

AIR 250 Parts & Maintenance Manual

KEISER®

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HOW IT WORKS

SAFETY CAUTIONS:

KEISER has put a number of safety cautions in this manual. We use the word **CAUTION** to inform you about things that could cause bodily injury to persons on or around the equipment if you were to ignore these warnings.

MACHINE DAMAGE NOTICES:

Also, in this manual you will find the word **NOTICE**. This is information about things that could hurt the machine if the warnings were ignored.

KEISER exercise machines provide infinite adjustable resistance, which can be increased or decreased by the user during exercise. KEISER Air 250 machines control resistance by means of thumb buttons at the hand grips. Resistance may be easily changed at any time during the workout. Resistance may also be set low during extension then increased prior to contraction for a higher resistance or negative exercise.

ALWAYS USE EXTREME CAUTION WHEN ADJUSTING RESISTANCE DURING NEGATIVE EXERCISE TO AVOID DAMAGE TO THE JOINTS, TENDONS AND MUSCLES.

When adjusting for a negative exercise, the correct resistance reading will appear only after returning the exercise arm to the rest position.

Each machine has a supply hose with a quick disconnect fitting plugged into a compressed air system. Air flows into the machine through this hose and through a filter, which removes moisture and particles that may be harmful to the machines components. Pressing the increase (+) button allows air to flow into the cylinders, tanks, and processor box. The more air let into the machine the greater the resistance will be. The maximum resistance will be determined by the pressure available in the compressed air system; this should be 100 PSI. Moving the exercise arm from the rest position moves the piston in the cylinder. This compresses the air in the cylinder into the tanks. The air pressure against the cylinder piston creates a mechanical resistance. The amount of resistance will be determined by the amount of air in the machine and the leverage of the exercise arm on the cylinder. Resistance is lowered by pressing the decrease (-) button, allowing air to flow out of the machine and into the atmosphere.

The digital display will hold the resistance reading once set and will not show a change during exercise motion. An exception to this occurs when the user adjusts the resistance during the exercise (as in doing negatives). In that case, the reading will vary during exercise motion, but will show and hold the correct resistance the next time the exercise arm is returned to the rest position. The digital display will also show the repetition count. If the resistance is changed during the exercise, the display will skip a count until another full exercise stroke has been performed. Then the repetition count will resume.

For those users who are extremely deconditioned and find that the lowest resistance is still too high, the resistance may be decreased below the normal minimum by pressing and holding the decrease (-) button while moving the exercise arms through the full range of motion. When at full extension, release the decrease (-) button and return the exercise arms to the rest position. This will create a vacuum in the machine and will counterbalance most or all of the weight of the exercise arms. In this condition the display will not show the correct resistance.

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 KEISER machines. Find the problem in the under-lined headings and check each part of the system as described in the questions below the heading. By following this method, the most likely problems will be checked first.

PROBLEM: Resistance not increasing when “+”button is activated.

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 bad 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 (see cylinder servicing, pg. 13)

Are any hoses kinked?

NO ? YES ? Straighten or replace damaged hose (see pg7)

Are all pivot bearings lubricated?

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

YES ? NO ? Lubricate the bearings (see pg. 19)

Are pivot bushings badly worn?

NO ? YES ? Replace bushings

Is the exhaust muffler clogged?

NO ? YES ? Replace the muffler (figure 7, pg. 13)

Check the cylinder bore for proper lubrication (see pg. 12)

PROBLEM: Pressure changes without valves being operated.

Replace the valves (see pg.9)

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", for low battery, instead of "off".

When replacing batteries use two industrial alkaline "D" cell batteries. These are accessed by removing the cover of the processor 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.

Wire Cable Part Numbers

- 110830 Digital Thumb Button
- 600801 Digital Processor Box
- 600803 Digital Display Gauge
- 962004 Connector-2mm Amp.F 2 Pin (x 2 for a set of thumb button wires)
- 962005 Connector - Mod M4-4 Hand (x 2 for a set of thumb button wires)
- 962006 Connector - Mod M4-4 Std (x 2 for a gauge wire)
- 966701 4 Cable - flat 4 wire-26 GA.

