



# **KESMAC**

## **Transportable Forklifts**

### **Operators Manual**

# Safety Precautions

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Operate your forklift defensively. Exercise caution in driving and load handling, and observe the safety points outlined below.

1. Do not operate the Kesmac forklift until you have completed your employer's training program as required by OSHA.  
**BE FULLY QUALIFIED.**
2. ALLOW NO RIDERS.
3. KEEP YOUR ARMS, LEGS, SHOULDERS, HEAD, ETC. INSIDE THE DRIVER'S COMPARTMENT.
4. DO NOT LIFT OBJECTS WHICH COULD EASILY FALL ON THE OPERATOR OR A BYSTANDER.
5. WATCH OUT FOR PEDESTRIANS.
6. DO NOT TURN ON AN INCLINE.
7. DRIVE SLOWLY AROUND CORNERS.
8. AVOID SUDDEN STARTS OR STOPS.
9. WATCH CLEARANCES AND DIRECTION OF TRAVEL.
10. WHEN LEAVING THE FORKLIFT, LOWER THE FORKS COMPLETELY, SET THE PARKING BRAKE, SHUT OFF THE ENGINE, AND REMOVE KEY. BLOCK THE WHEELS WHEN ON AN INCLINE OR WHEN SERVICING THE TRUCK.
11. DO NOT FILL THE FUEL TANK WHILE THE ENGINE IS RUNNING.
12. REPORT ANY DAMAGE OR FAULTY OPERATION OF FORKLIFT IMMEDIATELY. DO NOT OPERATE UNIT UNTIL FAULT IS CORRECTED.
13. OBSERVE ALL TRAFFIC RULES AND DRIVE CAREFULLY.
14. OBSERVE THE FOLLOWING LOAD HANDLING TECHNIQUES:
  - a) Handle only loads within rated capacity of forklift as directed by Kesmac.
  - b) Always centre the weight of wide loads between the forks.
  - c) Keep all loads against the carriage.

- d) Never travel with load raised higher than necessary.
  - e) For better vision with bulky loads travel in reverse.
  - f) Lift and lower loads with the mast vertical or tilted slightly back.
15. As a further safety precaution, it is recommended that a fire extinguisher be carried in a convenient location on the machine at all times.
  16. When checking engine coolant, remove the radiator cap slowly to relieve pressure and always use hand protection, if the engine is hot.
  17. Never use a naked flame to check the battery electrolyte level. The acid gasses could explode.
  18. Prevent battery electrolyte or hydraulic oil contacting your eyes or sensitive parts of skin.
  19. Always use lights, reflectors, and emblems to comply with relevant regulations whenever the machine is being driven on public roads.
  20. When getting on or off the machine, always use the handles and footsteps provided, do not jump.
  21. Maintain steps and cab floor free from mud, ice or grease, and loose objects that may obstruct the functioning of controls.
  22. Do not drive the machine against solid objects. If a load is too great to move, use alternative operating techniques which work the machine within its capacity.
  23. Always exercise caution when driving downhill.
  24. Only start the engine or operate the machine from the driver's seat.
  25. Before commencing work, test stabilizers, lights, horn and all safety devices. Be sure that steering, transmission and engine speed controls are working effectively.



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### IMPORTANT

Record the Serial Number of the machine. It **must** be quoted when ordering parts or making a service call.

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<b>kesmac</b> EQUIPMENT BUILT FROM EXPERIENCE	KESMAC INC. KESWICK, ONT. CANADA PHONE: (905) 476-6222 FAX: (905) 476-6744
<input type="text"/>	
<b>SERIAL NO.</b>	<input type="text"/>
<b>WEIGHT</b>	<input type="text"/> <b>kg.</b>
<input type="text"/>	<input type="text"/> <b>lbs.</b>

## FOREWORD

The operator's manual must be kept on the machine at all times.

Read this manual carefully to help understand the correct and safe operating procedures, day to day service and care of the machine, the safe working capacities and operating features that ensure safe and efficient operation. If you do not understand any instruction or procedure **ASK your immediate supervisor, or contact the factory for clarification, before operating the machine.**

All Kesmac machines are tested and inspected before leaving the factory to ensure that all safety devices and warning decals are in place.

**Do not operate the machine if any safety device or warning decal is damaged or missing.**

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### IMPORTANT

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To ensure the long term safe and satisfactory performance of the machine, the maintenance and service procedures outlined in this manual must be followed.

It is in the customers interest that the machine is serviced and maintained as recommended, and not abused in any way, as the warranty may be voided.

Warranty is provided as Kesmac Inc's commitment to customer service and satisfaction.

Kesmac reserves the right to change the design and/or specifications without notice or obligation to modify previously manufactured machines.

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Questions relating to service procedures that are beyond the scope of this manual should be directed to your Kesmac dealer or to the factory service department.

## SAFETY PRECAUTIONS

It is important, when carrying out service or repair work on Kesmac Forklifts, to follow all of the operating and service safety procedures that are outlined in this manual to ensure your own safety and that of any bystanders.

It is not possible to identify all situations that may arise that could affect the safety of service personnel, bystanders and the machine, therefore Kesmac cannot list all possible precautions that may prevent accidents.

The owner, operator, and service personnel must assume responsibility for their own safety, the safety of others and of the machine, by following all safety instructions and fully understanding the proper and safe operation of the machine as outlined in the manual.

The operator should at all times be aware of any potential safety hazards and take corrective action immediately if a dangerous situation should arise.

### IF YOU DO NOT UNDERSTAND .....ASK

### BE A QUALIFIED OPERATOR/SERVICE PERSON BY:

- Reading and following the instructions in this manual and those on the safety decals.
- Receiving training on the correct and safe operation of the machine.
- Asking your supervisor, your Kesmac Dealer, or contacting the factory for explanation of anything you do not understand concerning the operation of the machine.
- Explaining the instructions in this manual, and on the safety decals, to anyone that does not understand them that may be involved in its operation.



### WARNING

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Kesmac Forklifts must not be used for any purpose other than that for which they are designed.

Before starting the machine the operator must check that all safety devices and warning decals are in place and in good condition.

---

## SAFETY PRECAUTIONS



**Safety Alert Symbol.** Hazards are identified by this symbol followed by the signal words :

**DANGER : WARNING : CAUTION.**



**DANGER**

INDICATES AN IMMEDIATE HAZARDOUS SITUATION THAT IF NOT CORRECTED OR AVOIDED **WILL** RESULT IN SERIOUS INJURY OR DEATH.



**WARNING**

INDICATES A POTENTIALLY HAZARDOUS SITUATION THAT IF NOT CORRECTED OR AVOIDED **COULD** RESULT IN SERIOUS INJURY.



**CAUTION**

INDICATES A POTENTIALLY HAZARDOUS SITUATION THAT IF NOT CORRECTED OR AVOIDED **MAY** RESULT IN A MINOR OR MODERATE INJURY.

Always follow safe operating and maintenance practices to ensure your own safety and that of others.

Warning and safety decals are prominently displayed and strategically placed on the machine. Before operating the machine check that all warning and safety decals are in place, are not damaged and are easily readable.

See the following pages for the locations of the safety decals. It is important that you familiarize yourself with the decals and their locations.

Do not operate the machine if drugs, alcohol or medication are being used that will affect your alertness and/or physical co-ordination.

Seek professional advice before operating the machine if there is any doubt about the side affects of any medication being taken that may put your safety, or that of others, at risk.

## SAFETY PRECAUTIONS

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### IMPORTANT

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For reasons of clarity, some illustrations may show safety guards removed.  
The Forklift **MUST NOT BE OPERATED** with any safety devices removed.

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## FORKLIFT TIRES, WHEELS AND WHEEL NUTS

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### IMPORTANT

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Do not operate the Forklift if any of the tires are badly worn or damaged.  
The tires fitted to the machine are to Kesmac specifications.  
Replacement tires must meet the Kesmac specifications.  
Do not exceed the operating pressure shown on the tire sidewall.  
The wheel retaining nuts must be checked regularly for tightness.  
Operating the machine with loose wheel nuts will result in damage to, and  
require the replacement of, wheel components.

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### WARNING

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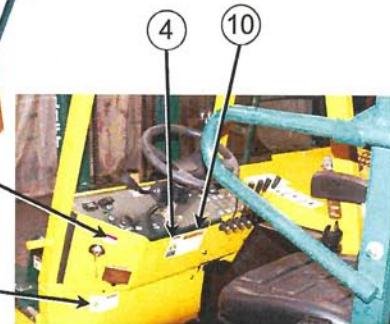
When removing wheel assemblies exercise extreme caution.  
Use only a hoist with adequate lift capacity, and suitable tools and equipment.  
It is recommended that only experienced and qualified personnel dismantle the  
wheel assemblies.

