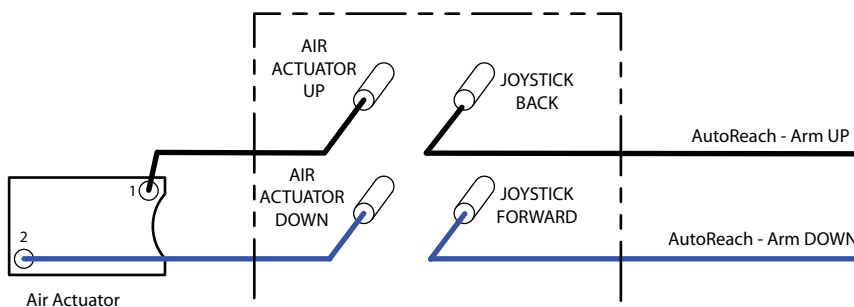


Figure 25

- Apply LOCKOUT/TAGOUT procedure to the Packer. Observe all conditions of the Safety Notice concerning "LOCKOUT/TAGOUT Procedures" on page 41.
- Remove the air lines from the "JOYSTICK FORWARD" (**Figure 25, 1**) and "AIRCAN DOWN" (**Figure 25, 2**) connections on Soft-Stop control box. Install the air gauge kit by inserting both air lines into the tee fitting.
- Remove the air lines from the "JOYSTICK BACK" (**Figure 25, 3**) and "AIRCAN UP" (**Figure 25, 4**) connections on Soft-Stop control box. Use a union fitting to splice the two air lines together.
- Remove LOCKOUT/TAGOUT and turn BATTERY switch ON.
- Turn the chassis ignition ON and start the chassis engine.
- Turn E-STOP and LOCKOUT toggle switches ON.
- Turn PUMP rocker switch on cab control box ON.
- Lower the arm assembly completely DOWN. While continuing to hold joystick forward, observe the air gauge reading.
- The air gauge should read system pressure between 80-95 psi.



AutoReach Soft-Stop System

TROUBLESHOOTING

- Apply LOCKOUT/TAGOUT procedure to the Packer. Observe all conditions of the Safety Notice concerning “LOCKOUT/TAGOUT Procedures” on page 41.
- Switch air lines between union and air gauge kit tee fittings.
- Remove LOCKOUT/TAGOUT and turn BATTERY switch ON.
- Turn the chassis ignition ON and start the chassis engine.
- Turn E-STOP and LOCKOUT toggle switches ON.
- Turn PUMP rocker switch on cab control box ON.
- Raise the arm assembly completely UP. While continuing to hold joystick back, observe the air gauge reading.
- The air gauge should read system pressure between 80-95 psi.
- Apply LOCKOUT/TAGOUT procedure to the Packer. Observe all conditions of the Safety Notice concerning “LOCKOUT/TAGOUT Procedures” on page 41.
- Determine the observed air gauge readings relative to the 80-95 psi range.
- Review the appropriate section in the following Troubleshooting Chart that corresponds to the readings observed.

Symptom	Possible Causes	How to Correct Problem
A. Both Air Gauge Readings Between 80-95 psi		
Both air gauge readings between 80-95 psi.	Arm operation is normal.	No correction is required. Proceed to “Soft-Stop Air Manifold Test” on page 44.
B. Both Air Gauge Readings Below 80-95 psi		
Both air gauge readings below 80-95 psi.	Packer air system pressure too low.	Troubleshoot Packer air system and correct.
Both air gauge readings below 80-95 psi.	Air regulator in Soft-Stop air supply assembly set too low.	Air regulator is non-adjustable. Replace air regulator.
C. Both Air Gauge Readings Above 80-95 psi		
Both air gauge readings above 80-95 psi.	Air regulator in Soft-Stop air supply assembly set too high.	Air regulator is non-adjustable. Replace air regulator.
D. Both Air Gauge Readings Not Equal		
Both air gauge readings not equal.	Air joystick in chassis cab is defective.	Inspect and test joystick in chassis cab and replace if required.
Both air gauge readings not equal.	Air line between joystick and Soft-Stop control box pinched or damaged.	Isolate and inspect air line between joystick and Soft-Stop control box. Repair or replace if required.

AutoReach Soft-Stop System



TROUBLESHOOTING

Soft-Stop Air Manifold Test

After the Packer Air System Test has been completed with the air gauge readings between 80-95 psi, the Soft-Stop Air Manifold Test can now be performed. To perform this test, an air gauge kit is plumbed in-line with the air lines reconnected to the Soft-Stop control box.

- Apply LOCKOUT/TAGOUT procedure to the Packer. Observe all conditions of the Safety Notice concerning "LOCKOUT/TAGOUT Procedures" on page 41.
- Remove the union and air gauge tee fittings.
- Reconnect the air lines to the appropriate connectors on the Soft-Stop control box.
- Remove the air line from the "AIRCAN DOWN" (**Figure 25, 2**) connection on Soft-Stop control box. Install the air gauge kit between the air line and connector on Soft-Stop control box.
- Remove LOCKOUT/TAGOUT and turn BATTERY switch ON.
- Turn the chassis ignition ON and start the chassis engine.
- Turn E-STOP and LOCKOUT toggle switches ON.
- Turn PUMP rocker switch on cab control box ON.
- Lower the arm assembly completely DOWN. While continuing to hold joystick forward, observe the air gauge reading.
- The air gauge should read system pressure between 80-95 psi.
- Apply LOCKOUT/TAGOUT procedure to the Packer. Observe all conditions of the Safety Notice concerning "LOCKOUT/TAGOUT Procedures" on page 41.
- Remove the air gauge kit and reconnect air line to the "AIRCAN DOWN" (**Figure 25, 2**) connector on Soft-Stop control box.
- Remove the air line from the "AIRCAN UP" (**Figure 25, 4**) connection on Soft-Stop control box. Install the air gauge kit between the air line and connector on Soft-Stop control box.
- Remove LOCKOUT/TAGOUT and turn BATTERY switch ON.
- Turn the chassis ignition ON and start the chassis engine.
- Turn E-STOP and LOCKOUT toggle switches ON.
- Turn PUMP rocker switch on cab control box ON.
- Raise the arm assembly completely UP. While continuing to hold joystick back, observe the air gauge reading.
- The air gauge should read system pressure between 80-95 psi.
- Apply LOCKOUT/TAGOUT procedure to the Packer. Observe all conditions of the Safety Notice concerning "LOCKOUT/TAGOUT Procedures" on page 41.
- Remove the air gauge kit and reconnect air line to the "AIRCAN UP" (**Figure 25, 4**) connector on Soft-Stop control box.
- Determine the observed air gauge readings relative to the 80-95 psi range.



AutoReach Soft-Stop System

TROUBLESHOOTING

- Review the appropriate section in the following Troubleshooting Chart that corresponds to the readings observed.

