Our Mission

To produce trucks with excellent quality level, delivery precision and operation flexibility to our customer.
Volvo & Renault Truck Assembly Plant

Start June 2015
17 trucks / day
5,000 trucks / year
App: 190 employees

Plot area: 55,000 m²
Building footprint: 10,824 m²
How much time do we add value?

Operator

Support function/Leaders

Waste

Necessary

Add value

Non value adding

Added value = 0

Good waste!

Waste

Necessary

Add value

Non value adding

Added value = 0

Good waste!
Lean Journey
Why?
The 7 Wastes

**MUDA** is the Japanese word for WASTE.

1. **Overproduction**
   - To produce sooner, faster or in greater quantities than customer demand.

2. **Inventory**
   - Raw material, work in progress or finished goods which is not having value added to it.

3. **Waiting**
   - People or parts that wait for a work cycle to be completed.

4. **Motion**
   - Unnecessary movement of people or parts within a process.

5. **Transportation**
   - Unnecessary movement of people or parts between processes.

6. **Rework**
   - Non right first time. Repetition or correction of a process.

7. **Over processing**
   - Processing beyond the standard required by the customer.

An 8th waste is the wasted potential of people.
Where?
The Sequence of Introduction of VPS

Current State

1. Organizational Structure
2. Cross-functional team
3. Targeted law education VPS / 5S

(Muri, Mura, Muda)

Stable Process

- 4 standardized work:
  - Saudi law business rules
  - Poke Yoke AM / WPO
  - Inspection / control plans
  - Process capability Cp / Cpk
  - Machine capability Cm / Cmk
  - Layer Audit

Data Collection

- 5 Loss Hunting:
  - Cost Deployment
  - Data collection with rotor saw categories OLE

Improvements

- Improvement
- Organization
- Improvement Culture
- Priority Problem Solving Methodology (11 focus areas)
- Focused improvement

Results

World class
VPS
Volvo Production System

- Takt
- Balancing
- Standardization
- Equalization

CUSTOMER

CONTINUOUS IMPROVEMENT

JUXT-A-TIME

BUILT-IN QUALITY

THE VOLVO WAY

TEAMWORK

PROCESS STABILITY

THE VOLVO WAY

Arabian Vehicles & Trucks Industry Co. Ltd.
A part of the overall picture

- Autonomous maintenance
- Professional Maintenance
- 5 S
- Takt
- Standardised way of work
- SMED: Single Minute Exchange of Die
- Reduced machine - MUDA
I cut stones

I am building a school
VPS Journey: ”Set the Vision”

- AVI’s vision is completed and will be explained in our transformation map, from 2017 - 2020
### Arabian Vehicles & Trucks Industry Co. Ltd.

#### Leadership
- Competence

### VPS
Will be presented

<table>
<thead>
<tr>
<th>2017</th>
<th>2018</th>
<th>2019</th>
<th>2020</th>
</tr>
</thead>
<tbody>
<tr>
<td>HR &amp; Admin</td>
<td>Train the Trainer</td>
<td>Autonomous VPS</td>
<td>100% Autonomous</td>
</tr>
<tr>
<td>LUTI Community</td>
<td>CI &amp; KAIZEN</td>
<td>Teams Level UP</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Autonomic Setup</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Development</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

#### Leadership Competence

- Flexible Facility
- Sustainable Facility & Improved
  - 85% achieved
- 5S: Understanding
- Quality Training
- Our Customer Impression of AVI Image
- Visitor Impression of AVI Image
- Customer Claim Understanding
- Zero Defect
- Zero 100 DP
- Five 25 DP
- Reduce Conversion 30%
- Reduce another 30%
- Zero 100 DP
- Zero 25 DP
- Platinum
  - Stake Holders Impression of AVI Image
- Public Impression of AVI Image

#### Collaboration

- Govt. Sectors
- Edu Sectors
- Researches
- Tech & Dev.

