CHAPTER 7
SUSPENSION

Refer to Specifications Section in Chapter 1 for Suspension Type / Model Application

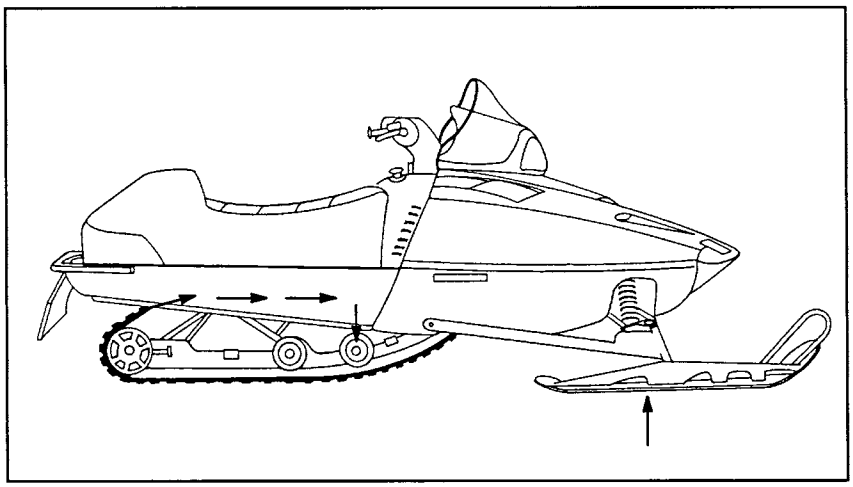
Rear Suspension Operation

The primary function of the rear suspension is to provide a comfortable ride in all types of riding conditions. It separates the rider from the ground, while allowing for complete vehicle control. The rear suspension also must provide weight transfer and maintain track tension.

The rear suspension has many adjustable features for fine tuning to achieve optimum comfort. The suspension can be adjusted to suit rider preference and deliver excellent performance for a given set of conditions. It should be noted, however, that suspension adjustments involve a compromise or trade off. A machine set up to perform well in the moguls would not suit the preference of a groomed trail rider.

Weight Transfer

The shifting of weight from the skis to the track is called weight transfer. As engine torque is applied to the drive axle the torque is transferred to the track, pulling it forward. This energy also tries to pull the suspension forward. The front torque arm reacts to this force by pushing down on the front of the track, in effect applying more weight to the front of the track and reducing the weight on the skis. It is important to note that energy used to lift the front of the machine is not available to push the vehicle forward.



Changing the angle of the front torque arm changes the suspension's reaction to the force. Adjusting the length of the limiter strap will change the front torque arm angle. Shortening the strap limits the extension of the front of the suspension; reducing the angle of the torque arm and increasing ski pressure during acceleration. Lengthening the strap allows the front of the suspension to extend further; increasing the angle of the torque arm and decreasing ski pressure during acceleration. Limiter strap adjustment has a great affect on weight transfer. Limiter straps only affect acceleration. It is important to check track tension whenever limiter strap length is changed.

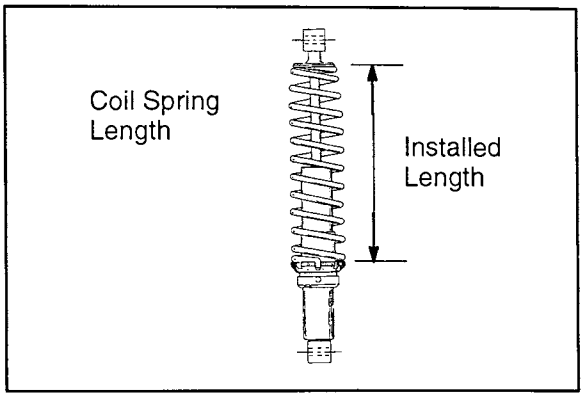
Front track shock spring preload also affects weight transfer. A stiffer spring and/or more preload on the spring transfers more weight to the track. A softer spring and/or less preload keeps more weight on the skis. Keep your riding application in mind when choosing springs and setting spring preload. Soft springs/preload will increase ski pressure, but may bottom out. Stiff springs/preload will provide more track pressure (reduced ski pressure), but may result in a less comfortable ride.

During acceleration, the rear of the suspension will compress and the IFS will extend, pivoting the machine about the front torque arm. Because of this pivoting effect, rear spring and spring preload also have some effect on weight transfer. Softer rear springs, or less preload, allow more weight transfer to the track and reduce ski pressure. Stiffer rear springs, or increased preload, allow less weight transfer to the track and increase ski pressure. The main function of the rear torque arm is to support the weight of the vehicle and rider, as well as to provide enough travel to absorb bumps and jumps.

Shock valving also has an effect on weight transfer. Refer to shock tuning information in this chapter.
Scissor stops also affect weight transfer. See scissor stop information in this chapter.

Springs

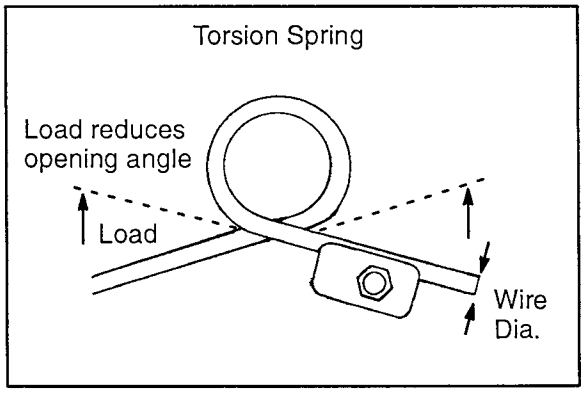
Two types of springs are employed in Polaris suspensions, coil springs and torsion springs. Following is some of the terminology used when referring to coil springs.



- *Free length* - the length of a coil spring with no load applied to the spring
- *Installed length* - the length of the shock absorber between the spring retainers. If the installed length of the spring is less than the free length, it will be pre-loaded.
- *Spring rate* - the amount of force required to compress a coil spring one inch. For example, if 150 pounds of force are required to compress a spring 1 inch, the spring rate would be 150 #/in.
- *Straight rate spring* - the spring requires the same amount of force to compress the last one inch of travel as the first one inch of travel. For example, if a 150 #/in. spring requires 150 pounds of force to compress it one inch, 300 pounds of force would compress it two inches, 450 pounds of force would compress it three inches, etc.
- *Progressively wound spring* - the rate of the spring increases as it is compressed. For example, a 100/200 #/in. rate spring requires 100 pounds of force to compress the first one inch, but requires 200 additional pounds to compress the last one inch.

When a bump is encountered by the suspension, the force of the bump compresses the spring. If the force were 450 pounds, a 100 #/in. spring would compress 4.5 inches. A 150 #/in. spring would only compress 3 inches. If the suspension had 4 inches of spring travel the 100 #/in. spring would bottom out, while the 150 #/in. spring would have one inch of travel remaining.

Torsion springs are much like coil springs, although shaped differently. The rate of the torsion spring is controlled by the free opening angle, the installed opening angle, the wire diameter of the spring, and the number of coils.



Many factors influence the overall handling characteristics of snowmobile suspensions. Rider weight, riding style, course conditions, and the condition of suspension components are some of the things that you have to consider when tuning a suspension.

On new machines, or whenever new suspension parts are installed, the sled should be ridden for at least one tank of fuel to allow moving parts in the shocks and suspension to wear in. The shock springs will also take their initial set and the setup will be more accurate.

- **Front Suspension:** The front suspension should sag (unloaded) about 1″ (measured at the front bumper) with the weight of the sled. Use stiffer or softer springs as needed to keep from bottoming too hard, and to ensure the entire range of travel is used.

Rear Suspension Tuning

To begin suspension tuning, check the condition of shocks and other suspension parts.

- Inspect and grease all suspension parts, making sure they pivot freely. All suspension components should be greased when disassembled. Regular maintenance greasing should be done with no weight on the component to allow grease to reach important contact areas.

- **Loaded Sag:** Set the preload on the rear springs for the correct sag. There should be 1 1/2″ of sag on the rear suspension when the rider on the snowmobile, measured at the rear bumper. Bounce on the suspension a couple of times to overcome any "stiction" and settle the sled to an accurate reference point. The rider should have their weight placed correctly on the machine. Adjust spring preload to achieve the 1 1/2″ sag dimension.

- **Unloaded (Free) Sag:** When the rider gets off the machine, the suspension should return to 1/2″ of sag. If the sag is less than 1/2″ stiffer springs may be needed. If it is greater than 1/2″ softer springs may be needed. This may seem backwards at first, but if the spring is too soft, the preload must be greatly increased to prevent excess loaded sag. This shows up in the form of less unloaded sag. Therefore, a stiffer spring is required. If the spring is too stiff, the preload will have to be backed off, and unloaded sag will be excessive. This is a very important step because the proper spring will also help ensure correct weight transfer.

Shock Tuning

The shocks work in two directions. Compression damping prevents the shock from bottoming hard while rebound damping keeps the shock from springing back too fast. Both compression and rebound damping can be adjusted for high and low speed damping characteristics. On Indy Select shocks, the compression damping can be changed by turning the adjuster screw. Refer to shock section in this chapter for adjustment. **NOTE:** When we refer to high and low speed, we are referring to the speed of the shock shaft or valve, ***not*** vehicle speed.

Rebuildable Shocks

Begin by taking the shocks apart, inspecting all parts for damage, and changing the oil. Even new shocks should get an oil change after break in to clean break-in material from the shocks and valve body.

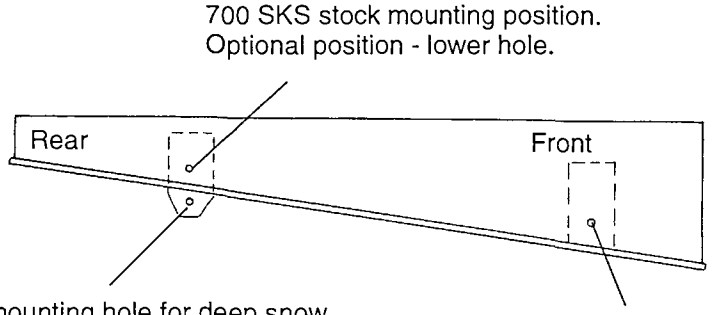
If oil is low, inspect seal cap O-Ring and seals for damage. If air or foam is evident in the oil, the O-Ring in the floating piston must be replaced. After changing the oil reassemble shocks, making sure oil level, floating piston depth (IFP), and nitrogen pressure are correct.

The use of nitrogen in Fox™ shocks provides consistent damping at extreme temperatures. Don't overcharge the shocks. Excess nitrogen pressure may cause seal "stiction" and prevent proper shock action. If too much oil is added, or if the IFP depth is set incorrectly (too low) shock travel will be limited.

1999 Rear Suspension Set Up / Tunnel Mounting Positions

Model	Front Limiter Strap	Rear Limiter Strap	Rear Torque Arm Tunnel Mount	Front Track Shock Mount	Front Torque Arm Tunnel Mount
340/340 Deluxe	Std	N/A	No Options	N/A	No Optional Mounting Positions
340 Touring	Std	N/A	No Options	N/A	
Sport	Std	N/A	No Options	N/A	
Sport Touring	Std	N/A	No Options	N/A	
TranSport	Std	N/A	No Options	N/A	
XCF	Quick Adjust	Quick Adjust	No Options	Lower	
440 XCR	Quick Adjust	Quick Adjust	No Options	Lower	
Trail	Quick Adjust	Quick Adjust	No Options	Lower	
Trail Touring	Std	Std	No Options	Lower	
Trail RMK	Std	N/A	No Options	Upper	
Super Sport	Quick Adjust	Quick Adjust	No Options	Lower	
WideTrak LX	Std	N/A	No Options	N/A	
500	Quick Adjust	Quick Adjust	No Options	Lower	
500 RMK	Quick Adjust	Quick Adjust	No Options	Upper	
500 XC/SP	Quick Adjust	Quick Adjust	No Options	Lower	
Classic	Std	N/A	No Options	N/A	
Classic Touring	Std	N/A	No Options	N/A	
XLT Special	Quick Adjust	Quick Adjust	No Options	Lower	
XLT Touring	Std	N/A	No Options	N/A	
XLT Classic	Std	N/A	No Options	N/A	
600 XC/SP	Quick Adjust	Quick Adjust	No Options	Lower	
600 RMK	Quick Adjust	Quick Adjust	No Options	Upper	
700 XC/SP	Quick Adjust	Quick Adjust	No Options	Lower	
700 XCR	Quick Adjust	Quick Adjust	No Options	Lower	
700 RMK	Quick Adjust	Quick Adjust	No Options	Upper	
700 SKS	Quick Adjust	Quick Adjust	Below(See Ill.)	Lower	
800 XCR	Quick Adjust	Quick Adjust	No Options	Lower	

NOTE: There are no optional front torque arm mounting positions. Do not re-locate the front torque arm.

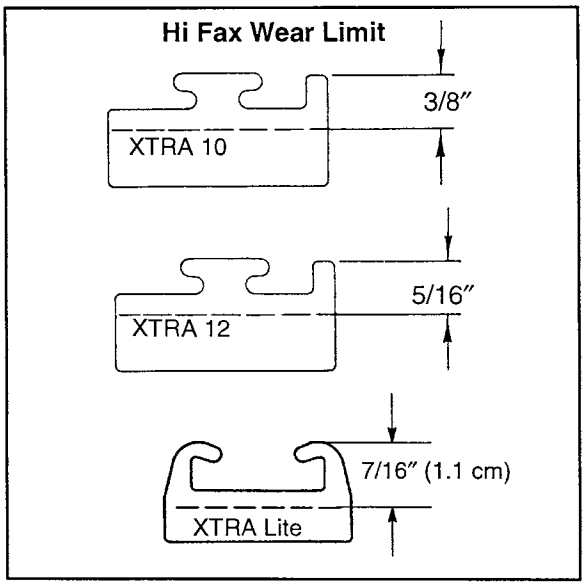


Hi-Fax Replacement - All Models

Hi-Fax replacement on all Polaris models is similar. When any area of the Hi-Fax is worn to 1/8″ (.3 cm), it should be replaced. This will save wear on other vital components.

The slide rail is designed to operate in conditions with adequate snow cover to provide sufficient lubrication. Excessive wear may be due to improper alignment, improper track adjustment or machine operation on surfaces without snow.

Replace Hi-Fax when worn to 5/16″ (.79 cm) on XTRA 12 suspensions; 3/8″ (.95 cm) on XTRA 10 and Sport style suspensions; 7/16″ (1.1 cm) on XTRA Lite style suspensions.



Suggested Hi Fax Wear Limit:

XTRA 12 - 5/16″ (.79 cm)

XTRA 10 - 3/8″ (.95 cm)

XTRA Lite - 7/16″ (1.1 cm)

Hi-Fax wear patterns are somewhat different on machines equipped with the XTRA 12 suspension than on conventional models. *The rear of the rail will wear rapidly at first.* After this initial break in period, the rapid wear will cease. This area should be checked frequently, however, replacement is not necessary until a thickness of 5/16″ (.79 cm) is reached.

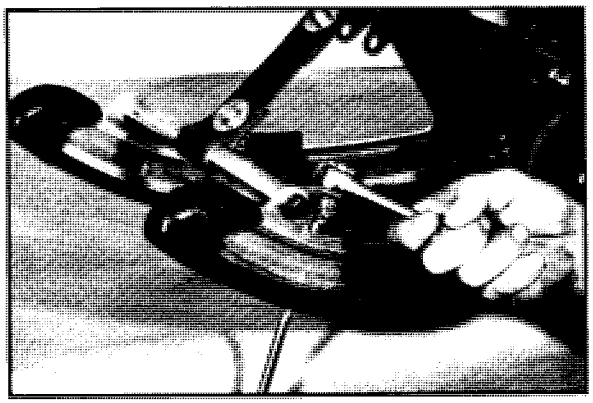
New Hi-Fax are best used in deep snow conditions. Marginal snow or hard-pack conditions are better suited to worn Hi-Fax, or Hi-Fax which have been cured or broken in.

Hi-Fax Removal

1. Remove suspension from machine.

NOTE: Some models may allow Hi Fax to be removed by sliding it through track windows with the suspension mounted in the machine.

2. Remove front Hi-Fax retaining bolt as shown.

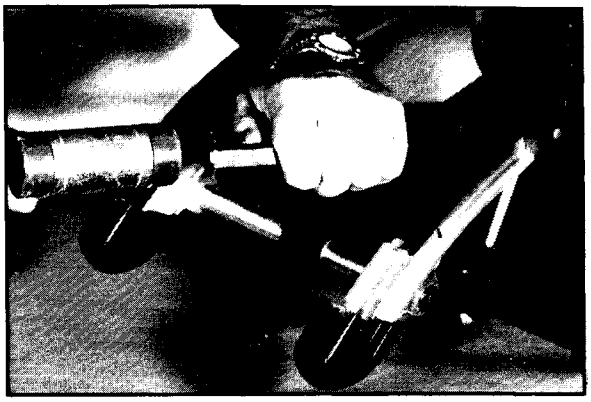


3. Use a block of wood or a drift punch and hammer to drive Hi-Fax rearward off the slide rail.

4. With Hi-Fax material at room temperature, install new Hi-Fax by reversing steps 1 - 3.

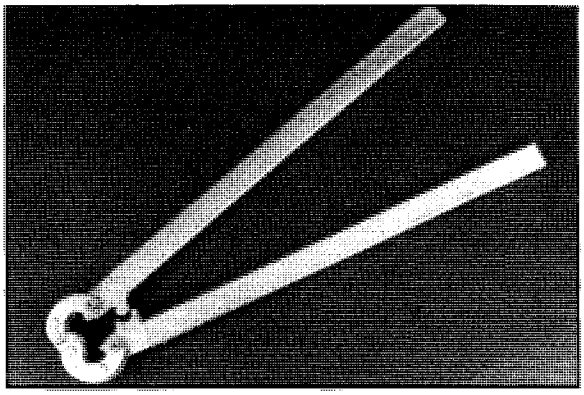
NOTE: Lightly coat Hi-Fax track clip area with a lubricant such as LPS2 or WD-40 to ease installation.

NOTE: Wide Hi-Fax should be narrowed on the leading sides to allow it to fit through narrow windows.



Track Clip Removal - All Types

1. Position removal tool jaws on edge of clip.
2. Squeeze handles together to spread clip.
3. Remove clip.

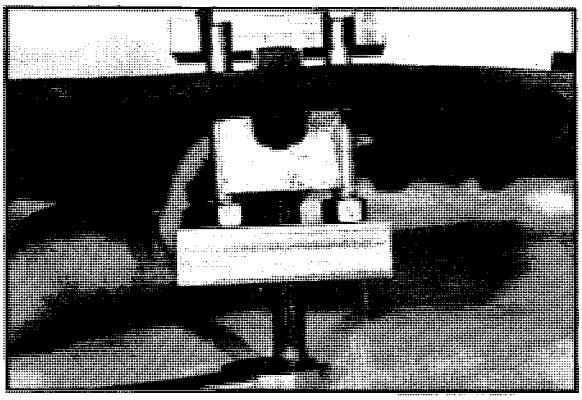


Track Clip Replacement - Yokohama

1. Install replacement clip and clipping tool as shown.

NOTE: For ease of operation, the tool may be placed in a vise.

2. Tighten drive bolt against forming die until clip is formed.

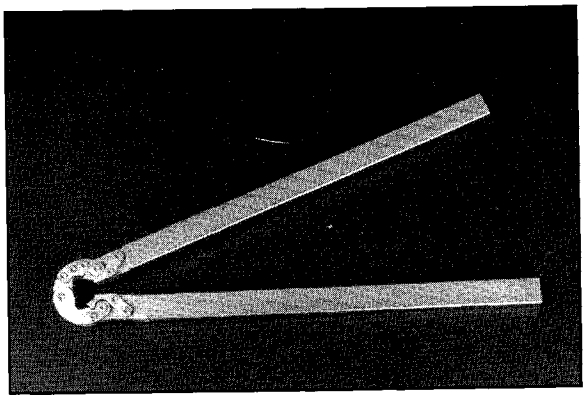


Track Clip Replacement - Camoplast

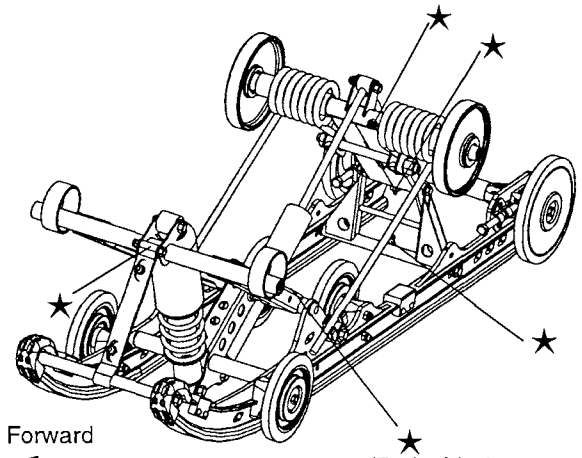
1. Place new clip in position on track.
2. Connect clip installation tool on top of clip.
3. Squeeze handles together to crimp new clip.

Track Clip Installation Tool (Camoplast)
PN 2871041

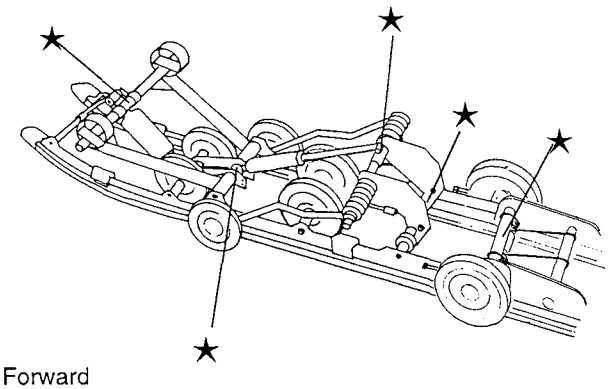
Track Clip Installation Tool (Yokohama)
PN 2870380



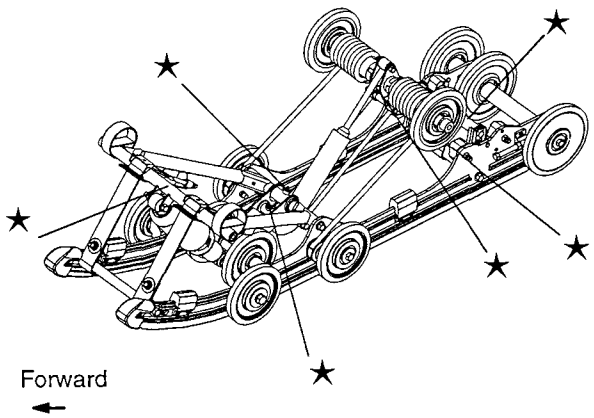
★ LUBRICATION POINTS - XTRA LITE
Grease at fittings



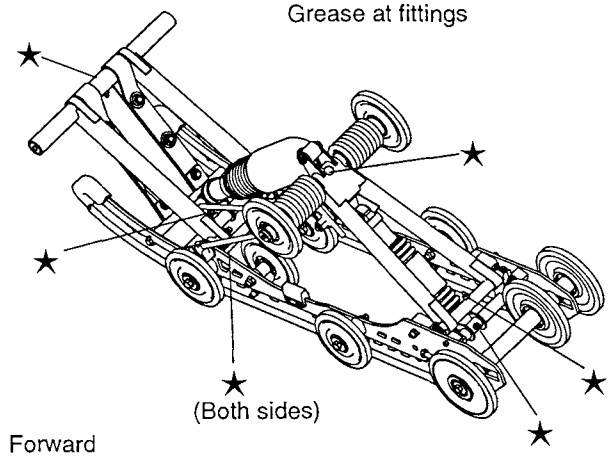
★ LUBRICATION POINTS - Widetrak LX/TranSport
Grease at fittings



★ LUBRICATION POINTS - XTRA-10
Grease at fittings



★ LUBRICATION POINTS - XTRA-12
Grease at fittings



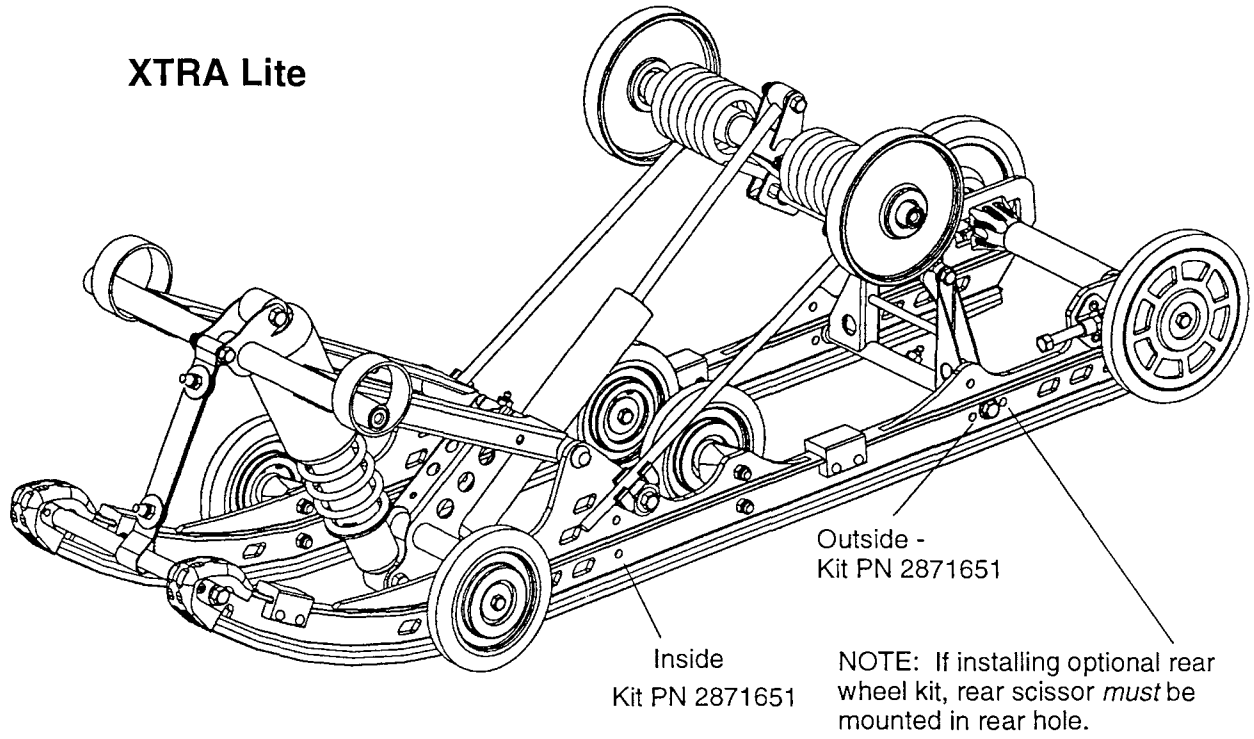
Suspension Torque Specifications

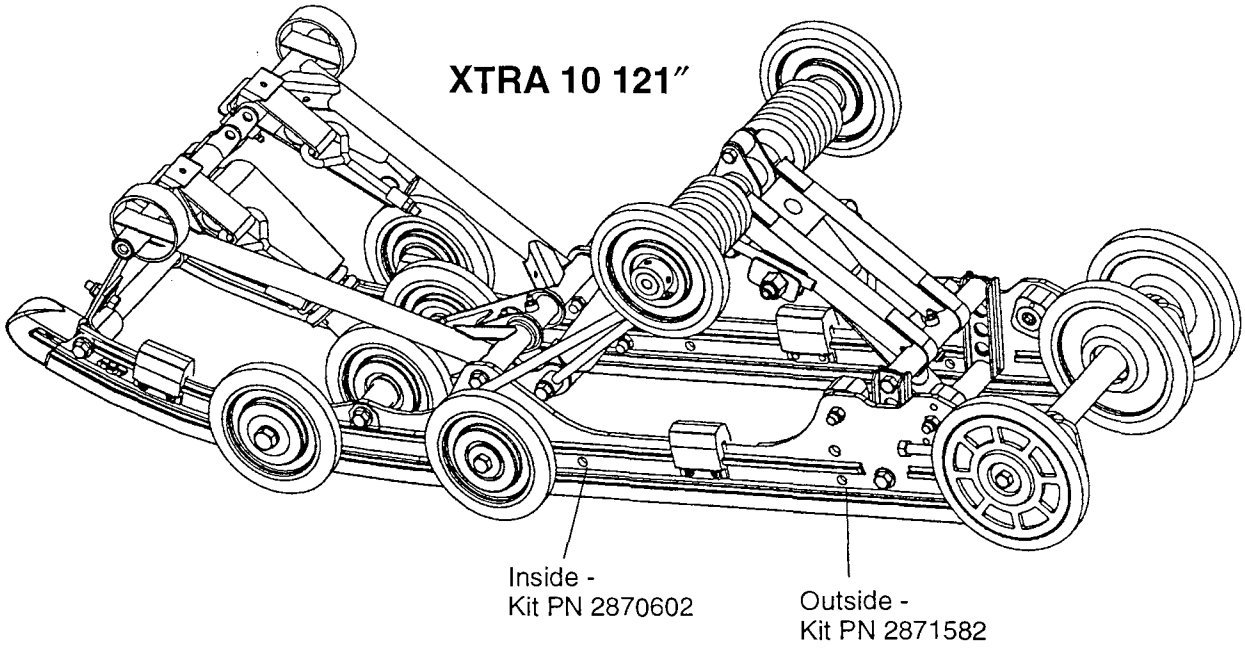
3/8″ top shock mounting bolts	28-30 ft. lbs. (3.85 - 4.14 kg-m)
3/8″ suspension mounting bolts	35 - 40 ft. lbs. (4.8 - 5.52 kg-m)
7/16″ suspension mounting bolts	55 - 60 ft. lbs. (7.61 - 8.30 kg-m)
Shock rod bolts (do not over torque)	12 ft. lbs. (1.66 kg-m)

* Shock rods must pivot freely after torquing

Wheel Kit Mounting Recommendations

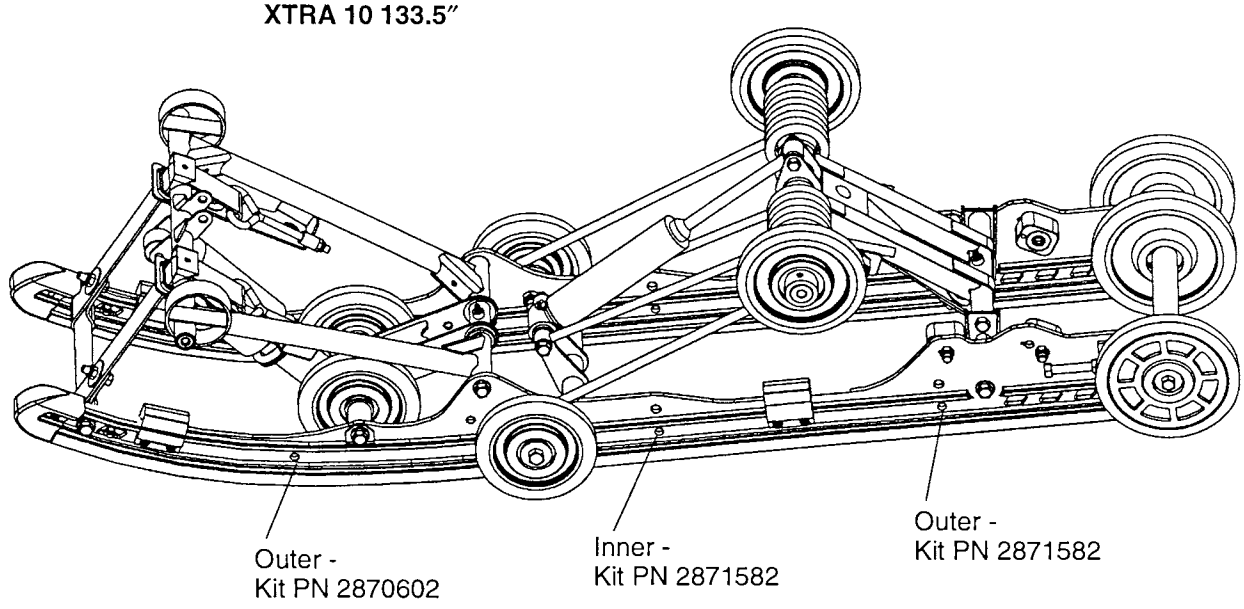
The following illustrations indicate proper installation of optional wheel kits.



