

LEARNING TO SEE WASTE

BROUGHT TO YOU BY:



Manufacturers Alliance
Providing Training & Education Peer to Peer

GUEST SPEAKER



Bart Hoemann, Plant Manager
New Flyer

How to:

- ✓ Remove department Siloes
- ✓ Lack of accountability
- ✓ No time for continuous improvement

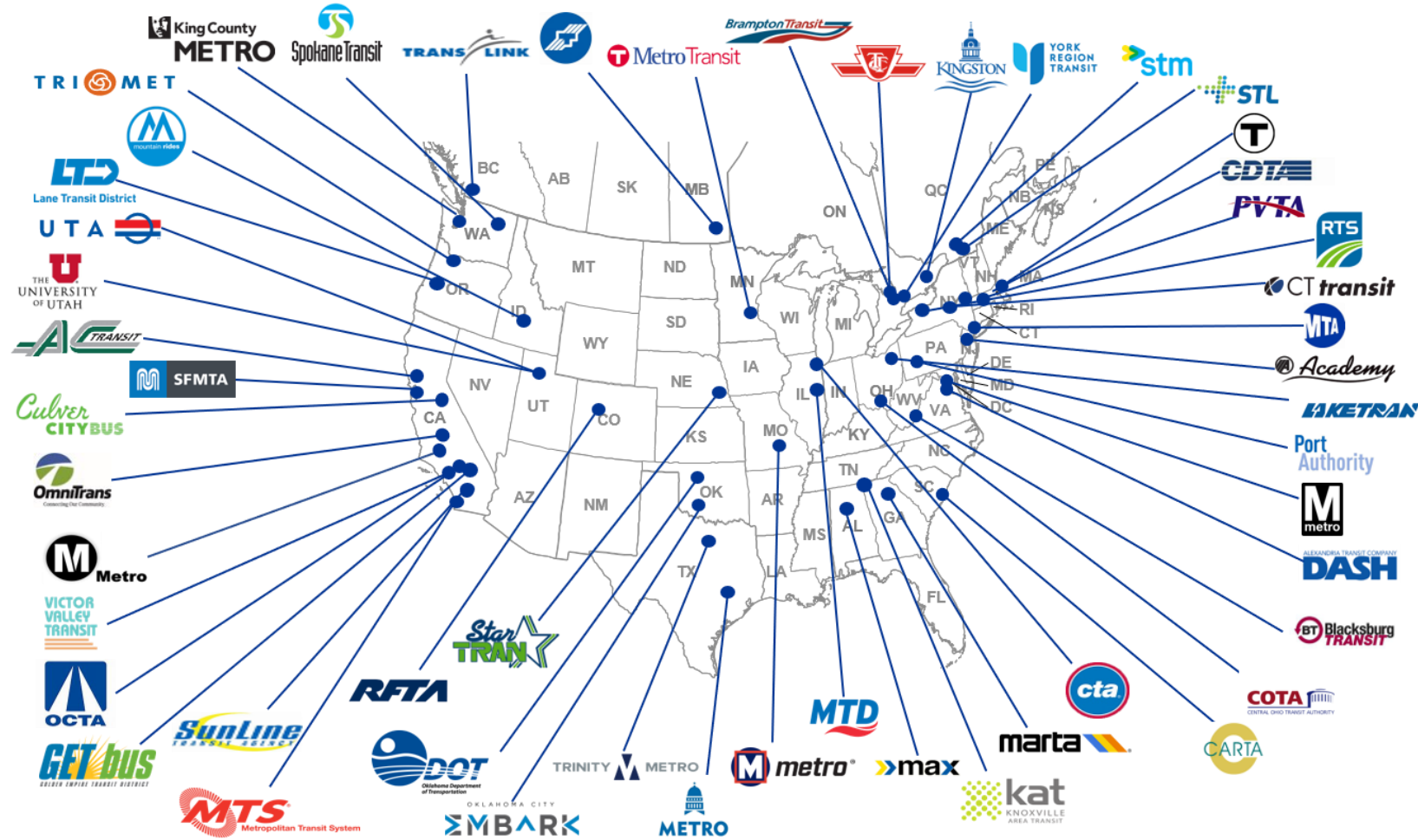


Global Leader in Mass Mobility Solutions

- 90 years of bus experience
- 8,000 employees across 9 countries
- 9,000 buses and coaches manufactured annually
- Supports 105,000 buses and coaches in service around the world
- Publicly traded on TSX (Toronto) under the symbol NFI
- NFI EVs have collectively travelled more than 50 million zero-emission miles



