

WALK-BEHIND TROWELS

PRO WALK-BEHIND



SAFETY & OPERATIONS MANUAL

Manual Part #: 080743 | Revision: C
Language: English | Original Instructions



DUAL-FUEL WALKBEHIND TROWEL

SAFETY & OPERATIONS MANUAL

This manual covers the Trowel Parts listed below:

Kitted Part Numbers (Includes Power Unit and Handle)

<u>Part No.</u>	<u>Description</u>
079450	TROWEL KIT, 446, DUAL-FUEL, FINE PITCH HANDLE (DuroMax)

Handle Only Part Numbers

<u>Part No.</u>	<u>Description</u>
063975	HANDLE, PRO, DUAL-FUEL, FINE PITCH, LONG ADJUSTMENT
070300	HANDLE, PRO, DUAL-FUEL, RAPID PITCH, LONG ADJUSTMENT

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.

Copyright © 2024 Allen Engineering Corporation
All rights reserved

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. No part of this manual may be reproduced or transmitted in any form or by any means, electronic or mechanical, for any purpose, without the express written permission of Allen Engineering Corporation (AEC). AEC assumes no responsibility or liability for any errors or inaccuracies that may appear in this manual.

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.

Table of Contents

GENERAL INFORMATION

Sect No.	Title	Page
	Table of Contents	3
	Limited Warranty	4
	Information Contained in this Manual	5
	Dealer Information / Ordering Parts	6
	Model Number / Serial Number Unit Identification	7
	Technical Specifications	8
	Engine Specifications - Duromax	9
1	SAFETY	10
	Federal / State Warnings	11
	Manual Tag Safety Detail	12
	Spark Arrestor Notice / Hazard Symbols	13
	Operating Safety	14
	Engine Safety	15
	Service Safety	16
	Propane Operating Safety	17
	Propane Operating Safety	18
	Lifting Safety	19
	Lifting Safety	20
	Transportation Safety	21
	Pan Installation Safety - Lifting Bridle	22
2	OPERATION	23
	Introduction	24
	Pre-Start Procedure	25
	Engine Control - DuroMax	26
	Fuel Conversion for DuroMax, Gas / LP	27
	Trowel Controls	28
	Trowel Controls	29
	Operating Instructions	30
	Operating Instructions	31
3	SERVICE	32
	Periodic Maintenance	33
	Trowel Gearbox	34
	Lift Lever Adjustment	35
4	ACCESSORIES	37
	Spare Parts	38
	Cleaning Procedure	39
	Parts Manual	40
	Revision	41

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.

Information Contained in this Manual

GENERAL
INFORMATION



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
ASSEMBLY**

**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 OEM instructions. See your battery manufacturer for battery warranty.

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: <hr/> <hr/>	Salesman: <hr/> <hr/>
Dealer Phone #: (____) - ____ - _____	Salesman Phone #: <hr/> <hr/>
Address: <hr/> <hr/>	Additional Comments: <hr/> <hr/> <hr/>
City / State / Zip: <hr/> <hr/>	

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 ensure 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.



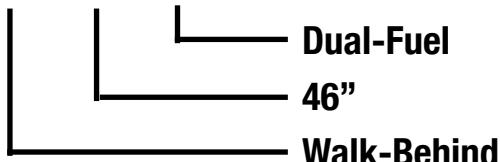
ALL INFORMATION, SPECIFICATIONS, AND ILLUSTRATIONS IN THIS MANUAL
ARE SUBJECT TO CHANGE WITHOUT NOTICE AND ARE BASED ON THE
LATEST INFORMATION AT THE TIME OF PUBLICATION.

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

PRO 446 DF



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.

446P 01 12 001



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 to Figure 1 for serial number and model number location. This plate should not be removed at any time.

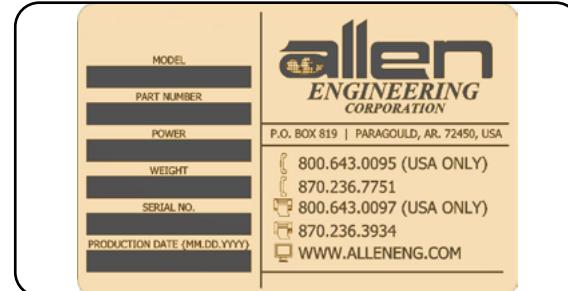
Please record the information found on this plate below so it will be available should the identification plate become lost or damaged. When ordering parts or requesting service information, you will always be asked to specify the model and serial numbers of the machine.

Model Number: _____

Serial Number: _____

Date Purchased: _____

Purchased From: _____



Measurements in this manual are in U.S. units and their customary metric units (i.e., metric units contained within brackets [8 mm]).

Machine Features:

- Dimensions (L x W x H) inch [mm]..... 72 x 38 x 39 [198.1 x 121.9 x 99.1]
- Dry Weight 275 lb [125 kg]
- Rotor Speed (RPM) 120
- Combo Blade Standard
- Gearbox Standard Duty (STD)
- Fixed Guard Rings Standard
- Gearbox Rotation Standard
- Safety Shutdown Switch Centrifugal
- Fuel Capacity 10 lb Tank
- Run Time (Approximate) hr 2.5
- Transmission Type Clutch
- Drive Belt Type V-Belt

Engine Specifications - Duromax

SECTION 1 SAFETY

DuroMax XP18HPX Engine Information

Engine Type:	4 Stroke Air Cooled OHV
Engine Shaft:	Horizontal
Displacement [cc]:	439
Fuel:	Propane / Gasoline
Max Speed [RPM]:	4000
Peak Torque (Nm.) [@2500 RPM]	35.6
Bore x Stroke [mm]:	3.6 x 2.5 [92 x 66]
Starter:	Recoil
Weight lbs [kg]:	79 [35.8]
Length inches [mm]:	19.29 [490]
Width inches [mm]:	13.98 [355]
Height inches [mm]:	18.11 [460]
Fuel Capacity US Gallons (L):	1.4 (5.2)
Recommended Oil:	Engine Oil SAE 10W-30
Oil Capacity US fl oz (L):	37.2 [1.1]
Muffler (type):	Standard
Lube System:	Splash
Emission Rating:	EPA / Carb



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



Some states require that in certain locations arrestors be used on internal combustion engines. A spark arrester 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.

