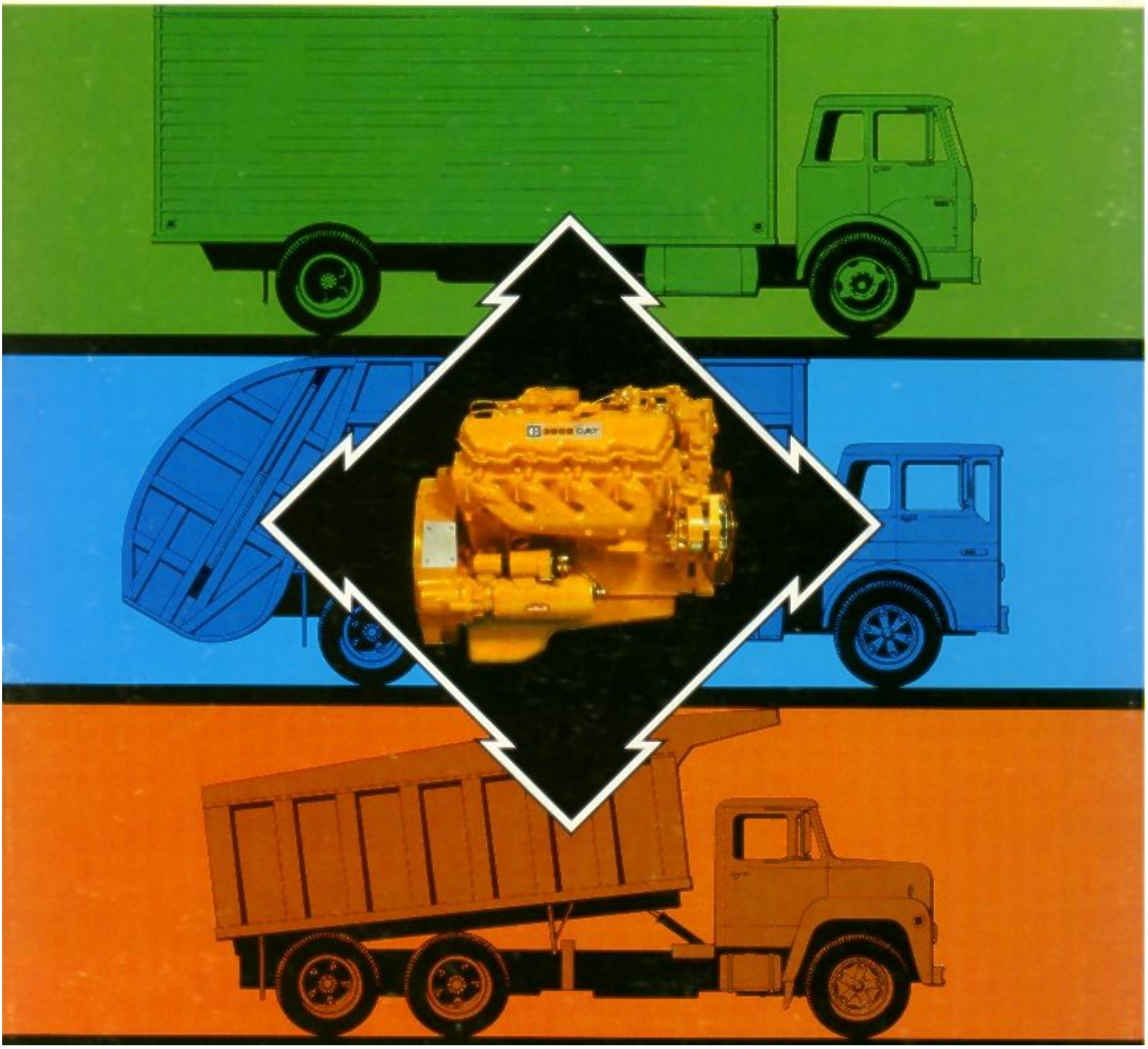
CATERPILLAR

The Cat 3208 Truck Engine

MODERN MID-RANGE DIESEL POWER



The 3208 Truck Diesel

Compact, reliable V8 power

Building upon the successful and respected 1100 Series, the 3208 continues Caterpillar leadership in economical diesel power for medium-duty trucks.

