



INSTA-CHAIN™
The AUTOMATIC ICECHAIN

***Maintenance &
Troubleshooting Guide
Revision May 2018***

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Regular Scheduled Maintenance

Regularly scheduled maintenance is highly recommended to ensure that your Insta-Chains last years longer, even the life of your truck. Like any other mechanism the more that you service it and care for it, the longer it will last.

1. You should perform regular maintenance, year round, by greasing all grease fittings. This should be checked whenever you have your scheduled maintenance on the vehicle, or once a quarter.
2. In the summer months: Remove the Chain Wheels, this will help to reduce stress and fatigue on the arm pivot joint, the brackets, and the spring inside the air can. It will also help to reduce unnecessary vibration. Unbolt the one bolt that attaches the Chain Wheel to the Arm (NOTE: Make note where the spacers are placed so the Wheels can be reinstalled properly later). When reinstalling the Chain Wheel in the Fall you should need to use a **brand new** Chain Wheel Nut (P/N: **5211**) as it would no longer be able to “lock”. We recommend replacing the Chain Wheel Bolt (P/N: **5222 for the regular bolt or P/N: 7004 for the adjustable Wheel Pivot Bolt**) as well. If the Chain Wheel Bolt is the Pivot Style leave the Pivot Bolt in place to maintain the wheel angle. In addition, wrap the threads with tape to protect them from debris and damage during the summer.
3. Check to make sure that all Bolts and Nuts are tight and within Torque Spec (See Page 8 for a Torque Chart). This should also be done once a quarter. **BOLTS SHOULD NOT BE TIGHTENED TO TORQUE WITH AN AIR GUN OR AIR WRENCH. YOU MUST USE A TORQUE WRENCH. FAILURE TO TORQUE PROPERLY WILL VOID YOUR WARRANTY.** If you use an air gun/ air wrench and not a wrench and torque wrench, you run a great risk of over-torquing and stretching the bolts which will cause the bolts to loosen and break which could cause the Chain Unit could fall off the truck. Under-torquing will cause the bolts to shear off.
4. Check all airlines and air tanks for buildup of moisture, even with dryers built into the trucks systems this can occur. Moisture will freeze in the airline clogging it and freeze in the solenoid causing it to fail. Grit can also get into the solenoid and can also cause it to fail.
5. If you encounter problems with the exhaust filter on the solenoid clogging up you can replace the filter with a 90 degree elbow and a piece of airline. Run the airline up along the inside of the frame rail of the truck where it will stay dry and can vent without collecting water and grit.
6. The solenoid valve should be actuated periodically to keep it clean and functioning properly.
7. Due to the **high spring tension** of the return spring, disassembly of the Insta-Chain air cylinders should only be done by qualified personnel. Insta-Chain recommends you send the air cylinder to the Insta-Chain factory for repair.

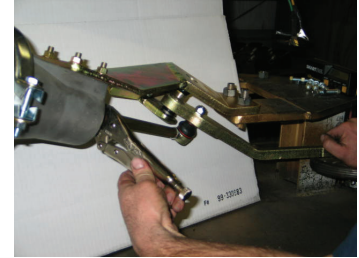
Diaphragm Replacement

CAUTION: The Air Cylinder contains a HIGH TENSION SPRING

There are two ways to replace the diaphragm. The first, which we RECOMMEND, is to leave the unit together. The second is to remove the Air Can and place it in a press. Below you will find the instructions for each.

1. Leave the Air Cylinder on the Chain Unit **WITH THE BALL JOINT CONNECTED TO THE ARM**. It is critical that you leave the Extension Coupling and Ball Joint attached to the Arm.

Remove the Dust Boot Clip. Pull the Arm down, then, pull the Dust Boot back. Next Place a vice grip on the Extension Coupling as close to the Cylinder as possible. (NOTE: It is would be a good idea to secure the arm by secondary means as a precaution by tying or strapping it down).



Remove the Clamps and Air Lid.

