

Model Identification



SS440-A3A

Foreword

This Invader SS440-A3A Shop Manual Supplement is designed to be used in conjunction with the Invader/LTD SS440-B1, SS340-A3, SS440-A3 Shop Manual (P/N 99963-3508). The maintenance and repair procedures described in this Supplement are only those that are unique to the SS440-A3A model. Most service operations for these models remain identical to those described in the base Shop Manual. Complete and proper servicing of the SS440-A3A model therefore requires both this Supplement and the base Shop Manual.

The base Shop Manual and this Supplement are designed primarily for use by snowmobile mechanics in a properly equipped shop. However, they contain enough detail and basic information to make them useful to the snowmobile owner who desires to perform his own basic maintenance and repair work. A basic knowledge of mechanics, the proper use of tools, and workshop procedures must be understood in order to carry out maintenance and repair satisfactorily. Whenever the owner has insufficient experience or doubts his ability to do the work, the adjustments, maintenance, and repair should be carried out only by qualified mechanics.

In order to perform the work efficiently and to avoid costly mistakes, the mechanic should read the text, thoroughly familiarize himself with the procedures before starting work, and then do the work carefully in a clean area. Whenever special tools and equipment are specified, makeshift tools or equipment should not be used. Precision measurements can only be made if the proper instruments are used, and the use of substitute tools may adversely affect safe operation of the snowmobile.

Whenever you see the symbols shown below, heed their instructions! Always follow safe operating and maintenance practices.

WARNING

This warning symbol identifies special instructions or procedures which, if not correctly followed, could result in personal injury, or loss of life.

CAUTION

This caution symbol identifies special instructions or procedures which, if not strictly observed, could result in damage to, or destruction of equipment.

NOTE: Indicates points of particular interest for more efficient and convenient operation.

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Illustrations in this publication are intended for reference use only and may not depict actual model component parts.

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Quick Reference Guide

	SECTION
Specifications	1
Maintenance and Theory	2
Repair	3

This quick reference guide will assist you in locating a desired topic or procedure.

- Bend the pages back to match the black tab of the desired section number with the black tab on the edge of each table of contents page.
- Refer to the section table of contents for the exact pages to locate the specific topic or procedure required.

SPECIFICATIONS

Table of Contents

1

General Specifications	1-2
Service Specifications	1-2
Torque Chart and Loctite Table	1-3

GENERAL SPECIFICATIONS

Refer to the specifications found under GENERAL SPECIFICATIONS in the Invader Shop Manual, except for:

GENERAL

Overall Height (With Windshield)	35.8 in. (909 mm)
Dry Weight (Approximate)	403 lb (183 kg)

SERVICE SPECIFICATIONS

Refer to the specifications found under SERVICE SPECIFICATIONS in the Invader Shop Manual, except for:

CHASSIS

Track Tension	3/4 in. (19 mm) maximum deflection, 5 lb (2.3 kg) pull
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GENERAL ENGINE TORQUE SPECIFICATIONS	Update Specs On Pages Indicated
Crankcase Bolts and Nuts	3-76
6 mm - 70 in. lb (0.81 kg-m)	
8 mm - 16 ft lb (2.2 kg-m)	3-76
Recoil Bolt	
70 in. lb (0.81 kg-m)	
Gearcase Bolts (Socket Head, 8 mm)	
16 ft lb (2.2 kg-m)	
(Hex Head, 6 mm)	
70 in. lb (0.81 kg-m)	

TORQUE CHART AND LOCTITE TABLE

Refer to the TORQUE CHART AND LOCTITE TABLE in the Invader Shop Manual, except for:

ENGINE MOUNT AND EXHAUST

Description	Quantity	Torque
Engine mount to damper - nuts	6	10 ft lb (1.4 kg-m)
Engine mount to chassis - nuts	2	35 ft lb (4.8 kg-m)

ELECTRICAL SYSTEM

Description	Quantity	Torque
Head lamp housing mounting - screws	4	25 in. lb (0.29 kg-m)
Head lamp hinge - screws	4	50 in. lb (0.57 kg-m)

SUSPENSION

Description	Quantity	Torque
Front pivot shaft to tunnel - bolt	2	25 ft lb (3.5 kg-m)
Idler wheel shaft mounting - bolt	2	25 ft lb (3.5 kg-m)
Limiter strap to swing arm - nuts	4	45 in. lb (0.5 kg-m)
Rail wear strip retaining - nut	2	25 in. lb (0.3 kg-m)
Rear axle adjusting bolt - jam nut	2	120 in. lb (1.4 kg-m)
Rear axle locking - bolt	2	25 ft lb (3.5 kg-m)
Rear limiter strap to pivot arm - nut	1	45 in. lb (0.5 kg-m)
Rear pivot shaft to tunnel - bolt	2	25 ft lb (3.5 kg-m)
Rear suspension arm to pivot arm assembly - bolt	2	25 ft lb (3.5 kg-m)
Idler wheels to rail brackets - nut	4	25 ft lb (3.5 kg-m)
Rear suspension arm to rail bracket - bolt	2	25 ft lb (3.5 kg-m)
Suspension brackets to rail - nuts	38	120 in. lb (1.4 kg-m)
Front spring cam mounting, front - bolt	2	35 in. lb (0.4 kg-m)
Front spring cam mounting, rear - bolt	2	120 in. lb (1.4 kg-m)
Rear spring cam mounting - nuts	4	45 in. lb (0.5 kg-m)
Suspension shock absorber mounting, front - bolt	2	25 ft lb (3.5 kg-m)
Suspension shock absorber mounting, rear - nut	1	15 ft lb (2.1 kg-m)
Suspension brace shaft - bolts	2	25 ft lb (3.5 kg-m)

DRIVE SHAFT

Description	Quantity	Torque
Bearing housing (flange) mounting - bolts	3	12 ft lb (1.7 kg-m)
Bearing locking collar set screw	2	70 in. lb (0.81 kg-m)

CHAINCASE AND JACKSHAFT

Description	Quantity	Torque
Chain tensioner mounting - bolts	2	40 in. lb (0.46 kg-m)

CHASSIS COOLANT SYSTEM

Description	Quantity	Torque
Duct assembly to brace - nut	1	95 in. lb (1.09 kg-m)
Radiator assembly to chaincase - bolt	1	60 in. lb (0.69 kg-m)

CDI MAGNETO

Description	Quantity	Torque	Update Specs On Pages Indicated
Stator plate mounting - screws	2	30 in. lb (0.35 kg-m)	3-53
Wire clamps to stator plate - screws	2	30 in. lb (0.35 kg-m)	
Exciter coil and pulser coil mounting - screws	2	30 in. lb (0.35 kg-m)	
Lighting coil mounting - screws	2	30 in. lb (0.35 kg-m)	

RECOIL STARTER

Description	Quantity	Torque
Drive plate mounting - nut	1	70 in. lb (0.81 kg-m)

MAINTENANCE AND THEORY

Table of Contents

Track, Suspension, and Steering System Operation	2-2
Fuel System	2-2
Fuel Filters	2-2
Suspension Adjustments	2-2
Track Adjustments	2-2
Track Tension	2-2
Track Alignment	2-3

2

Track, Suspension, and Steering System Operation

Refer to Invader LTD Shop Manual Addendum, page 5-16.

Fuel System

Fuel System Service is as described beginning on page 2-33 in the Invader Shop Manual, except for fuel filters.

Fuel Filters

The fuel system uses three separate filters.

- **Inline Filter** — Refer to Invader Shop Manual, page 2-34.
- **Internal Filter** — Refer to Invader Shop Manual, page 2-34.
- **Pick-up Filter** — To inspect the filter screen, reach through filler neck with a stiff wire and hook pick-up tube. To clean the screen, soak in carburetor cleaner, rinse in cleaning solvent, and blow through tube fitting with compressed air. Three washers are added to the fuel tube to keep the tube submerged.



Suspension Adjustments

Refer to Invader LTD Shop Manual Addendum, page 5-16.

