

LIGHTNING

EFI PROPANE RIDE-ON FLOOR SCRAPER

Rev 11.2016

**OPERATIONS AND MAINTENANCE MANUAL
MUST BE READ BEFORE OPERATING SCRAPER**



TABLE OF CONTENTS

LIGHTNING

SECTION 1	GENERAL DESCRIPTION
SECTION 2	SPECIFICATIONS
SECTION 3	SAFETY AND PRECAUTIONS
SECTION 4	INSTRUMENTS AND CONTROLS
SECTION 5	START-UP AND BREAK-IN
SECTION 6	MACHINE OPERATION
SECTION 7	PREVENTIVE MAINTAINANCE
SECTION 8	ENGINE
SECTION 9	FRAME & COWLINGS
SECTION 10	HYD AND DRIVE COMPONENTS
SECTION 11	STEERING JOYSTICK AND CABLES
SECTION 12	PROPANE PARTS

SECTION 1

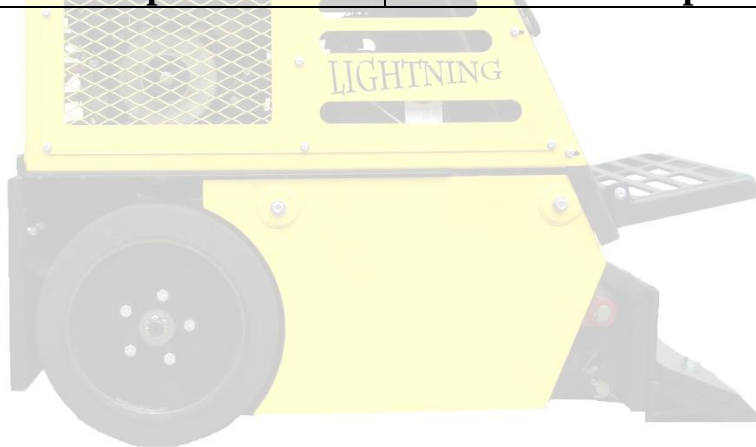
GENERAL DESCRIPTION

Lightning

A Kohler propane EFI engine powers the Lightning since mid 2014, driving a tandem hydrostatic pump system, creating a (skid-steer) zero turn radius drive train. Surface covering and coatings are removed by lowering a weighted blade onto the surface and moving forward under a high torque drive system. A flexible sharpened blade conforming to the floor surface then removes the surface coating. The weight of the machine holds the blade firmly to the floor and does not allow the blade to lift or ride over well-adhered surface coating material, thus lifting the floor coating.

SECTION 2

<i>SPECIFICATIONS</i>	
Weight	1,950 lbs
Removable weight	670 lbs
Machine without weights	1,280 lbs
Height	55 inches
Width	26 inches
Length	51 ½ inches
Engine	25 HP Propane EFI
Max Ground Speed	330 feet per minute



SAFETY WARNING

CARBON MONOXIDE can cause severe nausea, fainting or death. Do not operate engine in closed or confined area without proper ventilation! A CO (Carbon Monoxide) monitor is recommended when operating scraper inside.

SECTION 3

SAFETY AND PRECAUTIONS

Before operation of the **Lightning** please read the entire operation and safety manual with complete understanding of the safety section. If you have any questions on safety and precautions please call 1-866-636-7763.

There are several advantages to an effective safety program that include: lower operating costs, lower workers' compensations, less work time lost, high employee morale, and overall less problems. No one can work safely without knowing what precautions to take to insure personal safety. Operators must know what equipment to wear, which job practices are safe and which are not, and must be aware of what hazards are possible in the work area. A regular schedule of Preventive Maintenance on your equipment is the best protection against unpleasant surprises that slow production and sometimes result in injuries. Here are a few suggested safety tips.

1. The first step before any maintenance or inspection takes place should be: stop the engine and disconnect the battery terminals.
2. Wear proper eye and ear protection and heavy-duty work gloves at all times.
3. Practice good Preventive Maintenance.
4. Practice good housekeeping.
5. Allow the **Lightning** to come to a complete stop, turn off engine, and chock rear wheels before performing any maintenance procedures.
6. Replace worn parts when necessary.
7. Do not reach into blade or control arm areas while machine is in operation.
8. Do not attempt to open any access door until the machine has come to a complete stop and the engine and propane are turned off.
9. Be sure a qualified electrician does all electrical inspections or changes.
10. Loose surface coating can cause dangerous footing. Always be alert and careful.
11. After replacing parts, be sure all tools used are removed from the machine. Be sure all bolts and nuts are tight. The loose connection of a rotating part could cause the part to fly off with explosive force, causing serious damage to the equipment and possible injury to the operator.
12. Always lower blade to the ground when the machine is unoccupied by the operator. Serious bodily injury may result if arms are not in the lowered position when not occupied.
13. Never allow unauthorized personnel or the general public into the work area.
14. The work area should be barricaded off to adequately keep all untrained persons out of the work site. If an unauthorized person enters the work area, stop the machine immediately and do not restart the machinery until they have left the work area.
15. Always allow a 200-foot buffer safety zone around all surface preparation activity.
16. Always run the **Lightning** in a well-ventilated area, with an approved OSHA air-monitoring system in place at all times.