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# HYDRAULIC OIL TANK COVER



FRONT/FLOOR BOARD PANEL

1



2



12



8



9



3



5



6



7



10



11



4



## REAR WHEEL/BATTERY



## SPECIFICATIONS

SPECIFICATIONS		4500 Fixed & Retractable	5000 Fixed & Retractable	5500 Fixed Only
Load Capacity at 24 in./610 mm Load Centre. Lbs./kg		4500/2041	5000/2268	5500/2494
Lift Height** in./mm		120/3048	120/3048	120/3048
Side Shift - in./mm		6/152	6/152	6/152
Tilt		8 deg. Fwd & Back	8 deg. Fwd & Back	8 deg. Fwd & Back
Weight † lbs./kg	Fixed	4810/2182	4850/2200	5550/2517
Width* in./mm	Retractable	5120/2322	5160/2341	N/A
Width* in./mm		96/2438	96/2438	96/2438
Length* in./mm	Legs Extended (F.O.P.S. Folded)	96/2438	96/2438	96/2438
	Legs Retracted (Less Forks)	45/1143	45/1143	45/1143
Height* in./mm**	Mast Lowered	95/2413	95/2413	95/2413
	Mast Raised	155/3937	155/3937	155/3937
Truck Overhang* (Less Forks) in./mm		45/1143	45/1143	45/1143
Length Under Truck Platform* in./mm (Less Forks)	Retracted	0	0	0
	Fixed	31/787	31/787	31/787
Minimum Turning Radius in./mm	Legs Extended	57/1447	57/1447	57/1447
Tires. Selection of	Standard	10/16.5 NHS 8 Ply	10/16.5 NHS 8 Ply	10/16.5 NHS 8 Ply
	Optional	29 or 33 x 12.50 - 15 NHS 8 Ply	29 or 33 x 12.50 - 15 NHS 8 Ply	29 or 33 x 12.50 - 15 NHS 8 Ply
Engine		Kubota V 1505 Diesel. 4 Cyl.	Kubota V 1505-T Turbo Diesel 4. Cyl.	Kubota V 1505-T Turbo Diesel 4. Cyl.
Output		37.5 HP @ 3000/RPM Gross Intermittent	46.5 HP @ 3000/RPM Gross Intermittent	46.5 HP @ 3000/RPM Gross Intermittent
Max Travel Speed***		8 mph/13 kph	8 mph/13 kph	8 mph/13 kph
Drive		3 Wheel Hydrostatic	3 Wheel Hydrostatic	3 Wheel Hydrostatic
Fork Carriage		I.T.A. Class 11	I.T.A. Class 11	I.T.A. Class 11
Forks (Standard) in./mm		4x1 1/2 x 46 (102 x 38 x 1168)	4x1 1/2 x 46 (102 x 38 x 1168)	4x1 1/2 x 46 (102 x 38 x 1168)
Optional Forks		Available	Available	Available
Adjustable Forks in./mm		Standard 16/406. Mntg.	Standard 16/406. Mntg.	Standard 16/406. Mntg.
Posi-Traction, Manually Activated Hydraulic Diff. Lock		Standard	Standard	Standard
Theft/Vandalism Deterrence		Standard	Standard	Standard
Manual or Power Operated Hook-Up Kits		Available	Available	Available
Back Rest, Backup Alarm and Amber Strobe Light		Available	Available	Available
Counter Balance Weight Kit		Available	Available	Available

\*Standard Tires, \*\*Standard Lift Height, \*\*\*Finger Tip Hydrostatic direction control with Inching Pedal, † Dry Weight  
 Due to continual product development, specifications are subject to change without notice. Specialty products available upon request.



## OPERATING CONTROLS

- 1 Steering Wheel
- 2 Control Levers
- 3 Hydraulic Oil. Temperature
- 4 Engine Coolant. Temperature
- 5 Engine Oil Pressure. Warning Light
- 6 Alternator Charge. Warning Light
- 7 Park Brake Switch
- 8 Legs Retract Switch. (Option)
- 9 Diff-Lock Switch
- 10 Horn Button
- 11 Pre-Heat. 'ON' Light
- 12 Working Lights Switch
- 13 Hour Meter
- 14 Ignition. Start Switch
- 15 Fuse Block
- 16 F-N-R Lever
- 17 Throttle Pedal
- 18 'Inching' Pedal

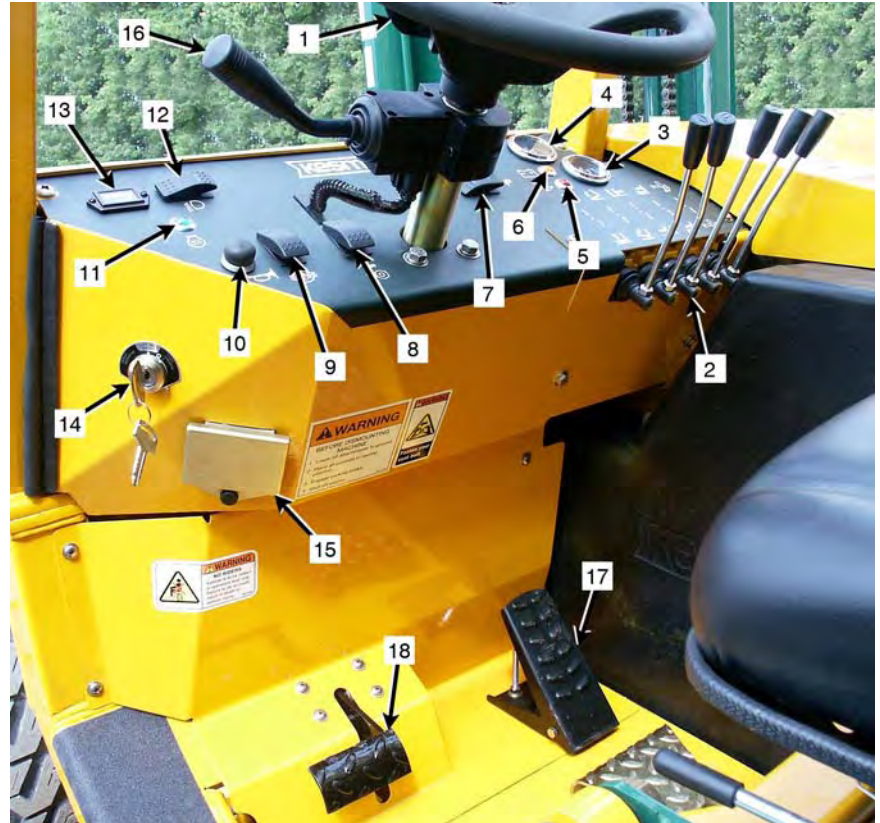


Fig.1

## CONTROLS

### PARK BRAKE

See Fig.3

The Park Brake must be 'ON' to start the engine.

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#### IMPORTANT

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The Park Brake must be 'ON' before leaving the operator's seat.

---

### IGNITION SWITCH

Fig.2

To start the engine turn the key to the 'RIGHT', do not apply the throttle until the engine is running.

Engine 'Pre-Heat' is required when the ambient temperature is below 50 deg. F. (10 deg.C).

Hold the key in the Pre-Heat position for 5 to 10 seconds  
Before starting the engine.

### F-N-R LEVER

Fig.3

The F-N-R Lever must be in 'NEUTRAL' before starting the engine.

---

#### IMPORTANT

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If the engine is started with the F-N-R Lever in forward or reverse, the machine will not move until the lever is put into 'NEUTRAL', and then into forward or reverse.

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Fig.2



Fig.3

## CONTROLS

### CONTROL LEVERS

Fig.5 & 6

**Do not operate the Control Levers** when not seated in the operator's seat, except when loading or unloading the Forklift on or off a truck or trailer.

- LEVER 'A'.** Forward – Forks 'DOWN'  
Rearward – Forks 'UP'
- LEVER 'B'.** Forward – Tilt 'FORWARD'  
Rearward – Tilt 'BACK'
- LEVER 'C'.** Forward – Side Shift 'LEFT'  
Rearward – Side Shift 'RIGHT'
- LEVER 'D'.** Forward – Carriage 'OUT'  
Rearward – Carriage 'IN'
- LEVER 'E'.** Forward – Stabilizer 'DOWN'  
Rearward – Stabilizer 'UP'

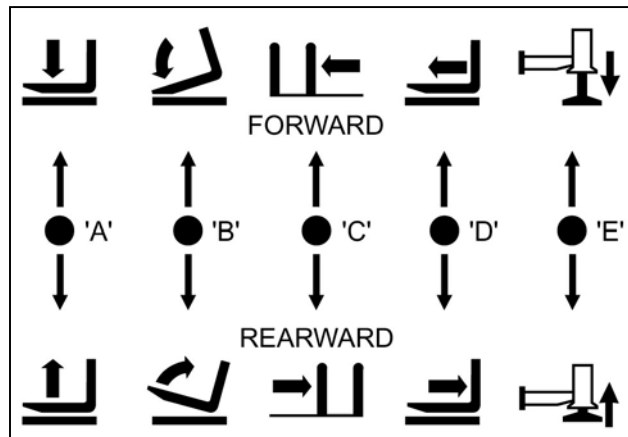


Fig.4



## RETRACTABLE MODEL – Option

The Retractable Model allows the transport of the forklift On a truck or trailer that does not have rear overhang.



### **DANGER**

When operating a Retractable Model Forklift the operator **must observe the following procedure.**

- **Do not operate the machine when the legs are retracted, except when mounting or dismounting the forklift from a truck or trailer.**
- **The forks must be positioned in the fork pockets with the legs fully extended before retracting the legs.**
- **Do not raise the forks when the legs are retracted.**

**Failure to follow these instructions may result in the machine tipping, resulting in serious injury or death.**

## **To retract/extend the legs :**

Fig.5

Position the Shift Lever in 'NEUTRAL' and start the engine. The mast must be fully forward.

Put the Park Brake Switch in the 'OFF' position.

Press and hold down the 'Extend/Retract' Switch and at the same time pull the Control Lever 'D' back, to retract the legs. The Extend/Retract Switch can be released as soon as the legs start to retract.

Release the Control Lever 'D' when the legs are fully retracted.

To extend the legs push the Control Lever 'D' forward. See pages 45-47 for transport/mounting instructions.



Fig.5

## DIFF-LOCK

Fig.6

Traction may be lost as a result of poor ground conditions or when driving up an incline.

The Diff-Lock can be applied to restore traction.

To apply the Diff-Lock :

Select 'FORWARD'.

Push, and hold down, the Diff-Lock switch in the 'ON' position.

Slowly press the Throttle Pedal to increase the travel speed.

Release the Diff-lock switch.

