MES34-OPS-1

SPECIALTY HAULAGE SOLUTIONS FOR CONSTRUCTION AND MINING

Operators Manual

MEGA CORP.®
700 Osuna Rd. N.E. • Albuquerque, NM 87113 • 1-800-345-8889 • 505-345-2661 • Fax 505-345-6190
www.megacorpinc.com

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MANUAL USAGE

This technical manual only contains information required to safely install or service an MES34 elevator scraper system. See the CAT 631 Operator's Safety Manual for tractor specific system information and operating procedures. If your system is not covered in this manual or you are experiencing difficulties, please contact MEGA Corp. Product Support Group at: US toll free: 1-800-345-8889, Direct: 1-505-345-2661 or visit our website at www.megacorpinc.com for more detailed contact information.

The exact location of the hazards and description of the hazards are reviewed in this section. All personnel working on or operating the machine must become familiarized with all the safety messages.

⚠ WARNING

Due to the nature of these processes, ensure that all safety information, warnings and instructions are read and understood before any operation or any maintenance procedures are performed. Some procedures take place with heavy components and at moderate heights, ensure proper safety procedures are maintained when performing these actions. Failure to use and maintain proper safety equipment and procedures will cause injury, death or damage to equipment.

WARNING, CAUTION AND NOTES

The following definitions are found throughout the manual and apply as follows:

⚠ WARNING

Operating procedures and techniques, which could result in personal injury and/or loss of life if not carefully followed.

CAUTION

Operating procedures and techniques, which could result in damage to equipment if not carefully followed.

NOTE

Operating procedures and techniques that are considered essential to emphasize.

USE OF SHALL, WILL, SHOULD AND MAY

Shall and **Will** – Used when application of a procedure is mandatory.

Should – Used when application of a procedure is recommended.

May - Used to indicate an acceptable or suggested means of accomplishment.

SECTION 1
Definitions and Abbreviations

SAFETY MESSAGES

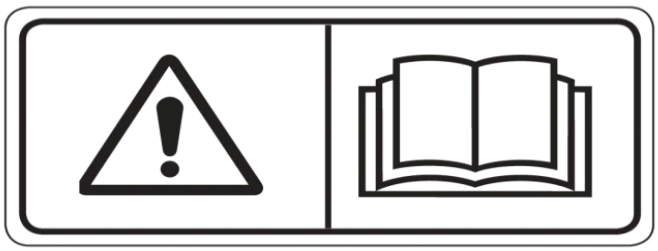
There are several specific safety messages on this machine. The exact location of the hazards and description of the hazards are reviewed in this section. All personnel working on or operating the machine must become familiarized with all the safety messages.

Make sure that all of the safety messages are legible. Clean the safety messages or replace the safety messages in you cannot read the words. Replace the illustrations if the illustrations are not legible. When you clean the safety messages, use a cloth, water and soap. Do not use solvent, gasoline or other harsh chemicals to clean the safety messages. Solvents, gasoline or harsh chemicals could loosen the adhesive that secures the safety messages. Loose adhesive will allow the safety messages to detach.

Replace any safety message that is damaged or missing. If a safety message is attached to a part that is replaced, install a new safety message on the replacement part.

DO NOT OPERATE (1)

This safety label is located on the outside of the cab.

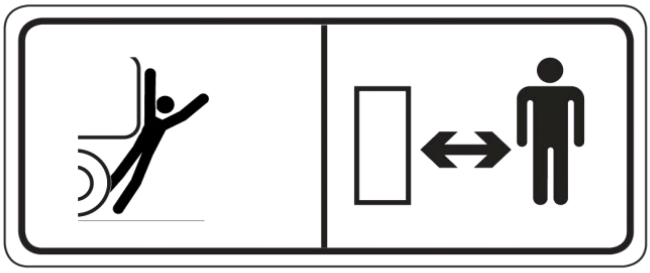


⚠ WARNING

Do not open this control box unless you read and understand the instructions and warnings in the Operator and Maintenance Manual. Failure to follow instructions or heed the warnings could result in serious injury or death.

BACKING RUNOVER HAZARD (2)

This safety label is located on the rear of the scraper and inside the cab.

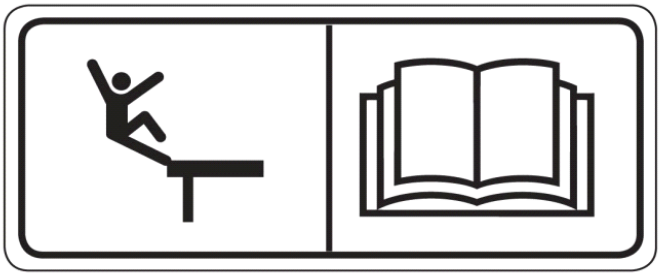


⚠ WARNING

The vehicle is equipped with a back-up alarm. Alarm must sound when operating this vehicle in reverse. Failure to maintain a clear view in the direction of travel could result in serious injury or death.

FALL HAZARD (3)

This safety label is located at the top of the scraper.

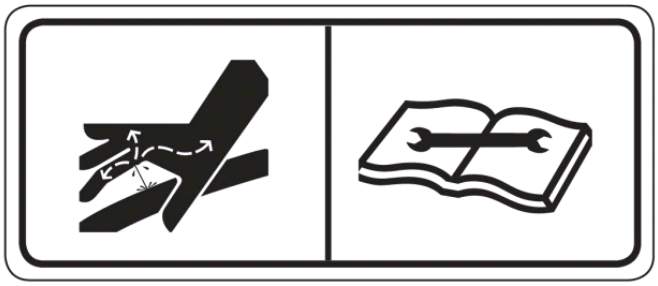


⚠ WARNING

Ensure PPE fall arrest harness is worn, adjusted properly and attached to an anchor point when performing maintenance on top of the MES34 or when fall hazards are present. Failure to use PPE when fall hazards are present may result in serious personnel injury or death.

SECTION 1
Definitions and Abbreviations

HIGH PRESSURE MOTOR (4)
This safety label is located on the hydraulic motor.



⚠ WARNING

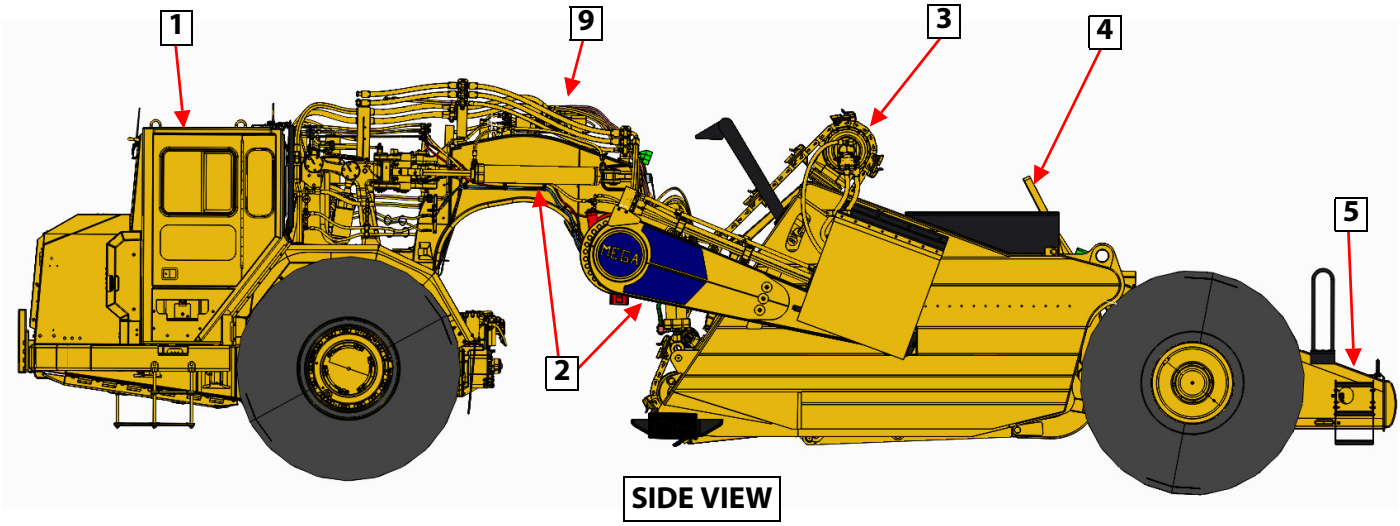
Hydraulic motor and supply lines contain oil under high pressure. Improper removal and repair procedures could cause severe injury. To remove or repair, instructions in the Maintenance Manual must be followed.