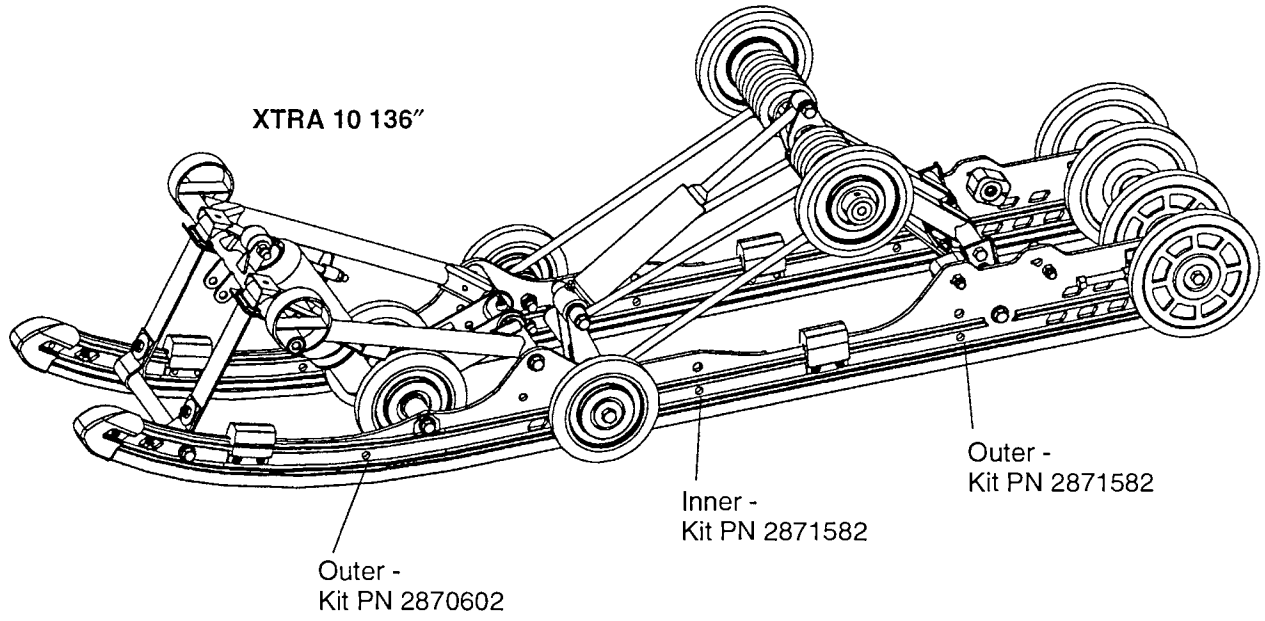


Wheel Kit Mounting Recommendations

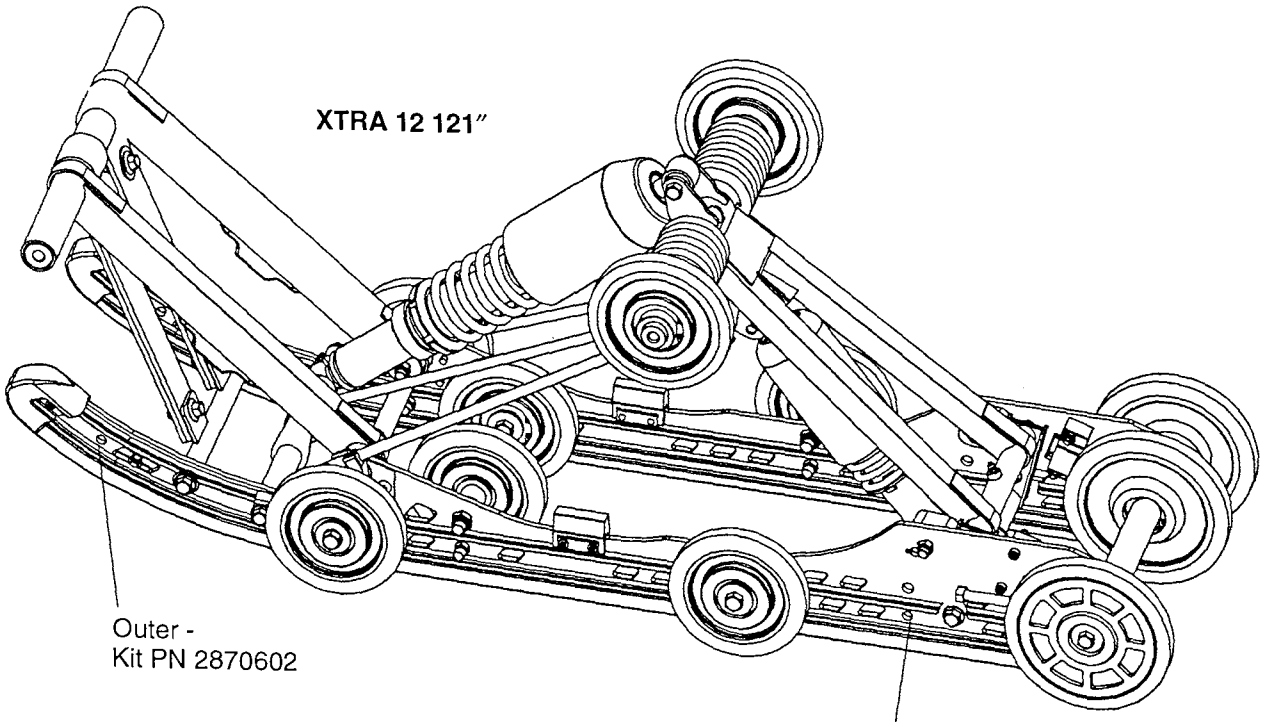
XTRA 10 133.5″

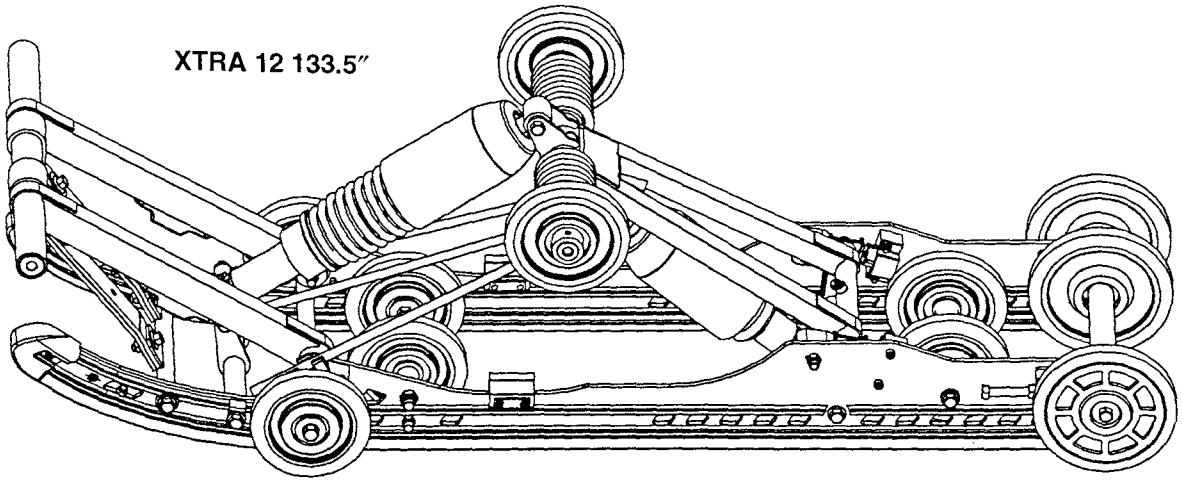


XTRA 10 136″

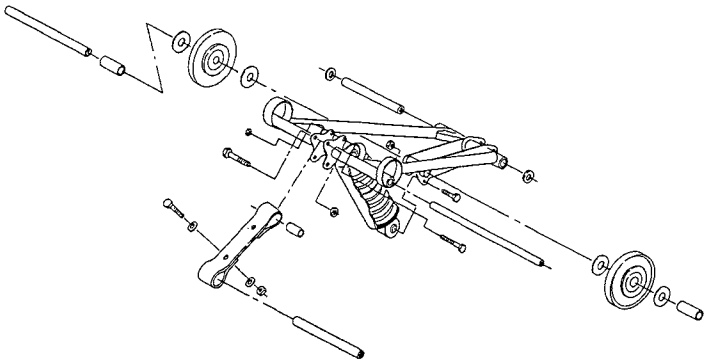


Wheel Kit Mounting Recommendations

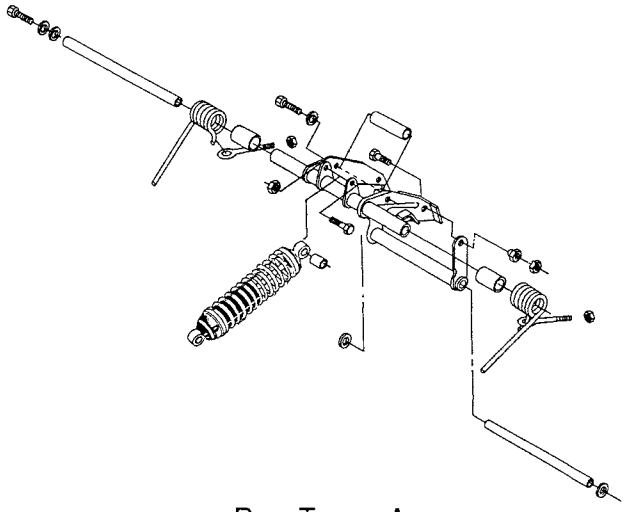




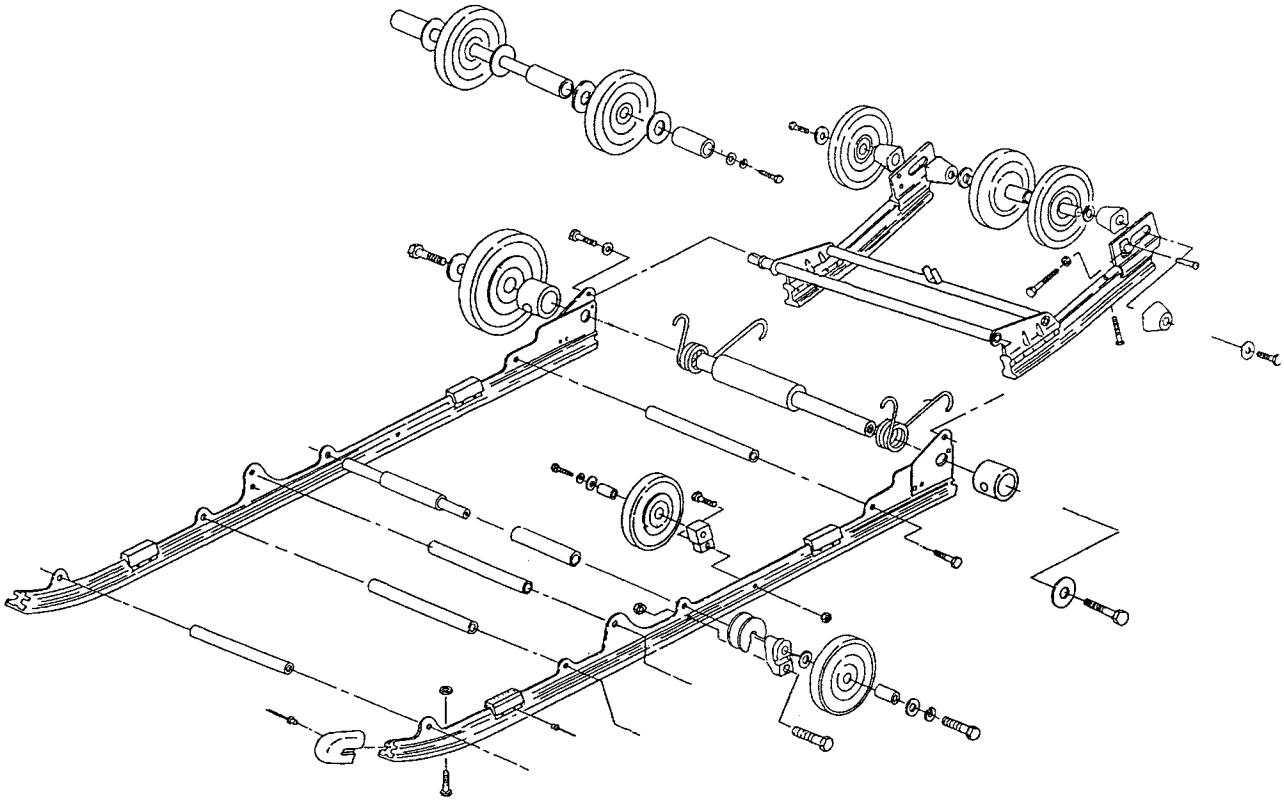
No Wheel Kits recommended for this suspension



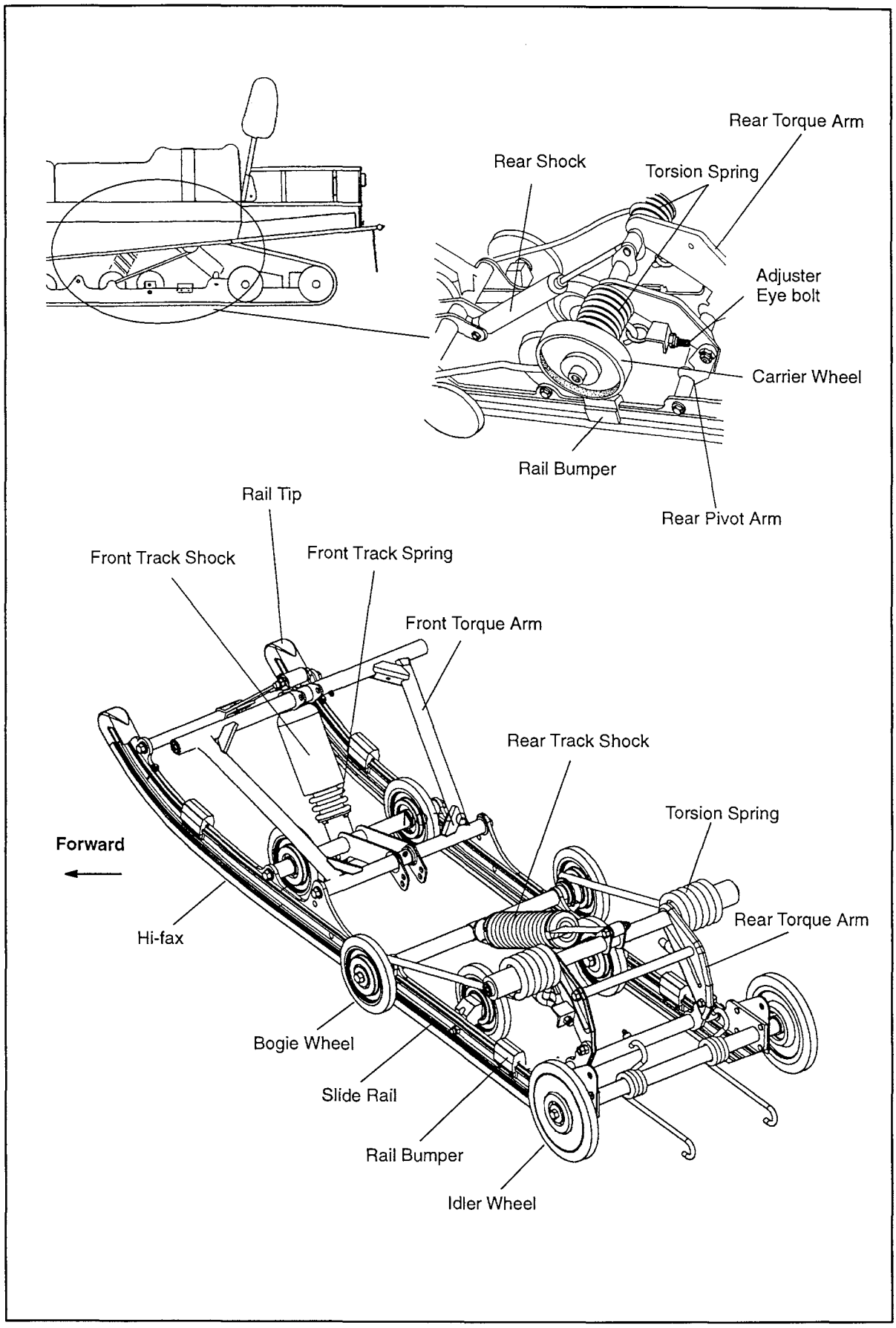
Front Torque Arm

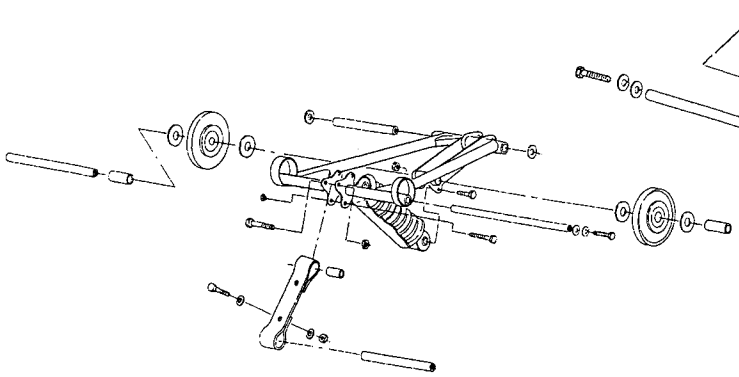


Rear Torque Arm

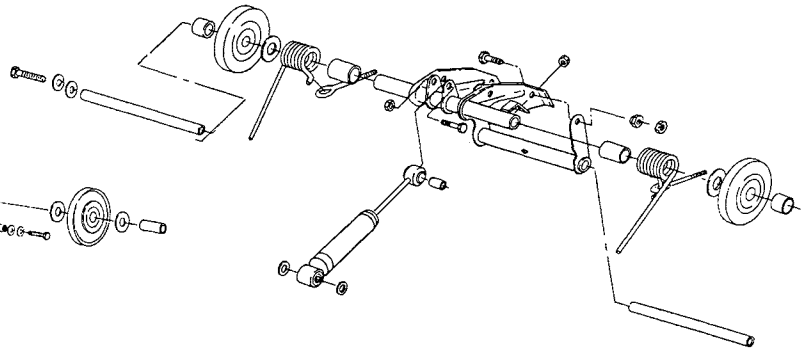


Rear Suspension Components WideTrak LX / TranSport

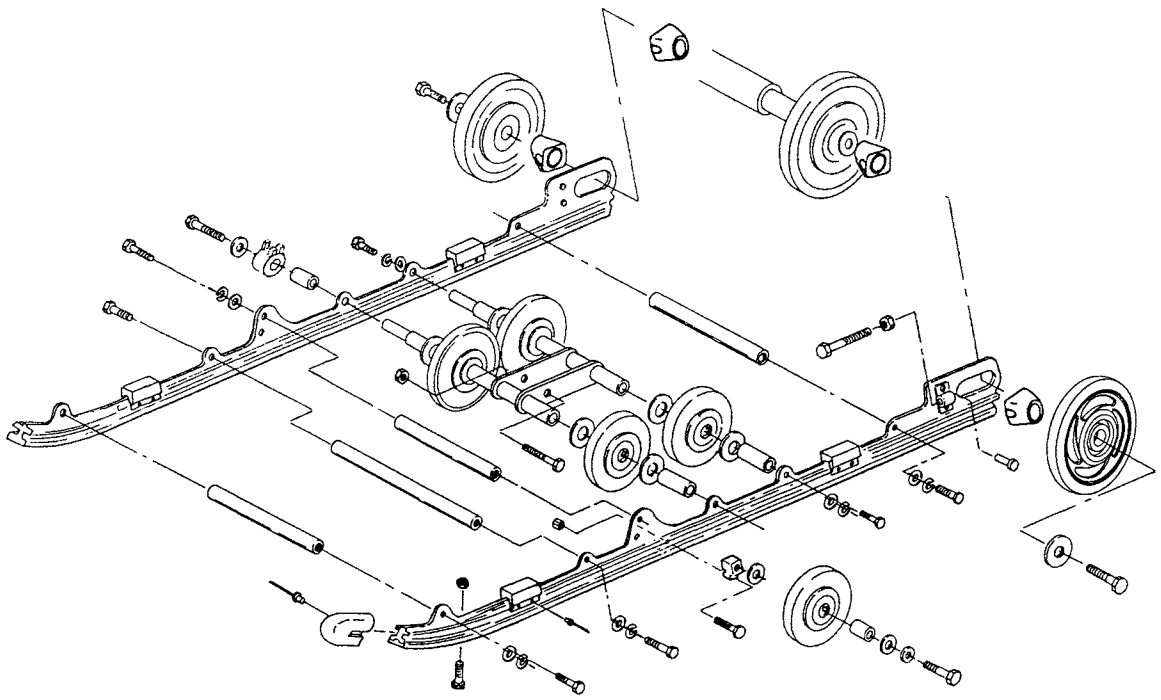




Front Torque Arm



Rear Torque Arm



SUSPENSION

Suspension Adjustment - WideTrak LX / TranSport

The Polaris WideTrak LX and TranSport suspension has been designed and set up to deliver a soft ride under average riding conditions. Rider weight, riding styles, trail conditions, and vehicle speed each affect suspension action.

The suspension can be adjusted to suit rider preference and deliver excellent performance for a given set of conditions. It should be noted, however, that suspension adjustments involve a compromise or trade off. A machine set up to perform well in the moguls would not suit the preference of a groomed trail rider.

Adjustable Features and Adjustment Options

- IFS compression spring preload
- Rear torsion spring preload
- Rear shock compression (if equipped with Indy Select shock)
- Optional coil springs for front track shock

Adjustment Procedures

It is a good idea to have customers break the suspension in for approximately 150 miles (240 km) before fine tuning adjustments are made.

All settings will vary from rider to rider, depending on rider weight, vehicle speed, riding style, and trail conditions. We recommend starting with factory settings and then customizing each adjustment individually to suit rider preference. The machine should be methodically tested under the same conditions after each adjustment (trail and snow conditions, vehicle speed,riding position, etc.) until a satisfactory ride is achieved. Adjustments should be made to one area at a time, in order to properly evaluate the change.

The purpose of the front track shock coil spring is to control ride height. If you find that in order to obtain the desired ride effect the spring preload is at its maximum, consider removing the existing spring and installing the next highest rate spring.

Rear Suspension Adjustments - WideTrak LX

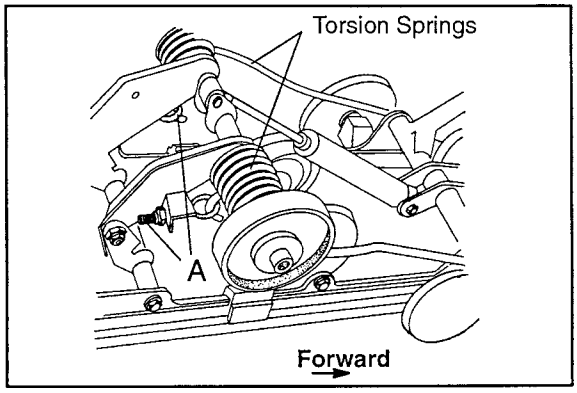
The primary adjustment for riding comfort is rear torsion spring preload adjustment. To check for the recommended settings:

1. Lift the rear of the machine to relieve the rear springs.
2. Slowly lower the machine and measure the distance between the ground and the running board at the rear of the tunnel.
3. Without letting the suspension settle, the rider should carefully mount the snowmobile.
4. Measure the distance between the ground and the same spot on the running board.

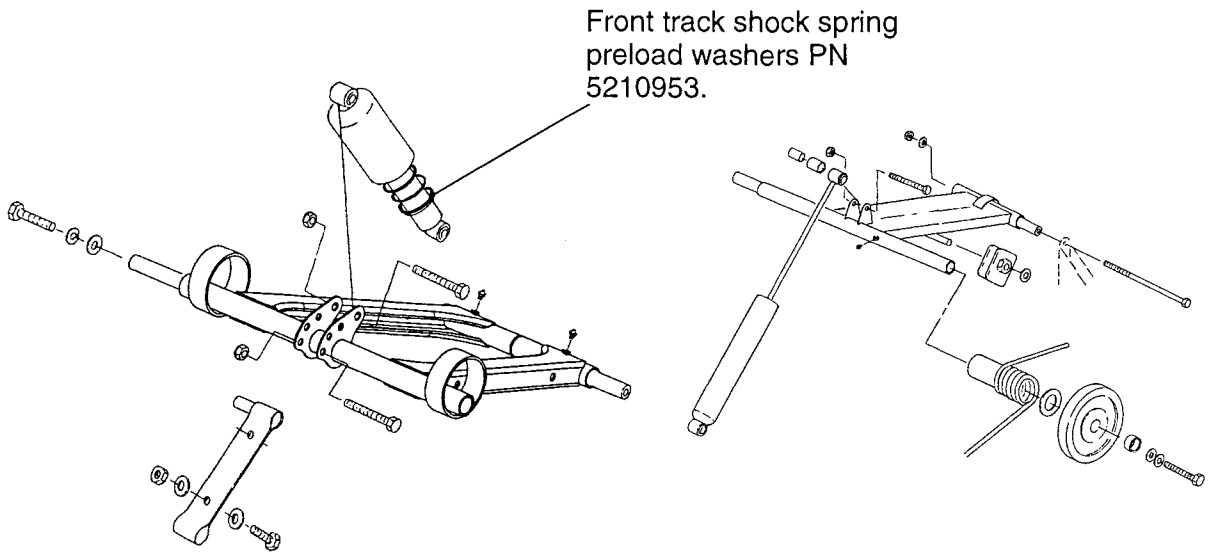
If the difference is greater than 1 1/2", the rear spring should be adjusted equally on both sides until the desired 1 1/2" drop is obtained.

Compensating adjustments for heavy or light drivers or cargo loads can be made by adjusting the rear torsion spring eye bolt (A) length. Adjust spring tension so there is equal tension on the long leg of each spring.

NOTE: Rear torsion spring settings will affect ski-to-ground pressure. It may be desirable to tighten rear torsion springs for an increase in ski-to-ground pressure. If ski pressure is too light, the machine will be hard to steer around curves and will tend to push, or drive straight through curves.

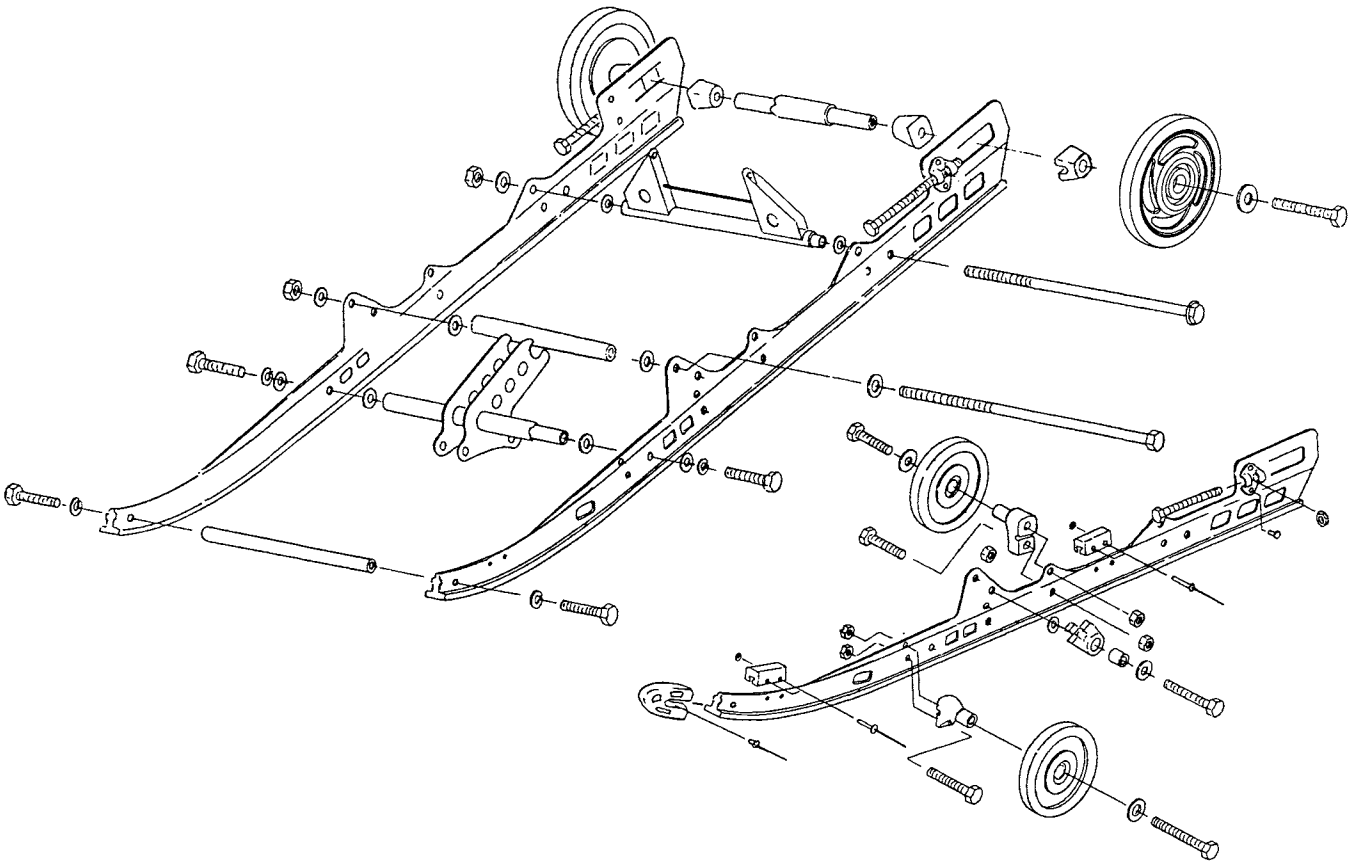


Rear Suspension Exploded View - XTRA Lite

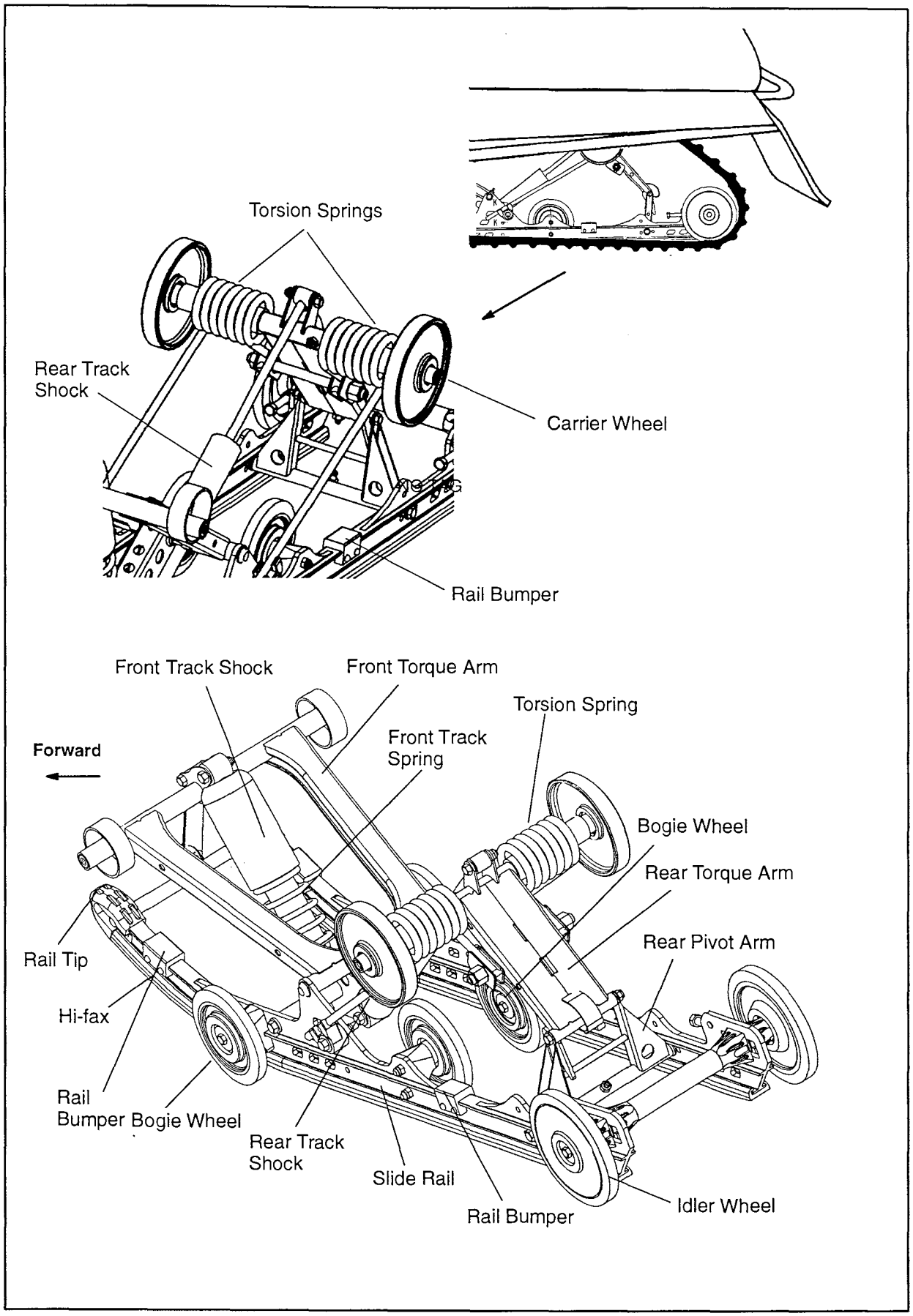


Front Torque Arm

Rear Torque Arm



Rear Suspension Components - XTRA-Lite



Suspension Adjustment

The Polaris suspension has been designed and set up to deliver a soft ride under average riding conditions. Rider weight, riding styles, trail conditions, and vehicle speed each affect suspension action.

