

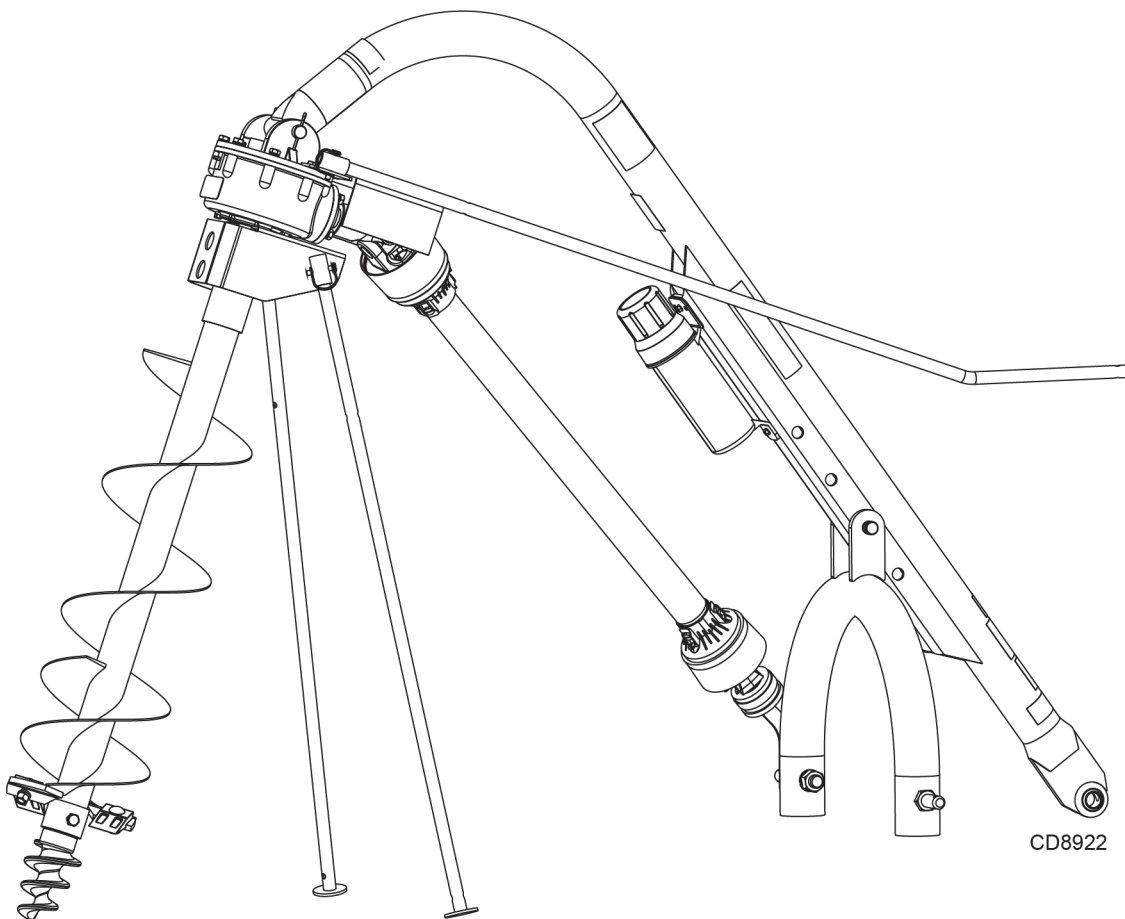


COUNTYLINE®
TRACTOR SUPPLY CO.

PHD 100 (602377)

POST HOLE DIGGER

3-POINT MOUNTED



* Auger sold separately



THIS SAFETY ALERT SYMBOL IDENTIFIES IMPORTANT SAFETY MESSAGES IN THIS MANUAL. FAILURE TO FOLLOW THIS IMPORTANT SAFETY INFORMATION MAY RESULT IN SERIOUS INJURY OR DEATH.

TO THE OWNER:

Read this manual before operating your equipment. The information presented will prepare you to do a better and safer job. Keep this manual handy for ready reference. Require all operators to read this manual carefully and become acquainted with all adjustment and operating procedures before attempting to operate. Replacement manuals can be obtained. Contact SpeeCo, Inc., 4909 SE International Way, Portland, OR 97222, or call 1-800-525-8322.

The equipment you have purchased has been carefully engineered and manufactured to provide dependable and satisfactory use. Like all mechanical products, it will require cleaning and upkeep. Lubricate the unit as specified. Observe all safety information in this manual and safety decals on the equipment.

Use only genuine SpeeCo service parts and SAE hardware. Substitute parts will void the warranty and may not meet standards required for safe and satisfactory operation. Record the model number and serial number of your equipment in the spaces provided:

Model: _____ **Date of Purchase:** _____

Serial Number: (see Safety Decal section for location) _____

Provide this information to customer service to obtain correct repair parts.

Throughout this manual, the term **NOTICE** is used to indicate that failure to observe can cause damage to equipment. The terms **CAUTION**, **WARNING**, and **DANGER** are used in conjunction with the Safety-Alert Symbol (a triangle with an exclamation mark) to indicate the degree of hazard for items of personal safety.



This is the safety alert symbol. It is used to alert you to potential physical injury hazards. Obey all safety messages that follow this symbol to avoid possible injury or death.



Indicates a hazardous situation that, if not avoided, will result in death or serious injury.



Indicates a hazardous situation that, if not avoided, could result in death or serious injury.



Indicates a hazardous situation that, if not avoided, could result in minor or moderate injury.

**IMPORTANT
or NOTICE**

Is used to address practices not related to physical injury.

NOTE

Indicates helpful information.



COUNTYLINE®
TRACTOR SUPPLY CO.

2 Introduction

Gen'l (Rev. 12/18/2018)

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This Operator's Manual should be regarded as part of the machine. Suppliers of both new and second-hand machines must make sure that this manual is provided with the machine.

GENERAL INFORMATION

WARNING

■ Some illustrations in this manual show the digger with safety shields removed to provide a better view. The digger should never be operated with any safety shielding removed.

The purpose of this manual is to assist you in operating and maintaining your post hole digger. Read it carefully. It furnishes information and instructions that will help you achieve years of dependable performance. These instructions have been compiled from extensive field experience and engineering data. Some information may be general in nature due to unknown and varying

operating conditions. However, through experience and these instructions, you should be able to develop procedures suitable to your particular situation.

The illustrations and data used in this manual were current at the time of printing but, due to possible inline production changes, your machine may vary slightly in detail. We reserve the right to redesign and change the machines as may be necessary without notification.

Throughout this manual, references are made to right and left direction. These are determined by standing behind the equipment facing the direction of forward travel.

SPECIFICATIONS

| | |
|-------------------------|--|
| Tractor Category | Category 1 and Category 2 tractors only |
| Gear Box | Special alloy pinion gears and tapered roller bearings on both sides of each gear, 540 rpm |
| Driveline | Equipped with quick-tach yoke to fit standard 6 spline PTO (completely shielded) |
| Augers | Sold separately. 6 in., 9 in., 12 in., 18in., and 24in. sizes available |
| Cutting Edges | Sold separately. Replaceable carbide |
| Point | Sold separately. Cast ductile iron, spiral point, replaceable. |
| Boom | 3 in. O.D. high strength tubing |
| A-frame | 3 in. O.D. high strength tubing |
| Safety Shields | On driveline, gear box "U" joint and gear box output shaft |
| Shear Pin | Replaceable. On input shaft to protect driveline, augers, and gears |
| Options | Hydraulic down force kit and weight mounting kit |

ORDERING INFORMATION

| PART NO. | DESCRIPTION |
|-----------------|--|
| 602377 | Heavy Duty post hole digger less auger |
| S24121100 | 6 in. auger with spiral point and replaceable carbide cutting edges |
| S24121400 | 9 in. auger with spiral point and replaceable carbide cutting edges |
| S24121700 | 12 in. auger with spiral point and replaceable carbide cutting edges |
| S24054800 | 18 in. auger with spiral point and replaceable carbide cutting edges |
| S24054900 | 24 in. auger with spiral point and replaceable carbide cutting edges |
| S24121900 | Spiral point 6 in., 9 in., 12 in., 18 in., and 24 in. augers |
| S24122200 | 2 in. carbide cutting edge for 6 in., 9 in., 12 in., 18 in., and 24 in. augers (Quantity required varies by auger size) |



SAFETY RULES

ATTENTION! BECOME ALERT! YOUR SAFETY IS INVOLVED!



Safety is a primary concern in the design and manufacture of our products. Unfortunately, our efforts to provide safe equipment can be wiped out by an operator's single careless act.

In addition to the design and configuration of equipment, hazard control and accident prevention are dependent upon the awareness, concern, judgement, and proper training of personnel involved in the operation, transport, maintenance, and storage of equipment.

It has been said, "The best safety device is an informed, careful operator." We ask you to be that kind of operator.



¡LEA EL INSTRUCTIVO!

Si no lee Ingles, pida ayuda a alguien que si lo lea para que le traduzca las medidas de seguridad.

TRAINING

■ Safety instructions are important! Read all attachment and power unit manuals; follow all safety rules and safety decal information. (Replacement manuals and safety decals are available from SpeeCo at 1-800-525-8322. Failure to follow instructions or safety rules can result in serious injury or death.

■ If you do not understand any part of this manual and need assistance, see your dealer.

■ Know your controls and how to stop engine and attachment quickly in an emergency.

■ Operators must be instructed in and be capable of the safe operation of the equipment, its attachments, and all controls. Do not allow anyone to operate this equipment without proper instructions.

■ Keep hands and body away from pressurized lines. Use paper or cardboard, not hands or other body parts to check for leaks. Wear safety goggles. Hydraulic fluid under pressure can easily penetrate skin and will cause serious injury or death.

■ Make sure that all operating and service personnel know that if hydraulic fluid penetrates skin, it must be surgically removed as soon as possible by a doctor familiar with this form of injury or gangrene, serious injury, or death will result.

CONTACT A PHYSICIAN IMMEDIATELY IF FLUID ENTERS SKIN OR EYES. DO NOT DELAY.

■ Never allow children or untrained persons to operate equipment.

PREPARATION

■ Heavy Components: To avoid muscle strain or back injury, use lifting aids and proper lifting techniques.

