



# TRAINING DOCUMENTS

## FOR SAFE OPERATION AND REPAIR OF CARS



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# PART I: CURRENT STATE OF SAFETY WORK FOR DRIVERS, REPAIR, AND MAINTENANCE OF AUTOMOBILES

## I. General Situation

Traffic accidents in the first 6 months of 2020 (from 15/12/2019 to 14/6/2020): Nationwide, there were 6,790 traffic accidents, killing 3,242 people, and injuring 4,939 people. Compared to the first 6 months of 2019, the number of traffic accidents decreased by 1,595 cases (down 19.02%), the number of deaths decreased by 568 people (down 14.91%), the number of injuries decreased by 1,419 people (down 22.32%).

Among these:

- Serious traffic accidents:
  - Road: 3,775 cases, killing 3,165 people, injuring 1,918 people. Compared to the same period last year, it decreased by 523 cases (-12.17%), decreased by 573 deaths (-15.33%), and decreased by 371 injuries (-16.21%).
  - Rail: 44 cases, killing 37 people, injuring 9 people. Compared to the same period last year, it decreased by 31 cases (down 41.33%), decreased by 16 deaths (-30.19%), and decreased by 21 injuries (down 70%).
  - Waterway: 38 cases, killing 33 people, injuring 4 people. Compared to the same period last year, it increased by 13 cases (up 52%), increased by 17 deaths (up 106.25%), and increased by 1 injury (33.33%).
  - Maritime: 7 cases, killing 7 people, no injuries. Compared to the same period last year, it increased by 1 case (up 16.67%), increased by 4 deaths and missing people (up 133.33%), the number of injuries did not change (0/0).
- Traffic collisions: 2,926 cases, causing minor injuries to 3,008 people. Compared to the same period in 2019, it decreased by 1055 cases (down 26.5%), decreased by 1,028 minor injuries (down 25.47%).

According to the summary report of the National Traffic Safety Committee, traffic accidents in June 2020 (from 15/5/2020 to 14/6/2020) nationwide occurred 1,135 cases, killing 489 people and injuring 871 people. Compared to the same month last year, it decreased by 264 cases (down 18.87%), decreased by 142 deaths (down 22.5%), and decreased by 234 injuries (down 21.18%).

## II. Some Automobile Accidents

On September 20, 2020, after a collision, a woman fell onto the road and was run over and killed.



On the evening of September 18, the Police Department of Tan An City (Long An) announced that they were coordinating with relevant agencies to investigate the scene of a traffic accident where a truck collided with a bus, resulting in 20 passengers being hospitalized for emergency treatment.

According to initial information, around 7 PM the same day, a bus with the license plate 62B - 11.29 (the driver's identity is not yet known) carrying many passengers was traveling on the bypass of National Highway 1 from Ho Chi Minh City to Long An. When it reached the intersection of National Highway 62 with the bypass of National Highway 1 in Ward 6, Tan An City, the bus turned left onto National Highway 62 to return to Long An bus station when it was hit by a truck with the license plate 50LD - 157.70 (the driver's identity is not yet known) traveling from Tien Giang to Ho Chi Minh City.



As a result, 20 passengers on the bus were injured and had to be taken to Long An General Hospital for emergency treatment and to assess the extent of their injuries. At the scene, the bus was deformed on the side, and the front of the truck was badly damaged.

## **PART II: LABOR SAFETY AND HYGIENE FOR DRIVERS, REPAIR, AND MAINTENANCE OF AUTOMOBILES**

### **I. LABOR SAFETY AND HYGIENE FOR DRIVERS**

#### **1. Occupational Characteristics**

##### **1.1. Driving is a profession with many difficulties**

- Heavy, dangerous, stressful
- Working in changing weather conditions (rain, sun); day and night; high population density
- Drivers must have good health to drive safely

##### **1.2. Driving is a profession with wide relationships**

- Highly social and popular
- Opportunities to travel to all regions of the country, experiencing various customs and habits
- Broad communication with different social classes, gaining a lot of new information

### **1.3. Driving is a profession prone to social evils**

- Easy to neglect personal life
- Prone to social evils such as drug addiction, gambling, and illicit relationships

### **1.4. Ethical qualities**

- Respect and comply with legal regulations
- Honest, straightforward, with a high sense of organization and discipline
- Hardworking, meticulous, calm

