



Owners Manual for Gas-Powered Models

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QUICK REFERENCE GUIDE

There is really only one thing that will usually cause problems: Failure to read the complete manual and not following the simple, step-by-step procedures!

The following guide is exactly what is implied: a quick overview of areas that need your special attention, but is NOT designed to replace reading the entire Manual. Failure to do so can, and/or will, result in non-warranted equipment failure or worse, injury.

1. This unit is shipped without oil. When adding oil, fill to the middle of the threads. The unit should be on a flat surface to observe the level of the oil. There are 2 oil fill ports. The light gray oil port plug has a dipstick. **The oil-alert system on the 4 and 5 HP engines could sense low-oil in a rocking sea and shut off. It has been disconnected for your safety. It is, therefore, the user's responsibility to check the oil daily.**

2. Add a light coat of marine lube to all the engine's metal parts before introducing it to salt water, and, after each day's use. Our recommendation is Boeshield T-9 or CorrosionX. **In a marine environment, this will be very important to you in protecting your investment. DO NOT spray protectant into the vented cover on the compressor, because you don't want to introduce any chemicals near the air compressor cylinder that could work their way into the air supply. The compressor already has an acrylic coating to protect it against corrosion.**

3. Approximately 1 foot of the end of the black heat hose must be in the water to cool the hot air before it gets to the more heat-sensitive yellow air hoses. For relatively short periods of time, like start-up testing, it is OK to leave the black heat hose out of the water. When the yellow hoses are not connected to the black heat hose (*for example, for the cleanup procedures*), the engine/compressor can run as long as needed without the black hose in water.

4. The splash cap attached to the black plastic air intake socket has a smaller red cap inside it. This is a measuring device for dumping fresh water into the compressor head to help remove internal salt deposits on the valve plate(s). **READ THE CLEAN UP AFTER THE DIVE DAY SECTION!!**

5. Use a gas stabilizer FULL TIME to prevent carburetor fouling from gas shellacing. By doing this you will be flushing the carb every time you use the gear. Every time you buy gas, add the prescribed amount of stabilizer.

DON'T GO NEAR THE WATER!!

"Without T-9 on your new Air Line." (Or, at least, some acceptable substitute.)

This is a must, around saltwater, to keep your life-support equipment looking good and in dependable working order.



The tests are in. **Boeshield T-9** and **CorrosionX** beat the can (oil can, that is) off the better-known, but cheaper hardware store products. They simply don't hold up in a dynamic marine environment. Silicone spray is O.K., but the viscous residue is messy to handle and attracts sand like a magnet. WD-40 is fine for a limited time, but just doesn't last under the splash of a choppy sea and is not good for rubber parts. Boeshield T-9 and CorrosionX have been proven to be the most durable for the gas-powered units for the tenacity of its waxy film.

It is **ESSENTIAL** that you follow this recommendation: Fuel and oil the engine according to the Honda manual. Attach the air intake staff in the black air intake socket. Liberally apply protectant to all metal surfaces on the engine. On the 4 and 5.5 HP engines, pay particular attention to the gas tank by loosening the cap and coating the rim of the unpainted tank. Don't overlook the underside of the cap. Spray the bare, tank mounting bracket from beneath. The red extension tube on the can works well for this. Coat all the hardware and screws. Lubricate the linkages. Inspect your work to ensure thoroughness. Let the fluid penetrate for several minutes, then wipe off the excess with paper toweling. A light coating is all that should remain on the surface. **It is unnecessary to coat the compressor as it is marinized at the factory. In fact, you should NEVER spray or use any chemicals in the compressor, because you don't want anything to get in the diver air supply.**

Spray protectant into the pull cord housing to protect that pull cord mechanism.



(This next step is a post-dive procedure, and is out of place here, but as it is similar to the pre-dive procedure you'll find it easier to remember.) After the dive day, when the engine has cooled down, put the air intake staff in and start the engine. Let it run at approximately half speed. Wash off the assembly with fresh water as soon as you start it. Spray it thoroughly. Two precautions: **1. Do not force, or squirt water into the engine air intake or the compressor air intake.** **2. Never spray water on a hot engine.**

Also spray into the pull-cord housing and then let the engine run for a minute, or two to make sure everything is dry before storing your unit. **After it has dried, touch up with protectant (if protectant has worn off), especially the lip under the gas cap, the hardware and all the bare metal.** Do this after every dive day and your Air Line will look good and work efficiently for years.

There are other simple, but important, post-dive procedures. They are explained in detail in the section appropriately called “**After the dive day**”.

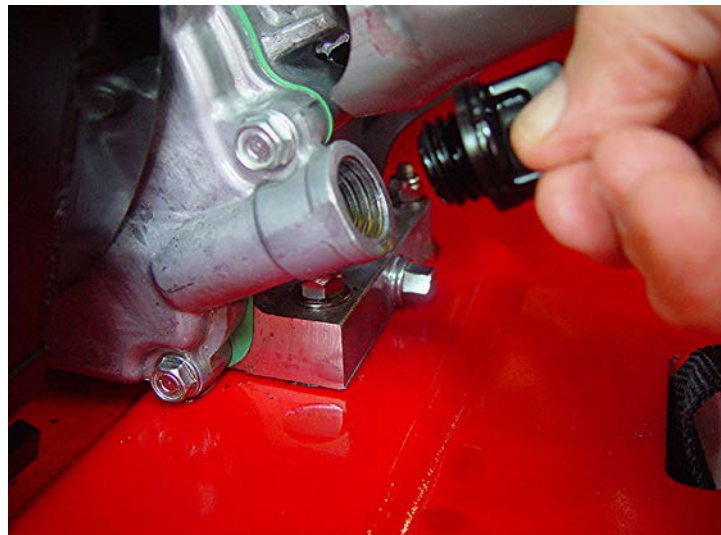


Before you get started, assemble a few items so you can complete the process without having to go look for things. You will need a can of Marine grade, lube/protectant (Manufacturer's choice is Boeshield T-9 or CorrosionX), a few watch-band size, and larger, Velcro ties, and a long stem funnel for adding oil to the engine. If you have purchased a #1905 Service Kit for the R260-4, you will also want a Phillips screwdriver and a #25 Torx. If you own an R360XL, the service kit is a 1915. Tools required are a 3/8 socket, w/extender; a #25 and a #20 Torx and a 5/32 Allen wrench. (More on the Service Kit, under Periodic Maintenance.)

Technically, you really don't need any tools to start, although the Velcro comes in very, very handy. For sure, procure a gas additive/stabilizer. Because of California EPA restrictions, the carburetor jets are very small to cut down on exhaust emissions. But, because they are so tiny, they are unforgiving and will clog up rather easily if the engine is inactive, even for fairly short intervals such as a few weeks. The recommended and effective procedure is to use fuel stabilizer full time. Meaning, add it to your gas container every time you fill it at the gas station. That way you won't have to remember to add it to the gas tank. The effect will be that the carb will always be flushed during normal usage and the need to clean the carb will be reduced if not eliminated. *You can clean the carb jets yourself, but why, if you can prevent it?*

DON'T BURN UP YOUR NEW ENGINE!

The engine dip stick will appear to have oil in the reservoir. This is only a residual from when it was tested. Never assume there is oil in the engine. **Never start your unit without first unscrewing the plug and seeing the oil from the middle to the top of the threads.** The engine is 4/cycle: no oil/gas mixing is required. The new unit is shipped without fluids. Follow the Honda manual's recommendations for type and amount. Fill to mid threads. Make sure you can see the oil level. There are two fill holes for the same oil reservoir. Use whichever one is most convenient and easiest to access. A long stem funnel will be very helpful to add oil.



Although this equipment is much easier to use than the more cumbersome scuba gear, it is still a serious LIFE SUPPORT SYSTEM and must be used only by trained divers who fully understand the effects of breathing compressed air underwater. **If you don't FULLY UNDERSTAND any of the skills required for safe diving, it is essential that you seek RE-TRAINING at a qualified diver training facility.** Before allowing anyone to use this equipment **IT IS YOUR OBLIGATION, AS THE OWNER,** to have them seek training from an agency, such as NAUI, SSI, PADI or NASE. All users must be certified in Surface Supplied Air or Scuba. You might think you are being a pal to let someone try it because “he snorkels a lot”. Risk the friendship; don’t give in.

Knowing your maximum depth capability for making a free ascent in an out-of-air situation is an important first step. **NEVER USE THE EQUIPMENT PAST YOUR FREE ASCENT CAPABILITY.** We **highly recommend and stress the need for an independent, back-up air supply, available from The Air Line or from your local dive shop.**



Your Air Line is designed for shallow water, unobstructed diving and should never be used in enclosed areas, such as caves, shipwrecks or ledge overhangs. Air Line diving requires most of the same skills as Scuba, but there are a few important differences.

Your system comes set up for at least two divers. This makes it economical, but more importantly, it adds to it’s safety by encouraging the practice of diving with at least one other person.

NEVER DIVE ALONE.

Dive with an experienced buddy after having carefully planned your dive.



Your unit has the capability of running for long periods of time (*much longer than Scuba*), and therefore requires EXTRA ATTENTION TO DEPTHS AND DOWN-TIME. **The rules for decompression are identical when breathing compressed air, regardless of the air source (i.e., compressor or scuba tank).**

You are cautioned to **never dive past a no-decompression time limit on any surface supplied air system. Should the engine run out of gas (and they do), or be accidentally turned off, the consequences would be very serious, if you did indeed exceed no-decompression limits.**

Should you feel that your last breath was slightly more difficult than the one previous, it is probably an indication that the motor has stopped. Rather than continuing to breath until the air hose has been sucked dry, start an immediate ascent at one foot per second while exhaling slowly. By ascending on the air hose you can estimate the rate by going hand-over-hand on the hose at approximately one foot intervals. As you feel the need, breath in from the hose, continue your ascent while continually exhaling slowly. **Never hold your breath.** As you rise, a proportionate amount of air in the hose will be expanding as it would in your lungs, therefore, if you **manage your breathing properly**, there will be a couple of extra breaths self-perpetuating. The technique takes practice. If you breathe it down at depth, there will be no reserve in the hose. When you are aware the the engine has stopped, take a small breath, grab the hose and measure an emergency ascent rate of approximately one foot per second. You will need to keep your throat open at all times during ascent while letting out a small stream of bubbles. The expanding air needs an unrestricted way to escape. Holding your breath during ascent will have dangerous, if not lethal consequences. PRACTICE, PRACTICE, PRACTICE. Everyone in your care needs to be thoroughly familiar with the out-of-air ascent technique.

By far, though, **the most efficient** and **safest** way to ascend in an out of air situation is with an **independent, redundant, backup air supply** such as the Spare Air system available at most dive stores or through The Air Line. For deeper dives, a 6 or 13 cubic foot pony scuba cylinder would be appropriate.