Wire and Hose Lengths

Model #	Pos. Thumb Button			Neg. Thumb Button		To	To Control	Feed	Gage	3/8" Poly
	+ Side(in)	- Side(in)	Wire(in)	+ Side(in)	Wire(in)	Tank(in)	Box(in)	Hose(in)	Wire(in)	Tubing(in)
1121	15.25	18.25	31	29.25	46	15.75	25.5	84	36	21.25
1122	15.25	18.25	31	29.25	46	15.75	25.5	84	36	21.25
1221	46	46	68	56	83	10	22.5	84	33	21.25
1222	46	46	68	56	83	10	22.5	84	33	21.25
1321	72.25	72.25	77	72.25	77	18	27	132	81	13
1335	72.25	72.25	103	72.25	103	18	32.5	132	58	(2) 16
1621	65	65	70	65	70	8	18	120	72	11.75
1721	85	80	143	80	143	4.75	35	84	53	4.75
1921	87	87	99	87	99	21	33	132	73	24
2021	52	52	115	52	115	7.5	22	132	55	10.5
2021(con)	35	35	35	35	35					
2021(con)	20	20		20						
2121	80	80	101	80	101	55	58	132	54	14
2221	100	88	135	105	155	23	24	132	52	7.125
2521	13	16.25	53	22.25	53	20	60	132	53	27
2521(con)										(2) 1.125 seat sleeves
2521(con)										
2621	65	65	113	100	Connect to +	5	16	100	48	35.5
2621(con)	65	65	85	35	thumb but.	5				
2721	75	75	67	75	67	10	34	108	54	15
2821	50	50	66	80	99	35	33	84	64	8.5

AIR HOSES AND FITTINGS

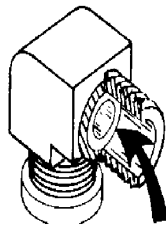
COMPRESSION FITTINGS

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. (NOTE: DO NOT GET WATER ON ELECTRONICS.) 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 Service Department (800) 888-7009.

To install a new hose, fitting or nut:

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 Figure 3).
4. Hold the tubing in the fitting and slide the nut down onto the fitting. Tighten the nut as tight as possible with fingers, then one full turn with a wrench.



PUSH HOSE INTO SHOULDER

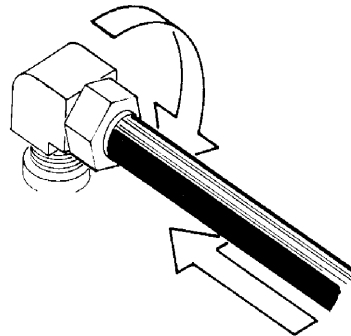


Figure 3

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.

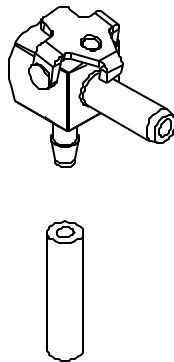
When replacing a component or hose using barb fittings:

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 metal 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 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 preventative maintenance chart for time interval for checking filters (pg.4, table 1).

The filter on 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 (800) 888-7009 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 (see figure 4). Always decrease the resistance of the machines to zero and unplug from the main air supply 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.

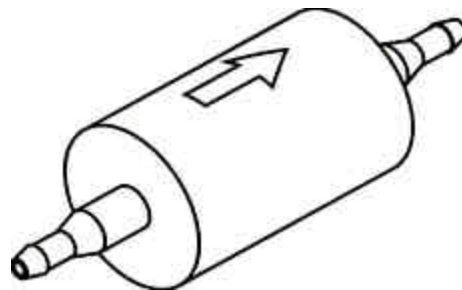


Figure 4

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 finely adjusting 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: 3/32" Allen wrench, Standard screwdriver, Wire Cutters
(Read entire instructions first).

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

-CAUTION-

IF RESISTANCE IS NOT REDUCED TO ZERO AND UNPLUGGED FROM THE MAIN AIR SUPPLY 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. By pulling out on the thumb button, the thumb button spool assembly will be removed. 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. 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 digital display wires from the thumb button plugs. If there are 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.

Digital Display wires must be re-connected. 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.