#### Facility

- Performance
- Our Customer Impression of AVI Image
- Visitor Impression of AVI Image
- Customer Claim Understanding
- Zero Defect
- Zero 100 DP
- Five 25 DP
- Reduce Conversion 30%
- Reduce another 30%
- Zero 100 DP
- Zero 25 DP
- Platinum
  - Stake Holders Impression of AVI Image
- Public Impression of AVI Image

#### Product

- Autonomous VPS
- Teams Level UP
- 100% Autonomous
- Zero 100 DP
- Zero 25 DP
- Platinum
  - Stake Holders Impression of AVI Image
- Public Impression of AVI Image

#### First Diamond KD Plant

- Educational Development
- Researches
How?
Lean Manufacturing

To establish a lean oriented organization must be started by:

- Leadership
- Commitment and understanding of the trip
- Create discipline
- Structure
- Standardize
- Request and follow up
- Coaching vs. rebuke
WHY STANDARDISED WAY OF WORK AND TAKT?
STANDARDS
Standards

Currently the best known and documented way to perform a task

• Necessary in order to detect what is not normal
• Base for continuous improvements
  – Visualizes and quantifies waste
• Contribute to predictability
  – Quality
  – Time

• Must be challenged and improved!
What is necessary to standardize?

- How work shall be performed
- How to prioritize
- Where and how to store an article
- How to move products between processes
- Criteria for eg. decision for overtime
- How to transfer to another step in process
- How to follow up
- How to handle deviations
- ...

EVERYTHING!
Result

• Increased focus on running the plant
• Better work situation for operator
• Clarify the benefit of working with takt deviations
• Better knowledge of the true capacity of the line
• Better predictability when planning
• Increased process efficiency
Train the Trainer (The LUTI – Learn, Use, Teach & Inspect) Concept

Presenting Autonomous Maintenance (LUTI)

Presenting New Yearly Meeting Agenda for 2016 & 2017
**VPS – Going For Diamond**

**MANAGEMENT COMMITMENT – VISUAL PLANNING**

<table>
<thead>
<tr>
<th>Description / Initiative</th>
<th>Charter</th>
<th>Priority</th>
<th>Account-able</th>
<th>Year 2016 / 2017</th>
<th>Plan</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Local Material Content</td>
<td></td>
<td></td>
<td>Masood</td>
<td>Wk. 40</td>
<td></td>
<td>On target as plan</td>
</tr>
<tr>
<td>VPS Self assessment</td>
<td></td>
<td></td>
<td>Amjad</td>
<td>Initial Discussion</td>
<td>Project Charter</td>
<td>Assessment by Engg starts</td>
</tr>
<tr>
<td>Team Boards</td>
<td></td>
<td></td>
<td>Amjad</td>
<td>Initial Discussion</td>
<td>Format Preparation &amp; Training</td>
<td>Daily Monitoring by Prod</td>
</tr>
<tr>
<td>Autonomous Maintenance</td>
<td></td>
<td></td>
<td>Amjad</td>
<td>Initial Discussion</td>
<td>1. Preparation and sharing</td>
<td>Pilot stage done, rest to be as AM calendar</td>
</tr>
<tr>
<td>Admin Improvement</td>
<td></td>
<td></td>
<td>Abdulrhman</td>
<td>Initial Discussion</td>
<td></td>
<td>Pilot stage done, rest to be as AM calendar</td>
</tr>
</tbody>
</table>

**Description / Initiative**

- **Local Material Content**
  - Initial Discussion
  - Project Charter
  - Assessment by Engg starts
  - Re-assessment

- **VPS Self assessment**
  - Initial Discussion
  - Format Preparation & Training
  - Daily Monitoring by Prod

- **Team Boards**
  - Initial Discussion
  - OMS / Skill matrix / takt for operation

- **Autonomous Maintenance**
  - Initial Discussion
  - Pilot stage done, rest to be as AM calendar

- **Admin Improvement**
  - Initial Discussion
  - Phase 2 started
Operational Management System: Level I & Level II

OMS Level 1 – Meeting - Production

OMS Level 2 - Meeting

OMS Level 1 – Meeting - Maintenance

OMS Level 1 – Meeting - Logistics
Operational Management System: Level III

Daily Operation Overview by Management Team

Tactical Overview by Management Team
### 3 X 3 X 3 concept

- 3 autonomous per operation: 94%
- 3 operations mastered per operator: 88%
- 3 polyvalents in the team: 2

#### Definitions

- **Polyvalent**: Operator at level U or O in the operation means he is autonomous.
- **Autonomous or Master**: Operator at level U or O in all operations of the team.