■ Check that all hardware is properly installed. Always tighten to torque chart specifications unless instructed otherwise in this manual.

■ Always wear relatively tight and belted clothing to avoid entanglement in moving parts. Wear sturdy, rough-soled work shoes and protective equipment for eyes, hair, hands, hearing, and head; and respirator or filter mask where appropriate.

■ Make sure attachment is properly secured, adjusted, and in good operating condition.

■ Make sure spring-activated locking pin or collar slides freely and is seated firmly in tractor PTO spline groove.

■ Connect PTO driveline directly to power unit PTO shaft. Never use adapter sleeves or adapter shafts. Adapters can cause driveline failures due to incorrect spline or incorrect operating length and can result in personal injury or death.

■ Power unit must be equipped with Roll Over Protection System (ROPS) or ROPS cab and seat belt. Keep seat belt securely fastened. Falling off power unit can result in death from being run over or crushed. Keep foldable ROPS system in "locked up" position at all times.

■ Make sure all safety decals are installed. Replace if damaged. (See Safety Decals section for location.)

■ Make sure shields and guards are properly installed and in good condition. Replace if damaged.

■ Keep unit from swinging side-to-side by using stabilizer bars, adjustable sway chains, or sway blocks on tractor lift arms. Adjust tightly for best results.



SAFETY RULES

ATTENTION! BECOME ALERT! YOUR SAFETY IS INVOLVED!



OPERATION

- Do not allow bystanders within 25 feet of the area when operating, attaching, removing, assembling, or servicing equipment.
- Consult local utilities before digging. Know location and depth of all underground cables, pipelines, and other hazards in working area and avoid contact.
- Do not put digger into service unless auger point and all cutting edges are intact and in good repair.
- Do not put digger into service unless all shields and guards are in place and in good condition. Replace if damaged.
- Keep bystanders away from equipment.
- Do not operate or transport equipment while under the influence of alcohol or drugs.
- Operate only in daylight or good artificial light.
- Never aim auger point with hands on auger, gearbox, boom or driveline. To place auger point use 3-point arms and handle.
- Keep hands, feet, hair, and clothing away from equipment while engine is running. Stay clear of all moving parts.
- Always comply with all state and local lighting and marking requirements.
- Never allow riders on power unit or attachment.
- Power unit must be equipped with Roll Over Protection System (ROPS) or ROPS cab and seat belt. Keep seat belt securely fastened. Falling off power unit can result in death from being run over or crushed. Keep foldable ROPS system in "locked up" position at all times.
- Always sit in power unit seat when operating controls or starting engine. Securely fasten seat belt, place transmission in neutral, engage brake, and ensure all other controls are disengaged before starting power unit engine.
- When digging holes, always sit in operator seat.
- To reduce rapid U-joint wear and driveline failure, never lift auger over 12" from ground when PTO is running.
- Shift tractor transmission into park or neutral and set brakes before engaging PTO and digging.

- Keep digger under control by running PTO at slowest speed possible (no faster than half-throttle in 540 rpm range).
- Look down and to the rear and make sure area is clear before traveling in reverse.
- Use extreme care when working close to fences, ditches, other obstructions, or on hillsides.
- Do not operate or transport on steep slopes.
- When digging in rough ground or hilly terrain, place digger uphill from tractor. If digger is downhill, tractor could tip when pulling auger from hole.
- Do not stop, start, or change directions suddenly on slopes.
- Use extreme care and reduce ground speed on slopes and rough terrain.
- When dislodging a stuck auger, disengage PTO, stop engine, set parking brake, remove key, disconnect PTO from tractor, and turn auger backwards with a wrench. Remove and store wrench before starting engine.
- Before performing any service or maintenance, lower digger to ground or block securely, turn off tractor engine, remove key, and disconnect driveline from tractor PTO.
- Never leave a running machine unattended.
- Before leaving tractor seat, stop PTO, set brake, shut off engine, remove key, and let auger come to a full stop.

MAINTENANCE

- Before performing any service or maintenance, lower digger to ground or block securely, turn off tractor engine, remove key, and disconnect driveline from tractor PTO.
- Never go underneath equipment (lowered to the ground or raised) unless it is properly blocked and secured. Never place any part of the body underneath equipment or between moveable parts even when the engine has been turned off. Hydraulic system leak down, hydraulic system failures, mechanical failures, or movement of control levers can cause equipment to drop or rotate unexpectedly and cause severe injury or death.
- Service and maintenance work not covered in OWNER SERVICE must be done by a qualified dealership. Special skills, tools, and safety proce-



SAFETY RULES

ATTENTION! BECOME ALERT! YOUR SAFETY IS INVOLVED!



dures may be required. Failure to follow these instructions can result in serious injury or death.

- When dislodging a stuck auger, disengage PTO, stop engine, set parking brake, remove key, disconnect PTO from tractor, and turn auger backwards with a wrench. Remove and store wrench before starting engine.

- Use a suitable lifting device of sufficient capacity. Use adequate personnel to handle heavy components.

- Do not modify or alter or permit anyone else to modify or alter the equipment or any of its components in any way.

- Never replace shear bolt or auger retaining bolt with a different length, or grade. Always use a grade 2 bolt as a replacement.

- Always wear relatively tight and belted clothing to avoid getting caught in moving parts. Wear sturdy, rough-soled work shoes and protective equipment for eyes, hair, hands, hearing, and head; and respirator or filter mask where appropriate.

- Do not allow bystanders within 25 feet of the area when operating, attaching, removing, assembling, or servicing equipment.

- Make sure attachment is properly secured, adjusted, and in good operating condition.

- Never perform service or maintenance with engine running.

- Keep all persons away from operator control area while performing adjustments, service, or maintenance.

- Tighten all bolts, nuts, and screws to torque chart specifications. Check that all cotter pins are installed securely to ensure equipment is in a safe condition before putting unit into service.

- Make sure all safety decals are installed. Replace if damaged. (See Safety Decals section for location.)

- Make sure shields and guards are properly installed and in good condition. Replace if damaged.

- When lubricating telescoping PTO drives, keep fingers out of shield access slots to prevent injury.

TRANSPORTATION

- Always comply with all state and local lighting and marking requirements.

- Never allow riders on power unit or attachment.

- Power unit must be equipped with Roll Over Protection System (ROPS) or ROPS cab and seat belt. Keep seat belt securely fastened. Falling off power unit can result in death from being run over or crushed. Keep foldable ROPS system in “locked up” position at all times.

- Do not operate PTO during transport.

- Do not operate auxiliary hydraulics during transport.

- Look down and to the rear and make sure area is clear before traveling in reverse.

- Do not stop, start, or change directions suddenly on slopes.

- Use extreme care and reduce ground speed on slopes and rough terrain.

- Use additional caution and reduce speed when under adverse surface conditions, turning, or on inclines.

- Do not operate or transport on steep slopes.

- Do not operate or transport equipment while under the influence of alcohol or drugs.

- A minimum 20% of tractor and equipment weight must be on the tractor front wheels when attachments are in transport position. Without this weight, front tractor wheels could raise up resulting in loss of steering. The weight may be attained with front wheel weights, ballast in tires, front tractor weights or front loader. Weigh the tractor and equipment. Do not estimate.

- Raise unit as high as possible for transport.

- Reduce transport speed to avoid bouncing and brief loss of steering control.

STORAGE

- Block equipment securely for storage.

- Keep children and bystanders away from storage area.

- Do not climb or lean on equipment stored on stand.





SAFETY & INSTRUCTIONAL DECALS

ATTENTION! BECOME ALERT! YOUR SAFETY IS INVOLVED!



Replace Immediately If Damaged!

BE CAREFUL!

Use a clean, damp cloth to clean safety decals. Avoid spraying too close to decals when using a pressure washer; high-pressure water can enter through very small scratches or under edges of decals causing them to peel or come off. Replacement safety decals can be ordered by calling customer service at 1-800-525-8322.



PART NUMBER: S52066500

LOCATION: TOP OF BOOM, TRACTOR END



PART NUMBER: S52020100

LOCATION: TOP OF BOOM, GEARBOX END & AUGER TUBE



PART NUMBER: S52020400

LOCATION: BOTH SIDES OF GEARBOX SHIELD



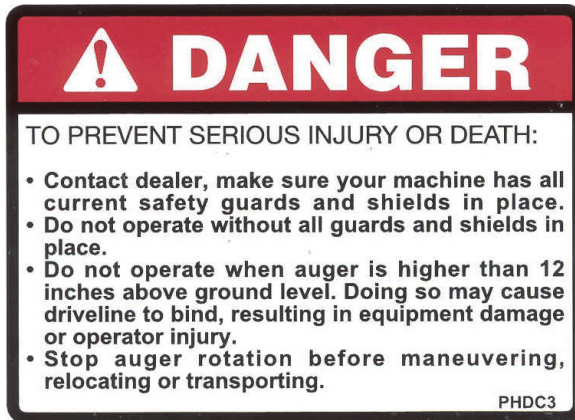
PART NUMBER: 18869

LOCATION: TOP END OF AUGER TUBE



SAFETY & INSTRUCTIONAL DECALS

ATTENTION! BECOME ALERT! YOUR SAFETY IS INVOLVED!
Replace Immediately If Damaged!



PART NUMBER: S52020200
LOCATION: UPPER RIGHT SIDE OF BOOM



PART NUMBER: S52056400
LOCATION: TOP OF BOOM, TRACTOR END



PART NUMBER: S52020300
LOCATION: BOTH SIDES OF GEARBOX SHIELD



PART NUMBER: S52019200
LOCATION: PTO DRIVE SHAFT SHIELD

OPERATION

The post hole digger and its individual components are NOT to be used for anything other than their intended use. The operator is responsible for the safe operation of the equipment. The operator must be properly trained. Operators should be familiar with the equipment, the tractor, and all safety practices before starting operation. Read the safety rules and safety decals on page 5 to page 9.

Post hole diggers are designed for one-man operation. You must always dig holes while sitting in the tractor seat. **It is the responsibility of the operator to see that no one else is within twenty-five feet (25') of the digger when it is operating.** Accidents have occurred when more than one person is in the immediate area of the operating equipment. Be sure no one else is near you when you operate this product.

DANGER

- Do not put digger into service unless all shields and guards are in place and in good condition. Replace if damaged.