17. Read and obey all safety labels placed on the machinery at all times. If safety labels have been destroyed or removed, call 1-866-636-7763 for free replacement prior to operating the machinery.
18. The **Lightning** is **not a toy**. All operators must be over 18 years of age, must have read and reviewed the safety and procedures manual before operating the machinery.
19. The **Lightning** is designed for surface preparation *ONLY*. It is not intended for towing, pushing, or any other procedure not described in this manual.
20. Propane systems should be checked and documented twice yearly by a certified propane professional for leaks or damaged parts. If a propane leak is detected, leave the machine immediately and seek assistance from a propane professional. Do not use or restart machinery until it is determined safe.
21. Horseplay and or high speed cornering is not allowed with this machine and could cause rollover resulting in injury or death.
22. No smoking or open flame is allowed while machinery is running or within 50 feet of the machine.
23. Operator must be sober, not under the influence of drugs or medication, and under full control of all bodily senses while operating this or any machinery.
24. When transporting the **Lightning** it is recommended to use transport dolly. This procedure spreads the weight of the machine over a larger surface area.
25. All **Lightning** operators must receive safety training before performing any functions with the machine. **OEM Products** offers a free safety, maintenance, and orientation seminar at its facility in Oklahoma City, OK.

New owners and operators are advised to call 1-866-636-7763 for an appointment.

