THE CULTURAL NEWSLETTER FOR WABTEC EMPLOYEES

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Wabtec CORPORATION

LEADER LETTER

Engine platform success

Justin Sokol fills us in on reaching Engine Platform milestones, as well as a visit to Grove City by U.S. government officials.

Team,

Over the past several months, a number of significant developments have kept the Engine Platform team highly engaged. Notably, progress on the Astana, Kazakhstan Multi-Year Agreement (MYA) has included the successful execution of key milestones, particularly in finalizing plans for the new warehouse to be located at the Astana Diesel Shop.

In support of this strategic initiative, the Grove City Engine team hosted a distinguished group of U.S. government officials on June 8 for a facility tour, showcasing one of the world's premier durable goods industrial manufacturing operations. Rafael Santana, Greg Sbrocco, Gokhan Bayhan, and the Rail Power team welcomed U.S. Secretary of Commerce Howard Lutnick, Under Secretary William Kimmitt, Under Secretary Jeffrey Kessler, Executive Director Hiro Rodriguez of the Advocacy Center, as well as key staff from each respective office. The visit was highly successful and reflected the strength of the organization's capabilities.

As the second quarter comes to a close, Engine Platform budget planning is now underway. The platform delivered strong performance metrics throughout the first half of the year and, with stable volume projections, is well-positioned to maintain this momentum in the second half.

As always, thanks for all you do to help us succeed.

Best,

Justin Sokol
Vice President, Engine Platform Operations

FRONTLINE SPOTLIGHT

Troubleshooting in the test cell

Mike Kane and Adam Reno explain why the test cell needs people with many years of knowledge, experience, and proficiency.

The test cell is where an engine is put through its paces before it's deemed ready to ship to the customer. While operators in other areas of our shops are generally focused on one part or function, this is where it all comes together in a complete engine.

"If you're in the rest of your shop, you're concentrating on your part, right? This is the whole part. This is everything put together," says Adam Reno, an ATP production supervisor in a Grove City test cell. "The final result is a quality engine, something you can be proud of when it ships to the customer."

"To add to that, we're just one part of the locomotive itself," says Mike Kane, GC1, Emissions Operator 2. "There's a gazillion other parts that connect to the engine. The alternator, all the power and computers, the wheels themselves. Everything is connected."

When an engine comes off the assembly line and is moved into the test cell, the team connects and pressurizes the water, oil, and fuel lines, and then checks for leaks. The engine is run through a break-in cycle, running through a range of notches, while performance and engine health are monitored.

> "Those holes are millimeters apart. But it came down to just that one little thing, to fix the whole engine."
>
> — Adam Reno

The experience required

Troubleshooting the sort of issues identified in the test cell demands a deep understanding of the many working parts of the engine. "I would just say that the technical knowledge required to be a test operator can take years of experience," Adam says. "Even guys that have eight years plus, we'll get into something that baffles everybody."

As an example of an issue that stumped the team, Adam describes trying to troubleshoot an engine with a temperature spread issue. "We were trying everything, for over a week, working with engineers and everybody," he says.

Finally, one of the test cell operators noticed that, on one of the fuel blocks, the supplier had drilled two holes incorrectly. "Those holes are millimeters apart. But it came down to just that one little thing, to fix the whole engine," Adam says.

Testing heroes

One of the advantages of a team with deep experience is the ability to zero in on what might be causing a particular issue. “Any time we catch anything, that person’s a hero,” Mike says. “We never want to pass any problems on to the customer. It’s better to deal with it in-house, finding the avenues to resolve the problems going forward so we don’t see it the next time in test.”

Often when a problem is identified, it can be fixed there in the test cell. “It it’s something minor, like a part or fitting with a defect, a test cell operator can easily change that out on his own in the cell,” Mike says.

> “Any time we catch anything, that person’s a hero. We never want to pass any problems on to the customer.”
>
> — Adam Reno

If it’s a larger problem, the engine will be pulled out of the test cell and sent to the sick bay where a team can address it. “For instance, it might be a pinched O-ring,” he says. “Something that small can be a big problem. We have to physically take that engine back out of the cell.”

The next step is to keep that issue from occurring again. “If a supplier part was the problem, we make sure we’re documenting that, getting that feedback to the teams that have to run it down,” Mike says. “We make sure we’re quarantining parts when we need to.”

Quality assured

By the time an engine is shipped to the customer, it’s been through rigorous testing on each element of its operation. “We have a quality assurance program that we complete at the end of the run to make sure the engine is up to par,” Adam says. “It’s a big checklist. Horsepower, fuel, pressure, RPG, all of it.

Before a Wabtec engine leaves the test cell, the team needs to feel completely confident in its quality. “That’s our name going out the door, so it’s a big deal,” Mike says.