- **Established reliability** . . . internal design proven in truck service since 1968 . . . thousands at work.
- **High performance power** . . . under 6 pounds per hp (3.6 kg/kW) at 210 hp output.
- **Big displacement** . . . 636 cu in (10.4 litres) fitted into compact size . . . 36 in (915 mm) long, 33 in (835 mm) wide.
- **Low friction design** . . . superior fuel economy and torque characteristics.
- **Exclusive no-adjustment fuel system** . . . delivers rated power and good fuel economy over the long term . . . no periodic maintenance.
- **Servicing simplicity** and minimum maintenance emphasized.

3208 636 cu in (10.4 litres) V8 Diesel			
Bore x Stroke	in mm	4.5 x 5.0 114 x 127	
Power Output @ 2800 rpm	hp kW*	175 135	210 160
Peak Torque @ 1400 rpm	lb-ft Nm	400 540	485 655
Torque Rise	%	22	23
Weight	lb kg	1225 555	1225 555

All ratings meet SAE J816b Standards.

Consult specification sheets for exact ratings, torque capabilities, fuel specifics and engine weights.

*kW: Kilowatts are International System of Units (SI) equivalent for horsepower.

Diesel power pays, more than ever.

3208 Diesel is the practical alternative to gasoline power for your intra-city or other medium-duty trucks. It delivers the economy and performance needed in days of high fuel and labor costs.

Start with *major* fuel cost savings compared to gasoline. We don't know your exact operating conditions, but figure on cutting your fuel bill about half, just for starters—more if you do a lot of idling.

Then, you cut maintenance costs and downtime, too. Eliminate tune-ups . . . no carburetor, plugs, points, coil, condenser or wiring.

Such substantial savings quickly pay out a modest extra initial investment. Check out money savings for your medium-duty application.

3208 ENGINE ECONOMY ANALYSIS

PART A. Estimated Fuel and Tune-up Savings

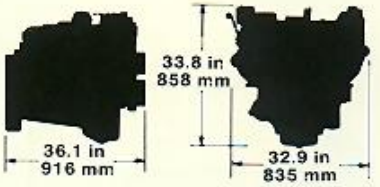
1. Annual fuel costs
   a. Your gasoline experience
      $\frac{\text{miles per year}}{\text{miles per gal}}$ × cost per gal $\_\_\_\_$
   b. Diesel fuel estimate
      $\frac{\text{miles per year}}{\text{miles per gal}}$ × cost per gal $\_\_\_\_$
2. Annual ignition & tune-up cost $____ $____
3. Sub-total $____ $____
4. Annual cost with gasoline truck $____
5. Less: Annual cost with diesel $____
6. **Annual 3208 Diesel savings** $____

PART B. Estimated Return on Investment

1. Annual savings (from Part A) $____
2. Average annual overhaul expense (diesel overhaul cost, less gasoline, divided by years truck is kept) $____
3. Net savings (Item 1 less Item 2) $____
4. Savings after taxes (.50 times Item 3, for 50% tax rate) $____
5. Net investment (extra price for diesel truck over gas, less trade-in gain) $____
6. **Annual return on investment** (Item 4 divided by Item 5, times 100) $\_\_\_\_$ %


