

The Homeowner's Compact Crawler

# MAGNATRAC<sup>®</sup>

*Junior*



**C. F. STRUCK CORPORATION - CEDARBURG, WISCONSIN 53012**



# Operator's/Technical Manual

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# TO THE OPERATOR

## ***Congratulations...***

on your purchase of a quality-built, American made compact Crawler. We are confident that the dependability and economical performance of your Magnatrac Jr. Crawler will prove that you made a wise choice.

The purpose of this Manual is to acquaint you with the Magnatrac Jr. Crawler. The Manual explains how to operate and service your Crawler, and how to maintain its high operating efficiency. Instructions are given clearly, with the intention of making these operations as easy as possible.

Keep this Manual in a convenient place for quick and easy reference. Use it as a guide whenever questions arise. You have purchased a dependable, sturdy Crawler, but only by operating and caring for it properly can you expect to receive the service and long life for which it was designed.

If in the future you need new parts to replace those that may be worn, insist on genuine Magnatrac Jr. parts. They are exact duplicates of the originals, made from the same patterns and of the same high-quality materials.

When ordering parts, always be sure to give the following information for your Crawler:

**Model Number:** \_\_\_\_\_

**Serial Number:** \_\_\_\_\_

**Engine Model Number:** \_\_\_\_\_

**Engine Serial Number:** \_\_\_\_\_

**C. F. STRUCK CORPORATION**  
W51-N545 STRUCK LANE  
CEDARBURG, WISCONSIN 53012  
Phone: (414) 377-3300  
Fax: (414) 377-9247

(Version 08.29.95)

## **RECOGNIZE SAFETY INFORMATION**



This is the safety-alert symbol. When you see this symbol on your Crawler or in this Manual, be alert to the potential for personal injury.

## **UNDERSTAND SIGNAL WORDS**

A signal word—DANGER, WARNING, or CAUTION—is used with the safety-alert symbol. DANGER identifies the most serious hazards.

Safety labels with the signal word DANGER or WARNING are typically near specific hazards.

General precautions are listed on CAUTION safety labels. CAUTION also calls attention to safety messages in this Manual.

## **FOLLOW SAFETY INSTRUCTIONS**

Carefully read all safety messages in this Manual and on your Crawler and Attachment safety labels. Follow recommended precautions and safe operating practices.

Keep safety labels in good condition. Replace missing or damaged safety labels.

To keep your Crawler running efficiently, read the instructions in this Manual.

Left side, right side, front, and rear are viewed by facing in the direction of the Crawler's forward travel.

Record your Crawler serial numbers in the space provided. You need this information when you order parts.

The Warranty of this Crawler appears on the last page of this Manual.

# SAFETY RULES



Reports on accidents show that careless use of machinery causes a high percentage of accidents. You can avoid many accidents by following the safety rules on these pages. Study these rules carefully and enforce them on the job.

## SAFETY BEFORE STARTING OR OPERATION

The Crawler should be operated only by persons approved to do so.

Clothing worn by the operator should be fairly tight and belted.

Fasten a first aid kit to the Crawler.

Fasten a fire extinguisher to the Crawler. Keep the extinguisher fully charged. Learn to use it correctly.

If the Crawler has an unsafe condition, do not operate. Put a tag on the Track Drive Controls.

Do not start or operate the Crawler unless you are in the operator's seat.

Before you start the Engine, be sure there is plenty of ventilation.

Keep hands, feet, and clothing away from power-driven parts.

Fasten a slow-moving vehicle sign to the rear of the Crawler.

Guards, shields, and other protective devices must be in place and in good condition.

Before you start or operate the Crawler, clear the area of all persons and obstacles.

## OPERATION SAFETY

When you operate the Crawler, do not allow anyone to ride on the Crawler or its equipment.

Drive at safe speeds at all times, especially on rough ground and hillsides.

Carry the Bucket or Blade as low as possible at all times, especially when you work on a hillside or back up a steep hill.

Do not drive too close to the edge of a ditch or excavation.

Watch for overhead wires. Do not touch wires with any part of the Crawler or its Attachments.

Do not leave your Crawler unattended with the Engine running.

Keep work areas as level as possible.

When loading logs with the Log Forks, make sure the logs are balanced.

When you drive out of a ditch or excavation, or up a steep hillside, or when Crawler is hitched to a heavy load, **engage Track Drive Controls slowly**. If the front of the Crawler comes off the ground, release Track Controls **immediately**.

Do not use the Crawler as a battering ram.

Do not guide cable onto Winch Drum with your hands.

When you drive the Crawler on a road, use the correct lights to warn operators of other vehicles.

Before you move any equipment, be sure all persons are away from the Crawler.

When the Crawler is operating, **only** the operator should be on it.

If it is necessary to make checks with the Engine running, **always use two people**...the operator at the controls should be able to see the person doing the checking.

**KEEP HANDS AWAY FROM MOVING PARTS!**

## **BEFORE YOU DISMOUNT:**

**Move Track Drive Controls to neutral.**

**Disengage Main Drive and lock Brake.**

**Lower all equipment to the ground.**

**Stop Engine and remove the key.**

## **SERVICE SAFETY**

Be sure you understand a service procedure before you work on the Crawler.

Unauthorized modifications to the Crawler may impair the function and/or safety and affect Crawler life.

Do not work under Crawler or raised equipment unless it is correctly supported...contact factory for recommended procedures.

Before you work on the Engine or electrical system, disconnect the battery's "ground" ( - ) terminal **first!** When work is finished, connect battery's "ground" terminal ( - ) **last.**

When driving connecting pins (Spring Pins), wear goggles or safety glasses.

Do not run Engine while working on the Crawler.

Be careful when handling any type of fuel. Do not smoke while filling the fuel tank or working on the fuel system.

Check for faulty wiring or loose connections.

Do not lubricate or work on the Crawler while it is moving.

When you work near the Track Springs, **use extreme care.** Do not disassemble parts unless you know the correct procedure and have correct tools.

## **FIRE PREVENTION MAINTENANCE**

Be prepared if an accident or fire should occur. Know where the first aid kit and the fire extinguishers are located...know how to use them.

Check fire extinguisher for correct charge.

Do not smoke while refueling or handling highly flammable material.

Shut off the Engine when refueling.

Use care in refueling if the Engine is hot.

Do not use open pans of gasoline or diesel fuel for cleaning parts. Use good commercial, nonflammable solvents.

Provide adequate ventilation when charging battery.

Do not check battery charge by placing metal objects across the posts.

Do not allow sparks or an open flame near battery. Do not smoke near battery.

Never check fuel, battery electrolyte, or coolant levels with an open flame.

Never use an open flame to look for leaks anywhere on the equipment.

Never use an open flame as light anywhere on or around the equipment.

When preparing Engine for storage, remember that inhibitor is volatile and therefore dangerous. Seal and tape openings after adding the inhibitor. Keep container tightly closed when not in use.

Inspect electrical wiring for worn or frayed insulation. Install new wiring if wires are damaged.

Temperature in Engine compartment may go up immediately after you stop the Engine. **Be on guard for fires.**

Before you clean trash from the Engine compartment, wait until the Engine has cooled. Open Hood to cool the Engine faster. While the Engine cools, clean trash from other areas.

Check for leaking fuel lines or fittings with a piece of cardboard or wood. Do not use your hands. Tighten loose fittings. If hoses are kinked, install new parts.

## NOISE PROTECTION

Prolonged exposure to loud noise can cause impairment or loss of hearing. Wear a suitable hearing protective device such as earmuffs or earplugs to protect against objectionable or uncomfortably loud noise.

## START ENGINE ONLY FROM THE OPERATOR'S SEAT!

Avoid possible injury or death from Crawler runaway.

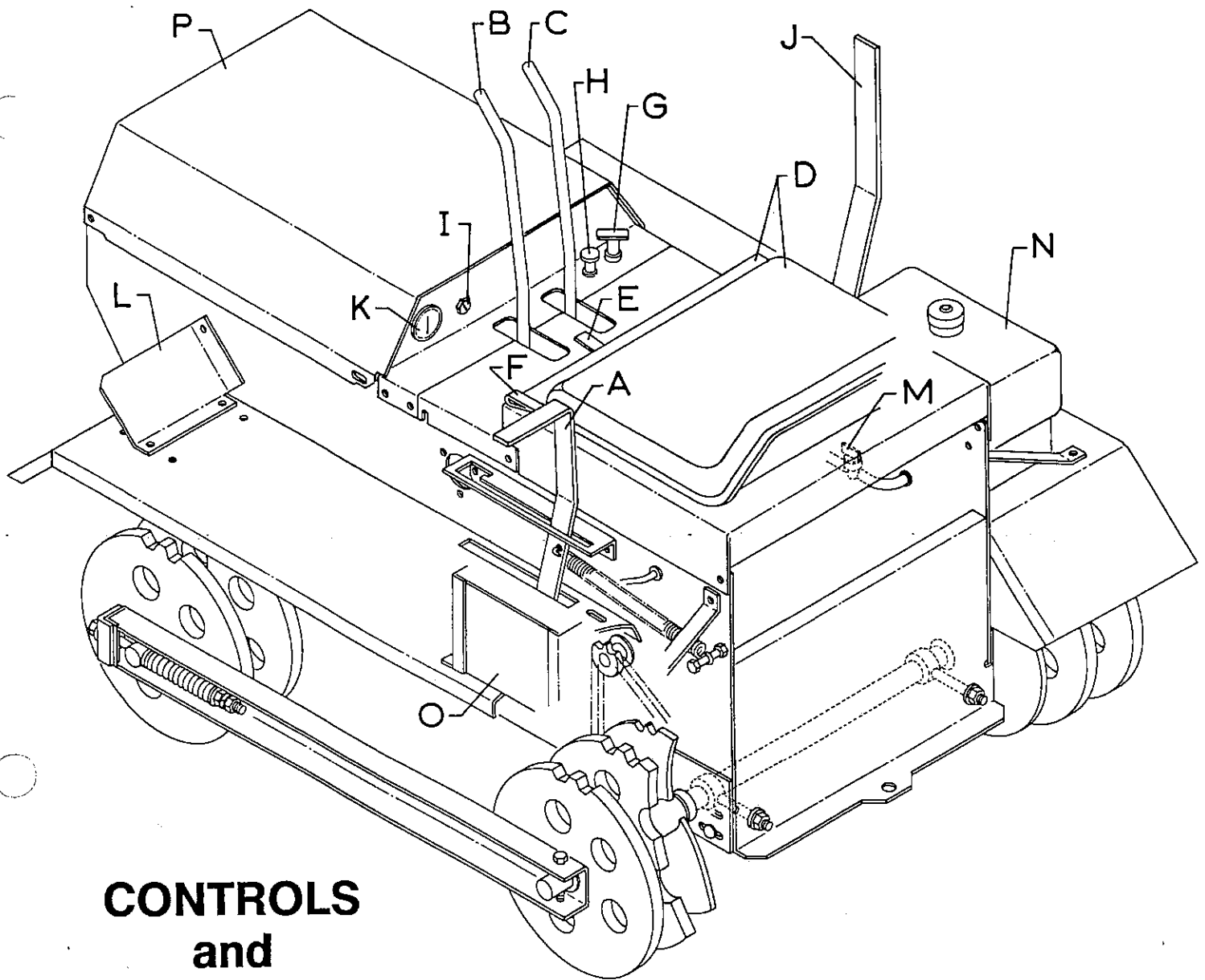
Do not start Engine by shorting across starter solenoid terminals. Crawler may start and move if normal circuitry is bypassed.



**CAUTION:** Never start Engine while standing on ground. Start Engine only from operator's seat, with Brake engaged.

Inspect your Crawler carefully each day before you start it. See "Pre-Start Inspection".

Clean your Crawler regularly.



## CONTROLS and INSTRUMENTS

Learn the location and purpose of all controls, instruments, and warning labels.

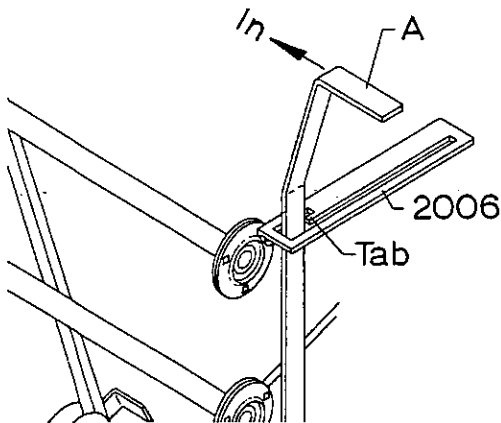
- |                                   |                             |
|-----------------------------------|-----------------------------|
| A - MAIN DRIVE CLUTCH/BRAKE LEVER | I - IGNITION SWITCH         |
| B - LEFT TRACK CLUTCH CONTROL     | J - FRONT HITCH LIFT HANDLE |
| C - RIGHT TRACK CLUTCH CONTROL    | K - AMMETER                 |
| D - SEAT/COVER ASSEMBLY           | L - FOOTREST                |
| E - SEAT LATCH                    | M - FUEL PETCOCK            |
| F - SEAT ADJUSTMENT LEVER         | N - FUEL TANK               |
| G - THROTTLE CONTROL              | O - BATTERY                 |
| H - CHOKE CONTROL                 | P - HOOD                    |

## (A) MAIN DRIVE CLUTCH/BRAKE LEVER

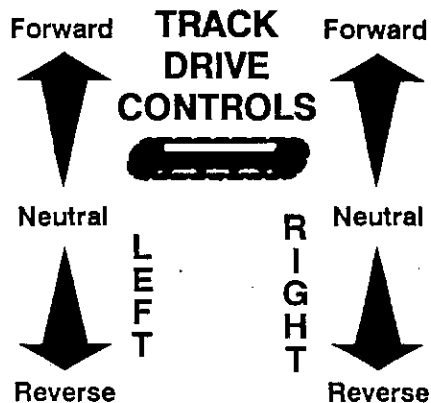
By pushing fully forward on Lever (A) you can disengage the Crawler's Main Drive Clutch and apply its Brakes .



Brakes will lock if Lever (A) is pushed fully forward and is drawn in toward operator, allowing it to hook behind the "tab" located on its #2006 Angle.



## (B) LEFT & (C) RIGHT TRACK CONTROLS



To move straight ahead, simultaneously push both Left and Right Track Controls forward.

To move straight rearward, simultaneously pull both Left and Right Track Controls rearward.

To turn right sharply, push forward on Left Track Control while leaving Right Track Control in neutral.

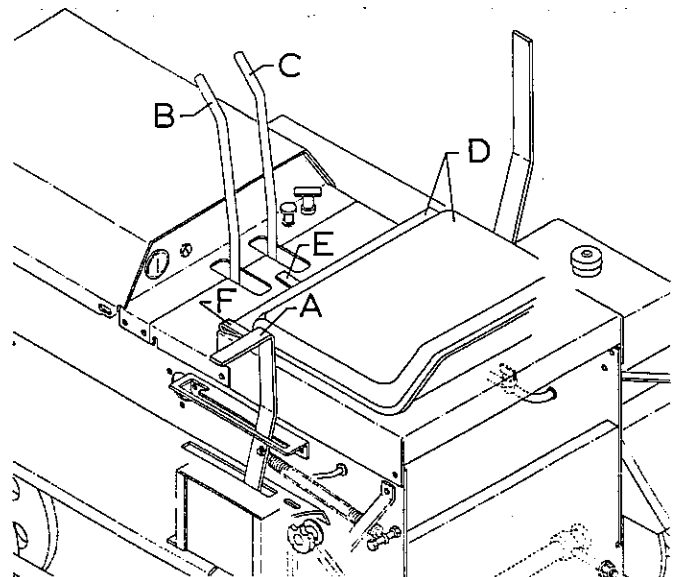
To turn left sharply, push forward on Right Track Control while leaving Left Track Control in neutral.

To counter-rotate Tracks (shortest turn possible), push one Track Control forward while simultaneously pulling rearward on the other Track Control.

**NOTE:** When either Track Control is "slowly" released, it will automatically return to neutral. **Never** allow Track Controls to "snap" back to neutral. See Operation section of this Manual for further instructions.

## (E) SEAT LATCH

Raise Seat Latch (E) to release internal "catch". Using the Seat as a handle, rotate the Seat/Cover Assembly (D) all the way to the rear until it hits its stop [back edge of the Cover acts as a stop].



**CAUTION:** At all times, especially on inclines, make sure (D) Seat/Cover Assembly is fully rotated to the rear and has hit its stop. If not properly positioned, the Seat/Cover Assembly can cut, strike or pinch the operator doing maintenance on the Crawler.

## (F) SEAT ADJUSTMENT LEVER

To slide Seat forward or back, push Seat Adjustment Lever (F) (under the lower left corner of the Seat) outwardly to release Seat. Set Seat's new position, then release Lever to lock in position. Seat Assembly can be installed at three different locations on Cover...see Service section of this Manual for complete instructions.



## (G) THROTTLE CONTROL

### THROTTLE

PULL OUT



SLOW



FAST



1/4 TURN TO LOCK

Turn Throttle Control 1/4 turn counter clockwise to **unlock**. Pull Throttle Control **out** (up) toward operator, to increase Engine speed. Push Throttle Control **in** (down) away from operator, to decrease Engine speed. Turn handle 1/4 turn clockwise to **lock** setting (Do not over-tighten!)

## (H) CHOKE CONTROL

### CHOKE

PULL OUT



On



Off

Pull Choke Control **out** (up) toward operator, to increase amount of Engine choking (**On** position). Push Choke Control **in** (down) away from operator, to decrease amount of Engine choking (**Off** position).

## (I) KEY IGNITION SWITCH

### KEY SWITCH



Run



Start



Off

Switch is activated by rotating key clockwise. Turning it fully clockwise will engage engine starter...release key and it will return automatically to the **Run** position. Turn fully counter-clockwise to **Off** position to stop Engine. Remove key.

## (J) FRONT HITCH CONTROL LEVER

Pushing forward on the Front Hitch Control Lever (**J**) lowers the Front Hitch and its Attachment. Pulling rearward on the Lever raises the Front Hitch and its Attachment. Lever will hold in a raised position if it is pulled fully rearward and then drawn **in** toward the operator and allowed to **lock** behind its "tab".

The Front Hitch is "spring assisted". Its springs carry the weight of the Front Hitch and its Attachment. The operator must expend effort **only** for the weight to be lifted by the Hitch & Attachment combination.

**NOTE:** Check Manual on Front Hitch for proper assembly, operating and safety information!

## (K) AMMETER

Measures electrical charge or discharge to battery. If Ammeter shows a discharge, shut down electrical system by turning Ignition Switch to **Off** and determine the problem.