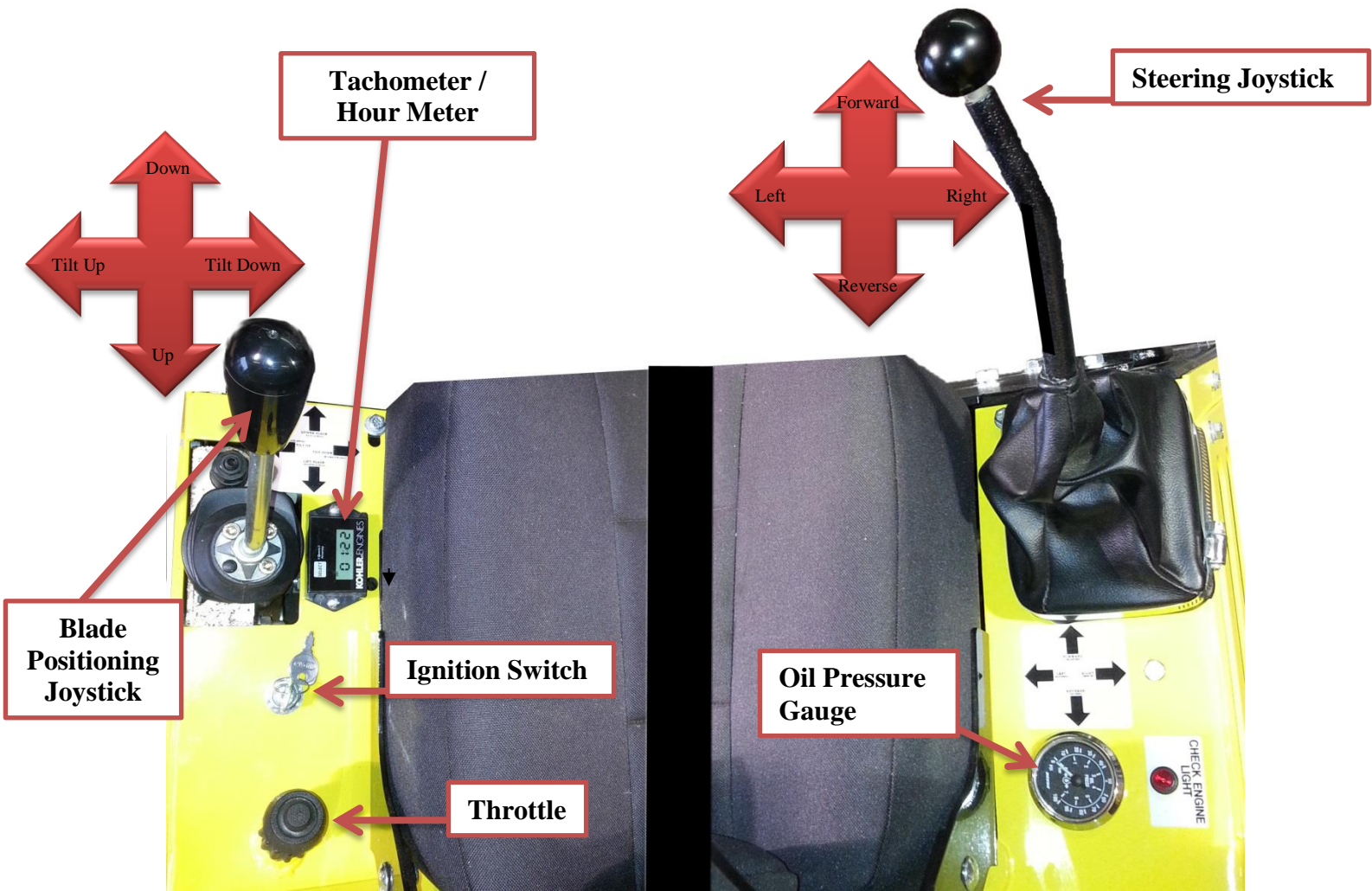
SECTION 4

Instruments and Controls

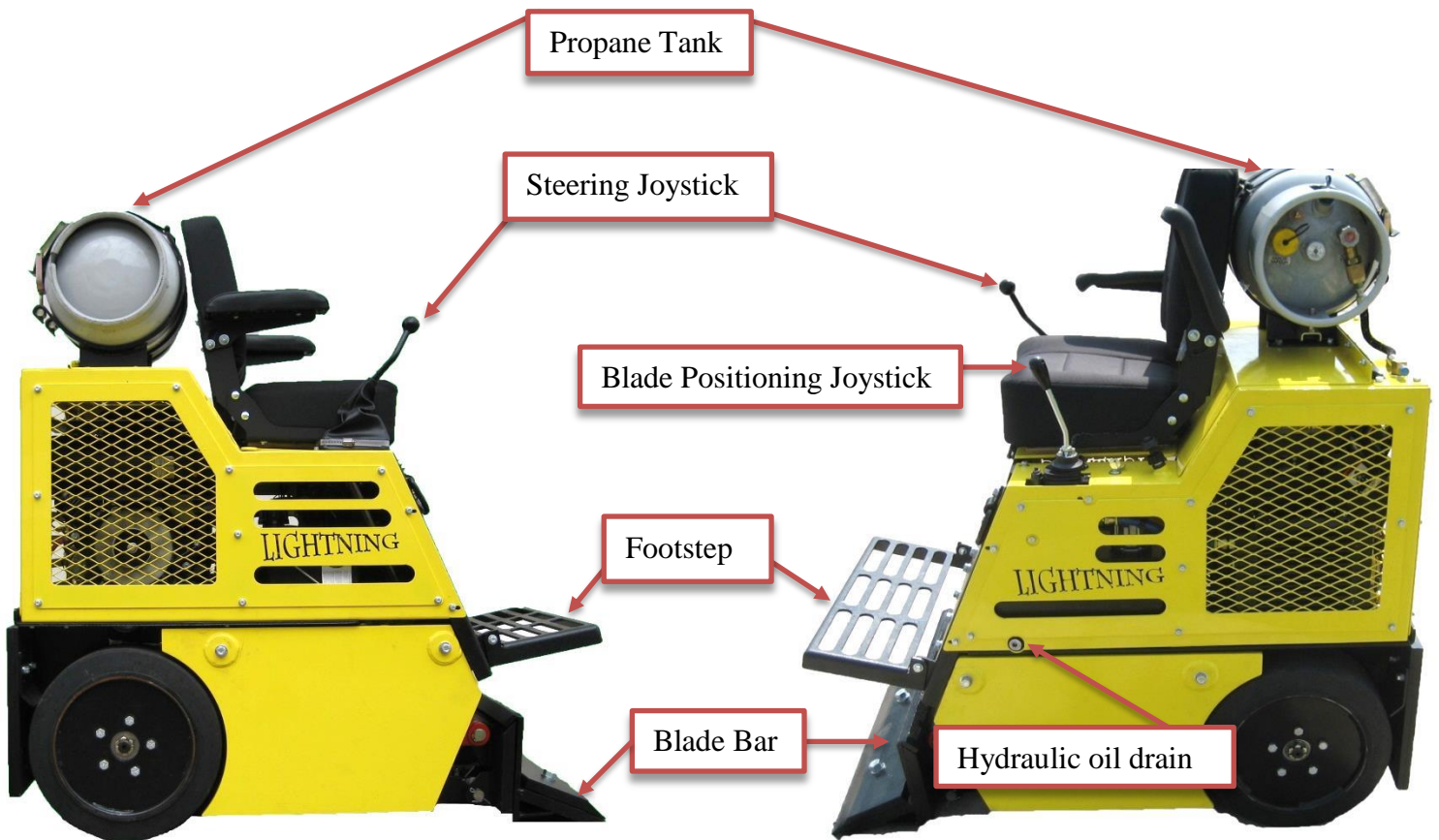
View # 1 – In-seat view of Lightning controls and gauges

View # 2 - Left and Right side view of Lightning machine

View #1 In-seat view



VIEW #2 LEFT AND RIGHT SIDE DETAIL



SECTION 5

Lightning START-UP AND BREAK-IN

The **Lightning** has been safety tested and run at our factory prior to shipping. The factory topped off all fluid levels; however, the propane tank shipped empty. Here is a recommended checklist of things to do before operating the **Lightning**:

1. Raise engine covers and check oil level.
2. Check air cleaner filter element for snug fit.
3. Check all battery cable connections for tightness.
4. Inspect for major hydraulic oil leaks. Snug hydraulic fittings using two wrenches. Use caution not to over tighten.
5. Fill propane tank.
6. Mount propane bottle in brackets, be sure bracket alignment pin corresponds with alignment slot on bottle.
7. Attach propane hose to liquid side of bottle by attaching to the handle valve. Snug fit the female connector attached to the hose and slowly turn valve on. You should hear gas briefly enter the propane hose. Immediately check for propane leaks with soapy water solution. If leak persists after retightening the knurled female connector: **STOP**, turn off the bottle at valve and seek assistance from a certified propane professional. Serious damage and or an explosion could occur.
8. Check lug bolt torque: 85-100 lbs.
9. Return all engine guards to proper position.
10. **Operator must be in seat before engine will start**
11. Crank the engine by turning the key in the on position. The engine will crank for 3 to 5 seconds while the propane enters the carburetor. If the engine does not start, turn the key off, wait 1 minute and try again. If again unsuccessful, check propane valve to be sure it is open. If still unsuccessful, turn off propane valve and seek assistance or call 1-866-636-7763.
12. Operation of the machine can continue when the engine is warm and running with the operator safely in the seat.

Please turn to Section VI for Machinery Operation.

NEW MACHINE BREAK-IN

Since the **Lightning** is a very low maintenance and user-friendly machine, the only break-in is for the Kohler engine. Please refer to the Kohler manual, the maintenance schedule can also be found inside the air cleaner plastic cover.

SECTION 6

MACHINERY OPERATION

Before reading the machinery operation section, new operators should familiarize themselves with VIEW#1 **In-seat view** and VIEW#2 **Left and Right side detail**. These pictures show the basic parts of the Lightning.

