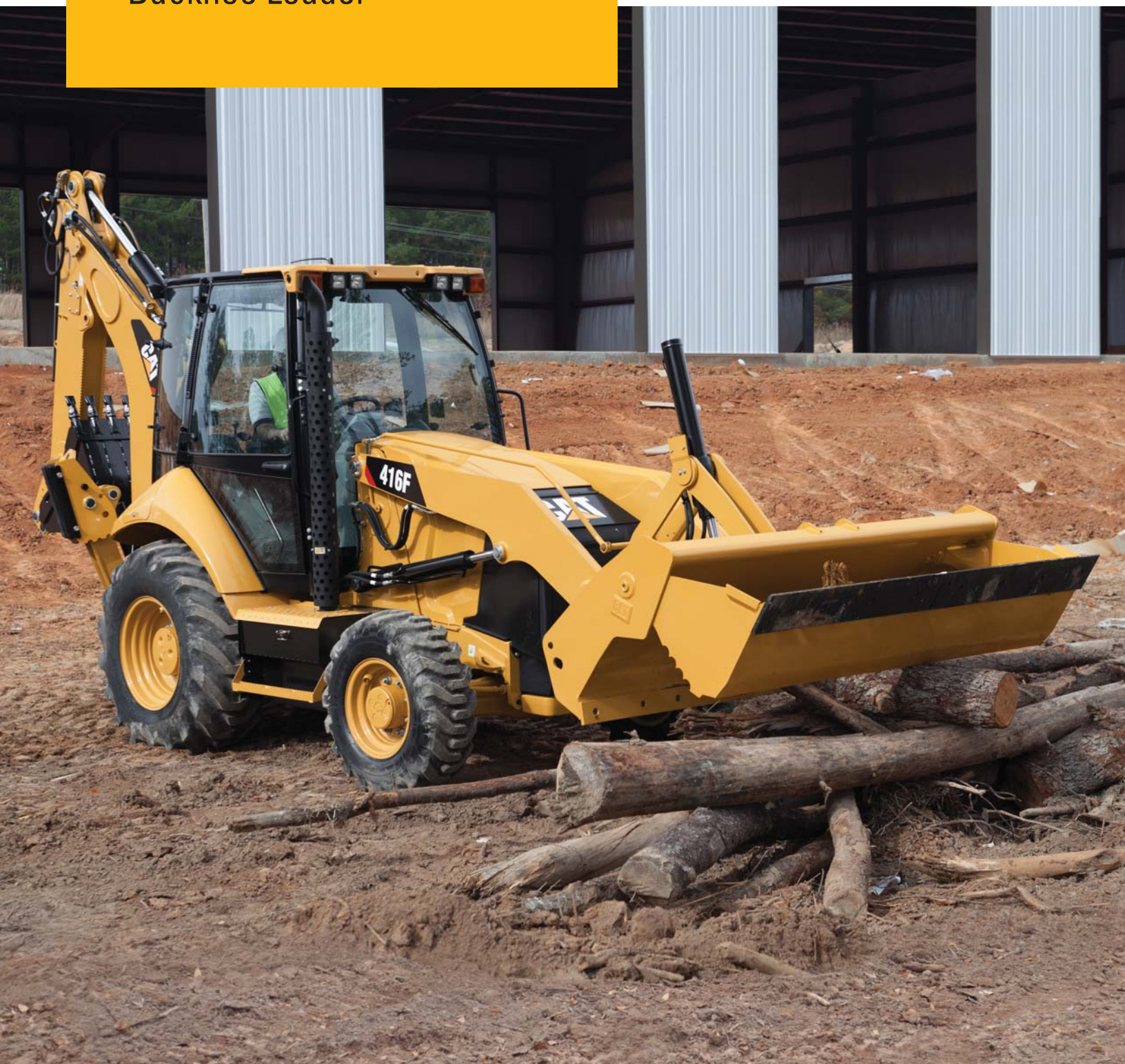


416F

Backhoe Loader



Engine

Engine Model	Cat® C4.4 ACERT™	
Rated Net Power – SAE J1349	65 kW	87 hp
Rated Net Power – ISO 9249	66 kW	88 hp

Weights

Operating Weight – Nominal	6783 kg	14,953 lb
Operating Weight – Maximum	11 000 kg	24,251 lb

Backhoe

Dig Depth – Standard	4360 mm	14'4"
Dig Depth – E-Stick Extended	5441 mm	17'11"

Engine

Engine Model	Cat C4.4 ACERT	
Gross Power		
SAE J1995	72 kW	97 hp
ISO 14396	70 kW	94 hp
Rated Net Power @ 2,200 rpm		
SAE J1349	65 kW	87 hp
ISO 9249	66 kW	88 hp
EEC 80/1269	66 kW	88 hp
Net Peak Power @ 1,800 rpm		
SAE J1349	67 kW	90 hp
ISO 9249	68 kW	91 hp
EEC 80/1269	68 kW	91 hp
Bore	105 mm	4.13 in
Stroke	127 mm	5 in
Displacement	4.4 L	268 in ³
Net Torque Rise @ 1,400 rpm – SAE J1349	37%	
Net Peak Torque @ 1,400 rpm	390 N·m	288 lb-ft

- Engine meets U.S. EPA Tier 4 Interim/EU Stage IIIB emission standards.

