

CATERPILLAR

**TANDEM
POWERED 627**

450 FLYWHEEL HORSEPOWER

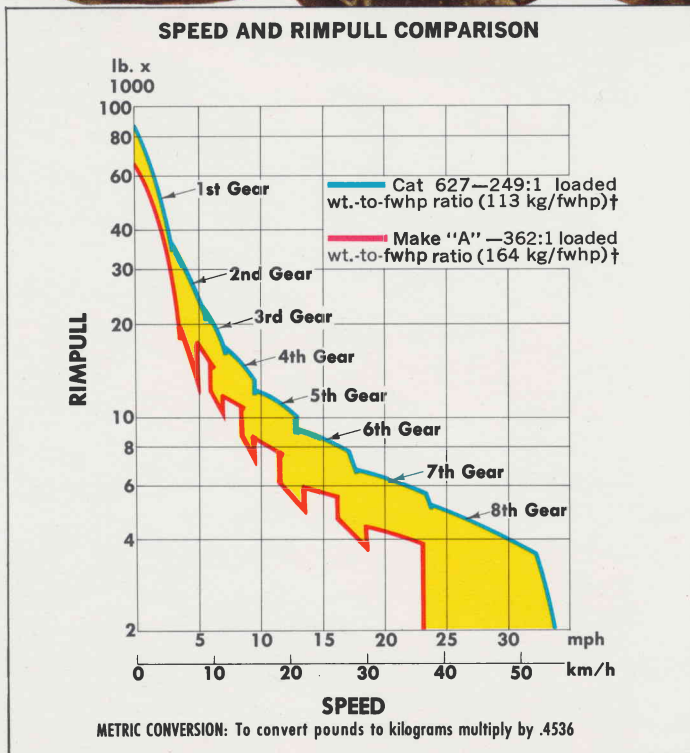
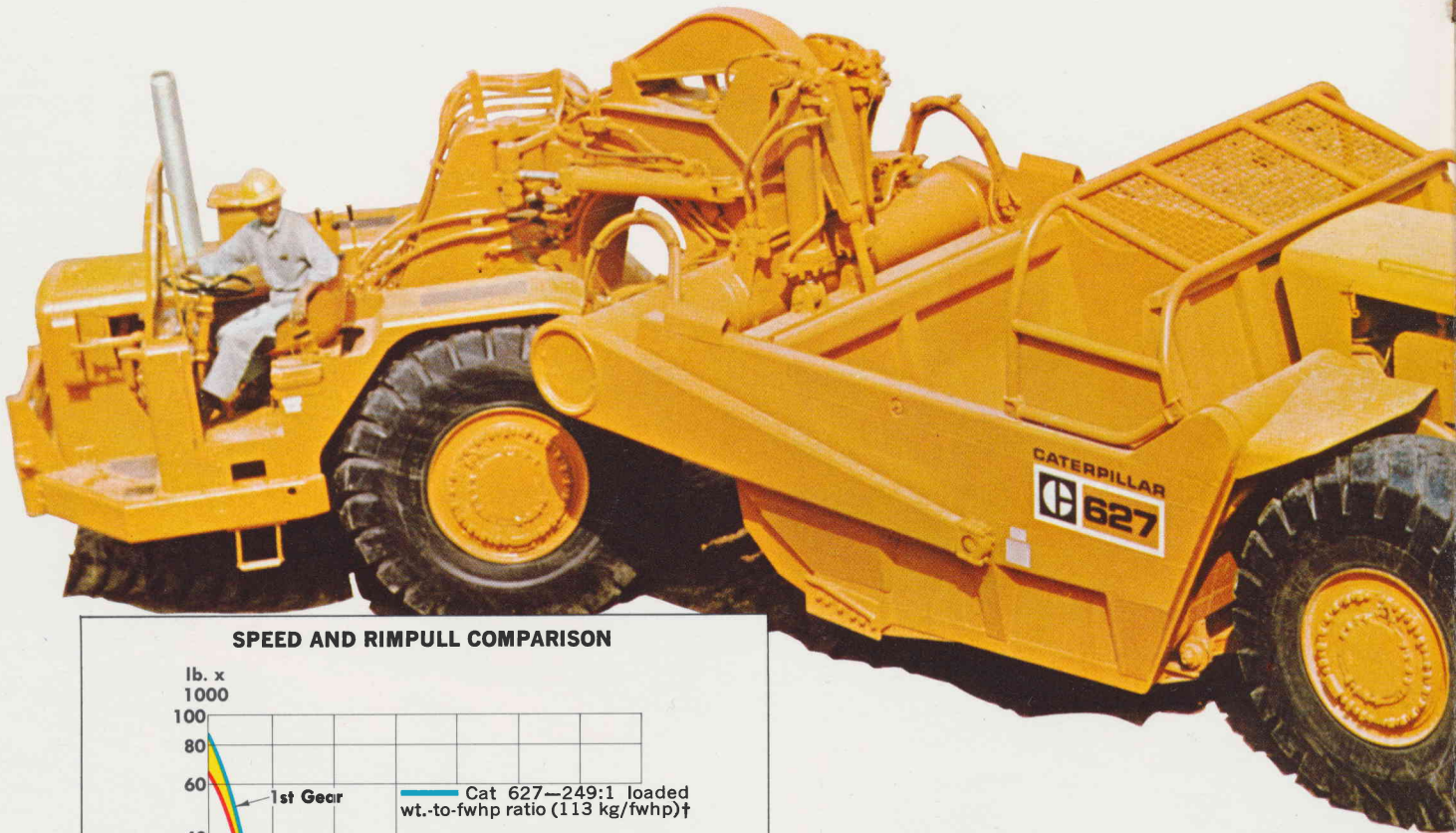
14/20 CU. YD. CAPACITY (10, 7/15, 3 m³)