Track Adjustments

For optimum performance and for long track life, proper adjustments must be maintained. Since the track is made of rubber and subjected to high torque loads, a certain amount of track stretch is expected. Track tension will compensate for stretch. Once correctly tensioned, the track must be aligned in the chassis to prevent wear to one side of the track.

WARNING

When raising the rear of the snowmobile off the ground, place the ski tips against a stationary object and be sure the vehicle is properly secured to prevent personal injury.

Track Tension

1. Raise rear of snowmobile so track is off the ground for its entire length.
- Securely brace the snowmobile so it cannot fall.

WARNING

When raising rear of the snowmobile off ground, place ski tips against a stationary object and be sure the vehicle is properly secured to prevent personal injury.

NOTE: Do not position snowmobile on its side to tension track as incorrect adjustment will result.

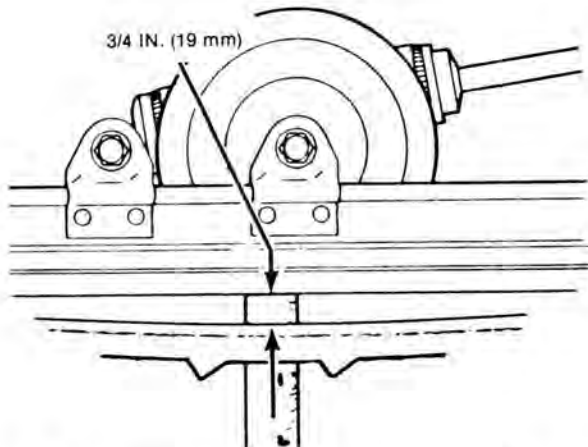
2. Measure track tension.

WARNING

To prevent personal injury, never perform track adjustment procedures with the engine running.

- Hang a 5 lb (2.3 kg) weight from the track below the center set of idler wheels.

- At a point below center idler wheel, measure the distance from track upper surface to the wear strip bottom surface.



- Correct track tension dimension is 3/4 in. (19 mm).

★ If tension is correct:

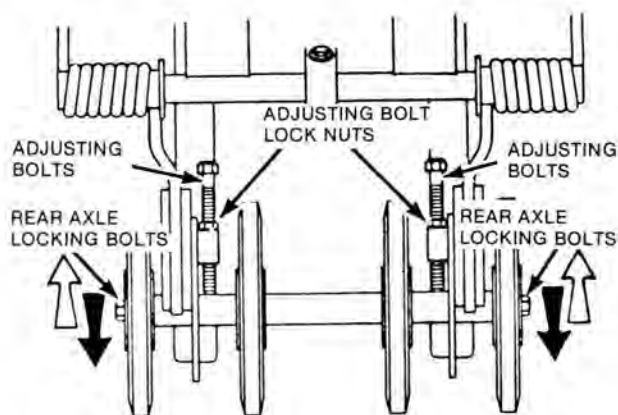
☆ Remove weight from track.

☆ Perform Track Alignment procedure.

★ If tension is incorrect, adjust tension as follows:

☆ Loosen rear axle locking bolts.

☆ Back off rear axle adjust bolt lock nuts.



☆ Turn adjusting bolts equally to attain proper tension. As a good starting point for track alignment, be sure both adjusting bolts measure the same length from bolt head to bracket.

☆ Remove weight from track.

☆ Perform Track Alignment procedure.

Track Alignment

NOTE: Perform Track Tension procedure prior to alignment check.

1. Raise rear of snowmobile so track is off the ground for its entire length.

- Securely brace the snowmobile so it cannot fall.

WARNING

Never raise rear of snowmobile by hand or stand behind the vehicle when engine is running or track is rotating. A rotating track can fling objects rearward at great velocity. This may cause severe personal injury. Remove all tools and foreign matter from track area before starting engine.

2. Rotate track using the engine.

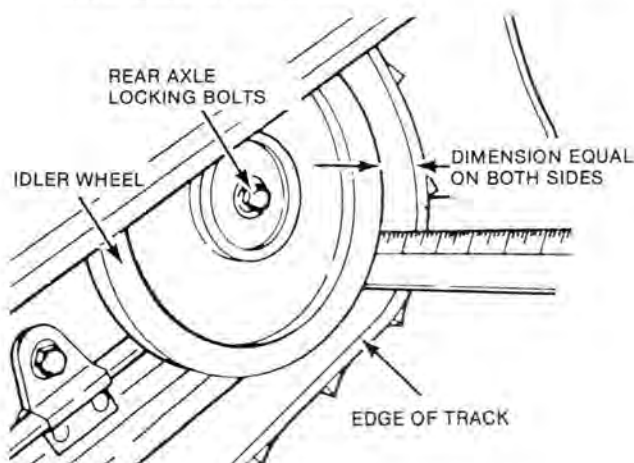
- Start engine and push on throttle lever only enough to turn the track slowly a few revolutions, then stop engine.

WARNING

Always stop the engine and allow track to coast to a stop before measuring track alignment.

3. Measure track alignment.

- Track alignment is correct when measurements from the rear idler wheel to the outside edge of the track are equal on both sides of the machine.



- ★ If alignment is correct:
- ☆ Return rear of vehicle to ground.
- ★ If alignment is incorrect:
- ☆ Start engine and apply throttle to turn track slowly a few revolutions. Let track coast to a stop and measure alignment.
- ☆ Loosen rear axle locking bolts.
- ☆ Back off rear axle adjusting bolt lock nuts.
- ☆ Tighten rear axle adjusting bolt, on the same side with the larger measurement, about 1/2 turn.
- ☆ Restart engine and recheck alignment. Repeat adjustment as necessary until alignment is correct.

CAUTION

If track alignment requires considerable adjustment, track tension should be rechecked to prevent damage to drive or suspension system.

- ☆ Tighten rear axle adjusting bolt lock nuts.
- ☆ Torque rear axle locking bolts to 25 ft lb (3.5 kg-m).

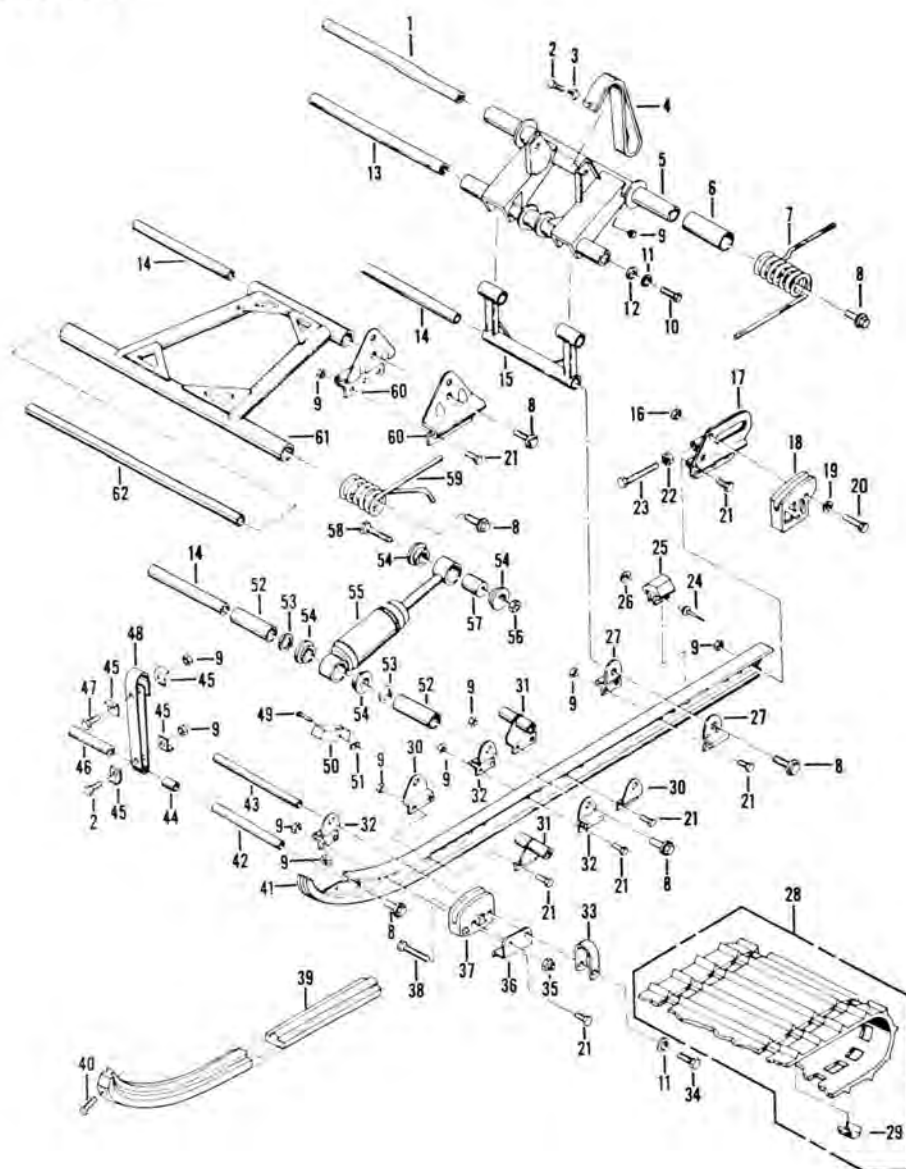
NOTE: After rear axle bolts have been tightened, check to be sure that spacers (tubing) over the rear axle squeeze against slide rail brackets, preventing the spacers from rotating. Loose spacers will permit the rear axle to float and proper track alignment cannot be maintained.