Even though compressor diving feels as free as snorkeling, IT IS NOT. While you will probably hold your breath during a snorkeling ascent, **NEVER HOLD YOUR BREATH WHILE ASCENDING WHEN USING A SURFACE AIR DEVICE.** Always breathe in and out. Should an out-of-air situation arise, at the very least you need to be expelling air continuously while making an emergency ascent. Remember, your life and that of your fellow divers rely on your good judgment. DON'T TAKE CHANCES. You have nothing to prove.

An extra word of CAUTION: The new technology of The Air Line allows it to produce greater volumes of air than old-fashioned models. This is done to provide comfort at shallow depths by ensuring that there is plenty of breathable air under times of heavy consumption such as adding a more divers, swimming against currents, or heavy task loading like moving and setting an anchor. Diving beyond no-decompression limits should never be done without adequate independent air and the training germane to it. As with Scuba, never dive beyond your training limits. At any depth, a fully independent back-up air supply is recommended and can be acquired from The Air Line or your local dive store.

WHEN YOU RECEIVE YOUR NEW COMPRESSOR SYSTEM

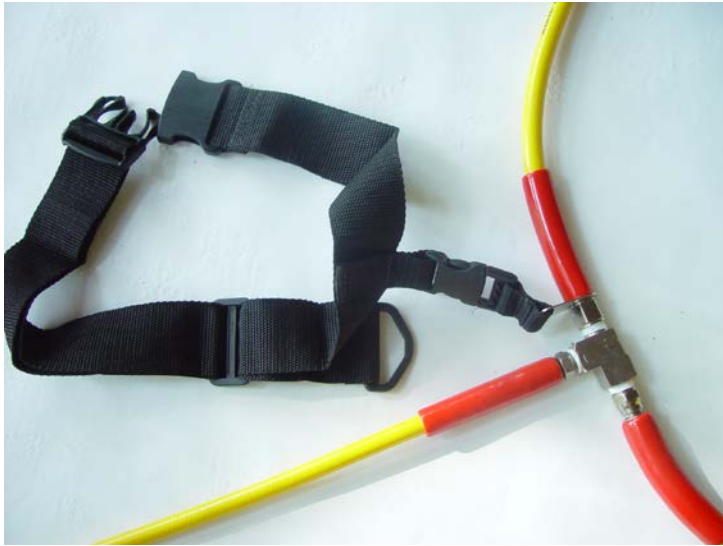
Inspect the contents to be sure everything is included. All the gas models, should include the compressor/engine assembly in a hard case (*on an aluminum plate for deck-mount units*); one clear air intake staff for the float models; (*a remote air intake hose system for the deck mounts*); a diver-down flag for the float units; a 5 or 10 foot black compressor heat hose (*attached*); a hose splitter (*two for Model R360XL, or if an additional diver package was ordered*); two or three of the following: 60 foot feeder hoses, with second stage regulators and swivel fittings attached; tow belts; weight belts; the float tube with Cordura cover and inflator hose; a large mesh gear bag; a Ziplok bag containing conical filter screens; the hose splitter(s), with spare washers and intake-staff filter(s). Along with this Manual will be a separate Honda engine manual.



The conical filter screens are attached to washers. They will be found in a separate bag, with spares, so they are not lost by being knocked loose during shipping. They will go, convex, inside the female end of the yellow hose as shown in the picture below.



You will find the tow belt has a female snap-in buckle receptor sewn on the belt. The regulator whip hose has a tab that has a male buckle insertor that connects to the tow belt receptor. To tighten the tow belt, pull on the D-ring after the belt has been snapped together around the waist. To loosen, simply feed some of the belt back through the belt slide next to the D-ring. The position of this belt slide can also be moved to make large adjustments in the overall length for varying sized individuals.



Tow belt attached to the diver hose. (Photo also shows the optional power inflator hose below the tow belt.)



Tow belt and diver hose on diver.

SETTING UP

The engine will operate best with unleaded gas certified at 86 octane or better. Never put oil in the gas. This is a 4 stroke engine.

RE-ADJUSTING THE SPEED OF THE ENGINE OR ALTERING THE PRESSURE RELIEF VALVE FOR ANY REASON WILL INVALIDATE THE WARRANTY. Higher pressure does not produce more air, just more compressor wear and heat. Faster speed does NOT necessarily produce more air. It actually may produce less if adjusted faster than what was pre-set, and will overheat the compressor bearings causing expensive, non-warranted damage. Insufficient air cannot be fixed by running the engine faster than the preset 3,400 RPM. It has nothing to do with engine speed and can be dealt with in the section entitled TROUBLE SHOOTING. Engine and compressor speeds are pre-set to 3,400 RPM at the high throttle setting. This was not an arbitrary decision. It is the correct setting for the proper balance of volume and pressure.



Throttle Lever

The throttle lever (*located directly over the engine pull-cord*) can be used to control engine speed. In some cases you may not need to run the engine at full throttle. A WARNING, however: setting the throttle too low could cause an engine stall with the system under full load. DO NOT ARBITRARILY LOWER ENGINE SPEED WHILE DIVING TO A DEPTH WHERE A STALL COULD PROVIDE A POTENTIAL DANGER, ESPECIALLY FOR PEOPLE WITH LIMITED EXPERIENCE. Worth repeating: Running the engine too slow under the breathing load could cause the engine to stall and create a safety hazard. (See the Honda manual for locations and positions of the throttle lever.) The safest course of action is to always run the engine at full throttle.

The remote breathing air intake is designed with two purposes in mind; 1. to increase compressor life by making it difficult for water to intrude into the compressor, and 2. to secure a proper distance between the air intake point and engine exhaust.. You will need to screw the black air filter into the clear air intake staff the first time you use the unit, as shown in the picture below. Hand-tighten snugly. Then you can leave it in place. The filter will already be installed on the remoted air hose for the deck mounts. Rain is not a problem. However, precautions must still be taken to ensure a totally pure air supply.

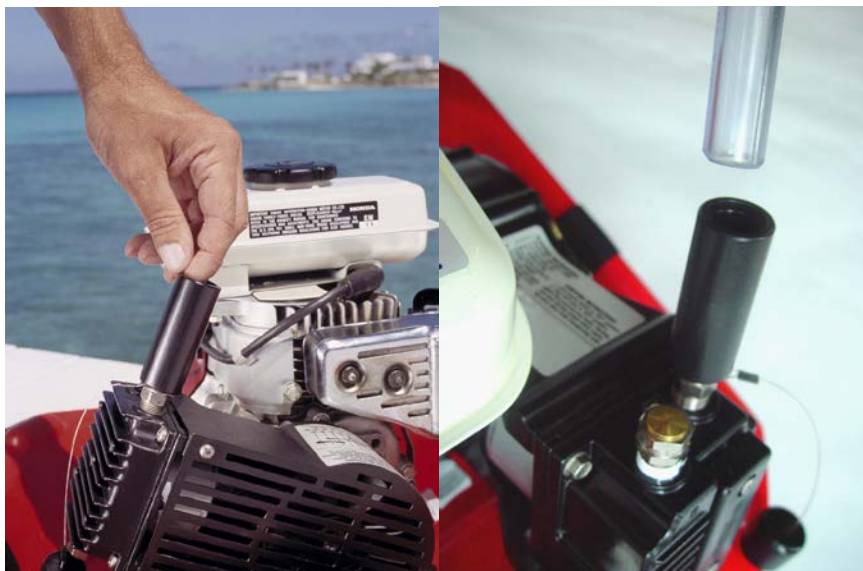
IMPORTANT: Never operate the equipment in a toxic fume environment such as near running outboard engines, exposed chemicals or fuel spills. The unit is for OUTDOOR USE ONLY and should never be run in an enclosed area. Gas powered units should only be operated in the open where there is good air circulation. If you purchased a floating unit, you may sometimes want to leave it on deck in some situations. For example, using the system for boat maintenance tasks, or running it from a dinghy for drift dives. It is possible in these situations that the engine/compressor may be placed where there is inadequate air circulation around the compressor (*e.g., inside the gunwales of a boat*). In such cases, you should purchase the inexpensive 10 foot long remoted air intake hose that is used on the deck mount systems. This will enable you to place the air intake point up high and away from the engine (*e.g., on a bimini, or similar structure*) where there is good air circulation.



Now is a good time to put your dive flag in place. Use the plastic tie-wraps supplied and place them through the holes in the flag as shown. Ensure that the flag stiffener will keep the flag hanging straight out (*i.e., the flag stiffener pocket nearest the intake staff should be on the bottom*).



Regarding the air intake socket: Before inserting the staff, **visually ensure that the O-ring is in place** about 3/8 inch from the top. Ensure, also, that it is slightly lubricated with a thin film of food-grade, silicone grease. If the O-ring is dry it could eventually be “rolled” down and into the compressor head.



Do not overlubricate, just a thin film of the food grade silicone grease. If you need to replace it, the "O" ring size is .020. If not available locally, you can order directly from The Air Line. This keeps out splash, but more importantly, acts as a seal against the possibility of an exhaust swirl.

STEP-1

Unsnap the long, loose travel strap that goes around the girth. Unsnap the short strap on top of the case at both junctions and put it and the travel strap away in your dive bag for recovering your unit for storage.



Lift the cover off and put it aside. **THE COVER IS FOR STORAGE ONLY. IT IS NEVER TO BE USED WITH THE ENGINE RUNNING.** *Tip for the day: You can put fresh water in the lid and use it for a small equipment wash. Tip bonus: When using a float model on the deck, running the end of the heat hose, or Y-Divider through the lid full of water will keep the yellow hoses cool.*

Remove the dust cap from the black socket located on top of the compressor. Make a mental note that there is a small red cap inside the black cap. More on this later.



DO NOT START THE ENGINE WITH THE DUST CAP ON. Check for the “O” ring which is in a groove about 1/4” down inside the black air staff receptacle. Place the clear PVC staff into the socket as far as it will go and make sure you screwed your filter on the top end of the staff. The dust cap, tied to the socket, must ALWAYS BE IN PLACE WHEN THE STAFF IS REMOVED. If not, water or dust can splash directly into the compressor head.



STEP-2

STARTING THE UNIT. (for tube inflation)

Make sure the oil reservoir and gas tanks are full. (*See SETTING UP for filling recommendations*) You are also advised to be sure you have coated the metal engine parts with a marine protectant. This is extremely important when the equipment is being used around salt water.

Flip the on/off switch to the "ON" position. Put the fuel switch in the "ON" position.