Weights*

Operating Weight – Nominal	6783 kg	14,953 lb
Operating Weight – Maximum	11 000 kg	24,251 lb
Cab, ROPS/FOPS	167 kg	368 lb
Air Conditioning	26 kg	57 lb
Four Wheel Drive	180 kg	397 lb
MP Bucket (0.96 m ³ /1.25 yd ³) (no forks or teeth)	745 kg	1,642 lb
Extendible Stick	301 kg	664 lb
Counterweights (Option 1)	115 kg	255 lb
Counterweights (Option 2)	240 kg	530 lb
Counterweights (Option 3)	460 kg	1,015 lb

* Specifications shown are for machine equipped with 0.76 m³ (1.0 yd³) general purpose loader bucket, 610 mm (24 in) heavy duty backhoe bucket, 115 kg (255 lb) counterweight, 80 kg (176 lb) operator and full fuel tank.

Transmission

Power Shuttle Transmission – Standard

Forward – 1st	6 km/h	3.7 mph
Forward – 2nd	9.6 km/h	5.9 mph
Forward – 3rd	20 km/h	12 mph
Forward – 4th	40 km/h	25 mph
Reverse – 1st	6 km/h	3.7 mph
Reverse – 2nd	9.6 km/h	5.9 mph
Reverse – 3rd	20 km/h	12 mph
Reverse – 4th	40 km/h	25 mph

Axle Ratings

Front Axle, 2WD

Static	22 964 kg	50,582 lb
Dynamic	9186 kg	20,233 lb

Front Axle, 4WD

Static	22 964 kg	50,582 lb
Dynamic	9186 kg	20,233 lb

Rear Axle

Static	22 964 kg	50,582 lb
Dynamic	9186 kg	20,233 lb

Hydraulic System

Type	Closed Center	
Pump Type	Variable Flow, Axial Piston	
Pump Capacity @ 2,200 rpm	132 L/min	35 gal/min
System Pressure – Backhoe	23 000 kPa	3,300 psi
System Pressure – Loader	23 000 kPa	3,300 psi

Steering

Type	Front Wheel	
Power Steering	Hydrostatic	
Bore	65 mm	2.6 in
Stroke	120 mm	4.7 in
Rod Diameter	36 mm	1.4 in
Axle Oscillation	11°	
Turning Circle – 2WD/4WD (inner wheel not braked)		
Outside, Front Wheels	8.18 m	26'10"
Outside, Widest Loading Bucket	10.97 m	36'0"

416F Specifications

Service Refill Capacities

Cooling System with Air Conditioning	22 L	5.8 gal
Fuel Tank	165 L	44 gal
Engine Oil with Filter	8.8 L	2.3 gal
Transmission – Power Shuttle		
2WD	18.5 L	4.9 gal
4WD	18.5 L	4.9 gal
Rear Axle	16.5 L	4.4 gal
Planetaries	1.7 L	0.4 gal
Front Axle (4WD)	11.0 L	2.9 gal
Planetaries	0.7 L	0.2 gal
Hydraulic System	90.0 L	23.8 gal
Hydraulic Tank	40.0 L	10.6 gal

- Requires ultra-low sulfur fuel ≤ 15 ppm fuel sulfur.

Tires

Choices listed as combination of front/rear tires:

- 11L-16 (12 ply) F-3/19.5L-24 (12 ply) R4 ATU
- 12.5/80-18 (12 ply) 1-3/19.5L-24 (12 ply) ATU
- 12.5/80-18 NHS (12 ply) 1-3/21L-24 (16 ply) R4 ATU
- 340/80R 18/19.5L-24 (12 ply) R4 ATU

Operating Specifications – Backhoe

Turning Circle: Outside, Front Wheels	8.18 m	26'10"
Turning Circle: Outside, Widest Loading Bucket	10.97 m	36'0"

- ISO 5010.
- 2WD, 4WD (inner wheel not braked).