The suspension can be adjusted to suit rider preference and deliver excellent performance for a given set of conditions. It should be noted, however, that suspension adjustments involve a compromise or trade off. A machine set up to perform well in the moguls would not suit the preference of a groomed trail rider.

Adjustable Features and Adjustment Options

- Rear torsion spring preload
- Optional coil springs for front track shock and spring preload washers
- Optional torsion springs
- Front limiter strap
- Optional coil springs for IFS shocks

Adjustment Procedures

It is a good idea to break the suspension in for approximately 150 miles (240 km) and re-grease all suspension parts before fine tuning adjustments are made.

All settings will vary from rider to rider, depending on rider weight, vehicle speed, riding style, and trail conditions. We recommend starting with factory settings and then customizing each adjustment individually to suit rider preference. The machine should be methodically tested under the same conditions after each adjustment (trail and snow conditions, vehicle speed,riding position, etc.) until a satisfactory ride is achieved. Adjustments should be made to one area at a time, in order to properly evaluate the change.

The purpose of the front track shock coil spring is to control ride height and front IFS preload. If you find that in order to obtain the desired ride effect the spring preload is over four additional washers (total of five), consider removing the existing spring and installing the next highest rate spring.

SUSPENSION
Suspension Adjustment - XTRA Lite
For Recommended Optional Settings, Refer to Suspension Set Up Decal Under Hood

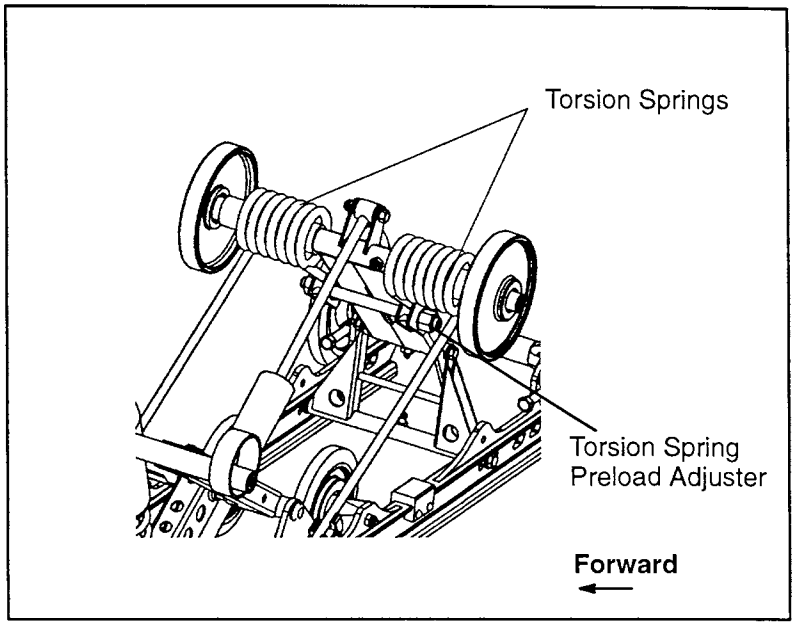
Rear Suspension Adjustments

The primary adjustment for riding comfort is rear torsion spring preload adjustment. To check for the recommended initial settings:

1. Lift the rear of the machine to relieve the rear springs.
2. Slowly lower the machine and measure the distance between the ground and the running board at the rear of the tunnel.
3. Without letting the suspension settle, the rider should carefully mount the snowmobile.
4. Measure the distance between the ground and the same spot on the running board.

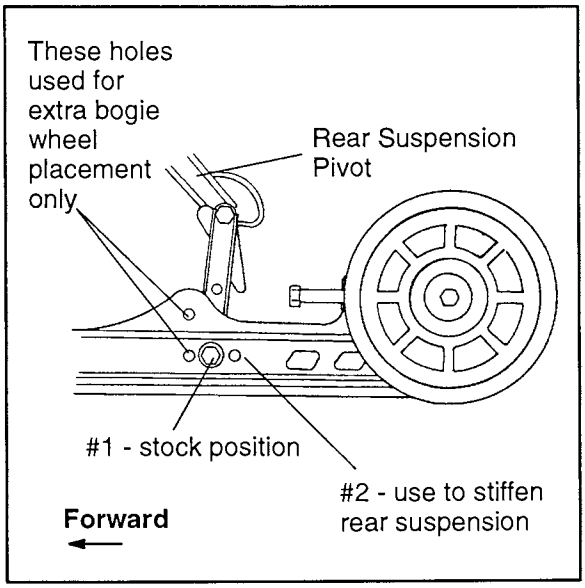
If the difference is greater than 1 1/2", the rear spring should be adjusted equally on both sides until the desired 1 1/2" drop is obtained. See adjustment information below.

Compensating adjustments for heavy or light drivers or cargo loads can be made by adjusting the preload adjuster. Remember, this is only the initial settings. Final settings should be determined by riding the snowmobile and readjusting.

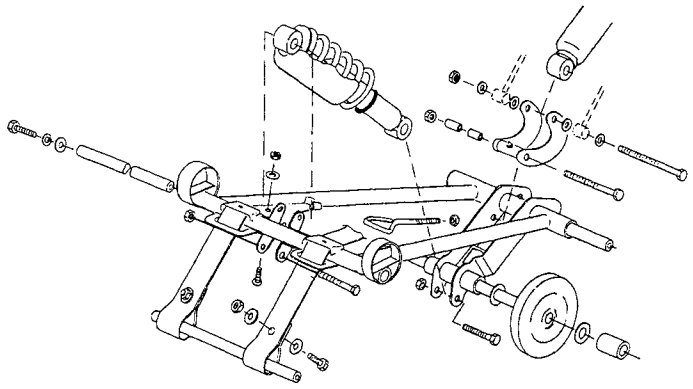


NOTE: Rear torsion spring settings will affect ski-to-ground pressure. It may be desirable to tighten rear torsion springs for an increase in ski-to-ground pressure. If ski pressure is too light, the machine will be hard to steer around curves and will tend to push, or drive straight through curves.

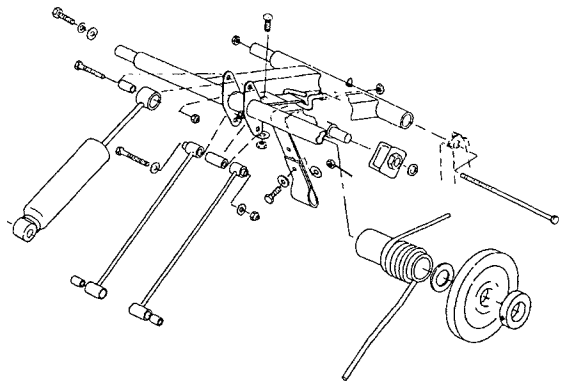
The XTRA Lite suspension comes from the factory with the rear suspension pivot mounted in the second hole from the front of the rail. *Do not* move to the front mounting hole.



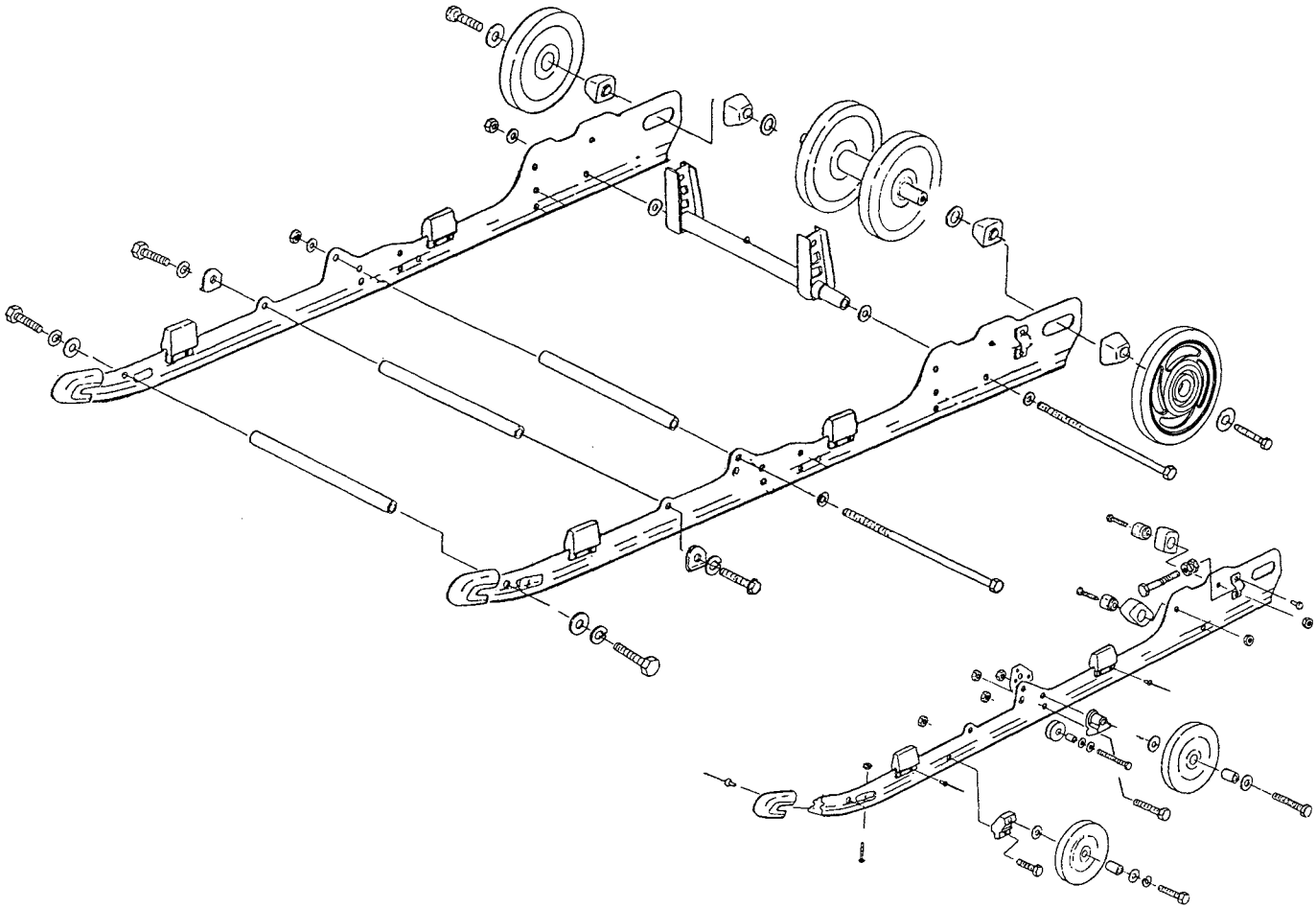
Rear Suspension Exploded View - XTRA 10 Style



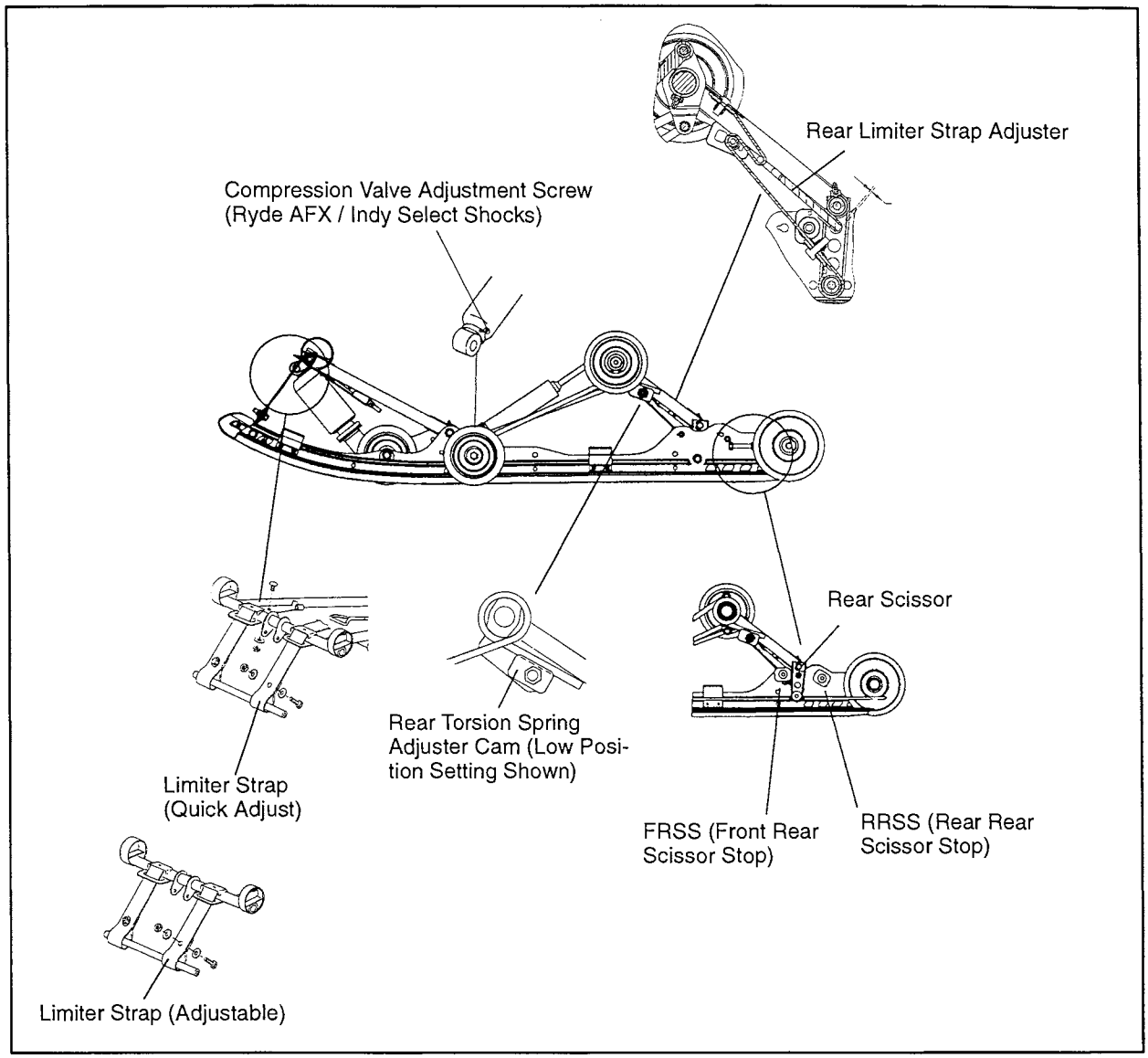
Front Torque Arm



Rear Torque Arm



Rear Suspension Components - XTRA 10 Style



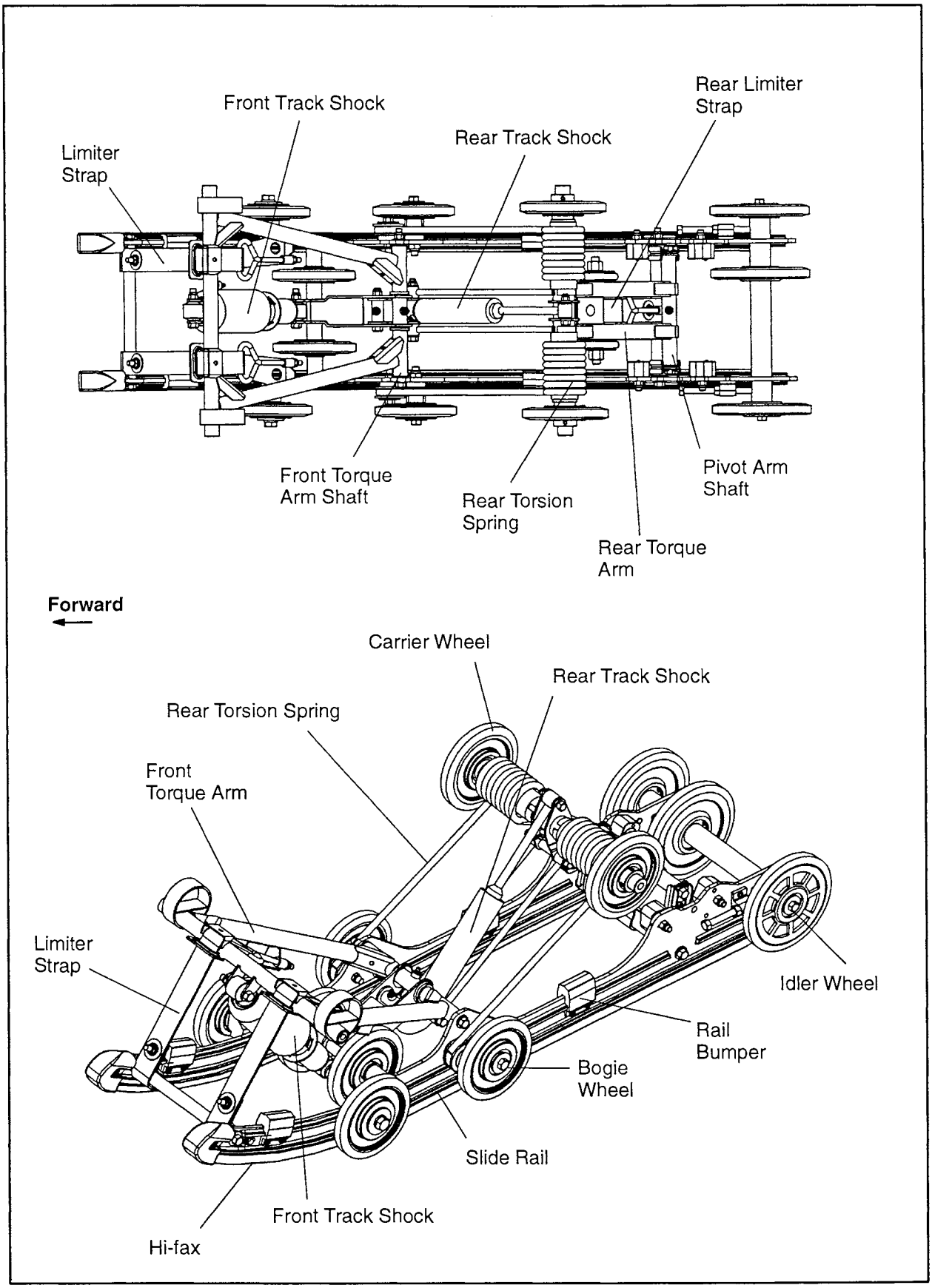
Front Limiter

The front limiter strap controls the amount of weight transfer, ski pressure, and to some degree the ride height. The rear limiter controls ride height and increases preload on the rear springs when tightened, which also decreases transfer (i.e. the lighter the torsion spring preload, the more weight transfer).

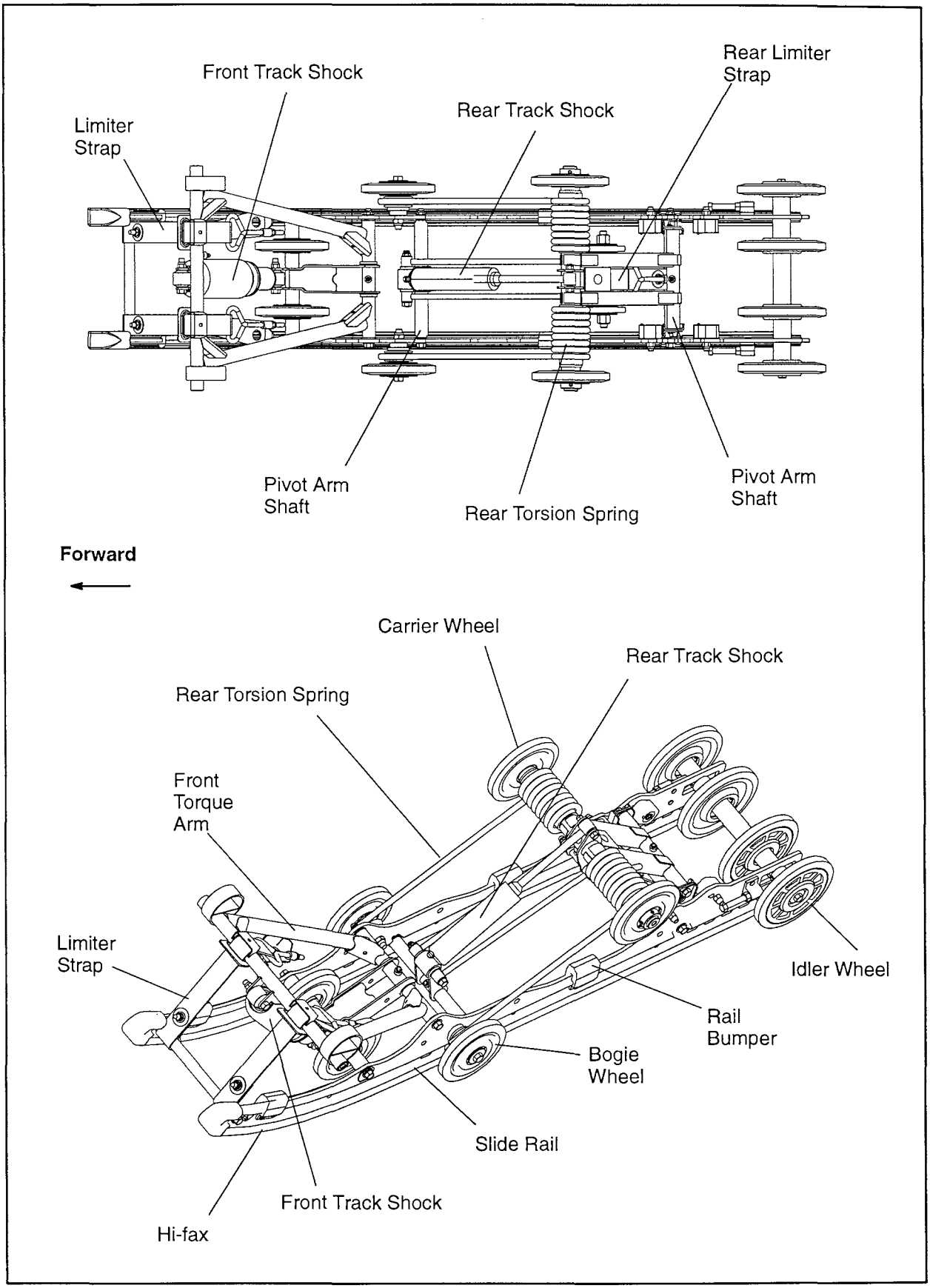
Setting	Ski Pressure	Weight Transfer
Longer	Decreased	Increased
Shorter	Increased	Decreased

NOTE: RRSS has greatest affect on weight transfer on XTRA 10 suspensions. See pages 7.24-7.25.

Rear Suspension Components - XTRA 10 121″ Style



Rear Suspension Components - XTRA 10 133.5″ / 136″ Style



Suspension Adjustment - XTRA 10 Style

The XTRA™ 10 suspension has been designed and set up to deliver a soft ride under average riding conditions. Rider weight, riding styles, trail conditions, and vehicle speed each affect suspension action.

The suspension can be adjusted to suit rider preference and deliver excellent performance for a given set of conditions. It should be noted, however, that suspension adjustments involve a compromise or trade off. A machine set up to perform well in the moguls would not suit the preference of a groomed trail rider.

Adjustable Features and Adjustment Options

Independent Front Suspension (IFS)

- Front shock spring preload (some models require washers)
- Optional springs
- Adjustable compression valving via Ryde AFX / Indy Select shock (on some models)

Rear Suspension

- Rear torsion springs
- Front rear scissor stop (FRSS)
- Rear rear scissor stop (RRSS)
- Optional coil springs for front track shock and spring preload (some models require washers)
- Optional torsion springs
- Adjustable compression via Ryde AFX / Indy Select rear track shock (on some models)
- Limiter straps - front and rear

Adjustment Procedures

It is a good idea to have customers break the suspension in for approximately 150 miles (240 km) before fine tuning adjustments are made.

All settings will vary from rider to rider, depending on rider weight, vehicle speed, riding style, and trail conditions. We recommend starting with factory settings and then customizing each adjustment individually to suit rider preference. The machine should be methodically tested under the same conditions after each adjustment (trail and snow conditions, vehicle speed,riding position, etc.) until a satisfactory ride is achieved. Adjustments should be made to one area at a time, in order to properly evaluate the change.

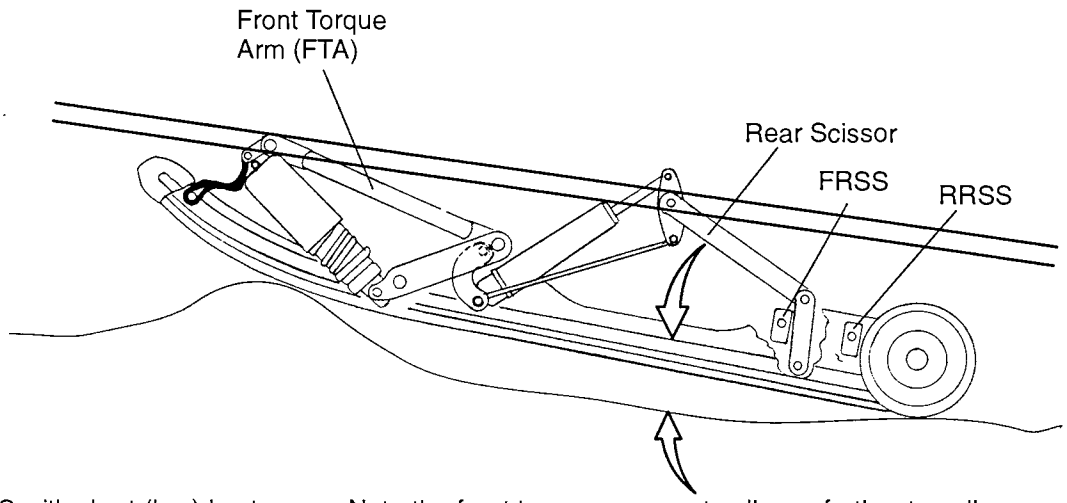
SUSPENSION
Front Rear Scissor Stop (FRSS) - XTRA 10 Style

The purpose of the front rear scissor stop (FRSS) is to control the bump attitude of the rear suspension. As the front torque arm (FTA) hits the bump, it forces the rear scissor to collapse a predetermined amount, depending on the FRSS block position.

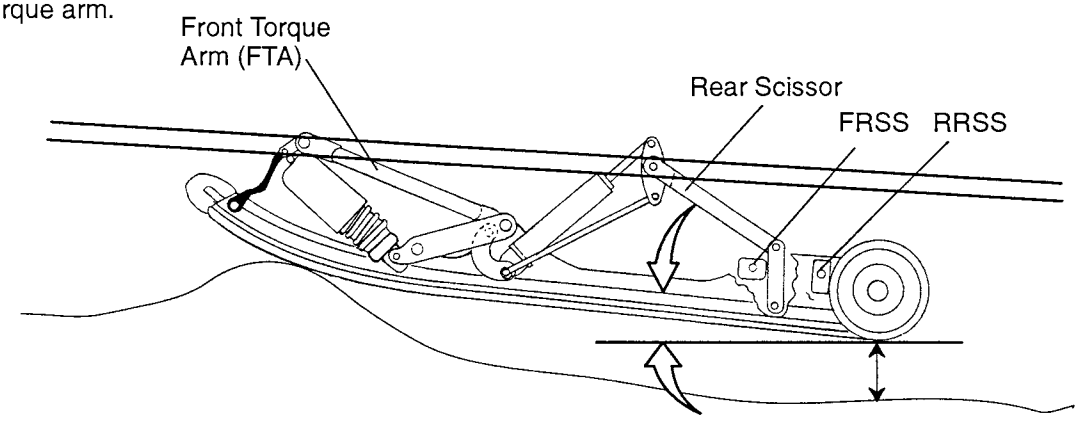
This accomplishes two important things, it allows a lighter spring rate on the FTA because it can borrow spring rate from the rear torsion springs; and it prepares the rear portion of the suspension for the bump, reducing secondary kick back.

