KEISER

Infinity Series

Operations & Maintenance
Manual

INTRODUCTION

We take pride in designing and building the highest quality fitness equipment on the market. This means that you will enjoy years of low maintenance and minimal repair from every one of our products. Only the highest quality products have the Keiser name on them.

This manual will assist you with the assembly, maintenance and safe operation of the Keiser Infinity Series. We strive to continuously improve our products, therefore, parts and machine designs are subject to change without notice. Please call our Service Department at (800) 888-7009 or visit our website at www.keiser.com for the latest product information.

CAUTIONS, WARNINGS AND NOTES

Please read all instructions contained in this manual prior to assembling and using this product. Failure to follow these instructions will invalidate the product warranty and could lead to serious injury.

We use the term ***Caution!*** to document things that could cause bodily injury to persons on or around the equipment if the information contained herein is ignored.

The term ***Warning!*** is used to ensure the proper installation of components for maximum machine life and user safety.

Note! is used to document things that we recommend and things to be aware of before performing a particular instruction.

WARRANTY

All products manufactured by Keiser Corporation shown in this manual are warranted against defects in materials and workmanship as follows (providing the damage was not caused by abuse, misuse, or neglect of normal care) :

Structural Integrity of Frame Members – 10 years;
Cylinders, Gauges, and all Electrical Components – 3 years (1 year if compressed air is not dried);
Compressor and Dryer, Cables, Pulleys, and Bearings – 2 years;
Pneumatic Valves and Chrome – 1 year;
Paint, Upholstery, Seat Belts, Hand Grips, and other Rubber and Plastic Products – 90 days

The warranty terms begin with the date of original delivery to be evidenced by appropriate shipping documents. Any alteration of the equipment so listed without express written consent of Keiser Corporation shall constitute a waiver by the buyer of this warranty. This warranty does not cover other brand name products distributed by, but not manufactured by Keiser Corporation which are subject to their respective manufacturers' warranties. During the warranty period, warranted defects will be repaired at Keiser Corporation, Fresno, Calif., or the defective part will be replaced, at the option of the manufacturer, without charge for either parts or labor to repair the defective part. This warranty does not cover the removal of the defective part and the installation of the repaired part. All claims under the warranty must be in writing and authorization obtained from the manufacturer, Keiser Corporation, to return defective parts for exchange. Defective parts must be returned to Keiser Corporation.

User's agents, or anyone directing the use of said equipment shall determine the suitability of the product for its intended use, and said parties are specifically put on notice that they shall assume all risk and liability in connection herewith. There are no warranties that attach to this product from the manufacturer either express or implied other than those specifically set forth above.

Process:

Call the Keiser Service Department at (800) 888-7009, Monday through Friday between 7:00 a.m. and 5:00 p.m. PST. Provide the following information:

Customer number:

Serial number(s):

As parts are ordered, the service technician checks the original delivery date to the customer, to determine whether the part is a warranty replacement or not. The parts are sent to whoever is responsible for the repair. Keiser Corporation will not be responsible for improper repairs made to Keiser machines. Keiser Corporation will not be responsible for non-authorized replacement parts used in repairs. Products or parts produced by another manufacturer and distributed by Keiser Corporation will be covered by the respective manufacturer's warranty.

Warning! ***Failure to follow the instructions as provided in this manual or any other instructions pertaining to the assembly and/or operation of this equipment will result in voiding the warranty and could lead to serious injury.***

PREVENTIVE MAINTENANCE SCHEDULE

This maintenance schedule is the recommended minimum requirement for all KEISER machines. Failure to follow these instructions at the suggested intervals will constitute neglect of normal care as required by the warranty.

