MORE DIG FOR THE DOLLAR

DESIGNED INTO EVERY DETAIL

Operator Training

GRADALL INDUSTRIES, INC.
Where Ingenuity Works

Thank you for purchasing and safely operating the Gradall D152 hydraulic excavators.

This presentation does not replace time taken by the operator to read and understand the operators manual provided with the machine.

This presentation is an overview of the operation of the Discovery D152. If there is any discrepancy between what is stated in this presentation vs what is in the operators manual the operators manual takes priority.

Please follow all instruction provided by all of the safety decals located on the machine.

ALAMO GROUP

This presentation focusses on the operation of the upper excavator as the carrier is a standard Freightliner M2 truck. There are a few modifications, however; that we make to the truck.

The rear suspension has been removed and the rear axle bolted directly to the frame.

The upper is mounted to a “torque box” which is then bolted to the carrier frame. This weldment significantly strengthens and stiffens the frame to prevent twisting that could cause early failure.

The front shock absorbers are removed and replaced with lock-out cylinders to add stability when operating the excavator.

Getting Started

This presentation focusses primarily on the operation of the upper excavator as the carrier is a standard Freightliner M2 truck. There are a few modifications, however; that we make to the truck. Some but not all are listed below.

We remove the rear suspension so that the rear axle can be mounted directly to the truck frame. This provides more stability when operating the excavator.

The excavator is mounted to a torque box that is bolted to the truck frame. This weldment significantly strengthens and stiffens the frame.

We also remove the front shock absorbers and replace them with lock-out cylinders that add significant stability when operating the excavator.

A few other bits about the truck. The machine does have a 12 volt electrical system. It has an advanced EGR system that does not decrease the power of the machine nor does it produce high temperature exhaust. The speed is governed at 55 MPH. Please be advised to familiarize yourself with the handling qualities of the machine before traveling at full highway speed. Because of the rigidity of the suspension and other factors the performance of the truck may somewhat “lively”.

A few last comments about the truck

We recommend that the diesel fuel be filled at the end of the day/shift. This practice diminishes the amount of head room in the tank and therefore lessens the potential amount of water condensation inside the tank.

We also recommend that each time you fill the diesel tank you top off the DEF tank as well. This will ensure that you do not run out of DEF.

NEVER PUT ANYTHING BUT CERTIFIED DIESEL EXHAUST FLUID IN THE DEF TANK, it take as little as 7 drops of any petroleum product to cause a total failure of the DEF system.

NEVER PUT DEF IN THE DIESEL FUEL TANK, this can cause a complete failure of the fuel system. Either can be an extremely expensive, non-warranty, repair.

The truck is equipped with a rear axle differential lock for extra tractive effort in low traction conditions. Always remember to disengage the Diff-lock before traveling on dry improved surfaces. If the Diff-lock is engaged in good traction conditions you may/will brake an axle shaft while turning.

Anderson Equipment Co.

We also want to take this opportunity to thank Anderson Equipment Company who is the Gradall dealer in the beautiful state of West Virginia. They have worked hard and sent their technicians to multiple training schools to be up to date on servicing the Gradall machines the state has purchased.

I encourage you that if you have any issues with your machines to please contact Anderson Equipment and let them know; even if it is a Freightliner issue.

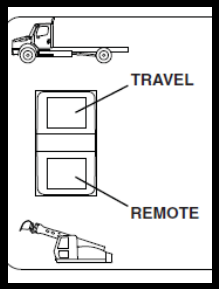
They are empowered to contact us if there are any issues and we will expedite the service you receive through Freightliner as best we can. We can't do anything if we don't know you have an issue, and Anderson is our line of communication.

How to transfer operation to the Upper

Park the machine in a safe location.

Make sure you have at least 100 psi of air pressure.

Set the Parking Brake by pulling out on the switch.



Turn off the engine.

Press the bottom of the Travel/Remote switch.

Go to the upper cab and start the engine.

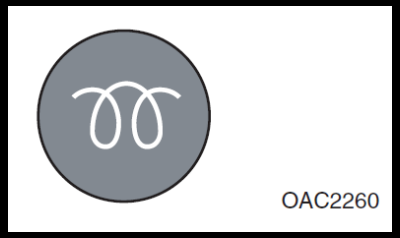
Parking Brake switch

Travel/Remote switch

Starting the engine from the Upper Cab

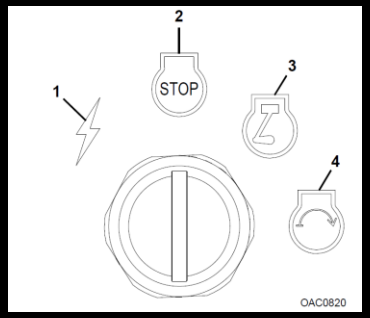
Make sure the control cut-out lever is in the upright position (all controls will be inactive).

Insert the key into the ignition switch and turn it to the “run” position.



The wait-to-start light will illuminate, the engine will not start while this light is lit.

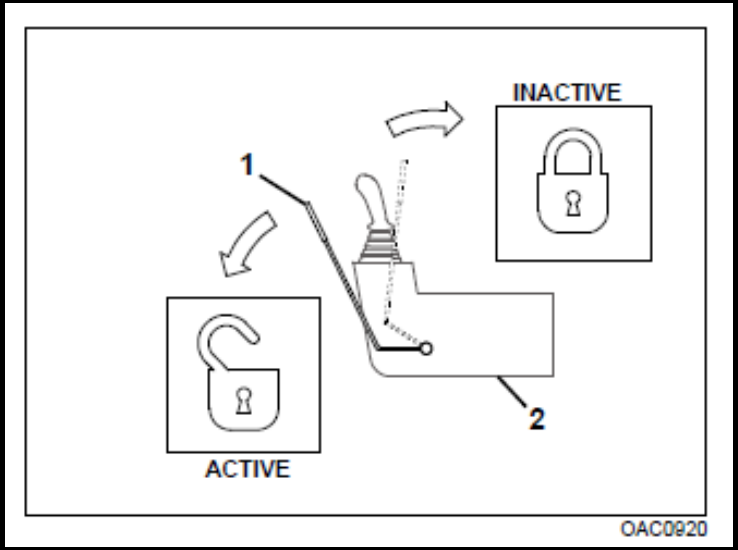
When the light goes out, turn the key to the start position and start the engine.

