OPERATING INSTRUCTION

CS & CSE AUGER UNITS AND ASSOCIATED EQUIPMENT

Models: CS 11-12, CS 16-15, CS 20-17, CS 22-20, CS 28-22, CS 35-25, CS 41-25, CS 38-30, CS 49-36, CS 39-37, CS 49-45, CS 62-48, CS 96-45, CS 104-48, CS 121-45, CS 131-48, CS 133-48, CS 167-59, CS 211-59

Models: CSE 15, CSE 20, CSE 25, CSE 30, CSE 35, CSE 45, CSE 50, CSE70, CSE70 PLUS, CSE 80 PLUS, CSE 130, CSE 140, CSE 160, CSE 170, CSE 180, CSE 240, CSE 280

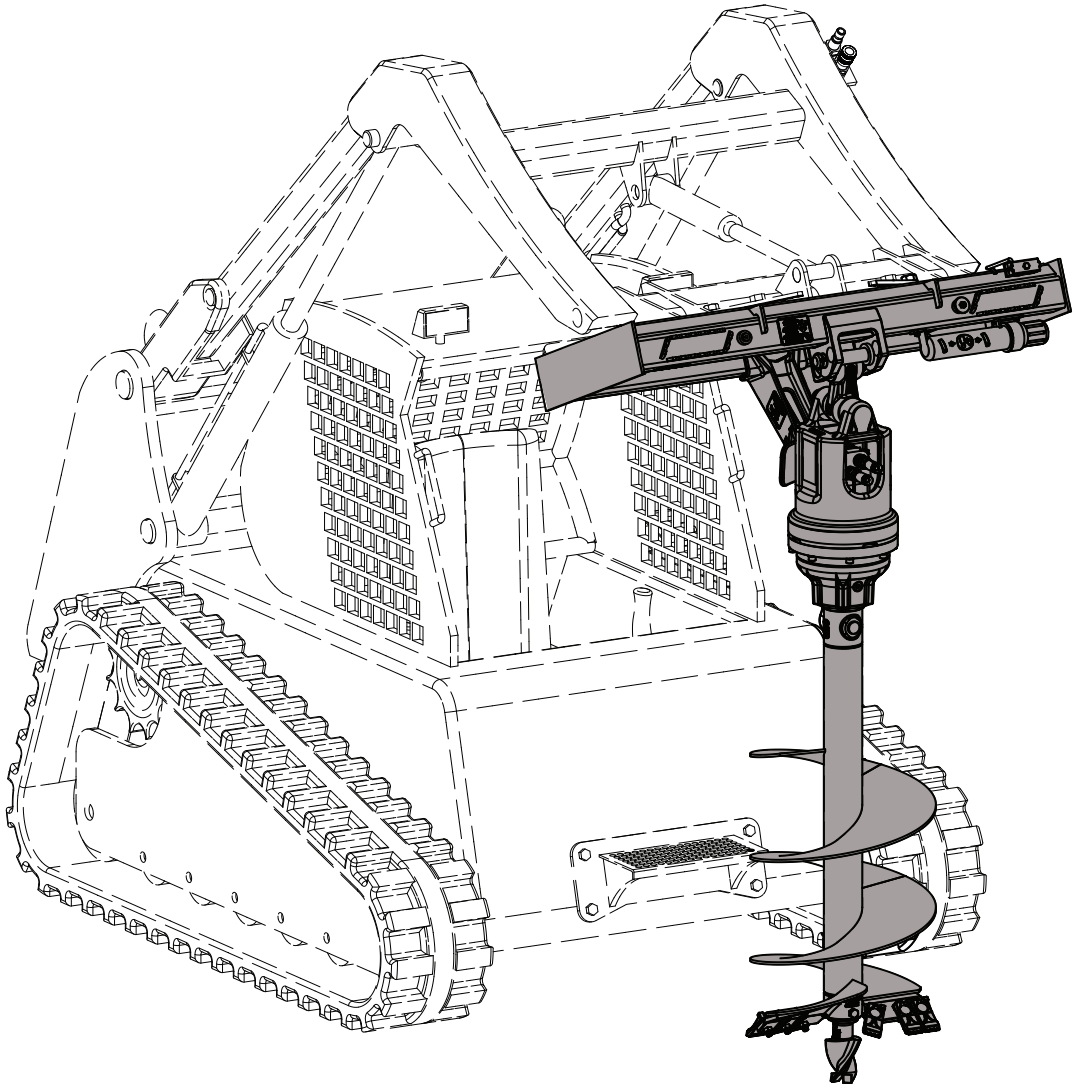


Table of contents

INTRODUCTION

Pengo appreciates your choice of our product for your application. Our number one priority is user safety which is best achieved by our joint efforts. We feel that you can make a major contribution to safety if you, as the machine use;

- Comply with all the relevant National Laws and Local Regulations.
- Read, understand and follow the instructions found within and within any other manuals supplied with this attachment/product.
- Use good, safe working practises with common sense.

ONLY use trained operators to operate theses attachments/products and who are directed by informed and knowledgeable supervision. Operators/Users **MUST** be compliant and accredited to operate this attachment/product and/or Parent machine in accordance with any plant operations/schemes/requirements/regulations. These schemes/requirements/regulations **MUST** be followed at all times.

We reserve the right to make improvements to attachments/products without incurring any need to change these operating instructions. Any modification to this attachment/product which has not been approved by the manufacturer in writing immediately invalidates the manufacturers warranty.

Pengo attachment/products have been designed **ONLY** for use with specific Pengo Mounting Brackets, Augers, Extensions and Wear Parts. Provided these are used and maintained correctly, they will provide a safe and reliable operation.

NOTE: This operating manual should be used in conjunction with the parent machines operating instruction. Copies of this operating manual can be supplied upon request by directly contacting Pengo.

Operators manuals should be regarded as part of the attachment/product. They should always be kept safe, with the attachment/product, for easy and quick reference.

NOTE: Your Auger Drive unit is supplied, pre-filled with the correct amount of gear oil.

INTENDED USE

The Pengo Auger Drive attachments have been designed to be used in conjunction with Pengo Mounting brackets, Auger Bits and Extension Shafts. **ALL** Pengo Auger Drive units are designed to drill bore holes, whilst being attached to a suitable “Prime Mover”. Any use or application deviating from the intended use is deemed to impermissible misuse. Impermissible use is **NOT** permitted, considered **UNSAFE** and **WILL** invalidate your product warranty.

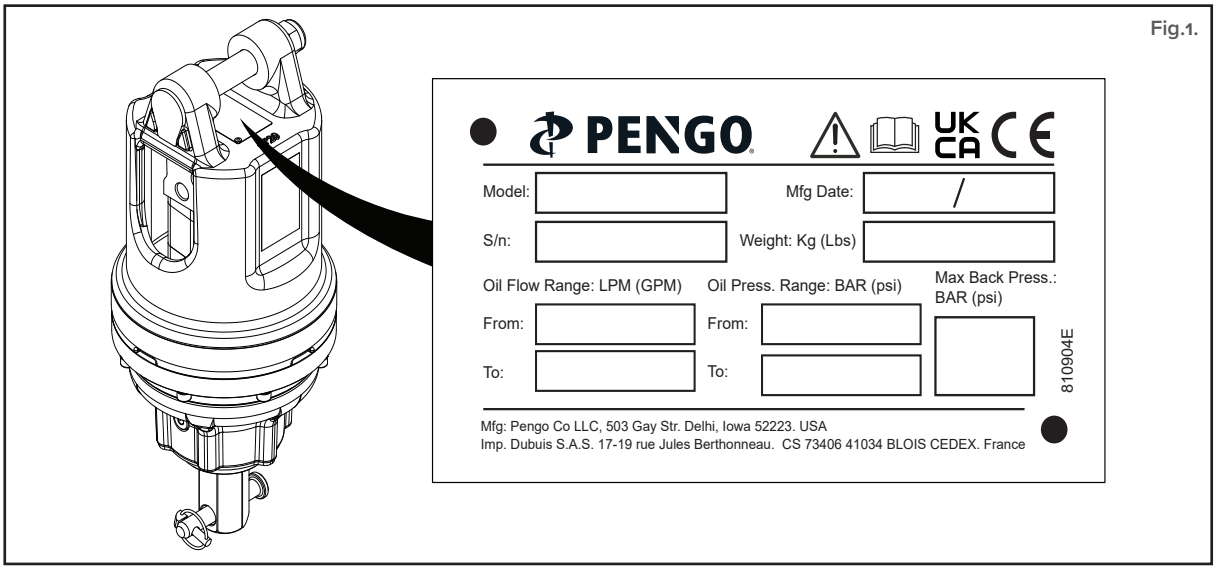
OPERATOR ORIENTATION

The directions Left, Right, Front and Rear, which may be mentioned throughout this manual, are seen from the driver’s seat and facing the direction of travel.

ENQUIRIES

Please state the model type and serial number when making enquiries, orders and all written correspondence. The serial number is recorded on a plate located on the top of the unit as shown. It is recommended that this space is used to record the details of your attachment. **Fig.1.** Contact details can be found on the reverse of this document.

Fig.1.



MACHINERY DIRECTIVE (EUROPEAN COMMUNITY ONLY)

The Machinery Directive 2006/42/EC provides the harmonisation of the essential health and safety requirements for machinery, through a combination of mandatory health and safety requirements and voluntary harmonised standards. Such directives apply only to products that are intended to be placed on or put into service in the market for the first time.

The manufacturer or the authorised representative must draw up a 'Declaration of Conformity'.

DECLARATION OF CONFORMITY (CE)

Where units are supplied in conjunction with Pengo manufactured mounting frames to form an Unit Assembly, Pengo have control over the suitability of the parts supplied. To show this and meet with the lawful requirements of the Machinery Directive a Declaration of Conformity is issued and a CE mark is applied to the assembly. **Fig.2.**

(Copy example)

DECLARATION OF CONFORMITY
ÜBEREINSTIMMUNGS-ERKLARUNG
DECLARATION DE CONFORMITE CEE
DECLARACION DE CONFORMIDAD
DICHIARAZIONE DI CONFORMITA
CONFORMITEITSVERKLARING

PENGO CE

I, the undersigned: / Ich, der Unterzeichnende: / Je soussigné: / El abajo firmante: / Io sottoscritto: / Ik, ondergetekende: — **Vervier, Patrick**

Hereby declare that the equipment specified hereunder: / bestätige hiermit, dass die Maschine: / déclare que l'équipement visé ci-dessous: / Por la presente declaro que el equipo se especifica a continuación: / Dichiaro che le apparecchiature specificate di seguito: / verklaar hierbij dat de hierna vermelde uitrusting:

1. Category: / Kategorie / Catégorie: / Categoria: / Categoria: / Categorie: — **Auger Drive Attachement**
2. Make/Marke/Marque/Marca/Marca/Merk: — **Pengo**
3. Type/Typ/Type/Tipo/Tipo/Type: — **CSE15, CSE20, CSE25, CSE30, CSE35, CSE45, CSE50, CSE55, CSE55PLUS, CSE70, CSE70PLUS, CSE80PLUS, CSE130, CSE140, CSE160, CSE170, CSE180, CSE240, CSE280**
4. Serial number of equipment: / Seriennummer des Geräts: / Numéro de série de l'équipement: / Numero de serie del equipo: / Matricola dell´attrezzatura: / Serienummer van de uitrusting: — **ALL**
5. Mass/Masse/Masse/Masa/Massa/Gewicht: — **58-215Kgs**

Has been manufactured in conformity with: / Wurde hergestellt in Übereinstimmung mit: / Est fabriqué conformément: / Ha sido fabricado de acuerdo con: / E' stata costruita in conformitá con: / vervaardigd werd in overeenkomst met:

Directive/Standards / Richtlinie/Standards / Directives/Normes / Directriz/Los Normas / Direttiva/Norme / Richtlijn/normen	No. / Nr / Numéro / No / n. / Nr.	Approved body / Prüfung durch / Organisme agréé / Aprobado / Collaudato / Erkende instantie
Safety of Machinery - General Hydraulic Fluid Power - General Safety of Machinery - Safety distances Earth Moving Machinery - General Supply of Machinery (Safety) Regulations 2008. Machinery Directive.	**BS EN ISO 12100:2010 BS EN ISO 4413:2010 BS EN ISO 13857:2008 BS EN 474-1:2006 and A6:2019 2008 No. 1597 2006/42/EC**	**Self**

6. Special Provisions: / Spezielle Bestimmungen: / Dispositions particulières: / Provisiones especiales: / Disposizioni speciali: / Speciale bepalingen:
   For compilation of the technical file the person listed under No. 9 is responsible.
   Spezielle Bestimmungen: Für die Zusammenstellung der technischen Unterlagen ist die unter Nr.9 genannte Person verantwortlich
   Dispositions particulières: Pour la compilation du dossier technique de la personne inscrite sous le n ° 9 est responsable
   Provisiones especiales: Para la compilación del expediente técnico a la persona que aparece bajo el N ° 9 es responsable
   Disposizioni speciali: Per la compilazione della scheda tecnica della persona elencato sotto No. 9 è responsabile
7. Representative in the Union: / Vertreter in der Union: / Représentant dans l'union: / Representante en la Union: / Rappresentante presso l'Unione: / Vertegenwoordiger in de Unie: — **Dubuis 17-19, rue Jules Berthonneau-BP 3406 41034 Blois Cedex, France.**
8. Done at/Ort/Fait à/Dado en/Fatto a/Opgesteld in: — **Pengo CO LLC, 503 Gay Street, Delhi, Iowa 52223. USA.**
   Date/Datum/le/Fecha/Data/Datum: — **August 2021**

Signature/Unterschrift/Signature/Firma/Firma/Handtekening:

Position/Position/Fonction/Cargo/Posizione/Functie: **Engineering Manager**

This machinery hereby complies with all relevant provisions of this Directive 2006/42/EC.

Fig.2.

Document No. 811400E1
Rev: B
Date: February 2023
Author: NB

Pengo Co LLC
503 Gay Street, Delhi
Iowa, 52223. USA

SUPPLY OF MACHINERY (SAFETY) REGULATIONS 2008 (UNITED KINGDOM ONLY)

The Supply of Machinery (Safety) Regulations 2008 implemented Directive 2006/42/EC on machinery. The EU Withdrawal Act 21018 preserves the Regulations and enables them to be amended so as to continue to function effectively now the UK has left the EU. Accordingly, the product Safety and Methodology etc. Regulations of 2019 fix any deficiencies that arose from the UK leaving the EU and make specific provisions for the GB market.

DECLARATION OF CONFORMITY (UKCA)

Where units are supplied in conjunction with Pengo manufactured mounting frames to form an Unit Assembly, Pengo have control over the suitability of the parts supplied. To show this and meet with the lawful requirements of the Supply of Machinery (safety) regulations 2008 a Declaration of Conformity is issued and a UKCA mark is applied to the assembly. **Fig.3.**

(Copy example)

DECLARATION OF CONFORMITY
ÜBEREINSTIMMUNGS-ERKLARUNG
DECLARATION DE CONFORMITE CEE
DECLARACION DE CONFORMIDAD
DICHIARAZIONE DI CONFORMITA
CONFORMITEITSVERKLARING

PENGO UK CA

I, the undersigned: / Ich, der Unterzeichnende: / Je soussigné: / El abajo firmante: / Io sottoscritto: / Ik, ondergetekende: **Vervier, Patrick**

Hereby declare that the equipment specified hereunder: / bestätige hiermit, dass die Maschine: / déclare que l'équipement visé ci-dessous: / Por la presente declaro que el equipo se especifica a continuación: / Dichiaro che le apparecchiature specificate di seguito: / verklaar hierbij dat de hierna vermelde uitrusting:

1. Category: / Kategorie / Catégorie: / Categoria: / Categoria: / Categorie: **Auger Drive Attachement**
2. Make/Marke/Marque/Marca/Marca/Merk: **Pengo**
3. Type/Typ/Type/Tipo/Tipo/Type: **CSE15, CSE20, CSE25, CSE30, CSE35, CSE45, CSE50, CSE55, CSE55PLUS, CSE70, CSE70PLUS, CSE80PLUS, CSE130, CSE140, CSE160, CSE170, CSE180, CSE240, CSE280**
4. Serial number of equipment: / Seriennummer des Geräts: / Numéro de série de l'équipement: / Numero de serie del equipo: / Matricola dell´attrezzatura: / Serienummer van de uitrusting: **ALL**
5. Mass/Masse/Masse/Masa/Massa/Gewicht: **58-215Kgs**

Has been manufactured in conformity with: / Wurde hergestellt in Übereinstimmung mit: / Est fabriqué conformément: / Ha sido fabricado de acuerdo con: / E' stata costruita in conformitá con: / vervaardigd werd in overeenkomst met:

Directive/Standards / Richtlinie/Standards / Directives/Normes / Directriz/Los Normas / Direttiva/Norme / Richtlijn/normen	No. / Nr. / Numéro / No. / n. / Nr.	Approved body / Prüfung durch / Organisme agréé / Aprobado / Collaudato / Erkende instantie
Safety of Machinery - General **Hydraulic Fluid Power - General** **Safety of Machinery - Safety distances** **Earth Moving Machinery - General** **Supply of Machinery (Safety) Regulations 2008. Machinery Directive.**	**BS EN ISO 12100:2010** **BS EN ISO 4413:2010** **BS EN ISO 13857:2008** **BS EN ISO 474-1:2006 and A6:2019** **2008 No. 1597** **2006/42/EC**	**Self**

6. Special Provisions: / Spezielle Bestimmungen: / Dispositions particulières: / Provisiones especiales: / Disposizioni speciali: / Speciale bepalingen:
   For compilation of the technical file the person listed under No. 9 is responsible.
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   Dispositions particulières: Pour la compilation du dossier technique de la personne inscrite sous le n ° 9 est responsable
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7. Representative in the Union: / Vertreter in der Union: / Représentant dans l'union: / Representante en la Union: / Rappresentante presso l'Unione: / Vertegenwoordiger in de Unie: **Dubuis 17-19, rue Jules Berthonneau-BP 3406 41034 Blois Cedex, France.**
8. Done at/Ort/Fait à/Dado en/Fatto a/Opgesteld in: **Pengo CO LLC, 503 Gay Street, Delhi, Iowa 52223. USA.**
   Date/Datum/le/Fecha/Data/Datum: **August 2021**

Signature/Unterschrift/Signature/Firma/Firma/Handtekening:

Position/Position/Fonction/Cargo/Posizione/Functie: **Engineering Manager**

This machinery hereby complies with all relevant provisions of this Directive 2006/42/EC.□

Fig.3.