	Symptom	Possible Causes	How to Correct Problem
A. Both Air Gauge Readings Between 80-95 psi			
	N/A	Air manifold passed test.	No correction is required. Proceed to "AutoReach Soft-Stop System Test" on page 45.
B. One or Both Air Gauge Readings Below 80-95 psi			
	N/A	Air manifold failed test.	Replace air manifold and repeat test.

AutoReach Soft-Stop System Test

After the "Packer Air System Test" and "Soft-Stop Air Manifold Test" have been completed with air gauge readings between 80-95 psi, the "AutoReach Soft-Stop System Test" can now be performed. The Packer air supply and system has been validated for proper operation.

The troubleshooting chart for the AutoReach Soft-Stop System is organized by power or operation conditions.

	Possible Causes	How to Diagnose	How to Correct Problem
A. Soft-Stop System Does Not Have Power			
	There is no pump power from the Packer.	Check LED lights of MAC solenoid valve stack on Packer. LED lights will be ON when there is pump power.	On Packer control box, turn E-STOP, LOCKOUT toggle and PUMP switches ON.
	Fuse in Soft-Stop control box is blown.	Remove fuse and visually inspect. Check for a good solid 12V DC power source to fuse holder. Reinstall fuse and check continuity with a multimeter.	Replace fuse in control box.
	System is wired backwards.	Refer to "Power Stub Harness Test" on page 19 to verify wiring is correct.	Correct wiring as required. The controller may also be burned out and require replacement.
	Power extension harness has poor connections or short.	There is no power at the fuse holder.	Make sure the system has power and all connections are made.

AutoReach Soft-Stop System



TROUBLESHOOTING

Possible Causes	How to Diagnose	How to Correct Problem
B. Soft-Stop System Has Power, But Is Not Operational		
DIN connector LEDs on MAC air valves are illuminated all the time.	Check for correct polarity. Refer to "Power Stub Harness Test" on page 19 to verify wiring is correct.	Correct wiring. Likely wired backwards. The controller may also be burned out and require replacement.
End limits are not set.	On initial power UP cycle, if the MAC air valve lights in the Soft-Stop control box flash four (4) times, the end limits required for operation have not been loaded.	Refer to "Setting the End Limits with the Magnet Probe" on page 38 to verify air lines are connected properly.
Linear sensor is defective.	Refer to "Linear Sensor Test" on page 56 to confirm the linear sensor is in normal working condition.	Replace linear sensor.
Linear harness has a short.	Refer to "Linear Harness Test" on page 57 to determine if linear harness is in normal working condition.	Replace linear harness.
Linear harness connections.	Refer to "Linear Harness Test" on page 57 to confirm the linear harness is in normal working condition.	Check harness connections for corrosion and continuity. Clean connections and reinstall using dielectric grease.
C. Soft-Stop System Has Power, But The MAC Solenoid Is Not Working Properly		
MAC air valve coil is defective.	DIN connector LEDs on MAC air valves are illuminated during dithering cycle, but air does not exhaust from air valve.	Replace MAC air valve.
MAC air valve is stuck closed.	DIN connector LEDs on MAC air valves are illuminated during dithering cycle, but air does not exhaust from air valve.	Replace MAC air valve.
MAC air valve is stuck open.	Air exhausts from air valve when joystick function is actuated.	Replace MAC air valve.
D. Soft-Stop System Is Operational (Dithers), But Functions Backwards		
Air lines are plumbed backwards.	Refer to "Connecting Air Lines" on page 34 to verify air lines are connected properly.	Correct the air line plumbing.
E. Soft-Stop System Is Operational (Dithers), But Arm Assembly Does Not Decelerate		
Control box is not mounted close enough to the VA20 control valve.	Move Soft-Stop control box closer to VA20 valve assembly and retest.	Mount control box as close as possible to the VA20 control valve.



AutoReach Soft-Stop System

TROUBLESHOOTING

Possible Causes	How to Diagnose	How to Correct Problem
F. Soft-Stop System Is Operational (Dithers), But Arm Operation Not Normal		
Arm operation is jerky.	Valve centering spring is broken.	Replace centering spring with red spring (1371847).
Arm operation is jerky.	Valve spool in VA20 valve section is sticky.	Disassemble and clean valve spool. Replace valve section if spool is scored.
Arm operation is slow.	Valve spool seals are leaking.	Replace valve spool seals.
Arm operation is slow.	Air actuator on VA20 valve section is leaking.	Reseal air actuator with seal kit or replace with air actuator kit.
Arm operates jerky.	Air actuator sticking.	Reseal air actuator with seal kit or replace with air actuator kit.

AutoReach Soft-Stop System



TROUBLESHOOTING

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AutoReach Soft-Stop System

PREVENTIVE MAINTENANCE

Design

The AutoReach Soft-Stop System is designed to provide exceptional performance and value while requiring a minimum amount of maintenance. Performing Preventive Maintenance will provide prolonged life of the Soft-Stop system, help prevent expensive downtime and minimize the potential for problems arising on the route.

Maintenance Intervals

NOTE

If the Packer is operated more hours per day or double shifted, the maintenance interval must be adjusted accordingly.

LOCKOUT/TAGOUT Procedures

All maintenance procedures must be performed by skilled service personnel. Safety and safe working procedures must be followed at all times.

OSHA LOCKOUT/TAGOUT procedures must be followed when performing maintenance on this equipment. If you are unfamiliar with the OSHA LOCKOUT/TAGOUT procedures or any other safety requirements, please contact McNeilus[®] Street Smart Parts and Service[™].

SAFETY NOTICE

Before entering Packer body, or climbing or getting under truck to perform any work, read and follow OSHA Regulations concerning entry and working in "CONFINED SPACE" OSHA 1910.146 and "LOCKOUT/TAGOUT" OSHA 1910.147.

Follow OSHA Regulations while performing any work to the Packer.

Follow all safety instructions in your AutoReach Soft-Stop System manual and your OEM Packer manual.

Shut off truck engine, lock cab doors and keep key in your pocket before entering or climbing on, or getting under truck to perform any work to the Packer.

Place magnetic "DANGER" signs on both cab doors.

Failure to do so can result in serious personal injury or death.

AutoReach Soft-Stop System

PREVENTIVE MAINTENANCE

Daily (10 Hours) Inspection and Check

Daily (10 Hours), before placing the AutoReach Soft-Stop System in service, a thorough and complete inspection for damage, loose hardware and oil leaks is required. Cycle the AutoReach arm several times before leaving the yard to verify the Soft-Stop system is operating properly.

Repair as necessary any deficiencies found during the inspection and check.