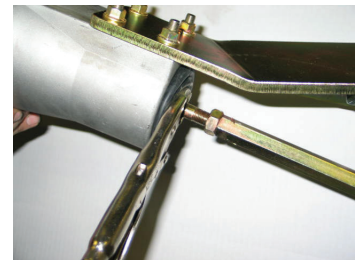
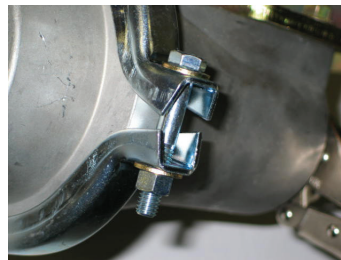


Replace the Diaphragm.

Replace the Clamps and alternate tightening so they will do so evenly. Leave about 1/4" (6-7mm) between the Clamp legs.

Release the Vice Grip and retract the arm carefully. Replace the Dust Boot Clip.

Test the Chains.



2. Remove the Air Cylinder from the Chain Unit. Place it in a press, remove the clamps, and then release the pressure. Place the new diaphragm in place, and press the can together. Replace the clamps, tightening them evenly, alternating. Leave about 1/4" space between the clamp legs.

Replace the Air Can on the Chain Unit and test the Chain Unit.

CAUTION: DO NOT ATTEMPT TO DISASSEMBLE THE AIR CAN WITHOUT IT BEING ATTACHED TO THE ARM & BALL JOINT OR IN A PRESS. IT COULD CAUSE SERIOUS INJURY.

Troubleshooting

The following are troubleshooting tips that you can pursue before calling in for further help.