On/Off Switch



Fuel Switch

You will have to choke a cold engine. Choking is usually only needed on the first start of the day, but is usually not needed if the engine is still warm from prior use. To choke the engine, move the choke lever to the closed position (*i.e., all the way to the left*). Put the throttle lever in about the middle position. Now grab the recoil starter handle and give a good stiff, quick pull. When the engine starts put the choke at about the half way point for approximately 30 seconds then you can switch the choke lever completely to the open position (*i.e., all the way to the right*).



Choke Lever



Throttle Lever



After it has warmed for about a minute, stop the engine, attach the inflator hose onto the black compressor hose.

STEP-3

THE TUBE COVER

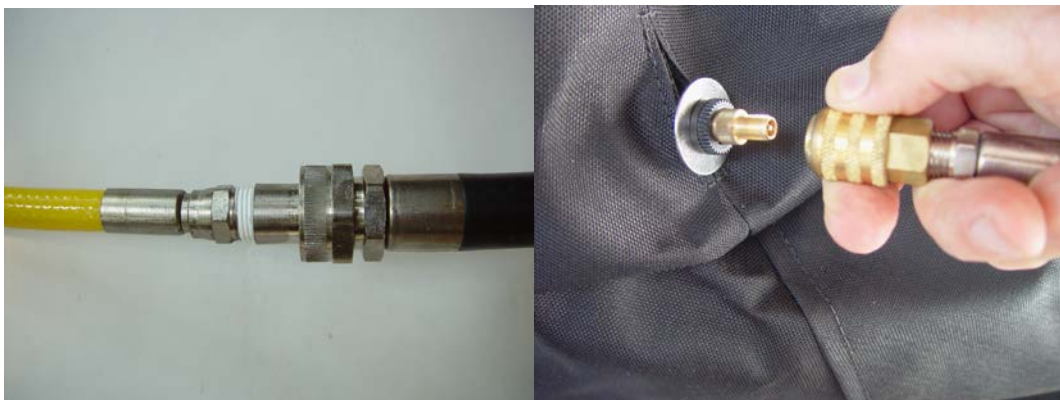
Install the black, innertube inside the yellow Cordura cover with the valve stem positioned to where it will align with the slot on the black side near the junction of the zipper ends (*see the series of photos below*).





Unscrew the black, plastic retainer nut on the valve and remove the large stainless steel washer. Slip the valve through the sewn slot just below the zipper and replace the washer and retainer nut. Arrange the tube uniformly inside the cover and zipper it closed. While the tube is inflating, but well before it is full, kind of slap it around to ensure it is inflating uniformly in relation to the stem, which you will want to be centered in the slot. You will only do this the first time you use your unit. You can leave the tube in the cordura cover after the initial setup.

The entire tube-inflator-valve unscrews from the tube. Remove it. Lubricate the valve with the protectant. Replace and tighten **snugly by hand**.





You do not need to run the engine at full speed here. Fill to where the cover is just full, but with a slight amount of room to allow for expansion when the sun is heating it. You should be able to pinch about $\frac{3}{4}$ inch of the cordura cover. Do not try to get all of the wrinkles out of the tube cover, this would be too full and might damage your cover. As we mentioned before, occasionally tug the cover to position uniformly. Check that the valve is straight and not being pulled off to one side. When full, remove the air chuck and turn off the engine.



STEP-4

MOUNTING THE UNIT IN THE FLOAT

Before nesting the pan into the tube, work the black hose into the hole directly in front of it on the bottom of the pan. **The black heat hose must be routed down through this hole, so that the divers are pulling the unit from the bottom center area.** Dangle the two short straps and compressor hose into the center of the inflated tube. Leave the long strap, located on the side, inside the pan for now.

Place the red pan in the inflated tube opening. It should nestle in the center with just a little pressure to provide a snug fit. If it does not, remove a slight bit of air by unscrewing the whole valve. Keep the unscrewed valve at the opening so that you can replace it when enough air has escaped to comfortably nestle in the red pan. Make sure the valve is securely hand-tightened.



Reach under and grab a short strap, bring it around to encircle the side of the tube and snap it into its receptor. Make sure the strap is not twisted. Grasp the loose end, with the “D” ring attached, and snug the strap to where it is just tight. Repeat with the other short strap. Now take the long strap and bring it all the way around and under the whole tube. Snap it into its receptor and snug the strap by pulling on the D ring. If you plan on using your unit regularly, you can keep the tube inflated if space permits.

Tip: When deflating the tube, you can unscrew and remove the valve stem completely to quickly deflate the tube. Remember to replace the valve when the tube is emptied. Reapply protectant as needed.

STEP-5

INSTALLING HOSES, REGULATORS AND TOW BELTS

For a single diver, (*assuming you will not dive alone but have an associate on another system such as Scuba*) screw one 60' yellow air hose directly, and snugly, onto the black, compressor hose. It will only attach one way, i.e. male garden hose to female garden hose. REMEMBER TO HAVE INSERTED THE SCREEN WASHERS INTO THE FEMALE GARDEN HOSE FITTING ON THE YELLOW HOSE.

For two divers, first screw a hose divider securely onto the compressor hose. Attach two yellow 60' down hoses with regulator as discussed above. Hand tightening should be sufficient, but **use enough force to ensure that the hoses will not unscrew from twisting and turning in the water.**



For three divers, screw a second hose divider onto the first, making three ports available. Screw on three 60' down hose assemblies. For the fourth diver, simply attach a third divider onto the first one.



The regulator, with whip hose, and the Tow Belt tab will already be assembled and tightened for you at the factory. Put on the Tow Belt. The belt tab for connecting to the hose will be at the center of the belt in the back. Put on the weight belt. (*Prior to this stage you will have established your proper weighting for neutral buoyancy as described below.*)

Weighting for Neutral Buoyancy

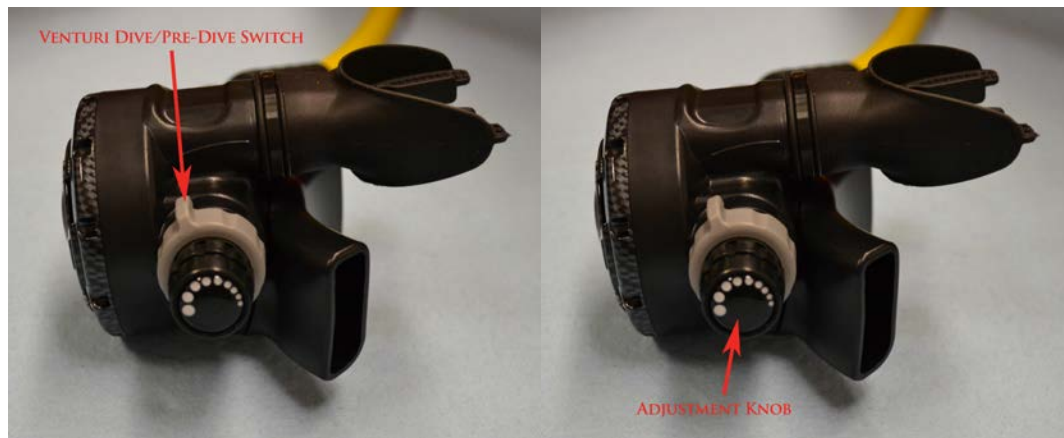
Practice buoyancy control off the boat, but safely connected to it with a trailing rope. Put on the weight belt. Establishing your weight requirement is very simple. Start with just a few pounds of weight. Hanging from the anchor line or a stern line, take a breath and hold it. The water line should be at about eye level. Exhale and hold it. You should start sinking **slowly**. If you don't sink at all when you exhale, then you need more weight. If you start sinking too fast when you exhale, you have too much weight. Add or subtract weights in small increments until the above process is complete. Ideally, if weighted properly you will neither sink nor float up when breathing normally. You should be able to maintain a particular depth without effort while breathing normally. Once establishing your proper weighting, unless you make some lifestyle changes or change an exposure suit, you will consistently be ready with the same weight. You might want to mark individual weights or remember what is required for each diver if you let others use your weight belt.

You should equalize the weight among the pockets, so that you are balanced. In the unlikely event that you have to jettison weights for an emergency ascent, you can either discard the entire belt by releasing the weight belt buckle, or remove individual weights from the pockets. The latter is preferable, if time and conditions permit, because one can discard just enough weight to make oneself slightly positively buoyant, and thus maintain better control of one's ascent rate. Each pocket in the weight belt will hold up to five pounds (*up to a 3 lbs. soft weight, and up to a 5 lbs solid weight*). Keep an assortment of smaller weights; ones, twos, threes, and fours, and perhaps some fives. This will allow you to quickly establish your requirement, and to make fine adjustments as needed.



The Regulator(s)

Your regulators have several features for comfort and safety. On the side of the housing is a gray venturi switch behind the adjustment knob. Because of the low pressures at which hookah regulators work, they are very sensitive to pressure. At the surface, where there is very little ambient pressure the regs may have a tendency to free-flow. This is not serious as you are not losing the limited amount of scuba tank air. At worst, it might be inconvenient when trying to communicate with others when at the surface of the water. If free flow occurs, simply put the gray venturi switch in the “Pre-Dive” position by pushing it forward, as seen in the photos. When ready to dive, you can rotate the gray venturi switch towards the rear to place it in the “Dive” position.



Venturi Switch

Adjustment Knob

The regulator is also adjustable using the adjustment knob. Under some conditions, such as very strenuous activity, if the breathing seems a bit labored, you can reach up and open the knob by turning counter-clockwise to reduce the spring tension, making it easier to draw a breath, but can increase the tendency to free flow. Turning the adjustment knob clockwise increases spring tension, making it a little harder to draw a breath, and reduces the tendency to free flow. You may want to try various settings of this knob during your first few dives to find the right position for you. The best practice is to set the regulator so that it breathes easily, just short of free flowing.

STEP-6

HOSE HANDLING

The most effective way to keep kinks out of hoses is with proper handling of the hoses. Even with the swivel fittings at each end of the long, down hose section, the hoses are not smart enough to remain kink-free without some guidance from you. Always unreel, rather than uncoil hoses. Hold the reel perpendicular to your chest as though you were holding a bass drum and roll out the hose turning the hose coil in a 360 degree motion like a wheel.



By so doing, the hoses will be straight when you have launched the float and it travels down wind. Retrieve hoses the same way. Start a couple of turns at the regulator and secure the first few coils with a small Velcro band. This will keep the regulator from unwinding and hitting you someplace sensitive. Like a----knee, for instance. After you have completely rolled up the hose into a coil, you can use the provided Velcro cinch straps (*3 per hose*) to secure the coil. More on hose retrieval later.

STEP-7

STARTING THE UNIT (For your dive)

Start the engine exactly as indicated in STEP-2, **remembering not to start up if the system is under load. It probably will not be under load the first dive of the day, but after the first start up of the day depress the purge button on a regulator and release all pressure from the system.** The purge button is the center section of the regulator. This is to be depressed to let air escape and depressurize the system.