Zero-Emissions Bus Deployments



NEW FLYER®

Learning to See Waste at New Flyer



WEBINAR

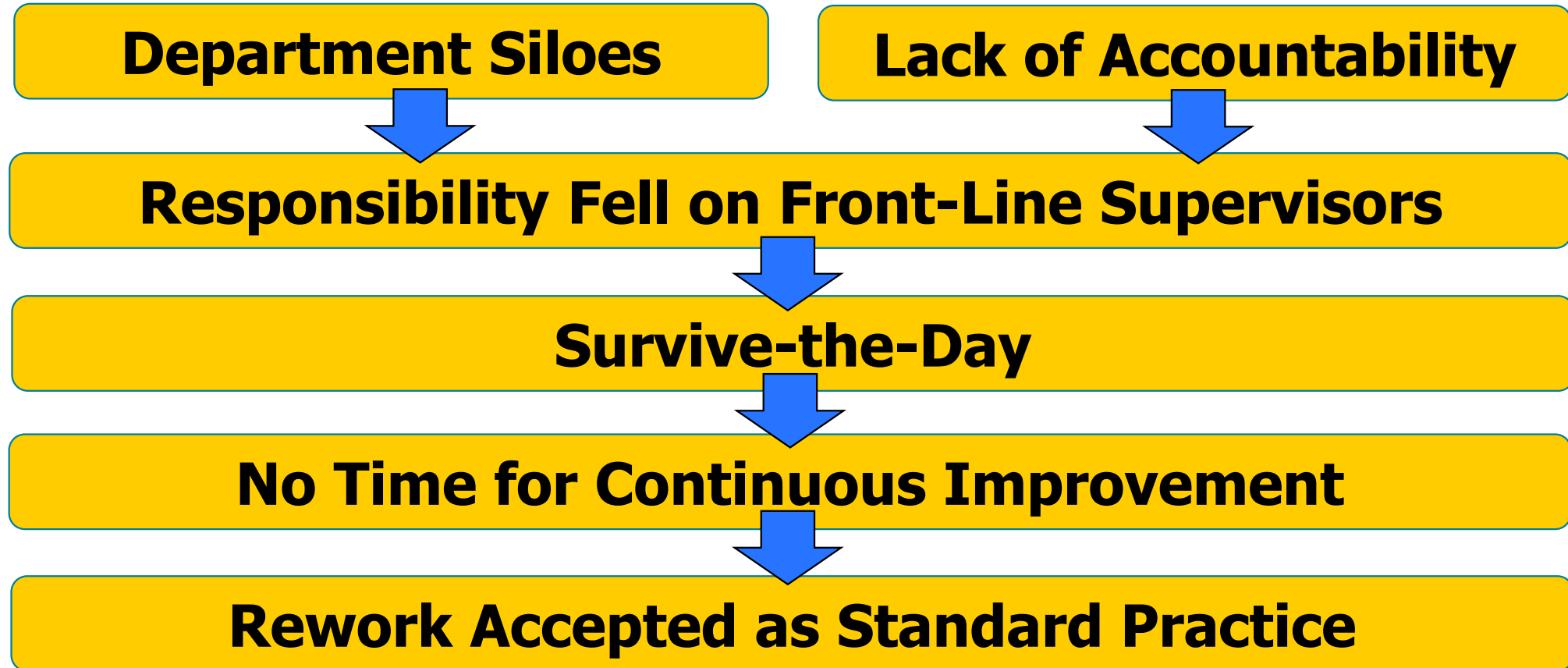
LEARNING TO SEE WASTE



NEW FLYER®

Learning to See Waste at New Flyer

The Challenge We Had to Overcome: **Our Culture**



Learning to See Waste at New Flyer

Action 1

Break Down
the Silos

Action 2

Put in Simple Continuous
Improvement Infrastructure

Focus on Safety

We Focused on Safety Because:

