

# VAPOR RECOVERY MANUAL

**31HPKUBOTA**

SERIES 96



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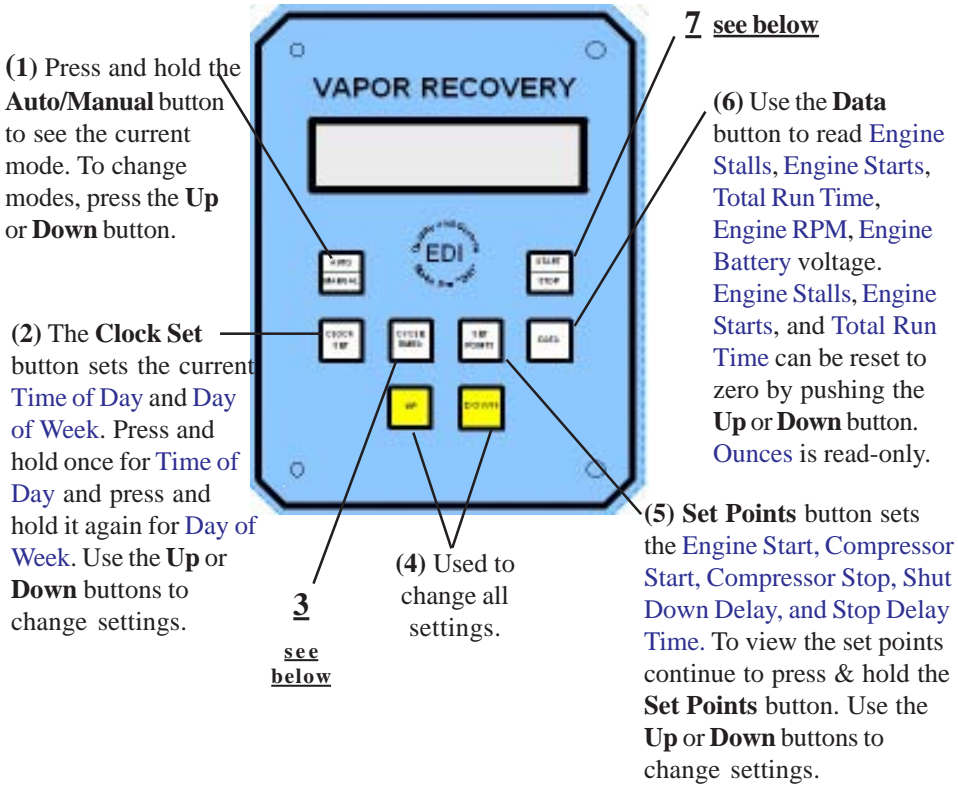
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# **TABLE OF CONTENTS**

<b>SECTION</b>	<b>PAGE</b>
Vapor Recovery Controller Operation	3
Vapor Recovery Connectons	4
Vapor Recovery Operation	5,6
External Inputs	7,8
Regulator Adjustments	9
Clutch Installation	10
Kubota Engine Specifications	11,12
Troubleshooting	13
Notes	14

- To run engine in automatic, key in engine must be in off position.
- Unit is powered by the red & black wires plugged into the board.
- After 5 failed start attempts or it reaches the low battery setpoint, the controller will put itself in manual mode.



(3) Scroll through the **Cycle Times** button until **Number of Cycles** appears on the screen. Use the **Up** or **Down** button to set the **Number of Cycles** the engine will run during a one-day period. Press & hold the **Cycle Times** button again to set the **Cycle Run** time for the first cycle. Press & hold the **Cycle Times** button again to set the **Cycle Stop** time of the first cycle. Use the **Up** or **Down** button to set cycle times. Do this for each cycle entered. When done, screen should be back to the **Number of Cycles**.

