TIRE EXPLOSION – FATAL INJURIES TO THE WORKER AND SERIOUS INJURIES TO THE OWNER
Type of Incident: Fatality and Serious Injury
Date of Incident: February 25, 2012
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SECTION 1.0   DATE AND TIME OF INCIDENT
1.1   The incident occurred on February 25, 2012 at 3:54 p.m.

SECTION 2.0   NAME AND ADDRESS OF PRINCIPAL PARTIES
2.1   Owner
2.1.1   4 Wheel Collision-Frame Ltd.
        4220-76 Ave.
        Edmonton, AB
        T6B 2H8

2.2   Prime Contractor
2.2.1   Not applicable

2.3   Employer
2.3.1   4 Wheel Collision-Frame Ltd.
        4220-76 Ave.
        Edmonton, Alberta
        T6B 2H8

2.4   Contractor(s)
2.4.1   Not applicable

2.5   Supplier(s)
2.5.1   Not applicable

2.6   Workers
2.6.1   The Owner (********* *********)
        ***** ******** ********
        *********** ********
        *** ***

2.6.2   The Worker (*** ********)
        *********** ***
        *********** ********
        *** ***
2.7 **Others**

2.7.1 The Worker’s Son (********** **********
**********
**********
***

2.7.2 The Owner’s Son and Director (************
**********
**********
***

SECTION 3.0 **DESCRIPTION OF PRINCIPAL PARTIES**

3.1 4 Wheel Collision-Frame Ltd., established in 2004, is an auto body shop that does auto repair, auto frame work and refinishing. It is mostly run by family members. (Attachment C – Photograph 1)

3.2 The Owner (************ and the Worker (***** ********) were brothers. The Worker (***** ********) and his Son (************ had arrived in Canada in the month of August, 2011. The Worker (***** ********) had applied for a worker’s visa and was issued one on February 7, 2012 and was valid until February 6, 2013. The Worker (***** ********) began working at 4 Collision and Frame Ltd.

SECTION 4.0 **LOCATION OF INCIDENT**

4.1 The incident occurred at 4420 76 Ave, Edmonton (Attachment A – Map).

SECTION 5.0 **EQUIPMENT, MATERIAL AND OBSERVATIONS**

5.1 **Equipment and Material**

5.1.1 The tire involved in the incident was a Kumho 11R.22.5 tubeless all steel radial with a 58.4 cm inside diameter radius rim. (Attachment C–photographs 4 and 9). The rim had eight weld beads around its rim (Attachment C–Photographs 6 and 7).

5.1.2 The dump truck that the tire and rim came from was a 1999 Freightliner, vehicle access code ************, ID **************, unit #301, license number *** ****. Mileage on the dump truck was 552390.0 km. (Attachment C–Photograph 5)

5.1.3 The welding unit being used was a Miller, Millermatic 210, wire welder made in the USA, 160 amp, 24.5 voltage, and serial # **********. The gas used in the welding unit was argon and carbon dioxide.
5.2 Observations

5.2.1 The investigators were met at the incident site by three members of the Edmonton Police Services (EPS), one Sergeant and two Constables. The Sergeant stated the Owner (********** ********) was at the Royal Alexandra hospital and the Worker (*** ********) was pronounced dead at the University of Alberta hospital.

5.2.2 According to the EPS, the Owner (********** ********) and the Worker (*** ********) were welding a dump truck’s rim due to a flat tire. Air was leaking from the rim area. The dump truck belonged to the Owner’s Son (******** ********). The Worker’s Son (******** ********), who does not work at the auto repair shop, was outside having a cigarette when the incident occurred.

5.2.3 The rim and tire were observed to be near an automobile in the west bay of the auto repair shop (Attachment B – Sketch). The tire was deflated. The brim of the tire was inside the rim. When the tire and rim were turned over, the brim of the tire was on the outside the rim. The valve core was tight (Attachment C–Photograph 8).

5.2.4 The front door window of the shop was approximately 22.25 m away and had been blown out (Attachment C–Photograph 2).

5.2.5 The compressor was activated to test its maximum psi. The compressor gauge was altered by the owner (********** ********) to increase its capacity from 125 psi when fully engaged to now a maximum of 160 psi. The maximum pressure for the tire was only 100 psi.