The FRSS is made of a resilient material allowing smooth action and preventing any suspension component damage.

This unique feature is applied to the XTRA™ 10 rear suspension. Patents are pending.



FRSS with short (low) leg to rear. Note the front torque arm must collapse further to collapse rear torque arm.

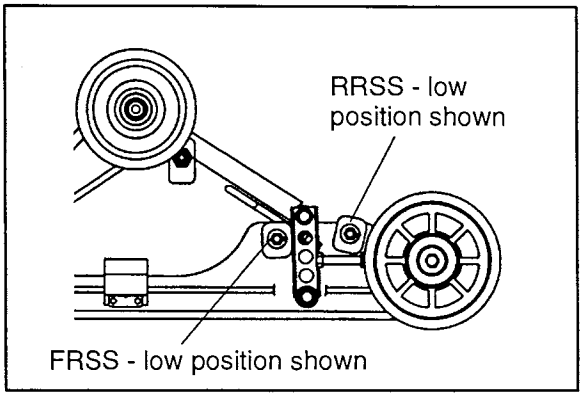


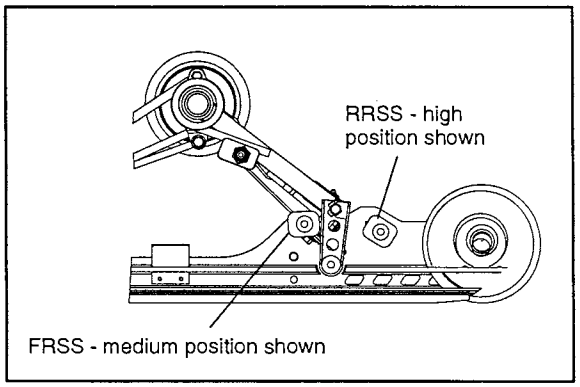
FRSS with long (high) leg to rear. Note this forces rear scissor to collapse with less front torque arm movement than when in short position. This keeps the rails more parallel to the chassis.

Rear Rear Scissor Stop (RRSS) - XTRA 10 Style

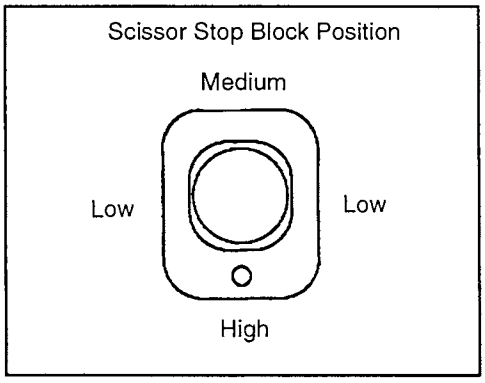
The RRSS controls weight transfer from the rear suspension to the skis. It also influences the stiffness of the ride by controlling the amount of coupling action between the front and rear torque arms. To increase the stiffness of the suspension, the RRSS should be set in the high position.

NOTE: On XTRA-10 models only, the RRSS can be totally removed for maximum weight transfer. However, unless the torsion springs and rear shock valving are changed, the ride will be compromised. Always maintain equal adjustment on both sides.



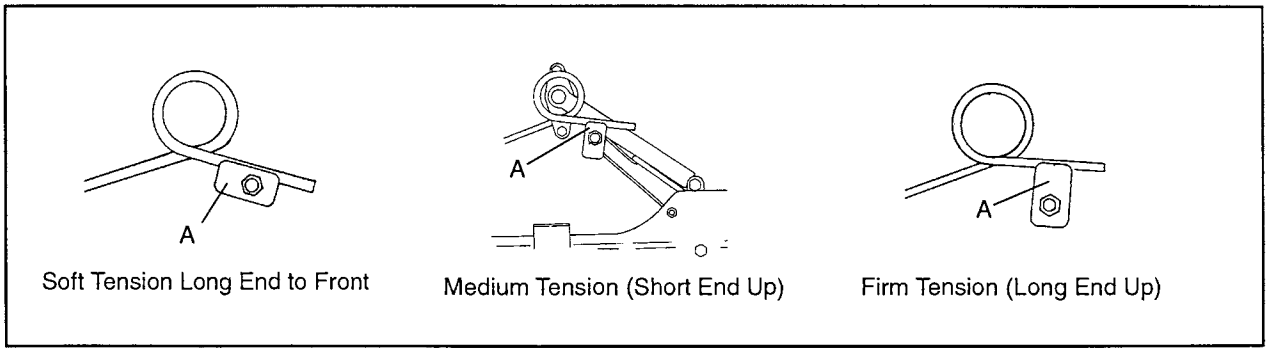


Be sure rear scissor stop face is square with the face of the scissor arm to ensure complete contact.

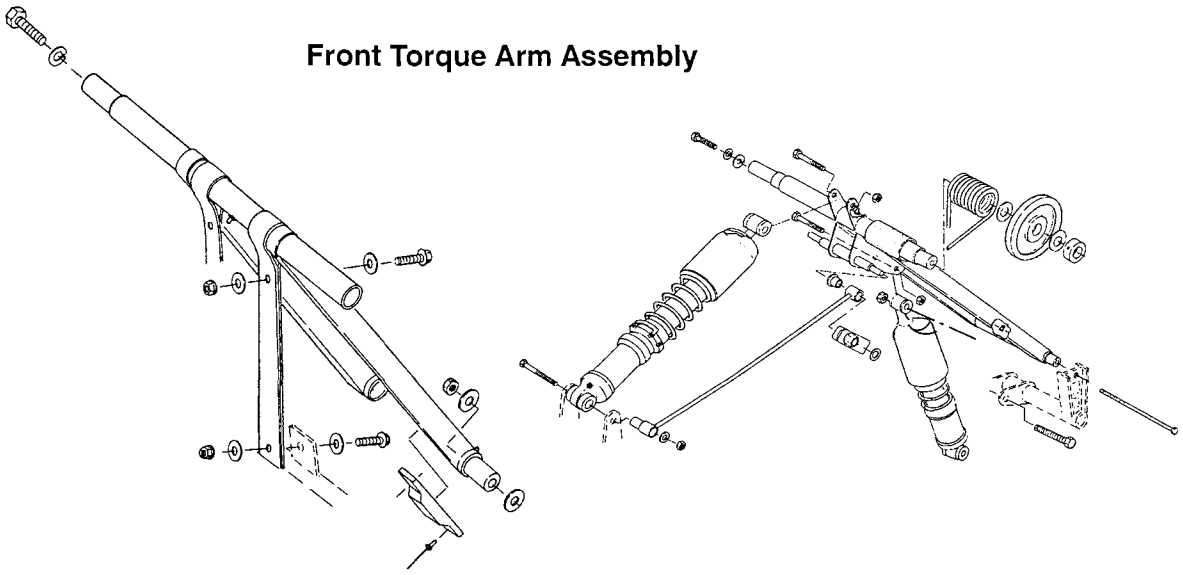


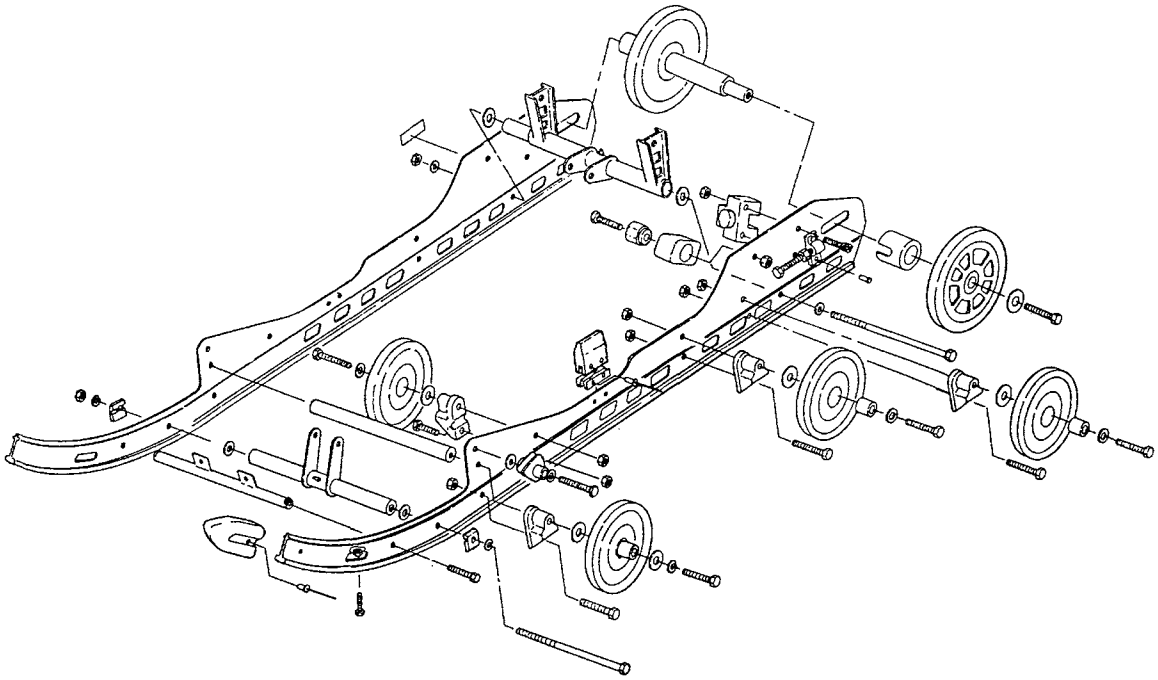
Rear Spring Tension

Rear spring tension adjustments are made by rotating the eccentric spring block (A) as shown with the engine spark plug tool. The block provides three spring tension positions. This adjustment is easier if the long spring leg is lifted over the roller and replaced after the block is properly positioned. Always maintain equal adjustment on both sides.

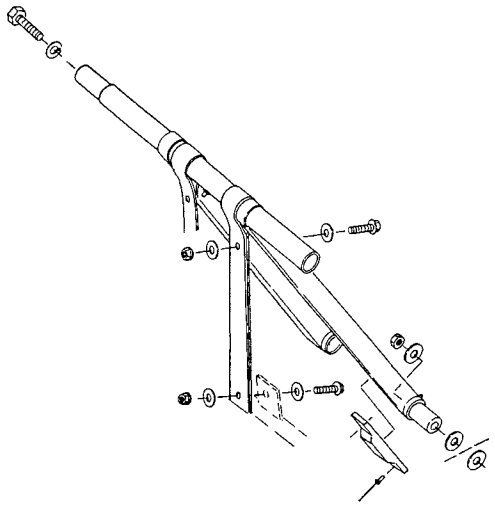


Rear Suspension Exploded View - XTRA 12 121″ Style

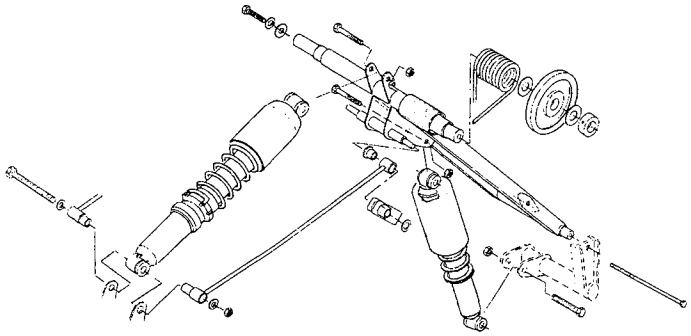




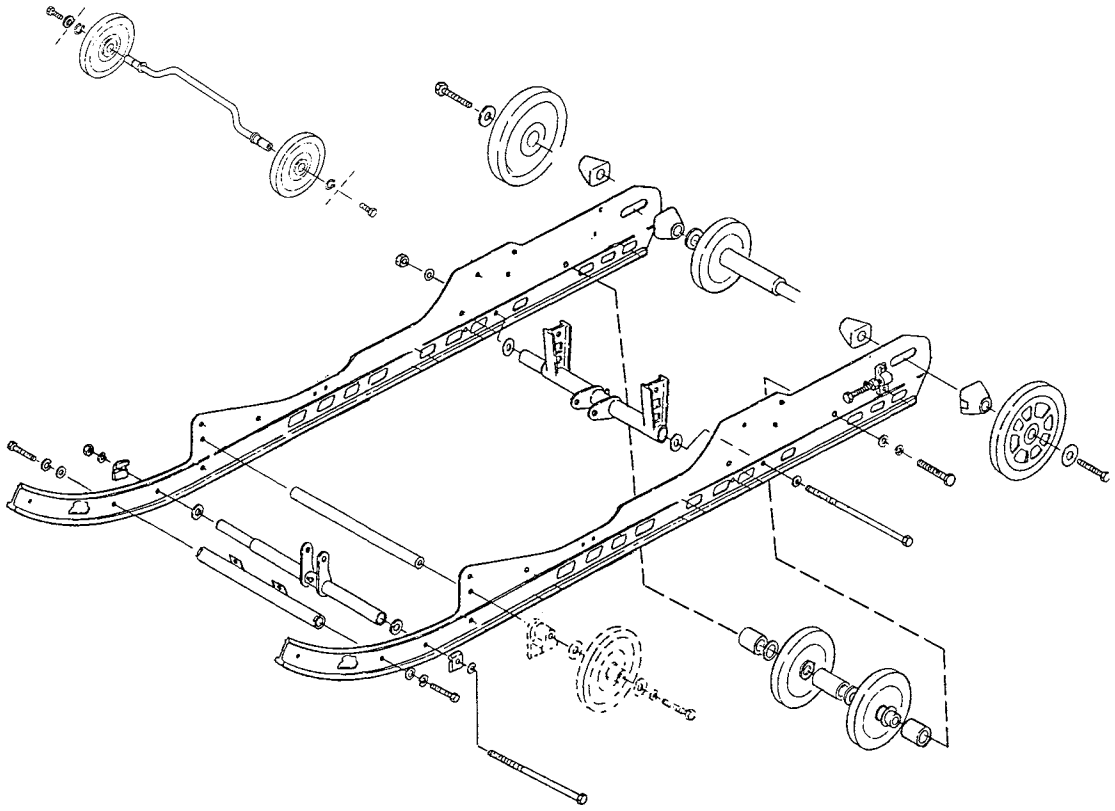
Rear Suspension Exploded View - XTRA 12 133.5″ Style



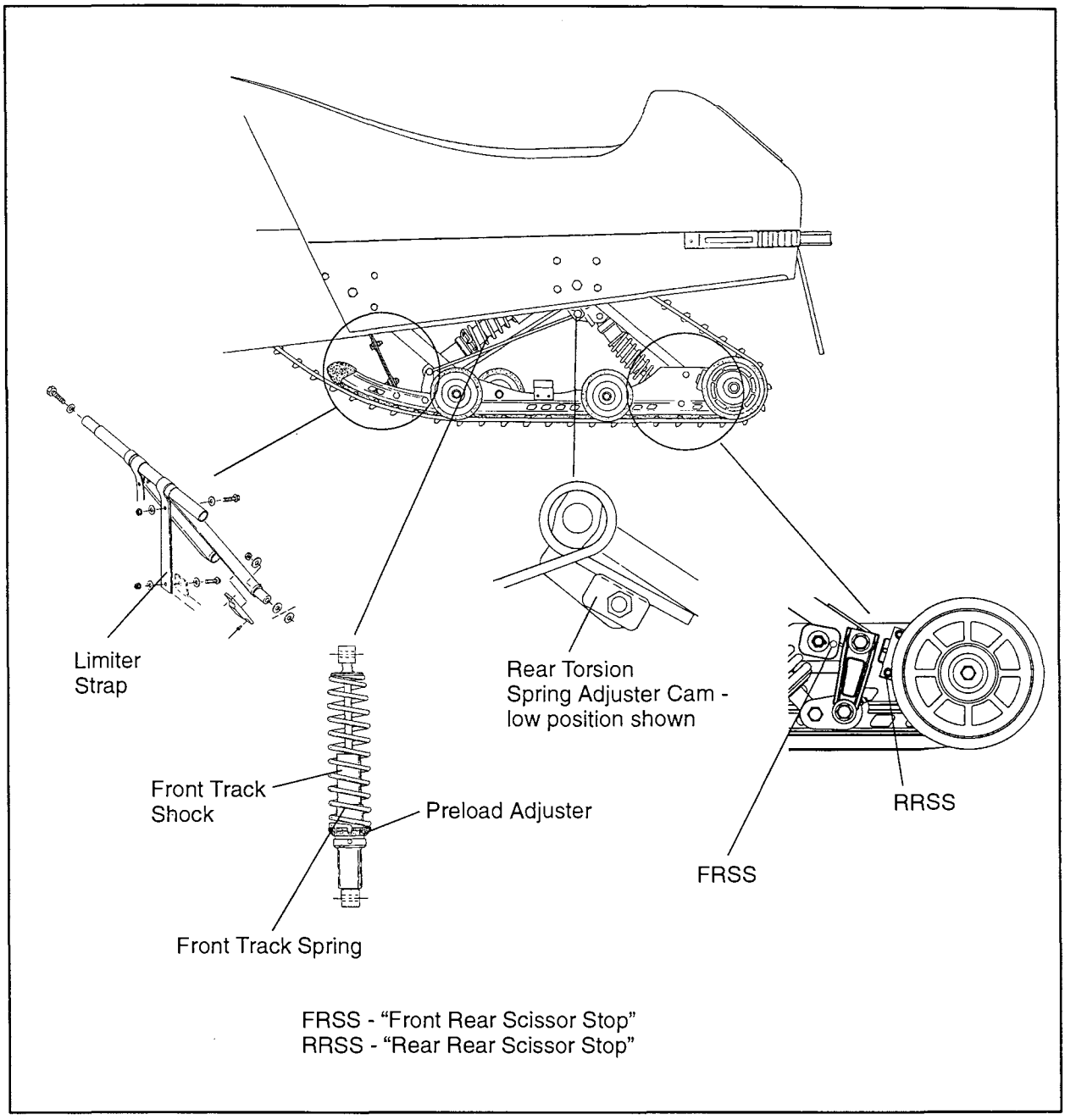
Front Torque Arm Assembly



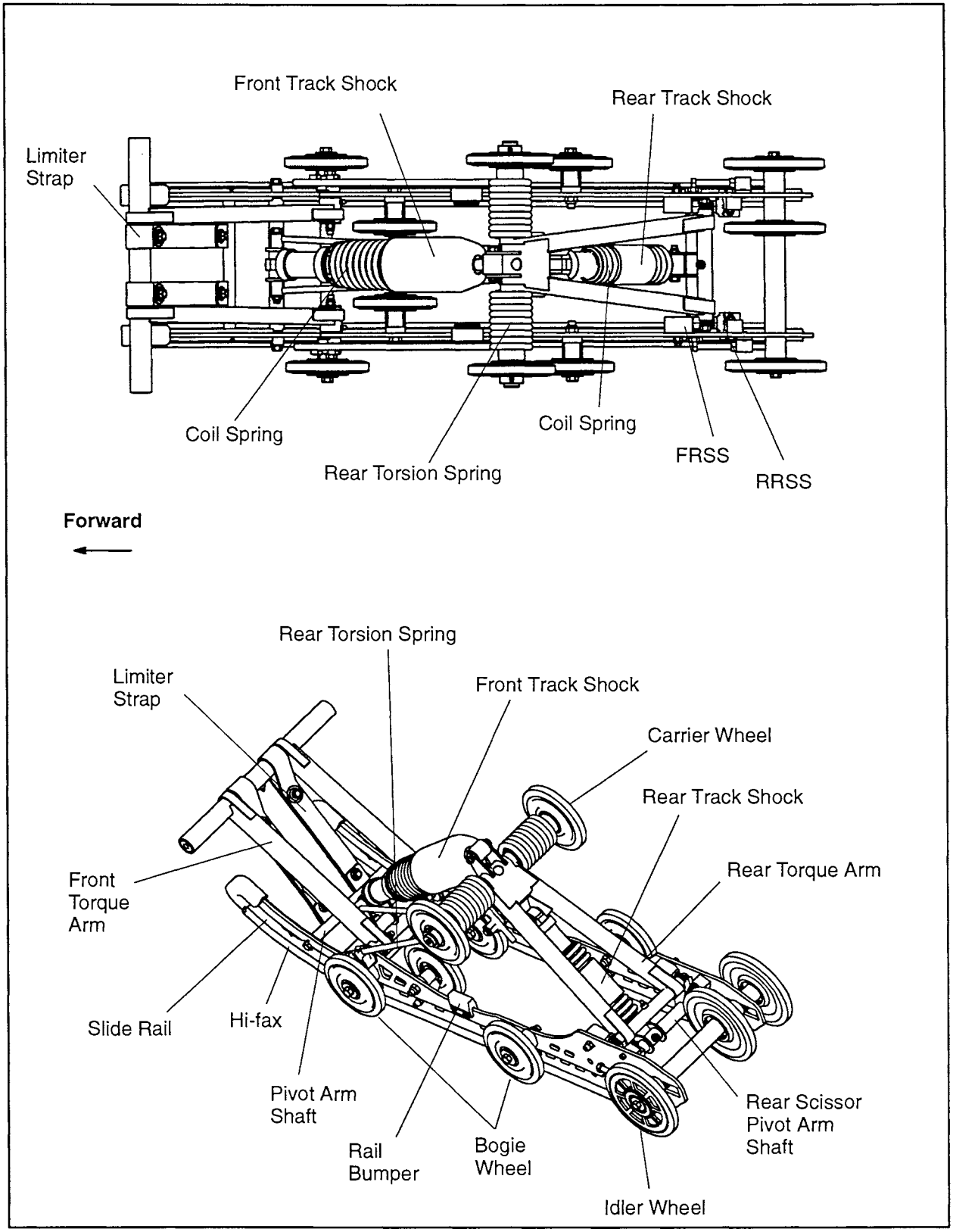
Rear Torque Arm Assembly



Rear Suspension Components - XTRA 12 Style



FRSS - "Front Rear Scissor Stop"
RRSS - "Rear Rear Scissor Stop"


Front Track Shock
Rear Track Shock
Limiter Strap
Coil Spring
Coil Spring
FRSS
Rear Torsion Spring
RRSS
Forward
Rear Torsion Spring
Limiter Strap
Front Track Shock
Carrier Wheel
Rear Track Shock
Front Torque Arm
Rear Torque Arm
Slide Rail
Hi-fax
Pivot Arm Shaft
Rail Bumper
Bogie Wheel
Rear Scissor Pivot Arm Shaft
Idler Wheel

SUSPENSION
Suspension Adjutment - XTRA-12 Style

The XTRA™ 12 suspension has been designed and set up to deliver a soft ride under average riding conditions. Rider weight, riding styles, trail conditions, and vehicle speed each affect suspension action.

The suspension can be adjusted to suit rider preference and deliver excellent performance for a given set of conditions. It should be noted, however, that suspension adjustments involve a compromise or trade off. A machine set up to perform well in the moguls would not suit the preference of a groomed trail rider.

Adjustable Features and Adjustment Options

Independent Front Suspension (IFS)

- Front shock spring preload
- Optional springs
- Compression adjust Indy Select / Ryde AFX shock

Rear Suspension

- Spring preload - front track shock
- Spring preload - rear track shock (Requires addition of washers)
- Rear torsion spring pre-load
- Front rear scissor stop (FRSS)
- Optional coil springs
- Optional torsion springs
- Limiter strap - front
- Compression adjust Indy Select Ryde AFX shock

Adjustment Procedures

It is a good idea to have customers break the suspension in for approximately 150 miles (240 km) and grease all suspension pivots before fine tuning adjustments are made. Use Polaris Premium All Season Grease.

All settings will vary from rider to rider, depending on rider weight, vehicle speed, riding style, and trail conditions. We recommend starting with factory settings and then customizing each adjustment individually to suit rider preference. The machine should be methodically tested under the same conditions after each adjustment (trail and snow conditions, vehicle speed,riding position, etc.) until a satisfactory ride is achieved. Adjustments should be made to one area at a time, in order to properly evaluate the change.

Rear Suspension Adjustments - XTRA 12 Style

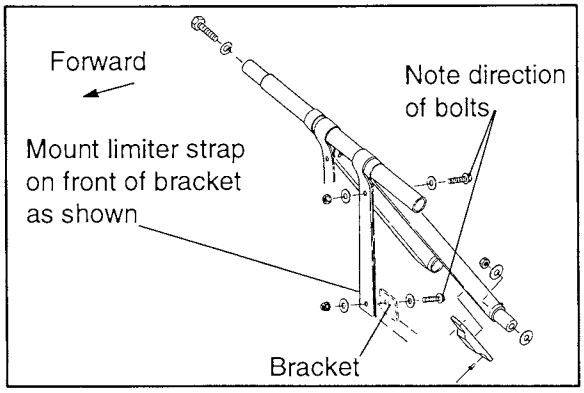
The primary rear suspension adjustments are the front track spring preload and the rear torsion spring preload. It is important to note that adjusting the limiter strap does not change weight transfer from the rear suspension to the skis as in a conventional suspension. Instead it will increase the entire rear suspension preload and decrease travel. To *increase* ski pressure the front rear scissor stop (FRSS) should be set to low. To *decrease* ski pressure the FRSS should be set to high.

To properly adjust the rear suspension, start with the lightest preload setting that will prevent heavy bottoming. Remember: adjustments should be made to one area at a time, in order to properly evaluate the change.

NOTE: Rear spring settings will affect ski-to-ground pressure. If ski pressure is too light it may be desirable to tighten rear springs for an increase in ski-to-ground pressure. It is also possible to reposition the FRSS for increased ski pressure.

Front Track Shock Spring

Front track shock spring preload is adjusted by grasping the spring and turning in a clockwise direction to *increase* the preload. Turn in a counterclockwise direction to *decrease* preload.

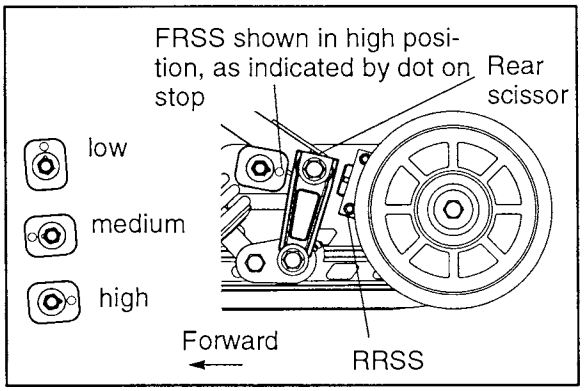


Rear Track Shock Spring

The rear track shock coil spring does not have a threaded adjuster. Washers can be added to increase preload. One option to *decrease* preload for *extremely light non-aggressive riders* is removal of the rear track shock spring.

Front Rear Scissor Stop (FRSS)

To adjust the FRSS compress the rear portion of rear suspension until the rear scissor pivots away from the FRSS (Support front of track on object). Turn adjuster to desired position. The dot on the stop indicates the high position. High position is with the dot located toward the rear of the machine (See illustration). Medium position is with the dot toward the front of the machine.

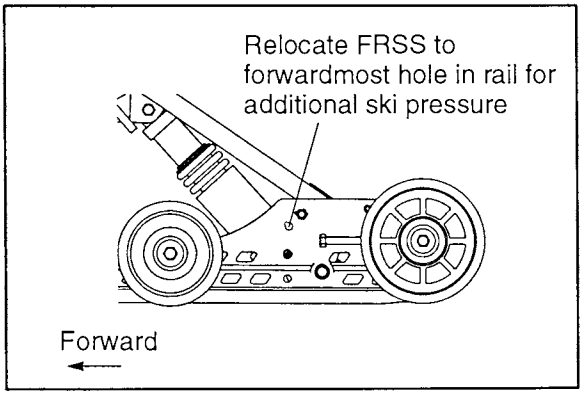


CAUTION:

Be sure both blocks are in the same position or suspension damage may occur.

NOTE: It may be necessary to loosen the FRSS mounting bolts to adjust the position. Tighten after adjustment.

If the FRSS is in the low position but additional ski pressure is desired, move the FRSS to the optional front hole. Remove the attaching bolts and relocate the FRSS blocks in the forwardmost hole. Reinstall bolts and tighten.



Rear Rear Scissor Stop (RRSS)

The RRSS is not adjustable but can be changed to provide more or less weight transfer. See chart below.

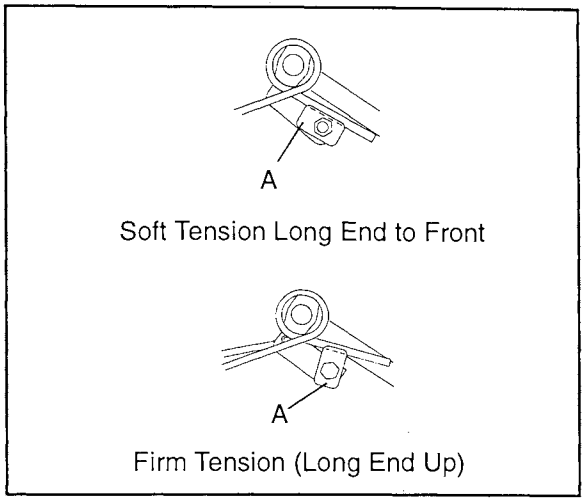
XTRA 12 RRSS Production Settings

Suspension	Length	Color	Part Number
121″	Short	Black	5410937-more transfer
133″	Long	Gray	5411041-less transfer

Rear Torsion Spring

Rear torsion spring preload is adjusted by turning the two position cams (A) on the short leg of the spring as shown with the engine spark plug tool. This adjustment is easier if the long spring leg is lifted over the roller and replaced after the cam is properly positioned.

Always maintain equal adjustment on both sides.

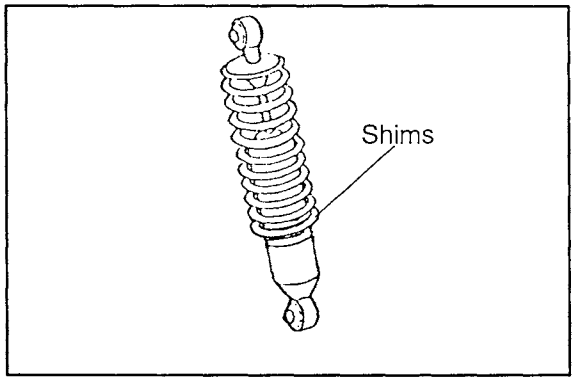


IFS ADJUSTMENTS

IFS Adjustments - XTRA-Lite / Widetrak LX / TranSport

IFS spring preload is one of the adjustment options which affects ride. Preload is the initial compression placed on the spring. The longer the installed length of the spring, the less the amount of preload; the shorter the installed length of the spring, the more the amount of preload. Increasing preload on the IFS spring will result in more bite on the skis, but will require more effort to turn. The IFS compression spring preload can be increased by adding shims (PN 5210953) under the spring.

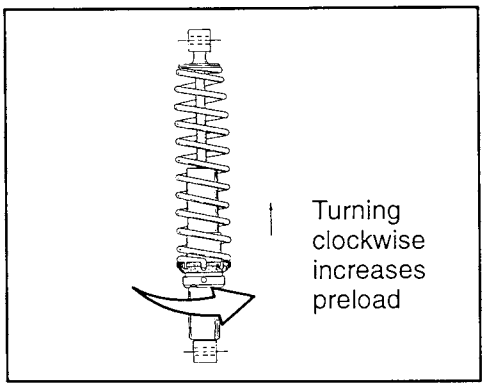
Always verify ski alignment before making adjustments to the IFS. See Body and Steering section.



