GRADALL

DISCOVERY SERIES

HIGHER PRODUCTIVITY
WITH A LOWER EQUIPMENT INVESTMENT

Crossover Hydraulic Excavators for Governments and Specialty Contractors

THE FIRST CROSSOVER HYDRAULIC EXCAVATOR

Gradall Industries introduces the cost-effective solution for governments and contractors who need to do more work with fewer machines on tight budgets.

Gradall's Discovery Series® excavators…the first crossover hydraulic excavators…combining the legendary benefits of Gradall's trademark full-tilting, telescoping boom with the proven over-the-road performance of a Freightliner chassis. All combined in one highly productive, cost-efficient package.

Working closely with Freightliner, Gradall engineers have specifically designed Discovery Series Gradall excavators to deliver reliable, purpose-designed multi-task workhorses that are available only through Gradall distributors – and at a surprisingly low cost.

GRADALL DISCOVERY SERIES

DESIGNED AND BUILT WITH AMERICAN INGENUITY

BENEFITS OF THE CROSSOVER:

- Compact, efficient design
- Short turning radius to work in tight areas
- Proven Freightliner chassis
- Full-size cabin with modern design
- Simplified and integrated electrical and hydraulic systems

EXCEPTIONAL MOBILITY…

…A LEGENDARY GRADALL ADVANTAGE TAKES A GIANT STEP FORWARD

From their earliest days, highway speed Gradall excavators impressed governmental entities and contractors because they could be driven by the operator. Traveling to jobsites at highway speeds, Gradalls get to work and then back to the safety of the equipment yard faster – all without the hassle and expense of a truck and a lowboy trailer.

Discovery Series models continue that tradition by integrating a popular Freightliner truck chassis with a highly productive Gradall excavator upperstructure. Operators are immediately comfortable driving Discovery Series excavators, and even repositioning them without leaving the upperstructure cab.

GRADALL ON-THE-GO:

- Get to jobsites quickly via interstate highways, city streets and county roads
- No time lost to loading and transporting with lowboy trailer
- Convenient, productive repositioning from upperstructure cab
- Reliable Freightliner trucks are preferred by many governmental fleets

GRADALL DISCOVERY SERIES

THE GRADALL BOOM...

...carving out a worldwide reputation for versatility. Now available in a high-value, budget-conscious design.

Gradall's legendary boom design efficiently positions attachments to achieve more productivity faster on a wider range of jobs. In effect, you can use just one machine to do the work of a backhoe, crane, grader, excavator and a host of manual laborers.

The entire boom tilts 220° without sacrificing boom power – a common problem with conventional mini excavators using rotating boom-end devices.

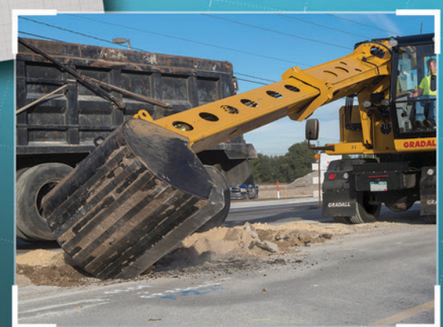
The rugged Gradall Discovery Series excavator has a strong boom with two overlapping sections that telescope out to 25 feet, 6 inches at grade – more reach and range that can be achieved with a tractor loader or mini excavator.

Plus, Discovery Series models benefit from the famous Gradall low-working-profile advantage. That's a low minimum working height that fits neatly under bridges, in tunnels, under trees and signage and into other low-overhead locations.

These are Gradall work sites where conventional digging machines simply cannot fit. Jobs conventional alternatives cannot reach. With travel capabilities that simply don't compare.

