

RIDING TROWEL

MSP475



SAFETY & OPERATIONS MANUAL

Manual Part #: 069599 | Revision: A
Language: English | Original Instructions



RIDING TROWEL

SAFETY & OPERATOR MANUAL

This manual covers the products listed below:

<u>Part No.</u>	<u>Description</u>
067405	MSP475, 8ft, Kubota, Gas, 57HP, Hydraulic Steering

NOTICE

This manual, or a copy of it, must be kept with the machine at all times.
There is a manual storage container located on the machine for your convenience.

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Allen Products are covered under one or more of the following patent numbers:
10,100,537; 9,068,301; 9,068,300; 8,360,680; 7,690,864; 7,114,876B1; 6,857,815B2; 6,582,153
With other Patents Pending.

Printed in U.S.A.

Limited Warranty & Limitation of Liability

GENERAL INFORMATION

Allen Engineering Corporation ("Allen") warrants its products to be free of defects in material or workmanship for:

TWO YEARS FROM END USER'S DATE OF PURCHASE

Warranty period begins on the date of purchase by the End User of the product. All warranty is based on the following limited warranty terms and conditions, including the disclaimer of implied warranties and consequential damages.



1. Allen's obligation and liability under this warranty is limited to repairing or replacing parts if, after Allen's inspection, there is determined to be a defect in material or workmanship. Allen reserves the choice to repair or replace.
2. If Allen chooses to replace the part, it will be at no cost to the customer and will be made available to the Allen Distributor, Dealer, or Rental Center from whom the End User purchased the product.
3. Replacement or repair parts, installed in the product, are warranted only for the remainder of warranty period of the product as though they were the original parts.
4. Allen does not warranty engines or batteries. Engine warranty claims should be made directly to an authorized factory service center for the particular engine manufacturer. Batteries are not warranted due to unknown treatment during transport, etc, and any battery claims should be directed to the battery manufacturer.
5. Allen's warranty does not cover the normal maintenance of products or its components (such as engine tuneups and oil & filter changes). The warranty also does not cover normal wear and tear items (such as belts and consumables).
6. Allen's warranty will be void if it is determined that the defect resulted from operator abuse, failure to perform normal maintenance on the product, modification to product, alterations or repairs made to the product without the written approval of Allen. Allen specifically excludes from warranty any damage to any trowels resulting from an impact to the rotors.
7. Impact damage to gear boxes is not covered under the Allen warranty and is deemed customer abuse.
8. Allen will pay shop labor on warranty items at the Allen Shop Labor Rate in existence on the date of the warranty claim. An Allen labor chart will determine the time allowed to complete a repair and will govern the shop labor hours that will be allowed.
9. Allen will pay freight on warranty replacement parts at worldwide standard ground rates. No warranty replacement parts will be shipped air freight at the expense of Allen. Allen only pays outbound freight charges when sending warranty replacement parts to the customer via ground service. Allen does not pay any inbound freight. However, if Allen determines this to be a warranted item, only then will Allen reimburse the customer for inbound freight at standard ground rates.
10. ALLEN ENGINEERING CORPORATION'S WARRANTY POLICY WILL NOT COVER THE FOLLOWING: TAXES; SHOP SUPPLIES; ENVIRONMENTAL SURCHARGES; AIR FREIGHT; TRAVEL TIME; LOSS OF TIME; INCONVENIENCE; LOSS OF RENTAL REVENUE; RENTAL COSTS OF EQUIPMENT USED TO REPLACE THE PRODUCT BEING REPAIRED; LOSS OF USE OF THE PRODUCT; COMMERCIAL LOSS; OR ANY OTHER CHARGES WHATSOEVER OR ANY LIABILITIES FOR DIRECT, INCIDENTAL, OR CONSEQUENTIAL DAMAGE OR DELAY.
11. ALLEN ENGINEERING CORPORATION MAKES NO OTHER WARRANTY, EXPRESSED OR IMPLIED. THIS LIMITED WARRANTY IS IN LIEU OF THE WARRANTY OF MERCHANTABILITY AND FITNESS. THERE ARE NO OTHER WARRANTIES THAT EXTEND BEYOND THE DESCRIPTION ON THIS DOCUMENT.
12. No Allen employee or representative is authorized to change this warranty in any way or grant any other warranty unless such change is made in writing and signed by an officer of Allen Engineering Corporation.

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This manual provides information and procedures to safely operate and maintain the Allen Machine.

For your own safety and protection from personal injury, carefully read, understand, and observe the safety instructions described in this manual. Keep this manual or a copy of it with the machine at all times.

Always operate this machine in accordance with the instructions described in this manual. A well maintained piece of equipment will provide many years of trouble free operation.

This manual is divided into the following sections:

SECTION 1 SAFETY

SECTION 2 OPERATIONS

SECTION 3 SERVICE

SECTION 4 ACCESSORIES

Complete any warranty requirements as specified by the engine manufacturer in their instructions found inside the manual box located on the back of the riding trowel operator's seat.

Your engine and clutch is not manufactured by Allen Engineering Corporation, Inc, and therefore is not covered under Allen Engineering Corporation, Inc warranty.

Your engine manufacturer should be contacted if you wish to purchase a parts manual or a repair manual for your engine.

Refer to enclosed owners engine manual for complete O&M instructions. See your battery manufacturer for battery warranty.



EC Declaration of Conformity

with the

European Machinery Directive 2006/42/EC

We hereby declare that the machinery stipulated below complies with all the relevant provisions of the EC Machinery Directive and the UK National Laws and Regulations adopting this Directive.

Declaration Ref. No.: CE1938

Manufacturer: Allen Engineering Corporation
(name and address) 819 South Fifth St., Paragould. AR 72450. USA

Authorised Representative in EU: Andrew Clark, Designplus (Eng.) Ltd.
(name and address) 10 Chapel Lane, West Bergholt, Colchester, Essex. CO6 3EG. UK

Equipment: MSP465 Riding Trowel
MSP475 Riding Trowel

Description: Ride-on concrete smoothing machine

Serial No.: xxxxxxxx

Notified Body: Not required.
(name and address)

Other EC Directives: EMC Directive 2014/30/EU

Harmonized Standards Applied: EN 12649: Concrete compactors and smoothing machines -
(in full) Safety

Harmonized Standards referenced:
(partially applied)

Person empowered to draw up the declaration: Jay Allen

Position: President

Place of issue: Paragould. AR 72450. USA

Signature:

Date:

11/22/2019

Modifications to the machine without prior approval from the undersigned will render this declaration null and void.



Sound Pressure Level Information:

Sound pressure is “A” weighted . Measured at the operators ear position while the ride-on trowel is operating at full throttle on concrete in a manner most often experienced in “normal ” circumstances. Sound pressure may vary depending upon the condition of the concrete. Hearing protection is always recommended.



Vibration Level Information:

The vibration level indicated is the maximum RMS (Root Mean Square) velocity value obtained at the handle grip while operating the ride-on trowel on curing concrete in a manner most often experienced in “normal ” circumstances. Values were obtained from all three axes of motion. The values shown represent the maximum RMS value from these measurements.

Summary Data Of Sound And Vibration Testing for CE Marking			
Operator Ear SPL	Seat Vibration Average	Left Hand Vibration Average	Right Hand Vibration Average
98 dB (A)	0.16 m/sec ²	2.39 m/sec ²	1.02 m/sec ²
This information was acquired from sound and vibration analysis tests conducted at Allen Engineering Corporation test facilities.			

OPERATOR IS NOT LIMITED

GENERAL INFORMATION

Dealer Information & Ordering Parts

Your Dealer has Allen Engineering Corporation trained mechanics and original Allen replacement parts. Always contact the Allen Dealer who sold you this machine for Allen Certified repairs and replacement parts.

Place Allen Dealer information below for future reference.

Dealer Name: _____		
Phone #: (____) - ____ - _____		
Address: _____		
City: _____	State: _____	Zip: _____
Salesman: _____	Mobile Phone: _____	
Additional Comments: _____		



NOTE

ALL INFORMATION, SPECIFICATIONS, AND ILLUSTRATIONS IN THIS MANUAL ARE
SUBJECT TO CHANGE WITHOUT NOTICE AND ARE BASED ON THE LATEST
INFORMATION AT THE TIME OF PUBLICATION.

The “PARTS & DECALS MANUAL” contain illustrated parts lists for help in ordering replacement parts for your machine. Follow the instructions below when ordering parts to insure prompt and accurate delivery:

1. All orders for service parts - include the serial number for the machine. Shipment will be delayed if this information is not available.
2. Include correct description and part number from the “PARTS & DECALS MANUAL”
3. Specify exact shipping instructions, including the preferred routing and complete destination address.
4. **DO NOT** return parts to AEC without receiving written authorization from AEC. All authorized returns must be shipped pre-paid.
5. When placing an order, please contact the AEC dealer nearest you.

Model & Serial Number / Unit Identification

GENERAL INFORMATION

Manufacturer's Codes:

When ordering parts or requesting service information, you will always be asked to specify the model and serial numbers of the machine. The legends below specifically defines each significant character or group of characters of the Model Number and Serial Number codes.

Model Number

MSP 475

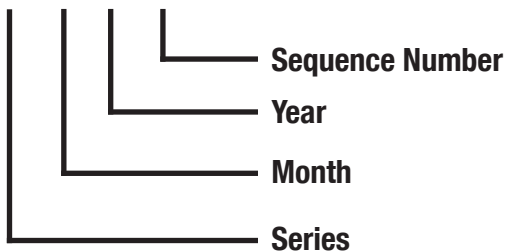


Serial Number

The serial number found on the identification plate is a ten digit format. The model number identifies your machine and will ensure that you receive the correct replacement parts.

Serial Number Example

475 01 19 001



Unit Identification Plate Location:

An identification plate listing the model number and the serial number is attached to each unit and is located on the rear lower left side of mainframe. Refer below for serial number and model number location. This plate should not be removed at any time.

Please record the information found on this plate below so it will be available should the identification plate become lost or damaged. When ordering parts or requesting service information, you will always be asked to specify the model and serial numbers of the machine.

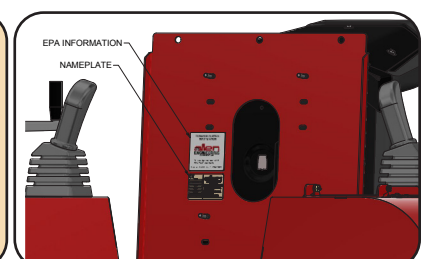
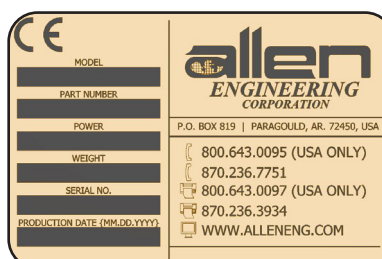
FILL IN FOR FUTURE REFERENCE