Document No. 811400E2
Rev: B
Date: February 2023
Author: NB

Pengo Co LLC
503 Gay Street, Delhi
Iowa, 52223. USA

SAFETY NOTES AND PRECAUTIONS

PROTECT YOURSELF

Make sure that you wear protective clothing and safety items.
For all procedures detailed within this manual you will need:

- **Safety goggles.**
- **Protective footwear.**
- **Hand protection.**
- **Hard hat.**
- **Ear protection.**
- **Hi visibility clothing.**
- **Foul weather clothing.**

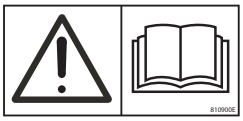
DANGER WARNING AND CAUTION SYMBOLS

The following symbols, which may be mentioned throughout this manual, have important meaning when used with the following captions.

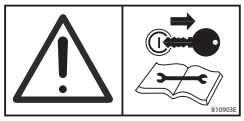
DANGER: An **IMMINENTLY HAZARDOUS** situation that **WILL** result in **VERY SERIOUS INJURY OR DEATH.**

WARNING: A **POTENTIALLY HAZARDOUS** situation that **COULD** result in **VERY SERIOUS INJURY OR DEATH.**

CAUTION: A POTENTIALLY HAZARDOUS situation that **MAY** result in **MINOR** injury.

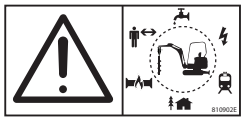


To reduce the risk of serious injury and/or death to yourself or others, read and understand the Safety and Operating instructions before installing, operating, repairing, maintaining. Ensure that copies of these instructions are available at **ALL** times.



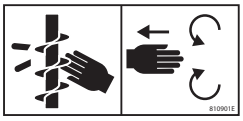
An involuntary start of the Auger Drive attachment can lead to severe injuries and/or death. **ALWAYS** switch off parent machine and lock out hydraulic controls before **ANY** works are undertaken.

Hydraulic oil, under pressure, can penetrate the skin and/or eyes. If any fluid is injected into the skin it **MUST** be surgically removed. **NEVER** use bare hands to check for hydraulic fluid leaks. **ALWAYS** use appropriate safety wear.



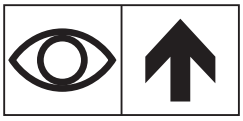
With ALL operations, ensure a **MINIMUM** of a 6 meter (20Ft) working radius is maintained. Before starting **ENSURE** that **NO** persons are within this working radius. A site survey **MUST** also be undertaken, specifically checking for underground risks. **IMMEDIATELY** switch off the attachment if **ANY** person(s) enters the working radius zone.

DANGER WARNING AND CAUTION SYMBOLS - CONTINUED

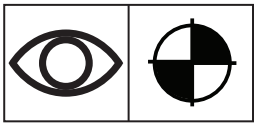


The attachment comprises of rotating parts and poses an entanglement risk. Stay clear of ALL rotating components. Maintain a clear working radius. **ALWAYS** switch off parent machine and lock out hydraulic controls before **ANY** works are undertaken.

The Auger Drive unit, Tools and associated equipment are heavy. **ALWAYS** use suitable lifting equipment to manipulate these components. Failure to do so may results in injury and/or death.



Orientation is of component parts is vital. Where applicable the above symbol is used and direction of orientation is shown by the arrow direction.



Alignment of mating components is vital. Where applicable, the above symbol is used.

HAZARD CLASSIFICATION (ONLY APPLICABLE TO ANSI SAFETY LABELS)

⚠ DANGER **DANGER: IMMEDIATE HAZARD:** Failure to understand or obey this information is likely to result in **PERSONAL INJURY OR DEATH.**

⚠ WARNING **WARNING**: Failure to follow these instructions may result in **PERSONAL INJURY OR DEATH.**

⚠ CAUTION **CAUTION**: Failure to follow these instructions may result in minor **PERSONAL INJURY OR DAMAGE** to the machine or the vehicle.

NOTICE **NOTICE**: This is important information for the proper use of this equipment. Failure to comply may lead to **PREMATURE EQUIPMENT FAILURE.**

MANDATORY SAFETY SYMBOLS

Take time to familiarise yourself with the following symbols, pay special attention and care when observed within this manual. It is advisable to protect yourself, with the following equipment, whenever working with this attachment.

DO NOT wear items of loose clothing, jewellery or other items and tie up long hair which could entangle within the controls or other parts of the machine.

UNPACKING

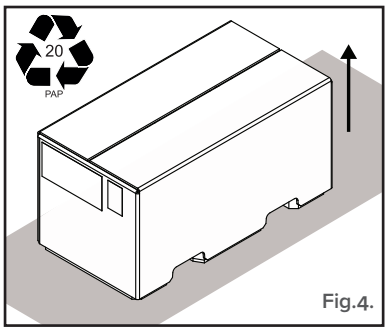


Fig.4.

Remove outer packaging (PAP20), dispose of in accordance with local regulations. **Fig.4**.

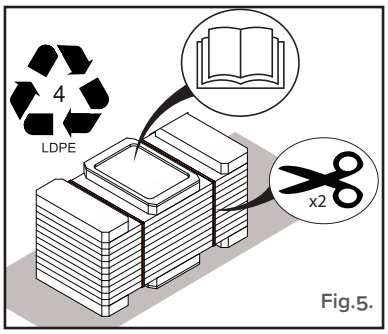


Fig.5.

Remove 2 x straps. Remove operations manual, store safely for further use. Remove upper packaging segment (LDPE4), dispose of in accordance with local regulations. **Fig.5.**

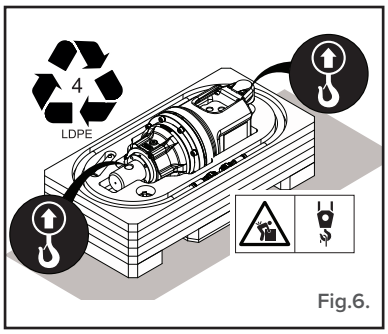


Fig.6.

Using suitable lifting equipment and using lifting points shown, remove Auger Drive unit from lower packaging. Remove all ancillary equipment. Dispose of lower packaging (LDPE4), in accordance with local regulations. **Fig.6.**

SAFETY PRECAUTIONS - GENERAL

- **NEVER** operate or assemble the equipment without fully understanding the operating instructions of both the attachment and parent machine.
- **NEVER** operate the equipment unless you are in good physical condition and mental health.
- **NEVER** operate the equipment under the influence of any substance that could impair your judgement or well-being, this includes drugs or alcohol.
- **NEVER** operate the equipment with damaged or missing parts. Use only genuine replacement parts.
- **NEVER** allow minors to operate the equipment.
- **ALWAYS** survey the work area before commencing operations. Check and remove any potential hazards.
- **ALWAYS** ensure that the attachment and/or parent machine is secure and stable, with its engine switched off and hydraulic system locked out, before carrying out any maintenance work.

WARNING

STAY ALERT. Should something break, come loose or fail to operate on this equipment. **STOP WORK**, lower equipment to the ground, shut of the engine and lock out the hydraulic supply. Inspect and complete repairs before resuming operation.

SAFETY DECALS

ALL safety decals listed **MUST** be fitted to the attachment and **MUST** be legible.

Use mild soap and water to clean safety decals - **DO NOT** use solvent based cleaners because they may damage safety decal material.

Safety decals are fitted to the attachment to warn of possible hazards and **MUST** be replaced immediately if they become unreadable or lost.

If the attachment is repaired and parts have been replaced on which safety decals were affixed, ensure new safety decals are fitted before the attachment/product is put into service.

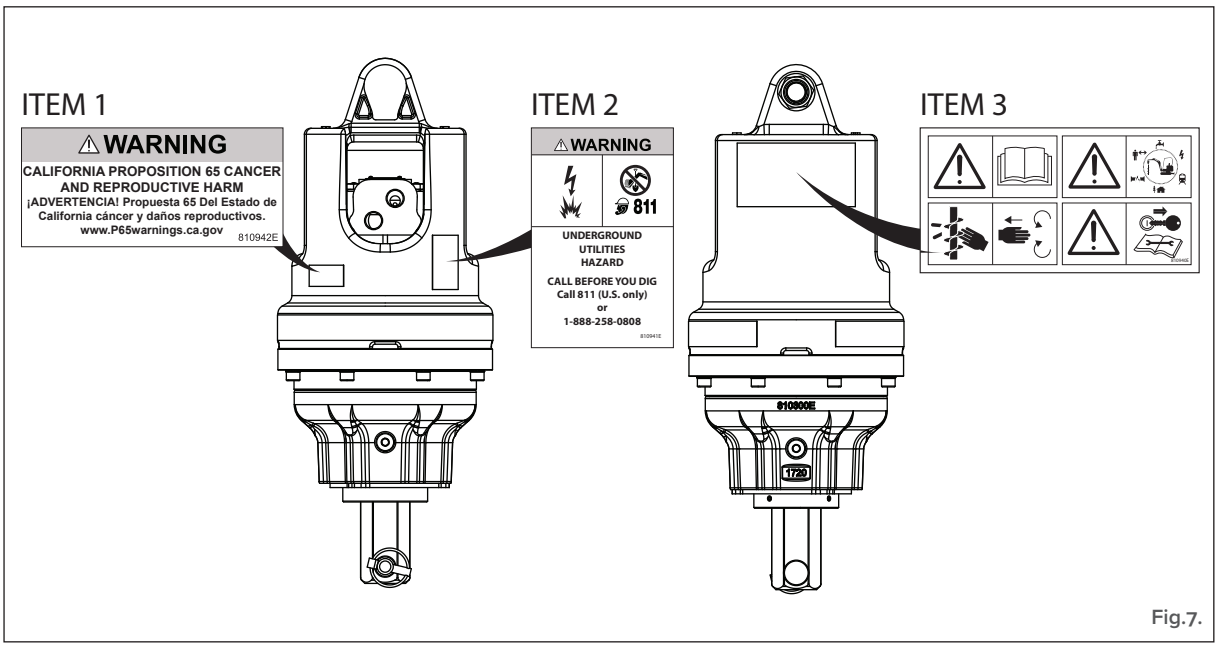


Fig.7.

Item	Description	Quantity	Part Number	Notes
1	LABEL CALIFORNIA PROPOSITION	1	810942E	USA ONLY
2	LABEL CALL BEFORE YOU DIG	1	810941E	USA ONLY
3	LABEL CAUTION AUGER DRIVE UNITS	1	810940E	All locations

EQUIPMENT / ATTACHMENT PRECAUTIONS

PARENT MACHINE LIFT CAPACITY

Alert yourself to the weight of the Drive Unit. **DO NOT** exceed the recommended lift capacity of the **PARENT MACHINE**. Refer to your PARENT Machine's owners manual for suggested lift capacity and lift considerations.

PARENT MACHINE / ATTACHMENT INSTALLATION

Ensure all connection pins, fasteners and latches are properly secured. **Ensure that the mounting frame / attachment mounting plate is rigidly secured to the PARENT MACHINE.** Improper installation can result in product damage, personal injury and death. See **pages 12.**

Ensure **ALL** hydraulic hose assemblies are of adequate length and have enough slack for full Drive attachment movement. Failure to provide adequate length hydraulic hoses can result in hose rupturing. A hydraulic hose rupture can result in product damage, personal injury and death.

OPERATING THE PARENT MACHINE

Avoid steep hillside operation, which could cause the **PARENT MACHINE** to overturn. Consult your **PARENT MACHINE** operator's and safety manuals for maximum incline allowable.

TRANSPORTING THE DRIVE ATTACHMENT

- Travel only with the Drive attachment in a safe transport position to prevent uncontrolled swinging. **"Working procedure - Transportation" on page 24**
- Tether the Drive attachment with a chain, if necessary, to prevent uncontrolled swinging of the auger when moving from hole to hole.
- Remove the earth auger or helical anchor from the Drive attachment before transporting to and from the job site.
- Use extreme care during transport to prevent contact between the Drive attachment and bystanders or solid objects. Contact with the Drive attachment could cause serious damage, injury or death.
- Never operate the Drive attachment while transporting.
- Drive slowly over rough ground and on slopes. Position the Drive attachment as low to the ground as possible maintaining a low centre of gravity.

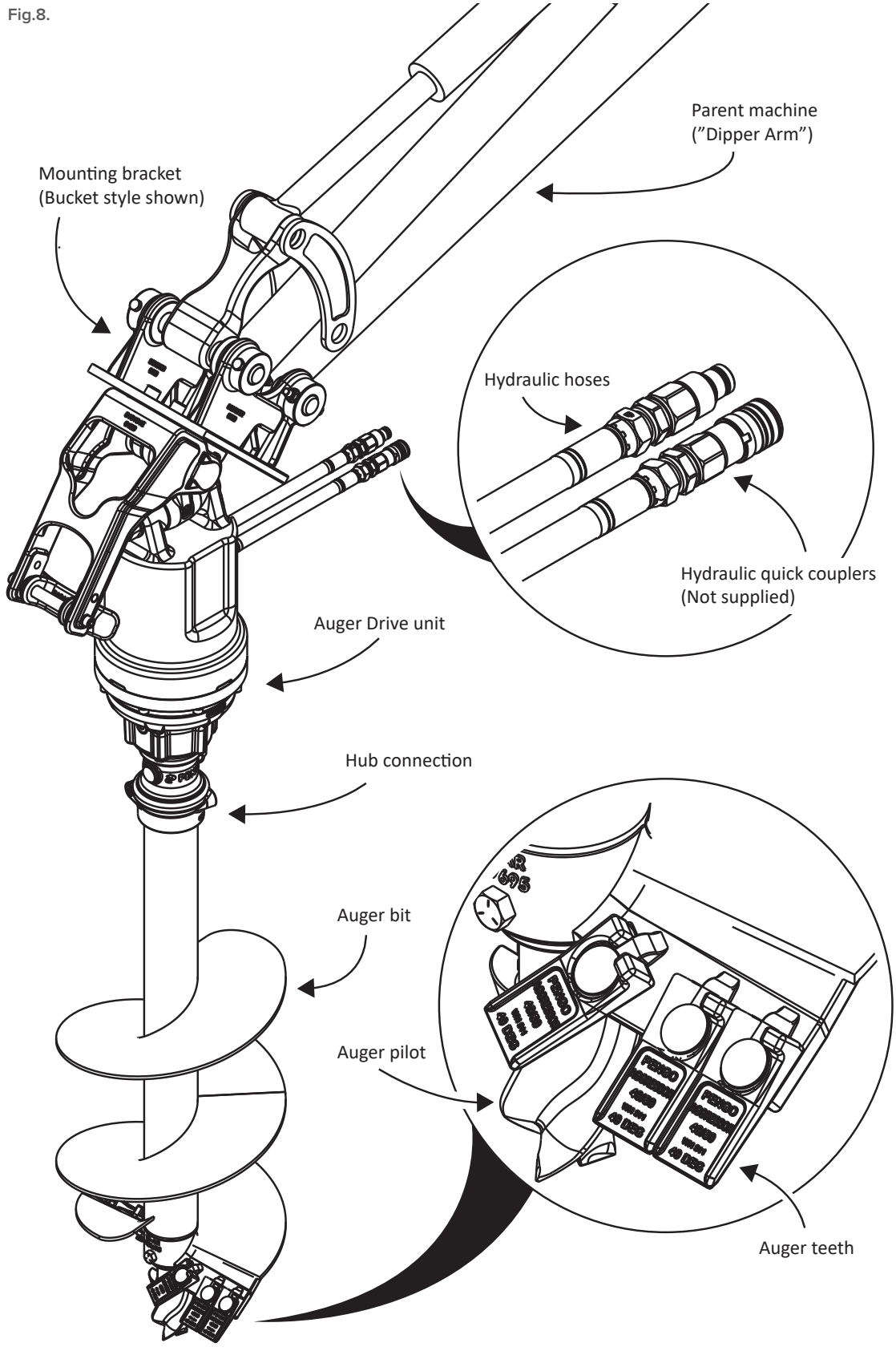
See **"Working procedure - Transportation" on page 24**

DRIVE ATTACHMENT SIDE LOADING

Side loading is NOT recommended. Excessive side loading can cause output shaft deflection and or failure. Avoid excessive side loading to prevent possible instantaneous output shaft failure. Such a failure could result in injury from disconnected parts and or being hit by the Drive attachment causing serious injury or death. See **"Working procedure" on page 23** .

IDENTIFICATION - MAIN COMPONENTS

Fig.8.



MOUNTING OPTIONS

FITTING PRECAUTIONS

ALWAYS work in pairs (2 Skilled operatives) whenever mounting components are being assembled or disassembled.

ALWAYS check the weight of the product/attachment and ensure that suitable lifting equipment is used where necessary.

ALWAYS check parent machine;
Is switched off
Is parked correctly on flat ground
Has its handbrake ON.
Is in good general/working health.

Ensure hitch and mounting points are clean and free from defects before fitting.
If a quick hitch is fitted, ensure that the operators instruction for the quick hitch use/maintenance are adhered to.

FITTING - SINGLE PIN MOUNT

NOTE: The Single Pin Mount **CANNOT** be fitted to a quick hitch. Please contact Pengo for further advice.
NOTE: Upon fitting completion ensure all lubrication points are fully greased.

Set the Auger Drive flat on the ground, with output shaft facing towards the parent machine. Ensure hose port location are facing upwards. **Fig.9.**

Insert item 1. into item 2. **Fig.10**. Insert item 3. Fit item 4. and 5. Tighten item 5. to 60-80Nm (44-59ft-lb).
Lubricate using greasing point.

Fig.9.