Maintenance Schedule

MAINTENANCE CHECKS	DAILY	WEEKLY	MONTHLY	QUARTERLY
1. CLEAN CHROME WHERE APPLICABLE	✓			
2. CLEAN UPHOLSTERY	✓			
3. WAX CHROME WHERE APPLICABLE		✓		
4. WAX UPHOLSTERY		✓		
5. INSPECT BELTS		✓		
6. WASH HANDGRIPS		✓		
7. INSPECT FILTERS		✓		
8. CHECK NUTS AND BOLTS			✓	
9. CLEAN AND LUBRICATE CYLINDER RODS			✓	
10. LUBRICATE PIVOT BUSHINGS			✓	
11. CHECK EXHAUST MUFFLERS ON CYLINDERS FOR DISCOLORATION				✓
12. BE SURE COMPRESSOR IS CYCLING ON AND OFF BETWEEN 100-120 psi.				✓

Table 1

TROUBLE SHOOTING

The following section will help you to diagnose any problem that might occur on your KEISER machines. Find the problem in the under-lined headings and check each part of the system as described in the questions below it. By following this method, the most likely problems will be checked first.

PROBLEM: <u>No resistance when increase valve is depressed.</u>

Is the machine's quick-disconnect plugged into the air system?

YES ↓ NO → Plug in the quick-disconnect

Do all other machines work?

YES ↓ NO → Check the compressor

Does the machine work when plugged into another outlet?

NO ↓ YES → Replace that outlet

Are any hoses kinked or damaged?

YES ↓ NO → Check the valves

Repair or replace the hose

PROBLEM: Exercise action is rough, noisy, uneven, or spongy.

Are the cylinder rods clean and lubricated?

YES ↓ NO → Clean and lubricate rods (figure 7, pg. 15)

Are any hoses kinked?

NO ↓ YES → Straighten or replace damaged hose (see pg.9)

Are all pivot bearings lubricated?

(Note: Sealed ball bearings without fittings are lifetime lubricated)

YES ↓ NO → Lubricate the bearings (see pg. 21)

Are pivot bushings badly worn?

NO ↓ YES → Replace bushings

Is the exhaust muffler clogged?

NO ↓ YES → Replace the muffler (figure 7, pg. 15)

Check the cylinder bore for proper lubrication (see pg. 14)

PROBLEM: Pressure changes without valves being actuated.

Replace the valves (see pg. 11)

DIGITAL DISPLAY

The digital display is battery powered. Periodic maintenance is limited to battery replacement. The display will show the set resistance and repetition count during use. When the equipment is idle the display will go into battery saver or sleep mode and will display "off". When the batteries are approaching the need for replacement the display will show "loba" instead of "off". As long as there is any life in the batteries at all

pressing the increase or decrease buttons will activate the display and it will work as normal.

When replacing batteries use two industrial alkaline "D" cell batteries. These are accessed by removing the cover of the electronics box fastened to the frame of the machine. To remove the cover, pull or pry the sides of the cover outward to free the detent boss from the holes in the body of the box. No removal of screws is necessary.

When the batteries have been replaced the display will run through a self check flashing a series of numbers. Once the test sequence stops and the display shows "off" the equipment is ready to use.

AIR HOSES AND FITTINGS

COMPRESSION FITTINGS

All KEISER machines use polyethylene tubing and "compress-align" fittings to connect the various pneumatic components within the machine.

If an air leak is suspected, first listen closely to the air hose connections. Leaks will make a hissing noise. Very slight leaks may not be loud enough to hear. These may be detected by dabbing soapy water on the suspected leak. Escaping air will make bubbles. If the leak is at the fitting, first tighten the nut no more than one-quarter of a turn. Test the connection again. If the fitting still leaks, the nut must be replaced. In most cases the air hose should be long enough to allow this, if not, order a new air hose from KEISER.

<u>To install a new hose, fitting or nut:</u>

1. Cut the tubing as close as possible to the nut. The cut must be clean and square.

2. Slip a new nut over the tubing.

3. Insert the tubing into the fitting all the way to the shoulder inside the fitting (see cutaway illustration).

4. Hold the tubing in the fitting and slide the nut down onto the fitting. Tighten the nut as tight as possible with the fingers, then one full turn with a wrench.