Purge Button

After starting the engine, you can release the purge button. The Quiet Valve on the compressor should release air shortly after you start the unit. On all systems, they are located at the compressor head. They are called Quiet Valves for good reason: They do not pop, or hiss when expelling unconsumed air. They are preset and require no adjustment. However, Air Line units put out such a volume of air that the excess air might continue escaping through the relief valve until the divers are at depth. When everything has checked out, stop the engine and release the pressure in the lines by purging the regulators. You are now ready to launch.

A NOTE ABOUT THROTTLE SPEED: The throttle lever has a fast-to-slow range. You will keep it on high. During wash-down you can throttle the engine down to about 1/3 to 1/2 engine speed.

STEP-8

BOAT LAUNCHING

Have the divers put on the tow belts and weight belts. When launching from a boat, position the participants on either side of the unit, being careful not to touch the hot exhaust cage. Gently lower the unit into the water with as little angle as possible, or at least with the gas cap at the highest point. Push the unit away from the boat, rolling out the hoses like a wheel as discussed in STEP 7. When you get to the regulator whip hoses, snap the male connector on the whip hose into the female connector on the tow belt. You may wish to take the tow belt off and secure it to a boat rail while you deal with your personal gear or simply not attach the hose to tow belt quite yet.

Restart the engine with a regulator purge button being held down. Push the unit away from the boat and it will go downwind without any kinks. Put on personal gear, tow belts, weight belts and enter the water any way that is comfortable and safe for you.

A few words about buoyancy: When diving with scuba tanks, a buoyancy compensating device (BCD) has some value because the weight of the compressed air in the cylinder is being consumed, making the cylinder increasingly buoyant throughout the dive. With hookah you need only enough weight to be neutrally buoyant in the water. Your buoyancy is not changing during the dive, so the same weight will suffice for the duration of the dive.

The use of a BCD is not discouraged. The Air Line offers a Horse Collar model, perfect for hookah diving. There are no bands or straps in the back, as there is no tank involved. It is low profile and with a slight amount of air it will float a traumatized diver face up. Because it will be connected to the air delivery hose, it can be power inflated off the compressor to assist a diver with a bag full of goodies to the surface. At the surface, the float provides a stable, high-visibility pick up station, and inflating the Horse Collar BC will supply an additional degree of hands-free comfort. A regular scuba BCD may also be used. The Air Line offers an optional Power Inflator Block with BCD Inflator Hose that can be installed in a diver hose to connect to the BCD power inflator valve.

Remember, also, that you are always linked to the surface with your air hose so you can ascend slowly and safely by going hand-over-hand up the hose to the surface. A whistle, or other signaling device attached to a tube-mounting strap might come in handy to signal the boat attendant.

Your Air Line is towed with little effort by the divers. **DO NOT ATTEMPT TO TOW IT FROM A MOVING BOAT as it will flip over and ruin your day.** If you are planning a second dive within a short time, retrieve the unit starting with the regulators by piling the hoses on the deck reversing the launching procedure. Reach over and turn off the motor. Unload the pressure by purging the regulators. Carefully lift or slide the unit onto the deck being very careful of the hot muffler cover. Put the unit on top of the hoses so that it is immediately ready to relaunch at the next stop. Obviously time, space and personal procedures will come into play.

After your last dive for the day, enter the boat, retrieve the unit by pulling in the hoses, but leave them in the water.

Stop the engine with the On/Off switch and let it float back away.



Purge the regulators to eliminate pressure. Unsnap them from their tow belts. Retrieve the hoses in reverse order of the launching, (*i.e., reel in a couple of loops starting at the regs*). Secure the loops at the regs so that they don't flop around (*Single-sided, one inch Velcro is a terrific tool*). Retrieve the balance of the hoses. Carefully lift the unit onto the boat. Unscrew the 60' air hoses from the divider and finish wrapping the hoses with the Velcro cinch straps. Leave the unit on the tube if you plan to use it later. Your particular needs will dictate this. Otherwise, unsnap it from the tube, remove the staff and put on the dust cap. Post dive maintenance will be covered later.

STEP 8A - BEACH LAUNCHING

When launching from the beach, first determine whether the surf will allow safe entry. Essentially hose handling is the same as for boat launching with the exception of protecting the regulators. **DO NOT LET REGULATORS DRAG IN THE SAND.** Secure them to the tow belts and drape them over the shoulder. Secure the second stage reg so that it cannot possibly hit the sand. A few granules can stop your dive. Preventative maintenance is still the best. Although the systems are protected against reasonable salt intrusion, they are essentially for calm water entry. Start the engine on the beach to ensure that everything is functioning properly. Stop the engine and purge the regs. Two people should guide the unit, with the engine off, past the surf to where it cannot be swamped or driven back to the shore. Then just reach up and give the recoil starter a pull. When coming back in turn the engine off before you get in the surf and guide it into shore. Upon return, the same care needs to be exercised to prevent swamping and dragging the regulators in the sand/bottom.

8B - USING AS A DECK MOUNT

AN IMPORTANT NOTE. The black heat transfer hose needs to be in the water for cooling hot compressor air. It is perfectly all right to have it out of the water for start up or wash down if the yellow air hoses are not attached, but prolonged running out of the water with the yellow hoses attached will cause the more heat-sensitive, yellow hose to soften and burst, or possibly loosen the fitting creating a potentially dangerous situation. If the provided black hose does not reach the water, black heat hose extensions can be ordered in 5', 10', or custom lengths. When using as a deck mount, or when inflating the tube, position the unit so that the exhaust is pointing downwind and that there is plenty of circulating air available to cool the engine. Also make sure that the exhaust is not too close to the gunwale (gunnel) to prevent exhaust from bouncing back into the intake air. The unit's design is usually sufficient to prevent this but being aware of the situation will totally ensure the air quality. **If a floating unit is used often as a deck mount, you need to order a heat hose extension. You should also purchase the inexpensive 10' remoted air intake hose that is used on our deck mount systems. This will enable you to place the air intake point up high, away from the engine (e.g., on a bimini, or similar structure).** You can also purchase yellow hose extensions of 40', 60' or 100' to get additional range away from the boat.

When deck mounting, secure the black heat hose to a stationary object so as not to pull or put excess pressure on the fitting at the compressor head.



SOME TIPS ON USE OF THE EQUIPMENT

It may help to remember that the air delivery from a compressor is somewhat different from a SCUBA cylinder. A fixed pressure is not descending and ascending with you. You will probably descend more slowly when breathing from a compressor. Having an almost unlimited supply of air means that you don't need to shorten your dive for fear of wasting limited air. This also allows you the luxury of clearing air passages at leisure and letting your respiration rate become normalized. Ensure that your companions are breathing comfortably and continue your descent. If the current appears to be strong, you may wish to test it. The safest way is to launch as indicated and toss out a safety line. Attempt a dive against the current, but at the safety line, monitoring your progress against the position of the boat. If diving against current is difficult or impossible, swim to the safety line. Against a moderate current, monitor your respiration and exertion levels. If they become high or you anticipate having to exert unusual energy to make progress, you will need another plan. You can either move to a calmer site or secure your floating unit to the safety line. You will at least be able to work laterally. Be sure that your line is not so long as to invite the danger of a boat passing over it. Should the unit get caught in a current you still have the huge advantage of being connected to your fellow diver(s) and the high visibility float. The person you've left as a tender in the boat can pick you up without any fear of losing contact with you. **NEVER DIVE WITHOUT A BOAT TENDER** who can retrieve the anchor and operate the boat in a manner consistent with the care of those in the water. These considerations need to be discussed at part of your dive plan. It may also help to discuss, and be aware of, the fact that there is available air in the hose system should the engine stop running. It will be necessary to inhale harder as the compressor is not supplying pressure. You should not depend upon this however as once the small reserve is used up you are still confronted with making a safe swimming ascent at a controlled rate. The advantage of surface supplied air is that a link is still maintained to the surface and the other diver(s) and no cumbersome gear has to be dealt with. Remembering to check fuel levels before diving will virtually eliminate the possibility of the engine stopping. **Small independent air systems are highly recommended.**



In the previous chapter we mentioned the term, “dive plan”. To fully enjoy the shared experience of Air Line diving, you need to map out a plan while still in the boat rather than rely on hand signals which might be misinterpreted. Keep reasonably together; at least be able to maintain eye contact with all the participants. Avoid frequent cross overs, although the hose swivel fittings and the initial, proper deployment of the hoses, will usually preclude problems. Although hose management is not a factor with scuba, you are more than compensating with the freedom from gear, the long operating times, the safety of the surface link, and the fact that none of the divers can be isolated.

THE CLEAN UP AFTER YOUR DIVE DAY

The key to long and productive life of your Air Line is in following a maintenance schedule. Sure, you will sometimes be tired and plan to clean up later, but invest the few minutes it will take to make sure that your Air Line is ready for the next adventure. **After the engine has cooled down,** put the air intake staff in place. **Disconnect the yellow diver hoses,** start up the engine and **immediately** start thoroughly spraying down the entire unit with fresh water with the engine running at 1/3 to 1/2 speed. **Do not let the engine block get hot before starting to spray the engine.** Do not force water into the compressor air intake or into the engine air cleaner. Fresh water can be safely sprayed over the rest of the unit, including into the pull cord housing of the engine. The interior of the pull-cord housing should have been treated as described in STEP 2 but it is wise to wash out this area EVERY TIME as a preventive measure. Wash the engine thoroughly including all the linkages.



To maximize the effect of the compressor wash-out, at this point, turn off the engine and force a spray of water from several angles directly into the vented cover. Turning off the motor will stop the cooling fan from turning and improve the efficiency of thoroughly rinsing the bearing/piston rod assembly. Re-start the engine and proceed with the next important step.

The dust cap on the compressor intake socket has a smaller red cap inside it, almost exactly the size of a thimble. With the engine running, and the yellow diver hoses disconnected, pull out the air intake staff and pour ONE RED CAPFULL, at a time, of freshwater into the compressor head. Let the engine run for 2-3 seconds and pour in another capful. Again, wait 2-3 seconds.



Repeat this at least 10 to 12 times, replace the staff and let the engine run for at least 4-5more minutes to ensure that the compressor and black heat hose have dried thoroughly internally.

NOTE: This light internal wash-out with the red cap will not totally eliminate salt deposits, but will certainly prolong intervals between compressor rebuilds. This has been tested for many years and really works. (This is easy and very effective.)

Stop the engine and reconnect the yellow diver hoses. Restart the engine and continue doing a thorough wash down of the rest of the components starting at the black heat hose fitting, down the hoses, tow belts, weight belts, and ending with the regulators. Wash the regulators by holding in the purge button and directing water into every orifice.