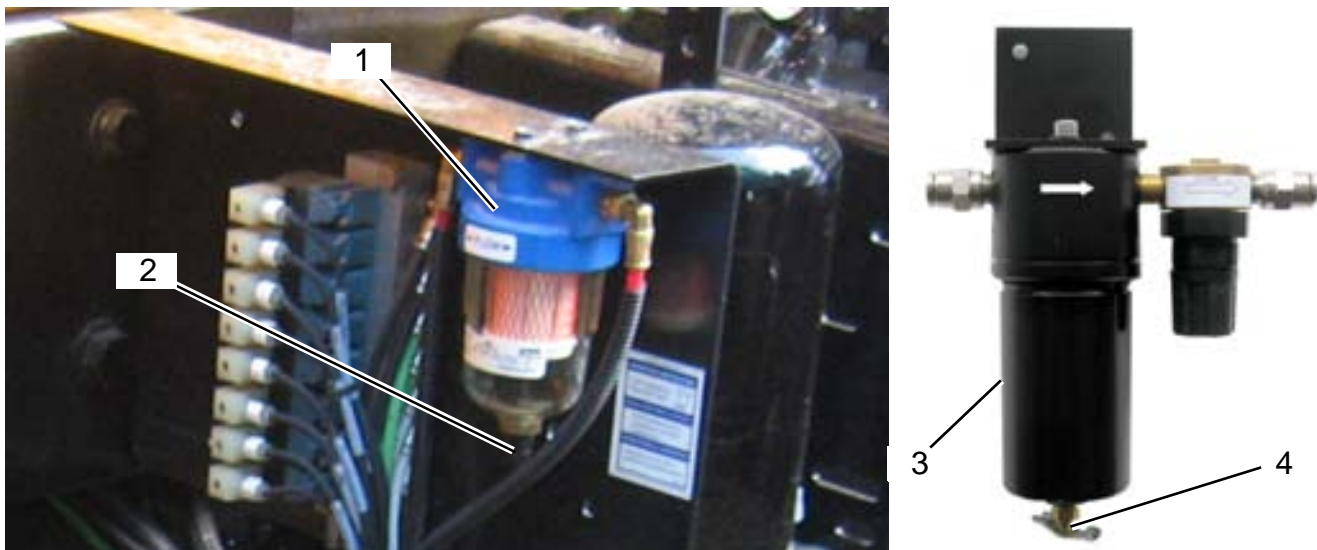


Figure 26

Packer Coalescing Filter

Daily (10 Hours)

- Drain the standard coalescing filter (**Figure 26, 1**) for the Packer air system.
- Locate the drain fitting (**Figure 26, 2**) on the bottom of the coalescing filter. Drain the filter by turning the drain fitting counterclockwise.
- Turn the drain fitting clockwise after all moisture and contaminants have drained from the canister.

Semi-Annual (1250 Hours)

- The filter element is the only maintenance item and must be changed semi-annually.
- Replace the filter element with McNeilus part number 0121415.



AutoReach Soft-Stop System

PREVENTIVE MAINTENANCE

Water Separator

Daily (10 Hours)

- Drain the water separator (**Figure 26, 3**) installed for the AutoReach Soft-Stop System.
- Locate the drain fitting (**Figure 26, 4**) on the bottom of the coalescing filter. Drain the filter by turning the drain fitting counterclockwise.
- Turn the drain fitting clockwise after all moisture and contaminants have drained from the canister.

Semi-Annual (1250 Hours)

- The filter element is the only maintenance item and must be changed semi-annually.
- Replace the filter element with McNeilus part number 1371872.

AutoReach Soft-Stop System



PREVENTIVE MAINTENANCE

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AutoReach Soft-Stop System

SERVICE PROCEDURES

This section of the manual describes procedures that may be required for proper maintenance of the AutoReach Soft-Stop System.

LOCKOUT/TAGOUT Procedures

All maintenance procedures must be performed by skilled service personnel. Safety and safe working procedures must be followed at all times.

OSHA LOCKOUT/TAGOUT procedures must be followed when performing maintenance on this equipment. If you are unfamiliar with the OSHA LOCKOUT/TAGOUT procedures or any other safety requirements, please contact McNeilus® Street Smart Parts and Service™.

SAFETY NOTICE

Before entering Packer body, or climbing or getting under truck to perform any work, read and follow OSHA Regulations concerning entry and working in "CONFINED SPACE" OSHA 1910.146 and "LOCKOUT/TAGOUT" OSHA 1910.147.

Follow OSHA Regulations while performing any work to the Packer.

Follow all safety instructions in your AutoReach Soft-Stop System manual and your OEM Packer manual.

Shut off truck engine, lock cab doors and keep key in your pocket before entering or climbing on, or getting under truck to perform any work to the Packer.

Place magnetic "DANGER" signs on both cab doors.

Failure to do so can result in serious personal injury or death.

AutoReach Soft-Stop System



SERVICE PROCEDURES

Linear Sensor and Harness Test

The use of a multimeter is required to test the linear sensor and harness for continuity. The multimeter is used to measure the OHM resistance across the pins of the linear sensor connector (**Figure 27, 1**) and Weatherpak connection (**Figure 27, 2**) on the linear harness.



Figure 27

LOCKOUT/TAGOUT

- Remove LOCKOUT/TAGOUT and turn BATTERY switch ON.
- Turn the chassis ignition ON and start the chassis engine.
- Turn E-STOP and LOCKOUT toggle switches ON.
- Turn PUMP rocker switch on cab control box ON.
- Fully extend the linear sensor rod by raising the AutoReach arm to the DUMP position.
- Apply LOCKOUT/TAGOUT procedure to the Packer. Observe all conditions of the Safety Notice concerning "LOCKOUT/TAGOUT Procedures" on page 53, including, but not limited to, safely securing the AutoReach arm assembly in the DUMP position.



Figure 28

SERVICE PROCEDURES

Soft-Stop Control Box Harness Connection Test

- Disconnect the 3-pin Weatherpak male connector (**Figure 29, 1**) end of the linear harness from the 3-pin Weatherpak female connector (**Figure 28, 1**) on the control box.

