SECTION 2 - CHASSIS

MERCURY
SNOWMOBILES

PART E - SUSPENSION and TRACK

MERCURY MARINE

A BRUNSWICK COMPANY

INDEX

SUSPENSION and TRACK

GENERAL

Track suspension is provided by 3 bogie wheel sets (Figure 1) or a slide rail suspension suspended in the chassis on pivot shafts. On bogie wheel models, rear axle assembly (idler) is suspended by a spring loaded idler arm on each side of the chassis.

Front axle drives the track by means of a sprocket splined to one end and driven by a chain running in a sealed chaincase. The endless track consists of crisscrossed layers of nylon, rayon or polyester in synthetic rubber.

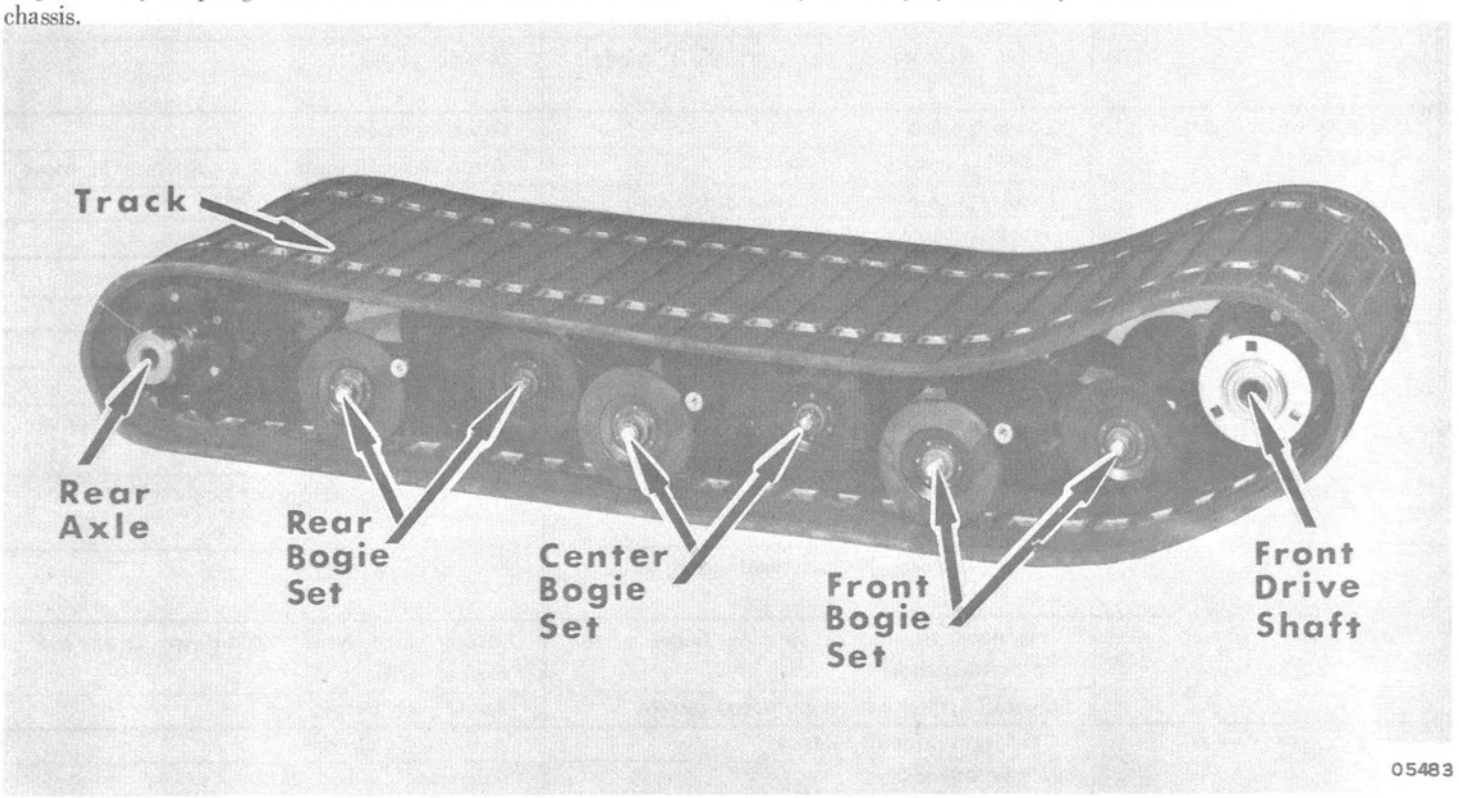


Figure 1. Suspension and Track

TROUBLESHOOTING

CONDITION	PROBABLE CAUSE	REMEDY
Track binding	Frozen to ground	Free track
	Stiffness due to extreme cold	Proper warmup
	Ice build-up in chassis "tunnel"	Remove ice from tunnel
	Tension too tight	Adjust tension
	Slides sticking or damaged (S/R models only)	Replace slides
Track "jumps" teeth on sprockets	Loose tension	Adjust tension
	"Dry" operation	Apply rubber lubricant or operate in snow
	Incorrect alignment between sprockets	Correct sprocket alignment
	Track and/or sprocket drive lugs worn	Replace track and/or sprockets
Wear on edge of track	Misalignment	Align track
	Drive shaft not centered	Center drive shaft
Loss of speed	Misalignment	Align track
	Tension too tight	Adjust tension
	Bogie wheels inverted	Rotate bogie wheels and route hold-down strap properly
	Worn bearings in rear axle, bogie wheels or drive shaft	Replace worn bearings or bogie wheels
	Slides sticking or damaged (S/R models only)	Replace slides
Bogie wheels inverted	Improper routing or missing bogie wheel hold-down strap	Install bogie wheel hold-down strap with correct routing
	Operating over extremely rough terrain	Avoid such terrain
Rapid sprocket wear	Operation on hard surface	Avoid such surface
	Misalignment	Align track
	Tension too tight	Adjust tension
	Incorrect alignment between sprockets	Correct sprocket alignment
	Metal clips missing from track	Replace clips
Cuts, checking or cracking of track	Operating over sharp objects	Avoid such objects
	Considerable wear	Replace track
	Tension too tight	Adjust tension
	Operating with missing clips	Replace clips
	Tire of bogie wheel missing	Replace bogie wheel and/or tire
Clips missing or damaged	Considerable wear	Replace track
	Operating over sharp objects	Avoid such objects
	Improper tension	Adjust tension
	Misalignment	Align track
"Bottoming out"	Snowmobile overloaded	Reduce load
	Bogie wheels inverted	Rotate bogie wheels and route hold-down strap properly
	Broken bogie wheel suspension springs and/or rear idler arm springs	Replace broken springs
	Suspension improperly adjusted for load (S/R models only)	Readjust

200, 220, 250, ROCKET and LIGHTNING MODELS

TRACK TENSION and ALIGNMENT

Proper track tension and alignment are essential to eliminate undue wear to drive components and track and to maintain efficient, economical operation of the snowmobile.

Check track tension and alignment after first 3-5 hours of operation and every 25 hours of operation thereafter. Tension should be set as follows: 200, 220 and 250 - ¼"-1", Rocket and Lightning - ¼" maximum. Tension in track is obtained at center of track when snowmobile is at rest with track supporting weight of snowmobile.

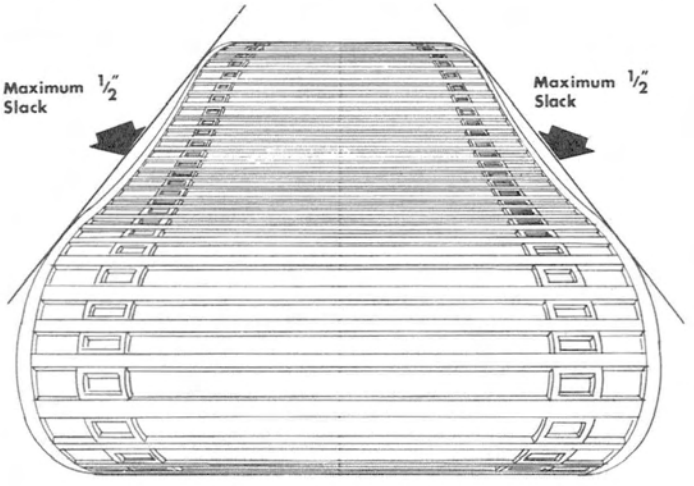


Figure 2. Typical View of Slack in Track

Adjust track tension as follows (220 and 250 Models):

1. Loosen adjustment anchor screws ("A" in Figure 3) and tighten adjusting nuts or screws ("B" or "C" in Figure 3) equally on both sides of vehicle until correct tension is achieved.
2. Tighten anchor screws "A".

IMPORTANT: Always check track alignment, as outlined immediately following, after performing a track tension adjustment.

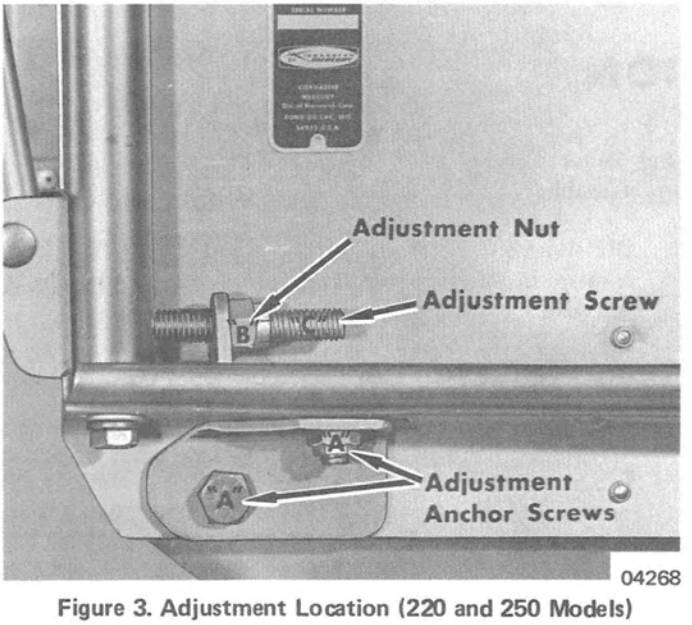


Figure 3. Adjustment Location (220 and 250 Models)

Adjust track tension as follows (200, Rocket and Lightning Models):

1. Loosen nuts on idler arm anchor screws ("A" in Figure 4) and adjust tension screws ("B" in Figure 4) equally on both sides of the vehicle until correct tension has been acquired.
2. Tighten nuts on anchor screws "A".

IMPORTANT: Always check track alignment, as outlined immediately following, after performing a track tension adjustment.

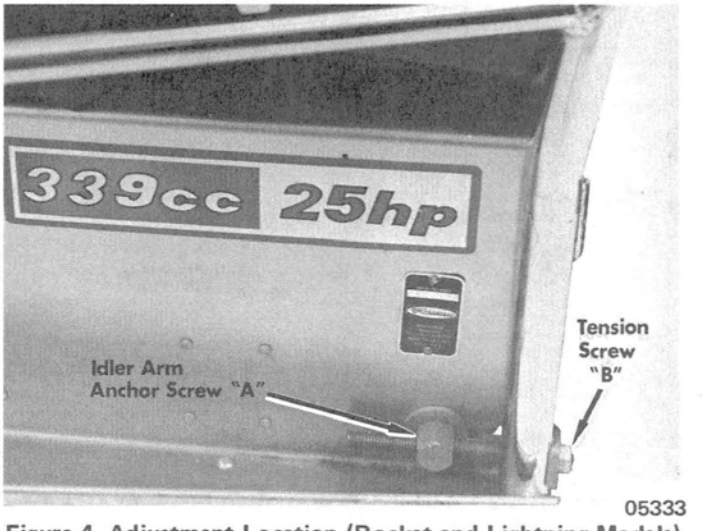


Figure 4. Adjustment Location (Rocket and Lightning Models)

Adjust track alignment as follows:

1. Place vehicle on its rear stand, or support rear of vehicle, with front end blocked for stability.

   NOTE On 220 and 250 Models with long track adjustment (3" screws), hex head screws (rather than carriage bolt) are used. To adjust track alignment, it is necessary to support rear of vehicle by means other than the rear stand so that a wrench can be placed on adjusting screw ("C" in Figure 3)

2. Start engine and run drive mechanism.

CAUTION: At this time, before stepping behind the vehicle to observe track alignment, make certain that the track is free of all particles which, possibly could be thrown out by the moving track. Keep hands and feet clear of track at all times.

3. Scan the moving track, making certain that the track centers itself between the sides of the chassis, and that teeth on sprockets enter evenly into drive slots of track. If track is not centered or drifts to either side, an adjustment is necessary. An improperly aligned track always will run or drift toward the LOOSE side, and this condition requires a track tension adjustment on the loose side only. Refer to "Adjust Track Tension", preceding.

REAR AXLE
REMOVAL

1. Lift and support rear of vehicle at a convenient working height.
2. Loosen track tension as far as possible. Refer to "Tension Adjustment", preceding.
3. Remove bogie tie-down strap and rotate bogie wheel sets 180° on axis to further relieve track tension. Relieve idler arm spring tension by moving spring from behind chassis.
4. Remove idler arm retaining screws from both sides of vehicle. (Figure 5)
5. Remove idler arms from axle assembly.

   NOTE: Bearings on rear axle are retained in cup of idler arms by a retaining screw in idler arm. By turning arm assemblies at approximate 45° angle to axle, idler arms can be removed from axle assembly without removing retaining screw.

6. Remove axle assembly from vehicle.

   NOTE: Install idler spring retaining clip on 250 Model to prevent possibility of rear idler springs slipping off rear brace. To guard against broken idler springs on snowmobiles used in heavy duty load conditions, install heavier idler spring retaining washer C-12-58446.

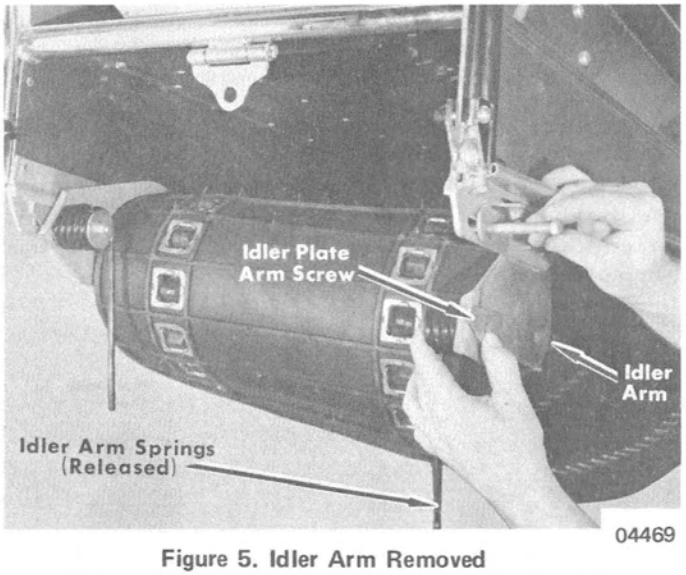


Figure 5. Idler Arm Removed

DISASSEMBLY

1. Remove ball bearings from axle, as follows:
   a. Loosen set screw in bearing lock collar.
   b. Using a punch and hammer, place punch in detent on locking collar and tap in opposite direction of normal axle rotation to loosen collar. (Figure 6)
   c. Slip bearing and collar from axle.
2. Remove sprocket retaining hubs and idler sprockets from axle.

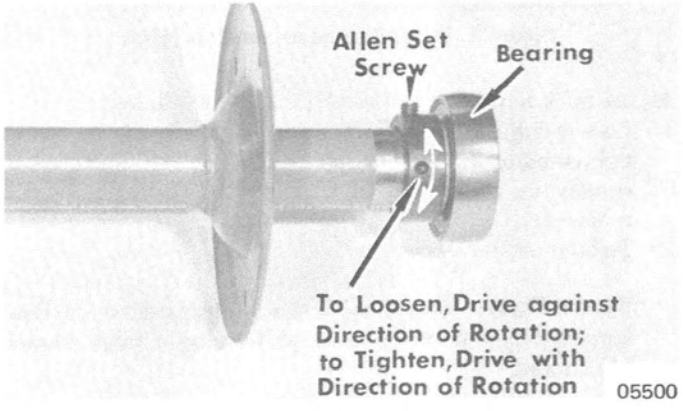


Figure 6. Axle Lock Collar

INSPECTION

SPROCKETS

Check for cracks, cuts and chipped or broken teeth. Rapid wear or chipped and broken teeth generally result from considerable vehicle use on hard surfaces, such as, ice, roads or frozen ground. Excessive wear at root of teeth usually is the result of (1) operating with incorrect track tension and/or alignment, (2) metal clips in track loose or missing or (3) incorrect alignment between idler sprockets.

IMPORTANT: Idler sprockets may show considerable wear but still perform satisfactorily. It should not be necessary to replace sprockets unless track slippage, jumping or misalignment of track occurs.

BEARINGS

Check for rough operation and/or excess play between inner and outer bearing race. Replace if bearing condition is questionable.

IMPORTANT: Ball bearings are a sealed unit. DO NOT immerse in solvent or cleaning fluid. DO NOT attempt to lubricate.

AXLE

Check axle to make sure it has not been bent or sprung and that welded hubs on axle are parallel with each other.

NOTE: Check wall thickness of axle on all 220 Models below VEHICLE Serial No. 2547366. Axle must have a minimum of .120" wall thickness. Replace axle if wall thickness is less than this dimension.

REASSEMBLY

1. Place spacers in sprocket mounting holes and mount sprockets and retaining hubs on axle. DO NOT torque retaining screws at this time.
2. With sprocket retaining screws snug, employ one of the following methods to check parallel alignment between sprockets:
   a. Place axle assembly on good flat surface. With axle resting on 2 teeth of each sprocket, apply light pressure on axle and attempt to "rock" axle on flat surface. If "rocking" is noted, shift either sprocket as necessary to remedy this condition.
   b. Place a straight edge across both sprockets at root of teeth. Sprockets must be parallel (tooth-for-tooth ± 3/64").

AXLE

1. Torque sprocket retaining screws to specifications.
2. Install lock collar and bearing on axle. Place inner bearing race flush with end of axle tubing.
3. Position lock collar on bearing eccentric with rotation of axle, as shown in Figure 6. Tap lock in direction of rotation to lock collar.
4. Secure lock collar with set screw.

INSTALLATION

1. Place rear axle assembly in track.
2. Install idler arms on axle assembly and install in chassis.
3. Place idler arm springs behind chassis bar to apply tension.
4. Rotate bogie wheels into correct position and install tie-down strap.
5. Adjust track tension and alignment as previously outlined.

BOGIE WHEEL SET

220 and 250 MODELS

REMOVAL

1. Use chain hoist and lift rear of vehicle.
2. Release track tension by loosening idler arm retaining screws and turning idler arm adjusting nut counterclockwise. (Figure 1)
3. Release idler arm spring by pushing end of spring away from chassis, bending toward center of track until it clears chassis, then pulling straight back.
4. Disconnect bogie wheel tie-down strap.

NOTE: To change a bogie wheel assembly, it is not necessary to remove complete set of bogies from vehicle.

5. Remove bogie pivot shaft screws from one side of vehicle. (Figure 1)
6. Pull downward on disconnected end of bogie pivot shaft until it clears chassis, then slide bogie tube assembly partially off pivot shaft. (Figure 2)
7. Hold exposed section of center (bogie set) pivot shaft, with a pair of vise-grips or pliers (to prevent turning) and remove pivot shaft screw on opposite side of vehicle.

IMPORTANT: DO NOT score pivot shaft. If metal is scored, file smooth again before reinstallation. Bogie tube assembly must pivot freely on pivot shaft.

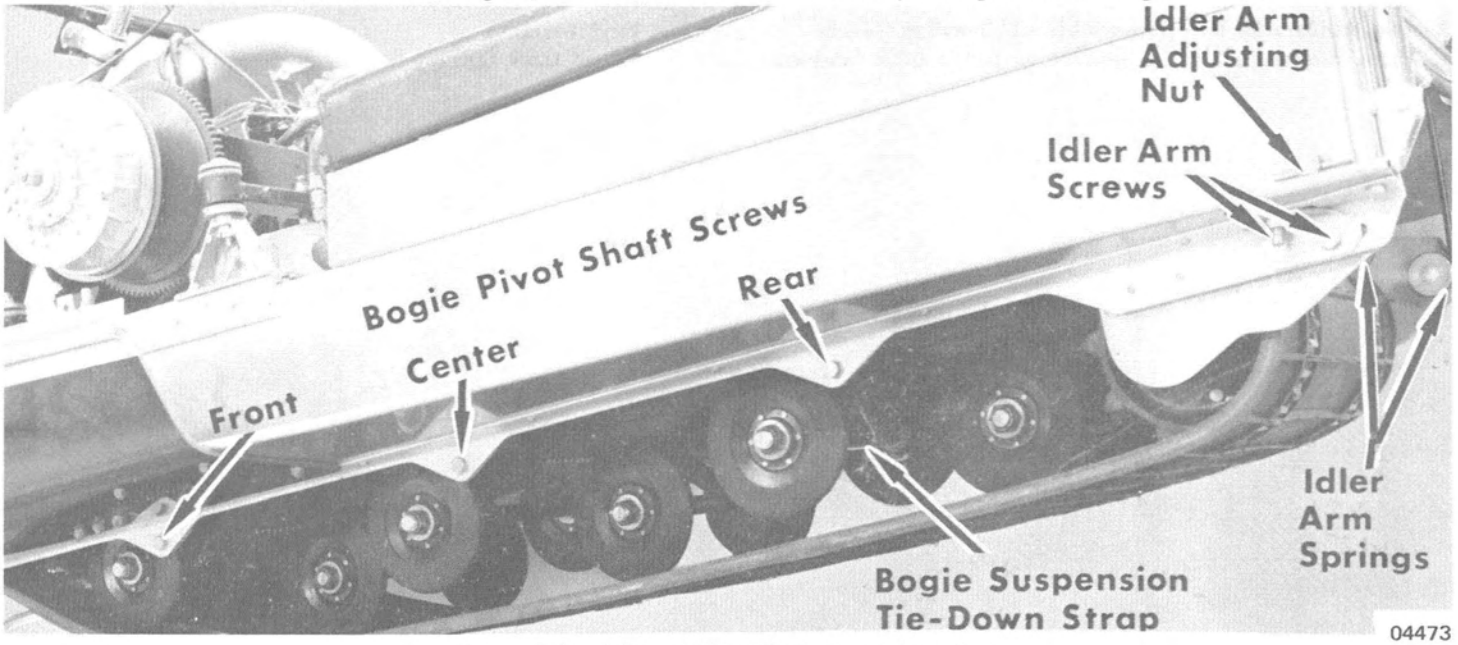


Figure 1. Bogie Wheel Pivot Shaft Screw Location

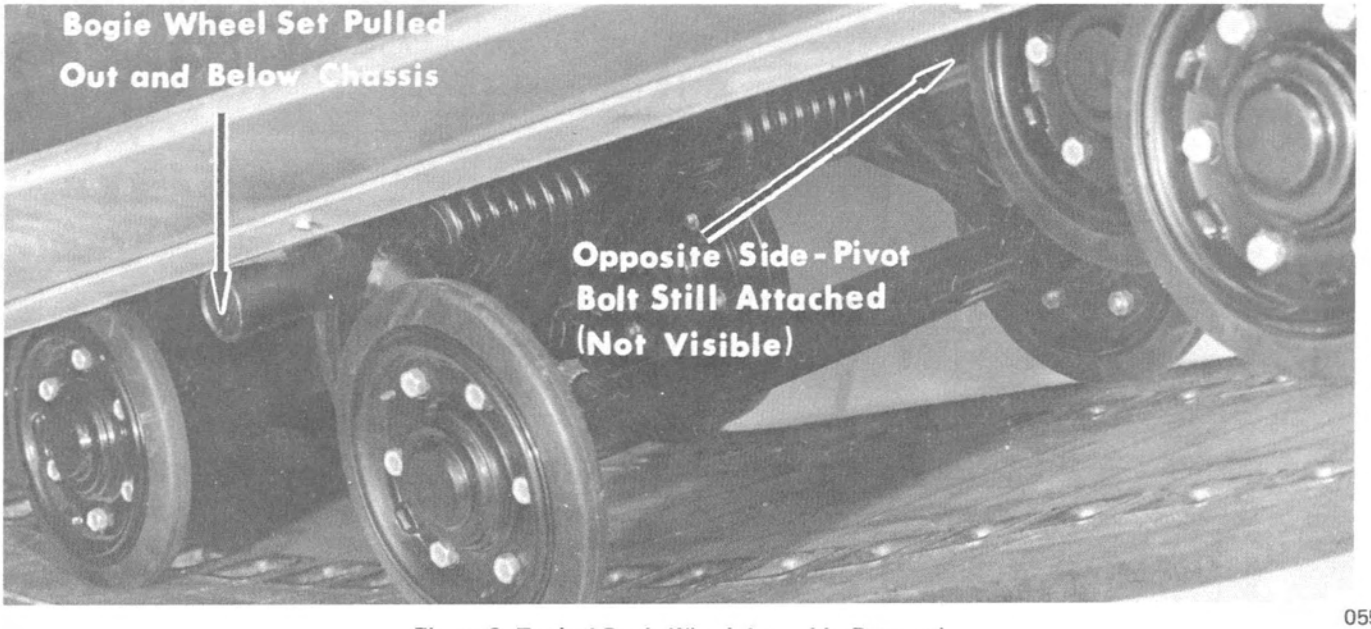


Figure 2. Typical Bogie Wheel Assembly Removal

DISASSEMBLY

1. Remove bogie wheel and axle from tube assembly by removing nut on one side, then sliding axle out of tube assembly. (Figure 3)
2. Place bogie axle in vise (with brass jaw protectors) and remove second bogie wheel by removing nut.
3. Remove second axle from tube assembly, as explained in Steps 1 and 2.
4. Open 4 tension spring retaining clips (on tube assembly) and disconnect tension spring ends. (Figure 3)
5. Slide pivot shaft out of tube assemblies.
6. Separate tube assemblies and remove tension springs.

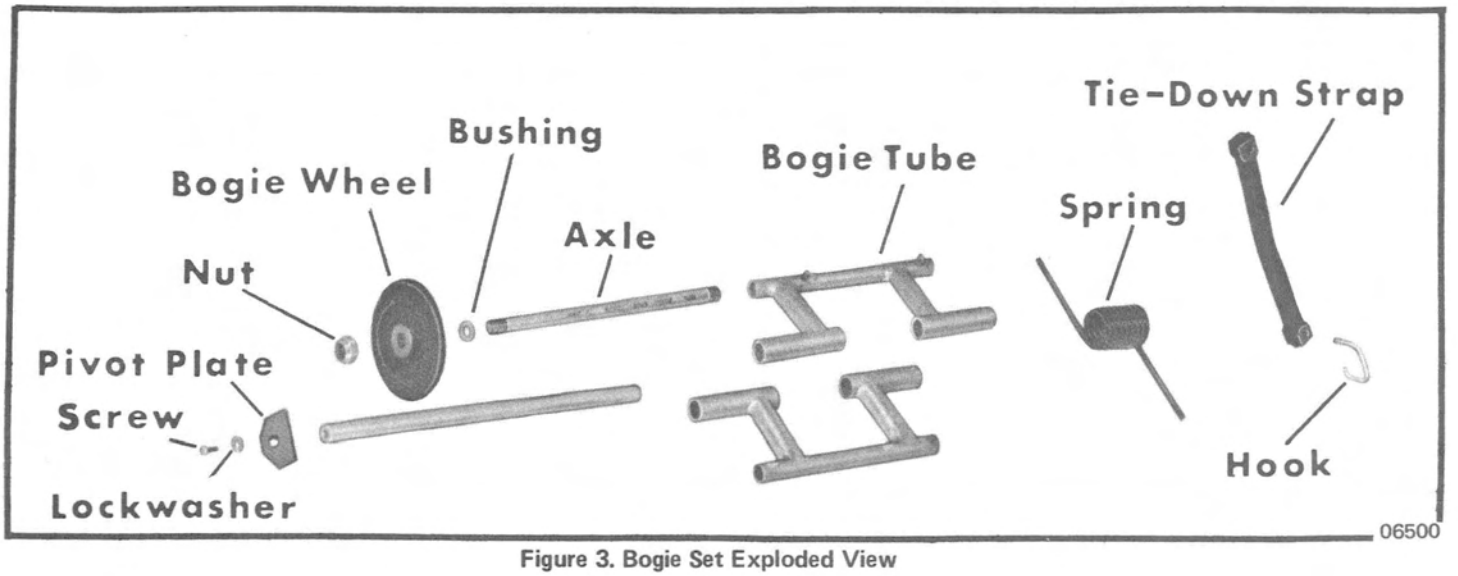


Figure 3. Bogie Set Exploded View

INSPECTION

1. Check axles and pivot shafts for straightness.
2. Inspect tube assemblies, bogie wheel and springs for damage.
3. Check sealed bearing (on bogie wheel) for roughness. If bearing is rough, replace complete bogie wheel.

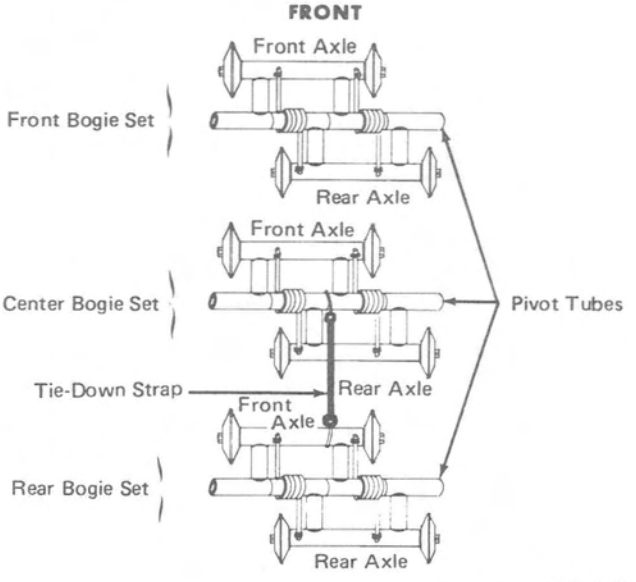
REASSEMBLY

1. Place tension springs on tube assemblies. Align tube assemblies and insert pivot shaft.
2. Anchor tension spring ends to tube assemblies by placing ends (of springs) in retaining clips and bending clips over.
3. Insert bogie axles thru tube assemblies. Place bushings, then bogie wheels on axle.
4. Thread elastic stop nuts on axle and tighten. Torque nuts to specifications.

INSTALLATION

1. Install front set of bogies first (if removed). Place bogie set on track and secure pivot shaft to chassis with screw, making sure that pivot screw plate is between chassis and pivot shaft. (Figure 1)
2. Next, install rear, then center set of bogies (if removed).
3. Torque pivot shaft screw to specifications.
4. Connect bogie suspension tie-down strap. (Figure 3A)

Figure 3A. Bogie Wheel Tie-Down Strap Location



5. Reconnect idler arm springs to chassis by bending end of spring toward center of track tunnel until spring clears chassis. Push end of spring forward until it is inside of track tunnel, then release.
6. Readjust track as explained in "Track Adjustment" and "Track Alignment", preceding.

200 MODEL

REMOVAL

1. Use chain hoist and lift rear of vehicle.
2. Release track tension by loosening idler arm retaining screws and turning idler arm adjusting nut counterclockwise.
3. Release idler arm spring by pushing end of spring away from rod in chassis, bending toward center of track tunnel until it clears rod, then pulling straight back.
4. Disconnect bogie wheel tie-down strap.
5. Remove bogie pivot shaft screw from one side of vehicle. Slide out plate which is located between pivot shaft and chassis.
6. Pull downward on disconnected end of bogie pivot shaft, until it clears chassis, then slide bogie tube assembly off pivot shaft.
7. Hold exposed section of center (bogie set) pivot shaft with a pair of vise-grips or pliers (to prevent turning) and remove pivot shaft screw on opposite side of vehicle. (Figure 4)

IMPORTANT: DO NOT score pivot shaft. If metal is scored, file smooth again before reinstallation. Bogie tube assembly must pivot freely on pivot shaft.

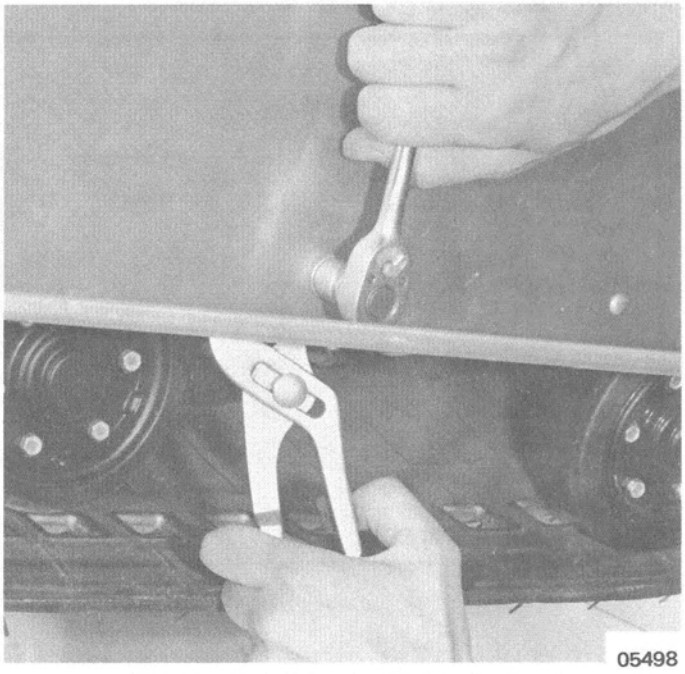


Figure 4. Bogie Wheel Assembly Removal

DISASSEMBLY (Figure 5)

Bogie wheels can be removed with or without disassembly of bogie wheel set.