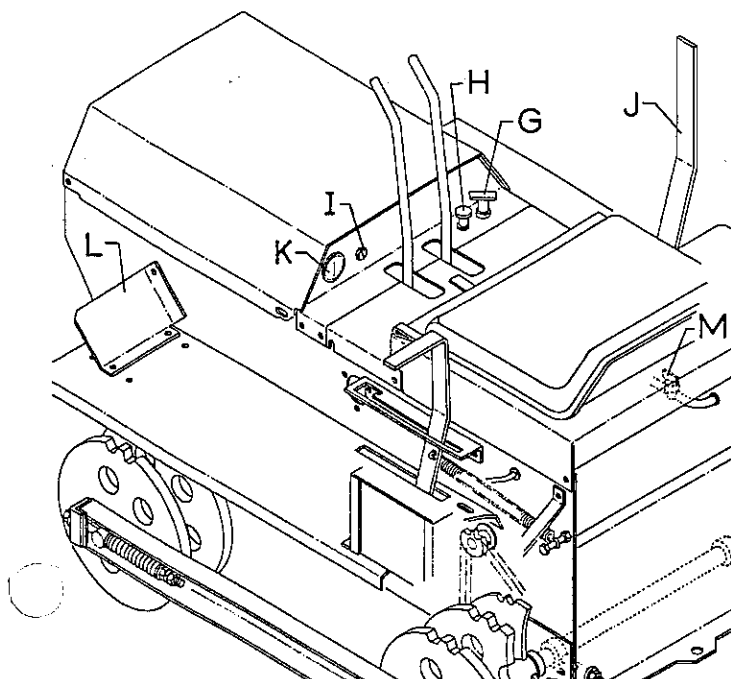
## (L) FOOTRESTS

The Right & Left Footrests are adjustable in three positions front to rear...see Service section of this Manual for complete adjustment instructions.

## (M) FUEL PETCOCK

The gas supply to the Engine can be turned **off** by rotating the handle of the Fuel Petcock (**M**) **clockwise** one-quarter turn. The gas supply can be turned **on**, by reversing the procedure and turning the Petcock one-quarter turn **counter-clockwise**...the illustration shows it in the on position.

The Fuel Petcock can be reached from the rear of the Crawler, or from the top by releasing the Seat Latch and raising the Seat/Cover Assembly.



# OPERATION

## PRE-STARTING INSPECTION

Before you start your Crawler for the first time each day, perform the following checks:

### ENGINE COMPARTMENT

- Check oil level.
- Check air intake system.
- Check fuel filter.
- Remove trash and oil/dirt deposits.

### TRACKS, ATTACHMENTS, SHEET METAL

- Check for bent, broken, or missing parts.
- Check Track Springs.

### HARDWARE

- Check for loose or missing parts.

### ELECTRICAL SYSTEM

- Check for worn or frayed wires or loose connections.

### LUBRICATION

- Check lubrication points shown in Periodic Service section of this Manual.

### GUARDS AND SHIELDS

- Check for tightness and condition.

### BATTERY COMPARTMENT

- Remove trash.
- Check cables for tightness and corrosion.

### FUEL TANK

- Check fuel level.

### OPERATOR'S STATION

- Check control levers for free movement.
- Clean fenders and instrument panel.
- Adjust Seat location to fit operator.



**CAUTION** - Before you start the engine:

Clear the work area of people and obstacles.

Check the condition of the Crawler. (Pre-start inspection).

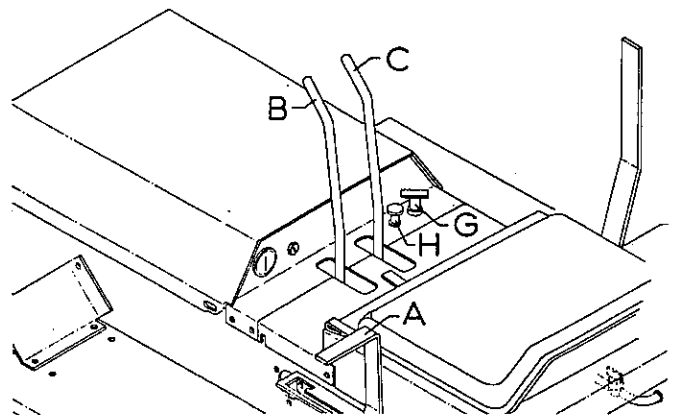
Be sure there is enough ventilation.

Be sure to know the correct starting and stopping procedure.

Sit in the Operator's Seat.

## PREPARE FOR ENGINE STARTING

1. Allow Left (**B**) and Right (**C**) Track Controls to assume their natural spring-loaded center **neutral** positions.
2. Make sure Main Drive Clutch/Brake Lever (**A**) is pushed fully forward and drawn in toward the operator until Lever **locks** behind "tab".
3. Check that all Attachments are in the fully lowered position.
4. Make sure you are properly seated so Seat Switch will engage.



## STARTING THE ENGINE

- 1a. **Cold Engine** - Place the Throttle Control (**G**) midway between the **Slow** and **Fast** positions. Place the Choke Control (**H**) into the **On** (fully choked) position.
- 1b. **Warm Engine** (normal operating temperatures) - Place the Throttle Control midway between the **Slow** and **Fast** positions. Place the Choke Control into the **Off** (no choke) position.

2. Activate the Key Ignition Switch (I) by rotating the key **clockwise** until starter engages. Release the key as soon as the Engine starts...Switch will return to the **Run** position.

**NOTE:** After starting a "cold" Engine, it may be necessary to leave the Choke partially **On** for a few minutes before moving it to the **Off** position.

**CAUTION:** Do not crank the Engine continuously for more than 10 seconds at a time. If the Engine does not start, allow a 60-second cool-down period between starting attempts. Failure to follow these guidelines can burn out the starter motor.

**CAUTION:** If the Engine develops sufficient speed to disengage the starter but does not keep running (a "false start"), the Engine rotation must be allowed to come to a complete stop before attempting to restart the Engine.

If the starter is engaged while the flywheel is rotating, the starter pinion and flywheel ring gear may clash, resulting in damage to the starter.

If the starter does not turn the Engine over, shut off starter immediately. Do not make further attempts to start the Engine until the condition is corrected.

If the battery charge is not sufficient to turn over the Engine, recharge the battery.

**CAUTION:** Do not attempt to jump start the Engine with another battery. Starting with batteries larger than those recommended can burn out the starter motor.

## WARM-UP PERIOD

Run Engine at half speed for 5 minutes.

Do not run Engine at fast, or slow idle.

Operate Crawler at less-than-normal loads and speeds for the first 15 minutes.



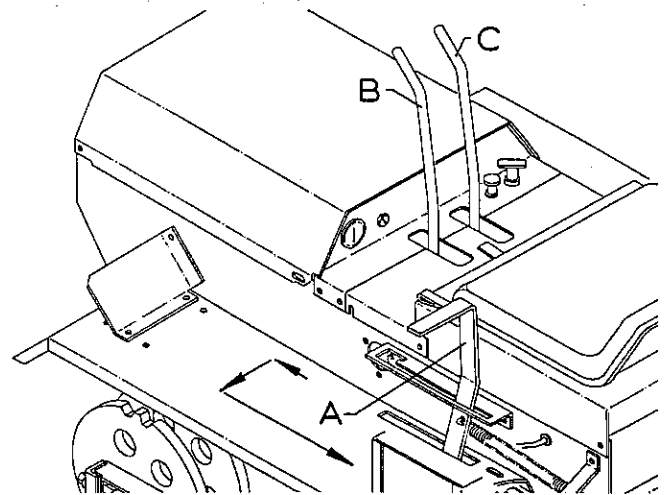
## WARNING: Lethal Exhaust Gases

Engine exhaust gases contain poisonous carbon monoxide. Avoid inhaling fumes, and never run the Engine in a closed building or confined area.

**NOTE:** Assembled Crawlers are "run in" under no load at the factory for 15 minutes to properly break-in their drive train.

## TRAVELING

Hold Main Drive Clutch/Brake Lever (A) fully forward, then push **outwardly**, to unlock it from behind its "tab". Slowly release pressure on the Lever allowing it to come back to its "spring loaded", rearward position!



Raise all Attachments to their recommended traveling heights.

To move **straight ahead**, simultaneously push both Right Track Control (C) and Left Track Control (B) forward.

To move **straight to the rear**, simultaneously pull both Right and Left Track Controls rearward.

To turn **sharply to the right**, push Left Track Control fully forward...leave Right Track Control in neutral.

To turn **slowly to the right**, push Left Track Control fully forward while simultaneously pushing "partially" forward on Right Track Control...the farther you push the Right Track Control forward, the slower you will turn right.

To turn **sharply to the left**, push Right Track Control fully forward...leave Left Track Control in neutral.

To turn **slowly to the left**, push Right Track Control fully forward while simultaneously pushing "partially" forward on the Left Track Control...the farther you push the Left Track Control forward, the slower you will turn to the left.

To counter-rotate Tracks, (shortest turn possible), push one Track Control forward while simultaneously pulling rearward on the other Track Control. You may counter-rotate **clockwise** or **counter-clockwise**; move in whichever direction satisfies the job at hand.

**Stopping the Crawler:** The Right and Left Track Controls are of the self-centering (neutral) type. This allows you to simply release pressure on both Track Controls to disconnect (declutch) active power to the Tracks and come to a complete stop. **Never** "snap" Track Controls back into neutral!

Tracks are frozen to the ground, be careful to avoid damage to the Tracks and drive train when you try to move the Crawler.



**CAUTION:** When you park your Crawler on a slope, put blocks against tracks. **Do not** park Crawler with tracks pointed downhill.

## PARKING THE CRAWLER

1. Lower all Attachments to the ground.
2. Allow Right and Left Track Controls to go "slowly" to neutral.
3. Push fully forward on Main Drive Clutch/ Brake Lever and **lock**.
4. Run Engine at half speed 2 minutes without load.
5. Move Throttle Control to slow idle.
6. Turn Ignition Switch to **Off**.

**IMPORTANT:** If Engine stops under load, remove load. Start Engine immediately. Run 30 seconds at half speed before adding load.

If Engine stops, you must turn key **Off** before you can start the Engine.

In freezing weather, park on a hard surface to avoid freezing the Tracks to the ground. If

# FUELS and LUBRICANTS

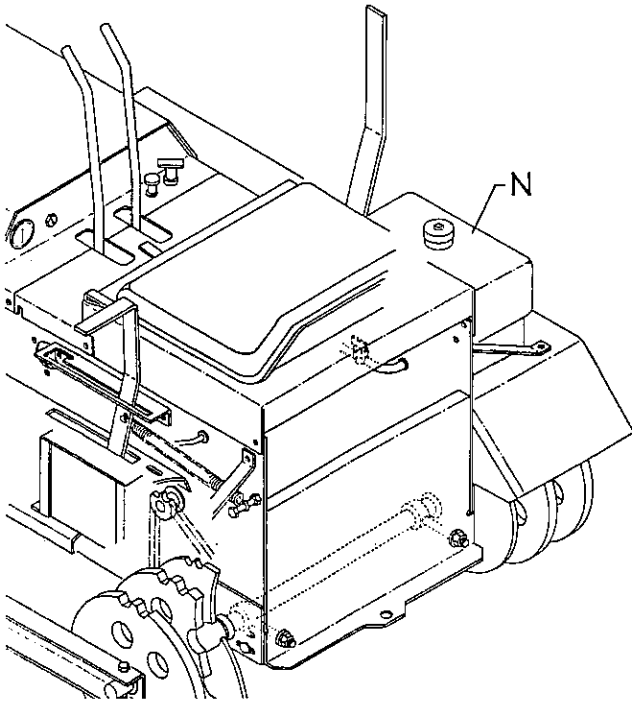
## FUELS

### FUEL SPECIFICATIONS

Check enclosed Engine Owner's Manual and closely follow their recommendations.

### FILLING FUEL TANK

The Fuel Tank (N) is located to the right of the Operator's Seat.



Fill Fuel Tank at end of each day's operation.

Fuel Tank capacity is 1.5 U.S. gallons.

Use unleaded gasoline per Engine Owner's Manual.



**CAUTION:** Handle fuel carefully. Do not fill fuel tank when the Engine is running. Do not smoke while you fill fuel tank or work on fuel system.

## STORING FUELS

Keep fuel in a container in a protected area. Water and sediment must be removed before fuel gets to the Engine. Do not depend on fuel filters to remove water.

If possible, install a water separator at the storage tank outlet.

Store fuel drums on their sides with plugs up.

**IMPORTANT:** Keep all dirt, scale, water, or other foreign matter out of fuel.

## LUBRICANTS

### ENGINE OIL

Check enclosed Engine Owner's Manual and closely follow their recommendations.

### GREASE

Use premium quality SAE Multi-Purpose Grease in a grease gun with a flexible "nose".

### STORING LUBRICANTS

Store lubricants in clean containers in an area protected from dust, moisture, and other contamination.

# LUBRICATION and PERIODIC SERVICE

## LUBRICATION AND SERVICE INTERVALS

Recommended service intervals are for normal conditions. Service more often if Crawler is operated under more difficult conditions such as high temperature, dust, etc. Use only quality lubricants at intervals specified in this manual.

## PERIODIC SERVICE CHART

### DAILY OR EVERY 10 HOURS

#### Engine Air Cleaner

Service per instructions in Engine Owner's Manual.

#### Engine Oil

Service per instructions in Engine Owner's Manual. **NOTE:** First oil change for a new Engine is at 5 hours.

#### Grease Zerks

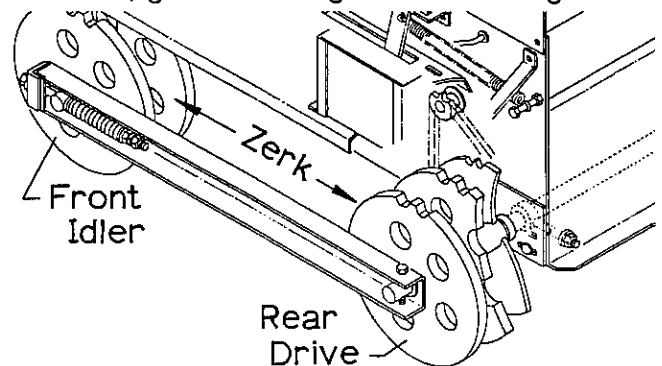
Lubricate all zerks per instructions in manual of each attachment you have mounted to, or are operating with your Crawler. [Clean zerks and area around them before servicing].

#### Front Idler/Rear Drive

Your Crawler is pre-lubricated at the factory for the first 25 to 50 hours of operation [25 hours for dusty, gritty conditions; 50 hours for normal conditions]. After that period you may use one of the following lubrication procedures:

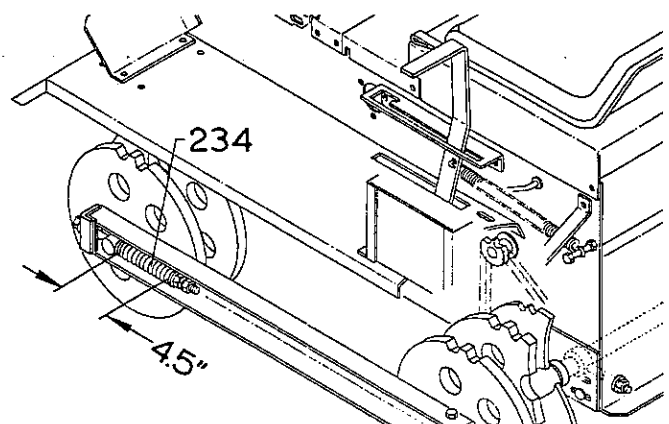
**Normal Conditions:** Clean area around each "zerk" in Front Idler and Rear Drive Assemblies. Remove zerks...try to have them on the "top-side". Using an oil can with SAE 30 motor oil, fill each reservoir through threaded hole...do this at day's end to allow oil to soak into the bearings. Repeat oiling next morning and replace zerks. Repeat process every 25 hours.

**Dusty Conditions:** Clean area around each "zerk" on Front Idler and Rear Drive Assemblies. Grease each zerk until you see, or feel, grease coming out the bearing ends.



#### Track Tension

Maintain 4.5" overall length of #234 Spring on each Track.



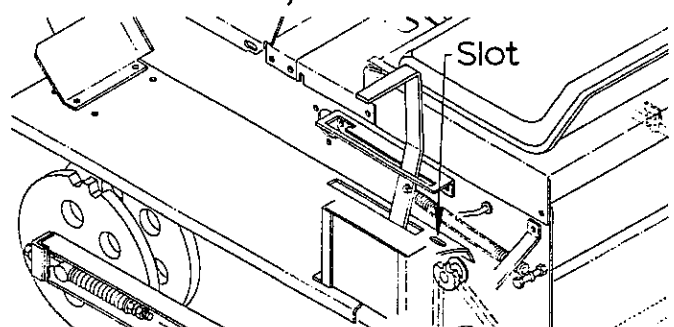
Check Service section of this Manual for complete explanation and Track Tensioning procedures.

#### Drive Chain Tension

Maintain proper chain tension in Crawler's final drive. Check Service section of this Manual for complete Drive Chain Tensioning procedures.

#### Drive Chain Lubrication

Use SAE 30 motor oil in pressure oil can. Lubricate through 3/8" wide by 1" long slot at "inside rear" of each Fender (located above each Drive Chain).



Thoroughly lubricate each Drive Chain. [TIP: Drive Crawler forward approximately six feet stopping to oil the Chain through the slot every foot]. Don't forget to do **both** Drive Chains!

#### **Safety Module**

Check for proper functioning...see Service section of this Manual.

#### **General Once-Over**

Check for loose nuts and bolts and any signs of premature wear. Correct any problems immediately. Contact factory with any questions or requests for help.

### **EVERY 50 HOURS**

#### **Engine Oil**

Drain and refill per recommendations in Engine Owner's Manual.

**NOTE:** Change Engine oil every 25 hours if you're working under constant heavy loads or extremely dirty conditions.

#### **Battery**

Check electrolyte level (if applicable) and fill with distilled water to the bottom of the filler neck.

#### **Filters**

Replace Engine Filter with filter recommended in Engine Owner's Manual.

Check Fuel Filter for dirt; if showing sediment, replace with new.

#### **Tracks and Track Sprockets**

Remove and pressure wash Track. Pressure wash Front Idler and Rear Drive Sprockets.

### **EVERY 200 HOURS**

#### **Fuel Filter**

Replace with new Fuel Filter at this time.

#### **Fuel Tank**

Remove and drain tank of any water or sediment.

# SERVICE

In the following Service section of this Manual, you will be required to do various assembly and disassembly procedures. Each section will try to remind you of safe procedures, but the best safety device is still the mechanic himself.



**CAUTION:** Try to do your work in a level, open area away from people and obstacles.

1. Pay attention to what you are doing...the parts you will be handling can be heavy, sharp or could pinch. Always wear heavy gloves when handling the Tracks and similar sharp, pinching components.
2. When you are required to block the Crawler to raise it off the ground, make sure you use strong blocking materials and think out how the Crawler will safely balance on your blocking.

Never be too proud to ask a friend or neighbor for help...especially when blocking up your Crawler or working with the Tracks.

As always, the factory is your best source for competent service advice and explanations of any service procedures that are unclear...always feel comfortable calling for whatever advice you may need!

## ENGINE

Your Crawler comes with a complete Engine Service Manual. It provides troubleshooting tips along with complete rebuilding procedures. If further help is needed, contact your local Engine dealer...he's listed in the telephone "Yellow Pages" under "Engines, gasoline".