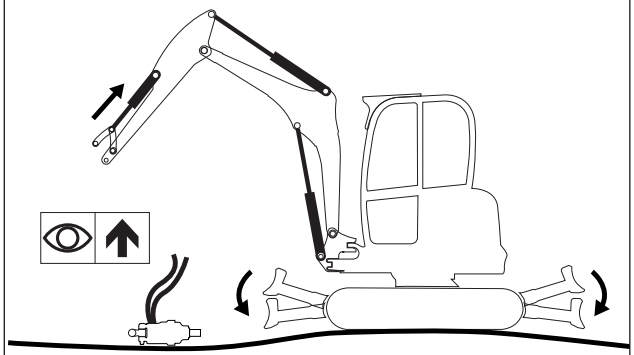
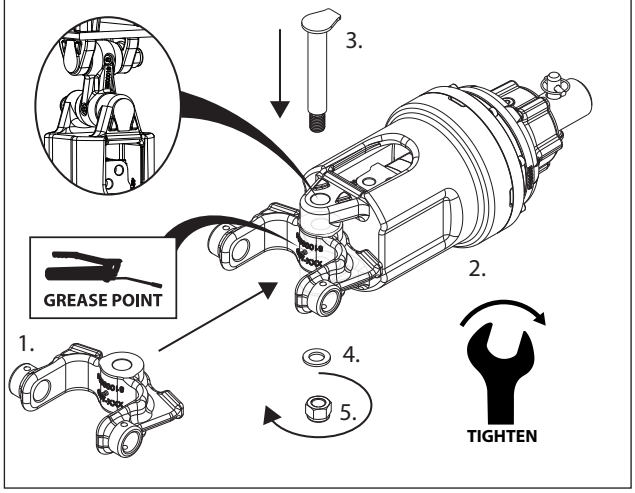
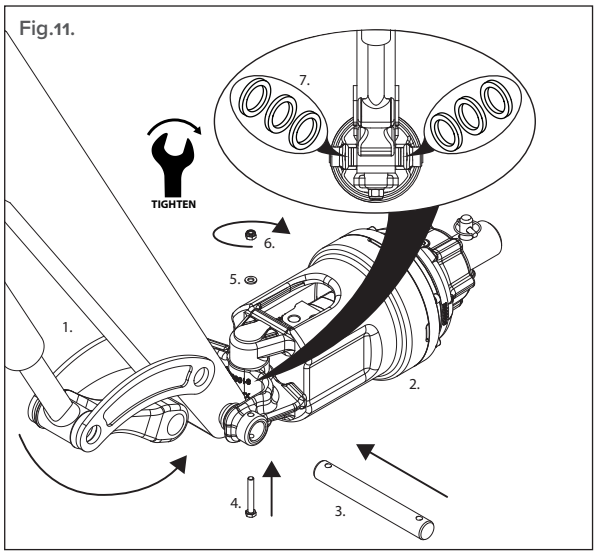


Fig.10.



FITTING - SINGLE PIN MOUNT - CONTINUED

Fig.11.



The Single Pin Mount is supplied with gap filling spacer washers, item(s) 7. **Fig.11.**

Spacer washers should be used to minimise gaps between item 1. **Fig.10 on page 12** and item 1. **Fig.11.**

An equal number of spacers should be used each side of item 7. **Fig.11.**

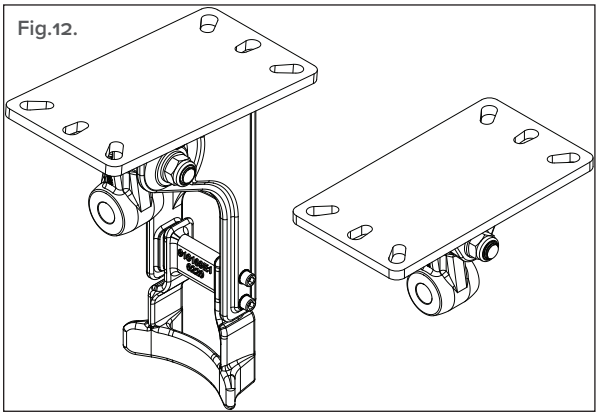
Insert item 3. into assembly 2. and through item 1.

Affix with Item 4., 5. and 6. (2 places) Tighten to 20-25Nm (14-18ft-lb), 2 places. **Fig.11.**

FITTING - GROUP 16 & 17 DRILLED MOUNTS

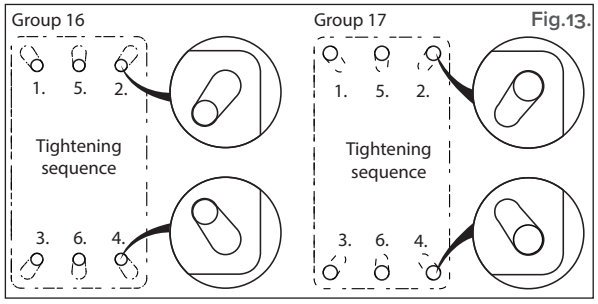
When fitting either the standard or bucket mount an addtional, manufacturer specific top mount will also be required. The following instruction has been provided to ensure correct coupling.
NOTE: Upon fitting completion ensure all lubrication points are fully greased.

Fig.12.



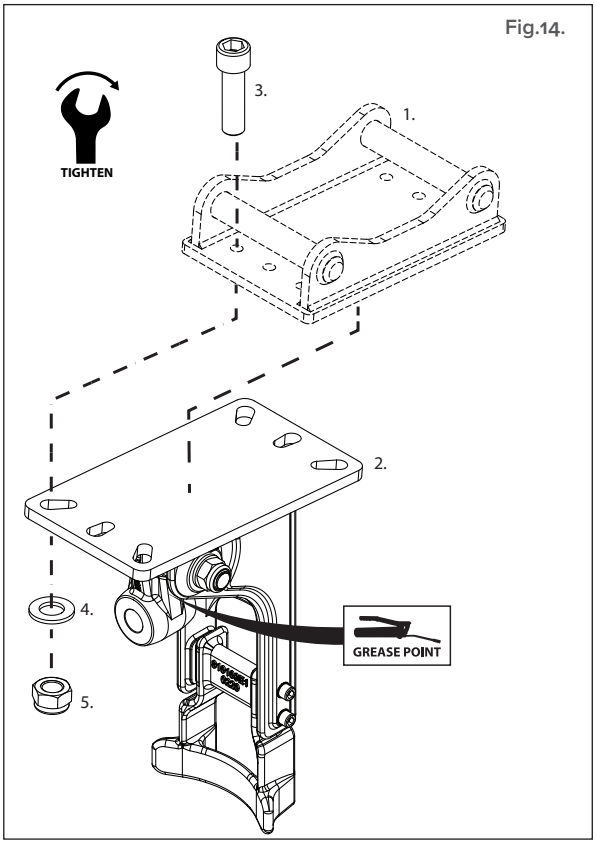
Bucket and standard drilled mounting brakets shown above
NOTE: Each Bracket is drilled to suit either Group 16 or 17 mounting patterns. **Fig.12.**

Fig.13.



Tightening sequence and installation torque.
Group 16 pattern utilises M16 Fixings - Tighetn in sequence to 120-140Nm (88-103ft-lbs).
Group 17 pattern utilises M20 Fixings - Tighten in sequence to 160-180Nm (118-132ft-lbs). **Fig.13.**

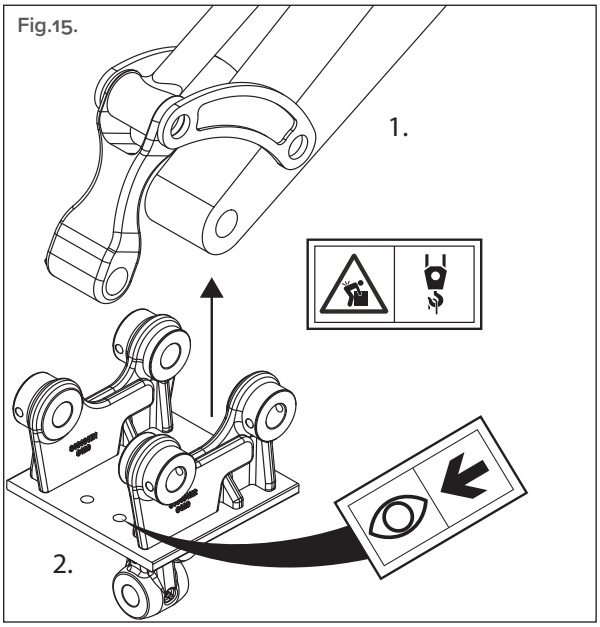
Fig.14.



1. Fit and align item 1 to item 2. **Fig.14.**
2 Secure with items 3,4 and 5 see **"Tightening sequence and installation torque." on page 13**

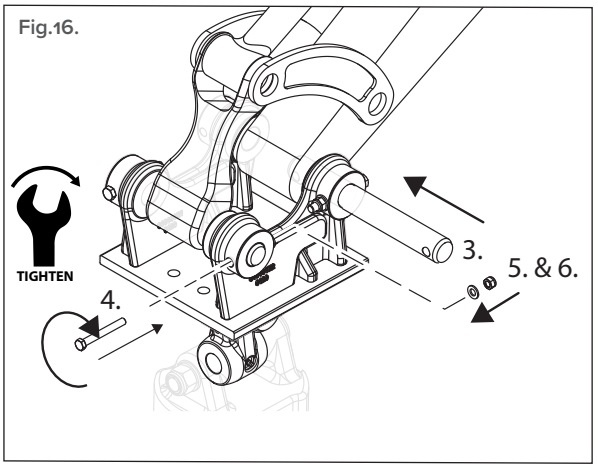
FITTING - DOUBLE PIN MOUNT

Fig.15.



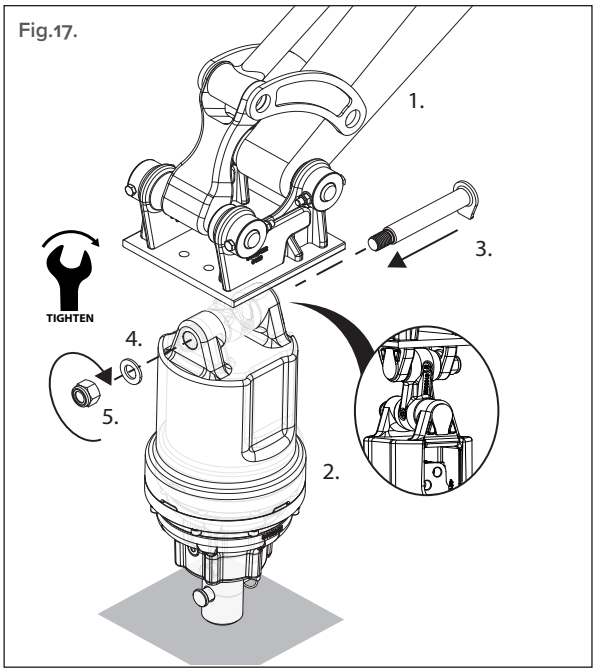
Using suitable lifting equipment raise item 2., in the direction shown, over item 1. **Fig.15** Align holes and temporarily secure.

Fig.16.



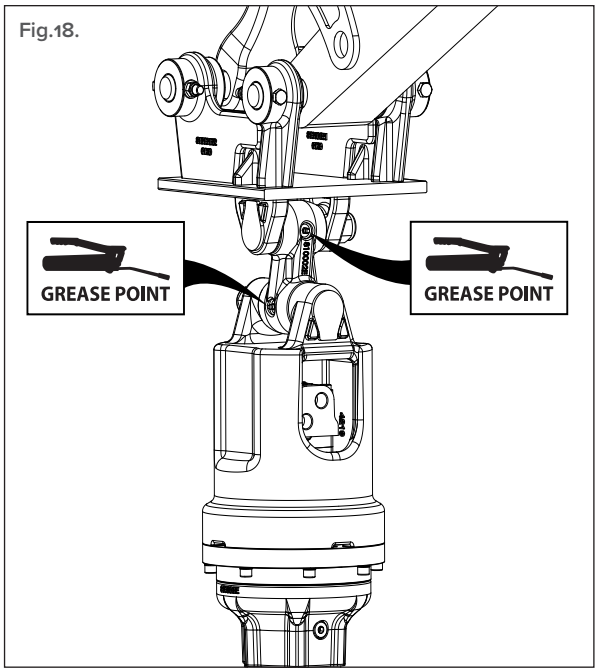
Insert item(s) 3. and affix with items 4., 5. & 6. (4 places). Tighten to 20-25Nm (14-18ft-lb), 4 places. Grease as per parent machinery manufacturers instruction. **Fig.16.**

Fig.17.



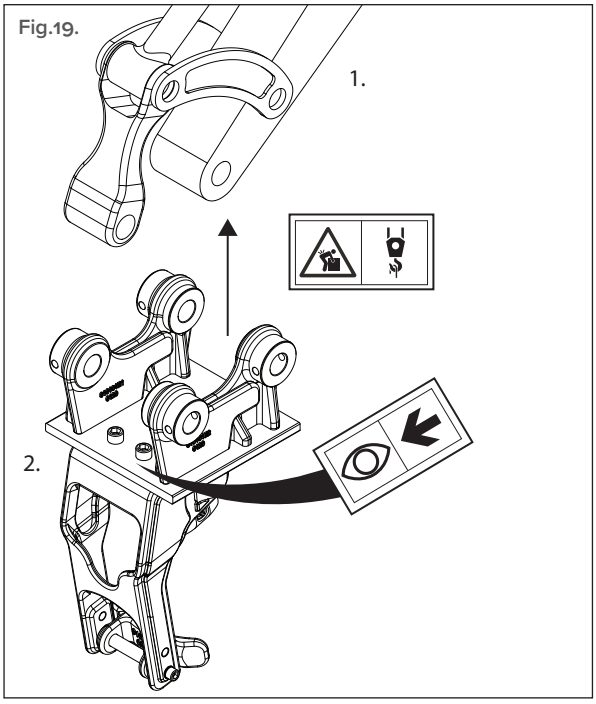
Secure item 2. to the ground. Align assembly 1. insert item 3. Affix using items 4. & 5. Tighten to 120-140Nm (88-103ft-lbs). **Fig.17.**

Fig.18.

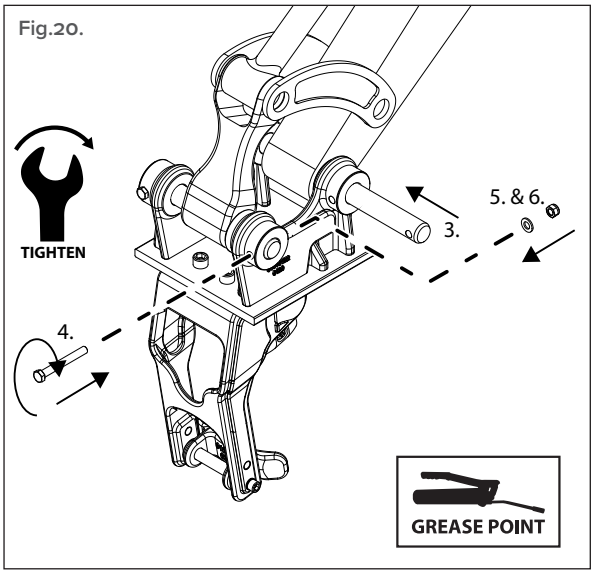


Grease, 2 places, as shown. **Fig.18.**

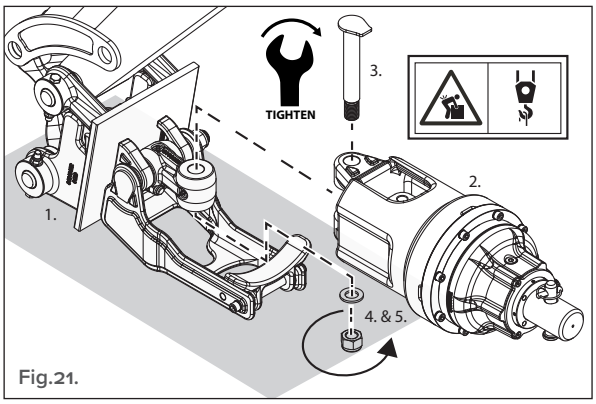
FITTING - DOUBLE PIN BUCKET MOUNT - NO QUICK COUPLER FITTED



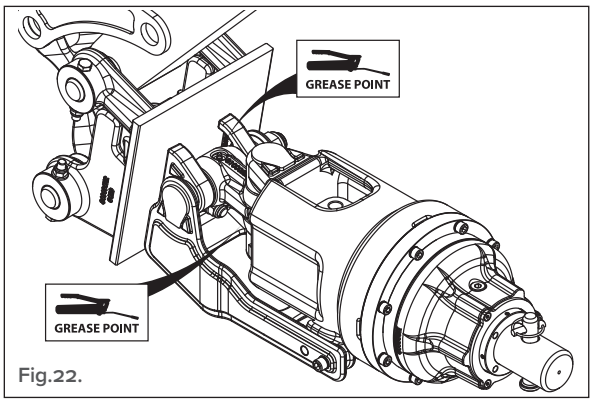
Using suitable lifting equipment raise item 2., in the direction shown, over item 1. **Fig.19** Align holes and temporarily secure.



Insert item(s) 3. and affix with items 4., 5. & 6. (4 places) Tighten to 20-25Nm (14-18ft-lb), 4 places. **Fig.20** Grease as per parent machinery manufacturers instruction.



Secure item 1. to the ground. Align assembly 2. insert item 3. Affix using items 4. & 5. Tighten to 120-140Nm (88-103ft-lbs). **Fig.21**.



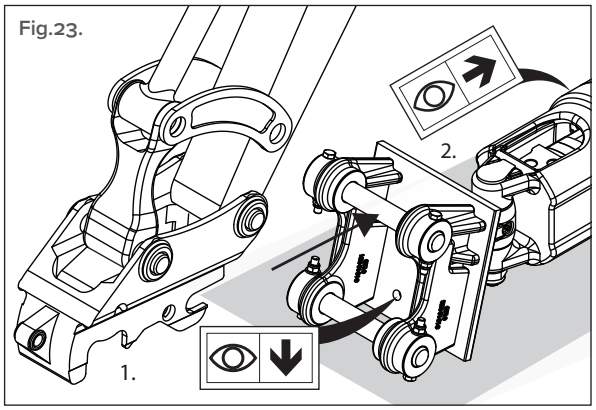
Grease, 2 places, as shown. **Fig.22.**

FITTING - DOUBLE PIN AND DOUBLE PIN BUCKET MOUNT - QUICK COUPLER

WARNING

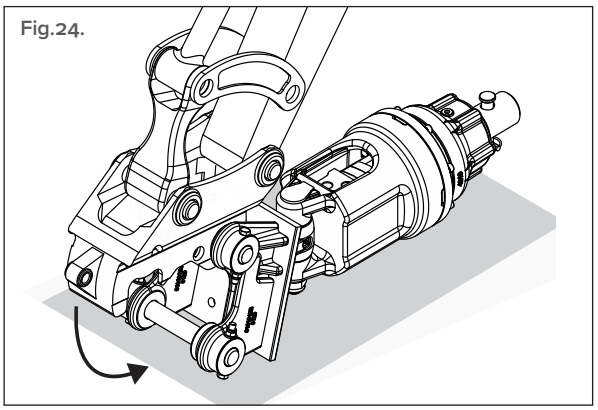
When the parent machine is fitted with a Quick Coupler ensure the manufacturers operators instruction are adhered to.