REPAIR

Table of Contents

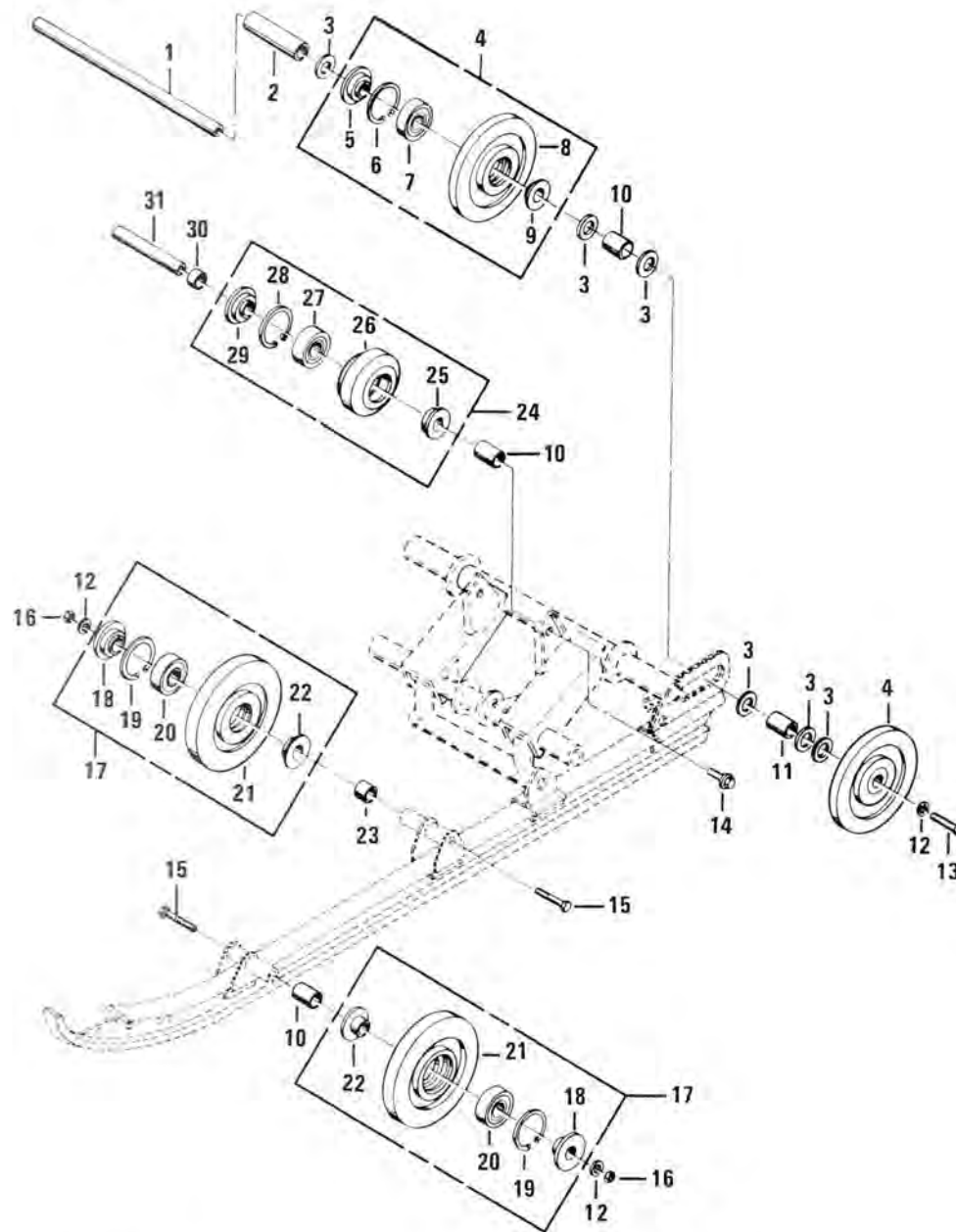
Suspension	3-2
Suspension Servicing	3-4
Suspension Adjustments	3-4
Ride Adjustment	3-4
Handling Adjustment	3-4
Front Swing Arm Adjustment	3-5
Suspension Removal	3-6
Suspension Installation	3-7
Wear Strips (Hi-Fax)	3-8
Wear Strip Removal	3-8
Wear Strip Installation	3-8
Front Swing Arm	3-9
Front Swing Arm Removal	3-9
Front Swing Arm Inspection	3-9
Front Swing Arm Installation	3-9
Idler Wheels	3-10
Idler Wheel Inspection	3-10
Idler Wheel Repair	3-10
Rear Arm	3-10
Rear Arm Removal	3-10
Rear Arm Inspection	3-11
Rear Arm Installation	3-11
Rear Axle	3-12
Rear Axle Removal	3-12
Rear Axle Inspection	3-12
Rear Axle Installation	3-12
Shock Absorber	3-12
Shock Absorber Removal	3-12
Shock Absorber Inspection	3-12
Shock Absorber Installation	3-13
Suspension Rails	3-13
Suspension Rail Disassembly	3-13
Suspension Rail Inspection	3-13
Suspension Rail Assembly	3-13
Driveshaft and Track	3-13
Track Repair	3-14
Steering System	3-14

Suspension



- | | | |
|----------------------------------|----------------------------------|---------------------------------|
| 1 SHAFT, rear arm | 21 BOLT, 1/4-28 x .75 | 43 BRACE, 8.2" (208.3 mm) long |
| 2 BOLT, 1/4-28 x 1.00 | 22 NUT, 3/8-16 | 44 SPACER, 1.20" (30.5 mm) long |
| 3 WASHER, plain 1/4" | 23 BOLT, special, 3/8-16 x 3.75 | 45 WASHER, special limiter |
| 4 LIMITER, rear suspension | 24 RIVET, 3/16" | 46 SPACER, 3.75" (95.3 mm) long |
| 5 PIVOT ASSY, rear arm | 25 BUMPER, rear | 47 BOLT, 1/4-28 x 1.12 |
| 6 SLEEVE, rear suspension spring | 26 WASHER, plain, 3/16" | 48 LIMITER, front suspension |
| 7 SPRING, right rear | 27 BRACKET, rear suspension arm | 49 PIN |
| 8 BOLT, special 3/8-16 x 1.00 | 28 TRACK ASSY, snow 15 x 121 | 50 BUMPER, front |
| 9 NUT, insert, 1/4-28 | 29 SHOE, track clip | 51 RETAINER, bumper pin |
| 10 BOLT, 3/8-16 x 1.00 | 30 BRACKET, idler wheel | 52 SPACER |
| 11 WASHER, spring lock, 3/8" | 31 BRACKET ASSY, idler wheel | 53 WASHER, special |
| 12 WASHER, special | 32 BRACKET | 54 BUSHING |
| 13 SHAFT, pivot | 33 GUARD, spring arm | 55 SHOCK ABSORBER |
| 14 SHAFT, pivot | 34 BOLT, 3/8-16 x 2.25 | 56 NUT, insert, 3/8-16 |
| 15 ARM ASSY, rear suspension | 35 NUT, insert, 3/8-24 | 57 SLEEVE |
| 16 NUT, insert, 5/16-24 | 36 BRACKET, front cam | 58 BOLT, 3/8-16 x 1.75 |
| 17 BRACKET ASSY, rear axle | 37 CAM, front spring | 59 SPRING, left front |
| 18 CAM, rear spring | 38 BOLT, 3/8-24 x 1.50 | 60 SPRING, right front |
| 19 WASHER, plain, 5/16" | 39 STRIP, rail wear | 61 ARM ASSY, swing |
| 20 BOLT, 5/16-24 x 1.75 | 40 SCREW, special, 1/4-28 x 1.25 | 62 SHAFT, front arm |
| | 41 RAIL, suspension | |
| | 42 BRACE, 8.4" (213.4 mm) long | |