## **2. Types of Traffic Accidents**

### **2.1. Collision**

- Colliding with obstacles on the road
- Colliding with other vehicles

### **2.2. Overturning**

- Overturning on the road
- Overturning into fields, canals

### **2.3. Fire**

- Vehicle catching fire while driving
- Vehicle catching fire upon collision

### **2.4. Falling into rivers or deep valleys**

- Crossing bridges, canals, rivers
- Crossing steep slopes or hills

## **3. Causes of Accidents**

### **3.1. Lack of concentration while driving**

- Continuous work fatigue
- Sleepiness due to lack of sleep
- Taking drowsy medications
- Alcohol intoxication
- External disturbances
- Eating while driving
- Using mobile phones, listening to music while driving

### **3.2. Careless driving and speeding**

- Carelessness and lack of attention
- Recklessness, hot temper, lack of experience
- Not understanding or not complying with traffic laws
- Pressure to reach the destination quickly, achieving business goals

### **3.3. Unsafe vehicle technical condition**

- Lack of periodic maintenance checks
- Brake failure
- Steering failure
- Tire burst
- Lack of lighting, reflective signs
- Fire outbreak

### **3.4. Unsafe infrastructure**

- Poor, dusty, slippery, bumpy roads with potholes
- Narrow, winding roads lacking safety signs
- Intersections (roads, railways) lacking safety signals or signs
- Narrow roads without barriers, inadequate lighting
- Bridges and culverts not meeting permissible load capacity

### **3.5. Unfavorable weather and environmental conditions**

- Rain causing slipperiness, landslides, fallen trees
- Visual illusions on the road
- Fog obscuring vision

### **3.6. Accidents caused by other road users**

- Pedestrians carelessly crossing the road
- Stray animals
- Other vehicles colliding or hitting
- Other vehicles speeding, reckless overtaking

## **4. Preventive Measures**

### **4.1. Regular vehicle maintenance and checks**

- Regularly scheduled maintenance and repairs according to the regulations (Decision No. 992/2003/QĐ-BGTVT dated 09/04/2003 by the Ministry of Transport)
- Reducing wear and tear on vehicle parts
- Preventing and detecting damage
- Maintaining good technical condition of the vehicle

### **4.2. Practicing safe braking techniques**



- Sitting in the correct posture while driving
- 2/3 of the back resting lightly on the seat cushion
- Comfortable driving position
- Basic braking: low gear, not pressing the clutch
- Step-by-step braking: releasing the accelerator and gradually pressing the brake pedal
- Combined braking: using foot brake, hand brake, and engine brake (without disengaging the clutch)
- Continuous press-release: in emergency cases where the brake does not have ABS

#### **4.3. Correct driving techniques for safe uphill and downhill driving**

- Using the same gear for going downhill as for going uphill
- Not driving in neutral gear downhill, as it reduces the effectiveness of the engine brake
- For long downhill stretches, combine braking, reducing throttle, and shifting down gears, and releasing the clutch

#### **4.4. Safety measures for night driving**

- Always keep the windshield clean for clear vision
- Adjust side mirrors
- When two vehicles pass each other, switch from high beam to low beam
- Stay alert to avoid drowsiness by taking appropriate rest breaks

#### **4.5. Yielding the right-of-way**

- Check safety ahead, right, left, and behind
- Actively yield the right-of-way when the vehicle behind signals to overtake
- Maintain a safe distance

#### **4.6. Fire prevention measures for vehicles**

- Some potential fire hazards in vehicles:
  - Presence of flammable substances
  - Fuel system leaks
  - Exposed or damaged wires causing short circuits
- Sparking from alternators or starters
- Cracked high-voltage wires, loose spark plug caps
- Damaged engine cooling system
- Overheated exhaust system
- Improper use and maintenance of the vehicle

#### **Preventive fire measures:**

- Proactively inspect and promptly address any unusual signs in the vehicle
- Use the correct type and quality of fuel as specified

- Do not store flammable materials in the vehicle, engine compartment, and equip with fire extinguishers
- Do not install additional electrical devices or accessories such as protective devices, lights, and horns
- Comply with vehicle maintenance and repair regulations

#### **4.7. Measures to combat fatigue and drowsiness while driving**

##### **4.7.1. Factors causing fatigue**

- Sleep factors: insufficient sleep, prolonged lack of sleep
- Time factors:
  - Working during hours that should be spent sleeping
  - Working too early
  - Continuous long working hours
- Job-related factors
  - Night driving
  - Continuous work
- Poor driving conditions: roads, weather
- Psychological factors:
  - Poor health
  - Emotional influence (sadness, happiness, etc.)
  - Sleep disorders

##### **Signs of fatigue**

- Yawning, tiredness
- Lack of concentration
- Eye irritation or strain
- Restlessness
- Drowsiness
- Slow reactions
- Feeling discouraged
- Inaccurate steering control
- Ignoring traffic signs and signals
- Unable to maintain lane
- Unintentional dozing off