Fig.23.



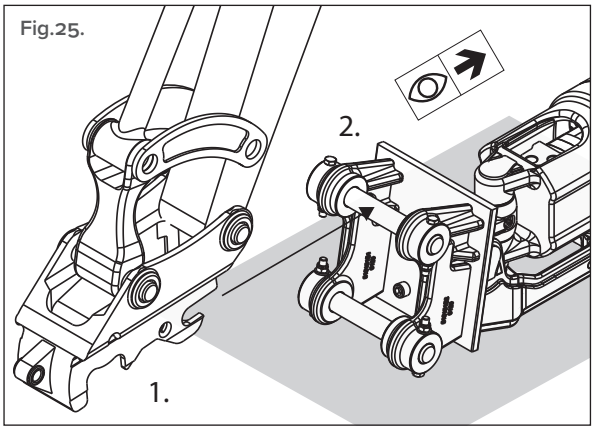
Double Pin Mount. Shown the correct orientation of the Auger Drive unit assembly 2. and Mounting Bracket 1.
The shaft of the Auger Drive should face the parent machine and operator. **Fig.23.**

Fig.24.



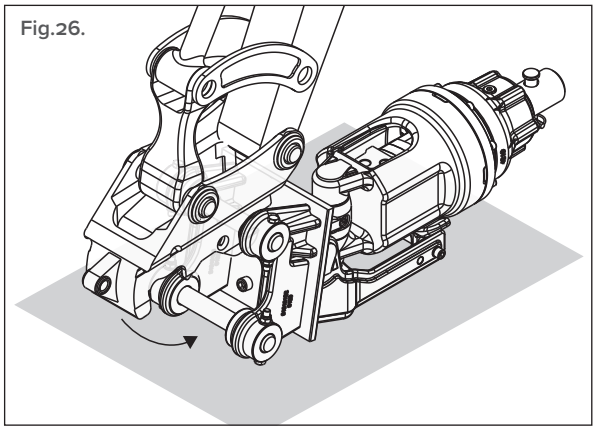
Rotate Quick Coupler and latch secondary pin. Follow Quick Coupler instruction to lock assembly. **Fig.24.**

Fig.25.



Double Pin Bucket Mount. Shown the correct orientation of the Auger Drive unit assembly 2. and Mounting Bracket 1.
The shaft of the Auger Drive should face the parent machine and operator. **Fig.25.**

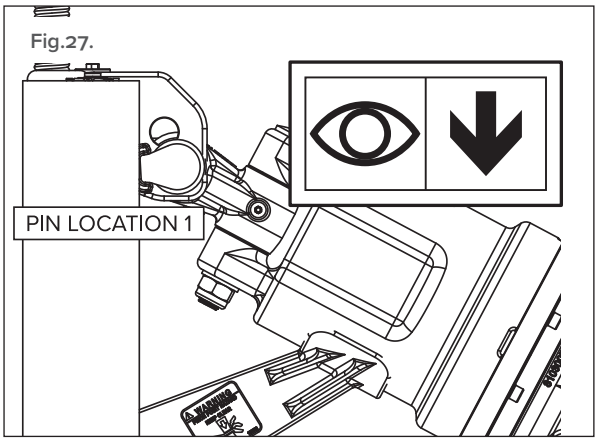
Fig.26.



Rotate Quick Coupler and latch secondary pin. Follow Quick Coupler instruction to lock assembly. **Fig.26.**

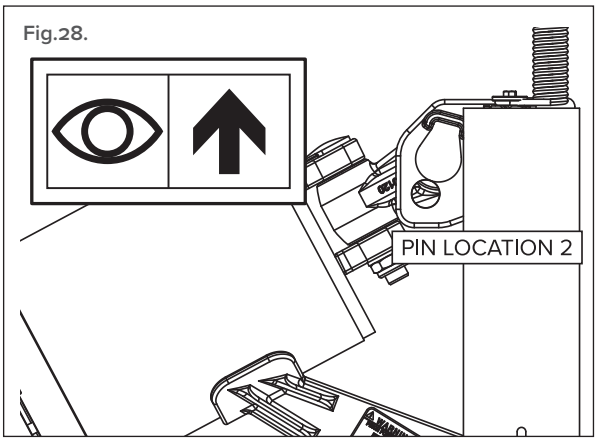
FITTING - LOADER FRAME

Fig.27.



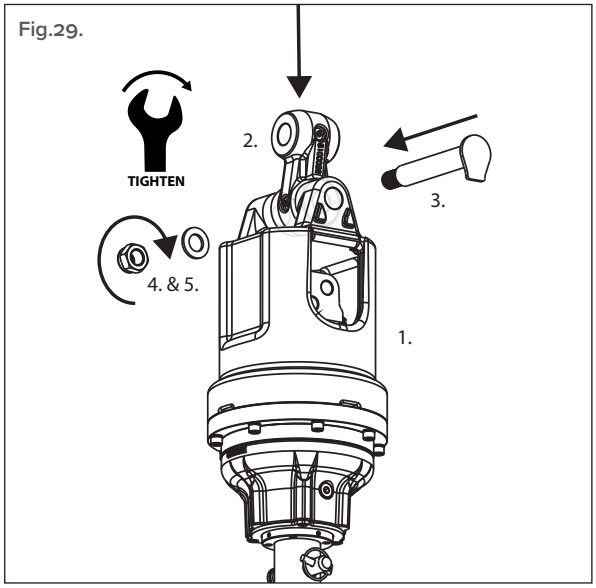
When fitting, models CS20, CS25, CS30, CS35 and CS45, using lower pin location 1. **Fig.27.**

Fig.28.



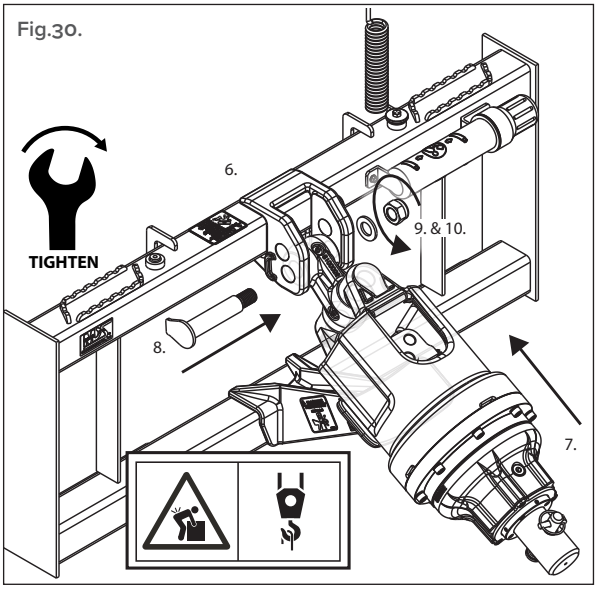
When fitting, models CS55, CS55PLUS, CS70, CS70PLUS, and CS80PLUS, using upper pin location 2. **Fig.28.**

Fig.29.



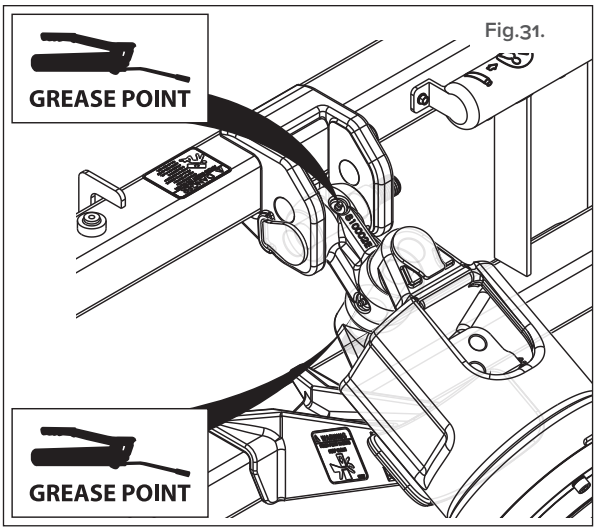
Secure item 1. Install item 2. Secure with item 3. 4. and 5. Tighten to 120-140Nm (88-103ft-lbs). **Fig.29.**

Fig.30.



Using suitable lifting equipment install item 7 into frame assembly 6., using appropriate location point. Secure with item 8., 9. and 10. Tighten to 120-140Nm (88-103ft-lbs). **Fig.30.**

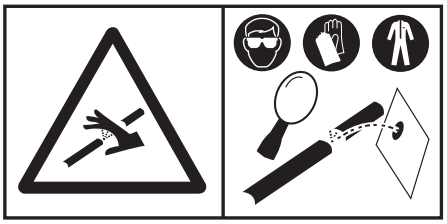
Fig.31.



Grease, 2 places, as shown. **Fig.31.**

HYDRAULIC CONNECTION

SAFETY PRECAUTIONS - HYDRAULIC FLUID



Hydraulic fluid, under pressure, can penetrate the skin and/or eyes causing 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 and ensure all appropriate safety PPE is worn. If any fluid is injected into t skin, it **MUST** be surgically removed. Seek immediate medical attention.

PARENT MACHINE REQUIREMENTS

All CS units can drill in both clockwise and anticlockwise rotation. A single Double Acting Hydraulic circuit is required. Fitting the CS unit to a single acting Hammer Hydraulic circuit will result in single directional rotation.

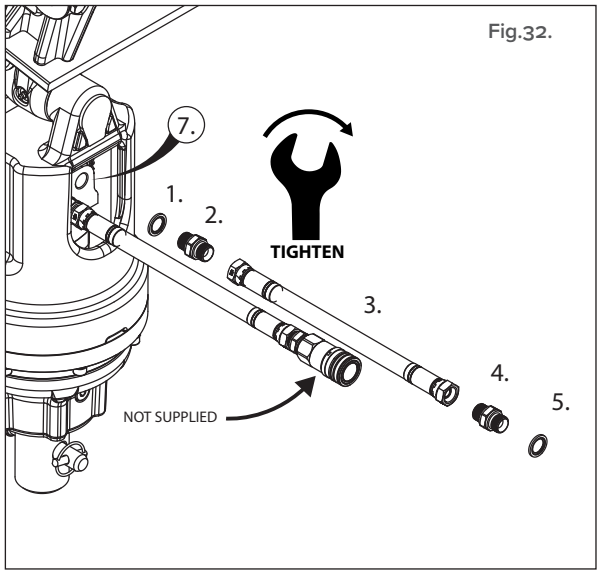
It is critical that the supply of oil is within the stated flow and pressure limits as stated on the data plate fitted to each CS unit or found in **“Specifications - CS models” on page 31 .**

HYDRAULIC HOSE CONNECTION

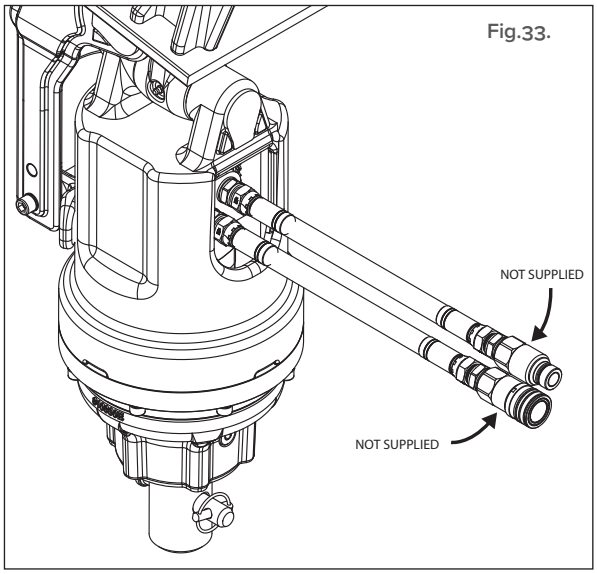
When fitting hydraulic hose assemblies, ensure all hydraulic seals and fittings are clean and tightened torque for the fitted thread size.

- 1/2” Hoses - Tighten to 56Nm/41FtLbs
- 3/4” Hoses - Tighten to 73Nm/54FtLbs
- 1” Hoses - Tighten to 110Nm/81FtLbs

Additional Hydraulic Quick Couplers may be required to enable final parent machine connection. The Hydraulic Quick Couplers are **NOT** supplied and **MUST** be purchased separately.



Install sealing washer 1. onto adaptor 2. install adaptor 3. into hydraulic motor (7) and tighten to required torque. Install item 3. onto item 2. and tighten to required torque. Install item 4. and 5. onto item 3. and tighten to required torque. (2 places). **Fig.32.**



Quick release couplers are not supplied and **MUST** be purchased separately. Follow manufacturers installation instruction. **Fig.33.**

HYDRAULIC HOSE CONNECTION - CONTINUED

Quick Release Couplers maybe needed for connection to the parent machine. These can be sourced locally and should be compatible with Quick Release Couplers already fitted to the parent machine.
The parent machine's axillary hydraulic connection can normally be found near the end of the loader arms/excavator dipper arm.

Ensure, when connecting to the parent machine's hydraulic supplied, that the preferred Auger Drive rotation is clockwise. **Fig.34** & **Fig.35**.

Fig.34.

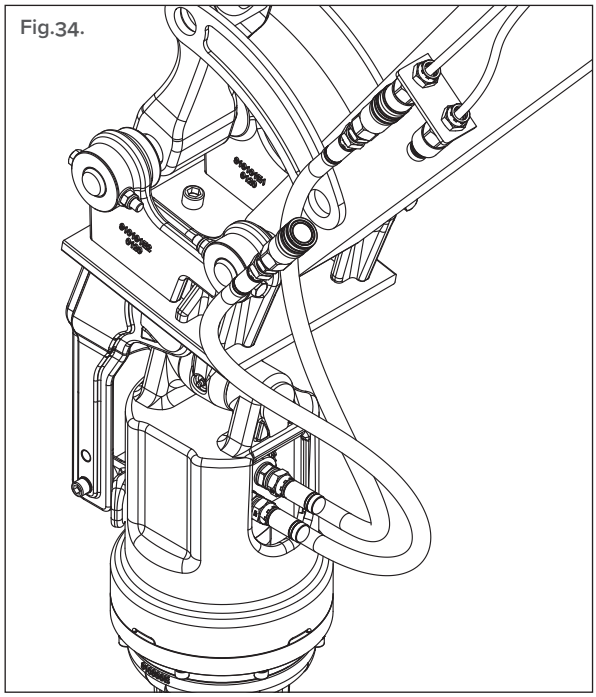
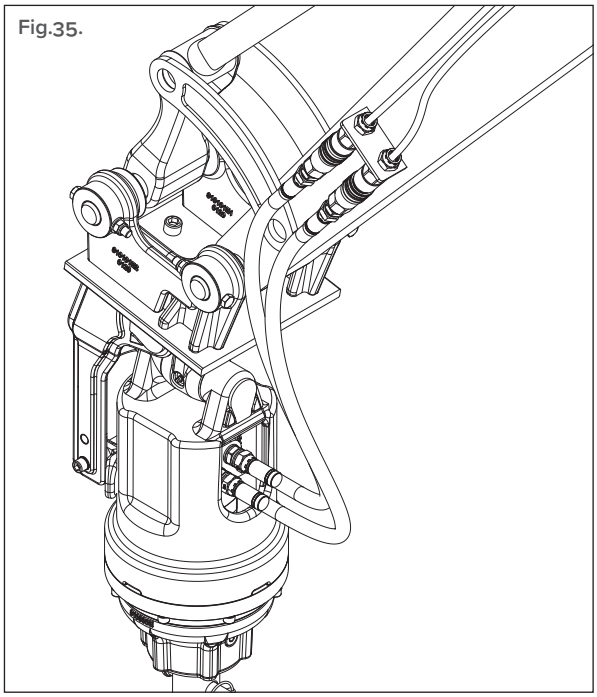


Fig.35.



When connecting Hydraulic Quick Couplers refer to the manufacturers instruction.

HYDRAULIC HOSE SPECIFICATION

Auger Drive Model	Hose Size	Specification	Minimum working pressure
CS 11-12, CS 16-15, CS 20-17, CS22-20, CS 28-22, CS 35-25, CS41-25, CS38-30, CS 49-36. CSE 15, CSE 20, CSE 25, CSE 30, CSE 35, CSE45, CSE55, CSE 70.	1/2" BORE	EN 853 2ST/SN SAE 100 R2	275Bar / 3990PSI
CS 39-37, CS49-45, CS62-48, CS96-45, CS121-45. CSE 70PLUS, CSE 80PLUS, CSE 130 CSE 160.	3/4" BORE	EN 857 2SC+ SAE 100 R12	280Bar / 4000 PSI
CS104-48, CS131-48, CS167-59, CS211-59. CSE 140, CSE 170, CSE 180, CSE 240, CSE 280.	1" BORE	EN 856 4SP ISO 3862-1 4SP SAE 100 R12	320Bar / 4640 PSI

Fig.36.

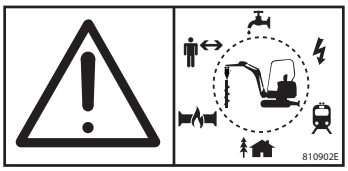
WARNING

Periodically check the conditions of the hydraulic hoses. The hydraulic hoses **MUST** immediately be replaced if any defects are found. **"Hydraulic connection" on page 18**

When sourcing hydraulic hoses separately the above specification **MUST** be used. **Fig.36**

Failure to replace damaged hydraulic hoses or those not confirming to the above specifications may result in injury and/or death.