Engine Features

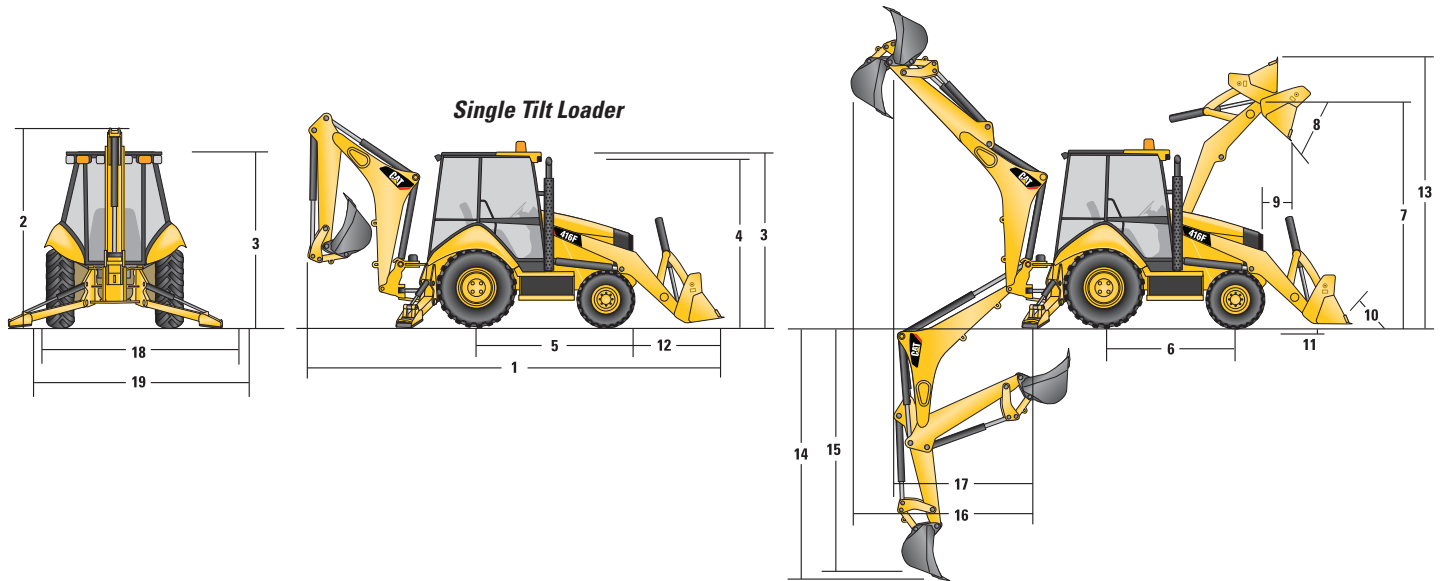
- Regeneration is passive and does not require any input from the operator or disrupt work.
- Three-ring pistons made of lightweight, silicon/aluminum alloy for strength and maximum thermal conductivity.
- Forged chrome/molybdenum-steel crankshaft with salt bath nitrocarburized pins and journals.
- Front and rear crankshaft oil seals are “lip” type Viton and PTFE designs featuring an integral dust lip.
- For durability, inlet valves are nitrided, martensitic chrome silicon steel, while exhaust valves are nitrided, austenitic chrome manganese-nickel steel.
- Cylinder block is high strength, cast iron alloy of deep skirt, monobloc design for increased strength and long life.
- Cylinder head is high strength, cast iron alloy construction with extra duty wall and deck thickness. Intake and exhaust ports are precision cast to promote optimum gas flow.
- Direct injection fuel system provides accurate fuel delivery and efficiency.
- Dry-type axial seal air cleaner with integral precleaner, automatic dust ejection system, and filter condition indicator.
- Direct electric, 12-volt starting and charging system with 880 CCA Group 31 maintenance free battery.
- Standard glow plug starting aid system for efficient cold weather starting.
- High contact ratio/gear train, peripheral fixed isolation top cover and open deck block design reduce bare engine noise.
- Higher low end torque for better engine/machine performance.
- Engine is equipped with electric fuel priming pump.

Brakes

Features:

- Brakes meet the following standards: SAE J1473 and ISO 3450 requirements.
- Self-adjusting, completely enclosed and sealed.
- Foot operated brake pedals can be interlocked for roading.
- Parking/secondary brakes are independent of the service brake system. Parking brake is mechanically applied through an adjustable hand lever located on the right console.