- It is the Right Thing to Do
- All Employees Can Support

Our Situation in Q3-2020

Not Egregiously Unsafe	Safety Goals	
Mediocre Performance (LTIs & Recordables)	<i>Supervisors</i> Complete Accident Investigation Within 24 Hours	<i>Supervisors</i> Complete Weekly Self-Audits
Weak Safety Committee		

Focus on Safety

Initial Actions to Change the Culture: **Safety is a Priority**

- Required Leadership Team to Attend Safety Committee Meeting
- Did Not Approve Weak Corrective Actions
- Leadership Team Started a Weekly Safety Audit Program

Safety Audit Cards

New Flyer Safety Observation Audit	
Audit Items	Yes/No
Are jack stands used properly?	
Are employees wearing masks/face coverings properly - over mouth and nose?	
Are bump caps worn when working under an elevated bus or mezzanine (when required)?	
Are cut resistant gloves used when handling a sharp object/part, & are employees using a vise when drilling?	
Are bus lift power cable plugs defective or missing parts or electrical pins? Will the cable block lock into the lift control box?	
Is fall protection in place (barriers, fall arrest, or fall restraint) for heights of 4' and higher?	
For 40' bus, are a maximum of 3 people in a bus that has windows installed with doors open? Or, 5 people if the AC is running, or the portable ventilation system is running, with windows & doors open? For 60' bus, are a maximum of 7 people in a bus with 2 ventilation systems running with windows and doors open?	
Are face shields worn when: drilling above shoulder (or when there is a potential for drilling to cause debris to fall onto a person's face or hair, whether or not you are the person drilling), using band & chop saw, & grinding wheel?	
Are steps used when entering and exiting the bus?	
When using compressed air, is the compressed air nozzle legal, are goggles or face shield & hearing protection worn & are other personnel away from the area?	

- Simple Audit to See "Waste"
- <10 Minutes to Complete
- Leadership Team Engaged

New Flyer Safety Observation Audit Schedule			
LT Member	Location	1st Shift	2nd Shift
Jeff Heuring	Power train 1	X	
Joe Helget	3600		X
Dan Metoyer	7200	X	
Ryan Urbanski	8400		X
Bart Hoemann	Weld Side, Roof, Front & Rear: West side N14- Wash bay	X	
Dan Champlin	4200	X	
Margaret Lewis	Audit Lane		X
Thomas Schreiner	9300	X	

Safety Audit Cards – Expanded

- Each Department Also Had to Complete an Audit Each Day
- Required Hourly Associates to Conduct Audits, Not Just Leadership
- Made Department-Specific Cards to Drive Relevance & Buy-in