FIRST OPERATION



As with all operations, ensure a minimum of a 6 metre clear working radius.

NOTE: Your Auger Drive unit is supplied, pre-filled with the correct amount of gear oil.

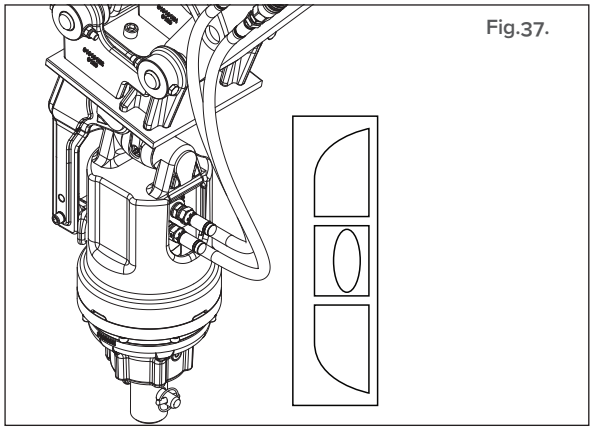


Fig.37.

To optimise the life of your CS Auger Drive a minimum running in procedure **MUST** be followed. To carry out the running in procedure first connect it to your parent machine, connect the hydraulic supply and hang in a vertical position. **DO NOT** connect an Auger Bit at this time. **Fig.37.**

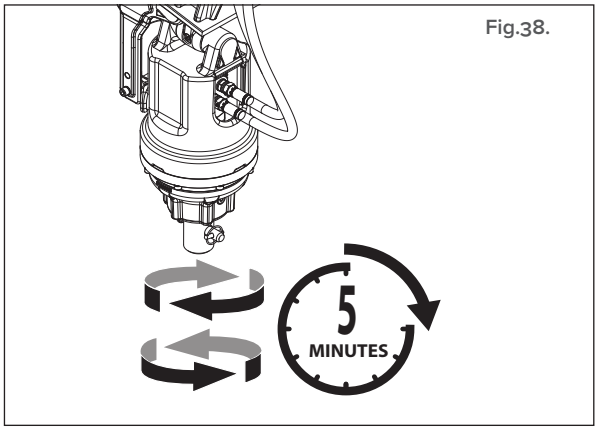


Fig.38.

1. Activate hydraulic supply and run the unit, in a clockwise rotation, at 30% of its rated speed for 5 Minutes.
2. Repeat operation in the anti-clockwise rotation. **Fig.38.**

TOOL FITTING - AUGER BIT AND EXTENSION

TOOL FITTING - PRECAUTIONS

ALWAYS work in pairs (2 Skilled operatives) whenever mounting components are being assembled or disassembled.

ALWAYS check the weight of the product/attachment and ensure that suitable lifting equipment is used where necessary.

ALWAYS check parent machine;
- Is switched off
- Is parked correctly on flat ground
- Has its handbrake ON.
- Is in good general/working health.

Ensure mounting points are clean and free from defects before fitting.

TOOL FITTING - AUGER BIT

WARNING

ALWAYS work in pairs (2 Skilled operatives) whenever mounting components are being assembled or disassembled.

ALWAYS check the weight of the product/attachment and ensure that suitable lifting equipment is used where necessary.

ALWAYS check the weight of the product/attachment and ensure that the parent machine is suitable, consult the parent machine load data charts for further advice.

ALWAYS check parent machine;
- Is switched off
- Is parked correctly on flat ground
- Has its handbrake ON.
- Is in good general/working health.

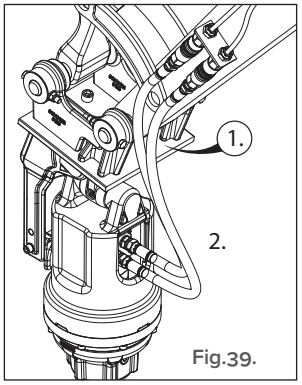


Fig.39.

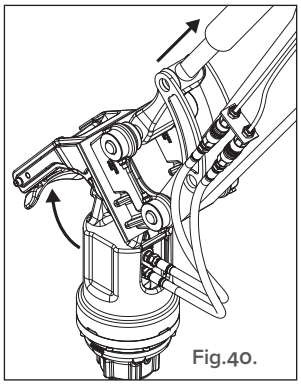


Fig.40.

If the Bucket Mount system 1., is fitted and before connecting any tool ensure that the bucket mount is retracted and the Auger Drive unit 2. is free to move. **Fig.39** & **Fig.40**.

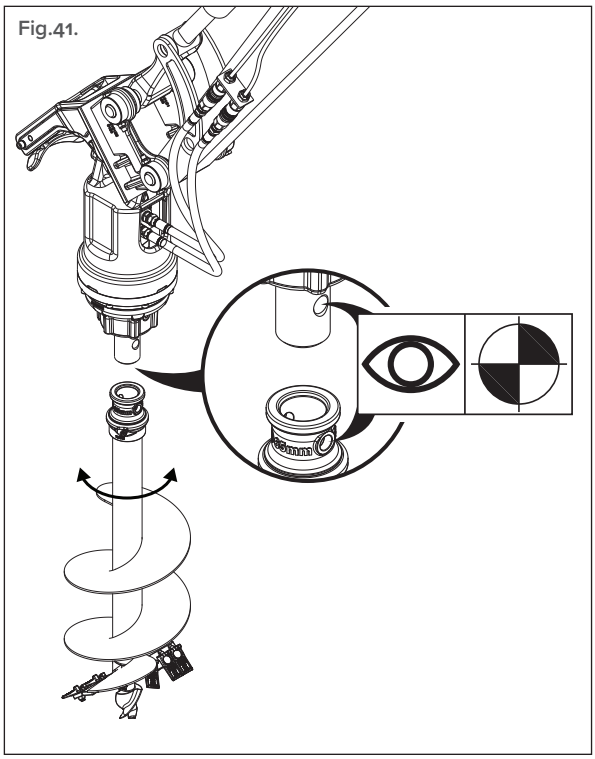


Fig.41.

Ensure Auger Drive shaft and Auger Tool receptacle are compatible.

Rotate Auger Tool and ensure mounting hole points are aligned. **Fig.41**.

Secure and stabilise the Auger Tool.

1. Lower parent machine boom and Auger Drive unit 1., engaging male output shaft into female Auger Tool receptacle. **Fig.42**.
2. Insert Auger Bit locking pin. 2. **Fig.42**.
3. Capture locking pin with locking clip. 3. **Fig.42**.
ONLY Genuine locking pins and clips to be used.

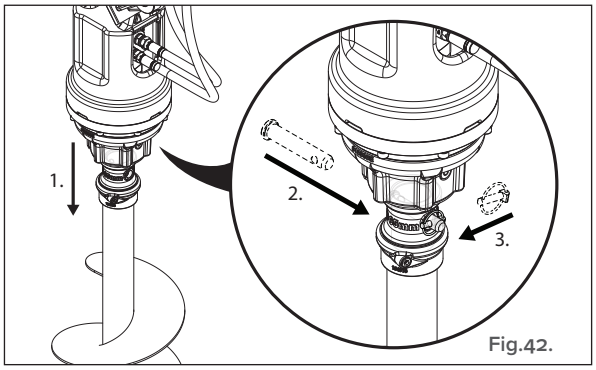


Fig.42.

TOOL FITTING - EXTENSION SHAFT

WARNING

ALWAYS work in pairs (2 Skilled operatives) whenever mounting components are being assembled or disassembled.

ALWAYS check the weight of the product/attachment and ensure that suitable lifting equipment is used where necessary.

ALWAYS check the weight of the product/attachment and ensure that the parent machine is suitable, consult the parent machine load data charts for further advice.

ALWAYS check parent machine;
- Is switched off
- Is parked correctly on flat ground
- Has its handbrake ON.
- Is in good general/working health.

When the required hole depth exceeds the capabilities of the Auger to be used then additional extensions should be used. NEVER exceed the lifting capacity of the parent machine.

If the Bucket Mount System is used please read **“Tool fitting - Auger Bit” on page 21** prior to fitting Extension shafts.

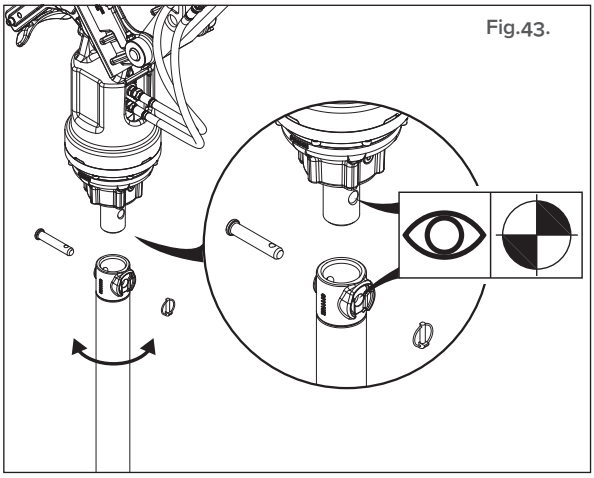


Fig.43.

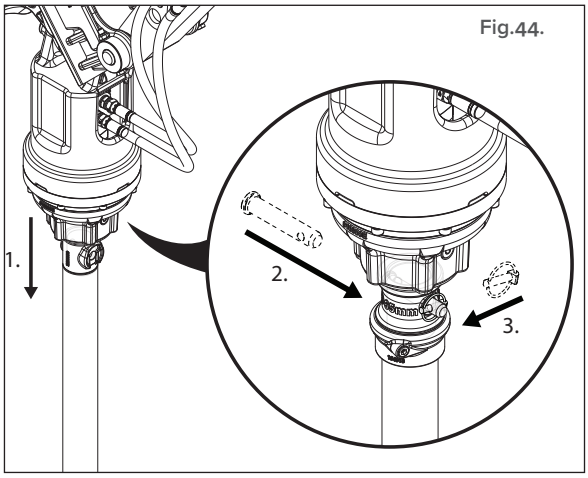


Fig.44.

Ensure Auger Drive shaft and Auger Tool receptacle are compatible.

Rotate Auger Extension and ensure mounting holes are aligned.

Secure and stabilise the Auger Extension.

1. Lower the parent machine boom and Auger Drive unit 1., engaging male output shaft into female Auger Extension receptacle. **Fig.43**
2. Insert Locking pin. 2. **Fig.44.**
3. Capture locking pin with locking clip. 3. **Fig.44.**
4. See **“Tool fitting - Auger Bit” on page 21** for details on how to fit the Auger Bit.

ONLY Genuine Locking Pins and Clips to be used.

WORKING PROCEDURE

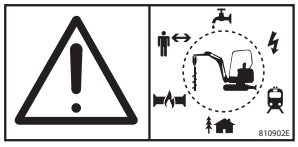
PREPARATION

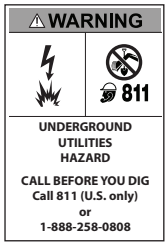
WARNING

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

Corden off work area from bystanders, livestock etc. Rotating parts can cause severe injury or death,

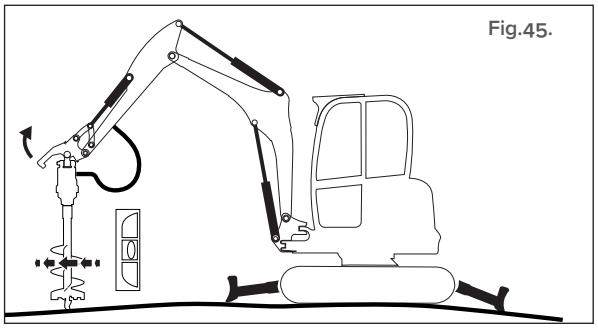
ALWAYS perform a site survey and risk assessment **BEFORE** commencing any works.

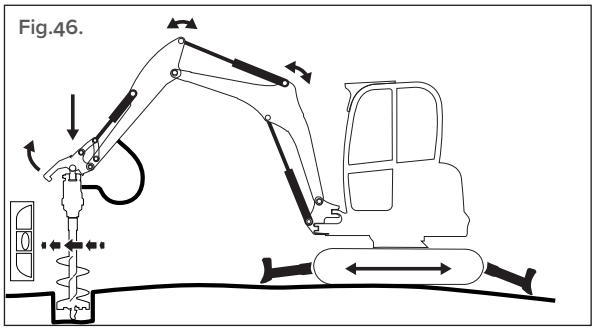


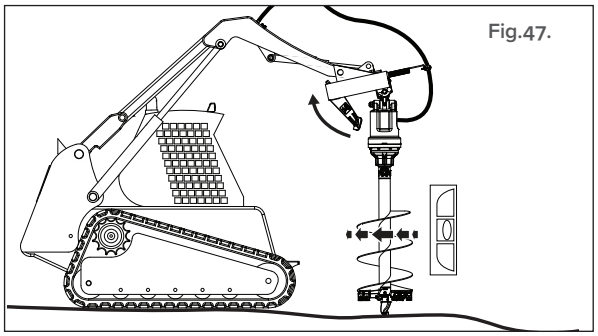


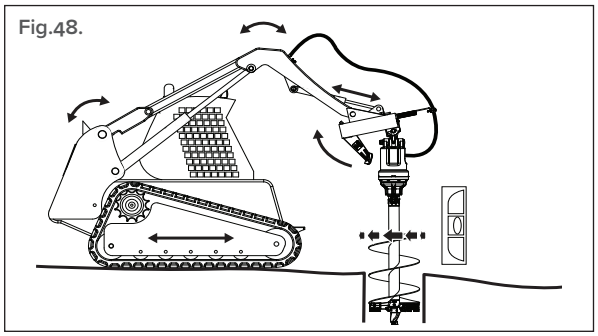
AVOID underground hazards.
AVOID overhead hazards.
AVOID existing infrastructure.
ENSURE working radius is free from bystanders.
CHECK with all authorities and follow any regulations in place.
IF IN DOUBT seek professional advice.

WORKING PROCEDURE - USE



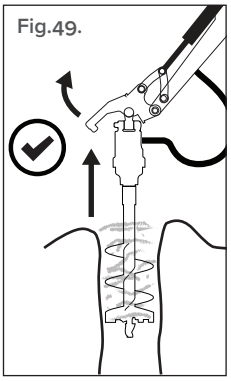




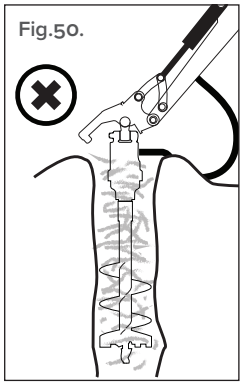


Position Auger Bit. If used, retract Bucket Mount. Start Auger Bit rotation, Clockwise direction. **Fig.45 & Fig.47.**

Apply, consistent, downward pressure, ensuring continuous rotation. Adjust position of Parent machine components to ensure correct drill position. **Fig.46 & Fig.48.** If used ensure Bucket Mount is in a retracted position throughout the entire drilling operation. **Fig.40 on page 21.**



Regularly raise the Auger Bit from the ground and spin off loose spoil. ALWAYS adhere to the lifting capacity of the parent machine. **Fig.49.**



NEVER drill beyond the length of the Auger Bit.
NEVER fully submerge the Auger Drive unit into the loose spoil. **Fig.50.**

WORKING PROCEDURE - USE - CONTINUED

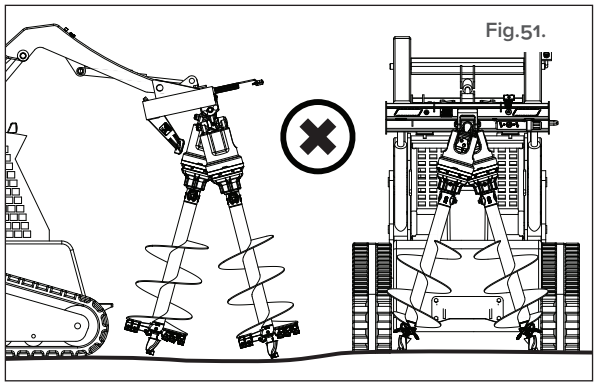


Fig.51.

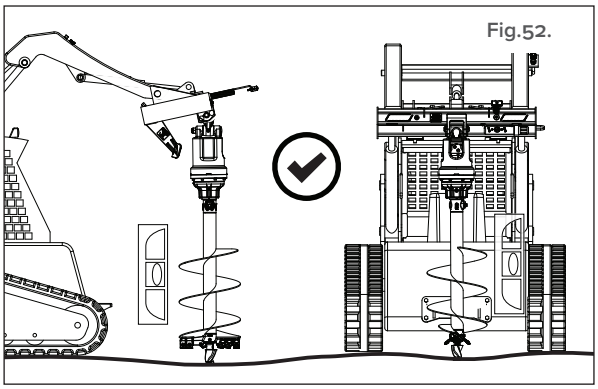


Fig.52.

Maximise productivity and avoid damaging the Auger Drive assembly by maintaining a vertical trajectory whilst drilling. **Fig.51 & Fig.52.**

WORKING PROCEDURE - TRANSPORTATION

TRANSPORTATION - PUBLIC HIGHWAYS

WARNING

ALWAYS remove the Auger Drive assembly, from the Parent machine, before transporting on public highways.

ALWAYS use suitable strapping and tie down points to secure the Auger Drive unit and its associated components.

TRANSPORTATION - WITHIN THE JOB SITE.

WARNING

ALWAYS manoeuvre the Parent Machine and Auger Drive assembly **SLOWLY**, avoiding Auger Swing.
It is recommended that the Bucket Mount assembly used where possible, keeping the Auger Drive assembly as low as possible to the ground. **Fig.53 & Fig.54.**
NEVER activate the Auger Drive assembly whilst transporting.
IF IN DOUBT Remove Auger Drive assembly and transport separately.

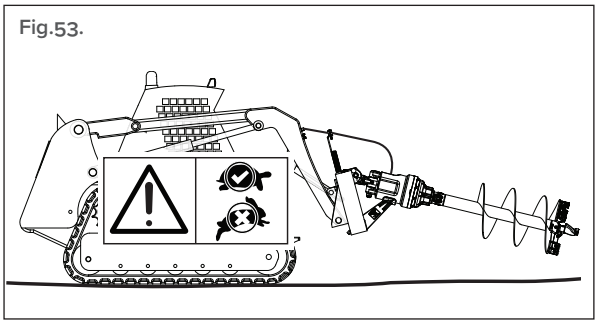


Fig.53.