GRADALL BOOM MOVEMENTS:

- Full boom tilts 220° for full boom and bucket force power, including reverse bucket functions
- Telescope to 25' 6" at grade
- Swing left and right
- Dig straight down at 60° angles
- Raise up for truck loading and material placement
- Low working profile under bridges, trees and in tunnels



MORE DIG FOR THE DOLLAR

DESIGNED INTO EVERY DETAIL

GRADALL DISCOVERY SERIES

BOOM

- Full boom tilts 220°
- No loss of power to attachment tilting capability
- Rugged 25′ 6″ telescoping boom
- Low working profile under bridges, trees and in tunnels
- Full selection of attachments
- Full-length boom visibility during the entire dig cycle unlike conventional boom
- Bucket capacity up to ¾ yard with 60-inch ditching bucket
- Fast cycle times – ditching, loading and spreading

CHASSIS CAB

- Freightliner cab accommodates a driver and a passenger
- Ergonomically designed interior with extra sound-deadening
- Standard convenience features include an adjustable steering column, electric powered door windows, dual reading lights and radio

EXCAVATOR

- Near-zero tail swing won't obstruct traffic on narrow roads
- Stable, without the need for outriggers
- All new electric remote drive system for positioning the chassis
- No need for second engine

CHASSIS DESIGN

- Reinforced chassis with a modified rear suspension, specifically designed in a collaboration between Gradall and Freightliner engineers
- Travel at highway speeds
- Allison 6-speed automatic transmission
- No need for outriggers
- Up to a 55-degree wheel cut, providing excellent curb-to-curb maneuverability
- Powered by a single Cummins 6.7 liter engine – emission compliant in all 50 states
- Fully supported by Freightliner distribution network

TYPICAL APPLICATIONS:

- Ditching
- Grading
- Culvert replacement
- Landscaping
- Mowing
- Vegetation control
- Curb, gutter, sidewalk replacement and removal

OPERATOR CAB

- Choose the Gradall, Deere or SAE joystick pattern using an in-cab switch
- Quiet, roomy cab with comfortable seating module
- Excellent job site visibility
- Standard air conditioning

ADVANCED SYSTEMS

- Legendary Bosch Rexroth design and reliability
- All new, modern high-pressure hydraulic system is electronically controlled with pressure-compensated, load-sensing valves
- Combined electrical system for chassis and excavator delivers advanced, effective operation

CABS DESIGNED FOR COMFORT AND EFFICIENCY

OPERATOR CAB

- All-electric joystick control system allows the operator to reposition the machine at speeds up to 7 mph
- Gauges and controls for critical functions are easy to read and reach
- High visibility cab has plenty of glass and exterior mirrors to see job site
- Wide doors and conveniently placed grab handles, both inside and out, make cab entry and exit easier
- Standard comfort and convenience features like heating, air conditioning, and a storable front window
- In-cab switch lets operator choose Gradall, Deere or SAE joystick pattern, expediting familiarity
- During repositioning, accelerate and brake with foot pedals

CHASSIS CAB

- Freightliner day cab with air ride driver seat and fixed passenger seat
- Plenty of head and elbow room, wider and taller doors and non-slip steps for easy entry and exit
- Multiple exterior handles
- Ergonomically designed interior has an automotive style flat dash, easy-to-read LED back-lit gauges, easy-to-reach controls
- Standard convenience features including adjustable steering column, electric powered door windows, dual reading lights and radio
- Extensive interior insulation reduces noise and provides protection against the elements
- Excellent air flow throughout cab with advanced heating and air conditioning system
- Large 2,500 square-inch tinted windshield and downward sloping aerodynamic hood offer a clear, wide-open view to the front and sides of the cab

GRADALL DISCOVERY SERIES

Get an even greater RETURN ON YOUR INVESTMENT combining designed-in Gradall versatility with a range of ATTACHMENTS

Governmental entities as well as small and specialty contractors will appreciate their return on investment, thanks to Gradall's famous designed-in versatility and a host of attachments.

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

High-pressure, load-sensing hydraulics adjust automatically to deliver the power you need to handle various jobs while also conserving fuel. Optional auxiliary hydraulics at the boom end further extend the range of available attachments.