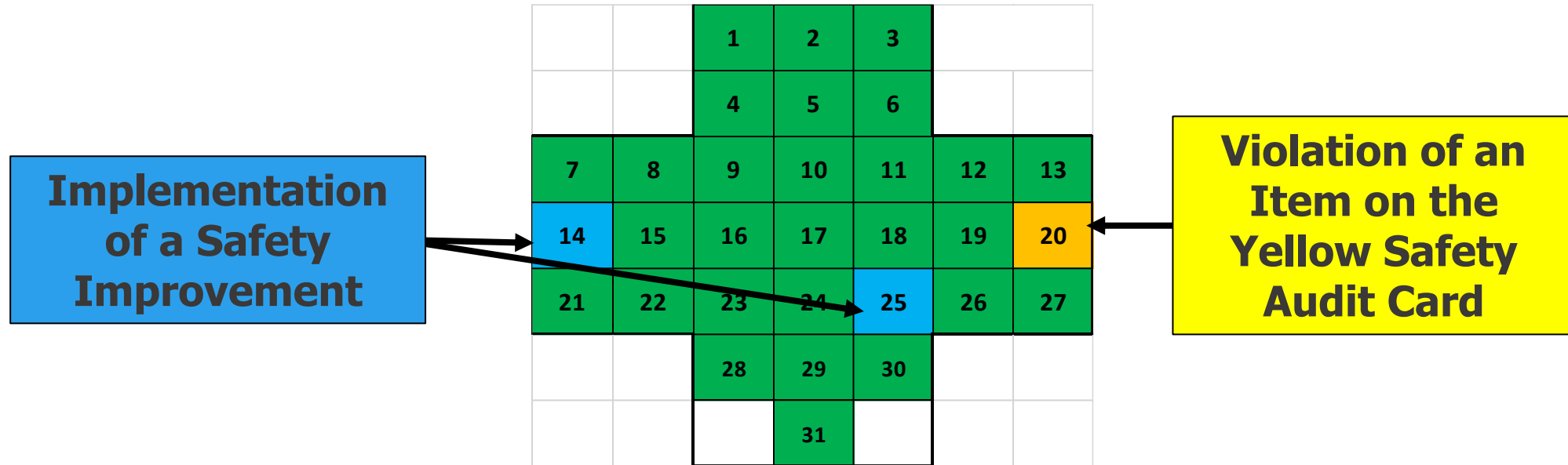
Name: Weld	
Cell:	Date:
New Flyer Safety Observation Audit	
Audit Items	Yes/No
Are trigger safety devices on grinders and cutoff wheels operational?	
Are Welders properly using the fume extractors?	
Are wires on weld leads properly covered & not exposed?	
Do lifting slings, harnesses, and chains have load limit tags, and are they free of defects?	
Is all required PPE in good repair and fully functional during use?	
Are all rolling ladders, steps and step stools free of defects?	
All wheels on bus dollies in good condition (no cracks, chips, divots, gouges, or flat spots)?	
Are NCP and Blue bins free of protruding parts?	
Are weld curtains closed and in good repair along the aisle?	
Are all gear boxes functional and in good repair?	

Name: Finish 2	
Cell:	Date:
New Flyer Safety Observation Audit	
Audit Items	Yes/No
Are jack stands used properly?	
Are locks used (not zipties) to lock out the battery disconnect switch when required?	
Are bump caps worn when working in the engine compartment & under an elevated bus or mezzanine (when required)?	
Are cut resistant gloves used when handling a sharp object/part, & are employees using a vise when drilling?	
Are bus lift power cable plugs defective or missing parts or electrical pins? Will the cable block lock into the lift control box?	
Is fall protection in place (barriers, fall arrest, or fall restraint) for heights of 4' and higher?	
Are face shields worn when: drilling above shoulder (or when there is a potential for drilling to cause debris to fall onto a person's face or hair, whether or not you are the person drilling), using band & chop saw, & grinding wheel?	
Are steps used when entering and exiting the bus?	
Are funnels closed and latched?	
Are oil & coolant drain pans drained fully and wiped cleaned?	
Are all bungs (including measurement bungs) inserted fully?	
Are mobile spill caddy (55 gallon drum dollies) clean of residual oil?	
Are the tops of used oil & coolant barrels clean of residual fluid, and are absorbent pads clean?	

Name: Road Test	
Cell:	Date:
New Flyer Safety Observation Audit	
Audit Items	Yes/No
Are jack stands used properly?	
Are locks used (not zipties) to lock out the battery disconnect switch when required?	
Are bump caps worn when working in the engine compartment & under an elevated bus or mezzanine (when required)?	
Are cut resistant gloves used when handling a sharp object/part?	
Are bus lift power cable plugs defective or missing parts or electrical pins? Will the cable block lock into the lift control box?	
Is fall protection in place (barriers, fall arrest, or fall restraint) for heights of 4' and higher?	
Are face shields worn when: drilling above shoulder (or when there is a potential for drilling to cause debris to fall onto a person's face or hair, whether or not you are the person drilling), using band & chop saw, & grinding wheel?	
Are steps used when entering and exiting the bus?	
Are safety block being used when the coach is in the air	
Are the safety gates being used properly around the pits	
Are funnels closed and latched?	
Are oil & coolant drain pans drained fully and wiped cleaned?	
Are all bungs (including measurement bungs) inserted fully?	
Are mobile spill caddy (55 gallon drum dollies) clean of residual oil?	
Are the tops of used oil & coolant barrels clean of residual fluid, and are absorbent pads clean?	