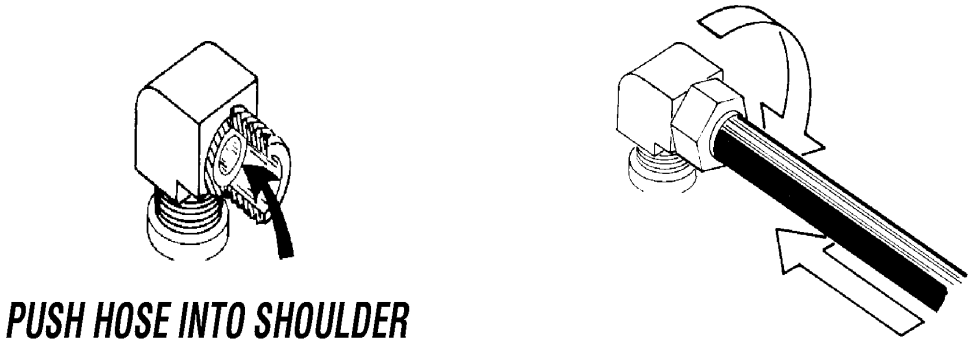


Figure 3

BARB FITTINGS

KEISER machines also use a 1/4" urethane hose. This is more flexible than the polyethylene tubing and is always installed on a barb style fitting. Barb fittings may also be used on some machines with the 1/4" polyethylene hose and are used on all thumb button air valves. Correct diameter of the barb is critical for proper sealing. Always use barb fittings supplied by KEISER for proper fit. Hoses are installed to the barb fittings by pushing the hose over the fitting. The barb ridges provide an air tight seal.

When replacing a component or hose using barb fittings:

1. Cut the tubing 1/2" away from the component to clear the barb ridges.

2. Pry the short hose section off the barb, being careful to avoid nicking or cutting the barb ridges.

3. Check the condition of the barb ridges. If they show cuts or nicks, replace the fitting. When replacing a barb fitting a thread locking compound (such as "Loctite® 242 -Blue") must be used on the threads to provide a proper air seal.

4. Push the end of the hose onto the fitting as far as you can.

Note: The urethane hose may be pried off the fitting without cutting the hose. The end of the hose will enlarge with repeated removals and will lose the ability to seal properly. If this happens cut 1/4" off of the end of the hose and reattach it to the barb.

QUICK-DISCONNECT

The feed hose is connected to the quick-disconnect using a barbed fitting on the quick-disconnect. If the feed hose must be repaired, shortened, or replaced, follow the procedure just outlined for **BARB FITTINGS.**

FILTER

The filter keeps moisture and dirt out of the cylinders and other components. KEISER air systems incorporate a refrigerant dryer on the compressor. Refer to the preventive maintenance chart for time interval for checking filters (table 1, pg. 4).

The filter on your KEISER machines is an “in line” filter. This filter cannot be disassembled and has no drain. When the filter element is dirty, the element turns a bright pink or red. At that point the filter must be replaced. Contact the KEISER Service Department for replacement filters.

All filters have a directional arrow and must be installed so the arrow points in the direction of air flow into the machine. Always decrease the resistance to zero before starting service or repair on any machine.

-CAUTION-
IF THE FILTER BOWL IS CRACKED, IT MUST BE REPLACED IMMEDIATELY.

-NOTICE-
IF FILTER BOWL IS CRACKED, AN AIR LEAK COULD RUN THE COMPRESSOR CONTINUOUSLY, PUTTING EXCESSIVE WEAR ON THE COMPRESSOR.

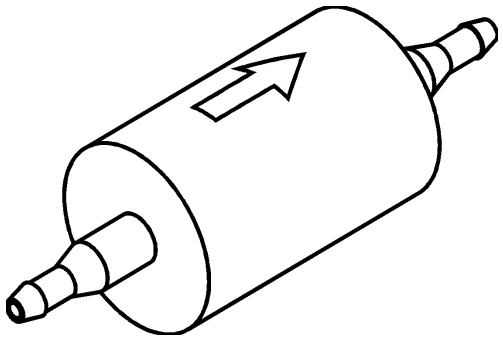


Figure 4

Direction of Air Flow in Filter

VALVES

-WARNING-

BEFORE ANY DISASSEMBLY, THE MACHINE MUST FIRST BE UNPLUGGED FROM THE AIR SUPPLY AND THE RESISTANCE DECREASED TO ZERO.