## STARTER

**IMPORTANT:** Do not hold down starter button longer than 10 seconds at a time. If the Engine does not start within 10 seconds, wait 60 seconds before pushing starter button again. After a false

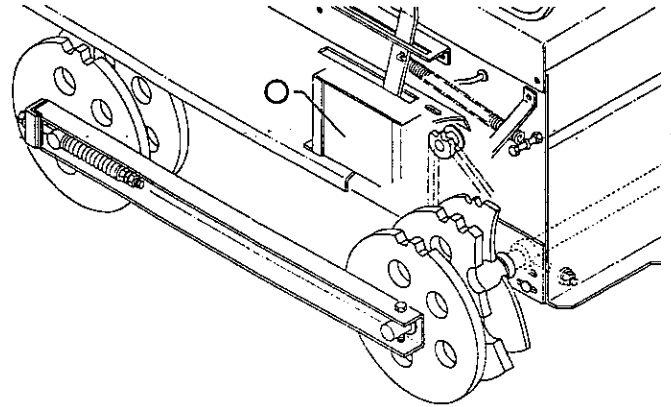
start, do not push starter button until Engine has stopped turning.

If the starter will not operate or operates sluggishly, check for the following:

- Run down battery.
- Dirty, loose, or corroded cables and wires.
- Engine oil viscosity too heavy.

## BATTERY

Your Crawler has a 12 volt, negative-grounded system with one Battery (O).



### BATTERY PRECAUTIONS



**CAUTION:** Sulfuric acid in batteries is a poison and could cause severe burns. Avoid contact with skin, eyes, and clothes. When you work around batteries, protect eyes and face from battery fluid and explosion.

**Antidotes for Sulfuric Acid:**

#### EXTERNAL

1. Flush skin well with water.
2. Flush eyes for 15 minutes.
3. Get medical attention immediately.

#### INTERNAL

1. Drink a large amount of water or milk.
2. Then drink milk of magnesia, beaten eggs, or vegetable oil.
3. Get medical attention immediately.



**CAUTION:** Keep flames and sparks away from battery.

Do not use booster cables or adjust battery terminal connections unless you know the correct procedure.

When you charge a battery or use a battery in a closed space, be sure there is enough ventilation.

Keep batteries where children cannot reach them.

Keep vent caps tight and level.

### COLD WEATHER BATTERY SERVICE

During cold weather, keep electrolyte in battery at correct level (if applicable). Keep battery fully charged.

### BATTERY STORAGE

If Crawler will be stored for more than 30 days, remove battery. Keep it fully charged.

### BATTERY MAINTENANCE

1. Remove corrosion from terminals with a stiff, **non-metallic** brush.

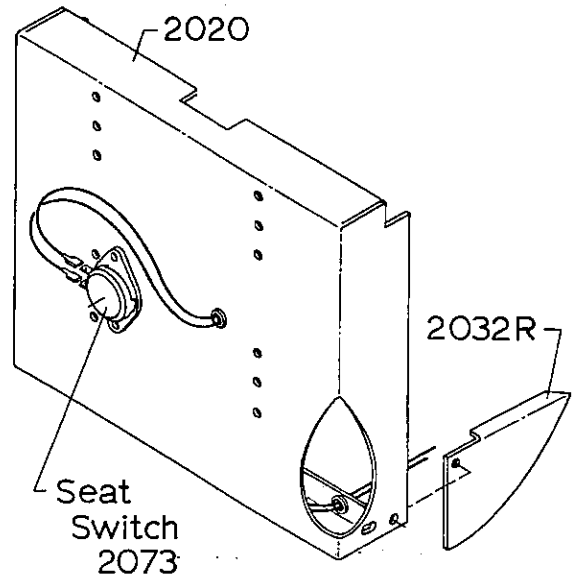


**CAUTION:** Use care when cleaning terminals so that you do not "short them out" with metallic brushes, scrapers, screwdrivers etc.

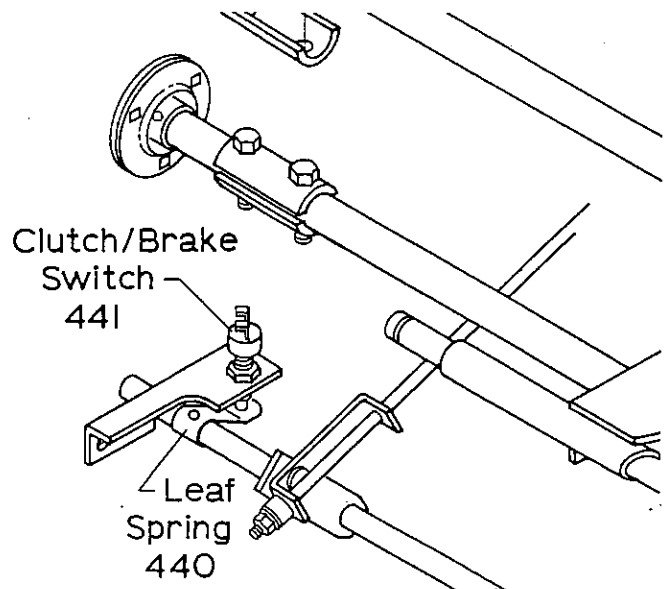
2. Clean battery with a baking soda solution (1/4 pound in a quart of water).
3. Flush battery and compartment with clear water.
4. Check electrolyte level (if applicable). Fill each cell to bottom of filler neck with distilled water or clean, soft water (not hard water).
5. Put petroleum jelly on terminals. Maintain protective covers on "positive" (+) and "negative" (-) terminals of battery.

## SAFETY INTERLOCK SWITCHES

Two Switches, one in the Seat...



...and one on the Main Drive Clutch/Brake Lever,



are used in the Crawler's electrical system as safety devices. They detect if the operator is properly seated, that the Main Drive Clutch is disengaged and that the Brakes are engaged and locked **before** the Crawler can start.

The **plunger** in each Switch has to be depressed for the Switch to **close** and activate the electrical circuits; the **plunger** has to be released for the switch to **open** and safely deactivate the circuit.

To check either the #2073 Seat Switch or the #441 Main Drive Clutch/Brake Switch, you must

remove the electrical connectors attached to each switch's terminals and connect a continuity tester to its terminals (a simple flashlight type continuity tester would be fine).

## SEAT SWITCH TEST

Reach underneath Seat to remove the electrical connectors attached to each of the #2073 Seat Switch's two terminals.

- A. By pushing down on the center of the Seat the Seat Switch should **close**. A continuity tester, attached to the two terminals of the Switch, should have its light **On** at this time!
- B. With pressure removed from the Seat, the Switch should **open**...the light should be **Off**!

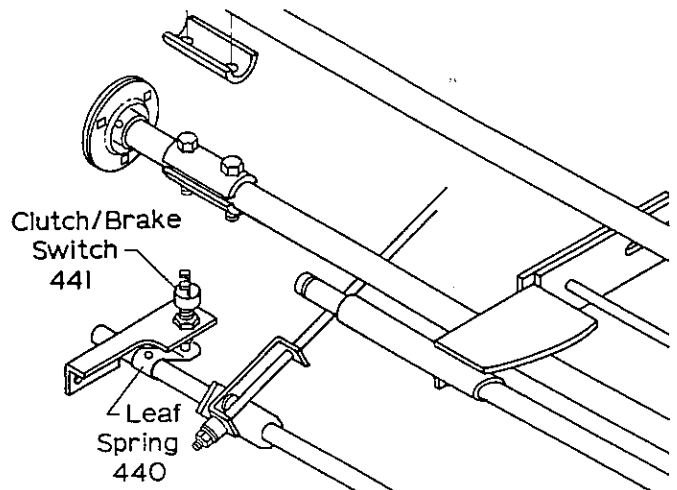
If **both** of the above conditions are not met, the Switch is defective and must be replaced. When test is completed, remove continuity tester and replace original electrical connectors on both terminals of Seat Switch.

Following recommended safe starting procedures, start the Engine...if it doesn't start, proceed with the Main Drive Clutch/Brake Switch Test (below).

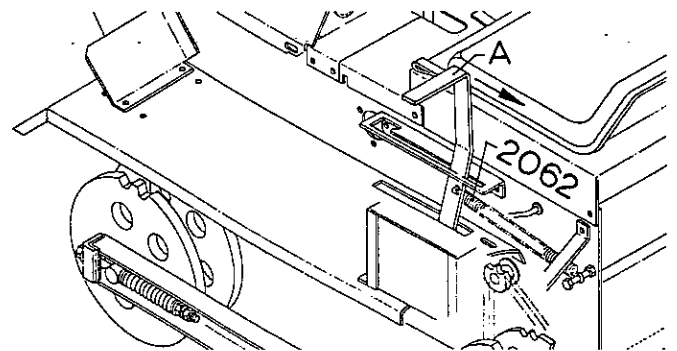
## MAIN DRIVE CLUTCH/BRAKE SWITCH TEST

For this test, raise the Seat Latch and swing the Seat/Cover Assembly fully to the rear until it hits its stop. Remove the electrical plug from the #441 Main Drive Clutch/Brake Switch and connect a continuity tester to its two terminals.

- (1) With "plunger" of Main Drive Clutch/Brake Switch **not depressed**, the light of the continuity tester should be **Off**. With "plunger" of Main Drive Clutch/Brake Switch **fully depressed**, the light of the continuity tester should be **On**.
- (2) When the Main Drive Clutch/Brake Lever is pushed fully forward and **locked** by being drawn behind its "tab", the Main Drive Clutch/Brake Switch should be **closed** (the result of contact with the rotated #440 Leaf Spring). The light of the continuity tester should be **On**!



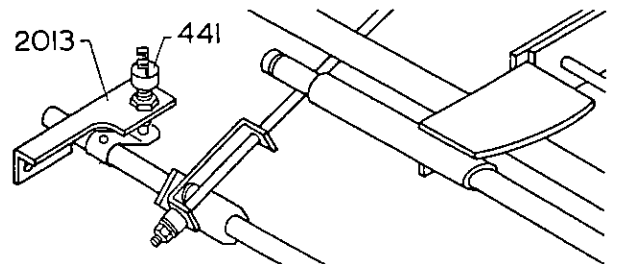
- (3) With the Main Drive Clutch/Brake Lever (A) **unlocked** and allowed to travel rearward (under #2062 Spring tension)...



...the Main Drive Clutch/Brake Switch should be **open** (the #440 Leaf Spring would have rotated down and away). The light of the continuity tester should now be **Off**!

If both conditions of procedure (1) (above) are not met, replace Main Drive Clutch/Brake Switch. If both conditions of procedure (1) are met, but the conditions of procedure (2) & (3) are not met, you must adjust the "vertical height" of the #441 Switch in its #2013 Bracket.

The #441 Main Drive Clutch/Brake Switch is secured top and bottom in the #2013 Bracket with hex nuts.



Raise or lower the Switch's height to meet requirements (1), (2) and (3) (above) by relocating its two hex nuts.

When adjustment is completed, tighten Switch's hex nuts...terminals of "tightened" Switch should point at approximately a 45 degree angle to the Right Body Wall. Remove continuity tester and replace electrical plug on terminals of Switch. Close Seat/Cover Assembly...check that it is positively latched!

At this time, following recommended safe starting procedures, start the Engine and check Main Drive Clutch/Brake Switch's setting...readjust if necessary.

## SAFETY MODULE

The #2058 Safety Module is a computer driven electronic device inserted into the Crawler's electrical system to electronically sense **safe starting** and **safe operating** conditions. The Module performs its **safe start** function by sensing the condition of the Seat Switch and the Main Drive Clutch/Brake Switch. [Both Switches must be **closed** before the Engine will crank over].

The **safe stop** function is accomplished by sensing the condition of the Seat Switch. Once the Engine is started, the operator must remain seated to keep the Seat Switch **closed**; if not, the Engine will shut down.

During Crawler operation, the Module will not cause the Engine to "totally" stop if the operator momentarily bounces in the Seat...the Module will always allow operator approximately three seconds to reseat himself before the Engine comes to a complete stop.

An added safety feature is its **closed to operate** function which ensures that the Crawler will not function if any of the switch leads are broken or become disconnected.

### TESTING SAFETY MODULE

Conduct the following tests to check proper functioning of Safety Module:

- (1) Following recommended safe starting procedures, and with operator seated but Main Drive Clutch/Brake Lever (A) **unlocked** (not hooked behind its "tab"), attempt to start Engine.

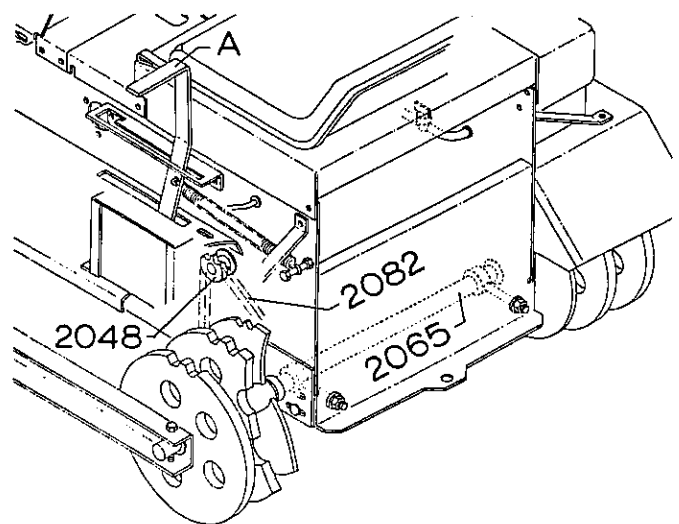
**The Engine should not start.** If it does, Main Drive Clutch/Brake Switch is mounted too **low** in its Bracket and is closing too soon.

Readjust location of #441 Main Drive Clutch/Brake Switch in #2013 Bracket per Main Drive Clutch/Brake Switch Test (above). If readjustment doesn't solve the problem, test Main Drive Clutch/Brake Switch with continuity tester...replace Switch if necessary.

- (2) Following recommended safe starting procedures, and with Main Drive Clutch/Brake Lever **locked** but with operator standing in operator's compartment (not seated), attempt to start the Engine. **The Engine should not start.** If it does, test Seat Switch with continuity tester...replace if necessary.
- (3) Following recommended safe starting procedures, with Main Drive Clutch/Brake Lever **locked** and operator properly seated, attempt to start Engine. **The Engine should start.** If it doesn't, run Seat Switch Test and Main Drive Clutch/Brake Switch Test (above). If both Switches check out OK, replace Safety Module and rerun procedures (1), (2) & (3) (above).

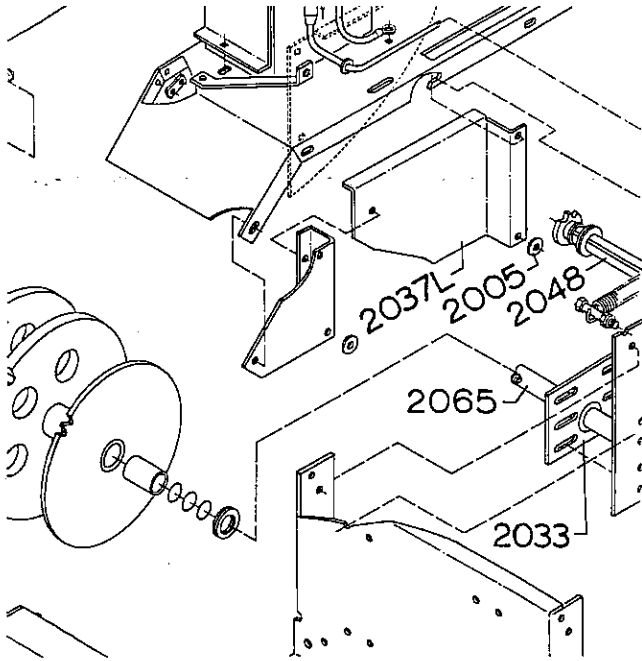
## DRIVE CHAIN TENSIONING

The #2082 Drive Chains (#50 Roller Chain) are tightened by increasing the center distance between the **movable** #2065 Rear Axle and the **fixed** #2048 Sprocket & Shafts.



Begin your Drive Chain Tensioning procedure by driving Crawler onto a firm, level surface. Shut off Engine and dismount...do not lock Main Drive Clutch/Brake Lever. [Though not absolutely necessary, it's extremely helpful in the following procedure to block your Crawler up and remove its Tracks...see Track Removal section of this Manual for instructions].

Raise Seat Latch and rotate Seat/Cover Assembly fully rearward and hit its stop. Remove the #2037R & #2037L Right & Left Chain Guards from left & right side of Crawler (be careful not to lose the special #2005 Washers).



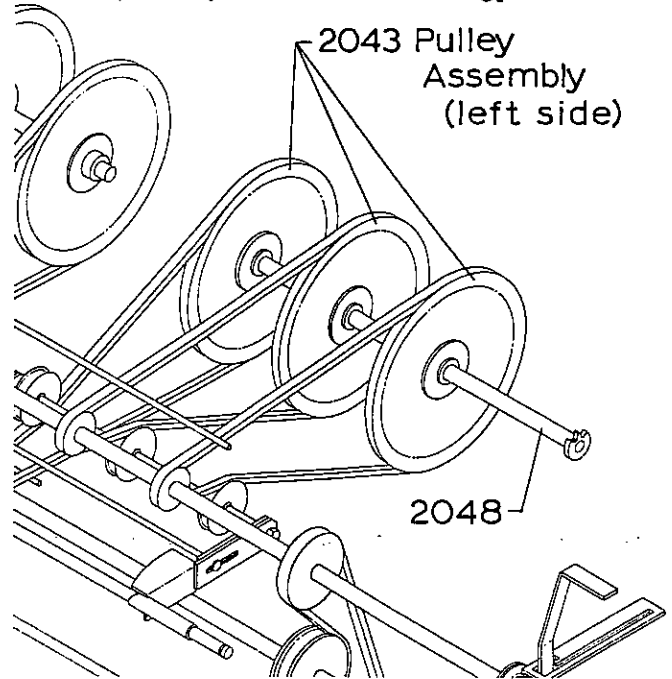
Do a thorough cleaning of the Chains and mating sprockets with a stiff brush. The sprockets and their mating Drive Chains must be clean to give proper chain adjustment. [You may want to remove the Drive Chains and soak in penetrating oil overnight if they seem stiff].

From inside the Crawler's body, loosen (but do not remove) the nuts on the twelve 3/8" x 1" Carriage Bolts (six on each side of Crawler) that secure the #2033 Supports (one on each side of body) which hold the #2065 Rear Axle. [TIP: A socket wrench works best for this step].

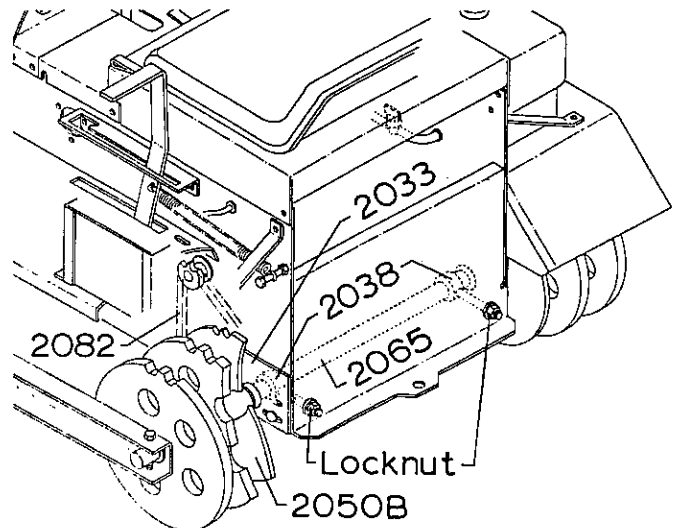
On each side, rotate each #2043 Three Pulley Assembly. Check that each Drive Chain is moving smoothly and that it is free of debris.

