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Caterpillar

287C2

Undercarriage Repair Manual

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Undercarriage Repair Manual

Product Safety

This section contains product safety information for your Track Loader. Read and understand all product safety information before attempting to service any Compact Track Loader.



Safety Alert Symbol

This symbol means: **Attention! Be alert! Your safety is involved!**

The safety alert symbol is used to alert you to potential personal injury hazards. Obey all safety messages that follow this symbol to avoid possible injury or death.

This symbol is used as an attention-getting device throughout this manual as well as on decals and labels fixed to the machinery to assist in potential hazard recognition and prevention.

Property or equipment damage warnings in this publication are identified by the signal word "NOTICE".

NOTICE

"NOTICE" Indicates a hazardous situation which, if not avoided, could result in property or equipment damage.

The word "Note" is used throughout this manual to draw your attention to specific topics or to supplement the information provided in that section.



Improper or incomplete maintenance/repair of a Compact Track Loader can be dangerous and may result in machine damage, injury or death.

Do not attempt to perform any type of repair or maintenance on a Compact Track Loader until you have read and fully understood both this manual and the machine specific operation and maintenance manual.

Refer to the Operation and Maintenance manual for instructions regarding proper machine operation and maintenance techniques before operating or servicing any Compact Track Loader.

The person(s) in charge of servicing a Compact Track Loader may be unfamiliar with many of the systems on the machine. This makes it especially important to use caution when performing service tasks. Familiarize yourself with the affected system(s) and components before attempting any type of maintenance or service.

It is not possible to anticipate every potential hazard. The safety messages included in this document and displayed on the machine are not all-inclusive. They are intended to make you aware of potential risks and encourage a safe approach to performing service work. If you use a tool, procedure, work method or operating technique that is not specifically recommended by the manufacturer, you must satisfy yourself that it is safe for you and others. You must also ensure that the machine will not be damaged or be made unsafe by the operation, lubrication, maintenance or repair procedures that you choose.



Basic Precautions

Safety Labels

Safety labels have been included and are displayed in various places throughout the machine to serve as warnings of potentially dangerous conditions. Read and understand all "Safety" labels on any Compact Track Loader before attempting to operate, maintain or repair it. Replace any damaged, illegible or missing labels immediately, prior to service.

Personal Protective Equipment

Personal protection equipment is recommended when performing maintenance or service on a machine. Always wear appropriate protective equipment for working conditions when working on or around the machine. Loose clothing should not be worn and long hair should be restrained. Wear hard hats, protective face/eyewear, safety shoes and any other equipment necessary to ensure your safety and the safety of others around you as you work.

Entering and Exiting

Always use steps and handholds when entering or exiting a Compact Track Loader. Clean any mud or debris from steps or work platforms before using them. Always face the machine when using steps and handholds. When it is not possible to use the designed entry/exit system, utilize ladders, scaffolds, or work platforms to safely gain access to the machine.

Lifting

Use a hoist when lifting components that weigh 50 lb (23 kg) or more, to avoid back injury. Make sure all chains, hooks, slings, etc., are in good condition and are of the correct capacity. Be sure hooks are positioned correctly and equipped with a spring latch. Lifting eyes are not to be side loaded during a lifting operation.

Hot Fluids and Components

Stay clear of hot components and system fluids of the engine, exhaust, radiator/oil cooler and hydraulic lines/tubes. Also, use caution when removing fill caps, breathers and plugs on the machine. Hold a rag over the cap or plug to prevent being sprayed or splashed by liquids under pressure. Be especially careful if the machine has been operated recently, fluids may still be hot.



To ensure your safety, allow the machine to cool before attempting any service procedure that involves hot fluids or components.

Corrosion Inhibitor

Corrosion inhibitor contains alkali. Avoid contact with eyes. Avoid prolonged or repeated contact with skin. Do not take internally. In case of contact, wash skin immediately with soap and water. For eyes, flush with large amounts of water for at least 15 minutes. Call Physician. Keep out of reach of children.

Batteries

Do not smoke when inspecting the battery electrolyte level. Never disconnect any charging unit circuit or battery circuit cable from the battery when the charging unit is operating. A spark can cause an explosion from the flammable vapor mixture of hydrogen and oxygen that is released from the electrolyte through the battery outlets. Do not let electrolyte solution make contact with skin or eyes. Electrolyte solution is an acid. In case of contact, immediately wash skin with soap and water. For eyes, flush with large amounts of water for at least 15 minutes. Call Physician. Keep out of reach of children.

Pressurized Items

1. Do not use hands or any other body part to check for fluid leaks in the hydraulic system. Always use a solid material like wood or metal to check for this type of leak. Leaking fluid under pressure can penetrate body tissue. Fluid penetration can cause serious injury and even death. If fluid is injected into your skin, get treatment immediately. Seek treatment from a doctor that is familiar with this type of injury.
2. Relieve pressure from the hydraulic system before disconnecting or removing any lines, fittings or related items. Do this by relaxing all hydraulic actuators. If the lift arms are raised, make sure they are securely braced. Be alert for possible pressure release when disconnecting any device from a pressurized system.
3. Lower the lift arms before performing any work on the machine. If this cannot be done, make sure they are securely braced to prevent them from dropping unexpectedly during service.
4. Loose or damaged fuel, oil, hydraulic, lines, tubes and hoses can cause fires. Do not bend or strike high pressure lines or install ones that have been bent or damaged. Check lines, tubes and hoses carefully. See item 1 for precautions on checking for fluid leaks.
5. Pressurized air or water can also cause injury. When pressurized air or water is used for cleaning, wear a protective face shield, protective clothing, and protective shoes. The recommended maximum air pressure for cleaning purposes is 30 psi (205 kPa). When using a pressure washer, keep in mind that nozzle pressures are typically very high. Generally, pressures are well above 2000 psi (13790 kPa). Follow all recommended practices provided by the pressure washer manufacturer.

Repair



Accidental machine starting can cause injury or even death to personnel working on a Compact Track Loader.

As a precaution, disconnect the battery cables from the battery terminals, tape the battery clamps and remove the key from the ignition switch prior to performing any service work on a Compact Track Loader.

Place a “Do Not Operate” tag prominently on the machine to inform personnel that the machine is being serviced.

1. Disconnect the battery and discharge any capacitor before beginning work on a machine. Attach a **Do Not Operate** tag in the cab to alert any operator that service is in progress.
2. If possible, make all repairs with the machine parked on a level, hard surface. Use blocks to prevent the machine from rolling while working on or under the machine.
3. Do not work on or under any machine that is supported only by a hydraulic jack or hoist. Always use suitable mechanical supports to ensure that the machine will not fall.
4. Make sure the work area around the machine is safe and make yourself aware of any hazardous conditions that may exist. If the engine needs to be started inside an enclosure, make sure that the engine's exhaust is properly vented.
5. Be sure all protective devices including guards and shields are properly installed and functioning correctly before beginning any service task. If a guard or shield must be removed to perform the repair work, use extra caution.
6. Always use the appropriate tools for the work to be performed. Tools should be in good condition and you should understand how to use them properly before performing any service work.
7. When replacing fasteners, use parts of equivalent grade and size. Do not use a lesser quality fastener if replacements are necessary.
8. Be prepared to stop an engine if it has been recently overhauled or the fuel system has been recently serviced. If the engine has not been assembled correctly, or if the fuel settings are not correct, the engine can possibly overspeed and cause bodily injury, death or property damage. Be prepared to shut off the fuel and air supply to the engine in order to stop the engine.

9. Be careful when removing cover plates. Gradually back off the last two bolts or nuts located on opposite sides of the cover. Then, pry the cover loose to relieve any spring or other pressure before removing the last two nuts or bolts completely.
10. Repairs requiring welding should be performed only by personnel adequately trained and knowledgeable in welding procedures and with the guidance of appropriate reference information. Determine the type of metal being welded and select the correct welding procedure and filler material to provide a weld that is as strong or stronger than the original weld.

NOTICE

Prior to welding, disconnect the following to prevent component damage:

- **Negative battery cable**
- **Engine ECU (firewall)**
- **Main controller (firewall)**
- **Output module (firewall)**
- **Display (machine)**

A proper ground is essential to protect the machine from damage when welding. Improper grounding can cause damage to mechanical, hydraulic and electrical components.

As a precaution, connect the welding ground clamp as close as possible to the weld area.