1. Remove 6 bolts which hold inner and outer wheel hubs together.
2. Pull off outer hub and tire.
3. Pull out red plastic plug from tube assembly.

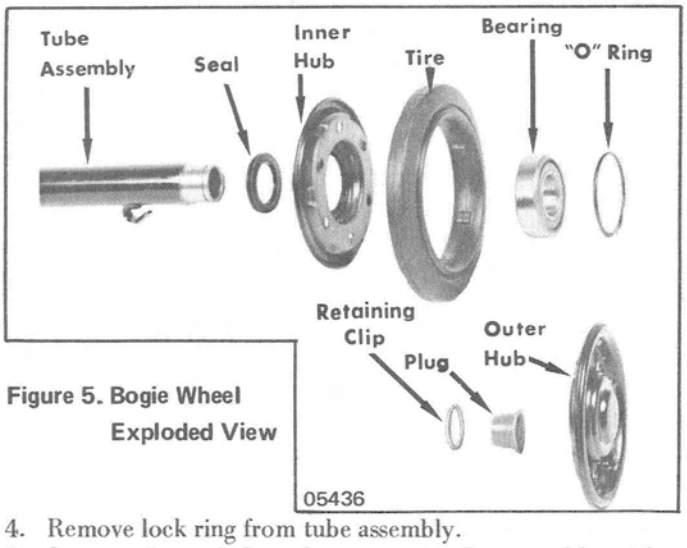


Figure 5. Bogie Wheel Exploded View

4. Remove lock ring from tube assembly.
5. Support inner hub and press out tube assembly with a suitable mandrel. (Figure 5)
6. Bend spring retainer on tube assembly upward to relieve spring tension.

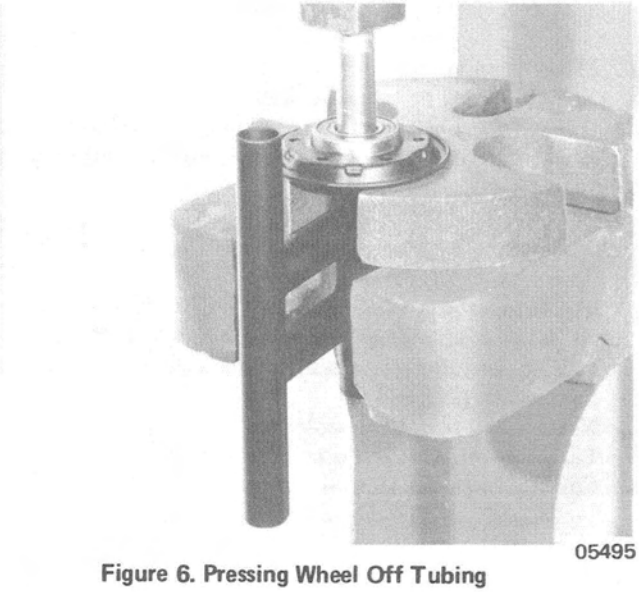


Figure 6. Pressing Wheel Off Tubing

7. Pull out pivot shaft from bogie wheel set.
8. Separate tube assemblies and remove tension springs.

CAUTION: Support wheel on outside diameter of inner hub to prevent damage to seal area.

NOTE: Bogie tension springs are not interchangeable from side-to-side (3 right side and 3 left side).

CLEANING and INSPECTION

1. Clean all parts and inspect for damage or wear.
2. Check wheel bearings for roughness.
3. Check tires for wear.

REASSEMBLY

NOTE: Bogie tension springs are not interchangeable (3 right side and 3 left side).

1. Place tension springs and tube assemblies in position. Insert pivot shaft.
2. Secure tension springs to tube assemblies by placing springs ends into retainers and bending retainers over spring ends.

NOTE: Component parts of bogie wheels (hubs, tires, bearings, retaining clips, and screws) are No Longer Available (NLA). If any of these components are damaged, replace with complete bogie wheel assembly (D-58537A2). Follow reassembly procedures outlined under Rocket and Lightning.

3. To replace any bogie wheels (which were removed), support tube assembly in press.
4. Position inner hub with seal installed on tube assembly.
5. Press bearing on tube assembly with open side up, using suitable tubing or socket with larger ID than tube assembly. (Figure 7)
6. Install lock ring in groove of tube assembly.
7. Insert red plastic plug in tube assembly.
8. If wheel bearing was replaced, pack with Low Temperature Grease (C-92-59999-12).
9. Place "O" ring on outside diameter of bearing.
10. Install tire between inner and outer hub and secure wheel together with 6 bolts and nuts.

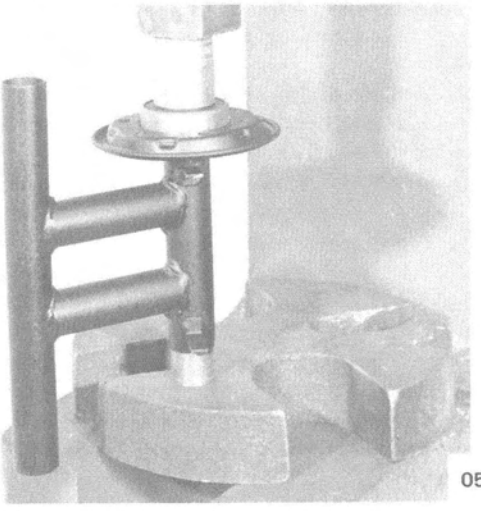


Figure 7. Installing Wheel Bearing

INSTALLATION

1. Install front set (set with extended front wheels) of bogies first (if removed). Place bogie set on track, with wide set of bogie wheels toward rear of vehicle (Figure 8), and secure pivot shaft to chassis with screws, making sure that pivot screw plates are between chassis and pivot shaft.
2. Next, install rear and then center set of bogies (if removed).

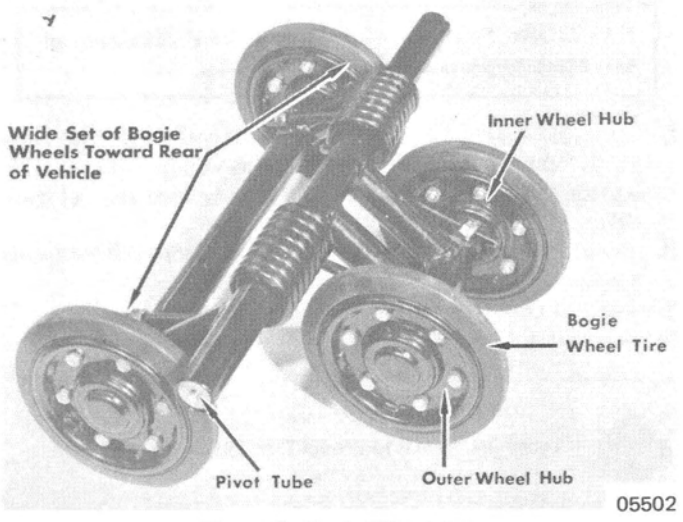


Figure 8. Bogie Wheel Set

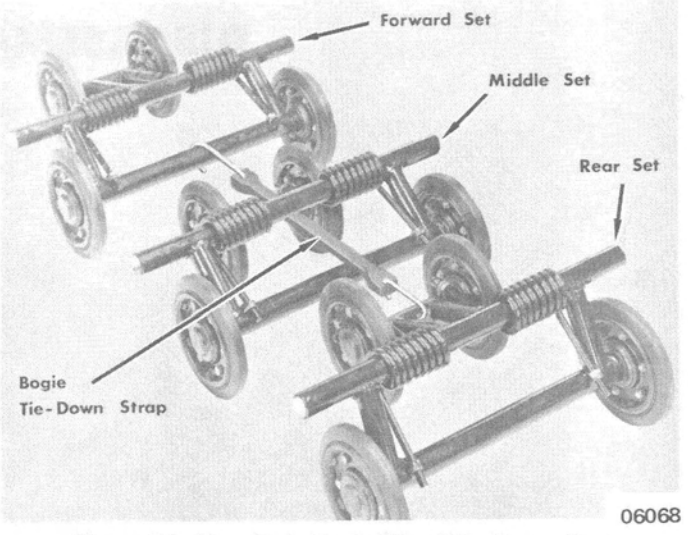


Figure 8A. New Style Bogie Wheel Tie-Down Strap

3. Torque pivot shaft screw to specifications.
4. Connect bogie suspensions tie-down strap as follows:

NOTE: A new style, tie-down strap prevents bogie wheel sets from inverting during operation. Use 2 D-59373 hooks to modify standard tie-down strap. Route strap as shown in Figure 8A.

a. Hook one end of strap to "REAR" axle of "FORWARD" bogie wheel set.
b. Route strap toward rear of vehicle over both axles and under pivot shaft of middle bogie set. Hook on "FRONT" axle of "REAR" bogie wheel set.
c. To prevent strap from unhooking, close hooks with pliers.

5. Reconnect idler arm springs to chassis by bending end of spring toward center of track tunnel until spring clears chassis. Push end of spring forward until it is inside of track tunnel, then release.
6. Readjust track as outlined in "Track Adjustment" and "Track Alignment", preceding.

ROCKET (339cc) and LIGHTNING (398cc)

REMOVAL

1. Use chain hoist and lift rear of vehicle.
2. Release track tension by loosening idler arm retaining screws and turning idler arm adjusting nut counterclockwise.
3. Release idler arm spring by pushing end of spring away from chassis, bending toward center to track tunnel until it clears chassis, then pulling straight back.
4. Disconnect bogie wheel tie-down strap.
5. Remove bogie pivot shaft screws from one side of vehicle. Slide out plate which is located between pivot shaft and chassis.
6. Pull downward on disconnected end of bogie pivot shaft until it clears the chassis, then slide bogie tube assembly partially off pivot shaft.
7. Hold exposed section of center (bogie set) pivot shaft with a pair of vise-grips or pliers (to prevent turning) and remove pivot shaft screw on opposite side of vehicle. (Figure 9)

IMPORTANT: DO NOT score pivot shaft. If shaft is scored, file smooth again before reinstallation. Bogie tube assembly must pivot freely on pivot shaft.

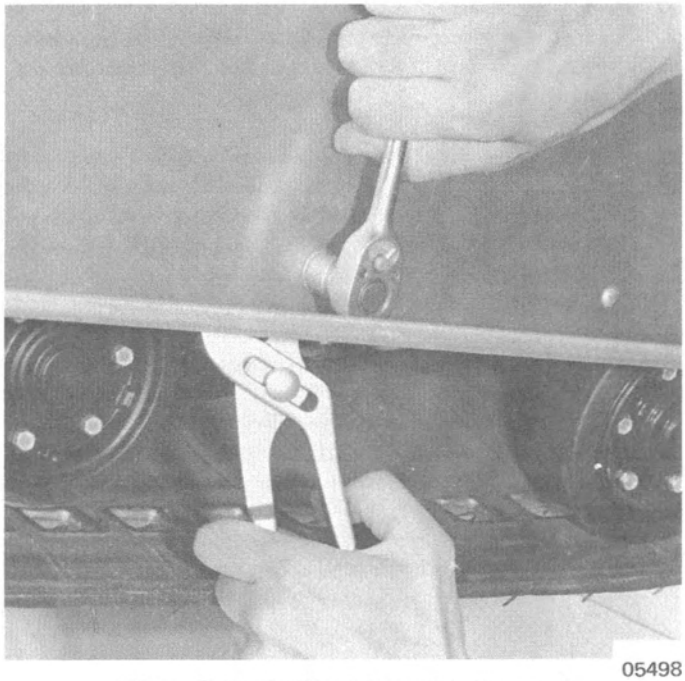


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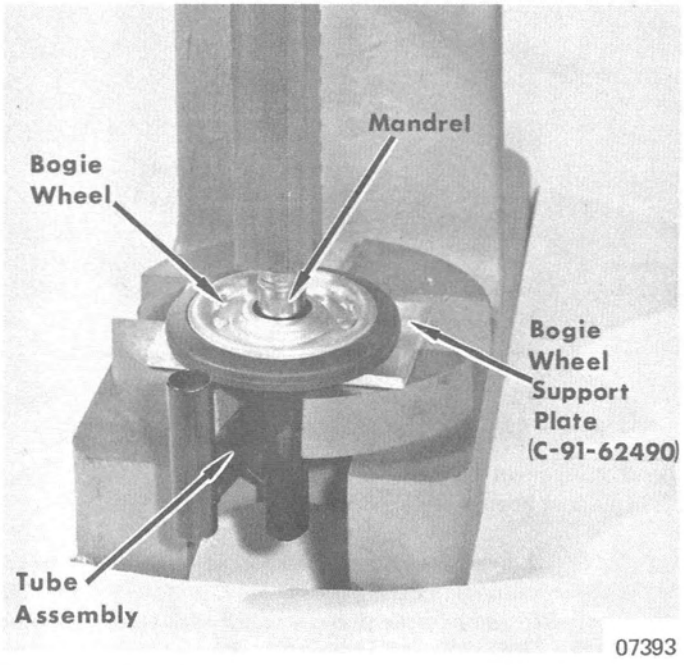
Figure 9. Bogie Wheel Assembly Removal

DISASSEMBLY (Figure 10)



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Bogie wheels can be removed with or without disassembly of bogie wheel set.

1. Remove center cap from wheel hub.

> **CAUTION: Support wheel on outside diameter of inner hub to prevent damage to seal area.**

2. Support inner hub with Bogie Wheel Support Plate (C-91-62490) and press out tube assembly with suitable mandrel. Wheel bearing is staked to tube assembly. (Figure 10)
3. Bend up spring retainer on tube assembly to relieve spring tension.
4. Pull out pivot shaft from bogie wheel set.
5. Separate tube assemblies and remove tension springs.

Figure 10. Pressing Wheel Off Tubing

CLEANING and INSPECTION

1. Clean all parts and inspect for damage or wear.
2. Check wheel bearings for roughness and tires for wear.

REASSEMBLY

1. Place tension springs and tube assemblies in position. Insert pivot shaft.

   NOTE: Bogie tension springs are not interchangeable (3 right side and 3 left side). Install WHITE higher tension springs on front bogie wheel set (set with extended front wheels).

2. Secure tension springs to tube assemblies by placing spring ends into retainers and bend over retainers.
3. To replace any bogie wheels which were removed, support tube assembly in press with Bogie Wheel Support Plate (C-91-62490).
4. Press wheel on tube assembly, using suitable tubing or socket with larger ID than tube assembly. (Figure 11)
5. Stake tube assembly to inner race of wheel bearing in 3 places and install dust cup.

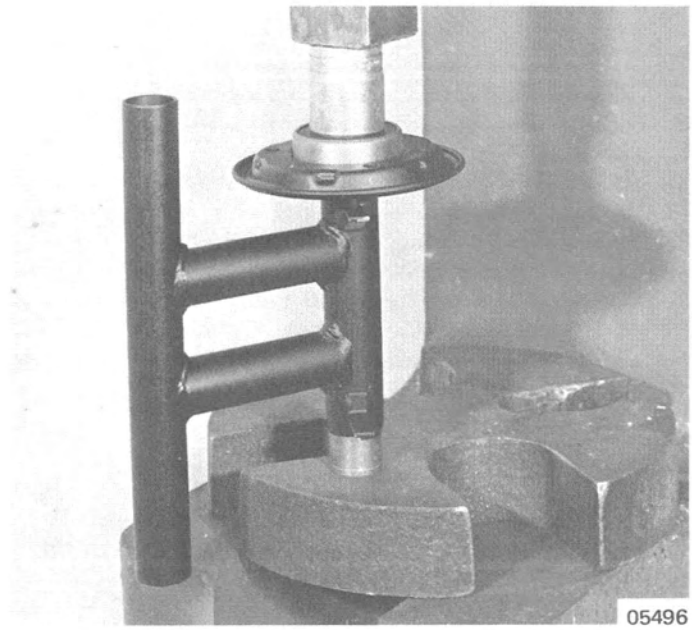


Figure 11. Installing Wheel

INSTALLATION

1. Install front set (set with extended front wheels) of bogies first (if removed). Place bogie set on track with wide set of wheels toward rear of vehicle (Figure 12) and secure pivot shaft to chassis with screw, making sure that pivot screw plate is between chassis and pivot shaft.
2. Next, install rear, then center set of bogies (if removed).
3. Torque pivot shaft screw to specifications.

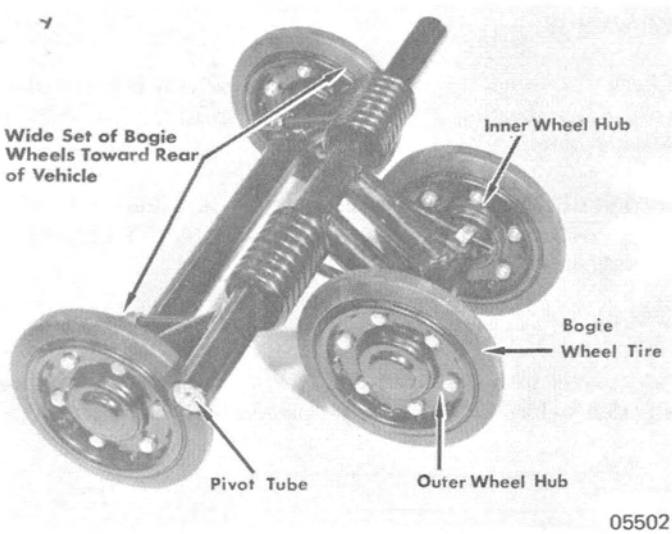


Figure 12. Bogie Wheel Set

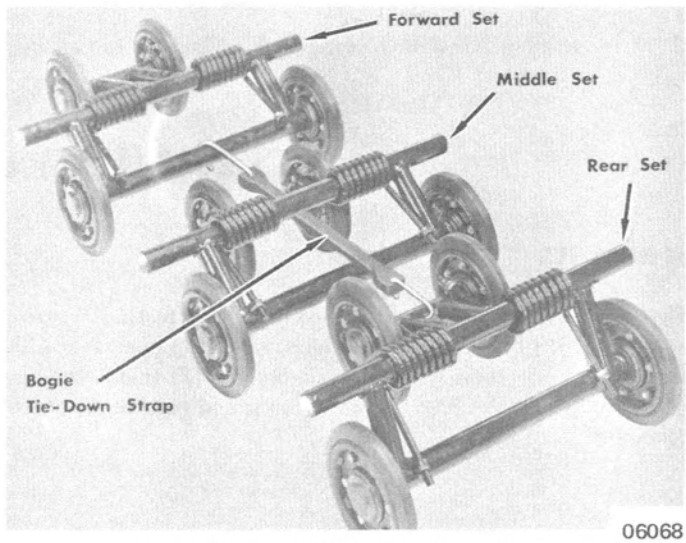


Figure 13. Bogie Wheel Tie-Down Strap

4. Connect bogie suspension tie-down strap. (Figure 13)
5. Install idler arm springs by bending end of spring toward center of track tunnel until spring clears chassis. Push end of spring forward until it is inside of track tunnel, then release.
6. Readjust track as outlined in "Track Adjustment" and "Track Alignment", preceding.

FRONT AXLE

220 and 250 MODELS

REMOVAL

1. Remove top cowl and battery box, if equipped with battery mounted on side of chassis.
2. Drain lubricant from chaincase and remove cover.
3. Loosen chain tension and remove front axle drive sprocket and chain.
4. Lift rear of vehicle. Remove rear axle and bogie wheel sets.
5. Loosen allen screw in left side lock collar on front axle and loosen collar by driving clockwise with a punch. (Figure 1)
6. Remove retaining bolts from right side bearing flangette.
7. Remove retaining bolts or nuts inside chaincase from left side bearing flangette.
8. Move front axle to left and pull right end down to clear chassis.
9. Pull front axle out of chaincase.

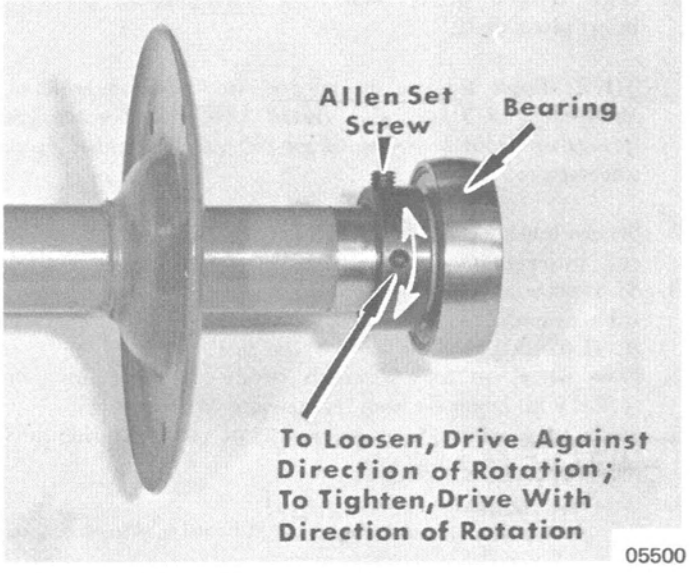


Figure 1. Loosening Lock Collar

DISASSEMBLY

1. Slide oil seal adaptor off splined end of front axle (if so equipped).
2. Loosen allen screw in bearing lock collar and tap against forward rotation with a punch to loosen. Slide bearing, lock collar and flangettes from front axle.
3. Remove hub retaining screws and slide sprockets and hubs from front axle.

CLEANING and INSPECTION

SPROCKETS

Check for cracks, cuts and chipped or broken teeth. Excessive wear at root of teeth usually is the result of (1) operating with incorrect track tension and/or alignment, (2) metal clips in track loose or missing or (3) incorrect alignment between sprockets.

IMPORTANT: Sprockets may show considerable wear but still perform satisfactorily. It should not be necessary to replace sprockets unless track slippage, jumping or misalignment of track occurs.

BEARINGS

Check for rough operation and/or excess play between inner and outer bearing race. Replace if bearing condition is questionable.

IMPORTANT: Ball bearings are a sealed unit. DO NOT immerse in solvent or cleaning fluid. DO NOT attempt to lubricate.

AXLE

Check axle to make sure that it has not been bent or sprung and that welded hubs on axle are parallel with each other.

REASSEMBLY

1. Place spacers in sprocket mounting holes and mount sprockets and retaining hubs on axle. DO NOT torque retaining screws at this time.
2. With sprocket retaining screws snug, use one of the following methods to check parallel alignment (Figure 2) between the sprockets:
   a. Place axle assembly on good, flat surface. With axle resting on 2 teeth of each sprocket, apply light pressure on axle and attempt to "rock" axle on flat surface. If "rocking" is noted, shift either sprocket as necessary to remedy this condition.
   b. Place a straight edge across both sprockets at root of teeth. Sprockets must be parallel (tooth-for-tooth) + 3/64".
3. Torque sprocket retaining screws to specifications.
4. Slide lock collar, bearing flangettes, bearing and oil seal adaptor or inside support plate (if so equipped) on splined end of front axle. DO NOT tighten bearing lock collar.

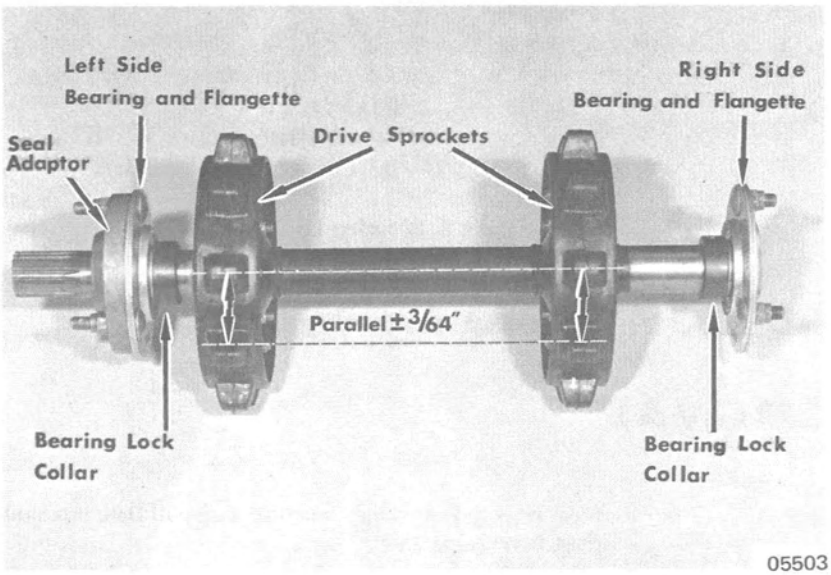
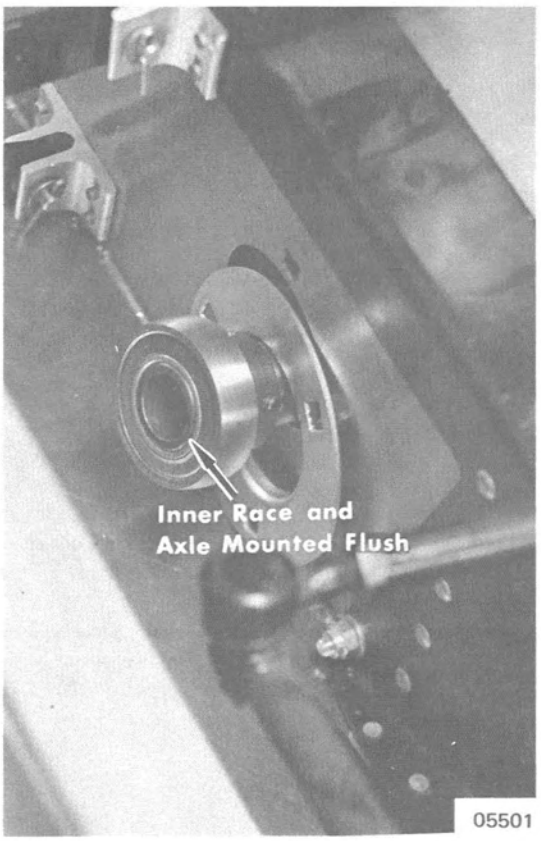


Figure 2. Sprocket and Axle Alignment



INSTALLATION (Figure 3)

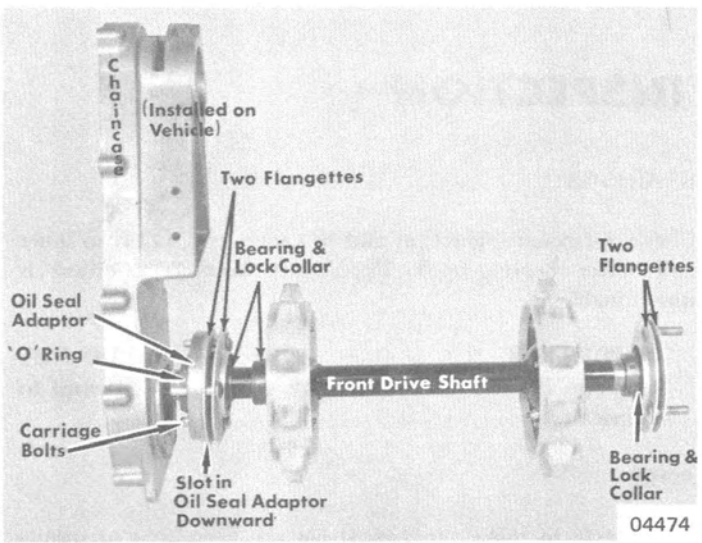


Figure 3. Front Axle Assembly

1. With track in tunnel, place front axle in chassis with splined end in chaincase. Be sure "O" ring on seal adaptor is intact and in position (if so equipped). On models without seal adaptor, place support plate on inside of chassis. Place right side bearing and flangettes on axle and place in position in chassis. (Figure 4)
2. On models below Serial No. 2547837, install bearing and flangettes on splined end of axle through chaincase.
3. Insert bolts through right and left flangettes and secure with washers and retaining nuts.
4. Secure locking collars to eccentrics on inner bearing races of left side bearing by tapping in direction of rotation. (Figure 5)
5. Tighten locking collar allen screw.

   NOTE: Torque locking collar allen screw to specifications to insure etching a full circle bite into the axle.
6. Install drive chain and sprockets.
7. Install chaincase cover and fill chaincase with lubricant, as specified.
8. Install top cowl.

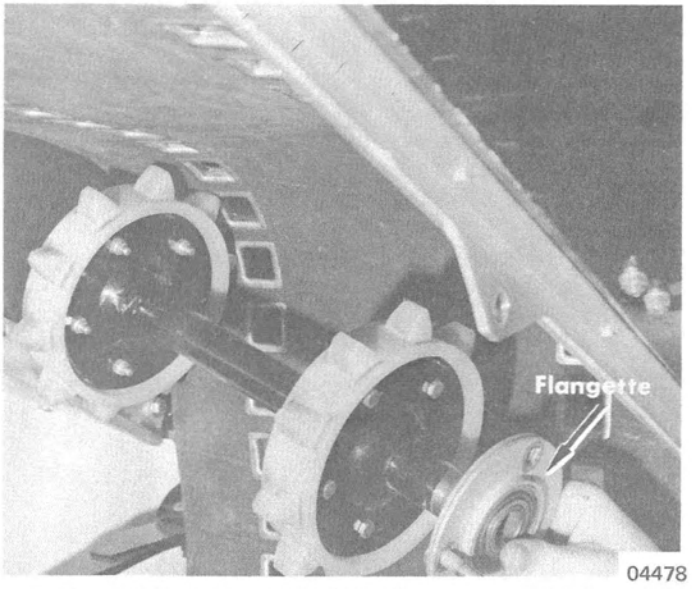


Figure 4. Installing Right Side Flangette and Bearing

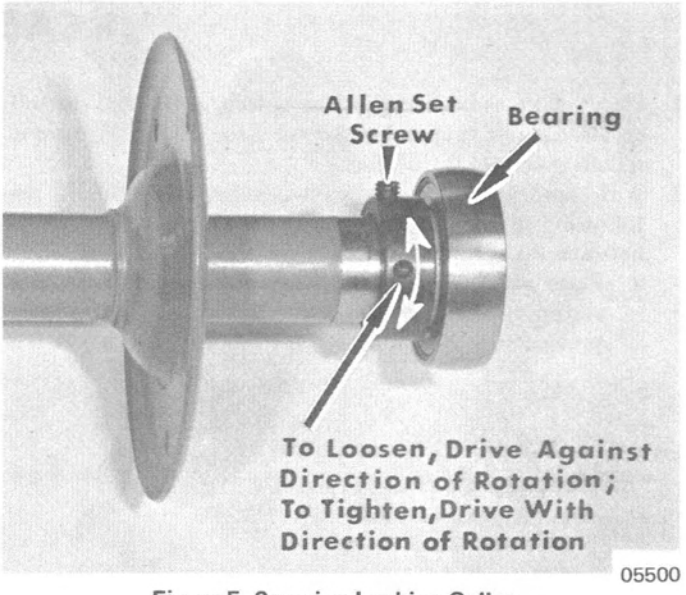


Figure 5. Securing Locking Collar

200, ROCKET and LIGHTNING MODELS

REMOVAL

1. Remove top cowl.
2. Drain lubricant and remove chaincase cover.
3. Loosen chain tension and remove front axle drive sprocket and chain.
4. Lift rear of vehicle. Remove rear axle and bogie wheel sets.
5. Loosen allen screw in right side lock collar and loosen collar by tapping counterclockwise with a punch. (Figure 5, above)
6. Remove right side bearing flangette and pull flangette and bearings from front axle.
7. Remove left side bearing flangette retaining nuts from inside chaincase.
8. Move front axle thru bearing hole in right side of chassis so that left end of front axle clears chassis. Pull left end down and remove front axle.

DISASSEMBLY

1. Slide oil seal adaptor off splined end of front axle.
2. Loosen allen screw in bearing lock collar and tap clockwsie with a punch to loosen. Slide bearing, lock collar and flangettes off front axle.
3. Remove hub retaining screws and slide sprockets and hubs off front axle.

CLEANING and INSPECTION

SPROCKETS

Check for cracks, cuts, and chipped or broke teeth. Excessive wear at root of teeth is usually the result of (1) operating with incorrect track tension and/or alignment (2) metal clips in track loose or missing. (3) incorrect alignment between sprockets.

IMPORTANT: Sprockets may show considerable wear but still perform satisfactorily. It should not be necessary to replace sprockets, unless track slippage, jumping or misalignment of track occurs.

BEARINGS

Check for rough operation and/or excess play between inner and outer bearing race. Replace if bearing condition is questionable.

IMPORTANT: Ball bearings are a sealed unit. DO NOT immerse in solvent or cleaning fluid. DO NOT attempt to lubricate.

AXLE

Check axle to make sure that it has not been bent or sprung and that welded hubs on axle are parallel with each other.

REASSEMBLY

1. Place spacers in sprocket mounting holes and mount sprockets and retaining hubs on axle. DO NOT torque retaining screws at this time.
2. With sprocket retaining screws snug, use one of the following methods to check parallel alignment (Figure 6) between sprockets:
   a. Place axle assembly on good flat surface. With axle resting on 2 teeth of each sprocket, apply light pressure on axle and attempt to "rock" axle on flat surface. If "rocking" is noted, shift either sprocket as necessary to remedy this condition.
   b. Place a straight edge across both sprockets at root of teeth. Sprockets must be parallel (tooth-for-tooth) + 3/64".
3. Torque sprocket retaining screws to specifications.
4. Slide lock collar, bearing flangettes, bearing and oil seal adaptor on splined end of front axle. DO NOT tighten bearing lock collar.

