



BIG BEAR

ENGINE COMPANY

4BT BUYERS GUIDE



So, you're seeking out a Cummins® 4BT for your automotive or industrial application. We get it... there is a lot of information out there and we hope to inform you as much as possible on these great engines.

You've made the right choice by coming to Big Bear, we live and breathe diesel engines and have accumulated about as much expertise that there is to know on the subject. We don't know if you've done any modifications yet, or you're doing the swap with a shop, or maybe doing it yourself, but you might want to consider a 4BT.

The good news is that we have a couple different options that could work for you on the new surplus engine side, or if you prefer, used running engines.

All of the info you could possibly need is below to make an informed decision. We also have the ability to send over a picture of the crated engine as well as the Complete Build Sheet for one of these models so you can get a true sense of what goes into these engineering masterpieces.

WE OFFER 4 NEW CRATE ENGINE OPTIONS:

- ✓ New Cummins Crate Engines
- ✓ Built with all brand new parts
- ✓ 105 HP, 130 HP and 140 HP Options
- ✓ Long Block (3/4 Engine) Also Available
- ✓ Dyno tested 15 hours
- ✓ 6 months parts replacement warranty
- ✓ Inline and Rotary fuel pump options available
- ✓ No core charge
- ✓ Same day shipping
- ✓ Financing available



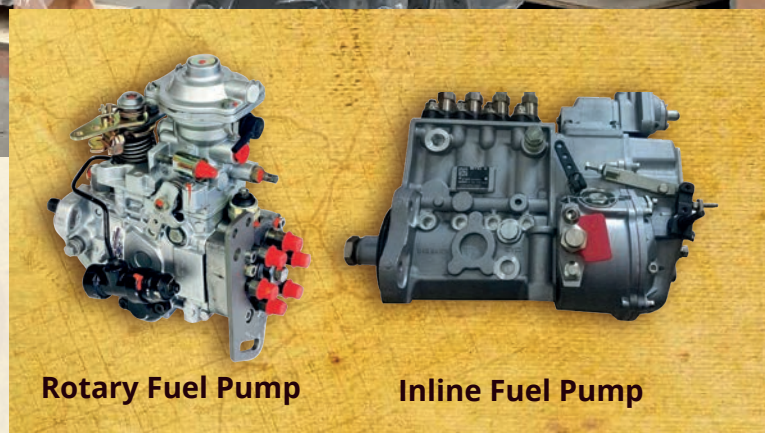
Choosing the Right Configuration

The 105 HP and 130 HP engines are drop-in ready and come with the inline fuel pump. The 140 HP comes with the more fuel-efficient Bosch VE Rotary Style Fuel Pump.

The blocks of the 105 HP, 130 HP and 140 HP models are essentially the same. It's actually the fuel pumps and air intake that makes the HP increase.

The Inline Pump a robust cam driven design which allows for a more pulsated or metered flow of fuel. With governor modifications (2800 RPM or 3500 RPM springs) the pump will get about 500 – 700 HP, 15-17 MPG. A fully modified engine would also include twin turbos, 550cc 12mm injector nozzles, performance camshaft, low compression pistons, ported head, modified head studs, intercooler and cold air intake. The sky is the limit with the inline fuel pump!

The VE Pump is a rotary style design that allows for constant backpressure and more consistent flow of fuel. It's more for customers looking for fuel economy as it gives a generous 21-24 MPG and 250 - 500 max HP (with modifications). We



Rotary Fuel Pump

Inline Fuel Pump

always recommend this fuel pump for a customer who uses their performance set up as mostly a daily drive vehicle. On the highway, the MPG can top out at 30 using a manual gearbox: 3.55, 3.73 or 4.10 gear ratio, lighter tires and easy acceleration.

When doing a swap you want to make sure you have enough room to work with the engine.

The engines come with either top (105 HP and 130 HP) or side mounted (140 HP) turbos to accommodate your space requirements. Some customers have flipped the exhaust manifold to accommodate a top mounted or side mounted setup to fit their application.