KEISER equipment uses a variable flow thumb valve capable of very fine adjustment to the resistance.

Note: There is a high pressure port and low pressure port on each valve. The decrease valve has the hose from the manifold connected to the high pressure port. The hose connecting the corresponding port on the increase valve should come from the filter and is the high pressure supply hose. If the hoses are not correctly installed, the valve will not seat properly and will not hold a set resistance.

REPLACING THUMB BUTTON VALVES

TOOLS REQUIRED: 5/64" Allen wrench, Slotted screwdriver, Sharp knife.

1. Unplug the quick disconnect on the supply hose and decrease the resistance to zero.

-CAUTION-

IF RESISTANCE IS NOT REDUCED TO ZERO BEFORE REMOVING THE +/- CAP, THE VALVE SPOOL MAY "SHOOT" OUT OF THE VALVE HOUSING.

2. Remove the +/- cap from the handle and pull the valve out using the flange on the valve. If you pull out on the thumb button, you will remove the thumb button spool assembly. Pull out until the hoses can be cut about 1/2" from the bottom of the valve housing.
   Mark the hose connected to the barb on the side next to the two ball plugs in the side of the valve housing. This is the high pressure hose and must be correctly reconnected or the valve will not seal properly.
   If you have a machine equipped with an optional digital display, the valve will also have one or two wire connectors plugged into the end.
   Sometimes it is necessary to push the hoses into the exercise arm where they enter it from the machine frame to get enough slack to remove the valve.

3. Disconnect any electrical connections, if you have two on one valve, they may be reconnected either way. Pry the hoses off the barb fittings or cut each about 1/2" from the end of the valve housing and pry the short piece off each barb. The

decrease valve has a short piece of hose on the barb that serves as an exhaust muffler.

-NOTICE

DO NOT CUT ACROSS THE RIDGES ON THE BARBS. DAMAGED BARBS ARE AREAS FOR POSSIBLE LEAKS.

4. Replace the valve, pushing the high pressure hose onto the barb on the side with the two pressed in balls. On the increase (+) valve the second hose connects to the machine system. On the decrease (-) valve the short notched hose or muffler connects to the other barb.
   Those machines equipped with the digital display also require plugging in the electrical connector. On these machines it is essential that the electrical wires have enough slack so the connector is not pulled off if the hoses must be pulled in during installation of the valve.

-NOTICE-

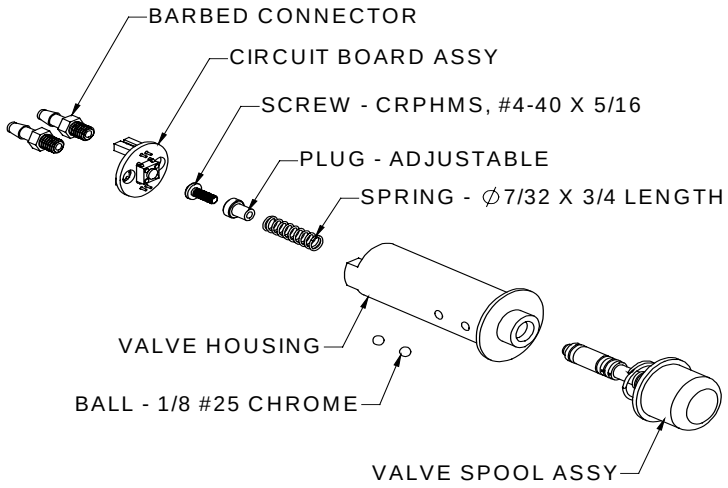
USE CARE DURING INSTALLATION. DO NOT PULL THE CAP OUT ON A NEW VALVE AS THIS WILL REMOVE THE CAP-SPOOL ASSEMBLY AND MAY DAMAGE ONE OF THE "O" RINGS ON THE SPOOL. IF THIS OCCURS THE VALVE MAY NOT SEAL PROPERLY.