Machine Dimensions



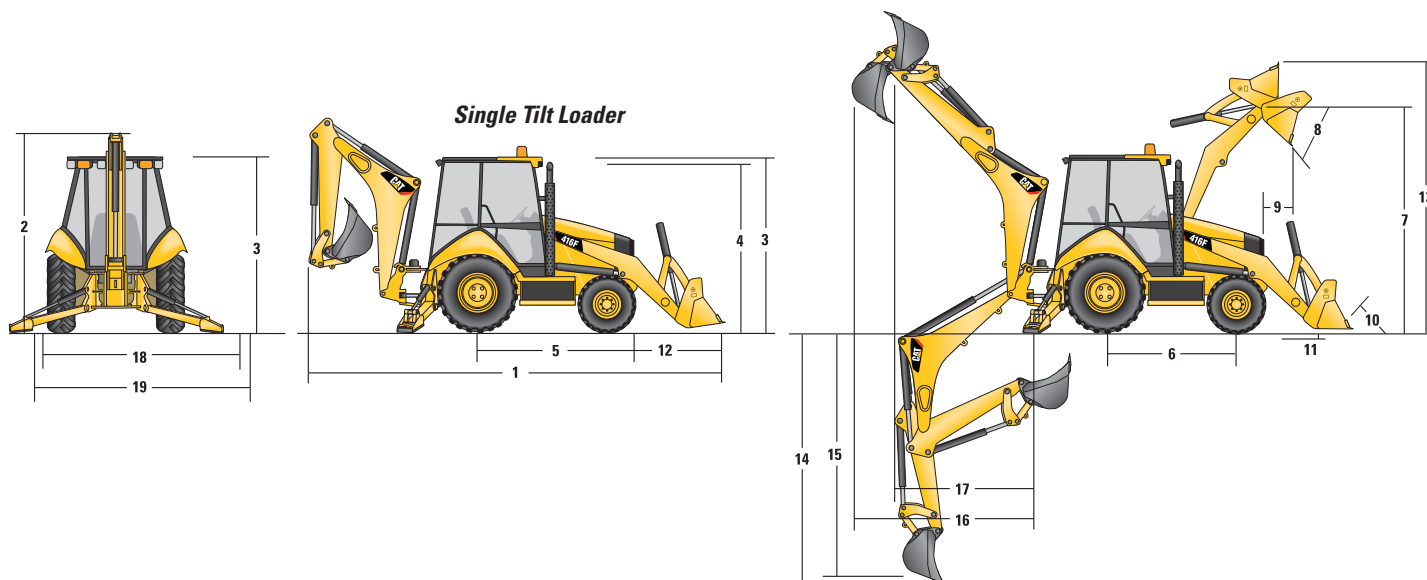
Single Tilt Loader

	General Purpose (0.76 m ³ /1.00 yd ³)		General Purpose (0.96 m ³ /1.25 yd ³)		Multi Purpose (1.00 m ³ /1.31 yd ³)		Multi Purpose with Forks (1.00 m ³ /1.31 yd ³)	
1 Overall Transport Length	7085 mm	23'3"	7168 mm	23'6"	7132 mm	23'5"	7132 mm	23'5"
Overall Length (loader on ground)	7027 mm	23'1"	7140 mm	23'5"	7057 mm	23'2"	7057 mm	23'2"
2 Overall Transport Height – Standard Stick	3577 mm	11'9"	3577 mm	11'9"	3577 mm	11'9"	3577 mm	11'9"
Overall Transport Height – Extendible Stick	3631 mm	11'11"	3631 mm	11'11"	3631 mm	11'11"	3631 mm	11'11"
Overall Width	2322 mm	7'7"	2322 mm	7'7"	2322 mm	7'7"	2322 mm	7'7"
3 Height to Top of Cab/Canopy	2819 mm	9'3"	2819 mm	9'3"	2819 mm	9'3"	2819 mm	9'3"
4 Height to Top of Exhaust Stack	2744 mm	9'0"	2744 mm	9'0"	2744 mm	9'0"	2744 mm	9'0"
Height to Loader Hinge Pin (transport)	381 mm	1'3"	381 mm	1'3"	432 mm	1'5"	432 mm	1'5"
Ground Clearance (minimum)	320 mm	1'1"	320 mm	1'1"	320 mm	1'1"	320 mm	1'1"
5 Rear Axle Centerline to Front Grill	2705 mm	8'10"	2705 mm	8'10"	2705 mm	8'10"	2705 mm	8'10"
Front Wheel Tread Gauge	1895 mm	6'3"	1895 mm	6'3"	1895 mm	6'3"	1895 mm	6'3"
Rear Wheel Tread Gauge	1714 mm	5'7"	1714 mm	5'7"	1714 mm	5'7"	1714 mm	5'7"
6 Wheelbase 2WD/AWD	2200 mm	7'3"	2200 mm	7'3"	2200 mm	7'3"	2200 mm	7'3"

Dimensions and performance specifications shown are for machines equipped with 12.5/80-18 SGL front tires, 19.5L-24 IT525 rear tires, ROPS canopy, standard stick with 610 mm (24 in) standard duty bucket, 0.76 m³ (1.00 yd³) loader bucket and standard equipment unless otherwise specified.