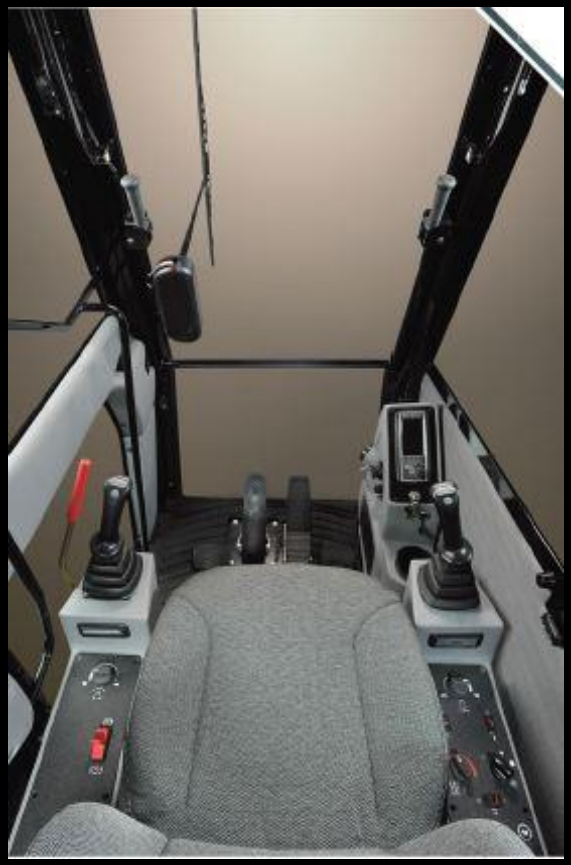


The ignition switch has four positions.

1. Acc.-electrical power is on.
2. Stop-turns off the engine and all electric power.
3. Run-position key will return to after engine starts.
4. Start-engages starter to start engine

Locking and unlocking the controls

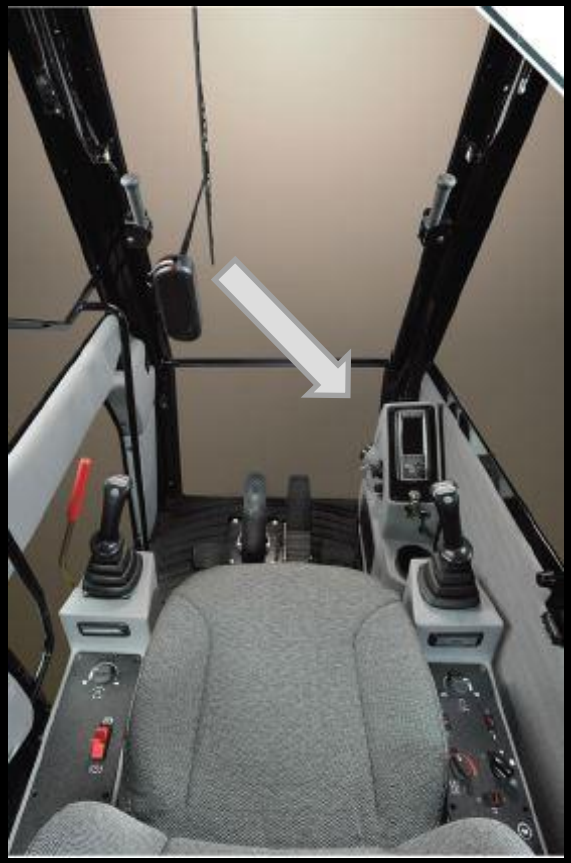




All controls will remain inactive/locked until the control lockout lever located beside the left joystick is lowered into the active/unlocked position.

When the lockout lever is in the lowered all controls are active, NEVER ENTER OR EXIT THROUGH THE FRONT WINDOW OF THE CAB WHEN THE LEVER IS IN THIS POSITION.

The LCD Monitor

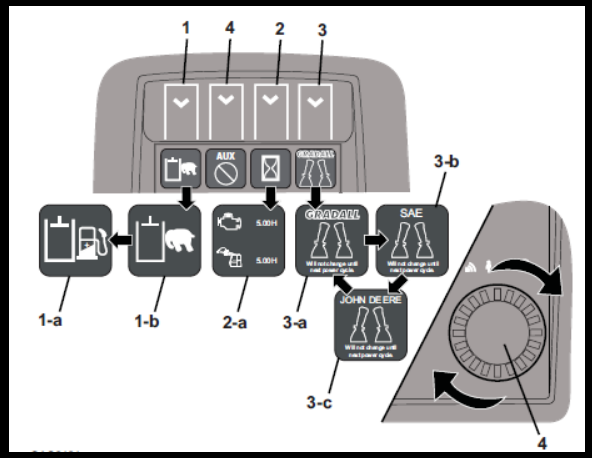


Most of the controls for machine operation are located in the Monitor located on the right side of the cab.

The top row of buttons and displays

Across the top of the display are a row of buttons (1-4). These buttons activate the function/display of the top row of icons.

Turn the knob in the lower right corner of the display to change the selected function.



Button 1 will turn the fine grade mode on or off

Button 2 is used to view the hour meter.