11. Take precautions to avoid damaging wiring during removal and installation operations. Carefully route wires so that they will not contact sharp corners, objects or hot surfaces during operation.
12. When performing service that requires the lift arms to be in the raised position, always utilize the lift arm brace located on the rear of the loader tower.
13. Relieve hydraulic system pressure by relaxing all hydraulic actuators prior to attempting any hydraulic maintenance or repair.
14. Always tighten connections to the correct torque specification. Make sure that all shields, clamps and guards are installed correctly to avoid excessive heat, vibration or unwanted contact between parts during operation. Shields that protect exhaust components from oil spray in event of a line, tube or seal failure must be correctly installed.
15. Do not operate a machine if any rotating part is damaged or contacts other parts during operation. Any high speed rotating component that has been damaged or altered should be checked for balance before reusing. Make sure all protective devices, including guards and shields, are properly installed and functioning correctly before starting the engine or operating the machine.

⚠ Attachments

Only use compatible attachments as defined by the machine specific operation and maintenance manual.

Make sure that all necessary guards and protective equipment are in place and functioning prior to operating any attachment.

Wear protective glasses and protective equipment as required by conditions or as recommended in the attachment's operation manual.

⚠ When replacement parts are required for your machine, use only genuine OEM replacement parts or parts that meet or exceed original specifications including, but not limited to physical dimensions, type, strength and material.

Installing lesser components can lead to premature failures, product damage, personal injury or death.

Ensure that all personnel are far enough away from the work area so they will not be struck by flying objects.

Stay clear of the cutting edges, pinching surfaces or crushing surfaces of the attachment while performing any attachment maintenance, testing or adjustments.

⚠ Machine Labels and Decals

Labels and decals placed on the machine provide safety information and operating instructions. Familiarize yourself with the location and significance of these labels to ensure your safety.

Safety Label Examples

Examples of the labels and decals displayed on the machine are shown on this page.



WARNING  Improper operation or maintenance of this equipment can result in death or serious injury.  Read and understand operator's manual and all safety signs before using or maintaining machine. If you do not understand the information in the manuals, consult your supervisor, the owner or the manufacturer.	WARNING  Crush Hazard Machine rollover can result in death or serious injury.  Always fasten seat belt. Keep all body parts inside the operator enclosure at all times.
WARNING  Fall Hazard Falling can result in death or serious injury.  Stay off of bucket or attachment. 2046-299	WARNING  Fall Hazard Falling can result in death or serious injury.  No Riders
NOTICE  Fire Hazard Flammable debris can collect near hot components and lead to a fire.  Read Operator's Manual Keep the engine, exhaust and chassis areas free of debris.	WARNING  Rollover Hazard Overturning this machine can result in death or serious injury.  Carry loads low. Load unload and turn on level ground. Travel on inclines with heaviest end of machine uphill. 2046-300
DANGER  Explosion/Burn Hazard Will cause death, burns or blindness due to ignition of explosive gasses or contact with corrosive acid.    • Keep all flames/sparks away! • No Smoking! • Read and understand all manuals prior to operation. 2030-603	WARNING  Burn Hazard Contact with hot surfaces can cause burns.  • Do not touch hot components! • Allow the machine to cool thoroughly prior to servicing. 2030-601

Jacking Procedure

Occasionally, your machine may need to be suspended off of the ground to perform maintenance. Exercise caution when jacking the machine. Always use a jack that is capable of lifting the machine and support its weight with suitable mechanical supports while suspended. Never work on or under a machine supported only by a jack.

To safely jack your machine:

1. Remove any attachments that may be fastened to the machine and raise the lift arms.
2. Install the lift arm brace as instructed on page 4-1.
3. Once the lift arms are secured, carefully exit the machine.
4. Roll or slide your jack under the front of the machine and center the lifting pad directly under the middle of the front torsion axle.
5. Once in place, jack the machine upward making sure it remains stable until it has reached sufficient height to install suitable mechanical supports beneath the machine.

! Mechanical supports may not be placed beneath the belly pans as they are not designed to support the weight of the machine. They must be placed beneath the torsion axles or beneath the perimeter chassis tubes only.

6. Slide the support(s) into place making sure they are placed in such a way that the machine remains stable when the jack is lowered and the front of the chassis rests on the supports.
7. Once the supports are in place, slowly lower the machine onto them and then remove the jack.

Repeat steps 4-7 at the rear of the machine should both ends of the machine need to be off of the ground for service.

Undercarriage

The undercarriage assemblies in Compact Track Loaders typically operate in harsh working conditions. They work in mud, gravel, debris and various other abrasive materials during operation. The manufacturer recommends a daily inspection of the undercarriage assemblies and cleaning if necessary.

Materials that are particularly sticky or abrasive like clay, mud, or gravel should be cleaned from the undercarriages more often to minimize component wear. A pressure washer works well for cleaning materials from the undercarriages. At times when a pressure washer is not available, use a bar, shovel or similar device to remove foreign materials.

When cleaning, pay particular attention to the drive tables, sprockets, and the front and rear wheels where debris is likely to accumulate. If working in scrap or debris, inspect more often and remove foreign objects that may wrap around or lodge themselves between components causing premature wear and damage.

Operation in loamy sand or on turf or other finished surfaces may require less frequent cleaning, but daily inspection is still advised.

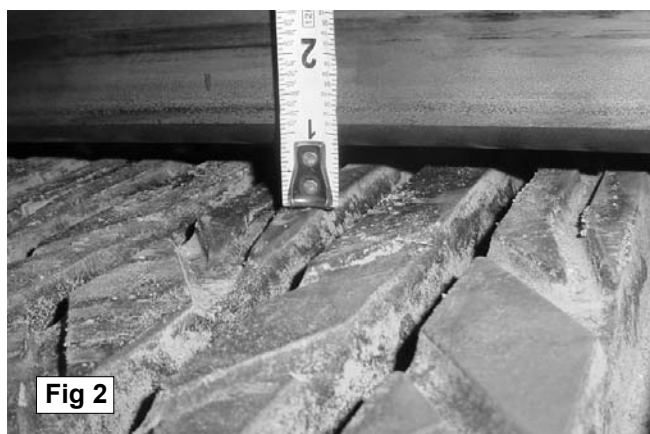
Track Tension

Proper track tension must be maintained for optimal performance and track/undercarriage life. Running a track that is too loose may cause the track to mis-feed possibly causing damage to the track and or undercarriage components. Running a track that is too tight may cause track stretch, premature bearing failure, or other preventable damage to the machine. As a rule, a track should only be tightened to the point where there is no visible sag. Never tighten your tracks beyond this point.

Note: During the first 50 hours of operation the tracks will "break-in" and will most likely require adjustment.

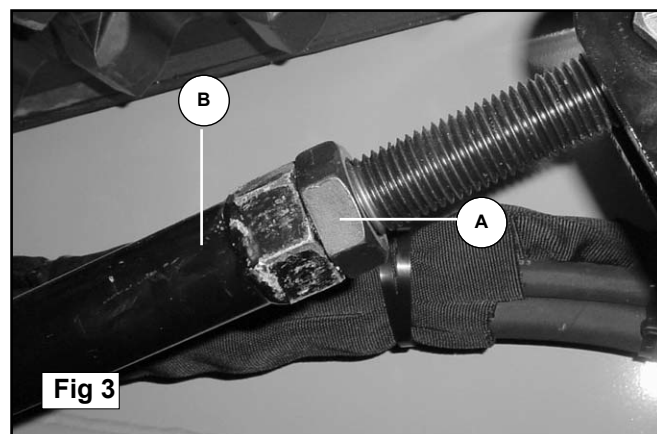
To check track tension: (fig. 1, 2)

1. Drive the machine forward 5 feet to remove belt
2. Lay a straight edge along the top of the track bridging the drive sprocket and front idler wheel.
3. Apply 90 lbs. of down force to the track by either placing weight on top or hanging it using rope or wire midway between the drive sprocket and front idler.
4. Measure from the bottom of the straight edge to the lug surface (top) of the track. The deflection should measure between 3/4" and 1".



To adjust track tension: (fig. 3)

1. Loosen the lock nut (A) on the turnbuckle (B) and adjust by turning the turn buckle itself until proper tension has been achieved.
2. Then tighten the turnbuckle lock nut to complete the procedure.
3. Repeat the adjustment procedure on the other side of the machine if necessary.



