



Manual: GH2S2 Series Power Unit

DANGER

Understand manual before use. Operating AMKUS Rescue Systems without understanding the manual, receiving proper training, and using appropriate personal protective equipment is a misuse of AMKUS equipment. This manual does not fully address safety. Additional safety information is published in AMKUS Safety Manual LAA-001. Obtain safety information at www.amkus.com/resources/information



Certified Model
NFPA 1936, 2015 Edition

CE EN13204 Designation: MTO

This manual is intended for use with manuals published by manufacturers of the prime movers (engine and pump) used in this power unit.



GH2S2-XL

Power unit with cage and hose hoop



GH2S2-XLNT

Power unit with cage



GH2S2-STD


Power unit with carrying handle

AMKUS RESCUE SYSTEMS
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PERSONAL RESPONSIBILITY CODE

The member companies of FEMSA that provide emergency response equipment and services want responders to know and understand the following:

1. Firefighting and Emergency Response are inherently dangerous activities requiring proper training in their hazards and the use of extreme caution at all times.
2. It is your responsibility to read and understand any user's instructions, including purpose and limitations, provided with any piece of equipment you may be called upon to use.
3. It is your responsibility to know that you have been properly trained in Firefighting and /or Emergency Response and in the use, precautions, and care of any equipment you may be called upon to use.
4. It is your responsibility to be in proper physical condition and to maintain the personal skill level required to operate any equipment you may be called upon to use.
5. It is your responsibility to know that your equipment is in operable condition and has been maintained in accordance with the manufacturer's instructions.
6. Failure to follow these guidelines may result in death, burns or other severe injury.



Fire and Emergency Manufacturers and Service Association
P.O. Box 147, Lynnfield, MA 01940 • www.FEMSA.org

1.0 MEANING OF SAFETY SIGNAL WORDS

A safety related message is identified by a safety alert symbol and a signal word to indicate the level of risk involved with a particular hazard. Per ANSI standard Z535.6-2011, the definitions of the four signal words are as follows:



DANGER indicates a hazardous situation which, if not avoided, will result in death or serious injury.



WARNING indicates a hazardous situation which, if not avoided, could result in death or serious injury.



CAUTION indicates a potentially hazardous situation which, if not avoided, could result in minor or moderate injury.



NOTICE is used to address practices not related to physical injury.

2.0 SPECIFICATIONS

GH2S2-XL Power Unit Specifications		
Length	23.0 in	584 mm
Width (with one hose loop standard)	19.0 in	483 mm
Height	20.5 in	521 mm
All weights include gas, engine oil, and hydraulic fluid		
Weight with Standard Couplings	114.0 lbs	51.7 kg
Rated Output Pressure	10,500 psi	724 bar

GH2S2-XLNT Power Unit Specifications		
Length	20.5 in	521 mm
Width (with one hose loop standard)	18.8 in	478 mm
Width (with no hose loop)	16.0 in	407 mm
Height	19.5 in	495 mm
All weights include gas, engine oil, and hydraulic fluid		
Weight with Standard Couplings	111.7 lbs	50.7 kg
Rated Output Pressure	10,500 psi	724 bar

GH2S2-STD Power Unit Specifications		
Length	19.5 in	495 mm
Width	15.0 in	381 mm
Height	22.0 in	559 mm
All weights include gas, engine oil, and hydraulic fluid		
Weight with Standard Couplings	105.0 lbs	47.6 kg
Rated Output Pressure	10,500 psi	724 bar