WARNING

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.

- **NEVER** operate this machine in applications for which it is not intended.
- **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** keep hands, feet, and loose clothing away from moving parts of the machine.
- **ALWAYS** read, understand, and follow procedures in the Operator's Manual before attempting to operate the equipment.
- **ALWAYS** be sure operator is familiar with proper safety precautions and operation techniques before using machine.
- **ALWAYS** close fuel valve on engines equipped with one when the 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.
- **ALWAYS** operate the machine with all safety devices and guards in place and in working order.

DANGER

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** use fuel that is more than 90 days old. Use of unmixed, improperly mixed, or fuel older than 90 days, (stale fuel), may cause hard starting, poor performance, or severe engine damage and void the product warranty.
- **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.



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** 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** 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.

WARNING

Facts About LP Gas - Propane

As a fuel, Propane gas is unmatched for both safety and dependability. It has been used as a domestic household fuel for over half a century, and for over thirty years as an internal combustion engine fuel. Propane is a highly flammable fuel that is contained under pressure as a liquid. Vaporized gas has a similar explosive force to gasoline and mixtures as low as 2% LP Gas to air may be ignited in a closed environment. Care should be exercised to avoid escaping vapor as it can freeze skin and cause frost bite. Vaporized fuel is heavier than air and will collect in the lowest confined space available.

Facts About Propane Tanks

Propane tanks are constructed according to ASME or Federal DOT #4ET20 pressure safety codes. Including the tank, all valves and fittings are UL Listed. Propane gas is noncorrosive and will not rust the inside of a tank. Should the tank exterior become damaged or rusted, discontinue use. DO NOT tamper with tank gauges or safety relief valves. NEVER use a tank not intended for use with a propane buffer. DO NOT substitute tanks that are used with a barbecue grill, etc. AEC recommends having propane tanks tested once a year by an authorized National LP Gas Association propane dealer. The fuel tank is supplied directly from the manufacturer and is void of fuel. This tank must be purged 'at the time of the first fill. Local fuel vendors should be familiar with this operation and will provide this service.

Recommended Purge Procedures

How to purge new LP-Gas Buffer cylinders equipped with the Overfill Prevention Device:

New containers may contain vapor, air, or other contaminants. It is essential that these be removed before filling the container and placing it into service. Air in the container will cause abnormally high pressure, with the result that the pressure relief valve may open. Air in the system is also likely to cause lean mixture, making ignition difficult. If a cylinder is suspected of being de-pressurized or open to the atmosphere for a period of time, it must be re-purged as if it were a new container.

Purging of containers should be performed in an approved area (see NFPA 05 8) using NPGA #13 3.89(a) procedure. To purge a container, the following steps should be taken.

1. Determine if the container pressure is zero. Should the cylinder contain only pressurized air, the air may be vented directly to the atmosphere through the service valve using an adapter and the outage valve.
2. Pressurize the container to approximately 15 psig with LP-gas vapor. Never purge with liquid LP-gas! To do so will cause the moisture vapor to chill and remain in the cylinder. LP gas liquid also expands 270 times to vapor making the purge process ineffective. Use LP-gas vapor only!
3. Make the connection to the quick coupler (A purge manifold system is most effective). Fully open the cylinder service valve as well as the outage valve. Vent to a safe atmosphere. A vent stack is recommended.
4. On Overfill Prevention Device cylinders, the purge time is increased as a result of the new valve design. Opening the outage valve will help improve the speed of the purge.
5. Repeat #3 and #4 for a total of FIVE purges.
6. Re-pressurize the container with odorized LP-gas vapor to 15 psig.
7. The container is now ready to be filled with LP-gas.
8. Once filled, check all fittings and tank openings for leaks using an approved leak detector solution.
9. The container is now ready to be placed in service. Add DOT and OSHA labels.

Symptoms of a non-purge cylinder:

- Relief valve opens due to over pressurized cylinder creating hazardous situation.
- Moisture in the cylinder.
- Buffer operates initially but shuts down when fuel mixture becomes too lean.

Refilling & Storing Propane Tanks

The NFPA Technical Committee prohibits the storage of such containers in buildings. There are few exceptions to this rule. In other words, propane tanks should NOT be stored in buildings used by the public or frequented by anyone passing through or who is working in the building. Full or empty, never leave tanks in small enclosed areas.

The tank(s) must be in a secure, tamper-proof storage enclosure that provides safety from accident or vandalism. **PROPANE TANKS SHOULD ALWAYS BE TRANSPORTED, INSTALLED AND USED IN AN UPRIGHT POSITION. OVERFILLING PROPANE TANKS IS HAZARDOUS.** The tank should NEVER be completely filled with liquid propane. 80% of the total tank volume is to be considered at ALL times as full. **EXPANSION MUST BE ALLOWED FOR.**

Propane Buffer tanks are equipped with a fixed liquid level gauge which contacts the liquid level at 80% of container capacity, allowing 20% for expansion. The top part of this device must be unscrewed counterclockwise so that vapor can escape through the small hole in its side, as the tank is refilled. When the escaping vapor starts to give way to liquid, the device must be quickly closed and the propane nozzle turned off.

! NOTE

“IMPORTANT” The engine and the fuel system on your trowel are designed to run on fuel vapor, not fuel liquid. Overfilling the propane tank will result in damaging the lock off and/or regulator. This will **VOID** the **WARRANTY** on these components.