Model Number: _____

Serial Number: _____

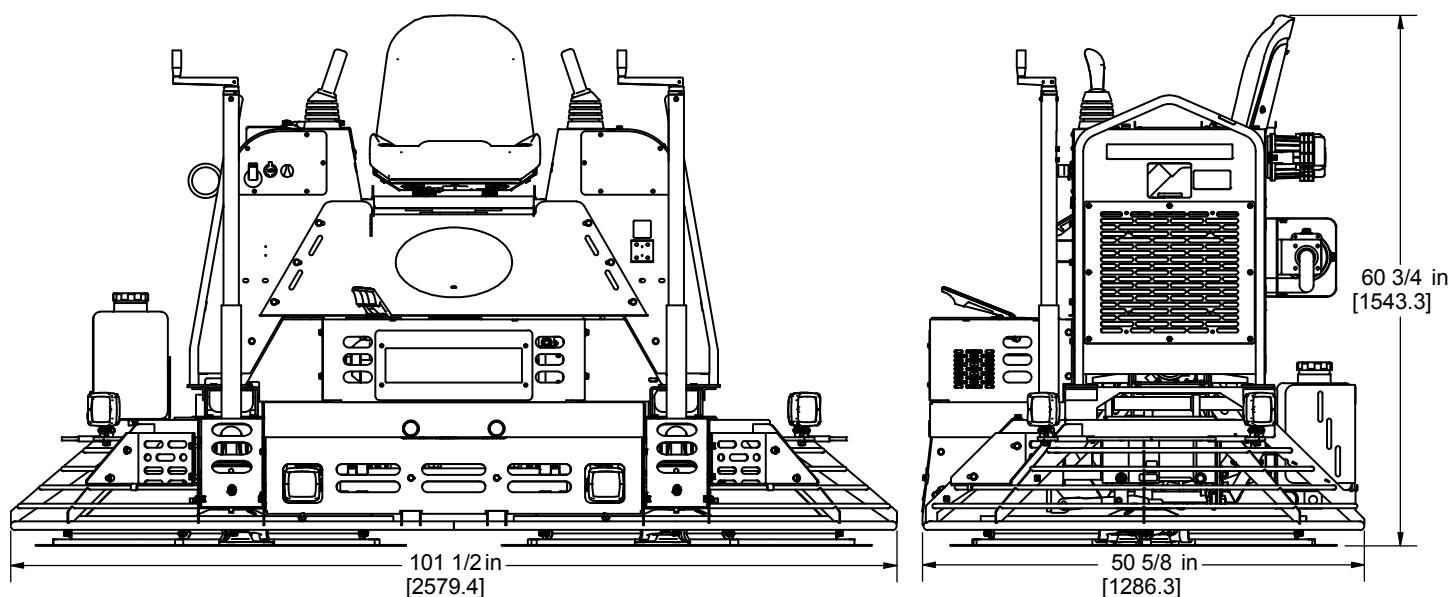
Date Purchased: _____

Purchased From: _____



Machine Specifications

- Horse Power: 57 hp [42.5 kW]
- Fuel Capacity:..... 12 Gal [45.4 L]
- Retardant Capacity: 6 Gal [22.7 L]
- Fuel Consumption (Approx.):..... 1.6 GPH [6 LPH]
- Steering System: Hydraulic
- Hydraulic Capacity:..... 3 Gal [11.4]
- Number of Operating Lights:..... 6
- Height: 60-15/16" [154.0 cm]
- Length: 101-1/2" [257.8 cm]
- Width: 50-5/8" [128.6 cm]
- Dry Weight: 1633 lbs [740.7 Kg]
- Panning Width: 97.5" [247.7 cm]
- Rotor Center Distance:..... 51" [129.5 cm]
- Rotor Diameter: 46" [116.8]
- Idle RPM:..... 1000
- Full RPM:..... 3600
- Lifting:..... 2-point, Top-Mounted

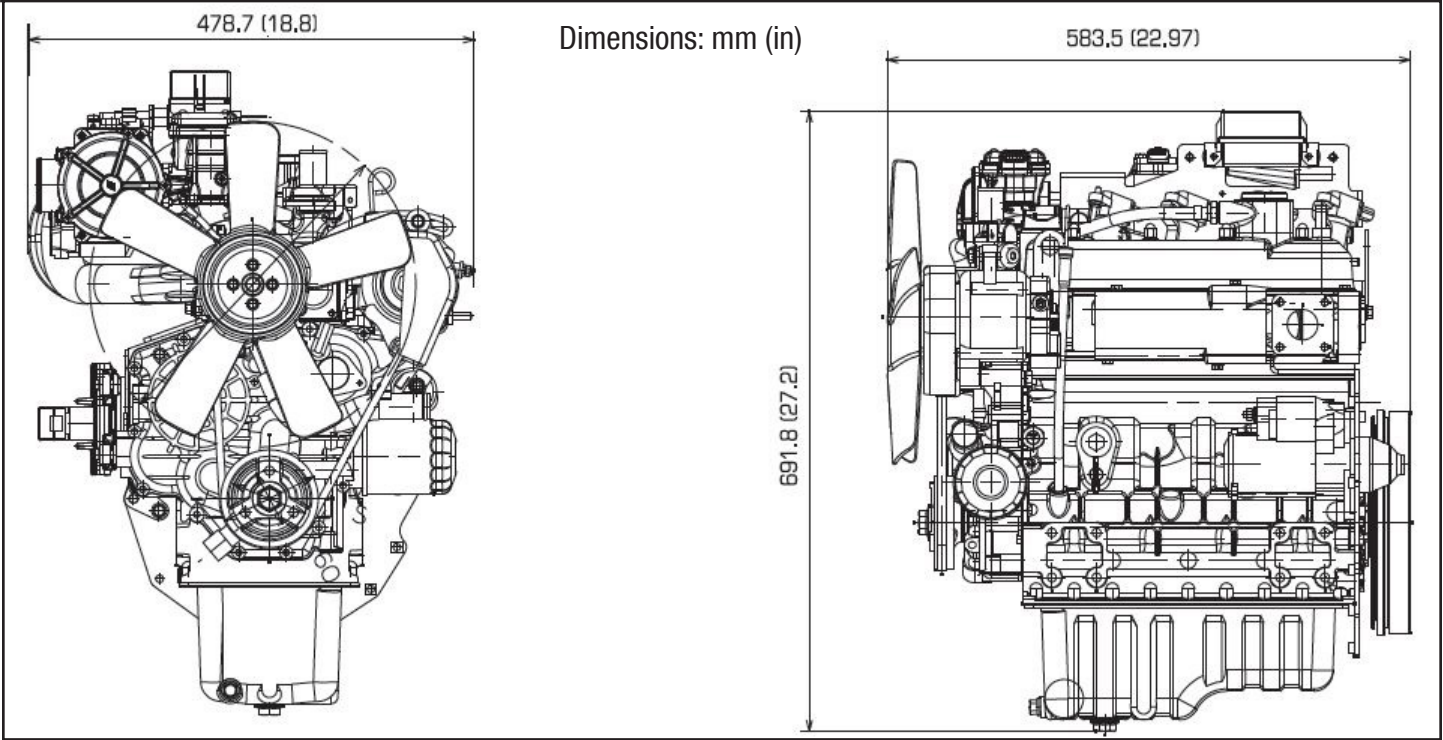
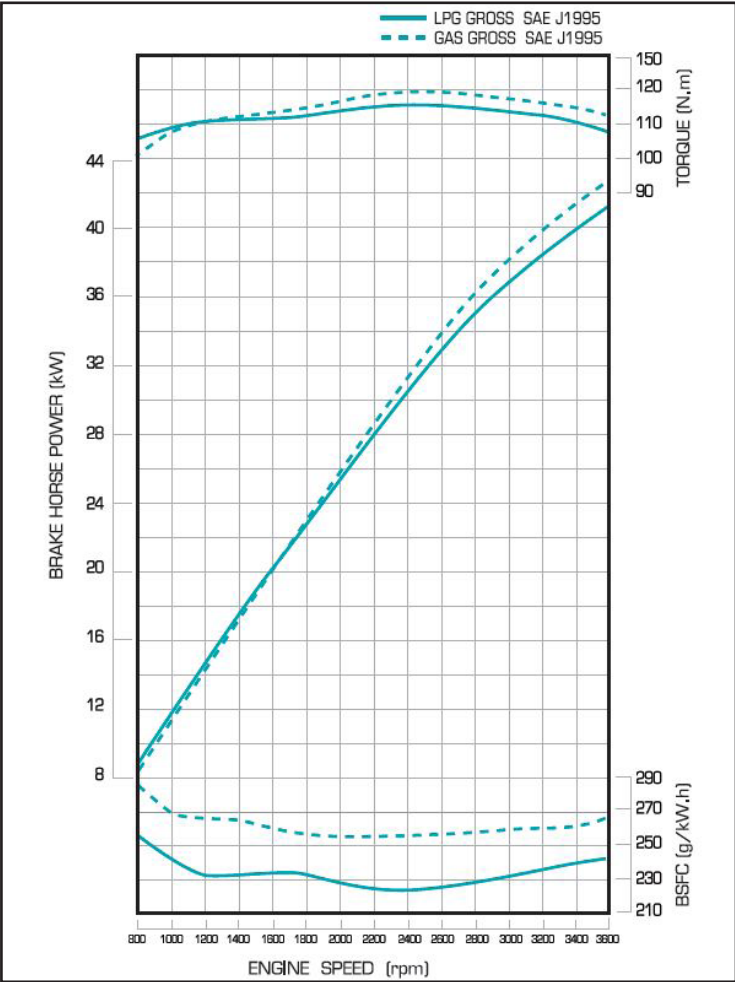


Kubota Engine Information

Model:	WG1605-G-E3
Fuel Type:	Gasoline
Horsepower [KW]:	57 [42.5]
Engine Type:	Vertical Liquid Cooled, 4 Cycle
Number of Cylinders:	4 In-Line
Bore x Stroke, in. [mm]:	3.11 x 3.09 [79 x 78.4]
Displacement (L):	1.537
Ignition System:	Coil on Plug
Intake System:	Naturally Aspirated
Compression Ratio:	9.1:1
Governor Type:	Electronic
Cooling System:	High Capacity Liquid
Direction of Rotation Rev.:	Counter-Clockwise (view from Flywheel)
Oil Pan Capacity in gal [L]:	1.59 [6.0]
Starter Capacity V-kW:	12V - 1.0 kW
Alternator Capacity:	12V - 40A
Dry Weight, lbs. [kg]:	264.6 [120]
Dimensions:	
• Length, in. [mm]:	23.3 [591.3]
• Width, in. [mm]:	18.8 [478.7]
• Height, in. [mm]:	25.7 [652.3]
Emission Certifications:	
• EPA Non-Road LSI Tier 2 Certified	
• CARB Off-Road LSI Tier 3 Certified	

GENERAL
INFORMATION

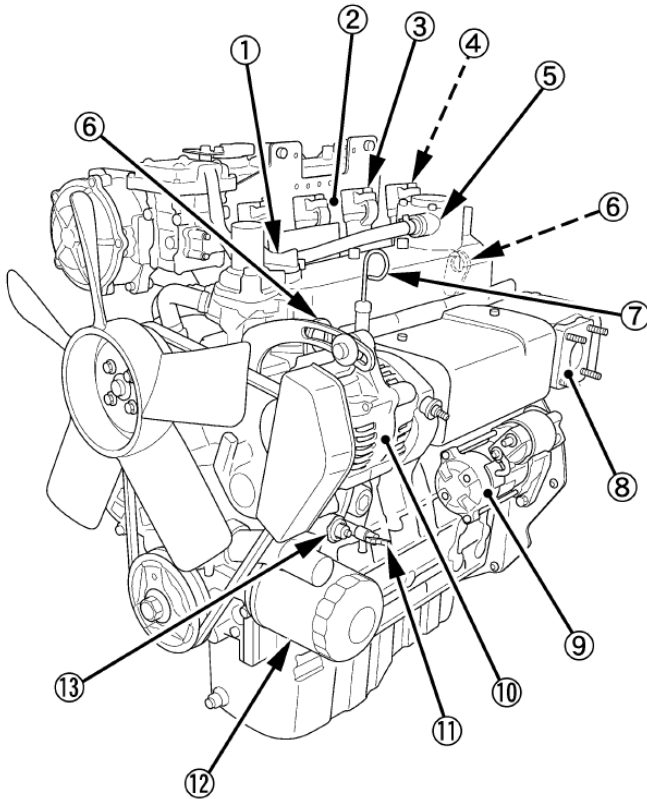
Engine Specifications



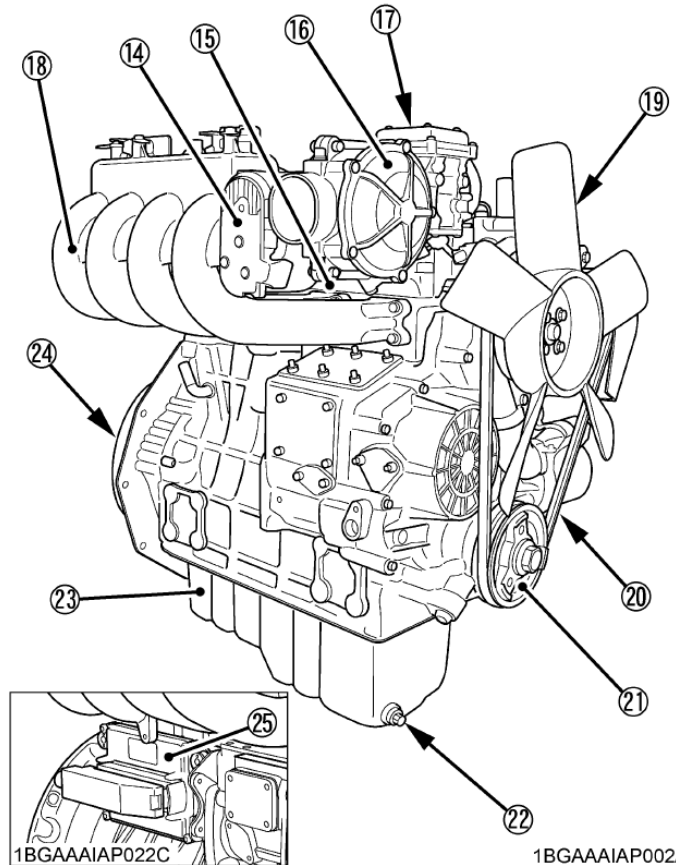
Engine Parts

GENERAL INFORMATION

Information taken directly from manufactures product literature. For further information please reference engine manufactures Operator's Manual.