Front Suspension Setup and Adjustments

Spring preload is one of the adjustment options which affects ride. Preload is the amount of pressure at which the spring is held. The longer the installed length of the spring, the less the amount of pre-load; the shorter the installed length of the spring, the more the amount of pre-load. An increase in IFS shock spring pre-load will result in an increase in ski pressure.

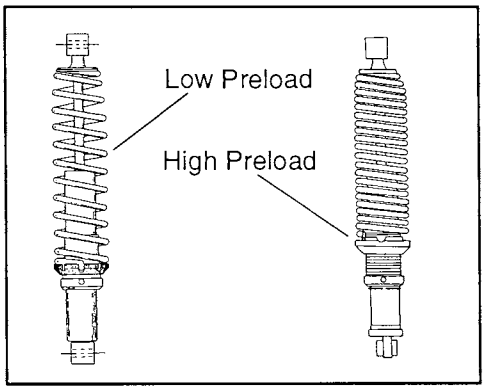
To adjust front spring preload on threaded adjust models, grasp the spring and turn in a clockwise direction (as viewed from the bottom of the shock) to increase the preload. Turn in a counter-clockwise direction to decrease preload.



In the adjacent illustration, high preload and low preload positions are depicted.

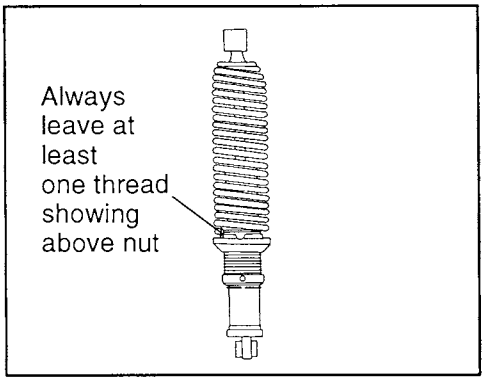
When adjusting, be sure springs on both the left and right sides of the machine are at the same adjustment.

For the best ride the spring preload should be as low as possible. Set the preload to use the full travel of the ski shock with occasional light bottoming.



CAUTION:

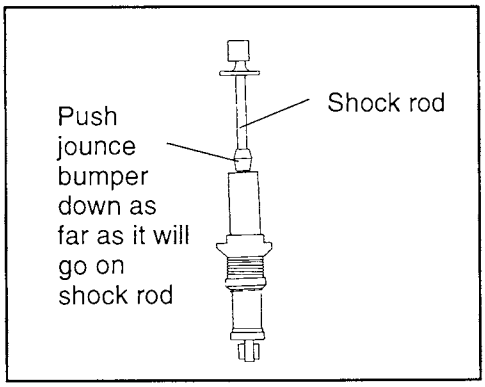
If the plastic nut is unscrewed from the threaded body the nut will break. Always leave one thread showing above the plastic nut or the spring coils will stack, resulting in damage.



For the best ride the spring preload should be as low as possible. Set the preload to use the full travel of the ski shock with occasional light bottoming. To determine if your machine is using full travel, push the shock jounce bumper down as far as it will go on the shock rod and test ride the machine.

The bumper will move up on the rod in direct relation to the amount of travel. For example, if the shock travel is full, the bumper will be seated at the top of the shock.

- Remove the existing spring and install the next highest rate spring, or
- Reduce the preload on the existing spring and change the shock valving to obtain the desired effect. **NOTE:** Shock valving can only be adjusted or changed on models equipped with Ryde AFX, Indy Select or Fox™ shocks.



⚠ WARNING

Changing shock valving on models equipped with Fox™ shocks requires special tools and a sound knowledge of mechanical theory, tool use, and shop procedures in order to perform the work safely and correctly. Shocks contain high pressure nitrogen gas. Extreme caution should be observed when handling and working with high pressure service equipment. See Fox™ Shock rebuilding information later in this chapter.

Always verify ski alignment before making adjustments to the IFS. If the skis are misaligned, we recommend the camber adjustment be checked as this may also be affected.

Front Torque Arm Limiter Strap Adjustment - XTRA-10 and 12 Style

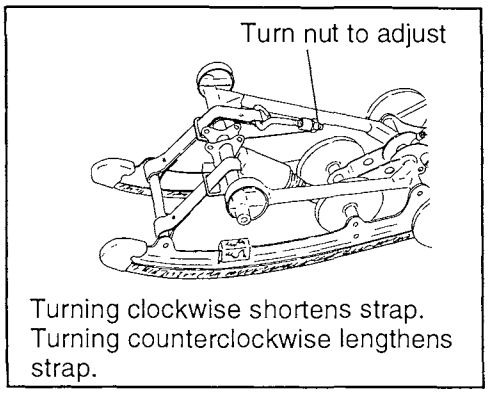
Front Torque Arm Limiter Strap Adjustment - XTRA-10

One method of changing ski-to-snow pressure is to change the length of the front torque arm limiter straps. The limiter strap is normally mounted in the fully extended position.

- Lengthening the straps decreases ski pressure under acceleration.
- Shortening the straps increases ski pressure under acceleration.

To adjust models with quick adjust front limiter straps,turn the eyebolt nut to lengthen or shorten the straps. To shorten the strap, turn the nut clockwise. To lengthen the strap, turn the nut counterclockwise.

NOTE: Both limiter straps must be adjusted evenly and remain equal in length to avoid improper Hi-Fax and track wear.



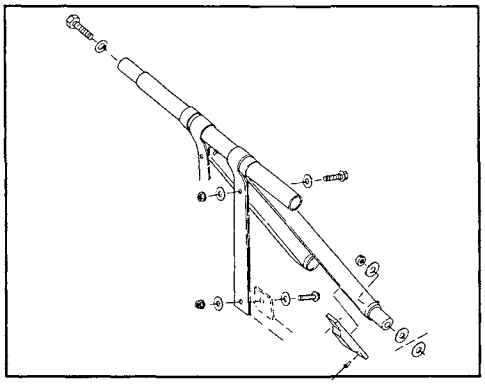
Turning clockwise shortens strap. Turning counterclockwise lengthens strap.

Front Torque Arm Limiter Strap Adjustment - XTRA-12

One method of changing ski-to-snow pressure is to change the length of the front torque arm limiter straps using the holes provided. The limiter strap is normally mounted in the fully extended position. It is important to note that decreasing limiter strap length will stiffen the whole suspension.

- Lengthening the straps decreases ski pressure.
- Shortening the straps increases ski pressure.

The preferred method for changing ski pressure is 1. Turn FRSS to a lower position. 2. Move the FRSS to the forward most hole. 3. Increasing or decreasing IFS preload.



Compression Damping Adjustable Shocks

Snowmobiles equipped with the Indy Select or Ryde AFX shocks allow the driver to make adjustments to the compression valving by turning the screw located near the base of the shock.

Adjustment

Locate the adjustment screw near the base of the shock. **NOTE:** This adjustment is easiest to make with the machine tipped on its side.

⚠ WARNING

Be sure to shut off the fuel supply before tipping the machine to prevent fuel spillage and flooding of the carburetors.

By turning the screw clockwise (a small screwdriver or dime work well), the compression valving is increased, stiffening the ride. To soften the ride, reduce the compression by turning the screw counter-clockwise. A great deal of ride performance is accomplished with a mere 1/2 to 1 turns. There are approximately 3 full turns of adjustment available.

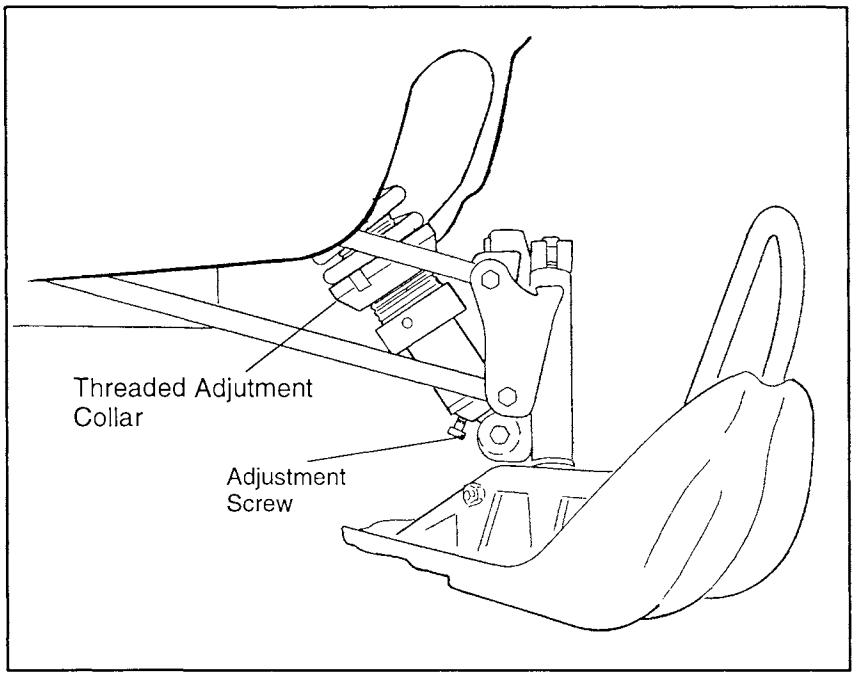
How to Adjust IFS

If the suspension is "bottoming," tighten the compression screw clockwise in 1/2 turn increments until the bottoming stops. Backing off 1/4 turn counter-clockwise at this point should give you the best possible ride ensuring use of the full travel of the suspension. The opposite procedure should be used if the suspension is too stiff upon initial set-up.

If bottoming continues after the screw is turned in full clockwise, the compression spring should be adjusted with the threaded adjustment collar. Back the screw out to the original starting position after the compression spring has been adjusted.

Riding conditions are ever changing. Keep in mind the compression damping adjustable can be adjusted at any time to achieve the best possible ride in any condition.

NOTE: Whenever shocks are replaced or reinstalled for any reason, the adjustment screw should be located toward the forward right side of the suspension. Access to the adjuster is not possible if reversed. Fox™ Shocks should be installed with the charge fitting up.



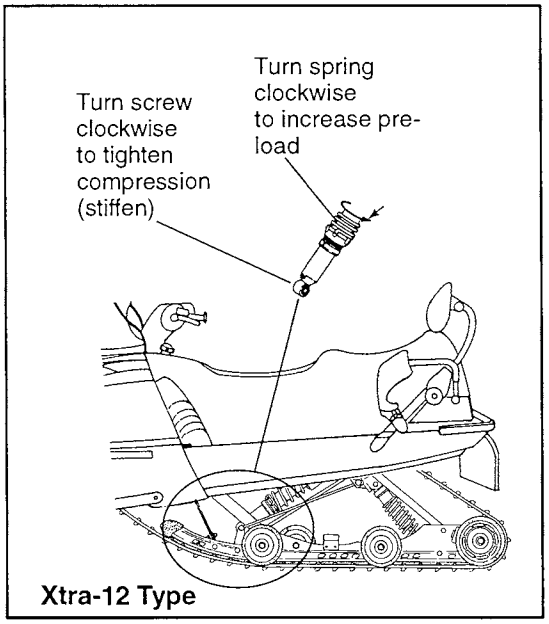
How to Adjust Rear Suspension

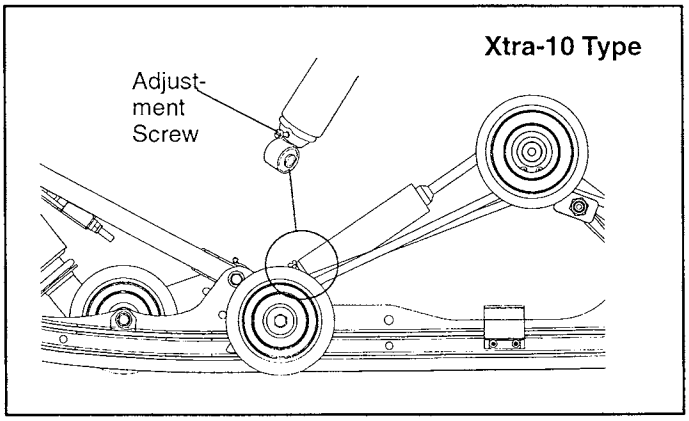
If the suspension is "bottoming," tighten the compression screw clockwise in 1/2 turn increments until the bottoming stops. Backing off 1/4 turn counter-clockwise at this point should give you the best possible ride ensuring use of the full travel of the suspension. The opposite procedure should be used if the suspension is too stiff upon initial set-up.

If bottoming continues after the screw is turned in full clockwise, the torsion spring should be adjusted using the adjustment block. Back the screw out to the original starting position after torsion spring preload has been increased.

Riding conditions are ever changing. Keep in mind the Indy Select / Ryde AFX shocks can be adjusted at any time to achieve the best possible ride in any condition.

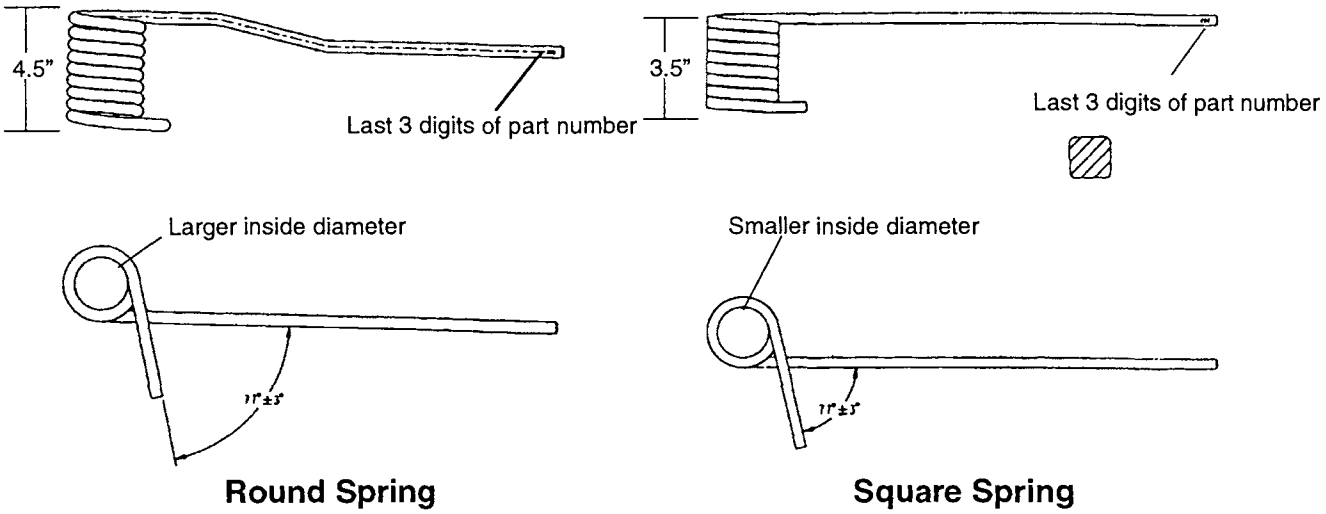
NOTE: Whenever shocks are replaced or reinstalled for any reason, the adjustment screw should be located toward the forward right side of the suspension. Access to the adjuster is not possible if reversed.





Round Springs vs Square Springs

Many 1999 model snowmobiles now utilize a square profile rear torsion spring. Square springs are lighter in weight (1.5 lbs.), and smaller in packaging. The square coils take up less room, therefore allowing the carrier wheels to be positioned more inward in the tunnel. Another benefit of the square profile spring is the ability to maintain the same characteristics of the round spring, but have fewer coils of wire. NOTE: The 1999 square profile springs will not retrofit to 1998 and previous models. The length of the coil stack is shorter on the square springs and the inside diameter of the coil stack is also smaller.



Round Spring **Square Spring**

NOTE: *The spring rates between the round wire springs and the square wire springs are identical.* For example: 7041465-067 has same *spring rate* as 7041631-067 even though the wire diameter is different. The chart below shows equal spring rates between round wire and square wire torsion springs.

NOTE: Square wire torsion springs will not fit in machines that come with round wire springs standard.

Spring Rates
.437″ dia. wire spring rate=.375″ dia. wire spring rate
.421″ dia. wire spring rate=.359″ dia. wire spring rate
.406″ dia. wire spring rate=.347″ dia. wire spring rate

Optional Springs - 1999 XTRA Lite Style

Following is a list of all available springs for the XTRA Lite front and rear suspension. These springs can be used to better suit individual riding preference.

For Optional Suspension Set Ups, See Suspension Tuning Decal Under Hood.

Torsion Spring Part No.	Wire Dia./Degrees
7041555-067 LH	.393/77°
7041556-067 RH	.393/77°
7041521-067 LH	.406/82°
7041522-067 RH	.406/82°
7041463-067 LH	.406/77°
7041464-067 RH	.406/77°

Front Track Spring Part No.	Spring Wire Dia. x Free Length - Rate
7041571-067	70 #/in
7041570-067	80 #/in
7041520-067	90 #/in

Optional Springs - 1999 TranSport / Widetrak

Following is a list of all available springs for the TranSport front and rear suspension. These springs can be used to better suit individual riding preference.

Torsion Spring Part No.	Wire Dia./Degrees
7041318-067 LH	.375/75°
7041319-067 RH	.375/75°
7041320-067 LH	.406/75°
7041321-067 RH	.406/75°
7041239-067 LH	.468/74°
7041240-067 RH	.468/74°

Optional Springs - 1999 XTRA 10 Style

Following is a list of all available springs for the XTRA 10 front and rear suspension. These springs can be used to better suit individual riding preference. **NOTE:** Square wire torsion springs cannot be substituted for round wire springs.

For Optional Suspension Set Ups, See Suspension Tuning Decal Under Hood.

Torsion Spring Part No. (Round Springs)	Wire Dia./Degrees
7041463-067 LH	.406/77°
7041464-067 RH	.406/77°
7041461-067 LH	.421/77°
7041462-067 RH	.421/77°
7041465-067 LH	.437/77°
7041466-067 RH	.437/77°

Torsion Spring Part No. (Square Springs)	Wire Dia./Degrees
7041627-067 LH	.347/77°
7041628-067 RH	.347/77°
7041629-067 LH	.359/77°
7041630-067 RH	.359/77°
7041631-067 LH	.375/77°
7041632-067 RH	.375/77°

Front Ski Spring Part No.	Length/Rate - Application
7041554-067	80# Fox
7041576-067	100# Fox
7041575-067	120# Fox
7041574-067	140# Fox
7041573-067	160# Fox
7041553-067	60# Gabriel/Arvin
7041552-067	80# Gabriel/Arvin
7041551-067	100# Gabriel/Arvin
7041550-067	120# Gabriel/Arvin
7041549-067	140# Gabriel/Arvin

Front Track Spring Part No.	Spring Wire Dia. x Free Length - Rate
7041361-067	.343 x 7.0 - 243 #/in
7041253-067	.312 x7.5 - 200/Var
7041362-067	.261 x 7.0 - 85 #/in
7041364-067	.283 x 7.5 - 126 #/in

NOTE: The XTRA Lite 136 suspension used on the 1999 Trail RMK uses the square wire torsion springs listed above.

1999 XTRA-12 Optional Suspension Springs

Following is a list of all available springs for the XTRA 12 front and rear suspension. These springs can be used to better suit individual riding preference.

For Optional Suspension Set Ups, See Suspension Tuning Decal Under Hood.

Xtra-12 IFS Shock Spring Part No.	Rate - Application
7041398-067	75#/in
7041405-067	65#/in
7041554-067	80# Fox
7041576-067	100# Fox
7041575-067	120# Fox
7041574-067	140# Fox
7041553-067	60# Gabriel/Arvin
7041552-067	80# Gabriel/Arvin
7041551-067	100# Gabriel/Arvin
7041550-067	120# Gabriel/Arvin
7041549-067	140# Gabriel/Arvin

Xtra-12 Front Track Shock Spring Part No.	Spring Wire Dia. x Free Length - Rate
7041351-067	.331 x 11.88 - 75/125 #/in
7041396-067	.283 x 11.88 - 50 #/in
7041398-067	.312 x 11.88 - 75 #/in
7041404-067	.343 x 11.88 - 90/150 #/in
7041405-067	.306 x 11.88 - 65 #/in
7041484-067	.406 x 9.0 - 275 #/in

Xtra-12 Rear Track Shock Spring Part No.	Spring Wire Dia. x Free Length - Rate
7041361-067	.343 x 7.0 - 246 #/in
7041362-067	.261 x 7.0 - 85 #/in
7041364-067	.283 x 7.5 - 126 #/in
7041484-067	.331 x 11.88 - 275#/in
7041561-067	.261 x 7.5 - 85 #/in
7041491-067	.438 x 13.00 - 190 #/in

Xtra-12 Torsion Spring Part No.	Wire Diameter / Degrees
7041394-067 - LH	.406 / 77°
7041395-067 - RH	.406 / 77°
7041406-067 - LH	.421 / 77°
7041407-067 - RH	.421 / 77°

For Optional Suspension Set Ups, See Suspension Tuning Decal Under Hood.

Following is a list of all available front track springs for Polaris snowmobiles and their part numbers.

Front Track Shock Spring Information

Part Number	# of Total Coils	# of Active Coils	Rate (#/in.)	Free Length	Wire Dia.	End Dia. #1	End Dia. #2
7041570-067	11.7	9.7	80 #/in	10.50″	.281″	1.89″	1.89″
7041569-067	11.8	9.8	60 #/in	10.50″	.263″	1.89″	1.89″
7041253-067	10.0	8.0	200/var	7.50″	.331″	1.90″	1.90″
7041710-067	8.0	–	181 #/in	6.68″-6.88″	.312″	1.90″	1.90″
7041712-067	8.0	–	181 #/in	7.50″	.312″	1.90″	1.90″
7041508-067	6.7	4.7	190 #/in	6.25″	.343″	1.89″	2.25″
7041561-067	10.1	–	85 #/in	7.50″	.261″	1.90″	1.90″
7041484-067	10.2	8.2	275 #/in	9.00″	.406″	1.90″	1.90″
7041364-067	9.0	–	126 #/in	7.50″	.283″	1.90″	1.90″
7041361-067	9.0	–	246 #/in	7.00″	.343″	1.87″	1.87″
7041362-067	9.0	–	85 #/in	7.00″	.261″	1.87″	1.87″
7041140	–	8.0	181 #/in	7.50″	.312″	1.90″	1.90″
7041127	–	8.0	181 #/in	6.88″	.312″	1.90″	1.90″
7041509-067	8.38	–	140/240	6.18″	.343″	1.89″	2.25″
7041510-067	8.52	–	165/245	6.25″	.362″	1.89″	2.25″
7041511-067	4.9	2.9	50 #/in	5.25″	.225″	1.89″	2.25″
7041512-067	5.3	3.3	85 #/in	5.25″	.263″	1.89″	2.25″
7041513-067	5.9	3.9	135 #/in	5.25″	.295″	1.89″	2.25″
7041514-067	7.0	–	100/180	5.25″	.297″	1.89″	2.25″

Fox™ upper retainer ID= 1.85″

Fox™ lower retainer OD= 1.85″/2.15″

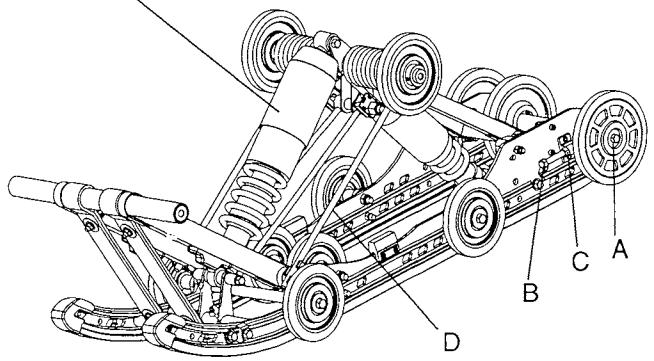
XTRA 12 Suspension - Shock Removal

XTRA 12 Suspension Shock Removal

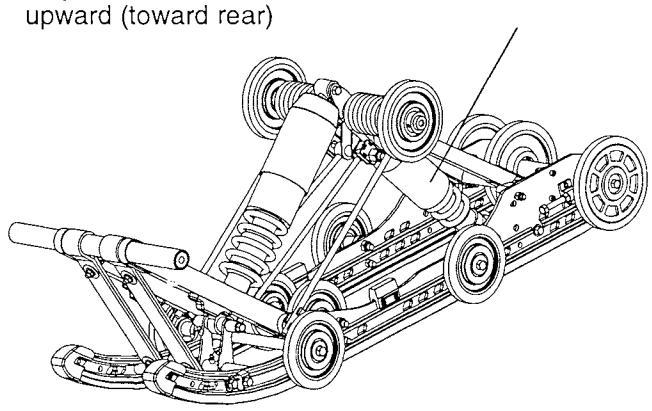
Steps 1-4 (immediately below) may be used for either front or rear track shock removal.

1. Turn fuel valve to off position.
2. Loosen rear idler bolts (A), lock nuts (C), and track adjuster bolts (B).
3. Remove (4) suspension mounting bolts.
4. Place a protective mat along side of machine. Tip the machine on its side onto protective mat.
5. Note orientation of shocks before removal - gas valve (Fox) or adjuster screw (Select) up or down.
6. Remove suspension.
7. Lift rear torsion springs (D) from their lower mounts.
8. Remove top bolt from front track shock.
9. Remove lower front track shock bolt (lift torque arm to gain access).
10. With front track shock removed, loosen and remove top and bottom bolts from rear track shock.

Front Track Shock Installation
Fox Shocks - Gas fitting positioned downward (toward track)
Indy Select Shocks - Adjuster screw positioned upward



Rear Track Shock Installation
Fox Shocks - Gas fitting positioned upward (toward rear)
Indy Select Shocks - Adjuster screw positioned upward (toward rear)



XTRA 12 Suspension Shock Installation

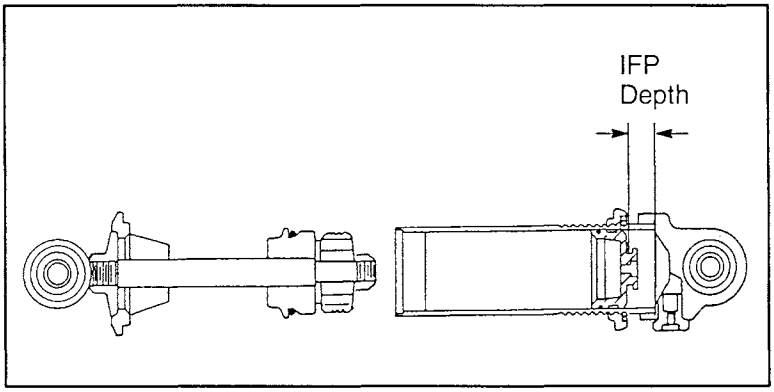
1. Reverse steps above for assembly, with the following notes:
   - Use new Flex-Loc™ nuts for installation. Tighten shock bolts to 15-18 ft. lbs. (2.07-2.48 kg/m). Be sure the shock still pivots freely.
   - Position torsion springs on top eccentric and lower mount.
   - Readjust and align track. See pages 2.12-2.16.
   - Torque suspension mounting bolts to 60 ft. lbs. (8.28 kg-m).
   - Secure jam nuts and tighten rear idler bolts.

INDEPENDENT FRONT SUSPENSION Fox™ Shock Specifications

IFS SHOCKS						
Shock PN	Body Length (in)	Shaft Length (in)	Max. Length (in)	*Max. Travel (in)	IFP Depth (in)	Shaft Part #
7041255	6.075	6.850	13.145	4.150	1.700	1500133
7041266	6.175	6.900	13.145	4.150	2.000	1500133
7041291	6.380	6.800	13.250	4.050	0.728	1500008
7041292	6.380	6.800	13.250	4.050	0.728	1500008
7041346	6.380	6.800	13.250	4.050	0.728	1500008
7041349	5.850	6.350	12.270	3.600	0.616	1500076
7041385	8.995	9.125	18.150	6.375	1.142	1500068
7041401	8.180	8.310	16.560	5.810	1.139	N/A
7041474	6.380	6.800	13.250	4.050	0.728	1500008
7041490	6.040	6.350	12.710	3.850	0.600	1500076
7041494	7.900	7.730	15.700	5.230	1.000	1500136
7041536	7.900	7.730	15.700	5.230	1.000	1500136
7041537	8.720	7.600	16.140	4.850	2.000	1500140
7041540	7.900	7.730	15.700	5.230	1.000	1500136
7041545	6.720	6.850	13.640	4.350	0.675	1500133
7041593	7.900	7.730	15.700	5.230	1.000	1500136
7041612	7.900	7.730	15.700	5.230	1.000	1500136
7041692	7.900	7.730	15.700	5.230	1.000	1500136
7041697	7.900	7.730	15.700	5.230	1.000	1500136

* Jounce Bumper Removed

Measure IFP depth from flat of piston as shown using the IFP depth tool (PN 2871351) or a dial caliper.