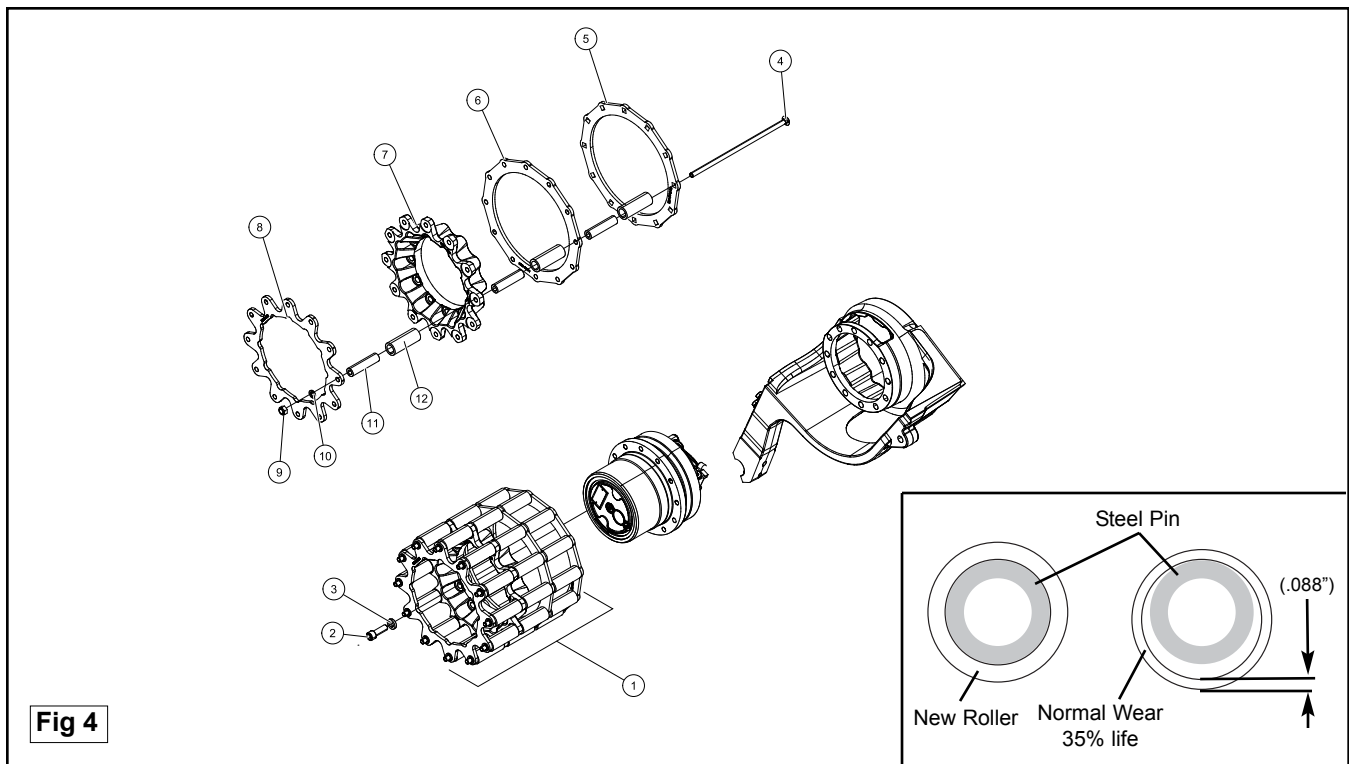


Fig 4

Sprocket Rollers

Your compact track loader utilizes rollers on the drive sprockets to drive the track. These rollers help minimize friction between the track and the drive sprocket to prolong track life.

The rollers rotate around hardened steel pins and usually wear on their inside surfaces. As they wear, the rollers become thinner, but will continue to function as long as they rotate freely around the pins. Sprocket rollers should be inspected every 50 hours of operation and replaced if cracked or worn to less than 35% of original thickness. (.088" / .22cm)

To replace worn rollers:

1. Begin by performing steps 1-4 in the track removal procedure on page 8 to allow the sprocket to be removed.
2. Remove the sprocket mounting bolts (2) to release the sprocket from the drive motor, then remove the sprocket.

Note: You may need to pry or lift the track upwards with a hoist above the drive sprocket to provide clearance for removal.

3. Remove one bolt (4) holding the steel pins (11) and rollers (12) in place.
4. Install the new rollers over the pins, then slide the bolt back through the sprocket and pins and secure it with the nut (9).
5. Repeat this process as required throughout the sprocket.

6. Reinstall the sprocket by reversing steps 2-3.
7. Repeat steps 1-5 on the other side of the machine if necessary.
8. Perform the track tension adjustment and check procedures on page 6.

Note: Replace rollers as a set to simplify inspection and maintain proper sprocket function.

Note: Figure 4 displays the drive motors and sprocket components found on early machines. The machines made after these will appear different, but are very similar. The procedure for inspecting and servicing the drive sprocket rollers is identical for both early and later production machines.

Track Removal/Installation

Tracks may need to be removed periodically to inspect undercarriage components or for replacement if worn or damaged. This section covers the procedure to remove and install a track.

Tools required:

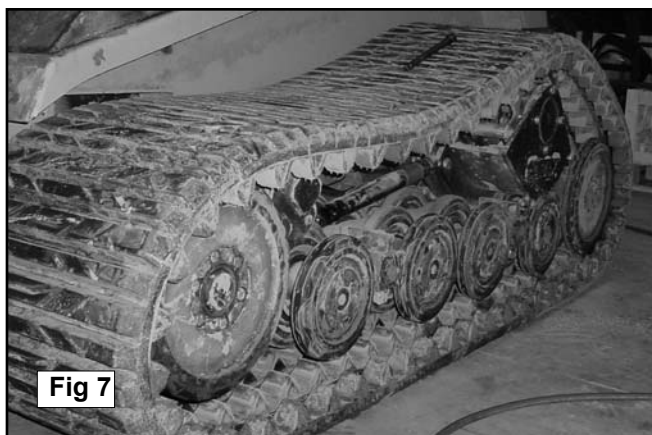
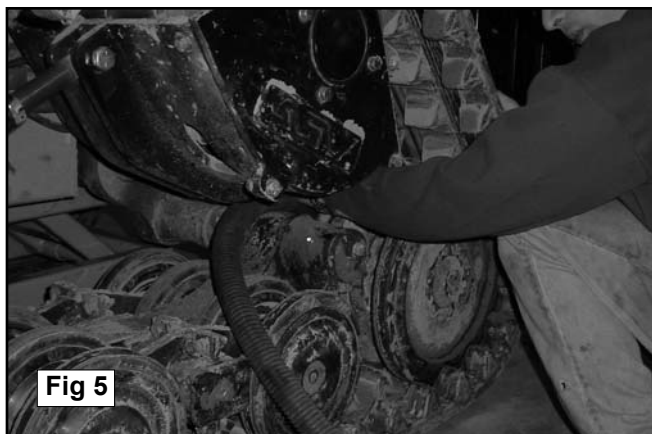
- Socket/impact wrench
- Ratchet strap
- Heavy duty hydraulic jack
- Combination wrench
- Long pry bar(s)
- Suitable mechanical supports (2)
- Spray lubricant
- Shop vac or Pressure washer

Track Removal

1. Break up and remove any foreign material from the cavity between the suspension rail and the drive table support. (fig. 5)

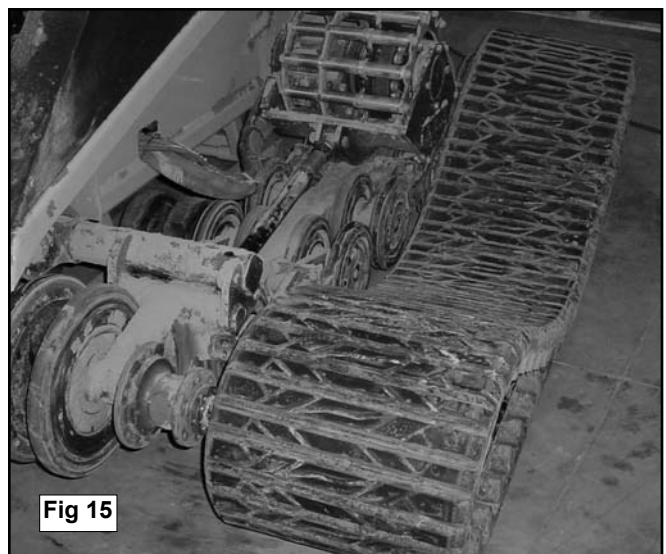
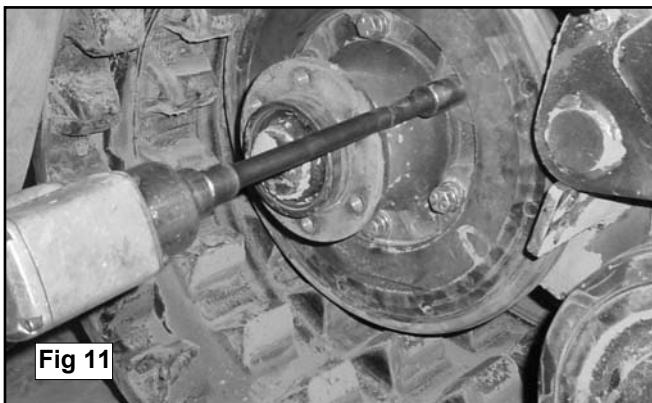
Note: A shop vac or pressure washer will work well to remove material from this cavity.