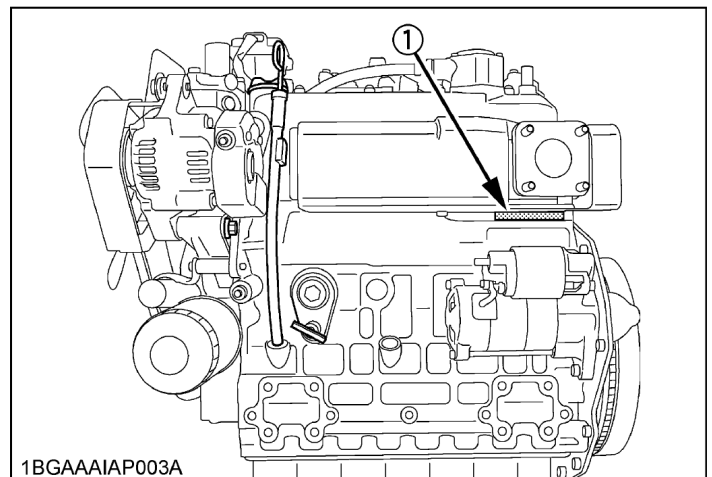
1BGAAAIP001A



1BGAAAIP002C

1BGAAAIP002A

REF. #	PART NAME	REF. #	PART NAME
1	Oil Filler Plug	15	Injector
2	Delivery Pipe (Gas)	16	Gas Mixer
3	Plug Ignition Coil	17	Pressure Regulator
4	Spark Plug	18	Intake Manifold
5	PCV Valve	19	Cooling Fan
6	Engine Hook	20	Fan Belt
7	Oil Level Gauge	21	Fan Drive Pulley
8	Exhaust Manifold	22	Oil Drain Plug
9	Starter	23	Oil Pan
10	Alternator	24	Flywheel
11	Coolant Drain Shutoff-Valve	25	ECU (Engine Control Unit)
12	Oil Filter Cartridge		
13	Oil Pressure Switch		
14	Electronic Control Throttle		



1BGAAAIP003A

(1) Engine serial number

SECTION 1 SAFETY



RESPIRATORY HAZARDS

Grinding/cutting/drilling of masonry, concrete, metal and other materials can generate dust, mists and fumes containing chemicals known to cause serious or fatal injury or illness, such as respiratory disease, cancer, birth defects or other reproductive harm.

SILICOSIS WARNING

Grinding/cutting/drilling of masonry, concrete, metal and other materials with silica in their composition may give off dust or mists containing crystalline silica.



CALIFORNIA PROPOSITION 65 WARNING

Gasoline engine exhaust from this product contains chemicals known to the State of California to cause cancer, birth defects and other reproductive harm.

Safety-Alert Signs

This manual contains Safety-Alert Signs, as defined below, which must be followed to reduce the possibility of improper service damage to the equipment or personal injury. Read and follow all Safety-Alert Signs included in this manual.



NOTE defines an operating procedure, condition, etc. which is essential to highlight that contains useful or important information.



EMERGENCY is used for the identification of safety equipment, first aid, or emergency egress locations.



NOTICE used to convey safety information on labels and signs.



CAUTION is indicative of a potentially hazardous situation which, if not avoided, may result in minor or moderate injury.




WARNING Indicative of a potentially hazardous situations that could result in death or serious injury





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

Spark Arrestor Notice / Safety Symbols

SECTION 1 SAFETY

**WARNING**







**ADVERTENCIA**



Operation of this equipment may create sparks that can start fires around dry vegetation. A spark arrestor may be required. The operator should contact local fire agencies for laws or regulations relating to fire prevention requirements.

El funcionamiento de este equipo puede producir chispas que pueden iniciar incendios en vegetación seca. Un supresor de chispas puede ser necesario. El operador debe comunicarse con las agencias locales de bomberos para las leyes o reglamentos relativos a los requisitos de prevención de incendios.

Some states require that in certain locations arrestors be used on internal combustion engines. A spark arrestor is a device designed to prevent the discharge of spark or flames from the engine exhaust. It is often required when operating equipment on forested land to prevent the risk of fires. Consult the engine distributor or local authorities and make sure that you comply with regulations regarding spark arrestors.

Symbol	Safety Hazard
	Lethal exhaust gas hazards
	Explosive fuel hazards
	Burn hazards
	Rotating parts/crush hazards
	Pressurized fluid hazards
	Hydraulic fluid hazards

Potential hazards associated with the operation of this equipment will be referenced with hazard symbols which may appear throughout this manual in conjunction with safety notes.

SECTION 1 SAFETY

Operating Safety



Familiarity and proper training are required for the safe operation of this equipment! Equipment operated improperly or by untrained personnel can be dangerous! Read the operating instructions contained in both this manual and the engine manual and familiarize yourself with the location and proper use of all controls.

- **ALWAYS** read, understand, and follow procedures in the Operator's Manual before attempting to operate the equipment.



- **NEVER** operate this equipment without proper protective clothing, shatterproof glasses, respiratory protection, hearing protection, steel-toed boots and other protective devices required by the job or city and state regulations.



- **NEVER** operate this machine while under the influence of drugs or alcohol.



- **NEVER** allow anyone to operate this equipment without proper training. People operating this equipment must be familiar with the risks and hazards associated with it.

- **NEVER** touch the engine or muffler while the engine is on or immediately after it has been turned off. These areas get hot and may cause burns.



- **NEVER** use accessories or attachments that are not recommended by AEC. Damage to equipment and injury to the user may result.

- **NEVER** operate the machine with the belt guard missing. Exposed drive belt and pulleys create potentially dangerous hazards that can cause serious injuries.



- **NEVER** leave machine running unattended.

- **DO NOT** run the machine indoors or in an enclosed area such as a deep trench unless adequate ventilation, through such items as exhaust fans or hoses, is provided. Exhaust gas from the engine contains poisonous carbon monoxide gas; exposure to carbon monoxide can cause loss of consciousness and may lead to death.



- **ALWAYS** remain aware of moving parts and keep hands, feet, and loose clothing away from the moving parts of the equipment.



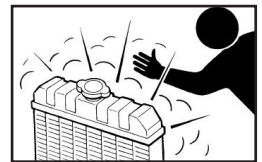
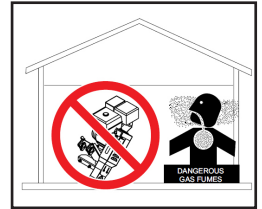
- **ALWAYS** close fuel valve on equipped engines when machine is not being operated.

- **ALWAYS** store the equipment properly when it is not being used. Equipment should be stored in a clean, dry location out of the reach of children.



Internal combustion engines present special hazards during operation and fueling. Read and follow the warning instructions in the engine owner's manual and the safety guidelines below. Failure to follow the warnings and safety guidelines could result in severe injury or death.

- **DO NOT** run the machine indoors or in an enclosed area such as a deep trench unless adequate ventilation, through such items as exhaust fans or hoses, is provided. Exhaust gas from the engine contains poisonous carbon monoxide gas; exposure to carbon monoxide can cause loss of consciousness and may lead to death.
- **DO NOT** smoke while operating the machine.
- **DO NOT** smoke when refueling the engine.
- **DO NOT** refuel a hot or running engine.
- **DO NOT** refuel the engine near an open flame.
- **DO NOT** spill fuel when refueling the engine.
- **DO NOT** run the engine near open flames.
- **ALWAYS** refill the fuel tank in a well-ventilated area.
- **ALWAYS** replace the fuel tank cap after refueling.
- **ALWAYS** keep the area around the muffler free of debris such as leaves, paper, cartons, etc. A hot muffler could ignite the debris and start a fire.

















SECTION 1 SAFETY

Service Safety



Poorly maintained equipment can become a safety hazard! In order for the equipment to operate safely and properly over a long period of time, periodic maintenance and occasional repairs are necessary.

- **ALWAYS** disconnect the battery before servicing the equipment. 
- **DO NOT** attempt to clean or service the machine while it is running. Rotating parts can cause severe injury. 
- **DO NOT** crank a flooded engine with the spark plug removed on gasoline-powered engines. Fuel trapped in the cylinder will squirt out the spark plug opening. 
- **DO NOT** test for spark on gasoline-powered engines if the engine is flooded or the smell of gasoline is present. A stray spark could ignite the fumes. 
- **DO NOT** use gasoline or other types of fuels or flammable solvents to clean parts, especially in enclosed areas. Fumes from fuels and solvents can become explosive. 
- **ALWAYS** turn engine off and remove key from machine before performing maintenance or making repairs. 
- **ALWAYS** handle blades carefully. The blades can develop sharp edges which can cause serious cuts. 
- **ALWAYS** keep the area around the muffler free of debris such as leaves, paper, cartons, etc. A hot muffler could ignite the debris and start a fire. 
- **ALWAYS** replace worn or damaged components with spare parts designed and recommended by AEC Corporation. 
- **ALWAYS** disconnect the spark plug on machines equipped with gasoline engines, before servicing, to avoid accidental start-up. 
- **ALWAYS** relieve all pressure in the air, oil and cooling systems before disconnecting any lines, fittings or related items. Escaping fluid under pressure has sufficient force to penetrate skin causing serious personal injury, DO NOT check for leaks your hands. 
- **ALWAYS** switch off the power supply at the battery disconnect before adjusting or maintaining the electrical equipment. 
- **ALWAYS** keep the machine clean and labels legible. Replace all missing and hard-to read labels. Labels provide important operating instructions and warn of dangers and hazards. 
- **ALWAYS** wear rubber gloves to avoid personal injury, when you treat fluids used in machine. In case of contact with skin, immediately wash off. 