Button 3 is used to select the control patter for the joysticks.

Button 4 will allow you to select the controls for the auxiliary hydraulics if equipped.

Fine Grade Mode

To turn the Fine Grade Mode on or off press the indicated button and the icon below the button will be enlarged turn the knob and the icon will change, when the desired function is displayed press the button again.

If the icon is of the fuel pump then Fine Grade Mode is on.

If the icon is the elephant then Fine Grade Mode is turned off.

When Fine Grade Mode is on the engine RPM is reduced by about 200rpm which will make the joysticks slightly less responsive and the machine operation smoother.

Auxiliary Hydraulics control

(Not all machines are equipped with the optional Auxiliary Hydraulics)

To select how the auxiliary hydraulics are activated: press the indicated button and the icon will enlarged in the middle of the screen. Cycle through the icons by turning the dial to find your preferred control option. Press the button again to lock in the selection. You must turn the engine off and restart to activate the selected control.

No Auxiliary hydraulics activation available

Auxiliary Hydraulics activated by pressing optional foot pedal.

Auxiliary Hydraulics activated by pressing round button on front of left joystick (bucket shake).

Auxiliary Hydraulics activated by pressing round button on front of the left joystick or the optional foot pedal.

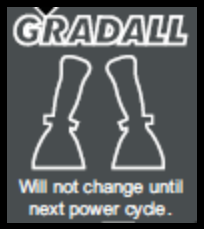
Hour meter

Hour meter: press button 2 to view the operating hours, the icon will enlarge on the screen.

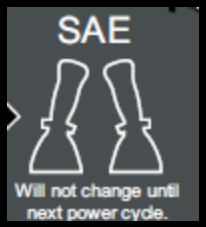
The total engine hours will be shown at the top of the icon and the operating hours from the upper will be shown at the bottom.

Joystick control pattern

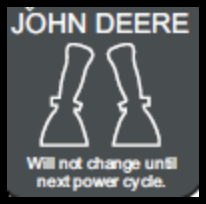
To select the joystick control pattern preferred: press the indicated button and the icon will enlarge in the display, turn the knob to cycle through the options. When the preferred option is displayed press the button again to lock in the selection. You must turn off the engine and restart it to activate the selected pattern.



Gradall pattern: Left joystick-raise and lower boom/open and close the bucket; Right joystick-extend and retract the boom/swing upper left and right.



SAE pattern: Left joystick-extend and retract boom/swing the upper left and right; Right joystick-raise and lower boom/open and close the bucket.



John Deere (Tractor/Loader/Backhoe): Left joystick-raise and lower boom/swing left and right; Right joystick-extend and retract the boom/open and close the bucket.

Button controls on Right Joystick

The small round button on the front of the joystick will select forward travel of the machine in remote operation. As long as the button is held down the transmission will remain in 1st gear. When it is released the transmission will return to neutral.

The small round button on the rear of the joystick will select reverse travel of the machine in remote operation. As long as the button is held down the transmission will remain in reverse. When it is released the transmission will return to neutral.

The rocker switch on the back of the joystick controls the tilt or rotation of the boom. Press on the left side of the rocker to rotate the boom counter-clockwise. Press on the right side of the rocker to rotate the boom clockwise.

Button controls on Left Joystick

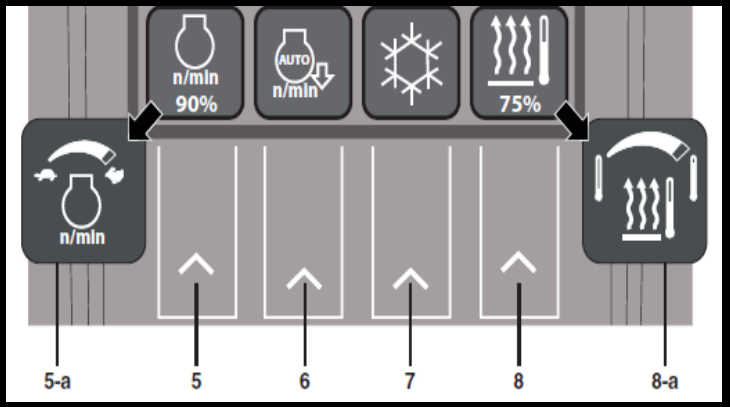
The little round button on the front of the joystick is a bucket shake. Press and hold the button and the bucket will shake and slowly open. (If operator has selected that the button activate the auxiliary hydraulics, the bucket shake is deactivated until the auxiliary hydraulics are turned off).

The little round button on the back of the joystick will sound the truck horn when pressed.

The rocker switch on the back of the joystick controls the remote steering. Press and hold the left side of the rocker to steer the carrier tires to the left (as sitting in the carrier cab) press and hold the right side of the rocker to steer the carrier tires to the right (as sitting in the carrier cab).

The bottom row of buttons and displays

Across the bottom of the display are a row of buttons (5-8). These buttons activate the function/display of the bottom row of icons



Button 5 controls the engine RPM

Button 6 controls the Auto-Idle function.

Button 7 turns the Air Conditioner on and off.

Button 8 controls the cab heater output temperature.

Throttle control (Engine RPM)

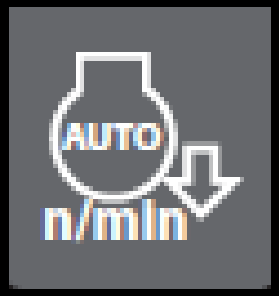
Press the indicated button to adjust the engine RPM. When the button is pressed the icon will enlarge in the middle of the display. Turn the dial to the right to increase rpm or to the left to decrease rpm.

The icon will always display the percentage of the rpm range to which the throttle is set.

Engine Auto Idle

Press the indicated button to turn the Engine Auto Idle function on or off.