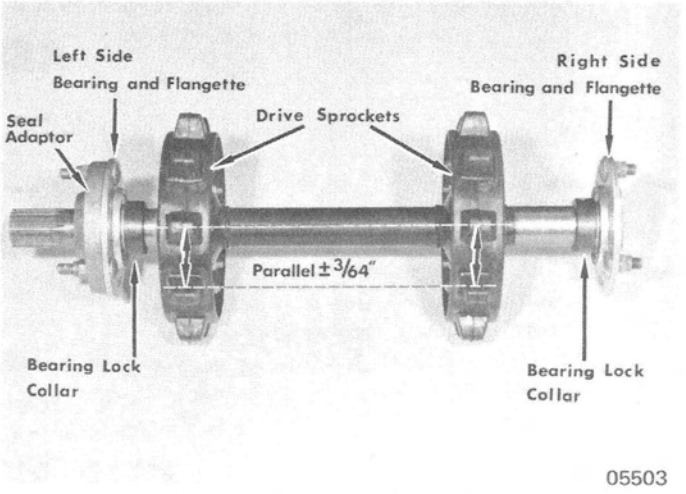


Figure 6. Sprocket Alignment

INSTALLATION (Figure 2)

1. With track in tunnel, place front axle in chassis with splined end in chaincase. Be sure that "O" ring on seal adaptor is intact and in position.
2. Slide locking collar, bearing and flangettes on right side of front axle from outside of chassis. (Figure 7)
3. Position end of front axle flush with inner race bearing. (Figure 8) Tighten locking collar and secure allen screw.

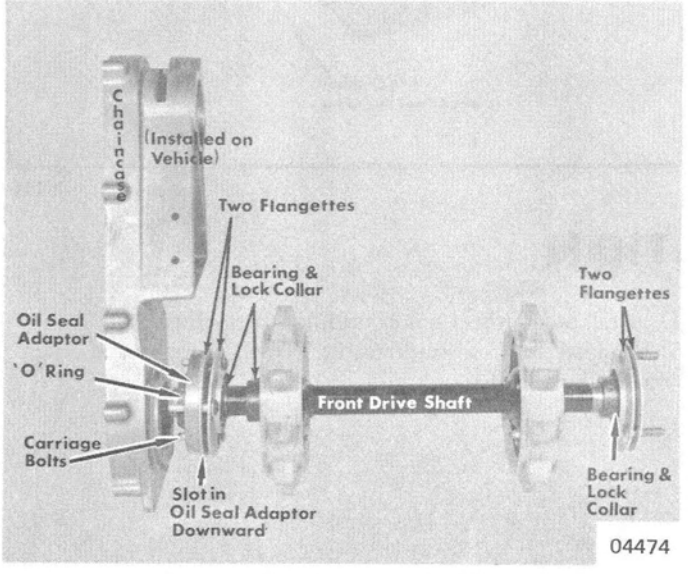


Figure 7. Front Axle Assembly

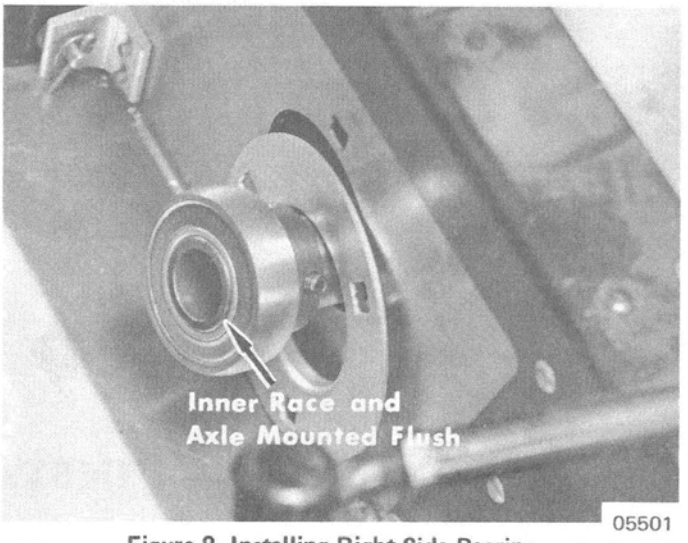


Figure 8. Installing Right Side Bearing

4. Insert carriage bolts thru right and left flangettes and secure with washers and retaining nuts.
5. Secure locking collar to eccentric on inner race of left side bearing by driving in direction of rotation.
6. Tighten locking collar allen screw.
7. Install drive chain and sprockets.
8. Install chaincase cover and fill chaincase with lubricant, as specified.
9. Install top cowl.

TRACK

200, 220, 250, ROCKET and LIGHTNING MODELS

REMOVAL

1. Remove rear axle assembly as outlined, preceding.
2. Remove bogie wheel sets and front axle as outlined, preceding.

INSPECTION

1. Check for and replace any missing clips.
2. Check track for large cuts or cracks.
3. Check edges of track for fraying or wear which would indicate misalignment.

NOTE: Broken steel transverse cables (track reinforcement) may protrude thru rubber covering on inside of track. If this occurs, DO NOT replace track; cut off and discard piece of cable(s).

CLIP REPLACEMENT

Tool C-91-53971A1 is required for replacement of clips in track sprocket holes. Clip replacement can be done without removal of track.

1. Position tool (C-91-53971A1) and replacement clip as shown in Figure 1.
2. Operate tool to compress and install clip.
3. Remove installation tool.

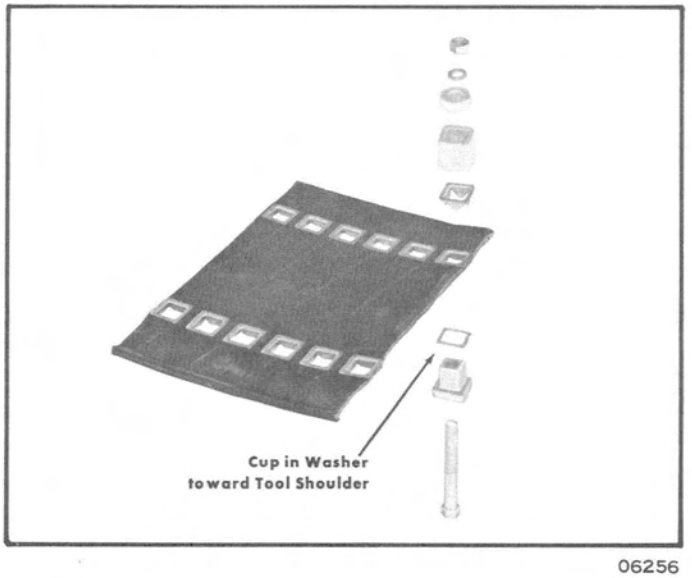


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Figure 1. Clip Installation Tool

INSTALLATION

1. Position track in chassis tunnel.
2. Install front axle as outlined, preceding.
3. Install rear axle assembly as outlined, preceding.
4. Install bogie wheel sets as outlined, preceding.
5. Readjust track as outlined in "Track Tension and Alignment", preceding.

HURRICANE (644cc)

BOGIE WHEEL SET

REMOVAL

1. Lift and support rear of snowmobile.
2. Release track tension as follows:
   a. Loosen idler arm anchor nut. (Figure 1)
   b. Loosen jam nut on track adjustment screw and turn track adjustment screw counterclockwise (when viewed from rear). (Figure 1)

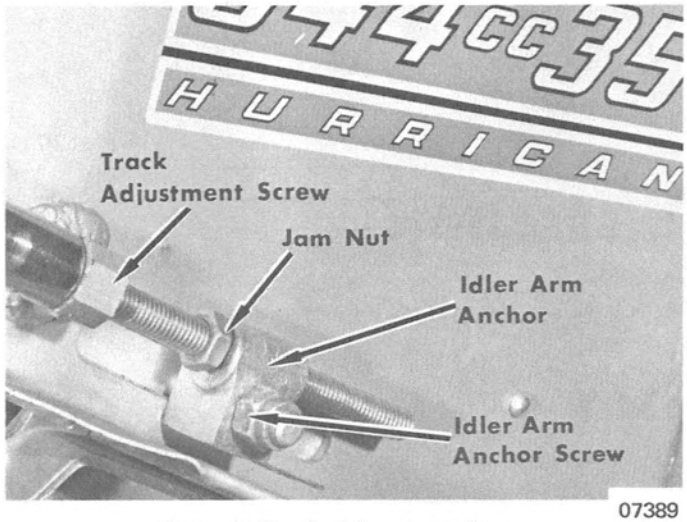


Figure 1. Track Adjustment Screw

3. Disconnect bogie tie-down strap. (Figure 2)
4. Remove pivot shaft clamps. (Figure 3)
5. Remove bogie wheel set.

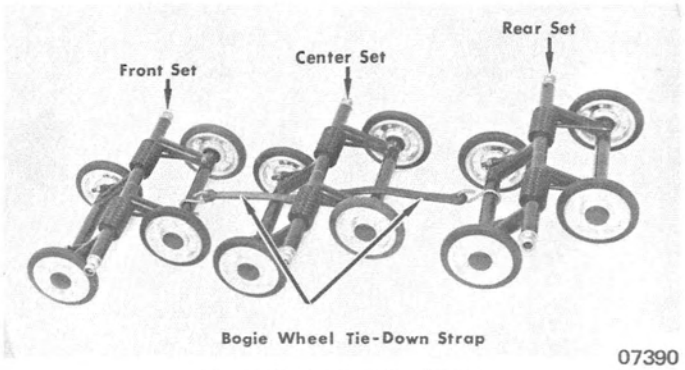


Figure 2. Bogie Wheel Sets

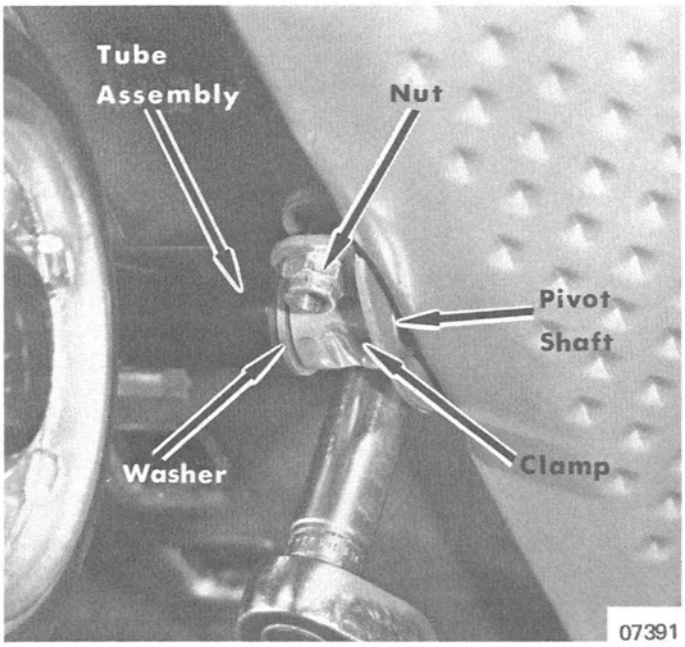


Figure 3. Removing Pivot Shaft Clamp

DISASSEMBLY

Bogie wheels can be removed with or without disassembly of bogie wheel set.

1. Remove center cap from wheel hub. (Figure 4)
2. Press out tube assembly with suitable mandrel and Bogie Wheel Support Plate (C-91-62490). (Figure 5)

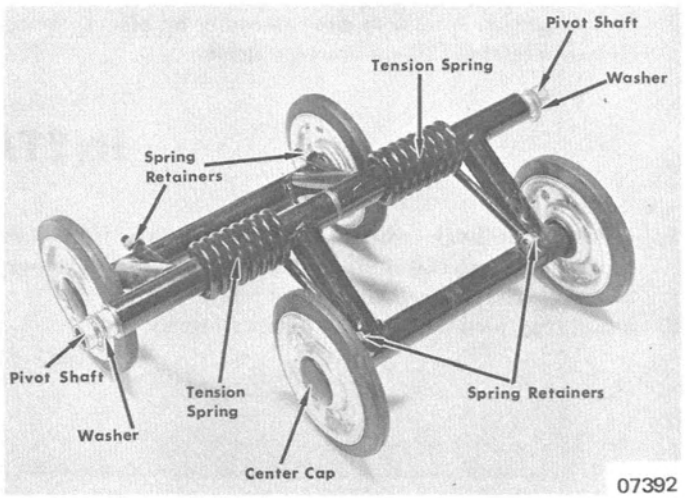


Figure 4. Bogie Wheel Set

3. Bend up spring retainers on tube assembly to relieve spring tension. (Figure 4)
4. Pull pivot shaft and bushings from tube assembly. (Figure 4)
5. Separate tube assemblies and remove tension springs. (Figure 4)

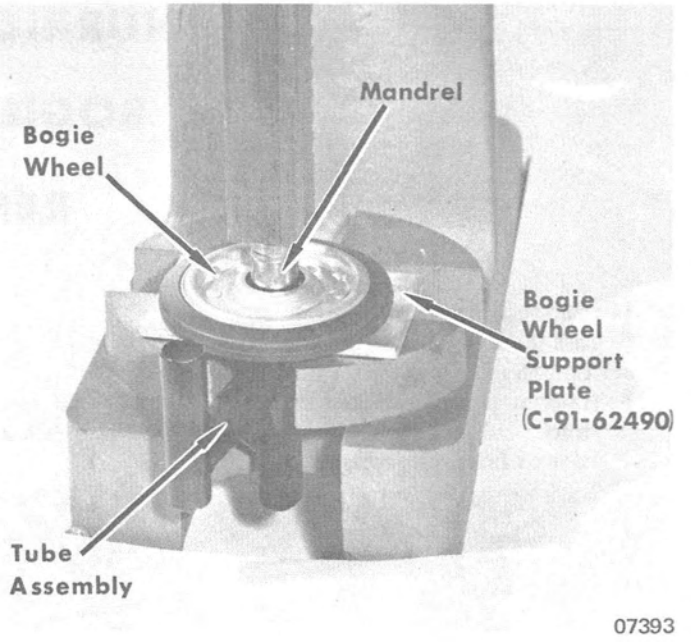


Figure 5. Pressing Wheel Off Tubing

CLEANING and INSPECTION

1. Clean all parts and inspect for damage or wear.
2. Check wheel bearings for roughness and tires for wear.

REASSEMBLY

1. Install bogie wheels by supporting tube assembly in press.

   NOTE: Use Bogie Wheel Support Plate (C-91-62490), if one wheel is already installed on opposite end of tube. (Figure 6)

2. Press wheel on tube assembly with suitable mandrel. (Figure 6)
3. Stake tube assembly to inner race of wheel bearing in 3 places and install center cap.
4. Place tension springs and tube assemblies in position. Lubricate inside of pivot shaft bushings and pivot shaft with Low Temperature Lubricant (C-92-59999). Insert pivot shaft bushings and pivot shaft into tube assembly.
5. Secure tension springs to tube assembly by placing spring ends into retainers. Bend down retainers.

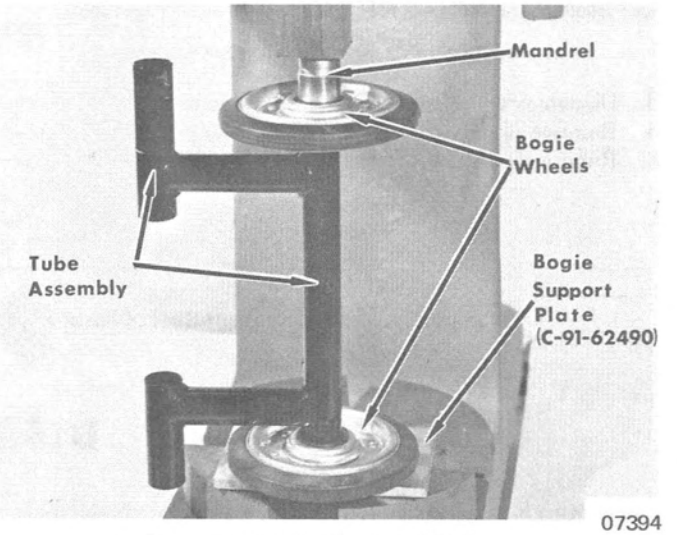


Figure 6. Install Wheel on Tubing

INSTALLATION

1. Install front bogie wheel set first (if removed). Secure pivot shaft to chassis with 2 clamps and 4 nuts. Make sure that washer is between chassis and tube assembly.
2. Install rear, then center set of bogies (if removed).
3. Connect bogie tie-down strap. (Figure 2)
4. Readjust track as outlined in "Track Adjustment" and "Track Alignment", preceding.

REAR AXLE

REMOVAL

1. Lift and support rear of snowmobile.
2. Remove snow flap.
3. Loosen track tension as far as possible. Refer to "Tension Adjustment", following.
4. Relieve tension from idler arm spring by moving spring from behind idler arm bracket. (Figure 1)
5. Remove nut, which holds support rod, from either idler arm bracket. (Figure 1)

   NOTE: Axle assembly, springs, washers and support tube will fall free when support rod is pulled out.

6. Remove axle assembly from track.

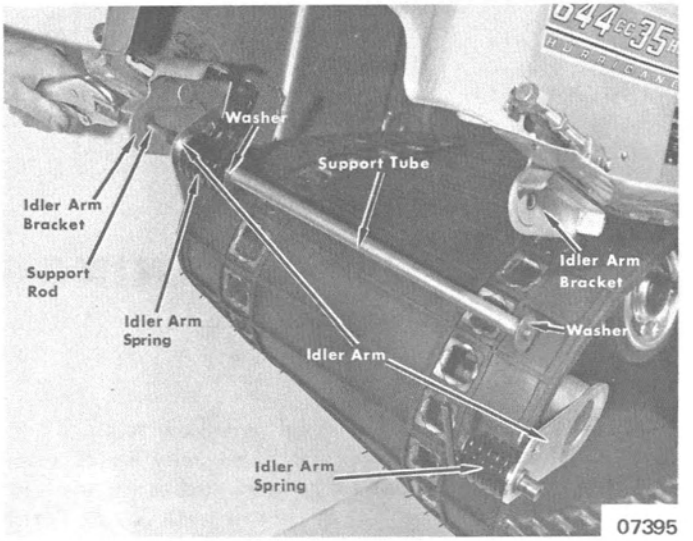


Figure 1. Removing Support Rod

DISASSEMBLY

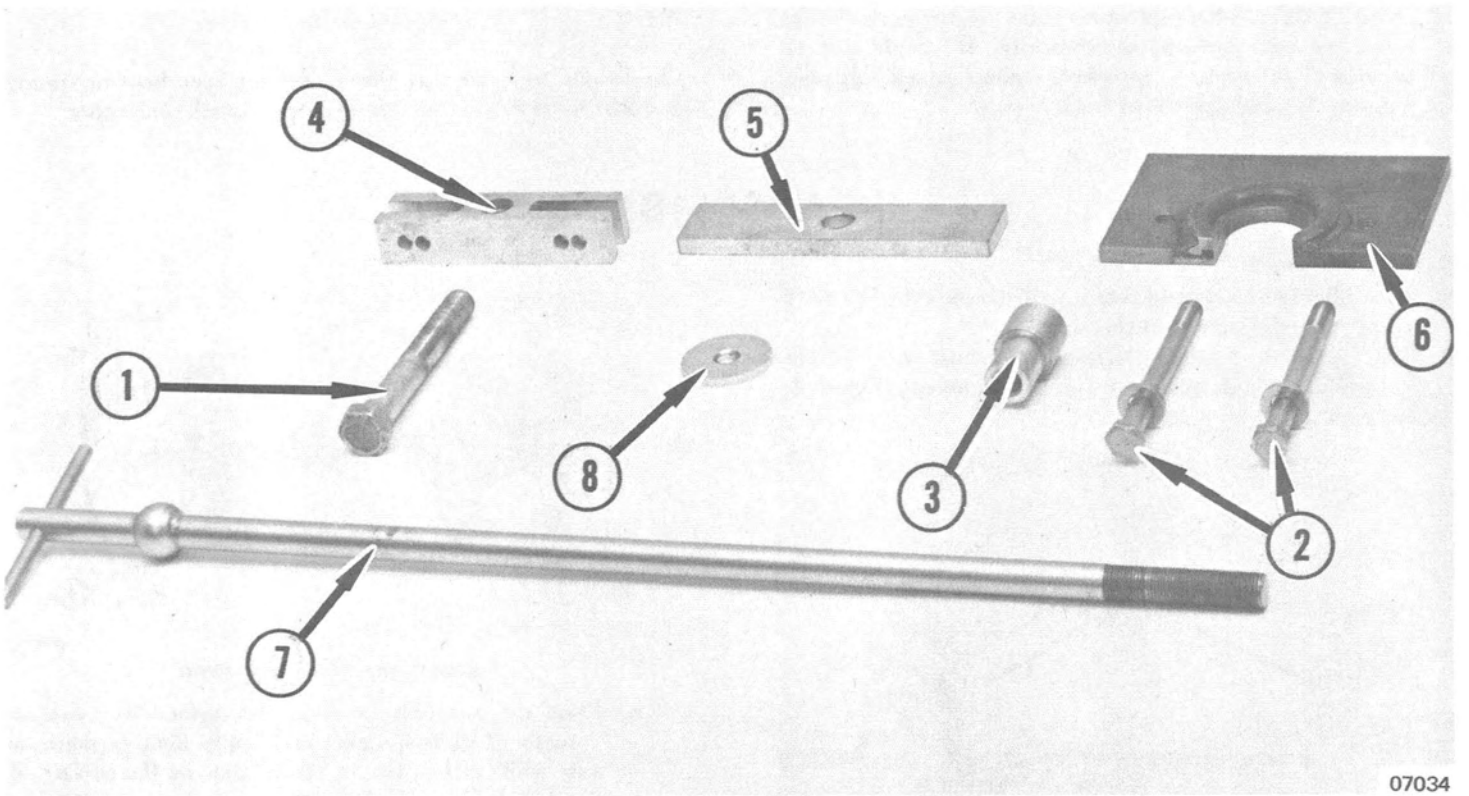
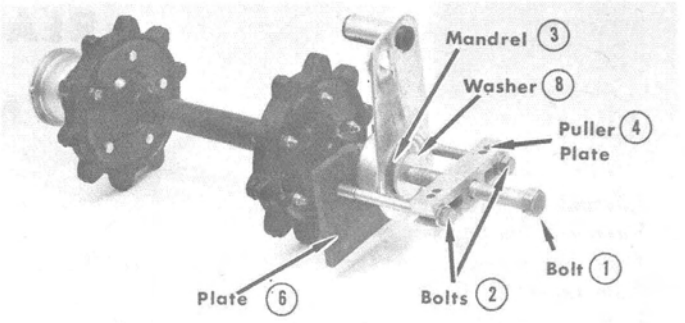


Figure 2. Idler Arm Tools

1 - C-10-53970 - Bolt (Part of C-91-53971A1) Clip Former Tool
2 - C-10-33112 - Mount Bracket (5x7/16-14) - MC 140-150
3 - C-91-37312 - Mandrel (Part of C-91-31229A1 Bearing Removal Kit)
4 - C-91-45560 - Puller Plate (Part of C-91-45560A1 Crankcase Puller)
5 - C-91-29310 - Plate (Part of C-91-31229A1 Bearing Removal Kit)
6 - C-91-62490 - Bogie Support Plate
7 - C-91-34569 - Shaft (Part of C-91-34569A1 Slide Hammer)
8 - C-12-58446 - Idler Arm Screw Washer - Snowmobile 250

1. Remove idler arms from axle assembly as shown in Figure 3.
2. Remove sprocket retaining hubs and idler sprockets from axle.

Figure 3. Removing Idler Arms



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CLEANING and INSPECTION

SPROCKETS

Check for cracks, cuts and chipped or broken teeth. Rapid wear or chipped and broken teeth generally result from considerable vehicle use on hard surfaces, such as ice, roads or frozen ground. Excessive wear at root of teeth usually is the result of (1) operating with incorrect track tension and/or alignment, (2) metal clips in track loose or missing or (3) incorrect alignment between idler sprockets.

IMPORTANT: Idler sprockets may show considerable wear but still perform satisfactorily. It should not be necessary to replace sprockets unless track slippage, jumping or misalignment of track occurs.

BEARINGS

Check for rough operation and/or excess play between inner and outer bearing race. Replace if bearing condition is questionable.

IMPORTANT: Ball bearings are a sealed unit. DO NOT immerse in solvent or cleaning fluid. DO NOT attempt to lubricate.

AXLE

Check axle to make sure that it has not been bent or sprung and that welded hubs on axle are parallel with each other.

REASSEMBLY

1. Place idler sprockets and retaining hubs on axle. DO NOT torque retaining screws at this time.
2. With sprocket retaining screws snug, use one of the following methods to check parallel alignment (Figure 4) between sprockets:

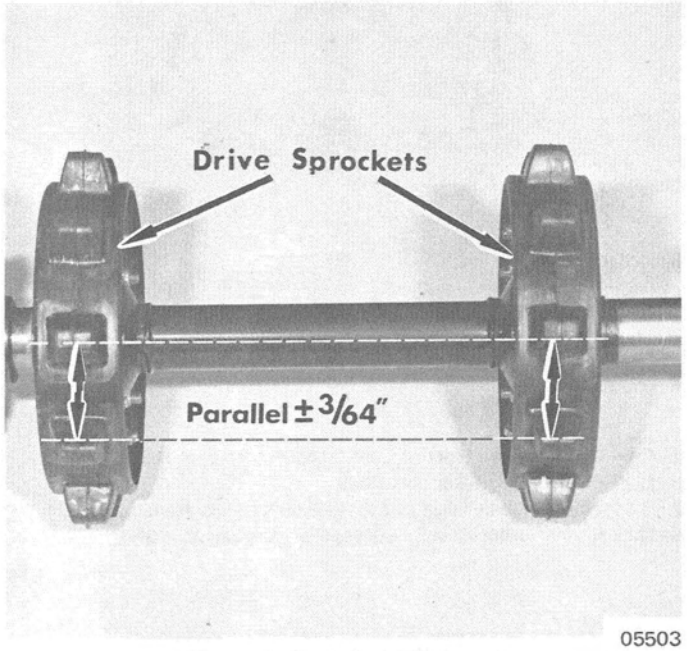

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Figure 4. Sprocket Alignment

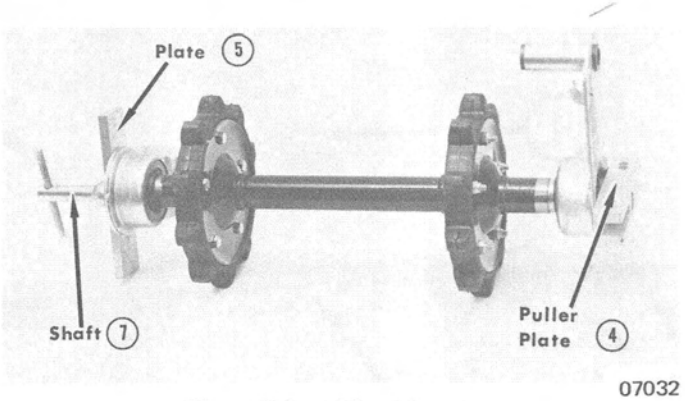

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Figure 5. Installing Idler Arms

a. Place axle assembly on good, flat surface. Rest axle on 2 teeth of each sprocket and apply light pressure on axle while attempting to "rock" axle on flat surface. If "rocking" is noted, shift either sprocket, as necessary, to remedy this condition.
b. Place a straight-edge across both sprockets at root of teeth. Sprockets must be parallel (tooth-for-tooth) ± 3/64".

3. Torque sprocket retaining screws to specifications.

NOTE: Make sure that idler arms are located on correct side (right idler arm on right side and left idler arm on left side).

4. Install idler arms as shown in Figure 5.

INSTALLATION

1. Install axle assembly on track.
2. Place axle assembly, springs, washers and support rod to idler arm brackets. Tighten nut on outside of each bracket.
3. Place idler arm springs behind idler arm bracket to apply tension to springs.
4. Readjust track as outlined in "Track Adjustment" and "Track Alignment", following.
5. Install snow flap.

FRONT AXLE

REMOVAL

1. Raise top cowl and remove battery.
2. Drain lubricant from chaincase and remove chaincase cover.

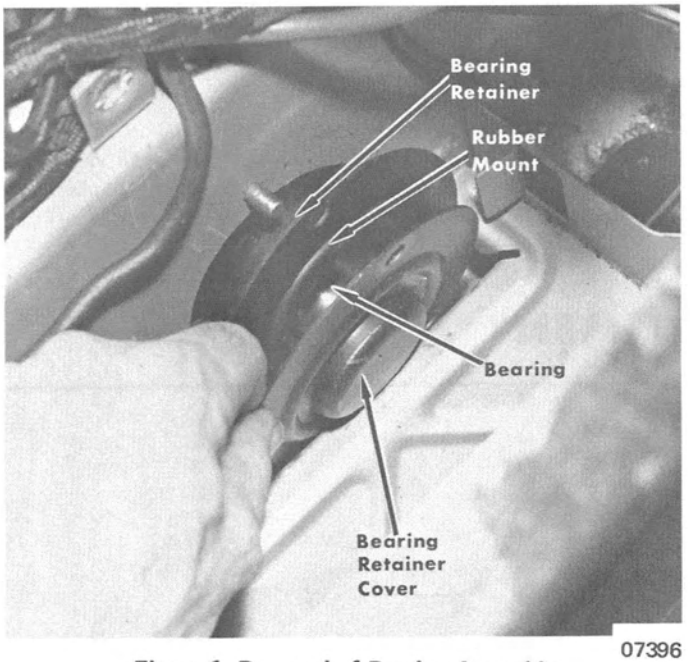

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Figure 1. Removal of Bearing Assembly

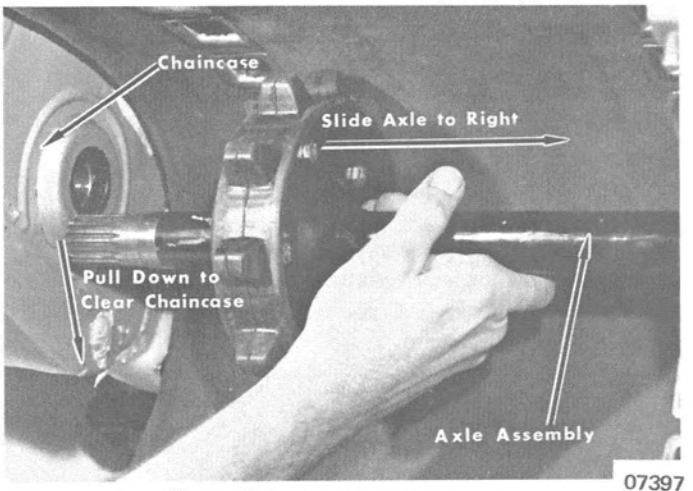

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Figure 2. Removal of Front Axle

3. Loosen chain tension and remove drive sprocket and chain.
4. Lift and support rear of snowmobile.
5. Remove snow flap, rear axle and bogie wheel sets.
6. Remove 3 nuts from bearing retainer on right side. Remove bearing retainer cover, bearing, rubber mount and retainer. (Figure 1)
7. Slide front axle to right and pull left end down to clear chaincase. (Figure 2)
8. Pull front axle out of chassis.

CLEANING and INSPECTION

SPROCKETS

Check for cracks, cuts and chipped or broken teeth. Excessive wear at root of teeth usually is the result of (1) operating with incorrect track tension and/or alignment, (2) metal clips in track loose or missing, (3) incorrect alignement between sprockets.

IMPORTANT: Sprockets may show considerable wear but still perform satisfactorily. It should not be necessary to replace sprockets, unless track slippage, jumping or misalignment of track occurs.

BEARINGS

Check for rough operation and/or excess play between inner and outer bearing race. Replace if bearing condition is questionable.

IMPORTANT: Ball bearings are a sealed unit. DO NOT immerse in solvent or cleaning fluid. DO NOT attempt to lubricate.

AXLE

Check axle to make sure that it has not been bent or sprung and that welded hubs on axle are parallel with each other. Check splines to be certain that they are not bent or twisted.

INSTALLATION

IMPORTANT: Lubricate lower seal in chaincase with Low Temperature Lubricant (C-92-59999) before axle is installed.

1. With track in tunnel, place front axle in chassis with splined end in chaincase.
2. Install retainer, bearing, rubber mount and retainer cover on axle. Install 3 nuts on cover.
3. Install bogie wheel sets, rear axle and snow flap.
4. Install drive chain and sprocket in chaincase.
5. Install chaincase cover and fill chaincase with lubricant as specified.
6. Install battery and lower top cowl.
7. Readjust track as outlined in "Track Adjustment" and "Track Alignment", following.

TRACK

REMOVAL

1. Remove rear axle assembly as outlined, preceding.
2. Remove bogie wheel sets and front axle as outlined, preceding.

INSPECTION

1. Check for and replace any missing clips.
2. Check track for large cuts or cracks.
3. Check edges of track for fraying or wear which would indicate misalignment.

NOTE: Broken steel transverse cables (track reinforcement) may protrude thru rubber covering on inside of track. If this occurs, DO NOT replace track; cut off and discard piece of cable(s).

CLIP REPLACEMENT

Tool C-91-53971A1 is required for replacement of clips in track sprocket holes. Clip replacement can be done without removal of track.