#### To have key users to training their own teams and visualized in skill matrix.
- Increase the VPS knowledge by using the Keys users to develop the team.
VPS – Going For Diamond
AUTONOMOUS MAINTENANCE

Step 1: Initial cleaning
Step 2: Countermears against sources
Step 3: General inspection
Step 4: Autonomous inspection
Step 5: Autonomous organization and housekeeping
Step 6: Fully implemented autonomous management
Step 7: Challenge this step and find benefits.

- Skill development
- Reduce equipment breakdown
- Work place improvement

SOP

AUTONOMOUS MAINTENANCE

Production
- VPS Valves + M.E. Tank
- PA AME + Plug Box
- Oil Filter Cartridge

Equipment
- AA
- A

AM Roll out Plan

<table>
<thead>
<tr>
<th>Department</th>
<th>Stage</th>
<th>Week</th>
<th>2016</th>
<th>2017</th>
</tr>
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<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Act</td>
<td>Act</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Run</td>
<td>Run</td>
</tr>
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<td>Run</td>
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<td>Run</td>
<td>Run</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Act</td>
<td>Act</td>
</tr>
</tbody>
</table>

Line Start Up Check Sheet

- No damage on cable and cable trolley
- No damage on cable and cable trolley
- No damage on cable and cable trolley
VPS – Going For Diamond

WORK PLACE ORGINIZATION – 5’S

1 - 4 - Operator Trolleys
5 & 6 - Chassis Trolleys
7 & 8 - Chassis Empty
8 & 9 - OH crane Remote control
9 - Tool Cabinet
10 - Bin
VPS – Going For Diamond
WORK PLACE ORGINIZATION – 5’S
Maintenance Room

Production Hall

Battery Box Pre-Assy.

Stage 4
## VPS – Going For Diamond

### MANAGEMENT COMMITMENT – GEMBA AUDIT LAYER

<table>
<thead>
<tr>
<th>Team: TP1</th>
<th>Day</th>
<th>Monitoring by (1 time / day) (KU) (Sign)</th>
<th>Control by (TL) (Sign)</th>
<th>Control by (SV) (Sign)</th>
<th>Inspection performed (Mrg) (Sign)</th>
<th>Inspection performed Management Group (GM) (Sign)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Safety:
1. Use appropriate PPE?
2. What observations have been reported. Have measures been taken?
3. Is the escape route legion and free from obstacles?

### Quality:
4. Reported deviations within the timeframe of 24 hours?
5. Ensure FI remarks mentioned on control cards by Q1?
6. Is team aware about campaign/Internal action on going?

### Delivery:
7. Line move as per the take time and deviation reported on takt board?
8. Ensure the action plan for the reported deviations?

### Logistics:
9. Are all materials in identified place?
10. Ensure no damage / Rejection parts mixed on station?

### Standardized work:
(124,582),(931,868)

### Improvement:
11. Are operators working as per the OBC?
12. Are skill matrix board updated and training followed?
13. Are all CI / Kaizen trend as per target vs actual displayed?

### Management by objectives:
14. Target Followed up according to the current rate?
15. Carried out adequate measures to achieve the objectives of what is the connection to the improvement work?

### Leadership:
16. Performed Audit Layer according to the plan?

### Environment:
17. Are the Waste are segregated as per the requirements?
18. Ensure the availability of spillage kit and properly used?

### RATE & RAG
- **KU**: 1 time / day or shift for line / facility.
- **TL**: 1 day / week for line / facility.
- **SV**: 2 times / month for line / facility.
- **Mrg**: 1 time / month.
- **Managerial Group**: Repeating 1 time / quarter
- **Verdict**: Green: No deviations, Yellow: Small deviations are corrected immediately, Red: Large deviations noted that requires action.