Suspension



- | | |
|---------------------------------|-----------------------|
| 1 AXLE, rear | 17 WHEEL ASSY |
| 2 SPACER, rear axle | 18 SPACER, large O.D. |
| 3 WASHER, special | 19 RING, snap |
| 4 WHEEL ASSY | 20 BEARING |
| 5 SPACER, large O.D. | 21 WHEEL |
| 6 RING, snap | 22 SPACER, small O.D. |
| 7 BEARING | 23 SPACER |
| 8 WHEEL | 24 WHEEL ASSY |
| 9 SPACER, small O.D. | 25 SPACER, small O.D. |
| 10 SPACER | 26 WHEEL |
| 11 SPACER, rear axle | 27 BEARING |
| 12 WASHER, plain, 3/8" | 28 RING, snap |
| 13 BOLT, 3/8-16 x 1.25 | 29 SPACER, large O.D. |
| 14 BOLT, special, 3/8-16 x 1.00 | 30 SPACER |
| 15 BOLT, 3/8-24 x 4.00 | 31 SHAFT, idler wheel |
| 16 NUT, insert, 3/8-24 | |

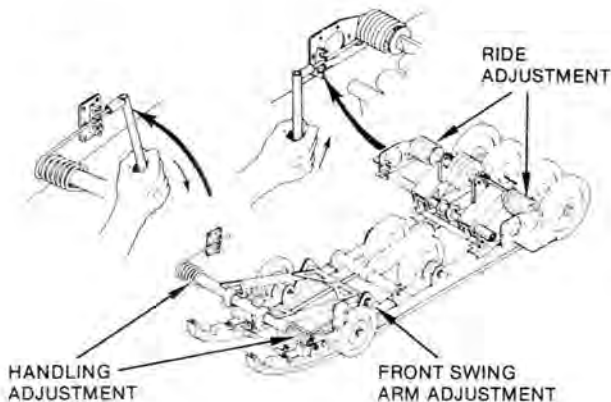
Suspension Servicing

Suspension Adjustments

The slider suspension is fully adjustable for rider comfort.

Three suspension adjustments are provided:

1. Ride Adjustment.
2. Handling Adjustment.
3. Front Swing Arm Adjustment.



RIDE ADJUSTMENT

The rear springs, located on each side of the rear pivot arm, control the ride by pushing downward on the suspension to hold vehicle up.

- Increasing rear spring tension will stiffen the ride allowing more driver or passenger weight.
- Decreasing tension creates a softer ride for lighter loads and improves weight transfer during hard acceleration.

To change rear spring tension:

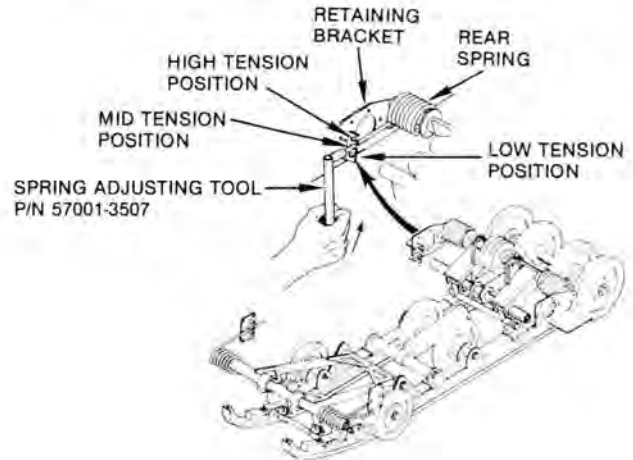
WARNING

Suspension springs are under heavy spring load. Improper adjusting techniques may result in personal injury.

CAUTION

Spring Tension (pre-load) of springs must be equal on each side of suspension (front to front, rear to rear). Higher tension adjustment on one spring can cause spring breakage or excessive slide wear strip wear.

1. Position spring adjustment tool (special tool) onto end of spring.



2. Release spring arm from bracket detent.
 - Apply firm grip on adjusting tool with both hands.
 - Carefully force spring out of retainer detent.
 - Be prepared to accept heavy spring load as spring is released from retainer detent.
3. Position spring to obtain desired tension.
 - Install into upper detent to increase tension.
 - Lower detent reduces tension on spring.
4. Repeat procedure on other rear spring to make tension equal on both sides of suspension (rear to rear).

HANDLING ADJUSTMENT

The front springs, located on each side of the front swing arm, control handling (steering response). The amount of pressure on the skis directly affects steering effort and response.

- Increasing spring tension forces the front of the suspension to lift more, shifting weight or pressure from skis to the suspension. Less ski pressure means easier effort but less response.
- Reducing spring tension causes less suspension lift, increasing pressure on skis. More ski pressure means increased steering response and effort.

To change front spring tension:

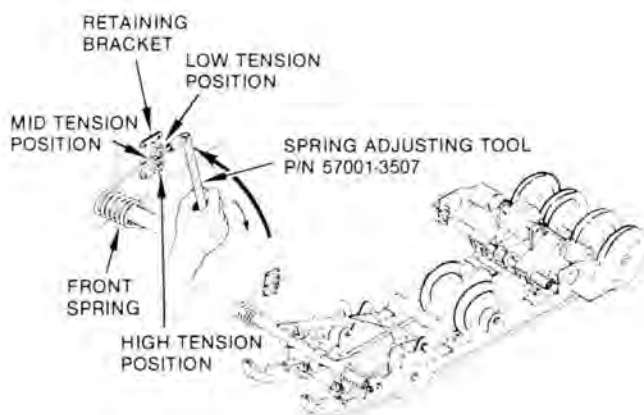
WARNING

Suspension springs are under heavy spring load. Improper adjusting techniques may result in personal injury.

CAUTION

Spring tension (pre-load) of springs must be equal on each side of suspension (front to front, rear to rear). Higher tension adjustment on one spring can cause spring breakage or excessive slide wear strip wear.

1. Position spring adjusting tool (special tool) onto end of spring.



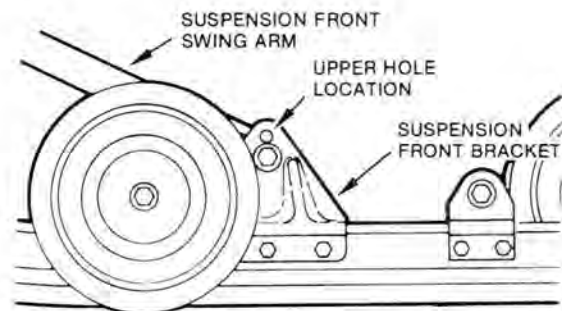
2. Release spring arm from bracket detent.
 - Apply firm grip on adjusting tool with both hands.
 - Carefully force spring out of retainer detent.
 - Be prepared to accept heavy spring load as spring is released from retainer detent.