“IMPORTANT” This engine is certified to operate on commercial propane (per GPA STD2140). If you have any questions, contact your propane supplier. LP mixtures containing higher than 5% propylene should **NOT** be used.

**ALWAYS ENSURE THAT THE WORK AREA IS WELL VENTILATED.
PROPANE ENGINES ARE NOT SAFE TO RUN IN ENCLOSED AREAS!**

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

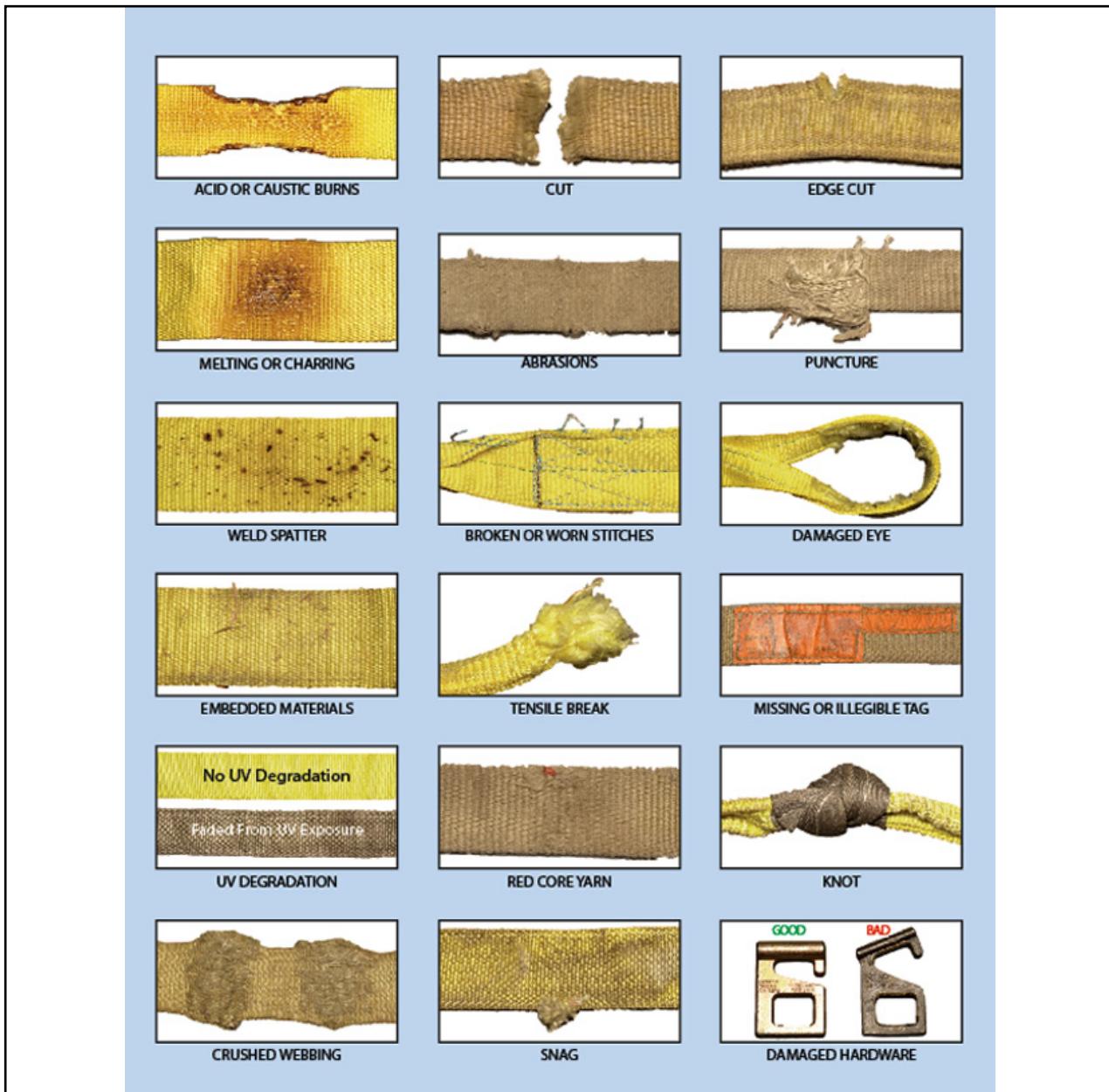
OSHA has set forth guidelines which detail the use of Rigging Equipment for Material handling. This guideline is found under

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:



- 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:

- 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. Machine weight will vary depending on handle selection, total dry weight approximately 275 lb [125 kg].
- **ALWAYS** shutdown engine before transporting.



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

Trowel Transportation Procedures

Extra care should be taken when lifting the trowel off the ground. Serious damage to the machine or personal injury could be caused by dropping a trowel.

CAUTION

The trowel is heavy and awkward to move around. Use proper heavy lifting procedures and **DO NOT** lift the trowel by the guard rings.

The lift bale (A) provides an optimal lift point for moving the trowel. A forklift can be used to lift a trowel up onto a building. Using a crane to move a machine with a lift bale is highly recommended, and is perfectly safe for the machine. Extra care should be taken when lifting the machine off the ground, however. Serious damage to the machine or personal injury could be caused by dropping a trowel.

Remove the auxiliary lifting tube (B) located on the bottom of the main handle. Insert the tube into the socket (C) located on the opposite side of the gearbox from the handle. Make sure that the hole in the tube engages with the socket. With one person lifting from the main handle, and another lifting from the auxiliary lifting tube pick up the machine to move it onto a slab.

CAUTION

The trowel must be stabilized by the person carrying the operator's handle. If it is not stabilized properly, the handle could swing around and flip the trowel, causing damage to the trowel and also bodily injury.



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.

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 and the edges of the pan may be sharp. As a precaution wear cut resistant gloves when installing pans.
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.



