

#### IAgrE Student Awards





### IAgrE CNH Industrial Award\* / Student Project Award\* Safety Award\* \*please delete as appropriate:

	Course Director/Head of Depart	tment)					
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Position: Lecturer							
University/College: Co	olegSirgar						
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Name of Student/Grou							
Kien Evans							
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Personal contact deta	ils (i e not college) to enable	us to contact the student(s) once their course has					
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name of course studio	ed: Level 3 City and Guilds E	xtended Diploma in Land based Technology					
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Period studied	From:September 2023	To:July 2025					
Qualification to be gain							
180 Credit extended dip	oloma						
Project Title:							
Side shift Headstock							
Details of material sul	bmitted with nomination: (Pro	oject/Exec Summary/videos etc)					
Powerpoint presentation							
SIGNED BY PROPOSI	ER: DR James	DATE SUBMITTED:					
		22/10/25					
f you wish to provide a	any additional information to	support this nomination, please do so in a covering letter.					

If you wish to provide any additional information to support this nomination, please do so in a covering letter. When complete, return this form, together with the supporting documents, to

The Secretariat, IAgrE, The Bullock Building (Bldg 53), University Way, Cranfield, Bedford MK43 0GH secretary@iagre.org

NB All work submitted is treated with complete Confidentiality; no part of the paper will be published by IAgrE except for the Title and Name of the winner in each category.

# Level 3 land based unit 333 Project 2024/25

**Kien Evans** 

#### Background

My name is Kien Evans I live in a small village of Cilcennin based in Ceredigion where I live in a small small holding consisting of small amount of land and stock this gave me the opportunity to think and design different ideas. I have been working in Gwili Jones for the last year where I began last September for college I also work on different farms helping with livestock and machines, I also study in Gelli Aur where I study level three agricultural engineering. I also attend Mydroilyn YFC where i have previously competed in RALI and public speaking .





#### Career aspirations

After leaving college I am hoping to continue my work as an Agricultural Engineer, working for Gwili Jones. I am also hoping to begin a small contracting business that would keep me busy on weekends and late nights.









#### Amcanion - Objectives

- The requirements of the unit were to come up with 4 initial project ideas that would be either new to the agricultural industry or aim to improve or modify an existing product or idea.
- I was tasked with choosing my final idea and designing / manufacturing and finally presenting my idea to my peers and a panel of judges







#### **Gwili Jones**



#### Research

Throughout the process of designing and thinking of different projects to design and create , I used a number of different research points these included -

- The Royal welsh show
- LAMMA show
- Manufactures
- Dealerships Gwili Jones
- Farmers
- Contractors
- Farmers weekly
- I also researched for any similar or same products already on the market





## Syniad 1/ Concept 1 - Clamp / safety rail around bales

Twin bale grab

Safety clamp lift down and up

Able to lift bales and transport safety wrapped

Able to lift up and down the bales threw lifting the clamp and closing

Easy to cart bales from fields to farms

many smaller farmers and smaller contractors







#### Concept Side shift headstock

Pallet forks

Adjustable



Ram fitted on either side allowing the headstock to slide

Able to adjust from the inside of the cab

Safety feature - able to lock the tines in place

Able to move pallets from side to side





#### Justification for my proposed

After designing three different ideas i have chosen to create the 2nd concept which is the adjustable headstock which are adjustable and have a side shift - I have chosen this idea due to these reasons

- Relevance to working in a dealership
- More of a target market
- Able to improve working rate
- Aids in health and safety





#### What's on the market?

Before justifying my idea I ensured to look online and carried out my research ensuring that their was no similar / existing products already on the market

During this process i found that there was a similar layout on a forklift but nothing on agricultural equipment. This layout was only able to support pallet forks rather than other tools.

Their is also adjustable pallet forks able to adjust each tine



#### Target market

Unlike similar products already on the market the side shift headstock for a front loader will benefit much more , whilst also having a larger target market

- Farmers
- Dealerships
- Contractors
- Haulage Unlading / loading
- Other industry



#### Risk assessment / Health and safety

Location : Gelli Aur Workshop

Task: Welding and hot works

Person Undertaken the Risk Assessment Kien Evans Date Undertaken 28/01/2024

Hazard	Person(s) at Risk	Existing Controls	Risk Rating (see matrix)			HighMed Low	Any additional control measures required.
Explosions	Myself and	Ensure all gas bottles are	Likelihood	Severity	Total		
	others in the workshop	secured correctly to the MIG welder - ( straps / chains ), all empty gas or unused gas bottles are to be stored outside in a locked cage make sure all fittings are correctly fitted to the gas bottle ensuring there are no leaks. Open the tap on the bottle and listen for any leaks and make sure that the pressure does not drop on the gauge, when welding, ensure that no flammable objects are nearby, ensure not to weld around containers or fuel tanks	2	5	10	MED	when and if welding outside use signage to allow others to know a welding process is taking place
Dust & Fumes	Myself and others in the workshop	When welding, ensure local exhaust ventilation ( LEV ) is turned on to extract the furnes, also ensure that doors are open allowing fresh air to circulate. when welding, ensure to weld in the correct space away from	2	4	8	MED	If any welding is done in a confined environment the use of air fed mask should be worn to filter the fumes created when welding.