1. Position Tool (C-91-53971A1) and replacement clip as shown in Figure 3.
2. Operate tool to compress and install clip.
3. Remove installation tool.

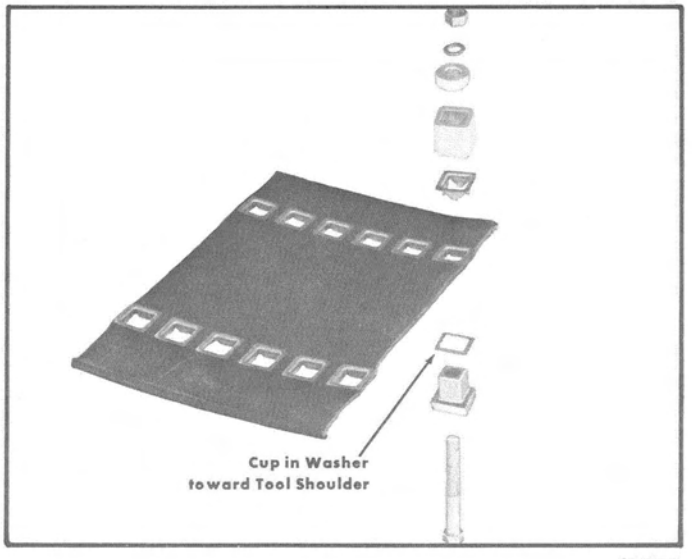

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Figure 3. Clip Installation Tool

INSTALLATION

1. Position track in chassis tunnel.
2. Install front axle as outlined, preceding.
3. Install rear axle assembly as outlined, preceding.
4. Install bogie wheel sets as outlined, preceding.
5. Readjust track as outlined in "Track Tension and Alignment", following.

TRACK TENSION and ALIGNMENT

Proper track tension and alignment are essential to eliminate undue wear to drive components and track and to maintain efficient, economical operation of the snowmobile.
Check track tension and alignment after first 3 to 5 hours of operation and every 25 hours of operation thereafter. Tension is correct when a maximum slack of 1/2" (12.7mm) is obtained. Slack MUST be measured at center of track when snowmobile is at rest with track supporting weight of snowmobile. (Figure 1) If necessary, adjust as follows:

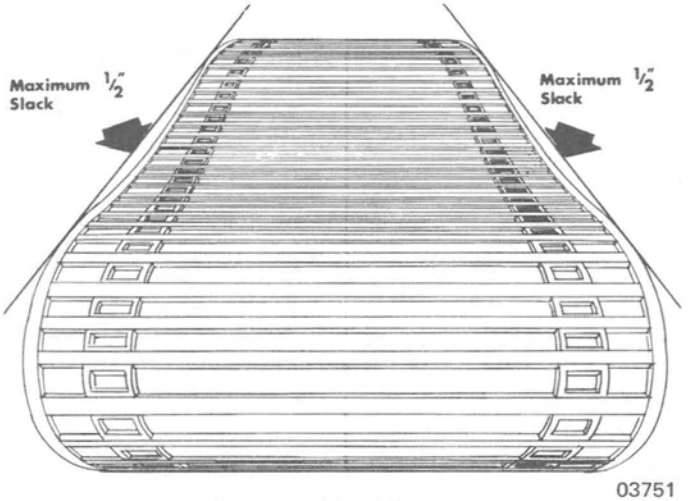

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Figure 1. Track Tension

TRACK TENSION

1. Loosen nuts ("A" and "B" in Figure 2) and adjust tension screws ("C" in Figure 2) equally on both sides of the chassis until correct tension has been acquired, as shown in Figure 1.
2. Tighten nuts "A" and "B".

IMPORTANT: Always check track alignment, as outlined immediately following, after performing a track tension adjustment.

TRACK ALIGNMENT

1. Place rear of snowmobile on suitable blocking to raise track off ground and block front end for stability.
2. Start engine and run drive mechanism.

WARNING: At this time and before stepping behind snowmobile to observe track alignment, make sure that track is free of all particles which, possibly, could be thrown out by the moving track. Keep hands and feet clear of track at all times.

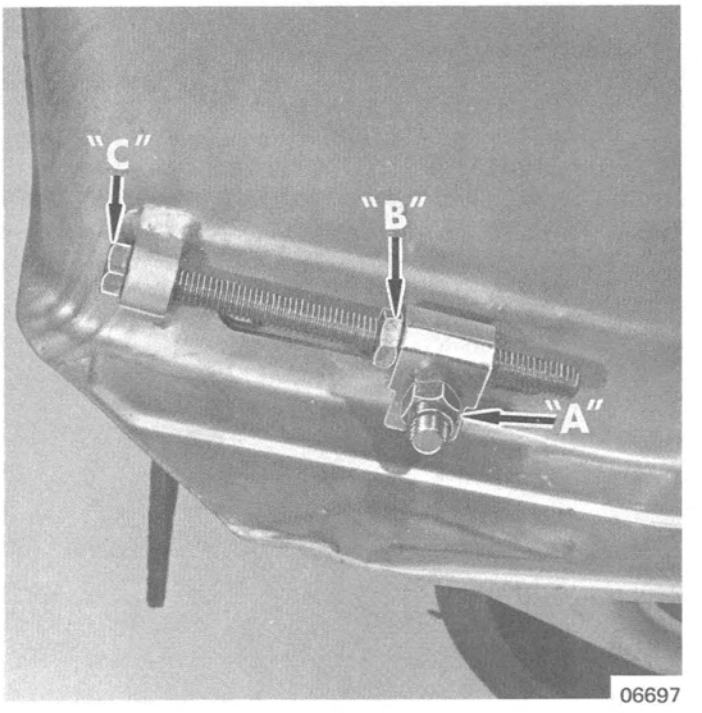

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Figure 2. Tension Adjustment

3. Scan the moving track, making certain that the track centers itself between the idler arms and that the teeth on the sprockets enter evenly into the drive slots of the track. (Figure 3) If the track is not centered or drifts to either side, an adjustment is necessary. An improperly aligned track always will run or drift toward the LOOSE side, and this condition requires a track tension adjustment on the loose side only. Refer to Steps 1 and 2, preceding, in "Track Tension".

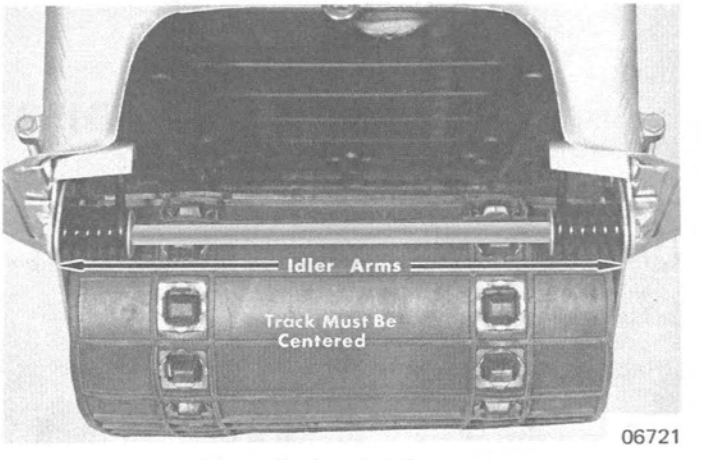

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Figure 3. Track Alignment

440 MAX and 440 M/X

BOGIE WHEEL SET

REMOVAL

1. Lift and support rear of snowmobile.
2. Loosen track tension as far as possible. Refer to "Track Tension", following.

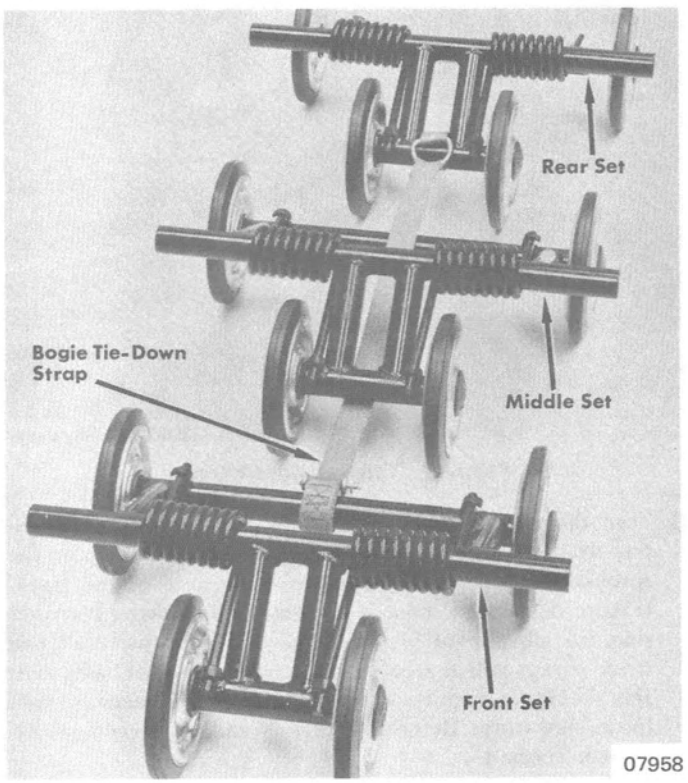


Figure 1. Bogie Wheel Sets

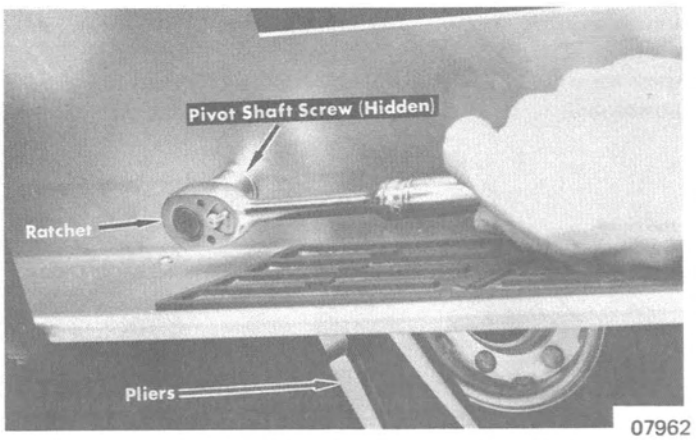


Figure 2. Bogie Wheel Assembly Removal

3. Disconnect bogie tie-down strap. (Figure 1)
4. Remove bogie pivot shaft screw from one side of chassis. A large washer is located between pivot shaft and chassis on each side.
5. Pull downward on disconnected end of bogie pivot shaft until it clears the chassis, then slide bogie tube assembly partially off pivot shaft.
6. Hold exposed section of pivot shaft with a pair of vise-grips or pliers and remove remaining pivot shaft screw. (Figure 2)

   IMPORTANT: DO NOT score pivot shaft. If shaft is scored, file smooth before reinstallation. Bogie tube assembly must pivot freely on pivot shaft.

7. Remove bogie assembly from inside track.

DISASSEMBLY

NOTE: Bogie wheels can be removed with or without disassembly of bogie wheel set.

1. Bend up spring retainers on tube assembly to relieve spring tension.
2. Pull out pivot shaft from bogie tube.

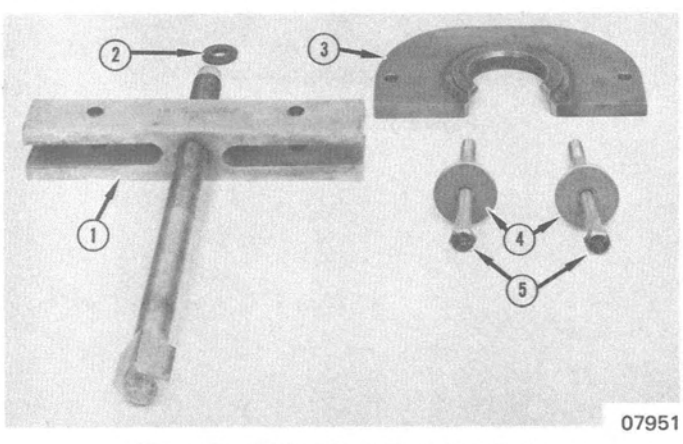


Figure 3. Bogie Wheel Removal Tools

3. Separate tube assemblies and remove tension springs.
4. Remove center cap from wheel hub.

   NOTE: 440 MAX snowmobiles with Chassis Serial No. 3709838 and above are equipped with polycarbonate bogie wheels. Remove a polycarbonate bogie wheel by (1) removing snap ring from wheel, (2) pull wheel off sealed bearing and (3) press sealed bearing off bogie tube, using an arbor press, a suitable mandrel and Puller Plate (C-91-37241). DO NOT attempt to use Bogie Wheel Support Plate (C-91-65341) for removal or installation of a polycarbonate bogie wheel.

5. Remove bogie wheel from tube assembly as shown in Figure 4. Wheel bearing is staked to tube assembly. Bogie wheel may be removed with a press, as shown in Figure 5.

   1. C-91-65146A1 – Puller Cross Block
   2. C-12-30473 – Washer (Part of C-91-65146A1)
   3. C-91-65341 – Bogie Wheel Support Plate
   4. C-12-46765 – Washer (Part of C-91-65146A1)
   5. C-10-33986 – Bolt (Part of C-91-65146A1)

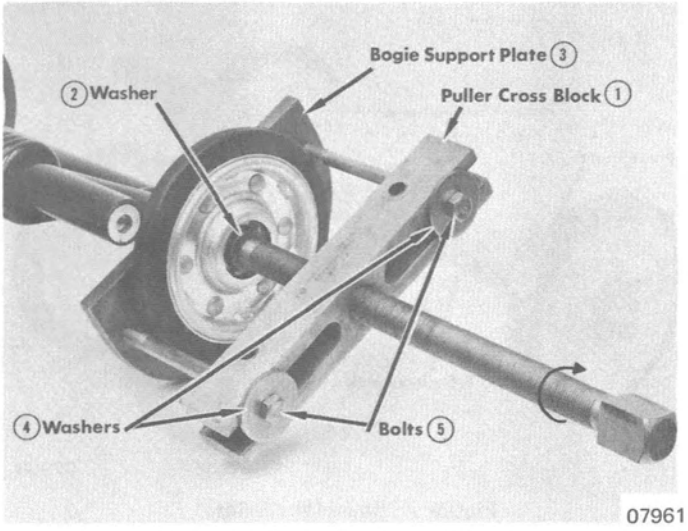


Figure 4. Removing Bogie Wheel

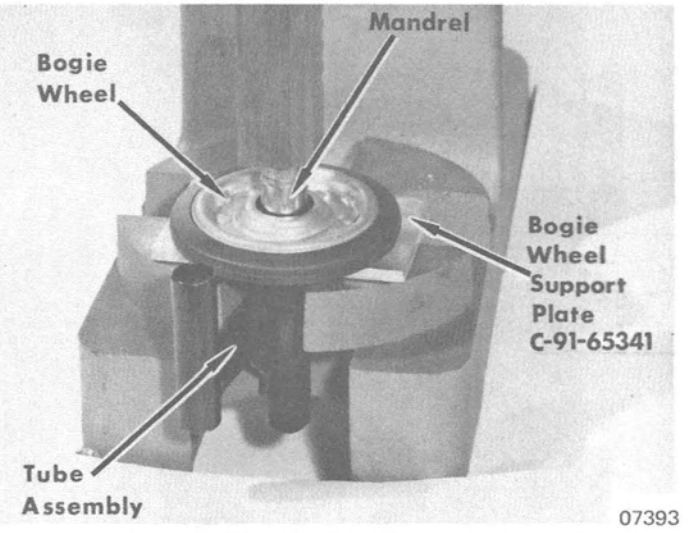


Figure 5. Pressing Bogie Wheel Off Tubing

CLEANING and INSPECTION

1. Clean all parts and inspect for damage or wear.
2. Check wheel bearings for roughness and tires for wear. Replace as necessary.

IMPORTANT: **Ball bearings are a sealed unit. DO NOT immerse in solvent or cleaning fluid. DO NOT attempt to lubricate.**

REASSEMBLY

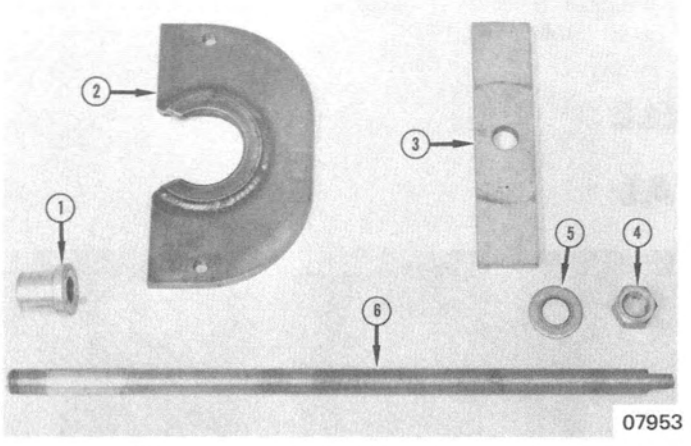


Figure 6. Bogie Wheel Installing Tools

1. C-91-36569 – Mandrel (Part of C-91-31229A1 Bearing Removal Kit)
2. C-91-65341 – Bogie Wheel Support Plate
3. C-91-29310 – Plate (Part of C-91-31229A1 Bearing Removal Kit)
4. C-11-24156 – Nut (Part of C-91-31229A1 Bearing Removal Kit)
5. C-12-34961 – Washer (Part of C-91-31229A1 Bearing Removal Kit)
6. C-91-31229 – Shaft (Part of C-91-31229A1 Bearing Removal Kit)

1. Install bogie wheel on tube assembly as shown in Figure 7. Bogie wheel may be installed with a press as shown in Figure 8.

NOTE: 440 MAX snowmobiles with Chassis Serial No. 3709838 and above are equipped with polycarbonate bogie wheels. Install an assembled polycarbonate bogie wheel on bogie tube, using suitable mandrels and an arbor press. DO NOT attempt to use Bogie Wheel Support Plate (C-91-65341) when installing a polycarbonate bogie wheel.

2. Stake tube assembly to inner race of wheel bearing in 4 places and install center cap.
3. Place tension springs and tube assemblies in position. Lubricate pivot shaft with Low Temperature Lubricant (C-92-59999). Insert pivot shaft into tube assembly. (Figure 9)

   NOTE: Make sure that bogie springs are located on correct side (right spring on right side and left spring on left side).

4. Secure tension springs to tube assembly by placing spring ends into retainers. Bend down retainers.

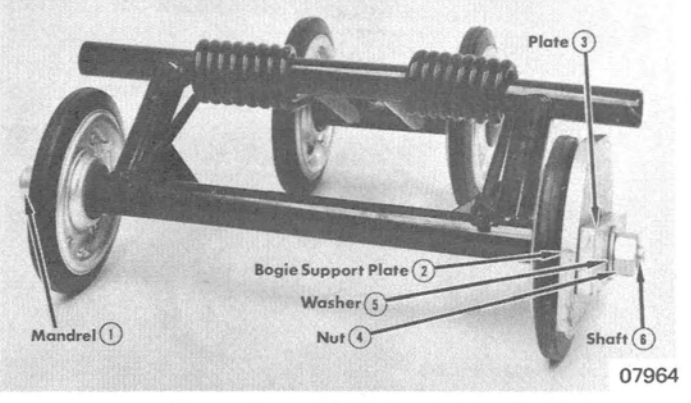
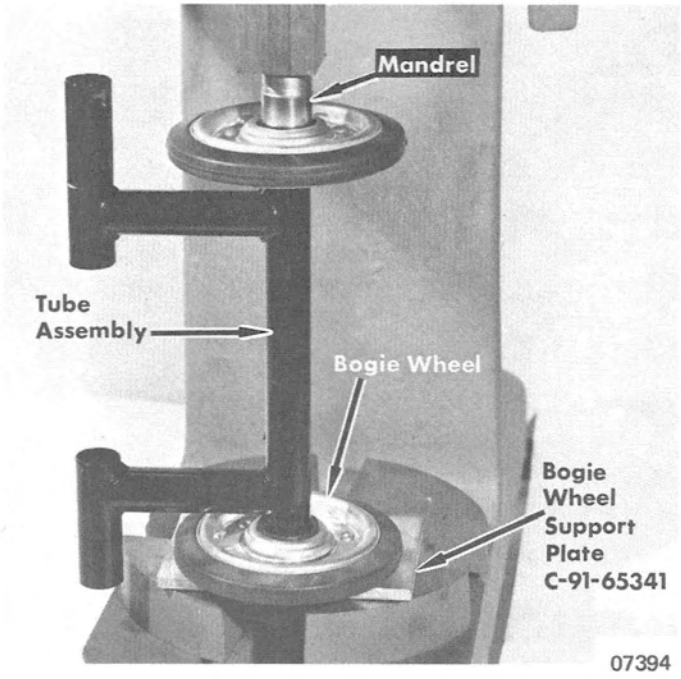


Figure 7. Installing Bogie Wheel



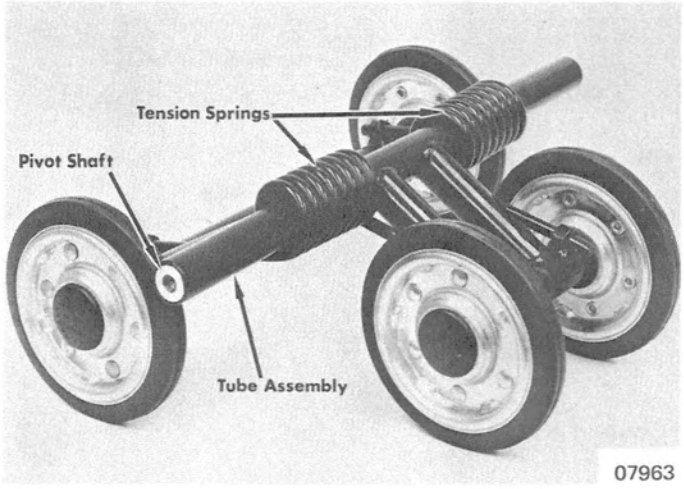


Figure 9. Bogie Wheel Set

Figure 8. Pressing Bogie Wheel on Tubing

INSTALLATION

1. Install rear axle and/or front axle assemblies, if removed. (Refer to "Rear Axle" and/or "Front Axle", following.)
2. Place bogie assembly in position with narrow spaced wheels forward. (Figure 9)
3. Secure pivot shaft to chassis with screws and washers. Large, flat washers MUST be positioned between tube assembly and chassis:
4. Connect bogie tie-down strap. (Figure 1, preceding)
5. Readjust track as outlined in "Track Tension and Alignment", following.

REAR AXLE

REMOVAL

1. Lift and support rear of snowmobile.
2. Loosen track tension as far as possible. Refer to "Tension Adjustment", following.
3. Remove rear bogie wheel set. (Refer to "Bogie Wheel Set", preceding.
4. Relieve tension from idler arm springs by moving springs from behind idler arm brackets.

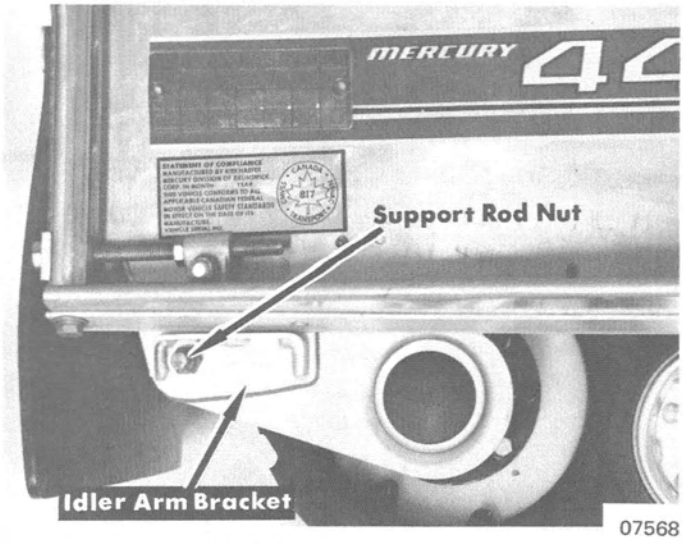


Figure 1. Idler Arm Bracket

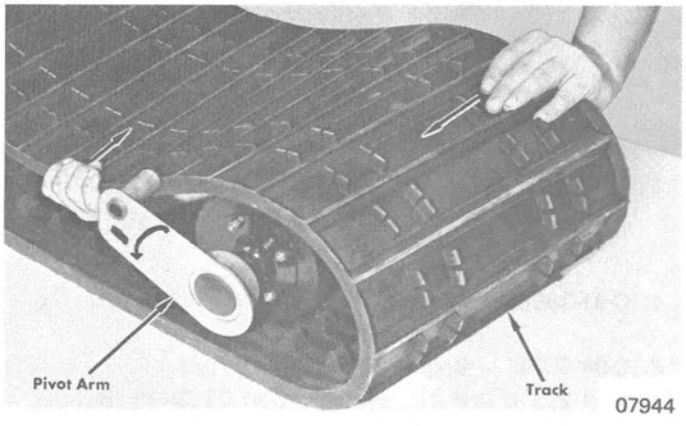


Figure 2. Removing Rear Axle from Track

5. Remove nut, which holds support rod, from either idler arm bracket. (Figure 1)
6. While holding axle and track assembly, remove support rod. Axle assembly, springs, bushings, washers and support tube will fall free when support rod is pulled out.
7. Position left pivot arm as shown in Figure 2. While pulling track under with right hand and pushing over with left hand, pivot arm will swing past track. Right pivot arm must be positioned 180° opposite left pivot arm.
8. Remove rear axle assembly from inside track.

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Figure 3. Pivot Arm Tools

1. C-91-29310 — Plate (Part of C-91-31229A1 Bearing Removal Kit)
2. C-91-53971A1 — Clip Former Tool
3. C-91-65146A1 — Puller Cross Block
4. C-91-45560A1 — Puller Cross Block
5. C-91-65333 — Idler Arm Plate
6. C-12-46765 — Washer (Part of C-91-65146A1)
7. C-10-33986 — Bolt (Part of C-91-65146A1)
8. C-91-34569 — Shaft (Part of C-91-34569A1 Slide Hammer)
9. C-12-46765 — Washer
10. C-91-37312 — Mandrel (Part of C-91-31229A1 Bearing Removal Kit)

DISASSEMBLY (Figure 3)

1. Remove rubber caps and snap rings from pivot arms.
2. Remove pivot arms from axle assembly as shown in Figure 4.
3. Remove wheel retaining hubs and idler wheels from axle.

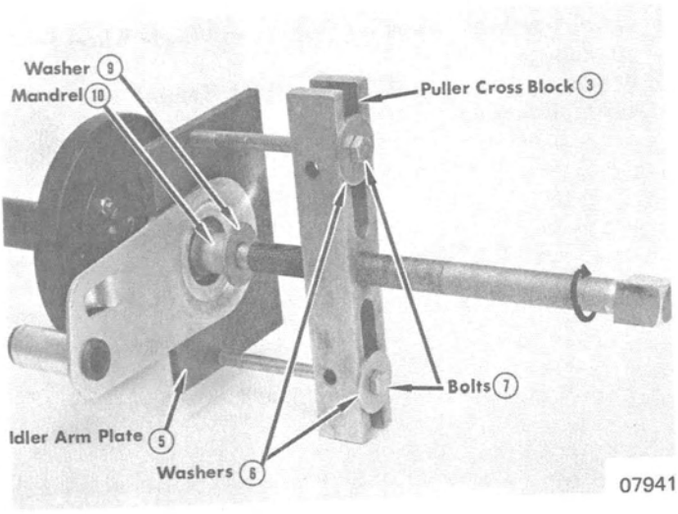


Figure 4. Removing Pivot Arms

CLEANING and INSPECTION

IDLER WHEELS

Check wheels for cracks, cuts, wear and chips. Rapid wear or chipped wheels generally result from extensive operation on sand or gravel. Incorrect track tension and alignment will also contribute to excessive wear.

BEARINGS

Check for rough operation and/or excess play between inner and outer bearing race. Replace if bearing condition is questionable.

IMPORTANT: Ball bearings are a sealed unit. DO NOT immerse in solvent or cleaning fluid. DO NOT attempt to lubricate.

AXLE

Check that axle has not been bent or sprung and that welded hubs on axle are parallel with each other.

REASSEMBLY

1. Place idler wheels and retaining hubs on axle (idler wheels will fit only one way; taper must be toward weld-seam on axle). Secure with screws and torque to specification. (Refer to "Specifications" Section 8.)
2. Install pivot arms as shown in Figure 5. One left side and one right side pivot arm must be installed on axle.
3. Install snap rings and rubber caps.

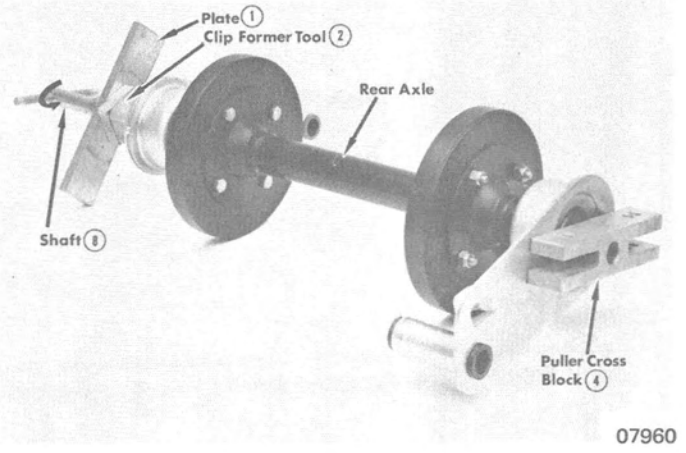


Figure 5. Installing Pivot Arms

INSTALLATION

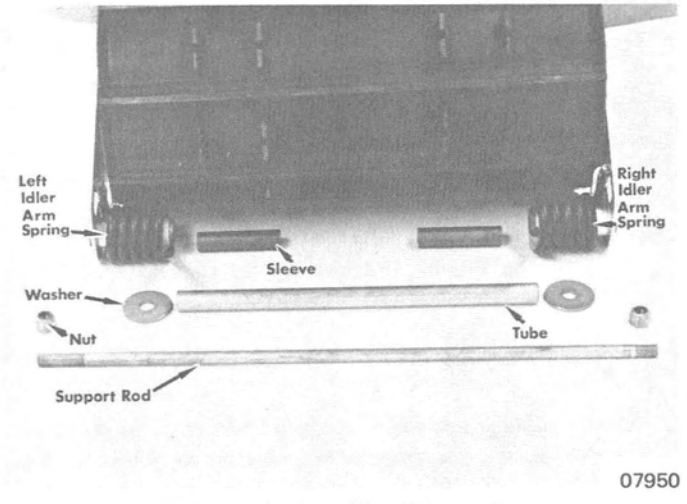


Figure 6. Installing Rear Axle

1. Refer to Figure 2 and install rear axle assembly. Make sure that pivot arms are on correct side of track when installed (right pivot arm on right side and left pivot arm on left side).
2. Position springs and bushings on pivot arms. (Figure 6) Left idler arm spring must be on left idler arm and right idler arm spring on right idler arm.
3. Raise axle assembly into place between idler arms. Install support rod thru idler arms, pivot arms and support tube. Large flat washers must be positioned between support tube and pivot arms.
4. Tighten support rod nut on outside of each idler arm.
5. Place idler arm springs behind idler arm bracket to apply tension to springs.
6. Install rear bogie wheel set. (Refer to "Bogie Wheel Set", preceding.)
7. Readjust track as outlined in "Track Tension and Alignment", following.

FRONT AXLE

REMOVAL

1. Raise top cowl.
2. Remove battery and battery box, if so equipped.
3. Drain lubricant from chaincase and remove chaincase cover. Remove speedometer angle drive assembly from chaincase cover, if so equipped.
4. Loosen chain tension and remove sprockets and chain. (Refer to this section, Part D.)
5. Lift and support rear of snowmobile.
6. Remove bogie wheel sets and rear axle, as outlined preceding.

NOTE: If removing only front axle, center and rear bogie wheel sets need not be removed.