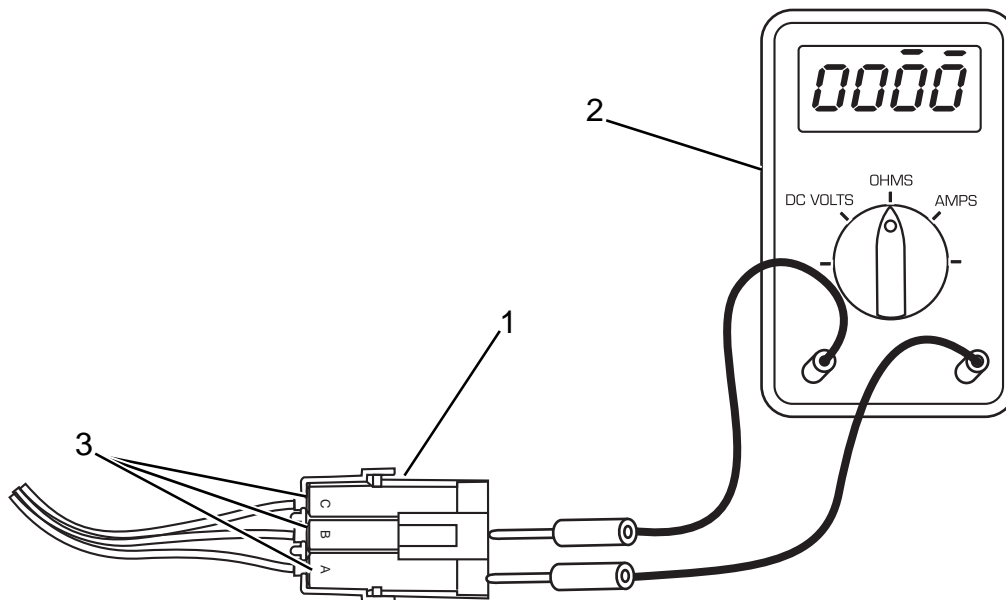


Figure 29

- Using a multimeter (**Figure 29, 2**), check the OHM resistance across "Pin A" and "Pin B" (**Figure 29, 3**) of the Weatherpak connector. The multimeter should read between 14500 and 16500 OHMS with the linear sensor extended.
- Remove the shoulder bolt fastening linear sensor rod to linear sensor mount (**Figure 5, 2**) on the dump cylinder rod (**Figure 5, 3**).
- Fully retract the rod on linear sensor.
- Using the multimeter again, check the OHM resistance across "Pin A" and "Pin B" (**Figure 29, 3**) of the Weatherpak connector. The multimeter should read between 400 and 700 OHMS with the linear sensor retracted.
- If both readings were within the specified ranges, both the linear sensor and linear harness are in normal working condition.
- Reattach the linear sensor rod to linear sensor mount on the dump cylinder rod.

AutoReach Soft-Stop System



SERVICE PROCEDURES

Linear Sensor Test

If the readings were zero or out of range, an additional test must be made at the linear sensor to determine if the linear sensor has failed or there is a short in the linear harness.

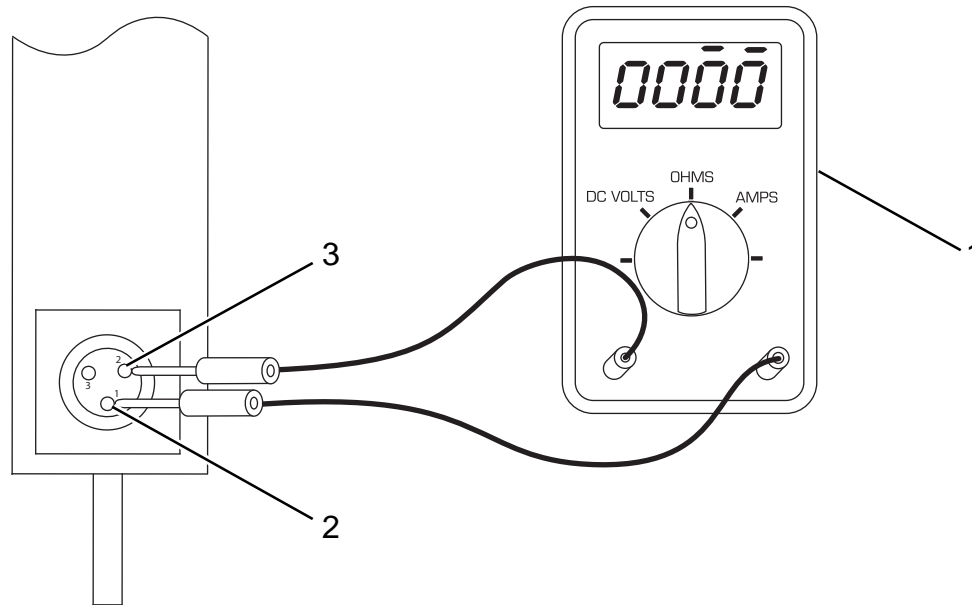


Figure 30

- Disconnect the linear harness connector (**Figure 27, 1**) from the connector at the base end of the linear sensor.
- Using a multimeter (**Figure 30, 1**), check the OHM resistance across "Pin 1" (**Figure 30, 2**) and "Pin 2" (**Figure 30, 3**) of the connector at the base of the linear sensor. The multimeter should read between 14500 and 16500 OHMS with the linear sensor extended.
- Remove the shoulder bolt fastening linear sensor rod to linear sensor mount (**Figure 5, 2**) on the dump cylinder rod (**Figure 5, 3**).
- Fully retract the rod on linear sensor.
- Using the multimeter again, check the OHM resistance across "Pin 1" and "Pin 2" of the connector at the base end of the linear sensor. The multimeter should read between 400 and 700 OHMS with the linear sensor retracted.
- If the readings were zero or out of range, the linear sensor is defective and must be replaced.
- If both readings were within the specified ranges, the linear sensor is in normal working condition.
- Next perform the "Linear Harness Test" on page 57 to determine if the linear harness has a short.



AutoReach Soft-Stop System

SERVICE PROCEDURES

Linear Harness Test

If the readings were zero or out of range, an additional test must be made to the linear harness to determine if the linear harness has a short. The linear harness has three (3) wires that correspond with the connector pins on each end of the harness. The following table (**Figure 31**) describes which Weatherpak connector pin indicated by the letters A, B and C corresponds with the pins of the DIN connector indicated by the numbers 1, 2 and 3. Use a multimeter to check for continuity between the pins for each wire in harness.

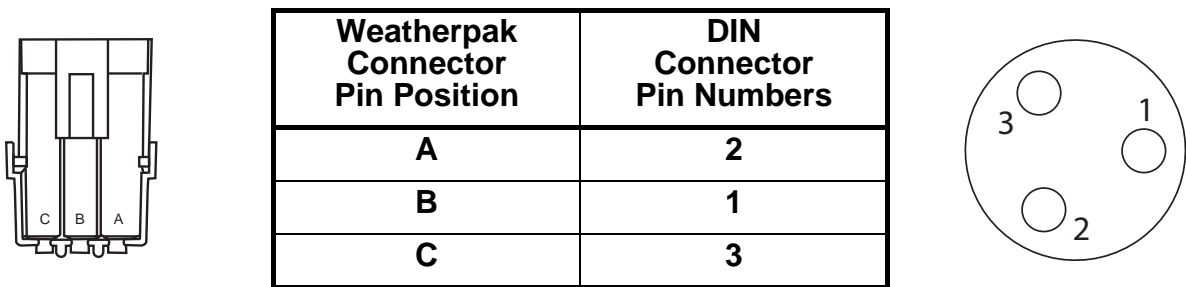


Figure 31

- Using a multimeter (**Figure 30, 1**), check the OHM resistance across "Pin 1" (**Figure 30, 2**) of linear sensor connector and "Pin B" (**Figure 30, 3**) of the Weatherpak connector. The multimeter should read 0 OHMS. If harness has a short, the multimeter will show an open circuit.