6

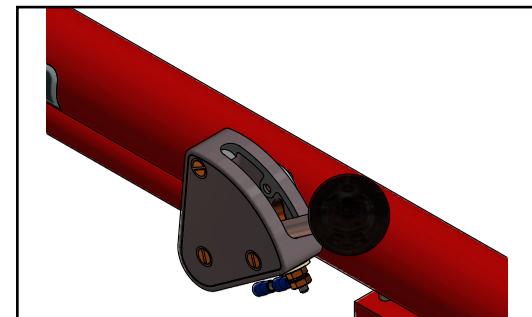
SECTION 2: OPERATION



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.

INTRODUCTION:

- The Walk-behind trowel is a modern high production machine. Finishing rates will vary depending on the operator's skill and job conditions. This trowel has four finishing blades. Walk-behind trowels are designed for the floating and finishing of concrete slabs.
- The standard duty gearbox is designed to provide exceptional performance with low maintenance and trouble-free use under some of the worst conditions. Power is transferred from the engine to the gearbox input shaft via a V-belt pulley drive system. The pulley engages using a clutch, see the Parts manual for a breakdown.
- All Allen Engineering Walk-behinds are equipped with a safety shutdown switch.
- Operating time between fuel refills is approximately 2-1/2 to 3 hours with a rotor speeds of 110 to 135 RPM.
- The walk-behinds are the most technically advanced riding trowels on the market today. With proper maintenance and use, your trowel will provide you with exceptional service and dependability.



Pre-Start Procedures

Propane Check (if using propane as a fuel source)

- Make sure that 80% of the tank is full.

Gearbox Oil

- Determine if the gearbox oil is low by removing the oil plug located on the side of the gearbox. The correct level of the lubrication oil should be to the bottom of the fill plug.
- If lubrication oil begins to seep out as the drain plug is being removed, then it can be assumed that the gearbox has a sufficient amount of oil.
- If lubrication oil does not seep out as the drain plug is being removed, fill with type Allen Oil Kit P/N 048386 gearbox lubricant oil until the oil filler hole overflows.

V-Belt Check

- A worn or damaged V-belt can adversely affect the performance of the trowel. If a V-belt is defective or worn simply replace the V-belt as outlined in the maintenance section of this manual.

Belt Guard Check

- Check for damage, lose or missing hardware.

Blade Check

- Check for worn or damaged blades. Check to see if a blade is worn out while the others look new. If this is the case there could be a blade pitch issue. Replace any worn blades.

Engine Oil Check

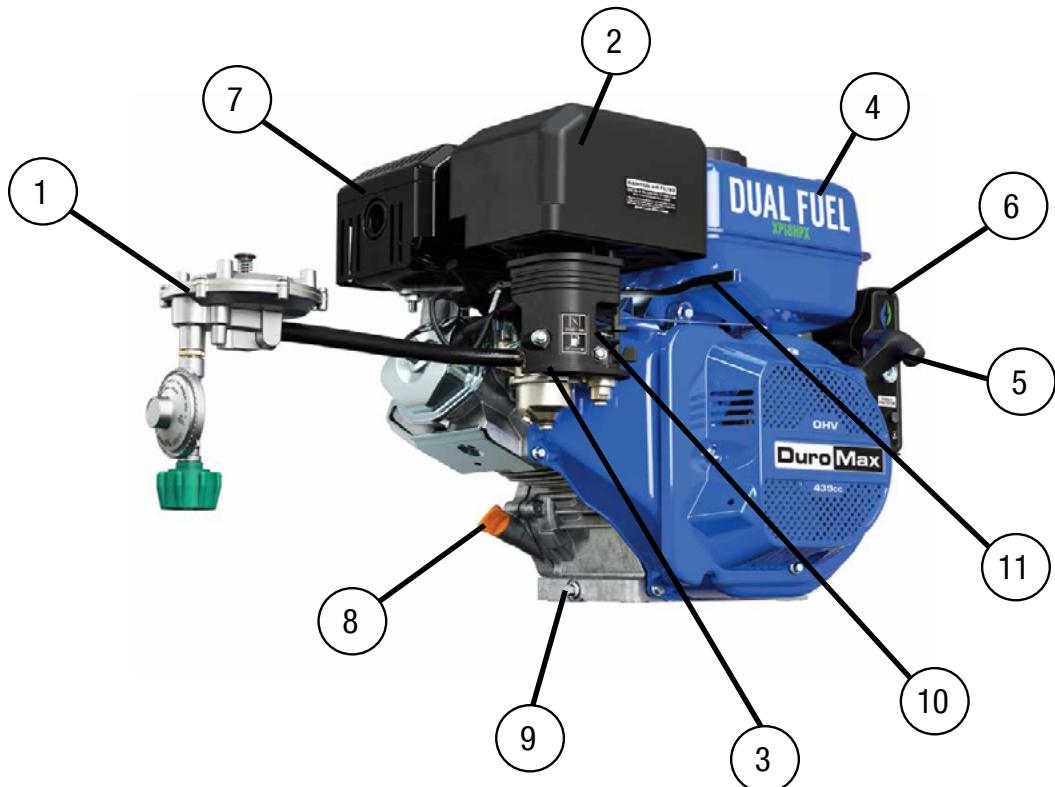
- To check the engine oil level, place the trowel on secure level ground with the engine stopped.
- Remove the filler dipstick from the engine oil filler hole and wipe clean.

Air Filter Check

- Check and clean cooling areas, air intake areas and external surfaces of engine (particularly after storage)
- Check air cleaning components and all shrouds, equipment covers, and guards are in place and securely fastened.

Verify Fuel Source

- Verify "Fuel Selector Valve" is in the proper position (Horizontal) for the fuel source that is being used.