---

### IMPORTANT

---

The Diff-Lock must be used for 'straight line' travel only.

The Diff-Lock must not be engaged if:

- the travel speed exceeds 4 mph.(6 Kph.)
  - or if one of the wheels is 'spinning'.
- 

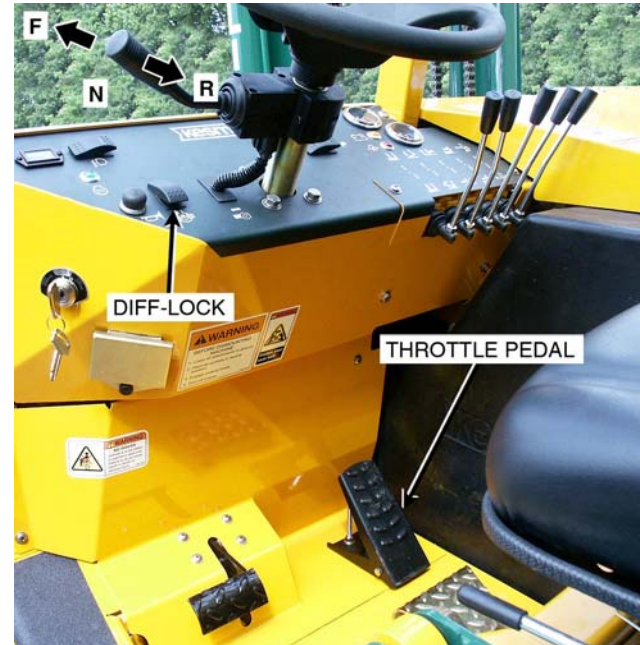


Fig.6

## THROTTLE PEDAL

Fig.7

The Throttle pedal controls :

- Engine speed
- Vehicle speed
- Rate of operation of the hydraulic functions.

## 'INCHING' PEDAL

Fig.7

The 'Inching' Pedal reduces the vehicle speed in relation to the throttle position. This allows for more precise control when positioning, picking up, or placing a load.

Pressing the 'Inching' Pedal completely 'down' will bring the forklift to a 'stop', while high engine speed can be maintained to allow the full speed operation of the hydraulic functions without shifting to 'NEUTRAL'.



### WARNING

The Inching Pedal does not function as a 'park brake'.

It is recommended that the 'park brake' is applied when on an incline when loaded.

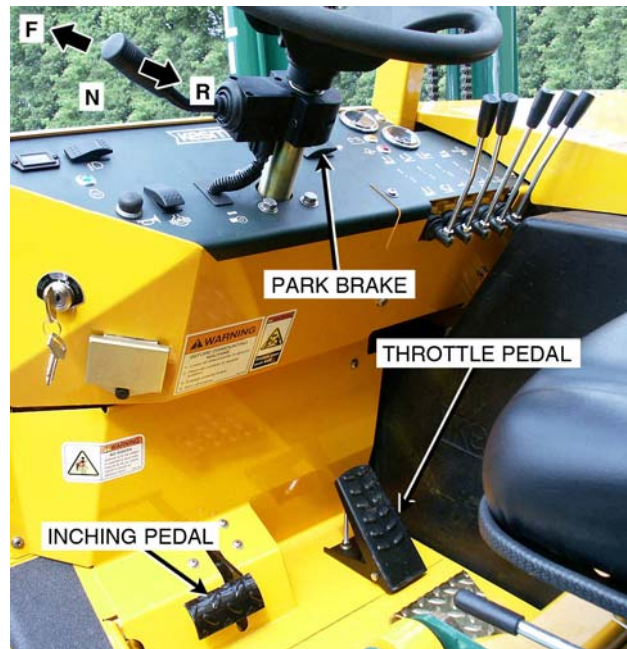


Fig.7

## INSTRUMENT PANEL

Fig.8

### LIGHTS SWITCH

The Lights Switch operates the Spot and Flood Lights that are mounted on the F.O.P.S. Frame and the Reverse Flood Light located in the rear panel.

### ENGINE COOLANT. Temperature.

Normal operating temperature is 185 deg. F. (85 deg. C). If the temperature exceeds this, allow the engine to 'idle' for a short time. If the temperature remains high, switch the engine 'OFF' immediately.

Check for any obvious signs of leaks.

Let the engine cool down before removing the radiator cap in order to check the coolant level.

Rectify any leaks and top up the coolant before operating the machine.

### HYDRAULIC OIL. Temperature.

Normal operating temperature is 160 deg. F. (71 deg. C). If the temperature approaches 200 deg. C. (93 deg. C.), Let the engine 'idle' for a short time. If the temperature remains high, shut down the machine immediately.

Check for hydraulic oil leaks.

Allow the system to cool down before checking the oil level or attempting to rectify any leaks.

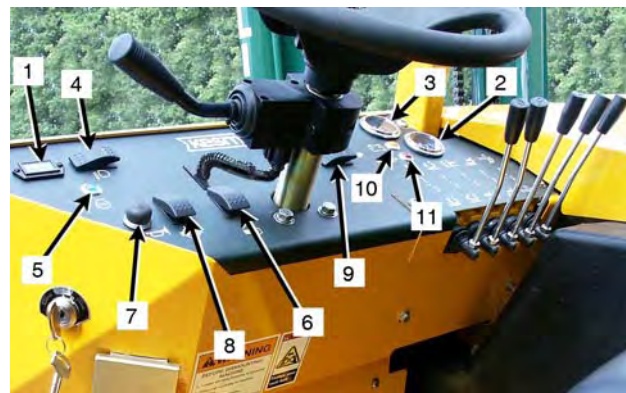


Fig.8

- |                         |                        |
|-------------------------|------------------------|
| 1. Hour Meter           | 7. Horn                |
| 2. Engine Temp.         | 8. Diff-Lock           |
| 3. Hydraulic Oil Temp'. | 9. Parking Brake       |
| 4. Lights Switch        | 10. Alternator Lamp    |
| 5. Pre-Heat Lamp        | 11. Engine Oil Press'. |
| 6. Retract/Extend Legs  |                        |

## INSTRUMENT PANEL. Cont..

Fig.9

### HOUR METER

The Hour Meter records the total hours of operation. It is important in keeping a record of service repair and maintenance periods.

#### NOTE

If the Ignition Switch is left in the 'ON' position and the engine is not running, **the Hour Meter will be recording.**

### HORN

At the start of daily operations, check that the Horn works. Failure of the horn to work in an emergency could result in an accident.

### ENGINE OIL PRESSURE

If the Engine Oil pressure Warning Lamp is 'ON' when the engine is running, **switch the engine 'OFF' immediately.** Locate and rectify the problem before operating the machine.

### ALTERNATOR LAMP

The Alternator Lamp will be 'ON' when the Ignition Key is in the 'ON' position but the engine not running.

If the Warning Lamp comes 'ON' when the engine is running, switch the engine 'OFF'.

Locate and rectify the fault before operating the machine.

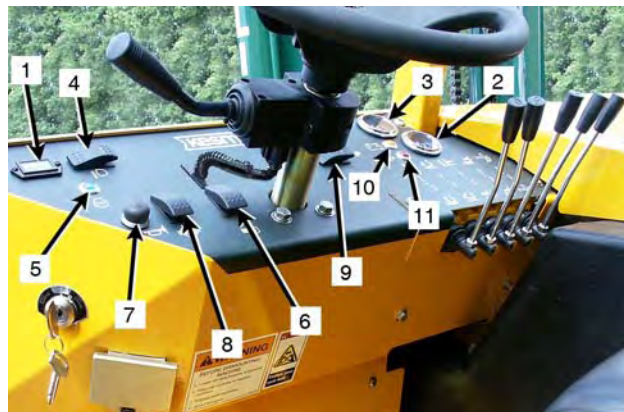


Fig.9

- |                        |                       |
|------------------------|-----------------------|
| 1. Hour Meter          | 7. Horn               |
| 2. Engine Temp.        | 8. Diff-Lock          |
| 3. Hydraulic Oil Temp. | 9. Parking brake      |
| 4. Lights Switch       | 10. Alternator Lamp   |
| 5. Pre-Heat Lamp       | 11. Engine Oil Press. |
| 6. Retract/Extend Legs |                       |

## OPERATING INSTRUCTIONS

### DAILY INSPECTION

Before Start-Up each day it important to do a careful 'walk-around' inspection.

#### Check the following items ;

- Missing or damage parts. Loose hardware.
- All Panels and Guards properly secured.
- Forks, Lift Chains and Mast, no excessive wear or damage.
- Damage to, and leaks from, hydraulic tubes, hoses, motors, pumps, and connections.
- Excessive wear or damage to the tires.
- Damage to the wheel rims and missing or loose lug nuts.
- All fluid levels. Top up as necessary.
- That the operating controls are not damaged, are correctly adjusted and working properly.

- The operator's seat and seat belt are properly adjusted and secured.
- Check around and under the machine for water or oil leaks.

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#### IMPORTANT

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**Do not operate the machine if any of the above items fail to pass inspection.**

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Fig.10

BATTERY LOCATION

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#### NOTE

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See the Kubota Operating Manual for battery service instructions.

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## OPERATING INSTRUCTIONS. Cont....

### Getting on or off the machine.

When getting on, or dismounting from the forklift, it is important to use the 'Three Point Contact' method. This means that three limbs, i.e. arms or legs, are in contact with the machine.

- Always use the step and grab handles that are provided.
- Do not use the control levers or the steering wheel as hand holds.
- **Never** attempt to get on, or dismount, from a machine when it is moving.

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### IMPORTANT

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For the correct starting procedure, maintenance, service, operation and specifications for the Kubota Diesel Engine used on the Kesmac Forklift, refer to the Kubota Operator's Manual that is supplied with the machine.