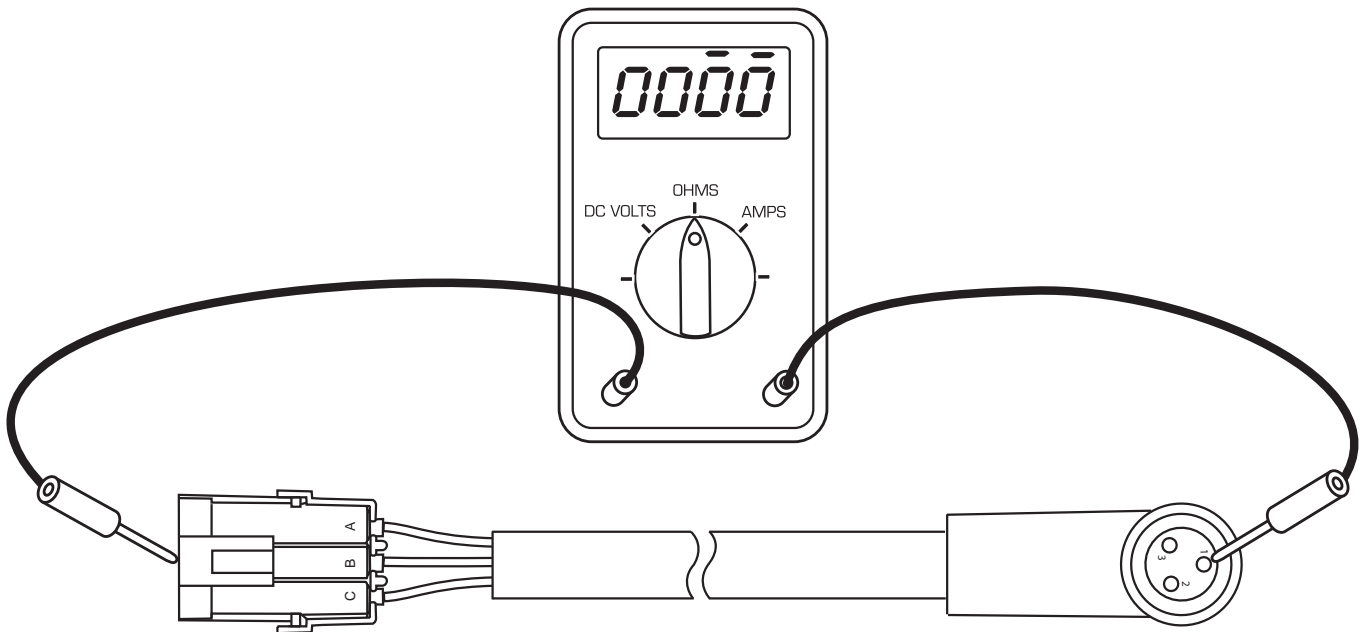


Figure 32

- Repeat the previous step again between "Pin 2" and "Pin A".

AutoReach Soft-Stop System



SERVICE PROCEDURES

- Finally repeat the previous step between "Pin 3" and "Pin C".
- If both readings were within the specified ranges, the linear harness is in normal working condition. Check all connections for corrosion and continuity. Clean connections and reinstall using dielectric grease.
- If the readings were zero or out of range, the linear harness has a short and must be repaired or replaced.
- For additional assistance, contact McNeilus® Street Smart Parts and Service™ for additional troubleshooting help.

SERVICE PROCEDURES

Soft-Stop Air Pressure Test

The most effective way to test and verify if the AutoReach Soft-Stop System is operating properly is to install the supplied 0-150 psi air gauge kit (**Figure 33, 1**) between the air actuator and the VA20 valve assembly.

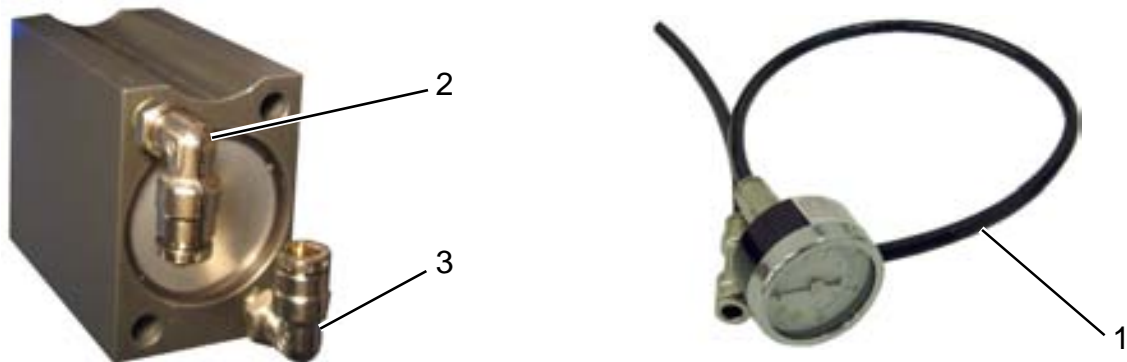


Figure 33

- Remove LOCKOUT/TAGOUT and turn BATTERY switch ON.
- Turn the chassis ignition ON and start the chassis engine.
- Turn E-STOP and LOCKOUT toggle switches ON.
- Turn PUMP rocker switch on cab control box ON.
- Fully lower the AutoReach arm to the HOME position.
- Apply LOCKOUT/TAGOUT procedure to the Packer. Observe all conditions of the Safety Notice concerning "LOCKOUT/TAGOUT Procedures" on page 53.
- Locate the air lines between the Soft-Stop control box and the VA20 control valve assembly mounted at the rear of the AutoReach arm assembly.
- Remove the air line from the air actuator fitting located at "Port 1" (**Figure 33, 2**). Install the air line into the tee fitting of the air gauge kit. Install air line from air gauge kit tee fitting into air actuator fitting at "Port 1".
- Remove LOCKOUT/TAGOUT and turn BATTERY switch ON.
- Turn the chassis ignition ON and start the chassis engine.
- Turn E-STOP and LOCKOUT toggle switches ON.
- Turn PUMP rocker switch on cab control box ON.
- Cycle the arm assembly UP and DOWN and observe the air gauge.
- When the arm assembly is in the UP stroke, the air gauge should read system pressure between 80-95 psi before it reaches the end point for dithering. When the Soft-Stop dithers, you should see the pressure reading drop to read 50-60 psi.
- If the gauge reading does not change, the AutoReach Soft-Stop System is NOT operational.