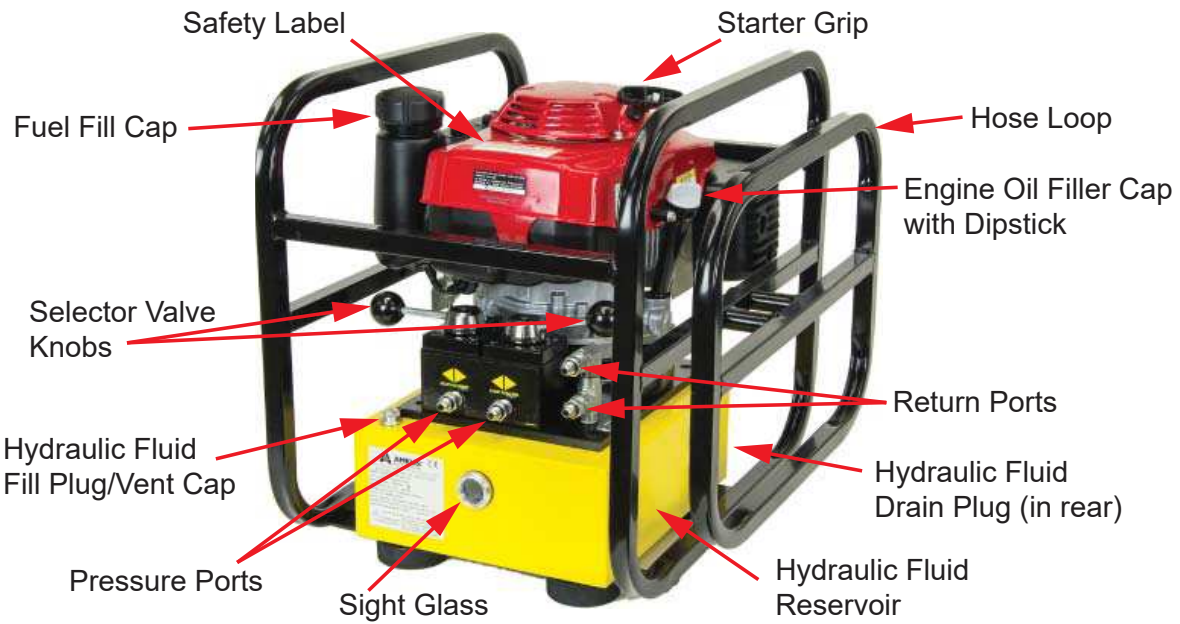
Hydraulic Specifications			
Rated Output Pressure			
Rated Flow Of The Pump first stage	150 in ³ /min	2460 cc/min	first stage
	40 in ³ /min	660 cc/min	second stage
Fluid Type:	AMKUS MV1 Mineral Base Hydraulic Fluid. Safety Data Sheet (SDS) for AMKUS MV1 Hydraulic Fluid is available at AMKUS.com and CHEMTREC.com (For equipment stored and operated in environments below 32 deg. F (0 deg C) contact Amkus Rescue Systems for recommendation.		
Hydraulic Fluid Reservoir Capacity:	2.0 gals. US	7.6 liters	
Usable Hydraulic Fluid Capacity:	1.45 gals. US	5.5 liters	
Maximum Angle of Inclination:	20 degrees from horizontal		

Engine Specifications	
Engine	Honda GXV160 4.3 bhp (3.2 kW)
Engine Oil	*Refer to Honda GXV160 owner's manual.
Fuel	*Refer to Honda GXV160 owner's manual.

DECLARED DUAL-NUMBER NOISE EMISSION VALUES in accordance with EN ISO 4871

Measured A-weighted emission sound pressure level, L_{pA} (ref. 20 μ Pa), in decibels: 88.6 Uncertainty, K_{pA} , in decibels: 1.5
Measured A-weighted sound power level, L_{WA} (ref. 1 pW), in decibels: 100.5 Uncertainty, K_{WA} , in decibels: 1.5
Values determined according to Annex B of EN 13204 using the basic standards EN ISO 3744 and EN ISO 11201.
Note: The sum of a measured noise emission value and its associated uncertainty represents an upper bound of the range of values which can occur in measurements.

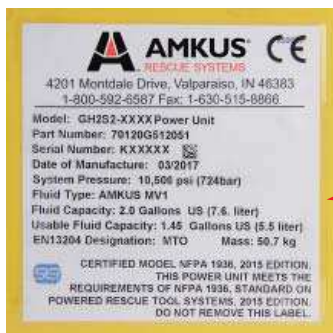
2.1 PART IDENTIFICATION



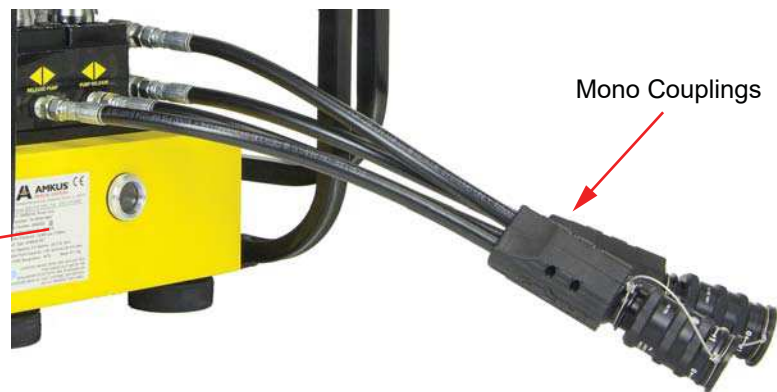
Fuel Shut Off

Throttle

Standard Couplings



Serial Number



Mono Couplings

3.0 PROTECTIVE CLOTHING

It is the responsibility of the user to insure that appropriate protective clothing and equipment are used to provide protection from those hazards to which personnel are exposed or could be exposed while working with this product.

