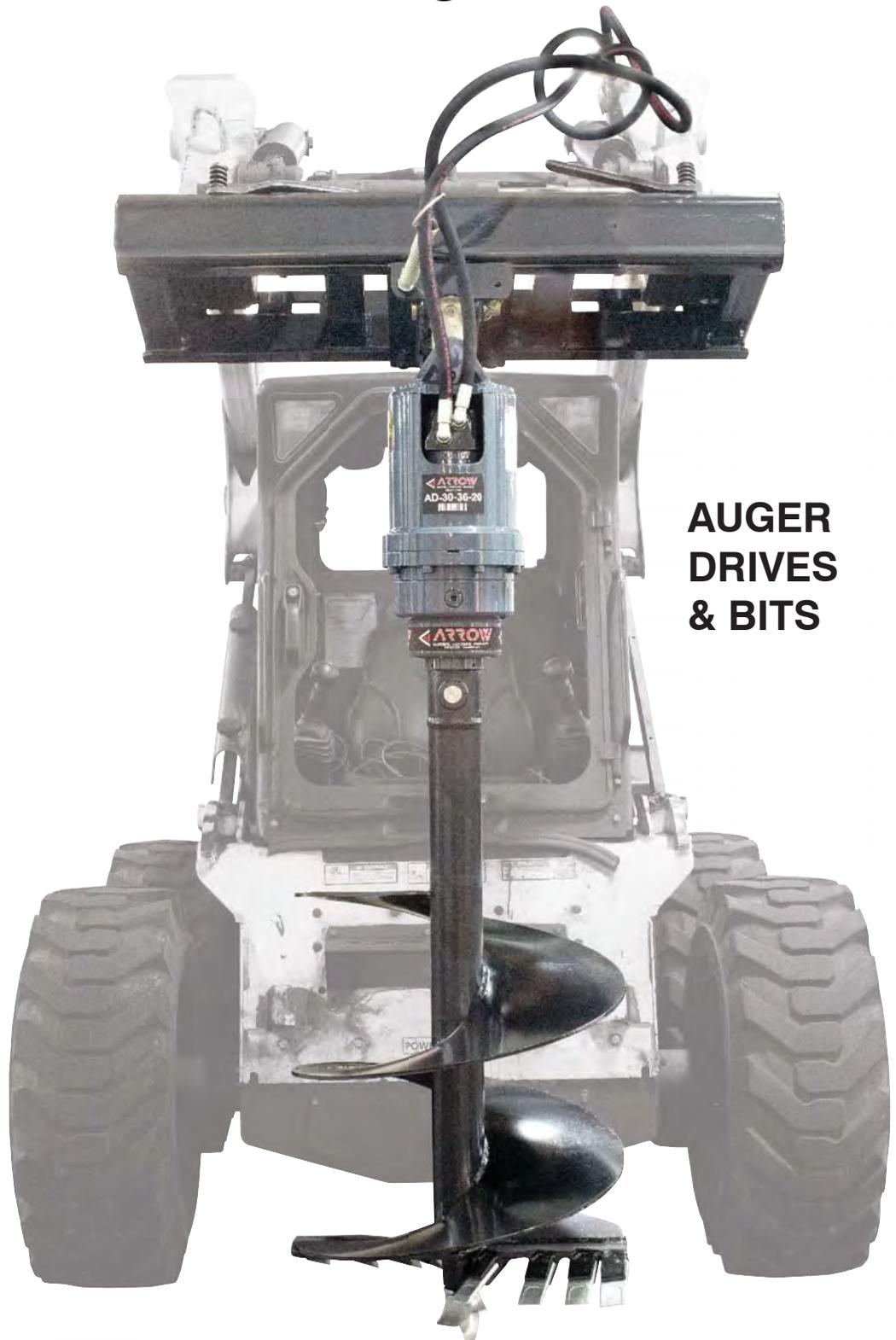


Instruction Manual & Work Safe Program



**AUGER
DRIVES
& BITS**

800-821-7563
www.ArrowMHP.com

Auger Drive Instruction Manual

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SAFETY NOTICE

SYMBOLS USED IN THIS OWNER'S MANUAL

Throughout this owner's manual (and on the attachment itself) there are universal safety symbols. They are commonly used in the equipment and attachment manufacturing industries. These symbols are meant to alert users to possible dangers when using the attachment. Please pay careful attention to any section of this owner's manual with one of these symbols.



**Read
Owner's
Manual**



**General
Warning
Hazard/Alert**



**Do Not Put
Hand In This
Area**



Flying Objects



**Pressurized
Hydraulic
Fluid**

BEFORE INSTALLATION AND OPERATION:



Be sure to read this owner's manual and understand its contents prior to operation of the ARROW Auger Drive. If there is anything in this manual you do not understand, please contact your authorized dealer, or ARROW Customer Service Department at 800-821-7563 or 913-495-4803. We will be glad to answer your questions.

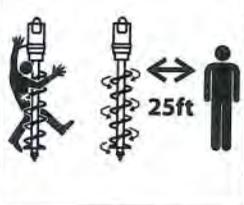
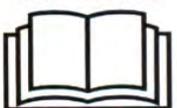
ARROW Material Handling Products (Arrow MHP) cares about your safety, and the safety of others who operate or are in the vicinity of the Auger attachment. ARROW takes great pride in engineering and building quality attachments with the operator's safety in mind, but the responsibility for the safe use of this attachment ultimately belongs to the operator.



Never let anyone operate the ARROW Auger Drive attachment unless they have first read this owner's manual.



Hydraulic Attachment machinery can be dangerous if not operated, handled or stored properly. The Auger features the following Safety Warning and Danger Labels which need to be read carefully BEFORE operation by all who will be operating or will be located near to the machine. More detailed safety information is contained on page 15.

 DANGER		 WARNING	
	<p>OPERATIONAL HAZARD</p> <p>Contact with moving parts during operation will result in death or serious injury.</p> <p>Stand minimum of 25 ft. from auger when in use. Keep earth drill in cradle during transit or when not in use.</p>		<p>HIGH PRESSURE FLUID HAZARD</p> <p>Incorrect hydraulic handling will result in death or serious injury.</p>
	<p>OPERATIONAL HAZARD</p> <p>Contact with underground or overhead cables will result in death or serious injury.</p>		<p>LIFTING HAZARD</p> <p>Equipment exceeds weight for 2 man lift. An attempt can result in death or serious injury.</p>
	<p>HIGH PRESSURE FLUID HAZARD</p> <p>Incorrect hydraulic handling will result in death or serious injury.</p> <p>Release pressure on system. Use card or wood sheet to identify leaks. Always wear safety glasses and safety gloves.</p>	<p style="color: red; font-size: small;">READ OWNERS MANUAL</p>  <p style="color: red; font-size: small;">KEEP WITH ATTACHMENT</p>	<p>WARNING</p> <p>Read Auger Drill Operator Manual thoroughly before use. Failure to do so before operating machinery can result in death or serious injury.</p>

SPECIAL NOTE: The information and illustrations contained in this ARROW Auger Drive owner's manual were current at the time of publication. ARROW Material Handling products (Arrow MHP) reserves the right to redesign all or any portion of this attachment and the owner's manual at any time without notification. For questions or concerns, or to inquire about updates, please contact your authorized dealer or the Customer Service Department at 800-821-7563 or 913-495-4803.

REGISTRATION

Complete this form and keep it with the manual.

 <p><i>16000 W. 108th Street Lenexa, Kansas 66219 p 913.495.4800 f 913.227.0523 sales@ArrowMHP.com</i></p>
MODEL NUMBER:
SERIAL NUMBER:
DATE OF MANUFACTURE:
SUPPLIER/DEALER:
DATE SOLD TO SUPPLIER/DEALER:
DATE SOLD TO ORIGINAL END USER:
OWNER OR OPERATOR:
PARENT MACHINE MAKE & MODEL:
<p>Note: Always quote the serial number in any communication with your supplier/dealer</p>

REGISTRATION

For warranty purposes this form must be completed and returned to Arrow Material Handling within 14 days of purchase by the end user.



For warranty purposes this form must be completed and returned to Arrow Material Handling



16000 W. 108th Street
Lenexa, Kansas 66219
p 913.495.4800 f 913.227.0523
sales@ArrowMHP.com

MODEL NUMBER:
SERIAL NUMBER:
DATE OF MANUFACTURE:
SUPPLIER/DEALER:
DATE SOLD TO SUPPLIER/DEALER:
DATE SOLD TO ORIGINAL END USER:
OWNER OR OPERATOR:
PARENT MACHINE MAKE & MODEL:
Note: Always quote the serial number in any communication with your supplier/dealer

For warranty purposes the form on the reverse of this page should be completed and returned to:

Arrow Material Handling Products, LLC
16000 W. 108th Street
Lenexa, Kansas 66219

Alternatively, if your machine has a pre-installation checks label, shown below, just fill in the details on the back and mail it to us. The address is pre-printed on the front.



INTRODUCTION

Arrow Material Handling Products, LLC (Arrow MHP) thanks you for purchasing your new product. This operating manual has been prepared to enable you to operate the equipment in a safe manner.

Arrow Auger Drive Units have been designed for use with specific Arrow mounting frames, Augers, Auger extensions and Auger replacement parts. Provided these are used and maintained correctly, they will provide a safe and reliable method of boring holes in the earth. (For information on lubrication and maintenance intervals, see pages 25 to 29)

Before operating the Arrow Auger Drive, please note:

- Your Auger Drive comes complete, filled with the correct amount of oil. There is no need to check the oil level.
- Hydraulic hoses must be inserted and tightened to the correct torque (see page 15).
- If a case drain hose is fitted to your unit, it must be connected correctly (see page 15).
- The unit must be run following the recommended procedure (see page 22).



Warning, Cautions and Notes

This symbol is used to highlight important messages. When you see this symbol, be alert to the possibility of injury to yourself or others. Carefully read the messages that accompany it.

NOTE:

This operating manual should be used in conjunction with the parent machine's operating instructions.

Instruction books should be regarded as part of the machine. They should always be kept safe with the machine for easy and quick reference.

New or extra copies can be obtained from your dealer or direct from Arrow MHP.

Arrow Auger Drive Units have been designed for use with specific parent machines along with the Arrow range of mounting frames, Augers, Auger extensions and Auger replacement parts. Provided these are used and maintained correctly, they will provide a safe and reliable method of boring holes in the earth.

Arrow MHP continually strives to improve and increase its range of products and therefore reserves the right to alter its specifications at any time without notice or obligation. The company accepts no responsibility for discrepancies which may occur between specifications of its products and descriptions thereof contained in its publications.

When ordering spare or replacement parts please quote the serial number of the Auger Drive, which can be identified by the serial number plate.

NEVER COMPROMISE ON SAFETY IT COULD CAUSE SERIOUS INJURY OR DEATH.

All operators must read and ensure they fully understand all of the safety, operating and maintenance instructions before using the Auger Drive unit .



If you are in any doubt as to any of the instructions or information provided you must contact your dealer or Arrow Material Handling before attempting to use the Auger Drive unit.

SAFETY PRECAUTIONS



DANGER: IMMEDIATE HAZARD! - Failure to understand, follow, or obey this information is likely to result in personal injury or death.

WARNING: Failure to follow these instructions may result in personal injury or death.

CAUTION: Failure to follow these instructions may result in minor personal injury or damage to the machine or the vehicle.

NOTICE: This is important information for the proper use of this equipment. Failure to comply may lead to premature equipment failure.

CLEAN OR REPLACE THE SAFETY LABELS IF THEY CANNOT BE CLEARLY READ OR UNDERSTOOD

NEVER operate or assemble the Auger Drive without **fully** understanding the operating instructions of both the Auger Drive unit and the parent machine. Arrow recommends you receive instruction before operating the Auger Drive unit.

NEVER operate the Auger Drive unless you are in good physical condition and mental health.

NEVER operate the Auger Drive under the influence of any substance (including drugs and alcohol), which might impair vision, dexterity and/or judgment.

NEVER operate the Auger Drive with worn, damaged or missing parts. Only use genuine Arrow replacement parts.

NEVER allow bystanders (including animals) within 25 ft. of the work area or allow minors to operate the Auger Drive unit.