3208 CAT

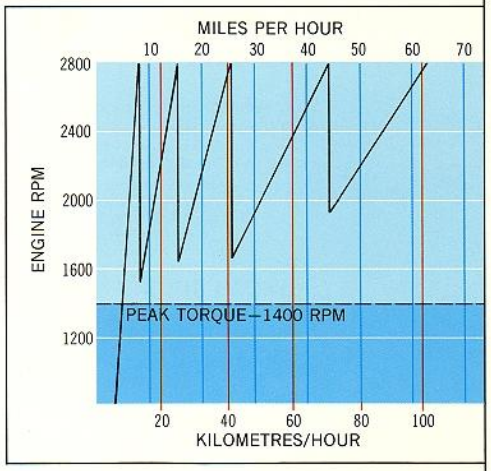

3208 CAT


33.8 in
858 mm
36.1 in
916 mm
32.9 in
835 mm

Job-Proven Performance

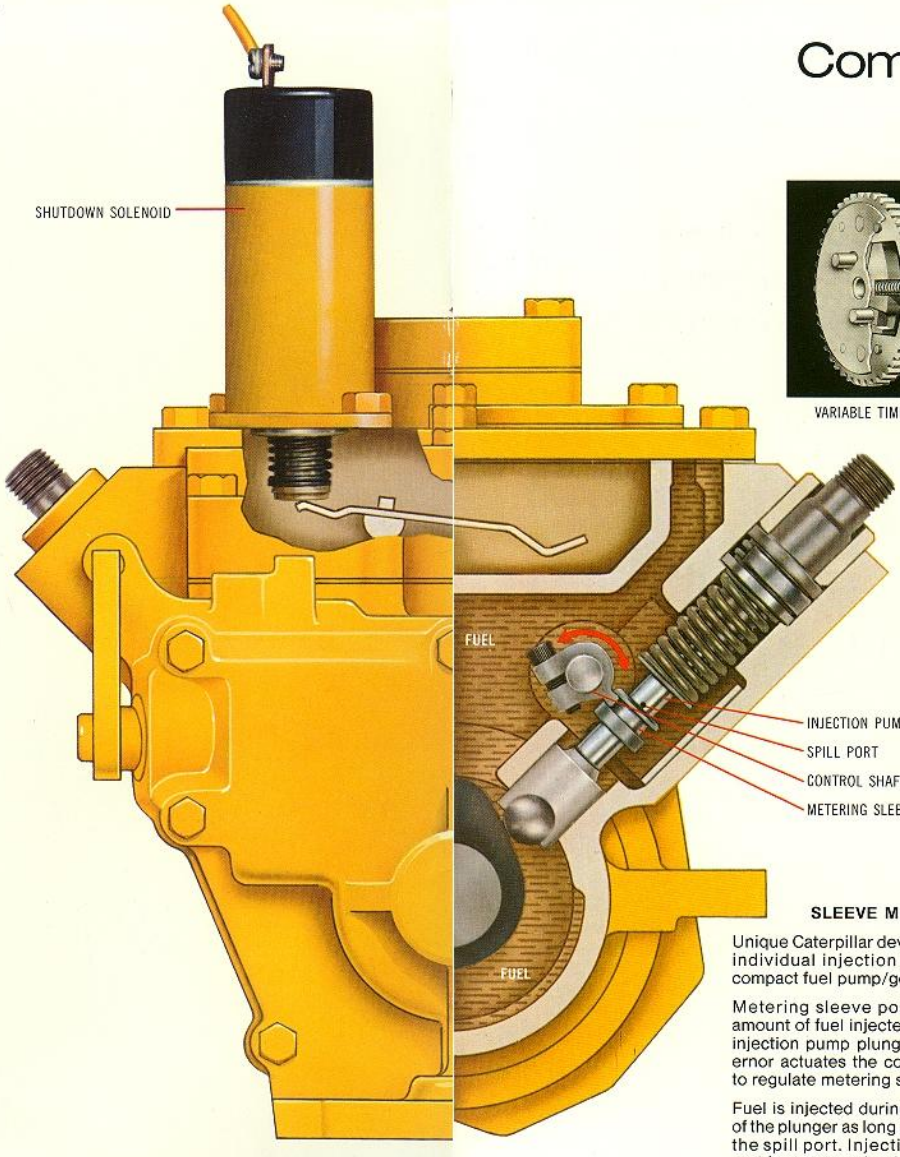
The responsive 3208 delivers performance needed for urban trucking, with big operating economies.

- ☐ Responds fast to accelerator... healthy 23% torque rise... broad 1400 rpm operating range. Result is excellent getaway, acceleration and gradeability.
- ☐ About 50% less fuel than gasoline engines for average city driving... even more saving at low load and idle.
- ☐ Low friction design saves up to 5% on fuel compared to other diesels.
- ☐ Low heat rejection means more fuel energy put to work... less heat burden for cooling system.
- ☐ Inherent balance and conservative speed minimize vibration.



BROAD TORQUE RANGE FOR SHIFTING EASE

Broad torque range means fewer gear speeds are needed for many medium-duty truck applications. Split chart illustrates that even a 5-speed transmission, matched to the 3208, has shift points comfortably above engine torque peak. (Example: 5.29 axle ratio, 10.00 x 20 tires.)



Compact Vee No-adjustment Fuel System

VARIABLE TIMING

- ☐ Individual fuel injection pumps have built-in calibration... sleeve metering type, adjustment-free.
- ☐ Centrifugal timing advance ensures fuel economy at idle or full rpm, easier starts.
- ☐ Governor is simple mechanical type. Sleeve metering pumps have low resistance to governor response, need no hydraulic boost.
- ☐ Start-up control provides full fueling regardless of throttle. Normal governing takes over at approximately 500 rpm.
- ☐ Shutdown is instantaneous... solenoid actuates metering sleeves for zero fuel delivery.
- ☐ Fuel lubricates all components inside injection pump housing... isolated completely from lube system.