When the auto idle is turned on the engine will go to idle rpm when no hydraulic control has been activated for a period of approximately 7 seconds. The engine will automatically return to the rpm selected when any hydraulic control is activated.



When the icon is red in color the auto idle is turned off when the icon is green the auto idle is turned on.

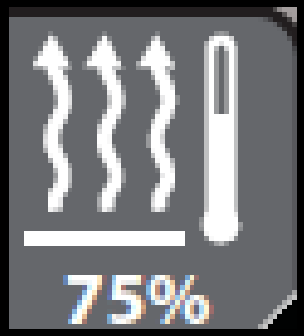
Air Conditioning On/Off

Press the indicated button to turn the cab air conditioning on or off. When the icon is blue the air conditioning is on, when the icon is gray the air conditioning is off.

It is important to remember that when the fan control is turned off you will not be able to turn the A/C on, the button will not operate.

Heater Temperature

Press the indicated button and the icon will be enlarged on the display. Turn the dial to the right to increase heater output temperature or to the left to lower the temperature output.



When the air conditioning is turned on you can not adjust the temperature, the air provided will be as cold as it can provide.

You will only be able to change the temperature when the fan switch is turned on.

Indicator icons on the Monitor

The rest of the icons on the monitor are indicators and gauges that are not adjustable

Icon 1 is the parking brake indicator. When it is red the parking brake in set.

Icon 2 is the low air pressure indicator. If there is low air the icon will turn red, an audible alarm will sound and all upper functions will stop.

Icon 3 is the check engine (LIM) indicator. It will turn yellow for any condition that may affect tailpipe emissions.

Icon 4 is the low hydraulic fluid level indicator. The icon will turn red if the hydraulic fluid level falls below an acceptable level.

Icon 5 is the hydraulic filter condition indicator. The icon will turn red when the main hydraulic filter needs to be replaced.

Indicator icons on the monitor cont'd

Icon 6 is the engine stop indicator. When a critical engine fault is detected the icon will turn red and an intermittent alarm will sound. Turn off the engine and contact service.

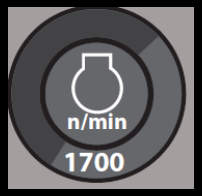
Icon 7 is the engine warning indicator. The icon will turn yellow when a non-critical engine fault is detected.

Icon 8 is the wait-to-start icon. When the icon is yellow the intake manifold heater is on. The engine will not start until the icon goes out.

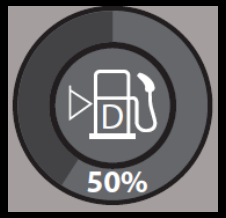
Icon 9 is the Diesel Particulate Filter Regeneration indicator. The icon flashes yellow when there is an need to regenerate the filter.

Icon 10 is the high exhaust temperature indicator. The icon turns yellow when the exhaust temperature is or is about to go above the normal operating temperature.

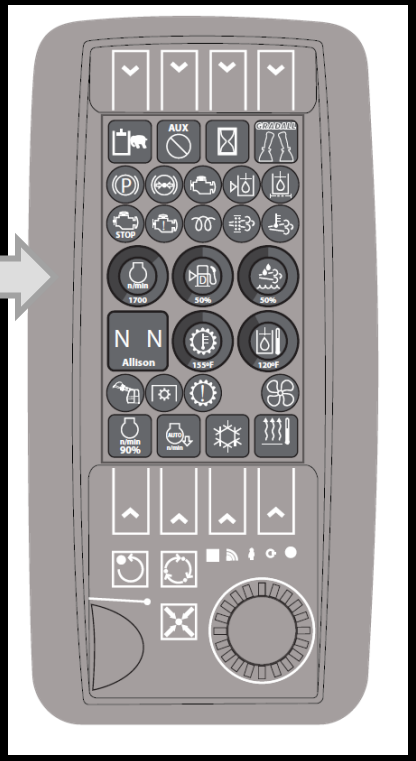
Indicator icons on the monitor cont'd

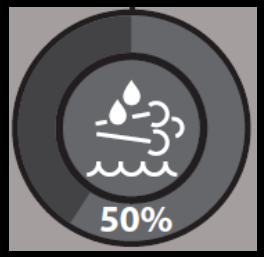


This is the engine RPM indicator. The actual rpm is displayed at the bottom of the icon.



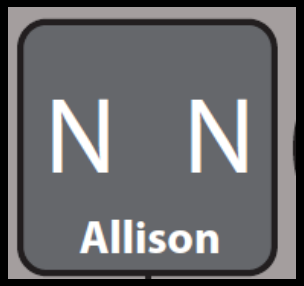
This is the fuel level indicator. The percentage of a full tank is displayed at the bottom of the icon.



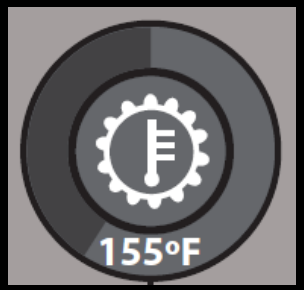


This is the Diesel Exhaust Fluid (DEF) level indicator. The percentage of a full tank is displayed at the bottom of the icon.

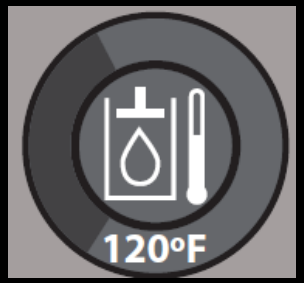
Indicator icons on the monitor cont'd



This is the Allison transmission gear indicator.



This is the transmission temperature indicator. The actual temperature of the transmission fluid is displayed at the bottom of the icon.



This is the hydraulic fluid temperature indicator. The actual hydraulic fluid temperature is displayed at the bottom of the icon.