NEVER drill beyond the length of the Auger.

NEVER expose fuel or lubricants to any possible source of ignition.

NEVER wear clothing that could become entangled with the Auger Drive.

ALWAYS survey the work area before work. Boring below ground risks electrocution and explosion through contact with unseen hazards such as electrical cables, communication lines, water, and gas lines.

ALWAYS ensure that the parent machine is secure and stable with its engine switched off and hydraulic system depressurised before carrying out any maintenance work.

ALWAYS protect yourself and the environment. Hydraulic oil, lubricants and exhaust fumes are toxic.

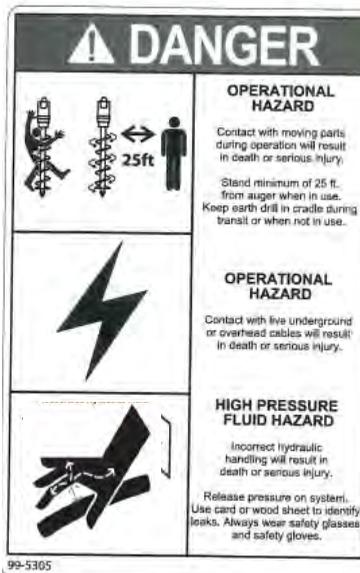
ALWAYS tie back long hair and remove jewelry before work. Wear suitable clothing that is close fitting while allowing freedom of movement.

ALWAYS protect hands - Auger parts are sharp and high pressure hydraulic fluid can penetrate the skin. Select gloves that are non-slip to improve grip and ones that protect against contact with oils and greases. Use cardboard or wood to locate any leaks.

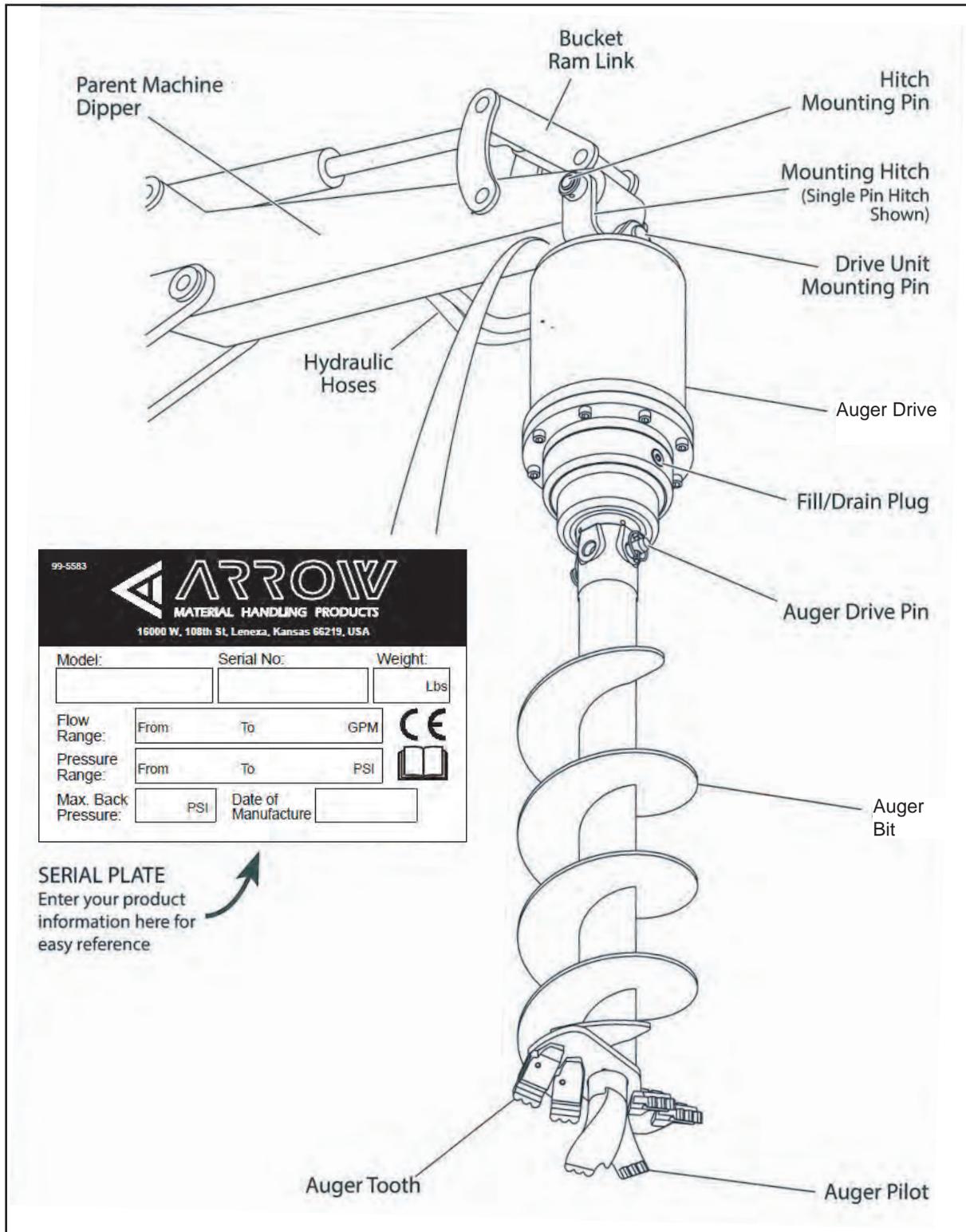
ALWAYS protect feet with safety boots (non-slip soles and steel-toe are recommended). Auger and drive parts are heavy and sharp.

ALWAYS wear head protection and eye protection when working on the Auger Drive.

ALWAYS follow parent machine instructions regarding noise protection.



IDENTIFICATION - Typical Setup



99-5583

ARROW
MATERIAL HANDLING PRODUCTS
16000 W. 108th St. Lenexa, Kansas 66219, USA

Model:	Serial No.:	Weight:
<input type="text"/>	<input type="text"/>	<input type="text"/> Lbs
Flow Range:	From: <input type="text"/> To: <input type="text"/>	GPM 
Pressure Range:	From: <input type="text"/> To: <input type="text"/>	PSI 
Max. Back Pressure:	<input type="text"/> PSI	Date of Manufacture: <input type="text"/>

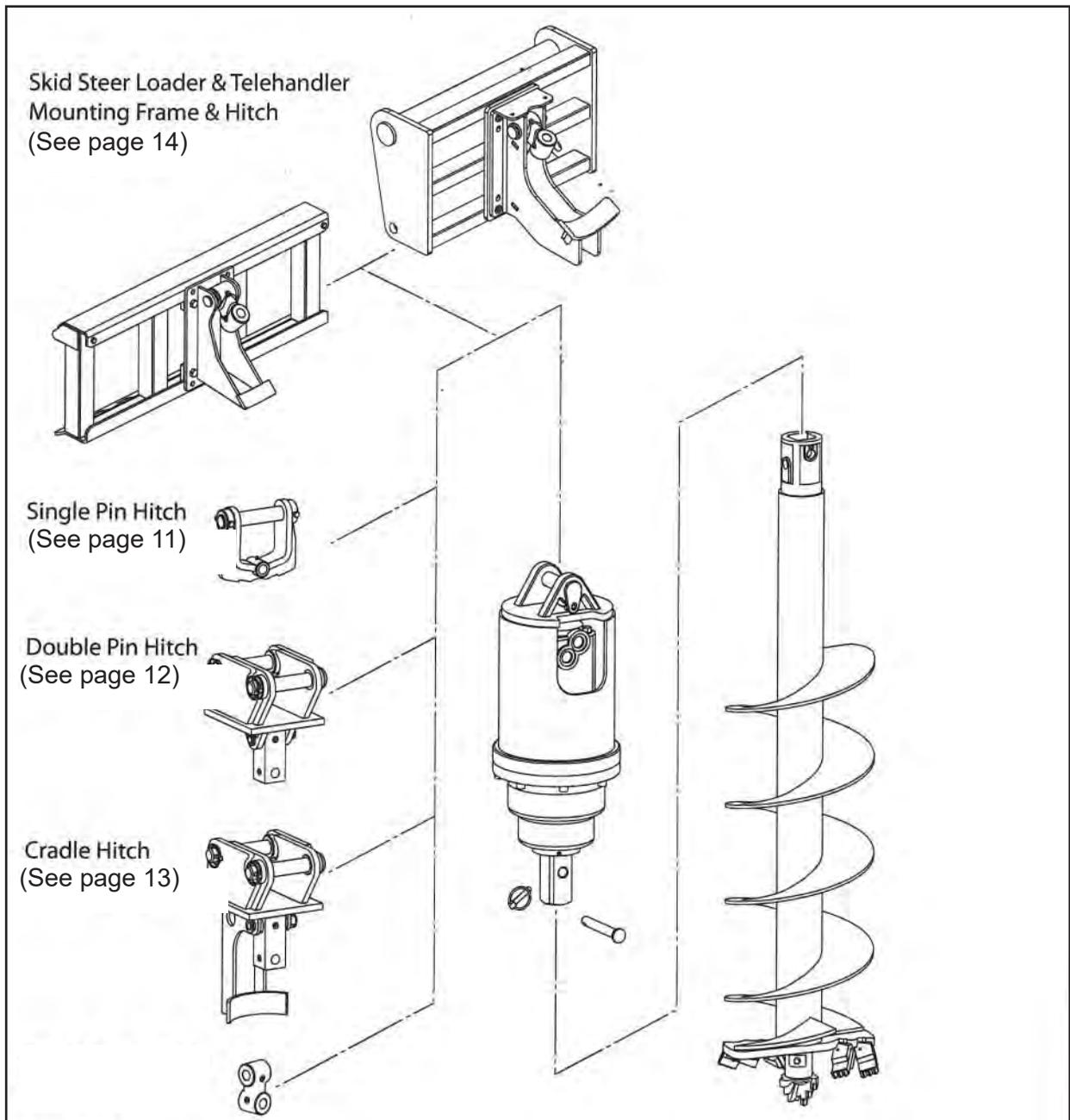
SERIAL PLATE
Enter your product information here for easy reference

IDENTIFICATION - Attachment Parts



ALWAYS work in pairs (2 skilled operators) whenever Auger Drive unit components are being assembled or disassembled from the parent machine. Always check the weight of the attachment and ensure you have the correct equipment for handling it.

First fit the mounting frame to the parent machine. Use the illustration below to find the correct fitting instructions for your machine.



MOUNTING HITCH FITTING - Single Pin Hitch



SAFETY FIRST

ALWAYS work in pairs (2 skilled operators) whenever Auger Drive unit components are being assembled or disassembled from the parent machine. Always check the weight of the attachment and ensure you have the correct equipment for handling it.



ALWAYS check parent machine:

- Is in correct working order
- Is parked correctly on flat ground
- Has its hand brake **ON**, its hydraulic circuit locked out and its engine switched **OFF**

Check that the mounting frame is of the correct model and type to fit the parent machine.

Ensure mounting frame and attachment points are clean before fitting.

Use suitably rated lifting equipment if required (see data plate for weight).



NOTE: The single Pin Hitch **CANNOT** be fitted to a quick Hitch.

FITTING Ensure all components are greased on assembly:

Set the Auger Drive unit horizontally, with the output shaft towards the parent machine as in Fig A.