3. Position spring to obtain desired tension.
 - Install spring into lower detent to increase tension.
 - Upper detent reduces tension on spring.
4. Repeat procedure on other front spring to make tension equal on both sides of suspension (front to front).

FRONT SWING ARM ADJUSTMENT

The front swing arm is positioned in lower hole of suspension front bracket for best overall acceleration and ride characteristics.

- Changing swing arm to upper hole location causes less weight transfer from skis to suspension during acceleration. Less weight transfer decreases ski lift allowing increased steering stability during acceleration.



NOTE: Applying maximum front arm spring tension will not improve ski lift during acceleration. It is impossible for the front springs to lift the snowmobile during acceleration. Snowmobile (ski) lift results from rear arm collapsing and front swing arm extending (lifting) which can only occur with adequate traction (very little track spin).

To change swing arm position:

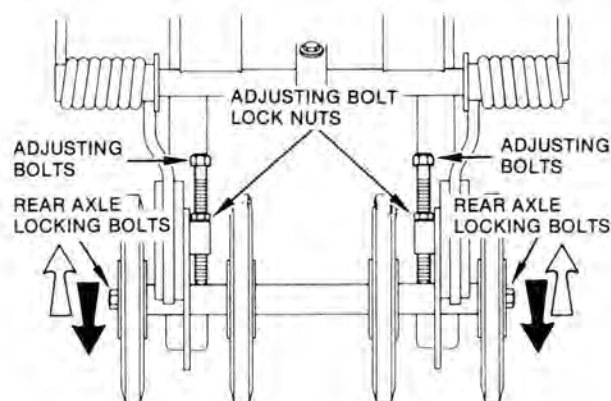
WARNING

Suspension front swing arm is under heavy spring load. Improper service techniques may result in personal injury.

1. Relieve spring tension from front swing arm.
 - Refer to Handling Adjustment procedure.

2. Relieve track tension.

- Loosen rear axle locking bolts.
- Back off rear axle adjusting bolt lock nuts.
- Unscrew both adjusting bolts to reduce track tension.



3. Place swing arm into desired position.

- Remove swing arm-to-bracket mounting bolts.
- Secure swing arm to desired bracket position, then tighten bolts to 25 ft lb (3.5 kg-m).

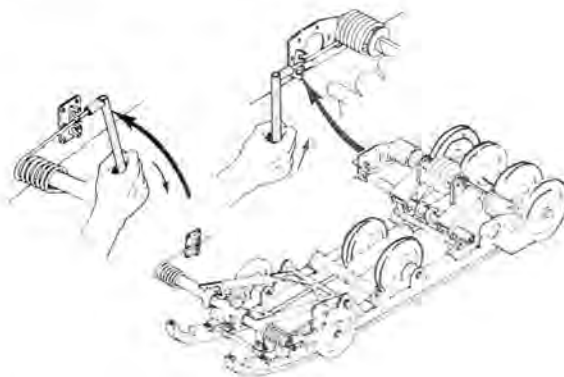
4. Apply spring tension to front swing arm.

- Refer to Handling Adjustment procedure.

5. Adjust track tension and alignment.

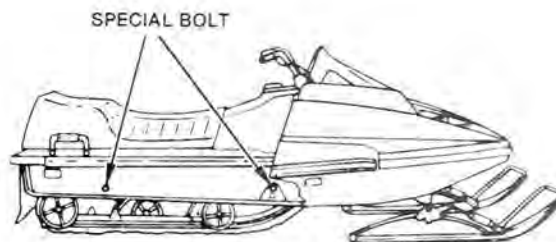
- Refer to Track Adjustments procedure.

- Refer to Ride and Handling Adjustment procedures for details of special tool usage.



3. Remove suspension from chassis.

- Remove four bolts (two on each side of snowmobile) securing suspension to chassis.



- Swing track and suspension out from chassis (approximately 90°) then lift suspension (rear end first) from track.

NOTE: To reduce removal effort, carefully guide pivot shafts and suspension springs around chassis brackets and rivets to prevent interference between components.

Suspension Removal

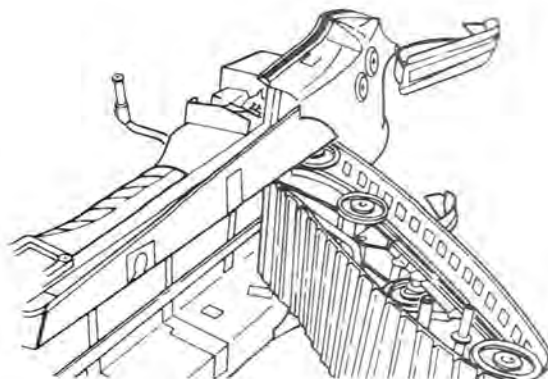
1. Place snowmobile on its side.

- Be sure to provide a protected surface to prevent marring finish of snowmobile.

2. Relieve spring tension from front and rear suspension arms.

WARNING

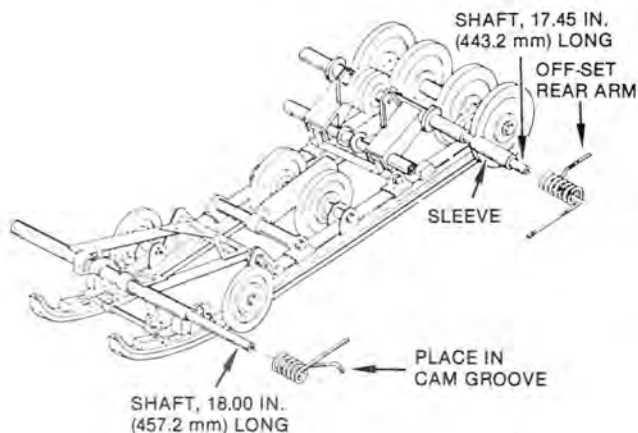
Suspension springs are under heavy spring load. Improper adjusting techniques may result in personal injury.



Suspension Installation

NOTE: Check suspension for correct assembly by measuring distance between slide rails several places along their length. If they are not parallel within 1/8 in. (3.2 mm), check spacers, shafts, brackets and washers for correct placement. Replace or straighten slide rails if assembly sequence is correct.

1. Apply a low temperature ep (extreme pressure) type grease on front and rear pivot shafts.
2. Install pivot shafts.
 - Insert long pivot shaft in front swing arm.
 - Slide short pivot shaft into rear arm assembly.



3. Install suspension springs.
 - Place front spring onto suspension with bent spring arm end in cam.
 - Slide spring sleeves onto rear arm assembly.
 - Position rear spring over sleeve with off-set spring arm in cam.

NOTE: Hold springs into position during suspension installation by stretching rubber band across suspension between arms of springs.

4. Place snowmobile on its side and swing track out from chassis approximately 90°.

5. Align drive lugs on track to properly mate with lugs on drive sprockets.



6. Insert suspension inside track.
7. Secure front swing arm to tunnel.
 - Align front swing arm pivot shaft with mounting hole in tunnel.

NOTE: To reduce installation effort, carefully guide pivot shaft and suspension springs around chassis brackets and rivets to prevent interference between components.

- Install front arm mounting bolts.
 - Torque bolts to 25 ft lb (3.5 kg-m).
8. Mount rear suspension arm assembly to tunnel.
 - Move rear suspension arm into tunnel to align pivot shaft with mounting hole in tunnel.

NOTE: To reduce installation effort, carefully guide pivot shaft and suspension springs around chassis brackets and rivets to prevent interference between components.

- Install rear mounting bolts.
 - Torque bolts to 25 ft lb (3.5 kg-m).
9. Adjust front and rear suspension spring tension.

WARNING

Suspension springs are under heavy spring load. Improper adjusting techniques may result in personal injury.

- Refer to Ride and Handling Adjustment procedures for details of special tool usage.
10. Check track adjustments.
- Refer to Track Tension and Track Alignment procedures.

Wear Strips (Hi-Fax)

Slide bar wear strips should be replaced when thickness of material measures 1/8 in. (3 mm) or less at any point along its length.