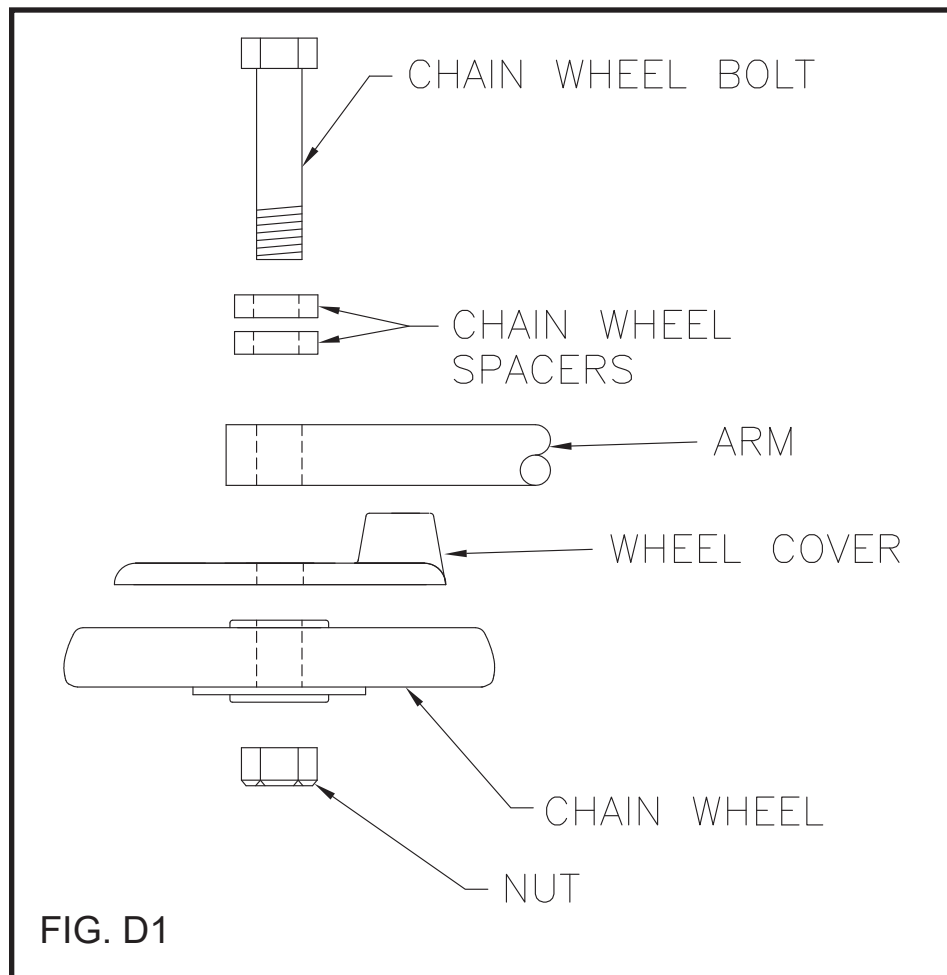
Chain Wheel

1. Insufficient chain throw is due to incorrect mounting, adjustments or worn out chain links. Check the angles and measurements of the Chain Wheel according to the mounting instructions.
2. Excess chain wear is due to using the Insta-Chain on bare pavement, or thin snow or ice. Excess chain wear can also occur if the Chain Wheel is mounted too low, below 3" or misalignment.
3. Excessive wear on the wheels is due to improper Chain Wheel angles or from the wheel not being lined up on the centerline of the tire. Re-check these measurements when this occurs.
4. Excessive wear may also occur from excessive speed.