AutoReach Soft-Stop System



SERVICE PROCEDURES

- If the gauge reading dithers in the range of 50-60 psi, the Soft-Stop is operating properly.
- Apply LOCKOUT/TAGOUT procedure to the Packer. Observe all conditions of the Safety Notice concerning "LOCKOUT/TAGOUT Procedures" on page 53.
- Remove the air gauge kit and reinstall air line into air actuator fitting at "Port 1".
- Remove the air line from air actuator fitting located at "Port 2" (**Figure 33, 3**). Install the air line into the tee fitting of the air gauge kit. Install air line from air gauge kit tee fitting into air actuator fitting at "Port 2".
- Remove LOCKOUT/TAGOUT and turn BATTERY switch ON.
- Turn the chassis ignition ON and start the chassis engine.
- Turn E-STOP and LOCKOUT toggle switches ON.
- Turn PUMP rocker switch on cab control box ON.
- Cycle the arm assembly UP and DOWN and observe the air gauge.
- When the arm assembly is in the DOWN stroke, the air gauge should read system pressure between 80-95 psi before it reaches the end point for dithering. When the Soft-Stop dithers, you should see the pressure reading drop to read 50-60 psi.
- If the gauge reading does not change, the AutoReach Soft-Stop System is NOT operational.



AutoReach Soft-Stop System

ILLUSTRATIONS and PARTS LISTS

How To Use

The pages are arranged with illustrations followed by the corresponding parts list.

ITEM	Description	Footnote	Qty.	MTM Part No.
	SSP Cart Tipper Assembly		1	1325031
1	1/2-13 UNC x 1.25 BHCS, ZP	F1	2	1332139
2	Torque Arm Retainer		2	1331920
3	Torque Arm Weldment		2	DBA
4	1/4-28 UNF x 0.38 Set Screw		2	1328563
5	Master Cylinder Assembly			1334084
	Master Cylinder Rod Assembly (Includes Items 2, 5, 6 and 9)		1	1332056
2	Rod End Mount		1	NSS
6	Cam Roller, 1" OD		1	NSS
9	Dowel Pin, 5/16" x 1-1/4"		1	NSS

F1 — The outside diameter for AutoReach dump cylinder barrel was increased effective 7/2009.

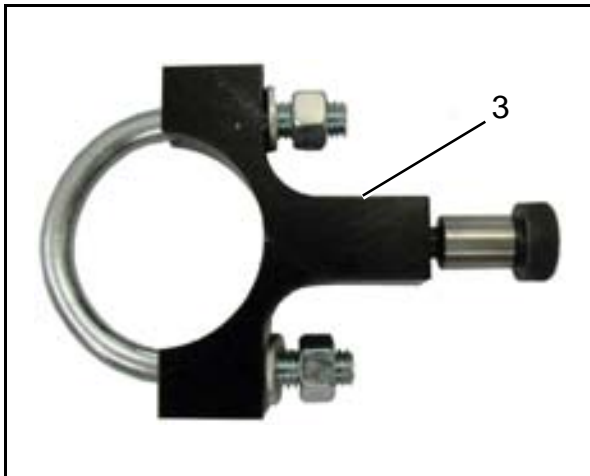
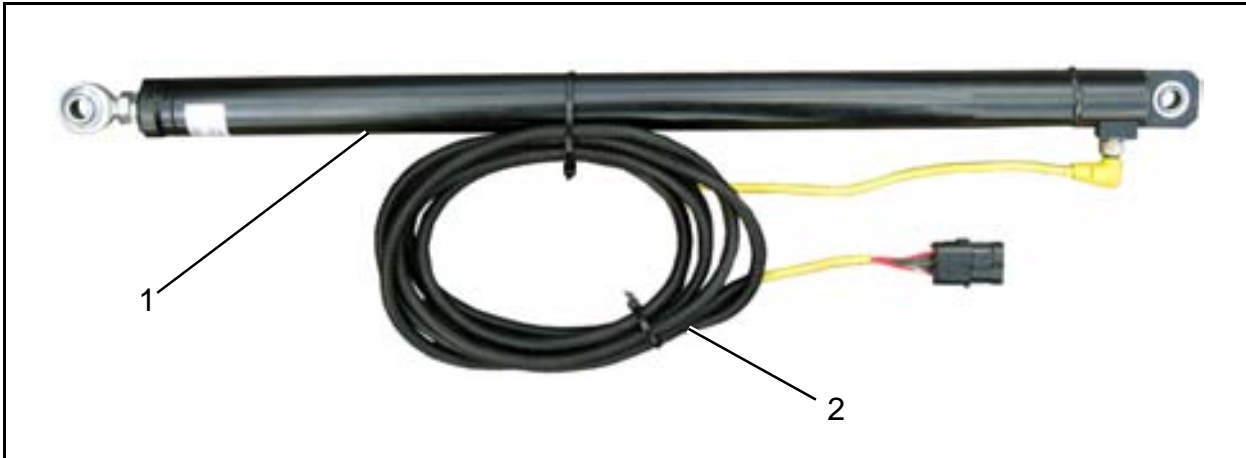
Figure 1

- ITEM:** Refers to callout and leader on corresponding illustration.
- Description:** Provides a description of item to identify size, type or application. The description is indented (**Figure 1, 6**) to indicate when the component is part of an assembly.
- Footnote:** A footnote is used when specific information is required for that item. A footnote is indicated by an "F" accompanied by a number such as F1 (**Figure 1, 7**). Additional sequential numbers are used when more than one footnote is used on the page.
- Qty:** Quantity of the part in the assembly
- MTM Part No.:** The McNeilus® part number to use when ordering replacement parts. When a component part is not available, an NSS is used to indicate that the part is Not Serviced Separately. When the application determines which part number is used, a DBA is used to indicate that the part is Determined By Application.

AutoReach Soft-Stop System

ILLUSTRATIONS and PARTS LISTS

Linear Sensor



ITEM	Description	Footnote	Qty.	MTM Part No.
1	Linear Sensor, 19" Stroke		1	1333489
2	Linear Harness, Includes 15' of 3/8" Split Loom		1	1333492
	Linear Mounts		1	1333490
3	Linear Sensor Mount, Cylinder Rod		1	1408982
4	Linear Sensor Mount, Cylinder Barrel	F1	1	1408983