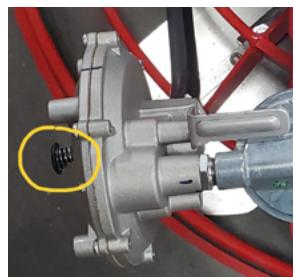
- 1. Propane Regulator** – Used to regulate the Propane fuel to the engine
- 2. Air Filter** – Uses an oiled element that can be removed and cleaned, to clean the air going into the engine.
- 3. Carburetor** – Controls the air fuel mixture of the engine.
- 4. Fuel Tank** – Metal 1.4gal gasoline fuel tank.
- 5. Recoil Starter** – Pull the recoil handle to start the engine without the electric start.
- 6. Key Switch Box** – An electric start switch that engages the starter motor.
- 7. Muffler** – Engine exhaust that features a noise dampening component.
- 8. Oil Fill** – This is used to refill the engine oil and check the oil level.
- 9. Oil Drain Plug** – Used to drain the oil of the engine.
- 10. Choke & Fuel Shut off Levers** - The choke lever is used in the starting of a cold engine, or in cold weather conditions. Open the fuel valve to let fuel flow, close to stop the flow of fuel
- 11. Throttle Lever** - Used to adjust engine RPM speed (lever advanced forward SLOW, lever back toward operator FAST)

To Run Engine On Gasoline:

1. Make sure gaseous fuel supply is not connected to the “Gaseous Fuel Regulator” (1)
2. Turn the “Fuel Shut-Off Valve” (10) to the “ON” position
3. Move the throttle lever to the low speed position
4. Turn the “Engine ON/OFF Switch (if equipped)” to the “ON” position.
5. If necessary pull the “Recoil Starter (pull rope)” (5) to start the engine.
6. Use the “Choke Lever” (10) as needed.

To Run Engine On Propane (ref. page 28):

1. If previously operated on gaseous fuel, make sure carburetor is emptied of all gasoline. If engine has previously ran on gasoline, turn “Gasoline Fuel Shut-Off Valve” (10) to the “OFF” position and let engine run out of fuel.
2. After shutting the fuel valve off, Connect the propane fuel supply to the “Propane Regulator” (1). To connect them screw the ACME nut on the propane regulator assembly to the tank. Ensure that the connections are secure, then open the tank valve.
3. Move the Choke Lever to ON, this lever is located above the fuel valve. Move the lever to the left hand side to the ON position. **NOTE:** If the engine is hot it is not necessary to use the choke.
4. Adjust the throttle lever to the **high speed position**.
5. Purge the Propane Regulator, hold the purge button for 3-5 seconds. This button is located in the center of the regulator and removes excess air in the regulator.
6. Turn the “Engine Key Switch (if equipped)” to the “ON” position or use the recoil starter.
7. If needed after allowing the engine to preheat, move the choke lever to the right hand side to the RUN position.



⚠ CAUTION

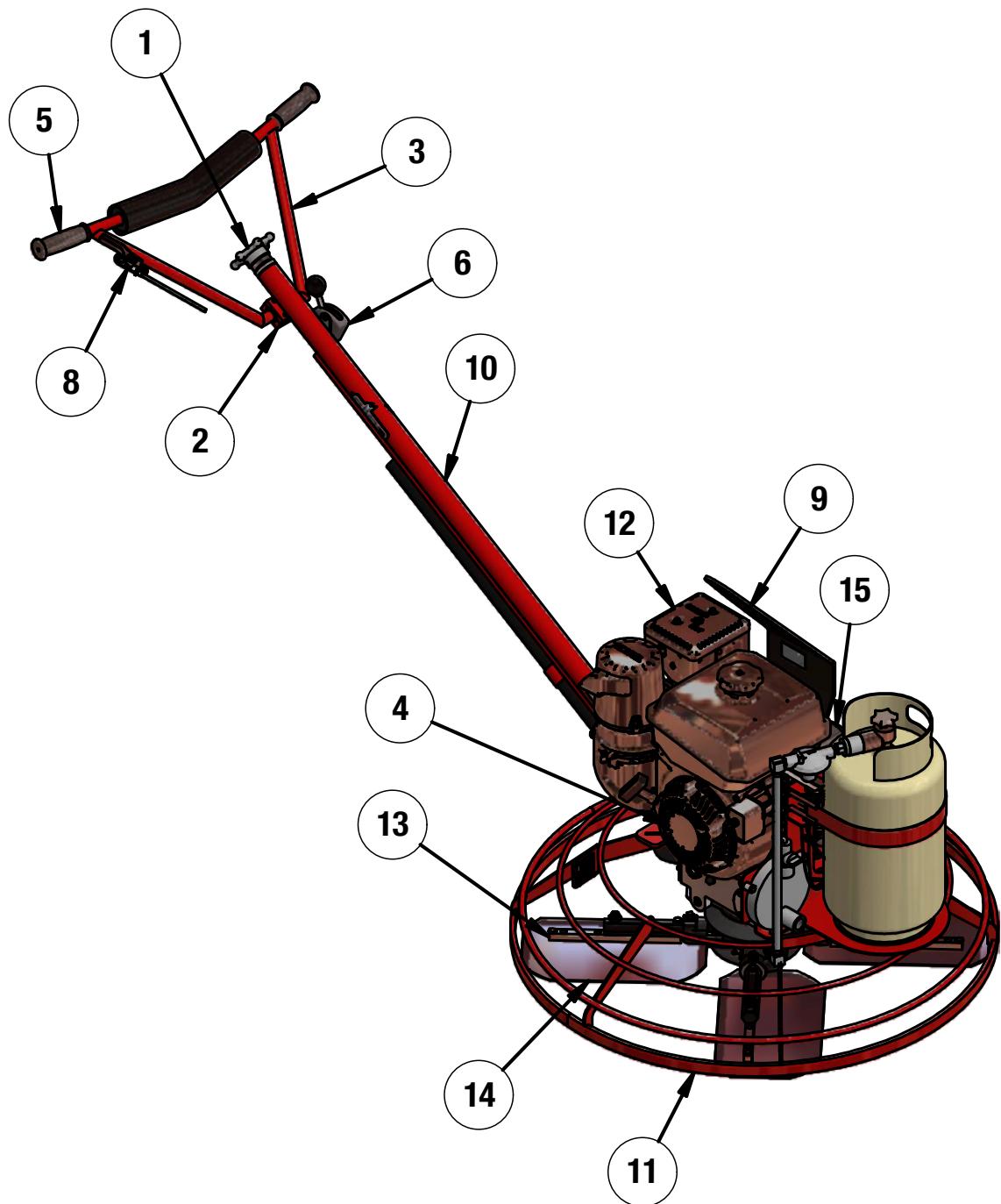
- Only start using the machine after the engine runs smoothly. If the propane gas leaks shut off the supply immediately.
- When stopping the engine turn off the propane supply then turn the key switch to the OFF position