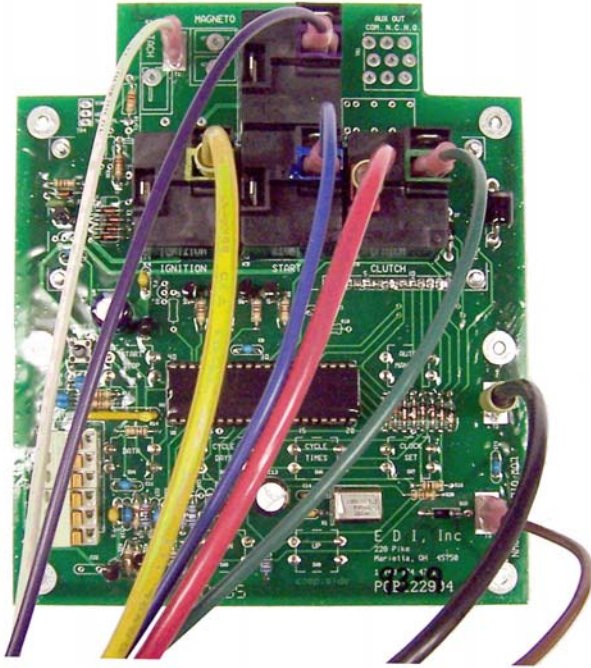
(7) The **Start/Stop** button is used to manually start and stop the engine. To start the engine, the controller must be in manual mode. Press the **Start/Stop** button. To stop the engine in manual or automatic mode, press the **Start/Stop** button. The controller will automatically place itself in manual mode if the engine is stopped with this button.

The **Start/Stop** button can be used to engage or disengage the clutch. The controller must be in manual. Start the engine with the key. Push the **Start/Stop** button to engage or disengage the clutch. Stop engine with the key.

\*Blue wording indicates LCD readout.

## Wiring Harness Connections

Relays and wires are color coded.



Pressure transducer is wired to terminal strip as shown in picture.



# VAPOR RECOVERY SYSTEM

The Vapor Recovery System will automatically recover vapors from the holding tank, compress the vapors and deliver back into the sales line.

## **AUTOMATIC MODE:**

- Engine will start when the “**Engine Start**” setpoint is reached.
- Engine runs “**Engine Warm-up**” time period.
- Clutch is engaged after warm-up period.
- When “**Compressor Start**” setpoint is reached, it turns the “**Compressor On**”.
- When “**Compressor Stop**” setpoint is reached, the “**Shut Down Delay**” timer is started.
- The “**Shut Down Delay**” timer will be reset if the pressure reaches the “**Compressor Start**” setpoint before timing out.
- The engine will shut down when the “**Shut Down Delay**” timer times out.
- If “**Engine Start**” setpoint is set at zero, the engine will only run on cycle times *not* pressure.
- If the engine started on “**Cycle Times**” the engine will not shut down until the cycle time times out.
- If the “**Engine Start**” setpoint is set above zero, *and* “**Cycle Times**” are set, the engine will start on whichever comes first.
- If started on “**Cycle Times**”, “**Shut Down Delay**” timer is disabled.

### *Automatic mode/ Displays:*

- During engine warm-up displays count down timer.
- When clutch is engaged, if started by “**Cycle Times**”, displays “**Clutch Engaged**”, day and time, if started by “**Engine Start**” setpoint, displays ounces.
- When compressor is on displays ounces.
- When compressor is off starts “**Shut Down Delay**” timer.
- During “**Shut Down Delay**”, count down timer is displayed.
- When system is idel displays series number, date and time.

## **MANUAL MODE:**

- Engine is manually started and stopped by the operator.
- Cycle times nor pressure will shut down or start the engine in manual mode.
- Clutch is engaged after warm-up period.
- When clutch is engaged, the “Compressor Start” setpoint turns the “Compressor On”.
- When the clutch is engaged, the “Compressor Stop” setpoint turns the “Compressor Off”.

### *Manual mode/ Displays:*

- During engine warm-up displays count down timer.
- When clutch is engaged displays “Clutch Engaged”, day and time. (example “Mon. 12:02”)
- When compressor is on displays ounces. (example “10 oz.”)
- When compressor is off displays “Clutch Engaged”, day and time. (example “Mon. 12:02”)

## **KEY START:**

- When engine is started with key, the operator can engage and disengage the clutch by pressing the Start/Stop button.
- When clutch is engaged, the “Compressor Start” setpoint loads the compressor.
- When the clutch is engaged, the “Compressor Stop” setpoint unloads the compressor.
- When engine is started with key, it must be shut down with key.