Indicators on the monitor cont'd

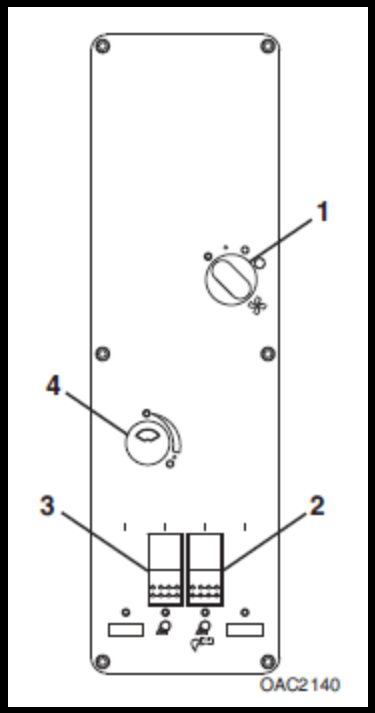
This is the remote/travel mode indicator. The icon of the truck cab will display in yellow until the required 70psi of air is available. The upper controls will not be active. As soon as the required air pressure is achieved the icon of the upper cab will appear in green; the upper controls will now be active.

This icon is inactive.

This is the check transmission indicator. It will light up in yellow to indicate that a problem has been detected in the transmission.

This is the fan on/off indicator. This icon will be gray when the fan is off. It will light up blue if the fan is on and the A/C is on. It will light up red if the fan is on and the Heater is on.

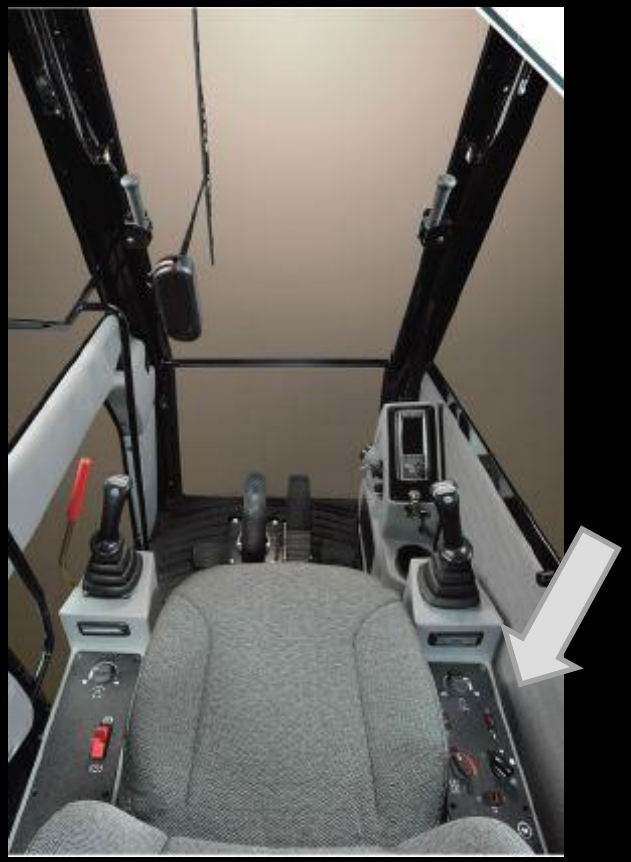
Controls on right hand arm pod



Dial 1 is the fan speed control for the heater or A/C

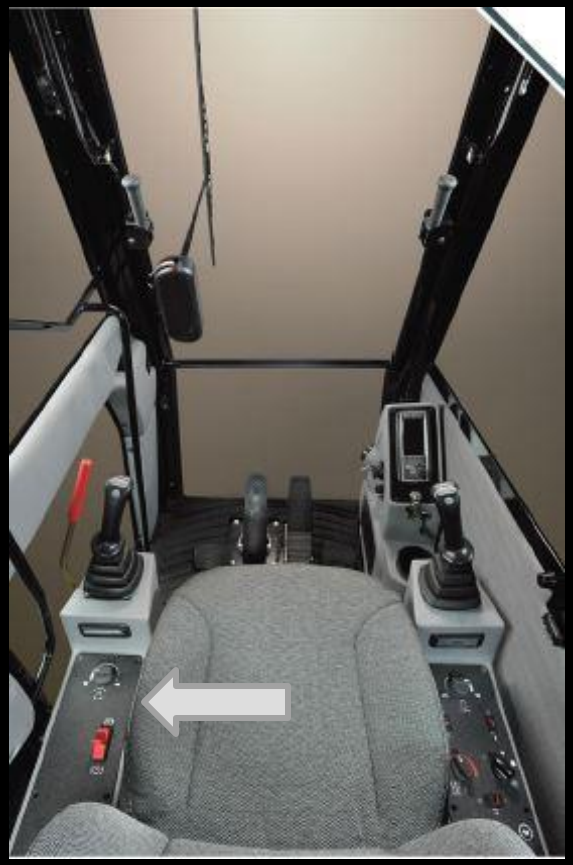
Switch 2 turns the boom lights on or off, if the machine has this option installed.

Switch 3 turns the work lights on or off, if the machine has this option installed.



Dial 4 is the intermittent windshield wiper control. Press the dial to activate the windshield washer function.

Controls on the left arm pod

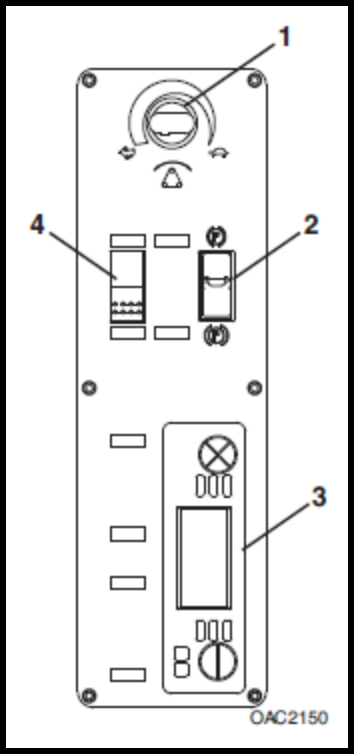


Dial 1 controls the speed of the tilt or rotation of the boom. Be aware that if it is turned all the way to the turtle the boom will not tilt.