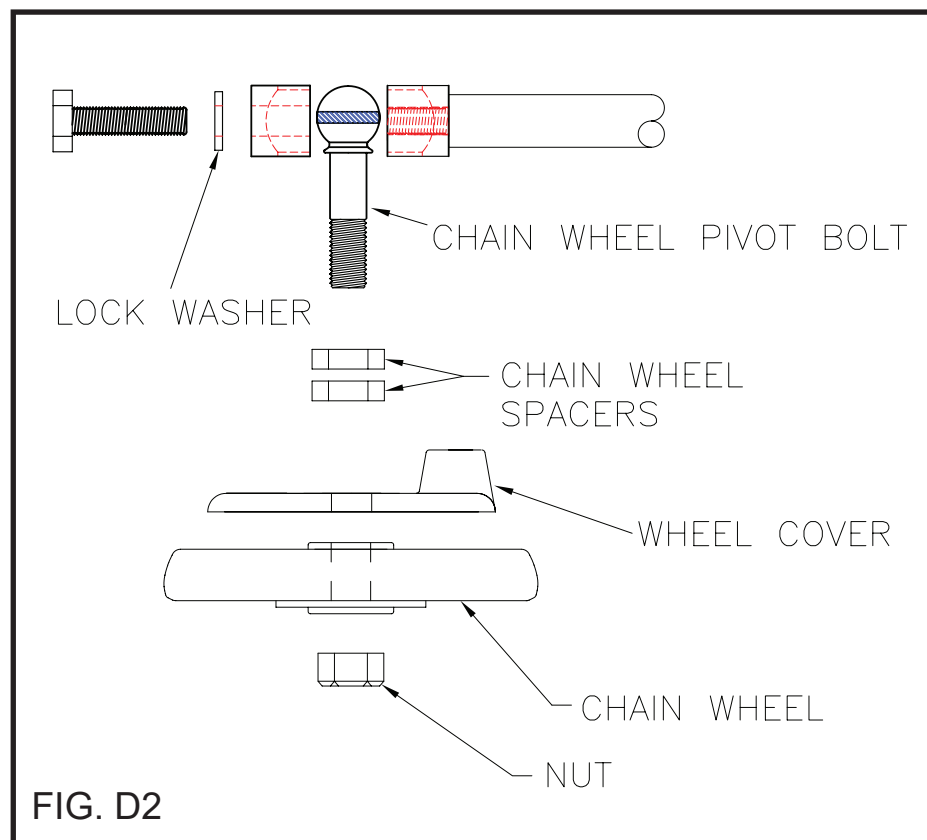
Arm

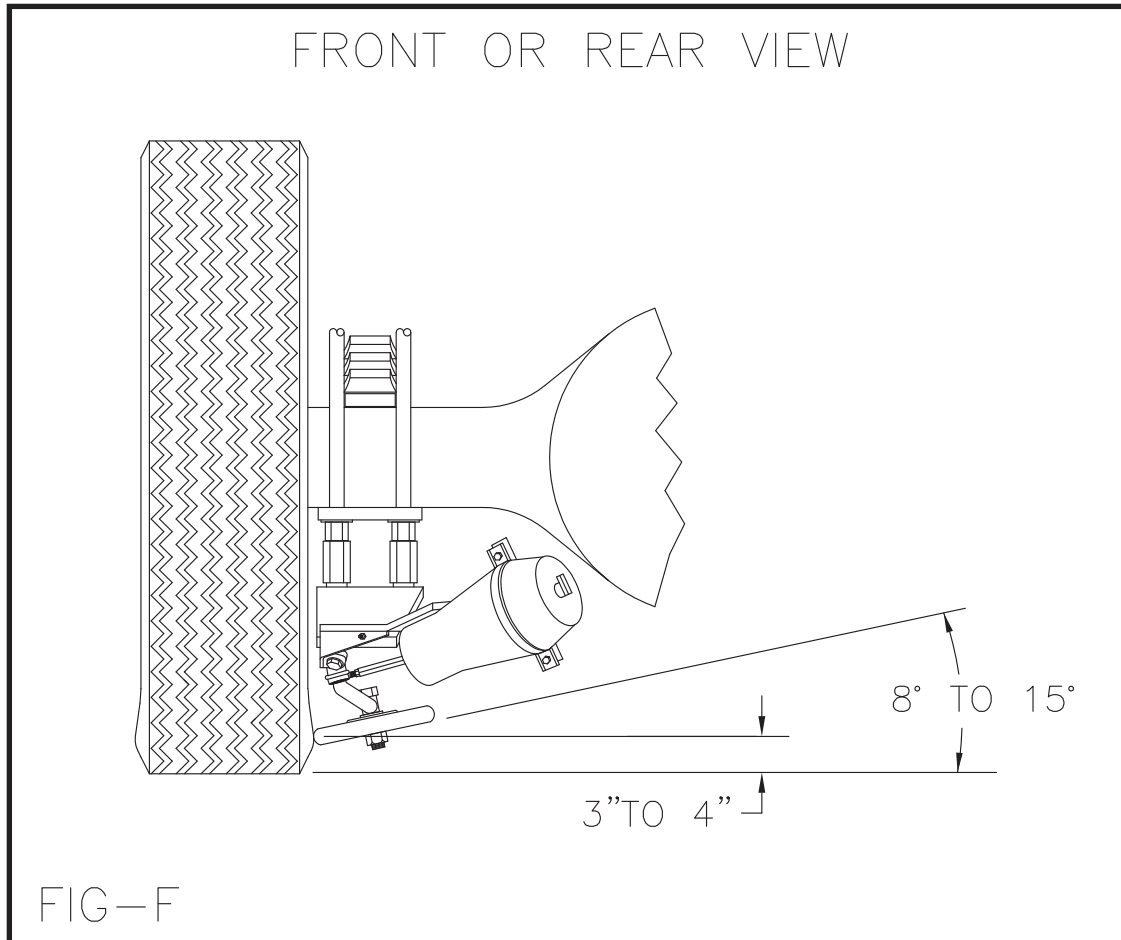
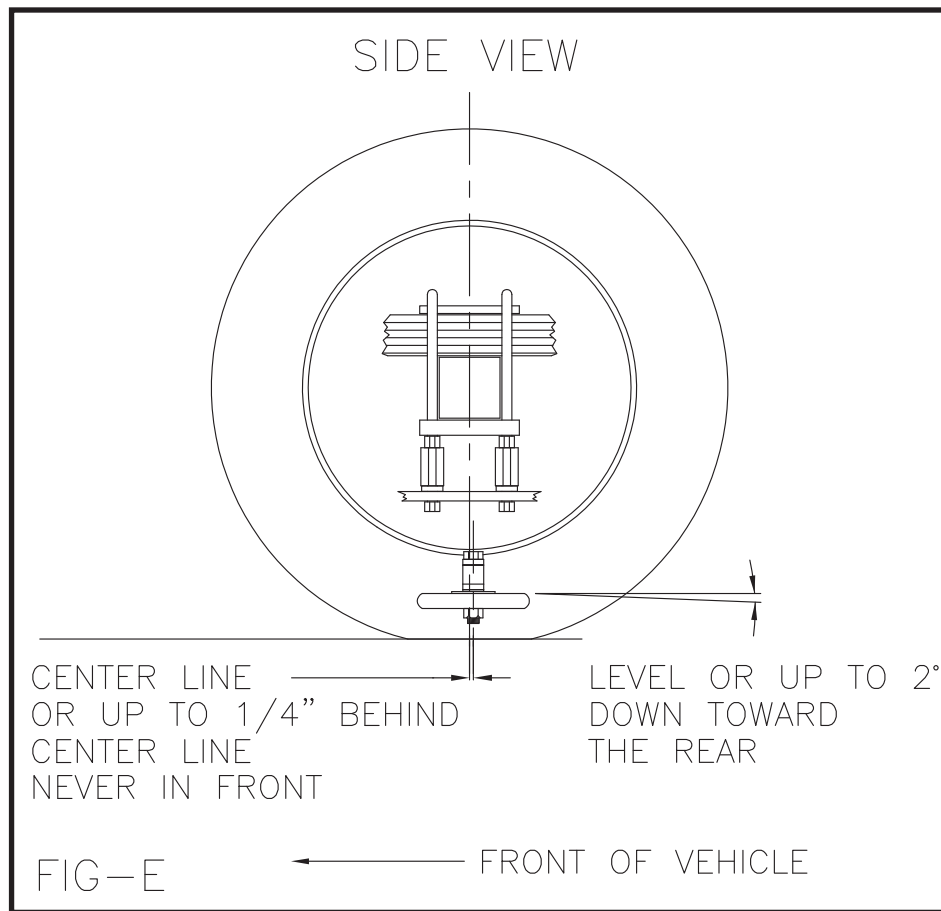
1. If the arm of the Chain Unit is hanging down loose and can be moved freely and you cannot engage or disengage the Chain Units, the spring or pushrod is most likely broken and will need to be replaced (See the Regular Scheduled Maintenance item 7).
2. If the arm is stuck down or up and doesn't respond when activated or deactivated, please check one of two things:
 - A. Solenoid Valve
 - i. There may be grit or water in the solenoid valve. To retract the arms try tapping on the solenoid valve to knock it loose if you can reach it, be careful to stay out of the way of the arms retracting, they will come up fast.
 - ii. If tapping on the solenoid doesn't work, try prying the arm, or knocking it loose to raise it up. ***IF YOU DO THIS STAY CLEAR OF THE ARM, DO IT FROM THE OPPOSITE DIRECTION OF THE SWING OF THE ARM.***
 - iii. Activate and deactivate the Chain Unit and listen for it activating and deactivating. If you don't hear it clicking open and closed then it is not receiving power. Check the wiring with a voltage meter to confirm this.
 - B. Arm Bearings
 - i. The arm bearing may be frozen. One way to check is to remove the Air Can nuts and remove the can. If the arm is still difficult to move then it is the arm bearings. Replace them. If the arm bearings move freely, then there is a problem with the cylinder or solenoid.