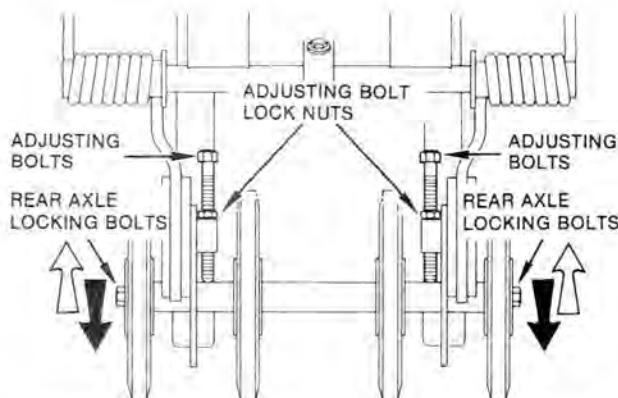
Wear Strip Removal

1. Raise rear of snowmobile off ground.
- Securely brace the snowmobile so it cannot fall.

WARNING

When raising rear of snowmobile off ground, place ski tips against a stationary object and be sure the vehicle is properly secured to prevent personal injury.

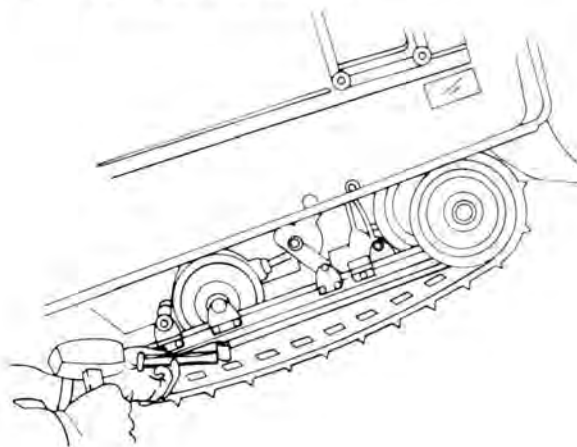
2. Relieve track tension.
- Loosen rear axle locking bolts.
 - Back off rear axle adjusting bolt lock nuts.
 - Unscrew both adjusting bolts to reduce track tension.



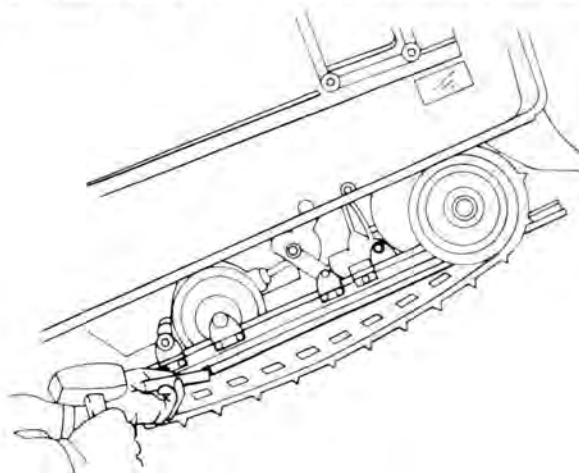
3. Remove screw and nut securing wear strip to front of slide rail.
4. Notch side of wear strip, near front end of suspension, using hammer and chisel.

CAUTION

Use care when cutting wear strips to prevent damage to slide rails.



5. Remove wear strips.
- Align track opening (space between clips) with wear strip at rear of suspension.
 - Tap wear strip rearward, off from slide rail.



Wear Strip Installation

NOTE: Be sure track tension has been loosened to provide clearance necessary between track bars for wear strip installation.

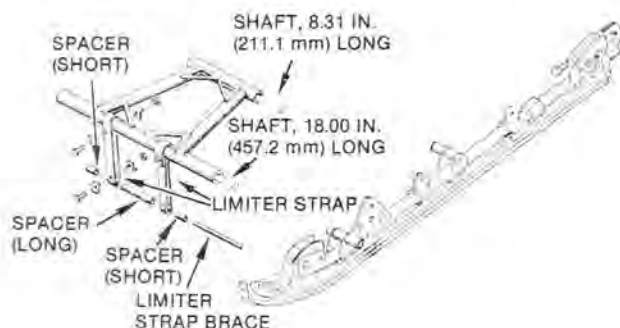
1. Insert wear strip through track openings at rear of suspension onto slide rails.

- Reduce effort required during installation by lubricating wear strip and slide rail.
2. Tap wear strip forward until holes between wear strip and slide rail are aligned.
 3. Secure wear strip to slide rail by installing screw and nut.
- Torque nut to 25 in. lb (0.3 kg-m).
4. Adjust track tension.
- Refer to Track Tension procedure.

Front Swing Arm

Front Swing Arm Removal

1. Remove suspension.
 - Refer to Suspension Removal procedure.
2. Separate front swing arm from suspension assembly.
 - Unscrew limiter strap brace bolts.
 - Remove rear pivot shaft bolts.

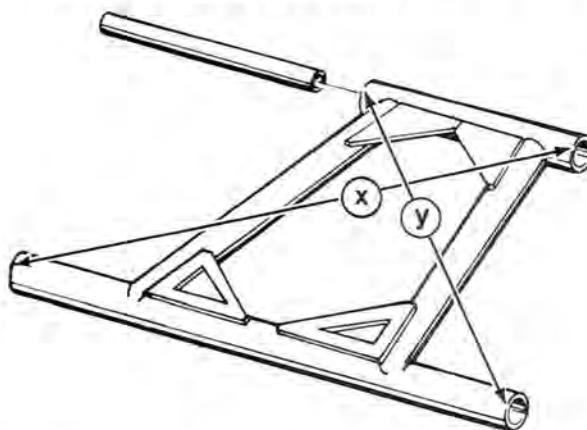


3. Remove limiter straps from swing arm.
 - Unscrew limiter strap mounting hardware.

Front Swing Arm Inspection

1. Check pivot shafts for straightness by placing on a flat surface. Shafts must roll easily and smoothly. Straighten or replace bent shaft.
2. Inspect swing arm for broken or cracked welds along brackets and pipes (tubing). Repair or replace as necessary.

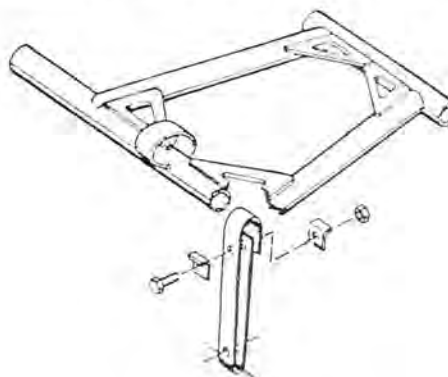
3. Check straightness of swing arm pipes (tubes) by inserting a good pivot shaft into pipe openings. If pivot shaft slides through pipe easily from one end to the other, swing arm pipes are good. If pivot shaft binds, repair or replace front arm.



4. Measure swing arm as shown. If dimension "X" is different than dimension "Y" by 1/8 in. (3.2 mm) or more, repair or replace front arm.
5. Inspect limiter straps for deterioration. Replace straps if necessary.

Front Swing Arm Installation

1. Secure limiter straps to front swing arm.
 - Torque nuts to 45 in. lb (0.6 kg-m).



2. Apply low temperature ep (extreme pressure) type grease to pivot shafts.
3. Secure rear pivot shaft to suspension rail brackets.
 - Torque bolts to 25 ft lb (3.5 kg-m).
4. Fasten front limiter strap brace to suspension slide rails.
 - Torque bolts to 25 ft lb (3.5 kg-m).

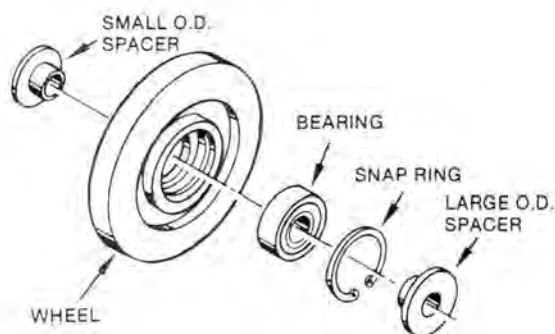
5. Install suspension.
 - Refer to Suspension Installation procedure.