POSITIVE DOZER-TYPE EJECTION



Cat 627 performance potential:

- ➔ 249:1 loaded weight-to-fwhp ratio (113 kg/fwhp)
- ➔ 450 fwhp, 4-wheel drive and speeds to 32 mph (51 km/h)
- ➔ Positive action, double-acting scraper hydraulics
- ➔ Easy loading bowl design and positive dozer-type ejection
- ➔ Hydraulic retarder options for safe downhill hauling



As the speed-rimpull comparison and charts on the next page show, the Cat 627 has unmatched cycling ability even under the poorest conditions and adverse grades. It also has quick-loading advantages in a wide variety of material—wider, lower bowl for easy loading and double-acting scraper hydraulics to assure positive scraper control. Compare this to single-acting hydraulic systems with gravity return. There's 57,300 lb. of down pressure (26 000 kg) at the cutting edge to penetrate hard materials. The apron has 24,000 lb. closure force (10 880 kg) to slice through and retain material in the bowl. And the dozer-type ejector provides excellent dump control, positive clean out of sticky materials—as opposed to roll-out ejection systems.

†To provide a common basis of comparison, flywheel horsepower is adjusted to 85° F. (29°C) and 500 ft. (152 m) above sea level with fully equipped vehicular engines.

COMPARATIVE DATA*

MAXIMUM SUSTAINED SPEED (Rated Load)

Total Resistance		Make "A"		Cat 627		627 Advantage
Lb./Ton	(kg/t)	mph	(km/h)	mph	(km/h)	
0	(0)	23.0	(37,0)	33.6	(54,1)	46%
200	(100)	8.6	(13,84)	10.8	(17,4)	26%
250	(125)	6.0	(9,60)	9.2	(14,8)	53%
400	(200)	3.4	(5,47)	5.1	(8,2)	50%
700	(350)	2.5	(4,02)	2.6	(4,2)	4%



SCRAPER DESIGN

Make "A"

Cat 627

FLOTATION †

Make "A"

