

ZumSteel

INC.

PEDAL STEEL GUITARS

Owner's Manual

ZumSteel

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Product References

Mothers Mag & Aluminum Polish: is a Trademark of Mothers Polishes - Waxes - Cleaners.

3-in-1 Oil: is a Trademark of WD-40 Company.

TRI-FLOW Superior Lubricate with Teflon: is a Trademark of Tri-Flow Products.

WD-40: is a Trademark of WD-40 Company.

Prolong SPL100: is a Trademark of Prolong Super Lubricants.

Teflon: is a Registered Trademark of the E.I. duPont deNemours Company.

Manual Edition

Edition 001, May 2001

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FORWARD

Congratulations! You are now the proud owner of the finest Pedal Steel Guitar that money can buy! Twenty five years of design and building experience has gone into it. In addition to this, improvement suggestions from world famous steel players have been made over the years and many of these have been implemented. The builder, Mr. Bruce Zumsteg, takes great pride in his work and has done everything he can to assure the high quality of your guitar. In the Steel Guitar community, he has been highly praised for his work and the amount of consideration he gives to small details. As he once stated, "When an owner has a problem or question and calls, I'm the one that answers the phone and has to come up with the solution or answer." It may also be gratifying to know that your **ZumSteel** was not built on an assembly line. It was hand-crafted to your specifications and in one sense, it could be "one of a kind" as there may not be another one exactly like it in the world.

Take a few minutes to read the information contained in this manual so that you will be familiar with the mechanics and general workings of your new steel. With normal care and maintenance, your **ZumSteel Guitar** should last a lifetime!

Please note that if your new ZumSteel Guitar is a double-neck, it is equipped with a 3-position Neck Selector Switch which will allow you to select what signal(s) goes to your amplification system as follows:

1. Select the front neck only, extreme left position.
2. Select both necks, center position.
3. Select the rear neck only, extreme right position.

GENERAL MAINTENANCE

Your **ZumSteel Guitar** has been highly polished, pre-lubricated, and fully adjusted at the factory. It requires little, if any, further adjustments. Of course, various adjustments are provided to allow for personal “feel”. Also, periodic lubrication, along with routine polishing will be necessary as a part of normal maintenance.

Care of the Finish

1. **Laminate Surface:** The laminate surface of the guitar is almost as durable as the counter tops in modern kitchens. The only difference is that most guitar laminates are of the “high-gloss” variety but they still can be cleaned with a mild soap and warm water. Some Steel players use a high quality furniture polish and even a few use an auto paste wax.
2. **Buffed Hardware:** The buffed aluminum surfaces of the guitar can lose their shine, though oxidation, over a period of time. To restore the luster, use a non-abrasive polish such as **Mothers Mag & Aluminum Polish** and follow the directions on the container. It has also been found that the application of auto paste wax to the aluminum surfaces can improve the shine and actually retard oxidation.

Note: If you use a paste wax, it should **ONLY** be a **pure carnauba wax**. A lot of auto waxes, paste or otherwise, contain grit compounds which will scratch the surfaces and actually damage the high gloss shine.

Lubrication

1. **Under Carriage:** All Cross-Shafts for the ‘All Pull System’ are on bronze or nylon bushings and have been pre-lubricated. Several drops of light-weight machine oil should be applied to both ends of each shaft once a year.
2. **Changer:** The Changer has been pre-lubricated during assembly. You should lubricate this with a light-weight machine oil several times per year.
3. **Roller Nuts:** This area requires occasional lubrication to ensure proper string return. A liquid Teflon lube is highly recommended, although a light-weight machine oil will also suffice.
4. **Pedals:** The pedals are mounted on nylon bushings. A small drop of light oil, at each bushing, a couple of times per year, will keep the pedals working freely. The ball joint connections at the pedal rod ends are not lubricated. If a squeak should develop in any of these, a small drop of light oil will eliminate this squeak.

A good light weight oil is “**3-in-1**”. Also, on all oiling points, you can use a Teflon based lubricate such as “**TRI-FLOW Superior Lubricate with Teflon**” that can be found at most bicycle shops. **DO NOT** use **WD-40**, **Prolong SPL100**, or any other such product, on any part of the guitar. These products evaporate and leave a gummy residue which will eventually cause a ‘freeze-up’ of

moving parts.

TUNING PROCEDURES

Basic System

The basic **ZumSteel** tuning is done in three steps as follows:

1. Tune each string to its open string pitch using the Tuning Keys at the left side of the guitar. The pedals and knee levers should be worked occasionally to insure that the 'stretch' is all out of each string, especially when changing strings.
2. Next, tune each string that is "raised" by engaging the pedal or knee lever that raises it and then turning the Nylon Hex Nut within the right end plate that is at the right end of the guitar. Clockwise turning cause the string to sharpen, Counter-Clockwise flattens it.
3. Finally, tune each string that is "lowered" using the same procedure as in Step 2 but note that Clockwise turning causes the string to flatten while Counter-Clockwise sharpens it.