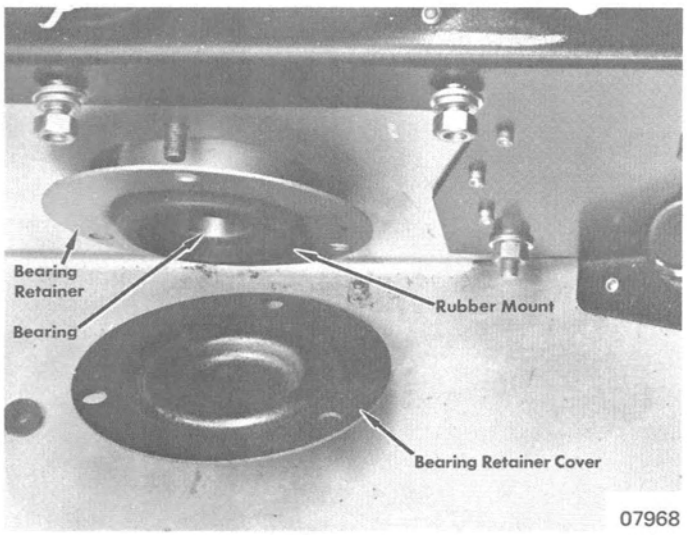


Figure 1. Removal of Bearing Assembly

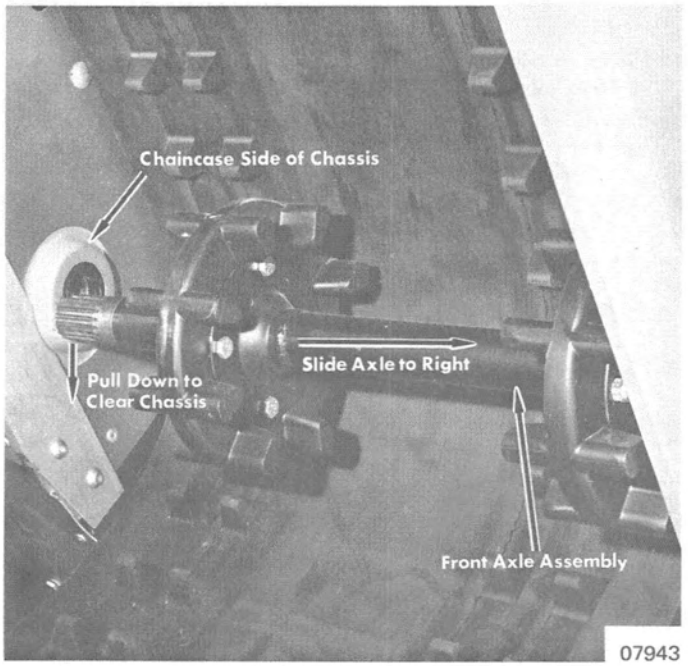


Figure 2. Removal of Front Axle

7. Remove 3 nuts from bearing retainer on right side of chassis. Remove bearing retainer cover, bearing, rubber mount and retainer. (Figure 1)
8. Slide front axle to right and pull left end down to clear chaincase. (Figure 2)
9. Pull front axle out of chassis.
10. Remove sprockets from front axle.

CLEANING and INSPECTION

SPROCKETS

Check for cracks, cuts and chipped or broken teeth. Excessive wear of teeth usually is the result of (1) operating with incorrect track tension and/or alignment or, (2) incorrect alignment between sprockets.

IMPORTANT: Sprockets may show considerable wear but still perform satisfactorily. It should not be necessary to replace sprockets, unless track slippage, jumping or misalignment of track occurs. Replace sprockets as a set ONLY if excessive wear is reason for replacement.

BEARINGS

NOTE: Front axle ball bearings are mounted in chaincase and chassis bearing retainer.

Check for rough operation and/or excess play between inner and outer bearing race. Replace if bearing condition is questionable.

IMPORTANT: Ball bearing mounted in chassis bearing retainer is a sealed unit. DO NOT immerse in solvent or cleaning fluid. DO NOT attempt to lubricate.

AXLE

Check that axle is not bent or sprung and that welded hubs on axle are parallel with each other. Check that splines are not bent or twisted.

INSTALLATION

1. Place sprockets and retaining hubs on axle (sprockets will fit one way only; taper must be toward weld-seam on axle). DO NOT torque retaining screws at this time.
2. With sprocket retaining screws snug, place a straight-edge across both sprockets. Sprockets MUST be parallel (tooth - for - tooth) ± 3/64".

3. Torque sprocket retaining screws to specifications in "Specifications" Section 8.

IMPORTANT: Lubricate lower seal in chaincase with Low Temperature Lubricant (C-92-59999) before axle is installed.

4. With track in tunnel, place front axle in chassis with splined end in chaincase.
5. Install retainer, bearing, rubber mount and retainer cover on axle. Install 3 nuts on cover.
6. Install battery box and torque retainer cover nuts and chassis extrusion nuts to specifications in Section 8.
7. Install rear axle and bogie wheel sets as outlined, preceding.
8. Install drive chain and sprockets in chaincase and adjust chain tension. Install chaincase cover and fill chaincase with lubricant. (Refer to this section, Part D.)
   NOTE: Install speedometer angle drive assembly in chaincase cover, if so equipped.
9. Install battery (if so equipped) and close top cowl.
10. Readjust track as outlined in "Track Tension and Alignment", following.

TRACK

REMOVAL

1. Remove bogie wheels sets as outlined, preceding.
2. Remove rear axle and front axle as outlined, preceding.
3. Remove track from chassis tunnel.

INSPECTION

1. Check track for large cuts or cracks.
2. Check edges of track for fraying or wear which would indicate misalignment.
3. Check teeth (Figure 1) for excessive wear.

IMPORTANT: Track teeth may show considerable wear but still perform satisfactorily. It should not be necessary to replace track unless track slippage or jumping occurs.

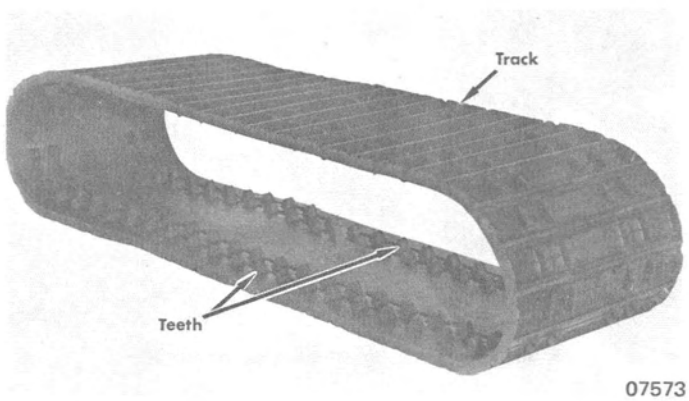


Figure 1. Track

INSTALLATION

1. Position track in chassis tunnel.
2. Install front axle, then rear axle as outlined, preceding.
3. Install bogie wheel sets as noted, preceding.
4. Readjust track as outlined in "Track Tension and Alignment", following.

TRACK TENSION and ALIGNMENT

Proper track tension and alignment are essential to eliminate undue wear to the drive components and track and to maintain efficient, economical operation of the snowmobile. Check track tension and alignment after first 3 - 5 hours of operation and every 25 hours of operation thereafter. Tension is correct when a slack of ½" to 1" (12.7mm to 25.4mm) is obtained. Slack MUST be measured at center of track when snowmobile is at rest with track supporting weight of snowmobile. (Figure 1) If necessary, adjust as follows:

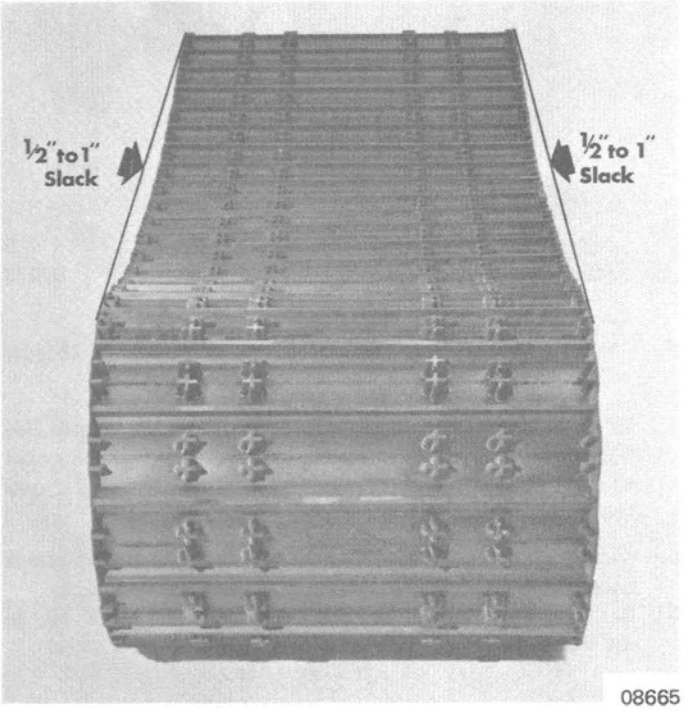


Figure 1. Track Tension

TRACK TENSION

1. Loosen nuts on idler arm anchor screws ("A" and "B" in Figure 2) and adjust tension screws ("C" in Figure 2) equally on both sides of the snowmobile until correct tension is obtained.

   NOTE: 440 MAX snowmobiles with Chassis Serial No. 3709838 and above are not equipped with jam nut "B".

2. Tighten nuts "A" and "B".

   IMPORTANT: Always check track alignment, as outlined immediately following, after performing a track tension adjustment.

TRACK ALIGNMENT

1. Place rear of snowmobile on suitable blocking to raise entire track off ground and support front end for stability.
2. Start engine and slowly run drive mechanism.

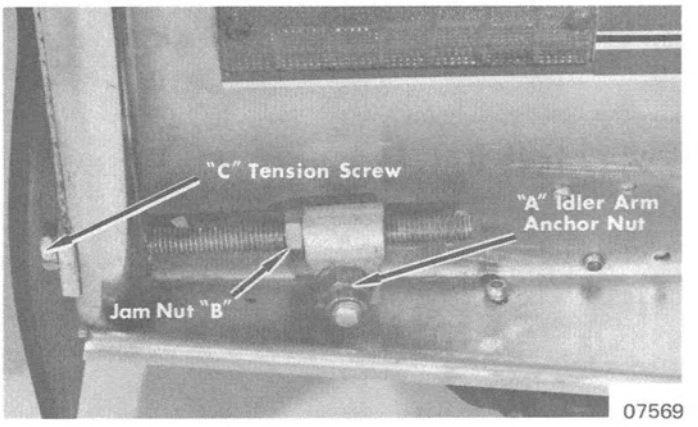


Figure 2. Tension and Alignment Adjustment

WARNING: Make certain that track is free of all particles which, possibly, could be thrown out by the moving track. KEEP HANDS and FEET CLEAR of TRACK at all times. DO NOT attempt to check track alignment while engine is running.

3. STOP the SNOWMOBILE ENGINE. Scan the track, making certain that track is centered between idler arms. (Figure 3) If track is not centered, an adjustment is necessary. An improperly aligned track always will run or drift toward the LOOSE side, and this condition requires a track adjustment on the loose side only. If track adjustment is necessary, refer to "Track Tension", preceding. After readjusting, recheck track alignment.
4. As a final track alignment check, it is recommended that snowmobile be run over smooth terrain and in a straight line for approximately 100 yards (91m). STOP the SNOWMOBILE ENGINE. With track on ground, recheck track alignment as shown in Figure 3. If further track adjustment is necessary, refer to Step 3, preceding.

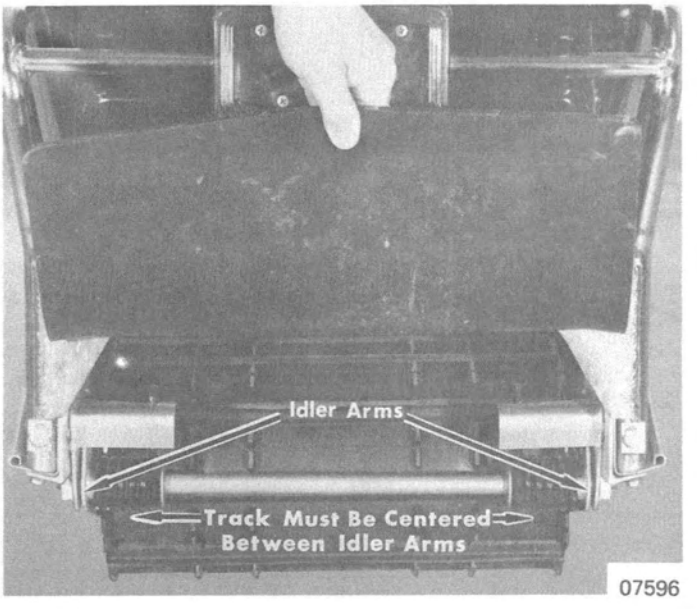


Figure 3. Track Alignment

MARK I (644cc) and MARK II (644cc) SHOCK ABSORBER REMOVAL

1. Lift and support rear of snowmobile. Raise snowmobile high enough to take most of the weight off the track. DO NOT raise track assembly off working surface.
2. Remove bottom shock absorber cap screw which attaches to swing frame. (Figure 1)
3. Remove top shock absorber cap screw which attaches to chassis. Remove shock absorber.

Figure 1. Shock Absorber

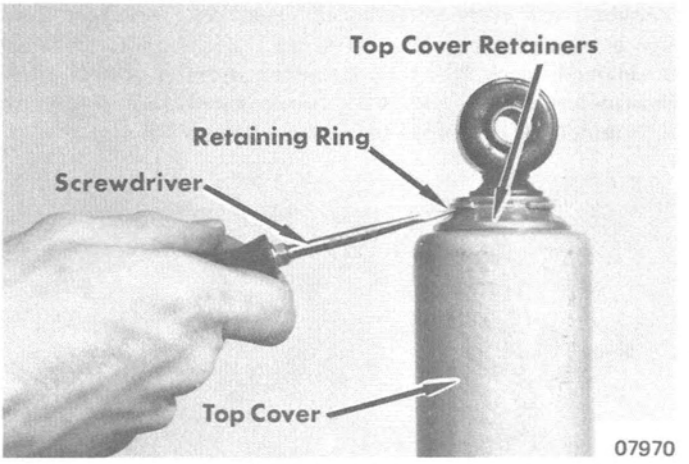


Figure 2. Shock Absorber Disassembly

4. Remove retaining ring from top cover retainers. (Figure 2)

   NOTE: Mark II snowmobiles with Chassis Serial No. 3787640 and above are equipped with a one-piece cover retainer (rather than two-piece as shown in Figures 2 and 3) and are not equipped with bottom shock cover.

5. Compress shock absorber spring by pushing on top shock cover toward the bottom. Remove top cover retainers.
6. Remove top cover, spring and bottom cover (if so equipped) from around shock absorber.

CLEANING and INSPECTION

1. Inspect shock absorber for signs of oil leaks.
2. Clean all parts and inspect for cracks, breaks or wear.

INSTALLATION (Figure 3)

1. Place bottom cover (if so equipped), spring and top cover around shock absorber. Shock absorber spring MUST be installed with "tightly wound" end "up", when installed on snowmobile.
2. Compress shock absorber spring by pushing on top shock cover toward the bottom. Install top cover retainers. Shock absorber MUST be fully extended before attempting installation of cover retainers.

   NOTE: Mark II snowmobiles with Chassis Serial No. 3787640 and above are equipped with a one-piece cover retainer (rather than two-piece as shown in Figures 2 and 3) and are not equipped with bottom shock cover.

3. Install retaining ring around top cover retainers.
4. Secure shock absorber to chassis and swing-frame. (Figure 1) A large, flat washer must be placed between shock and swing-frame.
5. Refer to "Specifications" Section 8 and torque shock absorber cap screws.

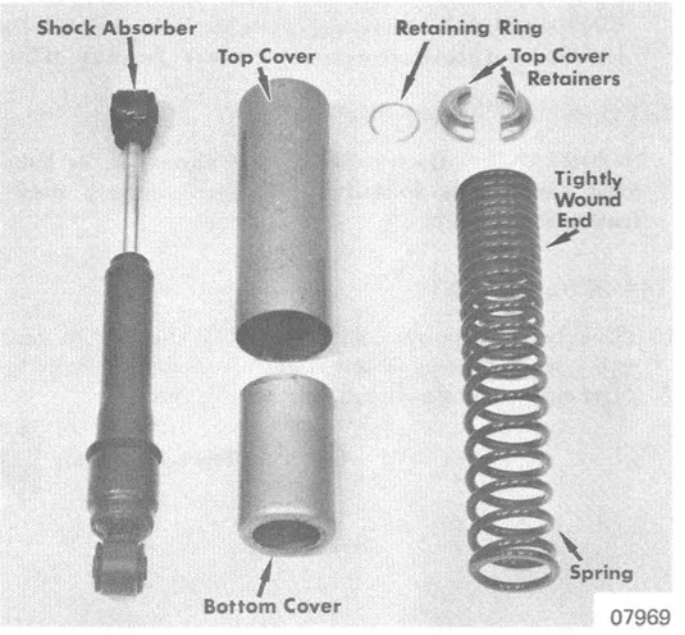
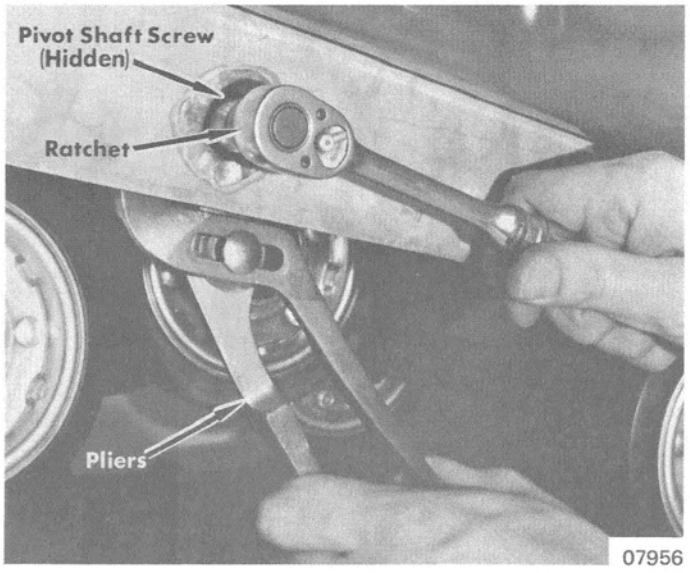


Figure 3. Shock Absorber Reassembly

BOGIE WHEEL SET
REMOVAL

NOTE: Center bogie wheel set MUST be removed if front bogie wheel set is going to be removed.

1. Lift and support rear of snowmobile.



2. Loosen track tension as far as possible. Refer to "Track Tension", following.

IMPORTANT: On Mark II snowmobiles with Chassis Serial No. 3787640 and above, it is necessary to remove and partially disassemble complete suspension assembly for removal of a bogie wheel set. Suspension removal is outlined under "Track-Removal", following.

3. Remove bogie pivot shaft screw from one side of chassis. Loosen pivot shaft screw on other side as far as possible or until pivot shaft starts to turn inside tube assembly.
4. Pull downward on disconnected end of bogie pivot shaft until it clears swing-frame, then slide bogie tube assembly partially off pivot shaft.
5. Hold pivot shaft exposed section with vise-grips or pliers and remove remaining pivot shaft screw. (Figure 1)

IMPORTANT: DO NOT score pivot shaft. If shaft is scored, file smooth before reinstallation. Bogie tube assembly must pivot freely on pivot shaft.

6. Remove bogie assembly from inside track.

Figure 1. Bogie Wheel Assembly Removal

DISASSEMBLY

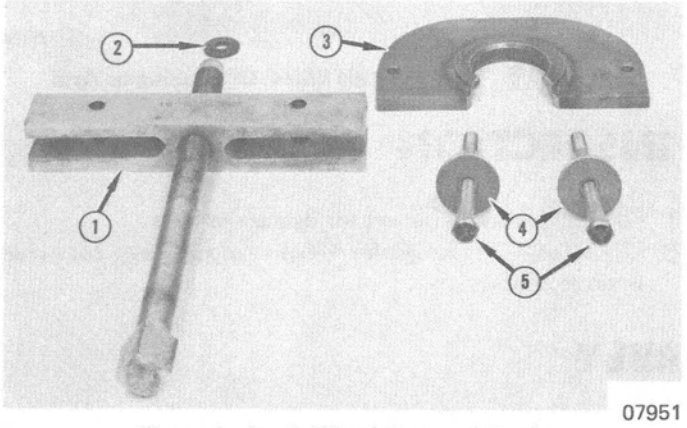


Figure 2. Bogie Wheel Removal Tools

1. C-91-65146A1 — Puller Cross Block
2. C-12-30473 — Washer (Part of C-91-65146A1)
3. C-91-65341 — Bogie Wheel Support Plate
4. C-12-46765 — Washer (Part of C-91-65146A1)
5. C-10-33986 — Bolt (Part of C-91-65146A1)

NOTE: Bogie wheels can be removed with or without disassembly of bogie wheel set.

1. Bend up spring retainers (Figure 3) on tube assembly to relieve spring tension.

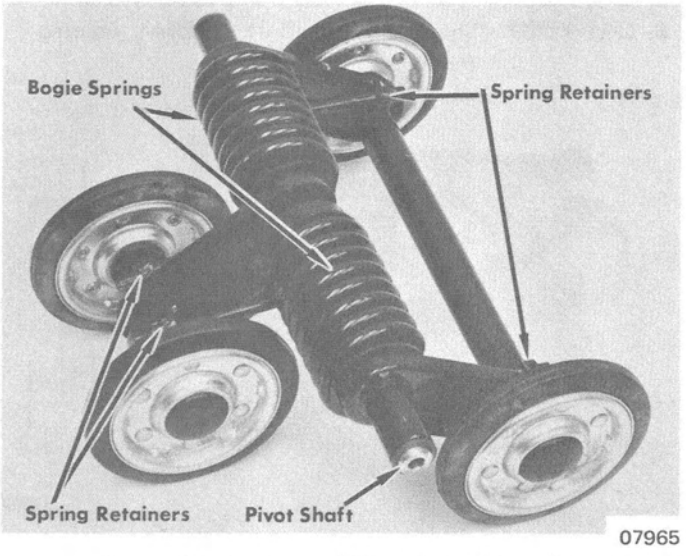


Figure 3. Center and Front Bogie Wheel Set

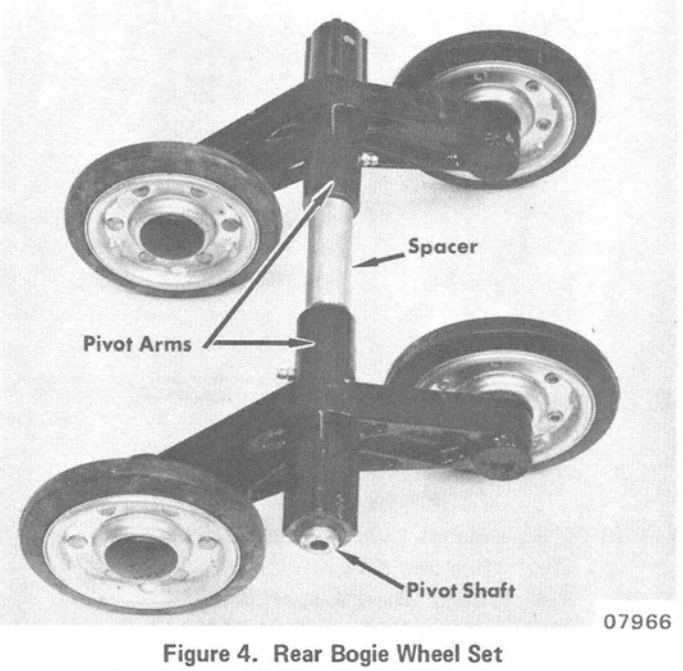


Figure 4. Rear Bogie Wheel Set

NOTE: Rear bogie wheel set (Figure 4) does not have springs. When pivot shaft is removed, pivot arms and spacer will separate. Bogie wheel removal is the same as for center and front bogie sets.

2. Pull out pivot shaft from bogie tube.
3. Separate tube assemblies and remove spring retainers (if so equipped) and tension springs. Remove bushings from tubes.
4. Remove center cap from wheel hub.

NOTE: Mark II snowmobiles with Chassis Serial No. 3787640 and above are equipped with polycarbonate bogie wheels. Remove a polycarbonate bogie wheel by (1) removing snap ring from wheel, (2) pull wheel off sealed bearing and (3) press sealed bearing off bogie tube, using an arbor press, a suitable mandrel and Puller Plate (C-91-37241). DO NOT attempt to use Bogie Wheel Support Plate (C-91-65341) for removal or installation of a polycarbonate bogie wheel.

5. Remove bogie wheel from tube assembly, as shown in Figure 5. Wheel bearing is staked to tube assembly. Bogie wheel may be removed with a press, as shown in Figure 6.

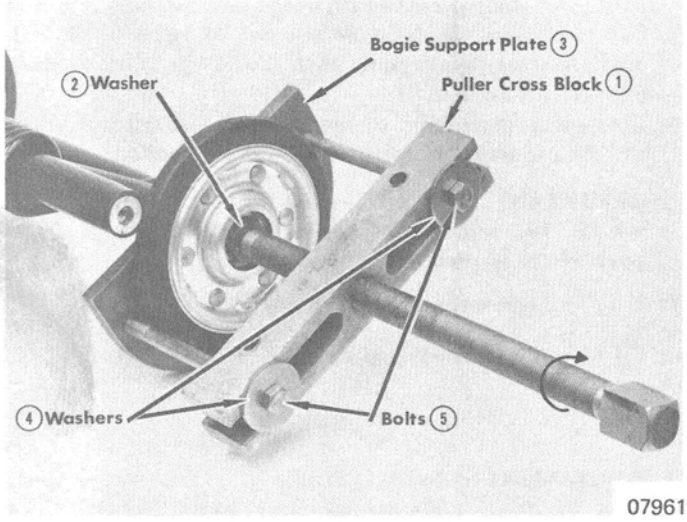


Figure 5. Removing Bogie Wheel

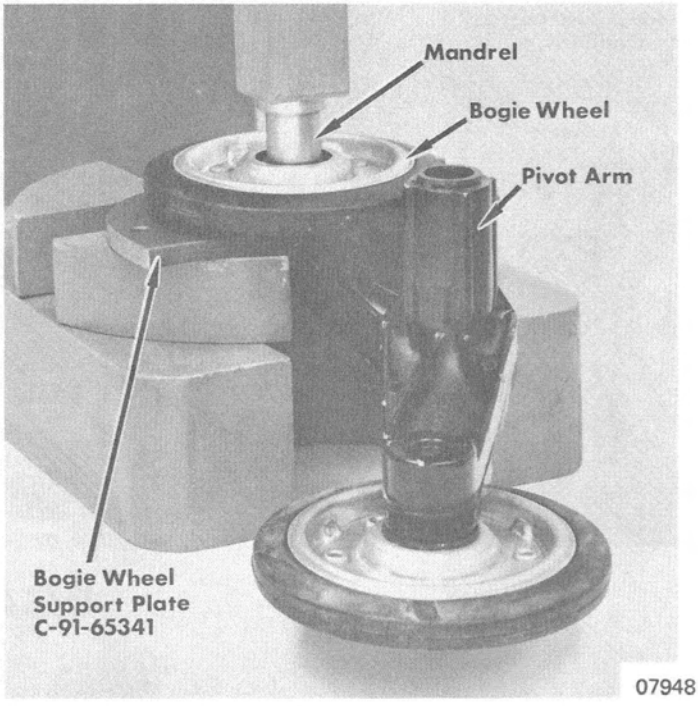


Figure 6. Pressing Bogie Wheel Off Tubing or Arm

CLEANING and INSPECTION

IMPORTANT: Ball bearings are a sealed unit. DO NOT immerse in solvent or cleaning fluid. DO NOT attempt to lubricate.

1. Clean all parts and inspect for damage or wear.
2. Check wheel bearings for roughness and tires for wear. Replace as necessary.

REASSEMBLY

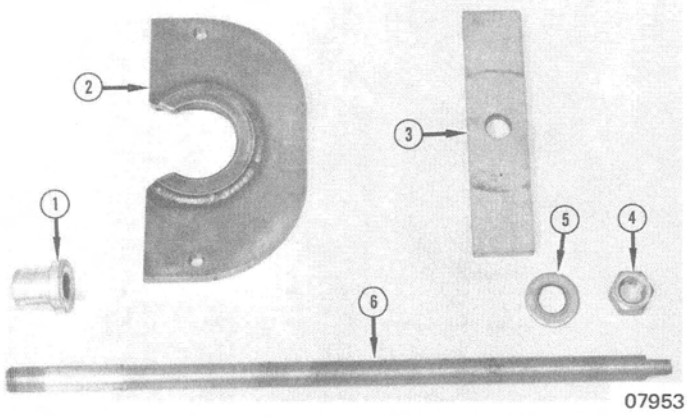


Figure 7. Bogie Wheel Installing Tools

1. C-91-36569 – Mandrel (Part of C-91-31229A1 Bearing Removal Kit)
2. C-91-65341 – Bogie Wheel Support Plate
3. C-91-29310 – Plate (Part of C-91-31229A1 Kit)
4. C-11-24156 – Nut (Part of C-91-31229A1 Kit)
5. C-12-34961 – Washer (Part of C-91-31229A1 Kit)
6. C-91-31229 – Shaft (Part of C-91-31229A1 Bearing Removal Kit)

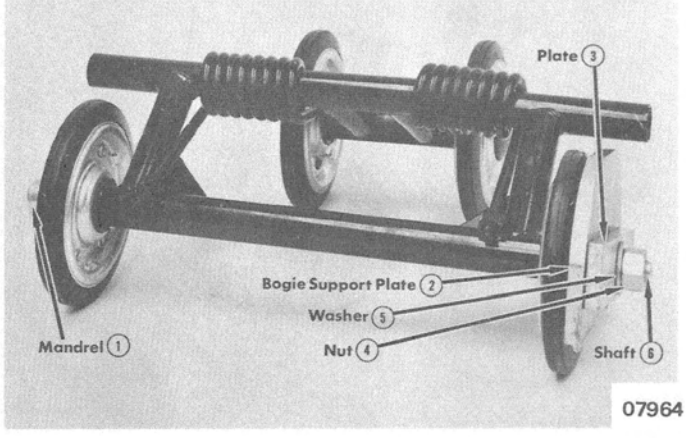


Figure 8. Installing Bogie Wheel

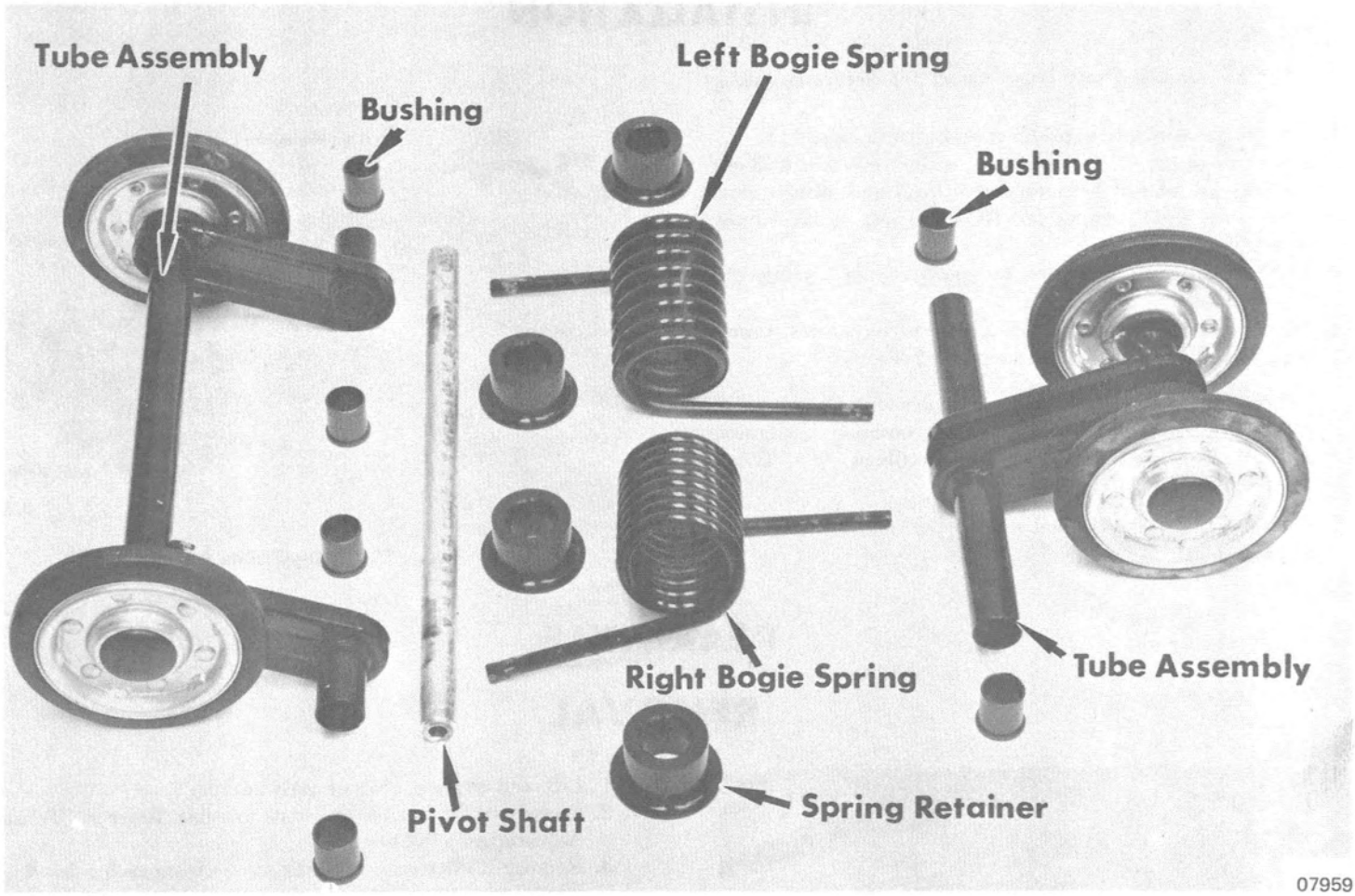


Figure 9. Center and Front Bogie Wheel Set

NOTE: Rear bogie wheel set (Figure 3) does not have tension springs. Lubricate pivot shaft thru grease fittings on pivot arms after installation.