---

**To ensure the standard way of working**
Quality Visualization
### Quality Visualization

#### QRQC BOARD

<table>
<thead>
<tr>
<th>Sr.</th>
<th>Problem Description</th>
<th>QROC Issue Date</th>
<th>Chassis No.</th>
<th>DP</th>
<th>Truck On Hold Y/N</th>
<th>Repetition</th>
<th>Firewall/Temporary Solution</th>
<th>RNC Start Y/N</th>
<th>Feed Back 5 Days</th>
<th>Root Cause Found</th>
<th>Implement Counter Measure</th>
<th>Resp</th>
<th>Status “RAG”</th>
<th>Feed Back After Rectification of Audit Truck</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Deep scratches on trim molding over front lid</td>
<td>3/10/18 9497867</td>
<td>5</td>
<td>No</td>
<td>Yes</td>
<td></td>
<td></td>
<td>Yes</td>
<td></td>
<td>No inspection during unloading</td>
<td>NAEEM</td>
<td>Green</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Radio shelf and glove box are damaged inside cab</td>
<td>3/10/18 9497867</td>
<td>5</td>
<td>No</td>
<td>Yes</td>
<td></td>
<td></td>
<td>Yes</td>
<td></td>
<td>Waiting for feedback from VTC</td>
<td>VTC</td>
<td>Orange</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Deep scratch and dent on cab LHS</td>
<td>21/01/18 953168</td>
<td>5</td>
<td>No</td>
<td>No</td>
<td></td>
<td></td>
<td>Yes</td>
<td></td>
<td>Followed by visually inspected during unloading</td>
<td>NAEEM</td>
<td>Orange</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Fuel pipe is touching with bracket inside frame LHS</td>
<td>21/01/18 953168</td>
<td>5</td>
<td>No</td>
<td>Yes</td>
<td></td>
<td></td>
<td>Yes</td>
<td></td>
<td>Unloading, the cab fuel pipes not clamped and routed properly</td>
<td>ALAN</td>
<td>Green</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
“Kaizen Environment is a Natural Way for us to Increase our Performance in all Areas”
SUMMERY OF KAIZEN

Area for improvement: Logistics

Current state, problem description:

Tyre trolley extension arm fell down on floor once removed from tow truck

Future state, wanted situation:

Ergonomically desinged support fixed with spring to avoid nearmiss & fell on floor

Result:

Safe way of working has been improved

Effect on:

<table>
<thead>
<tr>
<th>S</th>
<th>Q</th>
<th>D</th>
<th>C</th>
<th>E</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>☒</td>
<td>☒</td>
<td>☐</td>
<td>☒</td>
<td>☒</td>
<td>☐</td>
</tr>
</tbody>
</table>

Profit | Cost | Ratio
---|---|---
| | | |
Summary of Kaizen

Area for improvement:
Stage 10

Current state, problem description:
Exhaust kept on the floor and it’s unsafe to assemble to chassis (creates damage to floor & part).

Future state, wanted situation:
In-house designed trolley & safe way to use, transport & assemble with chassis.

Result:
5s and safe way of working has been improved.

Effect on:

<table>
<thead>
<tr>
<th>S</th>
<th>Q</th>
<th>D</th>
<th>C</th>
<th>E</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
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<td>☑</td>
<td>☑</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Profit</th>
<th>Cost</th>
<th>Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
IMPROVEMENT OF THE MONTH - TEAM

Oct 2018

Team Member: Shoaib with GM
IMPROVEMENT OF THE MONTH - TEAM

Oct 2018

Team Member: Samer with GM
EQUALIZATION
"Tact flow"

Daily follow up – Teamwork & short pulse

AVVIKELSER
1. Violin eller blad
2. Maskinflyt
3. Fräsbyte
4. Veran: stablingen där i från
5. Emag: utbana f staket
6. Möte - VGAS
7. Operatör säsong
8. Programändring Emag
9. Läckage Veran DWO 182467
10. Sjöge fastnor vid "klv"
11. Römde fastnor i "klvns"

Weekly follow up - Teamwork & long pulse

CD loops

QK/EWO/DWO/RNC/HERCA

QK, SK

SK, MK, AK

Production takt
Planed maintenance
Set up
Other, ex planed meeting
<table>
<thead>
<tr>
<th>Type of card</th>
<th>Under production</th>
<th>during set</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>level 1</strong></td>
<td><img src="image1" alt="Production Card" /></td>
<td><img src="image2" alt="Production Card" /></td>
</tr>
<tr>
<td>Card</td>
<td><strong>Production alt. rack Cards</strong></td>
<td></td>
</tr>
<tr>
<td><strong>level 2</strong></td>
<td><img src="image3" alt="Station Card" /></td>
<td><img src="image4" alt="Station Card" /></td>
</tr>
<tr>
<td>Station Short</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>level 3</strong></td>
<td><img src="image5" alt="Detailed Card" /></td>
<td><img src="image6" alt="Detailed Card" /></td>
</tr>
<tr>
<td>Detailed Card</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Balancing

• **Balancing work content between resources.**
  – equipment
  – Individuals

• **Important to.**
  – Achieve legal capacity
  – Achieve high resource
  – Make harmonious flow
  – Highlighting waste
Visual balancing

- Timed standard is the starting point.
- Conducted primarily by the operators.
- Visualizes coating at each position.