Idler Wheels

Idler Wheel Inspection

1. Replace idler wheel if rubber is excessively worn.
2. Spin wheel and check for noise or binding.
 - Wheel should rotate freely. Replace bearing if necessary.
3. Check for worn plastic spacers by wobbling wheel from side to side while wheel assembly is mounted.
 - Excessive movement indicates worn spacers or shaft. Replace defective item.

Idler Wheel Repair



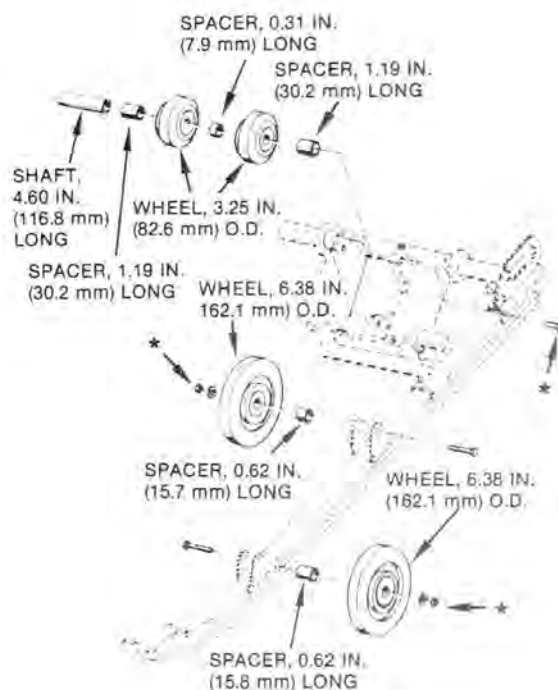
1. Remove wheel spacers.
 - Using a punch, evenly tap large and small spacers from center of wheel.
2. Remove snap ring retaining bearing inside wheel.
3. Tap bearing out of wheel hub.
 - Support wheel hub to prevent damage while removing bearing.

NOTE: Effort required to install bearing can be reduced by placing wheel on light bulb to expand bearing bore.

4. Press bearing into wheel hub.
 - Support wheel hub to prevent damage during installation.

5. Install snap ring to retain bearing.
 - Be sure ring is fully seated in groove of wheel hub.
6. Tap large and small spacers into bearing.

NOTE: When installing wheels on suspension, position large diameter spacer outward for wheels mounted outside slide rails. Wheels mounted between slide rails must have small diameter spacer facing outward.



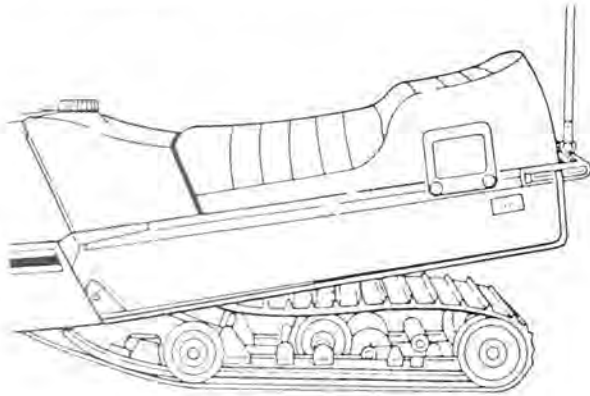
*TORQUE 25 FT LB (3.5 KG-M)

Rear Arm

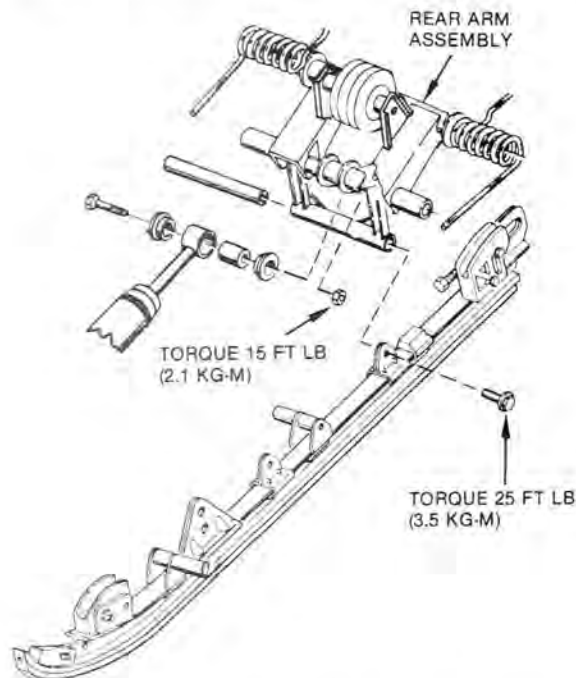
Rear Arm Removal

1. Remove spring tension from rear suspension arm.
 - Refer to Ride Adjustment procedure for details of special tool usage.
2. Separate rear suspension from chassis.
 - Unscrew rear suspension mounting bolts from each side of snowmobile.
 - Raise rear of vehicle.

- Be sure to securely brace snowmobile so it cannot fall.



3. Disconnect shock absorber from rear suspension arm.



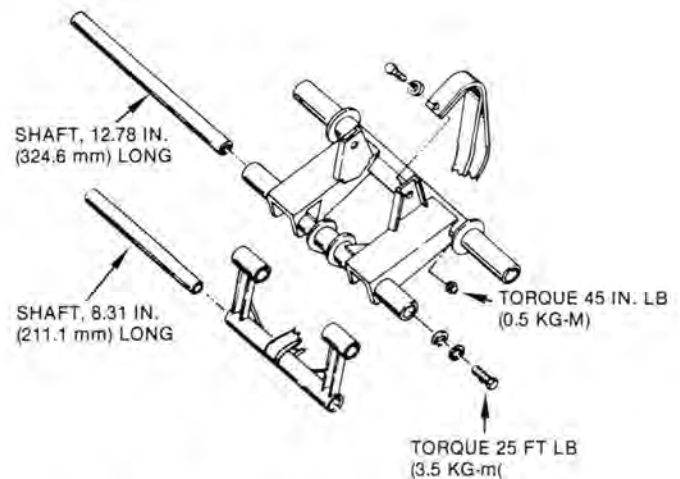
4. Remove rear suspension arm mounting bolts from rail brackets.
- Lift assembly from vehicle.

Rear Arm Inspection

1. Remove limiter strap.
- Unscrew limiter strap bolt from suspension arm.
 - Inspect limiter strap for deterioration. Replace strap if necessary.
2. Disassemble rear arm by removing pivot shafts.

3. Check pivot shafts for straightness by placing on a flat surface.

- Shafts must roll easily and smoothly. Straighten or replace bent shaft.
4. Inspect rear suspension arms for broken or cracked welds along brackets and pipes (tubing).
- Repair or replace as necessary.
5. Check straightness of rear arm pipes (tubes) by inserting a good pivot shaft into all pipe openings.
- If pivot shaft slides through pipe easily from one end to the other, rear arm is good. If pivot shaft binds, repair or replace rear arm.
6. Reassemble rear arm and tighten pivot shaft bolt to 25 ft lb (3.5 kg-m).
- Apply low temperature ep (extreme pressure) type grease to shaft.
7. Install limiter strap.
- Tighten limiter strap nut to 45 in. lb (0.5 kg-m).



Rear Arm Installation

1. Install rear arm assembly to suspension rail brackets.
- Grease rear arm pivot shaft with low temperature ep (extreme pressure) type grease.
2. Connect shock absorber to rear arm.
 3. Secure rear suspension arm to tunnel.
- Tighten bolts to 25 ft lb (3.5 kg-m).