Continue to purge the regulators for an additional minute, or two to allow condensation to evacuate the system.

DO NOT go back and rewash a hot engine. Cool water on a hot engine could do serious damage.

CAUTION: THE YELLOW HOSES WILL NOT WITHSTAND COMPRESSOR HEAT FOR LONG INTERVALS. THEY WILL WEAKEN AND EITHER COME APART NOW OR POSSIBLY LATER WHEN YOU ARE DOING YOUR NEXT DIVE. THE END OF THE BLACK, HEAT HOSE IS USUALLY IN THE WATER FOR COOLING PURPOSES DURING A DIVE. ALWAYS DISCONNECT THE YELLOW HEAT HOSES FROM THE BLACK HEAT HOSE AFTER 3-4 MINUTES DURING WASH DOWN. This will prevent heat build up and yellow hose damage. When the yellow air hoses are disconnected you can run the unit out of the water as long as you need to accomplish your task and without putting the black heat hose in the water.

You can use the black hose, with the engine running, to speed up drying off the compressor/engine. Use your thumb on the opening to create an air jet to direct the air into the crevices of the unit to blow excess water off. Do this on the engine, as well as through the vented compressor cover to help dry out the inside of the compressor housing.



The Honda engine is equipped with a Fuel Cut-Off switch.

USE IT!

If you are not going to use the unit for the rest of the day or you are going to store it away for a length of time, it is very advantageous to turn off the fuel during the wash down and allow the carburetor to run dry. You can also loosen the screw (using a 10mm wrench) on the bottom of the carburetor float bowl and let the fuel drain. This is a good way to get any sediment or water out of the carb. Replace it. Reminder: You should have been using a fuel stabilizer full time anyway so you are well on the way to preventing stale fuel and varnish deposits. Keep the gas tank topped off in storage. This minimizes air space inside the tank and, therefore, minimizes condensation.

If you have turned off the fuel you will note that as the carburetor empties, the engine will rev up and down as it is getting more air than fuel. You can maximize the fuel consumption by working the choke back and forth to where you can hear it burning the fuel uniformly. The engine will eventually run dry and stop. THE HONDA MANUAL CONTAINS SPECIFIC INFORMATION ABOUT PROPER STORAGE.

This next step is a must if you want to keep your unit good looking, in good working order and keep the effects of saltwater corrosion from slowly taking its toll on your life support unit.

When the engine is thoroughly dry, lightly spray a Marine Lubricant/Protectant such as Boeshield T-9 into the engine pull cord housing to further protect this area. You should do this without fail.



Lightly coat all the linkage parts and hardware of the Honda motor. Work all switches back and forth to ensure penetration. Lightly spray any metal surface that you think needs extra protection, but don't be messy. **DO NOT spray protectant into the vented compressor housing. We do not want any of the protectant to possibly work its way into the cylinder where your breathing air is compressed.**

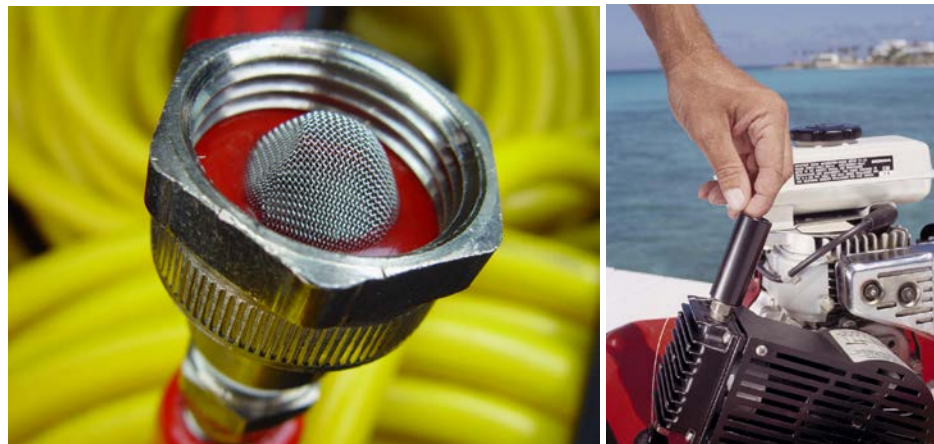
For storage, wrap the heat hose around the unit after being sure that the muffler is cool.

Put the soft goods neatly into your gear bag and you're ready to go next time.



PERIODIC MAINTENANCE

Much of the maintenance will be determined by wind and sea conditions and adherence to the simple post dive procedures. Change engine crank case oil according to the recommendations found in the Honda owner's manual. Break-in instructions for the Honda will also be found there. The particle filters in the female garden hose ends of the yellow air hoses need to be inspected regularly. They are washable and are removed by hand.



Occasionally, lubricate the "O"-ring in the compressor's black air intake socket with a MINISCULE bit of food-grade, silicone grease (*supplied with systems and available from most dive shops.*). DO NOT use an oil-based lube. The "O"-ring does not need to be removed. The merest coating will keep it fresh and prevent it from "rolling" when you insert the clear air intake staff. If it does get dry and is rolled down when inserting the intake staff, then it could be sucked into the compressor head and cause, if not damage, at least inconvenience. Ensure that the "O"-ring is in place every time you put the staff into the air intake socket. If it is not present it is probably in the compressor head, having been pushed down from not having the "O"-ring properly lubricated. Do not start the engine. It is not a serious thing for compressor life, but will result in not supplying enough air volume for comfortable breathing, which could be dangerous. Removal of the "O"-ring from the compressor valves is covered in the Troubleshooting section.

Occasionally, other compressor maintenance may be needed. Salt intrusion and long running times might require that you perform a full rebuild of the compressor head. Take heart; not difficult and not expensive. Service Kit Part # 1905 is all that's needed for the R260-4 or RD2100-4 and a 1915-20 for the R260XL, R360XL, or RD2100XL. Even so, each compressor head can be rebuilt in 20-30 minutes with common hand tools. A simple, single page diagram is included with the kit.

If you require compressor service, either warranty or post-warranty, or encounter a problem you can't easily deal with, call our service department at 352-307-1001. Explain which model you own and that it requires service. You will either be directed to a service center, or given advice for self-maintenance.

For Honda service, contact a local **Honda authorized small engine dealer**. You will need the Honda model (*located on the face of the pull-cord housing*) and serial numbers (*stamped in the engine block near the engine base on the side with the On/Off switch*). The locations will probably be convenient as there are thousands of centers worldwide.

For all other service, compressor and some Honda parts, contact The Air Line at 352-307-1001.

Your seasonal requirements and frequency of usage will dictate your maintenance schedule. Remember, salt perseveres. A little regular effort will ensure that your investment doesn't let you down when you need it most.

NEGLECT IS NOT WARRANTIED.

The simple secret of long and productive product life is following the daily and periodic maintenance procedures. Log usage time and follow a maintenance plan. Don't ever hesitate to call if you need advice, it is never an imposition.

A typical maintenance schedule will go some thing like this:

DAILY PRE-DIVE:	DAILY POST-DIVE:	PERIODIC:
Inspect fluid reservoirs.	Thorough wash down of engine/compressor after cooled.	Follow Honda manual maintenance schedule.
Inspect hose fittings.	Internal compressor rinse with red cap (<i>see page 31 in Clean Up section</i>).	Re-build compressor head, 300 – 500 hour * or, when delivered air inadequate.
Inspect hose particle filters.	Lubricate intake socket O-ring with tiny bit of food grade silicone grease.	Reapply protectant.
Inspect intake socket O-ring.	Through rinse of diver hoses and regulators.	Regulators serviced every 2 years or 100 dives.
Inspect compressor intake filter	If unit won't be run for a while; <ul style="list-style-type: none">• Close fuel cut off switch• Drain carburetor bowl using 10 mm wrench.	
	Store in a clean environment.	

* Conditions are so varied in diving as to make an exact compressor re-build schedule impossible. Your awareness and experience with the equipment will be the best yardstick in this determination.

Abused valve plate. A Warranty Caveat.

Too tired to take a few minutes after the dive day to take care of the gear?

The valve plate assembly shown here was actually removed from a compressor sent back to us for “warranty” service. Guess what?



In a way we are glad I have this to show you what eventually **will** happen when you get back dockside after “carefree” excursions into the briny and simply put the gear away hoping that, “For what I paid, this shouldn’t happen.”

A four word summation: Read the Owner’s Manual!!

TROUBLESHOOTING GUIDE

CONDITION: Diver headache, nausea, dizziness.

POSSIBLE CAUSE: Boat engines running in vicinity of compressor. Exposed chemicals or fuel near compressor.

SOLUTION: Abort dive or move to a cleaner air environment.

ANOTHER POSSIBLE CAUSE: Failure to follow safe diving practices.

SOLUTION: Immediately seek medical attention. Secure retraining before attempting to dive again.

CONDITION: Insufficient air.

POSSIBLE CAUSE: Air leak in hose system, engine RPM too low.

SOLUTION: Check the washer associated with the particle filter. Check that hoses are properly connected. Check for a hose burn or other accidental hose damage, check engine throttle.

ANOTHER POSSIBLE CAUSE: Salt or dirt, or socket “O”-ring stuck in valve in compressor.

SOLUTION: Clean valve plate(s) or replace according to Service Kit #1905 or #1915-20. If you have noted that the “O”-ring is missing from the intake air socket first, remove the compressor head. It should be clearly evident that the “O”-ring is holding open a valve. Remove it by hand or with tweezers. Inspect for other potential problem while open. If all else looks all right, then you should be back in business. If the problem persists, call our service department at 352-307-1001.

ANOTHER POSSIBLE CAUSE: Dirt, salt or some corrosive matter in pressure release valve.

SOLUTION: The valve is not easily cleaned. Replace it. A spare valve in a small zip lock bag is a good thing to keep on hand.

ANOTHER POSSIBLE CAUSE: Debris in stainless steel screen particle filters in hoses.

SOLUTION: Clean it or replace it. Spares are included in the Ziploc.

ANOTHER POSSIBLE CAUSE: Quiet relief valve shows part of an “O”-ring coming out.

SOLUTION: This is not fixable. The valve needs to be replaced. Do NOT remove the valve and plug up the hole. You WILL damage the compressor that way. Unconsumed air must be regulated with an overpressure valve.

CONDITION: System "frozen". Inability to pull engine starter rope.

POSSIBLE CAUSE: Corrosion in engine or compressor. To determine which, remove the compressor head and pull off the piston cylinder. If you can "rock" the piston rod top up and down then the problem will likely be the engine. If the piston is rigid, the problem will be with the compressor bearings.

