

Lowering TCO with the G Series

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At the core of the all-new G Series loaders from CASE is the concept of lower total cost of ownership (TCO). Combining productivity enhancing features with operational efficiencies, wheel loader owners have never been able to get more work out of a machine more efficiently than with the CASE G Series.

TCO is not an exact science. Every single application is different. But understanding how a machine can impact TCO should be a critical piece of the buying process. It also becomes integral to operator training once a machine is selected.

In this article we'll define TCO, describe key elements of the G Series wheel loaders that improve the TCO equation, and provide operational tips to further drive costs down.

What is TCO?

Total cost of ownership goes beyond the purchase price of the machine – that's simply the initial budget line item.

The loader itself is essentially the platform that allows its owner to do work. Having that machine – and whatever attachments or specialty options purchased with it – provides the capacity to perform a task. That task, combined with a variety of regional/geographic factors, will determine how often it can be put to work and what its billable rate is. This balance of cost/demand/capacity is often what drives a contractor to consider purchasing additional equipment, and it sets a baseline for return on investment.

True TCO is then determined by factoring in everything else that goes into operating that machine over its lifetime: productivity, fuel costs, maintenance costs, utilization, operator labor rates, resale value (what its owner will recoup after its service life with that company is done), etc.

It is those factors that CASE took into great consideration while designing the new G Series wheel loader.

Right Sizing/Configuration

- **Size:** Right-sizing a machine to the application is critical – and wheel loaders used in production/cycle environments impact upstream and downstream operations based on how efficiently they load

hoppers and trucks. Too large of a machine will end up sitting idle for long periods of time, and too small of a machine won't be able to keep up with production. CASE G Series wheel loaders are available in seven models ranging from 141 to 347 horsepower and common bucket sizes from 2.1 to 6.25 cubic yards. **Cost factor:** A right-sized machine will provide the right balance of productivity while optimizing utilization, wear and tear on the machine, and the time/cost of the operator at the controls.

- **Linkage:** G Series wheel loaders are available in three different linkage configurations: Z-bar, tool carrier and extended reach. Z-Bar is the standard linkage used for digging and loading applications. Tool carrier is ideal for applications where the loader carries stacked or palletized goods. Extended reach provides greater reach for loading high trucks or stacking goods higher. **Cost factor:** The right configuration matched to the application will make for a more productive and efficient machine.

Factors Affecting Productivity (Greater Profitability of Each Asset)

- **Transmission:** G Series wheel loaders come standard with a four-speed transmission, but the 721G, 821G and 921G offer an optional five-speed transmission. Applications that require a lot of roading – municipalities, agriculture, quarries – will benefit from the efficiencies of a five-speed transmission. **Cost Factor:** The five-speed transmission improves acceleration, travel speeds and climbing power (greater productivity/profitability), and can ultimately improve fuel efficiency (lower consumable costs).
- **Hydraulics:** The new G Series features an electro-hydraulic, load sensing system that allows for improved functionality, and precise bucket and loader functions that produce less heat, require less fuel, and provide speed and control options perfect for most wheel loader applications. **Cost Factor:** A direct benefit of CASE hydraulics is productivity/greater profitability. It also allows for greater fuel efficiency, as only the power needed to match the load is used to drive a variable-piston pump. More efficient use of horsepower also results in less heat being generated, which minimizes wear on surrounding components and extends service life.
- **Automatic bucket control options:** Electronics have evolved to a point where the machine – from operator compartment to the engine and everything in between – is connected and working together. A practical development of this is automatic bucket control features such as height control, return-to-dig and return-to-travel. These functions – easily set and selected through a new membrane keypad in the cab – help automate common boom and bucket functions, such as loading trucks or hoppers of a common height and then returning the bucket back to a desired travel position. **Cost Factor:** These

features help increase productivity and simplify operation, while simultaneously cutting down on wasted time, movement and fuel with each cycle. Every moment and ounce of fuel saved by eliminating excessive and corrective movements – especially in high-production, repetitive/cycle applications – adds up to savings to the bottom line.