TYPICAL ATTACHMENTS:

- Ditching Buckets
- Pavement Removal Bucket
- Excavating Bucket
- Mower
- Grapple
- Tree Limb Shear

GRADALL DISCOVERY SERIES

DISCOVERY SERIES MODEL OPTIONS:

- Set of 5 working lights
- Passenger side door step
- Rear step
- Radio in operator cab
- Auxiliary hydraulics

GRADALL MODEL D-152 4X2 LIFT CAPACITY OVER SIDE OR REAR - LB. (KG)

LOAD POINT HEIGHT		LOAD RADIUS						
		15' (4.6 M)		20' (6.1 M)		MAXIMUM RADIUS		
		OVER END	OVER SIDE	OVER END	OVER SIDE		OVER END	OVER SIDE
ABOVE GROUND LEVEL	19' 7" (6.0 M)					19' 10" (6.1 M)	3000 (1360)	3000 (1360)
	15' (4.6 M)	4985 (2260)	4985 (2260)	3440 (1560)	3440 (1560)	22' 5" (6.8 M)	2935 (1330)	2935 (1330)
	10' (3.0 M)	5805 (2635)	5805 (2635)	3835 (1740)	3835 (1740)	23' 9" (7.2 M)	2940 (1335)	2940 (1335)
	BOOM LEVEL 8' 8" (2.7 M)	5925 (2690)	5925 (2690)	3900 (1770)	3900 (1770)	23' 11" (7.3 M)	2950 (1340)	2950 (1340)
	5' (1.5 M)	5950 (2700)	5950 (2700)	3950 (1790)	3950 (1790)	23' 11" (7.3 M)	2990 (1355)	2990 (1355)
AT GROUND LEVEL		5225 (2370)	5225 (2370)	3710 (1685)	3710 (1685)	23' 0" (7.0 M)	3055 (1385)	3055 (1385)
BELOW GROUND LEVEL	5' (1.5 M)	4120 (1870)	4120 (1870)	3220 (1460)	3220 (1460)	20' 9" (6.3 M)	3095 (1405)	3095 (1405)
	10' (3.0 M)	3075 (1395)	3075 (1395)			16' 7" (5.1 M)	2965 (1345)	2965 (1345)
	14.3' (4.4 M)					14' 8" (4.5 M)	2795 (1270)	2795 (1270)

PRELIMINARY

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.

The rated lift capacity is based on the machine being equipped with 4,500 lb (2,040 kg) counterweight, standard boom, standard tires, no auxiliary hydraulics, and no bucket. Adjust the listed rated capacities by subtracting the value for bucket/attachment used:

8210-6011 60" (1.5 m)	Ditching -	639 lbs (290 kg)
8210-6029 36" (914 mm)	Excavating -	685 lbs (311 kg)

The load point is located on the bucket pivot point, including load listed for maximum radius.

Do not attempt to lift or hold any load greater than these rated values at specified load radii and heights. The weight of slings and any auxiliary devices must be deducted from the rated load to determine the net load that may be lifted.

ATTENTION: All rated loads are based on the machine being stationary and level on a firm supporting surface. For safe working loads, the user must make allowance for his particular job conditions such as soft or uneven ground, out of level conditions, side loads, hazardous conditions, experience of personnel, etc. The operator and other personnel must fully acquaint themselves with the Operator's Manual furnished by the manufacturer before operating this machine. Rules for safe operation of equipment must be adhered to at all times.

NOTE: Bucket adjustment values are 87% of the actual bucket weights.

SPECIFICATIONS

UNDERCARRIAGE

4 x 2 or 4 x 4
Wheelbase: 180" (4.57 m)
Width 102" (2.6 m)

Gross vehicle axle weight rating:
4 x 2 33,000 lb (15.0 kg)
4 x 4 33,000 lb (15.0 kg)

Front axles:
4 x 2 12,000 lb (5,443 kg) rating
4 x 4 12,000 lb (5,443 kg) rating, 6.14 ratio

Rear axle:
23,000 lb (10,433 kg) rating 6.14 ratio, single reduction with driver controlled differential lock.