WARNING

- Never aim auger point with hands on auger, gearbox, boom or driveline. To place auger point use 3-point arms and handle.
- Do not shovel dirt away from a running auger. The shovel could be caught and thrown by auger.
- Consult local utilities before working. Know location of all underground cables, pipelines, overhead wires, and other hazards in working area and avoid contact.
- When dislodging a stuck auger, disengage PTO, stop engine, set parking brake, remove key, disconnect PTO from tractor, and turn auger backwards with a wrench. Remove and store wrench before starting engine.
- Keep hands, feet, hair, and clothing away from equipment while engine is running. Stay clear of all moving parts.
- Keep hands and body away from pressurized lines. Use paper or cardboard, not hands or other body parts to check for leaks. Wear safety goggles. Hydraulic fluid under pressure can easily penetrate skin and will cause serious injury or death.
- Make sure that all operating and service personnel know that if hydraulic fluid penetrates skin, it must be surgically removed as soon as possible by

WARNING

a doctor familiar with this form of injury or gangrene, serious injury, or death will result.

CONTACT A PHYSICIAN IMMEDIATELY IF FLUID ENTERS SKIN OR EYES. DO NOT DELAY.

- Do not put digger into service unless auger point and all cutting edges are intact and in good repair.
- Keep bystanders away from equipment.
- Shift tractor transmission into park or neutral and set brakes before engaging PTO and digging.
- Keep digger under control by running PTO at slowest speed possible (no faster than half-throttle in 540 rpm range).

CAUTION

- Always wear relatively tight and belted clothing to avoid getting caught in moving parts. Wear sturdy, rough-soled work shoes and protective equipment for eyes, hair, hands, hearing, and head; and respirator or filter mask where appropriate.
- Tighten all bolts, nuts, and screws to torque chart specifications. Check that all cotter pins are installed securely to ensure equipment is in a safe condition before putting unit into service.
- When digging holes, always sit in operator seat.

IMPORTANT

- Never exceed the recommended auger capacity of the post hole digger. Use of an incorrect auger or auger extension can cause equipment damage, loss of operator control and personal injury. See specifications on page 4 for available auger capacities.

PREPARATION

Thoroughly read and understand your Operator's Manuals.

Before beginning operation, clear area of objects that wrap around the auger or might be thrown.

Contact local utility company to make certain there are no buried gas lines, electrical cables, etc., in the work area.

Check for ditches, stumps, holes, or other obstacles that could cause the tractor to roll.

To dig properly, your digger must be able to raise or lower through the highest and lowest points of your lift arm travel without binding against the tractor frame. Check carefully **BEFORE** attaching the auger. If it does bind, adjust the tractor 3-pt. linkage so that all movement is free.

Use stabilizer bars, adjustable sway chains, or sway blocks on your tractor lift arms to keep the post hole digger from swaying side to side. Adjust as tightly as practical for best performance. Remove or place tractor drawbar in storage position.

IMPORTANT

- **Post hole digger gearboxes are shipped without lubrication. Gearboxes must be serviced with 90W gear lube before operation.**
- **If PTO driveline interferes with swinging drawbar, swing drawbar out of the way or remove.**

OPERATING TECHNIQUE

WARNING

- **Never aim auger point with hands on auger, gearbox, boom or driveline. To place auger point use 3-point arms and handle.**
- **Do not shovel dirt away from a running auger. The shovel could be caught and thrown by auger.**

IMPORTANT

- **NEVER use body weight to help the auger penetrate the ground.**

1. Position the tractor so that the auger point is placed where the hole is to be dug.
2. Set tractor brakes. Shift transmission into park or neutral.
3. Do not allow anyone to stand within 25 ft of the auger during operation.
4. Lower auger point slowly to the ground with the PTO disengaged.

The point of the auger should be approximately 3" back of center of the gearbox. As the auger works into the ground, this slight angle will straighten, due to the pivoting action of the boom downward. If the auger has a side tilt, correct with the lift arm adjustment on the tractor hitch.

If the auger tilts too far forward or to the rear, it may be necessary to move the tractor slightly. Be careful not to bend the auger.

With the auger point lowered to the ground, set the engine speed to idle, then engage the PTO. Make sure the auger point is on the ground before engaging the PTO.

IMPORTANT

- **Under no circumstances should the PTO be run in excess of 540 RPM.**

As the auger penetrates the ground, lower the unit slowly with the 3-point lift arms. **Do not let the auger screw itself into the ground!** Auger must dig with the dirt breaking up and being carried to the top by the auger flighting.

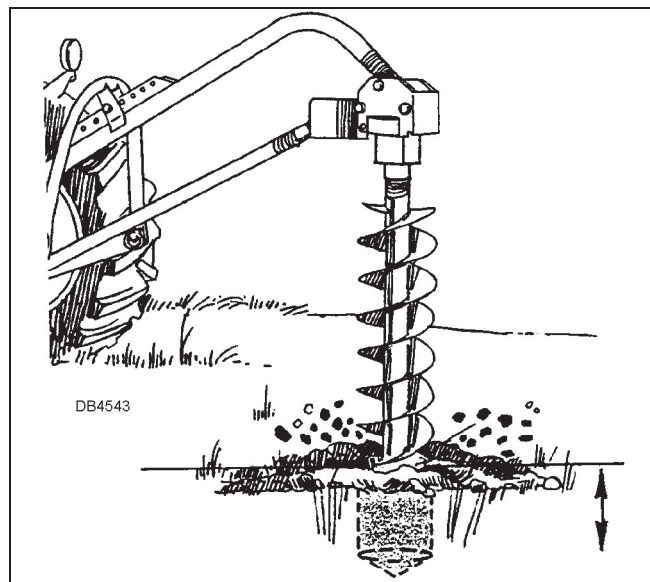


Figure 1. Operation

Dig the hole in small steps. Dig down several inches, then bring the auger up to let the soil clear. Repeat this procedure until the desired depth is reached. This allows better control of the auger and can prevent difficulties that could lead to an accident.

IMPORTANT

- **Be careful when raising the auger as high as your tractor's 3-point lift arms can go. This can put the PTO shaft universal joints at an extreme angle and cause damage to the PTO shaft! It is best to raise the auger just enough to clear the hole when the PTO is engaged.**

- **It is recommended NOT to raise the auger more than six (6) inches above the ground while it is running. Once the hole is dug to the desired depth raise the auger while rotating to bring the dirt out of the hole.**

To get a clean hole, it is sometimes best to lower the auger into the hole with the auger turning and then, when at the bottom, stop the rotation and raise the auger while not turning. This brings the dirt up with little left in the hole.

Disengage the PTO when traveling between holes.

In some types of soil it may be necessary to use the 3-point lift arms to prevent the auger from screwing itself into the ground.

When the ground is too tough to penetrate with your cutting edges and point, sharpen or replace them and try again. These are replaceable parts and must be in good condition to penetrate. (An optional Hydraulic Down Pressure Kit is available.)

If you have difficulty penetrating hard ground, refer to the Troubleshooting section in this manual for suggestions.

DOWN FORCE KIT OPERATION **(OPTIONAL)**

IMPORTANT

■ **Do not connect RETURN hose to a remote outlet. Remote outlet ports are blocked in the neutral position and will damage the hydraulic cylinder when boom is raised.**

1. Lower post hole digger using the 3-point arms and allow auger to dig.
2. If down force is required, slowly apply down force using the control lever for the remote outlet. Apply force in small amounts.
3. Continue to lower the auger using the tractor 3-point lift arms as the auger digs.
4. Raise auger with the 3-point lift arms. Cylinder will retract when auger is raised out of the hole.

TRANSPORT

! WARNING

■ **Do not operate PTO during transport.**

The post hole digger auger is free-swinging, and care should be taken while transporting the machine.

Be sure auger is completely retracted from the hole before attempting to move the tractor.

DO NOT transport the post hole digger while the PTO is engaged as this could cause the universal joints of the PTO driveline into a sharp operating angle and cause failure of the driveline.

Pay particular close attention to the Safety Messages regarding transport. Avoid unnecessary injuries and equipment damage by exercising cautious, conscientious travel procedures.

Attaching the implement to the tractor increases the overall length of the working unit. Allow additional clearance for the implement to swing when turning.

Raise the implement as high as possible for transporting.

LODGED AUGER

! WARNING

■ **When dislodging a stuck auger, disengage PTO, stop engine, set parking brake, remove key, disconnect PTO from tractor, and turn auger backwards with a wrench. Remove and store wrench before starting engine.**

■ **Removing a lodged auger can be dangerous work. Be careful.**

1. If the auger gets stuck in wet clay, stones or roots, disengage the PTO immediately and turn off the engine.
2. Turn the auger backwards several turns with a large pipe wrench. Then attempt to raise the auger with the 3-point lift arms. Extreme rocking or lifting loads while trying to clear auger can cause auger, gearbox, or boom failure.

NOTE: Do not attempt to raise the auger while turning it with a wrench or with a wrench attached to the auger. You could be injured if the PTO was accidentally engaged or the 3-point lift arms suddenly raised the auger.

3. Remove and store wrench before starting engine.

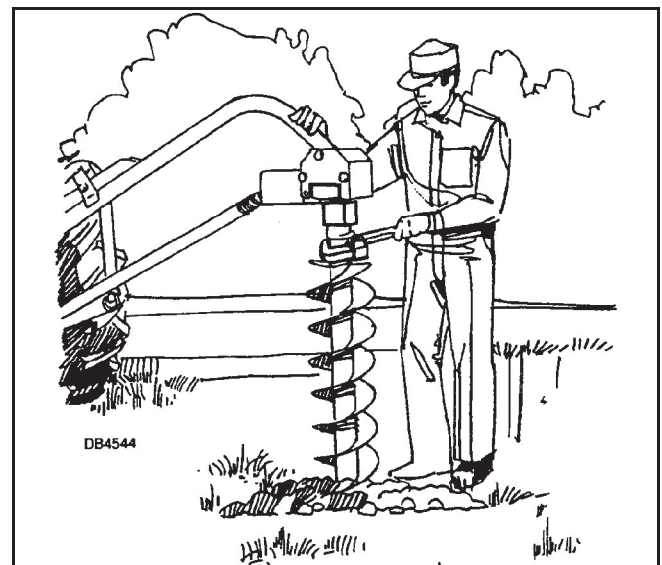


Figure 2. Dislodge Auger

SHEAR BOLT REPLACEMENT

⚠ WARNING

■ **Never replace shear bolt or auger retaining bolt with a different length, or grade. Always use a grade 2 bolt as a replacement.**

Shear bolts are important for both safety and preventing damage to the digger. Their intended function is to break when too much force is applied.