### *Key Start/ Displays:*

- “Manual Engine On”
- When compressor is on displays ounces. (example “10 oz.”)

## External Inputs:

When external inputs (example: switchgag) are connected to the terminal strip located at the lower left corner on the back of the board, at the terminals labeled “stop” and “common”, the external inputs will cause the following action:

If a “**Stop Delay Time**” is set, when an input is sensed, the controller will shut the engine down and hold the time set until the contacts open. Once the contacts open, the “**Stop Delay Time**” will count down. At the end of the “**Stop Delay Time**” the controller will resume normal operation.

If external inputs (example: switchgag) are connected to the terminal strip and no (zero) time is set in the “**Stop Delay Time**” the following action will take place: The controller will shut the engine down and switch to manual and remain in manual until the Auto/Manual button is pushed putting the controller back in automatic. The controller would then resume normal operation.



When external inputs (example: low compressor oil pressure switch) are connected to the terminal strip located at the upper right corner on the back of the board, connecting to the middle terminal (common) and either side of the terminal block, the external inputs will cause the following action:

If the external input (low compressor oil pressure switch) contacts are closed, the controller will shut the engine down, switch to manual and display “**COMP\*OIL\*LOW**”. The controller will remain in manual until the Auto/Manual button is pushed putting the controller back in automatic. The controller would then resume normal operation.





# KN-Regulator Adjustments



\*The KN-Regulator is used to supply gas to the engine. The Electric Primer engages when the ignition is turned on to start the engine and disengages after the engine starts. (Only engaged when the starter is running.)



\*The primer may need to be adjusted so the engine starts easily. By holding the washer behind the red adjusting knob, turn the adjusting knob counter-clockwise for less fuel and clockwise for more fuel.



\*After engine speed is determined (RPM) adjust the needle valve for best performance. Adjust clockwise for less fuel and counter-clockwise for more fuel.

**Note:** On the 13HP Honda the needle valve is located on top of the carburetor. (As Shown)

# Clutch Installation



Engine crank shaft.



Put spacer washer over crank shaft with **chamfer side to engine.**



Put electric clutch housing & rotor over crank shaft.



Install 1/4" key way completely into slot.



Install pulleys over rotor shaft.



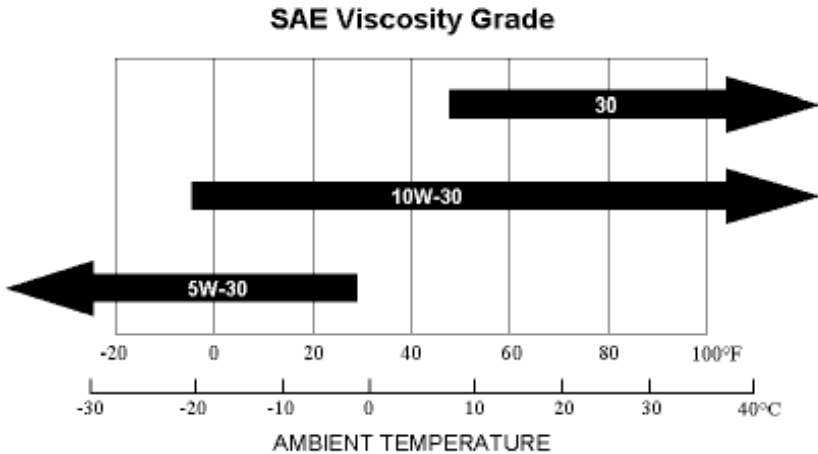
Install spacer washer & torque to 50ft. lbs.

# **KUBOTA**

## ***Oil Recommendations***

Oil is a major factor affecting performance and service life. Use 4-stroke automotive detergent oil.

SAE 10W-30 is recommended for general use. Other viscosities shown in the chart may be used when the average temperature in your area is within the recommended range.



The SAE oil viscosity and service classification are in the API label on the oil container. EDI recommends that you use API SERVICE category SM oil.

## Maintenance Schedule

The figure below shows the schedule **Kubota** recommends.