**ALWAYS DO A THOROUGH INSPECTION OF THE SLINGS, CHAINS, AND HOOKS
BEFORE ATTEMPTING TO LIFT THE MACHINE!**

OSHA has set forth guidelines which detail the use of Rigging Equipment for Material handling. This guideline is found under

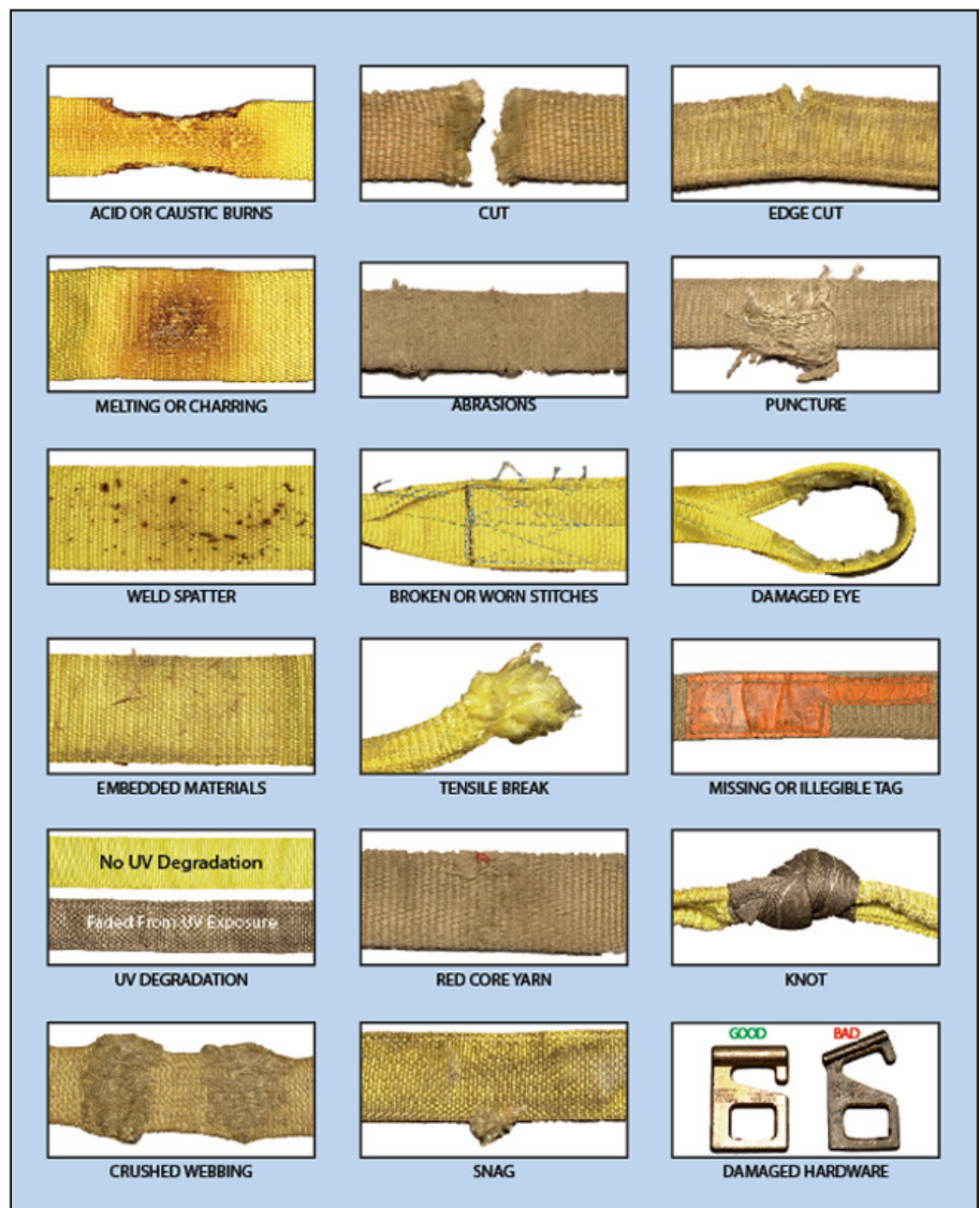
OSHA Standard Number: 1926.251

Please read and follow all guidelines found in this standard.

Removal from service.

Synthetic web slings shall be immediately removed from service if any of the following conditions are present:

OSHA 1926.251(e)(8)



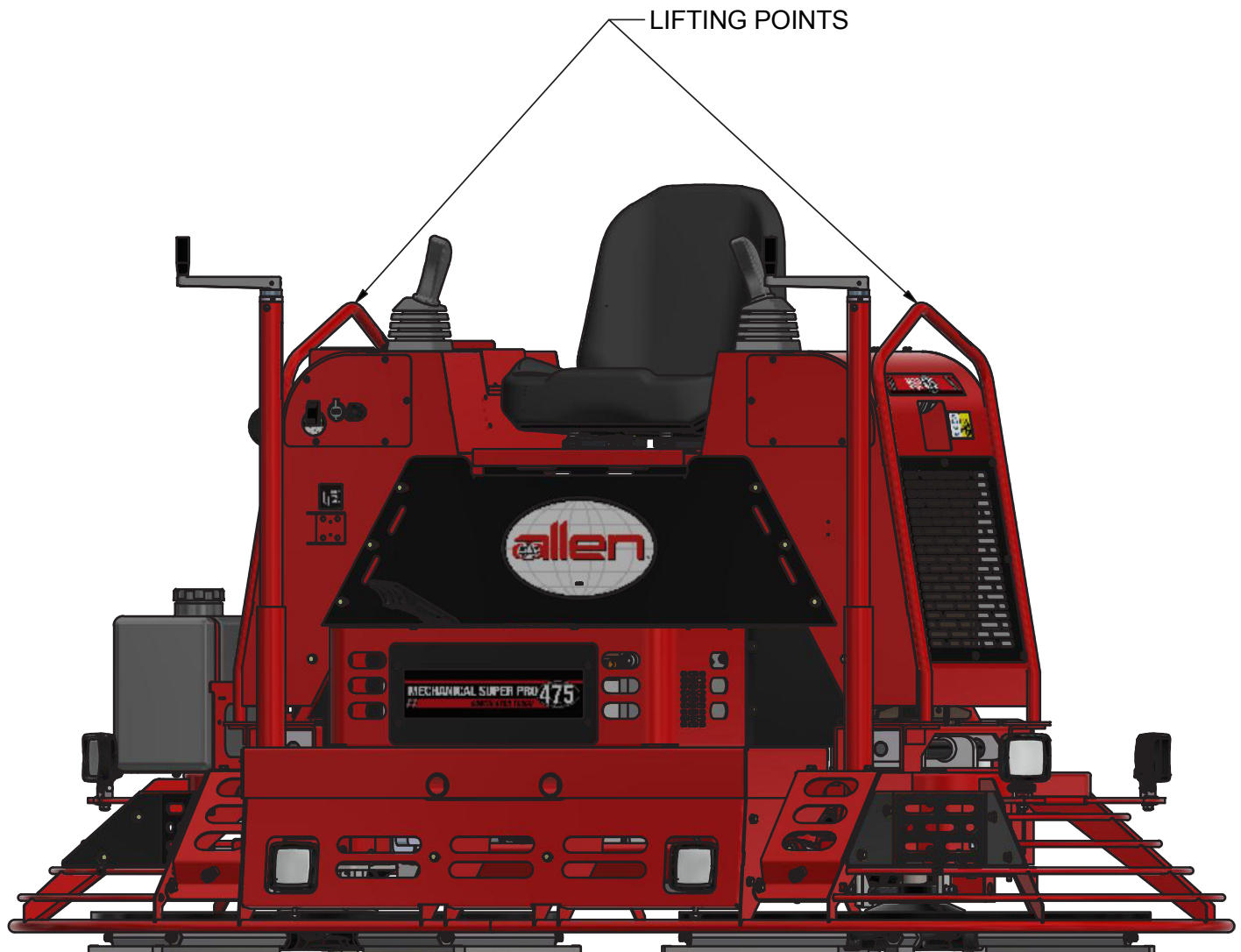
SECTION 1 SAFETY

Lifting Safety

- When lifting the machine, all personnel must be clear of the machine.
- **DO NOT** stand near or under the machine while it is being lifted.

Lifting instructions using a hoist:

- An optional lifting harness is available for purchase. Part number 067568
- Place slings, chains or hooks through each lifting point on the machine. Use a sling or chains connected to a central lifting device. Ensure that all lifting devices have sufficient weight-bearing capacity.
- **ALWAYS** shutdown engine before transporting.



- Make sure the hitch and coupling of the towing vehicle are rated equal to, or greater than the trailer “gross vehicle weight rating.”
- **ALWAYS** inspect the hitch and coupling for wear. Never tow a trailer with defective hitches, couplings, chains, etc.
- Check the tire air pressure on both towing vehicle and trailer. Trailer tires should be inflated to 50 psi cold. Also check the tire tread wear on both vehicles.
- **ALWAYS** make sure the trailer is equipped with a safety chain.
- **ALWAYS** properly attach trailer’s safety chains to towing vehicle.
- **ALWAYS** make sure the vehicle and trailer directional, backup, brake and trailer lights are connected and working properly.
- DOT Requirements include the following:
 - Connect and test electric brake operation.
 - Secure portable power cables in cable tray with tie wraps.
- The maximum speed for highway towing is 55 MPH unless posted otherwise. Recommended off-road towing is not to exceed 15 MPH or less depending on type of terrain.
- Avoid sudden stops and starts. This can cause skidding, or jack-knifing. Smooth, gradual starts and stops will improve towing.
- Avoid sharp turns to prevent rolling.
- Trailer should be adjusted to a level position at all times when towing.
- Raise and lock trailer wheel stand in up position when towing.
- Place chock blocks underneath wheel to prevent rolling while parked.
- Place support blocks underneath the trailer’s bumper to prevent tipping while parked.
- Use the trailer’s swivel jack to adjust the trailer height to a level position while parked.
- Use tie downs to ensure machine does not move during transportation.

SECTION 1 SAFETY

Pan Installation Safety Lifting Bridle

This section details the proper technique to utilize the lifting bridle system in a safe manner to install concrete finishing pans.

(NOTE: Images are for illustration purposes only)



Use a lifting sling (bridle) with a capacity of at least 2:1 weight ratio for the equipment being hoisted.

[See section "ACCESSORIES" for appropriate lifting harness part number]

1. Attach the lifting bridle to the machine shown in section "Lifting Safety"
2. Slowly lift the machine in a safe manner to a height that is required to safely install the pans. This is typically 6"-8" above floor level.
3. Carefully slide the pans under the machine making sure that you are aware of the corners on the blades as they are sharp.
4. Align the pans so that the clips will not be crushed when the machine is lowered back down.
5. Slowly lower the machine down onto the pans. Make sure the blades are going into the proper gaps. (Typically the pans can only be installed one way)
6. Once the machine is on securely on the ground with the pans underneath, remove the lifting bridle from the machine.
7. Start the machine and slowly increase the throttle until the blades begin turning and engaging the pans. The machine is now ready to finish the concrete utilizing the pans.



NOTE: Utilizing the lifting sling(bridle) and the dolly jacks are intended only for site transportation and the installation of pans and blades. DO NOT use them for regular maintenance without the additional use of jack stands to insure stability of the machine.

Pan Installation Safety

Lifting Jacks

SECTION 1

SAFETY

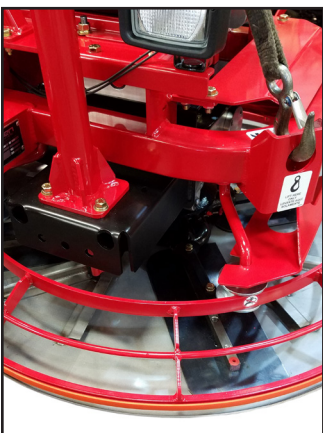
This section details the proper technique to utilize the Dolly Jack system in a safe manner to install concrete finishing pans.

(NOTE: Images are for illustration purposes only)

Use the appropriate set of lifting jacks that are designed for the machine you are lifting.
[See section "ACCESORIES" for appropriate dolly jack part number]



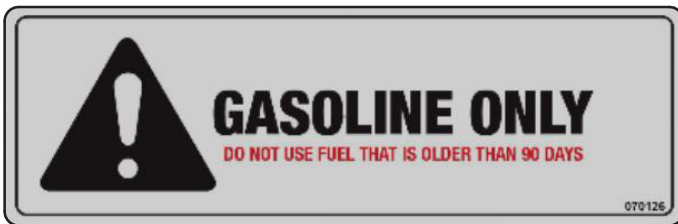
1. Attach the front and rear dolly jacks into the machine at the receiving tube locations.
2. Slowly lift the machine in a safe manner to a height that is required to safely install the pans. This is typically 6"-8" above floor level.
3. Carefully slide the pans under the machine, making sure that you are aware of the corners of the blades as they are sharp.
4. Align the pans so that the clips will not be crushed when the machine is lowered back down.
5. Slowly lower the machine down onto the pans. Make sure the blades are going into the proper gaps. (Typically the pans can only be installed one way)
6. Remove the dolly jacks from the machine
7. Start the machine and slowly increase the throttle until the blades begin turning and engaging the pans. The machine is now ready to finish the concrete utilizing the pans.