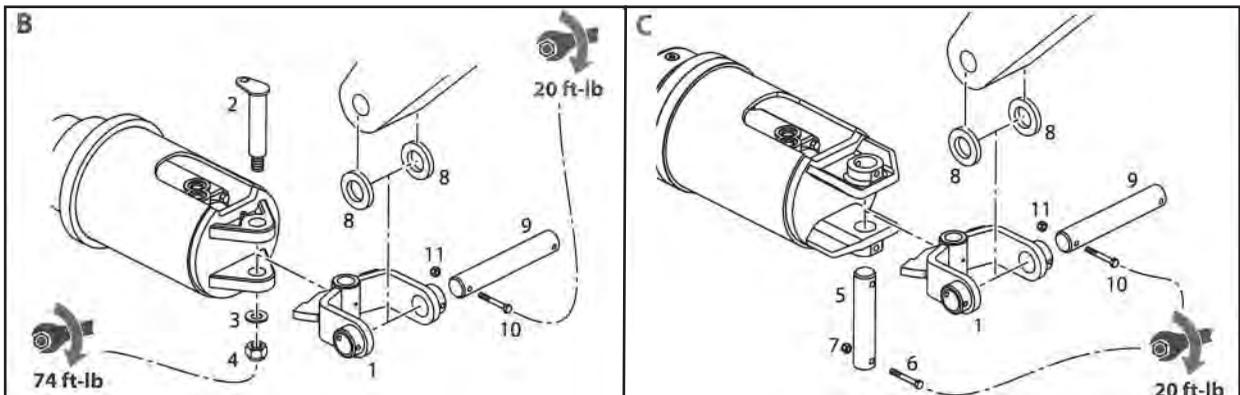
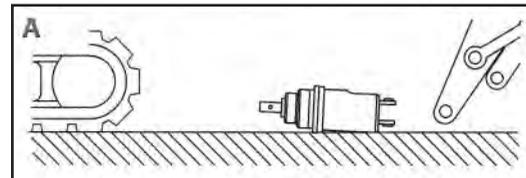
There are two types of Pins for fitting the hood to the Mounting Hitch (1) :

The Threaded Mounting Pin (item 2, Fig B) Has a locating plate with a hole that fits over a peg in the hood ear. Align the Pin holes, fit the Pin (2), washer (3) and nylon insert nut (4) and torque to 74 ft-lb.

To fit the **Through-Bolted Mounting Pin** (item 5, Fig C) Align the Pin holes and push the Pin (5) fully home taking care to line up the Through-Bolt holes. At both ends of the Pin fit the Through-Bolts (6) and Nylon Insert Nuts (7) and tighten to 20 ft-lb.

Fitting to the parent machine is with Through-Bolted Pins In all cases:

Align the Pin holes of the mounting Hitch (1) and parent machine, Align bolt location holes fit spacers (8) if required to centralize the Hitch. Push the Pin (9) fully home, taking care to line up the Through-Bolt holes. Fit the Through Bolts (10) and Nylon Insert Nuts (11) and tighten to 20 ft-lb.



Once fitted, check that the Auger Drive swings freely in all directions.

MOUNTING HITCH FITTING - Double Pin Hitch



SAFETY FIRST

ALWAYS work in pairs (2 skilled operators) whenever Auger Drive unit components are being assembled or disassembled from the parent machine. Always check the weight of the attachment and ensure you have the correct equipment for handling it.



ALWAYS check parent machine:

- Is in correct working order
- Is parked correctly on flat ground
- Has its hand brake **ON**, its hydraulic circuit locked out and its engine switched **OFF**.

Check that the mounting frame is of the correct model and type to fit the parent machine.

Ensure mounting frame and attachment points are clean before fitting.

Use suitably rated lifting equipment if required (see data plate for weight).

READ OWNERS MANUAL



KEEP WITH ATTACHMENT



NOTE: If a quick Hitch is fitted to the parent machine, refer to the quick Hitch manufacturer's installation instructions for correct fitting procedure.

FITTING: Ensure all components are greased on assembly. Set the Auger Drive unit horizontally, with the output shaft towards the parent machine as in Fig A.

There are two types of Pins for fitting the hood to the Mounting Hitch (1):

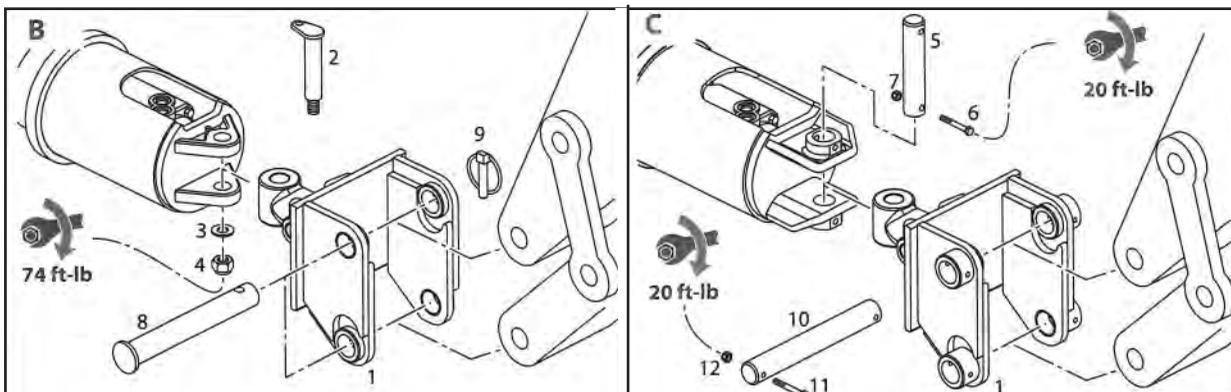
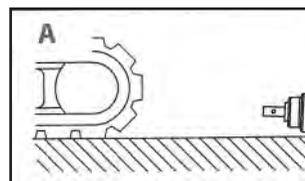
The Threaded Mounting Pin (item 2, Fig B) Has a locating plate with a hole that fits over a peg in the hood ear. Align the Pin holes, fit the Pin (2), washer (3) and nylon insert nut (4) and torque to 74 ft-lb.

To fit the **Through-Bolted Mounting Pin** (item 5, Fig C) Align the Pin holes and push the Pin (5) fully home taking care to line up the Through-Bolt holes. At both ends of the Pin fit the Through-Bolts (6) and Nylon Insert Nuts (7) and tighten to 20 ft-lb.

There are two types of Pin for fitting the Mounting Hitch (1) to the parent machine:

To attach a **linch Pin** fitting (item 8, Fig B), align the Pin holes, push the Pin (8) fully home and fit the linch Pin (9).

To fit the **Through-Bolted mounting Pin** (10, Fig C), align the Pin holes and push the Pin (10) fully home taking care to line up the Through-Bolt holes, fit the Through-Bolts (11) and Nylon Insert Nuts (12) and tighten to 20 ft-lb.



MOUNTING HITCH FITTING - Cradle Hitch



SAFETY FIRST

ALWAYS work in pairs (2 skilled operators) whenever Auger Drive unit components are being assembled or disassembled from the parent machine. Always check the weight of the attachment and ensure you have the correct equipment for handling it.



ALWAYS check parent machine:

- Is in correct working order
- Is parked correctly on flat ground
- Has its hand brake **ON**, its hydraulic circuit locked out and its engine switched **OFF**.

Check that the mounting frame is of the correct model and type to fit the parent machine.

Ensure mounting frame and attachment points are clean before fitting.

Use suitably rated lifting equipment if required (see data plate for weight).

NOTE: If a quick Hitch is fitted to the parent machine, refer to the quick Hitch manufacturer's installation instructions for correct fitting procedure.



FITTING: Ensure all components are greased on assembly. Set the Auger Drive unit horizontally in the Cradle Hitch, with the output shaft towards the parent machine as in Fig A.

There are two types of Pins for fitting the hood to the Mounting Hitch (1):

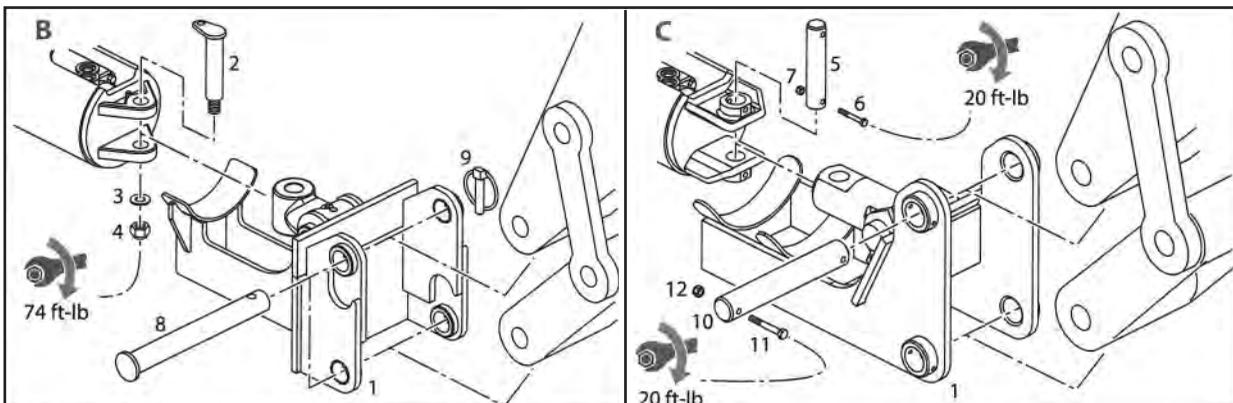
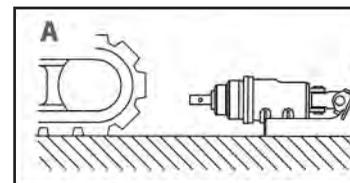
The Threaded Mounting Pin (item 2, Fig B) has a locating plate with a hole that fits on a peg in the hood ear. Align the Pin holes, fit the Pin (2), washer (3) and nylon insert nut (4) and torque to 74ft-lb.

To fit the **Through-Bolted Mounting Pin** (item 5, Fig C) align the Pin holes and push the Pin (5) fully home taking care to line up the Through-Bolt holes. At both ends of the Pin fit the Through-Bolts (6) and Nylon Insert Nuts (7) and tighten to 20 ft-lb.

There are two types of Pins for fitting the Mounting Hitch (1) to the parent machine:

To attach a **linch Pin** fitting (item 8, Fig B), align the Pin holes, push the Pin (8) fully home and fit the linch Pin (9).

To fit the **through-bolted mounting Pin** (10, Fig C), align the Pin holes and push the Pin (10) fully home taking care to line up the Through Bolt holes, fit the Through Bolts (11) and Nylon Insert Nuts (12) and tighten to 20 ft-lb.



MOUNTING HITCH FITTING - Skid Steer Loader & Telehandler



SAFETY FIRST

ALWAYS work in pairs (2 skilled operators) whenever Auger Drive unit components are being assembled or disassembled from the parent machine. Always check the weight of the attachment and ensure you have the correct equipment for handling it.



ALWAYS check parent machine:

- Is in correct working order
- Is parked correctly on flat ground
- Has its hand brake **ON**, its hydraulic circuit locked out and its engine switched **OFF**

Check that the mounting frame is of the correct model and type to fit the parent machine.

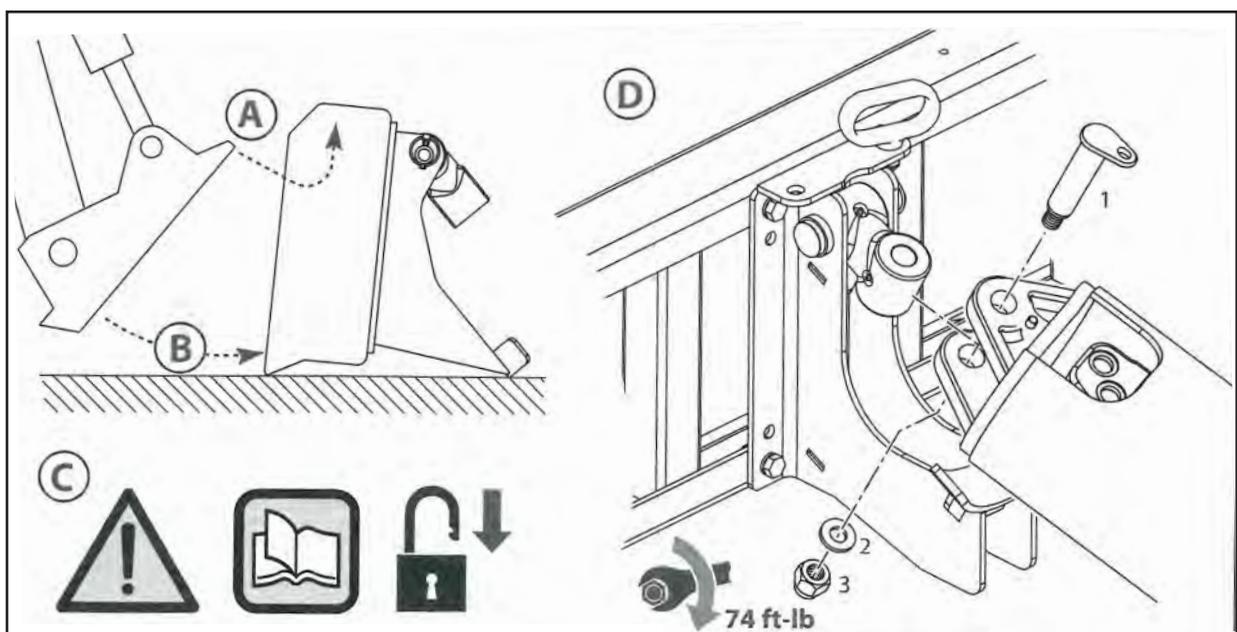
Ensure mounting frame and attachment points are clean before fitting.