ABBREVIATIONS

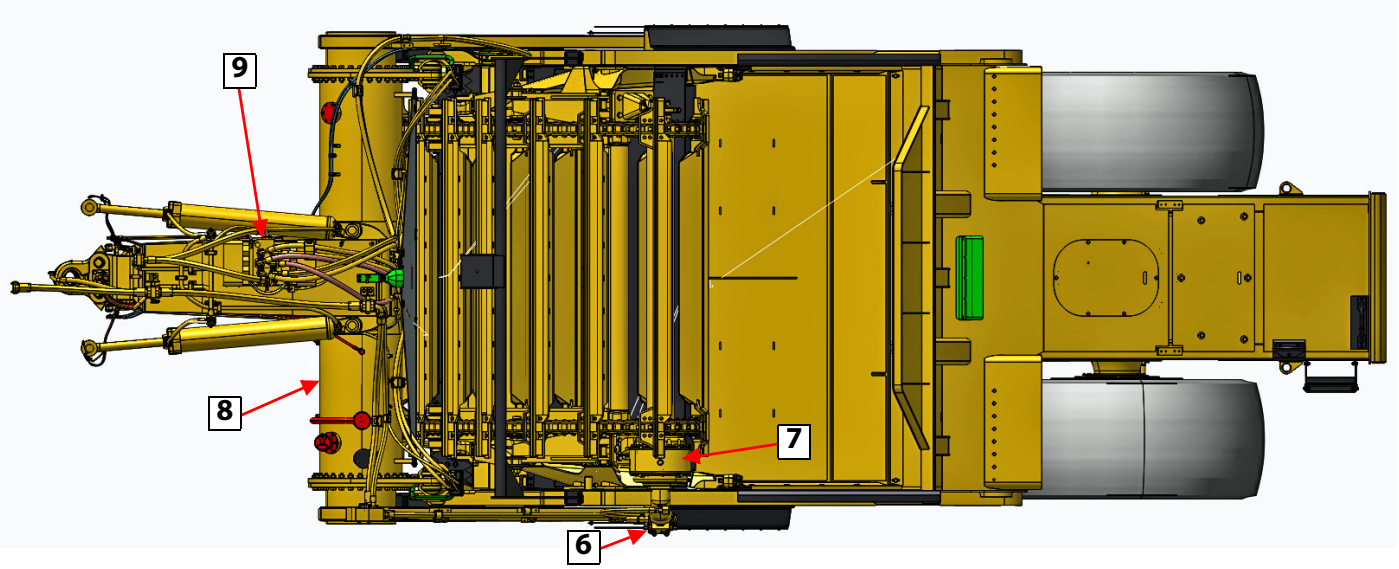
ft - feet
fpm - feet per minute
gpm - gallons per minute
GET - Ground Engaging Tools
KM-H - Kilometers Hour
Kg - kilograms
l - liters
lpm - liters per minute
LT - Left
M - meters
MES - MEGA Elevating Scraper
MPH - Miles Per Hour
PPE - Personnel Protective Equipment
psi - pounds square inch
RPM - Revolutions Per Minute
RT - Right
SQ FT - Square Feet

SECTION 1
Definitions and Abbreviations

MES34 OVERVIEW (TYPICAL)



SIDE VIEW



TOP VIEW

1	631G TRACTOR
2	DRAFT FRAME ASSEMBLY
3	ELEVATOR ASSEMBLY
4	SPILL GUARD
5	REAR BOGIE
6	ELEVATOR DRIVE MOTOR
7	SPEED DECREASER
8	FUEL TANK
9	IMPLEMENT VALVE

SECTION 2
System Description

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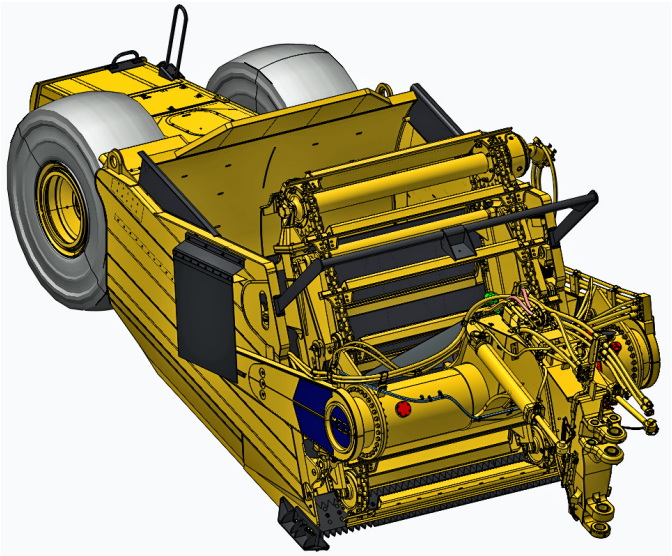
DESCRIPTION

The MEGA 34 cubic yard elevating scraper (MES34) is a high production unit, designed for heavy duty continuous load/haul/spread operations. It is capable of performing thin, precise lifts as well as heavy excavation with little support equipment.

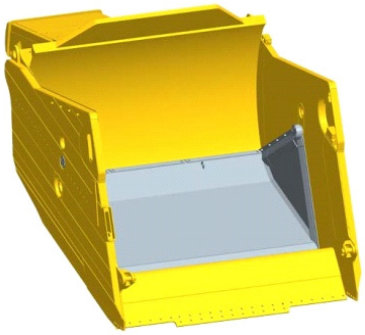
This new scraper bowl is combined with a current-production 631G scraper tractor and wheel groups to provide the latest in power train, operator comfort, electronic controls and emissions compliance. The scraper bowl assembly design has been changed from previously fielded systems to provide increased reliability in severe duty applications.

All scraper bowl assembly hydraulics, brakes, electrical, controls, indicating and warning systems are integrated into the existing 631G tractor control groups.

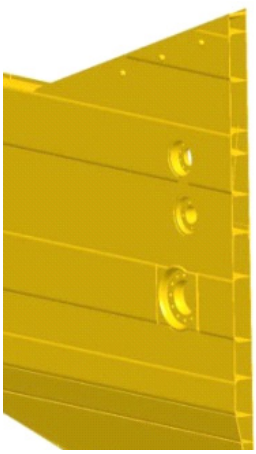
The scraper bowl assembly is comprised of a scraper bowl, rotating floor, elevator, rear bogie, wheel groups and a draft frame assembly.



SCRAPER BOWL



The scraper bowl has a 34 cubic yard/26 cubic meter heaped capacity for haulage and an adjustable full width cutting edge for precise cutting and heavy excavating. The bowl cutting edge is designed to support a variety of Caterpillar Ground-Engaging Tools (GET).



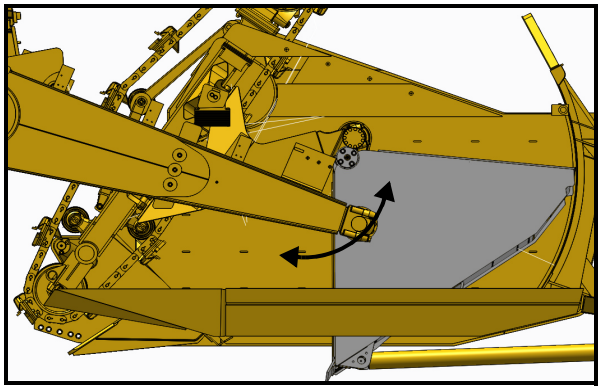
The scraper bowl utilizes a cellular design in its construction to add strength and dent resistance to the bowl sides. The cellular side wall construction also provides for mounting of several of the moving and stationary bowl components. These include the rotating floor, elevator frame mount arms, gooseneck draft arm trunnions, bowl lift cylinders, as well as rear bogie assembly. Provisions are also available for optional wear plates that increase bowl service life.