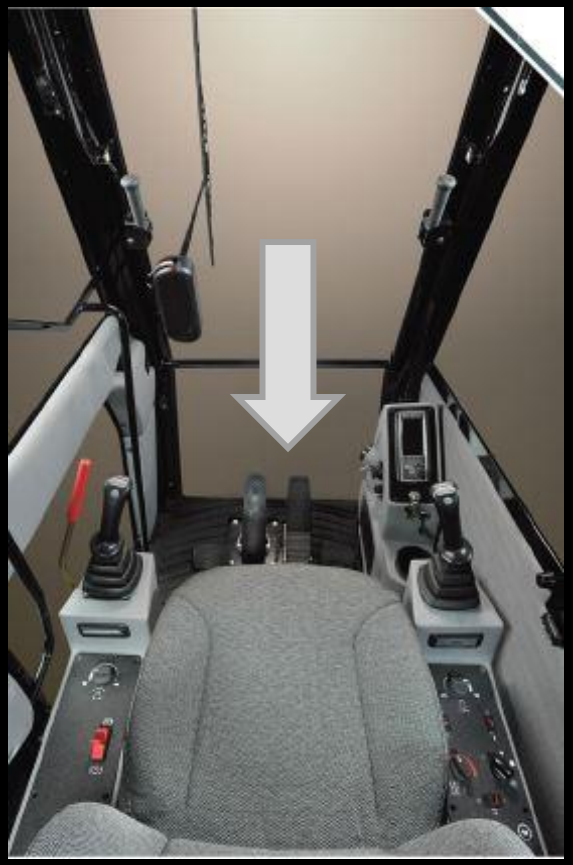
Switch 2 is the parking brake switch. Push the switch forward to set the brake and push it back to release the brake. Always set the parking brake before exiting the cab.

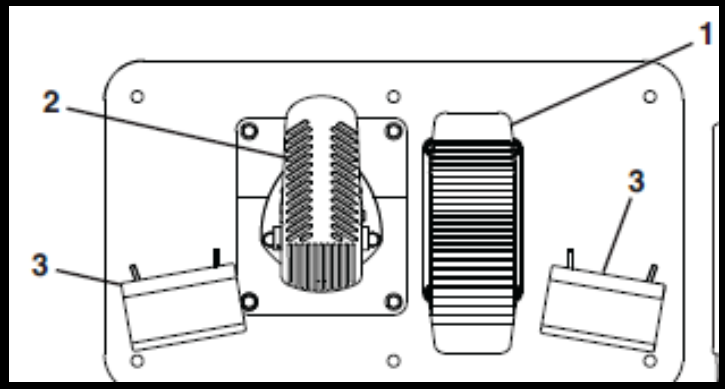
Item 3 is the radio. It is an AM/FM/Weather Band radio with an auxiliary input.

Switch 4 is the rotating beacon on/off switch, if the machine is equipped with this option.



Pedal Controls



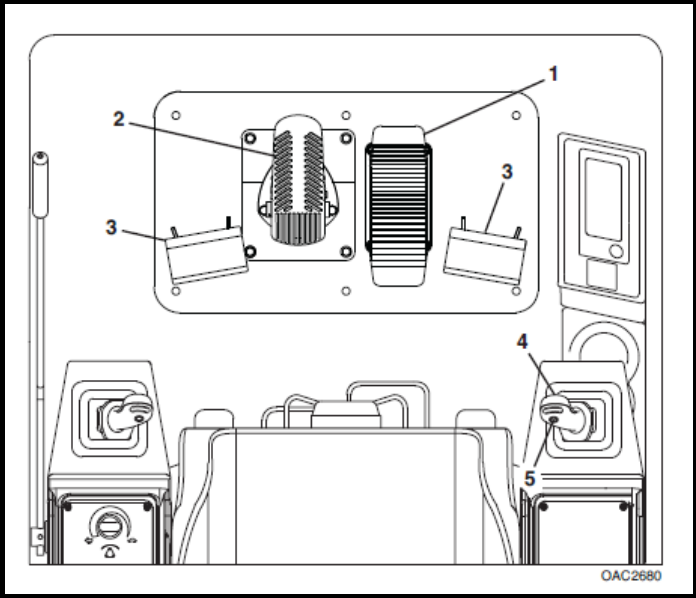


Pedal 1 is an accelerator. When the transmission has shifted into gear in remote operation, press pedal to increase engine rpm.

Pedal 2 is a brake pedal. Press the pedal to activate the service brakes in the truck.

Items 3 are foot rests. When not actively pressing pedal 1 or 2 it is strongly recommended that you rest your foot on these foot rests.

Engaging forward travel in remote



The control lock lever beside the left joystick must be in the down or locked position.

Press and hold the button on the front of the right joystick (4) to select forward travel.