Suspension:
Front: leaf springs with automatic lock-out cylinders.
Rear: Solid mount.

Brakes:
4 x 2 Front: Meritor "Q" Series Cam-Master. Size: 16.5" x 5" (419 mm x 127 mm). Automatic Slack Adjusters.

4 x 4 Front: Meritor "Q" Series Cam-Master. Size: 16.5" x 6" (419 mm x 153 mm). Automatic Slack Adjusters.

4 x 4 Rear and 4 x 2 Rear: Meritor "P" Series Cam-Master. Size: 16.5" x 7" (419 mm x 178 mm). Automatic Slack Adjusters.

Spring brake system incorporates emergency and parking brakes on the rear axle.

Wheels:
Hub piloted disc 10-stud, 11.25" (286 mm) bolt circle.

Tires:
4 x 2 Front and 4 x 2 Rear: 275/80R22.5 14-ply highway traction tread.

Steering:
Integral hydraulic power steering.

Standard chassis equipment:
Halogen headlights, tail lights, back-up lights and alarm, stoplights, identification lights front and rear, directional lights, 4-way hazard lights, work lights, and instrument panel lights. Windshield wiper/washer, West Coast style mirror system with plane and convex mirrors, front and rear tow hooks, desiccant type air dryer with automatic purge valve and thermostatically controlled heater.

HYDRAULIC SYSTEM

PUMPS

One load-sensing bent axis piston pump; 8-55 GPM (30-208 L/min) total.

SYSTEM SPECIFICATIONS

Four double acting cylinders:

- 2 hoist cylinders: 3.25" bore x 2.25"rod x 28.5" stroke (83 mm x 57 mm x 724 mm).
- 1 tool cylinder: 4.5" bore x 2.5" rod x 18.88 stroke (114 mm x 63.5 mm x 479 mm).
- 1 boom cylinder: 3.25" bore x 2.25" rod x 123" stoke (83 mm x 57 mm x 31.24 mm).

Two hydraulic motors:
Swing, 51 Hp (38kW); tilt, 21 Hp (16kW).

Operating pressures:

Hoist	4,300 psi	(296 BAR)
Tilt	2,500 psi	(172 BAR)
Swing	4,000 psi	(275 BAR)
Tool	4,300 psi	(296 BAR)
Telescope	4,300 psi	(296 BAR)
Pilot system	550 psi	(38 BAR)

Oil capacity:
Reservoir 54 gallons (204 L), system 62 gallons (235 L). Pressurized reservoir with visual oil level gauge.

Filtration system:
5 micron return filter with magnet. 10 micron pilot filter.

Fin and tube-type oil cooler with thermostatically controlled cooling fan.

Pressure-compensated, load-sensing valves with circuit reliefs in all circuits.

CHASSIS CAB

Two-person cab. Sun visor. Gauges for oil pressure, coolant temperature, air tank pressures, fuel level, DEF level, voltmeter, speedometer with odometer, tachometer, hour meter. Engine and transmission monitor lights. Engine shutdown controlled by engine electronics. Indicator lights and controls for front axle engagement (4 x 4 only) and rear axle differential lock. Park brake control. Tinted safety glass. Sliding side windows. Fresh air heater and defroster. Dome light. Air suspension seat with seat belt. Vent in door.

UPPERSTRUCTURE CAB

All-weather cab isolated from frame on rubber mounts. Tinted safety glass windows, skylight, acoustical lining, four-way adjustable operator's seat, dome light, filtered air heater and defroster. AM/FM Radio, Air-Conditioning, work light package.

The heat source is provided by a fast response, closed circuit hydraulic heater with 20,000 BTU/Hr. capacity.

Front window slides to overhead storage. Rear view mirrors on right and left sides of the machine. Windshield wiper and washer.