NOTE: Utilizing the lifting sling(bridle) and the dolly jacks are intended only for site transportation and the installation of pans and blades. DO NOT use them for regular maintenance without the additional use of jack stands to insure stability of the machine.

SECTION 1 SAFETY

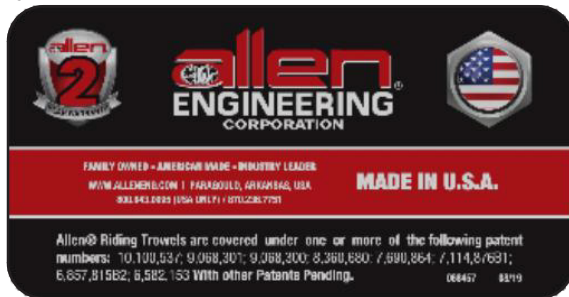
Safety Decals



DECAL - GASOLINE
ONLY
PART #: 070126
QTY: 2



DECAL - RETARDANT
ONLY
PART #: 065655
QTY: 1



DECAL - AEC INFO /
PATIENTS
PART #: 068457
QTY: 1



DECAL - COOLANT
WARNING
PART #: 069113
QTY: 1



DECAL - SAFETY
WARNINGS &
STEERING
PART #: 069119
QTY: 1



DECAL - HYDR.
PRESS.
WARNING
PART #: 070402
QTY: 1



DECAL - PROP 65
PART #: 069225
QTY: 1



DECAL - DROP HAZARD
PART #: 065656
QTY: 2



DECAL - HYDRAULIC FLUID
PART #: 066067
QTY: 1



DECAL - GEARBOX OIL
PART #: 048299
QTY: 1

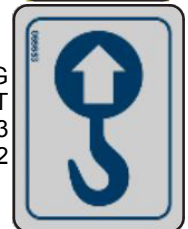
DECAL - MSP465
FUSE DETAIL
PART #: 070127
QTY: 1



DECAL - PINCH
HAZARD
PART #: 065917
QTY: 2



DECAL - LIFTING
POINT
PART #: 065653
QTY: 2



DECAL - TIE DOWN
PART #: 068459
QTY: 4



DECAL - EPA INFO
PART #: 067934
QTY: 1



DECAL - GREASE
PART #: 066103
QTY: 2



SECTION 2 OPERATION



This machine is built with user safety in mind. However, it can present hazards if improperly operated and serviced. Follow operating instructions carefully.

If you have any questions about operating or servicing this equipment, please contact your Allen Engineering Dealer or AEC Customer Service at 800-643-0095 or 870-236-7751.

The MSP475 riding trowel is a modern high production machine. Finishing rate will vary depending on the operators skill and job conditions. This riding trowel has ten finishing blades.

The Super Heavy Duty (SHD) Gearboxes are designed to provide exceptional performance with low maintenance and trouble free use under some of the worst conditions.

All Allen Engineering MSP465 Riders are equipped with a safety shutdown switch and a low oil warning for added job safety and engine protection. Operating time between fuel refills is approximately 2-1/2 to 3 hours depending on rotor speeds.

Before Starting Procedures

Before operation each day check for the following:

1. All guards, side screens and panels are in place
2. All safety and information signs are in place and legible
3. Engine, Gearbox, and Hydraulic Oil levels are correct.
4. Fuel level in fuel tank.
5. Check the battery level
6. Condition of air filter on engine.
7. Condition of riding trowel arms and blades.
8. Verify that daily maintenance of grease points have been performed.
9. Check operating controls for proper operation and adjustment
10. Check speed control operation before and after starting engine for proper operation
11. Check the steering left and right, for proper operation
12. Check for any hydraulic leaks
13. Remove any loose objects that could interfere with the operation of the trowel

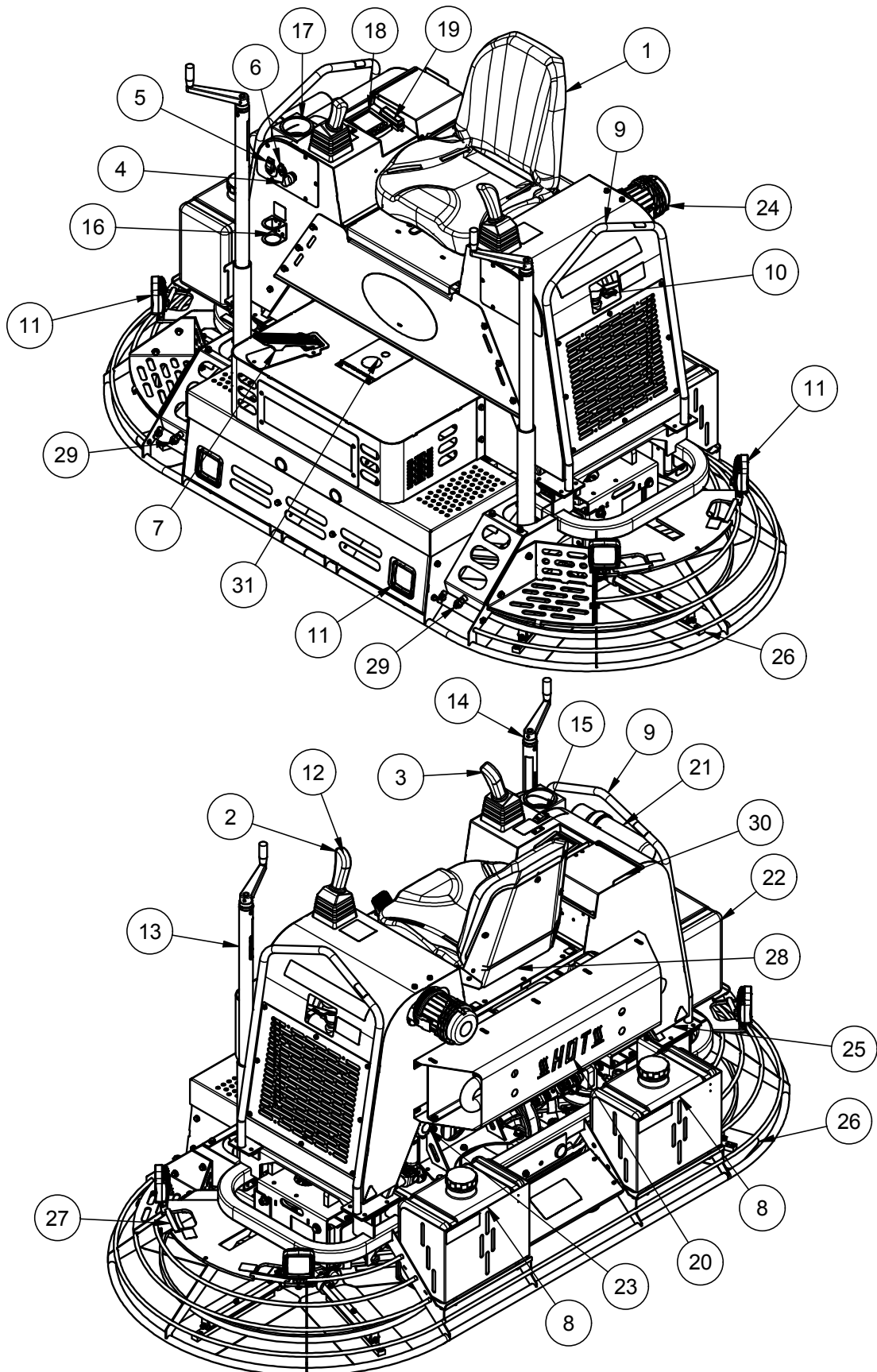
Note: If there is any indication that faulty equipment exists, shutdown safely, inform the proper authority and **DO NOT** operate the riding trowel until the problem has been fixed.

Starting Procedures

Turn ignition switch key to the start-position, immediately release key when engine starts. Allow engine to warm up for 5 minutes before operating riding trowel.



Operating the starter for more than 5 seconds can damage the starter or engine. If engine fails to start release the switch and wait 15 seconds before operating starter again.



1. Operator Seat - Rotors will not spin unless operator is seated. Seat is adjustable.
2. Left Joystick - Used to move the rider forward and backward
3. Right Joystick - Used to move the rider forward, backward, left & right.
4. Key Switch - Used to start that machine.
5. Light Switch - Turns the machine LED lights on or off.
6. USB - Dual USB plugs. 2.1A @ 5VDC MAX
7. Foot Control - Used to control rotor speed.
8. Fuel Tank - Holds 12 gal [45.4 L] of gasoline.
9. Lifting Point - Used to raise and lower the machine
10. Engine Coolant Access - Used to access the engine coolant
11. Machine Lights - 6 total - Used to illuminate the surrounding work area
12. Water Spray Button - (located on the left joystick) used to spray water on the work surface
13. Left Blade Pitch - used to change the pitch of the left blades
14. Right Blade Pitch - used to change the pitch of the right blades
15. Cruise Control Switch - Turns the machine cruise control on/off
16. Tool Holder - Store hand tools here
17. Cup Holder - Holds your favorite beverage
18. Engine Module - Controls engine RPM, shows fuel level, controls/monitors multiple other features
19. Fuse Box - Holds electrical fuses and relays
20. Muffler - Used to control exhaust sound and direction
21. Manual Tube - Holds the machine safety and operations manual. (for Parts Manual see page 59)
22. Retardant Reservoir - Holds the retardant fluid
23. Oil Filter - Filters the engine oil
24. Air Filter - Filters the engine air
25. Battery - 12VDC, 700 Cold Crank Amperes (CCA) (behind panel, battery not shown here)
26. Screed Blade - Used to smooth and finish concrete
27. Tie Down - 4 total - Use these to secure the machine during transport.
28. Unit Identification Plate - Model #, Serial #, Engine Power, Weight, Production Date
29. Spray Nozzle - Used to spray retardant on concrete
30. ECU/Fuse Cover - Used to cover the MCU and Fuse Holder when not in use
31. Hydraulic Fluid Fill - Used to add hydraulic fluid to machine.

SECTION 2 OPERATIONS

Trowel Operation

Operating The Riding Trowel

To utilize your Allen Engineering **MSP475** rider to its fullest capacity the machine should be driven in the direction the operator is facing. This will finish the widest possible area while giving the operator an excellent view of the slab surface about to be troweled. When the machine reaches the end of the slab make a 180 degree turn and repeat the straight line of direction to the other end of the slab. To familiarize a new operator with the riding trowel the following steps should be taken.

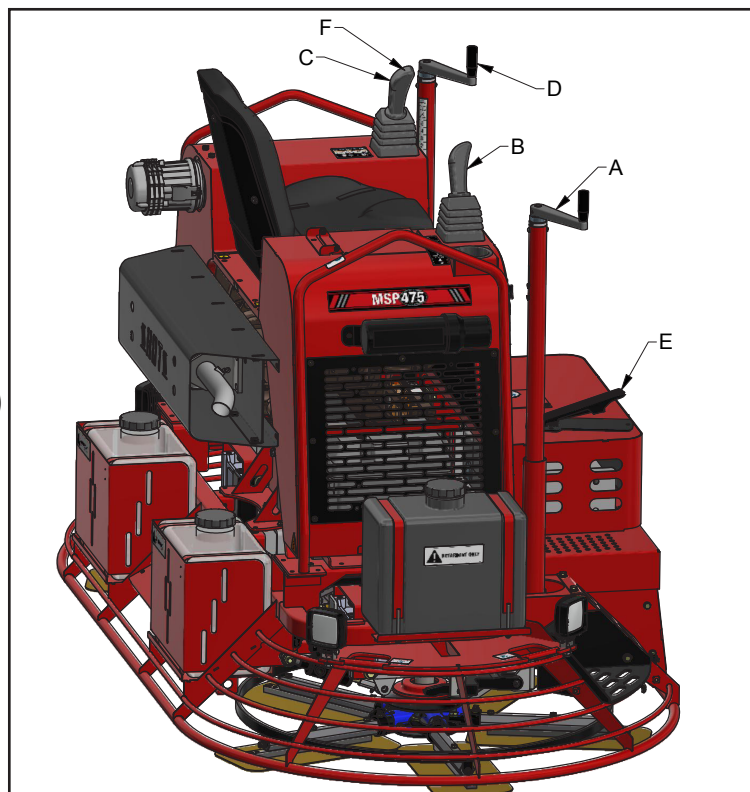


NOTE

All items in this manual are describe from the operator "Sitting On Machine" or **SOM** for short.