REAR SUSPENSION SHOCKS Fox™ Shock Specifications

FRONT TRACK SHOCKS						
Shock PN	Body Length (in)	Shaft Length (in)	Max. Length (in)	Max. Travel (in)	IFP Depth (in)	Shaft Part #
7041294	5.050	5.350	10.470	2.850	0.544	1500040
7041386	8.955	9.125	18.150	6.375	1.140	1500068
7041402	5.430	5.570	11.070	3.070	0.586	1500153
7041413	5.050	5.350	10.470	2.850	0.544	1500040
7041493	5.430	5.570	11.070	3.070	0.590	1500153
7041507	5.330	6.400	11.060	3.150	4.570	1500076
7041584	5.430	5.570	11.070	3.070	0.586	1500153
7041589	5.430	5.570	11.070	3.070	0.586	1500153
7041641	5.330	5.570	10.970	3.070	0.600	1500153
7041642	5.330	5.570	10.970	3.070	0.600	1500153
7041706	5.330	5.570	10.850	3.070	0.600	1500153
7041735	5.330	5.570	10.850	3.070	0.600	1500153
REAR TRACK SHOCKS						
Shock PN	Body Length (in)	Shaft Length (in)	Max. Length (in)	Max. Travel (in)	IFP Depth (in)	Shaft Part #
7041293	7.440	7.450	14.523	4.700	0.835	1500152
7041345	7.440	7.450	14.523	4.700	0.835	1500152
7041347	7.440	7.450	14.523	4.700	0.835	1500152
7041387	5.850	6.350	12.320	3.650	0.633	1500076
7041403	6.825	6.850	13.560	4.350	0.795	1500133
7041444	7.440	7.450	14.523	4.700	0.835	1500152
7041480	5.850	6.350	12.320	3.650	0.630	1500076
7041492	7.440	7.450	14.520	4.700	0.835	1500152
7041585	7.440	7.450	14.523	4.700	0.835	1500152
7041588	7.440	7.450	14.523	4.700	0.835	1500152
7041595	7.440	7.450	14.523	4.700	0.835	1500152
7041599	7.440	7.450	14.520	4.700	1.500	1500152
7041695	7.440	7.450	14.523	4.700	0.835	1500152
7041707	7.440	7.450	14.520	4.700	1.500	1500152
7041728	7.440	7.450	14.523	4.700	0.835	1500152
7041751	7.440	7.450	14.523	4.700	0.835	1500152
7041779	5.330	5.570	10.850	3.070	0.600	1500153

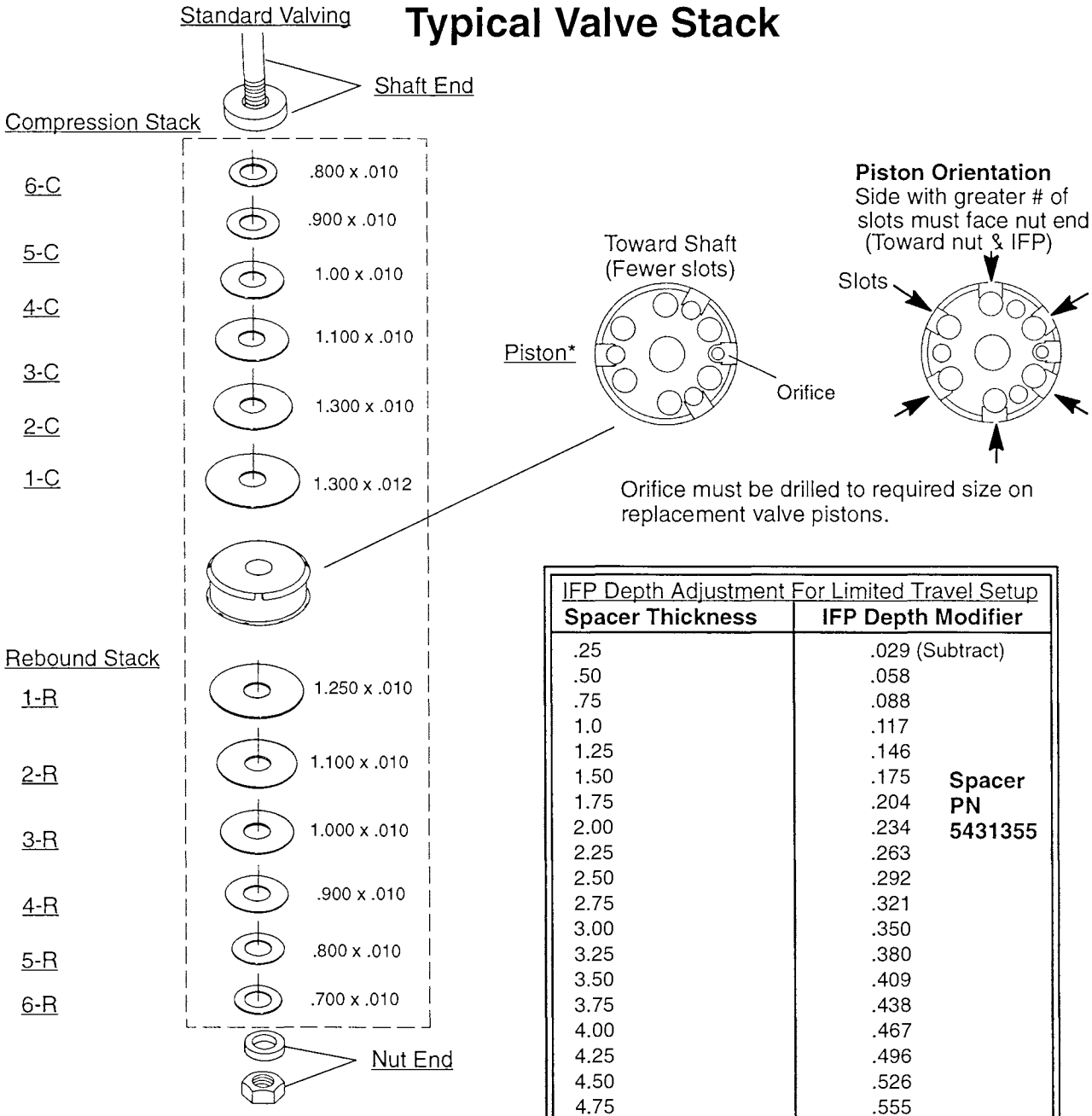
* IFP depth for limited build 1996 440 XCR SP with handlebar shock adjuster=4.570"

Typical Shock Valving Arrangement

Shown below is an example of how valving stacks are arranged. The tables on page 7.46 contain production valving specifications and piston orifice sizes. Optional valving (by shock part number) is listed in the tables on following pages.

Parts in box are an example of standard valving.

* Note direction of valve piston before disassembly. The side with the greater number of slots should face the IFP (nut end of the shaft).



IFP Depth Adjustment For Limited Travel Setup

Spacer Thickness	IFP Depth Modifier	
.25	.029 (Subtract)	
.50	.058	
.75	.088	
1.0	.117	
1.25	.146	
1.50	.175	**Spacer**
1.75	.204	**PN**
2.00	.234	**5431355**
2.25	.263	
2.50	.292	
2.75	.321	
3.00	.350	
3.25	.380	
3.50	.409	
3.75	.438	
4.00	.467	
4.25	.496	
4.50	.526	
4.75	.555	
5.00	.584	

Changing oil on Fox™ Shocks is recommended annually and should be included when performing end of season storage preparation. For competition use, shocks should be disassembled, inspected and serviced more frequently.

SUSPENSION
1997-1999 Production Valving Listed By Shock Part Number

Shock PN		7041385 IFS	7041494 IFS	7041536 IFS	7041537 IFS	7041540 IFS	7041545 IFS	7041593 IFS	7041692 IFS	7041697 IFS
Compress. Stack	8C	N/A	N/A	N/A	N/A	N/A	N/A	N/A	1.250x.010	1.250x.010
	7C	N/A	N/A	N/A	N/A	N/A	N/A	N/A	.800x.008	.800x.008
	6C	0.700X.008	1.250x.010	N/A	.700x.008	N/A	N/A	1.250x.010	.900x.010	.900x.010
	5C	0.800X.008	.800x.010	.800x.008	.800x.008	.800x.008	.800x.008	.800x.010	1.000x.010	1.000x.008
	4C	0.900X.008	.900x.010	.900x.008	.900x.008	.900x.008	.900x.008	.900x.010	1.100x.008	1.100x.008
	3C	1.000X.008	1.000x.010	1.00x.008	1.000x.008	1.000x.010	1.000x.008	1.000x.010	1.300x.010	1.300x.008
	2C	1.100X.008	1.00x.010	1.100x.008	1.100x.008	1.100x.008	1.100x.008	1.100x.010	1.000x.006	1.000x.006
	1C	1.300X.008	1.300x.010	1.300x.010	1.300x.008	1.300x.010	1.300x.010	1.300x.010	1.300x.008	1.300x.008
Orifice		0.078	0.081	0.078	0.078	0.078	0.078	0.081	0.081	0.086
Rebound Stack	1R	1.250X.008	1.250x.010	1.250x.010	1.250x.008	1.250x.015	1.250x.010	1.250x.010	1.250x.010	1.250x.010
	2R	1.100X.008	1.100x.008	1.100x.010	1.100x.008	1.100x.012	1.100x.010	1.100x.008	1.100x.010	1.100x.00
	3R	1.000X.008	1.000x.008	1.000x.010	1.000x.008	1.000x.010	1.000x.010	1.000x.008	1.000x.008	1.000x.00ხ
	4R	0.900X.008	.900x.008	.900x.010	.900x.008	.900x.008	.900x.010	.900x.008	.900x.008	.900x.008
	5R	0.800X.008	.800x.008	.800x.008	.800x.008	.800x.008	.800x.008	.800x.008	.800x.800	.800x.008
	6R	0.700X.008	.700x.008	.700x.008	.700x.008	N/A	.700x.008	.700x.008	.700x.008	.700x.008

Shock PN		7041507 Front Track	7041584 Front Track	7041589 Front Track	7041641 Front Track	7041642 Front Track	7041706 Front Track	7041779 Front Track	7041735 Front Track
Compress. Stack	8C	N/A	N/A	N/A	N/A	N/A	1.250x.010	N/A	1.250x.010
	7C	N/A	1.250x.010	.700x.010	N/A	.700x.010	.800x.010	.700x.010	.800x.012
	6C	1.250x.010	.900x.010	.800x.010	1.250x.010	.800x.010	.900x.012	.800x.010	.900x.012
	5C	.800x.008	1.000x.012	.900x.010	.800x.008	.900x.010	1.000x.012	.900x.010	1.00x.010
	4C	.900x.012	1.100x.012	1.000x.010	.900x.012	1.000x.010	1.100x.010	1.000x.010	1.100x.010
	3C	1.000x.012	1.300x.012	1.100x.010	1.000x.012	1.100x.010	1.300x.012	1.100x.010	1.300x.012
	2C	1.100x.012	.900x.006	1.250x.012	1.100x.012	1.250x.012	1.000x.006	1.250x.012	.900x.008
	1C	1.300x.012	1.300x.008	1.300x.012	1.300x.012	1.300x.012	1.300x.010	1.300x.012	1.300x.010
Orifice		0.075	0.075	0.075	0.075	0.075	0.075	0.076	0.076
Rebound Stack	1R	1.250x.010	1.250x.010	1.250x.010	1.250x.010	1.250x.010	1.250x.010	1.250x.010	1.250x.012
	2R	1.100x.010	1.100x.010	1.100x.010	1.100x.010	1.100x.010	1.100x.010	1.100x.010	1.100x.010
	3R	1.000x.010	1.000x.010	1.000x.012	1.000x.010	1.000x.012	1.000x.010	1.000x.012	1.000x.010
	4R	.900x.010	.900x.010	.900x.010	.900x.010	.900x.010	.900x.010	.900x.010	.900x.010
	5R	.800x.010	.800x.010	.800x.010	.800x.010	.800x.010	.800x.010	.800x.010	.800x.010
	6R	.700x.010	.700x.010	.700x.010	.700x.010	.700x.010	.700x.010	.700x.010	.700x.010

Shock PN		7041480 Rear Track	7041492 Rear Track	7041585 Rear Track	7041588 Rear Track	7041595 Rear Track	7041599 Rear Track	7041695 Rear Track	7041707 Rear Track	7041728 Rear Track
Compress. Stack	8C	N/A	1.250x.010	N/A	N/A	N/A	1.250x.010	1.250x.010	1.250x.010	N/A
	7C	N/A	.900x.010	1.250x.010	.700x.008	1.250x.010	.900x.010	.900x.012	.900x.012	N/A
	6C	0.700X.006	1.100x.012	.900x.010	.800x.008	.900x.010	1.000x.012	1.000x.008	1.000x.012	.900x.010
	5C	0.800X.006	1.100x.015	1.000x.010	.900x.010	1.000x.012	1.100x.015	1.000x.012	1.100x.015	1.000x.010
	4C	0.900X.006	1.250x.010	1.100x.015	1.000x.008	1.100x.015	1.250x.010	1.100x.015	1.250x.010	1.100x.010
	3C	1.000X.006	1.300x.015	1.300x.015	1.100x.008	1.300x.015	1.300x.015	1.300x.015	1.300x.012	1.250x.012
	2C	1.100X.006	1.000x.006	1.000x.006	1.250x.008	.900x.012	1.000x.006	.900x.012	1.000x.006	.900x.006
	1C	1.300X.006	1.300x.012	1.300x.010	1.300x.008	1.300x.012	1.300x.012	1.300x.012	1.300x.012	1.300x.008
Orifice		0.067	0.072	0.086	0.078	0.086	0.072	0.086	0.072	0.063
Rebound Stack	1R	1.250X.010	1.250x.010	1.250x.012	1.250x.012	1.250x.012	1.250x.010	1.250x.012	1.250x.010	1.250x.015
	2R	1.100X.010	1.100x.012	1.100x.012	1.100x.012	1.100x.012	1.100x.012	1.100x.012	1.250x.010	1.250x.012
	3R	1.000X.010	1.000x.012	1.000x.012	1.000x.012	1.100x.012	1.000x.012	1.100x.012	1.100x.012	1.100x.012
	4R	0.900X.010	.900x.012	.900x.012	.900x.012	.900x.012	.900x.012	1.000x.012	1.000x.012	1.000x.010
	5R	0.800X.010	.800x.012	.800x.012	.800x.012	.800x.012	.800x.012	.900x.012	.900x.012	.900x.010
	6R	0.700X.010	.700x.012	.700x.012	.700x.012	.700x.012	.700x.012	.800x.012	.800x.012	.800x.010

N/A = Not Applicable

1999 Optional Valving Listed By Shock Part Number

1999 500 XC SP / 600 XC SP / 700 XC SP							
Shock PN		LIGHT			HEAVY		
		7041697 IFS X-10 CRC	7041735 Front Track X 10	7041728 Rear Track X 10	7041697 IFS X-10 CRC	7041735 Front Track X 10	7041728 Rear Track X 10
Compression Stack	8C	N/A	N/A	N/A	0.8x.010	1.25x.010	See Kit Part Number 2872295
	7C	0.8x.008	0.8x.010	N/A	0.9x.012	0.8x.012	
	6C	0.9x.008	0.9x.010	N/A	1.0x.012	0.9x.015	
	5C	1.0x.006	1.0x.008	N/A	1.1x.010	1.0x.012	
	4C	1.1x.008	1.1x.008	N/A	1.3x.010	1.1x.012	
	3C	1.3x.008	1.3x.008	N/A	1.0x.006	1.3x.012	
	2C	1.0x.008	0.9x.008	N/A	1.25x.008	0.9x.006	
	1C	1.3x.008	1.3x.008	N/A	1.3x.008	1.3x.010	
Orifice		.086	.076	N/A	.086	.076	
Rebound Stack	1R	1.25x.008	1.25x.010	N/A	1.25x.010	1.25x.012	
	2R	1.1x.008	1.1x.010	N/A	1.1x.010	1.1x.012	
	3R	1.0x.008	1.0x.010	N/A	1.0x.008	1.0x.010	
	4R	0.9x.008	0.9x.010	N/A	0.9x.008	0.9x.010	
	5R	0.8x.008	0.8x.010	N/A	0.8x.008	0.8x.012	
	6R	0.7x.008	0.7x.010	N/A	N/A	0.7x.010	

1999 440 XCR							
Shock PN		LIGHT			HEAVY		
		7041692 IFS X-10 CRC	7041706 Front Track X 10	7041707 Rear Track X 10	7041692 IFS X-10 CRC	7041706 Front Track X 10	7041707 Rear Track X 10
Compression Stack	8C	1.25X.008	1.25x.010	1.25x.010	1.25X.010	1.25x.010	1.25x.010
	7C	0.8X.008	0.8x.010	0.8x.010	0.8X.010	0.8x.012	0.9x.012
	6C	0.9X.010	0.9x.010	0.9x.012	0.9X.012	0.9x.015	1.0x.012
	5C	1.0X.008	1.0x.012	1.0x.010	1.0X.010	1.0x.015	1.1x.015
	4C	1.1X.008	1.1x.008	1.1x.010	1.1X.010	1.1x.012	1.25x.012
	3C	1.3X.008	1.3x.010	1.3x.010	1.3X.012	1.3x.012	1.3x.015
	2C	1.0X.008	0.9x.008	1.0x.008	1.0X.006	1.0x.006	1.0x.006
	1C	1.3X.008	1.3x.008	1.3x.008	1.3X.010	1.3x.010	1.3x.012
Orifice		0.081	.075	.072	0.081	.075	.072
Rebound Stack	1R	1.25X.010	1.25x.010	1.25x.010	1.25X.010	1.25x.012	1.25x.012
	2R	1.1X.008	1.1x.010	1.1x.012	1.1X.010	1.1x.012	1.25x.012
	3R	1.0X.008	1.0x.008	1.0x.012	1.0X.008	1.0x.010	1.1x.012
	4R	0.9X.008	0.9x.008	0.9x.012	0.9X.008	0.9x.010	1.0x.012
	5R	0.8X.008	0.8x.008	0.8x.012	0.8X.008	0.8x.010	0.9x.012
	6R	0.7X.008	0.7x.010	0.7x.012	0.7X.008	0.7x.010	0.8x.012
	7R	N/A	N/A	N/A	N/A	N/A	0.7x.012

1999 Optional Valving Listed By Shock Part Number

1999 700 XCR / 800 XCR							
Shock PN		LIGHT			HEAVY		
		7041540 IFS X-10	7041779 Front Track X 10	7041695 Rear Track X 10	7041540 IFS X-10	7041779 Front Track X 10	7041695 Rear Track X 10
Compression Stack	8C	N/A	N/A	N/A	N/A	N/A	N/A
	7C	N/A	0.7x.010	1.25X.010	N/A	0.7x.010	1.25X.010
	6C	N/A	0.8x.008	0.9X.008	N/A	0.8x.012	0.9X.012
	5C	0.8X.008	0.9x.008	1.0X.008	0.8X.010	0.9x.012	1.0X.010
	4C	0.9X.008	1.0x.008	1.1X.010	0.9X.010	1.0x.012	1.10X.015
	3C	1.0X.008	1.1x.010	1.3X.012	1.0X.012	1.1x.015	1.3X.015
	2C	1.1X.006	1.25x.010	0.9X.012	1.1X.012	1.25x.012	0.9X.008
	1C	1.3X.008	1.3x.010	1.3X.010	1.3X.012	1.3x.012	1.3X.012
Orifice		0.078	.076	0.086	0.078	.076	0.086
Rebound Stack	1R	1.25X.012	1.25x.010	1.25X.012	1.25X.015	1.25x.012	1.25X.012
	2R	1.1X.012	1.1x.008	1.1X.010	1.1X.012	1.1x.012	1.10X.012
	3R	1.0X.012	1.0x.010	1.0X.010	1.0X.012	1.0x.015	1.0X.012
	4R	0.9X.010	0.9x.010	0.9X.010	0.9X.010	0.9x.012	0.9X.012
	5R	0.8X.008	0.8x.010	0.8X.010	0.8X.008	0.8x.010	0.8X.012
	6R	0.7X.008	0.7x.010	0.7X.010	0.7X.008	0.7x.010	0.7X.012
	7R	N/A	N/A	N/A	N/A	N/A	N/A

Refer to the appropriate parts manual for a complete listing of Fox shock parts. Fox, Registered Trademark of FOX Shox.

Shock Travel Limiting Spacer (1/4″) - Part Number 5431355

Valve Washer Part Numbers

Part No.	Description
1500052	1.300 x 0.006
1500050	1.250 x 0.006
1500049	1.100 x 0.006
1500048	1.000 x 0.006
1500053	0.900 x 0.006
1500054	0.800 x 0.006
1500055	0.700 x 0.006
1500030	1.300 x 0.008
1500051	1.250 x 0.008
1500031	1.100 x 0.008
1500032	1.000 x 0.008
1500033	0.900 x 0.008
1500028	0.800 x 0.008
1500029	0.700 x 0.008
1500062	1.300 x 0.010
1500026	1.250 x 0.010
1500027	1.100 x 0.010
1500045	1.000 x 0.010
1500046	0.900 x 0.010
1500047	0.800 x 0.010
1500044	0.700 x 0.010
1500079	1.300 x 0.012
1500078	1.250 x 0.012
1500060	1.100 x 0.012
1500059	1.000 x 0.012
1500058	0.900 x 0.012
1500057	0.800 x 0.012
1500056	0.700 x 0.012
1500087	1.300 x 0.015
1500086	1.250 x 0.015
1500085	1.100 x 0.015
1500084	1.000 x 0.015
1500083	0.900 x 0.015
1500082	0.800 x 0.015
1500081	0.700 x 0.015

Note: Subtract .029″ from IFP depth for each 1/4 inch spacer added to the shock damper rod for limiting.

For example: If standard (full shock travel) IFP depth is .835″, and 6 spacers are added to reduce shock travel by 1.5 inches, multiply .029 x 6 to calculate the amount to subtract from IFP depth.

.835 – .174 = .661 (± .025″) New IFP Depth

Changing oil on Fox™ Shocks is recommended annually and should be included when performing end of season storage preparation. This oil change is necessary to avoid any chance of corrosion which could be caused by moisture contamination. For competition use, shocks should be disassembled, inspected and serviced more frequently.

When performing maintenance on Fox™ Shocks, use Gas Shock Recharging Kit PN 2200421. It consists of the necessary valves, pressure gauge, and fittings to deflate and pressurize the shocks. The Body Holder Tool, Internal Floating Piston (IFP), and Shock Rod Holding Tool are not included in the Recharging Kit and must be ordered separately. Refer to your Victor Specialty Tool catalog for part numbers.

Gas Shock Recharging Kit

PN 2200421

⚠ WARNING

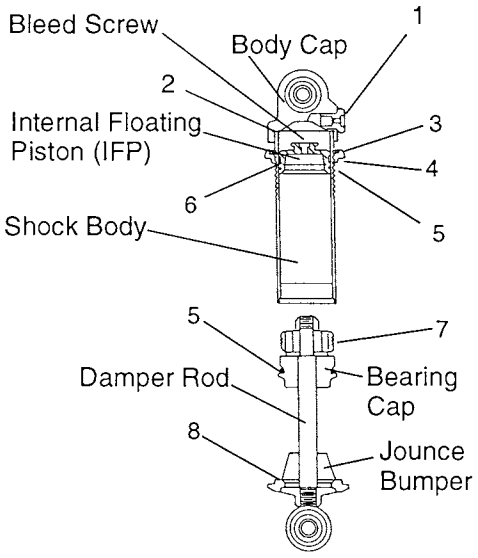
Extreme caution should be observed while handling and working with high pressure service equipment. Wear a face shield, safety glasses, and ear protection during service of these shocks.

Care should be observed while handling the inflater needle and pressure gauges. Maintain your equipment and keep it in good condition. If injury should occur, consult a physician immediately.

Extreme cleanliness is of utmost importance during all disassembly and reassembly operations to prevent any dirt or foreign particles from getting into the shocks.

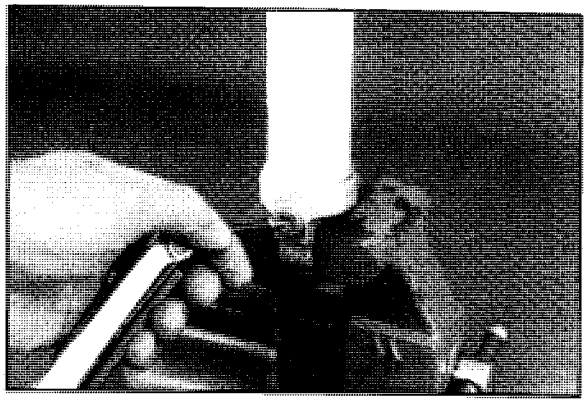
Keep the parts in order as they are disassembled. Note the direction and position of all internal parts for reassembly.

Ref. #	Qty.	Description
1	1	Pressure Valve
2	2	O-Ring
3	1	Retaining Ring
4	1	Spring Retainer Body
5	2	O-Ring
6	1	Piston Ring (Floating)
7	1	Piston Ring (Damping)
8	1	Spring Retainer, Slotted

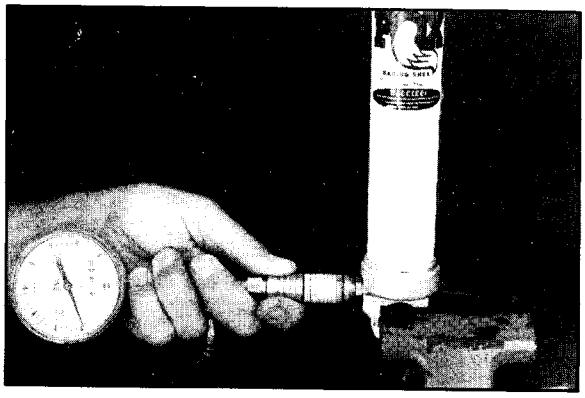


Disassembly

1. Remove spring and bushings from shock eyes. Thoroughly wash shocks in a parts washer or with soap and water to remove dirt and other debris. Dry thoroughly with compressed air. Position and clamp body cap of shock in soft jaws (aluminum or brass) of vise. Remove Allen screw from pressure valve.

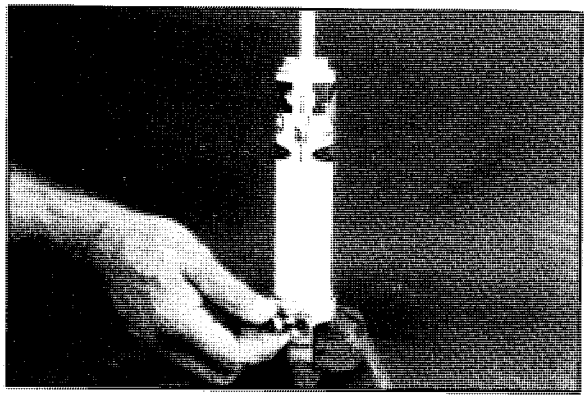


2. With valve outlet pointed in a safe direction, insert red tip of safety needle assembly into recess in shock pressure valve. Depress safety pin on safety needle and push gauge and needle assembly slowly toward shock, inserting needle. Be sure to push needle completely into shock valve. Release nitrogen in a safe direction away from everyone by turning T-handle clockwise (if equipped) or by depressing Schrader valve pin.



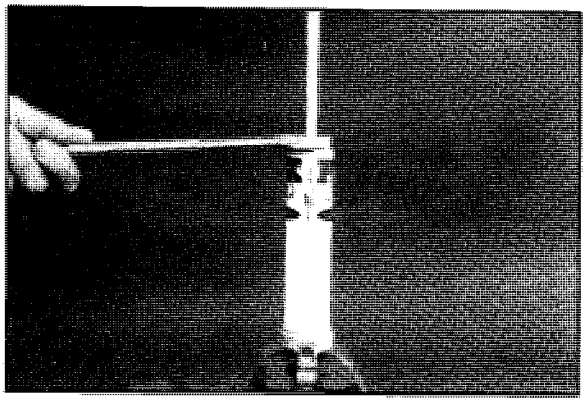
CAUTION:

It is possible for some residual pressure to remain in the shock regardless of the gauge reading. *Always* completely remove valve from body cap before further disassembly of shock.



3. Remove valve and sealing O-ring from body cap.

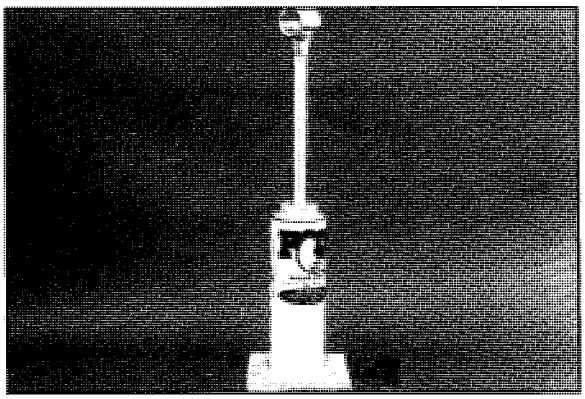
4. Extend shock shaft by pulling up on shock eyelet. Using a 1″ (25 mm) wrench, loosen shaft bearing cap.



Disassembly, Cont.

5. If body of shock starts to unscrew from body, tighten and try again. To keep body from turning, it may be necessary to use Body Clamp Tool clamped lightly around body in soft jaws of vise as shown.

NOTE: Position body clamp at least 1 1/2" below bearing cap.

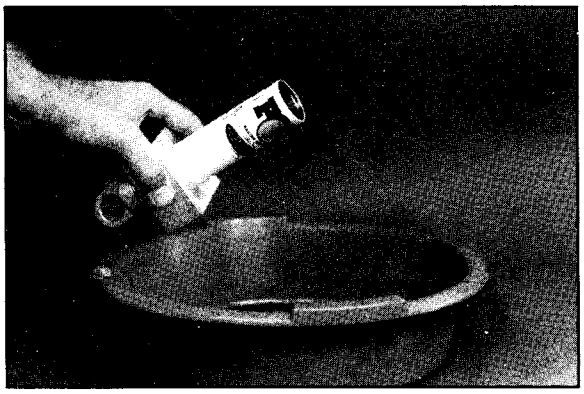


Shock Body Clamp Tool

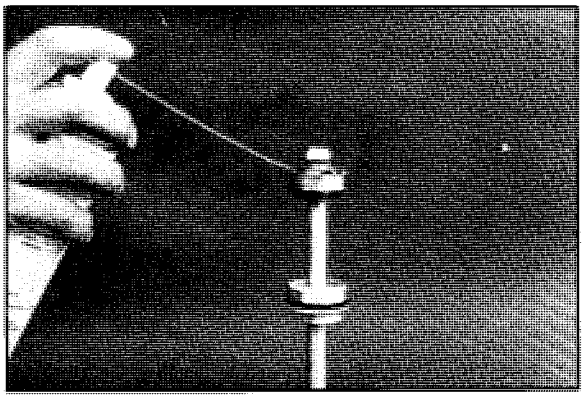
PN 2871071

6. Pull shock rod and piston straight out to avoid seal or valve damage. Be prepared to catch piston ring when removing the damper rod/valve piston.

7. Remove shock from vise and dispose of used oil properly in suitable container. Set shock body aside.



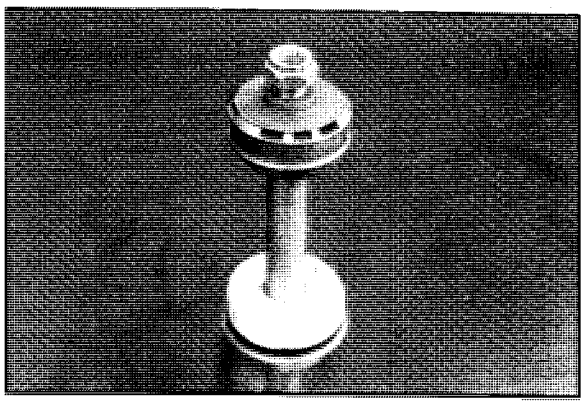
8. Mount damper rod in soft-jawed vise as shown. Loosen valve nut and clean the valve piston and valving washers with electrical contact cleaner. Dry thoroughly with compressed air. Tighten nut and torque to 12 ft. lbs. (1.66 kg-m).



Valve Nut Torque -

12 ft. lbs. (1.66 kg-m)

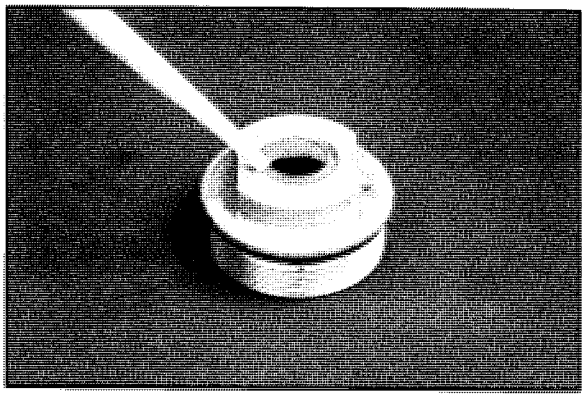
9. If bearing cap and/or seals are to be replaced, remove nut, washer, and valve piston with valving washers and set aside. Keep washers in order and note orientation of slots in piston for proper re-installation. The side with the greater number of slots must face the damper rod nut (toward IFP).



Seal Replacement

1. Remove bearing cap from damper rod. Inspect seals, o-ring, and bushing inside cap. Inspect cap O-ring and replace if torn or damaged.