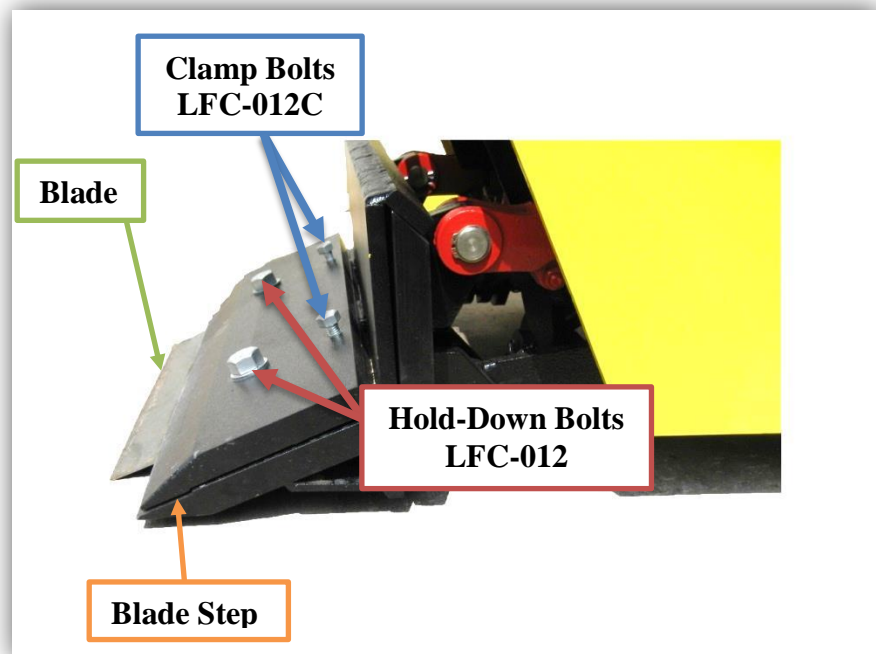
To move the machine: Using the right hand, slowly move the **Steering Joystick** in the desired direction. Forward and left moves the machine to the left, backward and right reverses the machine to the right. It is just that simple to drive. The amount of movement on the joystick, and the level of the throttle, controls the speed of the **Lightning**.

Throttle control is on the left side of the seat, taking the unit from idle to 3400 RPM. The optimum RPM is 2600 to 3200 RPM. To change the RPM of engine turn throttle knob clockwise to lower RPM and counterclockwise to raise RPM.

The left joystick lever positions the blade to the surface. Moving the lever forward and backward moves the blade up and down. Left and right movement changes the blade pitch.

To access the hydraulic reservoir: Lift up on the bottom of the seat

To change scraping blades: Stop engine. Loosen the smaller **Clamp Bolts** at the rear of the blade holder using a $\frac{3}{4}$ " open-end wrench. Slide the dull blade out. Loosen the **Hold-Down Bolts** if necessary to fit the replacement blade against the **Blade Step**. Retighten the **Hold-Down Bolts** by hand and then retighten the **Clamp Bolts** with your wrench. Lower the blade and resume scraping. With a little practice, you should be able to change the blades in 15 seconds. Dull blades may be sharpened and reused many times.