2. Clean the threads on the turnbuckle thoroughly using a stiff bristle brush.
3. Loosen the lock nut on the turnbuckle and spin it to the end of the threaded shaft to allow clearance when the drive table is lowered. (fig. 6)
4. Rotate the turnbuckle and lower the drive table as far as it will go. (fig. 7)
5. Remove the bolts securing the outer front wheel to the hub. Then remove the wheel. (fig. 8, 9,



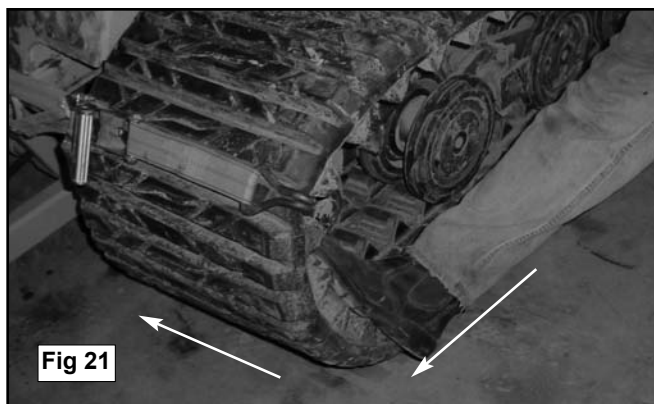


6. Remove the outer scraper plate from the suspension rail (fig. 10).
7. Remove the bolts securing the inner wheel to the hub, then remove the wheel (fig. 11, 12).
8. Use a pry bar to peel the track over the inner wheel(s) toward the outside of the machine. (fig. 13)
9. Once the track is off of the front wheel(s), pull the rear of the track clear of the suspension. (fig. 14, 15)



Track Installation

1. Slide the track over the drive sprocket at the rear of the machine (fig. 16, 17).
2. Slide the front of the track into position for installation (fig. 18).
3. Lubricate the inner front wheel(s) and the inside of the front portion of the track with a spray lubricant (fig. 19).
4. Attach a ratchet strap to the upper front portion of the track and the other end to one of the tow hooks on the front of the machine (fig. 20).
5. Tighten the strap until the track is pulled upward slightly and in position to slide over the inner idler wheel(s) at the front (fig. 20).
6. Pull all of the slack forward and make sure the track drive lugs are properly meshed with the sprocket to provide as much slack as possible for installation.
7. If you have an assistant, have them pull the track forward while you push inward on the track. Work the track over the wheel(s) and into place.
8. If you do not have an assistant, push the track forward in inward in a quick forceful motion to slide the track into place. The ratchet strap will help to keep the track in place while you work it over the idler(s) (fig. 21).



Undercarriage Maintenance

9. Once the track is in position over the idler wheels, install the inner idler wheel onto the hub and secure it in place with the mounting bolts. Torque them to 90 +/- 10 Lb. Ft. (122 Nm) (fig.22,23,24)

Note: You may need to use a bar to keep the wheel from spinning as you torque the mounting bolts to spec. (fig. 24)

10. Install the scraper onto the suspension rail and tighten the bolts to secure it in place. (fig. 25)
11. Install the outer idler wheel and secure it in place with the mounting bolts. Torque them to 90 +/- 10 Lb. Ft. (122 Nm) (fig. 26, 27)
12. Perform the track tension adjustment and check procedures on page 6 to complete installation.



Overview

This section provides removal and installation procedures for the undercarriages.

Note: For track removal and installation procedures, refer to pages 8-11 of this manual.

Note: For drive sprocket removal and roller inspection and replacement, refer to page 7 of this manual.



Personal Safety

Improper or incomplete maintenance/repair of a Compact Track Loader can be dangerous and may result in machine damage, injury or death.

Do not attempt to perform any type of repair or maintenance on a Compact Track Loader until you have read and fully understood the information in this manual. Refer to the Operation and Maintenance manual for instructions regarding proper machine operation techniques before operating any Compact Track Loader.

Prior to performing any type of service work on a Compact Track Loader, read and understand Pages 1-5 (Product Safety) for personal safety information.



Machine Preparation

Accidental machine starting can cause injury or death to personnel working on a Compact Track Loader.

As a precaution, disconnect the battery cables from the battery terminals, tape the battery clamps and remove the key from the ignition switch prior to performing any service work on a Compact Track Loader.

Place a "Do not Operate" tag prominently on the machine to inform personnel that the machine is being worked on.

Removal and Installation

Removal and installation procedures are provided for the following undercarriage components.

- Idler Wheels (Removal and installation)
- Bogie Wheels (Removal and installation)
- Hub Assembly Service Procedures

Note: Procedures are provided for only those components listed above. However, exploded parts diagrams exist and are available for download. They serve as visual aids in the removal and installation of other system components.

15" Idler Wheel

Note: The 15" idler and 10" bogie wheels may be removed from the undercarriage without removing the tracks.

Required Tools
Socket/impact wrench
Heavy duty hydraulic jack
Combination wrench
Suitable mechanical supports
Shop vac or Pressure washer

1. Raise and support the machine by following the jacking procedure on page 5.
2. Follow the track removal procedure from page 8, steps 1-7 for 15" front idler wheel removal.
3. Repeat step 7 of the track removal procedure as necessary to remove the 15" idler wheels throughout the undercarriage.

Installation

1. To install the 15" idler wheels, reverse the removal procedure. **Torque the wheel mounting bolts upon installation to 105+/- 10 lb. Ft/142 Nm.**

Bogie Wheel

Removal and Service Procedure

Required Tools

Socket/impact Wrench (including Allen)
Press & Various Press Tooling
Torque Wrench
Bench Vise

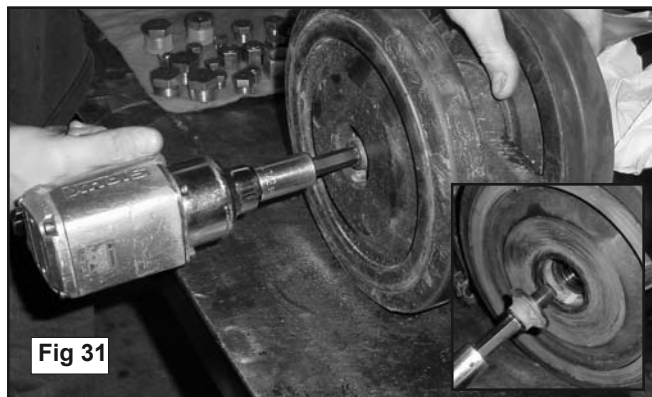
1. Perform steps 1-5 of the 15" idler wheel removal procedure on page 9 to loosen the track and provide clearance for the bogie wheel removal.



2. Remove the outer plate securing the assemblies to the shaft (most plates will be a two bolt design, single bolt version is shown here) (fig. 28).