**EDI** recommends an oil change every 150 hours due to the fact, natural gas burns hotter.

MAINTENANCE / CHECKING SCHEDULE									
In order to keep your engine in good working conditions, be sure to follow the maintenance / checking schedule given in the table below. (The schedule applies to an engine in use under normal conditions.)									
Item	Interval	Every 8 hours (daily)	Every 50 hours (weekly)	Every 100 hours	Every 200 hours	Every 1000 hours	Yearly	Each 2 years	Remarks & Ref. Item No.
Each parts	Check / Clean	●							
Engine oil	Check / Replace	●							
	Change		(Install change)		●				3
Oil Filter cartridge	Change		(Install change)		●				4
Spark plug	Clean			●					
	Adjust			▲					5
	Change					●			
Ignition wires	Change						●		
Air cleaner element	Check	▲							
	Clean	▲	●						2
	Change						●*1		
Intake pipe / clamp bands	Change						●		
Fuel filter	Check			●					
	Change			▲			●		
Fuel tank	Clean						●		Gasoline line
	Check setting	▲			●				LPG line
Fuel pipe / clamps (Gasoline line)	Check		●						
	Change						●		
Fuel pipe / clamps (LPG line : LPG tank-Dual carburetor)	Check the connector	●							
	Check fuel leakage		●						7
	Change						●	●	
Carburetor	Clean						●		10
LPG vaporizer regulator	Check					●			Hot water line / vacuum lock pipe
	Change							●	Hot water line / vacuum lock pipe
	Check inner parts*2							●	
Battery	Check		●						
	Change							●	
Radiator coolant	Check	●							
	Change						●		6
Radiator hoses and clamp bands	Check				●				
	Change							●	6
Radiator and water jacket	Clean						●		6
Fan belt tension	Check			▲					
	Adjust								1
Valve clearance	Adjust					●			
Cylinder head	Clean					●			
	Check / reup					●			

▲ : If necessary

\*1 Change more often when operating under dusty conditions.

\*2 If necessary, contact your local KUBOTA dealer.

To keep your KUBOTA performing for many years of service, use only genuine KUBOTA replacement parts.

# Troubleshooting

## Controller will not power up

1. Check fuse on wiring harness

## Engine will not crank with controller or key switch

1. Battery voltage too low
2. Battery not connected to positive post on starter
3. Blue wires not connected or making good contact to starter

## Engine will not crank with controller, but will with key switch

1. Blue wire not connected in back of controller
2. Blue wire not connected to starter
3. Relay not working properly

## Engine will only crank for a few seconds with controller

1. Starter shut off RPM not set properly
2. Starter max run time not set properly (Factory Settings)

## RPM will not display on LCD Data button

1. White wire not connected properly on back of controller
2. White wire not connected properly to engine harness

## Clutch will not engage during automatic mode operation

1. Warm-up time set too long (Factory Settings)

## Clutch will not engage in either automatic or manual modes

1. Green wire not properly connected in back of controller
2. Green wire not connected to electric clutch
3. Electric clutch not grounded properly
4. RPM reading not correct at controller
5. Relay not operating properly
6. Clutch not operating properly

## Controller Displays Low Engine Battery

1. Engine battery below low limit
2. Controller battery calibration off (Factory Setting)
3. Loose or bad battery connection

## Controller Will Not Shut Off With Start/Stop Button or Key Switch

1. Key switch not in off position
2. Brown wire not properly connected in back of controller
3. White wire not properly connected in back of controller
4. Ground wire not properly grounded from key switch
5. Loose connections from the magneto wires to the white and brown wires (**HONDA ONLY**)
6. Faulty relay

## **NOTES:**

- \* Warm up time before engaging clutch is 1 minute.
- \* If the engine fails to start, the starter will run for 5 seconds. This is followed by a 30 second cool off period before the engine attempts to start again.
- \* The engine will attempt to start 5 times before abandoning the time cycle.
- \* The starter will disengage when the engine exceeds 1000 RPM.
- \* The LCD will display “**Low Engine Battery**” if the battery voltage drops below 12.0 volts.
- \* If the battery falls below 12.0 volts and “**Low Engine Battery**” is displayed, the LCD will go to sleep to conserve power.
- \* Total run time is accumulated **ONLY** when the clutch is engaged.
- \* If the engine fails to start. “**Failed to Start**” is displayed on the LCD.
- \* If the engine starts and then stops “**Engine Stall**” is displayed on the LCD.