Safety Dept of the Month

Safety Cross



- Included Performance From Safety Card Audits
- Engaged Shop Floor to Implement Safety Improvements

Safety Dept of the Month – Improvements

Retractable Tape
When Bus in Air



Improved Fall
Protection



Adjustable Work
Table



Fixed Broken Lock
on Bus Lift



Safety Dept of the Month – Celebrating Success



Re-Start our A3 Program

Good News

Awareness of the A3 concept
from an Operational
Excellence initiative

Bad News

Experience was A3s added
work, but did not add value
(added waste)

Re-Start our A3 Program

Initial Actions

- Started Bi-Weekly Reviews That I Always Attend (now a priority)
- Set Goal for Each Department to Complete 2 Projects in 2021

Initial Results

- Only Supervisors Attended, Keeping Burden on Themselves
- A3s Presented as “Complete” Though Woefully Incomplete
- Some Successes; Ones That Addressed Persistent Rework

A3 Problem Solving Report

Start Date: 1/18/2021



A3 Owner / A3 Team Leader: Travis Winkelman A3 Tracking #: Weld-001-AC Compressor Support

1. Title: AC Compressor Support Fitment

Sponsor: Tyler Hartung A3 Sponsor Signoff & Date:

1b. Scope: Mitigate warpage issues associated with this install

Team Members:

Travis Winkelman, Brad McDermond, Daniel Blenkush

Proposed Countermeasures

Brainstorm Possible Solutions to the Root Causes in Section 4

1. Preload the subject tube prior to welding in the rear most AC support bracket that goes from the CS engine rail to the CS side tube.
2. Preloading has shown a dramatic improvement on installs. We will start documenting the amount in preload being used noting that the Septa coaches require additional preload.
3. Upon completion of testing fixtures will be modified to expand to the correct preload after the AC bracket has tacked in place.

PLAN

6. Implementation/Action Plan: (Can use attached Action Plan on third tab below)

Who	What	By When	Status
Travis W	Preload side tube after tacking AC support bracket in place	21-Jan	Complete
Travis W	Destaco 607 stright line clamp added to fixture	28-Jan	Complete
Travis W	Destaco 5130 stright line clamp added to fixture	3-Feb	Complete
Travis W	A longer handle was added to the 5130 clamp	5-Feb	Complete
Travis W	Monitor ease of install on specific SR's.... Need to create list	12-Mar	Complete
Travis W	SR list determined by which SR's use that style jig	15-Feb	Complete
Travis W	Have both shifts start using this modified Jig according to SR list	16-Feb	Complete

DO

7a. Follow-up: Collect Data

Date	Item Measured	Results	Date	Item Measured	Results	Date	Item Measured	Results
1/26/2021	Ease of install	Positive	2/5/2021	Clamp efficacy	Positive			
1/28/2021	Clamp efficacy	difficult						
2/3/2021	Clamp efficacy	moderate						

CHECK

7b. Is the Problem Resolved? YES / NO * (if NO go back to step 4, 5 or 6)

Yes

8. Standardize and Share

Documentation Created:

Training Plan:

Communication Plan:

ACT

2. Present Situation

Current Situation: What is going on? When is it happening? Where is it happening?

Currently there is fitment issues in 3400 when installing the AC compressor support. The bracket being installed has to be hammered into place.

GAP/Discrepancy: Current Measure versus Desired Measure

Currently have to use hammers, pry bars and sometimes a porta-power to install these parts. Ideally we want the parts to drop into place with little or no manipulation.

Proper fitment can be noticed when the jig is removed in weld.

Impact: Quality? Cost? Delivery? Safety? People?

Cost savings need to be calculated based on the reduction in install hours.
Increased safety from not having to force a part into place.

3. Target Condition

SMART Goal: Specific, Measurable, Achievable, Realistic, Timely

Reduce install times by 50%. 10-15 minutes per install, 10-15 installs a week, 50 weeks a year.

AVG 2.5hrs/week \$101.90 125hrs/year \$5095

Increase safety. **Need to see if there has been any incidents with this install.**

4. Root Cause Analysis

Potential causes:

1. Excessive weld size leading to excessive warpage
2. Warpage inevitable due to material type and joint configuration
3. No preload to account for warpage.