[TIP: It will ease rotating the Pulley Assemblies (above) if you follow the procedure for "Removal - Steering Clutch Belts" in Service

section of this Manual. Replace Belts per "Installation - Steering Clutch Belts" in Service section of this Manual after you have completed your chain tensioning].



To tighten the Drive Chains, start rotating clockwise the Locknut on the end of each #2038 Pull. To draw Rear Axle back evenly, turn one Locknut 1/4 turn, then go to the other side and tighten the other Locknut 1/4 turn...use this back and forth procedure until both Drive Chains are reasonably tight...not "bow-string" tight, but not slack either.



**NOTE:** While doing the above procedure, make sure you rotate each #2050B Sprocket a full revolution after each 1/4 turn of its respective Locknut. This will determine if there is a slight "high spot" in one of the mating sprockets...if so, use the "high spot" location for your point of tightening.

When satisfied that both Drive Chains are tightened evenly, retighten the twelve 3/8" Carriage Bolts holding the #2033 Supports. Using SAE 30 motor oil, thoroughly lubricate your Drive Chains at this time.

Replace the #2037R & #2037L Right & Left Chain Guards using original Cap Screws, Nuts and #2005 Washers. Close Seat/Cover Assembly and make sure Seat Latch catches securely.

If you have blocked-up your Crawler and removed its Tracks, replace Tracks and lower Crawler to ground at this time per Track Maintenance section of this Manual.

## MAIN DRIVE CLUTCH/ BRAKE LEVER

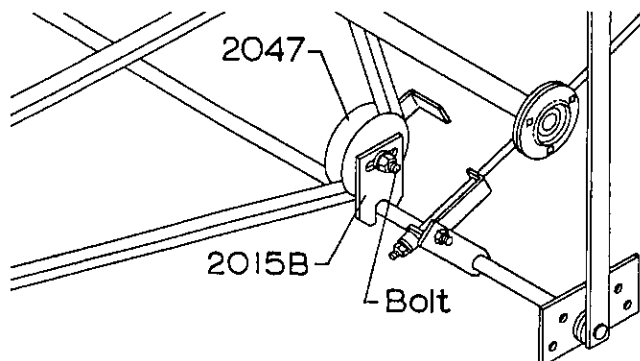
The Main Drive Clutch/Brake Lever (A) provides two important functions.

1. Pushing the Lever fully forward releases the Main Drive Belt from engagement with Engine's crankshaft pulley.
2. Pushing the Lever fully forward, drawing it in toward the operator and locking it behind its "tab", activates two heavy-duty independent band brakes (one for each track).

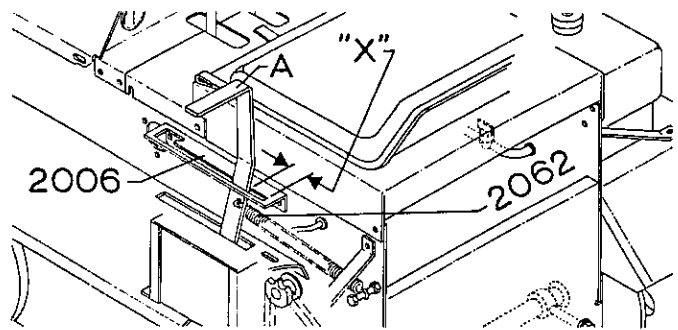
### ADJUSTMENT - MAIN DRIVE BELT

Begin your procedure by parking your Crawler on an open, firm, level surface. Shut off Engine and dismount. Raise Seat Latch and rotate Seat/Cover Assembly fully rearward to its stop.

Loosen (don't remove) the 3/8" Carriage Bolt that secures #2047 Idler Wheel to its #2015B Arm.

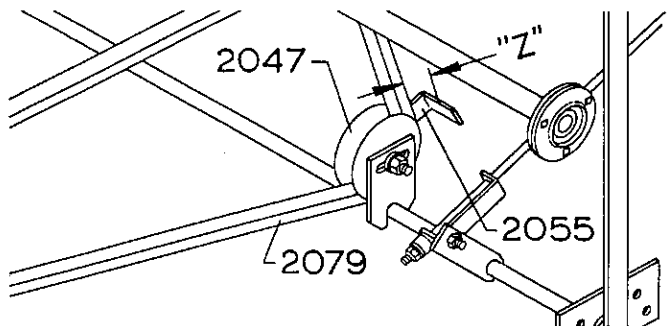


Adjust the #2047 Idler (front to rear) in its slot in #2015B Arm such that the "X" distance for Lever (A) (in #2006 Angle) is approximately 2" when under the tension of #2062 Spring.

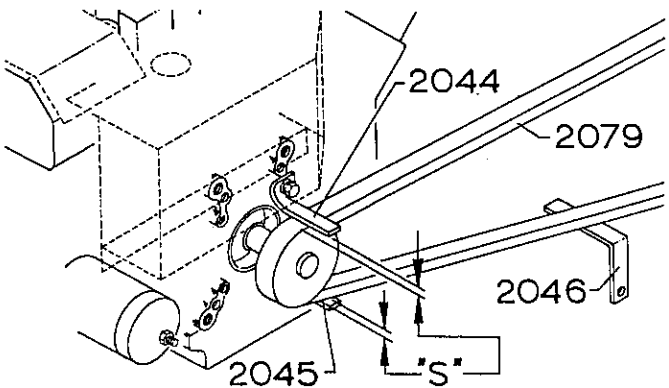


When satisfied with adjustment, tighten 3/8" Carriage Bolt holding #2047 Idler and #2055 Guide.

**NOTE:** When above assembly is finally tightened, there should be a distance "Z" of approximately 3/4" between forward edge of #2055 Guide and outside face of #2079 Main Drive Belt!



Loosen (do not remove) the Cap Screws holding the #2044 & #2045 Guides mounted to rear of Engine's crankshaft face.



Rotate each Guide such that there is a distance "S" of approximately 1/4" between the inside face of each Guide and the outside face of the #2079 Main Drive Belt...tighten both Guide's Cap Screws to hold this distance. Check that #2079 Belt is located above #2046 Guide. [Check drawing].

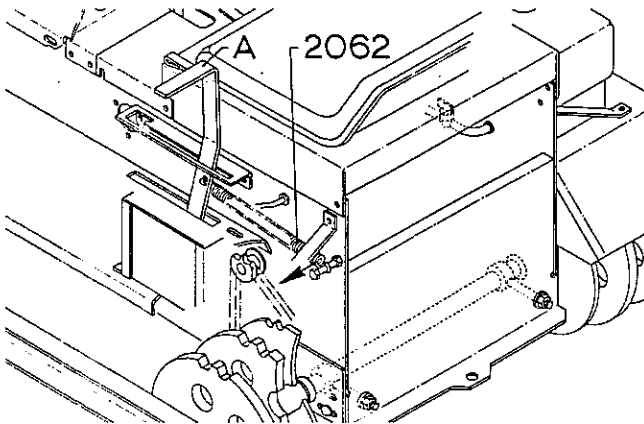
When satisfied with your adjustment, close your Seat/Cover Assembly and latch it securely.

## ADJUSTMENT - BRAKES

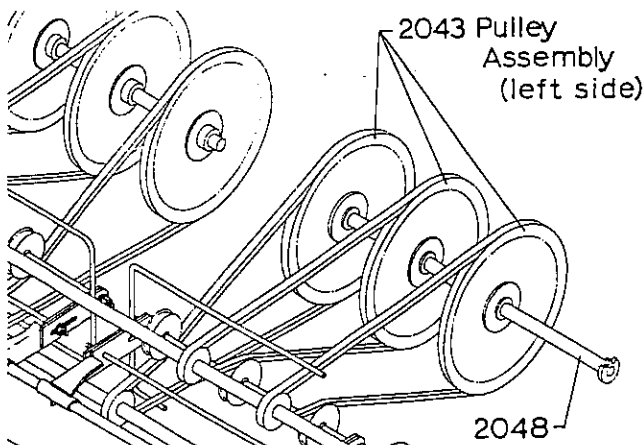
The two Track Brakes are applied simultaneously with the Main Drive Clutch/Brake Lever (A). To adjust them properly, you must first balance them.

Drive your Crawler to an open, firm, level surface. Shut off Engine and dismount. Raise your Crawler a few inches above ground and support it with solid blocking under its body...make sure the tracks are free to rotate.

Raise the Seat Latch and using the Seat as a handle, rotate the Seat/Cover Assembly fully rearward until it rests on its stop. Remove the #2062 Spring from its rear support bolt by sliding it off horizontally.

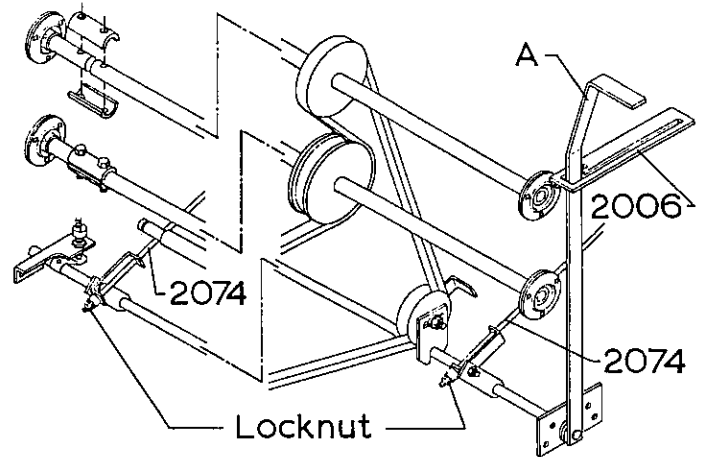


Push the Main Drive Clutch/Brake Lever (A) forward until the Brake Bands start to grab. Rotate each #2043 Three Pulley Assembly and determine which Brake Band is not grabbing as well as the other.



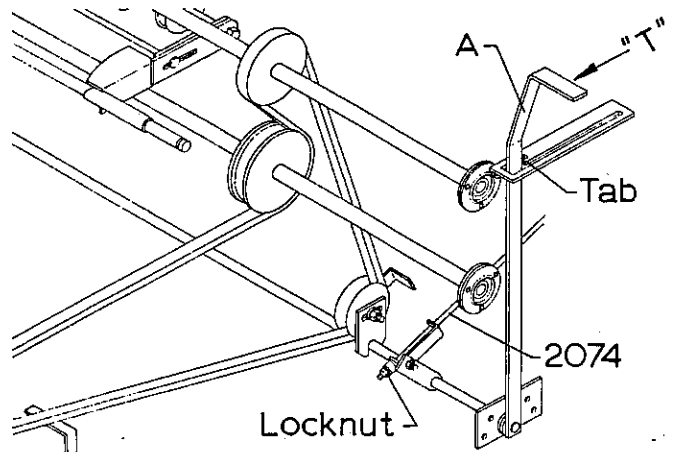
[TIP: It will ease rotating the Pulley Assemblies (above) if you follow the procedure for "Removal - Steering Clutch Belts" in Service section of this Manual. Replace Belts per "Installation - Steering Clutch Belts" in Service section of this Manual after you have completed your Brake adjustment].

Tighten the Locknut (a 1/4 of a turn at a time) on the threaded end of the #2074 Rod of the Brake Band that is not grabbing as well.



Do this until both Brakes grab approximately the same when the Lever (A) is held at a fixed point.

With both Brakes in balance, you can now evenly set their working tension. Using a "spring scale", pull forward at top of Lever (A) with a force "T" of approximately 50 lbs.



This force should allow the Lever (A) to reach the end of its slot in #2006 Angle and enable it to **lock** behind its "tab".

If it takes **less than** this pressure, evenly **tighten** the Locknut on the threaded end of the #2074 Rod of each Brake Band until you reach the approximately 50 lb. force level. Always make your adjustments in 1/4 turn increments. 1/4 turn on the first Rod, then 1/4 turn on the second Rod, then back to the first Rod again until you've completed your adjustment.

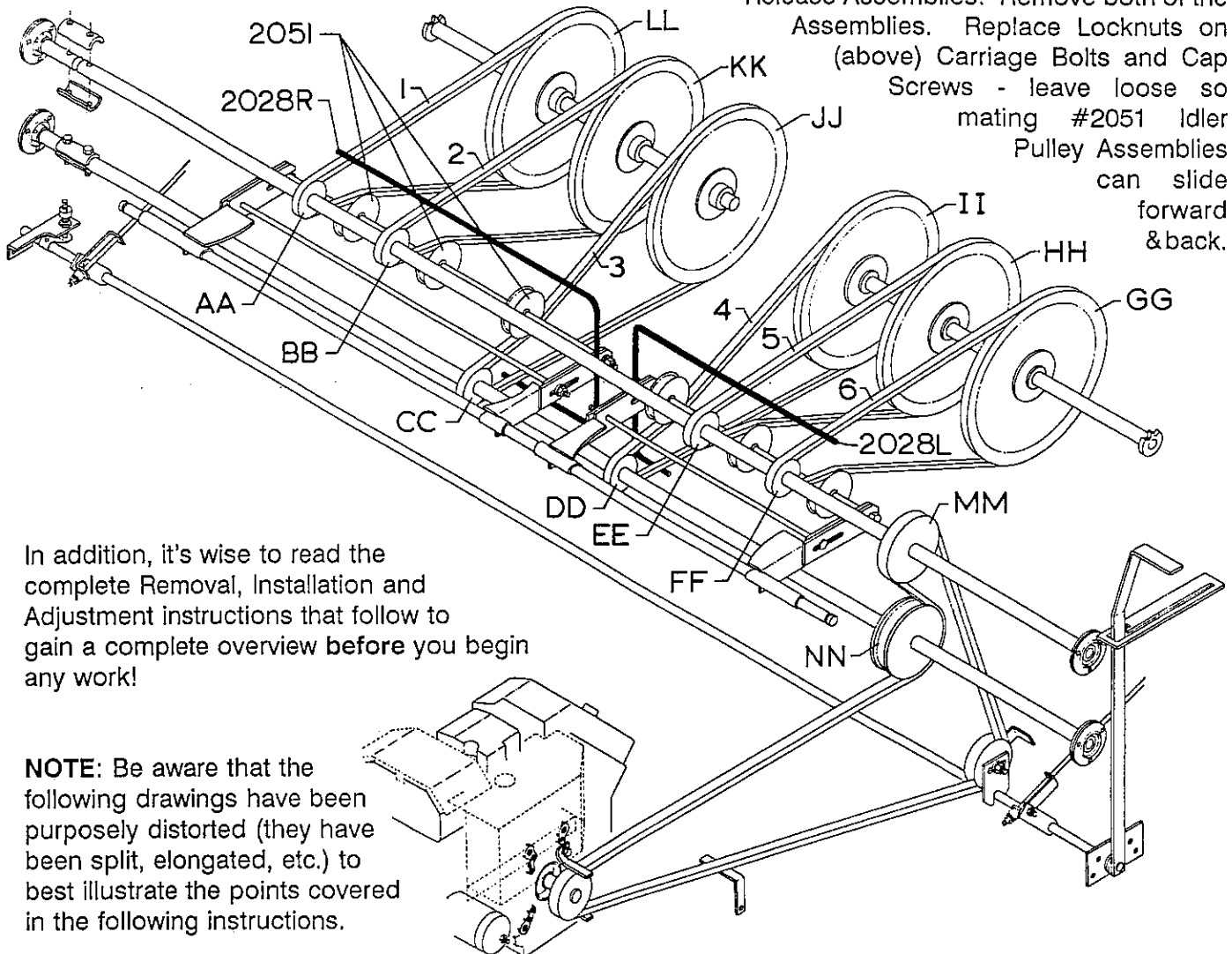
If it takes **more than** the recommended 50 lbs. pressure, evenly **loosen** the Locknut on the end of the #2074 Rod of each Brake Band

until you reach the 50 lb. force level. Again, always make your adjustments in 1/4 turn increments on the first Rod, then 1/4 turn on the second Rod, then back to the first Rod again until you've completed your adjustment.

When satisfied with your adjustment, close your Seat/Cover Assembly and latch it securely. Reattach #2062 Spring to its "support bolt". Remove blocking from beneath Crawler and safely lower it to the ground.

## STEERING CLUTCH BELT and MAIN DRIVE BELT REMOVAL and INSTALLATION

The installation and maintenance of the Track Clutch Belts and Main Drive Belt is most easily understood if you take the time to study the following drawings relating to Belt installation and learn how the Belts are "threaded" through the drive system.

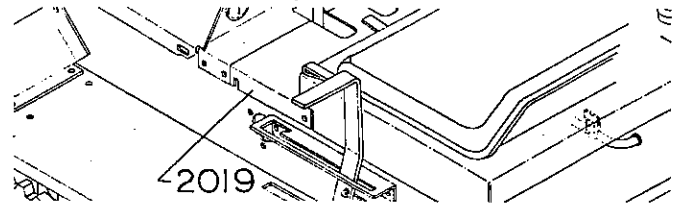


In addition, it's wise to read the complete Removal, Installation and Adjustment instructions that follow to gain a complete overview before you begin any work!

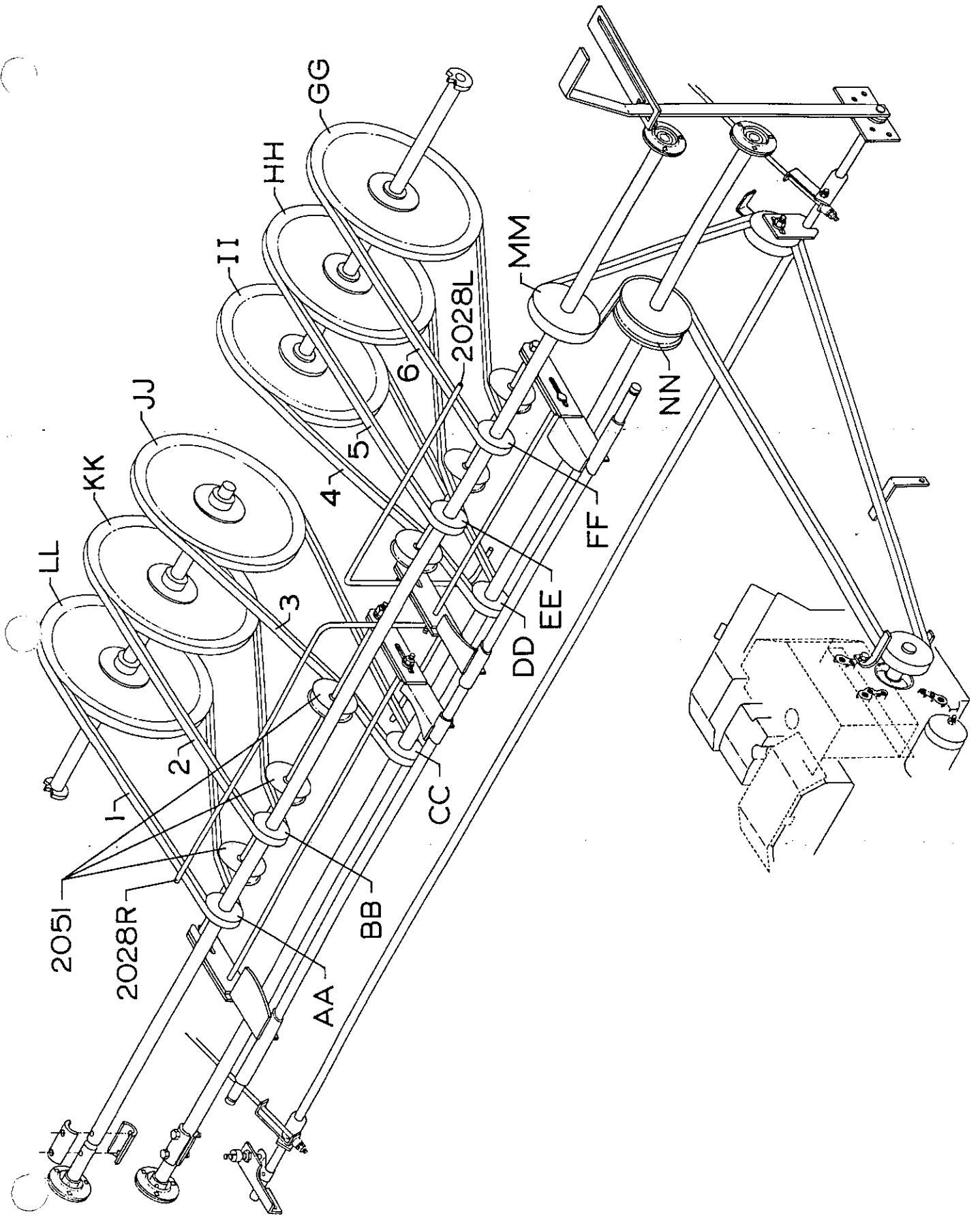
**NOTE:** Be aware that the following drawings have been purposely distorted (they have been split, elongated, etc.) to best illustrate the points covered in the following instructions.