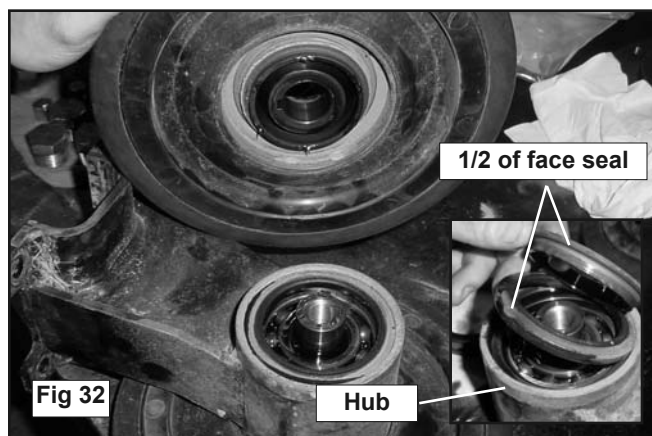


3. Loosen and remove the 4 bolts securing the bogie assemblies together around the mounting shaft (fig. 29, 30).



4. The inner and or outer bogie wheels may now be removed with an impact wrench and allen socket as shown in figure 31. If necessary, clamp one wheel in a vise to keep the axle from spinning while you remove the bolts.

Note: The wheel assemblies use metal face seals to keep dirt/debris out of the wheel bearings. During wheel removal/replacement, it is necessary to remove, inspect and clean all components prior to reassembly to ensure proper function.

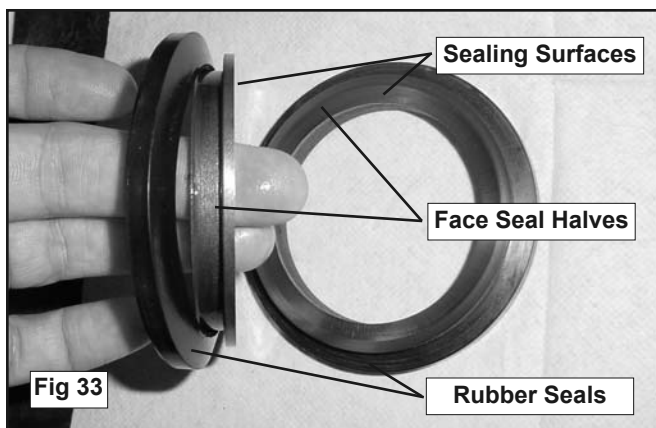


5. Remove both wheels from the hub (fig. 32).

Note: Take care not to drop the metal face seal halves. The sealing surfaces are surface ground and have an extremely fine finish. If scratched or disfigured, the seal will not function as intended.

Also, take care not to lose the keys for indexing the wheels onto the shaft.

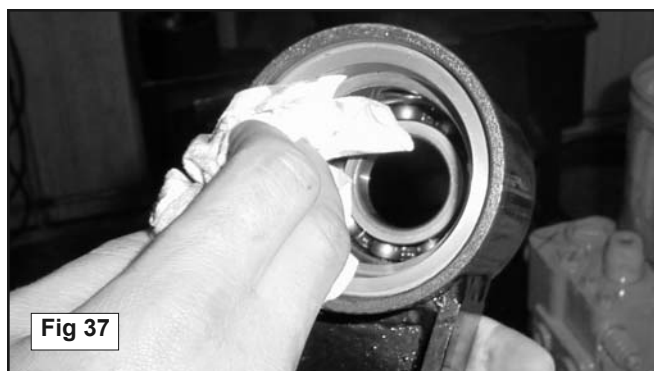
Note: Now is a good time to inspect the components for damage or wear. If the bearings do not roll smoothly when rotated, replace them. If the seals appear worn or damaged, replace them. If the wheels are worn or damaged, replace them. If the components appear to be in good working condition, you may reuse them.



Note: the metal face seals are a 4-piece design with one rubber outer seal and one metal face seal fitted into each wheel and one rubber outer seal and one metal face seal fitted into each hub. As they are assembled, the metal halves mate and ride against each other on a thin layer of oil to seal out dirt and debris. Figure 33 shows the various components that make up a face seal. Figure 34 shows the seal as a mated assembly.



6. Once the wheels have been removed, use a press to push the axle and far side bearing out of the hub as shown in figure 35 and 36.
7. If it is necessary to remove the other bearing for replacement, press it out as well. If not, you may leave this bearing in the hub during cleaning.



8. **Clean all parts** (including wheels) **thoroughly** with parts cleaning solution and **dry them** prior to reassembly. Wipe the inner hub surfaces to remove any solvent or oil residue (fig. 37).



9. Reinstall the bearing and shaft into the hub as found upon disassembly, then press the bearing back into the hub over the shaft (fig. 38).

Undercarriage Repair

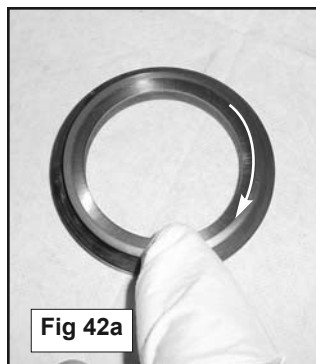
10. Disassemble and clean the face seals and their rubber outer seals thoroughly, then wipe them dry to ensure a good seal when assembled.



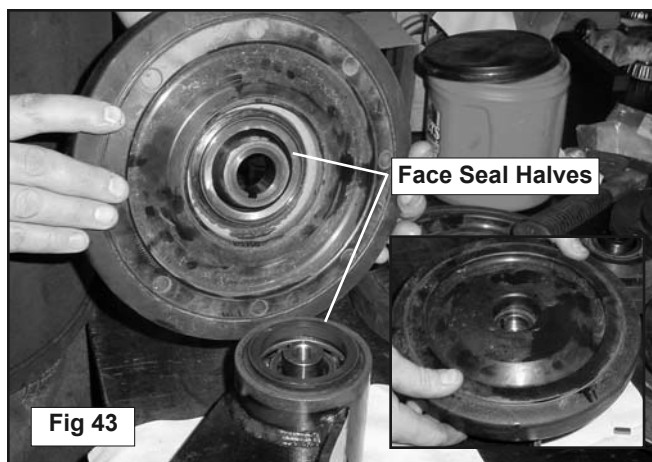
11. Once the seals and hubs have been thoroughly cleaned and dried, reinstall the hub portion of the face seal into the hub as shown. Make sure to work the rubber seal down into place within the hub (until it seats) to ensure a good seal (fig. 39).



12. Similarly, reinstall the wheel portion of the face seal into the (clean) wheel. Make sure to work the rubber seal down into place within the wheel (until it seats) to ensure a good seal (fig. 40).



13. Once the seals are in place, wipe the mating surfaces of the face seals with a clean shop cloth and alcohol in a circular motion ending in a gentle sweep from the inside to the outside of the face until clear of the face. This will ensure a clean mating surface and a good seal (fig. 41, 42).
14. Apply a **very thin** coating of fresh 10W30 engine oil onto the seal faces (**faces only**) in a circular motion to provide lubrication and help them seal.



15. Align the wheel hub and axle, then slide the wheel back onto the axle/hub assembly as shown in figure 43.



16. Install the key into the opening in the axle/hub assembly as shown in figure 44.



Fig 45

17. Apply red (high strength) thread locking compound to the wheel retaining bolt as shown (fig. 45).



Fig 46

18. Install the bolt and tighten it (fig. 46).
19. If you haven't already, repeat steps 10-18 of this procedure on the other side of the hub/wheel assembly to secure the second wheel in place.



Fig 47

20. Once the hub/wheel assembly is together as shown, torque the wheel retaining bolts to 180 ft. lbs / 244 Nm to secure them in place (fig. 47).