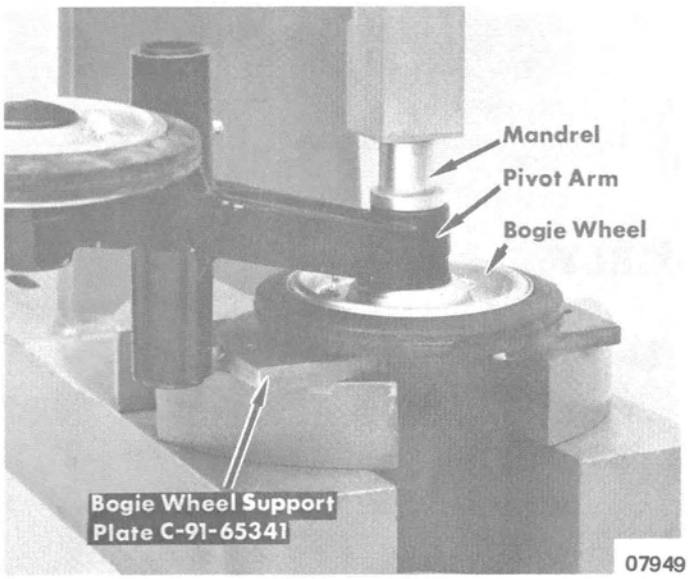


Figure 10. Pressing Bogie Wheel on Tubing or Arm

1. Install bogie wheel on tube assembly as shown in Figure 8. Bogie wheel may be installed with a press, as shown in Figure 10. Bogie wheels on rear bogie wheel set cannot be installed as shown in Figure 8; they MUST be pressed on.

   NOTE: Mark II snowmobiles with Chassis Serial No. 3787640 and above are equipped with polycarbonate bogie wheels. Install an assembled polycarbonate bogie wheel on bogie tube, using suitable mandrels and an arbor press. DO NOT attempt to use Bogie Wheel Support Plate (C-91-65341) when installing a polycarbonate bogie wheel.

2. Stake tube or arm assembly to inner race of wheel bearing in 4 places and install center cap.
3. Place tension springs, spring retainers (if so equipped), bushings and tube assemblies (Figure 9) in position. Make sure that bogie springs are located on correct side (right spring on right side and left spring on left side).
4. Lubricate pivot shaft with Low Temperature Lubricant (C-92-59999). Insert pivot shaft into tube assembly.
5. Secure tension springs to tube assembly by placing spring ends into retainers. Bend down retainers.

INSTALLATION

NOTE: Install front bogie wheel set before installing center set.

1. Place bogie assembly in position as shown in Figure 11.
2. Secure pivot shaft to swing-frame with screws and washers. Washers are placed between screw head and swing-frame. Make sure that bushings DO NOT fall out of bogie tube during installation.
3. Torque pivot shaft screws to specifications. (Refer to "Specifications" Section 8.)
4. Lubricate rear pivot shaft thru grease fitting on pivot arms with Low Temperature Lubricant (C-92-59999).

IMPORTANT: On Mark II snowmobiles with Chassis Serial No. 3787640 and above, after reassembling suspension, install suspension assembly as outlined in "Track-Installation", following.

5. Readjust track as outlined in "Track Tension and Alignment", following.

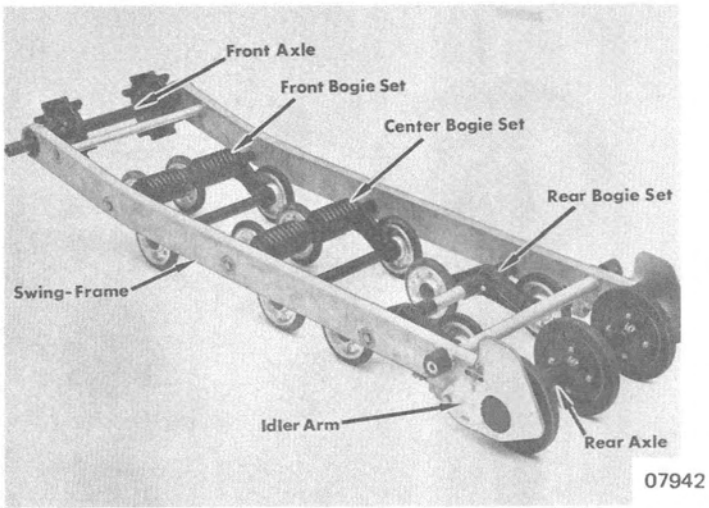
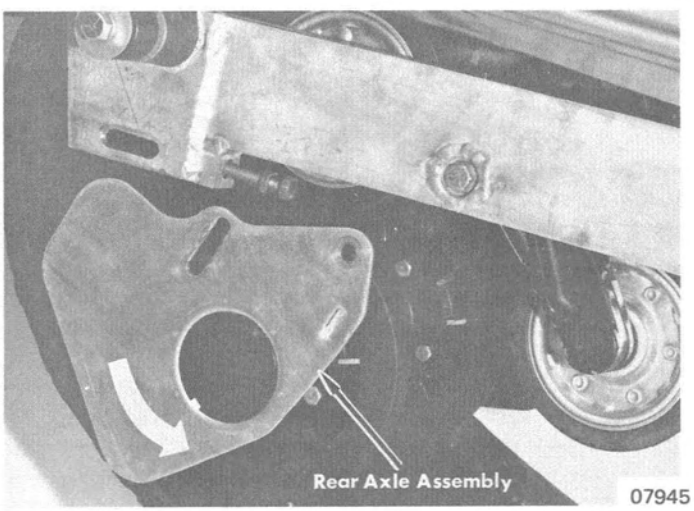


Figure 11. Swing-Frame Assembly

REAR AXLE

REMOVAL



1. Lift and support rear of snowmobile.
2. Loosen track tension as far as possible. Refer to "Tension Adjustment", following.
3. Remove 2 idler arm attaching screws from each side. When lower idler arm attaching screws are removed, track adjusting blocks will drop down.
4. Remove rear axle assembly as shown in Figure 1.

Figure 1. Removing Rear Axle

DISASSEMBLY

1. Remove rear idler arm caps and snap rings.
2. Remove idler arms from axle assembly as shown in Figure 2.
3. Remove wheel retaining hubs, hub and spacer assembly and idler wheels from axle.

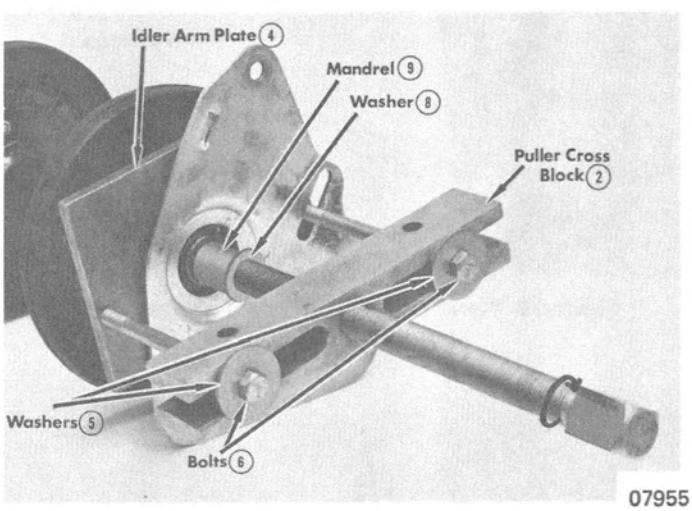


Figure 2. Removing Idler Arms

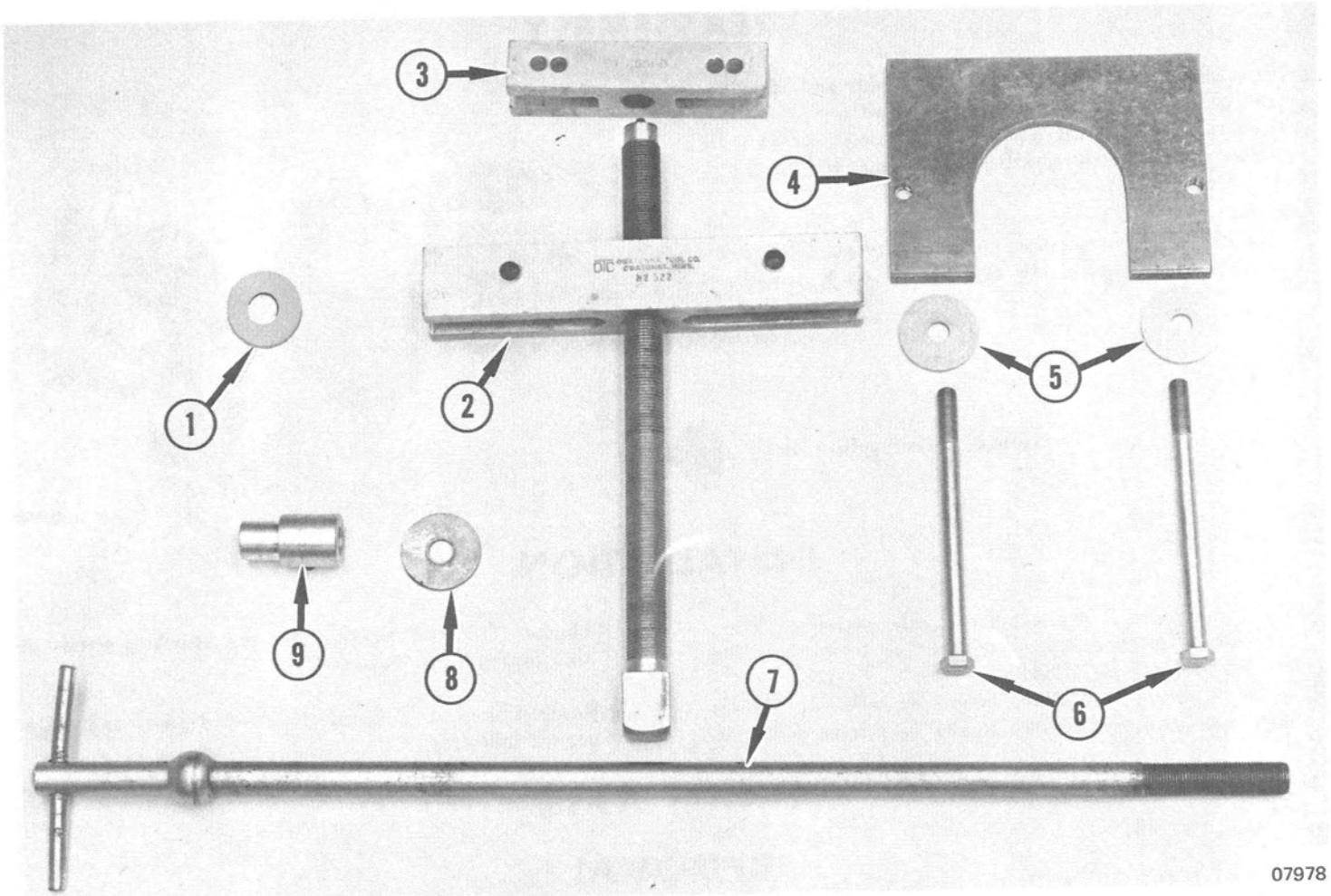


Figure 3. Idler Arm Tools

1. C-12-34961 — Washer (Part of C-91-31229A1 Bearing Removal Kit)
2. C-91-65146A1 — Puller Cross Block
3. C-91-45560A1 — Puller Cross Block
4. C-91-65333 — Idler Arm Plate
5. C-12-46765 — Washer (Part of C-91-65146A1)
6. C-10-33986 — Bolt (Part of C-91-65146A1)
7. C-91-34569 — Shaft (Part of C-91-34569A1 Slide Hammer)
8. C-12-46765 — Washer
9. C-91-37312 — Mandrel (Part of C-91-31229A1 Bearing Removal Kit)

CLEANING and INSPECTION

IDLER WHEELS

Check wheels for cracks, cuts, wear and chips. Rapid wear or chipped wheels generally result from considerable use on sand or gravel. Incorrect track tension and alignment also will contribute to excessive wear.

BEARINGS

Check for rough operation and/or excess play between inner and outer bearing race. Replace if bearing condition is questionable.

IMPORTANT: Ball bearings are a sealed unit. DO NOT immerse in solvent or cleaning fluid. DO NOT attempt to lubricate.

AXLE

Check axle to make sure that it is not bent or sprung and that welded hubs on axle and spacer assembly are parallel with each other.

REASSEMBLY

1. Place idler wheels, hub and spacer assembly and wheel retaining hubs on axle (idler wheels will fit one way only; taper must be toward weld-seam on axle.) Secure with screws and torque to specification. (Refer to "Specifications" Section 8.)
2. Install idler arms as shown in Figure 4. One left side and one right side idler arm must be installed on axle.
3. Install snap rings and plastic caps.

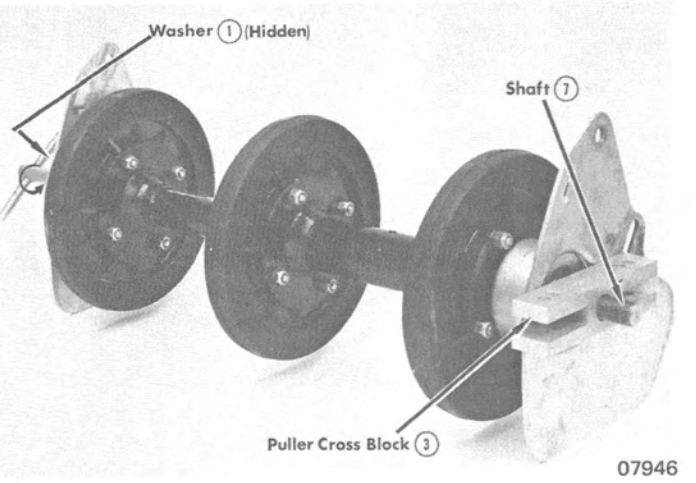


Figure 4. Installing Idler Arms

INSTALLATION

1. Refer to Figure 1 and install rear axle assembly. When rear axle is installed, right idler arm must be on right side and left idler arm on left side
2. Install 2 idler arm attaching screws on each side. Lower idler arm attaching screws thread into track adjusting blocks. DO NOT tighten idler arm attaching screws until adjusting track tension.
3. Readjust track as outlined in "Track Tension and Alignment", following.

FRONT AXLE

REMOVAL

1. Remove track from swing-frame assembly as outlined in "Track", following.
2. Remove front axle from swing-frame, as shown in Figure 1.
3. Remove sprockets from front axle.

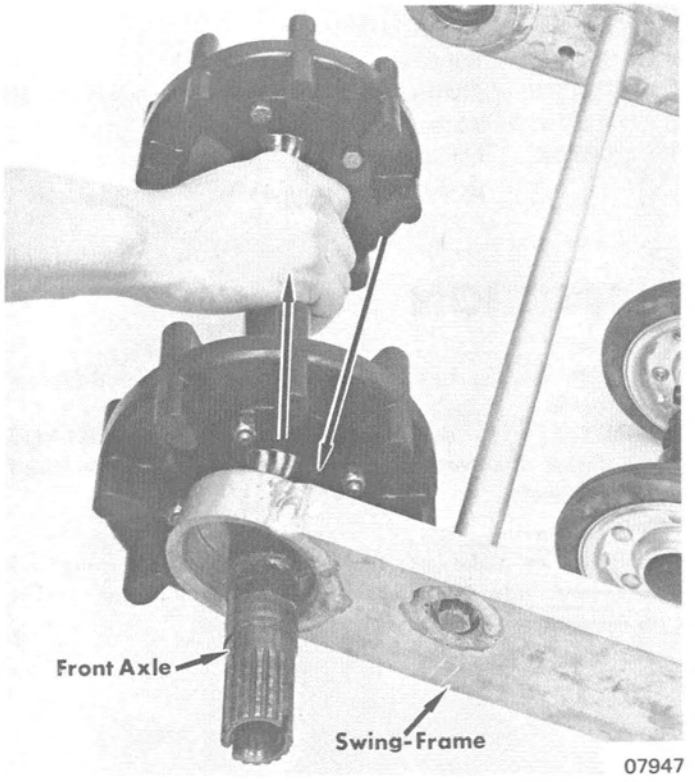


Figure 1. Front Axle Removal

CLEANING and INSPECTION

SPROCKETS

Check for cracks, cuts and chipped or broken teeth. Excessive wear of teeth usually is the result of (1) operating with incorrect track tension and/or alignment or (2) incorrect alignment between sprockets or (3) operation on sand or gravel.

IMPORTANT: Sprockets may show considerable wear but still perform satisfactorily. It should not be necessary to replace sprockets, unless track slippage, jumping or misalignment of track occurs. Replace sprockets as a set ONLY if excessive wear is reason for replacement.

BEARINGS

NOTE: Front axle ball bearings are mounted in chaincase and right swing-frame.

Check for rough operation and/or excess play between inner and outer bearing race. Replace if bearing condition is questionable.

IMPORTANT: Ball bearing mounted in right swing-frame is a sealed unit. DO NOT immerse in solvent or cleaning fluid. DO NOT attempt to lubricate.

AXLE

Check axle to make sure that it is not bent or sprung and that welded hubs on axle are parallel with each other. Check splines to be certain that they are not bent or twisted.

INSTALLATION

1. Place sprockets and retaining hubs on axle (sprockets will fit one way only; taper must be toward weld-seam on axle). DO NOT torque retaining screws at this time.

2. With sprocket retaining screws snug, place a straight-edge across both sprockets. Sprockets must be parallel (tooth-for-tooth) $\pm$ 3/64".

3. Torque sprocket retaining screws to specifications in Section 8.
4. Install front axle in swing-frame. (Figure 1) Front axle ball bearing, mounted in right swing-frame, must be seated all the way into swing-frame.
5. Place track around swing-frame assembly and install in snowmobile as outlined in "Track", following.

TRACK - REMOVAL

1. Raise top cowl
2. Drain lubricant from chaincase and remove speedometer angle drive and chaincase cover.
3. Loosen chain tension and remove drive sprocket (bottom) and chain. (Refer to this section, Part D.)
4. Remove shock absorber to swing-frame mounting screws.
5. Lift and support rear of snowmobile.
6. Remove 3 nuts from bearing retainer on right side of chassis. Remove bearing retainer and support bushing. (Figure 1)

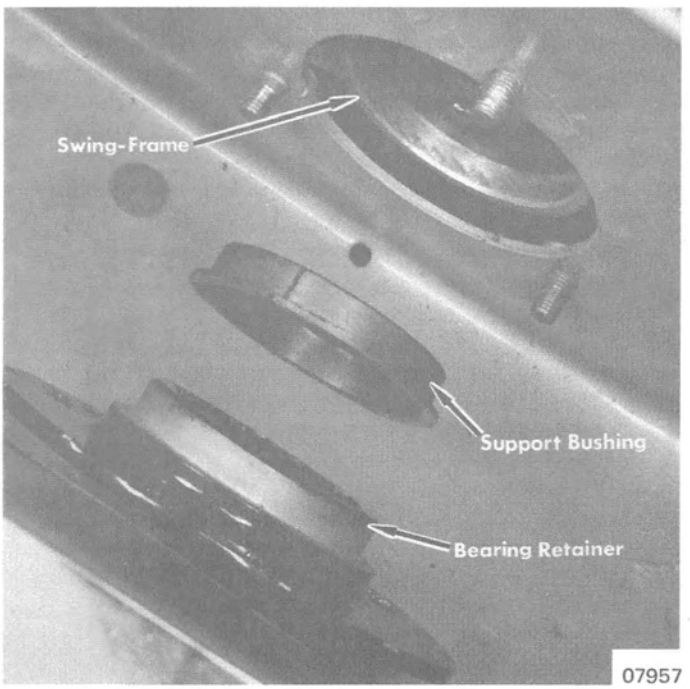


Figure 1. Removal of Bearing Retainer

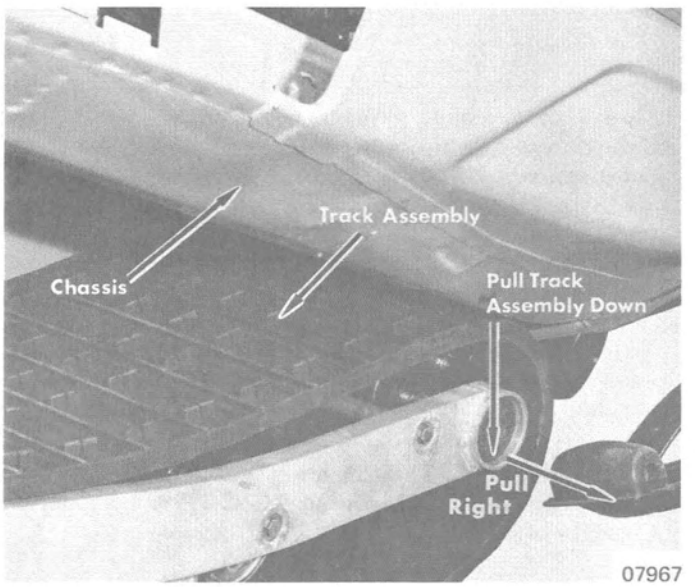


Figure 2. Removing Track and Swing-Frame

7. Remove chaincase to chassis attaching bolts and pull chaincase and sheave assembly away from chassis and front axle. Remove support bushing from chaincase or swing-frame. The 2 swing-frame support bushings are not identical and must not be interchanged.
8. Pull right side of track assembly down and pull right until splined end of front axle clears chassis.
9. Remove track and swing-frame assembly from chassis tunnel.

10. Loosen track tension as far as possible. Refer to "Track Tension", following.
11. Remove top idler arm attaching screw (Figure 3) from each side. Swivel rear axle down and under as far as possible.
12. Remove track from around swing-frame assembly.

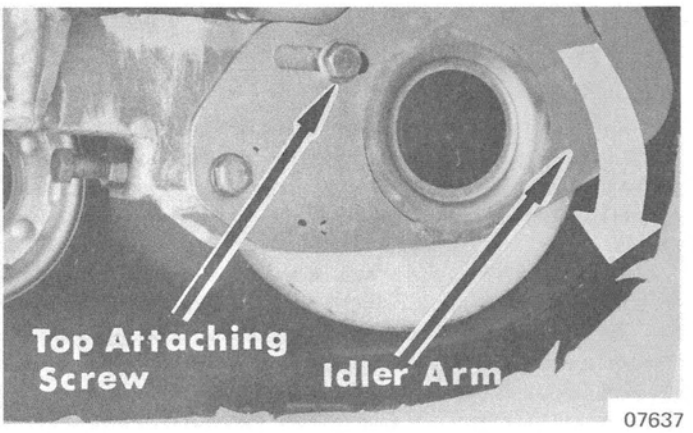


Figure 3. Idler Arm

INSPECTION

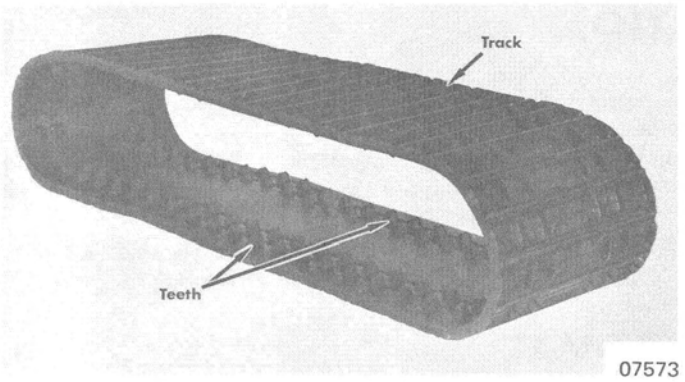


Figure 4. Track

1. Check track for large cuts or cracks.
2. Check edges of track for fraying or wear which would indicate misalignment.
3. Check teeth (Figure 4) for excessive wear.

IMPORTANT: Track teeth may show considerable wear but still perform satisfactorily. It should not be necessary to replace track unless track slippage or jumping occurs.

INSTALLATION

1. Install track around swing-frame assembly.
2. Swivel rear axle up into proper position and install top idler arm attaching screw (Figure 3) in each side.
3. Position track and swing-frame into position in chassis tunnel.
4. Lift front of track assembly and insert splined end of front axle into chaincase hole in chassis.(Figure 2)
5. Install support bushing and bearing retainer (Figure 1) into swing-frame on right side of chassis. Secure with nuts and torque to specifications. (Refer to "Specifications", Section 8.)

IMPORTANT: Lubricate lower seal in chaincase with Low Temperature Lubricant (C-92-59999) before installing over axle.

6. Place support bushing in position on chaincase. Carefully slide chaincase over front axle and against chassis. Be sure that chaincase and bushing are correctly positioned in swing-frame.
7. Secure chaincase assembly with bolts and torque to specifications in Section 8.
8. Install drive chain and drive sprocket in chaincase and adjust chain tension. Install chaincase cover and speedometer angle drive. Fill chaincase with lubricant. (Refer to this section, Part D)
9. Close top cowl.
10. Attach shock absorber to swing-frame with mounting screws and torque. (Refer to "Specifications" Section 8.)
11. Readjust track as outlined in "Track Tension and Alignment", following.

TRACK TENSION and ALIGNMENT

Proper track tension and alignment are essential to eliminate undue wear to drive components and track and to maintain efficient, economical operation of the snowmobile. Check track tension and alignment after first 3 to 5 hours of operation and every 25 hours of operation thereafter. Tension is correct when a slack of ½" to 1" (12.7mm-25.4mm) is obtained. Slack MUST be measured at center of track when snowmobile is at rest with track supporting weight of snowmobile. (Figure 1) If necessary, adjust as follows:

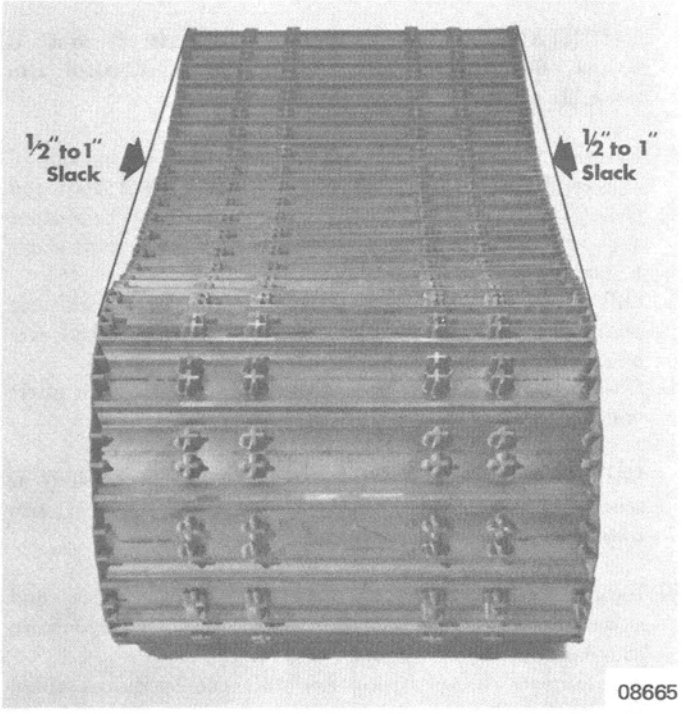


Figure 1. Track Tension

TRACK TENSION

1. Loosen idler arm anchor bolts ("A" and "B" in Figure 2) no more than ¼ to ½-turn on both sides of chassis.
2. Loosen tension bolt jam nuts ("C" in Figure 2) on both sides of chassis.
3. Adjust tension bolts ("D" in Figure 2) equally on both sides of chassis until correct tension has been acquired, as shown in Figure 1.
4. Tighten idler arm anchor bolts "B" before tightening bolts "A". Torque anchor bolts "B" and "A" (on both sides of chassis) to specifications. (Refer to "Specifications" Section 8.)

CAUTION: DO NOT overtighten idler arm anchor bolts ("A" and "B" in Figure 2).

5. Tighten tension bolt jam nuts "C".

IMPORTANT: Always check track alignment, as outlined immediately following, after performing a track tension adjustment.

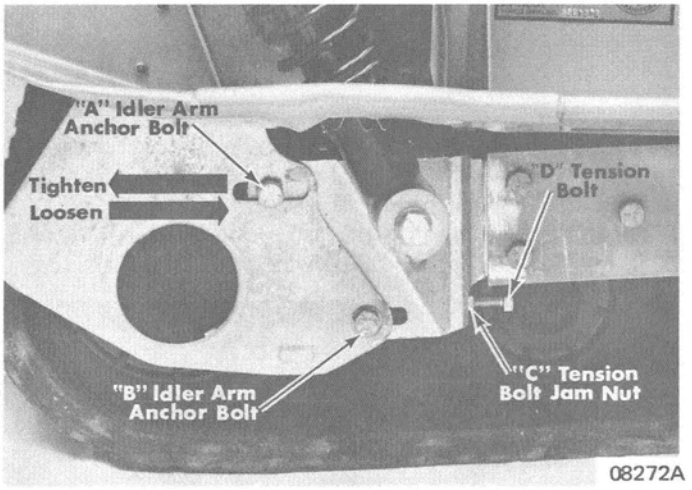


Figure 2. Tension Adjustment

TRACK ALIGNMENT

1. Place rear of snowmobile on suitable blocking to raise entire track off ground and support front end for stability.
2. Start engine and slowly run drive mechanism.

WARNING: Make certain that track is free of all particles which, possibly, could be thrown out by the moving track. KEEP HANDS and FEET CLEAR of TRACK at all times. DO NOT attempt to check track alignment while engine is running.

3. STOP the SNOWMOBILE ENGINE. Scan the track, making certain that track is centered between idler arms. (Figure 3) If track is not centered, an adjustment is necessary. An improperly aligned track always will run or drift toward the LOOSE side, and this condition requires a track adjustment on the loose side only. If track adjustment is necessary, refer to "Track Tension", preceding. After readjusting, recheck track alignment.
4. As a final track alignment check, it is recommended that snowmobile be run over smooth terrain and in a straight line for approximately 100 yards (91m). STOP the SNOWMOBILE ENGINE. With track on ground, recheck track alignment as shown in Figure 3. If further track adjustment is necessary, refer to Step 3, preceding.

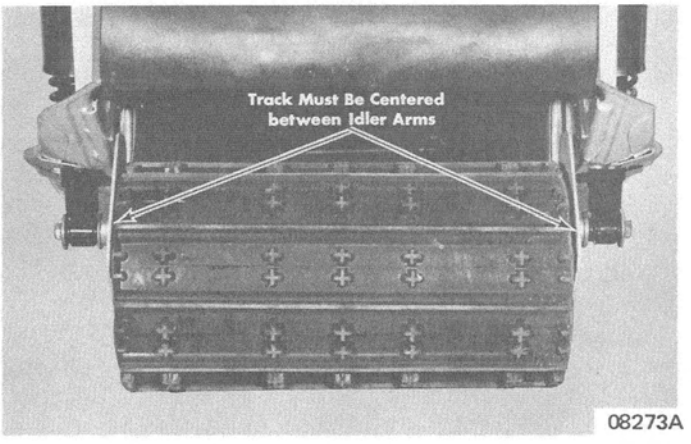


Figure 3. Track Alignment

340 S/R and 440 S/R SUSPENSION (TYPICAL) REMOVAL and DISASSEMBLY

1. Lift and support rear of snowmobile. Raise snowmobile high enough to take most of the weight off the track. DO NOT raise track assembly off working surface.
2. Loosen track tension as far as possible. (Refer to "Track Tension and Alignment", following.)

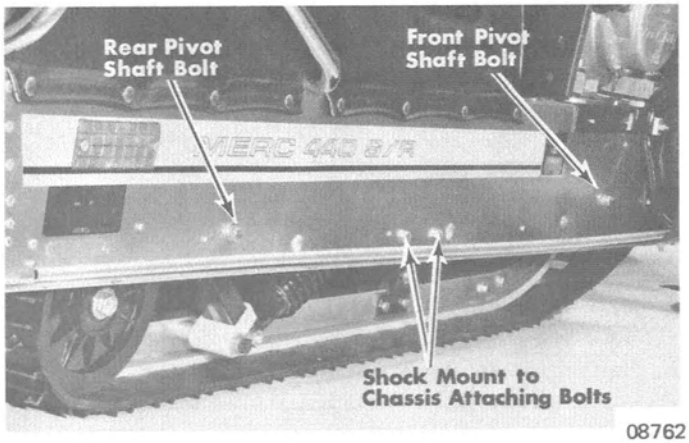


Figure 1. Suspension Removal

3. Remove bolts, flat washers and nuts which secure shock mount to each side of chassis. (Figure 1)
4. Remove rear pivot shaft bolt (Figure 1) from one side of chassis. A large washer is located between pivot shaft and chassis on each side. Loosen rear pivot shaft bolt on other side of chassis as far as possible or until pivot shaft starts to turn inside control arm assembly.
5. Raise snowmobile high enough to allow disconnected end of control arm pivot shaft to be pulled down until it clears chassis, then slide control arm assembly partially off pivot shaft.
6. Hold exposed section of pivot shaft with vise-grips or pliers and remove remaining pivot shaft bolt.

   IMPORTANT: DO NOT score pivot shaft If shaft is scored, file smooth before reinstallation. Control arm assembly must pivot freely on pivot shaft.

7. Remove front pivot shaft bolt (Figure 1) from one side of chassis. A large washer is located between pivot shaft and chassis on each side. Loosen front pivot shaft bolt on other side of chassis as far as possible or until pivot shaft starts to turn inside control arm assembly.
8. Pull downward on disconnected end of front control arm pivot shaft until it clears chassis, then slide control arm assembly partially off pivot shaft.
9. Hold exposed section of pivot shaft with vise-grips or pliers and remove remaining pivot shaft bolt.

   IMPORTANT: DO NOT score pivot shaft. If shaft is scored, file smooth before reinstallation. Control arm assembly must pivot freely on pivot shaft.

10. Raise snowmobile chassis all the way off track and suspension. Remove complete suspension assembly from chassis tunnel and from inside track.
11. Components of suspension assembly can be disassembled by simply referring to the illustrations in parts list. No special tools are required.