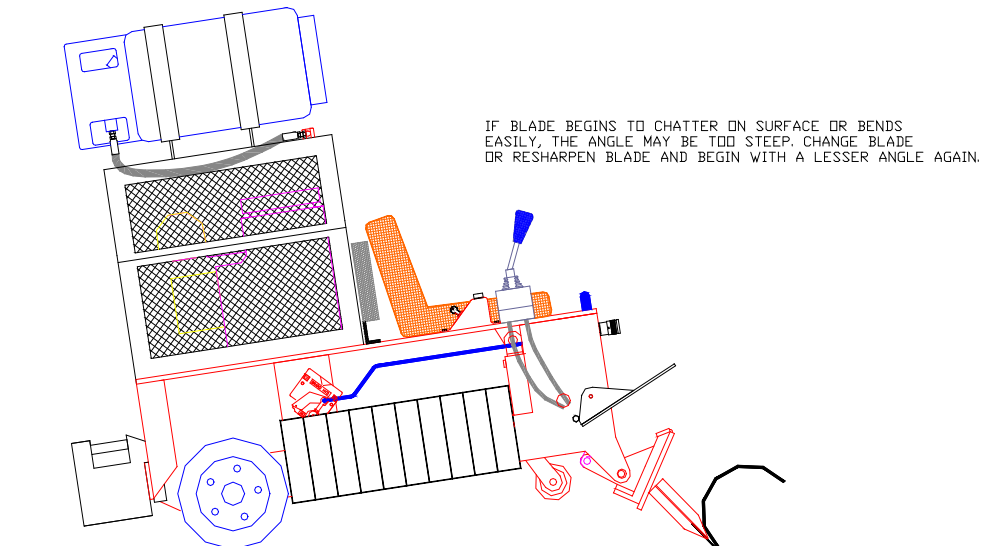
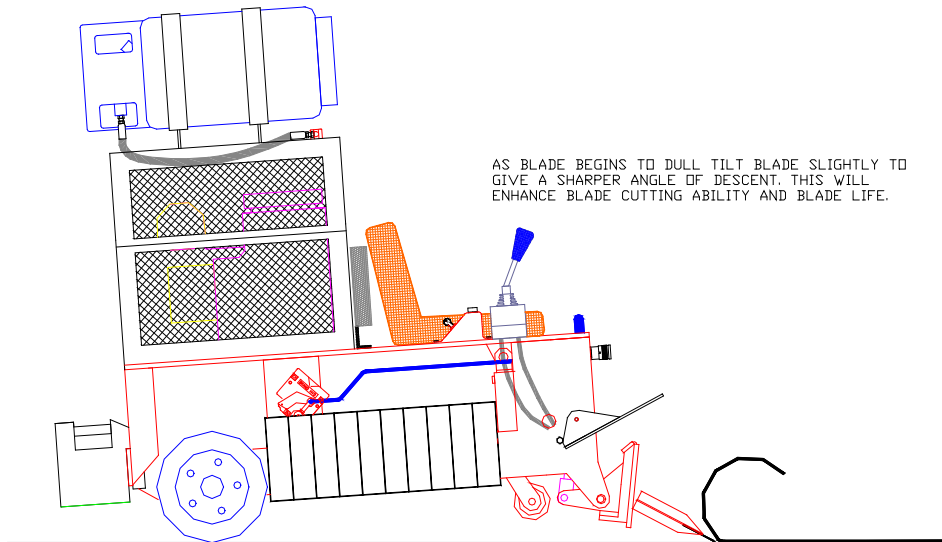
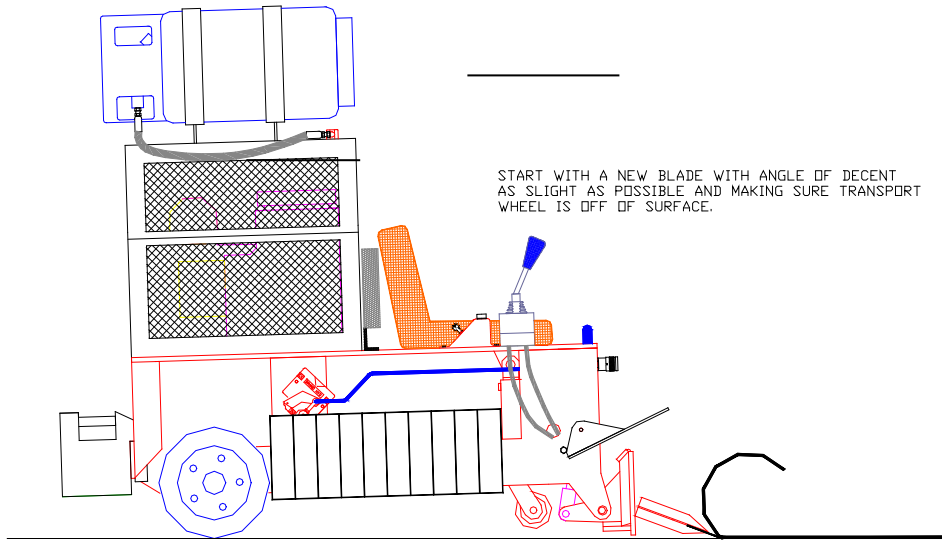
Operators should lower the blade by pressing the left hand lever forward each time they get off the machine. This safety practice eliminates possible bodily injury from running into the blade or lowering of the blade by unauthorized operators.

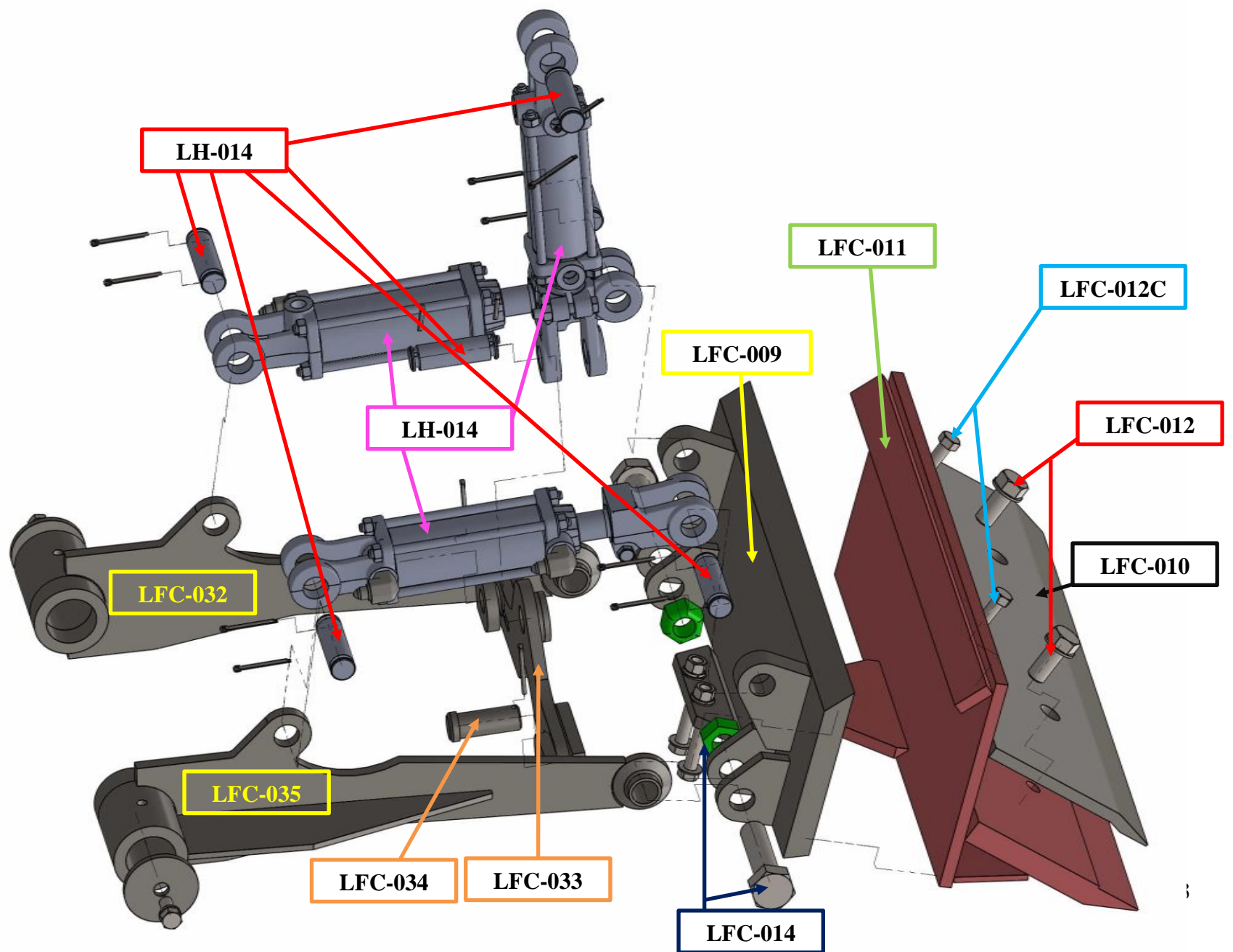
The **Caster Wheel** should not be in contact with the floor while scraping. The caster wheel will lift off the floor when the blade is lowered. Caster contact with the floor while scraping will negatively affect scraper productivity and steering. Caster wheel contact with hard debris while scraping can damage the caster wheel and shorten its life.