---

### When traveling.

- Avoid inclines and rough un-even ground. If it is un-avoidable, proceed slowly, with extreme caution.

### DO NOT

- Turn the machine when on an incline.
- Drive across an incline
- Stop or start 'suddenly'.

### Operate the controls smoothly.

### ALWAYS

- Avoid potholes or any obstacle that could result in a loss of stability, causing the machine to 'tip' resulting in an accident.
- Travel 'UP' and 'DOWN,' **NOT ACROSS**, an incline.



## OPERATING THE MACHINE

### With a load.

Fig.11

If negotiating an incline drive with the mast **retracted** and the forks and the load facing '**UP**' the incline. Always drive with caution, and be aware that the stability of the machine will be affected when operating on an incline.



### DANGER

In the event that the machine 'tips over', hold the steering wheel firmly, brace your feet and lean in the opposite direction to the 'tip over'.

Failure to observe this warning will result in serious injury or death.

### Without a load.

Keep the forks as close to the ground as possible and the mast carriage fully extended.

**Always drive with SAFETY in mind.**

**Do not take chances.**

**Wear your seat belt at all times.**

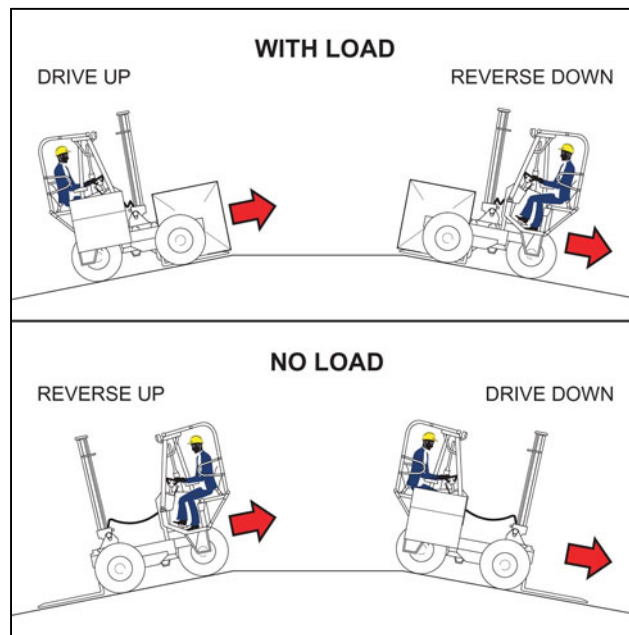


Fig.11



## LOAD CAPACITY

Fig.12

The 'rated capacity' of the machine is the load that it can lift under normal safe operating conditions.

The terrain being negotiated and poor ground conditions can reduce the load that should be safely carried.



### WARNING

**Never exceed the rated capacity of the machine,** as it could become unstable and tip over, resulting in serious injury or death.

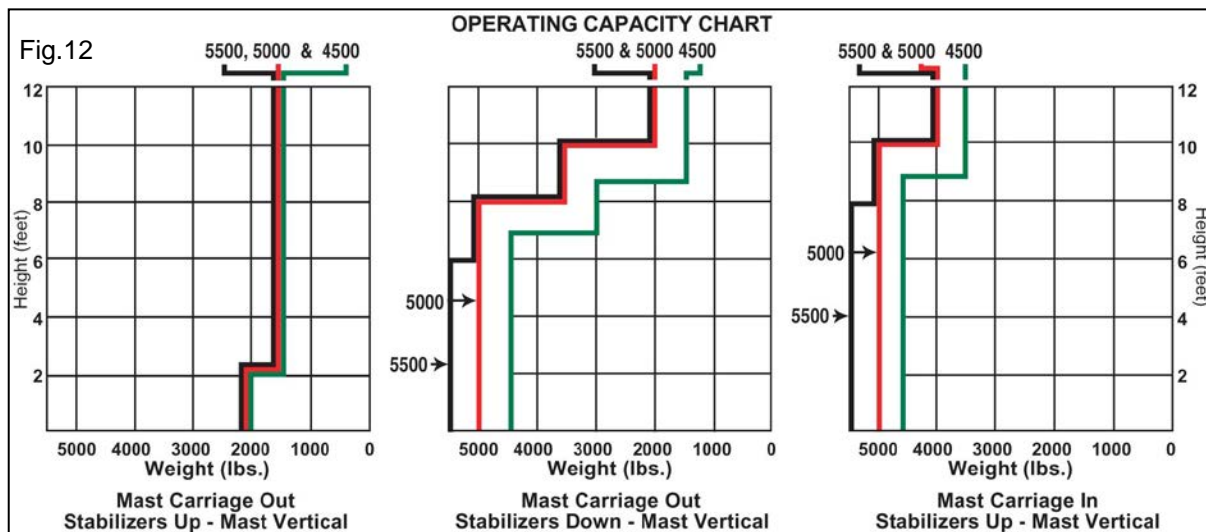
The shape of the load can affect the maneuverability of the machine. Operate with caution when lifting long or odd shaped loads.

If the load exceeds the lifting capacity it must be broken down into two loads.

To rate the lifting capacity of Forklift Machines a standardized load is used based on a 48 inch cube, the center of which is the center of gravity.

This is referred to as the '24 inch load center'.

If the size of the load is changed, the load center changes, affecting the lifting capacity of the machine.



## OPERATING LOAD CAPACITY

Refer to the Load Capacity Chart on the opposite page.

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### IMPORTANT

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The Load Capacity Chart is located on the oil tank cover to the right of the operator.

If the chart is damaged, illegible or missing, a new one must be fitted before operating the machine.

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You must fully understand the chart before operating the machine. The weight of the load to be lifted must not exceed the rated capacity of the machine.

**Center the forks before lifting the load.**



### WARNING

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**Do not use the Side-Shift** when traveling with a load and the forks raised. To do so could cause the machine to 'tip-over' resulting in serious injury or death

---

If there is any indication of loss of stability when lifting a load **'STOP' IMMEDIATELY and lower the load.** Identify and correct the problem before continuing operating the machine.



### WARNING

---

**Before leaving the operator's seat :**

- Lower the forks to the ground.
- Apply the Park Brake.
- Position the machine facing 'Up-hill' if loaded.
- Position the machine facing 'Down-hill' if unloaded.
- Turn the Rear Steer Wheel side-ways if parked on an incline.

Failure to observe the above warnings could result in serious injury or death.

---

## LIFTING AND TRANSPORTING A LOAD

Fig.13

With the Forklift positioned in front of the load :

- Fully extend the Carriage – Handle 'D'
- Align the forks with the load –Handles 'A' & 'C'
- Drive forward to place the forks under the load.
- Lower the Stabilizer Feet – Handle 'E'
- Lift the load 6 / 8 inches.(15/20.cm). Handle 'A'
- Keep the mast vertical –Handle 'B'
- Fully retract the Mast/Carriage keeping the load 6 to 8 inches from the ground. A wide load will be positioned above the Legs.
- Raise the Stabilizers – Handle 'E'
- Transport the load to its required location.

If driving conditions demand added traction, activate the Diff-Lock to help maintain a travel speed of 3 to 5 mph. Refer to Figure 8.

### IMPORTANT

#### Do not engage the Diff-Lock :

- If the machine is traveling at more than 4 mph. (6Kph.), or if one wheel is 'spinning'.
- If the machine is not traveling in a straight line.

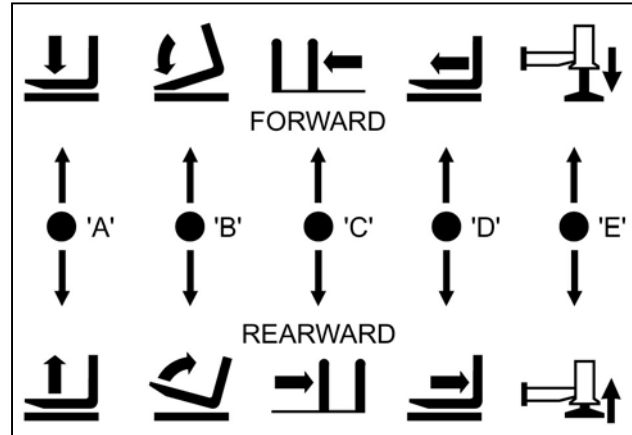


Fig.13

## LOADING AND UNLOADING

Refer to Fig.13 :

### Drive to the 'drop-off' location :

- Lower the Stabilizers – Handle 'E'
- Fully extend the Carriage – Handle 'D'
- Level the load (Mast forward) – Handle 'B'
- Lower the load to the ground – Handle 'A'
- Raise the Stabilizers – Handle 'E'
- Reverse away from the load.

### IMPORTANT

Keep the forks as close as possible to, but clear of the ground, and avoid any obstacles.

### Also

For better visibility and increased stability when operating without a load, maneuver with the Carriage fully extended.

Fig.14



### CAUTION

The rear location of the Steer Wheel causes the back of the machine to 'swing out' when turning sharply, always turn slowly.

Exercise caution, for your own safety and that of others.