SLEEVE METERING

Unique Caterpillar development simplifies individual injection pumps. Results in compact fuel pump/governor assembly.

Metering sleeve position controls the amount of fuel injected each stroke of the injection pump plunger; the engine governor actuates the control shaft and fork to regulate metering sleeve.

Fuel is injected during the upward stroke of the plunger as long as the sleeve covers the spill port. Injection ends when spill port is uncovered, releasing pressure.

Moving the sleeve *up* causes more fuel delivery each stroke... moving it *down*, less each stroke.

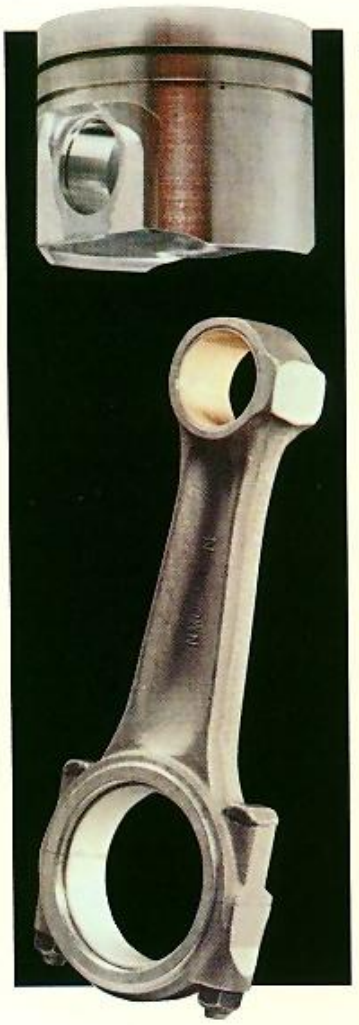
PENCIL INJECTORS

Fourth generation reliability results from experience since 1968 in over 100,000 Cat Diesels. ☐ Latest version eliminates bleed lines. ☐ Final filter protects each injector.

Metallurgy and Design Benefits

PISTON RINGS

- ☐ Two-ring design means less friction drag...better engine efficiency...less fuel usage.
- ☐ Twist-type top ring does double duty...seals compression effectively and contributes to good oil control.
- ☐ Top ring molybdenum-coated for extra life and less friction... witness lapped for ideal fit in cylinder bore.
- ☐ Second ring is spring-backed oil control type...chrome plated for excellent wear life.

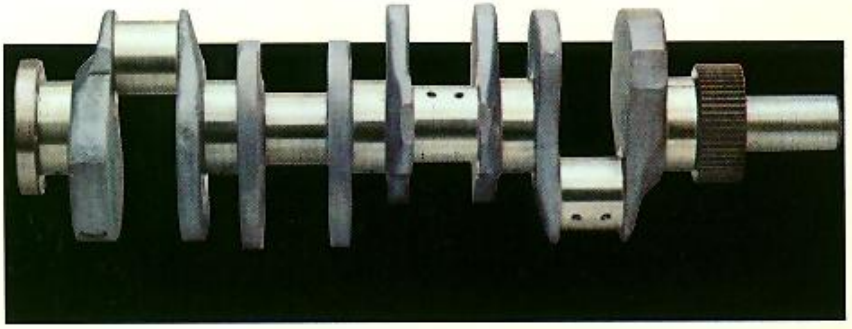


ALUMINUM ALLOY PISTONS

- ☐ Slight elliptical, tapered shape allows for heat expansion...holds rings true to cylinders at operating conditions for long-lasting power and low oil consumption.
- ☐ Cast-in nickel-iron band provides long-wearing groove for compression ring.
- ☐ Cardiod recess in top aids efficient distribution of combustion gases, excellent combustion.

CONNECTING RODS

- ☐ Forged H-sections of boron steel hardened and shot-peened for extra strength with minimum weight.
- ☐ Rigid heavy-wall wrist pins hardened and ground to support power stroke loads.
- ☐ Steel-backed aluminum alloy bearings combine load capacity with corrosion resistance.