There are 4 important grease points on the Lightning. A newer model Lightning will have a hole in the side weight cover for access to the grease zerk on the Lightning arms. If your Lightning does not have the access hole then simply remove the 2 bolts holding the side cover on for easy access. The other 2 points are on the caster assembly.

BLADE POSITIONING





SECTION 7
Preventive Maintenance

FOLLOW KOHLER SUGGESTED SCHEDULE FOR ENGINE
MAINTENANCE

DAILY MAINTENANCE

- CHECK HYDRAULIC OIL
- INSPECT FOR HYDRAULIC OIL
LEAKS
- INSPECT FOR PROPANE SYSTEM
LEAKS
- SERVICE ENGINE AIR CLEANER
- RETORQUE WHEEL LUG BOLTS

20 HR MAINTENANCE

- REPLACE ENGINE AIR CLEANER

100 HR MAINTENANCE

- GREASE CASTER BEARINGS
- INSPECT ALL BOLTS AND NUTS AND
TIGHTEN IF NEEDED

400 HR MAINTAINANCE

- CHANGE HYDRAULIC OIL WITH:
 - A Synthetic 15w-50 Motor Oil
- CHANGE HYDRAULIC OIL FILTERS

SECTION 8

ENGINE COMPONENTS LIST

DESCRIPTION	PART NUMBER
ENGINE	LE-001
GASKET, BREATHER	LE-002
ENGINE DIPSTICK TUBE KIT	LE-003
COOLING FAN, EXTERNAL, WHITE	LE-004
ENGINE FLYWHEEL	LE-005
FLYWHEEL FAN	LE-006
STATOR ASSEMBLY	LE-007
THROTTLE LINKAGE ASSEMBLY	LE-008
AIR CLEANER COVER	LE-009
ENGINE AIR FILTER WITH PRE-CLEANER	LE-010
PRE-CLEANER FOR AIR FILTER	LE-011
ENGINE OIL FILTER, KOHLER PROPANE EFI	LE-012-E
OIL PRESSURE SWITCH	LE-013
KIT, GOVERNOR GEAR W/PIN	LE-014
EXHAUST PURIFIER	LE-015
IGNITION SWITCH	LE-016
WIRING HARNESS	LE-017
ENGINE TACHOMETER	LE-018
MUFFLER BRACKET	LE-019
ENGINE SPARK PLUG	LE-020
ENGINE STARTER	LE-021
EXHAUST GASKET	LE-022
IDLER PULLEY	LE-023
BELT SET OF 3PC (3VX500)	LE-024
PULLEY, 3 GROOVE FRONT PUMP DRIVE	LE-025
FRONT HYDROSTAT QD BUSHING	LE-026
1-1/8" QD BUSHING	LE-027
BATTERY	LE-028
BLACK (-) BATTERY CABLE 24"	LE-029
RED (+) BATTERY CABLE 36"	LE-030
BATTERY CABLE LUGS 1/4" (2 ea)	LE-031
BATTERY CABLE LUGS 5/16" (2 ea)	LE-032
BELT TENSIONER ASSEMBLY	LE-033
BELT TENSIONER BACK PLATE	LE-034
BELT TENSIONER CONTROL ARM	LE-035
BELT TENSIONER PULLEY ARM	LE-036
BELT TENSIONER LINKAGE ROD	LE-037
BELT TENSIONER LK ROD ENDS	LE-038
ENGINE OIL CASE DRAIN HOSE	LE-039
IGNITION COIL	LE-040
SAM MODULE	LE-041

IGNITION KEYS	LE-042
IDLER PULLEY SPACER	LE-043
BELTS (SET OF 2)	LE-044
REAR HYDROSTAT QD BUSHING	LE-046
THROTTLE CABLE CLAMP	LE-047
GEAR PUMP DRIVE BELT	LE-048
2 GROOVE 3V5.00 ENGINE DRIVE PULLEY	LE-049
GEAR PUMP QD BUSHING	LE-051
1 GROOVE PULLEY	LE-052
REGULATOR RECTIFIER	LE-053-E
PROPANE FUEL FILTER KIT	LE-054-E