“It’s pretty cool to watch a locomotive go down the tracks,” adds Adam.

Commerce secretary visits Grove City

Grove City recently welcomed U.S. Secretary of Commerce Howard Lutnick, Rep. Mike Kelly, and Wabtec CEO Rafael Santana for a tour spotlighting the plant’s role in a 2025 landmark deal to build 300 locomotives for KTZ, Kazakhstan’s national railway, which was one of the largest orders in Wabtec’s history.

Grove City produces the engine kits that will be shipped to the Wabtec facility in Kazakhstan for final assembly.

The competitive advantage of EVO Advantage

The EVO series demonstrates a 20-year history of reimagining what's possible — while our competitors only tweaked existing engines.

Jim Gamble

VP, Technology

What's new now

The EVO Advantage is Wabtec's latest application of our eTurbo technology — harvesting previously wasted energy from the engine's exhaust system to boost fuel efficiency by around 5 percent without impacting reliability. "It sounds unusual, but the idea is to capture exhaust energy that's already driving the turbo and use that same energy to also drive an electric motor built into the middle of the turbocharger," explains Jim Gamble, VP, Technology.

"It's the latest introduction to our Evolution Series and builds off our successful launch of FDL Advantage into our engine installed base."

Reinventing, not just tinkering

When the Evolution Series was launched in 2005, it was in reaction to new EPA Tier 2 emissions standards. "While other locomotive manufacturers made incremental fixes to check off the new compliance requirement, we believed our customers would be best served by a more thorough reimagining of what's possible," Jim says. "Our solution was developing a brand-new engine architecture, loaded with innovative performance features that would also provide enough flexibility to adapt to future needs." There are now more than 10,000 EVO-powered locomotives operating today, and the Evolution Series engine family remains an industry leader in international, EPA T3, and EPA T4 applications.

Other locomotive manufacturers approached the issue by making adjustments to existing engines, which met compliance standards but reduced the engines' fuel economy. Wabtec's introduction of a new Evolution engine gave us a strong advantage in the market.

> "My strength is leading really smart people to do really complex things well."
>
> — Jim Gamble

Our vertical advantage

Wabtec can explore innovations our competitors can't, since we design not just the engines but the entire locomotive. "Because we're vertically integrated, we can do something unique," says Jim. "With no technology walls between the Turbocharger, Engine, and Locomotive teams, we could take the eTurbo from a small-scale lab demonstration to a full-scale turbocharging system."

An eTurbo on an engine and locomotive of this size hasn't really been done before, Jim says. "You see it on high-performance passenger cars to increase performance, but it has never been done to increase the overall efficiency of a system nearly as complex as a locomotive."

Jim leads turbocharger development, engine design, and development. Justin Downs and Justin Sokol own turbocharger manufacturing, and the wider Wabtec team owns the locomotive design.

But Jim is quick to point out that he's not the engineering brains behind his team's accomplishments. Although he holds multiple degrees in mechanical engineering, his first full-time job at Wabtec was on the shop floor. "My strength as a long-time technology leader is leading really smart people to do really complex things well. We have a great cross-functional collaboration between the Engineering and Supply Chain teams that enable us to do things others can't."

New builds vs. remans

Joe Bugzavich and Jonathon Hall take us through the differences in what happens in new builds and on their shop floors in Grove City.

Joe
Bugzavich

Senior Operations
Production Manager
Grove City New Build

Jonathon
Hall

Senior Operations
Production Manager
Grove City Reman

You're both sending engines out the door. But what would a visitor notice as a difference between your two shop floors?

Jonathon: One of the differences in our shop is that we receive the dirty engine and it gets torn down, versus Joe's shop where they assemble brand-new components.

Joe: I think one of the things that would jump out is the variety of engines that are running down our EVO assembly line here. Ours is a fixed model line, where we run Tier 2, Tier 3, Tier 4, UX Tier 4s, 16-cylinder EVOs, Kazakhstan, marine, and stationary engines — all going down the same assembly line.

How long will an engine typically spend on each of your assembly lines?

Joe: So the individual assembly can vary. They can be quite different. But we've succeeded in getting the attack time, across that variety, down to 3 hours and 27 minutes.

No matter what the variety going through, we've got that work divvied up in a way where we're able to utilize our workforce to finish the variety of the engines in that amount of time. You know, our Tier 4 engines have more material that has to be installed, in comparison to our standard engines. They actually have to go into an entire additional station that we have to man and unman.

Jonathon: On the teardown side, we have a mixed model line, so we tear down EVO, FDL, and Tier 4 engines on the same line.