Standard Chain Wheel



Adjustable Chain Wheel





CENTERLINE ADJUSTMENT

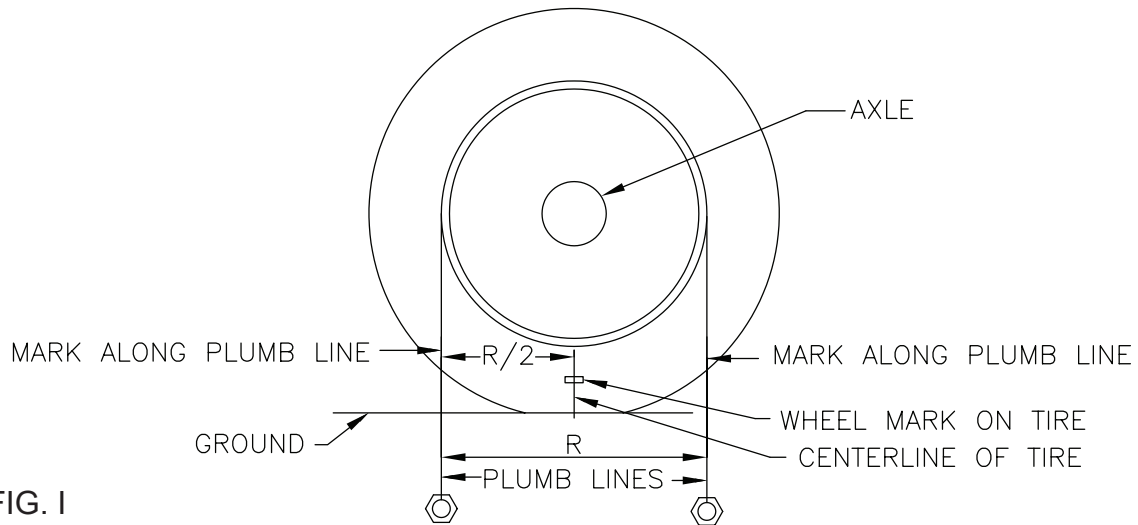


FIG. I

1. Make sure that the Chain Wheel is **LEVEL** front to back (check with an analog or digital angle finder, do not eyeball it or use a bubble level). The wheel may tilt towards the rear of the vehicle $1^{\circ} - 2^{\circ}$, but **NEVER** to the front of the vehicle (see Figure I). There are two ways to adjust this angle depending on the mounting system of the Chain Wheel.
 - a. If the arm on your Insta-Chain unit has two holes in the end of the arm and is not adjustable, you may add or remove washers from between the Mounting Bracket and the Coupling Nuts on either the front or rear U-bolts. A good rule of thumb is that one flat washer (1/8" thick) will level the bracket by one degree.
 - b. The other method is for Chain Units with an Adjustable Pivot Joint for the Chain Wheel. With this system you would loosen the two 3/8" bolts on the end of the arm and adjust to spec. Then retighten to Torque, **DO NOT USE AN IMPACT GUN OR WRENCH**, if you over torque the bolts it will cause them to break and you will lose the Chain Wheel. (See Torque Chart on Page 8 \ P/N 5135).
2. The Chain Wheel should tilt towards the tire $8^{\circ} - 15^{\circ}$ (see Figure F). Swiveling the unit side to side will change this operating angle. This will also affect the clearance between the Chain Wheel and the Drive Shaft/ Differential. If you have an Adjustable Wheel Pivot joint on your arm this can also be adjusted there.
3. The wheel should press tightly against the tire. If it is not tight against the tire, you can either swivel the unit inboard and it will increase the tire pressure, or you may adjust the Extension Coupling out. The Extension Coupling is the hex rod protruding from the air cylinder that connects to the ball joint. To adjust the Extension Coupling:
 - a. Activate the Chain Unit.
 - b. Remove the Clip from the Dust Boot and pull the Dust Boot up over the Jam nut.
 - c. Loosen the Jam Nuts on either side of the Extension Coupling and turn the Extension Coupling counter clockwise for more pressure and clockwise for less pressure.
 - d. Deactivate the Chain Unit, then pull the Dust Boot back down over the Jam Nut and replace the Clip.
4. With the Chain Wheel in the engaged position, grab the Chain Wheel and rub it back and forth against the tire in order to make the small mark on the sidewall. This mark will be about 1/2" high and 1" long (See Figure I).