Use suitably rated lifting equipment if required (see data plate for weight).



FITTING: Ensure all components are greased on assembly:

- A. Slot the top of the parent machine frame under the top edge of the Mounting Frame
- B. Swing the parent machine frame to the vertical position
- C. Following the parent machine operator's manual, ensure that the Mounting Frame is securely locked in place.
- D. Working as a pair, lift the Auger Drive in to place with the port opening facing upwards. Align hood ears with the hole in the linkage block. Secure the Auger Drive with the Pin (1), Washer (2), and Nylon Insert Nut (3) and torque to 74 ft-lb.



HYDRAULIC CONNECTIONS



WARNING:

Hydraulic fluid under pressure can penetrate the skin or eyes and cause serious personal injury, blindness or death. Fluid leaks under pressure may not be visible. Use a piece of card or wood to find leaks. **DO NOT** use your bare hands. Wear safety goggles to protect your eyes. If any fluid is injected into the skin, it **MUST** be surgically removed. Seek immediate medical attention.

All Arrow Auger Drive Units require a 'flow' and 'return' of hydraulic oil from the parent machine's auxiliary hydraulic power supply to operate. All gearboxes are reversible, but require the host machine to be fitted with a two-way flow auxiliary circuit. (Check with parent machine dealer for advice).

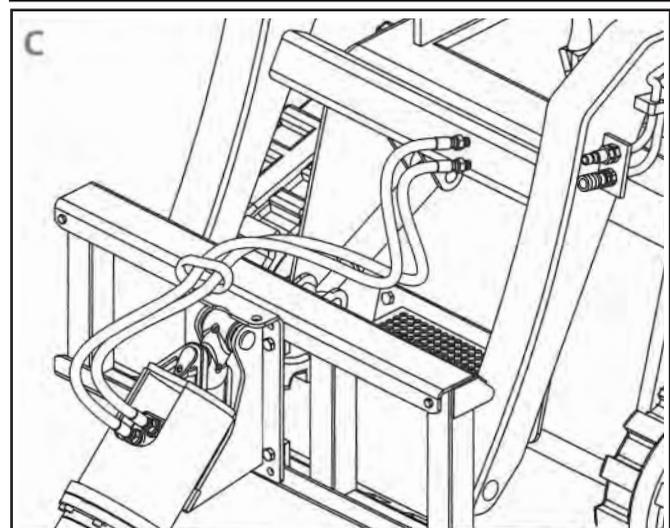
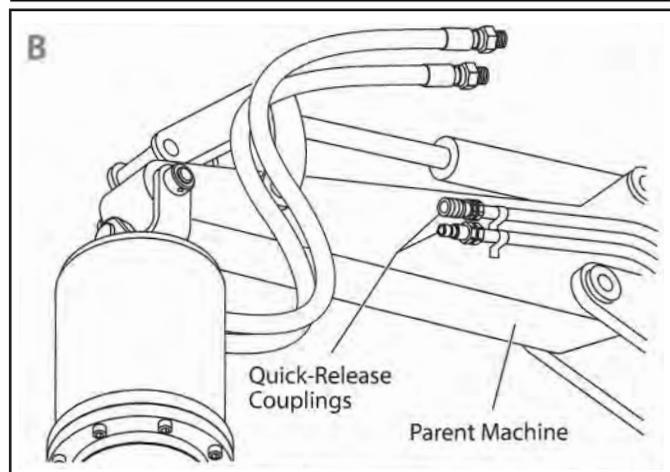
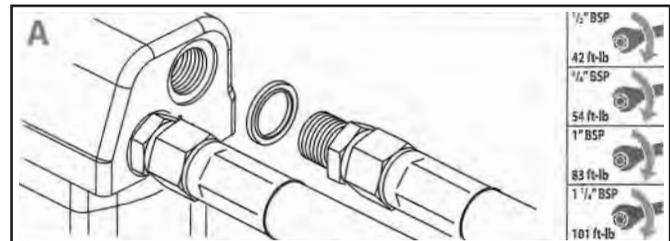
When fitting hydraulic hoses, ensure that they are tightened to the correct torque for the hose fittings (Fig A).

Quick Release Couplers are required for connection to the parent machine, but may not be supplied with the unit. These can be sourced locally and should be compatible with the auxiliary hydraulic Quick Release Couplers on the parent machine (Figs B & C). The parent machine auxiliary hydraulic connections are normally located near the end of the loader arms, excavator dipper or truck crane booms.

Ensure that the drilling rotation of the Auger Drive Unit is clockwise.

It is critical that the supply of oil is within the stated flow & pressure limits for the particular Auger Drive.

Refer to the serial plate on the top of the Auger Drive hood (see page 9).



FITTING THE AUGER



SAFETY FIRST

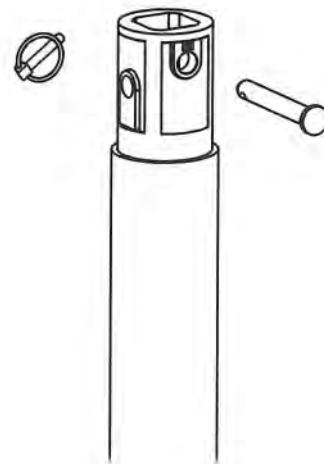
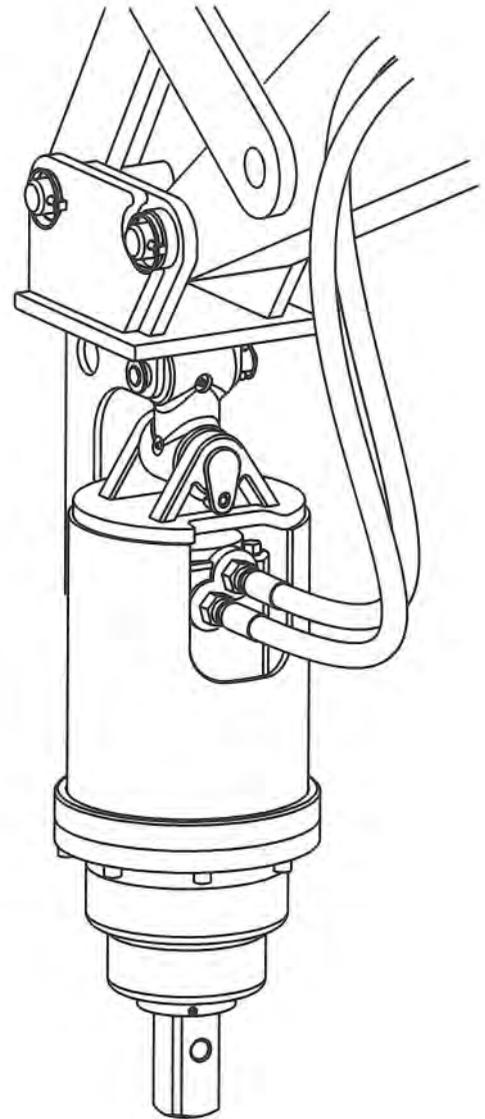
ALWAYS work in pairs (2 skilled operators) whenever Auger Drive unit components are being assembled or disassembled from the parent machine.



ALWAYS check parent machine:

- Is in correct working order
- Is parked correctly on flat ground
- Has its hand brake **ON**, its hydraulic circuit locked out and its engine switched **OFF**.

- **CHECK** that the Auger Bit is the correct model and type to fit the Auger Drive Unit.
- **ENSURE** that the Auger connections are clean before fitting.
- **USE** suitably rated lifting equipment if required (see data plate for weight).
- Position the Auger in the vertical work position and support it so that it cannot fall over.
- Position the Auger Drive over the Auger Bit and align the pin holes.
- Lower the Auger Drive Unit onto the Auger Bit
- Locate the Auger Drive Pin
- Secure the Auger Drive Pin with Linch Pin



PREPARATION



CONSIDER the topography (e.g. risk of subsidence, slope angle, position to embankments and any previous excavation) .



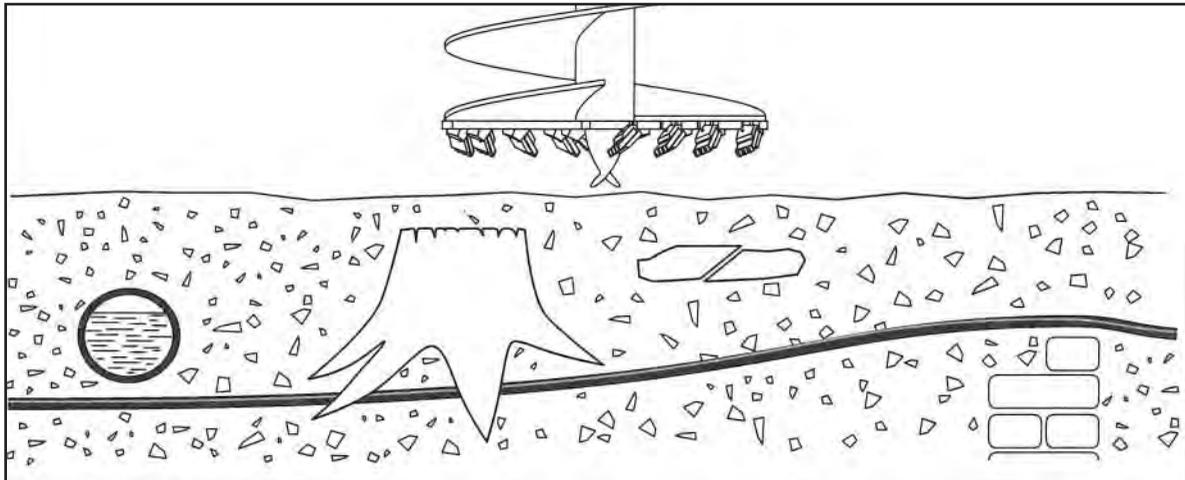
NOTE the type of soil and its condition to enable selection of suitable teeth and pilot

ALWAYS carry out a site survey and risk assessment **BEFORE** starting work

AVOID underground hazards, such as water / gas / electricity / communication lines etc.



If in doubt detection equipment and professional advice should always be considered before carrying out any work.



DRILLING WITH FIXED EXTENSIONS

When the required hole depth is greater than the length of the Auger, an Extension should be used. **DO NOT** allow the Auger Drive to enter the hole as seals can be damaged by soil being extracted.

SAFETY FIRST

Whenever Auger Drive Unit components are being assembled or disassembled from the parent machine **ALWAYS** work in pairs (2 skilled operators).

While fitting components **ALWAYS** check parent machine:

- Is in correct working order
- Is parked correctly on flat ground
- Has its hand brake **ON**, its hydraulic circuit locked out and its engine switched **OFF**.

CHECK that the Extension is the correct model and type to fit the Auger Drive Unit and Auger Bit.

ENSURE that all Auger Drive, Auger Bit and Extension connections are clean before fitting.

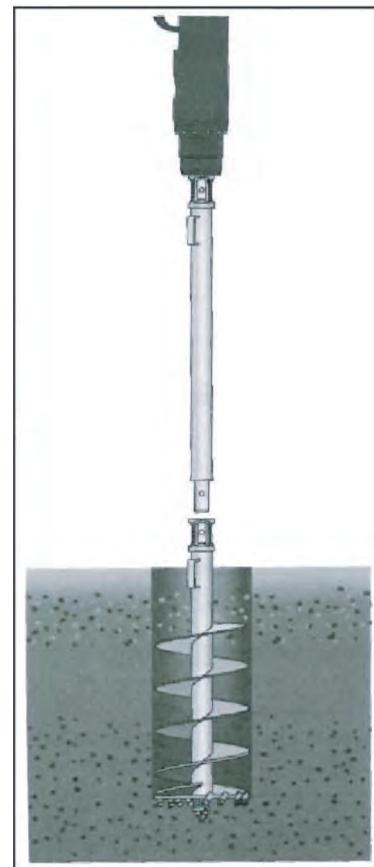
USE suitably rated lifting equipment if required.