SOLUTION: For the engine, take to an authorized Honda small-engine service center. For the compressor call our service center at 352-307-1001.

ANOTHER POSSIBLE CAUSE: System under load.

SOLUTION: Bleed off air pressure in the system by purging a regulator.

CONDITION: Any strange noises or erratic behavior in system.

POSSIBLE CAUSE: Bearing problem.

SOLUTION: Ascertain if the noise is in the engine or compressor as above. Contact us for recommendations.

CONDITION: Engine will not start, or only runs if the choke is manipulated.

CAUSE: Carburetor jets are clogging up.

SOLUTION: You probably have not been using a fuel stabilizer. See the specific instructions which follow.

Carburetor Cleaning 4 and 5.5 HP engines

This will be easier for you to take the unit out of the tub (only 4 x 7/16 bolts). This can be done in the tub if you choose to do so, (*for the brave only*) because this doesn't let you see much and then some of this procedure is by feel only.

Tools: 10 mm open end wrench, a long straight tip screwdriver (1/4 inch tip width and 3-4 inches long if you leave the unit in the tub), a very, very small diameter piece of wire (anywhere from 2" long or more), a pair of needle nose pliers, one can of carburetor spray.

1. Turn off the fuel valve before proceeding. On the underside will be two bowls. You will only be dealing with the larger, gold one. It has two screws in it. The bottom one is what holds it to the carb.

Place a rag under the bowl because some fuel will be in it and this will catch the small amount of run off. Remove the very bottom screw and pull the bowl straight down. Leave the screw that is slightly off to the side alone. This is only a fuel drain.



2. You will now notice a white plastic float that moves up and down. This controls the fuel flow into the bowl. Be gentle with this and do not use any force to remove this float. There is a small metal pin that slides left to right. Slide this pin out and let the float drop down into your hand. Notice that there is a small pointed black tip on the float and notice the small hole that this came out of. Use a pair of needle nose pliers to hold onto the pin.

Put these items where you will not lose them or damage them while you finish.

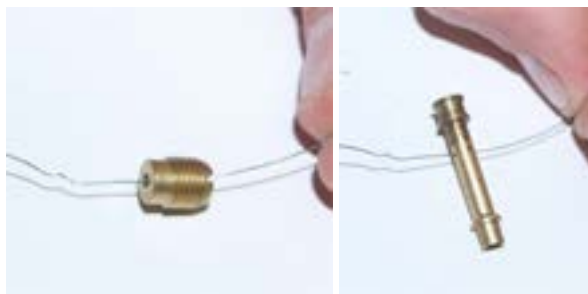


3. When you removed the bowl, the screw came out of a metal tube. The main jet is screwed up inside of this tube. Now you will need a 1/4" wide straight or slotted screwdriver. Make sure your screwdriver is as wide as the hole in tube. (In other words make the tip of the screwdriver as wide as you can. If you use too small a tip screwdriver you could mess up the main jet's slot that the screwdriver goes into and then you will have to drill and use an easy out to remove the main jet.) Use your small screwdriver and slide this up into the metal tube and turn it until you feel the tip of the screwdriver slip into the slot on top of the main jet. If your engine is out of the tub you can tilt the engine and see the main jet up inside the tube. Now unscrew the main jet counter clockwise.

After it breaks lose just unscrew it all the way out. You should have in your hand a small short jet about 3/8" long and a long skinny tube which is the fuel nozzle about an inch long. If the long jet does not fall out tap the metal tube gently to make it fall out and /or squirt some of your carb. cleaner up in the tube to get it to loosen up. This one is not screwed in. Also look and see which end falls out first so you can put it back in the right way. (The end with the bulge faces down.)



4. Now you should have two small brass pieces in your hand. They will have some very small holes. You will need to use a very small piece of wire to open these holes. Work the wire through every orifice, back and forth. Don't forget the holes in the little 3/8" jet. Carb cleaner by itself will not remove these old fuel deposits. This is the problem with your engine. Although by looking at it, it may not appear so, the tiny holes are partially plugged from old dried fuel. **Absolutely do not use a drill bit. Do not enlarge these holes or you will be buying new jets.** Enlarging these holes will affect the way your engine runs. Now take some spray carb cleaner and flush the jets out and then spray carb cleaner up an into all crevices in the carb. Spray it good and everywhere, you can't hurt anything. Spray it up into the orifice where the white float's black tip came out. Flush the entire carb really well.



5. You are almost finished. We just have to put it back together. Put the small end of the long skinny brass jet back up into the metal tube (bulged end facing down) followed by the shorter main jet. Screw the main jet back up inside the metal tube and just snug it down. Do not try to over tighten. Now take the white plastic float and hold it up so the black tip goes back up into its own hole. Now slide the metal pin back in place. This does not take any force. It should just slide into place. Now move the float gently up and down to see that the white float moves freely.

6. Now just replace the gold colored float bowl and the center screw. You are finito. Looks like you did a good job, too. Bet you didn't know you were an engine mechanic.

Now for the final test. Let's start the engine. Remove the air intake dust cap or caps. Lay the black heat hose out and remove anything on the end of the black heat hose. Place the engine start switch to the on position. Turn on the fuel valve. Set the choke to the on position (to the right). Put the throttle to about half speed.

O.K. this is it. Pull it over. It should start after two to four pulls. Remember we drained the fuel so give it an extra pull or two so the fuel has a chance to get into the carb. Once it starts put the choke at about the half way position for a few moments then you can turn it off completely.

GOOD JOB!

If for some reason you still have a problem call us at (352) 307-1001.

Now remember when you put this unit away each day, turn off the fuel. If you are going to use it again the next day it is not necessary to drain the carb. If you are not going to use the unit again for a week or more drain the carb. during wash down. Shut the fuel valve off while the engine is running while you are doing the rinsing, and let the carburetor run dry. The engine will stop when the fuel in the float bowl is gone. You can also remove the 10 mm screw on the side of the gold float colored bowl and drain it fast and all at once. (*Not the screw directly on the bottom*) Use a rag here to catch the small amount of fuel that will run out.

Note:

Use of a fuel stabilizer when your unit is being stored will definitely help. Don't just put the stabilizer in the fuel tank. Use it full-time by putting it into your gas CAN every time you fill it up. That way you won't have to remember to add it to the tank, and full time use will have a flushing effect every time the engine is run.

Now go have some more fun!

Carburetor Cleaning 3 HP engine

For the float model R260-3, this will be easier for you to take the unit out of the tub (only 4 x 7/16 bolts). This can be done in the tub if you choose to do so, (for the brave only) because this doesn't let you see much and then some of this procedure is by feel only.

Tools: 10 mm open end wrench, a long straight tip screwdriver (1/4 inch tip width and 3-4 inches long if you leave the unit in the tub), a very, very small piece of wire (anywhere from 2" long or more), a pair of needle nose pliers, one can of spray carburetor cleaner.

1. Turn off the fuel valve before proceeding. It is located to the left of the pull-cord housing.

To access the carb it is necessary to remove the air cleaner. Very easy. Just undo the two large screw holding on the cover, peel off the paper air cleaner and, with a 5/16 socket, remove the back plate, **which also supports the carburetor**. There is a gasket here so be sure to retain it. At the bottom of the plate will be a short tube that connects to a black rubber hose. Pull the tube out of the hose. Disconnect the clear plastic tube from the retainer on the plate as well. On the bottom of the float bowl will be a 10 mm screw. Place a rag under this float bowl to catch the small amount of fuel that will be remaining in the bowl. Remove the very bottom screw and pull the bowl straight down. Leave the screw that is slightly off to the side alone. This is only a fuel drain.



2. You will now notice a white plastic float that moves up and down. This controls the fuel flow into the bowl. Be gentle with this and do not use any force to remove this float. There is a small metal pin that slides left to right. Slide this pin out and let the float drop down into your hand. Notice that there is a small pointed black tip on the float and notice the small hole that this came out of. Use a pair of needle nose pliers to hold onto the pin. Please put these items where you will not lose them or damage them while you finish.

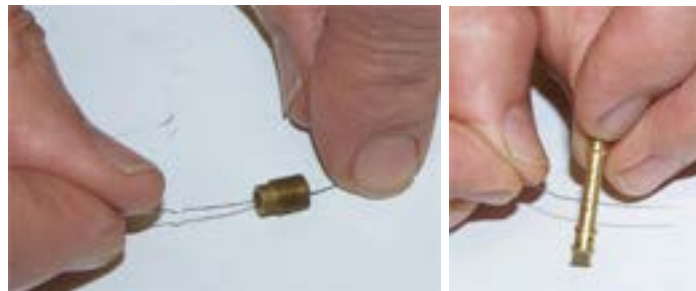


3. The float screw came out of the metal tube that is hanging straight down from the carb. The main jet is screwed up inside of this tube. Now you will need a 1/4" wide straight or slotted screwdriver. Make sure your screwdriver is as wide as the hole in tube. (In other words make the tip of the screwdriver as wide as you can. If you use too small a tip screwdriver you could mess up the main jet's slot that the screwdriver goes into and then you will have to drill and use an easy out to remove the main jet.) Use your small screwdriver and slide this up into the metal tube and turn it until you feel the tip of the screwdriver slip into the slot on top of the main jet. If your engine is out of the tub you can tilt the engine and see the main jet up inside the tube. Now unscrew the main jet counter clockwise.



After it breaks lose just unscrew it all the way out. You should have in your hand a small short jet about 3/8" long and a long skinny tube which is the fuel nozzle about an inch long. If the long jet does not fall out tap the metal tube gently to make it fall out and /or squirt some of your carb. cleaner up in the tube to get it to loosen up. This one is not screwed in. Also look and see which end falls out first so you can put it back in the right way. (The end with the bulge faces down.)

4. Now you should have two small brass pieces in your hand. They will have some very small holes. You will need to use a very small piece of wire to open these holes. Carb. cleaner by itself will not remove these old fuel deposits. This is the problem with your engine. Although by looking at it, it may not appear so, the tiny holes are partially plugged from old dried fuel. **Absolutely do not use a drill bit. Do not enlarge these holes or you will be buying new jets.** Enlarging these holes will affect the way your engine runs. Now take some spray carb. cleaner and flush the jets out and then spray carb. cleaner in all crevices in the carb. Spray it good and everywhere, you can't hurt anything. Spray it up into the orifice where the white float's black tip came out. Flush the entire carb. really well.



5. Not much more to do. We just have to put it back together (Actually, YOU have to put it back together, I'm just looking over your shoulder). Put the small end of the long skinny brass jet back up into the metal tube (bulged end facing down) followed by the shorter main jet. Screw the main jet back up inside the metal tube and snug it down. Do not try to over tighten. Now take the white

plastic float and hold it up so the black tip goes back up into its own hole. Now slide the metal pin back in place. This does not take any force. It should just slide into place. Now move the float gently up and down to see that the white float moves freely.