- **No regeneration/downtime:** G Series wheel loaders are the second generation of CASE wheel loaders to feature Selective Catalytic Reduction (SCR) emissions technology. SCR is an aftertreatment system that, unlike CEGR and diesel particulate filter (DPF) solutions, doesn't bog down the engine with recirculation. It also doesn't require regeneration, which spikes engine exhaust temperatures higher and can require the machine to run for 10-20 minutes without being operated. **Cost Factor:** Manual regeneration with CEGR equates to downtime (lost productivity), increased fuel burn and faster wear on surrounding components due to heat stress. SCR lets the engine run at peak performance with consistently fast cycle times and optimal uptime – all with greater fuel efficiency. One added cost with SCR systems is diesel exhaust fluid (DEF), but the advantages and cost savings of these systems far outweigh the added cost of DEF.

Factors Affecting Consumable Costs (Lower Line Item Expenses)

- **Fuel efficiency:** How does SCR improve fuel efficiency? In its most simple explanation: the engine is not required to burn extra fuel in order to run hotter and burn off collected particulate matter. The engine breathes freely without recirculating any exhaust gasses. Additionally, through advances in hydraulics and electronics working in conjunction with the engine, machine power is better leveraged/converted/stored for use in heavy working conditions (see previous hydraulics section), which allows the machine to work smarter and conserve energy and fuel. **Cost Factor:** Fuel is often the owner's greatest consumable expense. It's not uncommon to see owners of CASE wheel loaders who have switched from other solutions achieve fuel savings around 20 percent – and in some cases, higher.
- **Standard three-year planned maintenance contract:** As part of CASE ProCare, each G Series wheel loader comes standard with a three-year telematics subscription, a three-year/3,000-hour full-machine factory warranty, and a three-year/3,000-hour planned maintenance contract. It's important to understand what that planned maintenance contract means: for the first three years of operation, all parts and labor related to planned maintenance are covered by the dealer and OEM. **Cost Factor:** This

is an immediate line item savings related to ownership costs for the first three years ranging between \$8,000 and \$16,000 for the first three years of ownership, depending on wheel loader size and application.

- **Axle/Tire options:** CASE offers tire and axle options designed to meet the unique requirements of nearly all applications—ranging from standard limited-slip differential to heavy-duty front locking/rear open differentials. **Cost Factor:** Much like the undercarriage of a tracked machine, there is a lot of cost tied into the tires of a wheel loader. Pairing the wrong axle/tire configuration to a specific wheel loader application can cause increased wear to the tires, and can put the axles under unnecessarily excessive load.

Factors Affecting Reliability and Service Life

- **Cooling:** CASE G Series wheel loaders offer two cooling systems based on size of the machine. The 521G through the 921G feature the CASE-exclusive mid-mounted cooling module, which features coolers positioned in a cube design that ensures access to clean and cool ambient air, while also limiting debris buildup and providing easy access for routine cleaning. An optional variable-speed reversing fan further minimizes the need for manual cleaning.

The 1021G and 1121G feature the CASE cooling cube, which also provides direct access to fresh air for each cooler – nothing is stacked – and features a reversible fan and easy access for cleaning.

Cost factor: There are a couple of important elements at play here: By keeping temperatures down related to other cooling designs, it ultimately extends the service life of engine components and related systems. That's a lifetime cost/repair savings. The other – when working in environments with fine, combustible materials such as waste, timber and agriculture – is fire. Between reducing the risk of fire through lower operating temperatures, and not requiring the elevated temperatures created by DPF operation, CASE wheel loaders are often specified for use in environments with the risk of combustion. This ultimately helps reduce the chance of downtime, which is a major contributing factor to poor total cost of ownership.