416F Specifications

Loader Bucket Dimensions and Performance

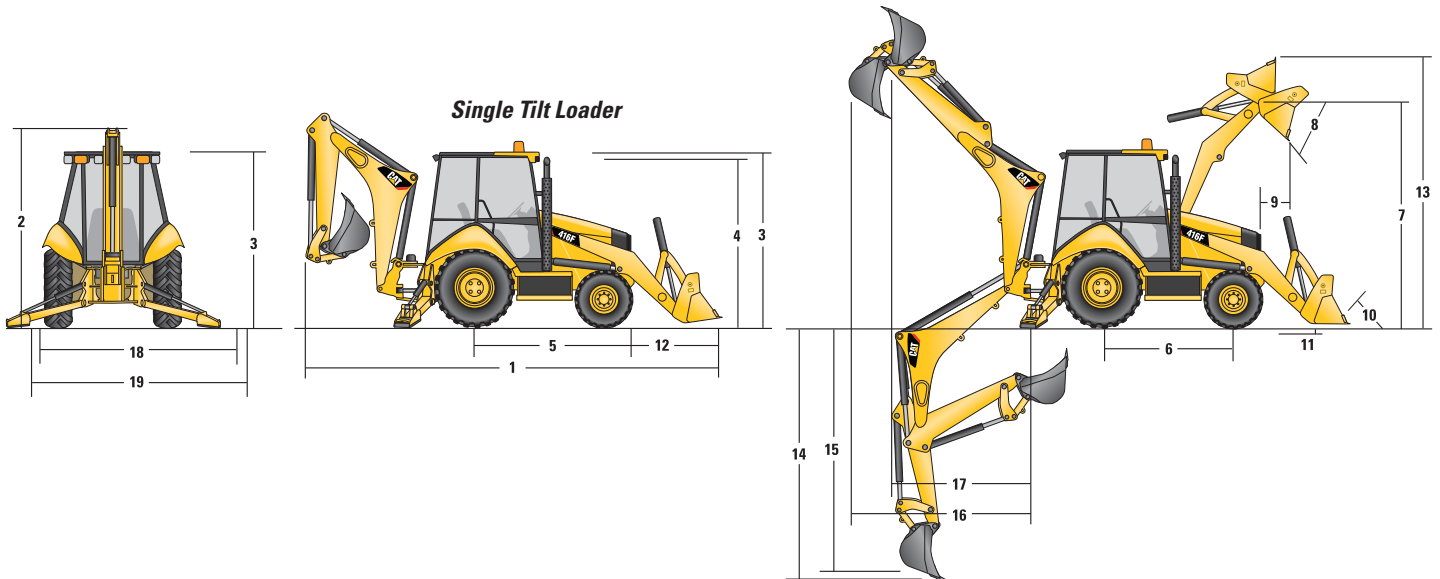


Single Tilt Loader

	General Purpose (0.76 m ³ /1.00 yd ³)		General Purpose (0.96 m ³ /1.25 yd ³)		Multi Purpose (1.00 m ³ /1.31 yd ³)		Multi Purpose with Forks (1.00 m ³ /1.31 yd ³)	
Capacity (SAE rated)	0.76 m ³	1.00 yd ³	0.96 m ³	1.25 yd ³	1.00 m ³	1.31 yd ³	1.00 m ³	1.31 yd ³
Overall Bucket Width	2262 mm	89"	2262 mm	89"	2279 mm	90"	2279 mm	90"
Lift Capacity at Maximum Height	3062 kg	6,751 lb	2964 kg	6,535 lb	2771 kg	6,108 lb	2656 kg	5,855 lb
Lift Breakout Force	47 919 N	10,772 lb	45 326 N	10,189 lb	44 392 N	9,979 lb	42 904 N	9,645 lb
Tilt Breakout Force	54 629 N	12,281 lb	45 993 N	10,339 lb	52 674 N	11,841 lb	51 760 N	11,636 lb
7 Maximum Hinge Pin Height	3474 mm	11'5"	3474 mm	11'5"	3474 mm	11'5"	3474 mm	11'5"
8 Dump Angle at Full Height	44°		44°		44°		44°	
Dump Height at Maximum Angle	2824 mm	9'3"	2746 mm	9'0"	2798 mm	9'2"	2798 mm	9'2"
9 Dump Reach at Maximum Angle	727 mm	2'5"	808 mm	2'8"	716 mm	2'4"	716 mm	2'4"
10 Maximum Bucket Rollback at Ground Level	37°		37°		38°		38°	
11 Digging Depth	83 mm	3"	83 mm	3"	110 mm	4"	110 mm	4"
Maximum Grading Angle	116°		112°		116°		116°	
Width of Dozer Cutting Edge	N/A		N/A		2262 mm	7'5"	2262 mm	7'5"
12 Grill to Bucket Cutting Edge, Carry Position	1404 mm	4'7"	1487 mm	4'11"	1451 mm	4'9"	1451 mm	4'9"
13 Maximum Operating Height	4206 mm	13'10"	4355 mm	14'3"	4404 mm	14'5"	4878 mm	16'0"
Jaw Opening Maximum	N/A		N/A		790 mm	2'7"	790 mm	2'7"
Bucket Jaw Clamping Force	N/A		N/A		50 600 N	11,375 lb	50 600 N	11,375 lb
Weight (does not include teeth or forks)	384 kg	847 lb	451 kg	994 lb	745 kg	1,642 lb	915 kg	2,017 lb

Dimensions and performance specifications shown are for machines equipped with 12.5/80-18 SGL front tires, 19.5L-24 IT525 rear tires, ROPS canopy, standard stick with 610 mm (24 in) standard duty bucket, 0.76 m³ (1.00 yd³) loader bucket and standard equipment unless otherwise specified.

Backhoe Dimensions and Performance



	Standard Stick		E-Stick Retracted		E-Stick Extended	
14 Digging Depth, SAE (maximum)	4360 mm	14'4"	4389 mm	14'5"	5441 mm	17'11"
15 Digging Depth, 610 mm (2 ft) Flat Bottom	4309 mm	14'2"	4350 mm	14'4"	5404 mm	17'10"
Reach from Rear Axle Centerline at Ground Line	6702 mm	22'1"	6738 mm	22'2"	7742 mm	25'6"
16 Reach from Swing Pivot at Ground Line	5612 mm	18'5"	5648 mm	18'7"	6652 mm	21'10"
Maximum Operating Height	5525 mm	18'2"	5549 mm	18'3"	6286 mm	20'8"
Loading Height	3643 mm	11'11"	3600 mm	11'9"	4170 mm	13'7"
17 Loading Reach	1838 mm	6'0"	1925 mm	6'4"	2840 mm	9'4"
Swing Arc	108°		108°		108°	
Bucket Rotation	205°		205°		205°	
18 Stabilizer Spread, Operating Position (center)	3310 mm	10'10"	3310 mm	10'10"	3310 mm	10'10"
Stabilizer Spread, Operating Position (outside)	3770 mm	12'4"	3770 mm	12'4"	3770 mm	12'4"
Stabilizer Spread, Transport Position	2322 mm	7'7"	2322 mm	7'7"	2322 mm	7'7"
Bucket Dig Force	57 709 N	12,973 lb	56 898 N	12,791 lb	56 898 N	12,791 lb
Stick Dig Force	32 378 N	7,279 lb	32 421 N	7,289 lb	23 796 N	5,350 lb