6. Now just replace the gold colored float bowl and the center screw. Now replace the back plate (don't forget the gasket or the hoses), paper air cleaner and cover. "Whew!" You are now a quasi-qualified, Honda mechanic.

Now for the final test. Let's start the engine. Remove the air intake dust cap. Lay the black heat hose out and remove the black, plastic dust cover on the end of the black heat hose (if you haven't already lost it). Place the engine start switch to the on position. Turn on the fuel valve. Set the choke to the on position (to the right). Put the throttle to about half speed.

O.K. this is it. Pull it over. It should start after two to four pulls. Remember we drained the fuel so give it an extra pull or two so the fuel has a chance to get into the carb. Once it starts put the choke at about the half way position for a few moments then you can turn it off completely.

GOOD JOB!

If for some reason you still have a problem (or to congratulate us) call us at (352) 307-1001.

Now remember when you put this unit away each day, turn off the fuel. If you are going to use it again the next day it is not necessary to drain the carburetor. If you are not going to use the unit again for a week or more drain the carb. Shut the fuel valve off while the engine is running while you are doing the rinsing, and let the carburetor run dry. The engine will stop when it can no longer pull fuel from the tank.

Note****

Use of a fuel stabilizer when your unit is being stored will definitely help. Don't just put the stabilizer in the fuel tank. Use it full-time by putting it into your gas CAN every time you fill it up. That way you won't have to remember to add it to the tank, and full time use will have a flushing effect every time the engine is run.

Now go have some more fun!

EMERGENCY MAINTENANCE PROCEDURE

- A. In the unlikely event that you accidentally submerge your unit, act quickly and the situation is savable. Get it on board or ashore. Remove and clean the spark plug.
- Pull the start rope repeatedly, and continually, until all excess water has been expelled from the cylinder.
 - Pour or spray a water displacing oil into the Honda engine cylinder. Marvel Mystery Oil is recommended but WD-40, or CRC will do. Pull the start rope several more times.
- B. Drain oil and gas completely, using whatever means are available. Replace with fresh fluids.
- Remove the carburetor float bowl, turn fuel valve on and flush carburetor and fuel lines with the fresh fuel, which will remove remaining water.
- C. Replace the spark plug.
- D. Remove the air intake cover on the engine.
- If there is a paper element, discard it but replace it as soon as possible. Remove sponge or foam filter if there is one. Set it aside.
 - If the engine is equipped with a sponge air cleaner, the element needs to be cleaned before reinstalling. Wash with gasoline using a kneading action. Let dry completely, then add several drops of oil, and squeeze sponge filter to distribute oil, and replace.
- E. Detach the air intake staff from the compressor. Start the engine and with the engine running,
- Use your red fresh water rinse cap located in your black dust cap, rinse out the compressor head as described in the “Clean Up After Your Dive Day” section above. *(DO NOT pour a heavy stream into the compressor head.)* Rinse with red capfuls several times *(the more times; the more effective)*. Let your unit run with the black heat hose laying on the ground for at least 45 min. to one hour. Stop and restart periodically over next few hours to ensure that all parts are working and moving.
- F. Remove the compressor head as soon as possible. Inspect and replace parts as needed. You may not need to do anything here. Just inspect and make sure nothing was damaged. A #1905 Or a 1915-20 Service Kit is all you should need if you have a problem. Otherwise call our Service Manager at (352) 307-1001 advise. The engine can be taken to any authorized Honda repair station.

AT NO TIME SHOULD OIL BE PUT INTO THE COMPRESSOR as this will introduce a toxic and hazardous substance into the air breathing system. It is sometimes mistakenly believed that food grade, vegetable, or synthetic oils are not harmful. OIL IS OIL and will cause eventual suffocation or permanent lung damage if it enters the breathing air supply.

A SPECIAL WORD ABOUT SAFETY!!

NEVER, EVER INDUCE GASOLINE INTO THE ENGINE IN ANY WAY OTHER THAN THE WAY IT IS DESIGNED. That is through the normal gas tank feed system. Pouring gas from an open container while, or when trying to start an uncooperative engine that has been partially dismantled is dangerous and presents a serious burn threat. Take the equipment to a professional, authorized Honda repair facility.

Airline Travel

Unfortunately, you will probably not be allowed to transport your Air Line as luggage on a commercial passenger flight. Any appliance that has ever had fuel in it is disallowed. With a few simple steps, however, it can be transported as air freight. Call the Air Line for more info at 1-352-307-1001

Air Quality

Bad memories linger. Once upon a time a major outboard motor company produced a hookah system that was removed from the market due to some questionable air. Welcome to the tort era.

Your Air Line is, indeed, a piece of life support equipment and, as such, meets very strict air quality standards. All of our system designs were originally tested by an independent laboratory. They meet, or exceed, the Compressed Gas Association specifications for grade "E" air quality as stated in CGA G-7.1. The rating is included in this manual.

ONE (1) YEAR LIMITED WARRANTY

The Air Line, surface-supplied air breathing system is warranted to you, the original purchaser, for a period of 1 year from the date of original retail purchase, to be free from defects in material or workmanship. If during the specified warranty period you believe the purchased product or any part thereof, has such a defect, you must return the product or part during such period with proof of purchase and at your cost to the Air Line or a service center authorized by Air Line, for replacement or repair of the defective part.

For **compressor service**, contact our Service Department at (352) 307-1001. Specify which Air Line model you have. For **Honda service**, locate your nearest **authorized** small engine dealer in the yellow pages. If unable to locate one, call American Honda Customer Service in Duluth, GA. The number is (404) 497-6400. Be prepared with the engine's model and serial numbers, not The Air Line's model and serial numbers. You will find this information at the base of the engine on the side of the On/Off switch. For all other service, contact The Air Line at (352) 307-1001.

If the product or part is found to have been defective in material or workmanship, it will be repaired or replaced (*at service center's discretion*) free of charge, and returned to the purchaser, freight paid by purchaser.

This warranty shall not apply to any system or part which, in the service center's judgment, has been subject to misuse, negligence or accident, or which, in the case of electric powered compressors, has been operated from a low or wrong power supply. Negligence on all models will mean failure to carefully follow operating and maintenance procedures as specified in the Owner's Manual. Further, this warranty will not apply to compressors that have been oiled internally, which will also constitute a dangerous health hazard.

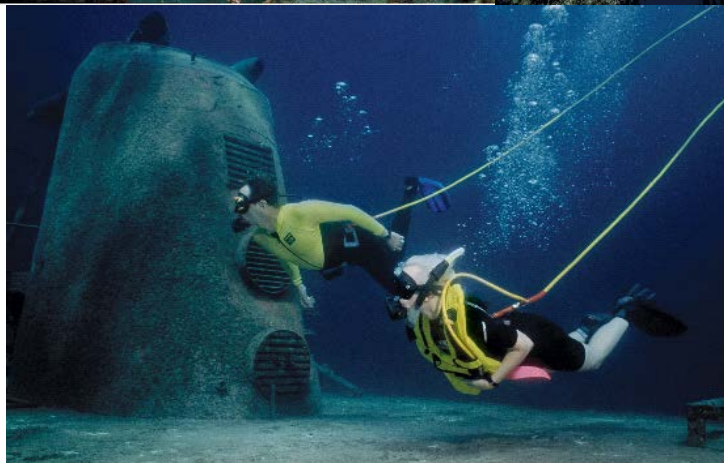
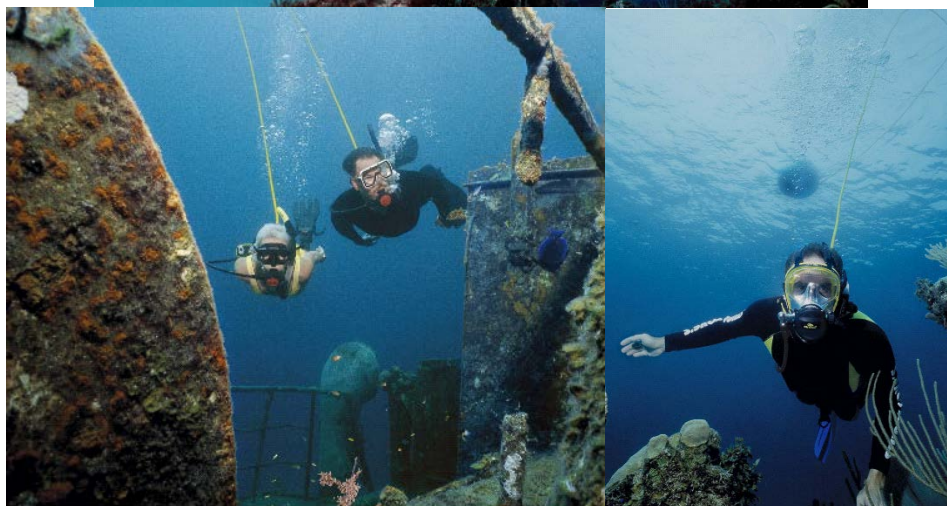
No implied warranties are in effect and the manufacturer disclaims any implications with respect to the product and its parts.


The remedy provided in this limited warranty for a defective product is purchaser's sole and exclusive remedy, subject to your state law. Further, this warranty gives you specific legal rights and you may have other rights which vary from state to state.

The Air Line understands that use of its equipment might be seasonal, but the one year warranty period from date of original purchase will be adhered to in the interest of comprehensible record keeping.

The Air Line
200 SE Hwy 484
Ocala, FL 34480
Corporate and sales offices: 352-307-1001
e-mail <info@airlinebysink.com>

We'll see you on the bottom !



The Air Line 

ENGINE POWER

9/11/02

The Air Line Co.
Tucson, AZ

Re: Honda Engine Approval for Diving Float Application.

<u>Engine Model #</u>	<u>Thomas Compressor Model #</u>	<u>The Air Line Model #</u>
G100K2QA2	TG-250C0-36	AL-R260
GX12OK1QX2	TG-402C0-36	AL-C360
GX12OK1QX2	TG400CO-36	AL-R26OXL

The Application Review of the Honda engine in your product is completed and has been approved for warranty. The approval paperwork is on file at Engine Power, Inc. as well as American Honda Motor, Co.

Application Approval means that American Honda has reviewed the expected use of this engine, contingent on the usage conditions as presented by the manufacturer of the equipment. Warranty will be provided under the conditions of the standard published warranty. Application Approval does not imply or guarantee warranty, beyond the conditions of the standard warranty. (See attached)

Some Honda Engine service centers may be somewhat skeptical about extending Honda warranty in this type of application. You can be assured that extensive testing was performed and that all requirements of the application approval process have been executed and completed. Although Honda has reviewed and approved the engine installation for warranty purposes, it is important to remember that application approval is not an endorsement of a manufacturers product.