CLEANING and INSPECTION

1. Thoroughly clean suspension assembly.
2. Inspect front and rear control arms (Figure 2) for cracks, breaks, bends and wear.
3. Check support rails (Figure 2) for cracks and bends. If support rails are bent, rails should be replaced rather than attempting to straighten.
4. Check rear axle brackets (Figure 2) for cracks, breaks and bends.

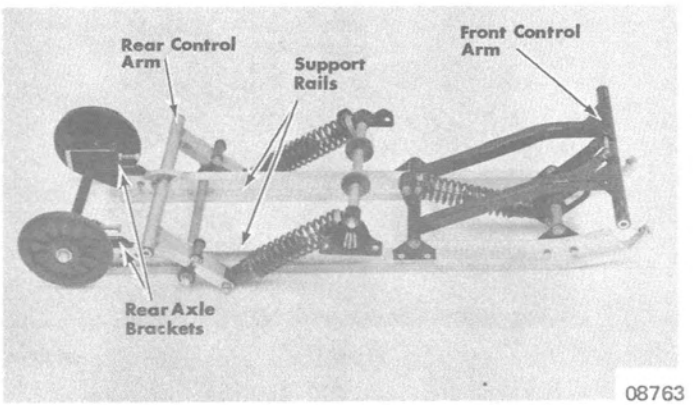


Figure 2. S/R Suspension Assembly

5. Inspect pivot shafts, side straps and bushings for wear and breaks.
6. Inspect shock absorbers for signs of oil leaks.
7. Replace parts as necessary.

SLIDE INSPECTION and REPLACEMENT

Slides should be inspected and checked occasionally for wear. Replace slides if worn down to ¼" (6.35mm) (minimum thickness) in any spot. (Figure 3) New slides MUST be installed in pairs only.

> **CAUTION: Failure to replace slides, when excessively worn, will result in track grouser bars wearing thru slides and into aluminum rails. This condition may necessitate replacement of rails as well as slides.**

It is not necessary to remove slide rail suspension from chassis to replace slides. If replacement of slides is necessary, replace as outlined following:

1. Remove screw and nut which attach each slide to front of each support rail. (Figure 3)

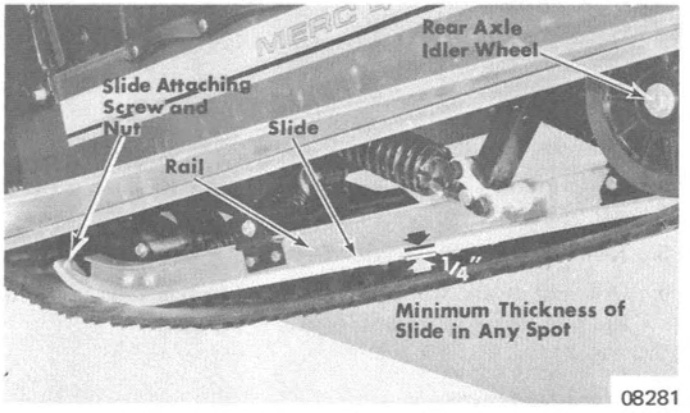


Figure 3. Slide Inspection and Replacement

2. Tap slides (with a leather mallet) off support rails and out thru openings at rear of track (between grouser bars). Bottom of support rails and top of slides are "dovetailed".
3. Install new slides (tap with a leather mallet) thru openings at rear of track and all the way on support rails. When slides are properly installed, ends of slides will be flush with ends of rails.
4. Drill a ¼" (6.4mm) hole thru front of each slide, using screw hole in front of each rail as a guide.
5. Secure slides to support rails by installing screws and nuts thru hole at front of each slide rail (screw head against slide). (Figure 3) Torque nuts to specification in "Specifications" Section 8.
6. Refer to "Track Tension and Alignment", following, and check track tension. Readjust track tension as necessary.

CHASSIS WEAR STRIP INSPECTION and REPLACEMENT

Wear strips in chassis tunnel should be inspected and checked occasionally for wear. Replace wear strips when track grouser bars are starting to strike the rivets which attach wear strips to chassis tunnel.

> **CAUTION: Failure to replace chassis wear strips, when excessively worn, may cause track grouser bars to wear thru wear strips and into chassis.**

If replacement of wear strips is necessary, replace as outlined following:

1. Refer to Section 4, Part C, and remove fuel tank from snowmobile chassis.
2. Remove suspension assembly as outlined in "Removal and Disassembly", preceding.
3. Drill out rivets, which attach wear strips to top of chassis tunnel, and remove wear strips from chassis.
4. Place new wear strips in position in chassis tunnel (chamfered edge toward rear of chassis) and secure with rivets.
5. Install suspension assembly as outlined in "Reassembly and Installation", following.
6. Install fuel tank. (Refer to Section 4, Part C.)

REASSEMBLY and INSTALLATION

1. Lubricate pivot shafts (2 on front control arm, one on rear control arm) with Low Temperature Lubricant (C-92-59999).
2. Reassemble components of suspension assembly by referring to Figure 2 and illustrations in parts list. Torque all fasteners to specifications in "Specifications" Section 8.

   IMPORTANT: Front shock absorber has a softer spring than rear shock absorbers. DO NOT install front shock absorber in rear or a rear shock absorber in front.

3. Lubricate front and rear suspension rollers with Low Temperature Grease (C-92-59999).
4. Position suspension assembly inside track and in chassis tunnel with front control arm above front axle.
5. Align front control arm pivot shaft with holes in chassis. Place large, flat washers between control arm assembly and each side of chassis. Secure pivot shaft to chassis with bolts and flat washers. Torque bolts to specifications in Section 8.

   IMPORTANT: Make sure that pivot shaft bushings DO NOT fall out of control arm during installation.

6. Lower snowmobile onto suspension far enough to align holes in shock mounts with holes in each side of chassis. Attach shock mounts to chassis with bolts, flat washers and locknuts. Torque bolts to specification.
7. Continue to lower snowmobile onto suspension until rear control arm pivot shaft is aligned with holes in chassis. Place large, flat washers between control arm assembly and each side of chassis. Secure pivot shaft to chassis with bolts and flat washers. Torque bolts to specification.

   IMPORTANT: Make sure that pivot shaft bushings DO NOT fall out of control arm during installation.

8. Readjust track as outlined in "Track Tension and Alignment", following.

REAR AXLE
REMOVAL

NOTE: Removal of suspension assembly is not necessary for replacement of rear axle idler wheels, rear axle and/or rear axle brackets.

1. Remove bolts, lockwashers and flat washers which secure rear axle idler wheels to rear axle. (Figure 3)
2. Loosen track tension as far as possible. (Refer to "Track Tension and Alignment", following.)
3. Pull rear axle idler wheels off rear axle.
4. Remove bolts, flat washers and locknuts which secure rear axle brackets to support rails.
5. Remove rear axle assembly from suspension.
6. Drill out rivets, which secure straps to rear axle brackets, and pull rear axle from slots in axle brackets.

CLEANING and INSPECTION

IDLER WHEELS

Check wheels for cracks, chips and wear. Rapid wear or chipped wheels generally result from extensive operation on sand or gravel. Incorrect track tension and alignment also will contribute to excessive wear.

Check idler wheel bearings for rough operation and/or excessive play between inner and outer bearing races. Replace idler wheels if condition of bearings is questionable.

IMPORTANT: Idler wheel bearings are a sealed unit. DO NOT immerse in solvent or cleaning fluid. DO NOT attempt to lubricate bearings.

AXLE and AXLE BRACKETS

Check axle for bends, a "sprung" condition and stripped threads.

Inspect axle brackets for bends, breaks and stripped threads. Replace parts as necessary.

INSTALLATION

1. Install rear axle in slots of axle brackets. Axle is properly installed in brackets when track adjusting bolts align with boss on axle. (Figure 4) Rivet straps to rear axle brackets.
2. Place rear axle assembly in position on support rails of suspension. Fasten axle brackets to support rails with bolts, flat washers and locknuts. Torque bolts to specification in "Specifications" Section 8.

   IMPORTANT: Position flat washers against support rails so that bolt heads and locknuts are not against support rails.

3. Install rear idler wheels on rear axle and secure with flat washers, lockwashers and bolts. DO NOT tighten idler wheel bolts at this time.
4. Align holes in rear axle bosses with track adjusting bolts. (Figure 4) Readjust track tension as outlined in "Track Tension and Alignment", following.
5. Torque rear axle idler wheel bolts to specification in Section 8.
6. Adjust track alignment as outlined,following.

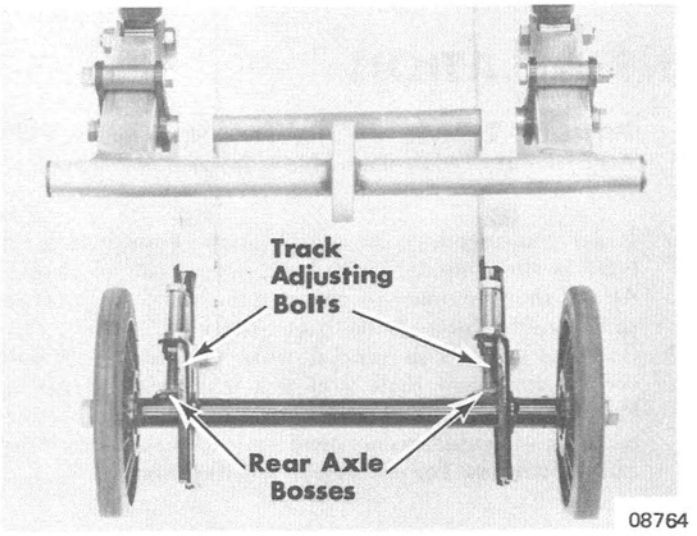


Figure 4. Rear Axle

FRONT AXLE
REMOVAL

1. Raise top cowl.
2. Remove battery and battery box, if so equipped.
3. Drain lubricant from chaincase and remove chaincase cover. Remove speedometer angle drive assembly from chaincase cover, if so equipped.
4. Loosen chain tension and remove sprockets and drive chain from chaincase. (Refer to this section, Part D.)
5. Remove suspension assembly as outlined preceding.
6. Remove 3 nuts from bearing retainer on right side of chassis. Remove bearing retainer cover, bearing, rubber mount and retainer. (Figure 5)
7. Slide front axle to right and pull left side of axle down to clear chaincase. (Figure 6)
8. Pull front axle out of chassis.
9. Remove sprockets from front axle.

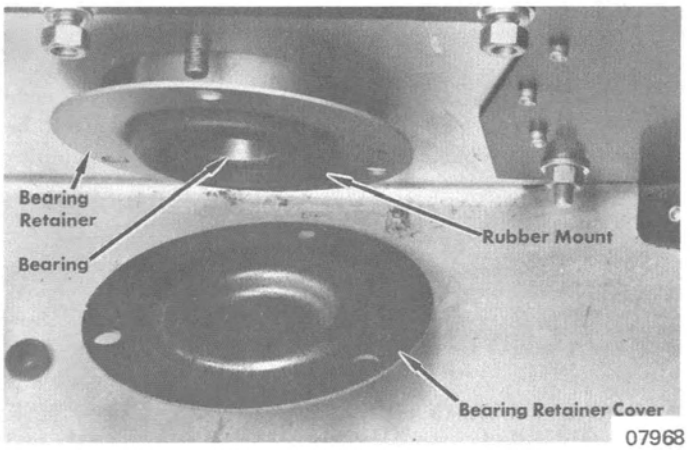


Figure 5. Removal of Bearing Assembly

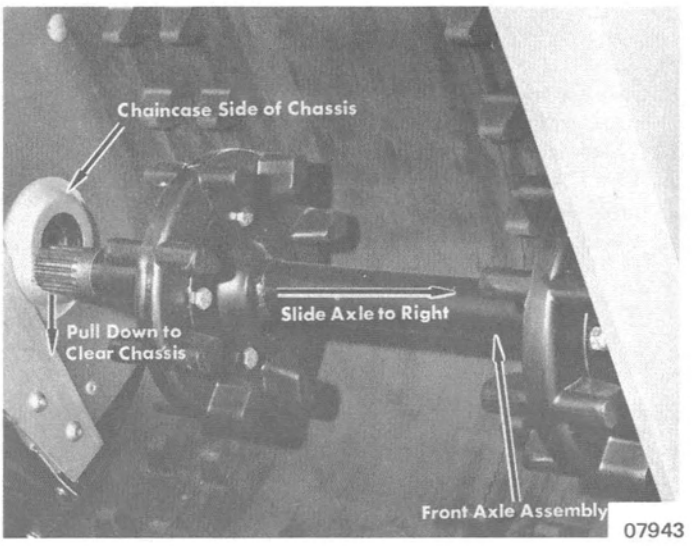


Figure 6. Removal of Front Axle

CLEANING and INSPECTION

SPROCKETS

Check for cracks, cuts and chipped or broken teeth. Excessive wear of teeth usually is the result of (1) operating with incorrect track tension and/or alignment, (2) incorrect alignment between sprockets or (3) operation on sand and/or gravel.

IMPORTANT: Sprockets may show considerable wear but still perform satisfactorily. It should not be necessary to replace sprockets, unless track slippage, jumping or misalignment of track occurs. Replace sprockets as a set ONLY if excessive wear is reason for replacement.

BEARINGS

NOTE: Front axle ball bearings are mounted in chaincase and chassis bearing retainer.

Check for rough operation and/or excess play between inner and outer bearing race. Replace if bearing condition is questionable.

IMPORTANT: Ball bearing (mounted in chassis bearing retainer) is a sealed bearing. DO NOT immerse in solvent or cleaning fluid. DO NOT attempt to lubricate bearing.

AXLE

Check axle to make sure that it is not bent or sprung and that welded hubs on axle are parallel with each other. Check splines to be certain that they are not bent or twisted.

INSTALLATION

1. Place sprockets and retaining hubs on axle (sprockets will fit one way only; taper must be toward weld-seam on axle). DO NOT tighten retaining bolts at this time.
2. With sprocket retaining bolts snug, place a straight-edge across both sprockets. Sprockets MUST be parallel (tooth-for-tooth) ± 3/64" (1.2mm).
3. Torque sprocket retaining bolts to specification in "Specifications" Section 8.

   IMPORTANT: Lubricate lower seal in chaincase with Low Temperature Lubricant (C-92-59999) before installation of axle.

4. With track in tunnel, place front axle in chassis with splined end in chaincase. (Figure 6)
5. Install bearing retainer, rubber mount, bearing and retainer cover in position on front axle and chassis. Secure bearing retainer assembly with 3 nuts. (Figure 5)
6. Install battery box (if so equipped) and torque bearing retainer cover nuts and chassis extrusion nuts to specifications as specified in Section 8.
7. Install suspension assembly as outlined preceding.
8. Install drive chain and sprockets in chaincase and adjust chain tension. Install chaincase cover and fill chaincase with lubricant. (Refer to this section, Part D.)
9. Install speedometer angle drive assembly (if so equipped) in chaincase cover and battery (if so equipped) in battery box. Close top cowl.
10. Readjust track as explained in "Track Tension and Alignment", following.

TRACK

REMOVAL

1. Remove suspension assembly as outlined, preceding.
2. Remove front axle as explained, preceding.
3. Remove track from chassis tunnel.

INSPECTION

1. Inspect track for broken or missing grouser bars. Replace damaged grouser bars as outlined, following.
2. Check track for large cuts or cracks.
3. Check edges of track for fraying or wear which would indicate misalignment.
4. Check track drive lugs for excessive wear.

IMPORTANT: Track drive lugs may show considerable wear but still perform satisfactorily. It should not be necessary to replace track unless track slippage or jumping occurs.

GROUSER BAR REPLACEMENT

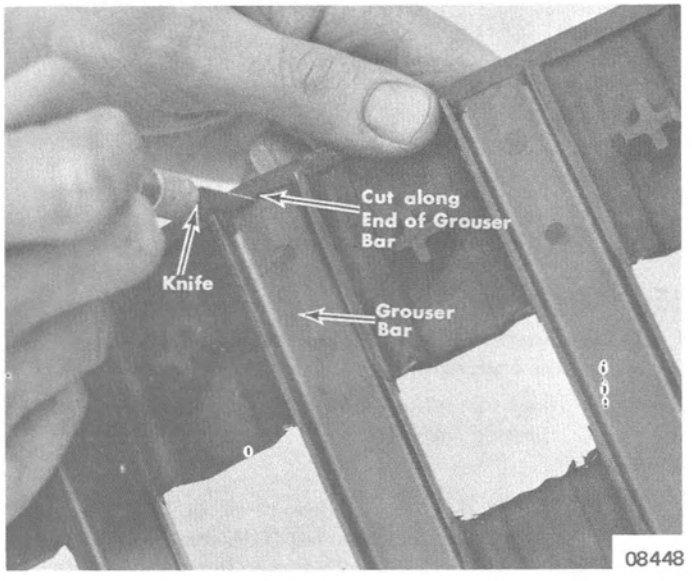


Figure 7. Cutting Grouser Bar Bonding

NOTE: Removal of track from snowmobile is not necessary for replacement of a grouser bar.

1. Make a shallow knife cut along end of grouser bar. Cut must be thru section of rubber and down to bare metal of grouser bar. (Figure 7)

CAUTION: A deep knife cut could result in damage to internal track cords.

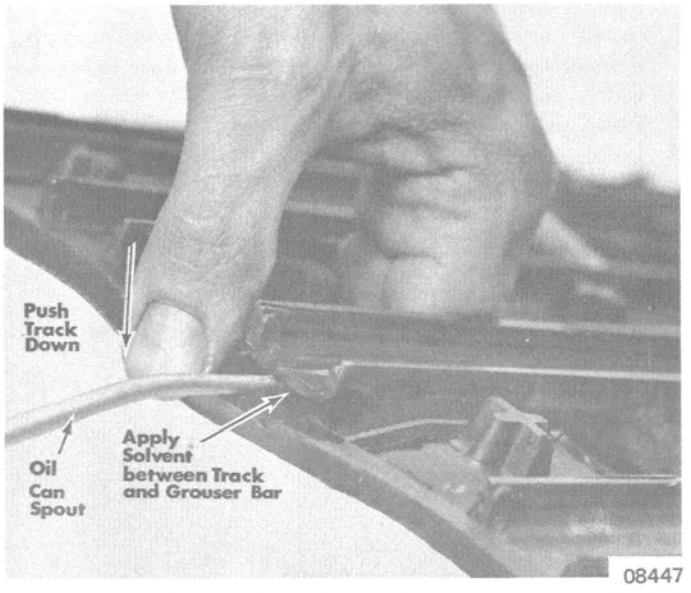


Figure 8. Grouser Bar Removal

2. With an oil can or other suitable container, apply MEK (methyl ethyl ketone) or acetone between track and grouser bar (Figure 8) where cut was made.
3. After several seconds, the solvent (MEK or acetone) will start to dissolve the adhesive which "bonds" grouser bar to track. Apply steady pressure to track and add small amounts of solvent as grouser bar is peeled off outside track band. (Figure 9)

CAUTION: Allow solvent to dissolve adhesive bonding before attempting to separate grouser bar from track bands. If this caution is not observed, some track material could be pulled away from track and expose internal track cords.

Figure 9. Grouser Bar Removal

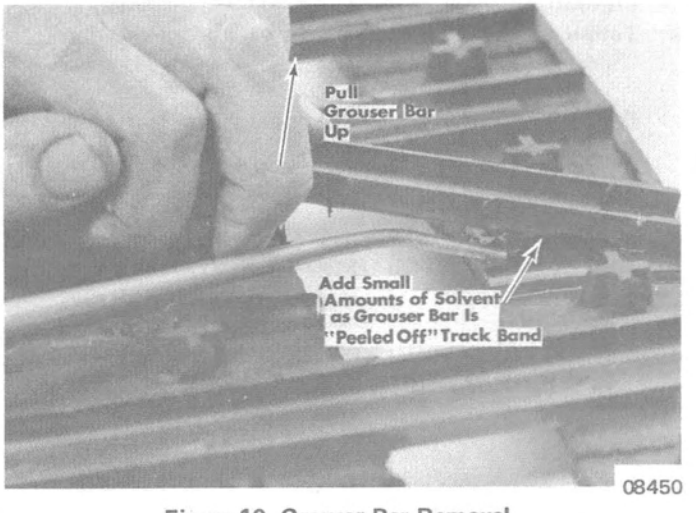
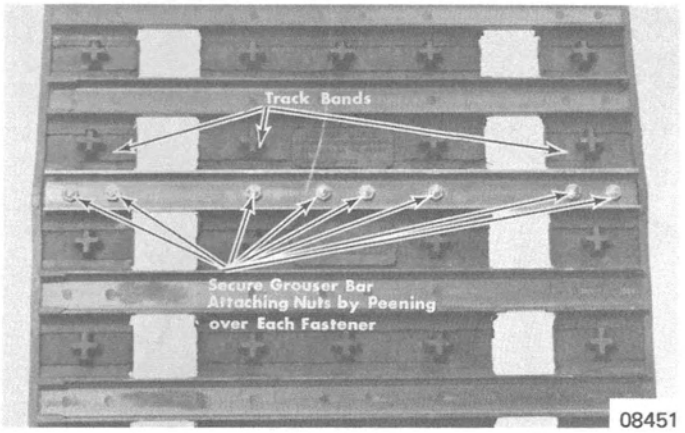


Figure 10. Grouser Bar Removal



4. Remove grouser bar from center track band and other outside track band in same manner. (Figure 10)
5. Place new grouser bar in position on track bands. Using grouser bar as a template, drill 3/16" (4.8mm) holes thru track bands at same locations as pre-drilled holes in grouser bar.
6. Secure grouser bar to track bands with fasteners and attaching nuts which are supplied with grouser bar. Tighten attaching nuts securely so that heads of fasteners are flush or depressed into track material. Lock attaching nuts securely by peening threaded fastener ends to one-half the height of original exposed end. (Figure 11)

Figure 11. Replacement Grouser Bar Installed

INSTALLATION

1. Position track in chassis tunnel.
2. Install front axle as outlined, preceding.
3. Install suspension assembly as explained, preceding.
4. Readjust track as outlined in "Track Tension and Alignment", following.

TRACK TENSION and ALIGNMENT

Proper track tension and alignment are essential to eliminate undue wear to drive components, track and slide rail suspension and to maintain efficient, economical operation of the snowmobile. Track tension and alignment should be checked after the first hour of operation and every 25 hours of operation thereafter. Tension is correct when a total slack of ¼" ± 1/8" (6.35mm ± 3.2mm) in the track is obtained between bottom of each slide and inside surface (bottom) of track. Track tension is measured at rear edge of front shock absorber mounting bracket with entire track supported off ground. (Figure 12) If necessary, adjust track tension as follows.

CAUTION: A loose snowmobile track could result in track grouser bars and/or traction devices (Merc-Studs, if so equipped) striking chassis tunnel and damaging chassis. A tight snowmobile track will cause track to "stretch" and decrease snowmobile performance.

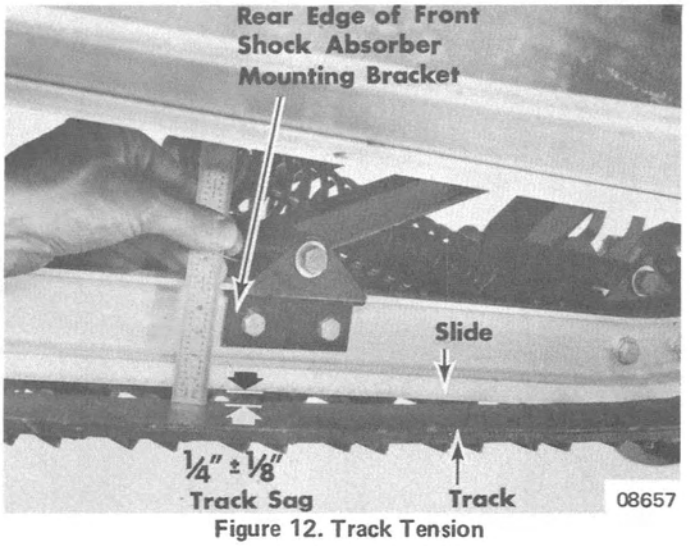


Figure 12. Track Tension

TRACK TENSION

1. Loosen tension bolt jam nuts "A" on both sides of suspension. (Figure 13)
2. Adjust tension bolts "B" (Figure 13) equally on both sides of suspension until correct tension is attained on both sides, as shown in Figure 12.
3. Tighten tension bolt jam nuts "A".

IMPORTANT: Always check track alignment, as outlined immediately following, after performing a track tension adjustment.

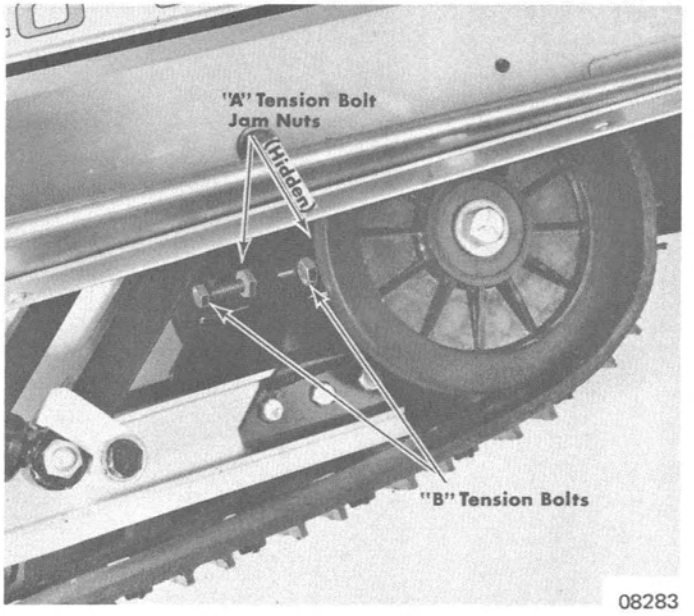


Figure 13. Track Adjusting

TRACK ALIGNMENT

1. Place rear of snowmobile on suitable blocking to raise entire track off ground and block front end for stability.
2. Start engine and slowly run drive mechanism.

> **WARNING: Make certain that track is free of all particles which, possibly, could be thrown out by the moving track. KEEP HANDS and FEET CLEAR of TRACK at all times. DO NOT attempt to check track alignment while engine is running.**

3. STOP the SNOWMOBILE ENGINE. Check position of rails in track grooves. Rails MUST be in center of track grooves with equal spacing on each side of rail between rail and track. (Figure 14)
4. Scan the track, making certain that track is centered between sides of chassis. (Figure 15) If track is not centered, an adjustment is necessary. An improperly aligned track always will run or drift toward the LOOSE side, and this condition requires a track adjustment on the loose side only. If a track adjustment is necessary, refer to "Track Tension", preceding. After readjusting, recheck track alignment.
5. As a final track alignment check, it is recommended that the snowmobile be run over smooth terrain and in a straight line for approximately 100 yards. STOP the SNOWMOBILE ENGINE. With track on ground, recheck track alignment as shown in Figures 14 and 15. If further track adjustment is necessary, refer to Step 4, preceding.

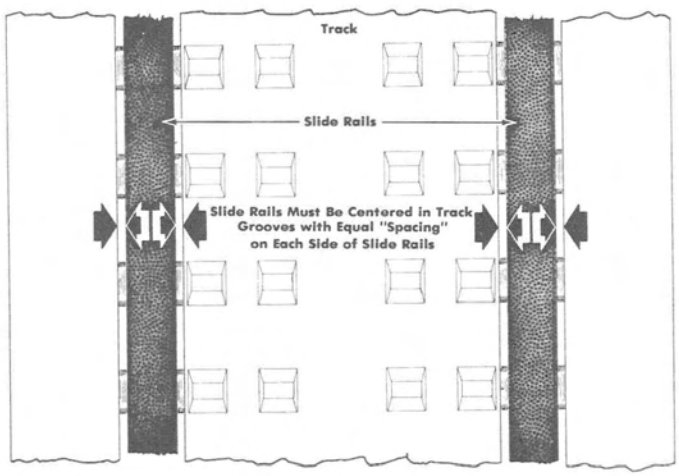


Figure 14. Checking Track Alignment

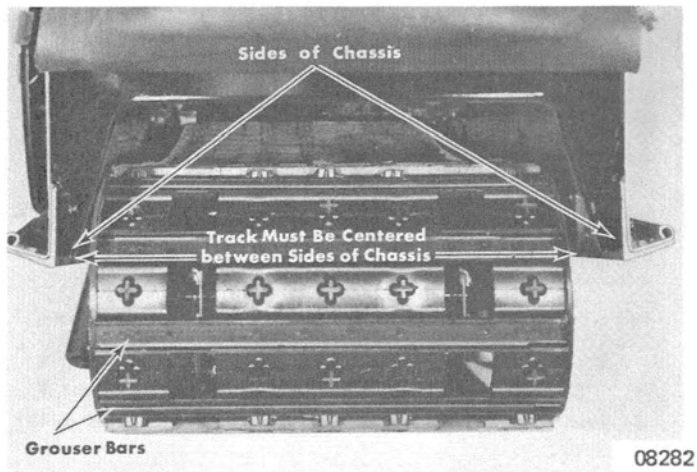


Figure 15. Checking Track Alignment

> **CAUTION: Slide rail suspension is designed for use on snow ONLY. Serious damage may result if this suspension is operated on sand, gravel, any dry surface or glare ice. Operation on surfaces of this type MUST BE AVOIDED, as serious damage to slides may occur in a short distance and/or minimal amount of operation. If an S/R model is test-run on a chassis dynamometer, slides MUST be lubricated during operation with soap and water mixture, rubber lubricant, etc.**

"TWISTER" SUSPENSION (TYPICAL)

REMOVAL and DISASSEMBLY

1. Loosen track tension as far as possible. (Refer to "Track Tension and Alignment", following.)
2. Lift and support rear of snowmobile. Raise snowmobile high enough to take most of the weight off the track. DO NOT raise track assembly off working surface.

Figure 1. Suspension Removal

3. Remove rear control arm shaft bolt and washer (Figure 1) from one side of chassis. Loosen rear control arm shaft bolt on other side of chassis as far as possible or until shaft starts to turn inside control arm assembly.
4. Raise snowmobile high enough to allow disconnected end of control arm shaft to be pulled down until it clears chassis, then remove snap ring and outside spacer from shaft.
5. Hold exposed section of rear control arm shaft with vise-grips or pliers and remove remaining shaft attaching bolt and washer.
6. Remove front pivot shaft bolt and flat washer (Figure 2) from one side of chassis. A flat washer is located between pivot shaft and chassis on each side. Loosen front pivot shaft bolt on other side of chassis as far as possible or until pivot shaft starts to turn inside front control arm assembly.

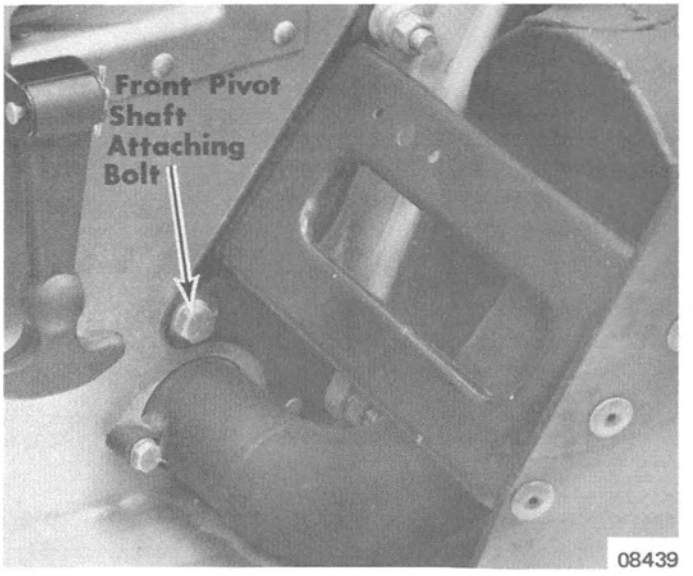


Figure 2. Suspension Removal

7. Pull downward on disconnected end of front control arm pivot shaft until it clears chassis, then slide control arm assembly partially off pivot shaft.
8. Hold exposed section of front pivot shaft with vise-grips or pliers and remove remaining pivot shaft bolt and flat washer.

   IMPORTANT: DO NOT score pivot shaft. If shaft is scored, file smooth before re-installation. Control arm assembly must pivot freely on pivot shaft.
9. Raise snowmobile chassis all the way off track and suspension. Remove complete suspension assembly from chassis tunnel and from inside track.
10. Components of suspension assembly can be disassembled by simply referring to illustrations in parts list. No special tools are required.

CLEANING and INSPECTION

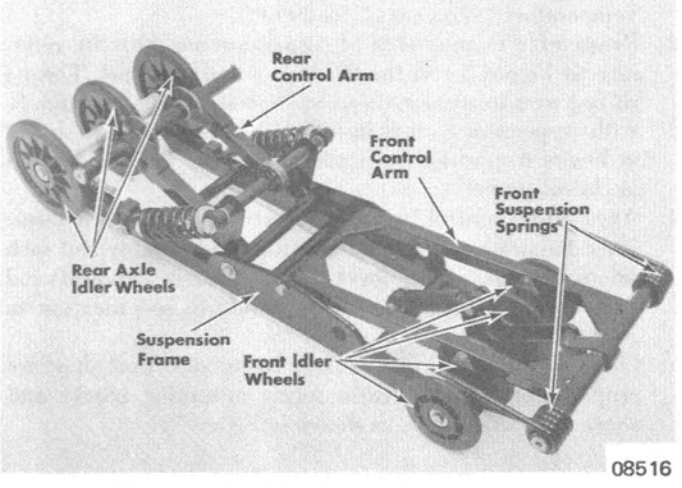


Figure 3. Suspension Assembly

1. Thoroughly clean suspension assembly.
2. Inspect front and rear control arms (Figure 3) for cracks, breaks, bends and wear.
3. Check suspension frame (Figure 3) for cracks, breaks and bends.
4. Check front suspension idler wheel axle and rear axle for cracks, breaks and bends. Check front idler wheel bearings for smooth operation.
5. Inspect pivot shafts for wear and breaks.
6. Inspect shock absorbers for signs of oil leakage.
7. Replace parts as necessary.