Footnote

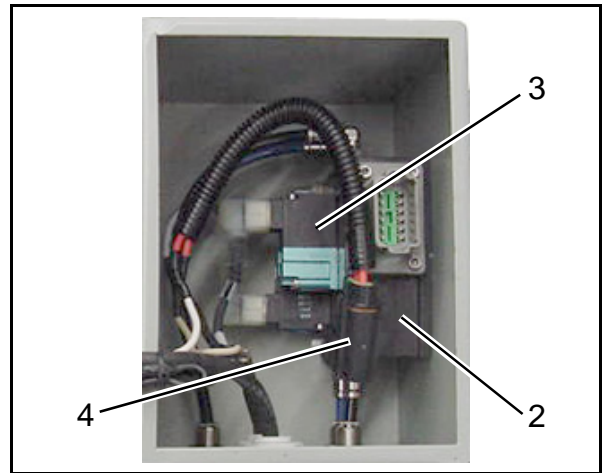
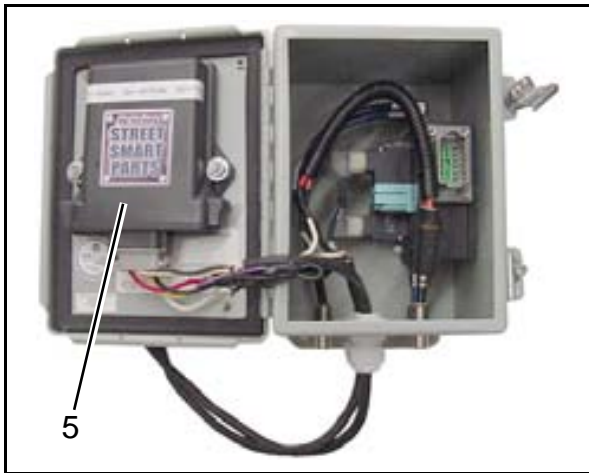
F1	The outside diameter for AutoReach dump cylinder barrel was increased effective 7/2009. The linear mount supplied in the kit will accommodate both dump cylinder barrel sizes. A spacer is supplied to be used when installing on the smaller barrel.
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AutoReach Soft-Stop System

ILLUSTRATIONS and PARTS LISTS

Control Box



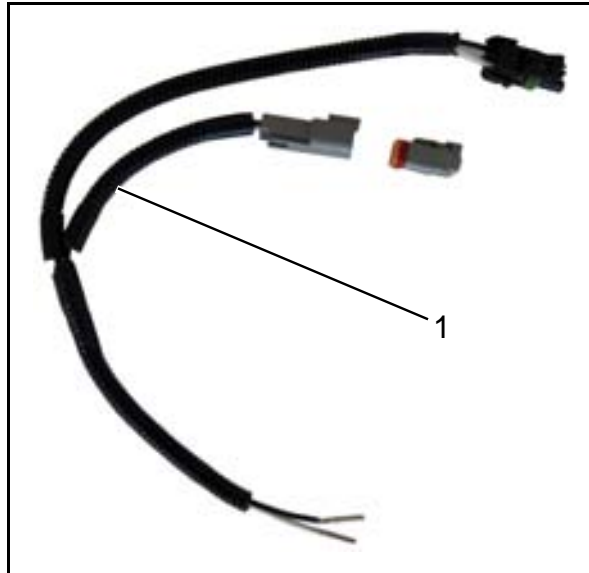
ITEM	Description	Footnote	Qty.	MTM Part No.
	Soft-Stop Control Box, AutoReach			1410088
1	Soft-Stop Control Box Enclosure	F1	1	1333487
2	Air Manifold, Without Air Valves		1	1333486
3	MAC Air Valve, 2 per Air Manifold		2	1333485
4	Fuse, 5 Amp		1	1140784
5	Controller		1	1410154
Footnote				
F1	Stubbed out with wiring harness assemblies			

AutoReach Soft-Stop System



ILLUSTRATIONS and PARTS LISTS

Power Stub Harness



ITEM	Description	Qty.	MTM Part No.
1	Power Stub Harness	1	1358681

Power Cord Extension



ITEM	Description	Qty.	MTM Part No.
1	Power Cord Extension	1	1408908



AutoReach Soft-Stop System

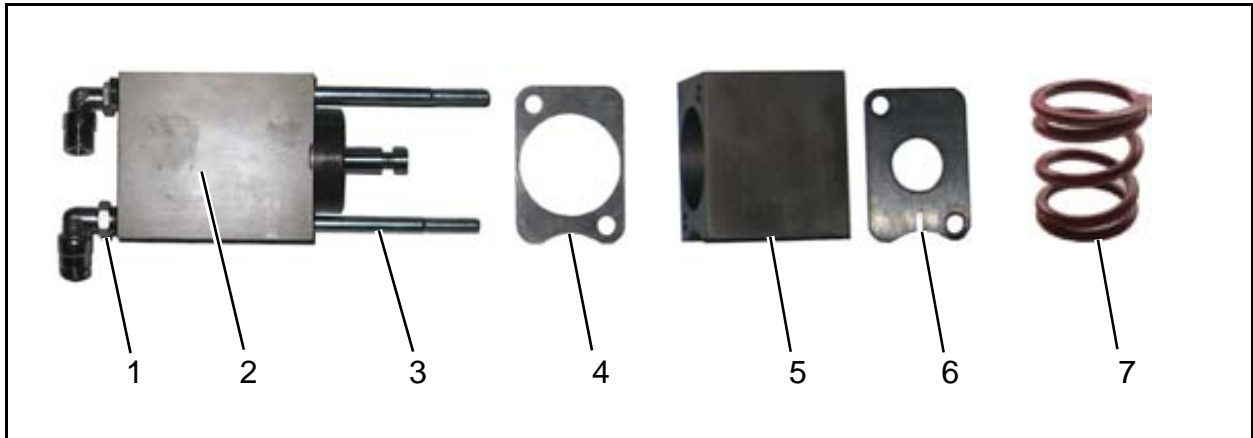
ILLUSTRATIONS and PARTS LISTS

Magnet Probe



ITEM	Description	Qty.	MTM Part No.
1	Magnet Probe	1	1410090

Air Actuator Kit



ITEM	Description	Qty.	MTM Part No.
	Kit, Air Actuator	1	1333493
1	Fitting, Air Lines	2	1410091
2	Air Actuator	1	NSS
	Seal Kit, Air Actuator	1	1371873
3	Cap Screws	2	NSS
4	Plate, Spacer	1	NSS
5	Spacer	1	NSS
6	Retainer, Spacer	1	NSS
7	Spring, VA20 Red	1	1371847

AutoReach Soft-Stop System



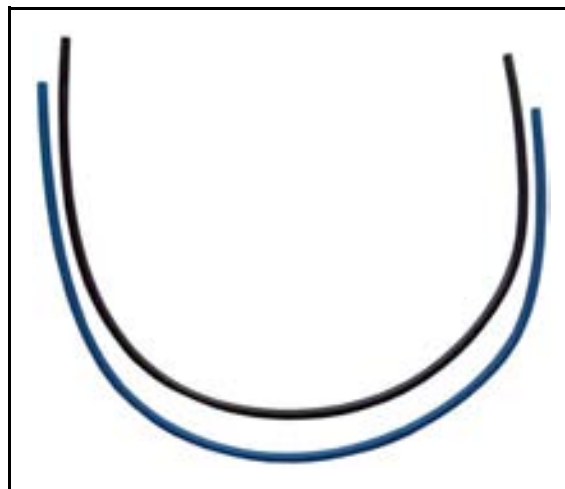
ILLUSTRATIONS and PARTS LISTS

Seal Kit, VA20



ITEM	Description	Qty.	MTM Part No.
	Seal Kit, VA20 Spool	2	1371160
1	Back-up Ring	1	NSS
2	O-Ring Seal	1	NSS

