

ACADEMIA ROBOTICA PUEBLO

VIQC Middle School - Career Readiness Online Challenge

“ADAPTATION OF SEMI-ELECTRONIC DIESEL PUMP FOR
OTHER MACHINERY”

COMPANY: PUNTO DIESEL S.A.

TEAM 71832M - RIDERS IV

ASUNCIÓN - PARAGUAY

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ABOUT THE COMPANY

PUNTO DIESEL S.A. is a company that specializes in offering solutions to problems by the diagnose and repair of diesel injection equipment such as pumps and conventional injectors, allowing them to serve a wide range of vehicles, boats, and heavy machinery from the following brands: Massey Ferguson, New Holland, John Deere, Case, Valtra, Kubota, etc.



PUNTO DIESEL S.A.
mbt

Servicios ✓

- ✓ Diagnóstico y Reparación de Bombas de Alta Presión.
- ✓ Reparación de Bombas Mecánicas.
- ✓ Limpieza y Reparación de Inyectores Common Rail.
- ✓ Scanner.
- ✓ Reparación de Inyectores EUI EUP PIEZO.
- ✓ Reparación de Turbos.

Venta de Repuestos ✓

- ✓ Bombas.
- ✓ Toberas.
- ✓ Inyectores CR.
- ✓ Válvulas de Presión.
- ✓ Sensores de Presión.
- ✓ Riel de Inyectores.
- ✓ Juego de Juntas.

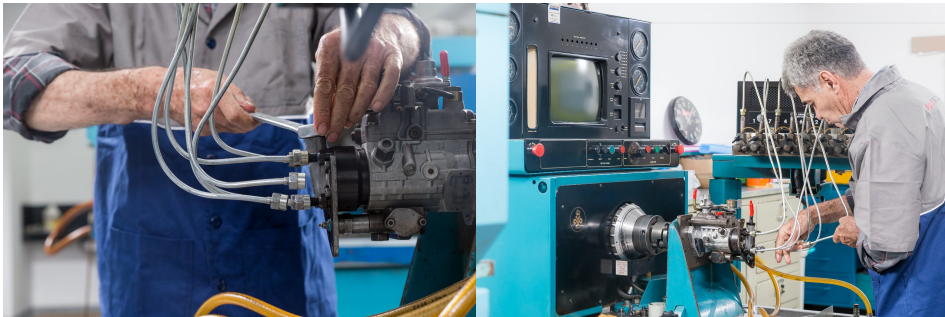
Distribuidores oficiales de las marcas:

DENSO **hartridge** **Stanadyne** **Delphi Technologies**

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We chose this company because we believe that it offers interesting and compelling solutions, in matters of economic and promptness to the problems that may arise in the country's industry.



PROBLEM AND SOLUTION

The situation we chose to analyze is the ADAPTATION OF SEMI-ELECTRONIC DIESEL PUMPS FOR OTHER MACHINERY, this being related to a specific situation that we will unfold below.

Paraguay, being one of the largest exporters of soy, organic sugar and meat, can't afford to delay its industry work. We were able to witness a situation alongside the mentioned company, where a John Deere harvester got damaged in the middle of the harvest. Time is a key factor here, since the harvest once started cannot be delayed more than 48 hours, otherwise the product will be lost. The harvester's problem was the fuel pump, "due to contaminants in the diesel", this pump is not available in the local market since there are no legal representatives of this company in Paraguay, the spare parts and other equipments can only be acquired through import, which can be an issue in matters of time and money.

By applying the engineering design process steps, the technicians investigated and analyzed the affected fuel pump in order to obtain accurate information about it. After acquiring information about power, performance and specific measurements, the technicians started to do comparisons with local available spare parts and found similarities with a Delphi pump, which adapts in a more accurate way to the John Deere fuel pump model. After various tests, and numerous modifications to the Delphi pump, they were able to replace the John Deere pump successfully, making the harvester work properly again in time to finish the harvest.



Companies such as PUNTO DIESEL S.A. are a vital pillar in the local industry, technicians in these companies are specialized and trained in offering quick and efficient solutions to given situations, all of these while applying the engineering design process steps.

COMPARATIVE ANALYSIS

The way a company deals with industry problems is similar to the way VEX robotics teams deal with problems; The situation is analyzed, the data is collected, Several possible solutions are proposed, tests are carried out, and if it doesn't work, it gets corrected and tested again, all these until a definitive solution to the problem is found. We execute these steps at VEX Robotics with almost the same challenging level: time limits, predetermined parts, regulations and rules, weight and size, among many other elements.

We, as a team, experienced a similar situation to the companies. While participating at a VEX competition in a foreign country, an important part of our robot dismantled during the trip. Since we were out of the country, our access to parts was limited, in addition, time was against us, since the competition was about to start. After identifying the problem and looking for information that might be useful in our engineering notebook, we were able to solve the issue, and after a few practice matches, the robot was ready to compete.

CONCLUSION

As the world constantly changes and more efficient, quick solutions are needed, STEM programs are playing a key role by proposing new engaging and stimulating challenges like the VEX Robotics courses and the VIQC for youngsters to learn through them. Not only does VEX robotics encourage them with the necessary tools like engineering knowledge, but it also enables young people to practice and gain the necessary experience to face the challenging world that is upon them. This translates into more prepared young people pursuing STEM related careers in the future, people that are able to perform better at their jobs and create a better world, that can make important discoveries or inspire others to follow their path.