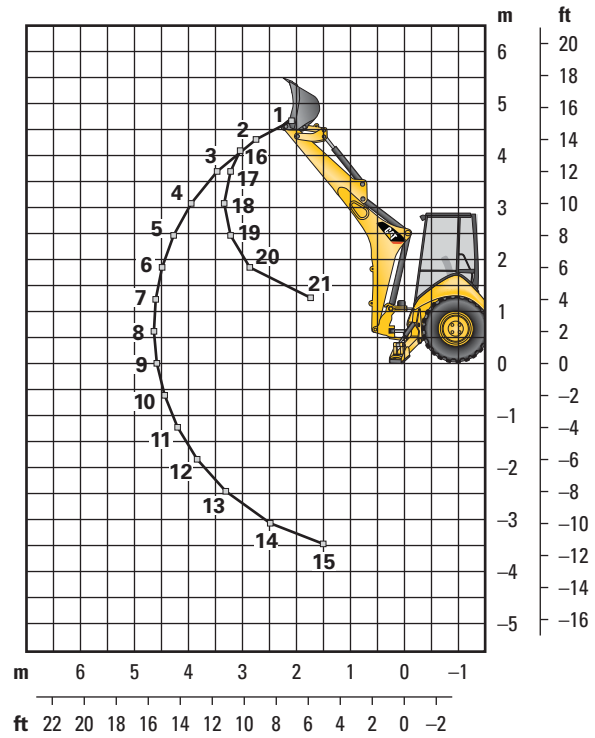
Dimensions and performance specifications shown are for machines equipped with 12.5/80-18 SGL front tires, 19.5L-24 IT525 rear tires, ROPS canopy, standard stick with 610 mm (24 in) standard duty bucket, 0.76 m³ (1.00 yd³) loader bucket and standard equipment unless otherwise specified.

416F Specifications

Backhoe Lift Capacity

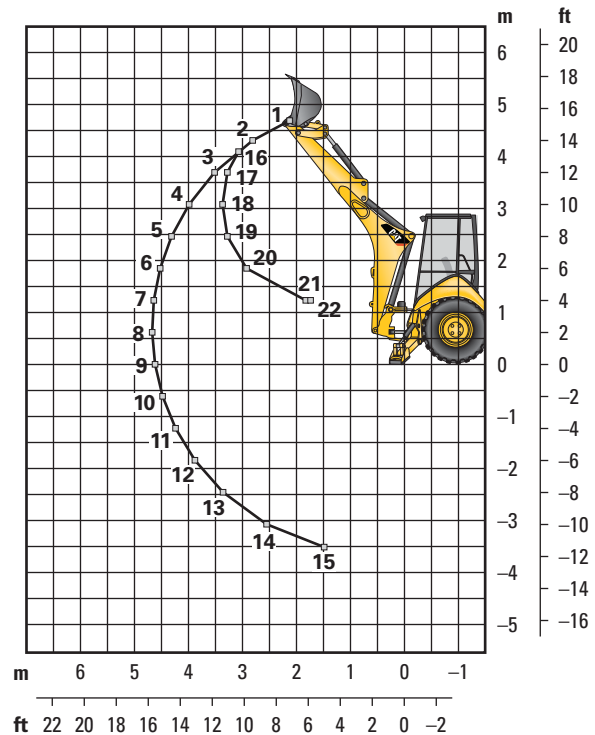
Cat 416F Standard Stick

Boom Lifting		kg	lb
1		1295	2,848
2		1408	3,097
3		1417	3,117
4		1376	3,027
5		1323	2,911
6		1268	2,790
7		1215	2,673
8		1165	2,562
9		1118	2,459
10		1075	2,364
11		1036	2,279
12		1002	2,204
13		977	2,149
14		974	2,143
15		1067	2,348
Stick Lifting		kg	lb
16		1311	2,884
17		1848	4,066
18		2306	5,072
19		2397	5,274
20		2787	6,130
21		5556	12,223



Cat 416F Extendible Stick – Retracted

Boom Lifting		kg	lb
1		1116	2,455
2		1214	2,672
3		1213	2,669
4		1168	2,570
5		1113	2,449
6		1056	2,324
7		1001	2,203
8		949	2,088
9		900	1,981
10		855	1,881
11		813	1,788
12		775	1,705
13		742	1,633
14		724	1,592
15		776	1,707
Stick Lifting		kg	lb
16		1168	2,570
17		1693	3,724
18		2107	4,635
19		2183	4,803
20		2533	5,573
21		4985	10,967
22		5331	11,729