Green magnets are the work moments we do today (both value creation and not value building operations). Red cards - waiting time - wasting.

The coating is visualized, it simplifies / allowing rebalancing. It creates engagement and participation!
Stay balanced alive!

• Changes in standards might require rebalancing
  – Modified work content.
  – Amended operation time
  – Moved operation. Etc.

• The balance needs to be kept alive!

• Required to "bring home profits"
Summary

Now that we have equalized, standardized and balanced production flow, we can start working with takt flow.
**VPS – Going For Diamond**

**OBJECTIVE**

- We want to have standardized operations by having Production, Station and Detail cards and optimizing these operations by visualizing our capacity and manpower requirements by Yamazumi Boards!

**OUTCOME**

- Zero defect mindset by implementation of SOP
- Value added to the work/ customer
- Improve the semi value added activity
- Eliminate the non value added activity
- Synchronize the operation for all variants with maximum utilization of resources
  - Visual, showing key issues
  - Promotes continuous improvement
  - Help engage teamwork
The Yamazumi board provides a mechanism to quickly rebalance a process when takt time changes and allows a visual indication.

The Yamazumi chart can be used for both process Waste Elimination or Line Balancing activity.

The tool is intended to support Business Process Improvement.

The Yamazumi chart is a great visual tool to show where wastage and blocks are happening.

**Study Mechanism**
- By using video cam for each operation
- Discussion with operator for improvement by recorded video
VPS – Going For Diamond

PRODUCTION CARDS – Pilot Stage 1

- Production card
  - All activities on the station

- Station card
  - Sub activities from production card

- Detail card
  - Detailed activities in case of critical process

- Card will explain the repetitive activity on the station
- SOP for all listed activities on the station
- Critical activities in terms of safety/quality will be explained through station/detail card
- FMEA control as easy to detect / control the defects
## VPS – Going For Diamond

### PRODUCTION CARD

**Production Card - Standard Operation Sheet**

<table>
<thead>
<tr>
<th>Process Name</th>
<th>Activity / Main Step</th>
<th>Key Point</th>
<th>Model 1</th>
<th>Model 2</th>
<th>Model 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Station 1 - Frame &amp; Cross member Dropping PA - Cross member</td>
<td>OMS Level 1 meeting</td>
<td>Check all the KPI’s as per level 1 board</td>
<td>5</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>Autonomous maintenance</td>
<td>Refer AM sheet, (How to perform its already available on check sheet)</td>
<td>3</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Assembly process</td>
<td>Station card</td>
<td>47</td>
<td>47</td>
<td>75</td>
</tr>
<tr>
<td></td>
<td>Job distribution</td>
<td>Refer OBC sheet</td>
<td>2</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>5s</td>
<td>Refer 5s daily/weekly check sheet</td>
<td>2</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>Calibration Status</td>
<td>Station card</td>
<td>2</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>Takt Board</td>
<td>Update the takt board as per line movement</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Skill matrix</td>
<td>Refer skill matrix board</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Quality Inspection - CC1</td>
<td>Station card</td>
<td>2</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>Check cards</td>
<td>Station card</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>DPP - Daily production plan</td>
<td>Follow the DPP sequence as per planned (Level 1 meeting)</td>
<td>0</td>
<td>0</td>
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<tr>
<td></td>
<td>Kanban</td>
<td>Station card</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>Defects/Damage parts</td>
<td>Station card</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>Waste Segregation</td>
<td>Station card</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

**Non Value added operations**

<table>
<thead>
<tr>
<th>Model 1</th>
<th>Model 2</th>
<th>Model 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Walking path</td>
<td>0.0</td>
<td>0.0</td>
</tr>
<tr>
<td>Taking parts</td>
<td>0.2</td>
<td>0.2</td>
</tr>
<tr>
<td>Putting parts</td>
<td>0.5</td>
<td>0.5</td>
</tr>
<tr>
<td>Total</td>
<td>0.0</td>
<td>0.0</td>
</tr>
</tbody>
</table>