SECTION 9

FRAME AND COWLINGS

KEY	DESCRIPTION	QTY	PART NUMBER
1.	TIRE/WHEEL – BLACK	2	LFC-001B
2.	TIRE/WHEEL (NON-MARKING) - WHITE	2	LFC-001
3.	LUG BOLTS	10	LFC-002
4.	WHEEL HUB	2	LFC-003
5.	1" 2-BOLT FLANGE BEARING	2	LFC-004
6.	CASTER ASSEMBLY (Front wheel with frame)	1	LFC-005
7.	BATTERY HOLD DOWN BRACKET		LFC-006
8.	FRONT WEIGHTS		LFC-007F
9.	SIDE WEIGHTS		LFC-007S
10.	TRANSPORT DOLLY		LFC-008
11.	BLADE BAR (24") MOUNT PLATE		LFC-009
12.	BLADE BAR (24") TOP		LFC-010
13.	BLADE BAR (24") BOTTOM		LFC-011
14.	BLADE HOLD-DOWN BOLTS		LFC-012
15.	BLADE BAR TOP CLAMP BOLTS		LFC-012C
16.	WEIGHT HANGER		LFC-013
17.	BLADE BAR PIVOT PINS WITH LOCK NUT		LFC-014
18.	SEAT	1	LFC-015
19.	SEAT MOUNTING PLATE		LFC-016
20.	SEAT MOUNTING PLATE HINGE		LFC-017
21.	FRONT PLATE		LFC-018
22.	FOOTREST		LFC-019
23.	TIE DOWN D-RINGS	3	LFC-020
24.	REAR PLATE		LFC-021
25.	REAR COWLING		LFC-022
26.	TOP COWLING HINGE		LFC-023
27.	TOP COWLING		LFC-024
28.	FRAME, RIGHT SIDE		LFC-025

29. COWLING, RIGHT SIDE		LFC-026
30. WEIGHT COVER, RIGHT SIDE		LFC-027
31. FRAME, LEFT SIDE		LFC-028
32. COWLING, LEFT SIDE		LFC-029
33. WEIGHT COVER, LEFT SIDE		LFC-030
34. FRAME, RIGHT SIDE		LFC-031
35. LEFT ARM		LFC-032
36. CROSSOVER ARM		LFC-033
37. CROSSOVER ARM PIN		LFC-034
38. RIGHT ARM		LFC-035
39. THROTTLE CABLE HEAT SHIELD		LFC-036
40. SCRUBBER HEAT SHIELD		LFC-037
41. FIRE SLEEVE, THROTTLE CABLE		LFC-038
42. THROTTLE CABLE	1	LFC-039
43. CENTER FRONT CASTER "WHEEL ONLY"	1	LFC-040
44. BATTERY HOLD DOWN BOLTS		LFC-041
45. HYDRAULIC COOLER MOUNTING PLATE		LFC-042
46. BLADE BAR (8") ASSEMBLY (TOP AND BOTTOM)		LFC-043
47. BLADE BAR (8") TOP ONLY		LFC-044
48. BLADE BAR (8") BOTTOM ONLY		LFC-045
49. BLADE ARM SPACER		LFC-046
50. BLADE ARM RETAINING WASHER		LFC-047
51. WHEEL SCRAPER		LFC-048

SECTION 10

HYDRAULIC COMPONENTS

DESCRIPTION	QTY	PART NUMBER
PISTON PUMP – REAR		LH-002
GEAR PUMP		LH-003
PISTON PUMP –FORWARD		LH-005
HYDRAULIC TANK		LH-007
TANK FILLER CAP		LH-008
FILTER HEAD	2	LH-009
FILTER	2	LH-010
WHEEL MOTOR		LH-011
LIFT/TILT CYLINDER		LH-014
LIFT/TILT CYLINDER CLEVIS		LH-015
LIFT/TILT CYLINDER PIN		LH-016
HYDRAULIC COOLER		LH-017
OIL COOLER ADAPTER		LH-018
OIL COOLER PLUG		LH-019
HYDRAULIC HOSE KIT		LH-020

HOSE – Left wheel motor	2	LH-021
HOSE – Valve to tilt cylinder forward tee		LH-022
HOSE – Valve to right tilt cylinder front tee		LH-023
HOSE – Left tilt cylinder front port to tee		LH-024
HOSE – Valve to tilt cylinder rear tee		LH-025
HOSE – Rear tee to right tilt cylinder rear		LH-026
HOSE – Rear tee to left cylinder clevis (9-1/2")		LH-027
HOSE – Valve to lift cylinder bottom port (13")		LH-028
HOSE – Valve to lift cylinder top port (19")		LH-029
HOSE – Valve to gear pump (26")		LH-030
HOSE – Right wheel motor	2	LH-031
HOSE – Engine Oil Drain Hose		LH-039
HOSE – Gear pump suction	1	LH-043
BLADE CONTROL JOYSTICK BOOT		LH-040
BLADE CONTROL JOYSTICK HANDLE		LH-041
BLADE CONTROL HYDRAULIC VALVE		LH-042
BLADE CONTROL VALVE REPAIR KIT		LH-042R