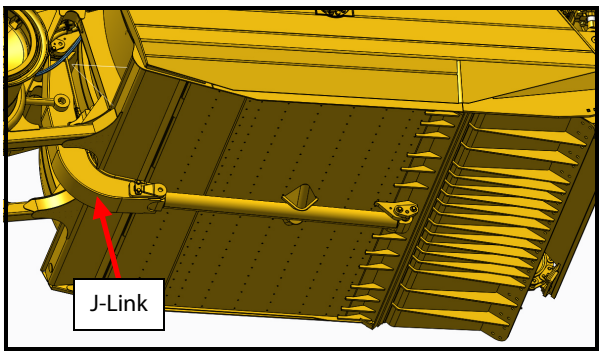
All hydraulic hoses and electrical cables for the rear bogie functions are routed inside the right bowl wall to the front of the bowl to eliminate the need for component shielding. Rubber shrouds are installed on the outer side walls to prevent wedging of material between draft arms and outer bowl walls, in turn protecting draft arms and trunnion ball mounts from cracking.

SECTION 2
System Description

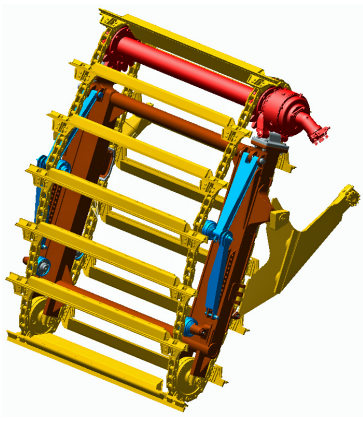
ROTATING FLOOR

The rotating floor also utilizes a cellular design in its construction for added strength and dent resistance. Two large hydraulic cylinders connected to the j-link rotate the door smoothly, allowing for precise spreading of materials. The floor is designed with close tolerances to the bowl for optimal material removal, helping create a work alone piece of machinery.



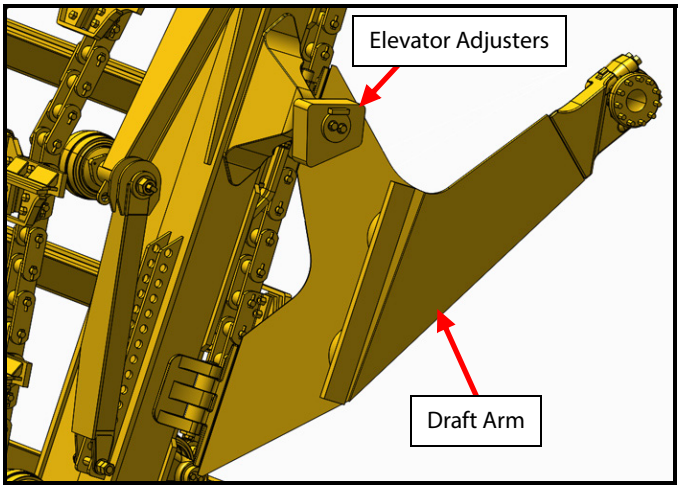


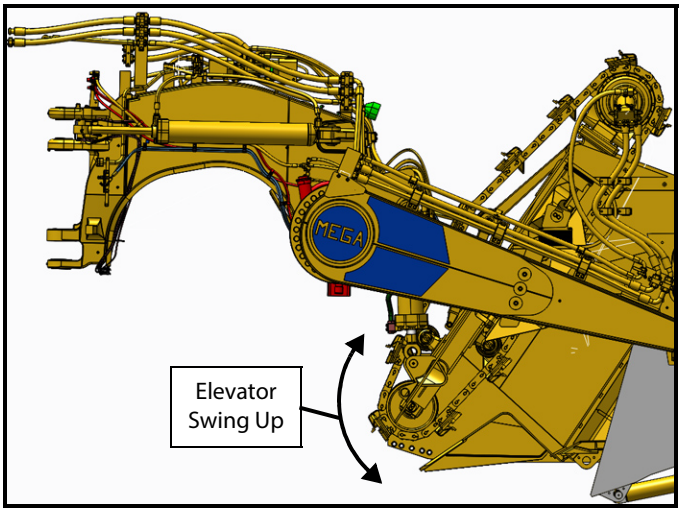
ELEVATOR ASSEMBLY



The elevator assembly conditions and loads materials into the scraper bowl. The assembly consists of an elevator frame and draft arms, a speed reducer, sprockets, chains, chain adjusters, idlers and flights. The upper corners of the frame is designed with a two piece steel casting that provides mounting for the elevator drive system, as well as lever-type elevator adjusters.

The frame incorporates draft arms which are used to mount the assembly to the inside of the scraper bowl. The draft arms, working in together with the elevator adjusters, creates a mounting system that protects the flights and cutting edge from rocks and other large objects by swinging up, then quickly returning back down to continue loading the bowl.

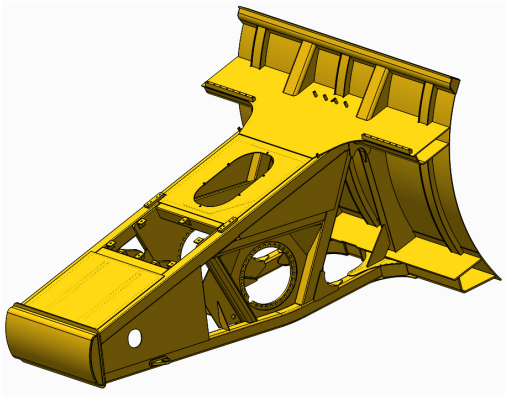




The flights are constructed of steel plates and perform the actual conditioning and loading of the materials. The flights are connected to dual drive chains that are driven by a single high torque hydraulic drive motor through the speed reducer.

SECTION 2
System Description

REAR BOGIE ASSEMBLY



The bogie is a structural steel tube frame and plating that mounts to the rear wall of the scraper bowl. The assembly provides mounting for the rear wheel groups, rear brake system, rotating floor cylinders and tail lights. The rear of the bogie also incorporates a push type bumper assembly.

The rear bumper design provides a pushing point to assist the MES34 up a grade or in poor underfoot conditions (wet, muddy or icy haul road). The bumper assembly is designed to be pushed straight on by the pushing (boosting) machine.

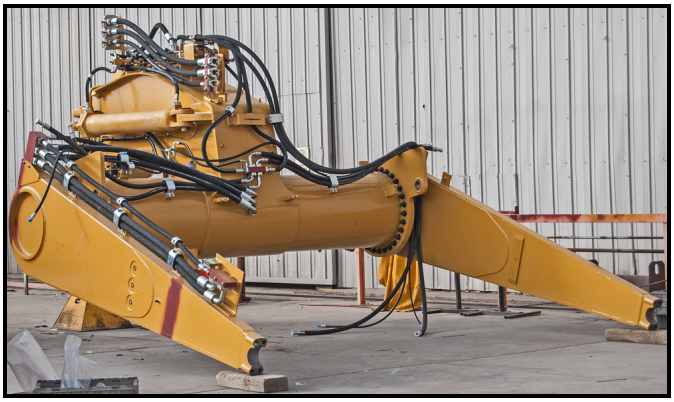
CAUTION

Routine HARD bumper contacts by the pushing (boosting) machine will cause structural fatigue and result in reduced bogie service life.

CAUTION

Angled blade contact of the bumper will reduce bull dozer blade to MES34 wheel clearance. Extreme blade angles will cause blade/bit to wheel contact and damage MES34 tires. MES34 and pushing (boosting) machine operators must communicate to ensure correct contact and maximum wheel to blade/bit clearance is maintained.