And so even though each model provides its own challenges with each station, we keep the same takt time of 117 minutes down that line.

On the flip side, when we assemble the engine, we have two separate assembly lines: one for EVA, one for FPL. Then after we tear down a Tier Four engine, we requalify and rebuild those subassemblies and we ship those to GRV — and they build all our UX Tier 4 engines right in their shop.

> "One of the differences in our shop is that we receive the dirty engine and it gets torn down, versus Joe's shop where they assemble brand-new components."
>
> — Jonathon Hall

What's the hardest part of your job?

Jonathon: I'd say the most challenging thing is the constant variation in condition of parts that have to be requalified. Sometimes we receive engine cores that have been in fires, in floods, they have freeze damage, they've even rolled off a truck during transport. So there's a constant unknown in the condition of our incoming material.

Joe: I'd say there are a couple of things. On our main assembly line, the mixed model variety that comes through is a pretty significant challenge. Our guys have to have a good knowledge base on all those different engines.

And then there's the testing. That's where we're going to find any problems. You never know when something's going to show up in testing. We have to troubleshoot and pivot and be able to repair all those things. We have to make sure these are quality engines and able to meet all the customer requirements before they make their way out the door.

> "I've been involved in testing for more than 15 years, but I can promise you that at some point this year, I'll see things I've never seen before."
>
> — Joe Bugzavich

And what's the best part of your job? Why do you love what you do?

Joe: For me, I love that no two days are the same. I always tell people that we thrive in a little bit of chaos over here. For instance, I've been involved in testing for more than 15 years, but I can promise you that at some point this year, I'll see things I've never seen before.

Jonathon: What I really enjoy is coming up with solutions to problems. Each day provides a set of new challenges, so we're always trying to come up with solutions. That keeps me coming back and excited about the job.

Check out the Managers' Roundtable video on the digital version of *Same Track*.

Moving engines

Every Wabtec engine — new builds or reman — starts in Grove City, then are sent to destinations all around the globe for assembly.

Some engines are sent to Erie for assembly. But Erie is the first stop for all engines headed overseas, where they're packed into shipping containers, then trucked to ports around the country.

New builds are designed and manufactured at our Main Street plant.

460 New engines per year average

Reman engines are shipped to our Barkleyville Road plant — via truck on flatbeds or covered trailers.

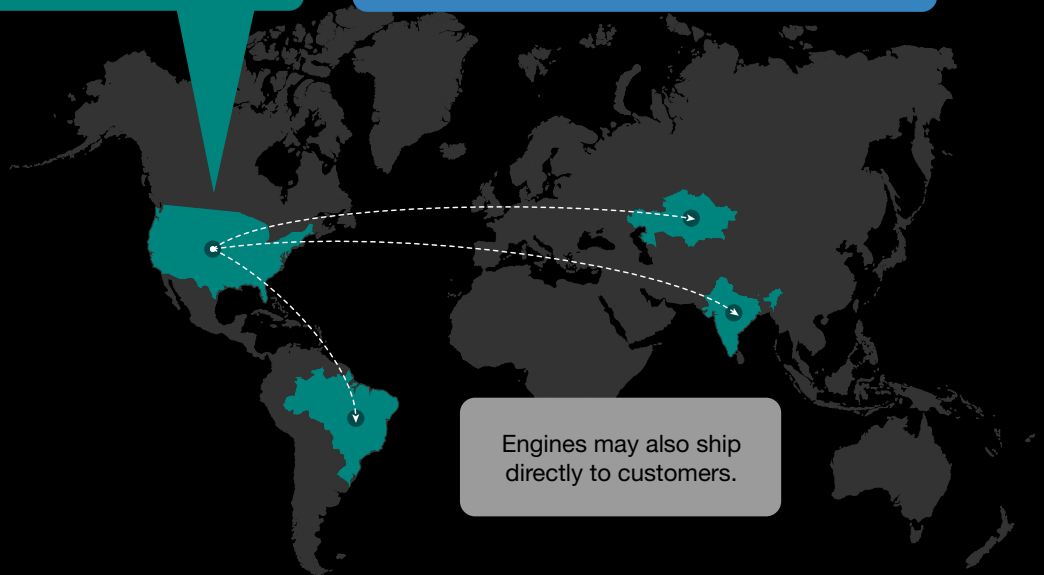
1,380 Reman'd engines per year average

Global destinations

Ports in NY, VA, LA, etc., feed assembly plants in Marhowra, India; Astana, Kazakhstan; and Contagem, Brazil. (3 to 8 weeks)

North America destinations

Erie (2 hours from Grove City)
Fort Worth (a couple days)
Monterrey & Saltillo, Mexico (a few days)



Engines may also ship directly to customers.