Air Line Kit



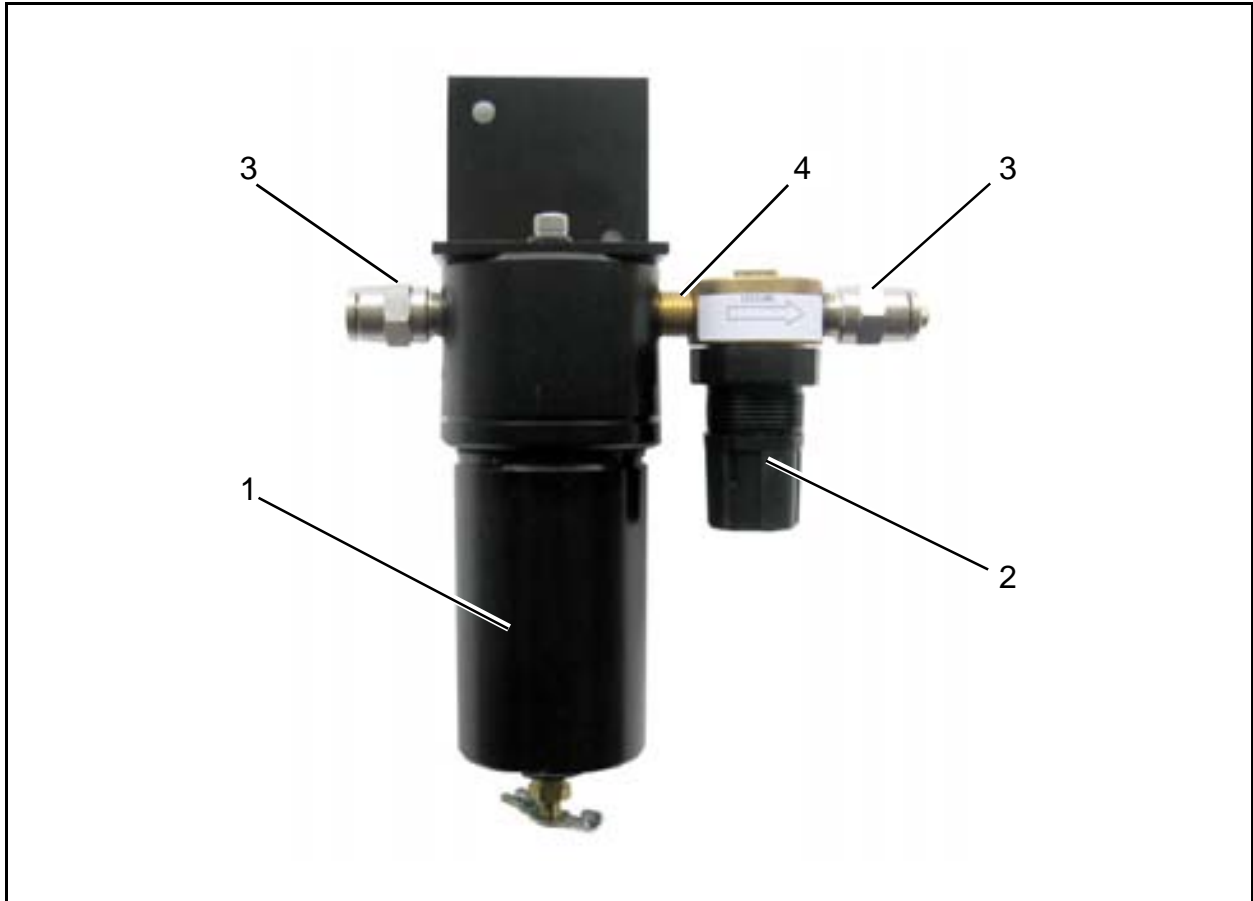
ITEM	Description	Qty.	MTM Part No.
	Air Line Kit	1	1408892
	Air Line, Blue	1	NSS
	Air Line, Black	1	NSS



AutoReach Soft-Stop System

ILLUSTRATIONS and PARTS LISTS

Air Supply Assembly

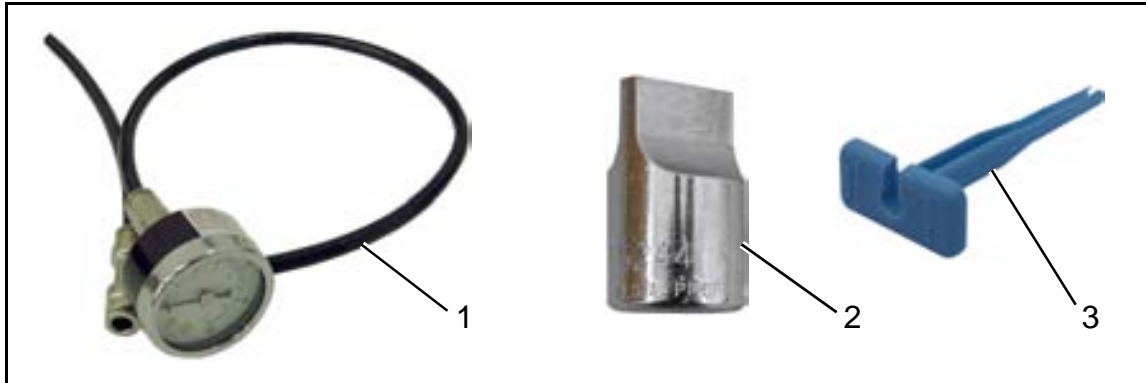


ITEM	Description	Qty.	MTM Part No.
	Air Supply Assembly	1	1408891
1	Water Separator	1	1334300
	Filter Element	1	1371872
2	Air Regulator	1	1333491
3	Fitting, Air Connection	2	1410092
4	Nipple, 1/4" NPT x 1"	1	0016167

AutoReach Soft-Stop System

ILLUSTRATIONS and PARTS LISTS

Tools



ITEM	Description	Qty.	MTM Part No.
1	Air Gauge Kit, 0-150 psi	1	1371871
2	Wide-Tip Adjustment Bit, 11/16"W x 1-1/8"L	1	1408981
3	Deutsch Extraction Tool, Blue	1	2FP669

Supplies



ITEM	Description	Qty.	MTM Part No.
1	Dielectric Grease	1	1418180
2	Loctite® Grade 262 Red	1	1410095
3	Loctite® Grade 609 Green	1	1410096

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