Cat 627

Inside Bowl Width.....	9' 6½" (2,91 m)	9' 8" (2,95 m)
Avg. Bowl Length.....	9' 0" (2,74 m)	9' 5¾" (2,87 m)
Avg. Floor Area.....	86.2 ft. ² (8,0 m ²)	91.6 ft. ² (8,5 m ²)
Avg. Bowl Side Height.....	4' 4½" (1,33 m)	4' ½" (1,23 m)

Tire Size (Standard)...	29.5-25, 22 PR	29.5-29, 28 PR
Inflation Pressure.....	45 PSI (3,15 kg/cm ²)	45 PSI (3,15 kg/cm ²)
Tire Load (calculated from GVW).....	25,075 lb. (11 350 kg)	28,000 lb. (12 700 kg)
Contact Area Per Tire (on cement surface)...	450 in. ² (2900 cm ²)	538 in. ² (3450 cm ²)
Ground Pressure.....	55.7 PSI (3,90 kg/cm ²)	52.8 PSI (3,70 kg/cm ²)

†(assume each tire carries ¼ the gross weight)



Another 627 performance feature is "auto-motive" follow-up type steering control with feel-of-the-road. This is compared with the "jerk steering" of Make "A".

For jobs with steep downhill hauling, the 627 has hydraulic retarders (attachment) for both tractor and scraper, not available for Make "A". The retarders permit safe, sustained downhill hauling and extend service brake life.



*Make "A" comparisons are based on the manufacturer's specification sheet dated August, 1968, Form No. S-5601.

Cat 627 power train features:

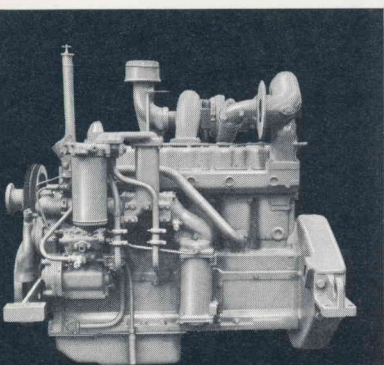
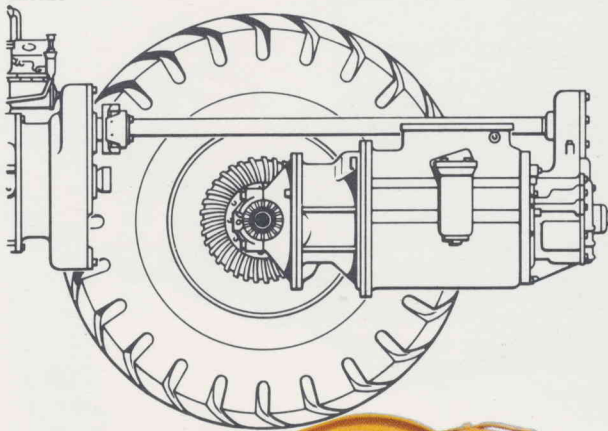
- ➔ Two field-proven D333T Engines producing 225 fwhp each.
- ➔ Cat 8-speed power shift tractor transmission with Semi-Automatic option.
- ➔ Cat 4-speed power shift scraper transmission giving positive push power regardless of ground speed.
- ➔ Differential torque controls for ALL drive wheels standard to assure maximum traction.

Modern Cat Diesel Power—The 627 is powered by two Cat D333T diesels, one in the tractor and one on the scraper. Each delivers a full 225 flywheel horsepower (total of 450) up to 5,000 ft. altitude (1500 m) —compared to Make "A" engines that lose at least 3% for every thousand feet (300 m) above 3000 ft. altitude (900 m).

The D333T is a four-stroke-cycle engine with six cylinders and 638 cu. in. displacement (10,5 lit). It's the same basic engine used in the No. 14 and No. 12 Motor Graders, 977 Traxcavator, 966C Wheel Loader, D6C tractor, and other Cat-built earthmovers. It is turbocharged, has an adjustment-free fuel system, a hydraulic governor and automatic fuel-injection timing advance. Together, these features give instant engine response, excellent lugging ability and easy starts. This, plus traditional Caterpillar reliability and long life, helps assure maximum 627 productivity.