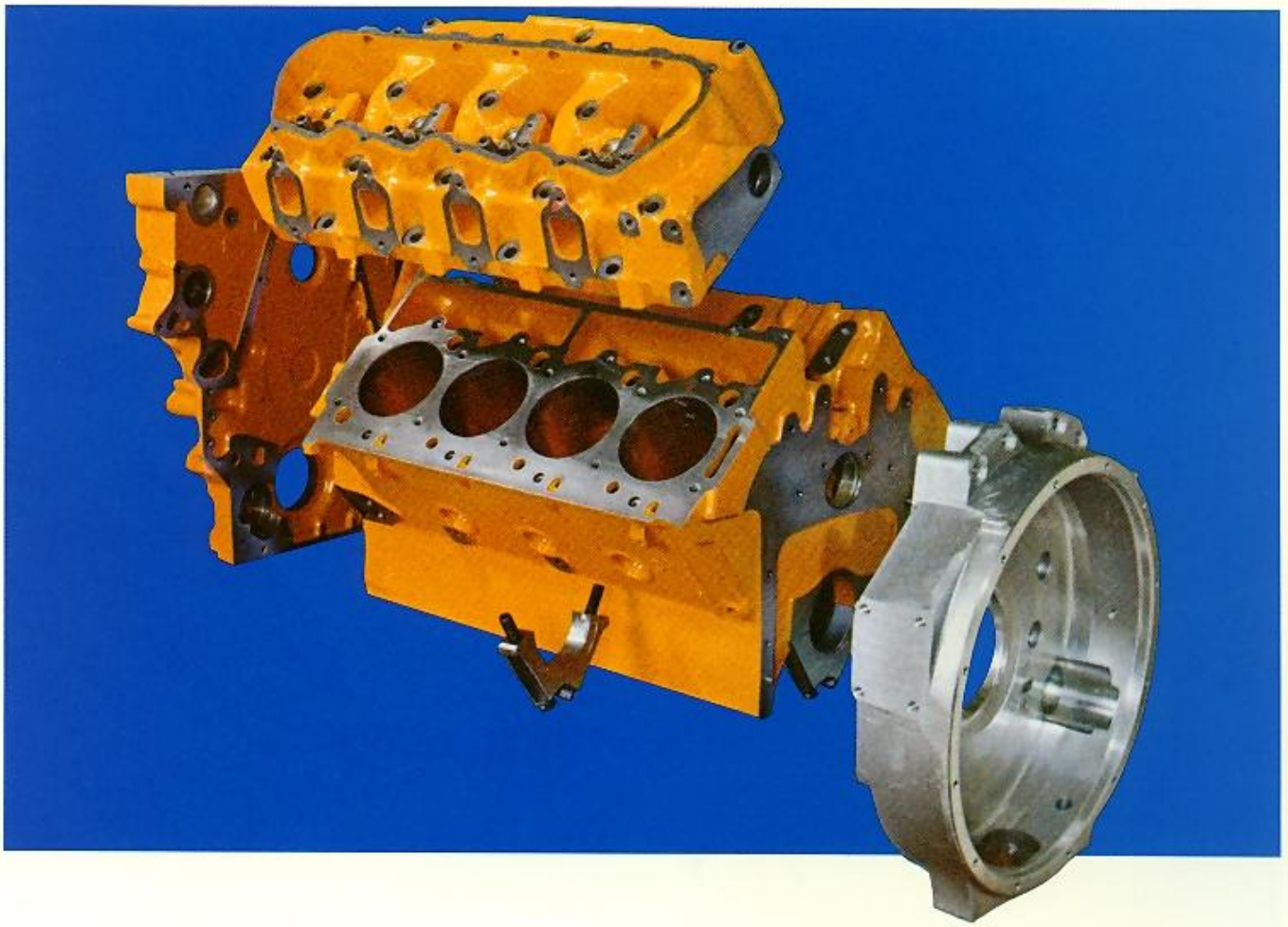
CRANKSHAFT

- ☐ Total Hardening, a unique fixture quenching process, provides a continuous deep-hardened surface ...no soft metal in fillets or cheeks. Result is consistently high fatigue strength, stronger crankshaft.
- ☐ Forged and precision machined from premium high tensile steel.
- ☐ To improve bearing life...eight counterweights for 210 hp engine ...six for 175 hp.

CAMSHAFT

- ☐ Only two lobes per cylinder since separate fuel injection camshaft is provided...means generous width lobe faces, sturdy camshaft.

Strength, Not Weight



Precise casting capability of Caterpillar's modern computer-controlled induction melt foundry means major structural castings have strength for reliable life ...without waste weight.

CYLINDER HEADS

- ☐ Special molybdenum-nickel cast iron combines toughness with strength...rigid construction resists warping and distortion.
- ☐ Intake manifolds cast integral with heads...eliminates gasketing ..stiffens heads.
- ☐ Generous-size water passages ensure even cooling.