**SPECIAL NOTE:** Though all six Track Clutch Belts are identical and carry the same part number (#2078), for simplicity they are designated in the following drawings and descriptions as Belts #1 through #6. In a similar manner, the Pulleys have their own part numbers (#2041B, #2041C, #2042A and #2043), but in the following instructions they will be designated as Pulleys AA through NN.

Begin your procedure by parking your Crawler on an open, firm, level surface. Shut off Engine, lock Main Drive Clutch/Brake Lever (A) and dismount. Raise Seat Latch and rotate Seat/Cover Assembly fully rearward to its stop. Remove #2019 Cover and save the 3/8" Cap Screws and Locknuts.



Remove Locknuts from the 1/4" Carriage Bolts and 3/8" Cap Screws holding #2028R & 2028L Belt Release Assemblies. Remove both of the Assemblies. Replace Locknuts on (above) Carriage Bolts and Cap Screws - leave loose so mating #2051 Idler Pulley Assemblies can slide forward & back.





## BELT REMOVAL PROCEDURE

### REMOVAL - STEERING CLUTCH BELTS

Remove Belts #3 and #4 from their mating CC & JJ and DD & II Pulleys by slipping them first off their larger II & JJ Pulleys (14" diameter) and then off their smaller CC & DD Pulleys (3" diameter). [Belts should be moved inwardly toward each other and remain at center of Crawler].

**HINT #1:** In the removal of Belts #3 & #4 (above) you will gain extra "slack" in each Belt by pushing forward on the Control Handles as you slide the Belts off their respective Pulleys.

**HINT #2:** In the removal of Belts #2, #5, #1 and #6 (below), you will gain extra "slack" in the Belts by pulling rearward on the Control Handles as you slide the Belts off their respective Pulleys!

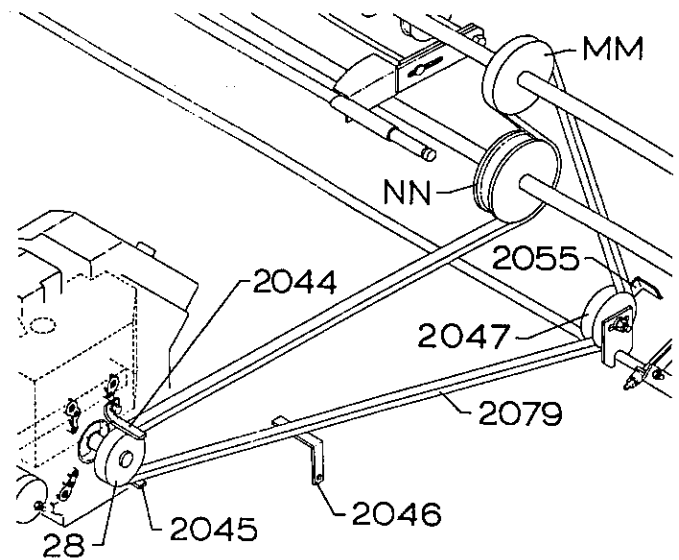
In a similar manner as above, move Belts #2 and #5 from their mating BB & KK and EE & HH Pulleys and locate them in center of Crawler. [TIP: Slip Belt #2 off its BB Pulley first and then work it off its KK Pulley and then the JJ Pulley. Similarly, slip Belt #5 off its EE Pulley first and then work it off its HH Pulley and then the II Pulley].

Lastly, move Belts #1 and #6 from their mating AA & LL and FF & GG Pulleys and locate them in center of Crawler. [TIP: Slip Belt #1 off AA Pulley and around BB Pulley. Slip Belt #1 off LL Pulley and around KK Pulley. Slip Belt #1 off BB Pulley. Now work #1 Belt off KK Pulley and then over and off JJ Pulley.

In a similar procedure, slip Belt #6 off FF Pulley and around EE Pulley. Slip Belt #6 off GG Pulley and around HH Pulley. Slip Belt #6 off EE Pulley. Now work #6 Belt off HH Pulley and then over and off II Pulley].

### REMOVAL - MAIN DRIVE BELT

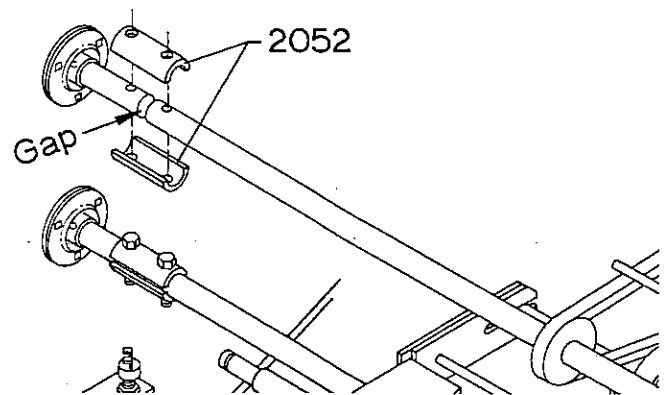
Loosen (do not remove) the 3/8" Carriage Bolt that secures #2047 Idler Wheel and slide it forward. Loosen the #2044 and #2045 Guides mounted to Engine's "crankshaft face". Rotate both Guides away from the outside face of the #2079 Main Drive Belt.



Slip Main Drive Belt off Engine's #28 Pulley and off MM & NN Pulleys. Slip #2079 Main Drive Belt off #2047 Idler Wheel making sure Belt clears #2055 Guide. Work Belt toward center of Crawler.

### REMOVAL - PROCEDURE FOR ALL BELTS

Remove the two 3/8" Cap Screws and Locknuts that join the ends of each pair of #2052 Sleeve Halves. [Blade of screwdriver inserted between Sleeve Halves and twisted will "pop" Sleeve Halves apart].



Move to the right, the Belts you wish to remove from the system. Slip them through their respective 1/2" wide "gap" exposed when you removed the #2052 Sleeve Halves (above).

## BELT INSTALLATION PROCEDURE

### INSTALLATION - PROCEDURE FOR ALL BELTS

Before installing any of the Belts (below) it is recommended that you coat each Belt generously with "talcum powder" (baby talcum is just fine).


Shake a generous amount of talcum in your hand and wrap your hand around one of the Belts as you slide the Belt through your closed hand. Generously coat each Belt "all-over" with talcum.

**EXPLANATION:** *The Belts used in your Crawler are special. Do not confuse them with inexpensive, fractional horsepower consumer Belts.*

*Your Crawler Belts are made for difficult, high horsepower, shock load, industrial applications. Formulated with industrial grade rubber compounds, they feature a Kevlar (bulletproof plastic) cabled core. Molded around each Belt is a special fabric jacket that forms the Belt's "clutch face".*

*In an hour or so of operation this fabric jacket gains a smooth "glaze" and forms the clutch face necessary for smooth Track Clutch engagement.*

*Talcum is used initially on a new Belt, as it will adhere itself to the Belt's fabric jacket and form an immediate artificial glaze. This allows smoother Belt (clutch) action until the Belt has a chance to "break-in" and form its own permanent glaze!*

 **CAUTION:** NEVER, NEVER, use fractional horsepower Belts in your Crawler. They are made with light weight, "sticky compounds" that will not form a proper glaze. This means you will not have the **SAFE** clutch action mandatory for **SAFE** Crawler control! In addition, fractional horsepower Belts will break during shock loads and will leave your clutch system out of control!

**NOTE:** During the first hour or so of "breaking-in" a new set of Belts, you potentially may hear a squealing sound when turning. Do not be alarmed. This is characteristic of a new set of Belts until they have become permanently "glazed" and gain proper smooth clutch action.

### **INSTALLATION - MAIN DRIVE BELT**

Slip the #2079 Main Drive Belt through the 1/2" wide gap on "Upper Power Shaft" (exposed when you removed the #2052 Sleeve Halves). "Work" the Belt fully to the left. Loop Belt around the MM Pulley, and back-wrap it around the NN Pulley.

[TIP: The clearance between NN & MM Pulley is purposely "narrow" to guarantee Main Drive Clutch Belt stability and to provide the greatest "contact area" of the Belt with its mating NN & MM Pulleys. You may therefore need to rotate NN & MM Pulleys while "feeding" the #2079 Belt between them. It's alright to compress the Belt slightly, but Never force the Belt into position...you may scuff or potentially cut it].

Loop the rearward end of the Belt around the #2047 Idler keeping it "inside" the #2055 Guide [check drawing closely].

Loop the forward end of Belt around Engine's #28 Pulley keeping it "inside" the #2044 and #2045 Guides and "above" the #2046 Guide.

### **INSTALLATION - STEERING CLUTCH BELTS**

Slip the Track Clutch Belts you are installing through the 1/2" wide "gap" on the appropriate Upper or Lower Power Shaft [Belts #1, #2, #5 and #6 on the Upper Power Shaft; Belts #3 and #4 on the Lower Power Shaft]. Slide them to the center of your Crawler.

Locate and replace the #2052 Sleeve Halves as "pairs" on the Upper and Lower Power Shafts and tightly secure with the original 3/8" Cap Screws and Locknuts.

Arrange the Belts and note that the two Belts on the Lower Power Shaft will be Belts #3 & #4 and will remain in the center (to be installed last). Locate Belts #1 & #2 (on Upper Power Shaft) just to the right of the #3 Belt. Locate the remaining Belts #5 & #6 (on Upper Power Shaft) just to the left of the #4 Belt.

**NOTE:** No single Belt can ever be around both the Upper and Lower Power Shafts at any one time!

Slip rearward end of Belt #1 first over JJ Pulley and then around KK Pulley. Now slip forward end of Belt #1 over BB Pulley and then around AA Pulley. Lastly, slip rearward end of Belt #1 around LL Pulley. [TIP: Pulling back on #2016D Track Clutch Control Handles during this and following procedures will give Belts more slack and ease installation].

In a method similar to step above, slip rearward end of Belt #6 first over II Pulley and then around HH Pulley. Now slip forward end of Belt #6 over EE Pulley and then around FF Pulley. Lastly, slip rearward end of Belt #6 around GG Pulley.

Slip rearward end of Belt #2 first over JJ Pulley and then around KK Pulley. Now slip forward end of Belt #2 around BB Pulley.

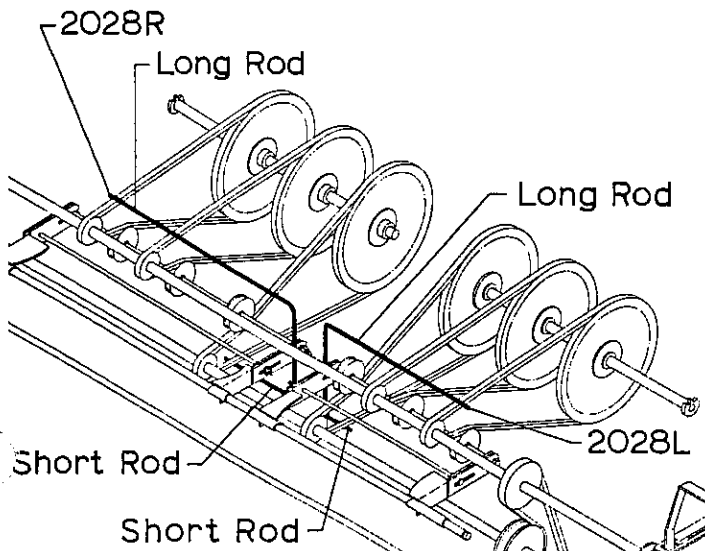
In a method similar to step above, slip rearward end of Belt #5 first over II Pulley and then around HH Pulley. Now slip forward end of Belt #5 around EE Pulley.

Slip forward end of Belt #3 around CC Pulley and then slip rearward end of Belt #3 around JJ Pulley. [TIP: Pushing forward on Track Clutch Control Handles during this step and the next, will give Belts more slack and ease installation].

In a method similar to step above, first slip forward end of Belt #4 around DD Pulley and then slip rearward end of Belt #4 around II Pulley.

At this point, each Belt should be in place and around its respective "pair" of Pulleys. Check drawing and make sure each Belt follows its proper path from Pulley to Pulley and that it rests against (and between the raised "flanges") of its respective #2051 Idler Pulley.

Remove Locknuts from the 1/4" Carriage Bolts and 3/8" Cap Screws you replaced above and reinstall the #2028R & #2028L Right & Left Belt Releases ...loosely secure them with original Locknuts.



**NOTE:** The longer horizontal "rod" of each #2028 Belt Release is **on top** and **over** the outside face of its pair of Belts (#1 & #2 on the right, #5 & #6 on the left). The shorter horizontal "rod" of each Belt Release is **below** and **under** the outside face of its Belt (#3 on the right, #4 on the left).

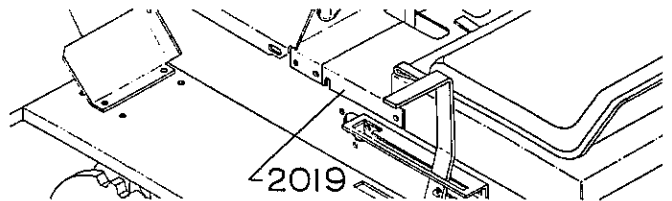
### ADJUSTMENT - MAIN DRIVE BELT

See Adjustment - Main Drive Belt procedure in "Main Drive Clutch/Brake Lever" portion of SERVICE section of this Manual.

### ADJUSTMENT - STEERING CLUTCH BELTS

Your Track Clutch Belts are adjusted as two "matched sets" of three belts each. One matched set (Belts #1, #2 and #3) for the Right Track and the other matched set (Belts #6, #5 and #4) for the Left Track.

Begin by raising Seat Latch and using the Seat as a handle, raise and rotate the Seat/Cover Assembly to the rear until it firmly hits its stop. Remove #2019 Cover and save the 3/8" Cap Screws and Locknuts.



Loosen the 1/4" Carriage Bolts and the 3/8" Cap Screws holding the #2028R & #2028L Right & Left Belt Release Assemblies. Loosen, so each Assembly (containing three #2051 Idler Pulleys) can slide in its respective #2016B Yoke.

Position each Belt Release Assembly (forward or rearward) such that its respective #2016D Track Clutch Control Handle can "rotate" a total distance of between 4-1/2" and 5" (when measured at the "furthest end" of #2016D Control Handle). Complete this adjustment for both Belt Release Assemblies.

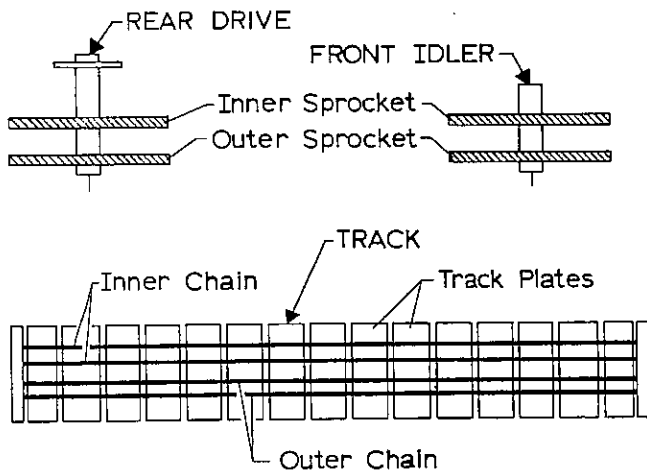
When satisfied with adjustment of both Belt Release Assemblies, tighten the Locknut on each 1/4" Carriage Bolt and 3/8" Cap Screw loosened above. Replace the #2019 Cover and secure with original 3/8" Cap Screws and Locknuts. Close Seat/Cover Assembly and latch securely.

**NOTE:** When adjusting a new set of Track Clutch Belts, favor a little looser setting (more movement in the Control Handles) to allow the Belts a chance to break-in and gain a slight "glaze"...this will give you the best clutch action. After an hour or so of "breaking-in" you can reset your Belt Release Assemblies per above instructions.

## TRACK MAINTENANCE

Before attempting to complete any part of this Track Maintenance section, it is recommended that you read all three parts (Track Removal, Track Replacement and Track Tensioning) to provide background on how the total Track System is adjusted and maintained.

Below are a series of drawings to aid you in parts identification as you read the following procedures. For clarity, only the parts described in the instructions are included in most of the drawings. In some cases, certain parts do not appear in all drawings, to lessen confusion.



**CAUTION:** When working with the Tracks, you will be dealing with some significant weights and lifting situations. Though the Crawler can be successfully "blocked up" off the ground and the Tracks removed and replaced by a single person, it's advisable to have an able-bodied "helper" available for both assistance and safety.

Begin any Track Maintenance procedure by checking that your Track System is relatively clean and free of debris...a high-pressure wash job is an excellent idea. In addition, drive your Crawler through a "clean area" to work out debris that may have lodged between Track Sprocket teeth or in

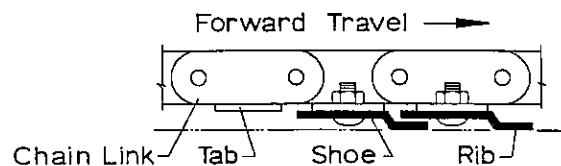
the Track's Chain Links. Park your Crawler on a firm level surface, shut off engine, set brake and dismount.

## TRACK ASSEMBLY

If you purchased your Crawler assembled, it comes from the factory without Track Chains or Track Shoes installed.

Begin your assembly by connecting the four lengths of Track Chain together (two for each Track) using the Connector Links provided and securing each Connector Link with cotter pins.