1/28/21

Destaco 607 inline clamp added to one of our AC support jigs.

This clamp works well, though it requires excessive force to apply the required preload.

2/3/21

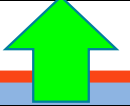
A larger Destaco 5130 clamp was ordered. This clamp has a higher holding capacity.

Clamp has been installed and tested. Though it is easier to use than the prior 607, it still requires more force than desired.


2/5/21

An additional 10" handle was added to the 5130 clamp

PLAN



Re-Start our A3 Program

A3 Problem Solving Report		Start Date:	1/18/2021	
		1. Title: AC Compressor Support Fitment		
1b. Scope: Mitigate warpage issues associated with this install				
2. Present Situation				
Current Situation: What is going on? When is it happening? Where is it happening? Currently there is fitment issues in 3400 when installing the AC compressor support. The bracket being installed has to be hammered into place.				
Hearing Waste ←				
GAP/Discrepancy: Current Measure versus Desired Measure Currently have to use hammers, pry bars and sometimes a porta-power to install these parts. Ideally we want the parts to drop into place with little or no manipulation. Proper fitment can be noticed when the jig is removed in weld.				

Re-Start our A3 Program

Lessons Learned:

- Don't Overthink Identifying the Problem
- Don't Need Data Analysis
- Just Ask: "What is Causing You the Most Frustration?"
- Break Down Barriers / Get Support Groups Actively Involved



A3 Problem Solving Report

Start Date: 08-Sep-21



A3 Owner / A3 Team Leader: Denis Stachowski A3 Tracking #: Fin2-202-poor dash seam fit

1. Title: Dash seam poor fit

Sponsor: Vern Geislinger

A3 Sponsor Signoff & Date:

1b. Scope: Dash panel installs in station 8200

Team Members:

Denis Stachowski, Sergio Moctezuma, Prajal Shakya, Michael Stitt, Randy Haddy

2. Present Situation

Current Situation: What is going on? When is it happening? Where is it happening?

Finish 2 is getting multiple calls a day to fix snags with the dash seam on multiple SR's. The installers struggle to get the seam to look good in station and even when they can get the seam to look good in station, they often get called by R/T Audit, or CAD later on about an issue that they think is bad or is written as a snag. The issue we see most often is that there is a small gap that occurs when the block clamp for the dash stanchion gets installed. We are also getting calls about the dash cluster being spongy by the windshield.

GAP/Discrepancy: Current Measure versus Desired Measure

There is no "set in stone" good or bad. It is subjective and dependant on the QA or Property writing the coach. Snags have been written for very small gaps.

Impact: Quality? Cost? Delivery? Safety? People?

When employees leave station to rework these possible snags, each legitimate snag takes 1 hour to correct. Plus the time lost in station. \$40.76/hour x 2 hours per occurrence x 5 occurrences per week = \$1,222.80 per week. There is also the potential for a lost sale.

3. Target Condition

SMART Goal: Specific, Measureable, Achievable, Realistic, Timely

To reduce this snag by 50% by Nov 1, 2021.

Success will be measured by proven snag reduction.

4. Root Cause Analysis

Man

Installers not installing to print from various stations

Machine

Materials

Parts not made to spec

Prob. Desc.

Reworking Dash Panel Seams



The defect is not defined

Heat distorting parts after installed

Methods

Measurements

Mother Nature

5. Proposed Countermeasures

Brainstorm Possible Solutions to the Root Causes in Section 4

- Complete install audits in F2 and S2.
- Measure parts to verify they are to print.
- Validate install after the paint booth to verify there is no warpage.