4.0 TRAINING

This product is designed to be used by emergency services personnel to facilitate the extrication of victims from entrapment. Its use should be limited to trained personnel only. All personnel using this equipment are assumed to have completed a course of instruction that is acknowledged as being educationally sound by the local authority having jurisdiction over such training. This document contains basic operating and maintenance instructions only.

5.0 SET-UP PROCEDURE

AMKUS manufactures equipment with superior craftsmanship and quality backed by the standard warranty published on the AMKUS website.

NOTICE

The engine ships WITHOUT OIL. Running engines dry or with an overfilled crankcase can quickly ruin the engine.

NOTICE

Only use AMKUS tools with AMKUS equipment. Mixing AMKUS tools with another manufacturer's equipment may cause operational problems, equipment failure, or denial of warranty claims.

NOTICE

Only use AMKUS mineral-base hydraulic fluid in AMKUS equipment. Using another manufacturer's hydraulic fluid in AMKUS equipment may cause operational problems, equipment failure, or denial of warranty claims.

Normally, AMKUS equipment is prepared and serviced by your dealer prior to delivery. If, however, you have decided to place the equipment into service yourself, please review the following instructions carefully.

1. Remove equipment from the packing cartons and carefully inspect for damage. Damage that occurs during shipment should be reported immediately to the carrier.
2. The Honda® engine that powers this unit is shipped without engine oil. Fill the engine crankcase with the proper oil as specified in the engine owner's manual and verify oil level using the dipstick.
3. Next, remove the hydraulic fluid reservoir fill plug/vent cap. Fill the hydraulic fluid reservoir with approximately 2.0 gallons U.S. (7.6 liters) of AMKUS mineral base hydraulic fluid. The fluid should reach a level that fills approximately ½ of the sight gauge window. Replace the fill plug/vent cap.
4. Following the instructions in the engine owner's manual, fill the engine fuel tank with the specified fuel. Avoid getting dirt or water in the fuel tank. Never use stale or contaminated gasoline or an oil/ gasoline mixture.
5. This power unit may be supplied either with hydraulic hoses attached (pump hoses) or with couplings (standard or mono) that require extension hoses.
 - If your unit is equipped with pump hoses with standard couplings, connect the male and female couplings at the end of each hose set, creating a loop.
 - If your unit is equipped with standard couplings, attach the extension hoses to the couplings on the power unit, and connect the male and female couplings at the opposite end of each hydraulic hose line set, creating a loop.
 - If your unit is equipped with mono couplings, simply make sure that the hoses are connected to the power unit.
6. Prior to starting the engine, place the selector valves in their neutral positions. Follow the operating instructions in the engine owner's manual for starting the engine. Then operate the engine in the fast throttle position.
7. To purge air from the hydraulic hoses, charge each hose line by moving the knob on the corresponding selector valve to the pressure position (in line with the selected hose line) and allowing the fluid to circulate through each hose line for at least one minute. Move each selector valve back to the neutral position.
8. Check the level of the hydraulic fluid in the sight gauge. Add more fluid if necessary. **DO NOT OVERFILL.**
9. If your unit is equipped with standard couplings, uncouple the male and female couplings on each hydraulic hose line set to open the loop that was created earlier. The power unit is now ready to use.

6.0 GETTING STARTED

Connect the tool connection hoses to the hose lines from the AMKUS hydraulic power unit.

1. For power units equipped with standard couplings: The male and female couplings on the tool connection hoses should be connected to the corresponding male and female couplings on the hose lines leading from the power unit. To connect the couplings, twist the sleeve on the female coupling so that the notch in the sleeve lines up with the pin. Push the sleeve back so the pin fits into the notch. While holding the sleeve back, push the male coupling into the female coupling. Release the sleeve; it will spring forward into place. Twist the sleeve ¼ turn so that the pin no longer lines up with the notch. Pull on the couplings to check that they are securely connected.
2. For power units equipped with mono couplings: The male coupling on the tool connection hoses should be connected to the corresponding female coupling on the hose lines leading from the power unit. To connect the couplings, place the male coupling into the female coupling. Rotate clockwise until you feel the coupling latch. Pull on the couplings to check that they are securely connected.