5. The center of the mark should hit the tire at the bulge, 3"-4" off the ground (see Figure F or I). This may be changed by adding or removing Chain Wheel Spacers between the arm and the Chain Wheel. These Chain Wheel Spacers are 3/8" thick. If the vehicle is an empty truck that will normally be hauling a lot of weight (i.e. over-the-road hauler, dump truck, or fire pumper) you will want to try to keep this measurement 3 1/2"-4" off the ground because of the squash in the tires when the vehicle is loaded. For vehicles with 16" tires, this measurement will need to be between 2 3/4"-3" because the bulge sits lower. The Chain Wheel needs to hit at the bulge of the tire. **NOTE:** if you are mounting the chains on a bare chassis this measurement needs to be 4"-4 1/2" off the ground because the weight of the body will drop the height of the Insta-Chains slightly.
6. Now check to see if the wheel mark is at the centerline of the tire, this is very critical to ensure the proper throw of the chains. The truck must be on the ground to ensure proper measurement. There are two methods for accurately finding the centerline:
 - a. Take a plumb line and hang it from each side of the tire rim. With a piece of chalk, make a small mark on the tire where the plumb line hits the sidewall. Measure the distance between these two marks (R in Figure I). Divide this measurement in half and measure this distance in from one of the plumb line marks (R/2 in Figure I). Make a small chalk mark at this point. This is the centerline of the tire and axle. For example, an 11R-22.5 tire has an outside rim measurement of 23 1/2"; half of this is 11 3/4". This means that the centerline is 11 3/4" from one side of the rim. Now draw vertical line on the tire. The center of the Chain Wheel mark must be lined up with the centerline of the tire. It may be up to 1/4" behind the centerline but **NEVER** in front of the centerline.
 - b. Use a Digital Level placed inside the rim. Place the level on the ground and zero it out. Then place the level inside the rim and find the center of the tire, this will be the centerline of the tire/ axle. Hang a plumb line down to make a mark at the bulge of the tire.

If you have a Universal Mounting Bracket you can adjust the unit so that it hits on centerline by loosening the two Mounting Tube Flange Bolts and push the unit forward or backward so that the Chain Wheel hits the center of the tire.

If you have a fixed Mounting Bracket or a 3 Coupling Nut Style bracket, you can try adjusting this in the two mounting holes where the Chain Unit attaches to the Mounting Bracket.

7. Each chain strand has 10 links of chain for trucks with 19.5 tires and larger. If the strands drag on the ground in the disengaged position, you may cut 1 link off each strand. **DO NOT REMOVE MORE THAN 2 LINKS OF CHAIN.** On vehicles with 16" tires you only have 8 links of chain, **DO NOT REMOVE LINKS.** There must be a minimum of 9 links (8 links for 16" tires) for the Insta-Chains to work effectively. If they are still dragging on the ground or are close enough to the ground to cause undue wear, Insta-Chain sells a Chain Tray to raise the chains off of the ground.