665 E 70th Ave, #2B Denver, Colorado 80229

Local 720-920-9162 Toll Free 1-844-340-4114

sales@4btengines.com | www.4btengines.com

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About the 4BT Crate Engines

The 4BT (3.9L) was originally built between 1983-2008 mostly by Consolidated Diesel Corp (Cummins) in North, Carolina and predominantly installed in Bread Trucks, Skid Steers, Dozers, Wood Chippers and Logging Skidders. These engines are regarded as “universal engines” and are installed in both industrial and automotive applications alike. The engines are all mechanical (no ECM or After-treatment) and use the mechanical cable start-up.

Today Cummins builds these crate engines for both the OEM and Aftermarket with all new castings in their global distribution network. The 4BT castings are all assembled by Cummins joint venture factories and are built to a Cummins Authorized Serial Number in Cummins QuickServe.

There are 8 Cummins Facilities throughout the world that still build the 3.9L (4BT). Once the internal castings are completed additional facilities finish the engines with Genuine Cummins Parts, Holset Turbos, Bosch Injectors etc...

The 4BT and 6BT engines are built with brand new parts and can ship within a day or so as they are already manufactured and crated.

The engines also come with an unlimited hours/miles 6 months parts replacement warranty and there's no core charge.

ENGINE PERFORMANCE DATA

140hp: 25 x 26 x 34", peak torque 370 ft-lb @ 1500rpm

130hp: 25 x 26 x 35", peak torque 280 ft-lb @ 1500rpm

105hp: 26 x 26 x 36", peak torque 243 ft-lb @ 1500rpm

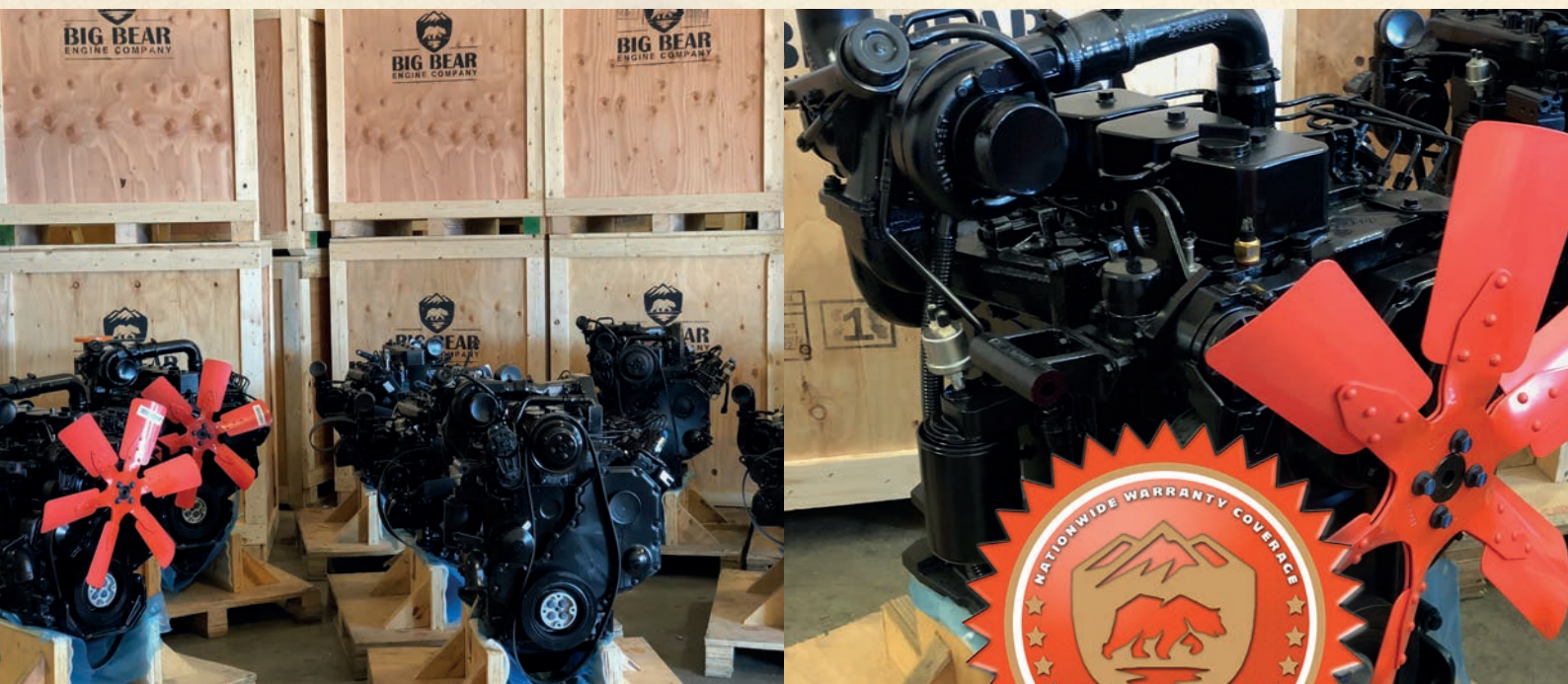
Engine Weight: 745-782 lbs with oil

Oil Pan Holds: 10 Quarts

Pan Length: 24" Pan Height: 14" Pan Width: 8"

With the 140 HP, the rear sump oil pan extends further than the 105 HP or 130 HP units.

Engines do not come with A/C or Power Steering Pumps. All B Series Cummins Engines come with Accessory Drives to power additional bolt-on applications.



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Helpful Automotive Swap Recommendations