SECTION 11

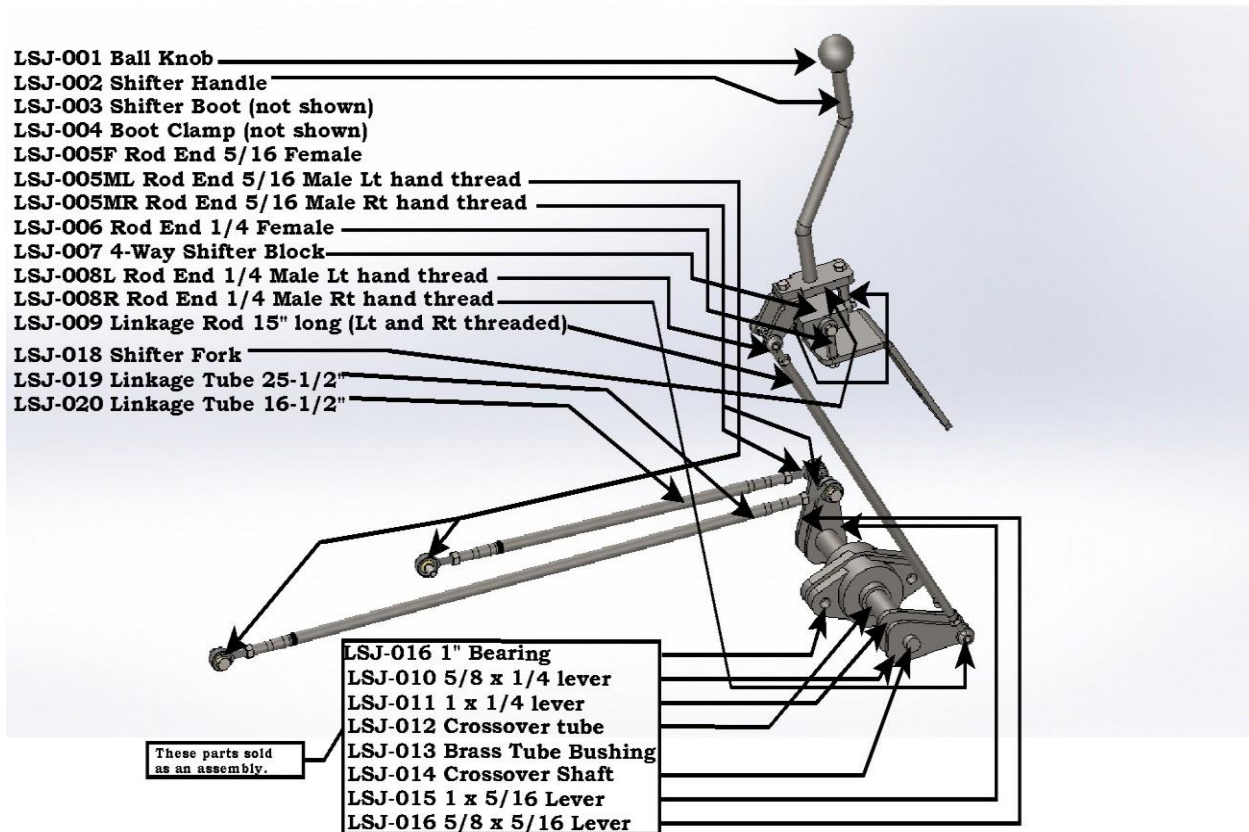


STEERING JOYSTICK ASSEMBLY

KEY	DESCRIPTION	QTY	PART NUMBER
	SHIFTER ASSEMBLY WITH BEARINGS	1	LSJ-021
	BALL KNOB	1	LSJ-001
	HANDLE	1	LSJ-002
	BOOT	1	LSJ-003
	CLAMP, JOYSTICK BOOT	1	LSJ-004
	LEFT HAND ROD END, 5/16	2	LSJ-005-ML
	RIGHT HAND ROD END, 5/16	2	LSJ-005-MR
	1/4"-28 FEMALE ROD END (NO STUD)	4	LSJ-006
	4 WAY SHIFTER PIVOT BLOCK		LSJ-007
	LEFT HAND 1/4" MALE ROD END w/STUD	4	LSJ-008L
	RIGHT HAND 1/4" MALE ROD END w/STUD	4	LSJ-008R
	TAPPED LINKAGE ROD 15" LONG		LSJ-009
	5/8" X 1/4" CONTROL LEVER		LSJ-010
	1" X 1/4" CONTROL LEVER		LSJ-011
	CROSSOVER TUBE		LSJ-012
	CROSSOVER TUBE BUSHING	2	LSJ-013
	CROSSOVER SHAFT (5/8 OD)		LSJ-014
	CONTROL LEVER "A" (1" ID)		LSJ-015
	TRUNION CONTROL LEVER "B" (5/8" ID)		LSJ-016

1" ID, 2 BOLT FLANGE BEARING
SHIFTER FORK
TRUNION LINKAGE ROD "A" 24-1/2"
TRUNION LINKAGE ROD "B" 15-1/2"
JOYSTICK BASE

LSJ-017
LSJ-018
LSJ-019
LSJ-020
LSJ-022



SECTION 12

PROPANE PARTS

TANK 20 lb, VAPOR	LIP-001V
TANK MOUNT ASSEMBLY	LIP-002
TANK MOUNT TOGGLE & NUT	LIP-003
TANK ALIGNING PIN	LIP-004
QUICK COUPLER	LIP-005
FITTING 1/4" MPT x 5/16" hose end	LIP-006
HOSE, Tank to bulkhead 12"	LIP-007
BULKHEAD	LIP-008
HYDROSTATIC RELIEF VALVE	LIP-009
HOSE, Bulkhead to lock-off solenoid	LIP-010
FITTING, 5/16" hose end x 3/8" flare	LIP-011
FITTING, 1/4" MPT x 3/8" Flare 90	LIP-012
LOCK-OFF SOLENOID	LIP-013
FITTING 1/4" MPT X 1/4" FPT 45	LIP-014
PROPANE VAPORIZER	LIP-015-E
REGULATOR	LIP-017
REGULATOR MOUNTING BRACKET	LIP-018
LOAD BLOCK	LIP-020
REGULATOR REPAIR KIT	LIP-022