Notes:

1. A slight amount of slack, called "Back-Slack", is required in the linkage system to allow room for normal tuning. This slack has been pre-adjusted at the factory for the string gauges used, (See Attached Chart at the end of Manual). Should you require more or less slack for some reason in any one of the pedals, this may be adjusted with the Set Screw in the Crank Shaft Actuator, near the Pedal Rod Hook. (See Figure 1). Turn the screw clockwise to reduce slack and counter-clockwise to increase it. The screws should not be adjusted so close that they prevent proper return of the Changer.
2. Knee Lever back-slack is adjusted with a Cap Screw which is incorporated into the Knee Lever Hinge Bracket or into the Reversal Transfer Bracket. (See Figure 2).

TUNING PROCEDURES Continued

Feel Stop

The Feel Stop on the 2nd string, (D#), of the E-9th tuning is adjusted as follows:

1. Tune the string open, with the Tuning Key as described in the basic procedure.
2. Tune the full tone lower change, (D# to C#), with the respective Nylon Hex Nut.
3. Tune the half tone lower “feel” by adjusting the Red Nylon Hex Nut that lowers the 9th string, (D). This nut should be adjusted to make contact with the 9th string Changer Finger when the 2nd string reaches its half tone change, (D# to D).
4. With the knee lever fully engaged, the 9th string will undoubtedly be slightly off from where it should be, C#. Correct this by adjusting the Set Screw in the end of the neck, right side, behind the 9th string Changer Finger.

Split Tuning Option

Guitars equipped with this option allow you to obtain a “combination or middle” note on strings that are raised a full tone and lowered a half tone, or vice-versa. The tuning procedure for each string that is affected is as follows:

1. Tune the string to its open-tuning pitch with the Tuning Keys as described in Basic Tuning.
2. Tune the “raise” note with the Nylon Nut as per the Basic Tuning procedure.
3. Engage **both** the “raise” and “lower” functions by pressing the proper pedal/knee lever combination at the same time.
4. Tune the “resultant/middle” note with the Nylon Nut that lowers the string, turning clockwise to flatten it or counter-clockwise to sharpen it.
5. With only the single pedal/knee levers that lowers the string engaged, tune the “lower” note with the Set Screw in the end of the neck, right side, behind the Changer Finger for that string.

Note: If the string you are tuning has a “Blue Nylon Nut”, use this nut instead of the “Set Screw” as described in Step 5 above.

TUNING PROCEDURES Continued

Temperament Compensators

Most guitars will have two different types of Temperament Compensators, “Pedal Activated” and “Body Mounted”. Both types are tuned with “Black Nylon Nuts” and are tuned as follows:

1. **Pedal Activated:** Compensators are merely another raise or lower of a string to temper its tuning with other strings being changed by pedals/knee levers. The most common use is on the 1st and 7th strings, F# notes, on the E-9th tuning. These strings are the “9th” of the E-9th chord when no pedals are engaged but they become the 6th of the A-6th chord when pedals “A & B” are both engaged. More often than not, a perfectly tuned 9th, (no pedals), will be slightly sharp when it becomes a 6th, (A & B pedals engaged). Therefore, these compensators are provided to correct this by allowing you to lower these strings.
2. **Body Mounted:** Compensators are provided to correct a problem that is inherent in all Pedal Steel Guitars called Hysteresis. When a string is both raised and lowered, and all three tuning points, (open pitch, raise pitch, lower pitch), are correct, the problem can occur. When you lower the string and then release it, the string will have a tendency to come back slightly sharp. Therefore, you use the “body mounted” compensator to bring the string back down to its proper open string pitch.

ADDITIONAL ADJUSTMENTS

There are several additional adjustments that can be made to your **ZumSteel** Guitar. Some adjustments are provided to accommodate your own personal “**desire and feel**” while other adjustments are provided to correct potential problems that can happen over a period of time. Personal “feel” mainly pertains to the way your left foot matches up with the Floor Pedals and the way your knees match up with the Knee Levers. These will all be explained here.

Guitar Tilt

Your guitar comes with four telescoping legs and even though you cannot change the length of the two front legs, the two rear legs can be made slightly longer to put a forward tilt on the guitar. Some players prefer this. Please note that a forward tilt will also change the height of the guitar and this should not be necessary by itself. The height of the guitar is one of the customizing items that was taken into consideration during construction.

Pedal Height

The Ball Joint connections at the ends of the Pedal Rods can be adjusted to vary the height of the individual pedals to allow for the individual “foot feel” of the player. To do this, loosen the hex nut above the Ball Joint that locks it in place and then turn the Ball Joint to change the height. Please note that the Ball Joint, completely screwed onto the Pedal Rod, will take approximately 17 full turns. You should never back this off to where there is less than 3 or 4 full turns. Also, you must make sure that when you lower the pedal, don't lower it so far that it hits the floor when fully depressed.

To raise the pedal, you must screw the Ball Joint further onto the Pedal Rod. There are two things to consider here. One, if the Ball Joint is fully screwed onto the Pedal Rod, additional raising will only be possible by shortening the Pedal Rod itself, by removing a small piece at the threaded end. This should only be done as a last resort. Two, please note that due to the design of the Pedals and the Pedal Board, there is a limit as to how high the pedals can be adjusted. If the Pedal Rod is too short, you will not be able to attach it to the Pedal.