When using extensions in drilling operations, a length of lumber is required for supporting the Auger while removing the Extension. The lumber must be of minimum dimensions 2" (51mm) x 6" (152mm) and long enough to span the hole being drilled, plus an additional 12" (305mm) length at each end.

FITTING A FIXED EXTENSION

When the hole has been drilled to the point where the top of the auger comes within 8" (203mm) above ground level:

- Stop drilling
- Remove the Auger Drive from the hole and clear the spoil from the Auger Bit.
- Lower the auger back into the hole so that its' weight is supported and remove the Linch Pin and Auger Drive Pin.
- Lift the Auger Drive clear of the Auger Bit and swing it to one side, clear of the hole and set it to a height that will allow the extension to be fitted easily.
- Position the Extension in the vertical work position and support it so that it cannot fall over.
- Position the Auger Drive over the Extension and align the pin holes.
- Lower the Auger Drive Unit onto the Extension.
Insert the Extension Drive Pin.
- Secure the Extension Drive Pin with Linch Pin.
- Position the Auger Drive and Extension over the Auger Bit and align the pin holes.
- Lower the Auger Drive and Extension onto the Auger Bit.
- Insert the Auger Drive Pin.
- Secure the Auger Drive Pin with Linch Pin.
- Continue drilling.



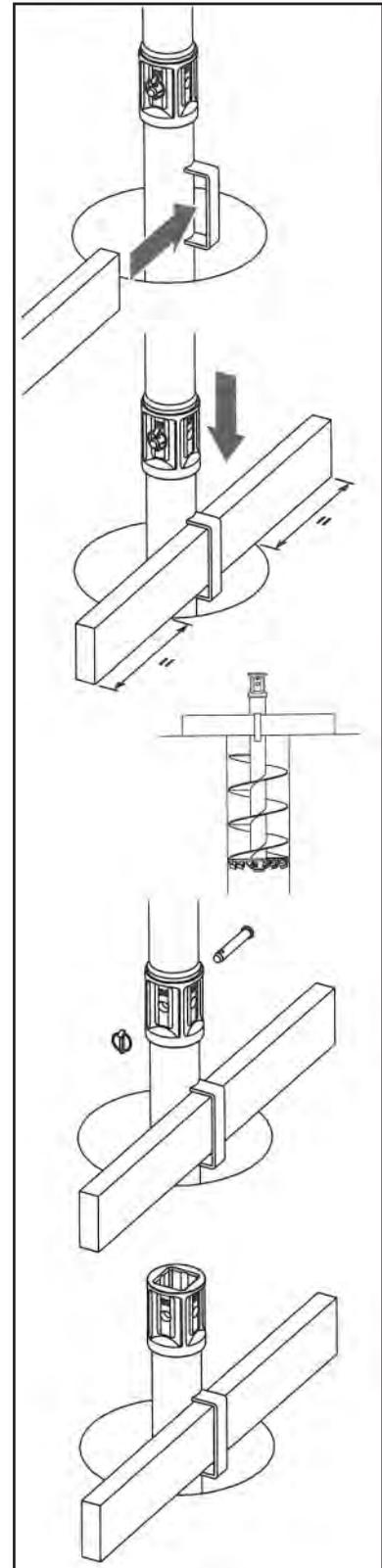
REMOVING A FIXED EXTENSION

If the parent machine has a high reach, it may be possible to lift the auger clear of the hole to clear the soil without removing the Extension. For smaller machines, and in cases where multiple Extensions are being used, it may be necessary to remove the Extension first.

- Lift the Auger Drive until the Auger Handle is clear of the ground and insert the timber support through the handle.
- Lower the Auger Drive until the weight of the Auger and Extension are supported by the timber. Make sure that the load is spread equally on either side of the hole.
- Remove the Linch Pin and Auger Drive Pin.
- Lift the Auger Drive until the Extension is clear of the Auger Bit and swing it to one side, clear of the hole and set it to a height that will allow safe removal of the extension.
- Support the weight of the Extension.
- Remove the Linch Pin and Extension Drive Pin.
- Remove the Extension and lay it on the ground.
- Position the Auger Drive over the Auger Bit and align the pin holes.
- Lower the Auger Drive Unit onto the Auger Bit.
- Insert the Auger Drive Pin.
- Secure the Auger Drive Pin with the Linch Pin.
- Lift the Auger Drive to remove the load from the timber support.
- Remove the timber support.

MULTIPLE FIXED EXTENSIONS

Following the procedures above, multiple fixed Extensions may be added to further increase the hole depth. As with the Auger, each Extension is fitted with a handle through which the timber support can be inserted to support the Extension while adding or removing additional Extensions.



DRILLING WITH TELESCOPIC EXTENSIONS

Telescopic Extensions enable the drilling holes deeper than the Auger length, without the need to remove the Extension to extract the Auger Bit.

DO NOT allow the Auger Drive to enter the hole as seals can be damaged by soil being extracted.

SAFETY FIRST

Whenever Auger Drive Unit components are being assembled or disassembled from the parent machine **ALWAYS** work in pairs (2 skilled operators).

While fitting components, **ALWAYS** check parent machine:

- Is in correct working order
- Is parked correctly on flat ground
- Has its hand brake **ON**, its hydraulic circuit locked out and its engine switched **OFF**.

CHECK that the Extension is the correct model and type to fit the Auger Drive Unit and Auger Drive.

ENSURE that all Auger Drive, Auger Bit and Extension connections are clean before fitting.

USE suitably rated lifting equipment if required.

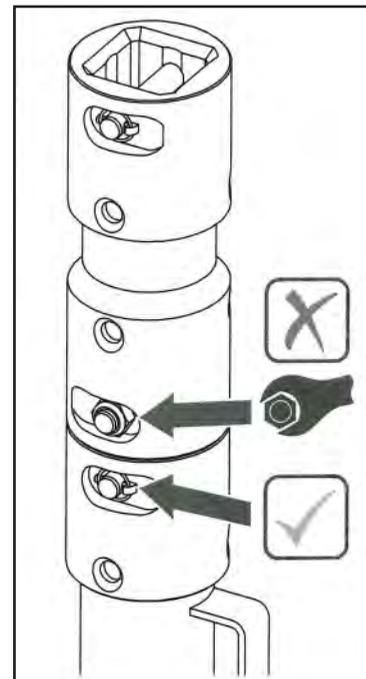
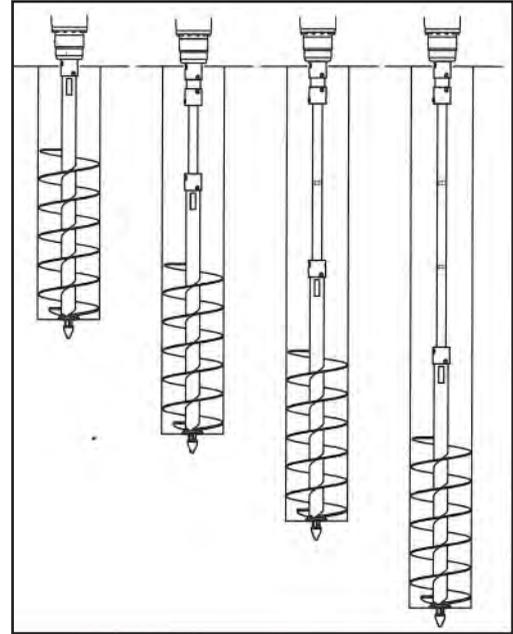
When using Telescopic Extensions in drilling operations, a length of lumber is required for supporting the Auger while adjusting the Extension. The lumber must be of minimum dimensions 2" (51mm) x 6" (152mm) and long enough to span the hole being drilled, plus an additional 12" (305mm) length at each end.

FITTING A TELESCOPIC EXTENSION

NOTE: The Telescopic Extension Hub is bolted to the Extension Shaft, **DO NOT** remove this bolt. The extension is fixed to the Auger with a pin and linch pin.

The Telescopic Extension can be fitted before drilling commences:

- Insert the Extension into the Auger Bit, ensuring that the pin holes line up.
- Fix the extension at the top pin hole (the shortest setting).
- Position the Auger and Extension in the vertical work position and support it so that it cannot fall over.
- Position the Auger Drive over the Auger and Extension and align the pin holes.
- Lower the Auger Drive Unit onto the Extension.
- Insert the Extension Drive Pin.
- Secure the Extension Drive Pin with Linch Pin.
- Commence drilling.



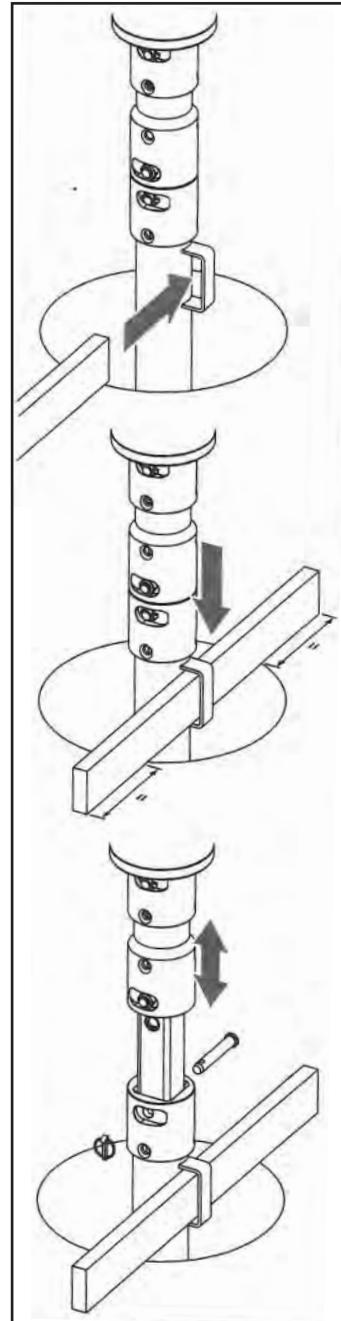
ADJUSTING A TELESCOPIC EXTENSION

To adjust the Extension length:

- Lift the Auger Drive until the Auger Handle is clear of the ground and insert the timber support through the handle.
- Lower the Auger Drive until the weight of the Auger and Extension are supported by the timber. Make sure that the load is distributed equally on either side of the hole.
- Remove the Linch Pin and Auger Drive Pin.
- Lift the Auger Drive until the desired Extension length is achieved and the holes in the Auger and Extension line up.

NOTE: The shaft of the Telescopic Extension has a red painted portion at the bottom end. When lifting the shaft out to increase the Extension length, the appearance of the red area above the Auger hub indicates that you are approaching the longest setting and the end of the shaft. Careful height adjustment in this area prevents the shaft coming out of the Auger and having to be lined up and re-inserted.

- Insert the Auger Drive Pin.
- Secure the Auger Drive Pin with the Linch Pin.
- Lift the Auger Drive to remove the load from the timber support.
- Remove the timber support.