SECTION 6.0 NARRATIVE DESCRIPTION OF THE INCIDENT

6.1 On February 25, 2012 the Owner’s Son (******** **) asked the Owner (********** ********) to repair a flat tire on the dump truck. The tire was removed from the dump truck and inflated. They noticed air was coming out from around the bead of the rim. The Owner (********** ********) used an argon–carbon dioxide wire welder to seal the holes.

6.2 The Worker (*** ********) had the duty of deflating the air out of the tire. The Owner (********** ********) would then weld beads on the rim where air was leaking out. The Worker (*** ********) would then re-inflate the tire and check for air leaks.

6.3 At the time of incident, evidence indicates the Worker (*** ********) had not deflated the tire as the valve core was tight. The Owner (********** ********) continued to weld the rim.

6.4 Heat and pressure built up inside the tire to the point that the tire blew away from the rim of the tire. The Owner (********** ********) was seriously injured and the Worker (********) was fatally injured.
6.5 The Worker’s (*** **********) Son (******** ********), who does not speak English, called the Owner’s (******** ********) son who then called the Emergency Medical Services (EMS).

SECTION 7.0 ANALYSIS

7.1 Direct Cause

7.1.1 One worker was fatally injured and another seriously injured when the heat from welding onto an air filled tire caused expansion within the tire and caused it to explode.

7.2 Contributing Factors

7.2.1 The tire had not been deflated and removed from the rim before commencing the final weld.

7.2.2 Previously, the Owner (******** ********) would send flat tires out to a third party and have them repaired.

7.2.3 The department’s Mechanical Engineer examined the tire and rim and stated: “under any circumstances, do not weld or use a cutting torch on a wheel with an inflated tire. This may cause a tire explosion resulting in serious injury or loss of life. Follow manufacturer’s instruction when inflating, deflating and repairing. Most manufacturers do not allow welding to fix the rim crack.”

SECTION 8.0 FOLLOW-UP/ ACTION TAKEN

8.1 Human Services; Occupational Health and Safety

8.1.2 Occupational Health and Safety issued an order to the Owner’s Son and Director (******** ********) of 4 Wheel Collision and Frame Ltd. for an investigation and for additional information.

8.1.2 Occupational Health and Safety issued a Stop Use order to the Owner’s Son and Director (******** ********) and also owner of the dump truck that had its tire and rim removed to be repaired. The dump truck was required to be re-certified prior to it being used for work progress.

8.1.3 As of August 31, 2012 the dump truck had still not been repaired and the Stop Use tag remains on the dump truck.
8.2 Industry

8.2.1 4 Wheel Collision and Frame Ltd. forwarded to Alberta Occupational Health and Safety their incident investigation report as well as the documentation requested.

8.3 Additional Measures

8.3.1 No additional measures at this time.

SECTION 9.0 SIGNATURES

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<tr>
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<tr>
<td>Manager</td>
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<td>Regional Director, Central</td>
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SECTION 10.0 ATTACHMENTS:

- Attachment A  Map
- Attachment B  Sketch
- Attachment C  Photographs
Attachment “A” Map
Showing Incident Location

Human Services, Occupational Health and Safety
Photograph #1 – Shows where the incident occurred.
Photograph #2 – Shows one of the front doors with the window panel blown out.
Photograph #3 – Shows the front door of the incident site from the inside with the window panel blown out.
Photograph #4 – Shows the inside of the shop, the tire and the rim. The blue arrows show where the tire struck a nearby vehicle after it had blown up. The yellow arrow shows the approximate area where the tire was being repaired.
Photograph #5 – Shows the truck where the tire came off. The blue arrow shows the approximate area where the tire was being repaired. The yellow arrow shows where the tire came off the truck to be repaired.
Photograph #6 – The yellow arrows show the areas of the rim where the rim was being welded to repair the leak around the rim.
Photograph # 7 – The yellow arrow shows other areas of the rim that had been welded to repair the leaks around the rim.
Photograph #8 – The yellow arrow shows the valve core that was still inside the stem valve. The core was tight.
Photograph #9 – Shows the outside of the tire. The blue arrows show the damage done to the rim of the tire when it blew up.
Photograph #10 – The yellow arrow shows the damaged mig welding gun. The welder was using argon-carbon dioxide as the shielding gas. The blue arrows show the area where the rim was being repaired.
Photograph #11 – Shows a closer look at the melted rubber around the brim of the tire.
Photograph #12 – The blue arrows show the remnant burned brim of the tire around the rim.