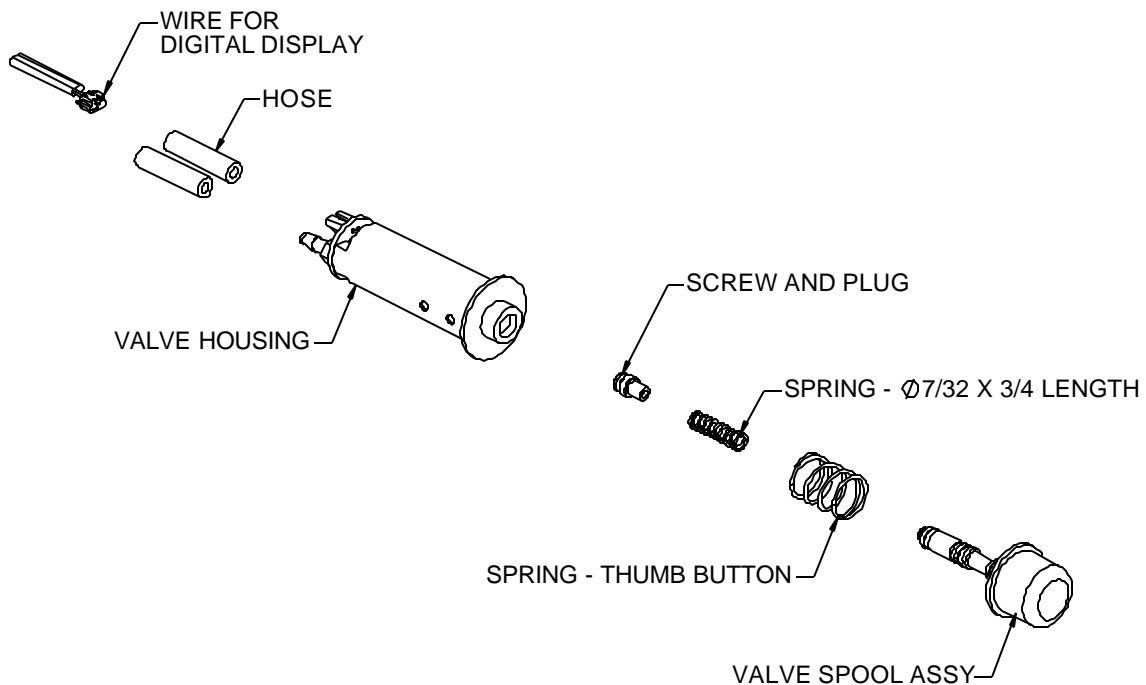
-NOTICE-

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 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

Three types of cylinders are used on the KEISER machines:

2 1/2" x 7" P/N 115317

2 1/2" x 12" P/N 135316

4" x 12" P/N 155314

Maintenance procedures are the same for all three types of cylinders.

TOOLS REQUIRED: Adjustable wrench, 5/16" or 1/4" Allen wrench and SAE 30 Wt. Motor Oil.

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.

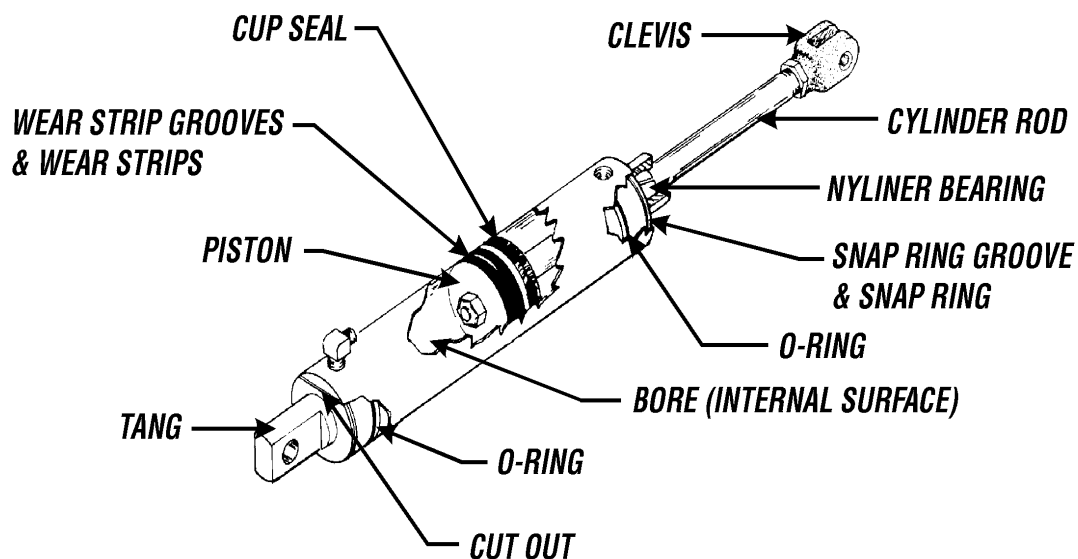


Figure 6

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).