RUNNING-IN (BREAKING-IN)

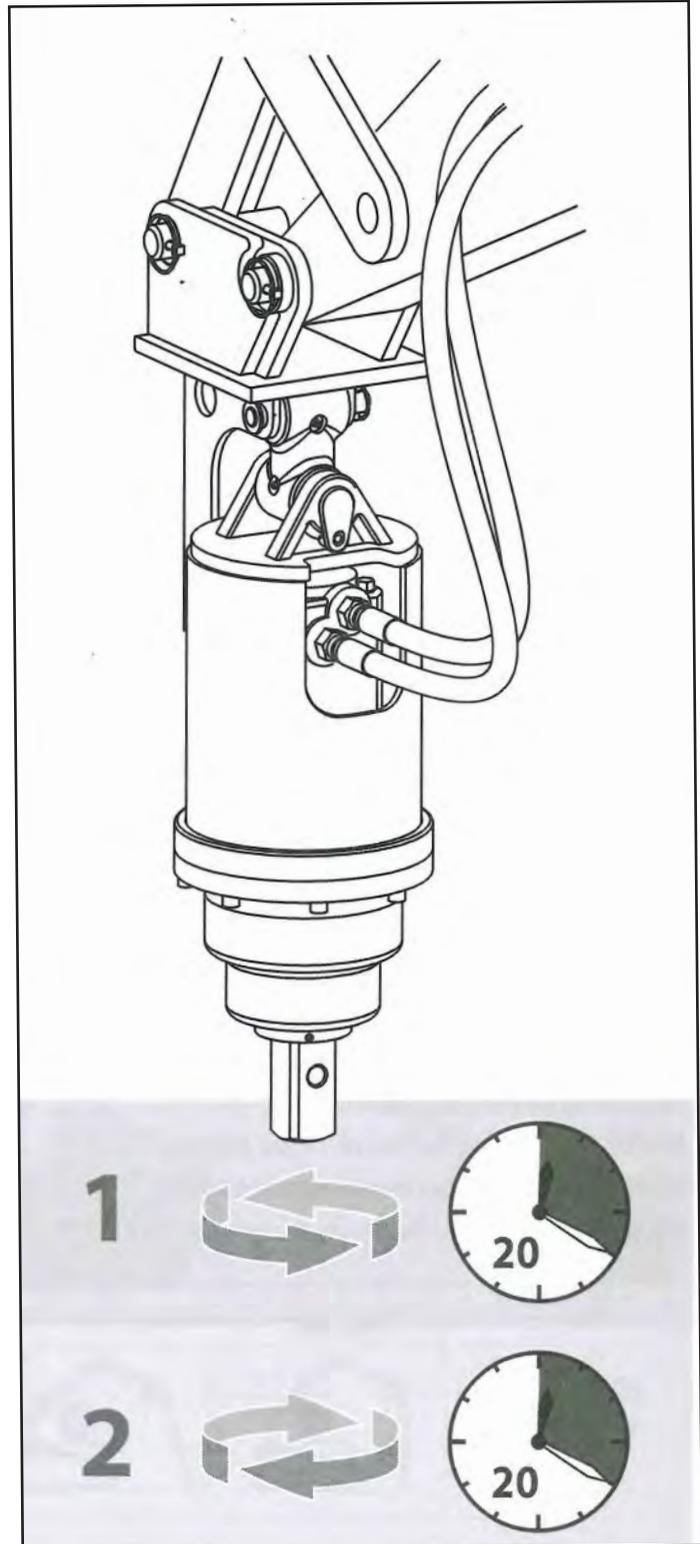
To maximize the life of the unit, new units and those unused for many months must be run in for a period.

To carry out the running in procedure, suspend the Auger Drive in its vertical, working position.

For the duration of the running in procedure, ensure that no bystanders (including animals) can get within 25 ft. of the work area.

Operate the motor at 30% of rated pressure for 20 minutes in each direction before application of full operating load.

To further ensure best motor life and maintain warranty, refer to page 26 for lubrication instructions.



WORKING PROCEDURE

Before commencing work, ensure that:



The correct hoses are fitted and tightened correctly (See page 15).

The unit has been properly run in (broken-in) (See page 22).

There are no bystanders are within 25 ft. of the work area.

SET Auger in a vertical drilling position (Fig A).

ENSURE the direction of rotation is **CLOCKWISE**.

ONLY start drilling after a site survey on a premarked safe location (see page 17).

GRADUALLY lower the parent machine arm(s) to apply down force to the Auger.

The harder the ground the more down force required. Maintain drilling speed. **DO NOT CONTINUALLY STALL** the Auger Drive unit with excessive down force, as this will overheat the hydraulic oil and could damage the machine.

KEEP THE AUGER VERTICAL

For skid steer machines (Fig B)

Adjust the angle of the arms, mounting frame and the position of the parent machine as necessary.

For excavators (Fig C)

Adjust the angle of the dipper and boom.

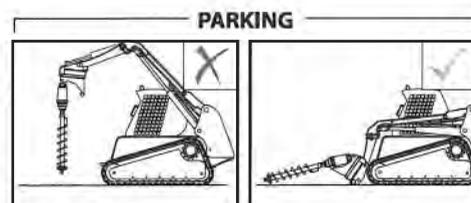
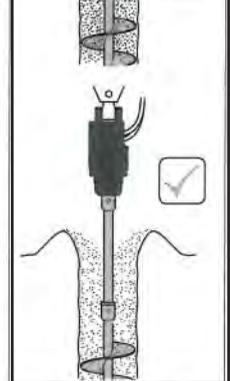
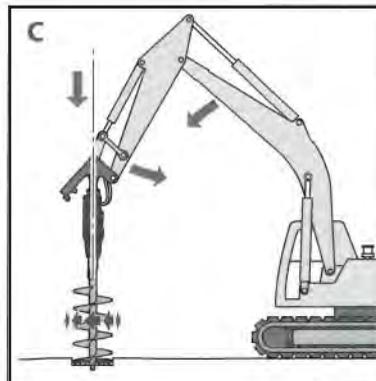
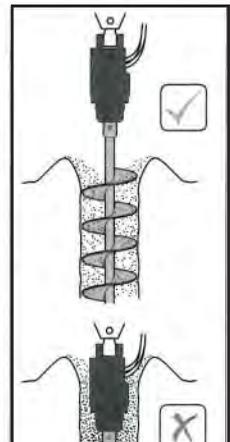
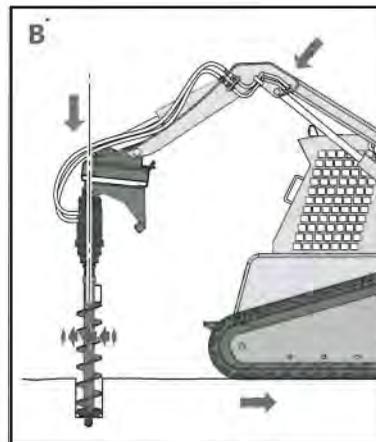
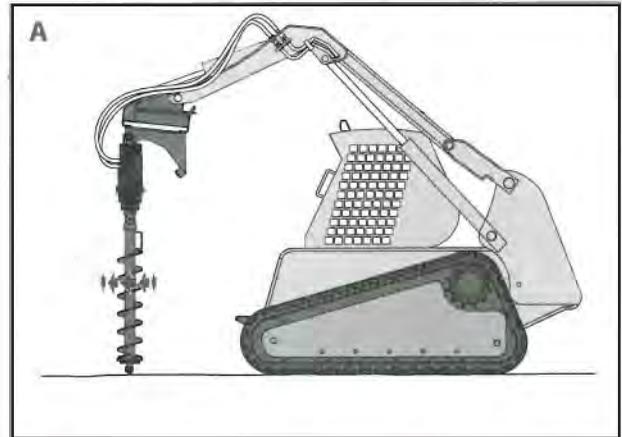
MAXIMIZE efficiency and avoid damaging the Auger assembly by keeping the Auger vertical.

REGULARLY raise the Auger out of the ground to clear material from the Auger. This will help maintain drilling effectiveness and ensure your machine does not become unstable.

NEVER Drill beyond the length of the Auger.

NEVER leave the Auger assembly suspended.

ALWAYS park with the Auger on the ground.



TRANSPORTATION

When attached to the parent machine the standard Auger Unit is free to swing and can be extremely dangerous during transport.

TRANSPORTATION ON PUBLIC HIGHWAYS:

ALWAYS remove the Auger Bit and Auger Drive before driving or transporting the parent machine on public highways.

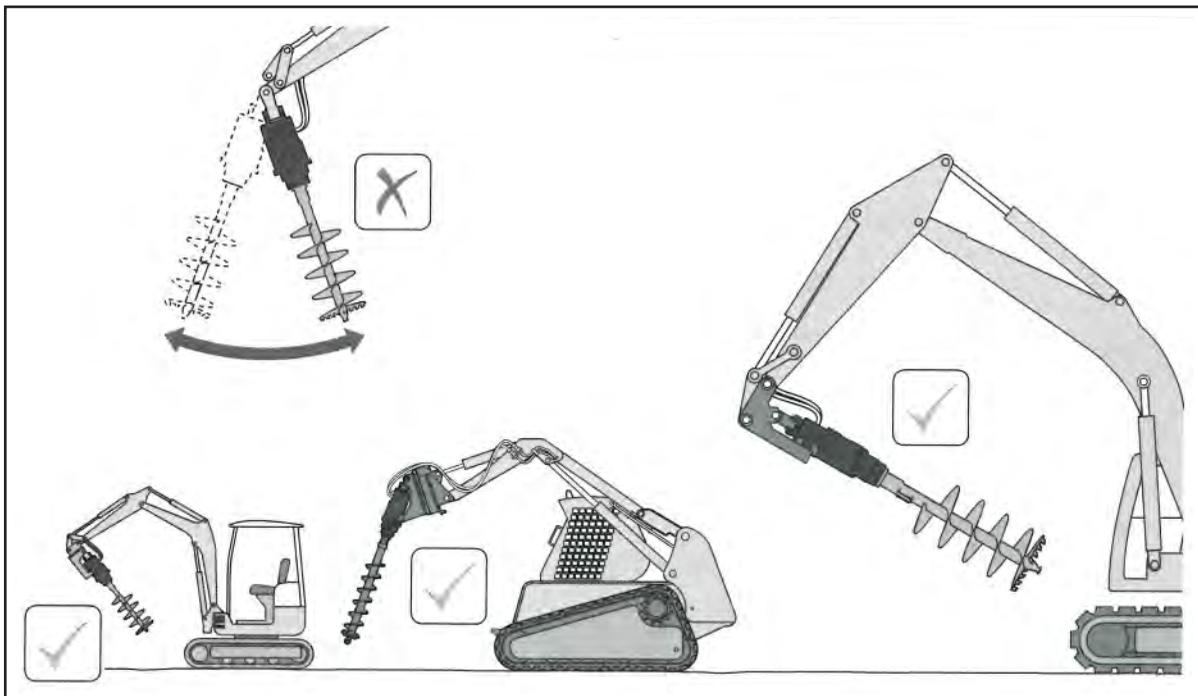
ALWAYS store the Auger Bit and Auger Drive securely and safely when removed from the parent machine taking special care of the hydraulic hoses and connections.

TRANSPORTATION WITHIN THE JOB SITE:

ALWAYS operate the parent machine slowly when on site taking great care to avoid the Auger swinging.

RECOMMENDED: where fitted use the hitch cradle to support the Auger Drive Unit when manoeuvring on site.

CRADLE HITCH SUPPORT



MAINTENANCE & LUBRICATION - Safety



Safety at all times



Ensure environmentally safe disposal of waste oil:

Do not pour down drain!



Avoid Fire or Explosion:

Do not smoke near, or expose lubricants to any possible sources of ignition (e.g. fire, electrical sparks or heat sources.)



All lubricants are toxic and potentially carcinogenic (cancer causing).



Avoid contact with skin and eyes:

Wear suitable protective clothing and gloves.



Always use a suitable barrier cream in case of skin contact.



Always wear eye protection:

In the event of skin contact, wash with soap and water.

In the event of eye contact wash with water and seek medical advice.



Do not ingest:

If swallowed seek medical advice immediately.

MAINTENANCE & LUBRICATION - Service intervals

Your Arrow Auger Drive Unit features a sealed gear housing filled with gear oil to lubricate the planetary gearset components and bearing within the housing.

Arrow Auger Drive Units are low maintenance, however regular checks for oil leaks and following the service schedules are recommended to ensure a trouble free product.

Weekly:

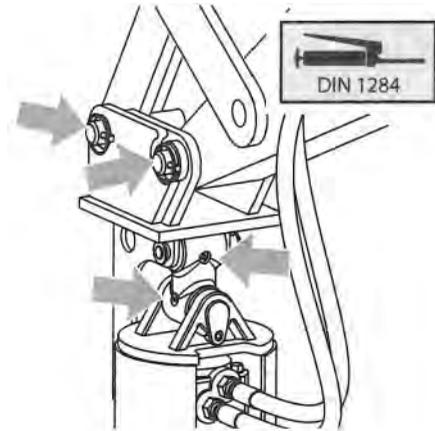
Grease hitch and Auger Drive pivot pins.