**Safety**

<table>
<thead>
<tr>
<th>Stock</th>
<th>Operating Area</th>
<th>Inspection</th>
</tr>
</thead>
<tbody>
<tr>
<td>Symbols</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Total time of non value added operation**

<table>
<thead>
<tr>
<th>Model 1</th>
<th>Model 2</th>
<th>Model 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Walking path</td>
<td>131.0</td>
<td>83.0</td>
</tr>
</tbody>
</table>

**Total Cycle time**

- Model 1: 131.0 minutes
- Model 2: 83.0 minutes
- Model 3: 8.0 minutes

---

**Arabian Vehicles & Trucks Industry Co. Ltd.**
### Station Card Operation Sheet

<table>
<thead>
<tr>
<th>Operation Name</th>
<th>Quality Inspection</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>No</strong></td>
<td><strong>Main Steps / Activity</strong></td>
</tr>
<tr>
<td>1</td>
<td>Inspect the chassis after operator completion</td>
</tr>
<tr>
<td>2</td>
<td>Refer the CC1 check</td>
</tr>
<tr>
<td>3</td>
<td>Measure the torque for CC1</td>
</tr>
<tr>
<td>4</td>
<td>Sign for CC1 and Check the operator sign in check card</td>
</tr>
</tbody>
</table>

#### Special instructions & Others:
- If there is any deviation in process, report to Team Leader/Supervisor as soon as possible.

#### Photographs, Drawings, Specifications and others.

1. Inspect the chassis after operator completion.
2. Refer the CC1 check.
3. Measure the torque for CC1.
## Line Start-Up Check Sheet

### Autonomous Maintenance

<table>
<thead>
<tr>
<th>Description</th>
<th>Checking Method</th>
<th>Inspection Position</th>
<th>Check Item Details</th>
<th>Countermeasure / source</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cleaning</td>
<td>N/A</td>
<td></td>
<td>Dust and rust to be removed</td>
<td>Cotton waste / Scissor W</td>
<td>Monthly</td>
</tr>
<tr>
<td>Visual Check</td>
<td>N/A</td>
<td>Position 1</td>
<td>No damages on remote, cable &amp; cable trolleys and dust or rust</td>
<td>N/A</td>
<td>Monthly</td>
</tr>
<tr>
<td>Operating Check</td>
<td>N/A</td>
<td>Position 2</td>
<td>Abnormal Braking condition</td>
<td>N/A</td>
<td>Daily</td>
</tr>
<tr>
<td>Over Head Crane</td>
<td>N/A</td>
<td></td>
<td>No damages on remote and cable</td>
<td>N/A</td>
<td>Weekly</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>No abnormal noise or damages on chain</td>
<td>N/A</td>
<td>Daily</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>No damages or deformation on chain &amp; hook</td>
<td>N/A</td>
<td>Daily</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Check for hook safety lock</td>
<td></td>
<td>Daily</td>
</tr>
<tr>
<td>Chassis Rack</td>
<td>N/A</td>
<td></td>
<td>Dust and rust to be removed</td>
<td>Cotton waste / Brush</td>
<td>Monthly</td>
</tr>
<tr>
<td>Visual Check</td>
<td>N/A</td>
<td></td>
<td>Check No dust or rust</td>
<td>N/A</td>
<td>Weekly</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Check no damages and rack screwed</td>
<td>N/A</td>
<td>Daily</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>As per picture</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Visual Check

- **Concern Description**: Check for hook safety lock.
- **Inform to**: Team Leader or Supervisor.
- **Date/Time**: Daily.
- **Comments on Maintenance Monthly Check**: N/A.

### Autonomous Maintenance

- **Judgement**: Good
- **Already Repaired**: Yes
- **Inspector Name**: [Name]
- **Month-Year**: Mar-17
- **Stage No**: Frame Area & Stage 01

### Notes
- All check points should be checked at the beginning of production.
- In case of no check mark, mark N/A.
- Don’t fill anything on weekend/off days and leave as blank.
- Don’t fill anything on weekend/off days and leave as blank.