DRAFT FRAME ASSEMBLY



The draft frame assembly is comprised of a gooseneck, fuel tank and draft arms. This assembly, along with two sets of hydraulic cylinders, is what turns the unit and raises and lowers the bowl assembly. The assembly also provides mounting for implement control valve assembly, hydraulic housing, electrical harnesses, protective guards and work light.

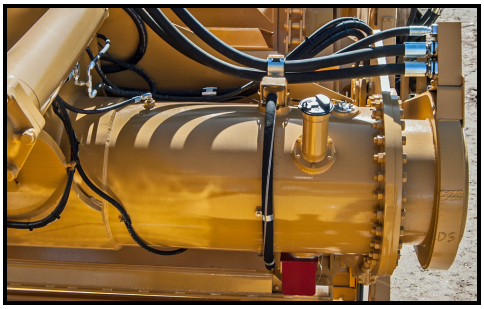
GOOSENECK

The gooseneck is made up of vertical hitch pin and steering cylinder castings, a ½" top plate, ¾" side plates and a 1½" bottom plate. The vertical hitch pin attaches to the tractor and provides the pivot point for the steering of the unit. The back side of the gooseneck attaches to the fuel tank to create mounting for the draft arms.

SECTION 2
System Description

FUEL TANK

Right-Hand Side



Left-Hand Side

The fuel tank is constructed from a 26' mechanical tube and two 1.5" thick flanges. The tank has a 250 gallon capacity with internal baffling to prevent sloshing. The tank contains a fuel quantity sensor, gravity fill port and the fast fill fuel system. The tank also provides mounting for the draft arms, implement control valve and the bowl lift cylinders.

DRAFT ARMS

The draft arms connect the draft frame to the bowl. They are constructed from steel plates, mechanical tube and cast steel trunnion bearings. The arms connect at the trunnions and create a pivot point between the draft frame and the bowl for raising and lowering the cutting edge of the bowl.

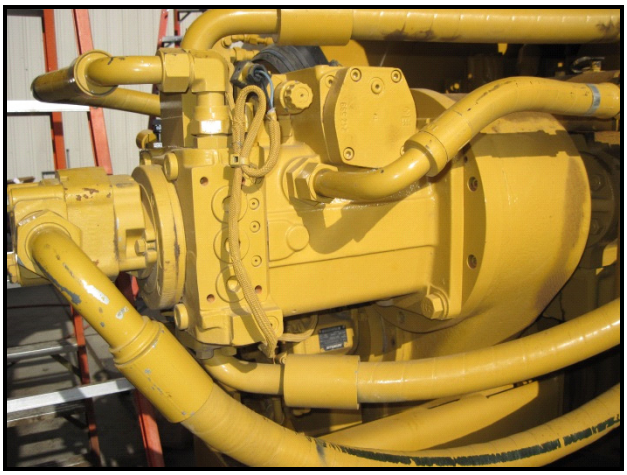
ELECTRICAL SYSTEM

The electrical system of the scraper bowl assembly is fully integrated with the existing tractor systems. These sub systems consist of all tail braking and turn signal lights, implement controls and all brake indicating and warning systems.

HYDRAULIC SYSTEM

The hydraulic power used to operate all scraper bowl functions comes from several components mounted on the tractor and bowl assembly. These components consist of an auger pump, elevator drive motor, implement pump, implement control value assembly, bowl lift cylinders and floor cylinders.

AUGER PUMP (VARIABLE PISTON)



The pump is mounted on the tractor transmission accessory section and provides hydraulic power to the elevator drive motor. The pump is a variable displacement type pump with hydraulic output being controlled by the tractor ECM.

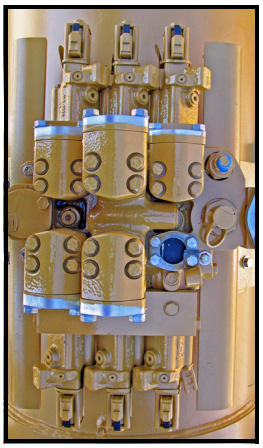
The tractor ECM will maintain the operators selected elevator speed within a desired range. This is accomplished by ECM resident software designed to control pump output based on a selected elevator speed. See CAT Operator and Maintenance manuals for more information.

ELEVATOR DRIVE MOTOR

The drive motor is powered hydraulically by the auger pump as commanded by the implement joystick thumb switch. The motor is mounted to the speed reducer that drives the elevator upper sprocket assembly.

SECTION 2
System Description

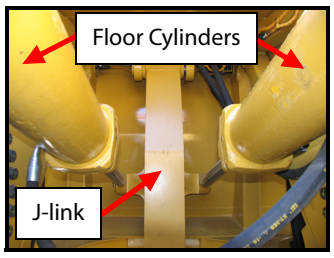
IMPLEMENT PUMP
The multi-section gear type pump mounted on the tractor transmission accessory section. The pump provides hydraulic power to the implement valve assembly to operate floor and bowl lift systems as commanded by the implement stick.

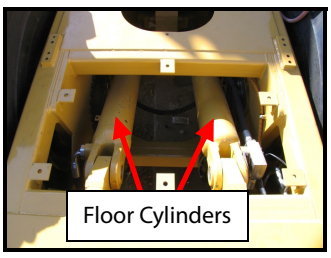
IMPLEMENT CONTROL VALVE ASSEMBLY


The implement control valve is mounted to the fuel tank and provides hydraulic control for bowl, rotating floor and elevator functions as commanded by the implement joystick. It also contains several pressure sensors to provide feedback for rotating floor auto functions.

BOWL LIFT CYLINDERS

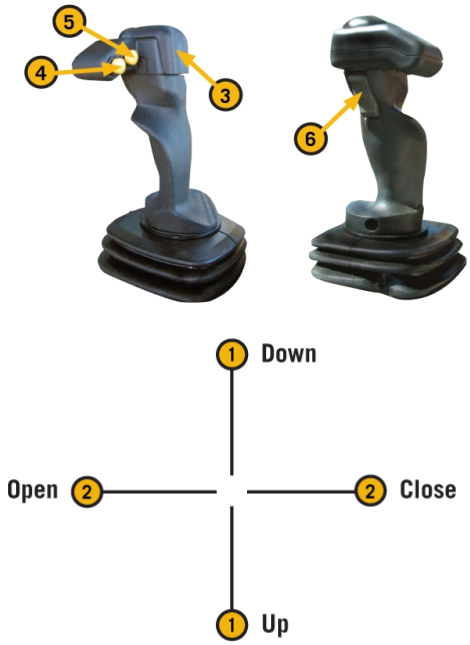

The two bowl hydraulic cylinders work together to raise and lower the bowl assembly. The cylinders are attached to the draft tube and lower bowl edge. The cylinders receive hydraulic pressure from the implement control valve as commanded by the implement control stick.

FLOOR CYLINDERS




The two hydraulic cylinders work together to open or close the bowl floor assembly. The cylinders are attached to the J-link and the rear bogie.

IMPLEMENT JOYSTICK
The joystick is located on the right side console and provides controls for elevator, bowl, cushion hitch and differential lock functions. See the CAT Operators manuals for specific information pertaining to cushion hitch and differential lock functions.



Implement Joystick function are as follows:

(1) Bowl Control (Joystick)
- Forward & Hold – **lowers** bowl.
- Rear & Hold – **raises** bowl.
- Releasing the joystick from a commanded position will hold the bowl in the current position.

SECTION 2
System Description

(2) Floor Control (Joystick)
- Left & Hold – **opens** floor fully.
- Right & Release – **auto closes** floor.
- Auto close can be interrupted by commanding floor open and release.

(3) Elevator Control (Thumb-switch)
- Left – elevator rotates to **load.**
- Right – elevator rotates to **unload.**
- Speed increases the further the thumb-switch is moved from center.
- If a different elevator direction is desired with "cruise control" on, elevator will delay for about 3 seconds before reversing direction.