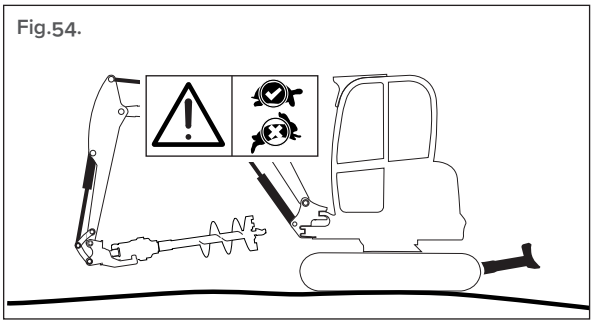


Fig.54.

WORKING PROCEDURE - PARKING

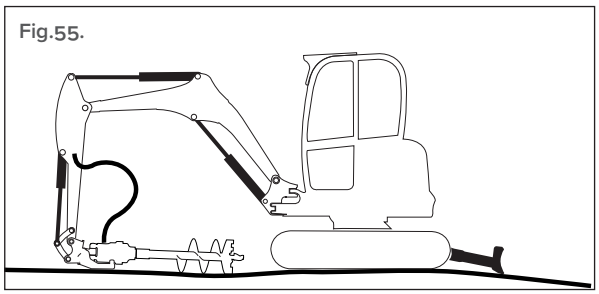


Fig.55.

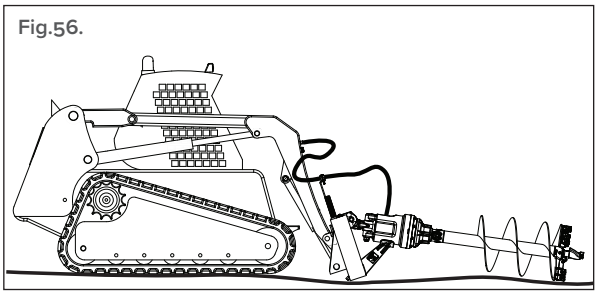


Fig.56.

When parking **NEVER** leave the Auger Drive assembly suspended. **ALWAYS** park with the Auger Drive assembly lowered to the ground. **Fig.55 & Fig.56. NEVER** operate the Auger Drive assembly whilst in the parked position.

MAINTENANCE

It is essential that regular maintenance checks are carried out to maintain the Auger Drive units efficiency. Equipment that is insufficiently maintained can be dangerous for both the operator and bystanders. **ALL** maintenance checks to be performed with the parent machine off and hydraulic system locked out.

PERIODIC CHECKS

DAILY CHECKS

- Check **ALL** Grease points and lubricate as necessary.
- Check condition of hydraulic components. See **"Fig.36." on page 19** for hydraulic hose specifications.
- Check condition of the Auger Tool / Extension Tool and its components.

WEEKLY CHECKS

In addition to the Daily Checks the following Weekly Checks **MUST** also be made.

- Check structural integrity of Auger Drive unit, Mounts and Auger Bit / Extension Tools. Replace / Repair as necessary.
- Check condition of Auger Tool / Extension Tool locating pins and locking clips.

MONTHLY CHECKS

In addition to the Weekly Checks the following Monthly Checks **MUST** also be made.

- Check oil level of Auger Drive unit. See **pages 25**

OIL SERVICE

The Pengo Auger Drive unit incorporates a sealed gear box, pre-filled with gear oil. This gear oil requires regular changing. Changing of this oil, at regular intervals, will prolong the life of this unit. See **Fig.57.**

Models	Oil Type	Quantity	First Service	Subsequent
CS 11-12, CS 16-15, CS20-17, CSE 15, CSE 20, CSE 25	ISO EP 320 AGMA 6EP **"Specifications - CS models" on page 31**	725ml / 25.5 floz	6 months / 250 hours*	Every 12 Months / 500 hours*
CS 22-20, CS28-22, CS35-25, CS41-25, CSE 30, CSE 35, CSE 45		830ml / 29.2 floz		
CS 38-30, CS49-36, CSE55, CSE70		1700ml / 59.8 floz		
CS 39-37, CS 49-45, CS 62-48, CSE70 PLUS, CSE80 PLUS		1700ml / 59.8 floz		
CS 96-45, CS 104-48, CS121-45, CS131-48, CSE130, CSE14, CSE160, CSE 170		2390ml / 84 floz	3 months / 125 hours*	
CS 133-48, CS 167-59, CS 211-59, CSE 180, CSE 220, CS3 280		5450ml / 192 floz		

Fig.57.

* Whichever period occurs first.

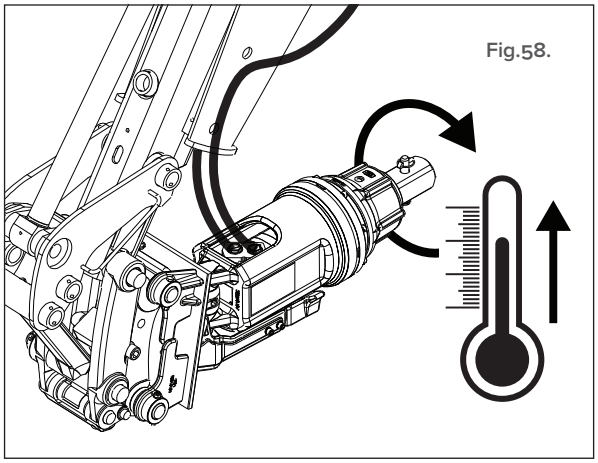


Fig.58.

Pre-heat Auger Drive unit by running, without an Auger Bit fitted, for 5 minutes. Ensure Auger Drive unit is secured in a horizontal position. **Fig.58.**

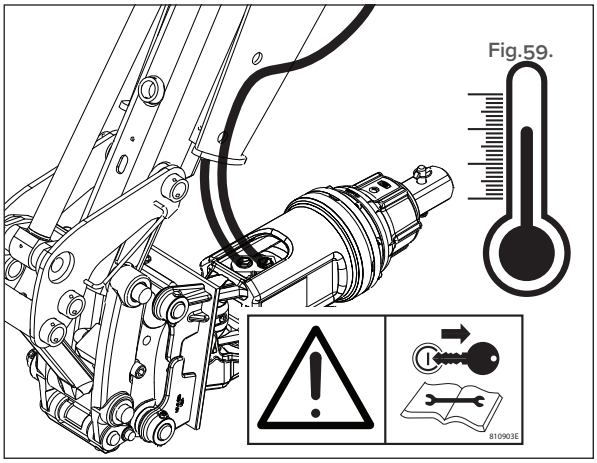
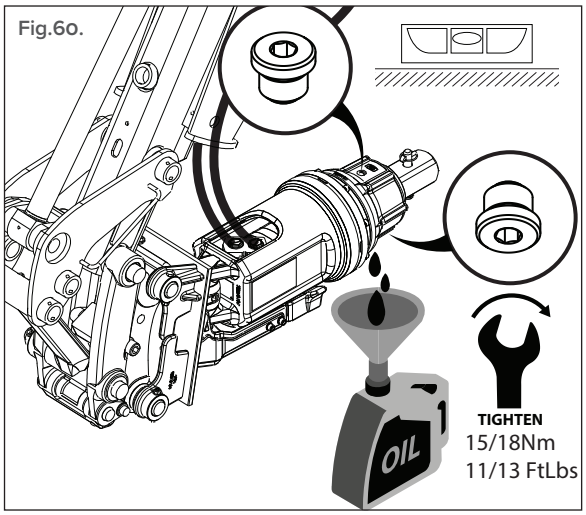


Fig.59.

Once the Auger Drive unit is warm, Switch off Parent machine and Lock Out Hydraulics. **Fig.59.**

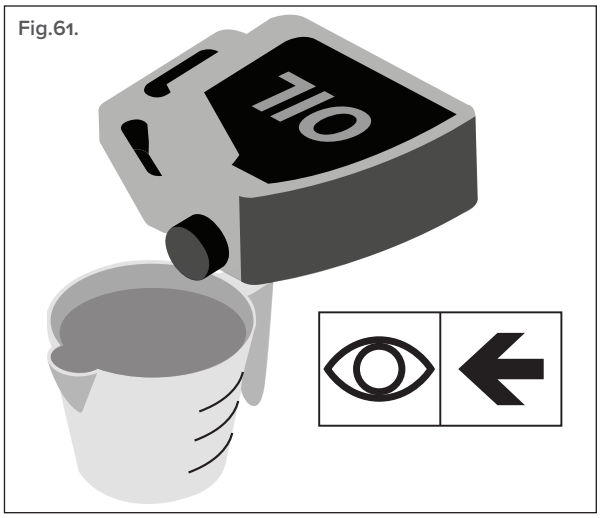
OIL SERVICE - CONTINUED

Fig.60.



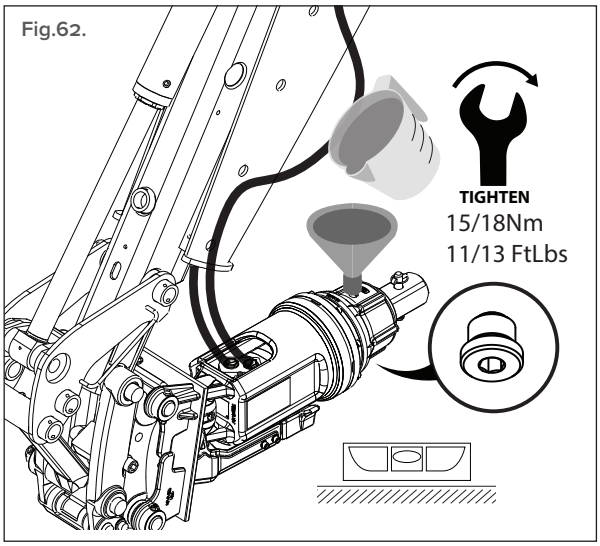
Place suitable container beneath lower drain plug. Remove lower drain plug. Remove upper fill plug. Allow to drain for 15 minutes or until no visible oil is draining from the unit. **Fig.60.** Dispose of used oil in accordance with local requirements. See **"Disposal" on page 29 .**

Fig.61.



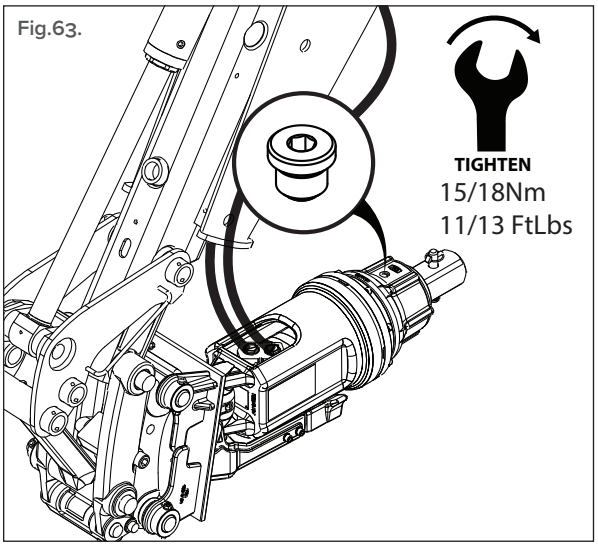
Measure out replacement oil, see **Fig.57 on page 25 and pages 31 pages 32** for grade and quantity.

Fig.62.



Re-fit lower drain plug and tighten to the required torque. Re-fill Auger Drive unit with metered amount, maintaining a horizontal position. **Fig.62.**

Fig.63.



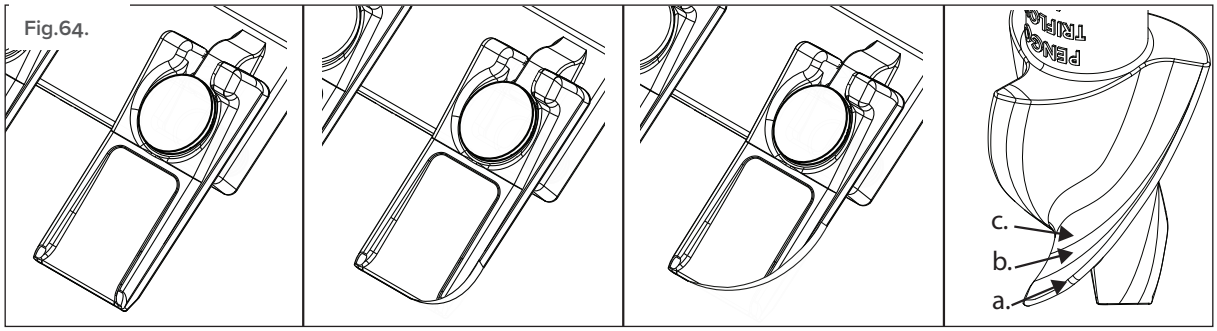
Re-fit upper fill plug and tighten to the required torque. See **"First operation" on page 20** . Observe for oil leaks and rectify as necessary. **Fig.63.**

AUGER BIT - WEAR PARTS

WEAR PART CONDITION

The cutting teeth and pilots should be checked regularly for wear. Failure to replace these wearing parts, when required, will result in poor drilling performance and/or damage to the Auger Bit.

Fig.64.



New - Optimum performance. **Fig.64.**

Partially worn - Performance reduced. **Fig.64.**

Excessive wear - Replace immediately. **Fig.64.**

Pos. a - New
Pos. b - Partially worn
Pos c. - Excessive wear replace **IMMEDIATELY. Fig.64.**

Fig.65.

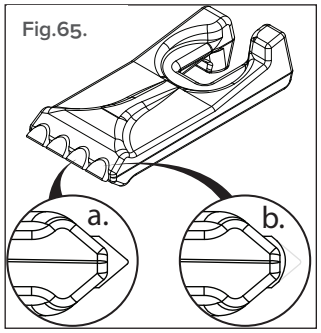
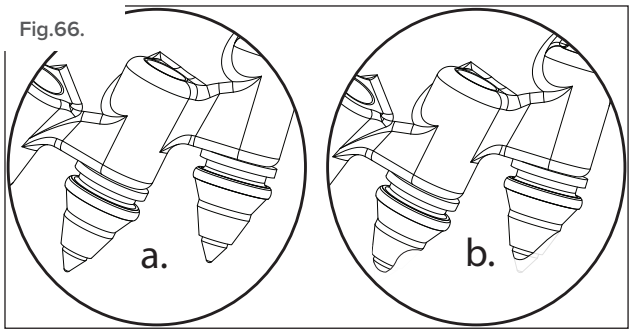


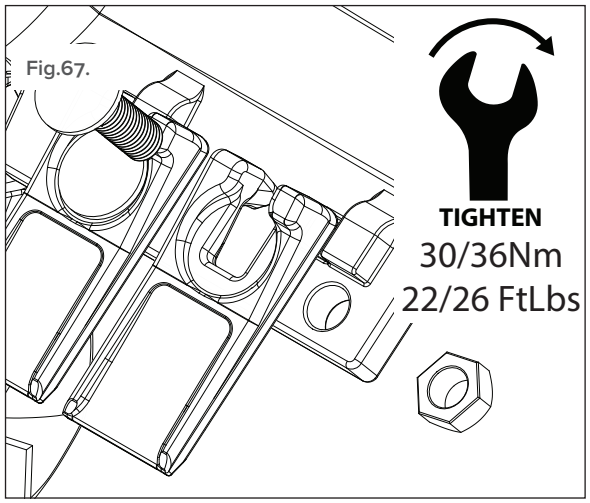
Fig.66.



Pos a. New - Optimum performance.
Pos. b - Excessive wear replace **IMMEDIATELY. Fig.65 & Fig.66.**

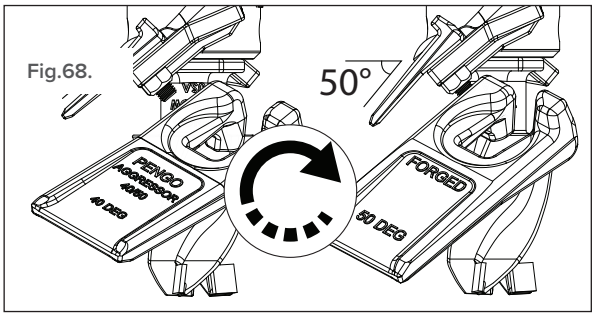
AUGER BIT TOOTH REPLACEMENT - BOLT ON

Fig.67.



Teeth affixed with a bolt can be removed by first undoing the retaining nut.
Fitting is the reversal of removal. **Fig.67.**

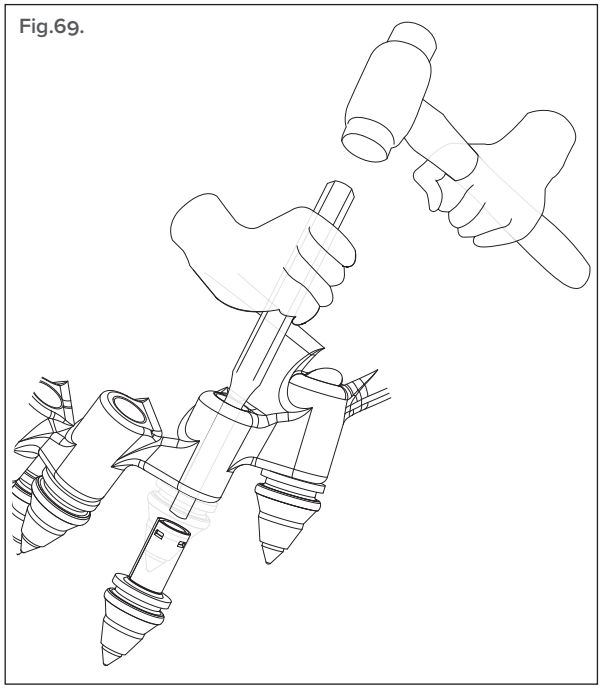
Fig.68.