The tractor transmission is an eight-range unit controlled by a single lever. Reverse, first and second are torque converter drive for high rimpull and anti-stall characteristics. Third through eighth are smooth, power-shifted direct drives for maximum efficiency.

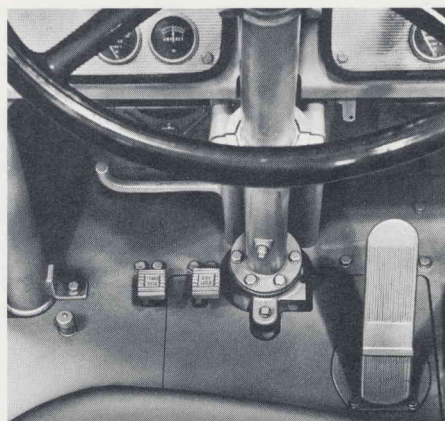
An 8-range *semi-automatic option* is also available that provides automatic shifting between second and any top speed selected by the operator. It can be locked in any gear by a pedal-operated Hold Valve. The semi-automatic option brings maximum cycle efficiency and longer engine and transmission life—all shifting is done automatically at the most efficient time.





The heavy-duty scraper transmission is a planetary type featuring full torque converter drive with four ranges. Each range matches two of the tractor ranges. During turns when the scraper's tires have a shorter turning radius and must go slower than the tractor's, the converter drive automatically adjusts to the differential without lugging down or killing the rear engine. And the drive always assures high engine rpm, regardless of ground speed, to maintain a constant, high torque pushing power.

Differential torque controls are standard on both tractor and scraper, providing maximum traction even on muddy, slick surfaces. The one for the tractor is operated by a foot pedal and locks the tractor wheels together so that neither can spin free. The scraper differential is an automatic type that transfers torque to the wheel with the best traction.





"Power Pack" design allows the scraper engine, transmission and all related components to be removed as a unit. The engine and power train are mounted on rails. To remove: (1) hook a hoist to the lifting bracket; (2) disconnect drive shaft U-joint, eight bolts holding rails to frame and the five quick-change control lines; (3) lift out. To service the transmission only, slide the power pack to the rear. Engine control lines need not be removed since they are long enough to make transmission readily accessible.

Routine servicing is quick and easy. Both engines have disposable spin-on fuel filters with top suspension mounting that lessens the chance of fuel contamination. Fuel priming pumps are standard on both engines. Engine lube oil filter housings are suspended, allow fast element replacement with less oil mess. An exhaust scavenging precleaner extends the periods between dry-type air cleaner servicing. All hydraulic and transmission system filters are easy to get at, check and change.

Cat 627 features:

- Scraper engine and power train have "Power Pack" serviceability.
- Routine servicing is simplified, fast and easy.
- Convenient, positive operating controls.
- Built-in safety systems for operator and machine.

The 627 operating features include "in-compartment" 24-volt, direct electric starting of both engines. The scraper engine can also be started from the rear. Engines are controlled together or individually by separate, side-by-side accelerator pedals. An air pressure system is used to control the scraper engine throttle.

One lever controls both transmissions. They are synchronized *electrically* for simplicity, shifting speed and safety—an air system for both transmission and brakes could leave the operator without control of either in event of air failure. The scraper transmission can be shifted to neutral by a dash-mounted switch when rear power is not desired.

Positive, fast control of scraper bowl, apron and ejection is provided by three levers at the operator's right.

A hand lever on steering column allows the operator to brake the right or left wheel individually. This and the differential controls give the 627 excellent flexibility to cope with bad underfooting.