NOTICE

In most cases, the mono couplings can be connected and disconnected while the hose line(s) are under flow. It is usually not necessary to place the directional control(s) of the power unit in the neutral position before connecting and disconnecting. However, certain circumstances, such as back pressure in the return line(s) and/or cold temperatures, may make connecting and disconnecting under flow extremely difficult or impossible. If you are unable to connect or disconnect while the line(s) are under flow, place the directional control(s) of the power unit in the neutral position and then connect or disconnect.

7.0 OPERATING INSTRUCTIONS

7.1 GENERAL

The GH2S2 series power units are simultaneous operation power units. Two tools can be connected simultaneously and operated either independently or simultaneously.

Prior to starting the engine, place the selector valves in their neutral positions. Start the engine by following the instructions in the engine owner's manual. Operate the engine at fast throttle for maximum rescue tool speed and performance. Use the idle position only when the rescue tools are not being operated.

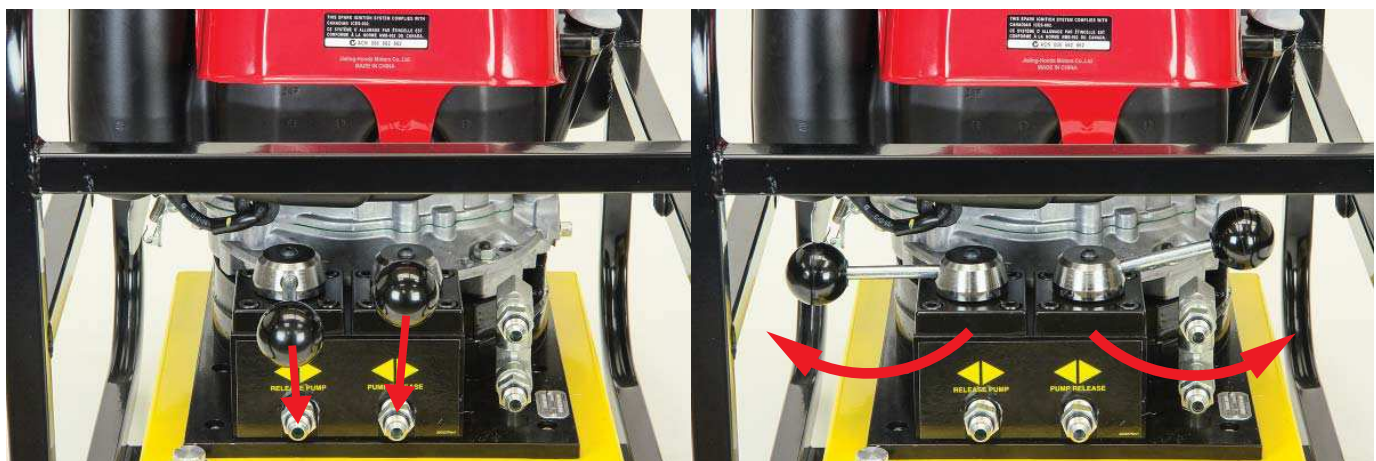
When you have finished operations, place the selector valves in their neutral positions. Follow the instructions in the engine owner's manual to stop the engine.

Please note that the minimum safe bend radius of the hoses is 4 inches (101.6 mm).

7.2 SELECTOR VALVES

The GH2S2 series power units are equipped with a pair of (2) two position selector valves. When facing the front of the power unit, the selector valves are in the Neutral position when perpendicular to the hose line, as shown below.

In order to operate a tool that is connected to the left set of hoses, move the left selector valve handle to the flow position, or toward the center of the power unit. In order to operate a tool that is connected to the right set of hoses, move the right selector valve handle to the flow position, or away from the center of the power unit. The two tools can be operated independently or simultaneously.



Left Oil Flow - Right Oil Flow

Neutral Position

To stop the flow of hydraulic fluid, move the knob of the corresponding selector valve to the neutral position (perpendicular to the hose line). The selector valve should be in the neutral position when an operation is finished or to stop the flow of hydraulic fluid.

8.0 TROUBLE SHOOTING GUIDE

Any problem not resolved by the following suggestions may require contacting your local dealer or AMKUS Rescue Systems for further guidance.