5. Replace each increase (+) and decrease (-) cap with the (+) or (-) symbol toward the user when in the exercise position. When in the exercise position, the increase (+) cap should be on the right side handle.

6. Reconnect the quick disconnect to the compressed air system.

-NOTICE-

BOTH INCREASE AND DECREASE CAPS MUST BE SECURED IN PLACE. IF THE AIR SUPPLY IS CONNECTED WITH THE CAPS REMOVED AND THE THUMB BUTTON IS PULLED SLIGHTLY, IT IS POSSIBLE TO BLOW THE SEAL OUT OF THE VALVE



Digital Thumb Button

CYLINDERS

2 1/2" x 12" P/N 13-5316

TOOLS REQUIRED: Adjustable wrench, 5/16" or 1/4" Allen wrench and an oil can.

REMOVAL

1. Unplug the quick-disconnect from the air system and reduce the resistance to zero.

2. Remove the air hose from the cylinder. On machines with dual cylinders it is best to remove one cylinder at a time. If both cylinders must be removed, mark the cylinders and air lines to avoid mistakes during reassembling.

3. Remove the nuts and bolts holding the cylinder and clevis. Check the bearings in the tang end of the cylinder and the lever arm. If they are loose or worn, they must be replaced.

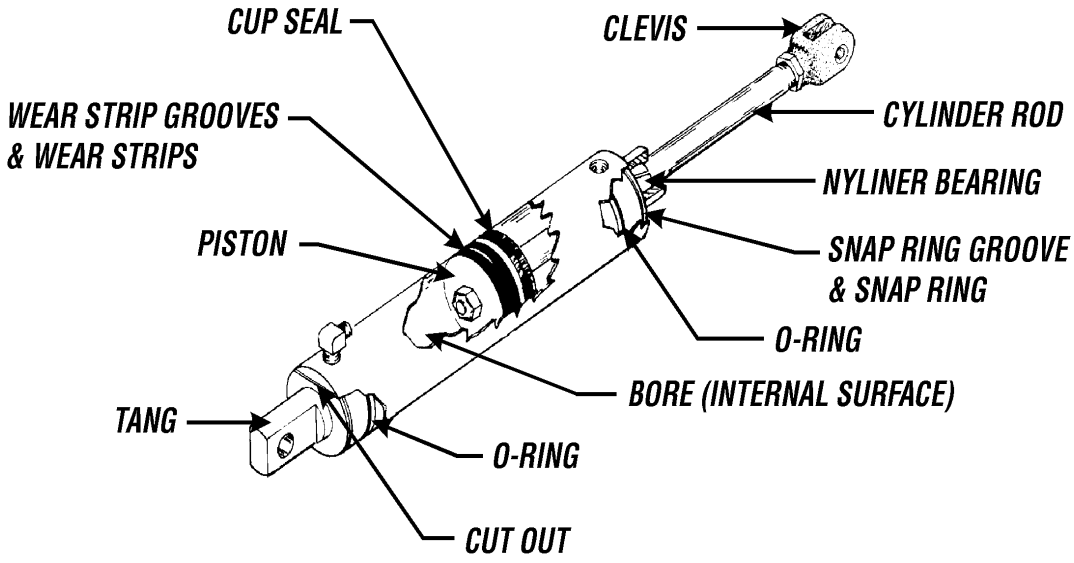


Figure 6

TO REPLACE THE CYLINDER

1. Put a drop of oil on the bearings and remount the cylinder. Tighten all nuts Securely.

2. Reattach the air hose. Tighten the nut finger-tight, plus one-quarter turn. Plug in the quick-disconnect and check for air leaks. If the fitting leaks, tighten the nut another one-quarter turn. If the leak persists, replace the nut.