Safety Systems for operator and machine:

- Braking power is assured for at least one axle in event of air failure, through separate 7¼ cfm air compressors (0,205 m³/min) tanks on tractor and scraper.
- Scraper brakes actuate slightly before tractor's and release after tractor's to prevent jackknifing.
- Reserve braking option provides emergency air should regular system fail.
- Variable rate retarder option for tractor and scraper permits safe, sustained production on steep slopes.
- Rear engine and transmission are protected by dash warning light and air horn on tractor—when jacket water overheats, oil pressure drops below safe level, or rear transmission goes out of synchronization. (The transmission also goes automatically into neutral.)
- If engines are started with shift lever in gear, a valve automatically locks both transmissions in neutral and the shift lever must be returned to neutral to release.

Cat 627 Brief Specifications

TWO CATERPILLAR D333T ENGINES

Flywheel Horsepower at 2200 RPM...225 each, total 450
Flywheel horsepower is the net horsepower at flywheel of standard engine operating under S.A.E. standard ambient temperature and barometric conditions—85°F (29°C) and 29.38" (746 mm) Hg. Standard engine equipment includes fan, air cleaner, water pump, lubricating oil pump, fuel pump, charging alternator and air compressor. Engine will maintain full horsepower up to 5,000 feet (1500 m) altitude.

Design Data, both engines: Four cycle, 4.75" bore (121 mm) and 6" stroke (152 mm), six-cylinder diesel. 638 cu. in. (10,5 lit) piston displacement. Direct electric starting with glow plugs for preheating precombustion chambers.

TRACTOR POWER TRANSMISSION:

Caterpillar-built. Eight manually selected ranges with single-lever shift control. First and second are torque converter drive. Remaining six ranges are direct drive.

Optional semi-automatic range selector provides automatic shifting in ranges 2 through 8.

SCRAPER POWER SHIFT TRANSMISSION:

Caterpillar 4-range converter transmission, synchronized electrically with tractor transmission.

DIFFERENTIAL CONTROLS:

Tractor—Caterpillar-built Differential Lock, engaged by foot pedal, positively prevents either drive wheel from spinning free.

Scraper—Automatic torque proportioning type.

TIRES (Tubeless):

Standard for tractor and scraper.....29.5-29 (28 PR)

STEERING:

Two double-acting hydraulic cylinders with follow-up linkage. Positive, constant-speed.

Width required for non-stop turn....36' 5" (11 100 mm)

BRAKES:

Air-actuated, cam-operated, expanding-shoe type. Tractor drive wheels may be braked individually by hand lever. Hydraulic retarders are optional.

WEIGHT ON WHEELS

(Total Unit, Approx.)

Empty:

Tractor 57.5%	37,000 lb.	(16 500 kg)
Scraper 42.5%	27,000 lb.	(12 300 kg)
Total	64,000 lb.	(28 800 kg)

Loaded: Based on 48,000 lb. (21 800 kg) average load:

Tractor 47%	53,000 lb.	(24 000 kg)
Scraper 53%	59,000 lb.	(26 600 kg)
Total	112,000 lb.	(50 600 kg)

CAPACITIES

Heaped, SAE rating.....20 cu. yd. (15,3 m³)

Struck, SAE rating.....14 cu. yd. (10,7 m³)

SCRAPER DESIGN:

Low and extra-wide scraper bowl operated by high-speed hydraulics. Power closing, true radius apron. Dozer-type ejector. Reinforced box-section construction with extensive use of high tensile strength steel.

Maximum depth of cut.....11¾" (298 mm)

Width of cut.....9' 11" (3000 mm)

Maximum depth of spread.....19" (480 mm)

HYDRAULIC OPERATION

Bowl lever has raise, hold and power down positions. Apron lever has open, hold, positive close and float positions. Ejector lever has forward, hold and return positions, with automatic kickout on return.

Bowl uses two 6" bore (152,4 mm) and 32" stroke (813 mm), double-acting hydraulic cylinders. Carry check valves isolate circuit from load in "hold" position.

Apron uses one 7.25" bore (184,2 mm) and 23.5" stroke (597 mm), double-acting cylinder.

Ejector uses one 6.5" bore (165,1 mm) and 61" stroke (1,549 mm), double-acting cylinder.

Materials and specifications are subject to change without notice.



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