Always replace shear bolts at the gearbox input with manufacturer's part or one of the same size, length and **SAE Grade 2** specification.

Hardened bolts or bolts that are too long can cause accidents resulting in injury or death.

The set screw, Figure 3, prevents the driveline from coming off gearbox shaft if the shear bolt should shear.

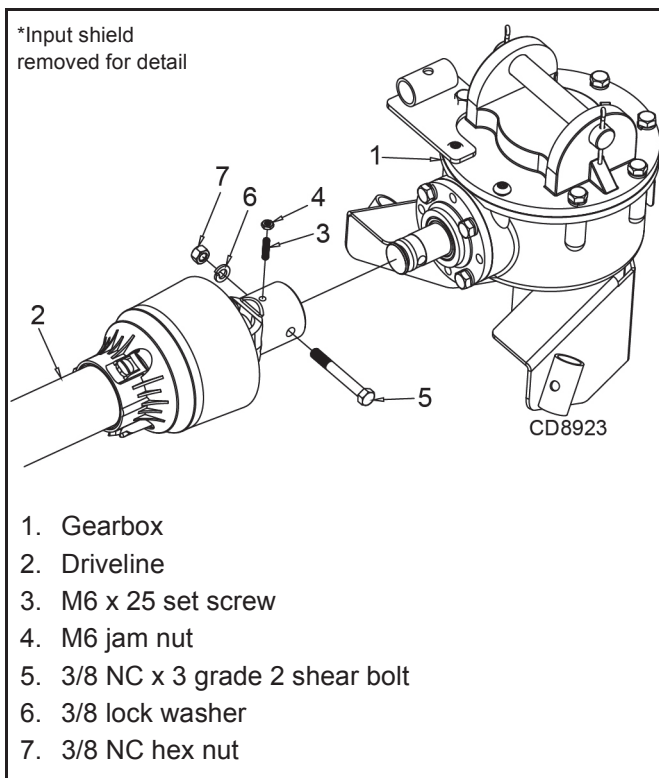


Figure 3. Shear Bolt Replacement

PRE-OPERATION CHECKLIST

- Review and follow all safety rules and safety decal instructions on pages 5 through 9.
- Check that all safety decals are installed and in good condition. Replace if damaged.
- Check that all shields and guards are properly installed and in good condition. Replace if damaged.
- Consult local utilities before digging. Know location of and avoid contacting all underground cables, pipelines, overhead wires and other hazards in digging area.
- Check that auger point and all cutting edges are intact and in good repair.
- Check that equipment is properly and securely attached to tractor.
- Make sure driveline spring-activated locking pin slides freely and is seated firmly in tractor PTO spline groove or gearbox PTO spline groove.
- Set tractor PTO at correct rpm for your equipment.
- Check all lubrication points and grease as instructed in "Service, lubrication information."
- Lubricate all grease fitting locations. Make sure telescoping PTO shafts and universal joints are lubricated.
- Check that all hydraulic hoses and fittings are in good condition and not leaking before starting tractor. Check that hoses are not twisted, bent sharply, kinked, frayed or pulled tight. Replace any damaged hoses immediately.
- Make sure tractor 3-point lift links do not interfere with hydraulic hoses or driveline throughout full turning range.
- Check that all hardware and cotter pins are properly installed and secured.
- Check attitude adjustment of auger.
- Check and keep all bystanders 25 ft away from equipment working area.
- Before starting engine, operator must be in tractor seat with seat belt fastened. Place transmission in neutral or park, engage brake and disengage tractor PTO.



OWNER SERVICE

The information in this section is written for operators who possess basic mechanical skills. For your protection, read and follow all safety information in this manual.

WARNING

■ Before performing any service or maintenance, lower digger to ground or block securely, turn off tractor engine, remove key, and disconnect drive-line from tractor PTO.

■ **NEVER GO UNDERNEATH EQUIPMENT.** Never place any part of the body underneath equipment or between moveable parts even when the engine has been turned off. Hydraulic system leak-down, hydraulic system failures, mechanical failures, or movement of control levers can cause equipment to drop or rotate unexpectedly and cause severe injury or death.

- Service work does not require going underneath implement.
- Read Operator's Manual for service instructions or have service performed by a qualified dealer.

■ Keep all persons away from operator control area while performing adjustments, service, or maintenance.

■ Keep hands, feet, hair, and clothing away from equipment while engine is running. Stay clear of all moving parts.

■ Keep hands and body away from pressurized lines. Use paper or cardboard, not hands or other body parts to check for leaks. Wear safety goggles. Hydraulic fluid under pressure can easily penetrate skin and will cause serious injury or death.

WARNING

■ Make sure that all operating and service personnel know that if hydraulic fluid penetrates skin, it must be surgically removed as soon as possible by a doctor familiar with this form of injury or gangrene, serious injury, or death will result.

CONTACT A PHYSICIAN IMMEDIATELY IF FLUID ENTERS SKIN OR EYES. DO NOT DELAY.

CAUTION

■ Always wear relatively tight and belted clothing to avoid getting caught in moving parts. Wear sturdy, rough-soled work shoes and protective

equipment for eyes, hair, hands, hearing, and head; and respirator or filter mask where appropriate.

ROUTINE MAINTENANCE

1. Check that all bolts, nuts, and screws are tight. Checking the bolts and nuts on the cutting blades is particularly important in rocky soil.
2. Check daily the level of the gearbox oil and top-off up to the correct level. Check for gearbox oil leaks. It should be noted that no warranty claim can be submitted on a gearbox that has run dry. It is essential that the gearbox is kept correctly filled with gearbox oil.
3. Grease the PTO shaft daily.
4. Check the wear on the cutting blades. Sharpen them routinely with an angle grinder or replace when worn down too far. Keep at least two sets of cutting blades, bolts, and nuts as spares.

LUBRICATION INFORMATION

CAUTION

■ When lubricating telescoping PTO drives, keep fingers out of shield access slots to prevent injury.

The accompanying chart gives the frequency of lubrication in operating hours, based on normal conditions. Severe or unusual conditions may require more frequent lubrication.

Do not let excess grease collect on or around parts, particularly when operating in sandy areas.

Use an SAE 90W gear lube in gearbox.

Use a lithium grease of No. 2 consistency with a MOLY (molybdenum disulfide) additive for all locations. Be sure to clean fittings thoroughly before attaching grease gun. When applied according to the lubrication chart, one good pump of most guns is sufficient. Do not over grease.

LUBRICATION CHART

| Ref. No. | Description | Frequency |
|----------|--------------------------------|-------------|
| 1 | Front U-Joint | 8 Hours |
| 2 | Rear U-Joint | 8 Hours |
| 3 | Rear U-Joint to Input Shaft | Seasonally |
| 4 | Gearbox (Fill to proper level) | Check Daily |

Daily lubrication of the PTO slip joint is necessary. Failure to maintain proper lubrication can result in damage to U-joints, gearbox, tractor PTO and/or driveline.

STORAGE

1. Drain and change the oil in your gearbox.
2. Check and replace, where necessary, blades, bolts, nuts on the machine.
3. Clean machine and touch up any rust spots that may have appeared.
4. Replace any safety decals if damaged, illegible, or painted over.
5. Make sure PTO driveline yoke and gearbox input shaft are clean and free of burrs. Keep well lubricated to prevent galling of yoke and input shaft when shear bolt becomes sheared.
6. Keep all shields in place. Order new shields if damaged or missing.
7. Keep cutting edges sharp. Sharp cutting edges dig easier and better. Outer cutting edges on larger augers wear faster than inner cutting edges; switching teeth will even wear.
8. Store implement in clean, dry location.

REMOVE DIGGER FROM TRACTOR

When off the tractor, post hole diggers can be an awkward piece of equipment to handle. Be careful not to pinch hands and fingers in the various hinge points of the digger.

INSTALL PARKING STAND

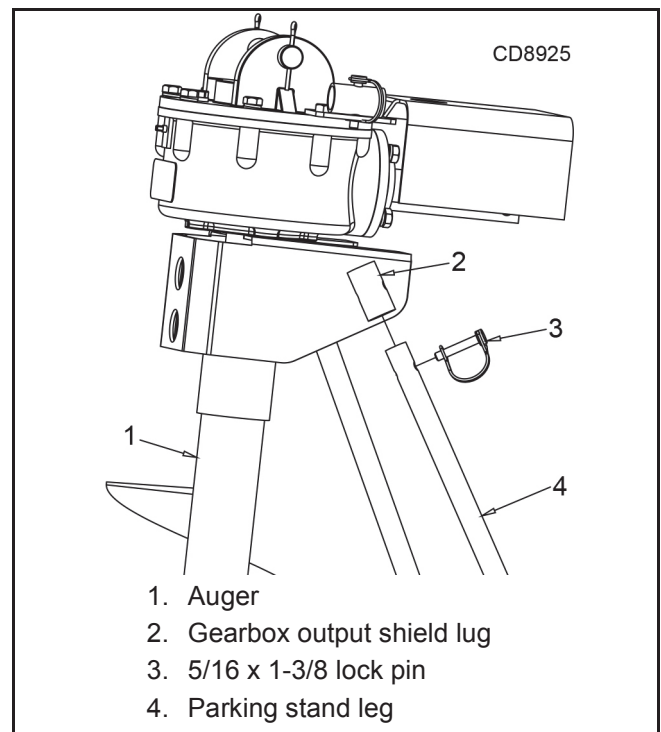


Figure 4. Parking Stand Installation

1. Raise digger to the transport position.
2. Insert the two stand legs (4) into the lug (2) on the front of the output shield. Secure with two locking pins (3).
3. Lower digger until the two legs and the auger form a tripod. This will support the post hole digger in a vertical position.
4. Remove 3-point arms and driveline from the tractor.
5. Hang the PTO end of the driveline over the PTO shaft storage bracket to help prevent dirt and debris from accumulating in the locking collar on the driveline PTO yoke.