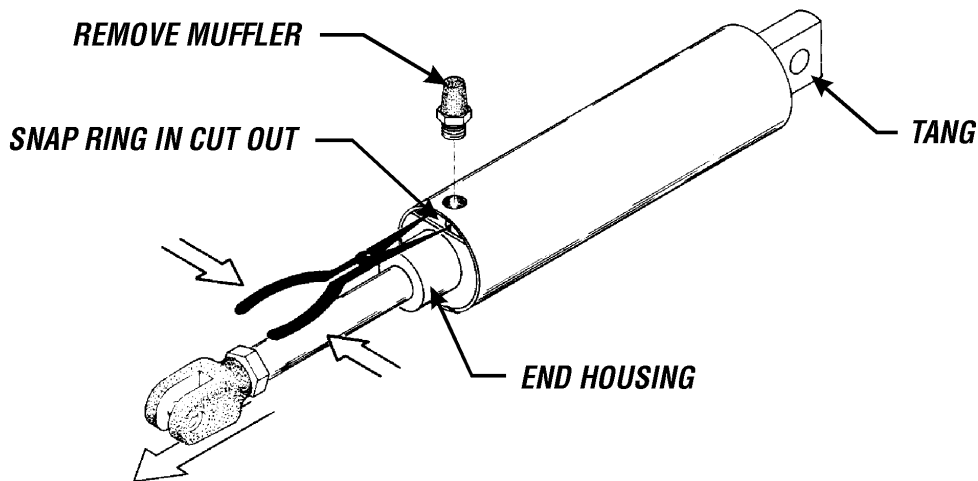


Figure 7

4. Wipe out the bore of the cylinder with a lint-free rag and inspect for scratches or uneven wear. If found, contact KEISER Service Department (800) 888-7009 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 Service Department (800) 888-7009 for a replacement.
6. Clean the wear strip grooves and apply a moderate coat of "Hydrotex[®] MT-55" light grease (available from KEISER Service Department) 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 oil 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.

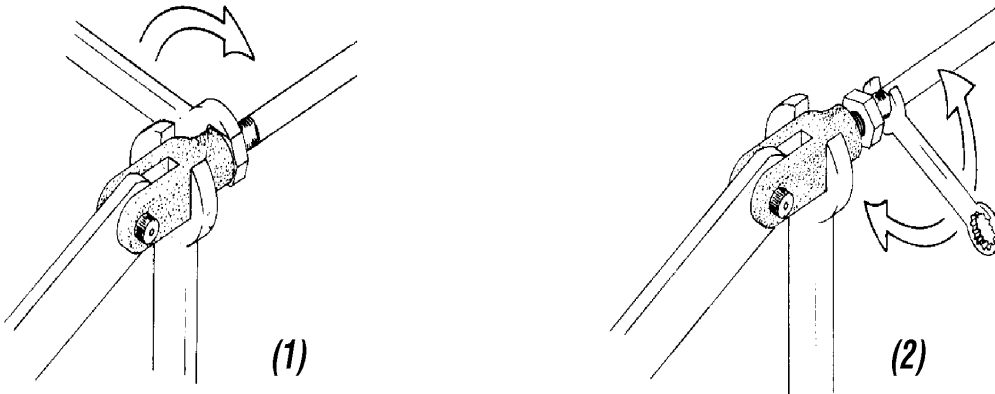


Figure 8

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 (800) 888-7009 for replacement mufflers.

FLAT BELT

Some of the KEISER machines transmit force from the exercise arm to the cylinder linkage arm through a special flat belt and pulley arrangement. There are two general systems in use. First, for bilateral machines in which the end of the belt is connected to both exercise arms and moves the cylinder linkage through a moving pulley (pivotally attached to the cylinder linkage arm). Second, for unilateral machines in which the end of the belt is connected to the single exercise arm and passes over a stationary pulley mounted to the machine frame, then fastens to the cylinder linkage arm.

BILATERAL MACHINES

1. Unplug the quick disconnect fitting from the air supply and reduce the resistance to zero.
2. Remove the screws in the clamps at both ends of the belt and remove the belt.
3. The belt has one side that is smooth and one side that is rough. Install the new belt so the smooth side lies against each pulley. Use "Loctite? 242" on each screw and reinstall clamps.

4. Pull each end of the belt through its clamp about 2" and tighten the screws enough to hold the belt under light load. Reconnect the quick disconnect and slowly move the exercise arms through the full range of motion. The belt should remain taut when the exercise arms are returned to the stops. For those machines on which the hand grips can come together at full extension, extend both exercise arms simultaneously to their maximum position and adjust the belt length as needed to give thumb clearance between the two thumb buttons. Be sure to bring resistance back to zero before loosening clamps.
5. After making final adjustments to belt length, torque each "Grade 8" 1/4" clamping screw to 15-20 ft.-lbs.