Fig 48



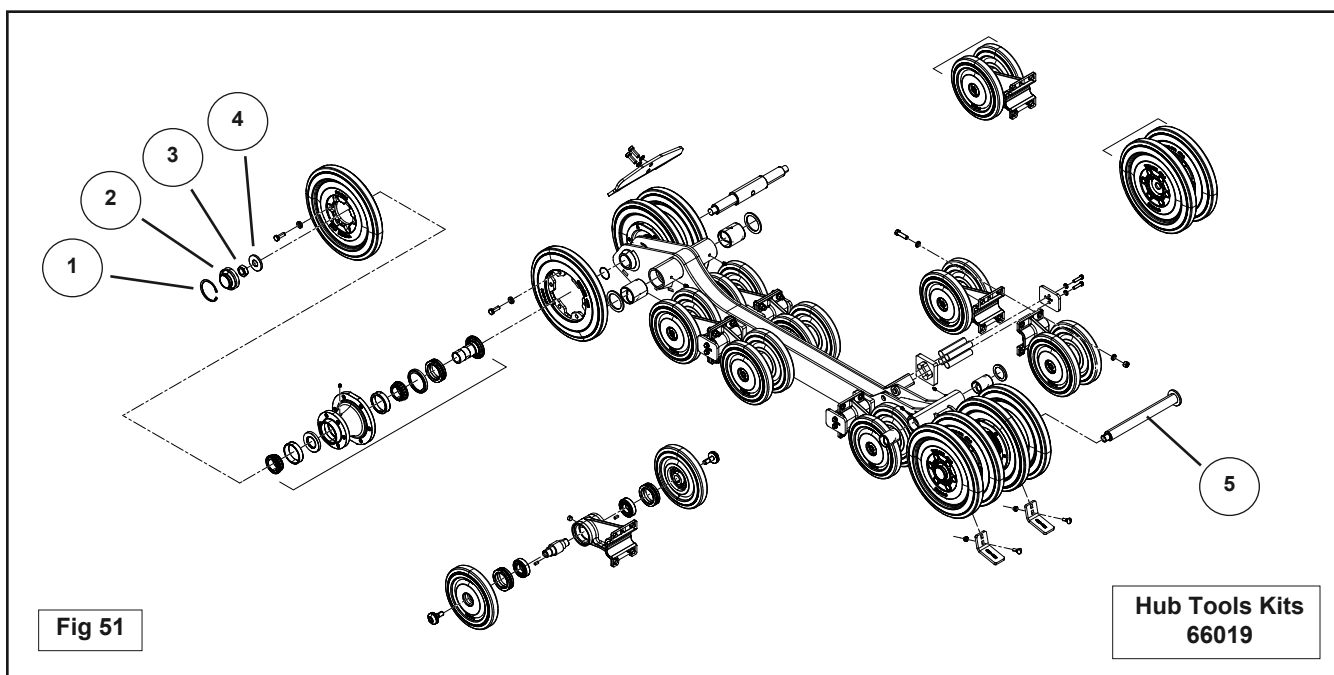
Fig 49

21. Remove the allen plug from the center of the hub assembly and fill it with 2 ounces of 10W-30API CH-4 engine oil. then reinstall the plug (fig. 48, 49).
22. Repeat this procedure on the other half of the bogie assembly if necessary prior to installing the two halves back onto the undercarriage.



Fig 50

23. Place the rubber rods back into position on the square shaft, then tape them in place to keep them secure while installing the bogie assemblies around them (fig. 50).
24. Reverse steps 1-3 of this procedure to reinstall the bogie assembly back onto the undercarriage and complete the procedure.
25. Repeat this procedure as necessary throughout the undercarriage to restore proper function.



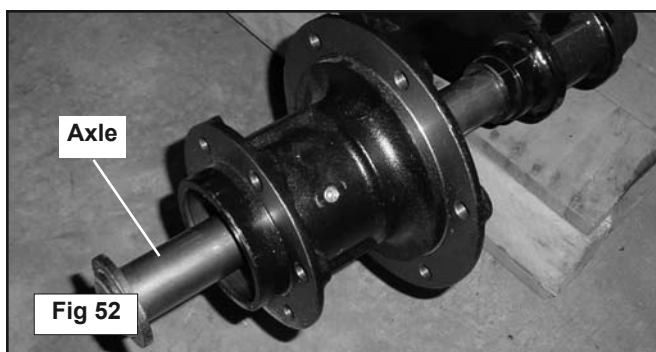
Idler Hub

Service Procedure

Required Tools

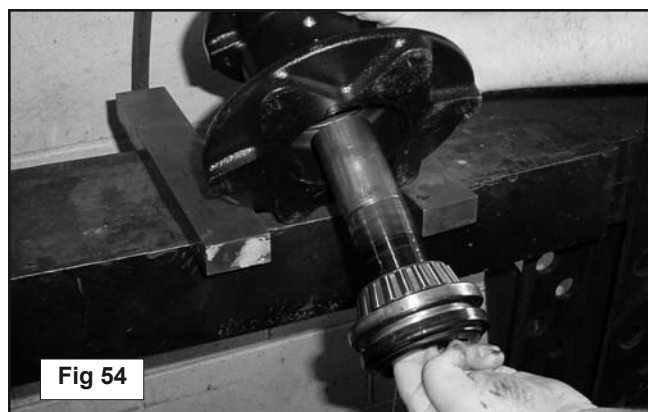
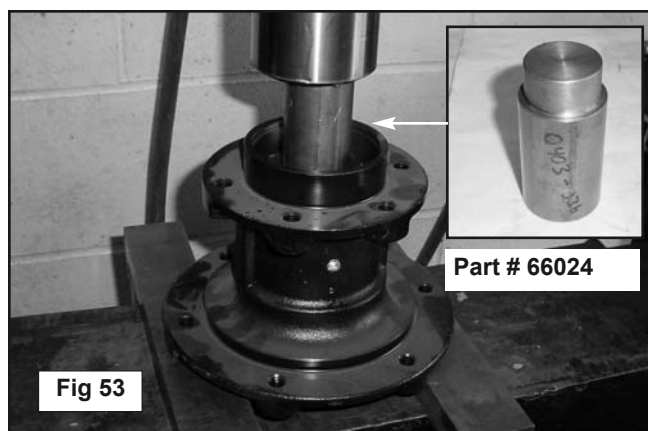
Socket/impact wrench
Heavy duty hydraulic jack
Combination wrench
Suitable mechanical supports
Shop vac or Pressure washer

1. Remove the hub assemblies from the undercarriages as required first by following steps 1-7 of the track removal procedure on page 8. The proceed to the steps below.
2. Remove the snap ring (item 1) securing the cap (item 2) in the hub assembly (fig. 51).
3. Remove the nut (item 3) and the washer (item 4), then remove the hub assembly from the axle shaft (fig. 51). (see note below)

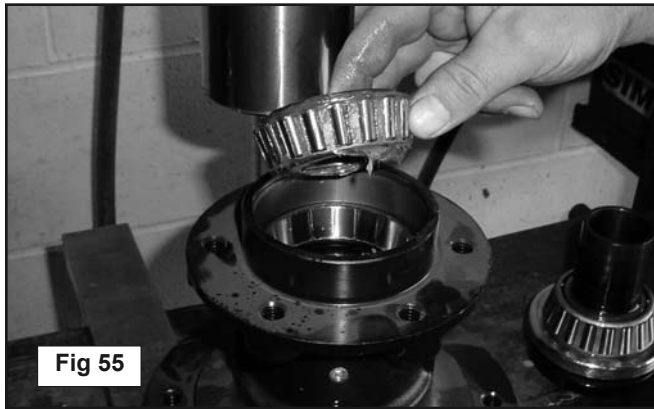


Note: If you removing the inner front hub assembly, you will have to slide the axle (item 5) out (fig. 51, 52).

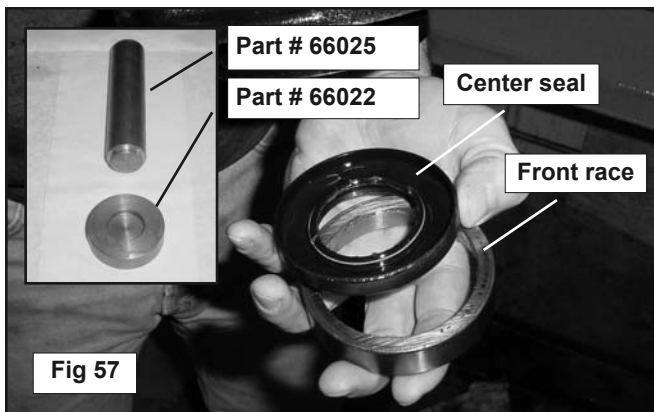
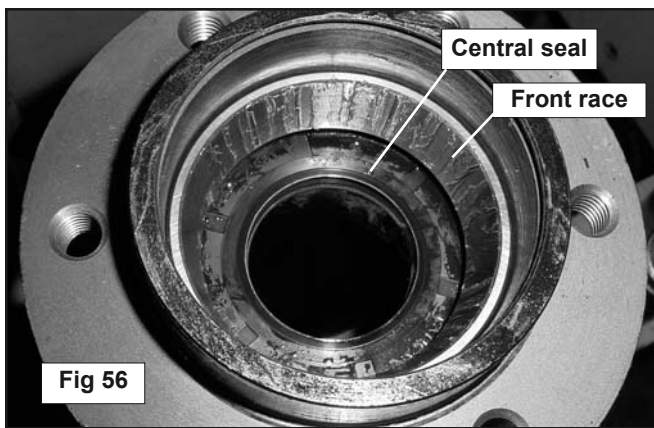
Note: If you are removing the outer to rear hub assemblies you will be able to remove the hub assembly once step 3 is complete.