(4) Transmission Hold (Outer Push Button)
- 1st Push & Release – **prevents** the transmission from shifting.

NOTE

When the transmission hold is engaged, an indicator light will illuminate on the front dash.
- 2nd Push & Release – **normal** shifting is resumed.

(5) Cushion Hitch (Inner Push Button)
- 1st Push & Release – **enables** cushion hitch.
- 2nd Push & Release – **disables** cushion hitch.

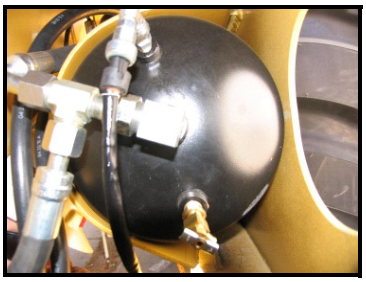
(6) Elevator On/Off/Resume (Trigger Switch)
- Pull bottom of trigger – **engages** "cruise control" and holds existing elevator direction and speed selected by thumb switch. If speed and direction was previously set, pulling the trigger will reestablish previous settings.
- Push top of trigger – disengages "cruise control".

REAR BRAKE SYSTEM

The MES rear brake system is integrated with the existing 631G tractor parking, service and emergency brakes. All three systems are activated with the existing brake controls located in the tractor cab. See the CAT 631G Operator and Service Manual for additional tractor brake information.

The MES rear brake system consists of a wheel group, two additional air tanks, pneumatic manifold assembly, pneumatic brake relay valve, brake pods, solenoid valve, pressure switch, pressure sending unit and hosing.

AIR TANKS



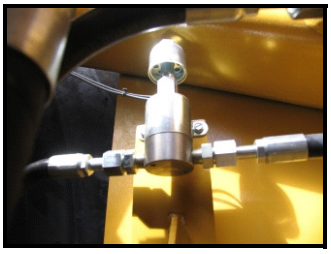
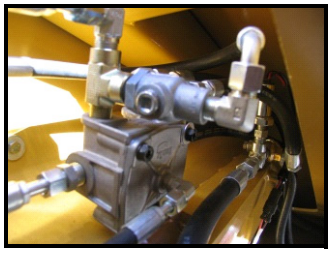
The MES is equipped with two air tanks mounted in the rear bogie that store 100-150 psi air. The tanks are interconnected and receive pressurized air from the tractor primary air tank that is mounted under the tractor cab. Each tank is equipped with drain port to remove moisture from the brake system.

TANK PRESSURE SENDING UNIT

A 24 VDC pressure sending unit is mounted on the rear bogie and is wired into the existing tractor brake pressure indicating and warning systems. The sending unit provides air pressure sensing for the tractor air brake sensing in the tractor cab. The sending unit also provides a signal to the brake low pressure warning system that sounds an audible warning tone when brake supply pressure drops below allowable limits.

SECTION 2
System Description

PNEUMATIC MANIFOLD ASSEMBLY

A pneumatic manifold mounted in the rear bogie used to route pneumatic pressure for service, parking and emergency brake operation. The manifold also provides mounting for a check valve, parking brake/ emergency solenoid and parking brake pressure switch.

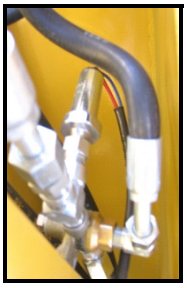
CHECK VALVE

A spring operated valve allowing air flow in only one direction. The valve is located with the pneumatic manifold assembly in the rear bogie.

PARKING/EMERGENCY BRAKE SOLENOID

A 24 VDC electrical solenoid that opens or closes to control the parking or emergency brake function. The solenoid valve responds to electrical signals as commanded by the parking or emergency brake in the tractor cab. The solenoid valve will open to bleed off parking/emergency brake release pressure from the brake pods. This release of air pressure will cause the parking/emergency brakes to be applied.

PARKING BRAKE PRESSURE SWITCH



A 24 VDC pressure switch used to illuminate the parking brake warning light in the tractor cab. The sensor will turn on the parking brake warning light when parking brake release pressure drops below allowable limits.

SERVICE BRAKE RELAY VALVE

A pneumatic relay valve that controls and routes air tank activation pressure to both brake pods. The relay controls air pressure applied to the brake pods as commanded by a pneumatic signal pressure by activating the service brake pedal located in the tractor cab.

BRAKE PODS

A pneumatic cylinder designed to extend or retract and apply service, parking or emergency brakes. The pods are mounted to the MES rear bogie and are connected to the wheel group brake activation lever. The pod contains a coil spring and responds to pressure received from the brake relay valve as commanded by service brake pedal. The pod will also apply parking or emergency brakes when one side of the cylinder is depressurized when commanded by the activation of the parking or emergency brakes. Loss of pneumatic pressure allows the brake pod coil spring to extend the rod end.

PARKING BRAKE THEORY OF OPERATION

The parking brake is applied by activating the parking brake switch in the tractor cab. Once the switch is moved to the park position an electrical signal is sent to the parking brake solenoid valve mounted on the rear bogie pneumatic manifold. The sent signal will open the solenoid valve allowing pneumatic pressure to decrease from one side of the brake pod. The brake pod coil spring can now overcome air pressure and extend the brake pod rod end attached to the wheel group brake lever and apply the brakes. Once parking brake pneumatic pressure drops below allowable limits, the parking brake pressure switch mounted on the pneumatic manifold will close and illuminate the parking brake warning light in the cab of the tractor.

The parking brake is released by activating the parking brake switch. Once the switch is moved an electric signal is sent to close the parking brake solenoid valve. The valve closing will allow pneumatic pressure from the pneumatic manifold to be routed to the brake pod. This pressure increase will eventually overcome the brake pod coil spring and retract the brake pod cylinder rod end attached to the brake pod releasing the brakes. As pressure increases above allowable limits, the parking brake pressure switch will turn off the parking brake warning light in the tractor cab once pressure is above allowable limits.

SECTION 2
System Description

SERVICE BRAKE THEORY OF OPERATION

The service brake is applied by pressing down on the service brake pedal in the tractor cab. Pressing down on the pedal will send a pneumatic pressure signal to the service brake relay valve mounted on the rear bogie. The sent signal will release pneumatic pressure from the brake pod chamber allowing the pod coil spring to extend the rod end and apply service brakes.

The service brake is released by releasing the brake pedal. Once the pedal released a pneumatic signal is received by the brake relay to increase air pressure to the brake pod. As pneumatic pressure increases the force of the brake pod coil spring is overcome and the service brake is released.

EMERGENCY BRAKE THEORY OF OPERATION

The emergency brake theory of operation is the same as the parking brake except for the means of activation. Activation is accomplished by using the emergency brake foot switch located on the floor of the tractor cab just left of the service brake pedal.

SECTION 3
Limitations

Contents

GROSS VEHICLE WEIGHT

Do not exceed 195,656 lbs/80,80495 GVW.

OPERATOR'S SEAT

⚠ WARNING

When you operate the machine in very rough ground conditions or at travel speeds not suitable for the ground conditions, this may result in excessive seat vertical travel with impact of the suspension against the travel stops, which may cause injury. Do not operate the machine on ground conditions and at travel speeds that could result in the seat suspension travel stops being contacted. In order to minimize impact loading on the operator, properly adjust the seat controls based upon your weight and based upon your height. Refer to the 631G Operation and Maintenance Manual, "Seat" for more information.

ENGINE & TRANSMISSION

Do not allow the engine to overspeed when you go downhill. Do not disengage the transmission while you are travelling downhill. If equipped, use the retarder control to reduce engine overspeed when you are going downhill. If your machine is not equipped with a retarder control, use the service brake control to reduce engine overspeed when you are going downhill. Never coast the machine.