HYDRAULIC REMOTE CONTROL

Upperstructure powered by chassis hydraulics through PTO. Travel and steering pedals in upperstructure cab. Digging brakes and front axle lockout cylinders set automatically with travel pedal in neutral. Parking brakes controlled by toggle.

Electrically operated alarm mounted on undercarriage signals remote control movement in either direction, reverse movement when driven from undercarriage cab.

ENGINE

Cummins

Air Filter: 2-stage dry type with safety element, ejector valve and service indicator.

Electrical System: 12 volt, 160 amp alternator with integral voltage regulator. 2 SAE Group 31 1900 CCA batteries.

Fuel Tank Capacity: 90 gal (378 L)

Area Tank Capacity: 13 gal (49 L)

Transmission: Allison 3500 RDS automatic.

Gear Speeds: (with 80R22.5 tires)

Gear	1	2	3	4	5
MPH	9.6	19.5	28.5	43.9	58.5
Km/hr	(15.4)	(31.4)	(45.9)	(70.7)	(94.1)

Gear	REV
MPH	8.8
Km/hr	(14.2)

Drivelines: Spicer 1710 Series with "Half Round" yokes.

UPPERSTRUCTURE CONTROLS

Two electronic joysticks (hoist & bucket, telescope & swing), one rocker switch (tilt) control. Joysticks are mounted on arm pods that are adjustable for individual operator comfort and convenience. Quick change joystick pattern switch located on instrument panel.

Two foot pedals for remote control of undercarriage travel and brakes. Steering is handled with a rocker switch on top of the left hand joystick.

Joysticks and pedals are self-centering; when controls are released, power for movement disengages and swing and travel brakes set automatically.

Engine Controls
Key ignition switch with neutral start and indicator lights for low air, engine status, park brake, travel status, hydraulic fluid temperature and level.

Automatic engine shut down occurs with low oil pressure or high coolant temperature.

SWING

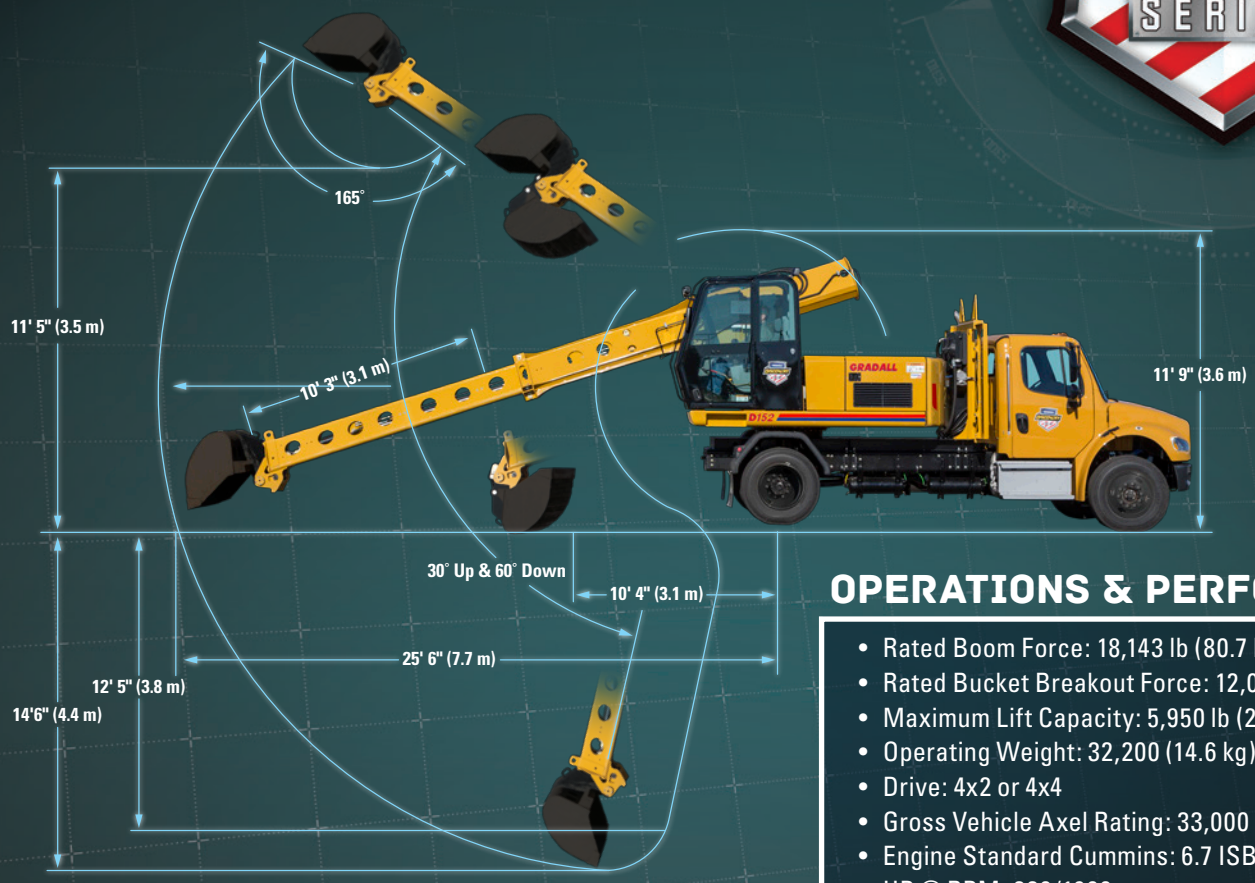
Priority swing circuit with axial piston motor. Planetary transmission. Swing speed: 8 rpm.