TRANSMISSIONS:

Transmissions are not our expertise but we do recommend that you should make sure that your transmission is rated (Nominal Torque Capacity) for the 4BT. It's easy to forget about upgrading your transmission and blow it out whilst making horsepower/torque modifications. Torque Converters are specific to the transmission and the application (industrial, on road, heavy-duty rock crawling).

All 4BTs used the SAE #3 Flywheel Housing and fit GM and Ford Adapter Kits. They bolt up to just about any transmission or power take-off (PTO).

ADAPTER PLATES:

For your adapter plates, we recommend a company called "Diesel Conversion Specialists®". They have around 250 different adapter kits, transfer cases and motor mounts.

CUSTOM PERFORMANCE MODS:

For your suspension, custom transmissions, turbos we recommend a company here in Denver called "ATS Diesel"®. They're huge on performance parts and should be able to help you with any sort HP/torque upgrades.

For Harmonic Balancers we recommend ATI Performance Products. Dampners are designed and

tuned to eliminate harmful crankshaft harmonics that cause HP/Torque loss. For performance list and profile camshafts we recommend Colt Cams or Hamilton Cams.

MOTOR MOUNTS:

The 4BT Engines are good old mechanical engines and can be quite loud within the cab, which is why we also recommend the hydraulic motor mounts from a company called "LORD Motor Mounts". Their hydraulic mounts have a rubber exterior filled with a hydraulic gel that really dampens the vibration and noise within a 360-degree radius around the engine. They are a little more expensive but well worth it!

AXELS:

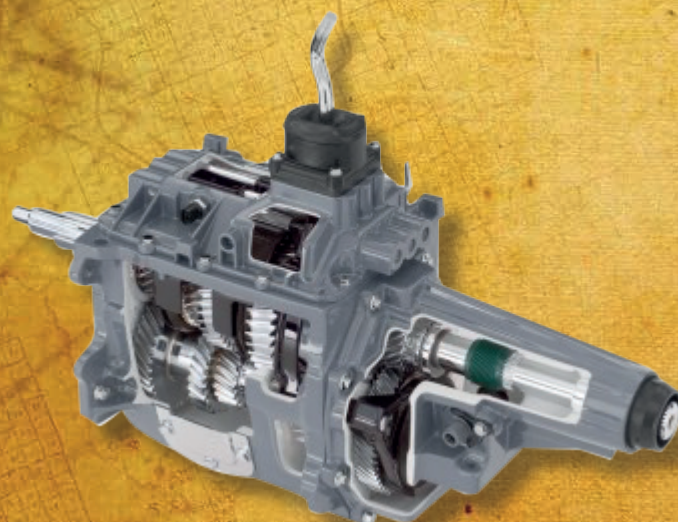
The most popular axels in the Jeep Swap Community are from a company called "Dana". Although, there are many configurations many enthusiasts will use D30/D35 or D44/D60 Axels, with 8.8" - 9" in the rear. For smaller Jeeps, ½ Ton or ¾ rated axels are more than enough to support the weight of everything. For a larger truck, 1 ton or larger is ideal.