4. Using a press and tool part # 66024, press the bearing sleeve out of the hub assembly (fig. 53, 54).

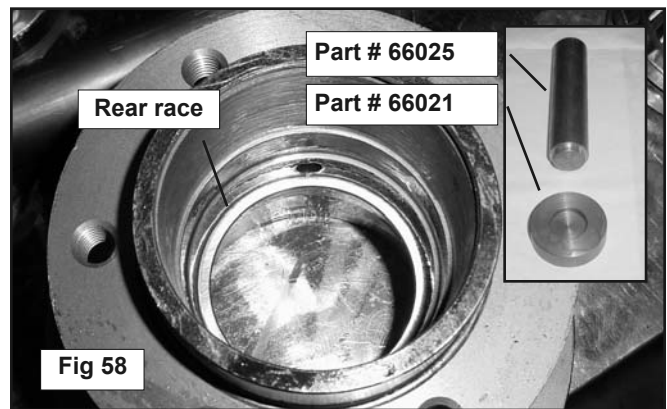


5. Remove the bearing out of the front of the hub as shown (fig. 55).

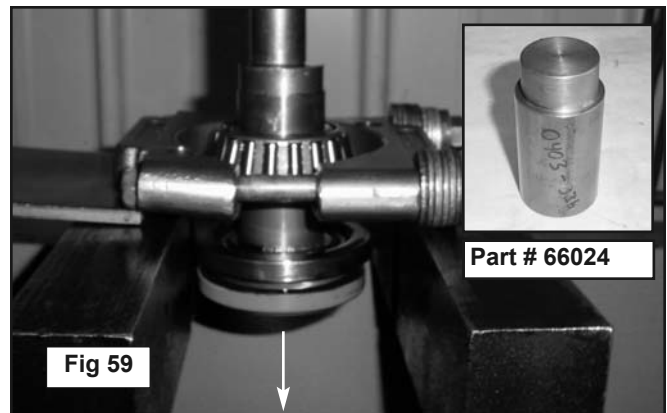


6. Press the center seal and front bearing race out of the assembly from the rear of the hub using tools 66025 and 66022 (fig. 56, 57)

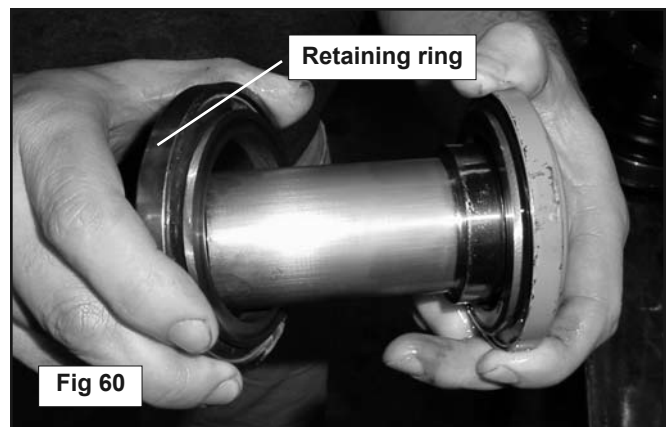
Note: The center seal will be destroyed during removal and must be replaced upon reassembly.



7. If bearings are to be replaced, press the rear bearing race out of the assembly from the front of the hub with tools 66025 and 66021 (fig. 58).



8. Press the bearing sleeve out of the rear bearing using tool 66024 (fig. 59).



9. Remove the face seals and retaining ring from the bearing sleeve for cleaning and/or replacement (fig. 60).

Undercarriage Repair

Note: Take care not to drop the metal seal halves. The sealing surfaces are surface ground and have an extremely fine finish. If scratched or disfigured, the seal will not function as intended.

Note: Now is a good time to inspect the components for damage or wear. If the bearings do not roll smoothly when rotated, replace them. If the seals appear worn or damaged, replace them. If the wheels are worn or damaged, replace them. If the components appear to be in good working condition, you may reuse them.

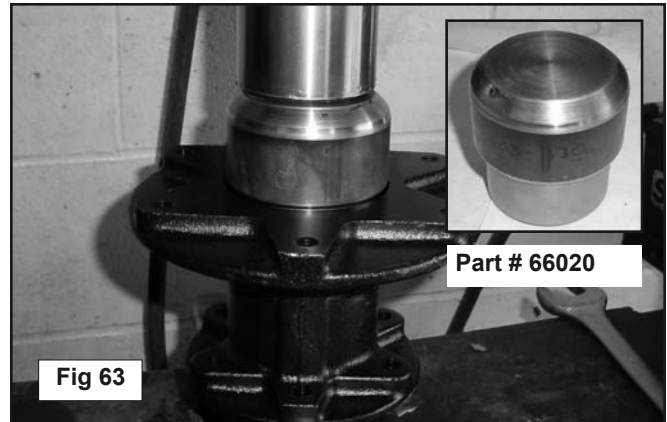
10. Thoroughly clean all parts with parts cleaning solution and gently blow them clean with air if necessary, then wipe dry.
11. Disassemble and clean the face seals and their rubber outer seals thoroughly, then wipe them dry to ensure a good seal when assembled.



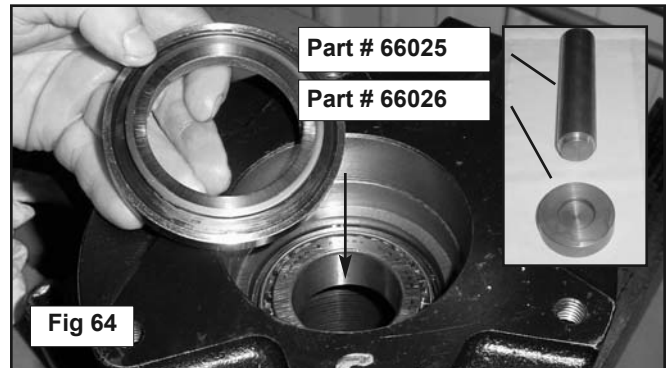
12. Once components are clean and dry, install half of the rear face seal into the bearing sleeve. Make sure to work the rubber seal down into place within the seal recess (until it seats) to ensure a good seal (fig. 61).



13. Install the other half of the rear face seal into the retaining ring. Make sure to work the rubber seal down into place within the ring (until it seats) to ensure a good seal (fig. 62).



14. If the rear race has been removed, press it into the hub from the rear until properly seated with tool # 66020, then install the clean, dry bearing (fig. 63).



15. Install the seal/retaining ring assembly into the rear of the hub and press into place until seated using the tools shown above (fig. 64, 65).





Fig 67

16. Once the seals are in place, wipe the mating surfaces of the face seals with a clean shop cloth and alcohol in a circular motion ending in a gentle sweep from the inside to the outside of the face until clear of the face. This will ensure a clean mating surface and a good seal (fig. 66, 67).



Fig 68

17. Apply a very thin coating of fresh 10W-30 engine oil onto the now clean seal faces (faces only) in a circular motion (fig. 68).

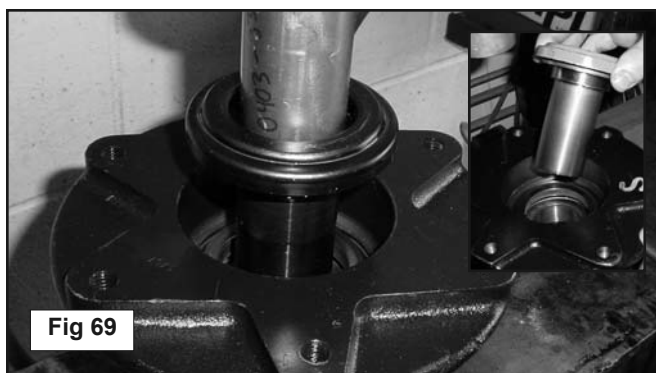


Fig 69

18. Press the bearing sleeve assembly (with face seal clean, installed, and oiled) into the hub with tool 66024 until seated (fig. 69).