CYLINDER SERVICING

-NOTICE-

IT IS VERY IMPORTANT THAT THE CYLINDER ROD AND BORE ARE NOT SCRATCHED OR DAMAGED IN ANY WAY. DAMAGED CYLINDER RODS AND BORES ARE AREAS FOR POSSIBLE AIR LEAKS.

TOOLS REQUIRED: 11/16" wrench or socket, internal snap ring pliers, rag and MT-55 light grease.

1. Using the 11/16" wrench, carefully remove the muffler from the end housing of the cylinder.

2. Clamp the tang of the cylinder in a vise or have someone hold the cylinder. If the ends of the snap ring are not visible; the end housing must be rotated until both ends are visible through the cut-out.

3. Pull the rod out 2/3 to 3/4 of the way. Squeeze the snap ring with snap ring pliers and pull on the rod to "tap" the end housing out of the cylinder (see Figure 7).

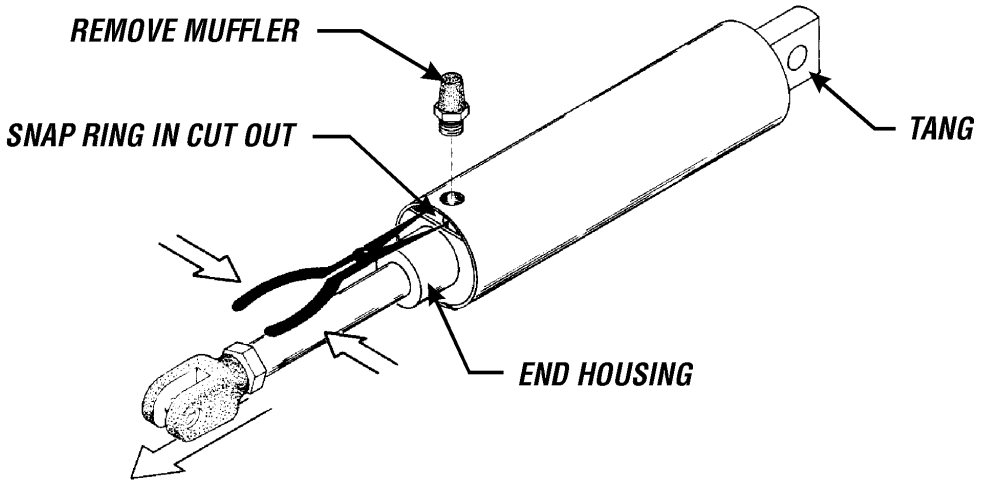


Figure 7

4. Wipe out the bore of the cylinder with a lint-free rag and inspect for scratches or uneven wear. If found, contact KEISER for a replacement.

5. Clean the piston and inspect for wear or damage. If any metal particles are found on the piston or inside the cylinder contact KEISER for a replacement.

6. Clean the wear strip grooves and apply a moderate coat of "Hydrotex® MT-55" light grease (available from KEISER) to hold wear strips in place during assembly. Lightly coat the bore, cup seal, piston and wear strips with MT-55 light grease. Carefully reassemble the cylinder.

-NOTICE-

OPEN END OF CUP SEAL MUST FACE AWAY FROM THE CYLINDER ROD.

7. Apply a very light coat of lube to the muffler threads and reinstall snug, but not tight.

8. Operate piston by hand through its stroke. There should be no stickiness or metal to metal contact.

9. Wipe the cylinder rods clean and coat them lightly with clean, SAE 30 wt. Motor oil, or with Silicon-based spray.

CYLINDER ADJUSTMENT

Cylinders are factory-adjusted and need not be readjusted unless the cylinder or clevis becomes loose or is replaced. While each machine is checked differently, cylinder adjustments are basically the same.

TOOLS REQUIRED: 2 large adjustable wrenches.

1. Hold the clevis in position with a wrench as shown (figure 8-1) and loosen the

lock nut.