- **Simple Electronics:** CASE has designed the electronic interfaces within the cab to be more intuitive than ever before, and more reliable for working in heavy production environments. The G Series features a solid-state controller that lowers the quantity of fuses, relays and wires in the machine to reduce the complexity of the system. An electronically controlled battery isolator has also been added

that engages automatically about five minutes after the key is turned off. This gives enough time for the SCR purge cycle to complete, but helps minimize the risk of accidental battery drain. **Cost factor:** Fewer fuses, relays and wires equate to greater reliability and less potential downtime.

Operating Factors

- **Operating Modes:** This is where operator training is important, and understanding how each operator mode affects productivity and fuel use is critical. Each G Series wheel loader offers four separate operating modes: ECO mode for maximum fuel efficiency while doing basic or light duty work, STANDARD mode for maximum efficiency during the most common loading tasks a loader will face, MAXIMUM mode for delivering full power to handle heavy duty work, and AUTO mode – which essentially responds to the current load on the machine and sets it to where it thinks it should be. **Cost Factor:** It is not uncommon for an operator to simply set a machine in one mode and never change it. We've seen numerous applications where an operator had the machine set at maximum – for no reason other than the assumption that maximum equals maximum power (which it does) – but whose same application could easily be performed without losing any productivity in ECO. Example: By simply switching the mode to ECO, the operator could perform the same task, without losing productivity – at a noticeably lower fuel rate.
- **Auto Idle/Auto Shut Down:** These settings can easily be set in the G Series' new monitor to automatically idle or shut down the engine when it's left running for a select period of time without input from the operator. **Cost Factor:** It's not uncommon for an operator to leave the machine running while they hop out to perform another task. This helps ensure that the machine doesn't constantly run at full RPM when not in use, helping save fuel and wear and tear on the machine.
- **Ergonomics:** The seat, controls, and how they are positioned in the cab, have been engineered to accommodate the optimal working parameters for 95 percent of the body shapes and sizes of today's equipment operators. This also includes positioning of mirrors and sight lines to minimize straining. **Cost Factor:** In the most simple examples: A more comfortable operator is a more productive operator. In extreme cases, especially in cycles where operators are performing consistent/repetitive movements: It helps minimize the chance for strain and injury that can slow productivity and potentially lead to lost time/worker compensation/downtime.

- **Operator panel:** A new eight-inch LCD monitor provides the operator with simple control and greater insight over many of the loader functions and activities. **Cost Factor:** More intuitive control settings equate to an increased likelihood that operators take advantage of the available options that simplify operation and make it more efficient. It also makes important, real-time operating parameters and conditions more directly accessible to the operator, which can help them make better decisions about how the machine is performing, maintenance needs, etc. And, in an industry where 43 percent of heavy equipment owners report having difficulty finding qualified operators, it helps train new operators and lower labor costs related to hiring experienced operators.
- **HVAC:** The HVAC system was completely redesigned from previous machines to allow for greatly improved defrosting/defogging capabilities. **Cost Factor:** Get up and running faster (greater productivity).

Support Factors

- **Telematics:** The way that telematics can affect TCO are almost endless, and many contractors are still finding ways to leverage the data and information provided by telematics to lower total cost of operation. With CASE ProCare, G Series wheel loaders come standard with a three-year subscription to CASE SiteWatch telematics – it costs nothing additional for the equipment owner to implement. **Cost Factors:** Identify potentially damaging machine conditions before they turn into a larger failure; better understand utilization and better allocate machines; pinpoint inefficiencies in production and coach/address as needed; streamline planned maintenance and incorporate dealer support to provide a second set of eyes on machine conditions. Even a relatively minimal time investment in understanding and monitoring telematics data can pay big dividends for fleets large and small. A telematics program also provides a detailed history of machine performance and maintenance – a valuable asset when turning that machine out on to the secondary equipment market that can help you get more for the machine and further lower TCO.

Source: Alarcon & Harris; CASE Construction Equipment