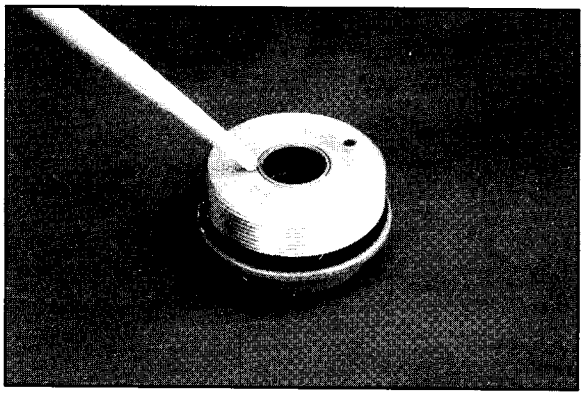
2. Using a small screwdriver or scribe pry upper seal, main seal, and O-ring out of bearing cap. Use care to avoid scratching the seal cavity.



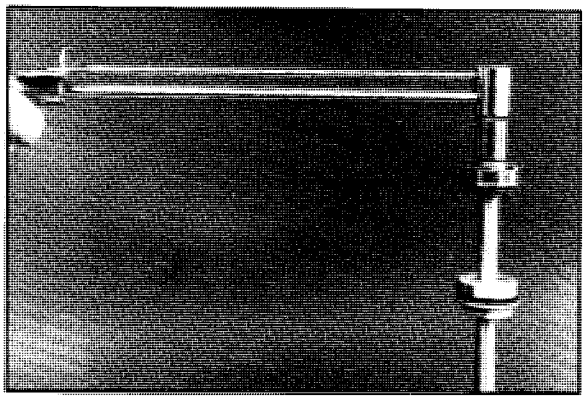
3. Clean seal cavity and inspect bushing for wear or damage and replace bearing cap if necessary.

4. Lubricate new seals and O-ring with Polaris shock oil and install. Be sure the seals are seated completely in the seal cavity.

5. Inspect jounce bumper (where applicable) and replace if damaged.



6. Inspect damper rod for nicks, scratches or abrasion. Install bearing cap and thick backing washer on damper rod. Install compression valve washer stack in same order as disassembly. Install valve piston with greater number of slots facing damper rod nut (toward IFP). Install rebound stack, washer, and a new nut. Torque nut to 12 ft. lbs.

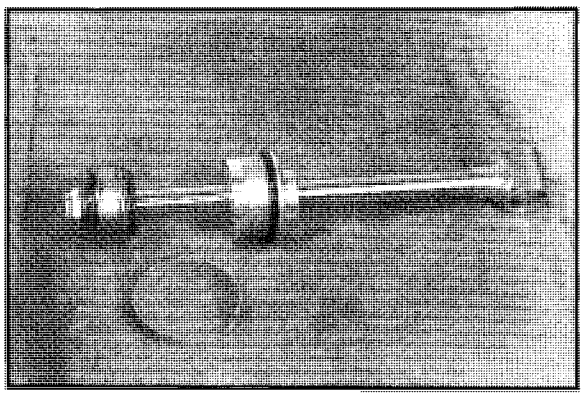


Valve Nut Torque -

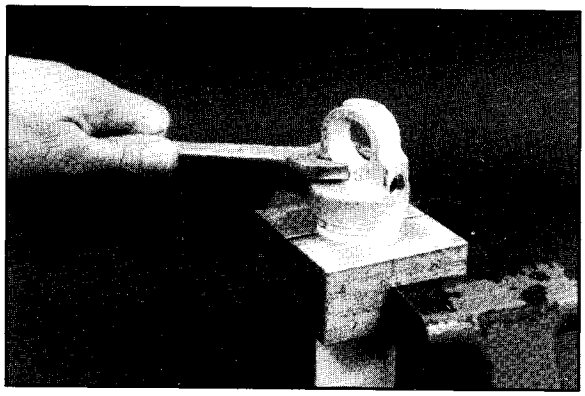
12 ft. lbs. (1.66 kg-m)

Seal Replacement, Cont.

7. Inspect valve piston ring for wear. The outer surface of the ring should be even in color. Set aside damper rod assembly for reinstallation.



8. Position shock in vise with Body Clamp Tool positioned as shown. Clean body clamp tool before installing.

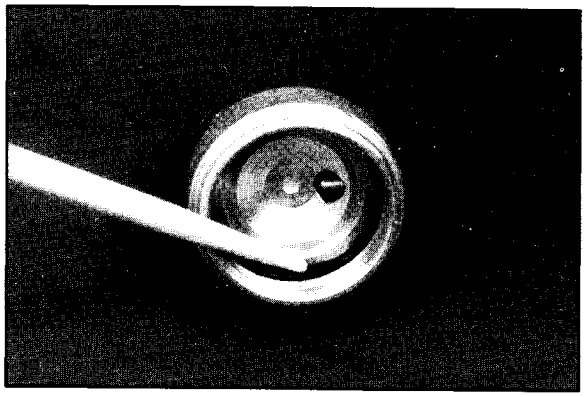


Shock Body Clamp Tool

PN 2871071

9. Using an open end or large adjustable wrench, unscrew the body cap from the body.

10. Inspect O-ring in body cap for damage.



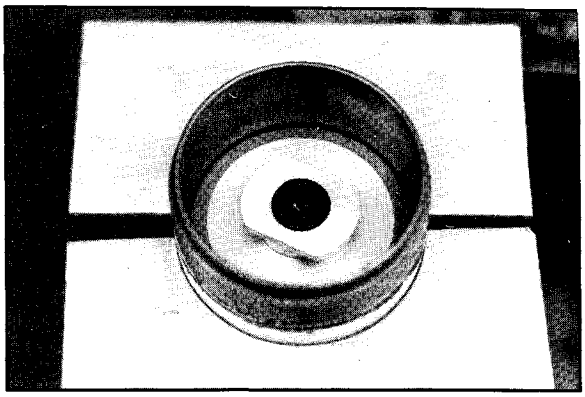
11. Note location of Allen screw in internal floating piston (IFP) for reassembly in body tube. Remove IFP through body cap end (external threaded end) using IFP tool. Be prepared to catch piston ring and piston as it comes out. Remove Allen screw from center of piston. Inspect bleeder screw O-ring and IFP sealing O-ring for wear or damage. Replace O-rings upon reassembly.

12. Carefully clean *all* parts thoroughly with electrical contact cleaner or solvent and dry with compressed air. Inspect shock body for scratches or wear.

Reassembly

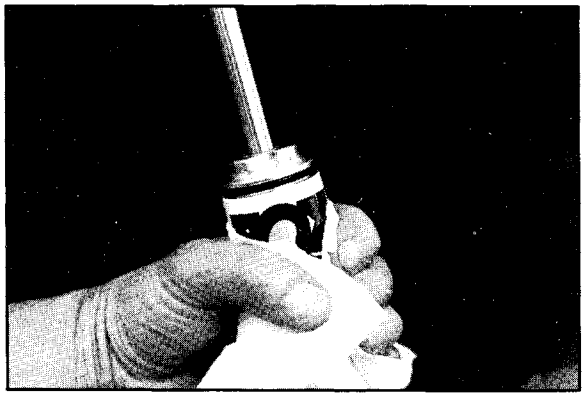
1. Install bleeder screw in IFP until O-ring is lightly seated.

NOTE: Bleeder screw must be positioned toward body cap (externally threaded) end of shock body.

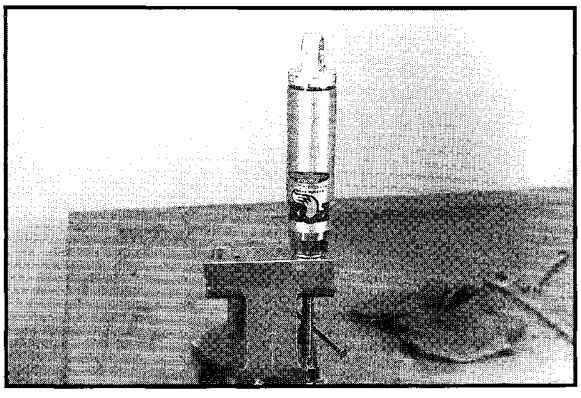


2. Compress flexible piston ring around valve piston and install piston into shock body.

3. Screw in bearing cap by hand until O-ring is fully seated.

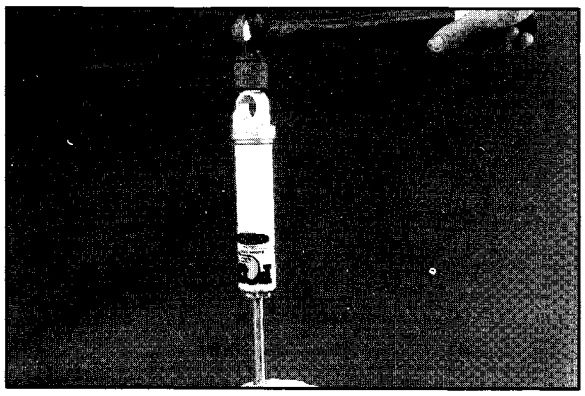


4. Invert shock and mount bearing cap flats lightly in vise. Caution: Be sure damper rod is fully extended.



Reassembly, Cont.

5. Fill with shock fluid to approximately 1″ (2.54cm) from end of body.



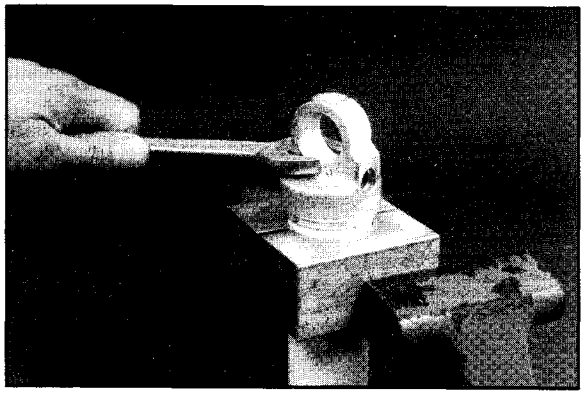
6. Install body cap until O-ring is lightly seated.

7. Mount shock in vise by top eyelet as shown. Support shock and strike body cap end 2-3 times with a soft faced hammer to remove all air trapped inside the valve piston. Allow shock to stand for 3-5 minutes.

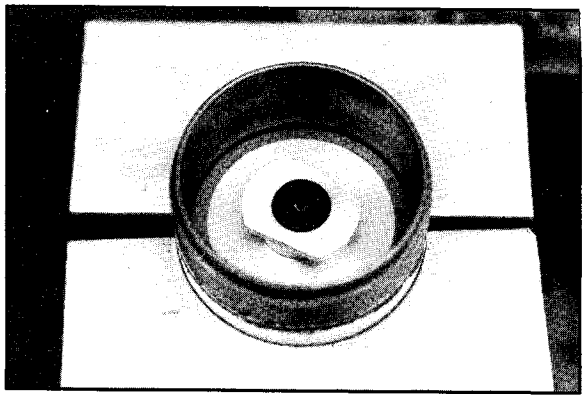
CAUTION:

Do not over-tighten vise or bearing cap may be damaged

8. Unscrew body cap and remove.

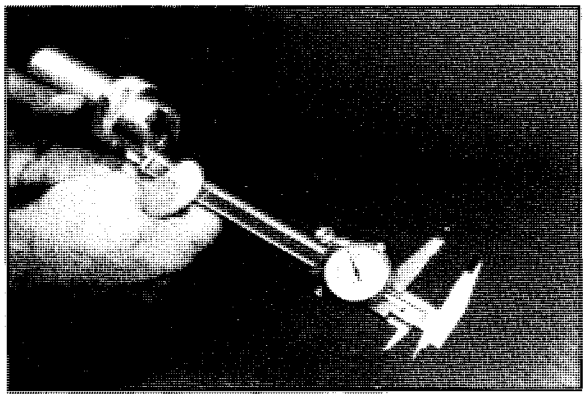


9. Remove IFP bleeder screw.



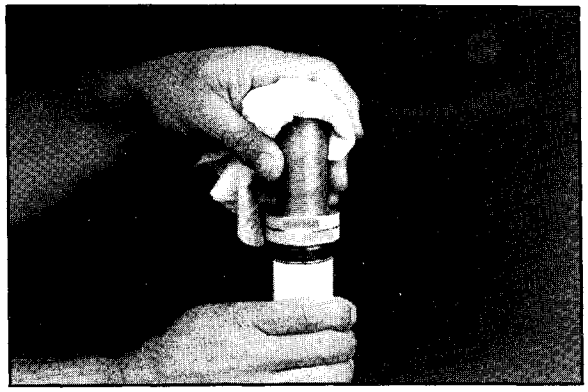
10. Set IFP tool to specified depth with a dial caliper as shown.

IFP Tool PN 2871351

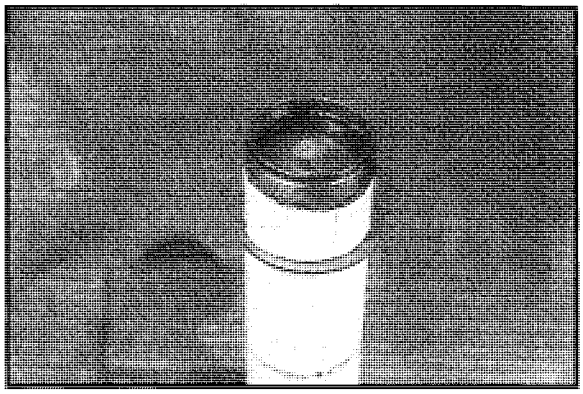


Reassembly, Cont.

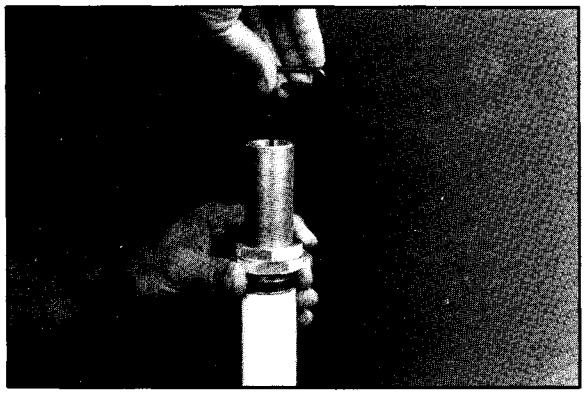
11. Place a shop towel over the end of IFP tool and slowly push IFP to specified depth.



12. With the IFP set and the bleeder screw removed, slowly stroke shock to force air through piston oriface. Move the shock body slowly to prevent aeration of the oil. Allow all air to purge throught the bleeder screw hole.



13. Install the bleeder screw with a new O-ring and tighten securely using the flats on the tool to prevent the IFP from turning. Pour out excess oil. It is not necessary to completely clean all oil from the nitrogen chamber, a small amount of oil will lubricate the IFP. Verify the proper IFP depth to within ± .025″ (.63mm) with a dial caliper. Be sure to measure to the flat portion of the IFP, not to the tapered outer edge.



14. Reinstall body cap with a new O-ring and tighten by hand. Mount shock with body cap end down in the soft jaws of a vise. Torque bearing cap to 8-10 ft. lbs. (1.10-1.38 kg/m). This will also tighten the body into the body cap.

CAUTION:

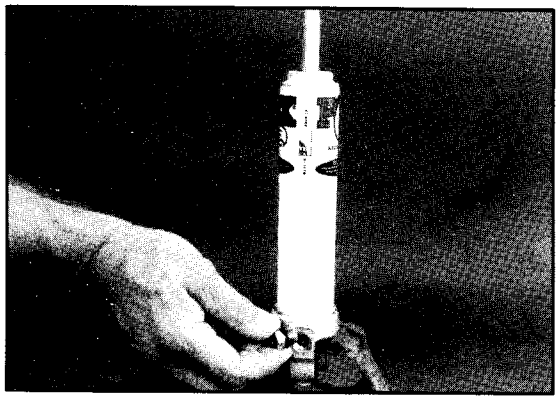
Do not over tighten or damage to the bearing may result.

Bearing Cap Torque -

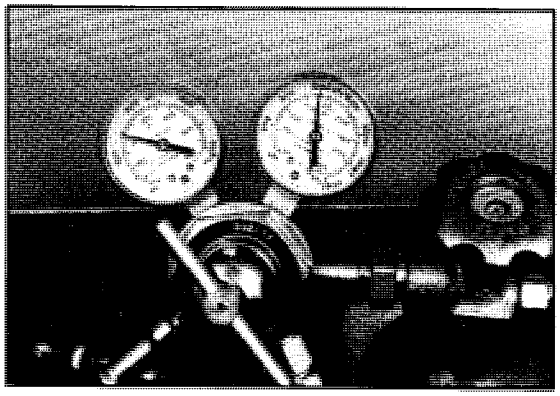
8-10 ft. lbs. (1.10-1.38 kg-m)

Reassembly, Cont.

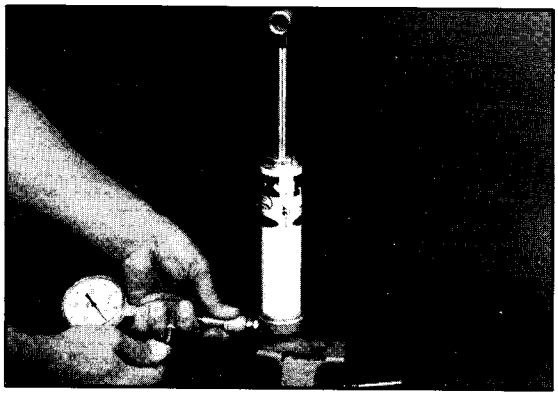
15. Install pressurizing valve with new O-ring and tighten securely.



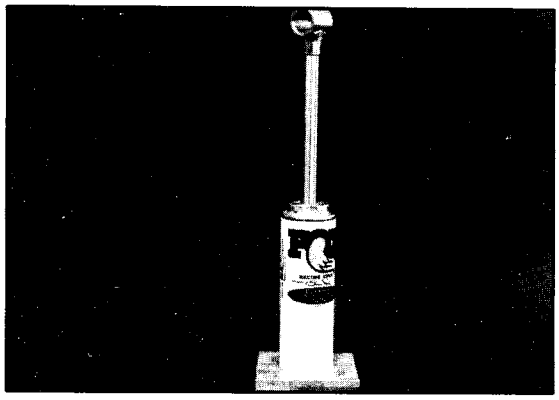
16. Set the nitrogen tank pressure regulator to 200 - 205 PSI.



17. Insert the Fox™ Safety Needle and charge with nitrogen to 200 PSI. Pull the needle straight outward and remove from the pressurizing valve while holding the pressure hose on the fitting. Do not insert the needle again to check pressure as the volume inside the gauge will reduce pressure in the shock.



18. As a final check, push the damper rod through a full stroke. The damper rod must bottom out at full travel, and then slowly rise to full extension. Shaft movement must be smooth and consistent throughout the entire compression and rebound stroke, without binding or loss of damping.



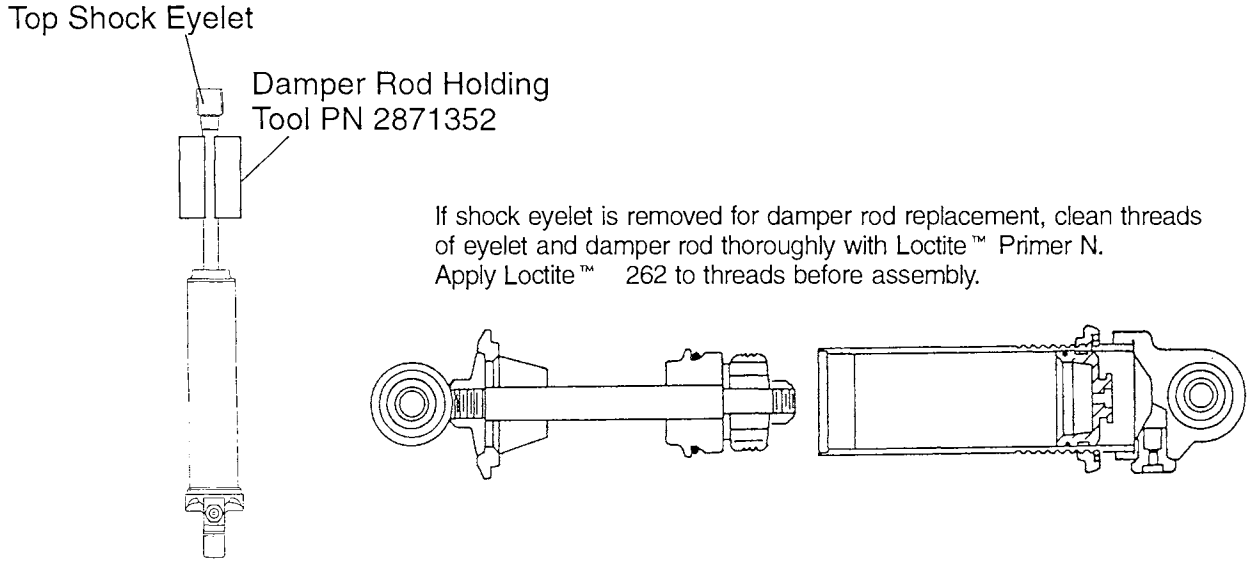
Reassembly, Cont.

19. To check for leaks, submerge the shock in water and look for bubbles or oil seepage around the bearing and body caps.

20. When reinstalling shocks on the machine, torque only to required specifications. If the shock is over tightened it will not pivot, possibly resulting in damage to shaft and seals.

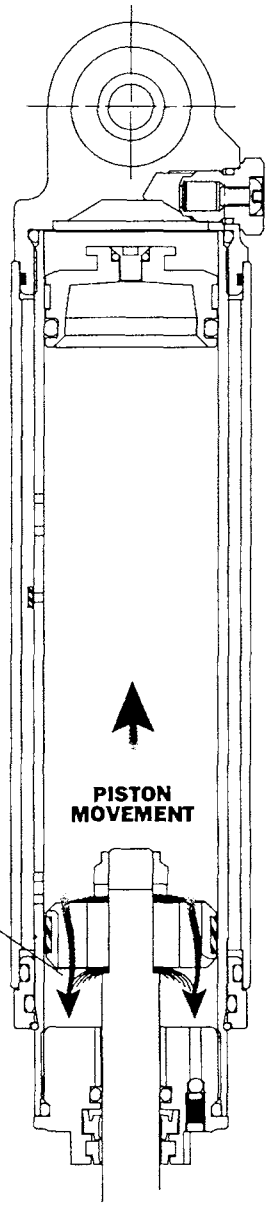
21. When installing IFS shocks, tighten top mount first. Pivot shock body into lower mount and determine if spacer washers are necessary to prevent twist or side loading of shock. Suspension assemblies should always be moved through entire travel without springs to verify free movement and proper alignment of all components.

Shock Eyelet Replacement



COMPRESSION STROKE

INITIAL COMPRESSION STROKE

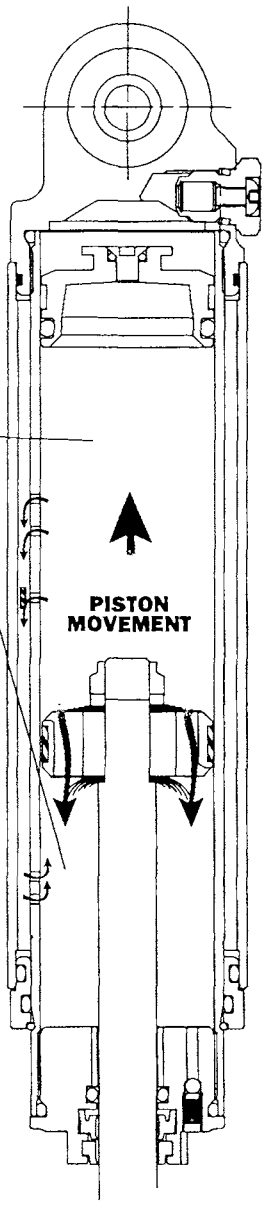


On initiation of compression stroke, all flow occurs through the piston only.

No bypass flow is available in this travel range.

Valves on this side of piston flex open to regulate flow.

MID-COMPRESSION STROKE



BASIC PRINCIPAL #1
For piston travel as shown, oil must get from this side of piston to this side of piston.

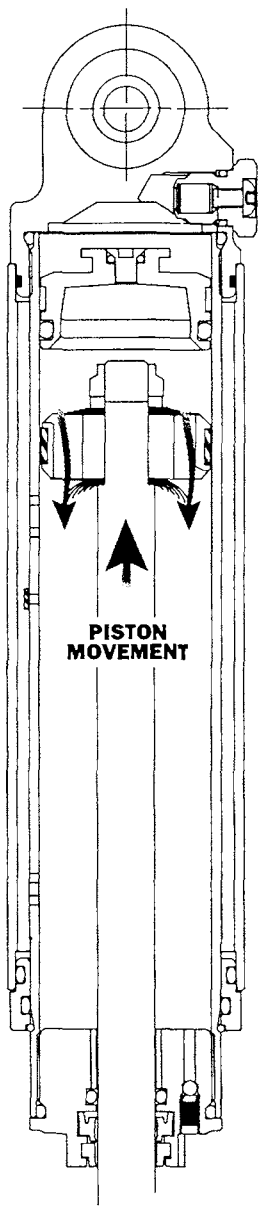
BASIC PRINCIPAL #2
Oil must either go through piston valving, or into outer chamber (bypass).

Maximum bypass of oil middle of compression stroke.

Lowest compression damping

Very plush ride.

END-COMPRESSION STROKE

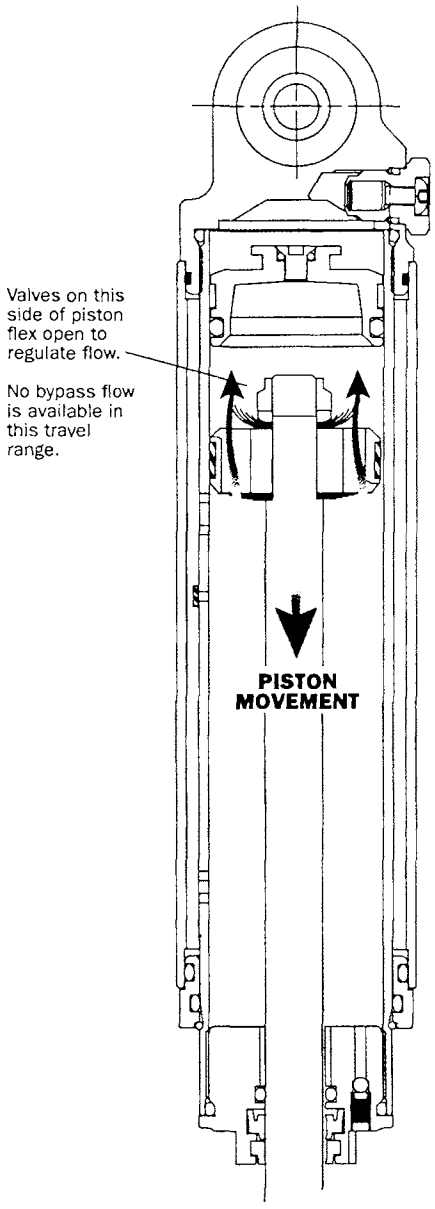


No bypass available.

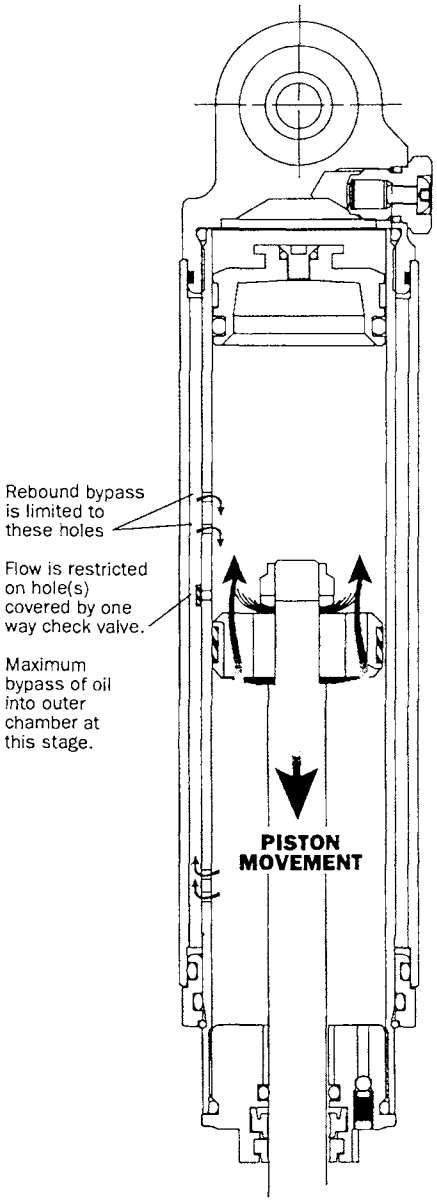
Increased compression damping for anti-bottom-out.