1. Location of all Operating Controls

- A. Right Pitch Control
- B. Joystick (Forward & Reverse)
- C. Joystick (Left & Right, Forward & Reverse)
- D. Left Pitch Control
- E. Right Foot Pedal
- F. Retardant Spray Pushbutton

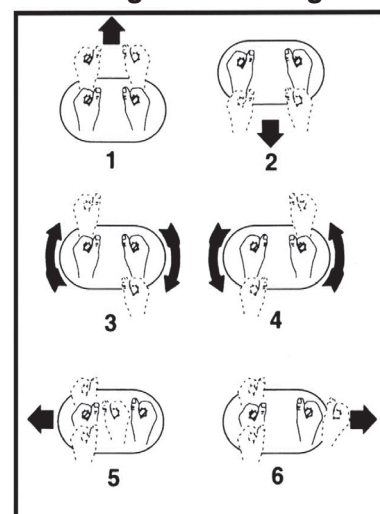


2. Steering the Riding Trowel

A slight "feathering motion" forward and backward with the left hand joystick is required to move the machine in a straight path to the left. The same motion is required of the right joystick to move to the right.

Position	Action
1	Forward
2	Reverse
3	Rotate Clockwise
4	Rotate Counter-clockwise
5	Sideways - Left
6	Sideways - Right

Steering Control Diagram



3. Stopping the Trowel

To stop the trowel's movement, let go of the joysticks [B] and [C]. They will return to their neutral position. Also release pressure on the right foot pedal [E].



This machine is equipped with a seat kill switch mechanism. If in need of an emergency stop, simply turning the key off or raising off the seat even while holding the right foot pedal down, will stop the engine from running.

4. With the operator in the seat, show him the functions of the joysticks [B] and [C] and how to start the machine.

A hard level concrete slab with water on the surface is an ideal place for an operator to practice with the machine. For practice pitch the blades up approximately 1/4 inch on the trailing edge. Start by making the machine hover in one spot and then practice driving the machine in a straight line and making 180 degree turns. Best control is achieved at full engine RPM.



After starting engine, fully engage the throttle. This allows the engine to warm up quicker and also engages the torque converter. At this time the machine's rotors will begin turning so long as foot pedal [E] is engaged.



***DO NOT** use excessive pressure on the joysticks. Excessive pressure does not increase the reaction time of the machine and can damage steering controls.*

5. Engine Speed

The engine has two primary speed settings: Idle (1200 RPM) & Full (3400 RPM)

The engine will start at idle speed. This machine is equipped with a **Cold Weather Start** circuit, meaning that the engine RPM will not increase above idle speed until the hydraulic oil has reached an optimum temperature. The operator can activate the RPM toggle to **FULL** during this period, however the RPM will not increase until that optimum temperature is achieved.

There is a seat sensor on the machine that will not allow the engine RPM to go above idle speed if the operator is not seated. Therefore, the operator must be seated AND the Cold Weather Start circuit must be disengaged in order for to achieve full RPM speed.

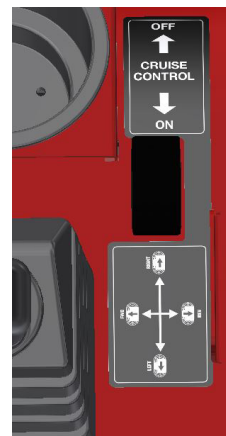
SECTION 2 OPERATIONS

Trowel Operation

6. Cruise Control

This machine comes standard with a cruise control function. The cruise will allow the operator to remove their foot off the foot pedal and still maintain rotor function.

To use the cruise control, enable the foot switch so that the rotors engage, then pull up on the cruise control button. To release the cruise control, press down on the center button on the cruise control then pull up slightly to disengage.

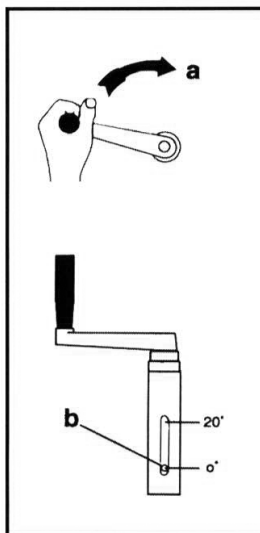


7. Pitch Adjustment

Different pitch angles are needed as you work the different stages of the concrete. When changing or setting pitch (angle of trowel blades), slow the machine down, set the desired degree of pitch on the left side of the machine and then adjust the right side to match.

To change the pitch, the operator will use the rocker switch located at the top of either joystick. By pressing the rocker switch towards the inside, the pitch will decrease, pressing the switch toward the outside of the joystick will increase the pitch level. (see Figure 2.5).

Pitch Adjustment	
Working Conditions of Concrete	Suggested Working Pitch
① Wet surface working stage	Flat (No Pitch)
② Wet plastic working stage	5° Slight Pitch
③ Plastic working stage	10° Additional Pitch
④ Semi-hard working stage	15° Additional Pitch
⑤ Hard finishing stage (burnishing)	20° Maximum Pitch



8. Enable Machine Blades

The machine trowel blades are enabled by the foot pedal (E). Hold down the pedal to enable the rotors to begin turning, release pressure off the pedal to stop the rotors.



The Murphy PowerView 380 features robust, multifunction displays for advanced monitoring of multiple electronic engines.

It's capable of monitoring multiple engines and machine parameters on an easy-to-read 3.8-inch (97mm) QVGA monochrome LCD. The display is capable of handling sophisticated engine diagnostics as well as basic engine alarm/shutdown. Customize the PV380 display using the PowerVision Configuration Studio®, an intuitive tool designed to make customization simple. Using the software tool, users can tailor basic graphics, designate screen layout and define custom parameters. The PV380 is

equipped with five tactile push buttons to quickly access a convenient menu. In addition, a back-lit and heated graphic display with LEDs indicate alarm or shutdown status.

Flat Screen Display

A 3.8" QVGA monochrome LCD screen displays gauges, soft key commands and fault messages as well as menu options for setup and configuration.

Soft Keys and Commands

The five tactile push buttons on the bottom of the display correspond to the options available for the screen being displayed.

Alarms

Red and amber warning LEDs; set point triggered output for external piezo buzzer or shut-down relay.

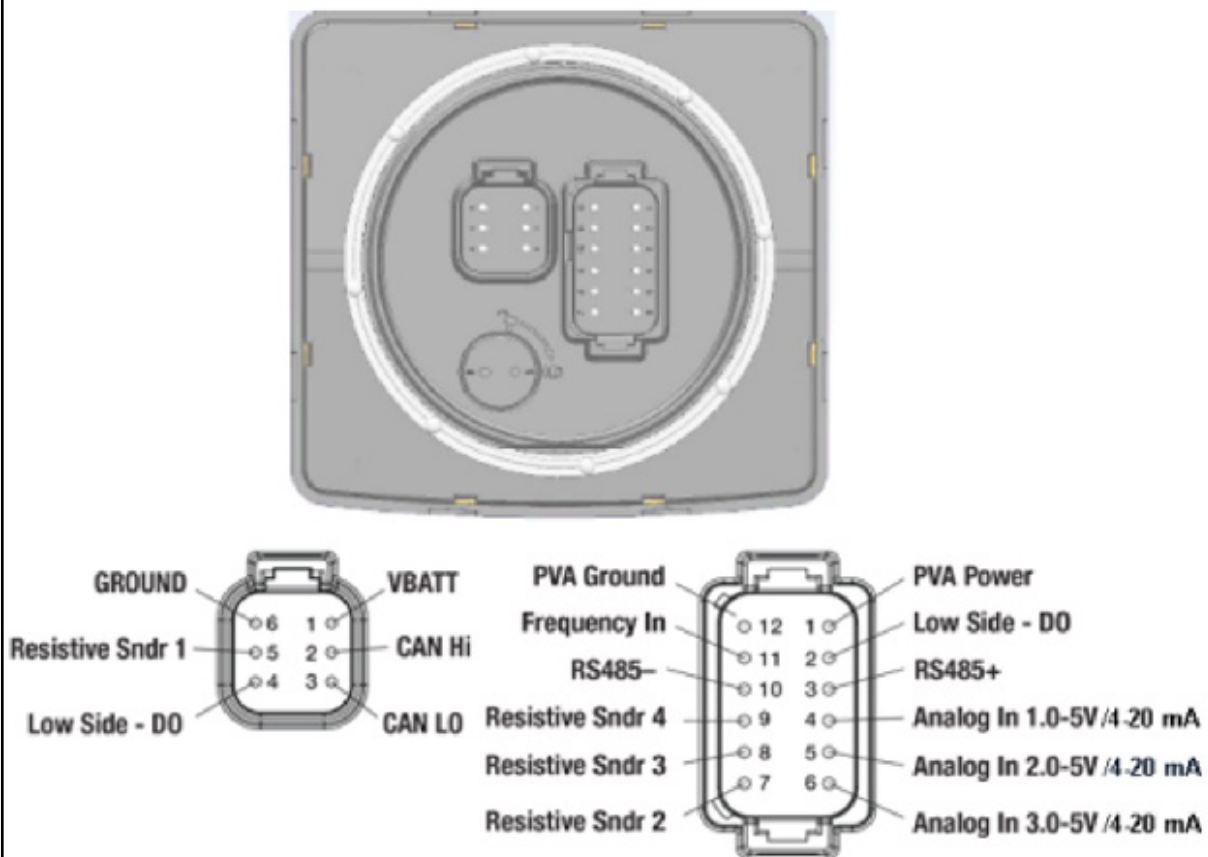
SECTION 2 OPERATIONS

Engine Control Unit (ECU)

Specifications:

- AEC Part #:066227
- Display: 3.8" Monochrome LCD
- Resolution:..... QVGA, 320 x 240 Pixels
- Orientation:..... Landscape
- Back-lighting: LED, White
- Flash Memory:.....2Mb
- RAM:256kb
- Operating Voltage:6-36 VDC
- Power Consumption:.....10 Watt
- Communications: CAN 2.0B & RS485 (Modbus)

PV380 Connector Pin Outs (Back View)





OPERATOR INTERFACE HOME SCREEN: This screen (shown above) is the instrument cluster screen and is where you will start to navigate to all other menus.

BUTTON ONE: This button will swap the language between English and Spanish.

BUTTON TWO: This button will display the Engine Fault Codes and the I/O Status Screen. By selecting I/O status, you will then be able to see real time status of the Machine ID points, Seat Switch status, Cold Start status, Desired Engine Speed, and Run/Idle Status.

BUTTON THREE: This button will allow a person to change the screen brightness, screen contrast, units of measure, and language. Use button 1 to move the selection “UP”, use button 2 to move the selection “DOWN”, button 3 will verify the selection, use button 5 to return to the home screen.

BUTTON FOUR: Directs you to the Service Reminder screen. The first screen will give an overview of the current state of all the service reminders that are set. To cycle through/reset the reminders, press OK (button 3), then press the down arrow (button 1) and select “+” (button 3). This will reset the selected option back to the appropriate service interval. To cycle through the different service options, press “+” (button 3) when the selection arrow is at the top.

BUTTON FIVE: This will alternate the top row of readouts to provide more real time engine process data. The top row will either display an “Engine Torque / Load RPM” option or a “Cool Temp / Fuel Temp” option.