Finally, when you are satisfied with the adjustment, make sure the Ball Joint lines up with the actual “ball” on the Pedal and be sure to tighten the hex nut again to lock the Ball Joint into place. Because of the Ball Joint line-up with the “ball” on the Pedal, it should be obvious that “full-turn” adjustments are the smallest change that can be made.

ADDITIONAL ADJUSTMENTS Continued

Knee Lever Tilt

All Knee Levers have an individual tilt adjustment screw but these do not affect the tuning or the function of the knee levers. Adjust each screw to bring the knee lever to your desired position using the “Allen” type wrench provided.

Changer Return Springs

The Return Springs on the Lowering Fingers of the Changer have been adjusted at the factory and normally will require no further adjustment but the tensions vary for each individual string gauge. Therefore, several problems can occur if these springs are too tight or too loose as follows:

1. On a string that is both raised and lowered, the return spring must be tight enough to hold the Lowering Finger against the Stop Bar while the Raise Finger makes its complete travel. If the Lowering Finger pulls away from the Stop Bar, slightly tighten the Return Spring by turning the Phillips Head Screw at the Right End Plate until the conditions are satisfied.
2. Conversely, if the Return Spring is too tight, the Raise Finger will pull away from the Stop Bar when the string is lowered. If this occurs, loosen the Return Spring.
3. Sometimes, it might seem impossible to get both 1 & 2 above to work. If this happens, the Helper Spring for the string may be too tight. Proceed to the Helper Spring adjustment and then come back here.

Raise Helper Springs

The Raise Helper Springs have been adjusted at the factory and should not require any further adjustment but their adjustment will be explained here. The stronger the tension is on any one of these springs, the easier it will be to raise that string, i.e. less pressure required to engage the pedal or knee lever that raises it. However, on strings which are both raised and lowered, the Helper Springs may be increased in tension “**only**” as long as operation of the Lowering Finger does not cause the Raise Finger to pull away from the Stop Bar.

Pickup Height

The Pickup Height has been adjusted at the factory and should not require and further adjustment. However, the distance between the strings and the pickups affects both the tone and the sensitivity of the pickups. Therefore, you may want to make adjustments and experiment. Between the Pickups and the Changer, you will find two Philips-head screws that will change the height of the pickups. Most players have found that a distance of two American Quarters is the ideal height.

ADDITIONAL ADJUSTMENTS Continued

Undercarriage Leverage Options

Your ZumSteel Pedal Steel Guitar has better leverage options than any other available steel. All Pull Rods have been placed in the best Changer Hole, (three raise & three lower), and Bell Crank position, (six). to give the most balanced and even pulls for your custom setup. Should you wish to revise or add to your custom setup, the following information will provide you with the proper assistance.

The Bell Crank Fingers have six holes which are used for balancing two or more pulls and to set the desired pulling speed of a pull. Should you ever wish to change one or more, relocate the Pull Rods by removing the Retainer Pin, reposition the rod to the desired hole in the Bell Crank Finger, and then replace the Retainer Pin for each rod that you wish to move. (See Figure 3) Of course, once you have made changes of this type, you will no doubt have to re-tune the guitar.

The ZumSteel All-Pull System is designed to allow changes and/or additions with a minimum amount of effort. This is accomplished by using a Bell Crank Fingers, (the part with six holes), that can be placed on the Square Crank Shafts without removing anything else on that shaft. Once in place, (in the desired position on the shaft), insert the Cap Screw and tighten, snug only. **DO NOT ATTEMPT TO OVER TIGHTEN** this screw. The Pull Rod may now be inserted into the appropriate Changer Hole and the desired hole in the Bell Crank Finger. Use a Nylon Washer and Retainer Pin when attaching to the Bell Crank Finger. At the Changer side, insert a Spacer over the threaded end of the Pull Rod and screw on a Nylon Hex Nut.

STRING GAUGES

The following chart shows the basic tunings and string gauges used on **ZumSteel** Guitars.

E-9th			C-6th		
String No.	Basic Tuning	String Gauge	String No.	Basic Tuning	String Gauge
1	F#	.013	1	G or D	.012 or .015
2	D#	.015	2	E	.014
3	G#	.011	3	C	.017
4	E	.014	4	A	.020
5	B	.017	5	G	.024w
6	G#	.020	6	E	.030w
7	F#	.026w	7	C	.036w
8	E	.030w	8	A	.042w
9	D	.034w	9	F	.054w
10	B	.038w	10	C	.070w

When replacing strings, use the above gauges if possible. Any deviation from these gauges will no doubt require a slight adjustment of the Nylon Tuning Nuts and could even require re-locating Pull Rods in the Bell Crank Fingers. See the TUNING PROCEDURES Section should tuning adjustments be necessary and the ADDITIONAL ADJUSTMENTS Section should re-location of Pull Rods be necessary.