Alternative Suggestions

If available, the digger can be hung from an overhead rafter or beam. Attach the chain or rope around the boom just ahead of the gearbox. This allows one man to easily reconnect the digger to the tractor when next use is required.

If storing outside, another idea is to dig a hole about 12-18 inches deep. Then shut the PTO off while the auger is in the hole. Set parking brake, turn off engine, and disconnect the digger from the tractor. The auger in the hole will keep the unit upright and make it possible for one person to disconnect or reconnect to the

tractor. Doing this, will cause rusting of the auger, but it is easy for one person to handle the unit.

REPLACE CUTTING EDGE

Cutting edges and center points are replaceable. They should be sharpened or replaced when worn.

1. Remove carriage bolt (4), lock washer (5), and hex nut (6) holding cutting tooth to the auger.
2. Replace or sharpen cutting tooth. Install carriage bolt, lock washer, and hex nut previously removed.
3. Remove center point (1) by removing cap screw (3), lock washer (5), and hex nut (6).

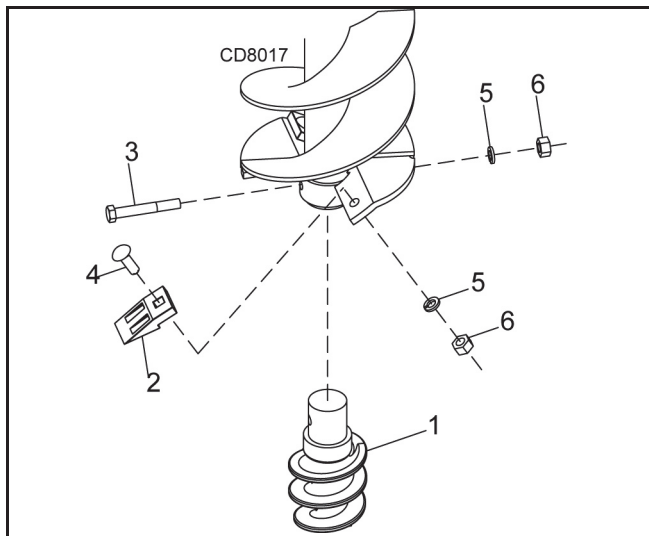


Figure 5. Cutting Tooth Replacement

POST HOLE DIGGER OPTION (HYDRAULIC DOWN FORCE KIT)

For tough, hard soil conditions. This will allow operator to put 300-400 lbs. of down force on the auger to force cutting edges into tough or hard ground. Tractor must have auxiliary hydraulic outlet. Contact your place of purchase for more information.

CLEAN POST HOLE DIGGER

After Each Use

- Remove large debris such as clumps of dirt, grass, crop residue, etc. from machine.
- Inspect machine and replace worn or damaged parts.
- Replace any safety decals that are missing or not readable.

Periodically or Before Extended Storage

- Clean large debris such as clumps of dirt, grass, crop residue, etc. from machine.
- Remove the remainder using a low-pressure water spray.
 1. Be careful when spraying near scratched or torn safety decals or near edges of decals as water spray can peel decal off surface.
 2. Be careful when spraying near chipped or scratched paint as water spray can lift paint.
 3. If a pressure washer is used, follow the advice of the pressure washer manufacturer.

TROUBLESHOOTING

| PROBLEM | POSSIBLE CAUSES & SOLUTION |
|--|--|
| Auger will not dig | <p>Shear bolt sheared – install new shear bolt.</p> <p>Teeth dull – sharpen or replace.</p> <p>Ground too dry and hard – order optional down force kit, or wait until it rains.</p> <p>Auger turning too fast and bouncing – reduce speed.</p> <p>Tall grass has wrapped around auger teeth – remove grass.</p> <p>Auger encountering rocks, roots, or other obstruction – lift auger from hole and inspect.</p> <p>Auger teeth improperly positioned – see Parts section in this manual for proper tooth pattern.</p> |
| Post hole digger sways side to side | <p>No sway bars or sway blocks on tractor – add some.</p> <p>Lift arms not adjusted evenly – adjust lift arms.</p> <p>Post hole digger is mounted with excessive looseness in the hitch connecting points – use proper size pins or bushings.</p> |
| Bent auger fighting or bent auger | <p>Tractor moved while auger was turning in hole – always set brakes on tractor and make sure it is out of gear.</p> <p>Operator moved tractor with auger in hole to try and straighten a hole being dug at an angle.</p> <p>Auger is encountering rocks or roots or other foreign objects – remove object from hole or change location.</p> <p>Outer edge of auger fighting is bending due to contact with rocks or roots – use heavy-duty auger with thicker fighting.</p> <p>Shear bolt has been replaced with harder bolt – replace with Grade 2 bolt per instructions.</p> |
| Auger screws itself into the ground | <p>Operator did NOT ease 3-point hitch to ground slowly.</p> <p>Tractor 3-point does not have position control. Lift auger after advancing every 3" - 4".</p> <p>Faulty 3-point hitch hydraulic system on tractor.</p> <p>Draft control is not in OFF position.</p> <p>Tractor is too small to handle digger.</p> |
| Excessive vibration | PTO driveline bearing cross is worn – replace. |
| PTO driveline assembly comes off input shaft of gearbox when shear bolt is sheared | Set screw missing in yoke at gearbox input shaft. Install set screw as per driveline installation instructions. THIS IS A DANGEROUS SAFETY HAZARD, CORRECT IMMEDIATELY! |
| Auger digs so far, but will not dig deeper | <p>See solutions for above.</p> <p>PTO assembly “bottoms out,” not allowing digger to lower – remove auger from digger and lower digger. Gearbox should lower to the ground; if not, PTO driveline assembly may need to be shortened.</p> |
| | <p>PTO driveline interferes with swinging drawbar – swing drawbar out of the way or remove.</p> <p>Tractor hydraulic system may be faulty – consult tractor dealer.</p> <p>Soil could have hardpan layer 6"-10" below surface – use optional down force kit (see list of optional equipment).</p> |

TROUBLESHOOTING

| PROBLEM | POSSIBLE CAUSES & SOLUTION |
|---|---|
| PTO driveline failure | <p>Operator raising post hole digger too high above ground when PTO is engaged – causes excessive PTO joint operating angle.</p> <p>PTO is engaged while moving between holes. (Auger swings, which causes excessive PTO joint operating angle.)</p> <p>Improper use of a hard shear bolt – use Grade 2 bolt per instructions.</p> <p>Driveline has not been properly lubricated.</p> <p>Engaging tractor PTO with engine at high rpm.</p> <p>Digging holes too deep so that PTO driveline contacts ground.</p> <p>Operating at high rpm.</p> <p>Use of auger extension can require post hole digger to be lifted high, which can cause excessive PTO joint operating angle.</p> |
| PTO driveline “galls” or “friction welds” to input shaft of gearbox | <p>Tractor is a “low profile model” (one that is low to the ground). Due to the low height of the tractor, the digger must be raised higher to have the bottom of the auger clear the ground. Generally, low profile model tractors can only use 30" long augers (standard auger length is 42"). Use a different tractor or purchase 30" long augers.</p> <p>No lubrication on input shaft of gearbox to allow yoke of PTO driveline to turn freely on input shaft when shear bolt is sheared. Always keep input shaft greased.</p> |
| Gearbox failure | <p>No oil in gearbox.</p> <p>Oil not changed per instructions.</p> <p>Shear bolt has been replaced with a harder bolt – replace with Grade 2 per instructions.</p> <p>Bent output shaft is due to operator moving tractor when auger is in hole.</p> |
| Gearbox overheating | <p>Low on lubricant – fill to proper level.</p> <p>Improper type lubricant – replace with proper lubricant.</p> |
| Auger bolts shear on gearbox output shaft | <p>Shear bolt on input shaft has been replaced with a harder bolt – replace with Grade 2 bolt as per instructions.</p> |
| Tractor stalls | <p>Auger is encountering rocks or roots or other foreign object – remove object or change hole location.</p> <p>Tractor idle is not set correctly – tune tractor engine.</p> |

ASSEMBLY INSTRUCTIONS

WARNING

- Keep hands, feet, hair, and clothing away from equipment while engine is running. Stay clear of all moving parts.
- Keep all persons away from operator control area while performing adjustments, service, or maintenance.
- Make sure spring-activated locking pin or collar slides freely and is seated firmly in tractor PTO spline groove.

CAUTION

- Always wear relatively tight and belted clothing to avoid getting caught in moving parts. Wear sturdy, rough-soled work shoes and protective equipment for eyes, hair, hands, hearing, and head; and respirator or filter mask where appropriate.
- Heavy Components: To avoid muscle strain or back injury, use lifting aids and proper lifting techniques.
- Failure to follow instructions in this manual can result in injury.

SET-UP INSTRUCTIONS

The digger is shipped partially assembled. Assembly will be easier if the components are aligned and loosely assembled before tightening hardware. Recommended torque values for hardware are located on page 26.

Select a suitable working area. Uncrate parts boxes and lay out parts and hardware to make location easy. Refer to illustrations, accompanying text, parts lists and exploded view drawings.

IMPORTANT

- Post hole digger gearboxes are shipped without lubrication. Gearboxes must be serviced with 90W gear lube before operation.

ATTACH A-FRAME AND BOOM TO TRACTOR

A tractor is required during assembly of post hole digger. A tractor will make part fit-up, part alignment, and part handling easier.

1. Connect lift arm pins (6), Figure 1, and hardware supplied with pins to the A-frame assembly (2).

Mount PTO shaft storage bracket as shown on outside of A-Frame.

NOTE: On tractors with 3-point arm spacing of 32 inches, place mounting pins on the outside of the yoke assembly. On tractors with 3-point arm spacing of 26 inches or less, place mounting pins on the inside of the yoke assembly.

2. Connect A-frame assembly to the tractor 3-point arms.
3. Attach boom (1) to the tractor top link bracket..
4. Align A-frame assembly with the adjustment channel on the boom, starting with the second hole. Secure into position using boom adjustment pin (3) and lynch pin (5).

IMPORTANT

- With boom attached to tractor, raise boom by hand. Check clearance between boom and top link bracket. If interference exists, change hole location and recheck. Failure to check can result in damage to the tractor or boom.