SUSPENSION:

Lifting the vehicle up using 5"+ suspension kits are also popular with 33"- 44" tires.

Some of the more popular options we've come across in the Swap community:

- NV4500
- FSO-6406A – Eaton/Fuller
- ESO-66
- G56
- TH400



Swapping in a Crate Motor

We know that getting the right fit is important with any industrial or automotive swap. We do our best to try and match up engine serial numbers to existing 4BT engines however the process isn't full proof.

All our crate motors are built to specific engine serial numbers and CPL configurations, that being said minor modifications might be required by you, the customer, to make the engine fit your application.

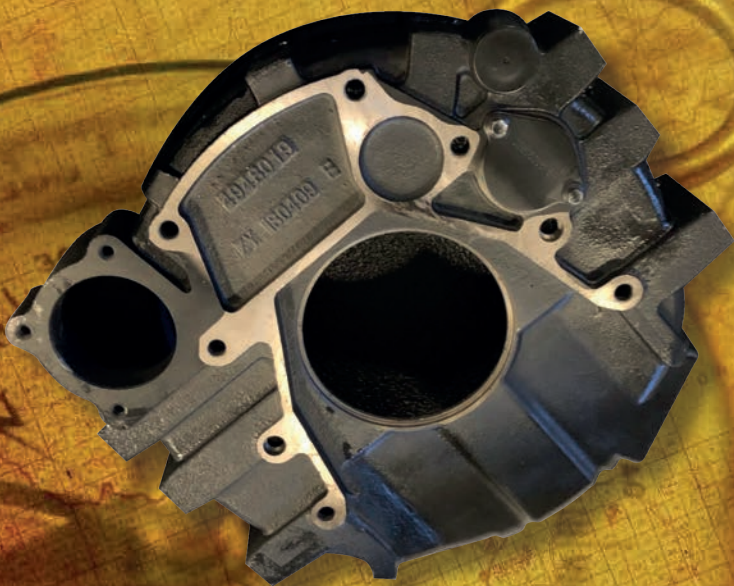
The good news is these minor modifications are rare and usually quite simple for a trained mechanic. We provide pictures, build sheets and run test videos upon request to aid in fit.

If a complete engine doesn't look optimal, long blocks (3/4 Engine) are a common replacement for industrial customers who are concerned about the application fit as they reuse existing bolt accessories from the old motor.

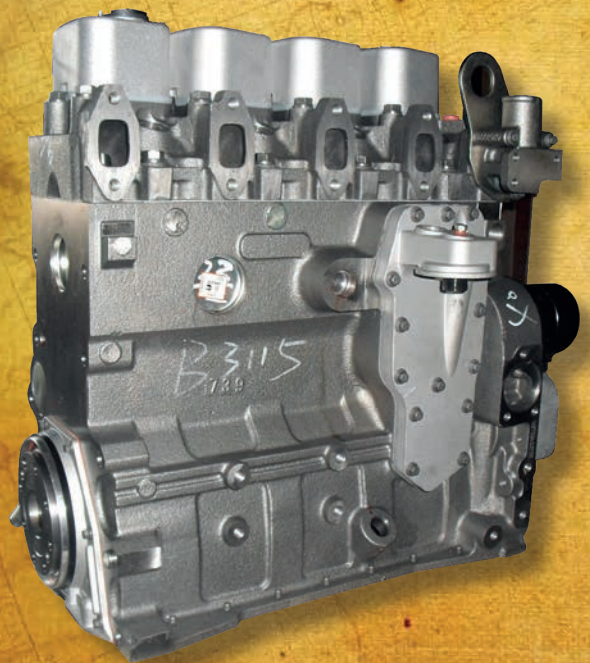
COMMON PART SWAPS INCLUDE:

- Flipping over the exhaust manifold to covert top mounted turbo to side mounted turbo
- Routing the exhaust with the use air cross over tubes
- Rotating the oil pan from rear sump to front sump and re-connecting pickup tube
- Using existing bellhousing from old engine to fit new crate motor (Engines use SAE #2 or SAE #3)
- Configuring optional power steering and A/C pumps to accessory drives
- Converting front to rear gear train applications (Inline vs. Rotary Fuel Pump Setups)
- Replacing front cover for inline vs. rotary setups
- Removing air compressor
- Using an optional step down converter from 24v to 12v electrical setup
- Using optional flywheel/flywheel housing adaptor plates and torque converters

SAE #3 Flywheel Housing - 105 HP Unit



4B Long Block Engine



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Financing

Big Bear can arrange the financing for these engines for both commercial and personal purchases.