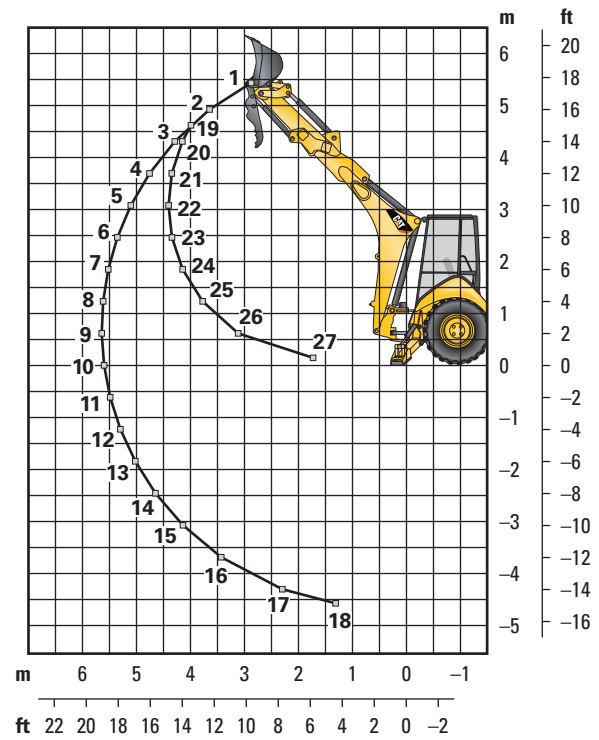


Lift Capacities are over-end values. Machine equipped with 4WD, OROPS, 0.76 m³ (1.00 yd³) general purpose bucket and 116 kg (255 lb) counterweight. Extendible stick includes 460 kg (1,015 lb) counterweight.

Backhoe Lift Capacity

Cat 416F Extendible Stick – Extended

Boom Lifting		kg	lb
1		615	1,353
2		749	1,648
3		796	1,752
4		803	1,766
5		792	1,742
6		768	1,689
7		751	1,652
8		727	1,600
9		703	1,547
10		680	1,497
11		659	1,449
12		639	1,405
13		622	1,368
14		609	1,340
15		604	1,329
16		616	1,355
17		705	1,550
18		1042	2,293
Stick Lifting		kg	lb
19		550	1,209
20		733	1,613
21		985	2,166
22		1159	2,551
23		1305	2,870
24		1458	3,207
25		1676	3,688
26		2189	4,816
27		5303	11,666



Lift Capacities are over-end values. Machine equipped with 4WD, OROPS, 0.76 m³ (1.00 yd³) general purpose bucket and 116 kg (255 lb) counterweight. Extendible stick includes 460 kg (1,015 lb) counterweight.

416F Specifications

Counterweights

Minimum Counterweight Recommendations

Standard Stick

Loader Bucket	Power Train	kg	lb
GP	2WD	240	530
GP	4WD	115	255
MP	2WD/4WD	no counterweight	

Extendible Stick

Loader Bucket	Power Train	kg	lb
GP	2WD/4WD	460	1,015
GP	2WD	240	530
MP	4WD	115	255

Backhoe Buckets

With weld on adapters and pin-on teeth

Standard Duty

Width		Rated Capacity		Weight		No. of Teeth
mm	in	L	ft³	kg	lb	
305	12	80	2.8	111	245	3
457	18	120	4.2	122	268	4
610	24	180	6.2	141	291	5
762	30	230	8.1	157	345	5
914	36	290	10.2	176	388	6

Heavy Duty

Width		Rated Capacity		Weight		No. of Teeth
mm	in	L	ft³	kg	lb	
305	12	80	2.8	121	266	3
406	16	110	3.9	128	282	3
457	18	120	4.2	135	299	4
610	24	180	6.2	151	333	5
762	30	230	8.1	177	391	5
914	36	290	10.2	201	443	6

Soil Excavation

Width		Rated Capacity		Weight		No. of Teeth
mm	in	L	ft³	kg	lb	
457	18	180	6.4	155	341	4
610	24	240	8.5	182	402	5
762	30	320	11.3	206	454	5
914	36	380	13.4	233	513	6

Heavy Duty Rock

Width		Rated Capacity		Weight		No. of Teeth
mm	in	L	ft³	kg	lb	
305	12	70	2.5	127	279	3
457	18	130	4.6	146	322	4
610	24	200	7.0	174	381	5
762	30	270	9.5	197	434	5
914	36	330	11.7	224	493	6

Coral

Width		Rated Capacity		Weight		No. of Teeth
mm	in	L	ft³	kg	lb	
305	12	60	2.1	134	295	4
457	18	100	3.5	155	341	6
610	24	140	4.9	182	402	8
762	30	190	6.7	210	463	10

Heavy Duty – Pin Lock

Width		Rated Capacity		Weight		No. of Teeth
mm	in	L	ft³	kg	lb	
305	12	96	3.4	113	249	3
406	16	123	4.3	131	288	3
457	18	139	4.9	139	307	4
610	24	207	7.3	168	370	5
762	30	275	9.7	194	428	5
914	36	345	12.2	224	494	6

High Capacity – Pin Lock

Width		Rated Capacity		Weight		No. of Teeth
mm	in	L	ft³	kg	lb	
305	12	96	4.6	113	287	3
406	16	123	5.6	131	327	3
457	18	139	6.5	139	346	4
610	24	207	9.6	168	414	5
762	30	275	12.9	194	475	5
914	36	345	16.2	224	543	6

Standard Equipment

Standard equipment may vary. Consult your Cat dealer for details.