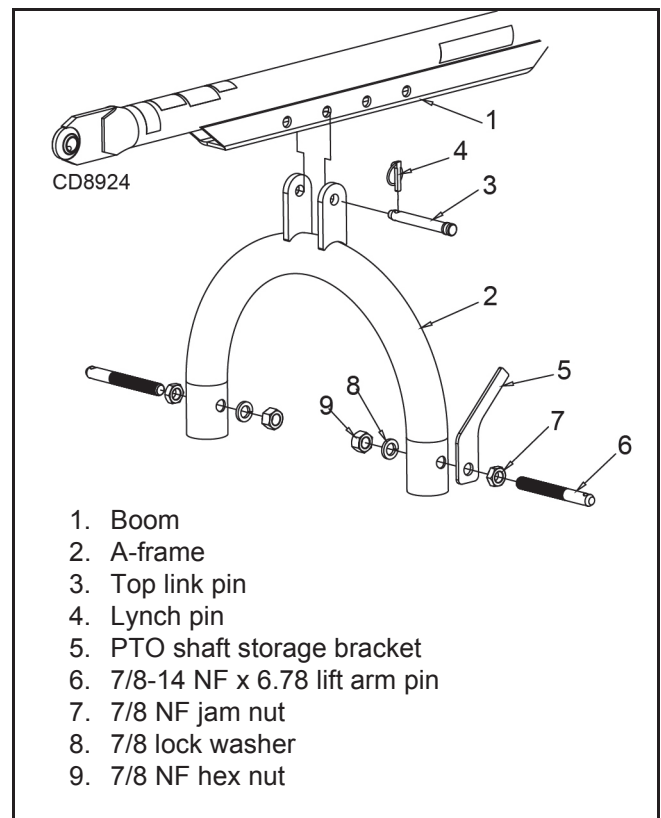


Figure 1. A-Frame to Boom Assembly

ATTACH GEARBOX TO BOOM

1. Place gearbox on level section of ground resting on output shaft shield.
2. Lower boom and align gearbox mount holes with boom mount hole.
3. Secure gearbox to boom using the supplied pin (4) and cotter pins (3).

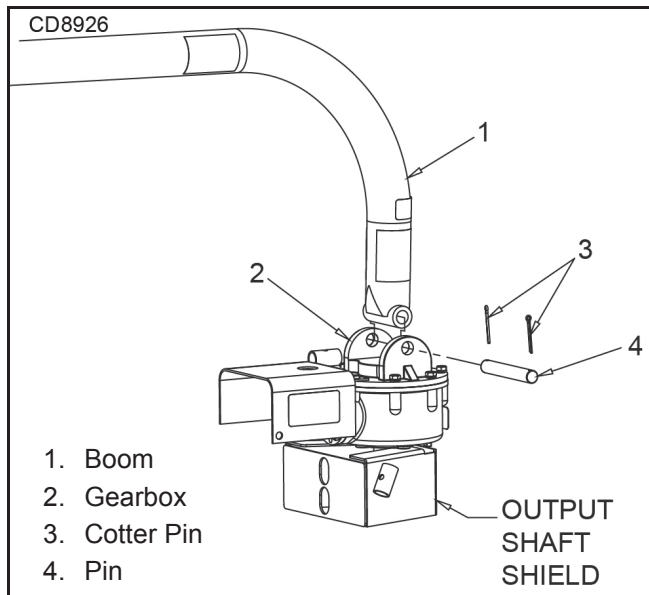


Figure 2. Gearbox to Boom Installation

ATTACH AUGER TO GEARBOX

1. Raise boom (1), allowing enough space to install auger.
2. Slide auger over gearbox output shaft and install 1/2 bolt (3), 1/2 lock washer (4), and 1/2 nut (5) in both hole locations. Tighten all hardware.

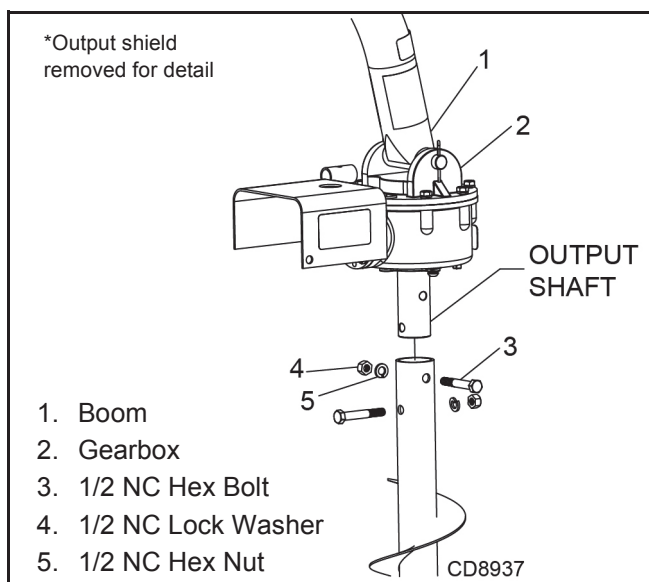


Figure 3. Auger to Gearbox Installation

INSTALL DRIVELINE

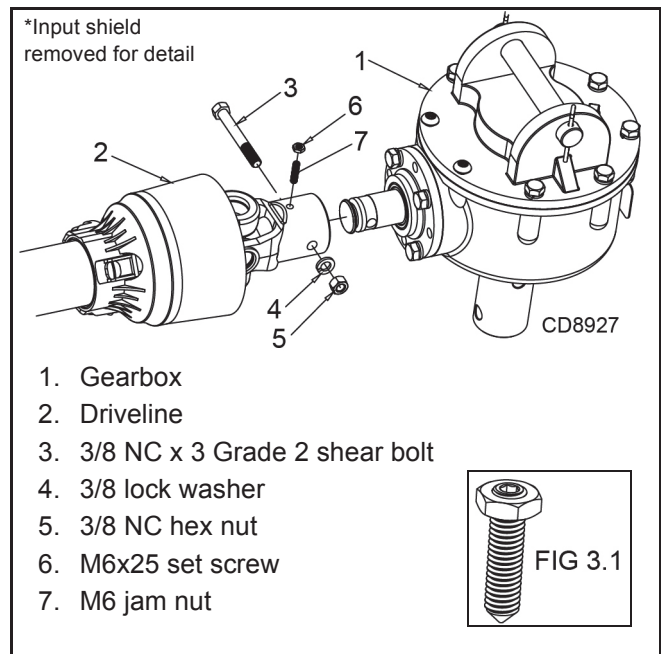


Figure 4. Driveline Installation

1. Clean input shaft on gearbox and smooth bore of driveline yoke. Remove any foreign material or paint. Lightly file any nicks or dents.
 2. Grease the input shaft of the gearbox. This reduces the chance of the driveline galling the shaft if the shear bolt should fail.
 3. Slide driveline over input shaft and align cross holes. Insert shear bolt (3) to hold parts together.
 4. Loosen the jam nut (6) so that it is flush with the top of the set screw (7, Fig 3.1). Tighten the set screw against the gearbox input shaft. Once tightened, loosen the set screw (7) a 1/4 turn. Continue to hold the set screw (7) in this position while tightening the jam nut (6). Remove shear bolt (3) from cross hole. Driveline yoke should spin freely on shaft.
- NOTE:** The set screw prevents the driveline from coming off gearbox shaft if the shear bolt should shear.
5. Secure drive line to input shaft with shear bolt (3), lock washer (4), and hex nut (5).

NOTE: Under no circumstances should driveline adapters be used when attaching driveline to tractor.

ADJUST DRIVELINE LENGTH

Check Driveline Movement

1. Remove auger from gearbox.
2. Attach driveline to the tractor PTO shaft.
3. Remove or place tractor drawbar in storage position.
4. Slowly raise and lower boom with the tractor 3-point arms. Check the driveline to see if it separates, binds, or bottoms out.

NOTE: Gearbox should lower to the ground. If not, change hole location between A-frame and boom or see if driveline is bottoming out. If driveline is bottoming out it will need to be shortened.

Shorten Driveline (If Required)

1. Remove driveline from gearbox shaft and tractor PTO.
2. Lower digger (with auger removed) until the input shaft of gearbox is in line with the PTO shaft of the tractor. This is the shortest distance required for the driveline.
3. Pull driveline apart. Connect driveline halves back to the gearbox and tractor PTO shaft.
4. Hold the two halves parallel to one another to determine how much the driveline must be shortened. Mark each end.

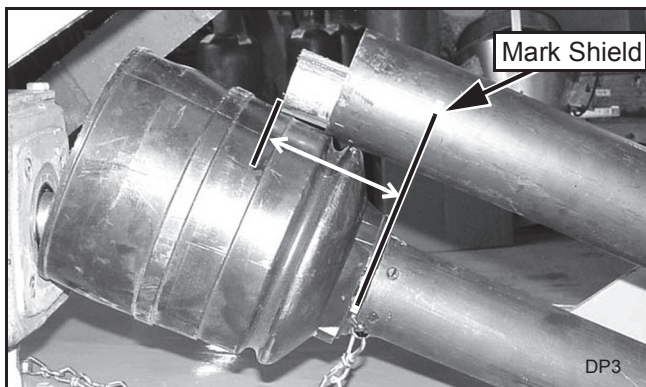


Figure 5. Example of Overlap

5. Raise the digger to the transport position using the tractor 3-point arms.
6. Hold the two halves parallel to one another and check for a minimum of 6-inch (15 cm) overlap.

NOTE: If driveline has less than 6 inches of overlap, do not use this driveline. Contact your place of purchase for a longer driveline.

NOTE: If driveline has more than 6 inches of overlap, the driveline will need to be shortened.