⚠ CAUTION

Propane gas must be shut off when using gasoline. Never run the engine with both fuel sources turned on

FOR FURTHER INFORMATION SEE ENGINE OWNERS MANUAL

1. **Fine Pitch Control Handle** – To adjust the pitch of the blades, turn the handle either clockwise or counter-clockwise to achieve the desired blade pitch.
2. **Handlebar Adjuster** – Change the angle/height of the handle bars by loosening bolts, adjust handlebars to desired location, tighten bolts firmly to hold handlebars in that position.
3. **Handle Bar** – When operating the trowel, place both hands on each grip to maneuver the trowel.
4. **Recoil Starter Housing** – Automatically spools the recoil starter rope when using to start the engine.
5. **Hand Grip** – Replace hand grips when they become worn or damaged.
6. **Centrifugal “Kill” Switch** – In the event the operator loses control of the trowel, this switch will shutdown the engine.
7. **Lifting Tube** - Use this tube to lift the trowel onto a slab. Tube is to be inserted into socket located in front of the gearbox.
8. **Throttle Lever** – Controls engine speed. Returns engine to idle when released.
9. **Trowel Lifting Point** – The trowel is equipped with a lifting bail that can be used to safely lift and move the trowel.
10. **Main Tube** - When disassembling components inside the tube exercise caution.
11. **Guard Ring** - NEVER! put hands or feet inside guard ring while the machine is running.
12. **Engine** – This trowel uses a Kohler CH395TF engine or a DuroMax XP18HPX engine.
13. **Trowel Arm** – **NEVER** operate the trowel with a bent, broken or out of adjustment trowel arm. If the blades show uneven wear patterns or some blades wear out faster than others, the trowel arm may need to be adjusted. Use the trowel arm alignment tool P/N 016863 to adjust the trowel arms.
14. **Blades** – This trowel is equipped with combination blades. These blades are versatile and should take care of most troweling needs. In addition, pans can be attached to the trowel arms that will allow the trowel to float on “wet” concrete.
15. **Belt Cover** – (NOTE SHOWN) Remove this cover to gain access to the drive belt. **NEVER** operate the trowel with this cover removed.



Operating The Trowel

The following steps are intended as a basic guide to machine operation, and are not to be considered a complete guide to concrete finishing. We suggest that all operators (experienced and novice) read “Slabs on Grade” published by the American Concrete Institute, Detroit, Michigan. Read the “Training” section of this manual for more information.

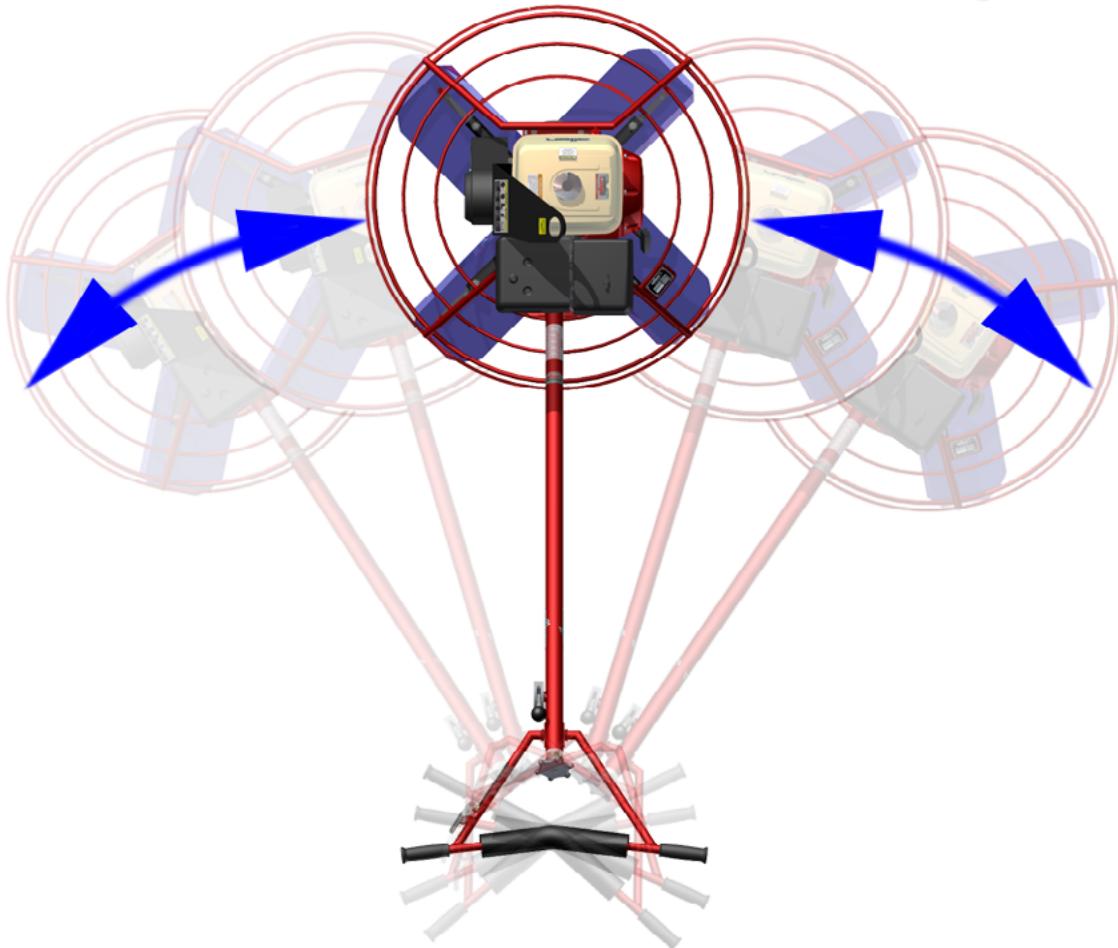
1. Get into the operator’s position behind the handle. With a secure foothold and a firm grasp on the handles slowly increase the engine speed until the desired blade speed is obtained. To maneuver the trowel, gently lift up on or press down on the main trowel handle. To move the machine to the operator’s left, lift up on the handle, to move machine to the right, push down on the handle.
2. The best method for finishing concrete is to slowly walk backwards with the trowel, guiding the trowel from side to side. This will cover all footprints on wet concrete.
3. Remember that if you let go of the trowel, just step away and let the trowel come to a complete stop before trying to recover the trowel.