4. Apply tension to rear arm springs.
 - Refer to Ride Adjustment procedure for details of special tool usage.

Rear Axle

Rear Axle Removal

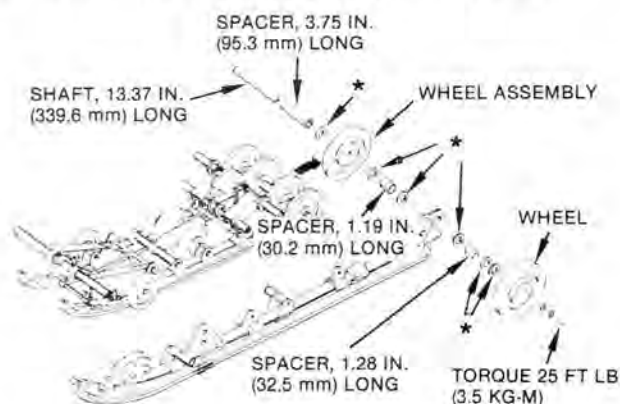
1. Remove suspension.
 - Refer to Suspension Removal procedure.
2. Unscrew bolt from either end of rear axle.
3. Tap rear axle from suspension.
 - Insert small diameter rod or punch into end of rear axle (be careful not to damage threads), then tap rear axle from suspension using a heavy hammer.

Rear Axle Inspection

1. Inspect idler wheels.
 - Refer to Idler Wheel Repair procedure if necessary.
2. Check shaft for straightness by placing on a flat surface.
 - Shaft must roll easily and smoothly. Straighten or replace bent shaft.

Rear Axle Installation

1. Assemble rear axle in sequence shown.



*WASHER, 12 REQUIRED

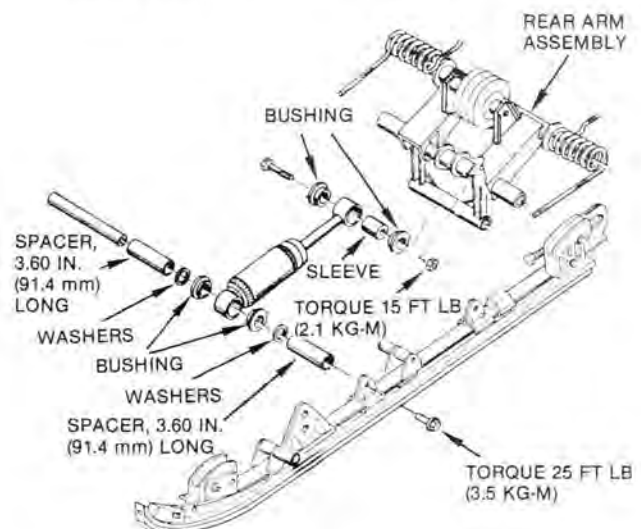
NOTE: During reassembly, be sure spacers and washers are properly placed to insure parallelism between suspension rails and to prevent premature idler wheel failure or track alignment problems.

2. Install suspension.
 - Refer to Suspension Installation procedure.
3. Perform Track Adjustments.
 - Refer to Track Adjustments procedure.

Shock Absorber

Shock Absorber Removal

1. Place snowmobile on its side.
 - Use a blanket or mat to prevent marring vehicle finish.
2. Remove shock absorber.
 - Disconnect shock absorber from rear arm assembly.
 - Remove bolts securing pivot shaft to suspension rail brackets at front of shock absorber.



Shock Absorber Inspection

1. Examine shock body.
 - If there are any signs of leakage or shaft corrosion, replace shock absorber.
2. If bushings or sleeve are worn or deteriorated, they must be replaced.
3. Check pivot shaft for straightness.
 - Shaft should roll smoothly on a flat surface.
 - Straighten or replace bent shaft.

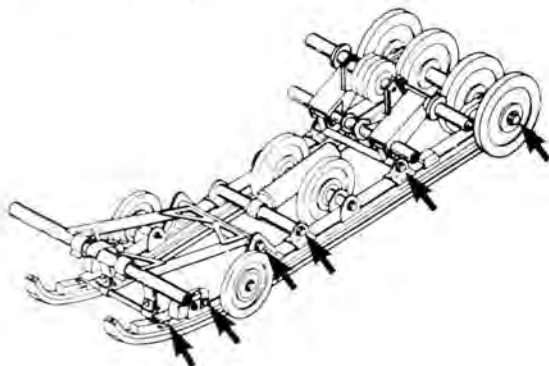
Shock Absorber Installation

1. Attach shock absorber to suspension rail brackets.
 - Position bushings, washers, and spacers as shown.
 - Torque bolts to 25 ft lb (3.5 kg-m).
2. Fasten shock absorber to rear arm assembly.
 - Position bushings and sleeve as shown.
 - Torque nut to 15 ft lb (1.9 kg-m).
3. Carefully lay snowmobile on track.

Suspension Rails

Suspension Rail Disassembly

1. Remove suspension.
 - Refer to Suspension Removal procedure.
2. Unscrew bolts securing slide rail to suspension assembly.



3. Remove brackets, bumpers and cams from rail.
 - Remove mounting hardware as required.

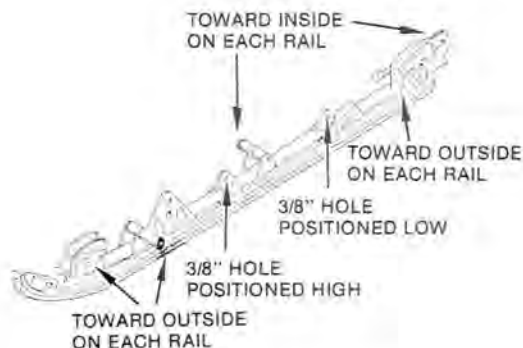
Suspension Rail Inspection

- Check rail I beam and all brackets for distortion or cracks.
- Inspect bumpers for wear and deterioration.
- Repair or replace damaged item.

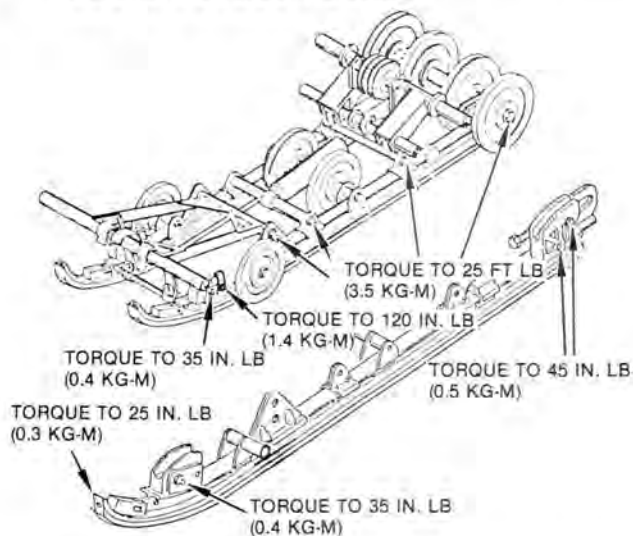
Suspension Rail Assembly

1. Assemble brackets, cams and bumpers on to left or right suspension rail as shown.

NOTE: Left hand rail assembly sequence shown.



2. Mount slide rail to suspension assembly.
 - Torque slide rail component mounting hardware to the value indicated.



3. Tighten bracket to slide rail mounting bolts to 120 in. lb (1.4 kg-m).
4. Tighten all idler wheel mounting bolts to 25 lb ft (3.5 kg-m).
5. Install suspension.
 - Refer to Suspension Installation procedure.

Driveshaft and Track

Driveshaft and track service is as described beginning on page 3-116 in the Invader Shop Manual, except for track repair.

Track Repair

1. Inspect track.
 - If track is torn, cracked, or gouged, it must be replaced.
 - Check for broken, worn, or missing track clips.
2. Remove any defective track clips.

NOTE: It is not necessary to drill completely through clip. Small indentations are sufficient to permit clip to split.

- Drill a series of indentations across top of clip.
- Split clip along indentations with a hammer and chisel.



3. Install new clips.
 - Position clips on track as shown.
 - Compress with track clip assembly tool (P/N 57001-3519) as shown.



Steering System

Steering system service is as described beginning on page 3-122 in the Invader Shop Manual, except for the addition of special washers to the rear spring bolts.