SECTION 3
Limitations

SECTION 4
Normal Operations

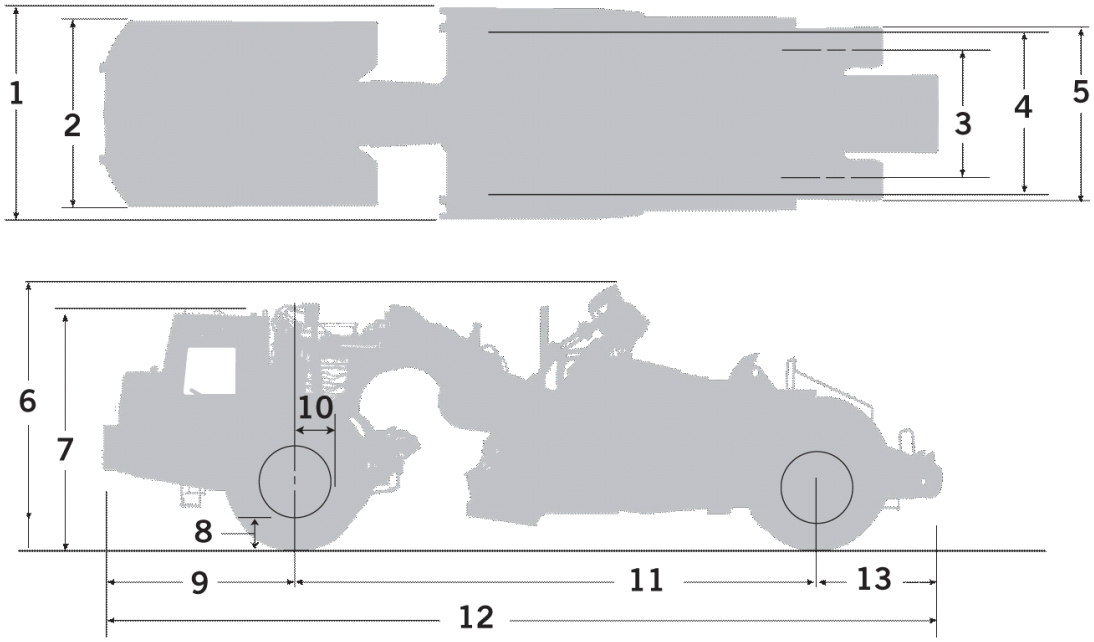
Contents

DESCRIPTION

This section provides the vehicle operator with step by step procedures used to operate the MES34 system only. See the CAT631(G) Operators' manual for specific tractor operations and system details.

The MES34 normal operating procedures mirror the established CAT format of operations. The procedures are separated into before operations, operations and after operations. A pocket size checklist of all MES34 procedures is contained in the Appendix for use in the vehicle cab.

WEIGHTS AND DIMENSIONS



1	Overall machine width	4,048 mm	13' 3"	8 Tractor ground clearance	665 mm	2' 2"
2	Tractor width	3,481 mm	11' 5"	9 Length from front of axle to front	3,359 mm	11' 0"
3	Width to center of rear tires	2,464 mm	8' 1"	10 Axle to vertical hitch pin	548 mm	1' 10"
4	Width to inside of bowl	3,405 mm	11' 2"	11 Wheelbase	8,955 mm	29' 5"
5	Width to outside of tires	3,636 mm	11' 11"	12 Overall machine length	14,466 mm	47' 6"
6	Overall shipping height	3,975 mm	13' 1"	13 Length from rear axle to rear	2,152 mm	7' 1"
7	Height to top of cab	3,715 mm	12' 2"			

MES34
Empty Weight = 113,456 LBS/46,475 KG
Loaded Weight = 195,656 LBS/80,495 KG

SECTION 4
Normal Operations

BEFORE OPERATIONS

These procedures are used to perform a walk-around inspection of the MES34 before use or beginning of the shift. This inspection is in addition to and does not replace the CAT 631G tractor inspection requirements found in the 631G Operation & Maintenance Manuals.

1. Chocks – As Required
2. Vehicle Parking Brake – ON
3. Gear Selector Lever – "N" Neutral
4. Cab Control Switches – SET AS REQUIRED
5. Cab Windows – DAMAGE AND CLEANLINESS
6. LH Tractor – DAMAGE, SECURITY AND LEAKS.
7. Front of Tractor – DAMAGE, SECURITY AND LEAKS.
8. Machine Kill Switch – OFF
9. Hydraulic Reservoir Level – CHECKED
10. Machine Lock-out Switch - ON
11. RH Tractor – DAMAGE, SECURITY AND LEAKS
12. King Pin, Transmission and Gooseneck – DAMAGE, SECURITY, SERVICING AND LEAKS
13. Fuel Tank, Gooseneck, Implement Valve Assembly and Hosing – DAMAGE, SECURITY AND LEAKS
14. Bowl Cutting Edge, Lift Cylinders and Hosing – DAMAGE, SECURITY AND LEAKS
15. Elevator Assembly, Floor Assembly and Bowl Interior – DAMAGE AND SECURITY
16. RH Exterior Bowl Structure, Mud Flaps and Draft Arm – DAMAGE AND SECURITY
17. Rear Bogie, Tires and Floor Cylinders – DAMAGE, SECURITY AND LEAKS
18. Brake Air Tanks - DRAIN VALVES CLOSED
19. LH Exterior Bowl Structure, Mud Flaps and Draft Arm – DAMAGE AND SECURITY
20. Elevator Drive Motor and Speed Reducer – DAMAGE, SECURITY AND LEAKS

OPERATIONS

Use these procedures to safely operate the standard and optional systems installed on the MES34.

1. Check for adequate clearance around the machine.

⚠ WARNING

Before you maneuver the machine, make sure that no personnel are between the machine and attachments. Pinch points and attachments will cause serious injury or death.

2. Mirrors – ADJUST
3. Engine - START
4. Operators Seat – ADJUST

NOTE

Only operate the machine while you are in a seat with a fastened seat belt. Only operate the controls while the engine is running.

5. Steering Column – ADJUSTED
6. Seat Belts – FASTNED
7. Bowl – RAISE
8. Cushion Hitch – ENGAGE AS REQUIRED

⚠ WARNING

Actuation of the cushion-hitch or steering control can cause movement in the hitch area, reducing clearances suddenly. Personal injury or death can result from hitch movement if a person is in the hitch area.

SECTION 4
Normal Operations

9. Service Brake Pedal – DEPRESS To prevent machine from moving

10. Parking Brake – RELEASE

11. Transmission Control Lever – MOVE TO DESIRED DIRECTION AND APPROPRIATE GEAR SPEED

NOTE

For operator comfort and maximum service life of power train components, deceleration and/or braking is recommended before any directional shifts are made.

12. Service Brake – RELEASE

13. Throttle Pedal – DEPRESS UNTIL DESIRED ENGINE SPEED IS ACHIEVED

14. Drive the machine forward in order to have the best visibility and the best control.

15. While you operate the machine slowly in an open area, check for proper operation of all controls and all protective devices.

⚠ WARNING

When you operate the machine in very rough ground conditions or at travel speeds not suitable for the ground conditions, this may result in excessive seat vertical travel with impact of the suspension against the travel stops, which may cause injury. Do not operate the machine on ground conditions and at travel speeds that could result in the seat suspension travel stops being contacted. In order to minimize impact loading on the operator, properly adjust the seat controls based upon your weight and based upon your height. Refer to the 631G Operation and Maintenance Manual, "Seat" for more information.

⚠ WARNING

There is restricted visibility to the area directly behind the machine. Failure to make sure the area is clear could result in injury or death. Use a second person on the ground to make sure that the area is clear before you operate the machine in the **REVERSE** position.

NOTE

The cushion-hitch should be turned on at all times except when you are loading materials or when you are dumping materials. When the cushion-hitch is turned OFF, depth of cuts will be more even and material will spread more smoothly during unloading. This will help you to achieve faster cycle times.

NOTE

The elevator does not need to be running when you are unloading fine material.

NOTE

Reduce engine speed when you maneuver in tight quarters or when you are going over a hill.