Stopping The Engine

1. Move the throttle lever to the IDLE or SLOW position and run the engine for three minutes at low speed.

NOTICE

- When using propane fuel with the DuroMax engine the throttle lever should always be in the high speed position.
2. After the engine cools, turn the engine start/stop switch to the “OFF” position.



- **Push down** on the handle to move the rotor assembly to the right.
- **Pull up** on the handle assembly to move the rotor assembly to the left.
- **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 increase the pitch, turn the pitch control clockwise use the pitch indicator to adjust pitch equally on both right and left trowel blades.

SECTION 3: SERVICE

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.

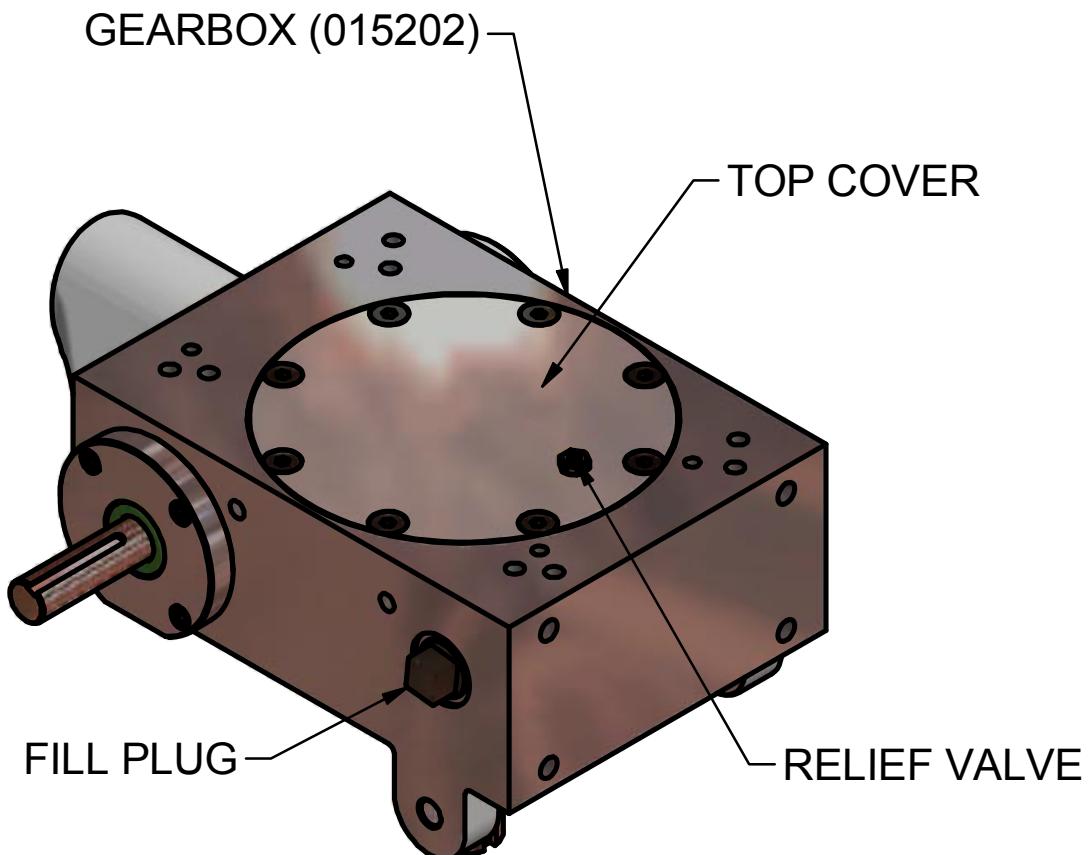
CHECK LIST					
ITEM	DAILY	EVERY 20 HRS	EVERY 50 HRS	EVERY 100 HRS	EVERY 300 HRS
Grease towel arms	✓				
Check oil level in gearbox	✓				
Check engine oil level	✓				
Check & tighten external hardware	✓				
Check drive belt for wear		✓			
Check valve clearance					✓
Change engine oil				✓	
Replace engine oil filter				✓	
Replace spark plug					✓

Trowel Gearbox Maintenance

Check Oil levels in the gearbox daily (every 8 hours) Add oil if oil level is below the check sight glass.

1. To add oil, tilt gearbox to the side and remove the fill plug. Add oil through hole opening. Replace fill plug after proper level has been achieved. Fill so that there is oil 1/2 way in the sight glass. Use Kluber GH 6-460 synthetic oil..

FILL PLUG LOCATION



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.