Our financing partners (Currency Capital and CAG Truck Capital) are great at working with all kinds of financial situations - and if it can be done, they're the people to do it.

If you do go that route they offer 12, 24, 36, 48 and 72-month options which can be a great option if you are looking to preserve cashflow.

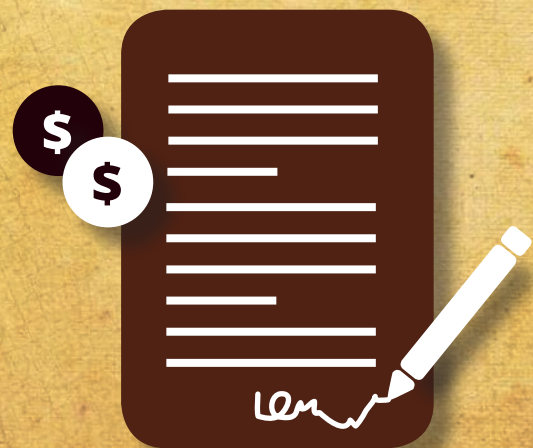
CAG is a direct lender offering simple loans to customers with excellent to challenged credit. They will evaluate any loan regardless of bankruptcy, tax lien, repo status as well as non-CDL investor deals or startups. Approval time is normally within 24 hours.

For further information please visit us at www.cagtruckcapital.com.

CAG IS HAPPY TO DO THE WORK AND WILL REPORT TO YOU IN A TIMELY MANNER:

- ✓ We report to all major personal and commercial credit bureaus including payment to help your customers re-establish credit
- ✓ The dealership maintains no liability if there is an issue with the loan after payment
- ✓ Simple Easy to Follow Application Process
- ✓ Quick Approval Time – Roughly 24 Hrs
- ✓ Conserve Working Capital
- ✓ Low Lease Rates
- ✓ Finance Engine Purchase and Installation in 1 Lease
- ✓ Low Fixed Monthly Payments Throughout Term
- ✓ Tax Savings Under IRS Section 179
- ✓ Extremely Turnaround Times on Credit Applications Less than \$100,000
- ✓ No Hidden Fees – Own Your Equipment Outright at the End of Lease Term

We can start a deal with anything from a credit application to a name and phone number, we will do the rest!



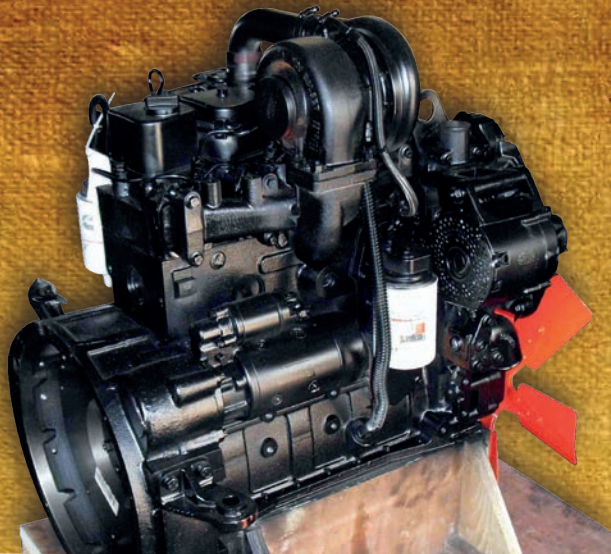
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Cummins 4BT Specs