Auger bits fitted with the Aggressor® tooth option can have their cutting characteristics altered simply by turning the tooth to match the above picture. The 50 degree cut is more aggressive and should only be used in softer ground conditions. **Fig.68.**

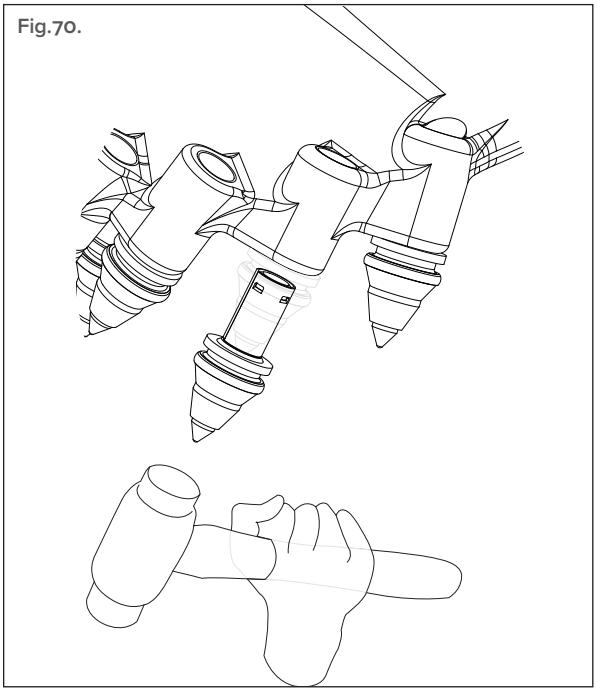
AUGER BIT TOOTH REPLACEMENT - CONICAL

Fig.69.



Remove Conical teeth by driving out from the rear, using a suitable sized parallel punch and soft faced hammer. **Fig.69.**

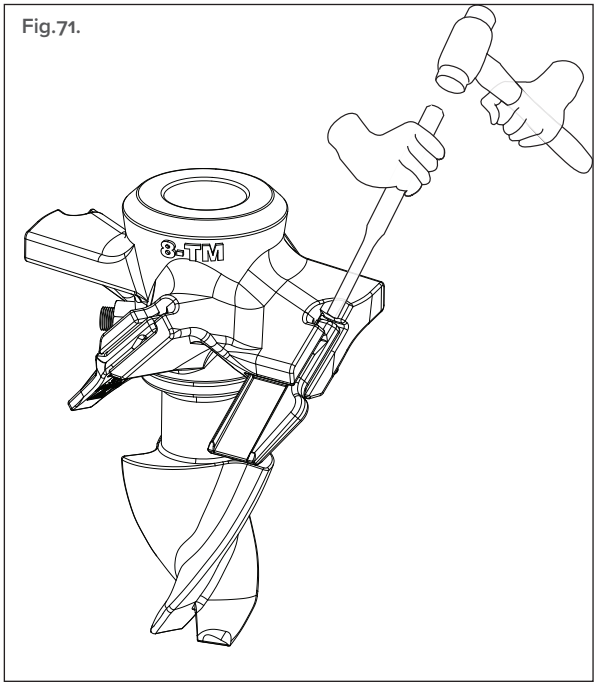
Fig.70.



Install Conical lock teeth by first inserting by hand and then driving in with a soft faced hammer. **Fig.70.**

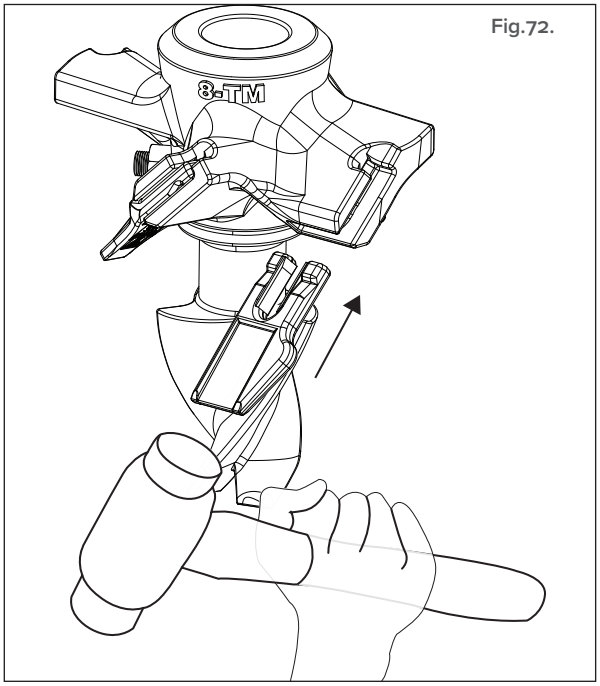
AUGER BIT TOOTH REPLACEMENT - FAS-N-LOK®

Fig.71.



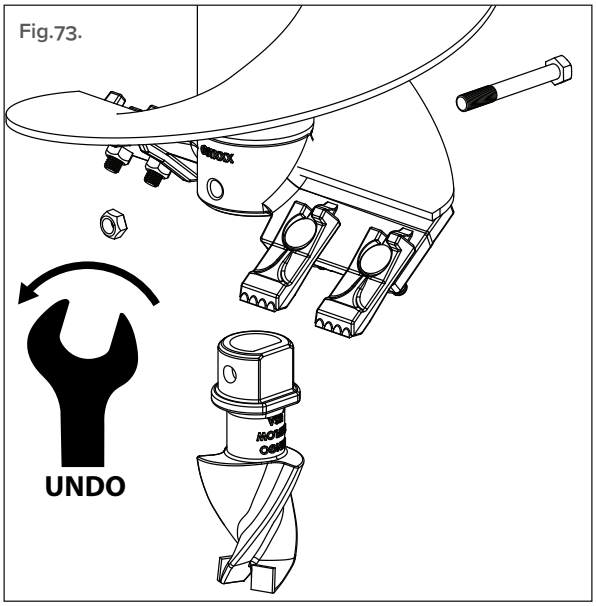
Remove Fas-N-Lok® teeth by driving out from the rear, using a suitable sized parallel punch and soft faced hammer. **Fig.71.**

Fig.72.

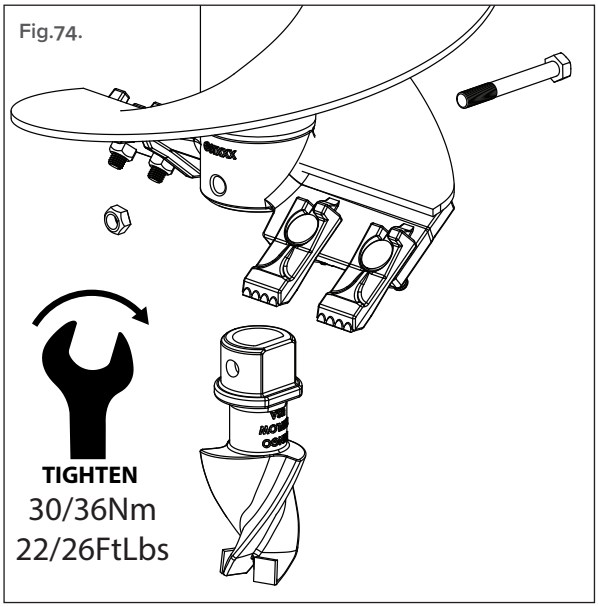


Install Fas-N-Lok® teeth by first inserting by hand, noting correct orientation, then driving in with a soft faced hammer. **Fig.72.**

AUGER BIT PILOT REPLACEMENT



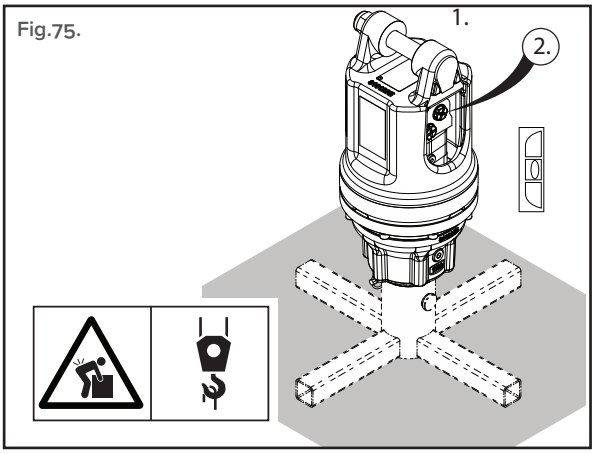
Remove fixings holding pilot in place. **ALWAYS** renew fixings when replacing pilot. **Fig.73.**

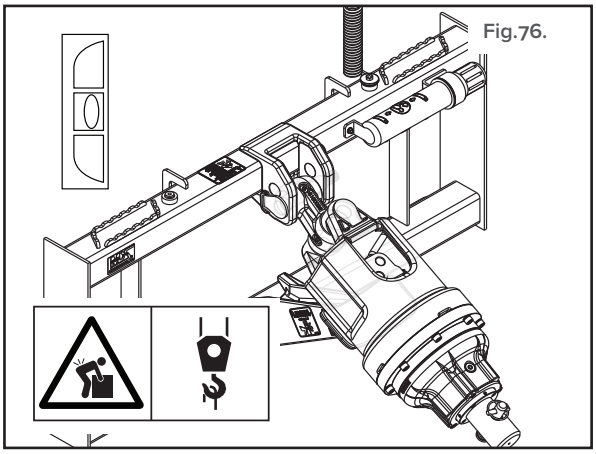


Align Pilot and fixing holes. Tighten fixings as shown. **Fig.74.**

STORAGE

If the unit is to be stored you **MUST** first remove the Auger Bit and Extension, see **"Tool fitting - Auger Bit and Extension" on page 20 .** Removal is the reversal of fitting.
It is also recommended to remove either the Single Pin,Double Pin or Double Pin Bucket Mount, see **"Mounting options" on page 12 .** Removal is the reversal of fitting.
When using a loader mount the Auger drive unit can be stored in situ. See **Fig.76.** Ensure the assembly is stable and **CANNOT** fall.
Remove hydraulic hoses and associated components. Install hydraulic bungs, item 2 **Fig.75**.
It is recommended to store the Auger Drive unit in a secure vertical position. **ALWAYS** clean the attachment before storing.
If stored for a prolonged period is it recommended that the unit is serviced before putting back into use, see **"Oil service" on page 25 .**





DISPOSAL

Hydraulic and Gear Oil.
Hydraulic and Gear oil can contaminate the air, ground and water if not properly recycled. Recycle hydraulic oil in accordance with local regulations at you nearest recycling facility.
Hydraulic hoses.
Hang hydraulic hoses to drain, collect the residual oil for recycling. Contact you local recycling authority for details of an approved hydraulic hose recycling site.
Tool body.
Disassemble the attachment and dispose of **ALL** non-metallic parts. Recycle the metal components. Contact you local recycling authority for recycling instructions.

TROUBLESHOOTING

FAULT	POSSIBLE CAUSE	ACTION
No rotation - Auger Drive unit.	No oil flow.	Check that the hydraulic hoses / couplers are correctly fitted. Check the Parent machine hydraulic system is functioning correctly.
	Insufficient Hydraulic oil pressure.	Check Parent machine. Refer to the required specifications for the Auger Drive unit fitted. See **“Specifications” on pages page 31 & page 33.**
	Auger Drive unit seized.	Contact Pengo corporation for further assistance.
	Auger Bit seized.	Remove Auger Bit from substrate before continuing.
	Insufficient Hydraulic oil flow.	Check Parent machine. Refer to the required specifications for the Auger Drive unit fitted. See **“Specifications” on pages page 31 & page 33.**
Slow digging speed / Rotation.	Insufficient hydraulic oil flow.	Check Parent machine. Refer to the required specifications for the Auger Drive unit fitted. See **“Specifications” on pages page 31 & page 33.**
	Incompatible Auger Drive unit.	Fit compatible Auger Drive unit. See **“Specifications” on pages page 31 & page 33.**
	Auger Bit too large.	Fit suitable Auger Bit.
	Auger Teeth / Pilot excessively worn.	Replace wear parts. See **“Auger Bit - Wear Parts” on page 27** .
	Worn hydraulic motor.	Replace Hydraulic Motor. Contact Pengo corporation for further assistance. ONLY use genuine replacement spare parts.
	Excessive Parent Machine down pressure.	Reduce Parent Machine down pressure. See **“Working procedure” on page 23** .
	Insufficient Parent machine down pressure.	Increase Parent Machine down pressure. See **“Working procedure” on page 23** .
Auger Bit stalls during use.	Insufficient Hydraulic oil pressure.	Increase Hydraulic oil pressure. See “**Specifications” on pages page 31 & page 33.**
	Insufficient Hydraulic oil flow.	Increase Hydraulic oil flow. See **“Specifications” on pages page 31 & page 33.**
	Blocked Hydraulic filter, Parent machine.	Refer to Parent machine’s maintenance manual / schedule.
	Excessive Parent Machine down pressure.	Reduce Parent Machine down pressure. See **“Working procedure” on page 23** .
	Incompatible Auger Drive unit / Auger Bit / Parent machine combination.	Fit compatible equipment. See **“Specifications” on pages page 31 & page 33.**
	Parent machine hydraulic pressure relief valve set too low / faulty.	Reset / replace Parent machine pressure relief valve. See **“Specifications” on pages page 31 & page 33.**
Excessive rotational speed	Excessive input hydraulic oil flow.	Check and adjust oil flow. See **“Specifications” on pages page 31 & page 33.**
	Incompatible Auger Drive unit.	Fit compatible equipment. See **“Specifications” on pages page 31 & page 33.**
Mounting frame does not fit Parent Machine.	Incorrect / Non-genuine mounting frame used.	Fit compatible mounting frame.
Excessive movement in locating pins.	Damaged / worn components.	Repair / replace worn components. **ONLY** use genuine components.
Auger Drive unit does not fit Mounting frame.	Incorrect / Non-genuine mounting frame used.	Fit compatible mounting frame.

Pengo Co LLC
503 Gay Street
Delhi
Iowa 52223
USA

SPECIFICATIONS - CS MODELS

Model Name	CS 11-12	CS 16-15	CS 20-17	CS 22-20
Service weight, Kg (Lbs)	58 (128)	59 (130)	59 (130)	71 (156)
Sutable carrier weight class, tonnes (Lbs)	1.0-1.5 (2200-3300)	1.5-2.5 (3300-5500)	2.0-3.0 (4400-6600)	2.5-4.0 (5,500-8,800)
Operating pressure range, bar (psi)	120-210 (1740-3046)	140-240 (2031-3481)	140-240 (2031-3481)	140-260 (2031-3770)
Operating oil flow range, lpm (gpm)	15-45 (3.96-11.89)	25-55 (6.60-14.53)	35-65 (9.25-17.17)	35-75 (1057-19.81)
Max. output torque, Nm (FtLbs)	1493 (1101)	2134 (1574)	2646 (1952)	3003 (2215)
Max. speed, RPM	101	98	94	103
Motor port connection	G1/2"	G1/2"	G1/2"	G1/2"
Max. back pressure, bar (psi)	38 (551)	38 (551)	40 (580)	40 (580)
Gearbox oil type	ISO VG 320EP MINERAL	ISO VG 320EP MINERAL	ISO VG 320EP MINERAL	ISO VG 320EP MINERAL
Gearbox oil capacity, ml (fl oz)	725 (25.5)	725 (25.5)	725 (25.5)	830 (29.2)

Model Name	CS 28-22	CS 35-25	CS 41-25	CS 38-30
Service weight, Kg (Lbs)	71 (156)	72 (158)	72 (158)	115 (253)
Sutable carrier weight class, tonnes (Lbs)	2.5-4.5 (5500-9900)	3.0-5.0 (6600-11000)	3.0-5.0 (6600-11000)	4.0-6.0 (8800-13200)
Operating pressure range, bar (psi)	140-260 (2031-3770)	140-260 (2031-3770)	140-240 (2031-3481)	140-260 (2031-3770)
Operating oil flow range, lpm (gpm)	40-85 (1057-22.45)	40-95 (10.57-25.10)	40-95 (10.57-25.10)	60-115 (15.85-30.38)
Max. output torque, Nm (FtLbs)	3780 (2788)	4739 (3495)	5593 (4125)	5211 (3843)
Max. speed, RPM	93	83	65	91
Motor port connection	G1/2"	G1/2"	G1/2"	G1/2"
Max. back pressure, bar (psi)	45 (653)	40 (580)	40 (580)	40 (580)
Gearbox oil type	ISO VG 320EP MINERAL	ISO VG 320EP MINERAL	ISO VG 320EP MINERAL	ISO VG 320EP MINERAL
Gearbox oil capacity, ml (fl oz)	830 (29.2)	830 (29.2)	830 (29.2)	1700 (59.80)

Model Name	CS 49-36	CS 39-37	CS 49-45	CS 62-48
Service weight, Kg (Lbs)	116 (255)	122 (268)	123 (271)	124 (273)
Sutable carrier weight class, tonnes (Lbs)	4.5-7.0 (9900-15400)	5.0-7.0 (11000-15400)	6.0-9.0 (13200-19800)	7.0-10 (15400-22000)
Operating pressure range, bar (psi)	140-260 (2031-3770)	140-260 (2031-3770)	140-260 (2031-3770)	140-260 (2031-3770)
Operating oil flow range, lpm (gpm)	70-135 (13.20-30.38)	70-140 (18.49-36.98)	70-160 (18.49-42.26)	75-170 (18.49-44.90)
Max. output torque, Nm (FtLbs)	6670 (4920)	5278 (3893)	6683 (4929)	8392 (6189)
Max. speed, RPM	84	110	99	84
Motor port connection	G1/2"	G3/4"	G3/4"	G3/4"
Max. back pressure, bar (psi)	40 (580)	22 (319)	28 (506)	39 (566)
Gearbox oil type	ISO VG 320EP MINERAL	ISO VG 320EP MINERAL	ISO VG 320EP MINERAL	ISO VG 320EP MINERAL
Gearbox oil capacity, ml (fl oz)	1700 (59.80)	1700 (59.80)	1700 (59.80)	1700 (59.80)