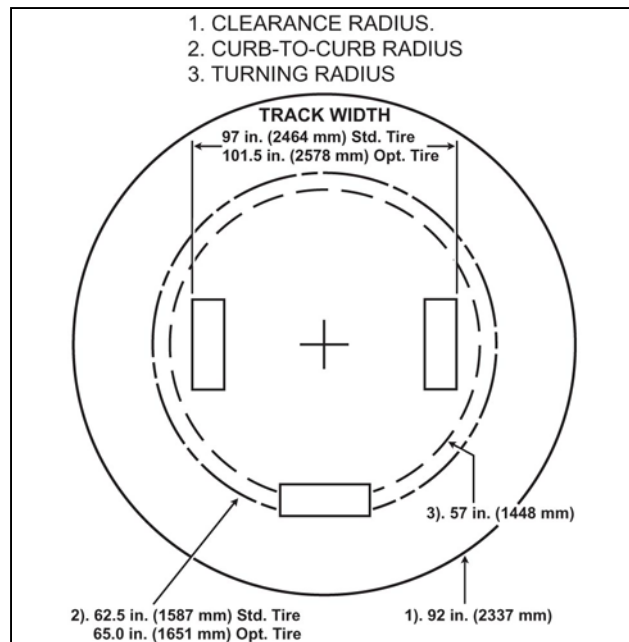


Fig.14

## MAINTENANCE.

### Daily checks.

To help maintain the forklift in good condition it is recommended that at the end of each workday the machine is pressure washed and thoroughly cleaned. Pay particular attention to the moving parts around the carriage, front wheels, rear steer assembly and the mast.

Remove dirt or debris from around the foot controls. On retractable models clean around the lower sliders. Do not direct the pressure wash water jet directly into any electrical components.

### ENGINE COMPARTMENT

Fig.15

To check the:

- Engine Oil Level
- Engine Coolant Level
- Air Cleaner.
- Hydraulic Oil Level
- 

To access the engine compartment. :

Release the Hood Closing Catches 'A'.

Lift the Hood, Handle 'B', and attach the Hood Support.

See following pages for maintenance check details.



Fig.15

## INSPECTION CHECKS

Refer to the Pre-Operating Daily Inspection on Page 19.

---

### IMPORTANT

---

Refer to the Kubota Engine Manual, supplied with the machine, for the recommended service procedures.

---

## DIESEL FUEL TANK

Fig.16

The fuel tank is located to the right of the operator's seat. Tank capacity is 7 ½ US gallons. (28.4 liters).

The fuel level indicator is in the filler cap.

---

### IMPORTANT

---

- Clean around the Filler Cap before removing it.
  - Do not allow dirt or water to enter the tank.
  - Use well filtered fuel.
  - Do not allow the tank to run dry.
- 

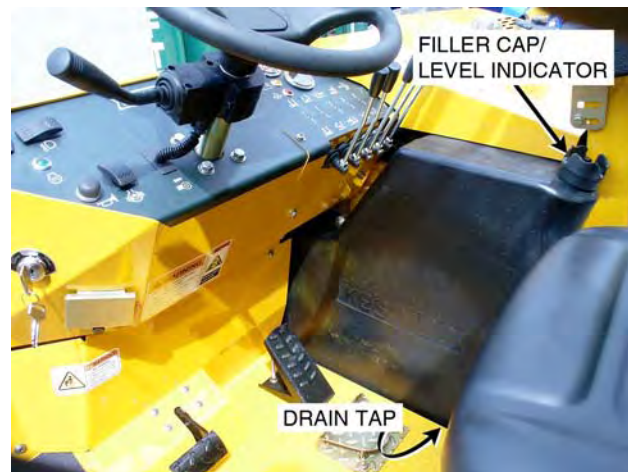


Fig.16

## ENGINE AIR CLEANER

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### NOTE

---

High Efficiency Donaldson Air Cleaners have been used on Kesmac Forklifts from Serial Number 25 onward.

---

Fig.17

Shown is the Air Cleaner installation on a Turbo Model.

The Air Cleaners have 'Servi-Signal' service indicators. Filter element replacement is based on the indicator reading. Filter service, based on indicator readings, gives a longer filter life and better engine protection. This results in lower maintenance/service costs, reduces possible problems such as contamination and filter damage.

When the 'Servi-Signal' unit shows a 'Red Flag' in the full view window this is the indication that the filter requires attention.

---

### IMPORTANT

---

When the service procedure is complete, the 'Re-set' Button, located on the top of the Servi-Signal unit, **must be pressed to re-set the unit.**

---

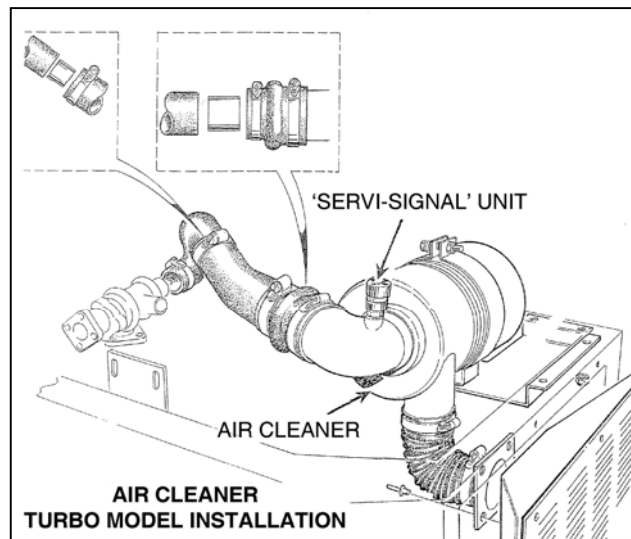


Fig.17

## FILTER REPLACEMENT

### NOTE

There are two elements fitted in the air cleaners used on the standard engine and the Turbo Model. The inner, or safety element, under normal operating conditions should not require replacement.

Fig.18

To replace the Primary Air Filter :

- Release the retainer latches 'A' on the End Cover 'B'.
- Remove the End Cover. The filter is a tight fit over the outlet tube, remove it carefully to prevent dust being dislodged.
- Carefully pull the filter off the outlet tube and out of the housing. Avoid knocking the filter against the safety element and the housing.

With a clean cloth wipe the sealing surface on the outlet tube. Dust on this will result in poor sealing and air leakage. All contaminants must be removed before installing the new filter.

Visually inspect the discarded filter for signs of leakage. Streaks of dust on the **clean side of the filter** indicate that there has been leakage.

Rectify any leaks before installing the new filter.

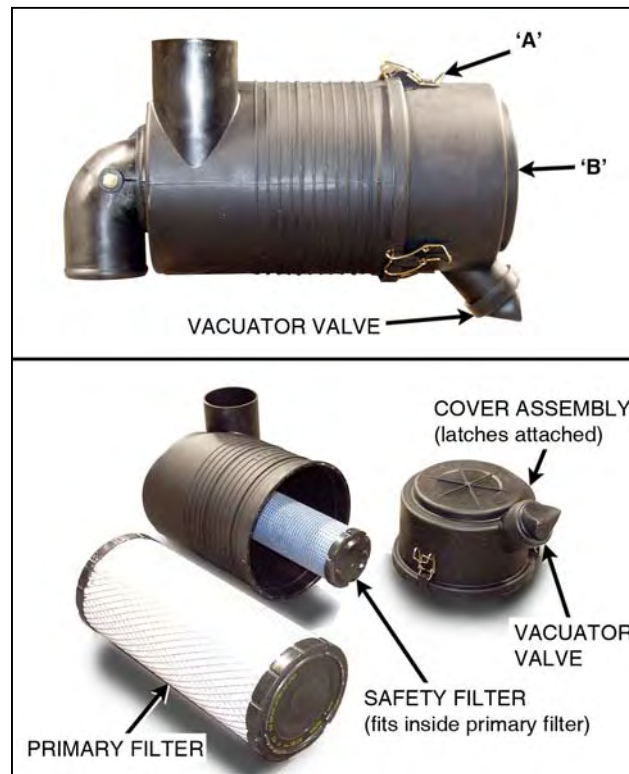


Fig.18



## ENGINE AIR CLEANER. Cont...

Before installing a new filter element check it carefully for damage. Pay particular attention to the 'open end'. The 'open end' must seal totally over the outlet tube.  
**Never install a filter element that shows signs of damage.**

Carefully insert the filter element over the inner, 'safety' element, and onto the outlet tube.  
The filter element must be fitted **completely** into the filter housing **before the cover** is fitted and latched into place.  
The cover should close easily and must not force the element into place, otherwise the element will be damaged.

The Vacuator Valve collects water, dust, and debris. It automatically discharges any accumulation. The valve should be checked each month for damage and correct fitting and replaced if necessary.

---

### IMPORTANT

---

Check that all clamps, bolts and connections in the air intake system are tight and free from leaks.  
Check the hoses and pipes for holes and repair or replace as necessary.

---

## HYDRAULIC SYSTEM

	LOW RANGE -20 deg. C to 25 deg. C -4 deg. F to 77 deg. F	STANDARD RANGE -10 deg. C to 25 deg. C -4 deg. F to 95 deg. F	HIGH RANGE -20 deg. C to 45 deg. C 32 deg. F to 113 deg. F
Castrol : Hyspin	AWH 32	AWH 46	AWH 68
B. P. Bartran	HV 32	HV 46	HV 68
Esso : Univis	N 32	N 46	N 68
Mobil	13M	15M	16M
Shell : Tellus Oil	T32	T46	T68
Texaco	HDZ 32	HDZ 46	HDZ 68

Oil conforming to I.S.O. G344 HV Grade must be used in the hydraulic system. These oils have improved viscosity and temperature characteristics.

The oil used must have the correct temperature range for the ambient temperature in which the machine will be operated.

---

### IMPORTANT

---

Always clean thoroughly around the filler/breather cap and the filter before removal to prevent dirt, water, or debris from entering the hydraulic tank.

---

## HYDRAULIC SYSTEM

### Oil Change procedure

Fig.19

**The hydraulic oil must be changed if:**

- The filter indicator needle enters into the 'RED ZONE', and the oil operating temperature exceeds 100 deg. F.(38 deg. C.).
- Or every 1000 hours.
- The oil has a 'milky' appearance, ie. Indicating that there is water in the oil.
- It has been subjected to 'over heating'.
- A hydraulic component has 'failed'. Possibly depositing metal debris into the system.