Problem	Solution
Engine will not start or poor engine performance	Check Honda owner's manual. Check fuel level
Tool lacks power or speed	Check hydraulic fluid level in power unit reservoir.
Fluid leaks at fittings or hoses	Check tightness of hose fittings. Replace damaged hoses or fittings.
Tools do not operate	Check to see that the power unit is running in fast throttle mode. Check to see that the line is charged. Check hydraulic fluid level in power unit reservoir.

9.0 ROUTINE MAINTENANCE

9.1 ROUTINE MAINTENANCE FOR GASOLINE ENGINE

Follow the maintenance guidelines in the engine owner's manual.

9.2 ROUTINE MAINTENANCE FOR HYDRAULIC PUMP

Normally, you will have a maintenance agreement for your system with your local dealer. However, if you have decided to service the equipment yourself, please review the following instructions carefully.

Change hydraulic fluid after each 20 hours of tool operation (approximately every 2 years). If you suspect your hydraulic fluid has been contaminated in any way, contact your local dealer or AMKUS Rescue Systems.

To change the hydraulic fluid, remove the hydraulic fluid reservoir fill plug/vent cap. Place the unit over a drain pan; unscrew and remove the drain plug. Be careful not to lose it! Allow the hydraulic fluid to drain completely. Clean and replace the drain plug. Fill the hydraulic fluid reservoir with new AMKUS mineral base hydraulic fluid. Replace the fill plug/vent cap.

The next step is to purge air from the hydraulic hoses. Please see Set-Up Procedures points 5-9. Check the pressure output of the power unit at each hose line by connecting a pressure gauge to the pressure line. Move the selector valve to charge the line to which the gauge is connected.

The rated hydraulic pressure at maximum output is 10,500 psi \pm 500 psi (724 bar \pm 34 bar). Verify performance by periodic testing using a pressure gage. If performance falls outside of this range, contact your local dealer or AMKUS Rescue Systems.

DO NOT ATTEMPT TO ADJUST THE INTERNAL PRESSURE RELIEF SETTING! Pressure relief valves are NOT user serviceable. User adjustment is a misuse of this equipment.

Properly dispose of all engine fuel, engine oil, and hydraulic fluid wastes. Do not release chemicals into the environment.

9.3 ROUTINE MAINTENANCE FOR HOSES

After each use, hoses should be wiped clean with a light cleaner such as Simple Green®. Inspect hoses for damage to the rubber outer cover. Damage which exposes the wire braided reinforcement subjects the wire to corrosion and may weaken the hose. Replace damaged hoses.

9.4 ROUTINE MAINTENANCE FOR COUPLINGS

Use care when making hydraulic connections by avoiding dirt, sand, and water puddles at the emergency scene. Even with care, residual oils on the moving parts will gradually accumulate dirt and grit making connections difficult. Couplings and dust caps can be periodically cleaned using an automotive type aerosol solvent de-greaser. Avoid water-based cleaning products. Apply a light spray lube (automotive, lock, or gun type) to keep the collars moving easily. Avoid covering a clean coupling with a dirty dust cap. Replace damaged fittings.

9.5 MAINTENANCE RECORDS

It is the responsibility of the user to keep maintenance records for each component of the rescue system. Maintenance shall be performed by qualified service technicians in accordance with the recommendations as outlined in this manual.

10.0 INSPECTION, CLEANING, DECONTAMINATION, AND STORAGE

1. Always store the power unit in a clean, dry space.
2. Never store a power unit under pressure.
3. Store the power unit upright.

BEFORE BEING PLACED BACK IN SERVICE, power units must be inspected to this checklist;

1. Check to see that all markings are legible. Contact your local dealer or AMKUS Rescue Systems for replacement labels.
2. Wipe tool, hoses, fittings and couplings clean (see routine maintenance for hoses and couplings).
3. Inspect the power unit, hoses, fittings and couplings after each use for damage, leakage and excessive wear.
4. If the power unit becomes contaminated, determine the nature of the contamination. IE: biological, chemical, radioactive. The authority having jurisdiction may follow internal decontamination guidelines or request technical advice from AMKUS.
5. Check engine oil per the manufacturer' recommendations after each use.
6. Check the hydraulic fluid levels after each use. Replenish as necessary with AMKUS MV1 mineral based hydraulic fluid.



Any power unit failing any part of the checklist is unsafe for use and must have the problem corrected before use or being placed back into service. Operating a power unit that has failed the checklist is a misuse of this equipment.

11.0 PARTS, SERVICE AND TECHNICAL INFORMATION

Parts, service and technical information may be obtained from your local AMKUS dealer, or by contacting AMKUS Rescue Systems.