	1	where the fumes are					
		white the turnes are extracted. use an airline to remove dust from the welding piece when carrying out thes process enure to wear the correct PPE witch consist of mask and goggles					
Slips, Trips & Falls	Myself and others in the workshop	Good housekeeping should be kept at all times ensuring all tools used are returned and kept out of the way. inform others in the workshop about yourself carrying out a welding task	3	2	6	MED	correct signage should be used if welding outside allowing others to know of cables and a work space
Crushes & Knocks	myself and others in the workshop	Aware of manual handling when lifting different materials - (Men / 25 KG - Women - 16 KG ) anything aid is to be used such as an engine crane if using vices and jigs keep aware of hand placement in a safe area out of crushing. This should also be carried out when using the vice when moving large lengths of steel and other materials across the yard to be aware of farm traffic.	2	3	6	MED	
Cuts & Splinters	Myself and others in the workshop	be aware of any byrs or sharp edges in pisces of metals , the correct PPE should be worn when	2	2	4	LOW	

#### Risk assessment / health and safety

		handling metals including gloves. The use of files should be used when preparing the metal for welding. When using power tools such as grinders and chop saws the correct rating is required all guards are to checked on these power tools before use					
Lifting & Straining	Myself and others in the workshop	Aware of manual handling when lifting different materials - (Men / 25 KG - Women - 16 KG ) anything above these weights a lifting aid is to be used such as an engine crane, when lifting different materials the correct lifting technique is required. If using a lifting aid the correct rating is to be used.	2	3	6	MED	
Chemicals & Poisons	MYself and others in the workshop	consider COSHH regulations when using chemicals and poisons that fall under the regulation , safety data sheets. use the correct PPE.	2	3	6	MED	Safety data sheets should be held at all materials found under the regulation.
moving Parts, Machinery & Vehicles	myself and others in the workshop	if working on any vehicles ensure the key is off and left in a safe state - handbrake and in nutrueal . checks	3	3	9	MED	

		should be used to secure the vehicle. Keep aware of moving parts on machinery and vehicles. When moving machinery the correct training is required to ensure that you are safe and confident to carry out the process. certain tools and machines require the correct certificate including the telehandler and oscillating wheels.					if using the telehandler on the yard and other machinery the area of should have the correct signage and potentially conned off
Noise Exposure	Myself and others in the workshop.	Anything over 80 DB will require ear defenders or ear plugs or when using power tools such as grinder for a long period of time.	2	2	4	LOW	
Eye Damage	Myself and others in the workshop.	any task such as grinding the correct PPE is to be wrong such as safety glasses, for any hot work such as brazing the correct PPE is to be worn this also applies when welding - welding masks are to be worn. When welding inside the workshop the UV curtains should be closed at all times ensuring others in the workshops are not affected.	3	3	9	MED	

#### Iechyd a Diogelwch/ Health and Safety

With the average age of a farmer being 59 years and 40 % being over the age of 60. This makes agricultural as one of the oldest working industry.

The Agricultural industry is one of the most dangerous industries with just over 1 in a 100 workers being injured and the majority having lower back pain .

My project would alleviate back problems as their will be no need for the manuel side off using a fork to clean the side of the shed . this project also aids in helping pick up different tools ensuring that farmer does not need to man handle the implement

With my project being able to side shift this allows to unload safety ensuring that the load is picked up securely and equally.

#### The Deadliest Industries

In 2015, 4,836 people died industry-related deaths. Farming, fishing and forestry have the highest death rates of any industry.



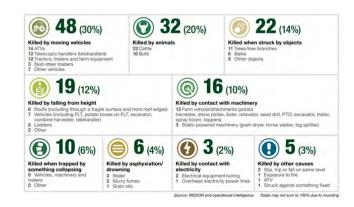
deaths per 100,000 agriculture, femistry, fishing and funting Workers



deaths per 100,000 transportation and wambousing workers 11.4

deaths per 100,000 Mining quarrying and oil and que extraction

Some Service Of Lance Common From Common Politics - (1977)



#### Timeline

	Week 1	Week 2	Week 3	Week 4
November	Research	Research	Research	Research
December	Researching	Researchi ng	Designs	Designs
January	Chosen final Design		Previous concepts	Research
February	Researching	sketching	Sketching	Sketching
March	Testing	Testing		Designing -
April	Designing	Fabricatio n	Fabrication	Fabrication
May/June	Fabrication			Final presentation

#### Manufacturing process























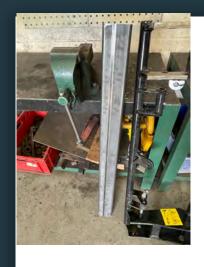








































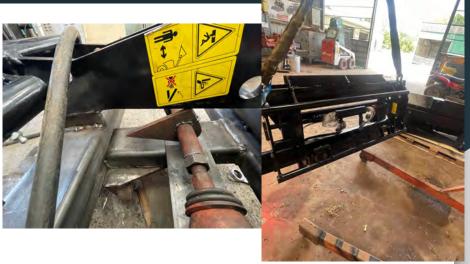






















#### Skills that I have used/learnt

- Welding preparing the work correctly
- CAD to stress test my product and mesure out the correct lengths
- Drawing initial sketches allowing me to present my ideas on paper
- Painting to finish of my product tiddly whilst also protecting from corrosion
- Measuring and cutting using the band saw and grinders to cut and measure the correct length
- Preparing a presentation



#### Costs

Euro 8 brackets - £ 60

Euro 8 headstock - £ 155

Hydraulic fittings - £ 20

Steel - £ 200

Steering ram - £ 150

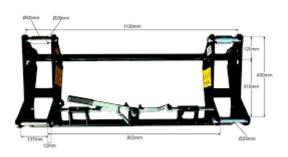
Hydraulic hoses - £80

Labour - 15 @ £ 18

Total - £ 935

sell for - £ 1200







#### Possible Improvements



With completing my final product and testing there's a few weak points and would need to be improved if I was to rebuild / redesign the product . for next i would ensure to -

- Bolt on the ram with the use of U bolts rather than welding brackets.
- Use a bigger ram allowing for more side shift movement.
- Hydraulic locking pins for the headstock



## Diolch am wrando Thank you for listening

Unrhyw cwestiynau?
Any questions