SLIDE INSPECTION and REPLACEMENT

Slides occasionally should be inspected and checked for wear. Replace slides if they are worn down to 3/8" (9.5mm) (minimum thickness) in any spot. (Figure 4) New slides MUST be installed in pairs only.

CAUTION: **Failure to replace slides, when excessively worn, will result in track drive lugs hitting suspension cross tubes and damaging both track and suspension.**

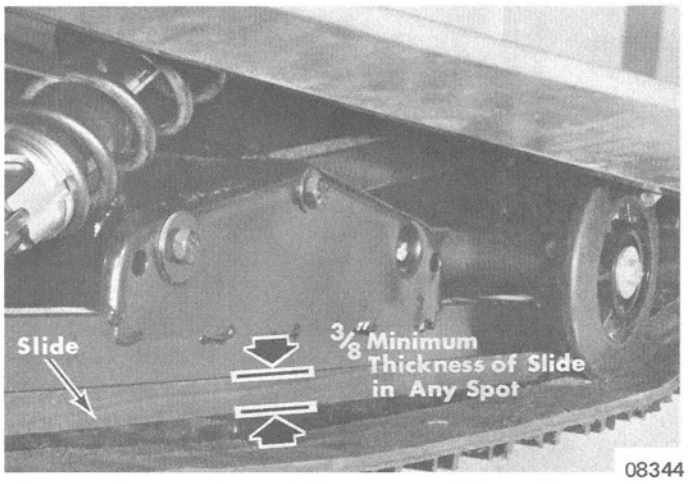


Figure 4. Slide Inspection

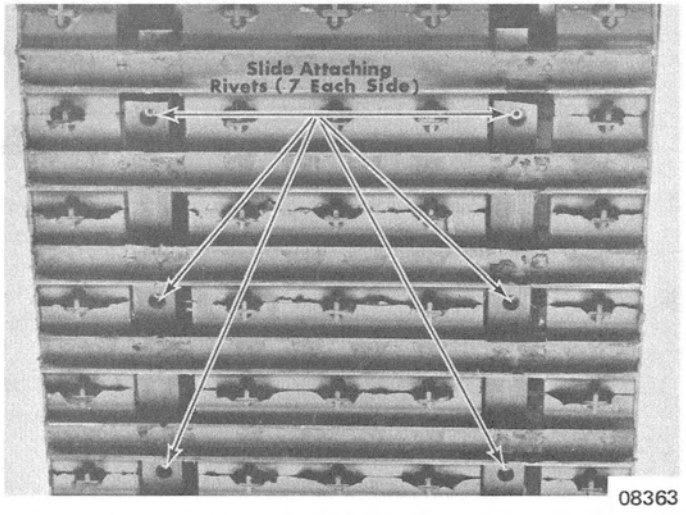


Figure 5. Slide Replacement

It is not necessary to change track tension or remove slide rail suspension from chassis to replace slides. If replacement of slides is necessary, replace as outlined following:

1. Lift and support rear of snowmobile.
2. Use a 3/16" drill to drill thru and remove rivets (Figure 5) which attach slides to suspension frame. Remove and discard old slides from beneath suspension frame.
3. Position new slides in place beneath suspension frame, with chamfered end of slide toward the front.
4. Attach slides to frame with 14 rivets.
5. Refer to "Track Tension and Alignment", following, and check track tension. Readjust track tension as necessary.

CHASSIS WEAR STRIP INSPECTION and REPLACEMENT

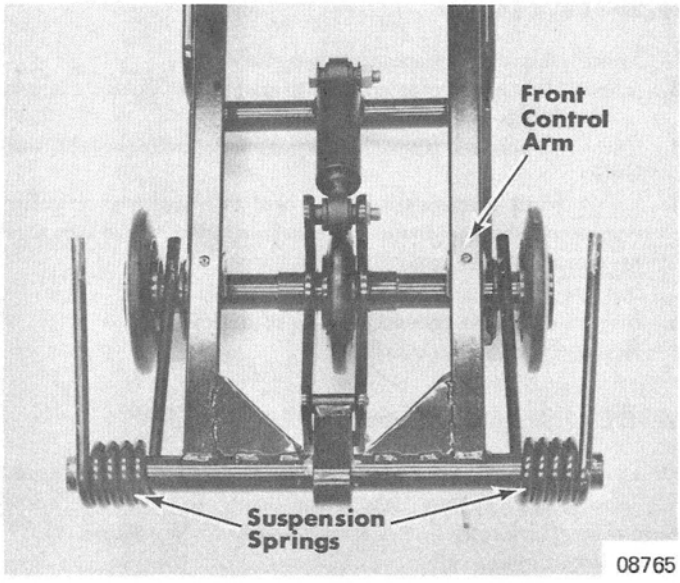
Wear strips in chassis tunnel should be inspected and checked occasionally for wear. Replace wear strips when track grouser bars are starting to hit the rivets which attach wear strips to chassis tunnel.

CAUTION: **Failure to replace chassis wear strips, when excessively worn, may cause track grouser bars and/or traction devices to wear thru wear strips and into chassis.**

If replacement of wear strips is necessary, replace as outlined following:

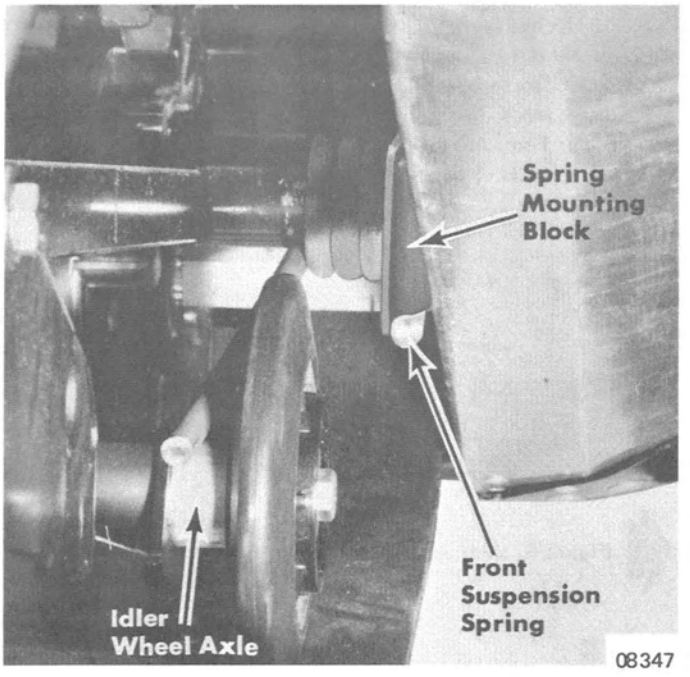
1. Remove main seat cushion from snowmobile chassis.
2. Refer to Section 4, Part C, and remove fuel tank from snowmobile chassis.
3. Remove suspension assembly as outlined in "Removal and Disassembly", preceding.
4. Drill out rivets, which attach wear strips to top of chassis tunnel, and remove wear strips from chassis.
5. Place new wear strips in position in chassis tunnel and secure with rivets.
6. Install suspension assembly as outlined in "Reassembly and Installation", following.
7. Install fuel tank on snowmobile chassis. (Refer to Section 4, Part C.)
8. Install main seat cushion on snowmobile chassis.

REASSEMBLY and INSTALLATION



1. Lubricate pivot shafts (2 on front control arm, one on rear control arm) and rear control arm idler wheels with Low Temperature Lubricant (C-92-59999).
2. Reassemble components of suspension assembly by referring to Figure 3 and the illustrations in parts list. Torque all fasteners to specifications in "Specifications" Section 8.
3. With suspension springs installed on control arm, as shown in Figure 6, position suspension assembly inside track and in chassis tunnel.
4. Align front control arm pivot shaft with holes in chassis. Place flat washers between control arm assembly and each side of chassis. Secure pivot shaft to chassis with bolts and flat washers. (Figure 2) Torque bolts to specification in Section 8.
5. Check front suspension springs to be sure that they are properly positioned below spring mounting blocks and above idler wheel axle, as shown in Figure 7.

Figure 6. Front Suspension Control Arm



6. Lower snowmobile onto suspension far enough to align rear control arm shaft with holes in chassis. Secure shaft to chassis with flat washers and bolts. (Figure 1) Torque bolts to specification.
7. Readjust track as outlined in "Track Tension and Alignment", following.

Figure 7. Suspension Installation

REAR AXLE REMOVAL

NOTE: Removal of suspension assembly is not necessary for replacement of rear axle idler wheels, rear axle and/or rear axle spacers.

1. Loosen track tension as far as possible. (Refer to "Track Tension and Alignment", following.)
2. Remove bolts and flat washers which secure rear control arm shaft to chassis. (Figure 1)
3. Raise and support chassis to allow access to rear axle.
4. Remove bolt and washers which secure one of the outer, rear axle idler wheels to rear axle. Pull idler wheel and small spacer from rear axle.
5. While pulling on other outer idler wheel, pull rear axle from spacers and suspension frame. Remove idler wheel and spacer from rear axle.
6. Remove center idler wheel and 2 spacers from between rear axle brackets of suspension frame.

CLEANING and INSPECTION

IDLER WHEELS

Check wheels for cracks, chips and wear. Rapid wear or chipped wheels generally occur from extensive operation on sand or gravel. Incorrect track tension and alignment also will contribute to excessive wear.

Check idler wheel bearings for rough operation and/or excessive play between inner and outer bearing races. Replace idler wheels if condition of bearings is questionable.

IMPORTANT: Idler wheel bearings are a sealed unit. DO NOT immerse in solvent or cleaning fluid. DO NOT attempt to lubricate bearings.

REAR AXLE and AXLE BRACKETS

Check rear axle for bends, a "sprung" condition and stripped threads.

Inspect axle brackets for bends, breaks and stripped threads. Replace parts as necessary.

REAR AXLE SPACERS

Check spacers for cracks, breaks and wear. If ends of spacers are "mushroomed" or worn down, axle assembly will not tighten against axle brackets when idler wheel bolts are tightened. Replace spacers as necessary.

INSTALLATION

1. Install center idler wheel and 2 large spacers between rear axle brackets, as shown in Figure 8.
2. Install rear axle thru axle brackets, spacers and center idler wheel.
3. Place small spacers on each end of rear axle and install outer idler wheels. (Figure 8) Install washers and bolts which secure idler wheels to rear axle. DO NOT tighten rear axle idler wheel bolts at this time.

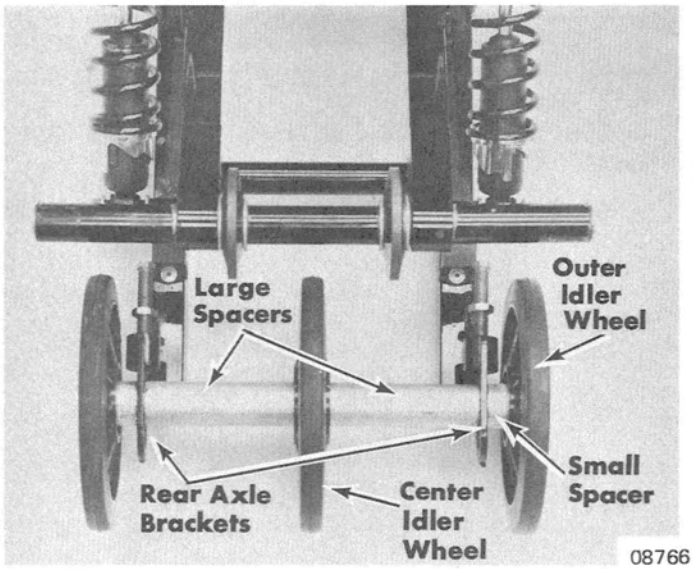


Figure 8. Rear Axle Assembly

4. Lower chassis down to suspension and attach rear control arm shaft to chassis with washers and bolts. Torque bolts to specification in "Specifications" Section 8.
5. Adjust track tension and track alignment as explained in "Track Tension and Alignment", following.
6. Torque rear axle idler wheel bolts to specification in Section 8.

FRONT AXLE

REMOVAL

1. Remove front axle bearing retainer cover from left side of chassis.
2. If front axle bearing will be removed from front axle, straighten locking tabs on tab washer, apply brake and remove bearing retainer bolt and tab washer from front axle. (Figure 9)

   NOTE: It is not necessary to remove bearing retainer bolt if bearing removal is not required. Bearing retainer bolt need not be removed for removal of front axle assembly from chassis.

3. Loosen drive chain tension and remove drive chain and drive sprocket from chaincase. (Refer to this section, Part D.)
4. Remove suspension assembly as outlined, preceding.
5. Slide front axle to left and pull right side of axle down to clear chaincase and chassis. (Figure 10)

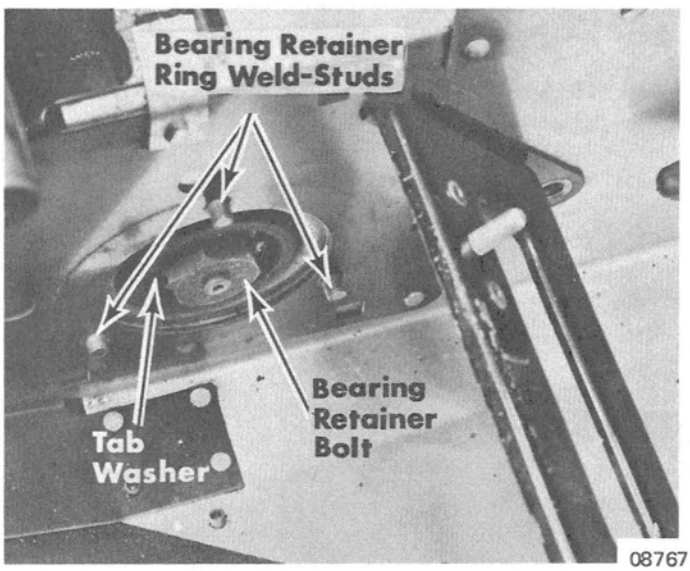


Figure 9. Front Axle Bearing Retainer Bolt

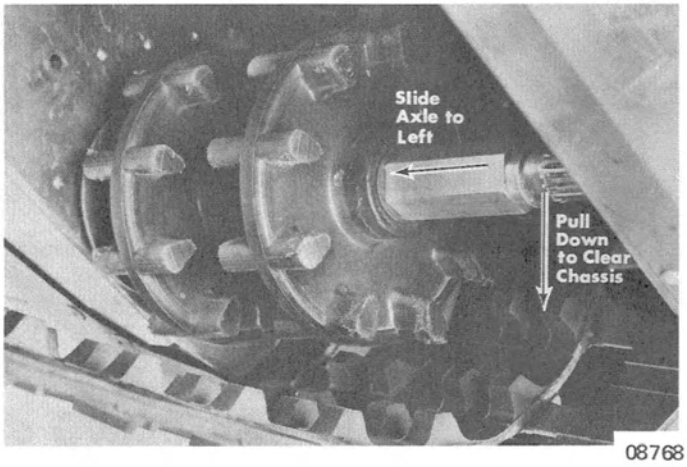


Figure 10. Removal of Front Axle

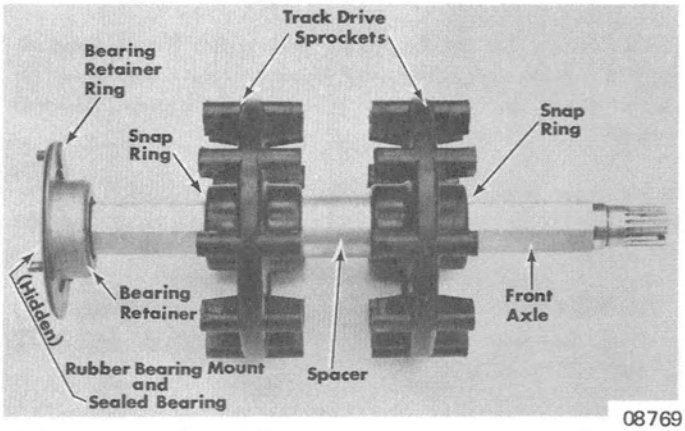


Figure 11. Front Axle Assembly

6. Remove front axle from chassis.
7. Pull bearing retainer ring, bearing retainer, rubber bearing mount and sealed bearing from front axle. (Figure 11)
8. Remove snap rings which hold track drive sprockets in position on front axle. Press sprockets and spacer (Figure 11) off front axle.

CLEANING and INSPECTION

SPROCKETS

Check for cracks, cuts and chipped or broken teeth. Excessive wear of teeth usually is the result of (1) operating with incorrect track tension and/or alignment or, (2) operation on sand and/or gravel.

IMPORTANT: Sprockets may show considerable wear but still perform satisfactorily. It should not be necessary to replace sprockets, unless track slippage, jumping or misalignment of track occurs. Replace sprockets as a set ONLY if excessive wear is reason for replacement.

BEARINGS

NOTE: Front axle ball bearings are mounted in chaincase and front axle bearing retainer. Removal of chaincase assembly is necessary if replacement of chaincase bearing is required.

Check for rough operation and/or excess play between inner and outer bearing race. Replace bearing(s) if condition is questionable.

IMPORTANT: Ball bearing mounted in front axle bearing retainer is a sealed bearing. DO NOT immerse in solvent or cleaning fluid. DO NOT attempt to lubricate bearing.

FRONT AXLE

Check axle to make sure that it is not bent, sprung or cracked and that threads are not stripped. Check axle splines to be certain that they are not bent or twisted.

INSTALLATION

1. Install spacer and track drive sprockets in position on front axle. (Figure 11) Sprockets must be installed on front axle so that drive lugs of right sprocket are aligned with drive lugs of left sprocket. Secure sprockets with snap rings.
2. Install bearing retainer ring, bearing retainer, rubber bearing mount and sealed bearing on front axle. (Figure 11)

   IMPORTANT: Lubricate lower chaincase oil seal with Low Temperature Lubricant (C-92-59999) before installation of axle.

3. With track in tunnel, place front axle in chassis with splined end in chaincase.
4. Install drive chain and drive sprocket in chaincase. (Refer to this section, Part D.)
5. Install tab washer and bearing retainer bolt on front axle. (Figure 9) Apply brake and torque retainer bolt to specification in "Specifications" Section 8. Bend locking tabs on tab washer against bearing retainer bolt.
6. Position bearing retainer ring in place with 3 weld-studs installed thru holes in chassis. (Figure 9) Install bearing retainer cover on weld-studs of retainer ring. Secure bearing retainer assembly with 3 nuts torqued to specification in Section 8.
7. Install chaincase cover, adjust drive chain tension and fill chaincase with lubricant. Install muffler and exhaust pipes. (Refer to this section, Part D.)
8. Install suspension assembly as outlined, preceding.
9. Readjust track as explained in "Track Tension and Alignment", following.

TRACK REMOVAL

1. Remove suspension assembly as outlined, preceding.
2. Remove front axle as explained, preceding.
3. Remove track from chassis tunnel.

INSPECTION

1. Inspect track for broken or missing track bars. If snowmobile IS NOT used for racing, replace damaged track bars as outlined following. If snowmobile IS used for racing, replace track assembly.
2. Check track for large cuts or cracks.
3. Check edges of track for fraying or wear which would indicate misalignment.
4. Inspect track drive lugs for excessive wear.

   IMPORTANT: Track drive lugs may show considerable wear but still perform satisfactorily. It should not be necessary to replace track, unless track slippage or jumping occurs.

TRACK BAR REPLACEMENT

IMPORTANT: If snowmobile is used for racing, it is recommended that track assembly be replaced, rather than attempting to replace a broken or missing track bar.

NOTE: Removal of track from snowmobile is not necessary for replacement of a track bar.

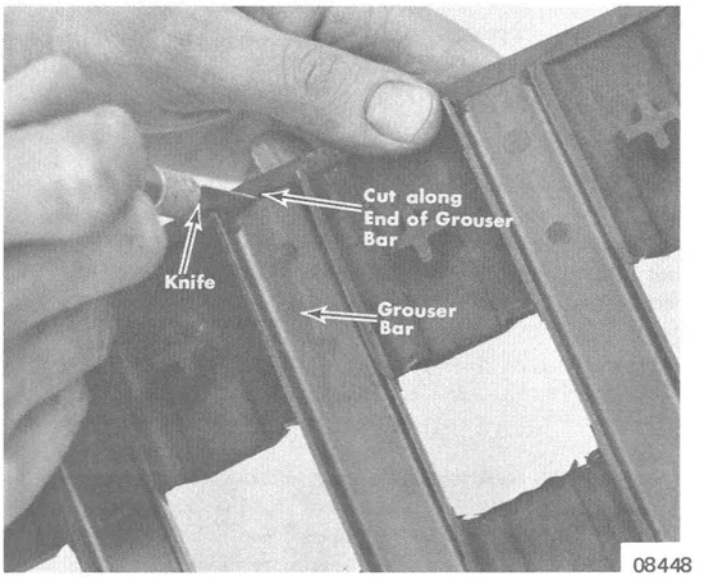


Figure 12. Cutting Track Bar Bonding

1. Make a shallow knife cut along end of track bar. Cut must be thru section of rubber and down to bare metal of track bar. (Figure 12)

> **CAUTION: A deep knife cut could cause damage to internal track cords.**

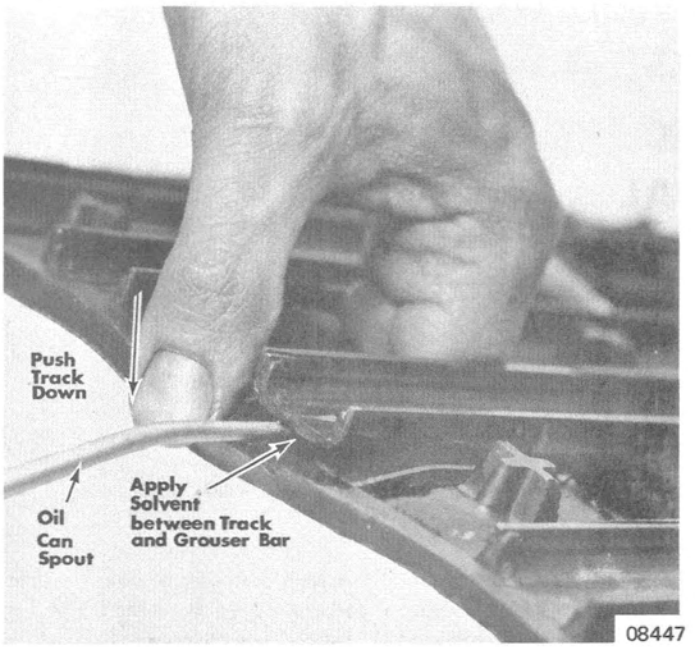


Figure 13. Typical Track Bar Removal

2. With an oil can or other suitable container, apply MEK (methyl ethyl ketone) or acetone between track and track bar (Figure 13) where cut was made.

Figure 14. Typical Track Bar Removal

3. After several seconds, the solvent (MEK or acetone) will start to dissolve the adhesive which "bonds" track bar to track. Apply steady pressure to track and add small amounts of solvent as track bar is peeled off outside track band. (Figure 14)

> **CAUTION: Allow solvent to dissolve adhesive bonding before attempting to separate track bar from track bands. If this caution is not observed, some track material could be pulled away from track and expose internal track cords.**

4. Remove track bar from center track band and other outside track band in same manner. (Figure 15)
5. Place new track bar in position on track bands. Using track bar as a template, drill 3/16" (4.8mm) holes thru track bands at same locations as pre-drilled holes in track bar.
6. Secure track bar to track bands with fasteners and attaching nuts which are supplied with track bar. Tighten attaching nuts securely so that heads of fasteners are flush

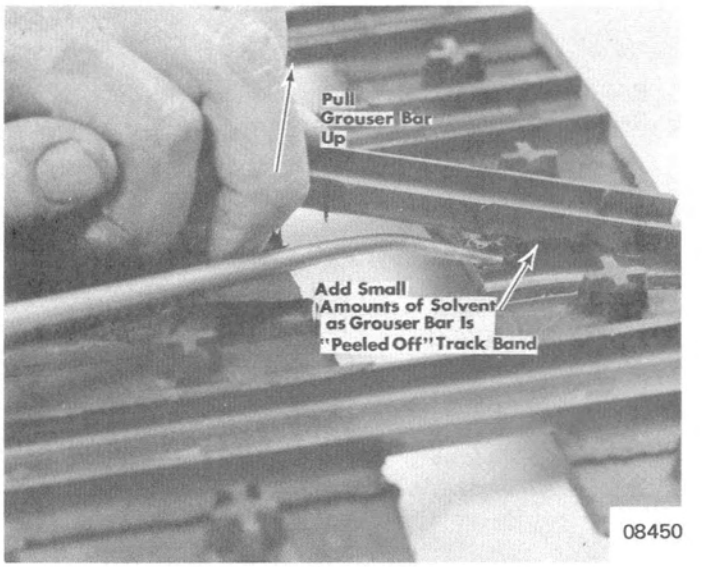


Figure 15. Typical Track Bar Removal

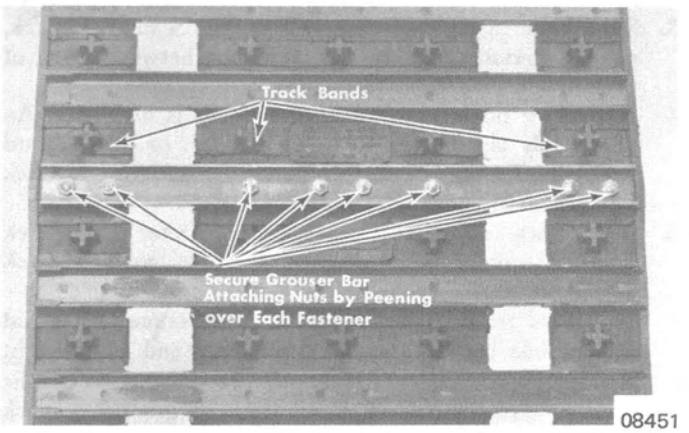


Figure 16. Typical Replacement Track Bar Installed

or depressed into track material. Lock attaching nuts securely by peening threaded fastener ends to one-half the height of original exposed end. (Figure 16)

INSTALLATION

NOTE: Snowmobile track can be installed either way (external track lugs in front of track bars, or track lugs behind track bars), depending on preference and snow conditions.

1. Position track in chassis tunnel.
2. Install front axle as outlined, preceding.
3. Install suspension assembly as explained, preceding.
4. Readjust track as outlined in "Track Tension and Alignment", following.

TRACK TENSION and ALIGNMENT

Proper track tension and alignment are essential to eliminate undue wear to drive components, track and slide rail suspension and to maintain efficient, economical operation of snowmobile. Track tension and alignment should be checked after first hour of operation and every 25 hours of operation thereafter. Track tension is correct when a total slack of 1" (25.4mm) in track is obtained between bottom of each slide and inside surface (bottom) of track. With entire track supported off ground and, while pulling down on track, measure track tension at center of track. (Figure 17) If necessary, adjust track tension, following.

CAUTION: A loose snowmobile track could result in track bars and/or traction devices (Merc-Studs, if so equipped) striking chassis tunnel and damaging chassis. A tight snowmobile track will cause track to "stretch" and decrease snowmobile performance.

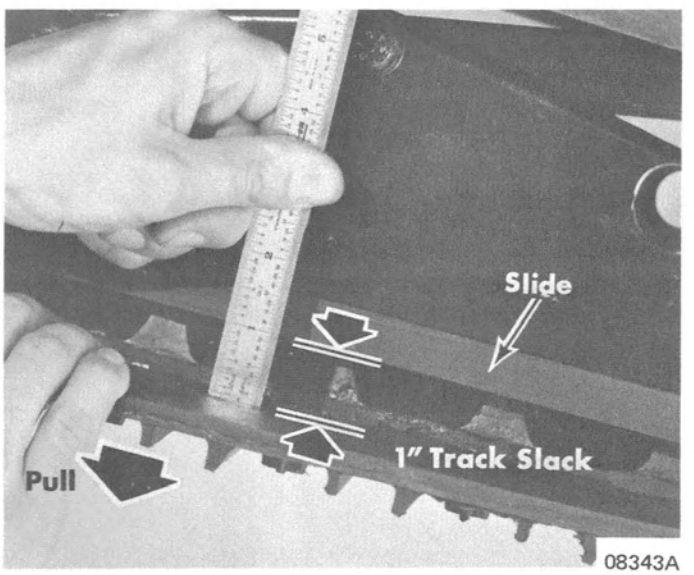


Figure 17. Track Tension

TRACK TENSION

1. Loosen attaching bolts, which secure idler wheels (Figure 18) to rear axle, far enough to allow movement of rear axle assembly.
2. Loosen tension bolt jam nuts "A" on both sides of suspension. (Figure 18)

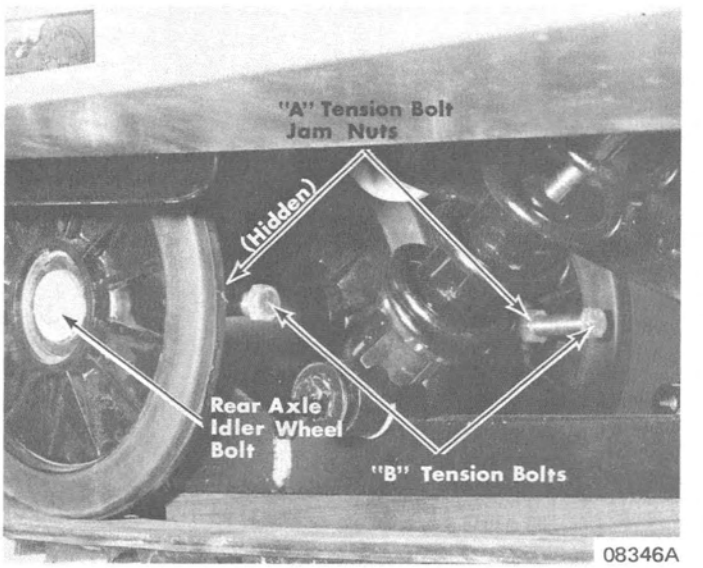


Figure 18. Track Adjusting

3. Adjust tension bolts "B" (Figure 18) equally on both sides of suspension until correct tension is attained on both sides, as shown in Figure 17.
4. Tighten tension bolt jam nuts "A".
5. Torque rear axle idler wheel bolts to specification in "Specifications" Section 8.

IMPORTANT: Always check track alignment, as outlined immediately following, after performing a track tension adjustment.

TRACK ALIGNMENT

1. Place rear of snowmobile on suitable blocking to raise entire track off ground and block skis for stability.
2. Start engine and slowly run drive mechanism.

> **WARNING: Make certain that track is free of all particles which, possibly, could be thrown out by moving track. KEEP HANDS and FEET CLEAR of TRACK at all times. DO NOT attempt to check track alignment while engine is running.**

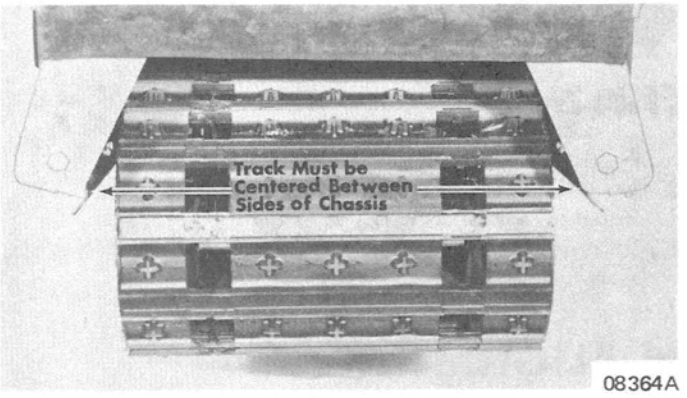


Figure 19. Checking Track Alignment

3. STOP the SNOWMOBILE ENGINE. Scan the track, making certain that track is centered between sides of chassis. (Figure 19)
4. If track is not centered, an adjustment is necessary. An improperly aligned track always will run or drift toward the LOOSE side, and this condition requires a track adjustment on loose side only.
5. If a track adjustment is necessary, refer to "Track Tension", preceding. After readjusting, recheck track alignment.
6. As a final track alignment check, it is recommended that snowmobile be run over smooth terrain and in a straight line for approximately 100 yards (91 meters). STOP the SNOWMOBILE ENGINE. With track on ground, recheck track alignment as shown in Figure 19. If further track adjustment is necessary, refer to Steps 4 and 5, preceding.

> **CAUTION: Slide rail suspension is designed for use on snow ONLY. Serious damage may result if this suspension is operated on sand, gravel, any dry surface or glare ice. If operation under any of these conditions is anticipated, bogie wheel kit (supplied with snowmobile) should be installed. If Sno-Twister is test run on a dynamometer, slides MUST be lubricated during operation with soap and water mixture, rubber lubricant or other suitable lubricant.**