Oil Lubrication

Your Auger Drive has been prefilled with Gear Oil. This oil requires regular changing. Changing the oil at regular intervals will prolong the life of you unit. Please refer to the chart on page 28 for recommended oil change intervals.

Important: To maintain product warranty your Arrow Auger Drive Dealer **MUST** record proof of this first oil change.

See page 27 for oil change procedure.



PROOF OF FIRST SERVICE

Dealer Stamp

Dealer Name

Date Serviced

MAINTENANCE & LUBRICATION

Oil change procedure:

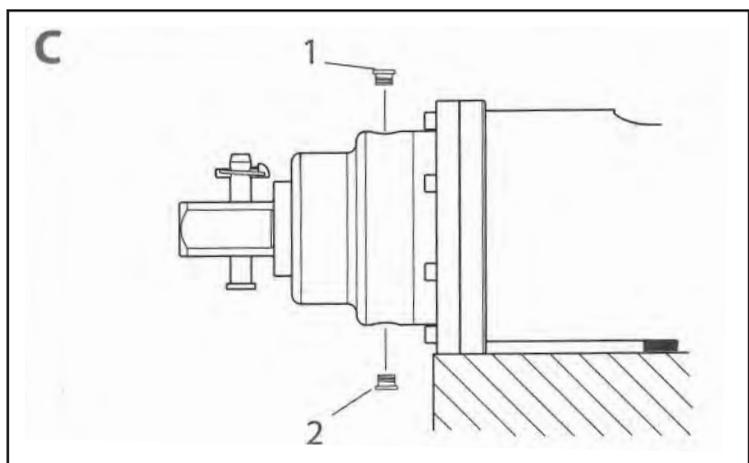
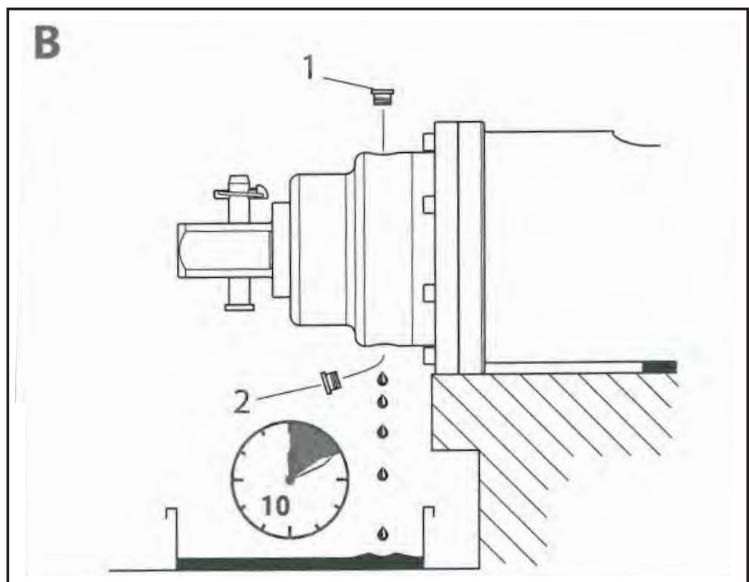
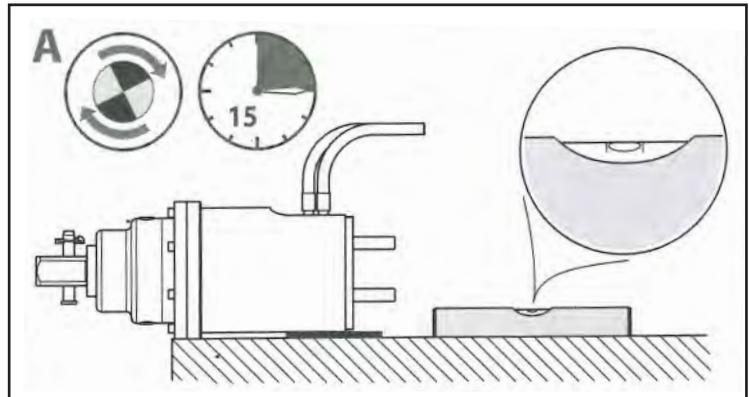
Before starting any maintenance work on this unit, read the instructions carefully and ensure you have the correct tools, materials and safety equipment to hand.

NOTE: The procedure described below should be carried out by a competent and proficient engineer.

1. Pre-heat the oil by running the unit for 15 minutes (Fig A). Ensure that the unit is safely supported in a horizontal position, with the fill & drain plugs (Fig 8, 1 & 2) at top and bottom of the housing
2. Remove drain & fill plugs using suitable tooling and allow oil to drain for a minimum of 10 minutes. For best results leave to drain overnight.
3. Replace drain plug (Fig C, 2) and fill with oil.

Refer to page 28 for correct oil grades and quantities.

4. Replace fill plug (Fig C, 1).
5. Check for signs of leakage, refill as necessary.



MAINTENANCE & LUBRICATION

Oil Change Frequency		
Model	First oil change after initial use	Subsequent oil change frequency
MD-17-20-20-H	3 months or 200 hours*	12 months or 800 hours*
AD-25-30-20-H		
AD-30-36-20-H		
AD-35-36-25-H	2 months or 120 hours*	12 months or 720 hours*
AD-40-48-25-H		

*Whichever time period occurs first.

Recommended Lubricants						
Model	Oil Quantity Gallons	Specification	Manufacturer		Planetary	Grade
			Millers	Mobil		
MD-17-20-20-H	0.11	AGMA 6EP	EP 320	600 Series	Yes	Mineral
AD-25-30-20-H	0.22					
AD-30-36-20-H	0.33					
AD-35-36-25-H	0.33					
AD-40-48-25-H	0.33					

All units are supplied with 320 viscosity oil unless otherwise requested.

When using or storing the units below 5°F (-15°C) a 150 viscosity oil must be used.

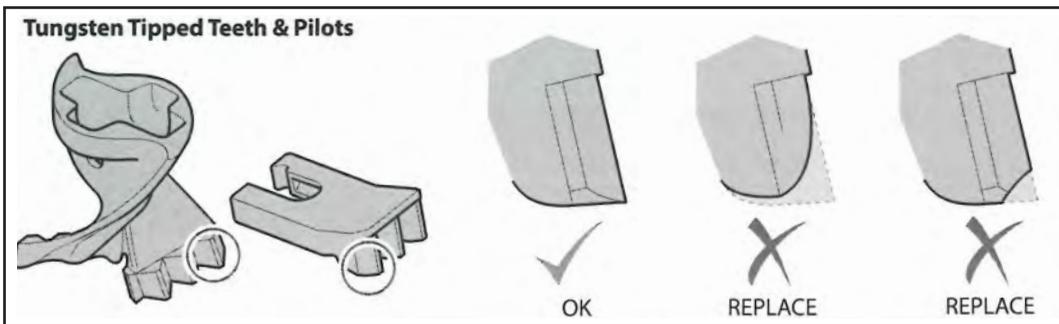
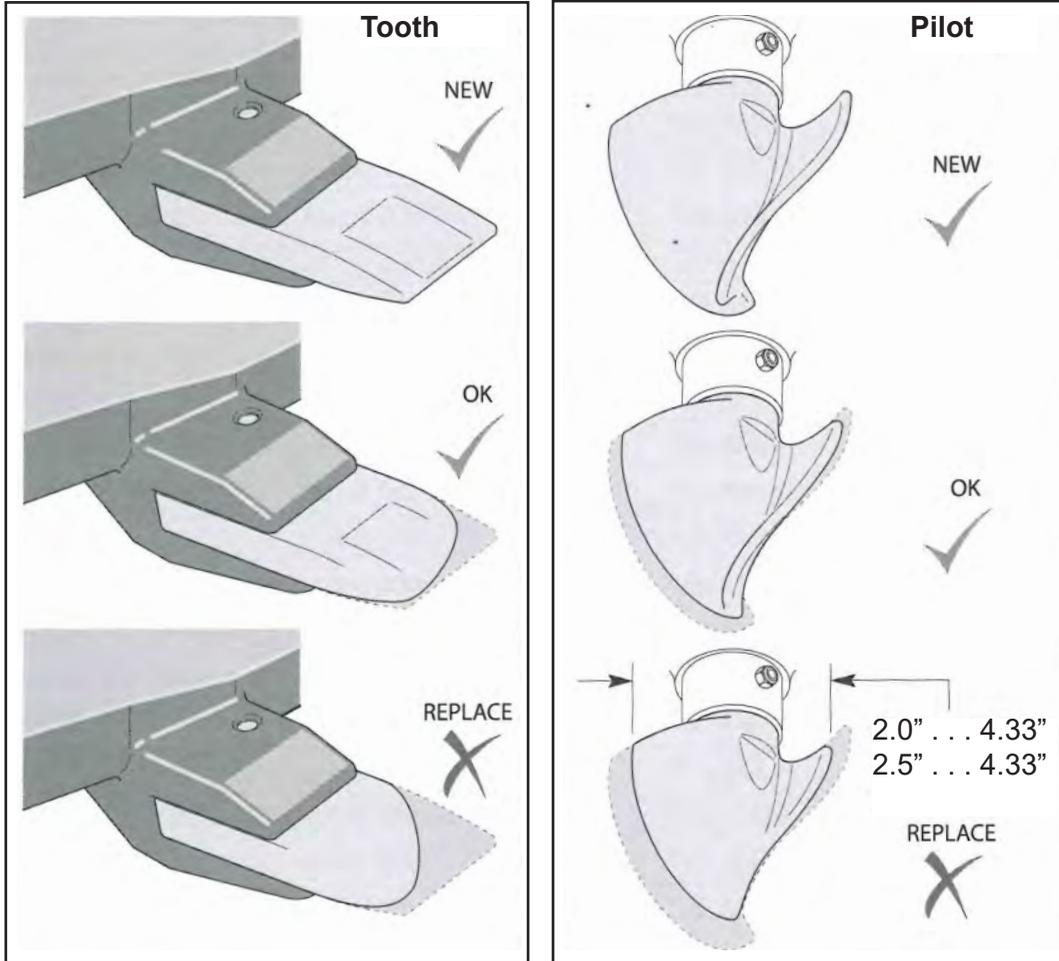
When using or storing units above 95°F (35°C) a 460 viscosity oil must be used.

COMPONENT WEAR



The cutting teeth and pilot should be checked regularly for wear.
The diagrams below show acceptable levels of wear.

NOTE: Excessively worn teeth & pilots may cause damage to the Auger



NOTE: Pilots can be replaced by unbolting the old pilot and bolting the new one in its place. For tooth replacement, refer to page 31.

AUGER TOOTH REPLACEMENT



NOTE Before removing Auger teeth, ensure that the Auger is horizontal and securely supported with the teeth easily accessible. Always wear appropriate protective clothing.

Teeth

Use a 3/16 in. pin punch to drive the retaining pin out through the bottom of the tooth holder.

The tooth and rubber can then be withdrawn.