Press the brake pedal (2)

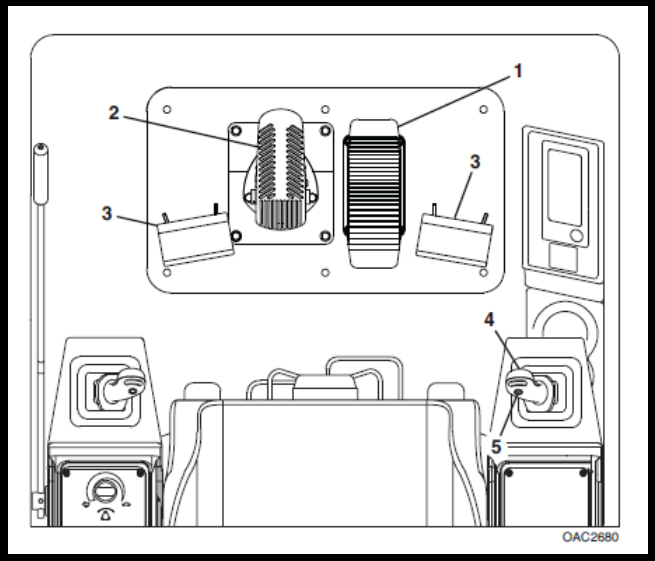
The transmission gear indicator on the monitor will show a “1” in the first position showing that 1st gear has been requested.

The engine RPM will drop and the transmission indicator will show a “1” in both positions indicating that the transmission has shifted in to 1st gear, the digging brake will release and the travel alarm will sound.

Ease up on the brake pedal (2) and the machine will travel forward. If you need more power or speed simply press on the accelerator (1).

Press the brake pedal (2) to stop the machine, release the joystick button (4) and the transmission will return to neutral, engine RPM will return to where the throttle dial is set, the digging brake will set and the travel alarm will stop.

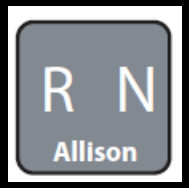
Engaging reverse travel in remote



The control lock lever beside the left joystick must be in the down or locked position.

Press and hold the button on the back of the right joystick (4) to select reverse travel.

Press the brake pedal (2)



The transmission gear indicator on the monitor will show an “R” in the first position showing that reverse has been requested.

The engine RPM will drop and the transmission indicator will show an “R” in both positions indicating that the transmission has shifted into Reverse, the digging brake will release and the travel alarm will sound.

Ease up on the brake pedal (2) and the machine will travel backward. If you need more power or speed simply press on the accelerator (1).

Press the brake pedal (2) to stop the machine, release the joystick button and the transmission will return to neutral, engine RPM will return to where the throttle dial is set, and the digging brake will set and the travel alarm will stop sounding.

ATTACHMENTS

GRADALL INDUSTRIES, INC.
Where Ingenuity Works

Not only can you drive your Discovery Series excavator quickly from one site to another, our attachments let you approach one or more jobs – ditching, concrete and asphalt repair, mowing and culvert replacement – in a single day.

Excavating Bucket

Grapple

Ditching Bucket

Tree Limb Shear

Pavement Removal Bucket

Mower Attachment

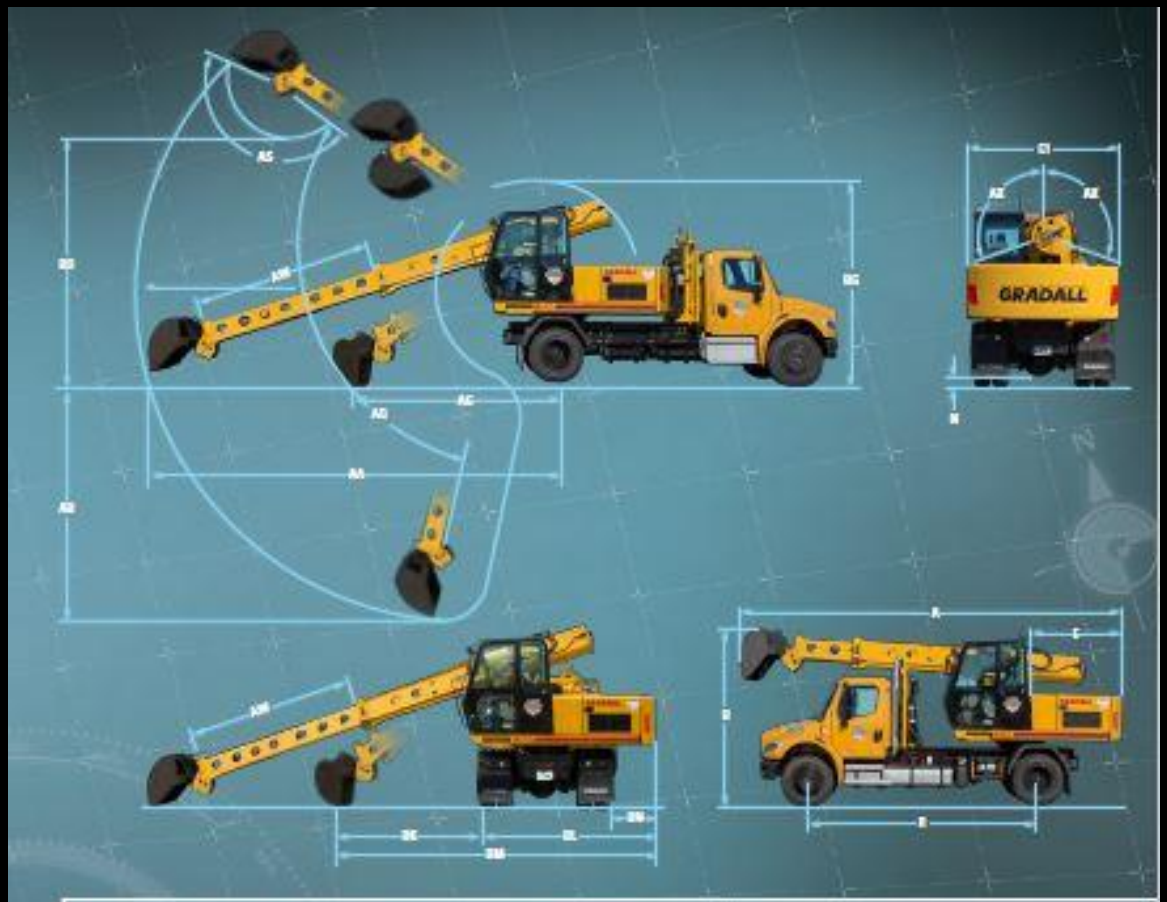
ALAMO GROUP

Please note the attachments you see are from the XL Series Excavators, but the Discovery models offer an equivalent version of each.