NOTE

Select the appropriate travel speed before you begin to drive the machine downhill. Do not shift the transmission control while you are going downhill.

NOTE

When you drive the machine downhill, use the same gear speed that would be used to drive the machine uphill.

NOTE

Do not operate the machine when the parking brake is applied.

NOTE

Loading the machine in a straight line is preferred.

NOTE

Do not overload the bowl.

NOTE

Do not operate the machine without normal air pressure.

SECTION 4
Normal Operations

NOTE

Do not allow the engine to overspeed when you go downhill. Do not disengage the transmission while you are travelling downhill. If equipped, use the retarder control to reduce engine overspeed when you are going downhill. If your machine is not equipped with a retarder control, use the service brake control to reduce engine overspeed when you are going downhill. Never coast the machine.

AFTER OPERATIONS

Perform these procedures after the end of the shift or end of the day. These steps are in addition to and do not replace the CAT631G after operation requirements established in the Operation and Maintenance Manual.

1. Machine – STOPPED
2. Parking Brake – APPLIED
3. Gear Shift Lever - NEUTRAL
4. Engine – OFF
5. Inspect the engine compartment for debris. Clean out any debris in order to avoid a fire hazard.
6. Remove all flammable debris from the front bottom guard through the access doors in order to reduce a fire hazard. Discard the debris properly.
7. Turn the key for the battery disconnect switch to the OFF position. When the machine is left for an extended period of one month or longer, you should remove the key. This will help to prevent a battery short circuit. Removing the key will also help to protect the battery from vandalism and from the current draw that is made by certain components.
8. Perform a walk around inspection of the entire machine looking for damage, security, leaks and servicing.
9. Lock all vandalism covers and all compartments.

SECTION 5
Performance

Contents

DESCRIPTION

This section contains MES34 performance data.