CONFIGURATION	Inline 4 Cylinder
DISPLACEMENT	3.9 L, 239 cubic inches
BORE X STROKE	4.02" x 4.72"
CYLINDER HEAD	Cast Iron
ENGINE BLOCK	Cast Iron
FIRING ORDER	1-3-4-2
COMPRESSION RATIO	17.5: 1
INJECTION	Direct Injection, Mechanical Injection Pump
ASPIRATION	Turbocharged, non-intercooled
VALVE TRAIN	OHV, 2 valves per cylinder
WEIGHT	745-782 lbs with oil
OIL CAPACITY	10 quarts
GOVERNOR SPEED	Varies with application
HORSEPOWER	Varies: 80 HP – 250 HP Stock @ 2300 rpm
TORQUE	Varies: 243 lb-ft – 420 lb-ft Stock @ 1600 RPM



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Parts List and Prices

COMPLETE ENGINES COME WITH:

- ✓ New Block
- ✓ New Cylinder Head
- ✓ New Camshaft and Lifters
- ✓ New Crankshaft
- ✓ New Connecting Rods
- ✓ New Rocker Assemblies
- ✓ New Gaskets, Liners, Rings, Seals, Wrist Pins, Bearings
- ✓ New Bosch Injectors
- ✓ New Oil Pump and Water Pump
- ✓ New Oil Cooler
- ✓ New Oil Filters
- ✓ New Intake and Exhaust Manifolds
- ✓ New Housings (Front and Rear)
- ✓ New Brackets and Pulleys
- ✓ New Fuel Injector Pump
- ✓ New Holset HX30 Wastegate Turbo
- ✓ New Starter
- ✓ New Alternator
- ✓ New Flywheel
- ✓ New Flywheel Housing
- ✓ New Oil Pan
- ✓ New Fan
- ✓ New Starter (Packaged Separately)
- ✓ New Alternator (Packaged Separately)
- ✓ New Flywheel (Packaged Separately)
- ✓ New Flywheel Housing (Packaged Separately)

LONG BLOCK ENGINES INCLUDE:

- ✓ Block
- ✓ Cylinder Head
- ✓ Camshaft
- ✓ Followers/Lifters
- ✓ Pistons
- ✓ Liners
- ✓ Rings
- ✓ Connecting Rods
- ✓ Intermediate Cover
- ✓ Timed Front Gear Group
- ✓ Crankshaft
- ✓ Oil Pan

Long blocks come in a rotary or inline setup based upon the fuel pump configuration. Depending on availability long blocks may not come with valve cover, pan, front cover.

We offer 4 options on the 4BT side:

COMPLETE ENGINE

4BT 105 HP	\$5,950
4BT 130 HP	\$6,350
4BT 140 HP	\$6,600

LONG BLOCK

4B	\$3,900
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Note: Preferred payment is wire or check.
With a credit card, there is a 3% fee on engines.

Forgive us if you simply wanted a price but as mentioned, engines are our passion and we can't help going into every wonderful detail.

If there is anything else you'd like to know, or if you'd like to chat things through, feel free to **get in touch**.



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About Big Bear Engine Company

Big Bear Engine Company was originally founded as a division of a larger diesel engine remanufacturing company called Capital Reman in Denver, Colorado. As the company grew the demand for smaller industrial Caterpillar and Cummins crate diesel engines became apparent and Big Bear Engine Company spun off on its own underneath Capital Reman. Today the two companies still work side by side and are located in the same engine manufacturing complex.

Today we specialize in engine 4 models: Cummins 4BT, Cummins 6BT, Cummins 6CT Engine and the Caterpillar 3306 Engines. Our talents lie within the finite science of engineering and manufacturing of diesel engines. Big or small we've done them all! All of our engines are produced using brand new parts and are assembled to exact OEM tolerances.

Our machine shop and remanufacturing facility specialize in building the bigger engines here at our facility in Denver (30-35 per month)... basically 8.0L and we dabble in these smaller 4BT, 5.9L and CAT 3306 Crate Engines with our subsidiary Big Bear Engine Company.

In addition to new surplus and reman engines our machine shop has the capability to remanufacture all of the internal components of an engine back to OEM spec. We can reman cylinder heads, camshafts, crankshafts, blocks, rocker assemblies, connecting rods, lifters and pistons. Surfacing, grinding, line boring, welding and magnafluxing are in our blood!

Feel free to check us out and if you are ever in Denver we would be more than happy to give you a tour of the **shop**.



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