GRADALL Model D152 4x2 Lift Capacity Over Side or Rear - LB. (kg)

LOAD POINT HEIGHT		LOAD RADIUS					
		15' 0" (4.6 m)		20' 0" (6.1 m)		Maximum radius	
		Over End	Over Side	Over End	Over Side	Over End	Over Side
ABOVE GROUND LEVEL	19' 1" (5.8 m)					3000 (1360)	3000 (1360)
	15' 0" (4.6 m)	4660 (2115)	4660 (2115)	3180 (1440)	3180 (1440)	2880 (1305)	2880 (1305)
	10' 0" (3.0 m)	5390 (2445)	5390 (2445)	3530 (1600)	3530 (1600)	2880 (1305)	2880 (1305)
	BOOM LEVEL 8' 8" (2.7 m)	5490 (2490)	5490 (2490)	3580 (1625)	3580 (1625)	2885 (1310)	2885 (1310)
	5' 0" (1.5 m)	5480 (2485)	5480 (2485)	3615 (1640)	3615 (1640)	2905 (1320)	2905 (1320)
AT GROUND LEVEL		4760 (2160)	4760 (2160)	3365 (1525)	3365 (1525)	2950 (1340)	2950 (1340)
BELOW GROUND LEVEL	5' 0" (1.5 m)	3690 (1675)	3690 (1675)			2955 (1340)	2955 (1340)
	10' 0" (3.0 m)	2695 (1220)	2695 (1220)			2690 (1220)	2690 (1220)
	10' 9" (3.3 m)					2580 (1170)	2580 (1170)

NOTE: The above loads are in compliance with the SAE standard J1097 DEC2005.
They do not exceed 87% of hydraulic lifting capacity or 75% of tipping capacity.



Shown with 8215-6006 60" (1.52 m) ditching bucket

	4 x 2	4 x 4	
A	27'1" (8.3 m)	27'1" (8.3 m)	Overall length (boom in rack) with bucket
B	12'3" (3.7 m)	12'9" (3.8 m)	Overall height (boom in rack) with bucket
C1	8'6" (2.6 m)	8'6" (2.6 m)	Width of upperstructure
E	6'7" (2.0 m)	6'7" (2.0 m)	Swing clearance, rear of upperstructure
N	10" (254 mm)	10" (254 mm)	Ground clearance (per SAE J1234)
R	15'10" (4.8 m)	15'10" (4.8 m)	Wheel base
AA	24'11" (7.6 m)	24'9" (7.5 m)	Maximum radius at ground line (165° pivot)
AB	13'6" (4.1 m)	13'0" (4.0 m)	Maximum digging depth (165° pivot)
AG	11'4" (3.5 m)	11'0" (3.4 m)	Minimum level cut radius with bucket flat on ground line
AO	30° Up & 60° Down	30° Up & 60° Down	Boom pivot angle
AS	165°	165°	Bucket pivot angle
AW	10'3" (3.1 m)	10'3" (3.1 m)	Telescoping boom travel
AX	110°	110°	Bucket tilt angle (both sides of center)

	4 x 2	4 x 4	
BD	16'4" (5.0 m)	16'10" (5.1 m)	Minimum clearance of bucket teeth, with bucket pivot at maximum height
BG	14'1" (4.3 m)	14'7" (4.5 m)	Maximum height of working equipment with bucket below ground line
BK	6'6" (2.0 m)	6'5" (2.0 m)	Minimum bucket cleanup
BL	10'8" (3.3 m)	10'8" (3.3 m)	Swing lane clearance
BM	17'1" (5.5 m)	17'7" (5.4 m)	Minimum machine swing radius at ground level
BN	30" (762 mm)	30" (762 mm)	Passenger side swing clearance

Rated boom force:
16,587 lb (97.9kN)

Rated bucket breakout force:
11,400 lb (50.7 kN)

Weight:
Approximate working weight, including a 60" (1.54 m) bucket, fuel tank half full.
4x2: 32,200 lb (14,600 kg)
4x4: 34,500 lb (15,650 kg)

Specifications subject to change without notice.

Chassis Warranty

GRADALL INDUSTRIES, INC.
Where Ingenuity Works

Freightliner Medium-Duty/Business Class

Coverage		
Description	**Time**[1]	**Distance**[1]
Basic Vehicle	2 Years	Unlimited
Battery	1 Year	100,000 mi/161 000 km
Brightwork	6 Months	Unlimited
Cab Corrosion/Perforation	5 Years	Unlimited
Cab Structure	2 Years	Unlimited
Chassis Paint	6 Months	Unlimited
Corrosion	6 Months	Unlimited
Crossmembers	5 Years	Unlimited
Drivetrain	2 Years	Unlimited
Frame Rails	5 Years	Unlimited
Paint	1 Year	100,000 mi/161 000 km
Steer Axle[2]	2 Years	Unlimited

[1]Time or distance, whichever comes first
[2] Steer axle coverage-group applies to glider only.

Warranty

Allison Transmission.

Applicable Models	WARRANTY LIMITATIONS (Whichever occurs first)		ADJUSTMENT CHARGE TO BE PAID BY THE CUSTOMER	
	Months	Transmission Mile or Kilometers	Parts	Parts
3500 RDS	0-24	No Limit	No Charge	No Charge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