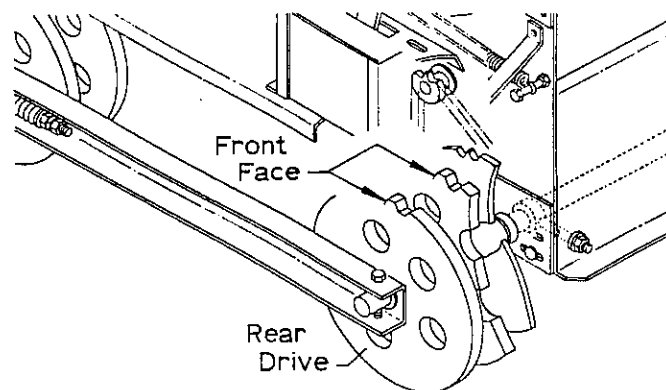
**NOTE:** Assemble Chain so that the two "tabs" on each Chain Link are facing outwardly. This will allow the Track Shoes to bolt to a flat surface.



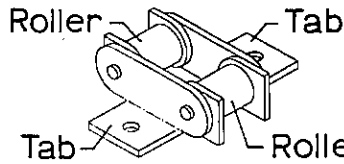
On each side of Crawler, loop an assembled Track Chain around the Inner Sprockets of the Front Idler and Rear Drive...engage Sprocket's teeth in Track Chain. In a similar manner, loop an assembled Track Chain around the Outer Sprockets of the Front Idler and Rear drive...engage Sprocket's teeth in Track Chain.

With all Track Chains in place (a "set" of two on each side of Crawler) refer to TRACK TENSIONING section of this Manual and properly tension the Track Chains at this time.

**SPECIAL NOTE:** As you follow the TRACK TENSIONING instructions, keep each set of two Track Chains (on each side of Crawler) "synchronized" with each other.



Make sure that the Chain Link Rollers (below)...



...of each Chain set are both touching the "front face" of each tooth of their respective Inner & Outer Sprockets on their Rear Drive (see both drawings above).

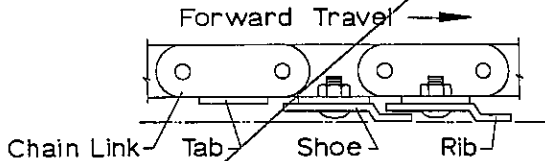
**NOTE:** As you work with the Tracks, realize that the more you can support the "lower strand" of each Track and keep it flat and close to its original operating level, the more slack you will have in the "upper strand" of the Track to work with!

Loosen and remove the first 1/2" Nut and Lock Washer from the **threaded end** of each #820 Tension Rod.

### TRACK SHOE INSTALLATION

With the Track Chain "sets" now properly tensioned and synchronized on each side of Crawler, begin the process of bolting the Track Shoes to the "offset tabs" of each set of Track Chains with 1/4" Carriage Bolts, Lock Washers and Nuts.

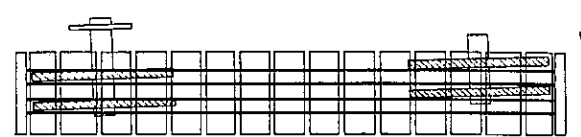
Shoes must be bolted on to the Track Chain with the "rib" of each Shoe pointing "forward", when it is on the ground (check illustration below).



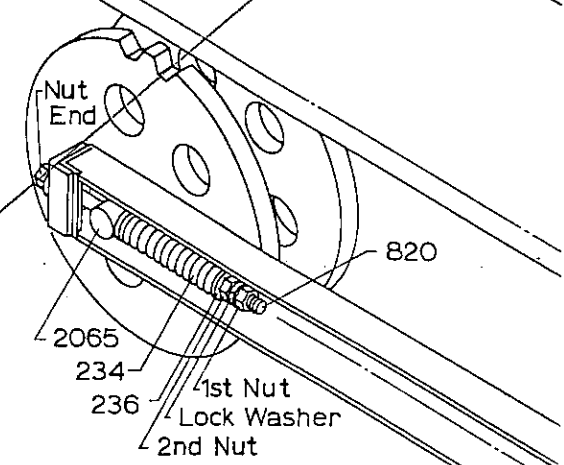
In addition, installed Shoes must be kept square with an imaginary line running down the center of each finished Track. [Making sure that the Chain Link Rollers of each Chain "set" are touching the "front face" of each tooth of their respective Inner & Outer Sprockets on their Rear Drive will guarantee this squareness!].

### TRACK REMOVAL

From below, support body of Crawler so its Tracks clear the ground by approximately 2" and are free to rotate...release Brake at this time. Use solid blocking and place it under the Crawler's body so that it will give the Crawler the greatest support left to right and front to rear. [When locating your blocking, analyze the total weight and balance of the Crawler as it will change as the Tracks are removed and then replaced!]



In a similar manner, rotate the Track rearward making sure that the Track's Inner Chain remains between the Inner & Outer Sprockets on the Front Idler. This time work the rearward end of the Track over **both** the Inner & Outer Sprockets of the Rear Drive...see drawing below.



By rotating the "nut end" of each #820 Tension Rod counter-clockwise, loosen and remove remaining 1/2" Nut, #236 Washer and #234 Spring. Slide #2065 Axle fully rearward.

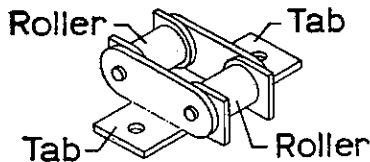
With gloved hands, begin to rotate the Track forward. [TIP: As you rotate the Track, you may want to work the Track Clutch Controls back and forth to relieve any "drag" from the Track Clutch Belts].

As the Track is rotated forward, work the forward end of the Track outward. Stop working the Track outward when the Track's Inner Chain is centered **between** the Inner & Outer Sprockets of the Front Idler...see below.

*See corrected next page*  
*Begin w/ Serial # 2171*

*1/4 Cap Screws and Nuts*

Make sure that the Chain Link Rollers (below)...

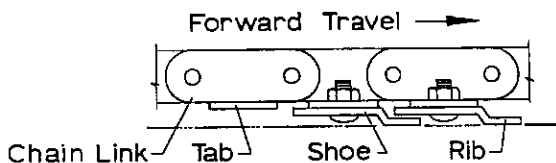


...of each Chain set are both touching the "front face" of each tooth of their respective Inner & Outer Sprockets on their Rear Drive (see both drawings above).

### TRACK SHOE INSTALLATION

With the Track Chain "sets" now properly tensioned and synchronized on each side of Crawler, begin the process of bolting the Track Shoes to the "offset tabs" of each set of Track Chains with 1/4" Cap Screws and Lock Nuts.

Shoes must be bolted on to the Track Chain with the "rib" of each Shoe pointing "forward", when it is on the ground (check illustration below).



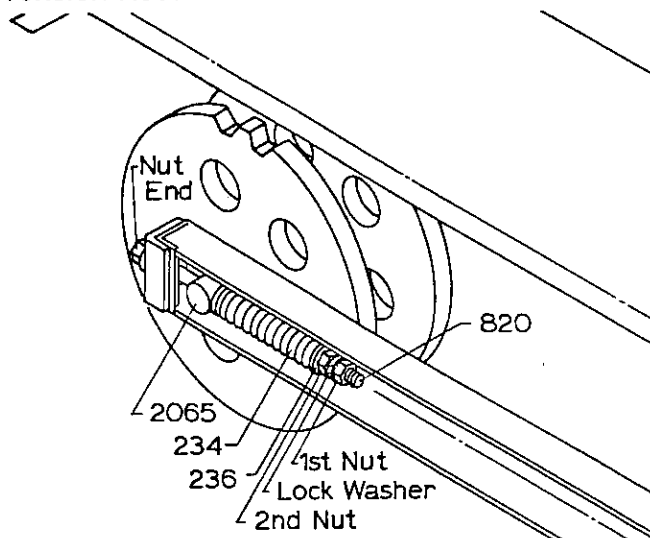
In addition, installed Shoes must be kept square with an imaginary line running down the center of each finished Track. [Making sure that the Chain Link Rollers of each Chain "set" are touching the "front face" of each tooth of their respective Inner & Outer Sprockets on their Rear Drive will guarantee this squareness!].

### TRACK REMOVAL

From below, support body of Crawler so its Tracks clear the ground by approximately 2" and are free to rotate...release Brake at this time. Use solid blocking and place it under the Crawler's body so that it will give the Crawler the greatest support left to right and front to rear. [When locating your blocking, analyze the total weight and balance of the Crawler as it will change as the Tracks are removed and then replaced!]

**NOTE:** As you work with the Tracks, realize that the more you can support the "lower strand" of each Track and keep it flat and close to its original operating level, the more slack you will have in the "upper strand" of the Track to work with!

Loosen and remove the first 1/2" Nut and Lock Washer from the threaded end of each #820 Tension Rod.



By rotating the "nut end" of each #820 Tension Rod counter-clockwise, loosen and remove remaining 1/2" Nut, #236 Washer and #234 Spring. Slide #2065 Axle fully rearward.

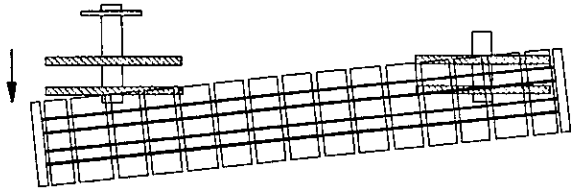
With gloved hands, begin to rotate the Track forward. [TIP: As you rotate the Track, you may want to work the Track Clutch Controls back and forth to relieve any "drag" from the Track Clutch Belts].

As the Track is rotated forward, work the forward end of the Track outward. Stop working the Track outward when the Track's Inner Chain is centered between the Inner & Outer Sprockets of the Front Idler...see below.



In a similar manner, rotate the Track rearward making sure that the Track's Inner Chain remains between the Inner & Outer Sprockets on the Front Idler. This time work the rearward end of the Track over both the Inner & Outer Sprockets of the Rear Drive...see drawing below.

*corrected copy 11-29-95  
Beginning with serial # 2171*

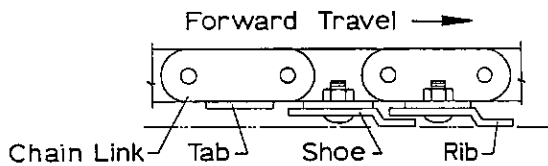


Pulling forward on the Track will allow you to now loop the Track off the remaining Outer Sprocket on the Front Idler allowing complete Track removal.

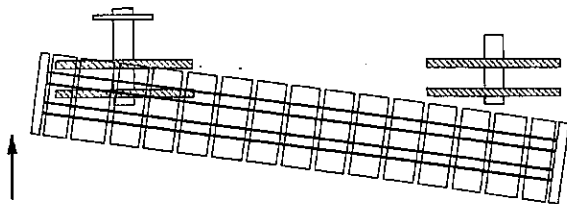
## TRACK REPLACEMENT

Before replacing a Track, it's wise to thoroughly clean it of all debris...a pressure wash job is a good idea.

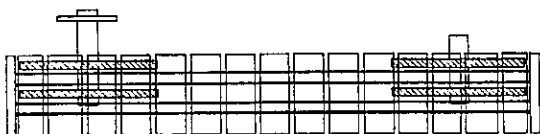
**NOTE:** Orienting the Track you are installing so that the "offset cleat" of each Track Shoe points forward when it contacts the ground.



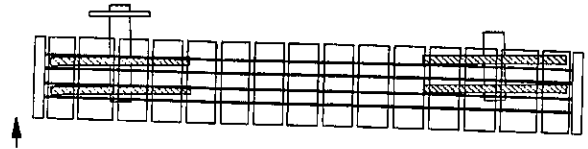
Slip the rearward end of Track around the Inner & Outer Sprockets of the Rear Drive engaging the Track's Inner Chain **between** the Inner & Outer Sprockets of the Rear Drive.



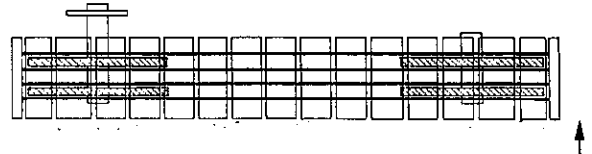
Loop the forward end of the Track around the Inner & Outer Sprockets of Front Idler engaging the Track's Inner Chain **between** the Inner & Outer Sprockets of the Front Idler. The Track's Inner Chain should now be located **between** the Inner & Outer Sprockets of the Front Idler and Rear Drive.



Begin rotating the Track rearward. As the Track rotates rearward work the Track inward until the Track's Inner & Outer Chains align and engage the teeth of their mating Inner & Outer Sprockets of the Rear Drive.

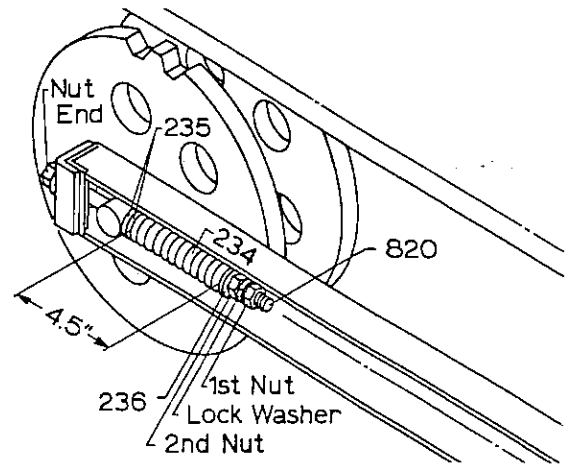


Rotate Track forward and work the Track inward until the Track's Inner & Outer Chains align and engage the teeth of their mating Inner & Outer Sprockets on the Front Idler.



**NOTE:** The above procedure is the same for the replacement of either Track.

Replace each #234 Spring (removed above) by slipping it over the threaded end of its respective #820 Tension Rod (on outside of each Track) and over its #262 Tube (which should still be in place on Tension Rod). Secure each Spring with its original #236 Washer and 1/2" Nut (fine thread). **NOTE:** "Notched edge" of #235 Washers should still be pointing in, toward crawler's center!



By rotating nut end of each #820 Tension Rod clockwise, draw the 1/2" Nut and #236 Washer (on each Tension Rod's end) against its respective #234 Spring such that each Spring is compressed to a total length of 4.5".

**NOTE:** Tighten the pair of #234 Springs 1/4" at a time. Tighten the left side #234 Spring 1/4", then stop and go to the right side #234

Spring and tighten it 1/4". Work back and forth from left side #234 Spring to right side #234 Spring, 1/4" at a time, until both Springs are 4.5" in total length. [Measure Spring length only...do not include the #235 and #236 Washers in your measurement].

At this time, slowly and safely remove all support blocking from underneath your Crawler so that the Crawler rests firmly on only its Tracks. Go on to the next section for instructions on Track Tensioning.

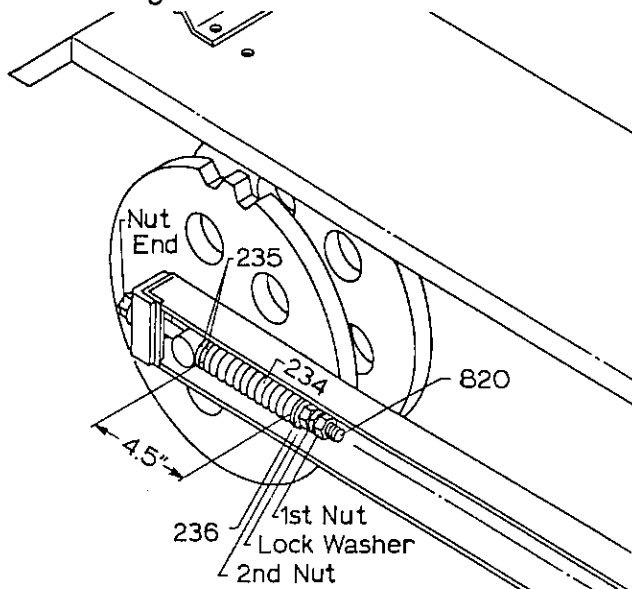
## TRACK TENSIONING

Remove the 1/2" Nut and Lock Washer on the **threaded end** of each #820 Tension Rod. [Omit this step if you have just completed Track Replacement above].

Begin your tensioning procedure by checking the overall length of the #234 Spring on each side of Crawler. Both Springs should be compressed to an overall length of 4.5". [The length measured is only the Spring; do not include the #235 & #236 Washers in your measurement!]

If your Springs have lost this 4.5" dimension, or you have just replaced a broken #820 Tension Rod, follow this procedure:

Rotate (clockwise or counter-clockwise) the nut end of each #820 Tension Rod so that its respective #236 Washer (next to #234 Spring) is drawn forward (or released rearward) thereby setting its respective #234 Spring to a final length of 4.5".

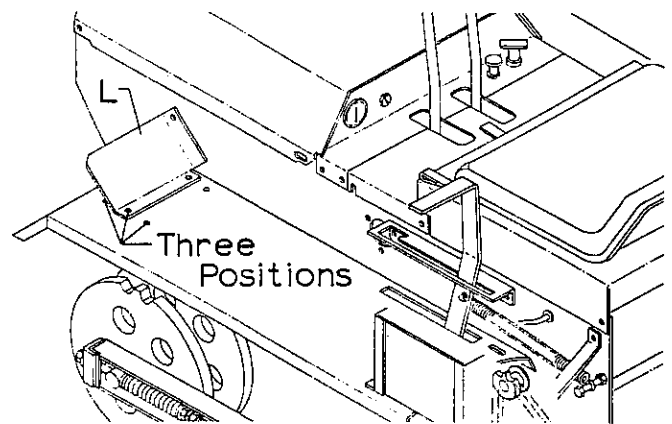


Work from left side to right side of Crawler tightening each Spring 1/4" at a time until you have achieved a 4.5" overall length for both Springs. [Measure Spring length only].

At this time remount and safely restart your Crawler. Drive it approximately 25 feet forward and then go in reverse, back to your starting point. Shut off the engine, set Brake and dismount. Check the overall length of your #234 Springs for any changes in length. Readjust to proper 4.5" overall length if necessary. When satisfied, secure each 1/2" Nut (on **threaded end** of each #820 Tension Rod) with a 1/2" Lock Washer and a second 1/2" Nut...tighten.

## FOOTREST ADJUSTMENT

Right & Left Footrests (L) are adjustable in three positions front to rear. To adjust, remove the three 3/8" Cap Screws holding each Footrest. Relocate Footrest to its new position by aligning the two 3/8" slots in lower lip of Footrest with a mating set of two 3/8" holes in floor of its respective Fender.

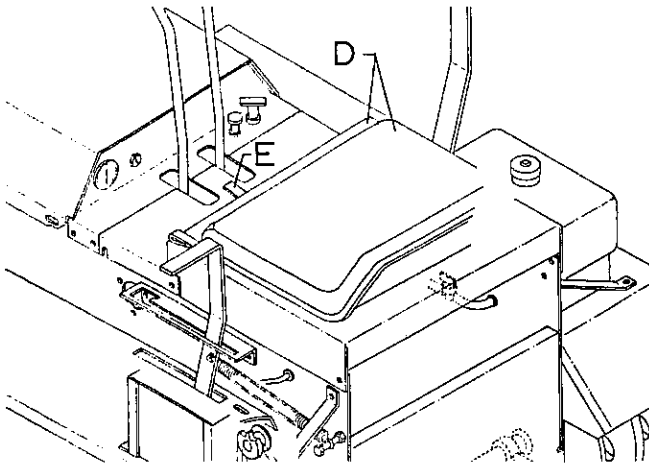


Locate the third 3/8" slot (in side lip of each Footrest) with closest mating 3/8" wide vertical slot in Crawler's body wall. From **outside**, insert 3/8" Cap Screws into the above mating holes and slots; secure inside with 3/8" Locknuts.