---

**SOP**

**NAME**:

**SIGN**:

---

**TO INSTALL**:

**DATE**: Mar-17
VPS – Going For Diamond

TAKT
“We don’t focus on our KPI’s”

“Due to our Journey Our Way of Working will Establish our KPI’s in an Excellent Position”

“that means we need to understand the Root Cause and to connect that to our way of working”
VPS – Going For Diamond
SAFETY MAP

PLANT SAFETY MAP

ACCIDENT FREE DAYS

969

Emergency Evacuation  Nearmiss  Accident Without Lost Time  Accident With Lost Time

06  05  00
### Safety Observation Card

**Questions asked during Gemba Audit**

1. When can you fill the observation card?
   - As soon as I find any safety observation/violation at the workplace.
2. What is the next step?
   - Inform the safety violator and the team leader and try to find the solution of observation.
3. What is the next step?
   - Give to my team leader.

**Safety Culture**

During the audit, the following observations were made:

1. **At risk behavior**
   - Use of PPE
   - Work place
   - Material Handling
   - Lifting / pulling
   - Equipment / tool use
   - Abnormal Tool / functioning

2. **Behavior**
   - Safe Behavior
   - At risk behavior

3. **Observation**:

4. **Action Taken**:

5. **Repetition**
   - Yes
   - No

6. **Observer**:

7. **Follow-up**
   - Yes
   - No

   If yes, when:

---

**Safety Observation Card**

**Questions asked during Gemba Audit**

1. **Area**: 
2. **Behavior**: 
3. **Safe Behavior**: 
4. **At risk behavior**: 
5. **Use Of PPE**: 
6. **Work place**: 
7. **Material Handling**: 
8. **Lifting / pulling**: 
9. **Equipment / tool use**: 
10. **Abnormal Tool / functioning**: 

---

**Observer**:

---

**Follow-up**

If yes, when:
Safety (No. of Accidents with Lost Time)

- 2013: 11 accidents
- 2014: 12 accidents
- 2015: 3 accidents
- 2016: 0 accidents
- 2017: 0 accidents
- 2018: 0 accidents

Accidents (No. of Accidents with Lost Time)
Product Audit

<table>
<thead>
<tr>
<th>Global Target</th>
<th>19 DP</th>
</tr>
</thead>
<tbody>
<tr>
<td>Internal AVI Target</td>
<td>10 DP</td>
</tr>
<tr>
<td>Diamond Status Target</td>
<td>5 DP</td>
</tr>
</tbody>
</table>

Produced more than 2497 trucks since last 100 DP. Produced more than 1167 trucks since last 25 DP.

- Factory Closure of 12 weeks
- RNC for all 5DP as well.

100 DP | Safety Risk. Vehicle Can not drive

25 DP   | Safety Risk but vehicle can be driven to service workshop

5 DP    | Customer will notice the fault but can wait till the next planned service interval.
Delivery Precision

Year: 2007 - 2018

Delivery Precision:
- 2007: 53%
- 2008: 68%
- 2009: 65%
- 2010: 90%
- 2011: 58%
- 2012: 61%
- 2013: 72%
- 2014: 67%
- 2015: 77%
- 2016: 77%
- 2017: 77%
- 2018: 73%

Target:
- 2007 - 2018: 80%
Introduction of two new variants in factory without any support from International Manufacturing.

**Hours / Truck**

- 2011: 239 hours
- 2012: 201 hours
- 2013: 141 hours
- 2014: 128 hours
- 2015: 134 hours
- 2016: 98 hours
- 2017: 81 hours
- 2018: 94 hours

**Target**

- Hours / Truck
- 2011: 239
- 2012: 201
- 2013: 141
- 2014: 128
- 2015: 134
- 2016: 98
- 2017: 81
- 2018: 94
Absent (Permanent)

<table>
<thead>
<tr>
<th>Year</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>2012</td>
<td>7%</td>
</tr>
<tr>
<td>2013</td>
<td>3%</td>
</tr>
<tr>
<td>2014</td>
<td>1.2%</td>
</tr>
<tr>
<td>2015</td>
<td>1.6%</td>
</tr>
<tr>
<td>2016</td>
<td>0.5%</td>
</tr>
<tr>
<td>2017</td>
<td>0.20%</td>
</tr>
<tr>
<td>2018</td>
<td>0.20%</td>
</tr>
</tbody>
</table>