#### **IMPORTANT**

If the oil appears to have water contamination, it must be removed from the system by a qualified hydraulic service center, **as soon as possible.**

#### **OIL LEVEL**

Check the oil level in the sight gauge. It should be at the 'half full' mark with all cylinders retracted, legs extended-when applicable, and the oil 'warm'.

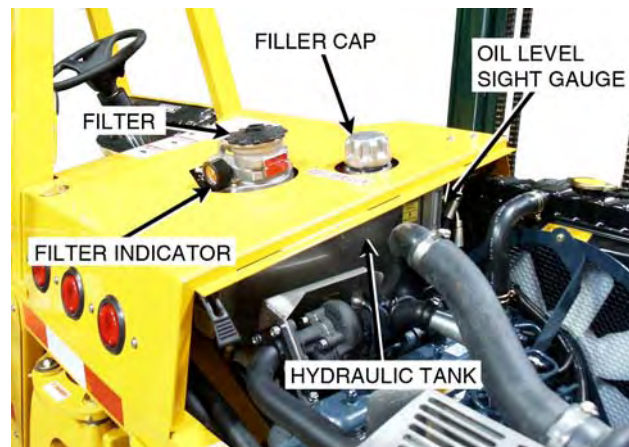


Fig.19

#### **'START- UP' procedure after oil change.**

The oil in the lines, cylinders, valves and pump will be cleaner than the new oil. To minimize contamination do not operate any of the controls until the following procedure has been carried out.

Start the engine. Allow it to 'idle' for at least 20 minutes. This allows the new oil to circulate through the pump and filter only, before flowing into the system when the controls are operated.

## HYDRAULIC PUMP

### Drive belt adjustment.

Fig.20

Hydraulic oil pressure is generated by a pump that is belt driven from the engine.

To access the Drive Belt and its adjustment mechanism remove the right hand side Rear Panel.

To adjust the Drive Belt tension :

- Loosen the lower lock nut 'A'.
- Tighten the adjuster nut 'B' until there is  $\frac{1}{4}$  inch deflection of the belt at point 'C', midway between the engine and pump sheaves.
- Tighten the lock nut 'A'.

---

### IMPORTANT

---

On a new machine check the Drive belt tension after the first 20 hours of operation.

Then after every 100 hours of operation

Fit a new Drive Belt every 750 hours of operation, or every 12 months.

---

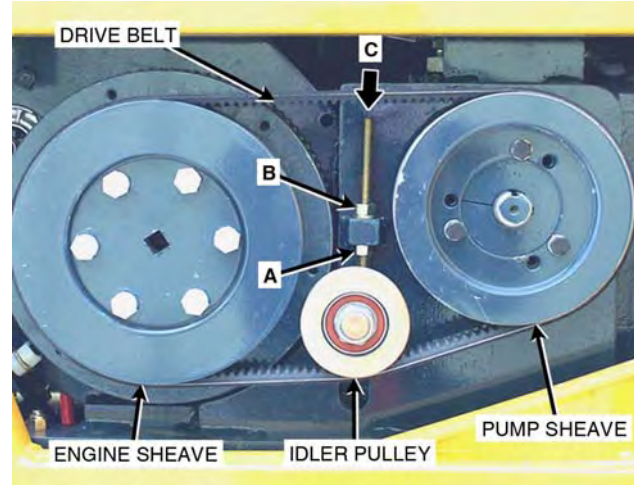


Fig.20

### DRIVE BELT REPLACEMENT

Fig.20

To remove the Drive belt :

Loosen the lock nut 'A' sufficient to allow the Idler Pulley to be pushed 'up' and the Drive Belt to be removed.

Fit the new Drive belt and adjust to the correct tension.

## WHEELS AND TIRES

Refer to the Specification Chart on page 10 for the correct tire sizes and the optional tires that may be available.

For minimum rolling resistance on 'hard' ground, and when carrying loads at the machines rated capacity, the tires should be inflated to 55 psi. maximum.

When operating on 'soft' ground the tire pressures can be reduced to increase traction. Refer to the chart below.

### TIRE PRESSURE

MODEL			Min. front tire pressure.	
4000	4500	5000& 5500	Std. Tire	Opt. Tire
Load. (Pounds)				
3000	3000	3000	35 psi.	25 psi.
3500	3500	3500	40	30
4000	4000	4000	50	35
	4500	4500	55	40
		5000&5500	60	45
Rear tire. All loads			35 psi.	30 psi.

### IMPORTANT

Check regularly :

- Lug nuts. Tighten to 100 lb.ft. (135 Nm.)  
Do not over-tighten the lug nuts.
- That the tires are not damaged, have no 'bulges', and are not excessively worn.
- That the wheel rims are not cracked or damaged.

Replace **immediately** any tires or wheels that show signs of excessive wear or damage.



### WARNING

Do not install tires or wheel rims that do not meet Kesmac specifications. To do so could result in an accident resulting in serious injury or death.

## ELECTRICAL SYSTEM

### FUSES

Fig.21

The fuse block is conveniently located as shown. Replacement fuses **must be of the correct amperage**. If a fuse fails repeatedly, trace and rectify the fault. Do not bypass or bridge a fuse as this may damage components and cause a fire in the circuit.

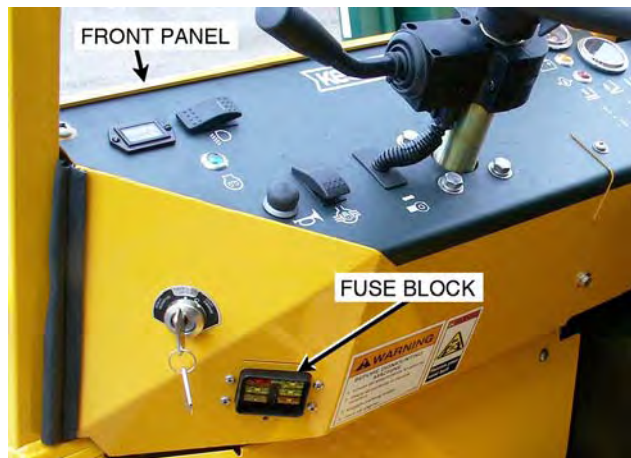


Fig.21

### Circuit Diagram. (Opposite page).

Fig.22

- |                            |                            |
|----------------------------|----------------------------|
| 1. Fuel Shutdown Solenoid  | 20. Bulb c/w Holder        |
| 2. Horn                    | 21. Limit Switch           |
| 3. Hour Meter              | 22. 'Ground' Cable         |
| 4. Glow Plugs 'ON' Light   | 23. Cable.Batt. to Starter |
| 5. Alternator Light        | 24. Terminal Cover         |
| 6. Oil Press. Light        | 25. Panel Switch           |
| 7. Fuse Block              | 26. Ground Bar             |
| 8. Fuse. 20 Amp.           | 27. Fuse. 5 Amp.           |
| 9. Fuse. 10 Amp            | 28. Strobe Light           |
| 10. Water Temperature      | 29. Ignition Switch        |
| 11. Oil Temperature        | 30. Alternator             |
| 12. Work-light             | 31. Oil Pressure Switch    |
| 13. Bulb. 12V 55W          | 32. Starter Motor          |
| 14. Sender-Oil Temperature | 33. Glow Plugs             |
| 15. Sender-Water Temp.     | 34. Back-up Alarm          |
| 16. Battery                | 35. F.N.R. Control         |
| 17. Panel Switch-Lights    |                            |
| 18. Panel Switch- Brake    |                            |
| 19. Horn Button            |                            |

**Fig.22**

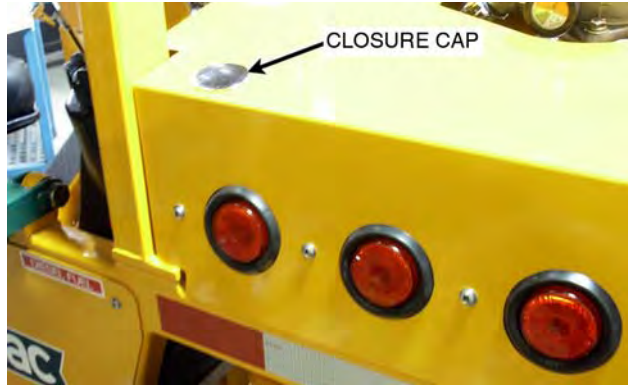
**ELECTRICAL SYSTEM**

**ACCESSORIES**

## AUTOMOTIVE CONTROLLER

Fig.23

The Automotive Controller controls the Hydrostatic Drive. A removable Closure Cap in the Oil Tank Cover allows the L.E.D. Lights in the Controller Unit to be observed and 'FAULT' diagnosis made.



The Controller receives inputs from the F.N.R. Control, 'Inching Pedal, and a 'Pulse Pick-up' on the flywheel. Output from the Controller is transmitted to two coils on the hydraulic pump.

If the Controller detects a 'fault' from one of the inputs, it signals it with the Red and Yellow L.E.D. lights.

Faults that will be most obvious to the operator are :

- the machine slowing down to a complete stop.
- that it cannot be driven at all.

Fig.24

To show the location of the Controller Unit the Oil Tank Cover has been removed. As noted in Fig.23, the Closure Cap in the Tank Cover must be removed to observe the L.E.D. Lights.