TORQUE SHEET

INSTA-CHAIN PART NUMBER	FASTENER DETAILS	INSTA-CHAIN DESCRIPTION	NOMINAL TORQUING FT/LBS	
			DRY TORQUING FT/LBS	LUBRICATED TORQUING FT/LBS
CHAIN UNIT HARDWARE				
5211-W	M20x2.5 Nut GRD 8	Chain Wheel Nut	135	
5438	M10x2.0 Nylon Nut	Ball Joint Nut	45	
5134	M14x1.5 Nut	Extension Coupling Jamb Nut	75	
4613	3/8"-24 Lock Nut	Chain Plate Nut	45	
5207	3/8"-24 Lock Nut	Air Cylinder Nut	35	
5409-T	3/8"-16 Nylon Nut	Air Cylinder Clamp Nut	30	
5130-B	3/8"-16 Lock Nut	Stop Bolt Nut	30	
5135	3/8"-16x1 3/4 GRD 12 Bolt	Ball & Socket Arm Bolt	60	45
MOUNTING BRACKET HARDWARE SPECS (See Fig 1)				
0226	5/8"-11 GRD 8	Mounting Hole Lock Nut	128	
0250	5/8"-11 x 2 1/2" GRD 8	Mounting Hole Bolt	128	
Varies by Length	5/8"-11 GRD 8	Coupling Nut Bolt	175	
0226	5/8"-11 GRD 12	Mounting Hole Lock Nut	130	
90250	5/8"-11 x 2 1/2" GRD 12	Mounting Hole Bolt	135	
Varies by Length	5/8"-11 GRD 12	Coupling Nut Bolt (Heavy Duty See Fig 1)	185	
MOUNTING CONFIGURATION HARDWARE SPECS (See FIG.1 for Hardware Identification)				
Varies by Size	OEM U-Bolt Size	Coupling Nut (When installed underneath original OEM nuts)	130	100
Varies by Size	OEM U-Bolt Size	Coupling Nut (When OEM nuts are removed and replaced)	See OEM U-Bolt Specs	
Varies by Model	1"-14 Bolt GRD 8	Bar-Pin Mounting Bracket	See OEM Bar-Pin Specs	
Varies by Model	3/4"-16 U-Bolt GRD 8	U-Bolt Saddle Mounting Bracket	312	
Varies by Model	5/8"-18 U-Bolt GRD 8	U-Bolt Saddle Mounting Bracket	175	
SOLENOID SYSTEM HARDWARE				
5206	1/4"-20 Lock Nut	Solenoid Mounting Nut	5 lbs or (50 in/lbs.)	
5406	1/4"-20 Bolt	Solenoid Mounting Bolt	5 lbs or (50 in/lbs.)	
OEM U-BOLTS				
No P/N	Vehicle U-Bolt	OEM U-Bolts Replacement	See OEM Torque Specs	
<u>MUST READ IMPORTANT TIPS FOR INSTALLING INSTA-CHAIN PRODUCTS</u>				
<div>1.) Insta-Chains coupler nuts are required to be fastened underneath OEM U-bolt nuts with an Anti-Seize. 2.) Mounting bracket bolts are required to have high strength locking fluid when fastening bracket to its fixture. 3.) ALL NUTS can only be re-used and fastened THREE times (otherwise the lock nut will lose its locking set.) 4.) Always tighten bolts in cross patterns and in 1/2 torque stages until the appropriate torque is reached. 5.) All OEM U-Bolts should be fastened by using the OEM specs of torquing. 6.) Never exceed torque specs over 5% this will result in stretched bolts. 7.) Lubricated Torquing is defined as fastening a nut or bolt by using a thread locker or Anti-seize. (Anti-Seize is to be used on all through pins, coupling nuts, and U-bolts when fastening.)</div>				
<div><div><div>GRD 12</div></div><div><div>GRD 8</div></div><div></div></div> <div>FIG. 1</div>				

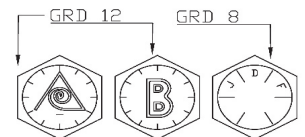


FIG. 1

Warranty

The Insta-Chain system is warranted to be free from defects in material for one (1) year from the date of purchase, or 50,000 miles, whichever comes first, when used for the purpose intended under normal conditions, except the solenoid valve, which is guaranteed for 90 days. If it has been past 90 days, Insta-Chain will try to obtain a manufacturer's warranty, but cannot guarantee any warranty replacement. This warranty does not include the following: freight charges, labor to replace the defective part, normal wear on the chains or chain wheels, failure to grease the wheel or arm bearings, or any problems resulting from improper installation of the Insta-Chain on the vehicle. Damage resulting from road debris, potholes, curbs, rocks or other things that could hit and damage the chain unit is also not included. Insta-Chain reserves the right to inspect the parts to determine whether to repair, replace, or return the damaged parts. Defective parts must be returned to Insta-Chain for warranty inspection. Abuse or misuse, including operating the Insta-Chains while driving over 30 mph, VOIDS any warranty.