GRADEABILITY/SPEED/RIMPULL

631G Gross Weight
37.25R35 Tire

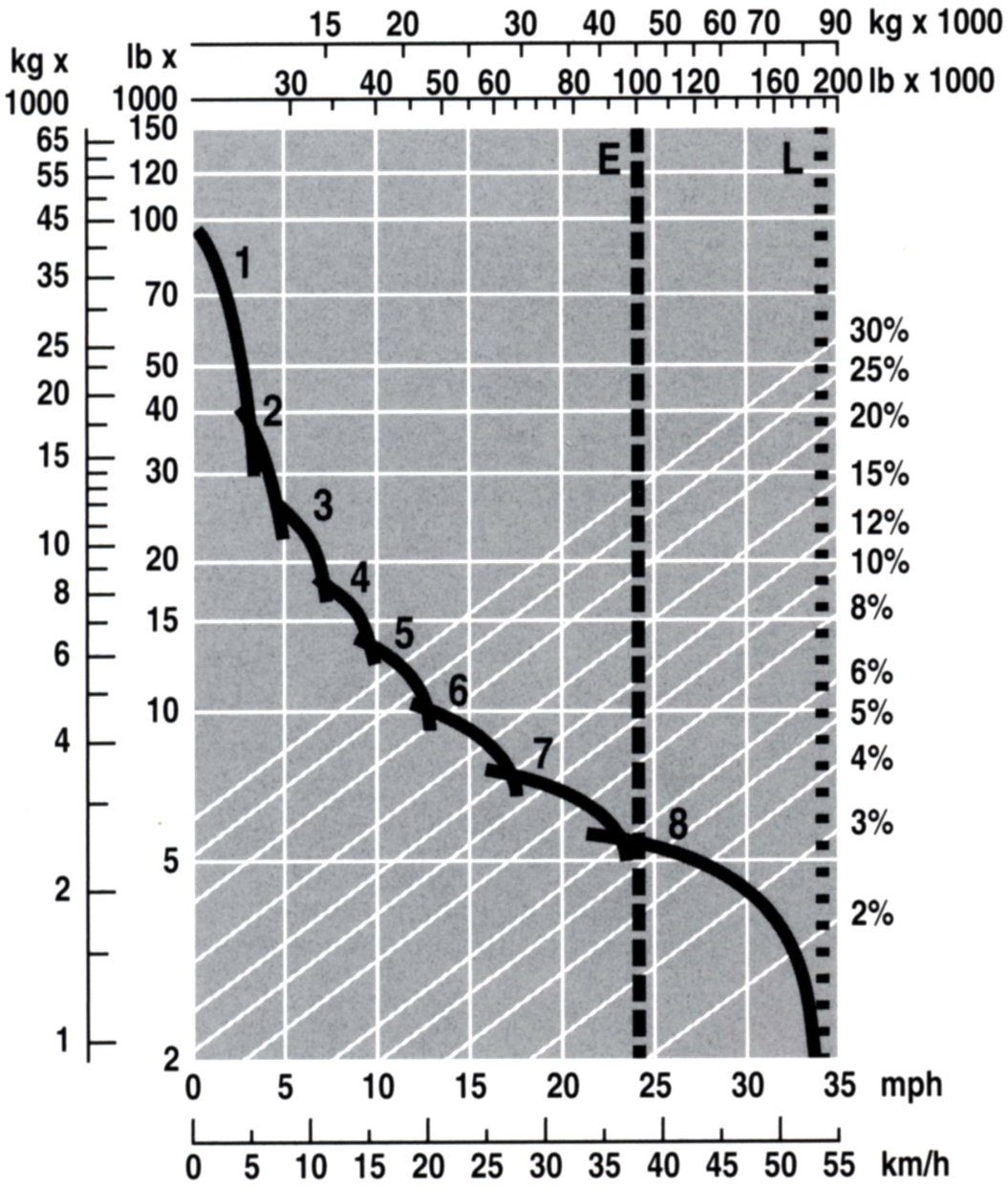


Figure 5-1: Gradeability/Speed/Rimpull

SECTION 5
Performance
RETARDING

631 Gross Weight

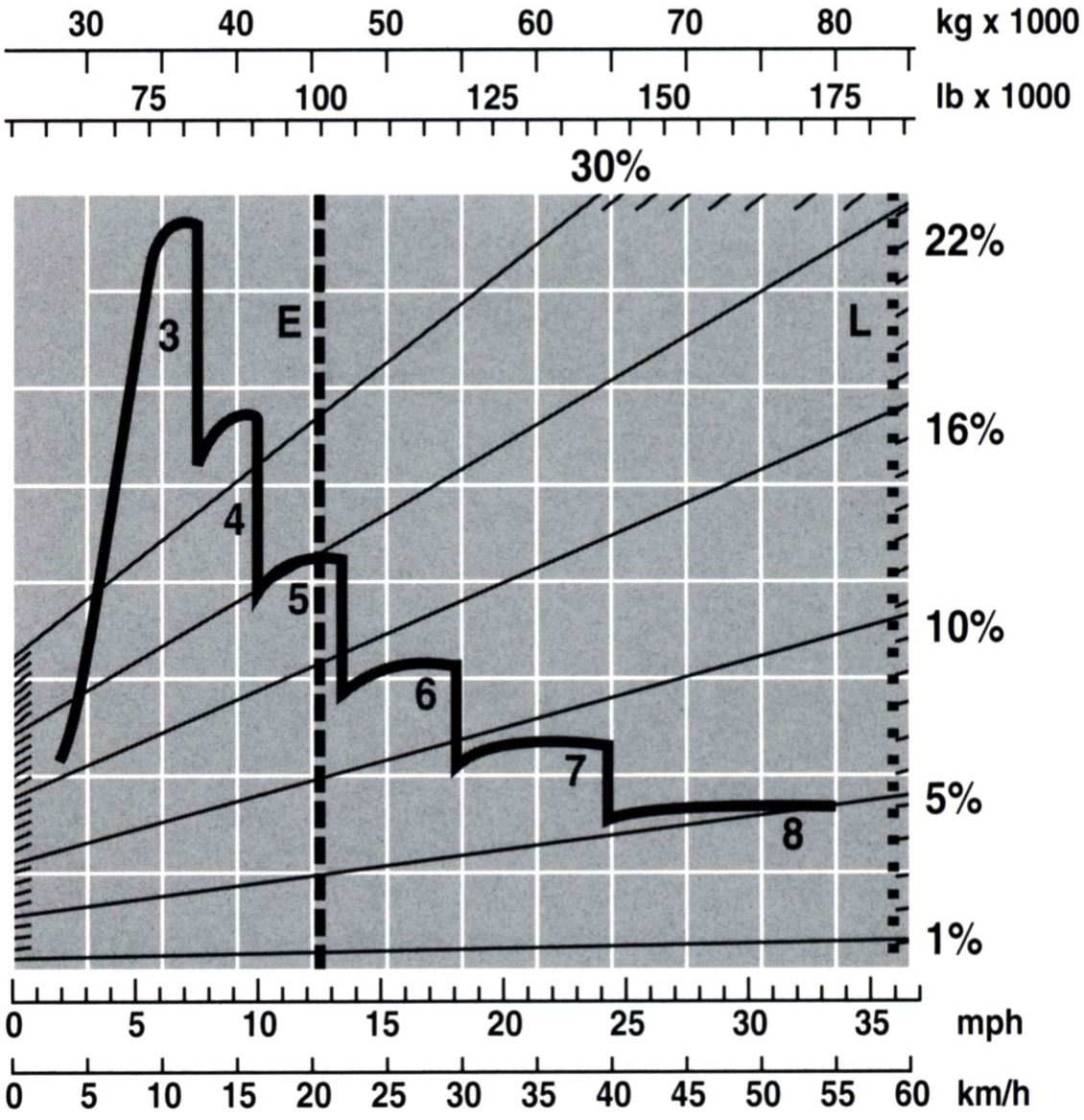


Figure 5-2: Retarding

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MES34-OPS(CL)-1
21 Feb 2014

MES34 OPERATOR'S CHECKLIST

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MES34-OPS(CL)-1
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BEFORE OPERATIONS

These procedures are used to perform a walk-around inspection of the MES34 before use or beginning of the shift. This inspection is in addition to and does not replace the CAT 631G tractor inspection requirements found in the 631G Operation & Maintenance Manuals.

1. Chocks – As Required
2. Vehicle Parking Brake – ON
3. Gear Selector Lever – "N" Neutral
4. Cab Control Switches – SET AS REQUIRED
5. Cab Windows – DAMAGE AND CLEANLINESS
6. LH Tractor – DAMAGE, SECURITY AND LEAKS.
7. Front of Tractor – DAMAGE, SECURITY AND LEAKS.
8. Machine Kill Switch – OFF
9. Hydraulic Reservoir Level – CHECKED
10. Machine Lock-out Switch - ON

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Appendix

11. RH Tractor – DAMAGE, SECURITY AND LEAKS

12. King Pin, Transmission and Gooseneck – DAMAGE, SECURITY, SERVICING AND LEAKS

13. Fuel Tank, Gooseneck, Implement Valve Assembly and Hosing – DAMAGE, SECURITY AND LEAKS

14. Bowl Cutting Edge, Lift Cylinders and Hosing – DAMAGE, SECURITY AND LEAKS

15. Elevator Assembly, Floor Assembly and Bowl Interior – DAMAGE AND SECURITY

16. RH Exterior Bowl Structure, Mud Flaps and Draft Arm – DAMAGE AND SECURITY

17. Rear Bogie, Tires and Floor Cylinders – DAMAGE, SECURITY AND LEAKS

18. Brake Air Tanks - DRAIN VALVES CLOSED

19. LH Exterior Bowl Structure, Mud Flaps and Draft Arm – DAMAGE AND SECURITY

20. Elevator Drive Motor and Speed Reducer – DAMAGE, SECURITY AND LEAKS

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OPERATIONS

Use these procedures to safely operate the standard and optional systems installed on the MES34.

1. Check for adequate clearance around the machine.

   ⚠ WARNING

   Before you maneuver the machine, make sure that no personnel are between the machine and attachments. Pinch points and attachments will cause serious injury or death.

2. Mirrors – ADJUST

3. Engine - START

4. Operators Seat – ADJUST

   NOTE

   Only operate the machine while you are in a seat with a fastened seat belt. Only operate the controls while the engine is running.

5. Steering Column – ADJUSTED

6. Seat Belts – FASTENED

7. Bowl – RAISE

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8. Cushion Hitch – ENGAGE AS REQUIRED

⚠ WARNING

Actuation of the cushion-hitch or steering control can cause movement in the hitch area, reducing clearances suddenly. Personal injury or death can result from hitch movement if a person is in the hitch area.

9. Service Brake Pedal – DEPRESS To prevent machine from moving

10. Parking Brake – RELEASE

11. Transmission Control Lever – MOVE TO DESIRED DIRECTION AND APPROPRIATE GEAR SPEED

NOTE

For operator comfort and maximum service life of power train components, deceleration and/or braking is recommended before any directional shifts are made.

12. Service Brake – RELEASE

13. Throttle Pedal – DEPRESS UNTIL DESIRED ENGINE SPEED IS ACHIEVED

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14. Drive the machine forward in order to have the best visibility and the best control.

15. While you operate the machine slowly in an open area, check for proper operation of all controls and all protective devices.

⚠ WARNING

When you operate the machine in very rough ground conditions or at travel speeds not suitable for the ground conditions, this may result in excessive seat vertical travel with impact of the suspension against the travel stops, which may cause injury. Do not operate the machine on ground conditions and at travel speeds that could result in the seat suspension travel stops being contacted. In order to minimize impact loading on the operator, properly adjust the seat controls based upon your weight and based upon your height. Refer to the 631G Operation and Maintenance Manual, "Seat" for more information.

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There is restricted visibility to the area directly behind the machine. Failure to make sure the area is clear could result in injury or death. Use a second person on the ground to make sure that

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the area is clear before you operate the machine in the **REVERSE** position.

NOTE

The cushion-hitch should be turned on at all times except when you are loading materials or when you are dumping materials. When the cushion-hitch is turned OFF, depth of cuts will be more even and material will spread more smoothly during unloading. This will help you to achieve faster cycle times.

NOTE

The elevator does not need to be running when you are unloading fine material.

NOTE

Reduce engine speed when you maneuver in tight quarters or when you are going over a hill.

NOTE

Select the appropriate travel speed before you begin to drive the machine downhill. Do not shift the transmission control while you are going downhill.

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NOTE

When you drive the machine downhill, use the same gear speed that would be used to drive the machine uphill.

NOTE

Do not operate the machine when the parking brake is applied.

NOTE

Loading the machine in a straight line is preferred.

NOTE

Do not overload the bowl.

NOTE

Do not operate the machine without normal air pressure.

NOTE

Do not allow the engine to overspeed when you go downhill. Do not disengage the transmission while you are travelling downhill. If equipped, use the retarder control to reduce engine overspeed when you are going downhill. If your

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machine is not equipped with a retarder control, use the service brake control to reduce engine overspeed when you are going downhill. Never coast the machine.

AFTER OPERATIONS

Perform these procedures after the end of the shift or end of the day. These steps are in addition to and do not replace the CAT631G after operation requirements established in the Operation and Maintenance Manual.

1. Machine – STOPPED
2. Parking Brake – APPLIED
3. Gear Shift Lever - NEUTRAL
4. Engine – OFF
5. Inspect the engine compartment for debris. Clean out any debris in order to avoid a fire hazard.
6. Remove all flammable debris from the front bottom guard through the access doors in order to reduce a fire hazard. Discard the debris properly.

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7. Turn the key for the battery disconnect switch to the OFF position. When the machine is left for an extended period of one month or longer, you should remove the key. This will help to prevent a battery short circuit. Removing the key will also help to protect the battery from vandalism and from the current draw that is made by certain components.

8. Perform a walk around inspection of the entire machine looking for damage, security, leaks and servicing.

9. Lock all vandalism covers and all compartments.

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