6. Implementation/Action Plan: (Can use attached Action Plan on third tab below)

Who	What (begin with verb)	By When	Status
Sergio	Audit has been completed for F2 and Shell 2	Week 42	complete

7a. Follow-up: Collect Data

Date	Item Measured	Results	Date	Item Measured	Results	Date	Item Measured	Results
10/28/2021	Shell 2 SIKA	Pass	10/28/2021	Dash Panels	Pass			
11/2/2021	R/T fitment	Pass						

7b. Is the Problem Resolved? YES / NO * (if NO go back to step 4, 5 or 6)

Yes

8. Standardize and Share

Documentation Created:

Training Plan:

Communication Plan:

PLAN

DO

CHECK

ACT



Re-Start our A3 Program

A3 Owner / A3 Team Leader: Denis Stachowski A3 Tracking #: Fin2-202-poor dash seam fit

Sponsor: Vern Geislinger A3 Sponsor Signoff & Date:

Team Members:
Denis Stachowski, Sergio Moctezuma, Prajal Shakya, Michael Stitt, Randy Haddy

Team Includes ME, Materials, & QA

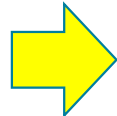
	A3 Problem Solving Report		Start Date:	08-Sep-21	
	1. Title: Dash seam poor fit		1b. Scope: Dash panel installs in station 8200		
2. Present Situation					
<p>Current Situation: What is going on? When is it happening? Where is it happening? Finish 2 is getting multiple calls a day to fix snags with the dash seam on multiple SR's. The installers struggle to get the seam to look good in station and even when they can get the seam to look good in station, they often get called by R/T Audit, or CAD later on about an issue that they think is bad or is written as a snag. The issue we see most often is that there is a small gap that occurs when the block clamp for the dash stanchion gets installed. We are also getting calls about the dash cluster being spongy by the windshield.</p>					
<p>GAP/Discrepancy: Current Measure versus Desired Measure There is no "set in stone" good or bad. It is subjective and dependant on the QA or Property writing the coach. Snags have been written for very small gaps.</p>					

Waste of Fixing Problems That Are Not Problems

Re-Start our A3 Program

4. Root Cause Analysis			
Man	Machine	Materials	Prob. Desc.
Installers not installing to print from various stations		Parts not made to spec	
			Reworking Dash Panel Seams
Methods	Measurements	Mother Nature	
	The defect is not defined	Heat distroting parts after installed	

5. Proposed Countermeasures
Brainstorm Possible Solutions to the Root Causes in Section 4
1, Complete install audits in F2 and S2.
2, Measure parts to verify they are to print.
3, Validate install after the paint booth to verify there is no warpage.

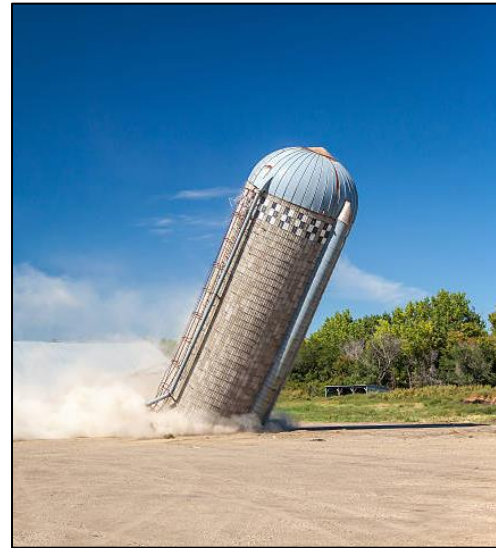


Learning to See Waste at New Flyer

Culture Change Starts at the Top

New Flyer Safety Observation Audit Schedule			
LT Member	Location	1st Shift	2nd Shift
Jeff Heuring	Power train 1	X	
Joe Helget	3600		X
Dan Metoyer	7200	X	
Ryan Urbanski	8400		X
Bart Hoemann	Weld Side, Roof, Front & Rear, West side N14-Wash bay	X	
Dan Champlin	4200	X	
Margaret Lewis	Audit Lane		X
Thomas Schreiner	9300	X	

Remove the Silos



Keep it Simple

New Flyer Safety Observation Audit	
Audit Items	Yes/No
Are jack stands used properly?	
Are employees wearing masks/face coverings properly - over mouth and nose?	
Are bump caps worn when working under an elevated bus or mezzanine (when required)?	
Are cut resistant gloves used when handling a sharp object/part, & are employees using a vise when drilling?	
Are bus lift power cable plugs defective or missing parts or electrical pins? Will the cable block lock into the lift control box?	
Is fall protection in place (barriers, fall arrest, or fall restraint) for heights of 4' and higher?	
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Celebrate Success





Thank You!

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