-NOTICE-

LOOSENING THE LOCK NUT WITHOUT HOLDING THE CLEVIS CAN DAMAGE THE BUSHINGS, CLEVIS AND THE CYLINDER ROD.

2. Adjust the rod length (figure8-2) as required.

3. Hold the clevis and tighten the lock nut. Watch the rod to make sure it does not turn while tightening the nut.

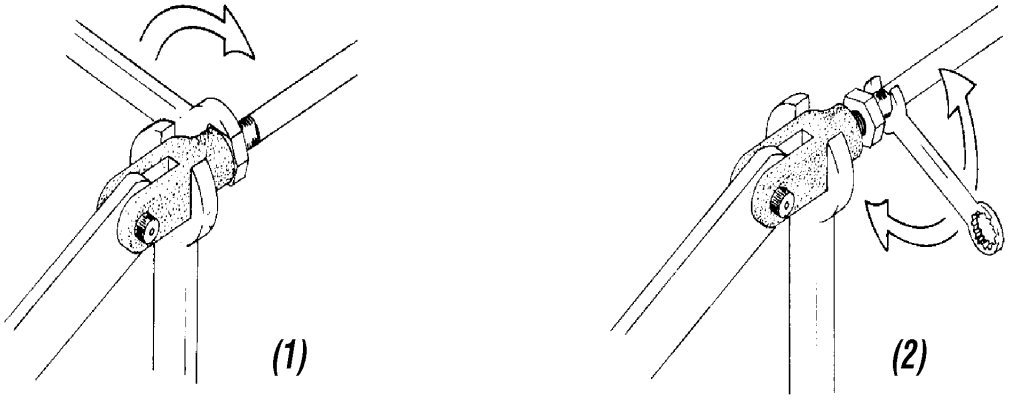


Figure 8

MUFFLERS

The mufflers on the rod ends of the cylinders should be replaced at any time cylinder problems are suspected. Removing the muffler and moving the exercise arm through its range will determine if the muffler is clogged. A clogged muffler will make the motion spongy or rough. When replacing a muffler, coat the threads with oil, silicon lubricant, or "WD-40", and reinstall snug but not tight. Mufflers should be replaced every 12 months. Contact the KEISER Service Department for replacement mufflers.

FASTENERS

NUTS, SCREWS AND SET SCREWS

Tightness of nuts and screws should be checked monthly. Most screws should not be tightened any more than necessary to keep them from turning freely. Any screws that need to be torqued are noted in the previous pages.

All screws must use self locking nuts to prevent loosening. Those, which thread into tapped holes (including set screws), must be retained by a thread locking compound such as “Loctite® 242 (blue)”. Screws, which bear on painted surfaces, will normally have a washer to protect the surface.

There are several types of screws used in the equipment. Hex head cap screws are “Grade 5” and are general purpose screws used for most assemblies. Shoulder screws are “Grade 8” and have a hardened and ground shoulder portion. The size of a shoulder screw is determined by the diameter of the shoulder. These are high strength screws generally used as linkage pivots.

Socket head cap screws have a recessed hex in a round head (similar to shoulder bolts) and are “Grade 8”. These are high strength screws used in critical load bearing applications such as retaining cams and belts.

All high strength bolts should be torqued to the tabulated values to obtain maximum strength. Screws used for clamps must be tightened gradually so both sides pull in evenly. The cap of the clamp must stay parallel to the mating half so the screw heads bear evenly on the cap. Only once the cap has been securely snugged down should the bolts be torqued.

Note: When screws are installed using a thread locking compound (such as “Loctite®”) torque to the lower value of the range listed.

When replacing screws use an equal or higher grade. Socket head cap screws must be non-plated to achieve maximum strength.

BEARINGS

The 1/2", 5/8", and 1" flange bearings must be lubricated every 3 months. Using SAE 30 wt. motor oil, put one drop on the exposed portion of each bearing. Move the machine through its range to work the oil in, then wipe the area around it free of exposed oil.