CYLINDER BLOCKS

- ☐ Cast of nickel-chrome alloy iron with tensile strength specified at 40,000 psi (275 MPa). Cast-in stresses relieved through controlled heat treatment.
- ☐ Designed rigid and strong, without excess weight...metal strategically placed in load-bearing areas to maintain accurate alignment... walls are uniform but light.
- ☐ Deep-skirt block construction ...extends almost four inches (100 mm) below crankshaft centerline... adds block strength and rigidity.

MAIN BEARING CAPS

- ☐ Unique main bearing caps have securing bolts angled 30° from vertical. Impart rigidity to block assembly without troublesome cross-tie bolts through block.

FLYWHEEL HOUSING

- ☐ Heat-treated aluminum alloy casting approaches strength of cast iron, yet saves weight.
- ☐ Optional SAE No. 2 housing (shown) has external attachment to block to sustain higher torque loads or stresses from driven components like an unsupported transmission.

Diesel Durability

VALVES

- ☐ Exhaust valves are of two materials...stems of hardened steel for resistance to wear, heads of special alloy for high temperature strength.
- ☐ Intake valve heads and stems are hardened stainless steel to give toughness and wear resistance for long life.
- ☐ Seat inserts for exhaust valves provide high temperature wear resistance. Intake valve seat inserts can be installed at overhaul time, if needed.

CYLINDERS

- ☐ Cylinder bores are precision honed...provide a smooth, slightly velvety surface for good oil control, minimal friction.
- ☐ At overhaul can be rebored... two standard oversizes .020 and .040 inches (0.5 and 1.0 mm).
- ☐ Linerless design contributes to low engine weight and compact size...saves liner replacement cost.

BEARINGS

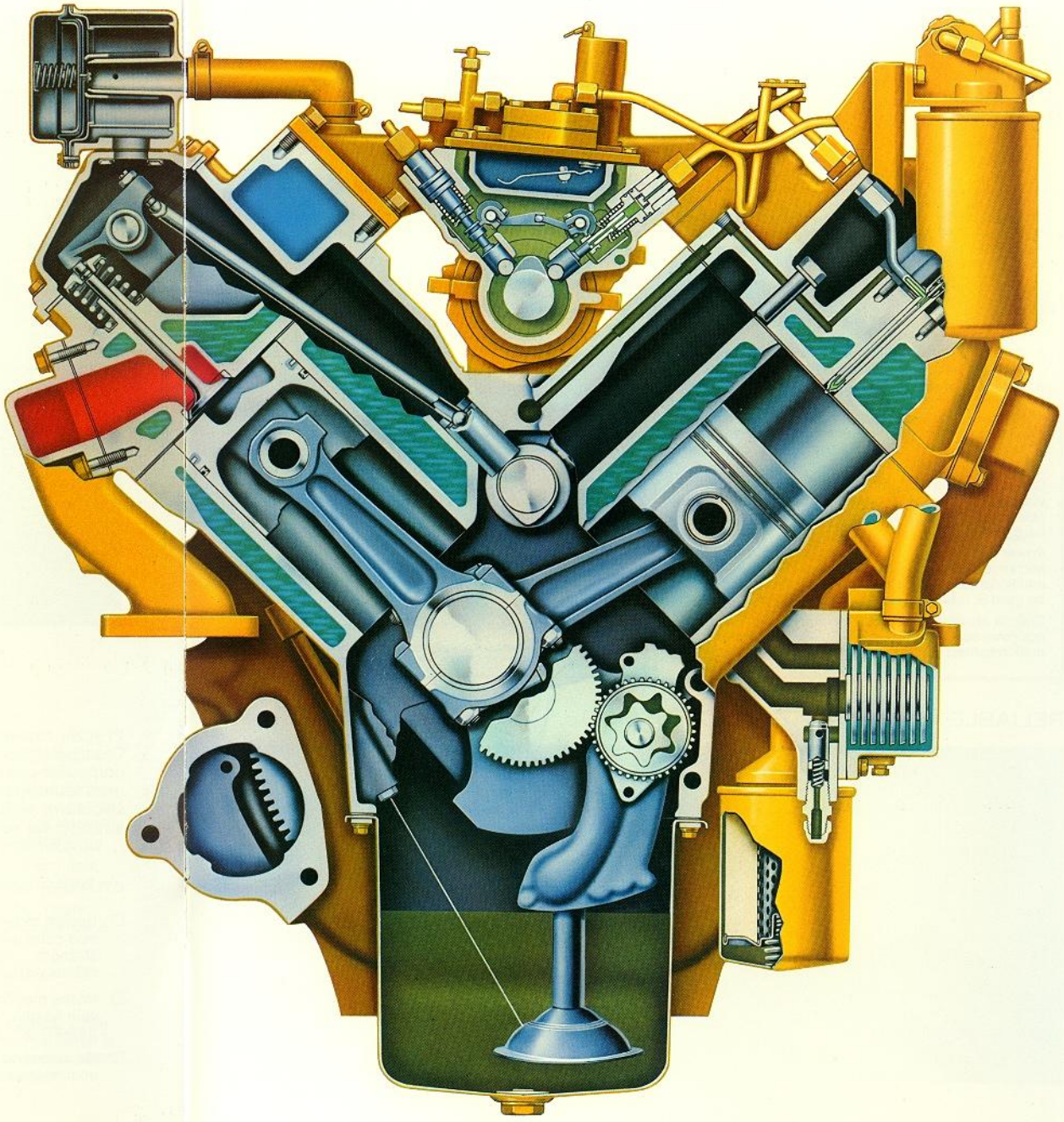
- ☐ Main and connecting rod bearings are aluminum alloy bearing material, steel backed...a combination of outstanding bearing strength and corrosion resistance.