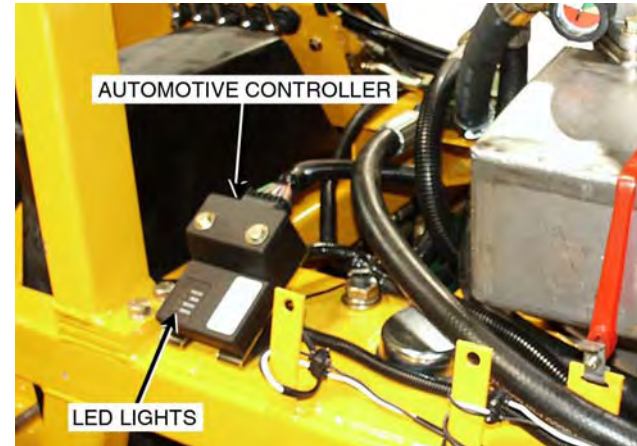


Fig.24

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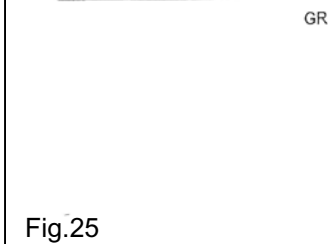
### IMPORTANT

---

See the following pages for detailed instructions on the Fault Codes and their translation.

---

The diagram illustrates the connection of the Controller Unit to the main unit. The Controller Unit is shown with a ribbon cable connecting it to the main unit's internal components.



---



## FAULT CODES

When the Controller detects a fault condition, it signals the specific fault using the Red Status LED and the Yellow Mode LED (shown below). Under normal circumstances with no error present, the Red LED is 'off' and the Yellow LED blinks at a 1 Hz rate. If no application code is loaded in the Controller, the Red LED is 'off' and the Yellow LED blinks at a 10 Hz rate. All other errors (those specific to the application) are decoded by observing the 'blink codes' generated by the Red and Yellow LED's.

Yellow LED ( Mode)	Red LED (Status)	System Status
10 Hz Blink rate	Off	No application loaded
1 Hz Blink rate	Off	Application loaded and no error
1 Hz Blink rate	4 bit blink code to describe fault	Application loaded and error

### Description of Blink Code Algorithm

If the Yellow LED blinks at an unvarying 1 Hz rate and the Red LED is blinking, the cause of the fault can be decoded from the Red LED alone as follows : The Red LED will flash a four bit sequence, followed by a pause, followed by the four bit sequence, the pause, and so on. The long flash, symbolized by a “-“, lasts approximately one second. The short flash, symbolized by “•”, lasts approximately 0.5 seconds. The pause between the four bit sequence lasts approximately 3.5 seconds. If more than one fault exists, each fault will be displayed in sequence before being repeated.

## BLINK CODE TRANSLATION

Fault Code	Flash Bit Sequence	Device fault	Cause of Fault	Machine Response
1	— — • •	Inch Pedal	Voltage signal out of phase.	Machine decelerates to a 'Stop'. Last valid value remains in effect. To be able to move with reduced Speed (if configured) bring F-N-R into 'neutral'.
2	• — — •	Pump Coil	Coil Resistance out of range.	Machine decelerates to a 'Stop'. No output current.
3	• • — •	Engine PPU	Engine RPM < $\leq$ (NFPE Start RPM) / 2.	Machine cannot move. To reset fault bring F-N-R into 'neutral'.
4	• — • •	F-N-R Handle	F-N-R both switches are 'on'	Machine cannot move. To reset fault bring F-N-R into 'neutral'.

Note. "•" = short flash. "—" = long flash.

## SCHEDULED MAINTENANCE

After first 10 hours. ( or daily ).

Check :

- Engine Air Filter Indicator.
- Engine coolant level.
- Hydraulic oil level.
- Fuel level.

After 50 hours ( 3 months ).

Check :

- The Air filter indicators. **Do not remove the filter until necessary.** See page 28.
- All fasteners for tightness.
- The hydraulic system filter indicator.
- The wheel lug nuts. Torque to 100 lb/ft. ( 135 Nm.)
- Grease all lubrication points. See page 45.
- Hydraulic oil level with all cylinders retracted, and on retractable models the legs extended. Top as required, **but do not over-fill.**
- Lift chains tightness : Raise the forks, the front chain should be 'hard tight', the rear chain 'snug tight'.
- Battery electrolyte level. Clean the terminals.

After 250 hours.

---

### IMPORTANT

---

If the machine is operated in dry, dusty conditions or an environment that may warrant it, carry out this service before the recommended schedule time.

---

Check :

- Air filter indicator. **Do not remove the filter until necessary.** See page 28.
- All fasteners for tightness.
- Hydraulic system filter indicator, and oil level.
- Wheel lug nuts. Torque to 100 lb/ft. (135 Nm).
- Lift chains 'tightness'. ( See 50 hour check).
- Transport and working lights.
- Transport mounting points. Safety chains and Hook-up Cable.
- Adjust the engine 'idle' speed : Standard Engine 1000 rpm. Turbo Engine 1200 RPM. Refer to the Kubota Engine manual.
- Hydraulic cylinders, hoses, tubes and fittings for leaks.

---

### NOTE

---

All of the above checks to be carried out every 250 hours, unless otherwise specified.

---

## AFTER 1000 HOURS. ( Annually).

### Check :

- Engine Air Filter Indicator. **Do not remove the filter until necessary.**
- Hydraulic pump drive belt tension. See page 32.
- Engine cooling fan belt tension. Refer to the Kubota Engine manual.
- All fasteners for tightness.
- Hydraulic system oil filter indicator.
- Hydraulic oil level with all cylinders retracted, and on retractable models the legs extended. Top-up as required, **but do not over-fill.**
- Lift chains 'tightness'. (See 50 hour check). If excessive wear/elongation, fit new chains.
- Transport and working lights.
- Transport mounting points, safety chains and Hook-up Cable.
- Hydraulic cylinders, hoses, tubes and fittings for leaks.
- Adjust the engine 'idle' speed. Refer to the Kubota Engine Manual.
- Test drive the machine , **with a full load.**  
Checking the operation of : The steering system, Control Levers, Diff-Lock, F-N-R Control, Throttle and 'Inching' pedals, Horn, All Dash Panel Gauges and Warning Lamps.
- For Damage or excessive wear to the tires and wheel rims. Adjust the tire pressures.
- Hydraulic hoses for damage or signs of cracking or wear.
- The mast, forks and carriage for excessive wear or damage.

---

### IMPORTANT

---

The recommended maintenance schedule will ensure a safe and efficient machine. Regular maintenance and service also helps to reduce maintenance costs.

---

## LUBRICATION SCHEDULE

### IMPORTANT

The machine must be lubricated as recommended, using the correct grades and types of lubricants, to ensure the efficiency of the machine and a long working life and reduced operating costs.

'A' = Grease Gun. 'B' = Spray. 'C' = Apply by hand.

### Recommended lubricants ;

- Lithium EPT2. or the equivalent in the bearings and rollers. Fill to capacity.
- NLG1. No.2 EP. on the retractable leg sliders.
- Spray-on white grease to the mast chains.

### NOTE

The special 'hardened' top plates, that the carriage rollers run on, must be kept clean and dry to prevent the build-up of dirt and premature wear to the plates and rollers.