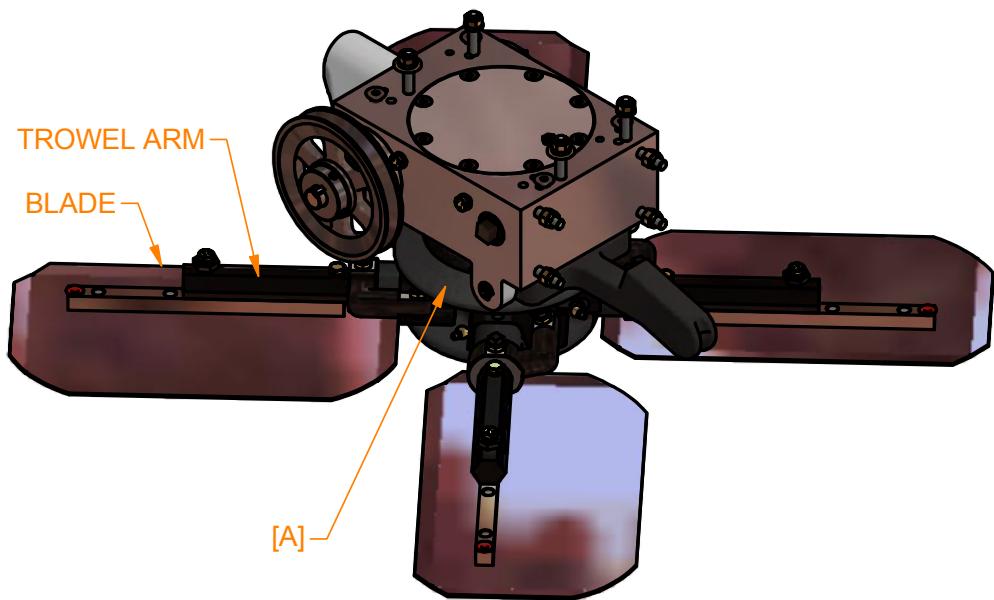
Adjusting the trowel arms is accomplished by using the optional trowel arm alignment jig (Part #: 016863). The service manual that is included with the alignment jig describes in detail the steps to perform this procedure and to check the flatness and straightness of the trowel arms. The steps below describe the general procedure to remove the trowel arms to be aligned.

1. Block up pressure plate [A] using a wooden block.

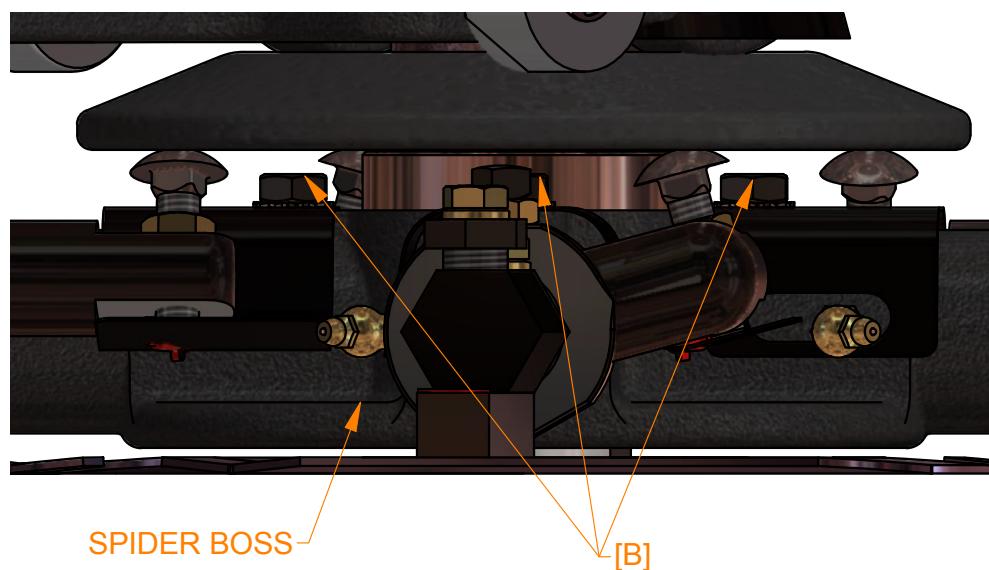
Make sure there is NO pitch in the blades before attempting to remove a trowel arm.

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 (Part #: 016863).
7. Perform the alignment procedures as outlined in the alignment jig service manual (Part #: 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).

PRESSURE PLATE LOCATION



FASTENER HARDWARE REMOVAL



**SECTION 4:
ACCESSORIES**



Part #: 079361 (16652-Z010710-00A0)
Description: Fuel filter (under gas cap), For Duromax XP18HPX



Part #: 079362 (17150-Z710110-0000)
Description: Air filter element, For Duromax XP18HPX



Part #: 079343 (77100HZ0T0110-00A0)
Description: 2nd Stage Regulator, For Duromax XP18HPX

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.

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 the link, or go to the following website

[Allen Engineering Equipment Manuals](http://AllenEngineeringEquipmentManuals)

Mail:

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

Allen Engineering
P.O. Box 819
Paragould, Ar.
72451, USA

Phone: 1.800.643.0095 (USA Only) / 1.870.236.7751

Fax: 1.800.643.0097 (USA Only) / 1.870.263.3934

MANUAL REVISION DETAIL

REVISION #	REVISION DATE	REVISION REFERENCE #	REVISION BY
-	6/25	Initial Release	MK
A	01/26	(26-032) Added 079343 to Spare Parts Page	MK



AEC FACTORY & HEADQUARTERS

819 S. 5TH STREET
PARAGOULD, ARKANSAS 72450
870.236.7751
800.643.0095 (TOLL FREE (USA ONLY))

MAILING

PO BOX 819
PARAGOULD, ARKANSAS 72451

ALLENENG.COM

CONNECT WITH US ON SOCIAL