COOLING SYSTEM

- ☐ Full-length water jackets, generous size water passages, ample pump capacity...ensure even temperatures under all conditions.
- ☐ Water pump engineered for long service life...seal seats on wear-resistant ceramic insert...heavy-duty bearings support pump rotor, shaft and pulley.

LUBRICATION SYSTEM

- ☐ Six-lobe oil pump provides uniform pressure...capacity 28 gpm (1.8 litres/sec), 15% more than predecessor models.
- ☐ Twin full-flow spin-on filters protect against particles as small as 15 microns...plate-type cooler controls oil temperature...bypass valves assure oil flow.
- ☐ Oil passages drilled internally...no external lines to crimp or break.



Cat 3208 Selection Guide– INTRA-CITY Service

3208 Engines are designed for INTRA-CITY service ... where loads and speeds are generally below vehicle ratings, and average speed (based on travel time only—not idle or stop time) does not exceed 60% of top geared speed. 3208s are not designed for heavy-duty applications involving high speeds for long periods of time. Proper applications are in-city and suburban service, allowing some expressway use.

The charts show the minimum approved ratio for various GVW and GCW ratings and resulting speed based on 10.00 x 20 tires, level smooth-surface road, low wind resistance, smooth-side body and no wind.

To select the Cat 3208 Diesel Engine for your performance requirements:

1. Select the truck or tractor application closest to your needs.
2. Select the GVW or GCW of your vehicle. For weight between values given, use the next larger value.
3. Read across to select the engine that gives the highest desired operating speed. The overall reduction ratio listed for that engine and that speed is the minimum approved ratio, including overdrive where applicable. A lower numbered overall ratio will exceed application limits.

Charts are for operation below 2500 feet altitude. For sustained operation at higher altitude engine horsepower must be reduced, lowering top speed 3 mph for each 2500 feet.

Power requirements for radiator cooling fan, alternator and air compressor are included. If power is required for additional auxiliaries, a higher horsepower engine should be used or maximum travel speed reduced.

Special application approval is required for conditions not covered in this Selection Guide. For further information contact your truck dealer.

TRUCK 4 x 2, 6 x 2, 6 x 4

75 sq ft Frontal Area
Van
Stake
Refuse
Tanker
Special Body

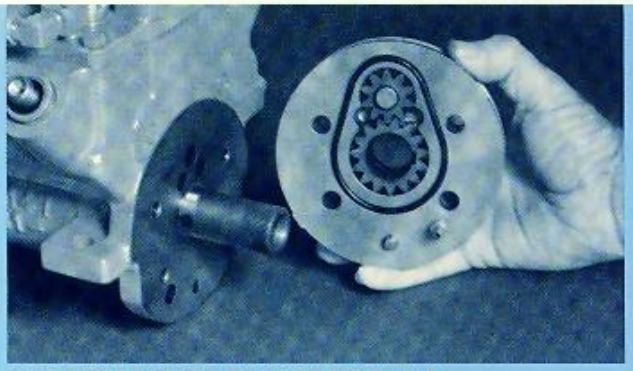
GVW (lbs)	175 hp Min. Ratio	175 hp MPH	210 hp Min. Ratio	210 hp MPH
20,000	5.22	64	5.12	65
25,000	5.35	62	5.12	65
30,000	5.52	60	5.12	65
35,000	5.62	59	5.12	65
40,000	5.85	57	5.12	65
45,000	5.95	56	5.22	64
50,000	6.20	54	5.35	62
55,000	6.27	53	5.48	61
60,000	6.50	51	5.62	59
65,000	6.78	49	5.76	58

Vehicle usage must be in accordance with application conditions described in preceding paragraphs.