UNILATERAL MACHINES

1. Unplug the quick disconnect fitting from the air supply and reduce the resistance to zero.
2. Remove the screws in the clamp at the cylinder arm end of the belt and slide the end of the belt out.
3. Remove the single bolt and keeper washer from the pivoting bracket at the other end of the belt.
4. To install a new belt, fasten the single screw end first. For standard (non-range limiter) machines install the belt so the smooth side will ride against the pulley. For range limited machines install with the smooth side of the belt against the pivoting bracket. Note that the bracket is made with one mount surface almost in line with the pivot center. The belt should lie against that surface so it pulls straight through the pivot center. The outside of the belt should clamp with the keeper washer with the recessed side against the belt. Torque the "Grade 8" 5/16 " screw to 25-35 ft.-lbs. Be careful to keep the belt straight.
5. Route the belt over the pulley and under the clamp on the cylinder arm. Use Loctite[®] 242 on the 1/4" and reinstall the clamp. Pull the belt through about 2" and tighten the screws enough to hold the belt.
6. Plug the quick disconnect into the compressed air supply and slowly increase resistance to 10-15 lb. standing clear of any exercise arms that may be extended. Move the exercise arm through the full range of motion checking that the belt remains taut when the exercise arm is returned to the stop. If necessary, decrease pressure to zero and take up belt slack.
7. When the belt length is correctly set, go through the complete range of motion, observing whether the belt is tracking straight and clears the sides of the slot in the range limiter.

8. Once the belt is tracking properly torque each “Grade 8” 1/4” clamping screw to 15-20 ft.-lbs. If the belt will not track properly, contact the Keiser Service Department, (800) 888-7009.

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.

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”. 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.

SPRING PINS

TOOLS REQUIRED: Drift punch and hammer

Spring pins are used to hold a shaft in place. Spring pins are always shorter than the diameter of the shaft. The procedures for removal and replacement of spring pins are as follows:

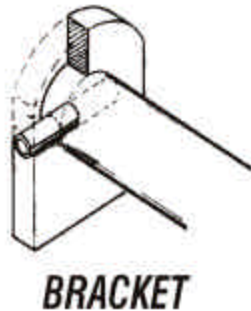


Figure 9

SPRING PIN REMOVAL

-WARNING-

EYE PROTECTION MUST BE WORN WHEN REMOVING SPRING PINS.

1. Look at the exploded view of the machine in the parts section and find the size of the pin.
2. Using the proper size drift punch, tap the pin into the shaft until the pin is completely out of the bracket.
3. Remove the shaft from the bracket and tap the spring pin through and out of the shaft.

-NOTICE-

ALWAYS REMOVE THE PIN FROM THE SHAFT IMMEDIATELY. ACCIDENTAL INSTALLATION OF A SECOND PIN WILL DAMAGE THE MACHINE.

SPRING PIN REPLACEMENT

1. Check the hole in the shaft to make sure the old pin has been removed. Check to ensure that the new spring pin will fit snugly in the hole in the shaft. If it is loose, the shaft must be replaced.
2. Assemble the shaft in the bracket.
3. Tap the new spring pin into the bracket until the end of the pin is flush with the outside. Be careful not to damage paint.

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.

HAND GRIPS

All fixed grips are replaced as follows:

THUMB BUTTON GRIP

1. Remove the old grip from machine and clean the handle with rubbing alcohol. Be sure not to get any rubbing alcohol on the thumb button.
2. Slide the grip sleeve onto the handle about 1/2" past the thumb button.
3. Slide the grip end cap onto the end of the handle and position the set screw. Tighten the set screws while holding the cap all the way onto the handle. Those end caps with (+) or (-) should be turned with the symbol toward the equipment user. **NEVER OVER TIGHTEN THE END CAP.**

PARTS IDENTIFICATION

Part numbers shown in this manual are unique to KEISER equipment. Six-digit numbers are KEISER-built parts, and can only be obtained through KEISER CORPORATION. See the back of the maintenance manual for fax and telephone numbers. The four digit part numbers are standard fasteners and fittings available through most hardware stores. Bolts and nuts are zinc or nickel plated and are a minimum of grade 5. Pneumatic fittings are PARKER "Compress-align", or standard pipe fittings. Upholstery part numbers given are for our standard upholstery. Special-order upholstery must be ordered from KEISER.

FOR ANY QUESTIONS OR ASSISTANCE, PLEASE CALL KEISER SERVICE DEPARTMENT; (800) 888-7009