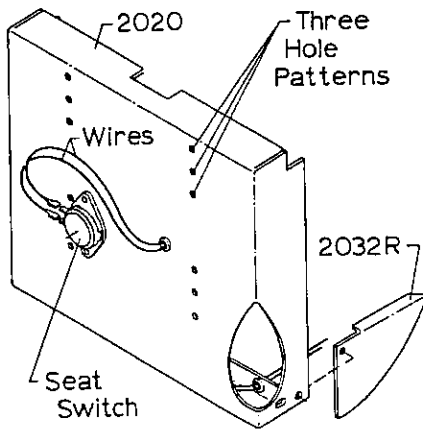
## SEAT LOCATION

The Seat and its associated "track assembly" can be located in three positions (front to rear) on the Cover assembly. To change Seat location, release Seat Latch (E) and using the Seat as a handle, rotate the Seat/Cover Assembly (D) rearward until it hits its stop.





Inside the Cover (D), remove the four 5/16" Nuts and Lock Washers holding the Seat's track assembly's threaded studs in place. Let the Seat and its track assembly drop away from the Cover...protect the wires connecting the Seat Switch!



Reinsert the threaded studs of the track assembly into one of the three new "hole patterns" you have selected on outside of Cover. Secure inside Cover with original 5/16" Nuts and Lock Washers. [Make sure Seat Switch wires are back in place and that the Seat can slide forward and back without pinching the wires.]

Close Seat/Cover Assembly and secure Seat Latch.

# LIMITED WARRANTY FOR NEW MAGNATRAC CRAWLERS and/or ATTACHMENTS

(Effective with shipments made after September 1, 1995)

## A. GENERAL PROVISIONS -

C. F. Struck Corp. will repair or replace, at its option, for the original purchaser of a new Magnatrac crawler and/or Attachment, any covered part or parts found upon examination at our factory in Cedarburg, Wisconsin, to be defective in material or workmanship or both; **this is the exclusive remedy.** Warranty service must be performed by the C. F. Struck Corp. at their factory in Cedarburg, Wisconsin 53012. Warranty service will be performed without charge for parts or labor. The purchaser will be responsible, however, for transportation charges to and from the factory.

## B. WHAT IS WARRANTED -

All parts of any new Magnatrac crawler and/or Attachment are warranted for one (1) year, with the following exceptions: Belts, which are warranted for 90 days (excludes normal wear and tear); Engines, which are warranted by their manufacturer; and Batteries, which are provided on a complimentary basis and carry no warranty whatsoever. C. F. Struck Corp. reserves the right to make product design and specification changes without notice and without obligation on their part to present product owners. The Warranty term begins on the date the product is delivered to the purchaser.

## C. WHAT IS NOT WARRANTED -

(1) Used Products; (2) Any product that has been altered or modified in ways not approved by C. F. Struck Corp.; (3) Depreciation or damage caused by normal wear, lack of reasonable and proper maintenance, failure to follow the product's Operator's/Technical Manual instructions, failure to upgrade crawler with parts furnished at no charge, misuse, lack of proper protection during storage, or accident; (4) Normal maintenance parts and service; (5) Use of Magnatrac crawler and/or Attachments in certain industrial-type applications may affect Warranty coverage.

## D. SECURING WARRANTY SERVICE -

To secure Warranty service, the purchaser must:

- (1) Report the product defect to the factory in Cedarburg, Wisconsin (414) 377-3300.
- (2) Make the part available to the factory in a reasonable period of time.

## E. LIMITATION OF IMPLIED WARRANTIES AND OTHER REMEDIES -

To the extent permitted by law, neither C. F. Struck Corp. nor any company affiliated with it makes any Warranties, representations or promises as to the quality, performance or freedom from defect of the products covered by this Warranty. IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE, TO THE EXTENT APPLICABLE, SHALL BE LIMITED IN DURATION TO THE APPLICABLE PERIOD OF WARRANTY SET FORTH ON THIS PAGE. THE PURCHASER'S ONLY REMEDIES IN CONNECTION WITH BREACH OR PERFORMANCE OF ANY WARRANTY ON C. F. STRUCK CORP. PRODUCTS ARE THOSE SET FORTH ON THIS PAGE. IN NO EVENT WILL C. F. STRUCK CORP. OR ANY COMPANY AFFILIATED WITH IT BE LIABLE FOR INCIDENTAL OR CONSEQUENTIAL DAMAGES. (Note: Some states do not allow limitations on how long an implied Warranty lasts or the exclusion or limitation of incidental or consequential damages so the above limitations and exclusions may not apply to you.) This Warranty gives you specific legal rights, and you may also have other rights which vary from state to state.

# TRACKED VEHICLE — Operation & Procedure

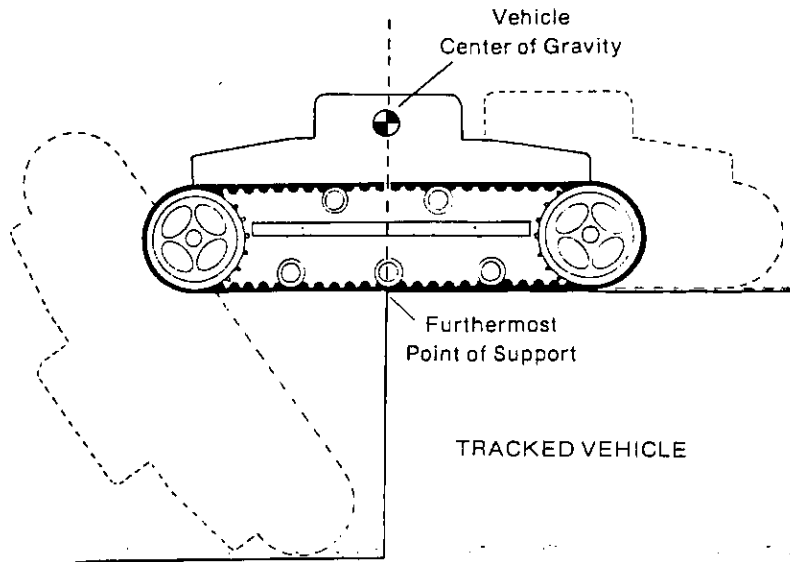
A Tracked Vehicle, by its very nature, requires the use of operating techniques and procedures that are unfamiliar to most people used to driving wheeled vehicles.

This means that a person intending to operate a Tracked Vehicle must allow himself ample opportunity to familiarize himself with the controls and characteristics of the machine.

It is the purpose of this booklet to inform and instruct prospective Tracked Vehicle operators in an effort to help them use it safely.



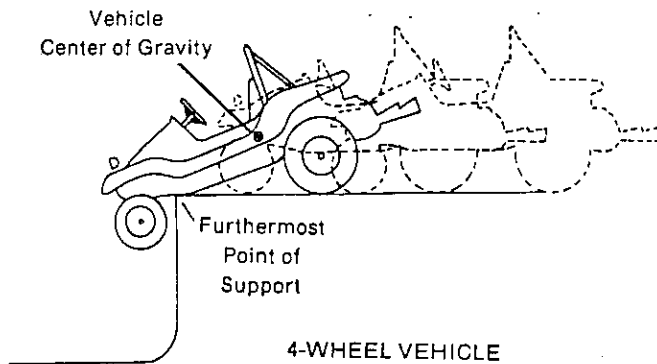
**SAFETY WARNING: NO PERSON SHOULD ATTEMPT TO OPERATE A TRACKED VEHICLE BEFORE READING THIS BOOKLET THOROUGHLY. IF ANY PORTION OF THIS BOOKLET IS NOT CLEARLY UNDERSTOOD, WRITE TO US AT THE ADDRESS ON THE FRONT COVER.**



**SAFETY WARNING: ANYTIME A PORTION OF THE TRACK IS NOT IN CONTACT WITH THE GROUND, STABILITY IS REDUCED. NEVER ATTEMPT TO 'JUMP' A TRACKED VEHICLE OVER DROP-OFFS, HILL CRESTS, OR OTHER OBSTACLES. THIS CAN BE EXTREMELY HAZARDOUS.**

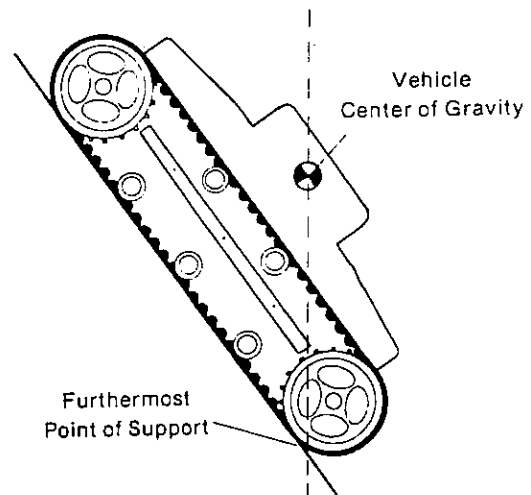
## TRACKED VEHICLE CHARACTERISTICS

Tracked vehicles possess certain inherent features not found on standard four-wheel vehicles. For instance, a standard vehicle will hit bottom when the wheels on either end are driven over a drop-off. In most cases this will stop vehicle motion and give immediate warning.



A Tracked Vehicle, however will continue on without any warning until its center of gravity passes across an imaginary line drawn straight up from the furthestmost point of support with the ground. It will drop **SUDDENLY**. (See illustration upper right). **THIS WILL HAPPEN EVEN AT THE VERY SLOWEST SPEEDS.**

A Tracked Vehicle can climb or descend steep slopes, so steep in fact that the vehicle can tip over forward or backward, before it loses traction.



Tipover occurs when the Vehicle's center of gravity passes across an imaginary line drawn straight up from the furthestmost point of support with the ground.

When the Vehicle's center of gravity passes this point, the vehicle will tip over **SUDDENLY**.

## TRACKED VEHICLE OPERATION

A Tracked Vehicle, by its very nature, is a vehicle requiring a great degree of care and judgment during operation. It should be kept in mind that while your Tracked Vehicle is designed to operate in rough terrain, this same fact allows for the possibility of a hazardous condition developing at any time. Safe operation of your Tracked Vehicle must be based on the understanding of the vehicle's limitations, thorough knowledge of the controls and their functions, and the operator's good judgment and experience.



**SAFETY WARNING: WHERE THE OPERATOR IS NOT CERTAIN OF THE VEHICLE'S ABILITY TO TRAVERSE AN OBSTACLE OR TERRAIN SITUATION, OR; IS NOT CERTAIN OF HIS OWN ABILITY TO SAFELY OPERATE THE VEHICLE, AN ALTERNATE ROUTE MUST BE TAKEN.**

## OPERATION ON SLOPES

Tracked Vehicle operation on slopes presents an obvious opportunity for the vehicle to tip over. This type of operation demands constant attention to changes in terrain and the ability to anticipate and avoid possible hazards.

This ability can only be developed through careful study of the points noted in this section and a slow, planned effort on the operator's part to become proficient.

The most effective guard against hazards while operating on slopes, especially during downhill operation is to keep vehicle speed very slow.



**SAFETY WARNING: WHEN OPERATING ON SLOPES VEHICLE SPEED SHOULD BE KEPT VERY SLOW AND THE OPERATOR SHOULD BE EXTREMELY ALERT FOR CHANGES IN TERRAIN.**

Vehicle stability on a hill, for example, is determined not only by the general slope of the hill but also by terrain conditions (rocks, ditches, logs, drop-offs, etc.)-and by the nature of the hill surface (gravel, sand, grass, snow, rock, etc.), the payload which the vehicle is carrying, the manner in which the payload is distributed within the vehicle, attachments and accessories which have been added to the vehicle, and so forth.

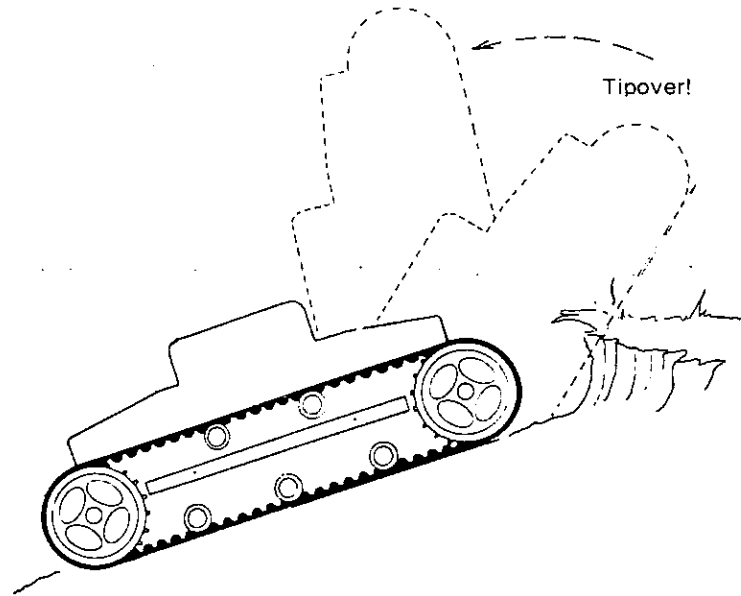
Similarly, driving technique and its effect on vehicle stability enters into any determination of what constitutes a safe slope. Excessive speed, sudden braking, choice of path - all can be critical.

## UPHILL OPERATION

The following illustrations depict some situations in which a Tracked Vehicle can be expected to tip over. Variations in speed, loading, terrain and vehicle condition must all be analyzed to determine whether or not a specific obstacle can be traversed. If in doubt, do not attempt.

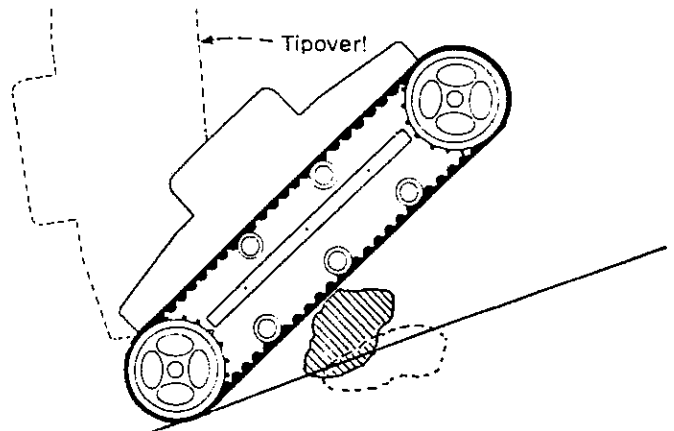


**SAFETY WARNING: ON STEEPER SLOPES SMALLER OBSTACLES WILL CAUSE A TRACKED VEHICLE TO TIP OVER.**



It is common to see a situation where natural erosion has caused the very top of a bank or hill to rise sharply. Always check for this condition before attempting to climb any such type of terrain. A Tracked Vehicle could climb up to a point at which it falls over backward.

It is also very important to check for this terrain condition before going down over the edge of a bank or dropoff.



The same situation can occur where an imbedded object is pulled from the ground. The vehicle track may 'grab' a rock or log. As the object emerges from the ground, rolling under the track, the vehicle could climb to the point at which it falls over backward.

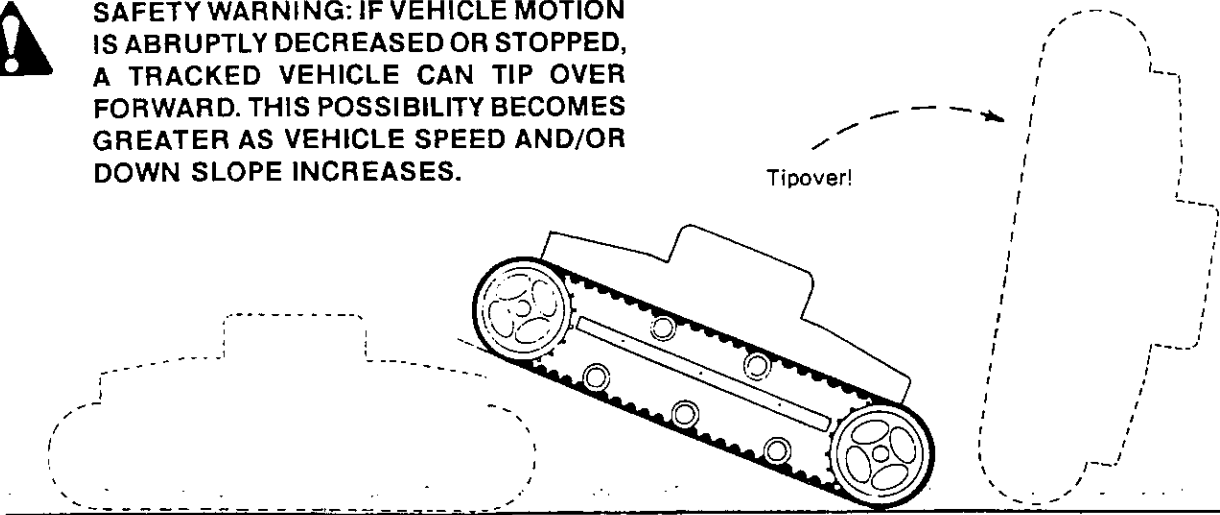
## DOWNHILL OPERATION

### SUDDEN STOPS

If a Tracked Vehicle is driven down a slope and the tracks are stopped suddenly, the vehicle's exceptional traction may cause it to tip over forward.



**SAFETY WARNING: IF VEHICLE MOTION IS ABRUPTLY DECREASED OR STOPPED, A TRACKED VEHICLE CAN TIP OVER FORWARD. THIS POSSIBILITY BECOMES GREATER AS VEHICLE SPEED AND/OR DOWN SLOPE INCREASES.**

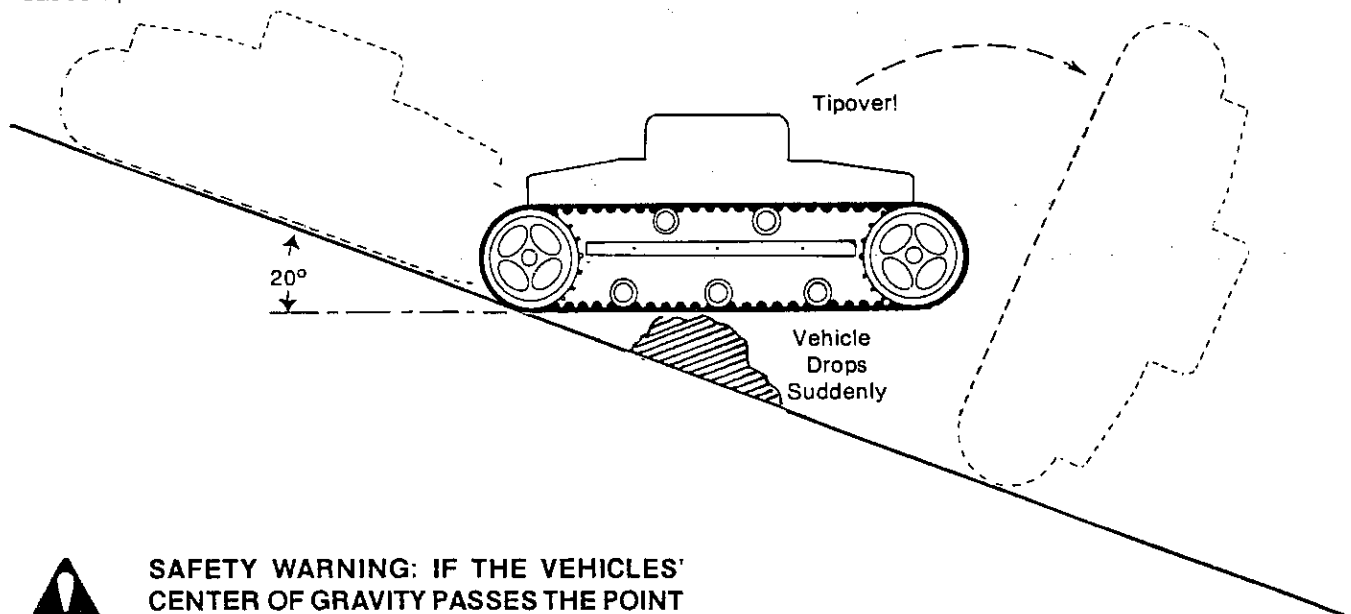


### CROSSING OVER AN OBJECT

This illustration is drawn to depict an obstacle situation in which a Tracked Vehicle can be expected to tip over. Variations likely to occur in natural terrain, the approach to the obstacle, operator skill and loading of a Tracked Vehicle may reduce the size of obstacle or steepness of the slope required, which could cause tipover.