Cut Driveline

1. Place driveline half in a padded vise and cut shield off at the determined length.

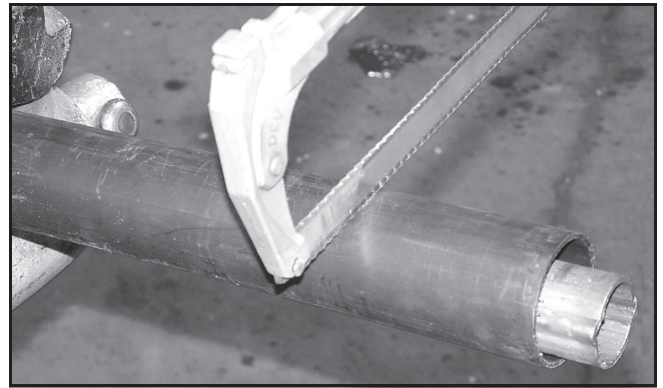


Figure 6. Cut Shield (Example)

2. Place the cutoff portion of the shield against the end of the shaft and use it as a guide. Mark and cut the shaft.

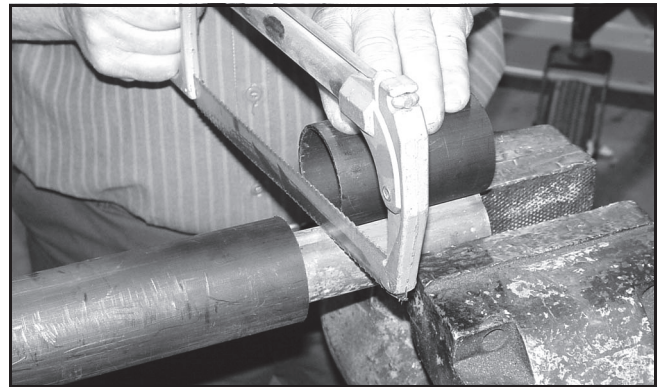


Figure 7. Cut Shaft to Length

3. Repeat steps for other drive half.
4. File and clean cut ends of the both drive halves.
5. Apply a multi-purpose grease to the outside of the male drive half. Slide the two drive halves together.
6. Connect driveline to gearbox and tractor PTO.

WARNING

■ **Make sure spring-activated locking pin or collar slides freely and is seated firmly in tractor PTO spline groove.**

7. Make sure roll pin is installed in driveline yoke to secure driveline to gearbox input shaft.
8. Carefully raise and lower the digger to check that the driveline does not pull apart or bind through its range of motion.
9. Use stabilizer bars, adjustable sway chains, or sway blocks on your tractor lift arms to keep the post hole digger from swaying side to side. Adjust as tightly as practical for best performance.

FILL GEARBOX

1. Level gearbox and remove top fill plug and top sight plug on back side of gearbox.
2. Fill gearbox with SAE 90W gear lube until oil runs out of sight hole.
3. Install both plugs.

INSTALL HANDLE

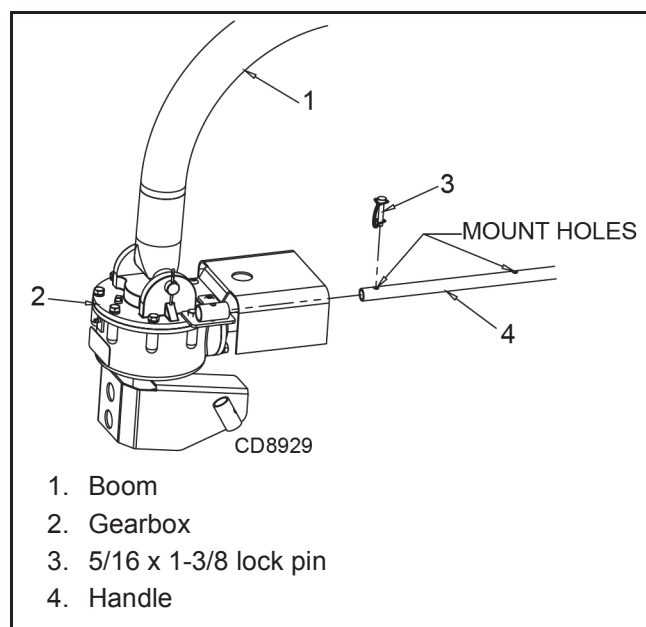


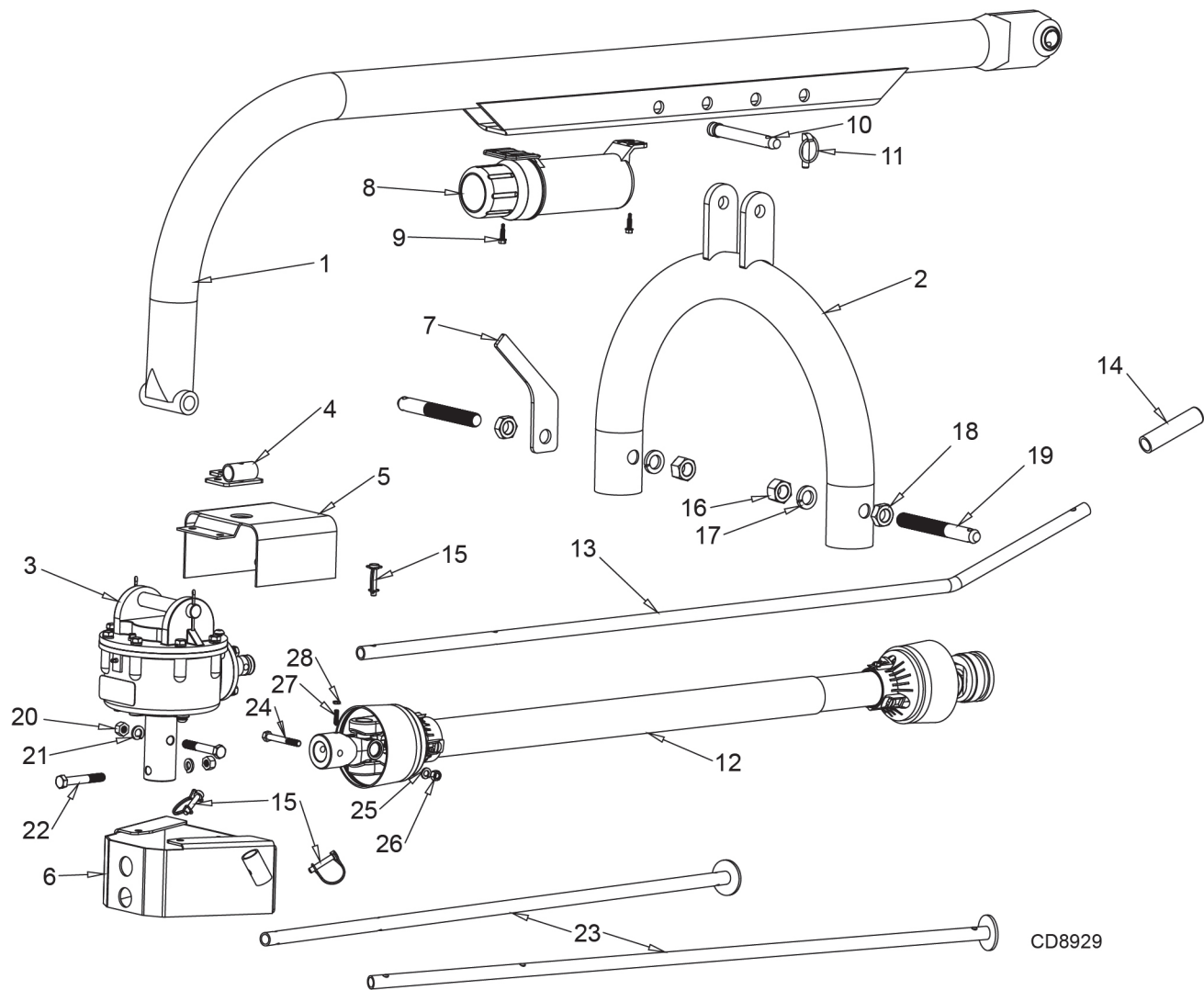
Figure 8. Handle Installed

Handle is used to position the auger as you lower the tip to the ground. You should be able to easily reach handle while seated in the tractor seat and operate the tractor 3-point lift arms. Adjust as necessary.

1. The handle (4) has three holes that can be pinned at the gearbox: one on the short end and two on the long end. Use the hole that allows for safe clearance and access to the handle from the tractor seat.
2. Install supplied handle grip once the handle position has been determined.

NOTES

PHD100 POST HOLE DIGGER ASSEMBLY



CD8929

PHD100 POST HOLE DIGGER ASSEMBLY PARTS LIST

| REF | PART | QTY | DESCRIPTION |
|-----|------------|-----|--------------------------------------|
| 1 | 602390 | 1 | BOOM |
| 2 | 602376 | 1 | A-FRAME |
| N/A | 602415 | 1 | GEAR BOX, COMPLETE (WITH 3, 4, 5, 6) |
| 3 | S24070100 | 1 | GEAR BOX |
| 4 | 602389 | 1 | LUG BRACKET |
| 5 | S24075100 | 1 | INPUT GUARD |
| 6 | 602383 | 1 | OUTPUT GUARD |
| 7 | 602416 | 1 | PTO SHAFT STORAGE BRACKET |
| 8 | S24087600 | 1 | MANUAL CANISTER |
| 9 | 585648* | 2 | 1/4" x 3/4" SELF TAPPING SCREW |
| 10 | S07071500 | 1 | 3/4" TOP LINK PIN |
| 11 | S07090100* | 1 | 7/16" LYNCH PIN |
| 12 | S24117000 | 1 | DRIVE LINE, LARGE, SLIDE COLLAR |
| 13 | 602386 | 1 | HANDLE, PHD |
| 14 | 75393 | 1 | GRIP |
| 15 | S07095400* | 3 | LOCK PIN, 5/16" x 1-3/8" |
| 16 | 30007* | 2 | 7/8" NF HEX NUT |
| 17 | 30008* | 2 | 7/8" LOCK WASHER |
| 18 | 37009* | 2 | 7/8" NF JAM NUT |
| 19 | 1009383A | 2 | PIN, LIFT ARM, 7/8" x 6.78 |
| 20 | S17010500* | 2 | 1/2" NC HEX NUT |
| 21 | S17030300* | 2 | 1/2" LOCK WASHER |
| 22 | S17056600* | 2 | 1/2" NC x 3-1/4" HEX BOLT, GRADE 5 |
| 23 | 602380 | 2 | LEG |
| 24 | 1036156* | 1 | 3/8" NC x 3" SHEAR BOLT, GRADE 2 |
| 25 | S17030100* | 1 | 3/8" LOCK WASHER |
| 26 | S17010100* | 1 | 3/8" HEX NUT |
| 27 | 612141 | 1 | M6 x 25MM SET SCREW |
| 28 | 612140 | 1 | M6 JAM NUT |

* OBTAIN LOCALLY

BOLT TORQUE CHART

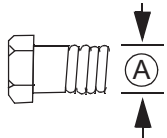
Always tighten hardware to these values unless a different torque value or tightening procedure is listed for a specific application.