- Air cleaner
- Alarm, back-up
- Alternator, 150 amp
- Audible system fault alarm
- Backhoe position footrest
- Battery, maintenance-free, 880 CCA
- Battery disconnect switch
- Battery remote jumpstart
- Boom transport lock
- Brace, lift cylinder
- Brake, secondary parking
- Brakes, hydraulically boosted, oil disc, dual pedals, interlocking
- Bucket level indicator
- Canopy, ROPS/FOPS
- Coat hook
- Coolant/antifreeze, extended life
- Counterweight, bumper
- Diesel particulate filter, long life
- Dome light (cab only)
- Diagnostic port for engine
- Differential lock
- Engine, Cat C4.4 ACERT (Direct Injection Turbocharged), meets U.S. EPA Tier 4 Interim/EU Stage IIIB emission standards
- Engine enclosure
- Fan, suction and guard
- Fast reversing shuttle, all gears
- Fenders, rear
- Filters, spin-on: fuel, engine oil, transmission oil, water separator
- Filters, bowl and cartridge: hydraulic fluid
- Floor mat
- Flow-sharing hydraulic valves
- Fuel priming pump, electric
- Fully hinged front grill for cooling package cleaning access
- Ground level fuel fill
- Guard, fuel tank bottom
- Hazard flashers/turn signals
- High ambient cooling package
- Hood lock
- Hydraulic hose, XT™
- Hydraulic oil cooler
- Hydraulic oil level sight gauge
- Hydraulic valve, hydrostatic steering
- Hydraulic valves, loader 2 function
- Hydraulic valves, backhoe 4 function
- Hydraulics, load sensing with variable displacement piston pump
- Indicators: air cleaner service, water separator service, engine coolant, oil pressure, torque converter temperature high, fuel level, charging, engine warning #1, engine warning #2, action lamp, wait-to-start
- Instrument panel lights
- Key start/stop system
- Lights, working (2 front, 2 rear)
- Load sensing, variable flow system
- Loader, self-leveling, return-to-dig and transmission disconnect switch
- Loader, single tilt
- Lunch box and drink holder
- Mirror, rearview
- Open circuit breather
- O-ring face seal hydraulic fittings
- Power receptacle, 12 volt, 2 internal, 1 external
- Power steering, hydrostatic
- Premium Gauge Cluster:
 - Gauges: coolant temperature, fuel level, tachometer
 - LCD screen: hour meter, torque converter oil temperature, operator settings, service mode diagnostics
- Seat belt, retractable, 51 mm (2 in)
- Stabilizer shoes, street
- Steering knob
- Seat, air suspension, fabric or vinyl cover, with armrest
- Starting system, glow plugs
- Steering, hydrostatic
- Storage compartment, internal
- Stop and tail lights
- Swing transport lock
- Tires
- Toolbox, external, lockable
- Torque converter
- Throttle, hand and foot, electronic
- Transmission, four speed, syncromesh
- Transmission neutralizer switch
- Transport tie-downs
- Two Wheel Drive
- Vandalism locks
- Warning horn, electric

416F Optional Equipment

Optional Equipment

Optional equipment may vary. Consult your Cat dealer for details.

- Battery, additional, 880 CCA
- Cab, standard
- Cab, standard with air conditioning
- Cold weather fuel (–30° C/–22° F)
- Cold weather package, including additional battery, engine block heater, radiator antifreeze (–50° C/–58° F), cold weather fuel (–30° C/–22° F) and mounting for an ether bottle
- Counterweights, 115 kg (255 lb), 240 kg (530 lb) or 460 kg (1,015 lb)
- Fenders, front with integral steps
- Fenders, rear extensions
- Four Wheel Drive/Brake Mode Selector
- Guard, boom protection plate
- Guard, stabilizer, rock
- Guard, fuel tank front and rear
- Hydraulic valves, loader (3rd valve for GP, MP or Quick Coupler)
- Hydraulic valves, backhoe (5th and 6th function)
- Hydraulic lines, combined function auxiliary
- Machine Security System
- Product Link
- Quick Coupler, manual, dual lock
- Quick Coupler, pin lock
- Radio ready cab
- Ride Control
- Rotating beacon, magnetic mount
- Seat belt, 75 mm (3 in)
- Stabilizer pads, grouser type
- Stabilizer pads, reversible
- Stick, extendible
- Storage box
- Vandalism protection, gauge cover
- Work Tool Attachments such as buckets, forks, material handling arms, augers, hammers, brooms, cold planers and vibratory plate compactors. See your Cat dealer for more information.

416F Backhoe Loader

For more complete information on Cat products, dealer services, and industry solutions, visit us on the web at **www.cat.com**

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AEHQ6861-01 (10-2012)
Replaces AEHQ6861