SPECIFICATIONS CS MODELS - CONTINUED

Model Name	CS 96-45	CS 104-48	CS 121-45	CS 131-48
Service weight, Kg (Lbs)	168 (370)	170 (374)	169 (372)	171 (376)
Sutable carrier weight class, tonnes (Lbs)	8.0-13.0 (17,600-28,600)	10.0-15.0 (22,000-33,000)	12.0-16.0 (26,400-35,200)	14.0-18.0 (30,800-39,600)
Operating pressure range, bar (psi)	140-240 (2031-3480)	160-260 (2321-3771)	140-240 (2031-3480)	160-260 (2321-3771)
Operating oil flow range, lpm (gpm)	70-170 (18.49-44.91)	90-180 (23.78-47.55)	70-170 (18.49-44.91)	90-225 (23.78-59.44)
Max. output torque, Nm (FtLbs)	13,004 (9,591)	14,088 (10,391)	16,361 (12,067)	17,725 (13,073)
Max. speed, RPM	50	53	40	53
Motor port connection	G3/4”	G1”	G3/4”	G1”
Max. back pressure, bar (psi)	14 (203)	8 (116)	17 (247)	8 (116)
Gearbox oil type	ISO VG 320EP PAO	ISO VG 320EP PAO	ISO VG 320EP PAO	ISO VG 320EP PAO
Gearbox oil capacity, ml (fl oz)	2390 (84)	2390 (84)	2390 (84)	2390 (84)

Model Name	CS 133-48	CS 167-59	CS 211-59	
Service weight, Kg (Lbs)	212 (466)	213 (469)	215 (473)	
Sutable carrier weight class, tonnes (Lbs)	16.0-22.0 (35,200-48,400)	18.0-27.0 (39,600-59,400)	20.0-30.0 (44,000-66,000)	
Operating pressure range, bar (psi)	160-260 (2321-3771)	160-260 (2321-3771)	160-260 (2321-3771)	
Operating oil flow range, lpm (gpm)	90-180 (23.78-47.55)	90-225 (23.78-59.44)	90-225 (23.78-59.44)	
Max. output torque, Nm (FtLbs)	17,990 (13,269)	22,635 (16,695)	28,660 (21,139)	
Max. speed, RPM	41	41	33	
Motor port connection	G1”	G1”	G1”	
Max. back pressure, bar (psi)	8 (116)	8 (116)	12 (174)	
Gearbox oil type	ISO VG 320EP PAO	ISO VG 320EP PAO	ISO VG 320EP PAO	
Gearbox oil capacity, ml (fl oz)	5450ml (192)	5450ml (192)	5450ml (192)	

SPECIFICATIONS - CSE MODELS

Model Name	CSE 15	CSE 20	CSE 25	CSE 30
Service weight, Kg (Lbs)	58 (128)	59 (130)	59 (130)	71 (156)
Sutable carrier weight class, tonnes (Lbs)	1.0-1.5 (2200-3300)	1.5-2.5 (3300-5500)	2.0-3.0 (4400-6600)	2.5-4.0 (5,500-8,800)
Operating pressure range, bar (psi)	120-210 (1740-3046)	140-240 (2031-3481)	140-240 (2031-3481)	140-260 (2031-3770)
Operating oil flow range, lpm (gpm)	15-45 (3.96-11.89)	25-55 (6.60-14.53)	35-65 (9.25-17.17)	35-75 (1057-19.81)
Max. output torque, Nm (FtLbs)	1493 (1101)	2134 (1574)	2646 (1952)	3003 (2215)
Max. speed, RPM	101	98	94	103
Motor port connection	G1/2”	G1/2”	G1/2”	G1/2”
Max. back pressure, bar (psi)	38 (551)	38 (551)	40 (580)	40 (580)
Gearbox oil type	ISO VG 320EP MINERAL	ISO VG 320EP MINERAL	ISO VG 320EP MINERAL	ISO VG 320EP MINERAL
Gearbox oil capacity, ml (fl oz)	725 (25.5)	725 (25.5)	725 (25.5)	830 (29.2)

Model Name	CSE 35	CSE 45	CSE 55	CSE 70
Service weight, Kg (Lbs)	71 (156)	72 (158)	115 (253)	116 (255)
Sutable carrier weight class, tonnes (Lbs)	2.5-4.5 (5500-9900)	3.0-5.0 (6600-11000)	4.0-6.0 (8800-13200)	4.5-7.0 (9900-15400)
Operating pressure range, bar (psi)	140-260 (2031-3770)	140-260 (2031-3770)	140-260 (2031-3770)	140-260 (2031-3770)
Operating oil flow range, lpm (gpm)	40-85 (1057-22.45)	40-95 (10.57-25.10)	60-115 (15.85-30.38)	70-135 (13.20-30.38)
Max. output torque, Nm (FtLbs)	3780 (2788)	4739 (3495)	5211 (3843)	6670 (4920)
Max. speed, RPM	93	83	91	84
Motor port connection	G1/2”	G1/2”	G1/2”	G1/2”
Max. back pressure, bar (psi)	45 (653)	40 (580)	40 (580)	40 (580)
Gearbox oil type	ISO VG 320EP MINERAL	ISO VG 320EP MINERAL	ISO VG 320EP MINERAL	ISO VG 320EP MINERAL
Gearbox oil capacity, ml (fl oz)	830 (29.2)	830 (29.2)	1700 (59.80)	1700 (59.80)

Model Name	CSE 70 PLUS	CSE 80 PLUS	CSE 130	CSE 140
Service weight, Kg (Lbs)	123 (271)	124 (273)	168 (370)	170 (374)
Sutable carrier weight class, tonnes (Lbs)	6.0-9.0 (13200-19800)	7.0-10 (15400-22000)	8.0-13.0 (17,600-28,600)	10.0-15.0 (22,000-33,000)
Operating pressure range, bar (psi)	140-260 (2031-3770)	140-260 (2031-3770)	140-240 (2031-3480)	160-260 (2321-3771)
Operating oil flow range, lpm (gpm)	70-160 (18.49-42.26)	75-170 (18.49-44.90)	70-170 (18.49-44.91)	90-180 (23.78-47.55)
Max. output torque, Nm (FtLbs)	6683 (4929)	8392 (6189)	13,004 (9,591)	14,088 (10,391)
Max. speed, RPM	99	84	50	53
Motor port connection	G3/4”	G3/4”	G3/4”	G1”
Max. back pressure, bar (psi)	28 (506)	39 (566)	14 (203)	8 (116)
Gearbox oil type	ISO VG 320EP MINERAL	ISO VG 320EP MINERAL	ISO VG 320EP PAO	ISO VG 320EP PAO
Gearbox oil capacity, ml (fl oz)	1700 (59.80)	1700 (59.80)	2390 (84)	2390 (84)

SPECIFICATIONS CSE MODELS - CONTINUED

Model Name	CSE 160	CSE 170	CSE 180	CSE 240
Service weight, Kg (Lbs)	169 (372)	171 (376)	212 (466)	213 (469)
Sutable carrier weight class, tonnes (Lbs)	12.0-16.0 (26,400-35,200)	14.0-18.0 (30,800-39,600)	16.0-22.0 (35,200-48,400)	18.0-27.0 (39,600-59,400)
Operating pressure range, bar (psi)	140-240 (2031-3480)	160-260 (2321-3771)	160-260 (2321-3771)	160-280 (2321-4061)
Operating oil flow range, lpm (gpm)	70-170 (18.49-44.91)	90-225 (23.78-59.44)	90-180 (23.78-47.55)	90-225 (23.78-59.44)
Max. output torque, Nm (FtLbs)	16,361 (12,067)	17,725 (13,073)	17,990 (13,269)	24,376 (17,979)
Max. speed, RPM	40	53	41	41
Motor port connection	G3/4"	G1"	G1"	G1"
Max. back pressure, bar (psi)	17 (247)	8 (116)	8 (116)	8 (116)
Gearbox oil type	ISO VG 320EP PAO	ISO VG 320EP PAO	ISO VG 320EP PAO	ISO VG 320EP PAO
Gearbox oil capacity, ml (fl oz)	2390 (84)	2390 (84)	5450ml (192)	5450ml (192)

Model Name	CSE 280			
Service weight, Kg (Lbs)	215 (473)			
Sutable carrier weight class, tonnes (Lbs)	20.0-30.0 (44,000-66,000)			
Operating pressure range, bar (psi)	160-260 (2321-3771)			
Operating oil flow range, lpm (gpm)	90-225 (23.78-59.44)			
Max. output torque, Nm (FtLbs)	28,660 (21,139)			
Max. speed, RPM	33			
Motor port connection	G1"			
Max. back pressure, bar (psi)	12 (174)			
Gearbox oil type	ISO VG 320EP PAO			
Gearbox oil capacity, ml (fl oz)	5450ml (192)			

WARRANTY STATEMENT

The Pengo Co LLC Auger Drive Unit is warranted to be free from defects with regard to materials and workmanship for the period of eighteen (18) months from date of commissioning but not longer than twenty-four (24) months from the date of purchase by the Contracting Partner.

Parts that have been repaired or replaced by Pengo Co LLC or its Contracting Partner pursuant to the above are warranted under normal and proper use, storage, service and maintenance against defects in workmanship and material for a period of three (3) months from date of repair or adjustment or the expiration of the product warranty, whichever is longer.

Pengo Co LLC original spare parts are warranted to be free from defects with regard to materials and workmanship for the period of three (3) months from date of purchase.

Pengo Co LLC may offer extended warranty at a certain cost. Please contact Pengo Co LLC for more information. In case the Contracting Partner extends the warranty period to its Customer then this additional period and this warranty is the sole obligation of the Contracting Partner and potentially associated cost must be borne by the Contracting Partner.

Occasionally applications may be outside the product's designed scope. Pengo Co LLC expressively declares that, if in doubt, these applications must be approved by Pengo Co LLC's Contracting Partner prior to commissioning the product.

Exclusions:

The warranties do not apply to expendable components. Nor will Pengo Co LLC or its Contracting Partner have any obligation to make repairs or replacements which are required by normal wear and tear, or which result, in whole or in part, from catastrophe, fault or negligence, or from improper installation, storage, operation, service or repair of the products, or use of the products in a manner for which they were not designed, or by causes external to the products.
In addition to the above warranty does not include loss of income due to downtime, damage due to misuse or abuse, negligence, accidents, alterations, routine maintenance or normal wear.
Any parts that are found missing after the initial in-service date are not covered under warranty.
The tightening of loose fittings or hoses is to be considered a maintenance issue, therefore any hydraulic leaks due to a loose fitting is not covered under warranty.

Warranty Procedures:

If a product allegedly is defective in material or workmanship within the warranty scope, the purchaser must promptly contact Pengo Co LLC or an Contracting Partner to determine whether the purchaser should either (a) send the product to a service location or (b) make the product available at the purchaser's location (or another location) for examination by Pengo Co LLC or its Contracting Partner. The cost and risk of transporting the allegedly defective Product to Pengo Co LLC or its Contracting Partner will be borne by the purchaser, and the cost of transporting the corrected Product back to the purchaser will be borne by Pengo Co LLC or the Contracting Partner, FCA the location from which Pengo Co LLC or its Contracting Partner sends back the corrected Product to the purchaser. (If the allegedly defective Product that purchaser sends to Pengo Co LLC or a Contracting Partner is not defective, the purchaser will also bear the cost of the transport of the product back to the purchaser.) If examination by Pengo Co LLC or its Contracting Partner results in a determination that the Product is defective in workmanship or material, subject to the warranty scope and limitations, the Product will be repaired or replaced (or credited) at no charge. If the Product upon such examination is found to not be defective in workmanship or material (for example, if the Product is not functioning properly due to abnormal use, improper service, or alteration, modification or parts usage), then such repair or replacement, if any, will be performed by Pengo Co LLC or an Contracting Partner at normal servicing charges to the purchaser plus shipping costs.

Every warranty claim, by Contracting Partner's customers, based upon alleged nonconforming Products, regardless of the manufacturer of those Products, and all information relating thereto which is communicated to Contracting Partner will be communicated in writing to Pengo Co LLC. The Contracting Partner also will promptly ascertain and communicate to Pengo Co LLC the pertinent facts, including a full description of the Products, a copy of Pengo Co LLC's sales invoice or serial number, the nature of the alleged defect, the circumstances under which the defect was discovered and, if applicable, any misuse or neglect or inappropriate installation, maintenance, or storage in connection with the Products. The Contracting Partner will not for the account of Pengo Co LLC do any repair work nor replace Products nor grant refunds to customers except upon and pursuant to terms of specific written instructions from a duly representative of Pengo Co LLC. The Contracting Partner promises to perform all warranty repairs that are authorized and approved by Pengo Co LLC and the Contracting Partner will be reimbursed in the following manner:

a) Pengo Co LLC, at its option, will either supply replacement parts free of charge or credit Contracting Partner's account at current prices for parts supplied from Contracting Partner's inventory. All replaced parts must be held by Contracting Partner for at least ninety (90) days following the filing date of Contracting Partner's warranty claim pending instructions from Pengo Co LLC as to disposition of the parts.

b) No other expenses of travel, Labour or consumables will be reimbursed unless agreed to in advance by Pengo Co LLC Limited in writing. Pengo Co LLC reserves the right to disapprove the number of hours, miles claimed or consumable items if they appear to be unreasonable.

WARRANTY STATEMENT - CONTINUED

c) Pengo Co LLC will assume all cost to ship replacement part from its locations to the Contracting Partner. This may include freight and customs duty.

d) I n order for Contracting Partner to be eligible for reimbursement (for applicable labour, parts, mileage etc.) in accordance with the foregoing, the following must be true: (i) the repair or replacement work is covered by warranty; (ii) Contracting Partner is able to document, at Pengo Co LLC's request, completion of recommended or required maintenance for the Product at prescribed intervals using correct parts; and (iii) the warranted repair or replacement work is performed by an Contracting Partner.

e) All warranty claims must be received within thirty (14) days of repair or replacement including the required information:

i. Pengo Co LLC's model number.
ii. Pengo Co LLC's serial number.
iii. Description of problem.
iv. Itemised bill of repair with breakdown of numbers of hours to perform warranty work and labour charges as listed above.
v. Part used for repair with Pengo Co LLC part numbers.
vi. R.M.A. number of applicable (claim number)
vii. Contact details at Pengo Co LLC

f) Pengo Co LLC will invoice any part or new product supplied. A credit note will be issued if after assessment of the returned material warranty is granted.

Correction of non-conformities, in the manner and for the period of time provided herein, will be the purchaser's sole and exclusive remedy and will constitute fulfilment of all liabilities for such non-conformities, whether based on contract, warranty, negligence, indemnity, strict liability or otherwise with respect to or arising out of such product.

The above warranties are exclusive and in lieu of all other warranties of any kind, written, oral or implied, and all other warranties including any warranty of merchantability or fitness for purpose are hereby disclaimed.

Ordering and Returning Spare Parts, Repairs:

Ordering Spare parts:
In order to guarantee quick delivery, please be sure to include the following when placing orders:

i. Pengo Co LLC's model and serial number.
ii. Designation and number of the part in accordance with the spare parts list.
iii Designation and number marked on the individual component (if applicable) Return of spare parts:
iv. To receive credit on returned parts, the original purchase date must be within 3 months.
v. Parts must be received in new condition. Any part received not in new condition will be subject to inspection and possible refusal if part cannot be brought back to new condition. The cost of rework will be deducted from credit amount.
vi. All parts being returned must have a R.M.A. (Return Merchandise Authorisation) number, copy of original invoice, and a detailed packing list of returned parts. All returned parts are subject to a 15% restocking charge.
vii. R.M.A. numbers will be issued by parts department, and are valid for 30 days. All returned R.M.A. parts must be returned to Pengo Co LLC by prepaid freight.

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Document number: 811400E
Title: Operator instruction - CS & CSE - English
Revision: B
Date: September 2025
Author: NB

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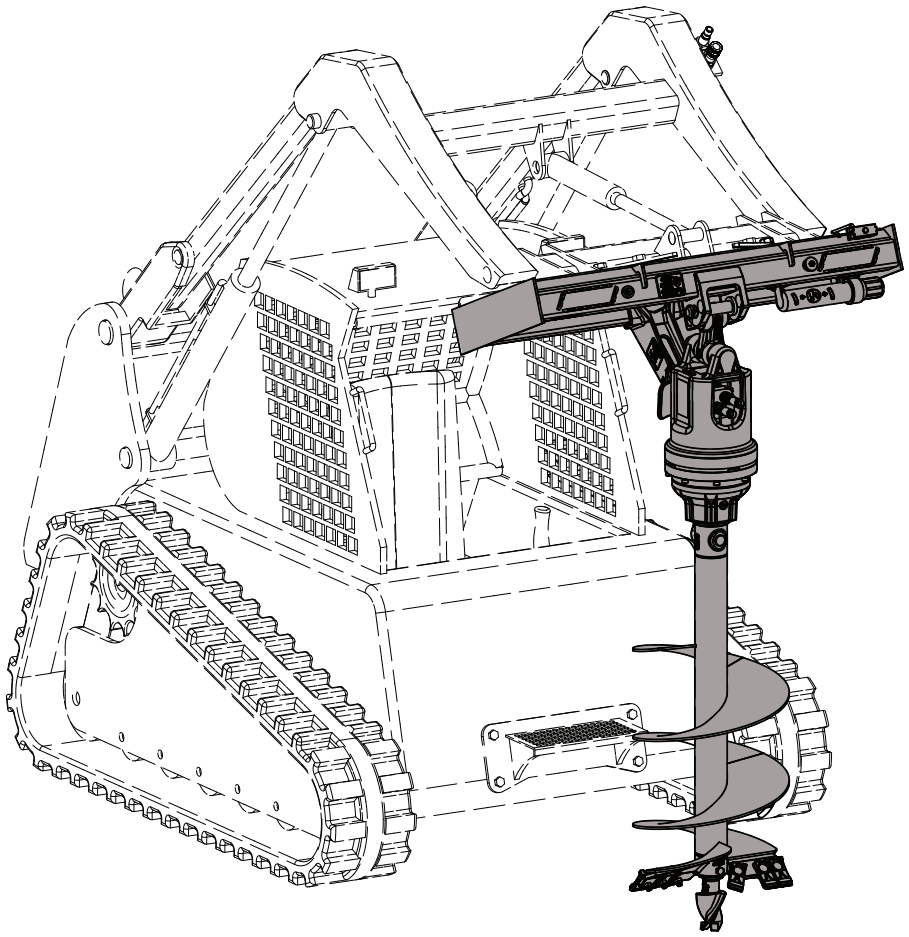
OPERATING INSTRUCTION



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