Best Regards,

Mike Hale
Application Specialist-EPI

January 25, 2007

Mr. Joe Sink
The Air Line by J. Sink, Inc.
4340A S.E. 95th Street
Ocala, FL 34480

Dear Joe,

In follow up to our conversation earlier this week, please find the following.

As you know Thomas is the worlds leading OEM compressor manufacturer in the world. As a result, Thomas has a very broad array of products with many available features to suit a variety of applications and needs. As an OEM manufacturer we build, both standardized and customized products. Customized products would be those which are configured to a particular customer's requirements. When Thomas customizes a product, building it per a particular customer requirement, a unique customer number is assigned to the product, which then results in that particular model number being proprietary to that customer. As a result, that particular product with a specific customer number is proprietary to that one customer and not offered or sold to other customers. With regard to The Air Line, models specific to The Air-Line include Thomas Model Numbers T-30WTCO-36 & TG-400HCO-36, The Air Line Model Numbers AL-E160 and AL-R260XL respectively. Additional models proprietary to The Air Line include Thomas models TG-250COLM-36 and TG-400COLM-36.

As always, we appreciate your business, but more importantly, we appreciate the long standing relationship that has evolved over time with The Air-Line and look forward to a continued long mutually beneficial future.

If you have any questions or comments, please do not hesitate to contact me.

Best regards,



Randy M. Blindauer
Dir. of N.A. Distribution & Specialty Products

cc : John Worth – Thomas Products Division

ANALYSIS RESULTS FOR GRADE "E" AIR

STL#18646

SITE OF TEST	AL-R260
CLIENT	The Air Line

INTRODUCTION:

On 05 May 1999, SEMTEC personnel performed an analysis on a portable air compression system being used to supply breathing air for under water use. The analysis is performed to ensure that the air being delivered conforms to Grade "E" air specifications outlined by the Compressed Gas Association, Inc..

RESULTS:

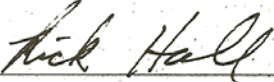
The standards below are specified by the Compressed Gas Association, Inc., under CGA, G-7.1 for Grade "E" Air.

ANALYTE	SPECIFICATION	RESULT
%O ₂ in Air	19.5- 23.5%	21.0
Carbon Monoxide (CO)	<10 ppm	< 1
Carbon Dioxide (CO ₂)	<1000 ppm	375
Condensed oils	<5 mg/m ³	< 1
Total Hydrocarbons	< 25 ppm	< 0.1
Water Vapor	Varies with intended use	10,700 ppm
Particles	No visible particles	Pass
Odor	No pronounced odor	Pass

CONCLUSIONS:

The above identified portable compressed air system **PASSES** the specifications required by the Compressed Gas Association, Inc. as stated in CGA G-7.1 for Grade "E" air.

Note: This certification applies only to the air being delivered by the compression system. This document does not include certification of any alarm systems (i.e. carbon monoxide, high temperature or low pressure) or calibration levels of the aforementioned alarm systems.


Rick Hall
Technical Analyst
SEMTEC Laboratories, Inc. 10 May 1999

THE AIR LINE
9531 E. LOCHNAE Ln TUCSON, AZ
FINAL TESTING RESULTS FOR GRADE E AIR

STL 22180

INTRODUCTION:

SEMTEC Laboratories performed a series of tests on an air compressor designed to directly feed compressed ambient air to divers. The model was **AL-R 260 XL**. The unit was brought to SEMTEC and operated in the parking lot of SEMTEC during the testing. The air was sampled at the distal end of a 60-foot delivery hose. Grade E compressed air is specified as intended for self-contained underwater breathing apparatus (SCUBA).

Grade "E" air is defined by the Compressed Gas Association (CGA) in the publication G-7.1-1997 "Commodity Specification for Air."

RESULTS:

The following table provides the test results and the specifications as given by CGA in document G-7.1-1997:

ANALYTE	SPECIFICATION	TEST RESULT
% Oxygen	20-22%	21.1%
Carbon Monoxide (CO)	<10 ppm	<1 ppm
Carbon Dioxide (CO2)	<1000 ppm	350 ±25 ppm
Oil (condensed droplets)	<5 mg/m ³	<5 mg/m ³
Water Vapor	not specified	near saturation
Odor	none	good
Total Hydrocarbons (as CH4)	<25 ppm	<1 ppm

CONCLUSIONS:

The above-identified air compression system PASSED all specifications for Grade E air.

Note: This certification applied only to the air being delivered by the compression system. This document does not include certification of any alarm systems (e.g. carbon monoxide, high temperature or low pressure) or calibration levels of the aforementioned alarm system.

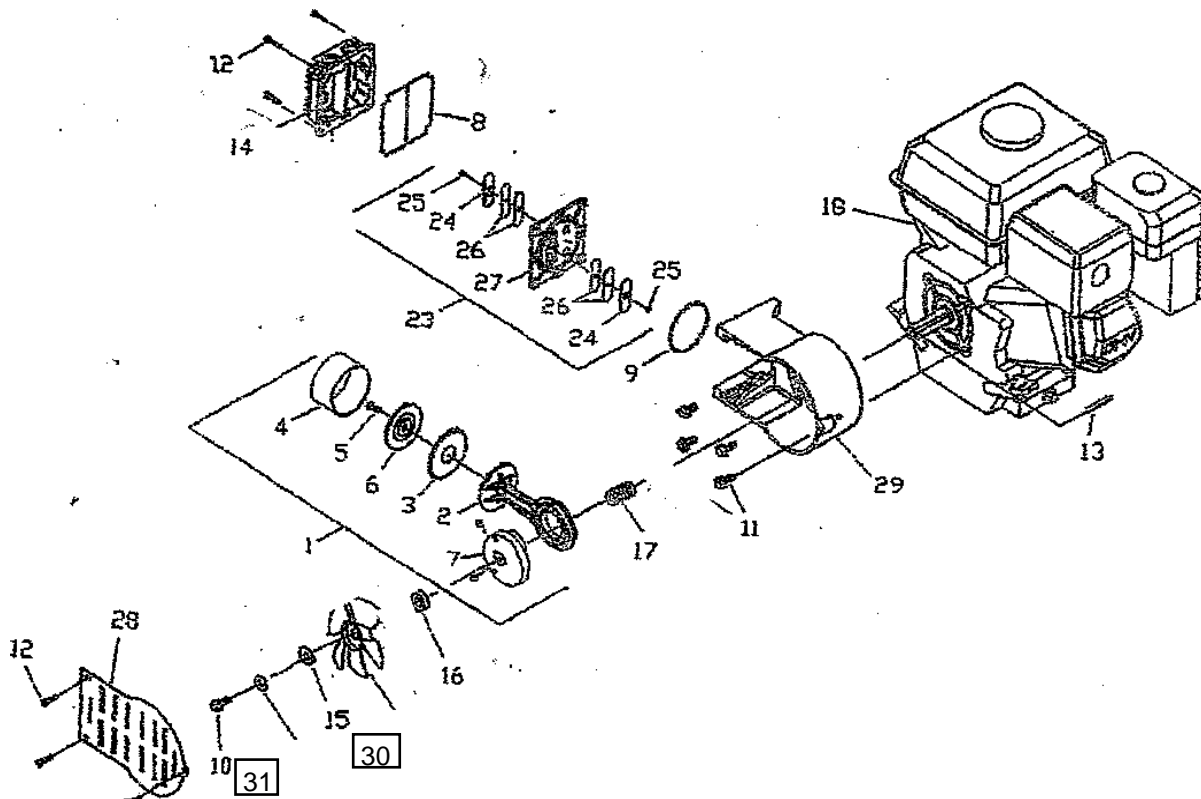


7/15/02

Ed Holdsworth
General Mgr
SEMTEC Laboratories, Inc.

R260-4 4.0 HP PARTS LIST

ITEM #	PART #	DESCRIPTION	QTY	ITEM #	PART #	DESCRIPTION	QTY
1	666446	Con Rod Ecc & Bearing Assbly	1	15	626299	Washer - Connect Rod to Shaft	1
3	624377	Piston Cup	1	16	626869	Spacer - Connect Rod to Shaft	1
4	618119	Piston Sleeve	1	17	627247	Spring - Connect Rod to Shaft	1
5	625198	Screw - Retainer	1	18	GX120	Engine - 4 HP Honda	1
6	626730	Retainer	1	23	662566	Valve Plate Assembly	1
8	623624	O-Ring Gasket - Head	1	24	617312	Valve Restraint	2
9	623638	O-Ring - Sleeve	1	25	625857	Screw - Valve Flapper	2
10	625388	Screw - Connecting Rod to Shaft	1	26	662054	Valve Flapper	4
11	625294	Screw - Housing to Engine	4	28	664715	Front Cover	1
12	625646	Screw - Head & Front Cover	7	29	669159	Housing	1
13	626275	Key	1	30	638504	Fan	1
14	669160	Head	1	31	626035	Lockwasher	1



R260-XL 4.0 HP PARTS LIST

ITEM #	PART #	DESCRIPTION	QTY	ITEM #	PART #	DESCRIPTION	QTY
1	643316	Engine - Honda 4.0 HP	1	16	626299	Washer SS	2
2	669254	Housing - Black Acrylic Coat	1	17	626298	Lockwasher SS	1
3	625294	Screw 5/16" - 24 x .75" Hex Hd	4	18	625388	Screw 5/16 -24 x .75 Hex Wsh SS	1
4	626275	Key Square - 3/16" x 1"	1	19	662405	Front Cover	1
5	627247	Spring	1	20	623075	O-ring	1
6	666500	Ecc.Brg, Rod & Sleeve Assy	1	21	625278	Screw 10-32 x .38 T-20 Fit Hd SS	2
7	625008	Set Screw 5/16" - 18 Hex	2	22	617499	Valve Restraint - Acrylic Coat	2
8	626183	Piston Cup	1	23	662563	Flapper Valve	2
9	626398	Cup Retainer - Acrylic Coat	1	24	662826	Valve Plate - Acrylic Coat	1
10	625170	Screw 1/4"-20 x .88" Fit Hd SS	2	25	625385	Screw 1/4"-20 x 1.25 Hex Wsh SS	5
11	618193	Cylinder Sleeve	1	26	623082	O-ring Gasket	1
12	626387	Spacer	1	27	669253	Head-Acrylic Coat	1
14	625383	Screw #10-24 x .5" Pan SS	4	28	625198	Screw #10-24 x 7/8" Trx Hd SS	3
15	638745	Fan - 7 Blade 6.0" CCW	1	29	664141	Cover - Filter	1