Fasteners must always be replaced with the same grade as specified in the manual parts list.

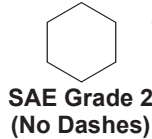
Always use the proper tool for tightening hardware: SAE for SAE hardware and Metric for metric hardware.

Make sure fastener threads are clean and you start thread engagement properly.

All torque values are given to specifications used on hardware defined by SAE J1701 MAR 99 & J1701M JUL 96.




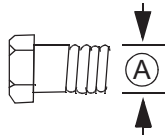
SAE SERIES TORQUE CHART



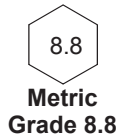
SAE Bolt Head Identification



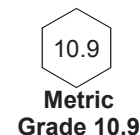
|  Diameter (Inches) | Wrench Size | MARKING ON HEAD | | | | | |
|---|----------------|-----------------|-----|--------|-----|--------|------|
| | | SAE 2 | | SAE 5 | | SAE 8 | |
| | | lbs-ft | N-m | lbs-ft | N-m | lbs-ft | N-m |
| 1/4" | 7/16" | 6 | 8 | 10 | 13 | 14 | 18 |
| 5/16" | 1/2" | 12 | 17 | 19 | 26 | 27 | 37 |
| 3/8" | 9/16" | 23 | 31 | 35 | 47 | 49 | 67 |
| 7/16" | 5/8" | 36 | 48 | 55 | 75 | 78 | 106 |
| 1/2" | 3/4" | 55 | 75 | 85 | 115 | 120 | 163 |
| 9/16" | 13/16" | 78 | 106 | 121 | 164 | 171 | 232 |
| 5/8" | 15/16" | 110 | 149 | 170 | 230 | 240 | 325 |
| 3/4" | 1-1/8" | 192 | 261 | 297 | 403 | 420 | 569 |
| 7/8" | 1-5/16" | 306 | 416 | 474 | 642 | 669 | 907 |
| 1" | 1-1/2" | 467 | 634 | 722 | 979 | 1020 | 1383 |



METRIC SERIES TORQUE CHART

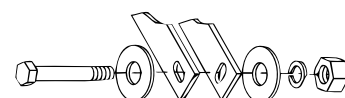
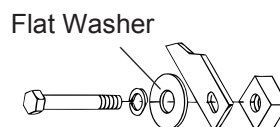
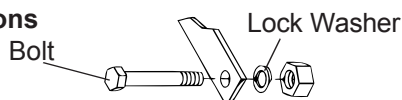


Metric Bolt Head Identification



| <div>Ⓐ</div> <div>Diameter & Thread Pitch (Millimeters)</div> | Wrench Size | Coarse Thread | | | | Fine Thread | | | | <div>Ⓐ</div> <div>Diameter & Thread Pitch (Millimeters)</div> |
|---|----------------|-----------------|--------|-------------|--------|-----------------|--------|-------------|--------|---|
| | | Marking on Head | | | | Marking on Head | | | | |
| | | Metric 8.8 | | Metric 10.9 | | Metric 8.8 | | Metric 10.9 | | |
| | | N-m | lbs-ft | N-m | lbs-ft | N-m | lbs-ft | N-m | lbs-ft | |
| 6 x 1.0 | 10 mm | 8 | 6 | 11 | 8 | 8 | 6 | 11 | 8 | 6 x 1.0 |
| 8 x 1.25 | 13 mm | 20 | 15 | 27 | 20 | 21 | 16 | 29 | 22 | 8 x 1.0 |
| 10 x 1.5 | 16 mm | 39 | 29 | 54 | 40 | 41 | 30 | 57 | 42 | 10 x 1.25 |
| 12 x 1.75 | 18 mm | 68 | 50 | 94 | 70 | 75 | 55 | 103 | 76 | 12 x 1.25 |
| 14 x 2.0 | 21 mm | 109 | 80 | 151 | 111 | 118 | 87 | 163 | 120 | 14 x 1.5 |
| 16 x 2.0 | 24 mm | 169 | 125 | 234 | 173 | 181 | 133 | 250 | 184 | 16 x 1.5 |
| 18 x 2.5 | 27 mm | 234 | 172 | 323 | 239 | 263 | 194 | 363 | 268 | 18 x 1.5 |
| 20 x 2.5 | 30 mm | 330 | 244 | 457 | 337 | 367 | 270 | 507 | 374 | 20 x 1.5 |
| 22 x 2.5 | 34 mm | 451 | 332 | 623 | 460 | 495 | 365 | 684 | 505 | 22 x 1.5 |
| 24 x 3.0 | 36 mm | 571 | 421 | 790 | 583 | 623 | 459 | 861 | 635 | 24 x 2.0 |
| 30 x 3.0 | 46 mm | 1175 | 867 | 1626 | 1199 | 1258 | 928 | 1740 | 1283 | 30 x 2.0 |

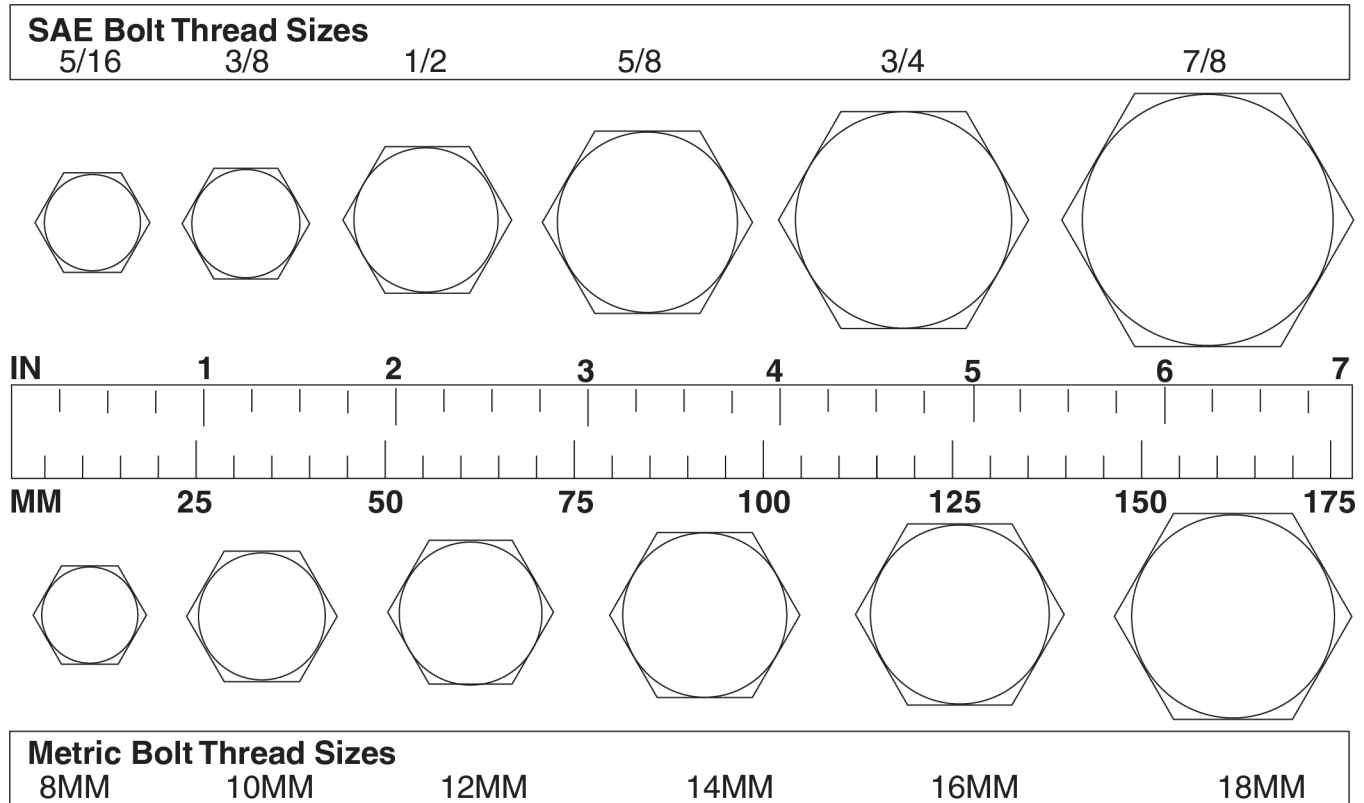
Typical Washer Installations



8/9/00

BOLT SIZE CHART

NOTE: Chart shows bolt thread sizes and corresponding head (wrench) sizes for standard SAE and metric bolts.



ABBREVIATIONS

AGAgriculture
 ASABE American Society of Agricultural & Biological Engineers (formerly ASAE)
 ASAE American Society of Agricultural Engineers
 ATFAutomatic Transmission Fluid
 BSPP British Standard Pipe Parallel
 BSPTM..... British Standard Pipe Tapered Male
 CV Constant Velocity
 CCW Counter-Clockwise
 CW Clockwise
 F..... Female
 FT..... Full Thread
 GA..... Gauge
 GR (5, etc.) Grade (5, etc.)
 HHCS Hex Head Cap Screw
 HT Heat-Treated
 JIC..... Joint Industry Council 37° Flare
 LH Left Hand
 LT..... Left
 m..... Meter
 mm Millimeter
 M..... Male

MPaMega Pascal
 N Newton
 NCNational Coarse
 NF National Fine
 NPSM National Pipe Straight Mechanical
 NPTNational Pipe Tapered
 NPT SWF National Pipe Tapered Swivel Female
 ORBM..... O-Ring Boss - Male
 P Pitch
 PBY Power-Beyond
 psi.....Pounds per Square Inch
 PTO Power Take Off
 QD Quick Disconnect
 RH Right Hand
 ROPSRoll-Over Protective Structure
 RPM..... Revolutions Per Minute
 RT..... Right
 SAE Society of Automotive Engineers
 UNC..... Unified Coarse
 UNF Unified Fine
 UNS Unified Special

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