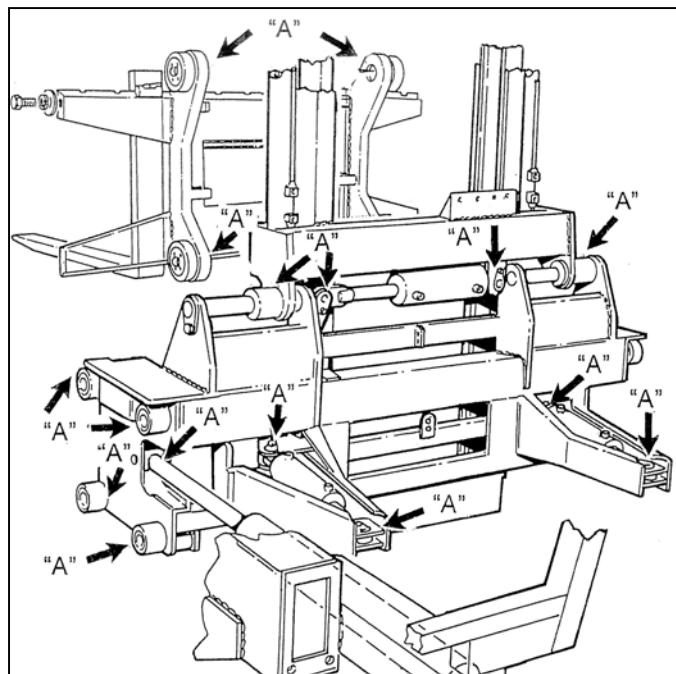


Fig.26 Mast / Forks Carriage, Tilt and Side Shift

## LUBRICATION

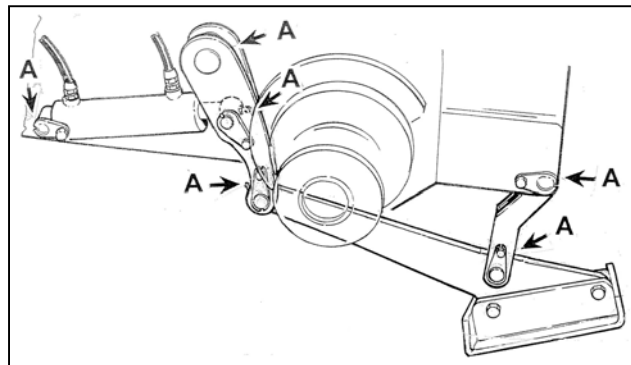


Fig.27 **Stabilizer Leg**

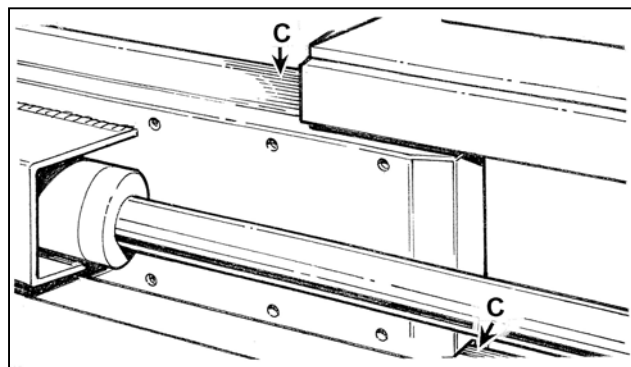


Fig.28 **Retractable Leg (option)**

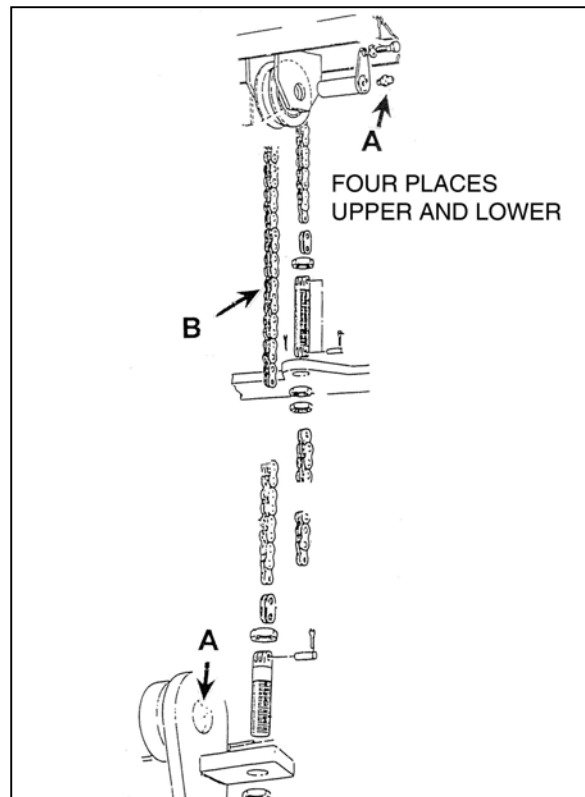


Fig.29 **Lift Chains and Rollers**

## LUBRICATION

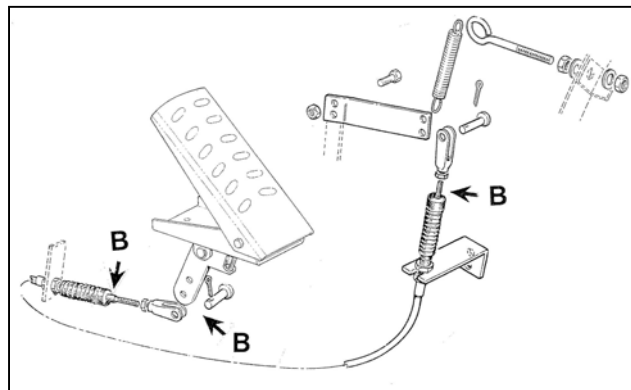


Fig.30 Throttle Pedal Assembly

### Note

Lubricate all hinges, pivots, springs and bushings with light oil.

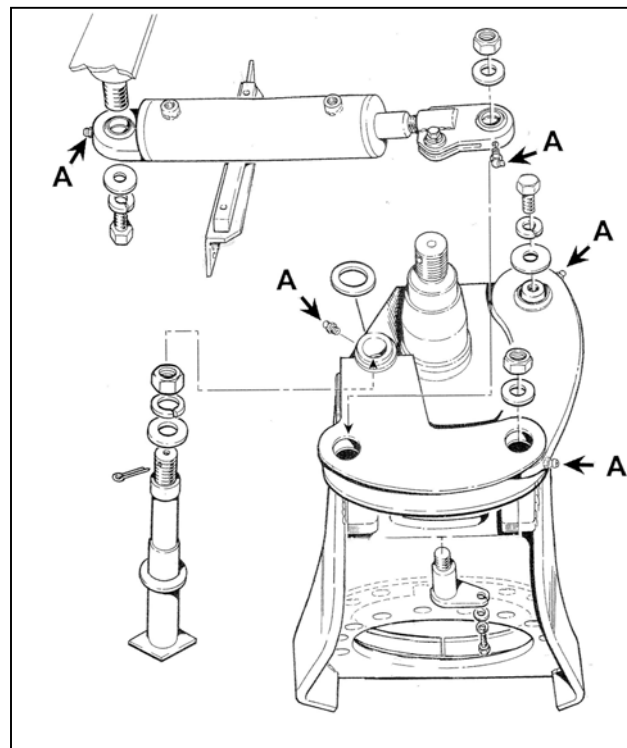


Fig.31 Rear Steer Assembly

## TRANSPORTATION

---

### IMPORTANT

---

When transporting the Kesmac Lift check the height of the machine above the trailer/truck deck **to avoid contact with overhead wires or obstructions.**

---

It is recommended that the trucks and trailers that are used to transport the Kesmac Lift have a Kesmac Hook-Up System installed. These systems are designed specifically for the Kesmac Lift.

There are Manual, Air Slide or Air Swing systems available.

The mounting systems ensure a safe and precise installation for fixed or retractable models.

The Kesmac Lift is designed to comply with current weight and over-hang regulations.

If the machine is to be used on public highways it is the owner/operator's obligation to ensure that it complies with all provincial, state and federal laws and regulations, including licensing, and also the identification and recognition of the machine, from all directions, by other vehicles.



Fig.32

**Fixed Leg Model**



Fig.33

**Retractable Model**



## TRANSPORT- Fixed Leg Machine Loading the Machine.

Line-up the machine with the trailer/truck and fully retract the mast carriage.

Align the forks with the forks pockets.

Raise the forks and insert them into pockets until the base of the forks contacts the rear deck.

Fig.34

Raise the machine by lowering the forks. Lever 'A'

Tilt the machine 'forward' by tilting the mast/forks 'back'. Lever 'B'.

Dismount from the machine.

From the ground, raise the machine above the 'support

pyramids' on the support arms. Lever 'A'.

Extend the support arms – manual, air swing or air slide.

Position the pyramids directly below the support points in the frame and slowly lower the machine onto the support pyramids. Lever 'A'.

Hook-up the safety chains and slowly raise the forks to apply minimum down pressure. Lever 'A'.

Fig.35

Raise the FOPS/Seat assembly and secure it into place with the support brace.

Plug the power cord into the truck/trailer receptacle.

Switch the engine 'OFF'.

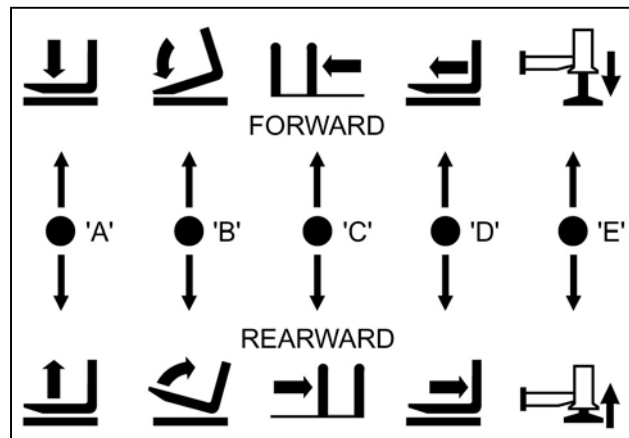


Fig.34



Fig.35

## **TRANSPORT- Fixed leg machine**

### **Unloading the machine.**

See figure 35.

Unhook the support brace and lower the FOPS/Seat Assembly.

#### **From the operator's seat :**

Start the engine.

Raise the machine clear of the support arms by lowering the forks, Lever 'A'. (Fig.33)

#### **Dismount from the machine.**

Retract the support arms (manual, air slide or air swing).

Un-hook the safety chains.

Un-plug the power cord.

#### **From the operator's seat :**

Turn the steer wheel to 'straight ahead'.

Lower the machine to the ground, by raising the forks.

Lever 'A'.(Fig.34)

Reverse away from the truck/trailer.

## **Retractable Model.**

### **Loading the machine.**

Fig.35

Line-up the machine with the truck/trailer and fully extend the Legs and Carriage. Align the forks with, and insert them into, the forks pockets until the base of the forks contacts the rear of the deck.

Raise the machine until all wheels are clear of the ground, by lowering the forks. Lever 'A'.

Press and 'hold' the Extend /Retract Switch, at the same time retract the mast carriage by pulling Lever 'D' back. Release the Extend/Retract Switch as soon as the legs start to retract.

Release the Lever 'D' when the mast is fully retracted.

Proceed as with the fixed leg machine. See Fig 34 & 35.

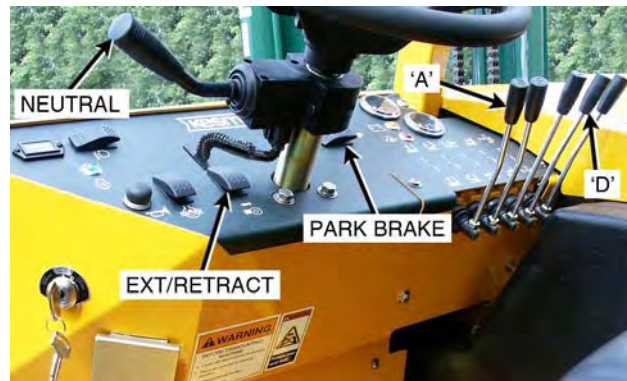


Fig.36

**Unload the machine in reverse order**, except that the Lever 'D' would be pushed 'forward' to extend the mast carriage.

#### **NOTE**

As a theft deterrent a Lock can be fitted to secure the Support Brace to the pin on the frame.

## **KESMAC Inc.**

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