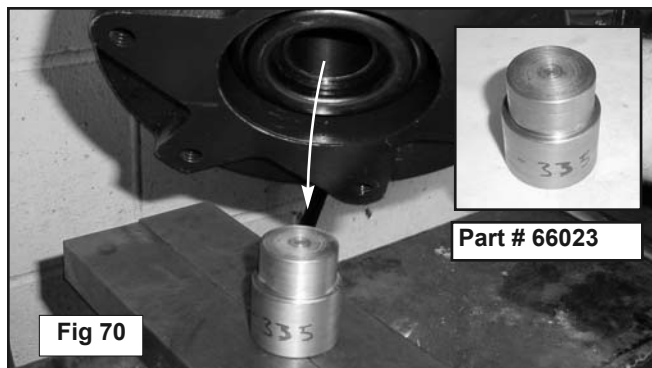


Fig 70

19. Flip the hub over, support the bearing sleeve from the bottom with tool 66023 and set it onto the press for center seal installation (fig. 70).

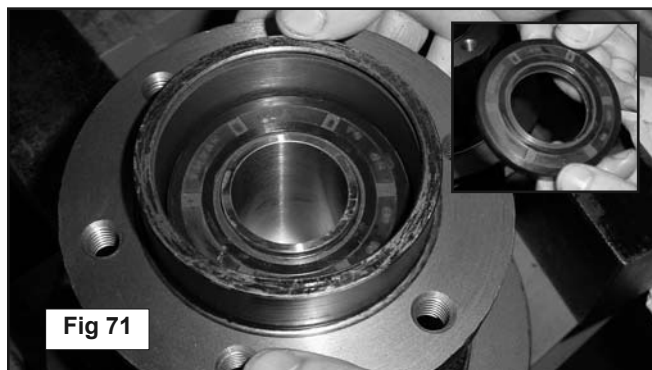


Fig 71

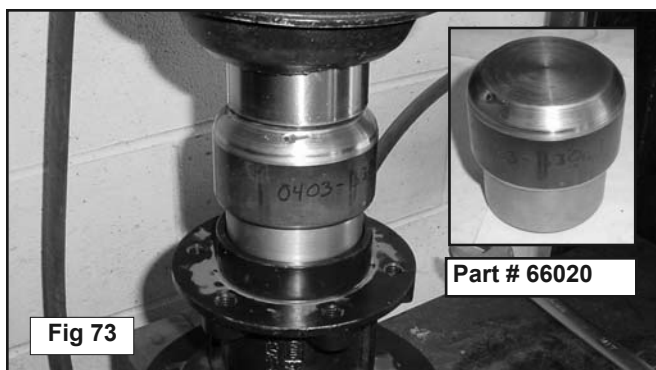
20. Install the center seal into the hub. Work the inner lip around the bearing sleeve with your fingers prior to pressing it into place (fig. 71).



Fig 72

21. Install the race into the hub as shown above the seal. When the race is pressed into place, it will push the seal into position (fig. 72).

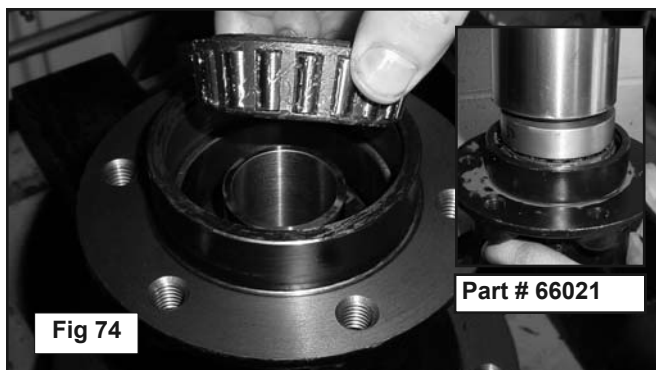
Note: See step 22 for tool information and race installation instructions.



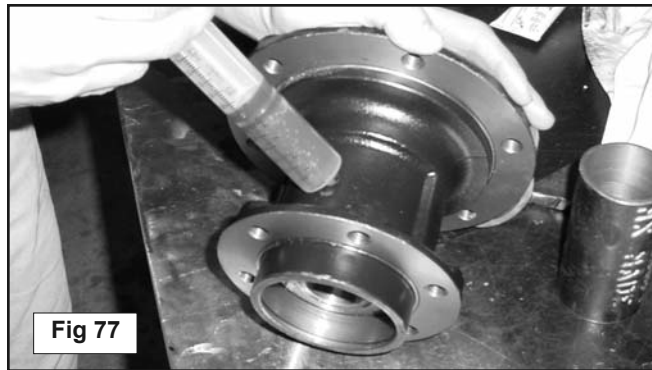
- 22.** Press the outer bearing race into the hub with tool # 66020 until it seats (fig. 73).



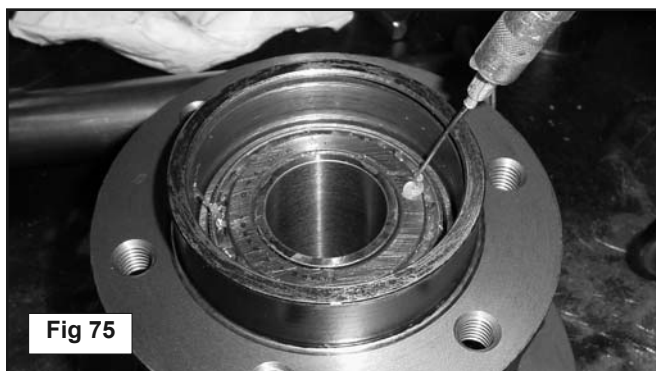
- 26.** Remove the Allen plug in the center portion of the hub (fig. 76).



- 23.** Pack the bearing with Mult-Purpose EP Lithium grease and then install it onto the bearing sleeve using tool 66021 (fig. 74).
- 24.** Press it into the assembly until it gently seats into the bearing race (fig. 74).



- 27.** Add 2 ounces of 10W-30 (API-CH-4) engine oil to the hub as shown, then reinstall the plug and tighten (fig. 77).



- 25.** If necessary, use a needle dispenser to fill any places in the bearing that are not full of grease to ensure adequate lubrication (fig. 75).



- 28.** The hub assembly is now ready to be reinstalled. To install it onto the machine, reverse steps 1-3 on page 17 of this procedure. Make sure to read the note below step 3 prior to reinstalling (fig. 78).
- 29.** Repeat this procedure throughout the undercarriage as necessary to repair worn or damaged components and restore proper function.

Front and Rear Axles - Removal

Required Tools

Socket/impact wrench
Heavy duty hydraulic jack (& mobile lifting device)
Combination wrench
Suitable mechanical supports
Shop vac or Pressure washer

Note: The front and rear axles may be removed from the chassis while leaving the suspension assemblies intact.

1. Jack the machine and support its weight according to the jacking procedure on page 5.



2. Remove the three bolts that secure the suspension mount brackets to the front axle (fig. 79).



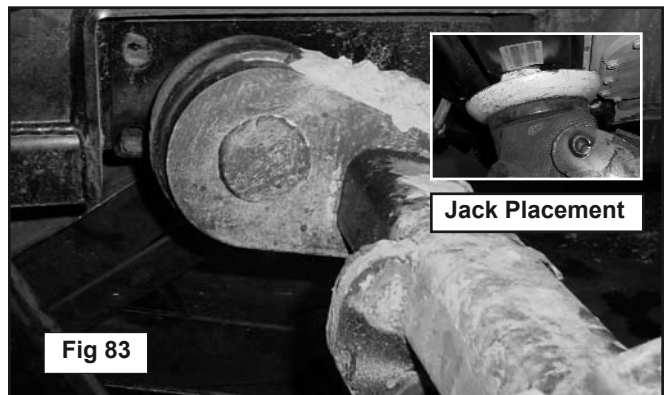
3. Remove the two bolts that secure the suspension retaining washer to the rear axle (fig. 80).



4. Remove the four bolts that secure the drive hose guides found on both the right and left hand sides of the machine (fig. 81).



5. Support each undercarriage with a suitable mobile lifting device (forklift, hoist, jack), then slide each of the undercarriages outward and off of the axles (fig. 82).



6. Support the axle with a suitable lifting device (as shown), then remove the four bolts that secure front and rear axles to each side of the chassis (fig. 83).

Note: Always place the jack beneath the center of the axle.



7. Lower and remove the axle (fig. 84). Repeat on the opposite end of the machine if needed.

Note: Support the axles at the ends while lowering to keep them steady on the lifting device as they are lowered.

Installation

1. To install rear and front axles, reverse the removal procedure.

Note: Prior to installing each undercarriage onto the axles, coat each axle shaft with anti-seize compound (fig. 85).