SECTION 2 OPERATIONS

Engine Control Unit (ECU)

FUNCTIONS:

- Cruise Control - To use the cruise control, enable the foot switch so that the rotors engage, then press the "Cruise Control Toggle Switch" in the "ON" direction. To disengage the cruise control function, simply press the "Cruise Control Toggle Switch" in the "OFF" direction. "
- Seat Switch - The machine cannot be in RUN RPM unless the seat switch is made. If the operator stands up while in run RPM, the machine will return to IDLE RPM. The status of this function can be viewed in the IO STATUS screen under "SEAT SW".
- Run Light - When the oil temp has reached an acceptable temp, the green light to the right of the operator will illuminate.
- Lift-Off - When lifting the machine off the slab, with no operator in the seat, someone can hold the Run/Idle Rocker to achieve a higher Engine RPM for 5 seconds and press the foot pedal while the machine is being pulled from the concrete.

The start up screen will display for 5 seconds once power is supplied to the control unit (the machine key is turned on). This screen will display the Allen logo, the Machine Series Name, and the relevant software information that is needed for troubleshooting



MACHINE
SERIES NAME

CONTROLLER
SERIES

REVISION # FOR
THE PROGRAM
GENERATION

PROGRAM
GENERATION

SECTION 3 SERVICE

SECTION 3 SERVICE

Maintenance Schedule

Periodic Maintenance Schedule

The table below list basic trowel and engine maintenance. Refer to OEM engine manufacturer's Operation Manual for additional information on engine maintenance. A copy of the engine operator's manual was supplied with the machine when it was shipped.

Maintenance Schedule						
Description	Daily	20 Hrs	200 Hrs	500 Hrs	1K Hrs	4K Hrs
INSPECT						
Inspect Engine Oil Level	X					
Inspect Hydraulic Oil	X					
Inspect Air Filters	X					
Inspect Radiator Fins	X					
Inspect Radiator Coolant	X					
Inspect for Leaks	X					
Check poly V-belt				X		
Inspect all Hardware				X		
Inspect Belts					X	
Inspect Wiring					X	
Inspect Battery					X	
Inspect Exhaust					X	
Inspect Coolant Hoses					X	
Inspect Catalyst					X	
ACTION						
Control Linkage Lubrications		X				
Change Engine Oil			X			
Change Hydraulic Oil			X			
Change Fuel Filters			X			
Change Oil Separator Element					X	
Change Air Filters				X		
Drain Water Separator				X		
Replace Fan Belt				X		
Clean Entire EGR System						X
Change Coolant						X

Replace Hydraulic Fluid with Hydraulic Oil 46 (DTE25) or Equivalent

Above 25°C (77°F)	SAE30 or SAE10W-30 SAE15W-40
0°C to 25°C (32°F to 77°F)	SAE20 or SAE10W-30
0°C to -20°C (32°F to -4°F)	SAE10W or SAE10W-30
Below -20°C (-4°F)	SAE5W-30

- Change the type of engine oil according to the ambient temperature.
- When using oil of different brands from the previous one, be sure to drain all the previous oil before adding the new engine oil.

Filter Replacement

SECTION 3 SERVICE



Part #: 043920

Description: Filter, Fuel, For Kubota WG1605



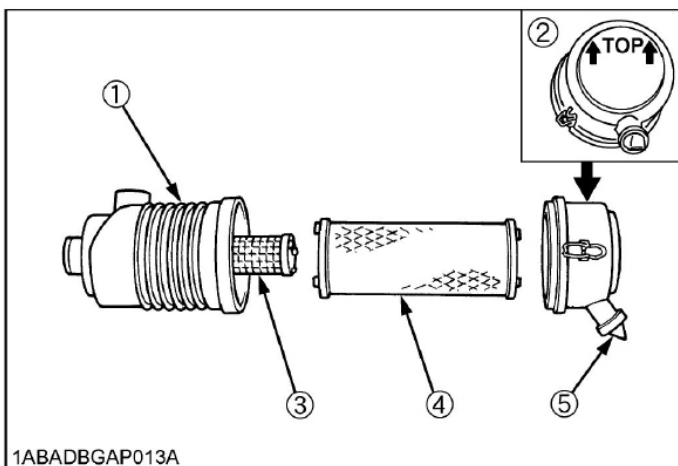
Part #: 064828

Description: Filter, Oil For Kubota WG1605



Part #: 049801

Description: Filter, Hydraulic, Spin-On, 10 micron



- (1) Air cleaner body
- (2) Cover
- (3) Secondary element

- (4) Primary element
- (5) Evacuator valve

#3



Part #: 069249

Description: Filter, Air, Safety For Kubota WG1605

#4



Part #: 069428

Description: Filter, Air, Primary For Kubota WG1605

Battery Jump Start Procedure

Occasionally it may be necessary to jump start a weak battery. If jump starting is necessary the following procedure is recommended to prevent starter damage, battery damage, and personal injury.



Jump starting a battery incorrectly can cause the battery to explode resulting in severe personal injury or death. Do not smoke or allow any ignition sources near the battery and do not start a frozen battery.



Electrical arcing can cause severe personal injury.
Do not allow positive and negative cable ends to touch.

1. Use a battery of the same voltage (12V) as is used with your engine.
2. Attach one end of the positive booster cable (red) to the positive (+) terminal of the booster battery. Attach the other end to the terminal of your engine battery.
3. Attach one end of the negative booster cable (black) to the negative (-) terminal on the booster. Attach the other end of the negative cable to your engine battery.
4. Jump starting in any other manner may result in damage to the battery or the electrical system.



Over cranking the engine can cause starter damage.
Allow 5 minutes for starter to cool if engaged for more than 15 seconds.



When using lights or high amperage draw accessories,
idle the engine for a period of 20 minutes to bring the battery to charge state.

Lift Lever Adjustment Procedure

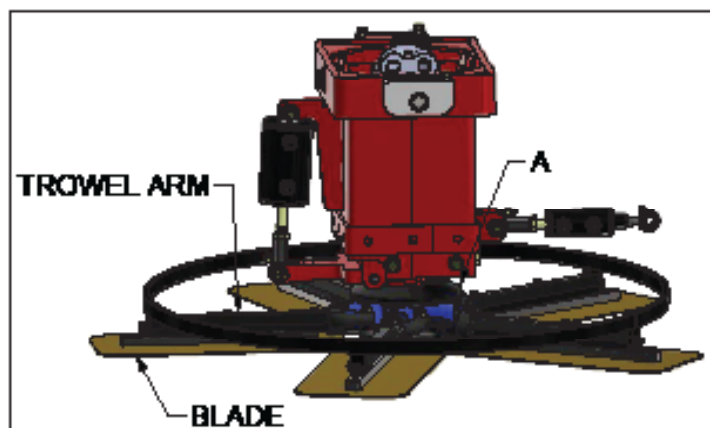
- Damage to and/or replacement of a trowel arm can change the adjustment of the lift lever. This can unbalance the trowel arms and cause the riding trowel to wobble during operation. To operate smoothly the lift lever on all trowel arms must be adjusted the same to ensure that the riding trowel is balanced correctly.
- Adjusting the trowel arms is accomplished by using the optional trowel arm alignment jig AEC PN 016863. The service manual that is included with the alignment jig describes in detail the steps to perform this procedure and to check the flatness and straightness of the trowel arms.

NOTE

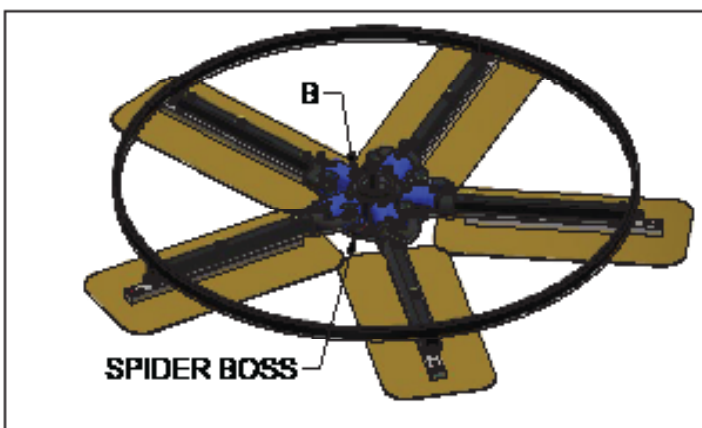
Make sure that there is no pitch in the blades before attempting to remove a trowel arm.

- The steps below described the general procedure to remove the trowel arms to be aligned.
 1. Block up pressure plate **[A]** using a wooden block.
 2. Remove stabilizer ring from spider assembly (only on available models).
 3. Remove blades from trowel arms.
 4. Loosen hex head cap screw **[B]** and remove it and the external star washer from the spider boss.
 5. Remove trowel arms from spider boss with lift levers in place.
 6. Clean flats on trowel arm before placing it in the trowel arm jig (PN 016863).
 7. Perform the alignment procedures as outlined in the alignment jig service manual (PN 047427).
 8. Re-attach trowel arm to spider boss and blades to trowel arms.
 9. Tighten down hex head cap screw to secure trowel arm in place.
 10. Reattach stabilizer ring (only on available models).

PICTURES FOR REFERENCE ONLY



PRESSURE PLATE LOCATION



FASTENER HARDWARE REMOVAL

SECTION 3 SERVICE

Fault Codes

Diagnostic Trouble Component (DTC)	SPN Code	FMI Code	Issue
Manifold Absolute Pressure	106	16	<ul style="list-style-type: none"> Sensor or Wiring Harness Short to Power Sensor Malfunction
		4	<ul style="list-style-type: none"> Sensor or Wiring Harness Open or Short to Ground Sensor Malfunction
Fuel Pressure	94	3	<ul style="list-style-type: none"> Sensor or Wiring Harness Short to Power
		4	<ul style="list-style-type: none"> Sensor or Wiring Harness Open or Short to Ground Sensor Malfunction
		0	<ul style="list-style-type: none"> Fuel Pressure Abnormality (High Side)
		1	<ul style="list-style-type: none"> Fuel Pressure Abnormality (Low Side)
Fuel Temperature	174	3	<ul style="list-style-type: none"> Operating in a Hot Environment Sensor Out of Calibration
		4	<ul style="list-style-type: none"> Operating in a Frigid Atmosphere Sensor Out of Calibration
	3486	1	<ul style="list-style-type: none"> Not Vaporized Completely
Engine Coolant Temperature	110	3	<ul style="list-style-type: none"> Sensor or Wiring Harness Open or Short to Power Sensor Malfunction
		4	<ul style="list-style-type: none"> Sensor or Wiring Harness Short to Ground Sensor Malfunction
		15	<ul style="list-style-type: none"> Engine Coolant Temperature Abnormality (High Side Stage 1)
		0	<ul style="list-style-type: none"> Engine Coolant Temperature Abnormality (High Side Stage 2)
Intake Air Temperature	105	3	<ul style="list-style-type: none"> Sensor or Wiring Harness Open or Short to Power Sensor Malfunction
		4	<ul style="list-style-type: none"> Sensor or Wiring Harness Short to Ground Sensor Malfunction
		15	<ul style="list-style-type: none"> Engine Coolant Temperature Abnormality (High Side Stage 1)
		0	<ul style="list-style-type: none"> Engine Coolant Temperature Abnormality (High Side Stage 2)
Knock	731	4	<ul style="list-style-type: none"> Sensor or Wiring Harness Open or Short to Power Sensor Malfunction
		2	<ul style="list-style-type: none"> Knock Signal Abnormality (High Side) Sensor Malfunction
Battery Voltage	168	15	<ul style="list-style-type: none"> System Voltage Abnormality (High Side)
		17	<ul style="list-style-type: none"> Wiring Harness Open or Short or Damage Battery Abnormality
5V External	1079	3	<ul style="list-style-type: none"> Wiring Harness Short to 12V Power ECM Malfunction
		4	<ul style="list-style-type: none"> Wiring Harness Short to Ground ECM Malfunction
	1080	3	<ul style="list-style-type: none"> Wiring Harness Short to 12V Power ECM Malfunction
		4	<ul style="list-style-type: none"> Wiring Harness Short to Ground ECM Malfunction
	1079	31	<ul style="list-style-type: none"> Wiring Harness Short to 12V Power or Ground ECM Malfunction