**SAFETY WARNING: ON STEEPER SLOPES, SMALLER OBSTACLES WILL CAUSE A TRACKED VEHICLE TO TIP OVER.**



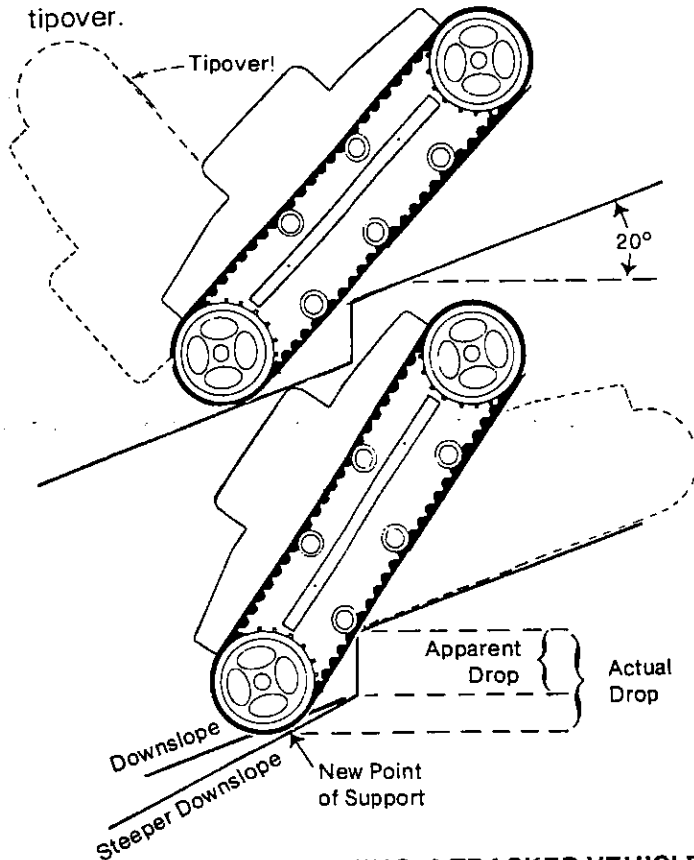
**SAFETY WARNING: IF THE VEHICLES' CENTER OF GRAVITY PASSES THE POINT OF SUPPORT, A TRACKED VEHICLE WILL BEGIN TO TIP. UNLESS THE TERRAIN ON THE DOWNSIDE OF THE OBJECT PROVIDES A NEW POINT OF SUPPORT, FAR ENOUGH AHEAD OF THE VEHICLE CENTER OF GRAVITY TO NEGATE THE EFFECT OF INERTIA, A TRACKED VEHICLE WILL TIP OVER FORWARD.**



**SAFETY WARNING: OBSTACLES, SOME OF WHICH MIGHT BE DRIVEN OVER SAFELY WHILE ON LEVEL TERRAIN, CAN CAUSE A HAZARD WHILE OPERATING ON SLOPES.**

## DROPOFFS

This illustration is drawn to depict a dropoff situation in which a Tracked Vehicle can be expected to flip. Variations occurring in natural terrain, the approach to the obstacle, operator skill, and loading of a Tracked Vehicle may reduce the size of the drop-off or the steepness of the slope, which could cause tipover.



**SAFETY WARNING: A TRACKED VEHICLE MUST BE OPERATED WITH GREAT CARE AT ALL TIMES AND ON ANY SLOPE. SLOPES STEEPER THAN 20° SHOULD BE REGARDED AS ULTRA-HAZARDOUS AND APPROACHED WITH EXTREME CAUTION. EVEN ON SLOPES OF LESS THAN 20°, A TRACKED VEHICLE CAN BE TIPPED OVER BY A SUDDEN STOP, EXCESSIVE SPEED, UNEVEN TERRAIN, OR OTHER SPECIAL CONDITIONS OR COMBINATIONS OF SUCH CONDITIONS.**

An important variable in determining if a given obstacle will cause a Tracked Vehicle to tip over is the vertical distance between the last point of contact and the new point of support. Note that the new point of support can be on level ground, a downhill slope, or a steeper downhill slope. The apparent size of the obstacle or dropoff is not the same as the drop it causes. Among the many other variables are the steepness of the slopes, size of the obstacle causing the drop, the shape of the last point of support, the load on the Tracked Vehicle, initial speed, tightness of the track, traction, symmetry of the obstacle to the Tracked Vehicle and operator skill and judgment.

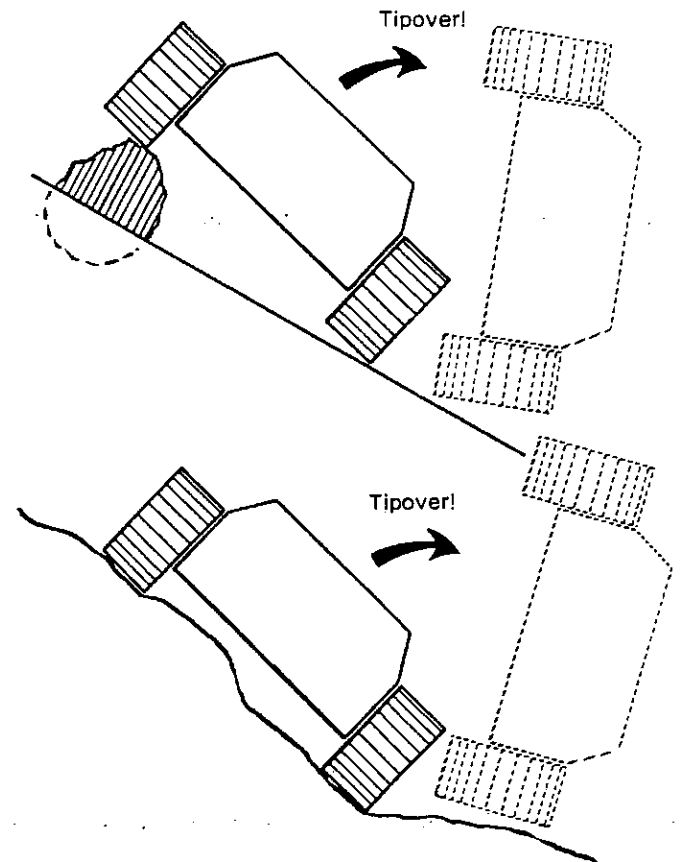
## SIDEHILL OPERATION

The illustrations show how driving over an obstacle with the uphill track or into a hole with the downhill track will cause the vehicle to tip over sideways.

A slippery surface, like snow, ice, frozen sand, and loose gravel can also be dangerous. It is possible to slide into a tree or rock or to slide off the edge of a cliff.



**SAFETY WARNING: REGARD ALL OPERATIONS ON SLOPING TERRAIN AS HAZARDOUS.**



## PARKING THE VEHICLE

When a Tracked Vehicle is parked on a sufficient slope, failure to engage the parking brake or failure of the parking brake to function properly can result in the vehicle rolling down the slope, out of control.

## OPERATING SAFETY PRECAUTIONS

1. Keep hands and feet inside vehicle.
2. Never attempt to operate the vehicle from anywhere other than the driver's seat.
3. Avoid unnecessary quick stops.
4. Avoid quick turns.
5. Shut off engine and engage parking brake when leaving vehicle.
6. Park sideways on slopes.

# PARTS LIST

## MAGNATRAC® JUNIOR

The following Parts List includes all parts used to produce a Magnatrac Junior crawler tractor. Standard hardware store fastenings (cap screws, washers, nuts, etc.) are not included. **SPECIAL NOTE:** This Parts List refers to parts in the drawing printed in the center section of this Manual.

Each part, has its own identification number or letter series. A whole number like #2041 refers to a complete part...a part that can't normally be disassembled. In this case a #2041 is the complete "welded" Upper Power Shaft Assembly. A number with a letter after it, like #2041A, means that it is one specific part (which can't normally be disassembled) of the whole assembly. In this case the #2041A Shaft of the #2041 Upper Power Shaft Assembly.

A further variation is possible if this part appears as left or right versions in the completed assembly. In this case the #2016R means that it is the right version of a #2016 Clutch Assembly. A number in parentheses ( ), indicates how many of this particular part is used (if more than one), in the completed assembly.

After each part number (or letter), and its single word name, is more information useful in identifying a specific part. In addition, the last term in each part's description relates to the location or use of that part. This description is helpful in quickly locating specific parts and understanding their use.

### TRACTOR COMPONENTS

- 28 Pulley, "V", 3-1/2" OD x 1" bore, 1/4" keyway, engine
- 47 Grip, handle, black, track control (2)
- 228 Key, 1/4 x 1/4 x 1", pulley (9)
- 234 Spring, tension, track (2)
- 235 Washer, notched, 1-9/16" OD x 1/2" ID, track spring (4)
- 236 Washer, 1-9/16" OD x 1/2" ID, track spring (4)
- 252 Bearing Assembly, sprocket/shaft (4)
  - 252A Shell (2)
  - 252B Cartridge, bearing, self-aligning, 1" bore
- 262 Tube, stop, track spring (2)
- 268 Petcock, gasoline

# PARTS LIST - MAGNATRAC JUNIOR

The following Parts List includes all parts used to produce a Magnatrac Junior crawler tractor. Standard hardware store fastenings (cap screws, washers, nuts, etc.) are not included although special "non-standard" washers, pins, etc. are all included.

Each part, has its own identification number or letter series. A whole number like #2041 refers to a complete part...a part that can't normally be disassembled. In this case a #2041 is the complete "welded" Upper Power Shaft Assembly. A number with a letter after it, like #2041A, means that it is one specific part (which can't normally be disassembled) of the whole assembly. In this case the #2041A Shaft of the #2041 Upper Power Shaft Assembly.

A further variation is possible if this part appears as left or right versions in the completed assembly. In this case the #2016R means that it is the right version of a #2016 Clutch Assembly. A number in parentheses ( ), indicates how many of this particular part is used (if more than one), in the completed assembly.

After each part number (or letter), and its single word name, is more information useful in identifying a specific part. In addition, the last term in each part's description relates to the location or use of that part. This description is helpful in quickly locating specific parts and understanding their use.

## TRACTOR COMPONENTS

- 28 Pulley, "V", 3-1/2" OD x 1" bore, 1/4" keyway, engine
- 47 Grip, handle, black, track control (2)
- 228 Key, 1/4 x 1/4 x 1", pulley (9)
- 234 Spring, tension, track (2)
- 235 Washer, notched, 1-9/16" OD x 1/2" ID, track spring (4)
- 236 Washer, 1-9/16" OD x 1/2" ID, track spring (4)
- 252 Bearing Assembly, sprocket/shaft (4)
  - 252A Shell (2)
  - 252B Cartridge, bearing, self-aligning, 1" bore
- 262 Tube, stop, track spring (2)
- 268 Petcock, gasoline



- 277 Grommet, 3/4" ID x 1/8" gap, wiring/gas hose (3)
- 424 Band, brake, 4" ID x 3/8" slotted loop, brake drum (2)
- 425 Drum, brake, 4" OD x 1" bore, sprocket/shaft (2)
- 433 Clip, coated, wiring & gas hose (13) [Individually numbered on drawings as C1 - C13]
- 434 Clamp, gas hose (4)
- 440 Spring, leaf, main drive clutch
- 441 Switch, sensing, with nuts, main drive clutch
- 442 Battery, 12 volt, 32 amp. [Complimentary, no warranty]
- 443 Solenoid
- 444 Switch, ignition
  - 444A Body, with lock washer & nut
  - 444B Key (2)
- 445 Meter, ampere
  - 445A Body, with lock washers & nuts
  - 445B Retainer
- 495 Latch, hood (2)
- 704 Washer, shim, 1-3/16" ID x 1-7/8" OD, front & rear axle
- 706 Ring, "O", 1-3/16" ID, front idler & rear drive track sprocket assembly (24)
- 707 Bearing, sleeve, 1-3/16" ID x 2" long, oilite, track sprocket assemblies (8)
- 716 Washer, shim, 1" ID x 1-1/2" OD, sprocket/shaft
- 726 Grommet, 3/8" ID x 1/8" gap, wiring (3)
- 727 Ring, retaining, 1-3/16" ID, front & rear axle (4)
- 729 Ring, retaining, 1" ID, sprocket/shaft (4)
- 820 Rod, threaded, tensioning, track spring (2)
- 933 Seat Assembly
  - 933A Seat
  - 933B Glide, with handle
  - 933C Glide, without handle
- 2001 Shoe, rib plate, 8" wide x one pitch (112)

- 2002 Baffle, base, engine
- 2003 Baffle, housing, engine
- 2004 Baffle, leg, engine
- 2005 Washer, spacer, 3/8" ID x 1" OD, chain guard (4)
- 2006 Angle, main clutch handle
- 2007 Plate, bearing, main clutch rod
- 2008 Tray, bottom
- 2009R Support, bearing slide, right
- 2009L Support, bearing slide, left
- 2010 Dash
- 2011 Grill
- 2012 Slide, bearing, right & left support (2)
- 2013 Bracket, switch, main drive clutch
- 2014 Brace, right & left fender
- 2015 Clutch Assembly, main drive
  - 2015A Tab, brake pull loop (2)
  - 2015B Arm, idler pulley
  - 2015C Handle, main clutch
  - 2015D Rod, main clutch
  - 2007 Plate, bearing, main clutch
- 2016R Clutch Assembly, right track
  - 2016A Tube
  - 2016B Yoke
  - 2016C Tongue
  - 2016D Handle, control
- 2016L Clutch Assembly, left track
  - 2016A Tube
  - 2016B Yoke
  - 2016C Tongue
  - 2016D Handle, control
- 2017 Channel, engine mount
- 2018 Mount, engine

2019 Cover, track clutch  
2020 Cover, seat  
2021 Deflector, muffler  
2022R Footrest, right  
2022L Footrest, left  
2023 Case, battery  
2024 Mount, gas tank  
2025 Hood  
2026 Expander, track (2)  
2027 Drawbar, rear  
2028R Release Assembly, track clutch belt, right  
-2028A Plate, track clutch  
-2028B Guide  
2028L Release Assembly, track clutch belt, left  
-2028A Plate, track clutch  
-2028B Guide  
2029 Loop, brake pull (2)  
2030 Strip, right & left fender (4)  
2031 Cap, track expander (2)  
2032R Wall, right  
2032L Wall, left  
2033 Support Assembly, rear axle (2)  
-2033A Plate  
-231B Collar  
2034R Gusset, engine mount, right  
2034L Gusset, engine mount, left  
2035R Fender, right  
2035L Fender, left

2036R Elbow, fender, right rear

2036L Elbow, fender, left rear

2037R Guard, chain, right

2037L Guard, chain, left

2038 Pull Assembly, rear axle (2)

-2038A Rod, threaded

-231B Collar

2039 Latch, seat/cover

2040 Rod, track clutch

2041 Power Shaft Assembly, forward drive, upper

-2041A Shaft

-2041B Pulley, "V", 3" OD (4)

-2041C Pulley, "V", 5-1/4" OD

2042 Power Shaft Assembly, reverse drive, lower

-2041A Shaft

-2041B Pulley, "V", 3" OD (2)

-2042A Pulley, flat, 5-3/4" OD

2043 Pulley, "V", 14" OD x 1" bore, 1/4" keyway, sprocket/shaft (6)

2044 Guide, main drive belt, upper, engine

2045 Guide, main drive belt, lower, engine

2046 Guide, main drive belt, lower, body

2047 Pulley, "V", idler, 4" OD x 3/8" bore, main drive belt

2048 Sprocket/Shaft Assembly (2)

-2048A Sprocket, 9 tooth, #50 chain

-2048B Shaft

2049 Sprocket Assembly, track idler, front (2)

-2049A Tube

-212B Sprocket, ductile iron, 22 tooth, #550 chain (2)

2050 Sprocket Assembly, track drive, rear (2)

-2050A Tube

-2050B Sprocket, steel, 54 tooth, #50 chain

-212B Sprocket, ductile iron, 22 tooth, #550 chain (2)

2051 Pulley, flat, idler, 3" OD x 3/8" bore, track clutch (6)

- 2052 Sleeve, half, power shaft (4)
- 2053 Nipple, power shaft (2)
- 2054 Spring, rubber, brake (2)
- 2055 Guide, idler, main drive belt
- 2056 Bearing Assembly, power shaft (4)
  - 2056A Shell (2)
  - 2056B Cartridge, bearing, self-aligning, 3/4" bore
- 2057 Tank, gasoline, with cap
- 2058 Module Assembly
  - 2058A Plug
  - 2058B Safety Module
- 2059 Grip, handle, black, seat latch
- 2060 Grip, handle, red, main clutch
- 2061 Zerk, 1/8" pipe thread (4)
- 2062 Spring, main clutch handle
- 2063 Spring, track clutch (2)
- 2064 Spring, seat latch (2)
- 2065 Axle, front & rear (2)
- 2066 Hose, petcock/filter
- 2067 Hose, tank/petcock
- 2068 Rod, support, threaded, brake band (2)
- 2069 Control, choke
- 2070 Control, throttle
- 2071 Cap, protective, red, battery & solenoid (2)
- 2072 Cap, protective, black, battery
- 2073 Switch, sensing, seat
- 2074 Rod, pull, brake band (2)

- 2075 Pin, roll, 1/8 x 1", brake band (2)
- 2077 Washer, shim, 3/4" ID, track clutch rod
- 2078 Belt, track clutch (6)
- 2079 Belt, main drive
- 2080 Chain Assembly, track (2)
  - 2080A Chain, A550, 55 links
  - 2080B Link, connector, with cotter pins
- 2081 Ring, retaining, 3/4" ID, track clutch rod (2)
- 2082 Chain Assembly, drive (2)
  - 2082A Chain, precision roller, #50, 61 pitches
  - 2082B Link, connector, with cotter pins
- 2083 Engine [#2083 indicates engine related component...muffler, crankshaft, air cleaner etc.]
- 2084 Pilot Assembly (2)
  - 2084A Rod, threaded
  - 2028A Plate, track clutch