REBOUND STROKE

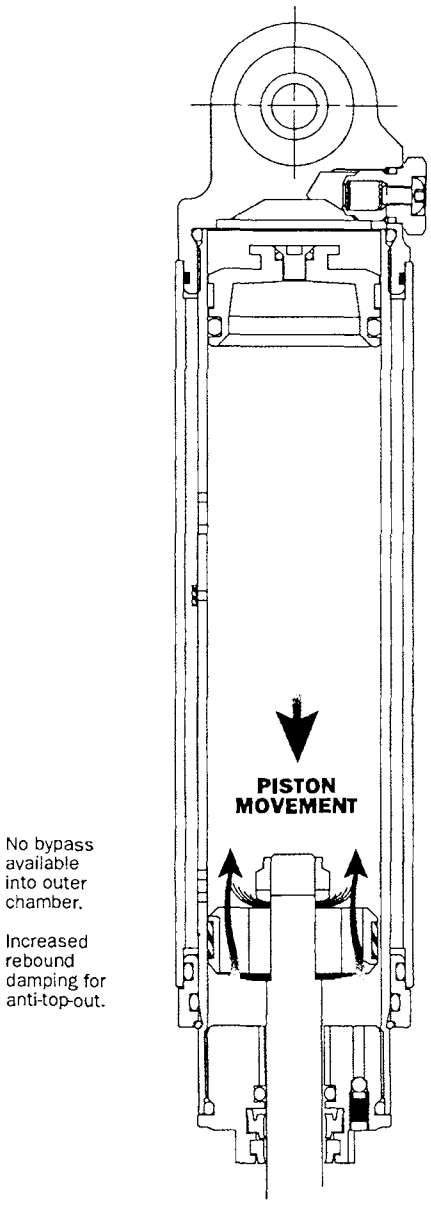
INITIAL REBOUND STROKE

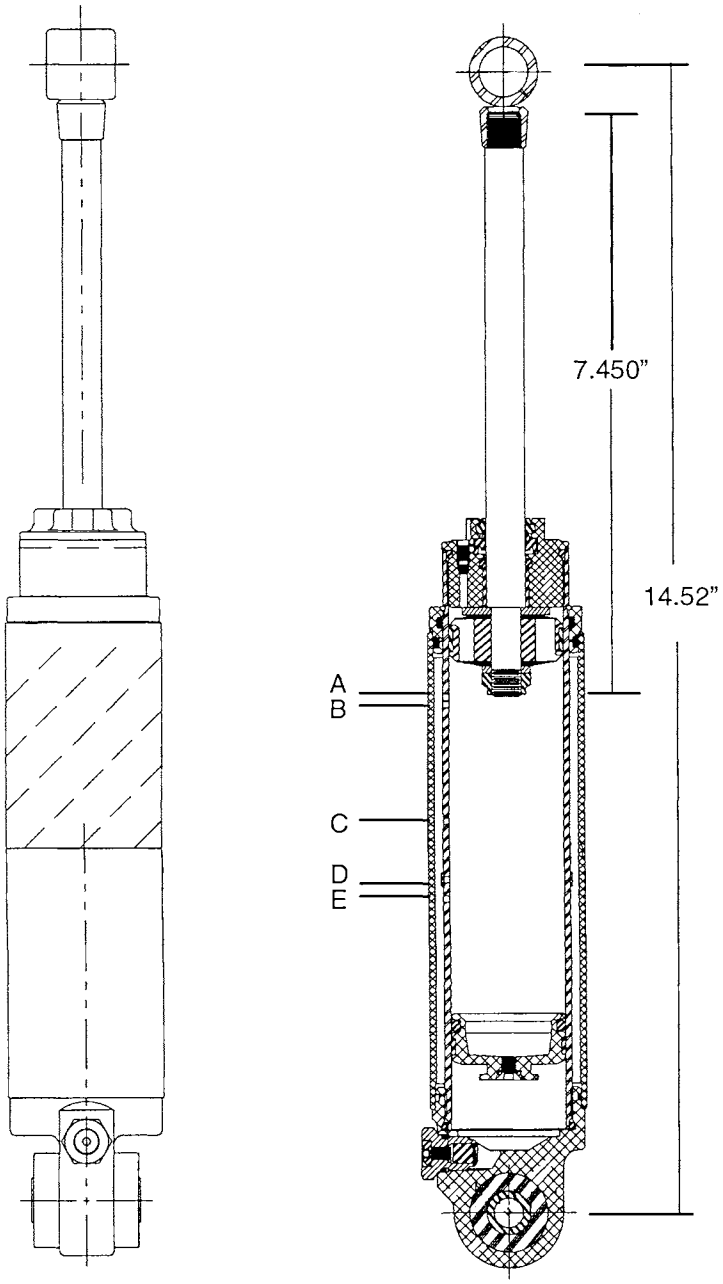


MID-REBOUND STROKE



END-REBOUND STROKE





SHOCK VALVING

COMPRESSION:

1. 1.300 x .008
2. .900 x .006
3. 1.250 x .012
4. 1.100 x .010
5. 1.000 x .010
6. .900 x .010

REBOUND:

1. 1.250 x .015
2. 1.250 x .012
3. 1.100 x .012
4. 1.000 x .010
5. .900 x .010
6. .800 x .010

PISTON ORIFICE: .063

SHOCK DESIGN DETAILS:

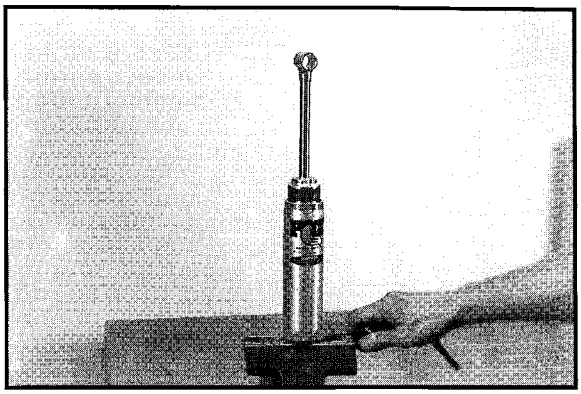
Travel	4.70"
Extended Length	14.52"
Compressed Length	9.82"
IFP Depth	.835"
Bearing	1.15"
Nitrogen Pressure	200 PSI

BY-PASS HOLE DETAILS:

LOCATION	QUANTITY	CHECK VALVE	DIAMETER
A. 1.80	1	NO	0.0787"
B. 2.00	3	NO	0.0787"
C. 3.50	1	NO	0.0787"
D. 4.25	2	YES	0.0787"
E. 4.50	1	NO	0.0787"

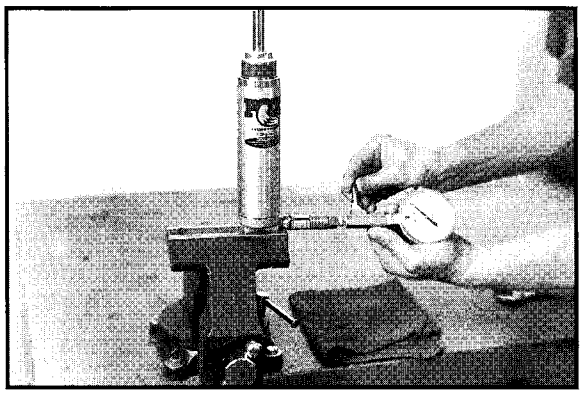
Disassembly

1. Remove bushings from body cap. Thoroughly wash shock in a parts washer or with soap and water to remove dirt and other debris. Dry thoroughly with compressed air. Position and clamp body cap of shock in soft jaws (aluminum or brass) of vise, body cap down (as shown).



2. Remove Allen screw from pressure valve.

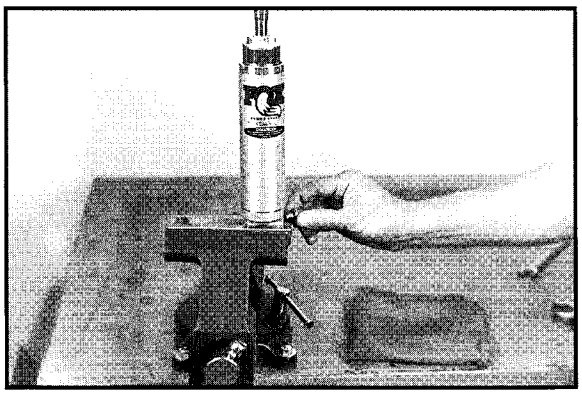
3. With valve outlet pointed in a safe direction, insert red tip of safety needle assembly into recess in shock pressure valve. Depress safety pin on safety needle and push gauge and needle assembly slowly toward shock, inserting needle. Be sure to push needle completely into shock valve. Release nitrogen in a safe direction away from everyone by turning T-handle clockwise (if equipped) or by depressing Schrader valve pin.



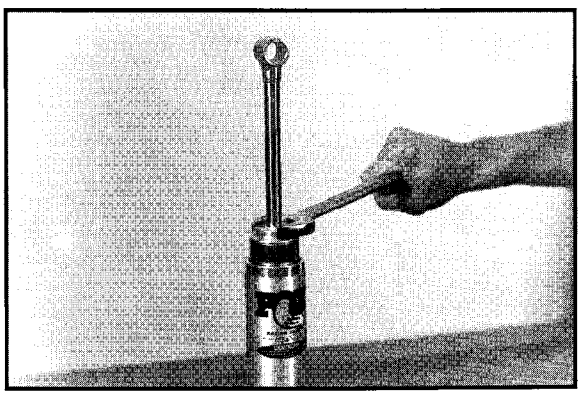
CAUTION:

It is possible for some residual pressure to remain in the shock regardless of the gauge reading. *Always* completely remove valve from body cap before further disassembly of shock.

4. Remove valve and sealing O-ring from body cap.

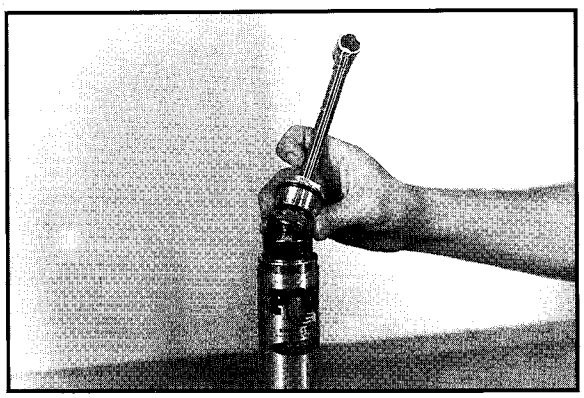


5. Extend shock shaft by pulling up on shock eyelet. Using a 1" (25 mm) wrench, loosen shaft bearing cap.

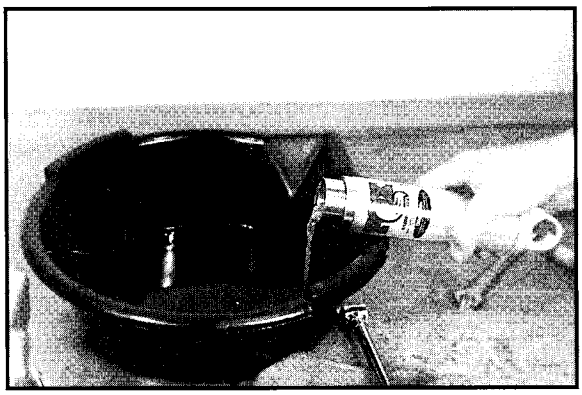


Disassembly, Cont.

6. *If bearing comes loose first*, unscrew bearing from body and remove the shaft assembly from the body. Pull shock rod and piston straight out to avoid seal or valve damage. Be prepared to catch piston ring when removing the damper rod/valve piston.



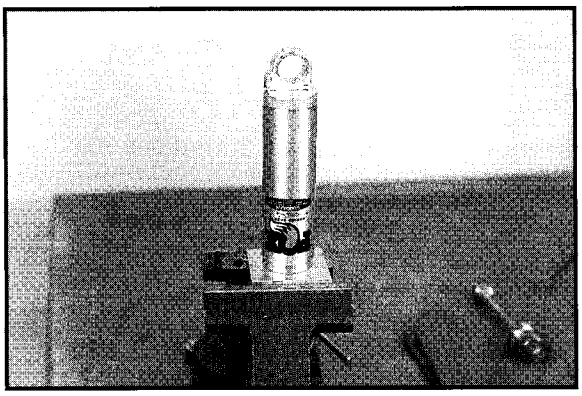
7. Remove shock from vise and dispose of used oil properly in suitable container.



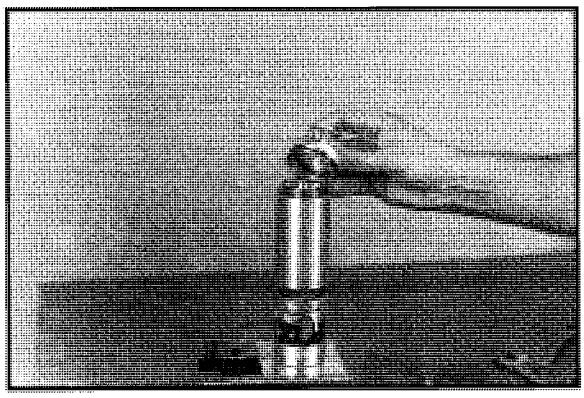
8. Clamp the exposed portion of the shock body in a vice using shock body clamp tool, body cap up. DO NOT clamp on bypass sleeve or damage to the shock will occur.

Shock Body Clamp Tool

PN 2871071

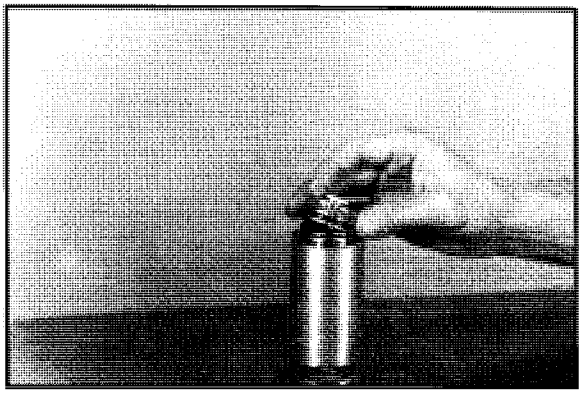


9. Remove the body cap

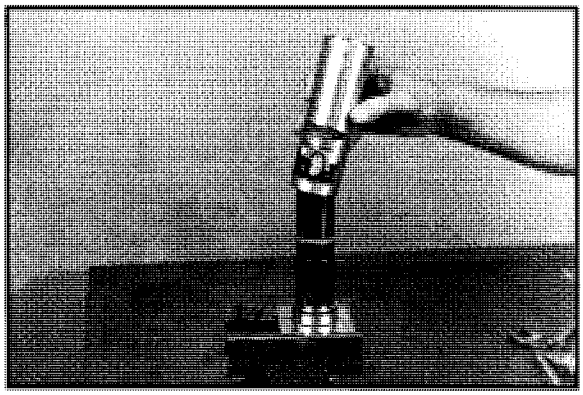


Disassembly, cont.

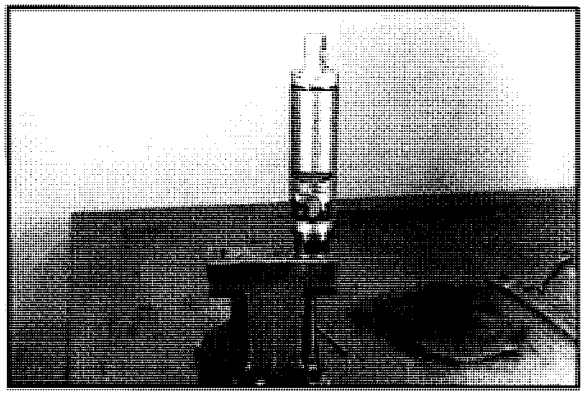
10. Remove IFP



11. Remove bypass Sleeve.

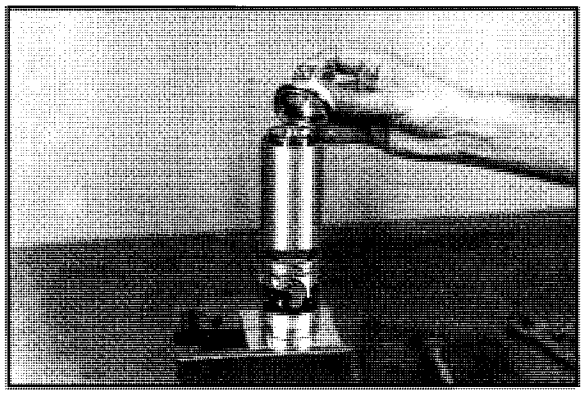


1. *If body cap comes loose first*, reclamp shock in vice, gripping on bearing flats with the body cap up.



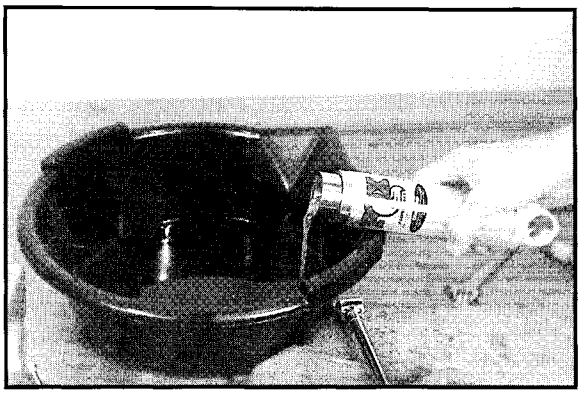
2. Remove body cap.

NOTE: Make sure bypass sleeve remains in contact with collar during this procedure. Oil will spill if bypass sleeve separates from collar.

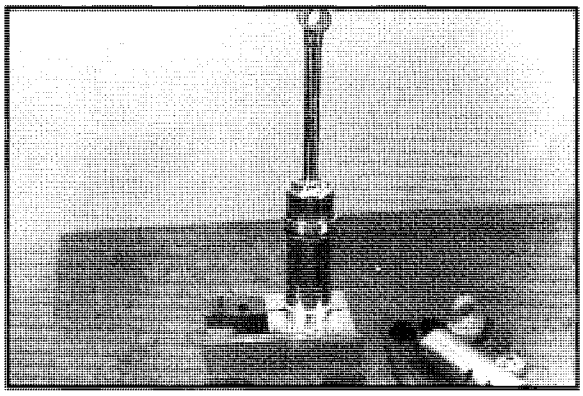


Disassembly, Cont.

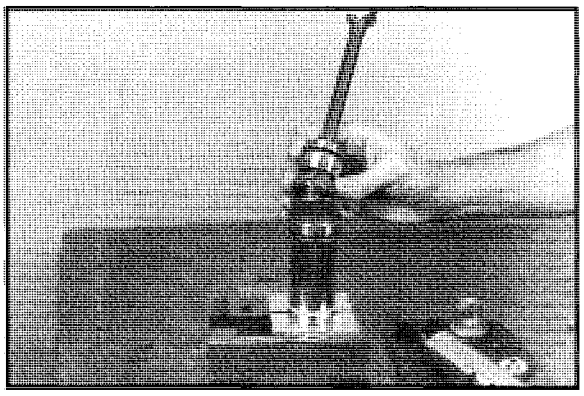
3. Remove IFP and dispose of shock oil properly.



4. Remove bypass sleeve and clamp shock body in vise using body clamps.



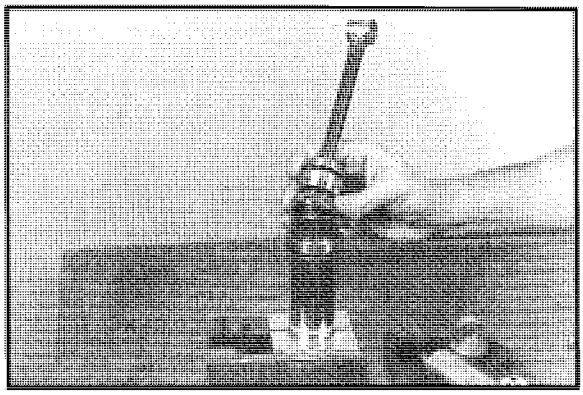
5. Unscrew bearing from body and remove shaft assembly from body. Be prepared to catch piston ring.



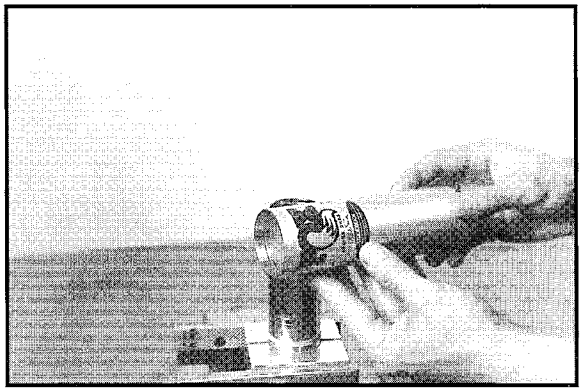
6. Follow procedures in Fox™ shock maintenance section for inspection, cleaning, and valving if needed.

Assembly

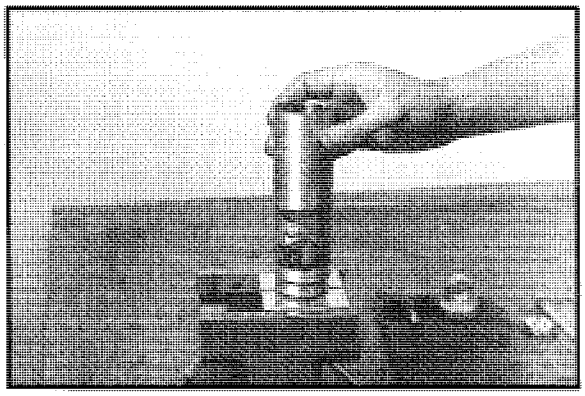
1. Compress piston ring and insert shaft assembly into shock body.



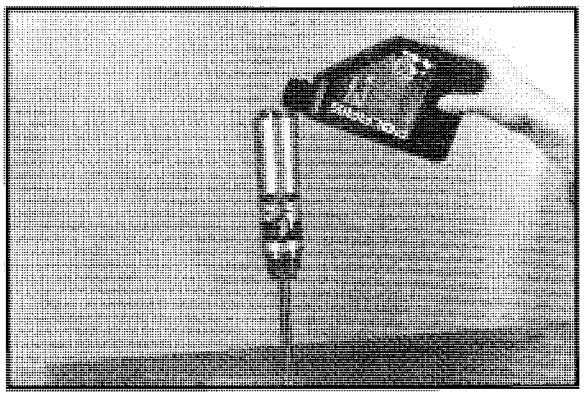
2. Inspect bypass sleeve for burrs, dents, or other physical damage.



3. Lube collar O-ring and replace bypass sleeve over body. Be sure of a snug fit - do not pinch or cut O-ring.

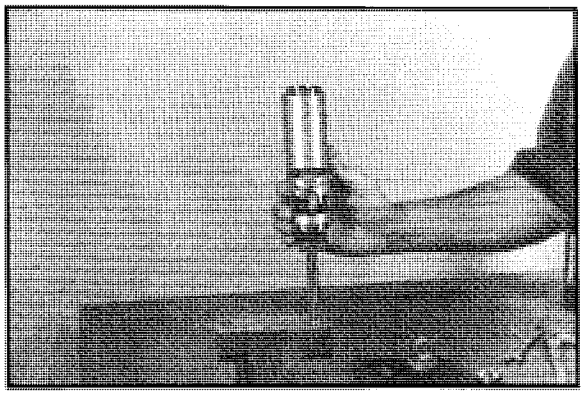


4. Clamp eyelet of shock in the vise body up. Fill shock and bypass sleeve through shock body. Oil should cover all bypass holes. Fill to approximately one inch (2.54cm) from end of body.



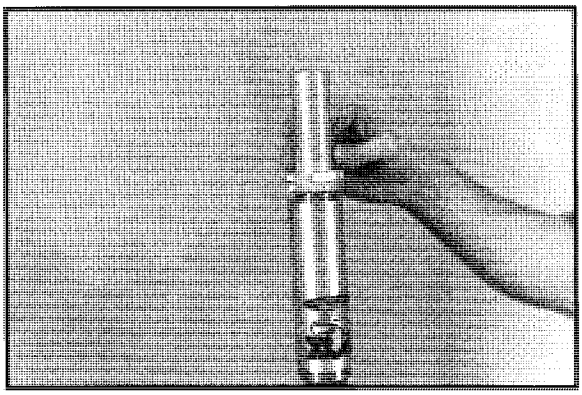
Aassembly, Cont.

5. Cycle shock through the first couple inches of travel to release trapped air. Take care not to spill oil over the bypass sleeve or introduce air through bypass holes.

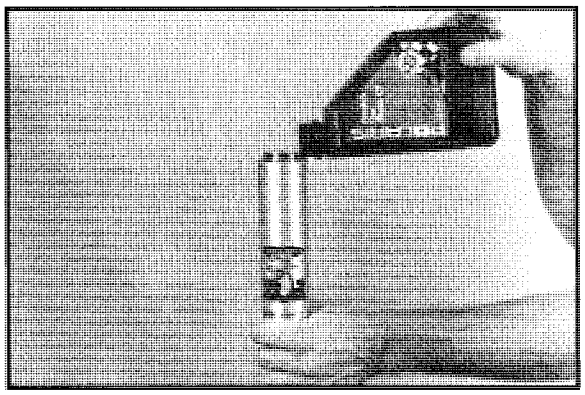


6. Ensure that the shaft is fully extended and set the IFP to the proper depth. Remove IFP bleeder screw to be sure no air is trapped under the IFP. Install IFP.

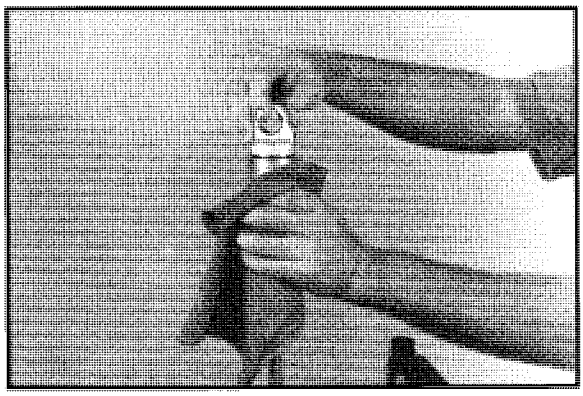
IFP Depth:
.835″ (21.2mm)



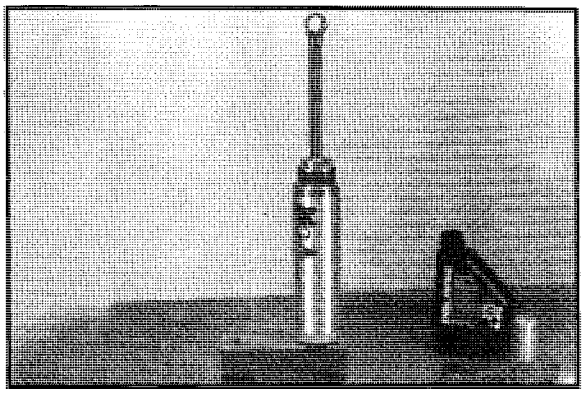
7. Replace the IFP bleed screw with a new O-ring and tighten securely. Hold shock fully extended and fill oil in bypass sleeve to the top.



8. Replace the body cap. Oil will drain over the edge of the bypass sleeve until the O-ring seals.

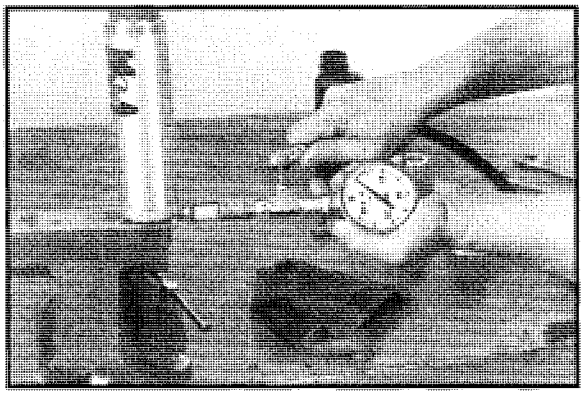


9. Once the body cap O-ring seals, re-position the shock in the vice by clamping on the body cap with the shaft up.



10. Continue to tighten the body cap utilizing flats on the bearing. Torque cap to 55 ft lbs. Install pressure valve with new O-ring and tighten securely. Pressurize shock to 200 psi.

Body Cap Torque
55 ft. lbs.



Problem	Solution
Rear suspension bottoms too easily	-Increase torsion spring preload -Increase rear shock compression valving by turning screw clockwise (if equipped with optional Indy Select shock) -Install overload kit PN 2871042 for extreme use
Rides too stiff in rear	-Check for binding suspension shafts and grease all pivot points -Decrease torsion spring preload adjustments -Decrease rear shock compression valving by turning screw counterclockwise (if equipped with optional Indy Select shock) -Check for proper track tension
Machine darts from side to side	-Make sure skis are aligned properly (straight forward with rider on machine) -Make sure spindles and all steering components are free turning -Make sure skags are straight on skis -Check hi-fax and replace if worn -Reduce ski pressure: •Increase front track spring preload •Reduce IFS spring preload if shims have been added •Reduce rear torsion spring preload
Front end pushes	-Check for worn skags -Check for binding suspension shafts and grease all pivot points -Increase IFS spring preload by adding shims
Steering is heavy	-Check ski alignment -Check skags and skis for damage -Reduce ski pressure: •Increase front track spring preload •Reduce IFS spring preload if shims have been added •Reduce rear torsion spring preload
Setting up for deep snow operation	-Change worn hi-fax -Lower front and rear torque arms (see Performance section at the back of this manual)

Suspension Troubleshooting - XTRA Lite Style

Problem	Solution
Rear suspension bottoms too easily	-Increase torsion spring preload -Increase rear shock compression valving by turning screw clockwise (if equipped with optional Indy Select shock)
Rides too stiff in rear	-Check for binding suspension shafts and grease all pivot points -Decrease torsion spring preload adjustments -Decrease rear shock compression valving by turning screw counterclockwise (if equipped with optional Indy Select shock)
Machine darts from side to side	-Make sure skis are aligned properly (straight forward with rider on machine) -Make sure spindles and all steering components are free turning -Make sure skags are straight on skis -Check hi-fax and replace if worn -Reduce ski pressure: •Increase front track spring preload •Reduce IFS spring preload if shims have been added •Reduce rear torsion spring preload
Front end pushes	-Check for worn skags -Check for binding suspension shafts and grease all pivot points -Increase IFS spring preload by adding shims
Steering is heavy	-Check ski alignment -Check skags and skis for damage -Reduce ski pressure: •Increase front track spring preload •Reduce IFS spring preload if shims have been added •Reduce rear torsion spring preload
Setting up for deep snow operation	-Change worn hi-fax -Lower front and rear torque arms (see Performance section at the back of this manual)

Suspension Troubleshooting - XTRA 10 Style

Problem	Solution
Rear suspension bottoms too easily	-Increase torsion spring preload -Increase rear shock compression valving by turning screw clockwise (if equipped with optional Indy Select shock) or refer to optional valving on Suspension Wall-chart for Fox equipped models -Change RRSS to highest setting
Rides too stiff in rear	-Check for binding suspension shafts and grease all pivot points -Decrease torsion spring preload adjustments -Decrease rear shock compression valving by turning screw counterclockwise (if equipped with optional Indy Select shock) or refer to optional valving on Suspension Wallchart for Fox equipped models -Set RRSS to lowest position or totally remove
Machine darts from side to side	-Make sure skis are aligned properly (straight forward with rider on machine) -Make sure spindles and all steering components are free turning -Make sure skags are straight on skis -Check hi-fax and replace if worn -Reduce ski pressure: ●Increase front track spring preload (requires shims) ●Reduce IFS spring preload by adjusting cam ●Reduce rear torsion spring preload ●Lengthen front limiter strap
Front end pushes	-Check for worn skags -Check for binding suspension shafts and grease all pivot points -Increase IFS spring preload by adjusting cam or adding washers -Shorten front limiter strap
Steering is heavy	-Check ski alignment -Check skags and skis for damage -Reduce ski pressure: ●Increase front track spring preload ●Reduce IFS spring preload by adjusting cam ●Reduce rear torsion spring preload
Setting up for deep snow operation	-Change worn hi-fax -Lower rear torque arms (see Performance section at the back of this manual) -Increase front limiter strap length -Based on rider preference, RRSS may be removed to increase weight transfer

Suspension Troubleshooting - XTRA 12 Style

Problem	Solution
Rear suspension bottoms too easily	-Check to be sure FRSS block is in highest position -Adjust torsion spring blocks to highest position -Adjust coil over spring on front track shock to increase preload -Change to .421 torsion springs (PN 7041405, 7041406) -Change to next heavier coil spring (e.g. 75/125 #/in. to 90/150 #/in. -Change to stiffer shock valving (refer to wallchart) -Check charge in shocks on models equipped with Fox™ shocks
Rides too stiff in rear	-Check for binding suspension shafts and grease all pivot points -Decrease spring preload adjustments -Remove rear track shock spring or reduce rate of spring (refer to wallchart) -Change front track shock to lighter spring -Change to lighter shock valving on models equipped with Fox™ or Indy Select shocks (refer to wallchart)
Machine darts from side to side	-Make sure skis are aligned properly (straight forward with rider on machine) -Make sure spindles and all steering components are free turning -Make sure skags are straight on skis
Front end pushes	-Check for worn skags -Check for binding suspension shafts and grease all pivot points -Increase front IFS preload -Change FRSS to low setting or move to forwardmost hole
Steering is heavy	-Check ski alignment -Check skags and skis for damage -Change FRSS to high setting -Decrease IFS spring preload
Setting up for deep snow operation	-Rotate FRSS to lowest setting, depending upon rider preference -Decrease preload on front track spring -Move FRSS to forwardmost hole -Tighten limiter strap one hole