Diagnostic Trouble Component (DTC)	SPN Code	FMI Code	Issue
Throttle Position Sensor	51	3	<ul style="list-style-type: none"> TPS Circuit in the Harness Short to Power TPS Malfunction
		4	<ul style="list-style-type: none"> TPS Circuit in the Harness Short to Ground TPS Malfunction
	3673	3	<ul style="list-style-type: none"> TPS Circuit in the Harness Short to Power TPS Malfunction
		4	<ul style="list-style-type: none"> TPS Circuit in the Harness Short to Ground TPS Malfunction
	51	0	<ul style="list-style-type: none"> TPS Malfunction
		1	
		7	
		31	
Barometric Pressure	108	1	<ul style="list-style-type: none"> Sensor Out of Calibration Loss for 5V Reference Feed (5V_ext1) to MAP Signal Wire Open or Shorted to Ground
Foot Pedal Position (FPP)	91	3	<ul style="list-style-type: none"> Wiring Harness Open or Short or Damage FPP Malfunction
		4	
		16	
		18	
		31	<ul style="list-style-type: none"> FPP Malfunction
	29	3	<ul style="list-style-type: none"> Wiring Harness Open or Short or Damage FPP Malfunction
		4	<ul style="list-style-type: none"> Wiring Harness Open or Short or Damage FPP Malfunction
Engine Speed	515	15	<ul style="list-style-type: none"> Engine Over Speed Condition, Stuck Throttle, Large Vacuum Leak Into Intake Manifold After Throttle Blade
		16	<ul style="list-style-type: none"> Engine Over-Speed Condition, Faulty Crank Sensor or Input
		0	<ul style="list-style-type: none"> Engine Over-Speed Condition, Faulty Crank Sensor or input
Oil Pressure	100	1	<ul style="list-style-type: none"> Low Oil Pressure
Adaptive Learn	4237	0	<ul style="list-style-type: none"> Exhaust Leaks Upstream or Near the HEGO Sensor Reduced Fuel Supply Pressure to the Gaseous Fuel Control System An Inoperative Sensor An Injector that is Stuck Closed or Dirty Weak Spark or Lack of Spark to a Cylinder A Fuel Supply or Manifold Leak A Non-Responsive HEGO Sensor
		1	<ul style="list-style-type: none"> An inoperative O2 sensor High fuel supply pressure or temperature Internal mechanical engine damage An injector that is stuck open or leaking High fuel supply pressure to the gaseous fuel control or faulty pressure regulator A non-responsive HEGO sensor

SECTION 3 SERVICE

Fault Codes

Diagnostic Trouble Component (DTC)	SPN Code	FMI Code	Issue
Closed Loop	4236	0	<ul style="list-style-type: none"> Exhaust leaks upstream or near the HEGO sensor Reduced fuel supply pressure An injector that is stuck closed Reduced fuel supply pressure to the gaseous fuel control system A fuel supply or manifold leak A non-responsive HEGO sensor
		1	<ul style="list-style-type: none"> High fuel supply pressure to the fuel injection system A non-responsive HEGO sensor An injector that is stuck open High fuel supply pressure to the gaseous fuel control or faulty pressure regulator A non-responsive HEGO sensor
Catalyst Monitor	3050	11	<ul style="list-style-type: none"> Physically Damaged Catalyst Contaminated Catalyst Element Post Signal Circuit Shorted to Pre-signal
EGO Sensors	3217	5	<ul style="list-style-type: none"> Open feed circuit to O2 heater Open or shorted to ground O2 signal wire Open sensor ground (5Vrtn1) Inoperative sensor
	3227		
Injectors	651	5	<ul style="list-style-type: none"> Loss of 12 V feed to injector Open injector coil Open or shorted to ground injector driver circuit in engine harness
		6	<ul style="list-style-type: none"> Injector coil shorted internally Injector driver circuit shorted to voltage between injector and ECM
	652	5	<ul style="list-style-type: none"> Loss of 12 V feed to injector Open injector coil Open or shorted to ground injector driver circuit in engine harness
		6	<ul style="list-style-type: none"> Injector coil shorted internally Injector driver circuit shorted to voltage between injector and ECM
	653	5	<ul style="list-style-type: none"> Loss of 12 V feed to injector Open injector coil Open or shorted to ground injector driver circuit in engine harness
		6	<ul style="list-style-type: none"> Injector coil shorted internally Injector driver circuit shorted to voltage between injector and ECM
	654	5	<ul style="list-style-type: none"> Loss of 12 V feed to injector Open injector coil Open or shorted to ground injector driver circuit in engine harness
		6	<ul style="list-style-type: none"> Injector coil shorted internally Injector driver circuit shorted to voltage between injector and ECM

Diagnostic Trouble Component (DTC)	SPN Code	FMI Code	Issue
Spark Coil Primary	1268	5	<ul style="list-style-type: none"> A Short to Ground or Open Circuit in the Harness An Open Internal to the Primary Coil
		6	<ul style="list-style-type: none"> A Short to Power in the Harness A Short Internal to the Primary Coil
	1269	5	<ul style="list-style-type: none"> A Short to Ground or Open Circuit in the Harness An Open Internal to the Primary Coil
		6	<ul style="list-style-type: none"> A Short to Power in the Harness A Short Internal to the Primary Coil
	1270	5	<ul style="list-style-type: none"> A Short to Ground or Open Circuit in the Harness An Open Internal to the Primary Coil
		6	<ul style="list-style-type: none"> A Short to Power in the Harness A Short Internal to the Primary Coil
	1271	5	<ul style="list-style-type: none"> A Short to Ground or Open Circuit in the Harness An Open Internal to the Primary Coil
		6	<ul style="list-style-type: none"> A Short to Power in the Harness A Short Internal to the Primary Coil
Lock off/Fuel Diagnostics	632	31	<ul style="list-style-type: none"> Leak Fuel at Solenoid Faulty Solenoid Open or Short to Ground
Fuel Pump Feedback	1347	5	
		6	
Fuel Pump Relay Control/Coil	1348	4	<ul style="list-style-type: none"> Relay pull in coil shorted internally Relay driver circuit shorted to ground in wire harness
		5	<ul style="list-style-type: none"> Open coil in relay Open in relay driver circuit in engine harness
		3	<ul style="list-style-type: none"> Shorted relay pull in coil Relay driver circuit shorted to voltage in wire harness
Power Relay Control / Coil	1485	4	<ul style="list-style-type: none"> Short to Ground in Relay Pull in Coil Short to Ground in Relay Driver Circuit in Wire Harness
		3	<ul style="list-style-type: none"> Shorted Relay Pull in Coil Relay Driver Circuit Shorted to Voltage in Wire Harness
EPR Diagnostics	520260	0	<ul style="list-style-type: none"> Inlet Pressure to DEPR is too high
		1	<ul style="list-style-type: none"> Inlet Pressure to DEPR is too Low Malfunctioning Lock Off Valve, Plugged Fuel Filter, Close Manual Valve or Fuel Tank Out of Fuel
		3	<ul style="list-style-type: none"> Wiring Harness Open or Short or Damage
		4	<ul style="list-style-type: none"> Wiring harness Open or Short or Damage Faulty EPR Power Circuit
		12	<ul style="list-style-type: none"> Short or Open Circuit in Actuator Coil Associated Wiring Overheating or Actuator Drive Electronics DEPR Internal Microprocessor or Memory Failure, Fuel Temperature Sensor Failure
		34	<ul style="list-style-type: none"> Faulty CAN connection CAN termination incorrect

SECTION 3 SERVICE

Fault Codes

Diagnostic Trouble Component (DTC)	SPN Code	FMI Code	Issue
Cam/Crank Sensors	636	2	<ul style="list-style-type: none"> Cam+ or Cam- Circuits in Wrong Connector Terminal Slot
		4	<ul style="list-style-type: none"> Loss of Sensor Feed Open Sensor Ground Open or Shorted Ground Signal Wire
		8	<ul style="list-style-type: none"> Mechanical Misalignment Between Cam and Crank
	723	2	<ul style="list-style-type: none"> Cam+ or Cam- Circuits in Wrong Connector Terminal Slot
		4	<ul style="list-style-type: none"> Loss of feed voltage to Cam sensor Loss of signal or ground circuits Faulty sensor
Internal Processor Diagnostics	628	13	<ul style="list-style-type: none"> Faulty ECU
	629	31	<ul style="list-style-type: none"> Faulty ECU
	630	12	<ul style="list-style-type: none"> Faulty ECU
	1634	2	<ul style="list-style-type: none"> Faulty ECU
J1939 Network	695	9	

This is only a partial list of the most common error codes that are available. If an alternate code is shown that is not on this list, please contact Allen Engineering Service Department for details.

Machine Cleaning Procedure

When cleaning the machine, please adhere to the following information to ensure proper cleaning and to keep the machine in the best condition possible.

Power Washing Procedure:

NOTICE

- Ensure that the water pressure is below 2000 PSI (14 MPa)
- Always keep the water temperature below 180°F (80°C)
- Use a spray nozzle with at minimum 40° wide spray angle
- Keep the nozzle at least 1 foot (300mm) away from the machine
- Keep a perpendicular angle (90°) when cleaning over a decal.
 - Holding nozzle of a pressure washer at an angle different from 90° may lift the decal from the machine.
- Recommended using a safe cement dissolver, **BACK-SET** or similar, to remove hardened concrete.
- It is **NOT** recommended to use chemicals such as:
 - Muriatic Acid
 - Hydrochloric Acid
 - Hydrofluoric Acid
 - Sulfuric Acid
 - Phosphoric Acid
- To prevent build-up of concrete on the machine, use **BODY GUARD** or similar protection wax.

Filter Cleaning Procedure:

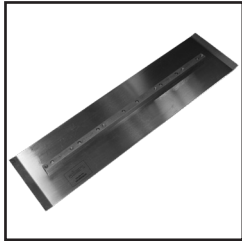
- Remove air filters and blow out with compressed air, **NOT** to exceed 80 PSI.

SECTION 4 ACCESSORIES



Trowel Blade, Combo, 8" X 18", VP Silver Series
(only sold as set of 4)

Part Number: 016094V-4



Trowel Blade, Finish, 6" X 18", VP Silver Series
(only sold as set of 4)

Part Number: 015695V-4



Float Pan, Clip On, 46.5" O.D., Universal Flat, 80° Lip Angle,
5-Blade

Part Number: 051552



Float Pan, Safety Catch, 46.5" O.D., Universal Flat, 80° Lip Angle,
5-Blade

Part Number: 051553



Lifting Bridle, 6,000 Pound Max, 2-Point x 3 Foot

Part Number: 064568



Dolly Jacks are available for HDX riders to make mobilization easier. These tires are foam-filled to help support the added weight of the machine and to help prevent flats. (Comes in set of 2)

Part Number: 039090-F

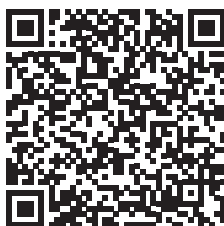
NOTICE

Parts Manual

In order to provide a premier experience to our customers, we have moved the “Parts” section out of this manual and placed it in a separate “Parts & Decals Manual”. This will allow us to provide any changes or other important information quicker to you, the customer. See below for ways to access the “Parts & Decals Manual”.

Mobile Device:

Scan this QR code with a compatible device (cellular phone, tablet, etc.)



Computer:

[CLICK HERE FOR THE "PARTS AND DECALS MANUAL"](#)

Mail:

A physical copy of the parts manual can also be mailed to you upon request. Please contact Allen Engineering service department and one can be sent to you.

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Revision Detail

GENERAL INFORMATION

MANUAL REVISION DETAIL

REVISION #	REVISION DATE	REVISION REFERENCE #	REVISION BY
-	10/19	Initial Release	MW
A	01/22	Updated Covers	MK



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