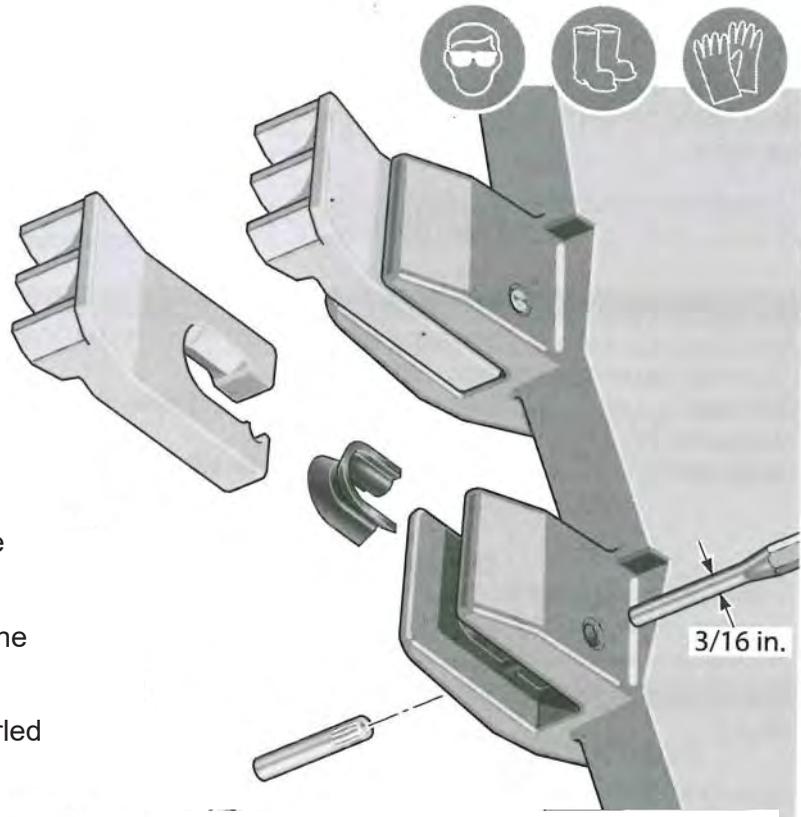
To install a replacement tooth, fit the rubber into the slot in the tooth.

Press the tooth and rubber into the tooth holder, ensuring that the cut-out for the pin is on the correct side. You may need to use a soft-faced hammer to drive it in fully.

Insert a new retaining pin into the top of the tooth holder, plain end first.

Drive the pin in, ensuring that it locates in the cut-out in the tooth.

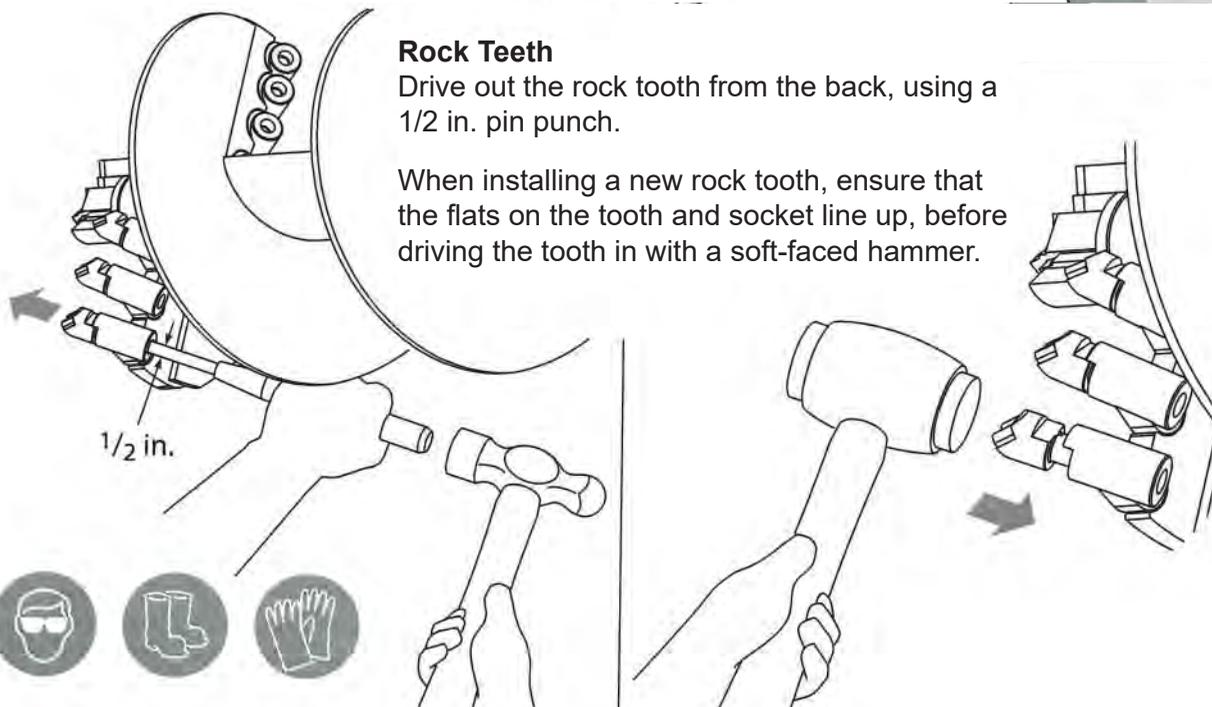
Use a pin punch to make sure that the knurled end of the pin is fully engaged in the hole.



Rock Teeth

Drive out the rock tooth from the back, using a 1/2 in. pin punch.

When installing a new rock tooth, ensure that the flats on the tooth and socket line up, before driving the tooth in with a soft-faced hammer.



TROUBLESHOOTING

AUGER DRIVE - OPERATION		
FAULT	POSSIBLE CAUSE	ACTION
Auger Drive output shaft does not rotate	Parent machine pressure relief valve faulty or set too low	Test, reset or replace to parent machine's specification
	Auger Drive Unit seized	Seek advice from Auger Drive distributor
	Auger jammed in ground	Remove Auger from ground before starting machine
Slow digging speed / slow rotation of Auger Drive output shaft	Insufficient oil flow from parent machine	Check that parent machine hydraulic system is operating correctly and has sufficient oil of the correct grade
	Incompatible Auger Drive to parent machine combination	Check specification. Seek advice from Auger Drive distributor
	Incorrect Auger, boring teeth or pilot fitted or worn boring teeth/pilot	Ensure Auger size is compatible with Auger Drive Unit (not too large) and that boring teeth/pilot are suitable for the ground conditions and not worn
	Worn Auger Drive hydraulic motor possibly due to incorrect or dirty oil supply	Seek advice from Auger Drive distributor. Only use genuine spare parts. Charge parent machine hydraulic oil and filter before fitting replacement drive unit
Auger stalls during work	Parent machine pressure relief valve faulty or set too low	Reset/replace pressure release valve to parent machine's specification
	Restricted oil flow	Check for damaged or incorrect hydraulic hoses and connections.
	Blocked hydraulic filter	Change parent machine filter and oil.
	Excessive parent machine downforce on Auger	Reduce down force.
	Incompatible Auger Drive / Auger size / parent machine combination	Check. Seek advice from Auger Drive distributor

LIMITED WARRANTY

Arrow Auger Products

Overview

The goal of Arrow Material Handling Products' warranty policy is to assure confidence, reduce downtime and minimize cost of ownership. Should issues arise, please contact your authorized dealer or Arrow's Customer Service Team at 913-495-4803 or CustServ@ArrowMHP.com and we will strive to resolve the issues in a timely manner.

Normal hours of operation are Monday through Friday, 8:00 AM to 5:00 PM CST. If calling after hours, you may leave a message and we will return your call as soon as possible. Arrow is closed for most US national holidays.

Arrow Material Handling Products ("Arrow") offers a Limited Warranty on Auger Attachments against faulty design, material, and workmanship for normal use when properly maintained. Auger Gearboxes are warranted for a period of sixty (60) months from date of shipment, Auger Motors are warranted for twenty four (24) months from date of shipment. Auger Bits, Frames and Cradles are warranted for a period of twelve (12) months from date of shipment. Refer to the Product Manual for proper maintenance procedures. Spare, Replacement and After Warranty Parts including hoses and components are warranted for ninety (90) days. Disassembly, modification or welding of units without Arrow's written authorization voids the warranty. Hydraulic hoses are warranted against failure due to workmanship. Improper installation, ripping or cutting due to unauthorized modifications of Arrow installation procedures is not warranted. An Authorized Dealer or Arrow representative must install hydraulic kits and components for failures to be given warranty consideration.

No warranties are expressed or implied as to the fitness of the equipment on which the attachment or accessory is installed. The purchaser is responsible for promptly informing Arrow Customer Service of any suspected operational deficiencies or failures. Arrow is the sole party responsible for analysis of reported deficiencies or failures. Replacement or repair will be at the sole discretion of Arrow.

In some cases, Arrow may approve field repairs. Compensation for field repairs will be negotiated. Dealer labor rate charges on approved warranty repairs shall not exceed 70% of dealer regular hourly rate. Overtime charges need prior written approval. Claims received 30 days past the repair date will not be considered for warranty coverage and shall be null and void. Field repairs undertaken without prior approval by Arrow Customer Service may invalidate the warranty. Please see general (below) for additional warranty information and return procedure for details on how to initiate a claim.

General

The Arrow Limited Warranty is extended only to the original purchaser and may be void in the event that the product is sold or otherwise transferred. No warranty will apply to any product that has been (i) modified, altered or adapted without Arrow's written consent, (ii) abused or misused, (iii) repaired by any third party in a manner that fails to meet Arrow's repair standards, (iv) improperly installed, or (v) used with any device or implement not covered by this warranty. This warranty does not include and hereby excludes normal maintenance parts, replacement parts and consumables, including but not limited to hydraulic fluid, hoses, auger teeth, auger pilots and similar items.

The warranties set forth herein are in lieu of any and all other warranties, express or implied, including the warranties of merchantability and fitness for a particular purpose. The purchaser acknowledges that no other representations or warranties were made or relied on in connection with the purchase of the Arrow Auger Drive, Auger Bits or attachments. No person is authorized to vary, modify or change the terms of this limited warranty.

Neither party shall be liable for any indirect, punitive, special, incidental or consequential damage in connection with or arising out of the use of the property sold to the purchaser, including without limitation, loss of business, revenue, profits, goodwill, consequential damages, whether in contract or tort, including negligence.

LIMITED WARRANTY (continued)

Nothing in this warranty affects any statutory rights of consumers or other purchasers that cannot be waived or limited by contract. This limited warranty gives you specific legal rights, and you may have other rights, which vary from state to state.

Limitations

This LIMITED WARRANTY does not cover product, which in the opinion of Arrow, is damaged due to abuse, misuse, misapplication, prohibited operation, improper maintenance, alteration, unauthorized service, contamination by the base machine, or normal wear and tear. This LIMITED WARRANTY is void if the product is modified in any way without the written consent or instruction of Arrow. This LIMITED WARRANTY is null and void if the product is used in a prohibited operation, or unauthorized adjustment/assembly/disassembly has occurred. This LIMITED WARRANTY is the exclusive warranty and is given in lieu of any and all other warranties, whether expressed or implied, arising in any fashion including but not limited to the course of dealing and course of performance, and including but not limited to warranty of merchantability or warranty of fitness for a particular purpose. Dealers or Agents of Arrow have no authority to make any type of representation or warranties on behalf of Arrow beyond those expressly set forth in this document.

Arrow Auger Teeth, Pilots and Couplers are manufactured with a patented design to interface with Arrow attachments, extensions and adapters. The use of attachments other than Arrow Auger Teeth, Pilots, attachments, extensions and/or adapters, will void all warranty on Auger Drive and Bits. The use of Arrow adapters on unapproved attachments is not sanctioned. A "home-made" or non-standard attachment outside the specifications for the machine will void the Arrow warranty.

In no event shall Arrow be liable to any party, including but not limited to buyer, for any direct, incidental, consequential, punitive, or special damages, including but not limited to loss of profits, loss of productivity, in any way related to or arising, directly or indirectly, from the product. The liability of Paladin for any and all losses and damages to buyer, its successors and assigns, resulting from any cause whatsoever, including the negligence of Arrow, irrespective of whether such defects are discoverable or latent, shall in no event exceed the purchase price of the product with respect to which such losses or damages are claimed.

Return Procedure

Any product being returned for any reason must be approved, prior to shipment, by Arrow Customer Service. Returns require a Return Authorization Number, to be supplied by Arrow Customer Service. To initiate a return, call Arrow's Customer Service Team at 800-821-7563.

Custom manufactured attachments that do not fit because of incorrectly provided specifications are non-cancellable and non-returnable.

Arrow may, at its own discretion, accept material returns for non-obsolete product shipped from an Arrow facility within ninety (90) days, unused, unopened, in original packaging, in good condition and not requiring touch-up or repair. Restocking of returns are subject to a minimum 20% restocking fee.

Goods not returned within 30 days of the issuance of the Return Authorization will not be accepted. Unauthorized returns may be reshipped to the customer freight-collect.

*16000 W. 108th Street
Lenexa, Kansas 66219
p 913.495.4800 f 913.227.0523*



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