RELIABLE, LOW MAINTENANCE DESIGN

Diesel Simplicity: Forget about spark plug fouling, distributor point wear, coils, condensers and timing problems. Carburetor rebuilds, too.

And you don't buy new problems. Adjustment-free injection pumps can last life of engine, with proper fuel filtration.



GEAR-TYPE FUEL TRANSFER PUMP

The 3208 has a reliable gear-type pump built into the fuel injection pump housing. No diaphragm to fail, so forget about fuel transfer pump replacements.

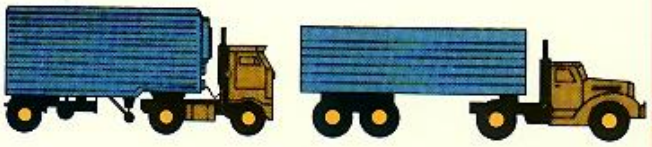
CONSTRUCTION TRUCK 4 x 2, 6 x 2, 6 x 4

75 sq ft Frontal Area
Dump Truck
Ready Mix Truck

GVW (lbs)	175 hp Min. Ratio	175 hp MPH	210 hp Min. Ratio	210 hp MPH
40,000	5.85	57	5.12	65
45,000	5.95	56	5.22	64
50,000	6.20	54	5.35	62
55,000	6.27	53	5.48	61
60,000	6.50	51	5.62	59
65,000	6.78	49	5.76	58

Vehicle usage must be in accordance with application conditions described in preceding paragraphs

TRACTOR & TRAILER 4 x 2

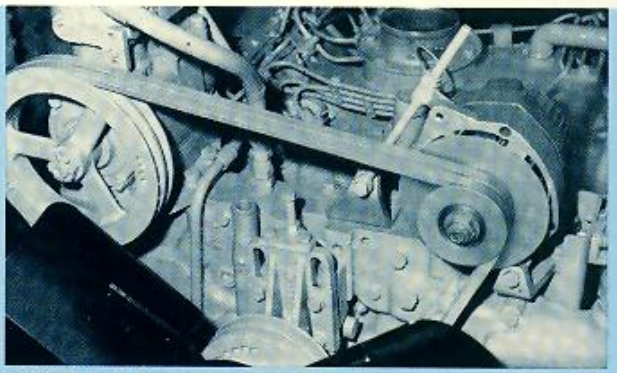


95 sq ft Frontal Area
City
Suburban
Shuttle

GCW (lbs)	175 hp Min. Ratio	175 hp MPH	210 hp Min. Ratio	210 hp MPH
40,000	6.20	54	5.48	61
45,000	6.27	53	5.62	59
50,000	6.35	52	5.76	58
55,000	6.50	51	5.85	57
60,000	6.78	49	5.95	56

Vehicle usage must be in accordance with application conditions described in preceding paragraphs

VALVE ADJUSTMENT EASE
Maintenance is simplified with just two lash adjustments per cylinder—no extra rockers and tappets for cam-operated injectors.



RIGID ACCESSORY MOUNTING
"Flat top" front cover offers substantial mounting platform for air compressor and other accessories. Increases attachment durability and ease of maintenance.

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TRUCK ENGINES - PARTS & SERVICE

Product support...

ANOTHER FEATURE OF YOUR CAT-BUILT 3208 DIESEL

The next time you specify urban truck power, stay with the Cat 3208... the diesel that provides you economy and reliability. And it is backed by convenient Cat Diesel parts and service, too... from authorized Cat Truck Engine service outlets and from Caterpillar Dealers.

REMANUFACTURED ENGINES

When overhaul time comes, plan on like-new performance at about 65% new engine cost. A specialized Cat factory completely remanufactures 1100 Series, will add 3208 as population builds. Ask your truck dealer for details.

CAT-QUALIFIED SERVICEMEN

You get going again faster and at less cost with Cat-qualified service technicians. Benefit from a continuing program of service training in support of 3208 and 1100 Series Engines.

2000 DEALER LOCATIONS

Over 1500 dealer parts and service outlets support Cat Truck Diesels in North America... over 500 on other continents. Backed by 23 Caterpillar parts facilities throughout the world.

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