Swing brake: Automatic spring-set/hydraulic release wet disc parking brake. Dynamic braking is provided by the hydraulic system.

Both Gradall and Freightliner maintain extensive distribution networks designed to help governments and contractors receive the full value in their Discovery Series equipment investment.

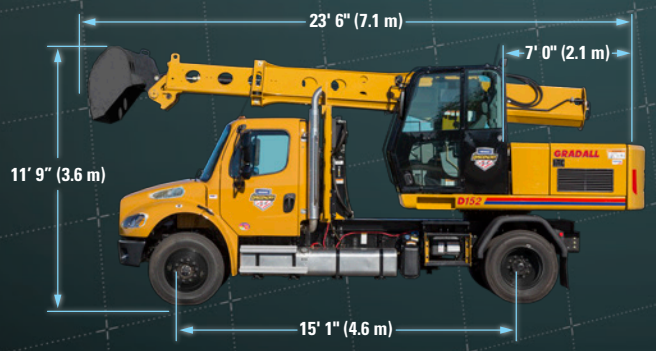
With combined experience of well over 100 years, Gradall and Freightliner are proud of their reputations for helping machine owners get the quality service and authorized parts support they want and need. Dedicated factory support systems assure full productivity and long machine life.

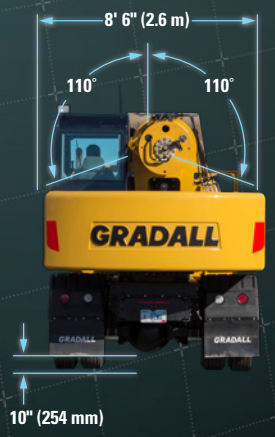
GRADALL DISCOVERY SERIES



OPERATIONS & PERFORMANCE

- Rated Boom Force: 18,143 lb (80.7 kN)
- Rated Bucket Breakout Force: 12,000 lb (53.4 kN)
- Maximum Lift Capacity: 5,950 lb (2,700 kg)
- Operating Weight: 32,200 (14.6 kg)
- Drive: 4x2 or 4x4
- Gross Vehicle Axel Rating: 33,000 lb (15.0 kg)
- Engine Standard Cummins: 6.7 ISB
- HP @ RPM: 220/1900
- Travel Speed - MPH: 55 mph (88.5 kph)





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