##### **4.7.2. Ways to avoid fatigue and drowsiness**

- Get enough and deep sleep before driving
- Do not take sedatives, alcohol, or substances before and during driving
- Do not drive continuously for more than 4 hours; take breaks every 2 to 3 hours
- Set the air conditioner to draw outside air
- Regularly exercise and maintain a healthy diet



## 5. Labor safety and hygiene for drivers

### 5.1. General regulations

- Drivers must be within the working age
- Have good health as regulated by the Ministry of Health
- Trained in labor safety and hygiene and have the appropriate driving license for the vehicle
- Comply with road traffic laws
- Use and wear the provided personal protective equipment as required

### 5.2. Checking the vehicle's technical condition before driving

- Brake system
- Tire wear, tire pressure, wheel tightness
- Steering system
- Lighting system, signal lights, horn
- Windows, wipers, mirrors
- Fuel, lubricating oil, coolant
- Fire extinguisher

### 5.3. Fastening the seat belt

- Fasten the seat belt correctly as per regulations (Article 9, Traffic Law)

### 5.4. Compliance with traffic signals (Article 11, Traffic Law)

- Traffic lights

### 5.5. Compliance with speed regulations:

- Drive within the allowed speed limits (Circular No. 13/2009/TT-BGTVT)

### 5.6. Maintaining a safe distance from the vehicle in front:

- Maintain the "minimum distance" between two vehicles as per regulations to avoid collisions

### 5.7. Ensuring safety when overtaking:

- Check safety ahead, right, left, and behind the vehicle
- When overtaking, ensure conditions are met (Article 14, Traffic Law)
- Signal intention to overtake with lights or horn (Article 14, Traffic Law)
- Ensure sufficient safe distance

### 5.8. Ensuring safety when changing vehicle direction:

- Signal before changing direction and only change direction where permitted (Article 15, Traffic Law)

### **5.9. Prohibiting alcohol, beer, and stimulants:**

- Reduce the ability to react to dangerous situations
- Impair judgment
- Create false confidence, causing drowsiness and fatigue

### **5.10. Ensuring the regulated driving time:**

- Do not drive for more than 10 hours in a day
- Do not drive continuously for more than 4 hours
- Ensure appropriate rest time

### **5.11. For truck drivers**

- Prohibit carrying people in the truck bed
- Prohibit minor repairs while loading
- Do not carry goods that exceed the vehicle's dimensions
- Only unload goods upon receiving permission from the receiving location. Prohibit unloading while the vehicle is moving
- When leaving the vehicle for a break, turn off the engine, apply the parking brake, shift gears, remove the key, and lock the door
- Turn off the engine when refueling

## **6. Handling Emergency Situations**

### **6.1. Brake failure: quickly shift to a lower gear**

- Stay calm
- Release the accelerator
- Feel the brake pedal
- Pump the brake pedal continuously
- Shift to a lower gear
- Use the handbrake
- Maintain visibility
- Signal other vehicles
- Use obstacles to reduce speed
- Find a place to safely stop

### **6.2. Steering failure**

- Causes:
  - Technical faults: tire blowout, steering system failure

- Driving errors: speeding, driving on slippery roads
- Measures:
  - Drive slower for safety
  - Keep a firm grip on the steering wheel, do not oversteer
  - Release the accelerator and do not brake
  - Gradually steer back onto the road

### 6.3. Escaping from a sinking vehicle

- Prepare for the impact with water
- Unfasten the seatbelt
- Open the window as soon as possible
- Escape through the broken window
- Exit the vehicle once it is fully submerged and swim to the surface
- Call for rescue

### 6.4. Vehicle fire on the road

- Calmly turn off the ignition, park the vehicle on the roadside away from crowds and flammable materials
- Use a fire extinguisher, sand, or water to extinguish the fire
- Report to the fire department
- If the fire cannot be extinguished, move away from the burning vehicle to a safe location

### 6.5. What to do in case of a traffic accident

- Check for the possibility of a fire
- Place warning signs in front and behind the scene to alert others. Protect the accident scene
- Assess the victim's condition:
  - Check the victim's consciousness
  - Check if the victim is breathing and check the pulse
  - Examine the victim's body for injuries, deformities, fractures, or bleeding
  - Check for foreign objects in the victim's mouth
  - Check for head, neck, or joint injuries
- If the victim is seriously injured, report the accident to the nearest law enforcement agency (113) or emergency center (115)

#### First aid steps:

- Place the injured person in the most favorable position for breathing
- If the injured person has difficulty breathing, clear the airway, remove mucus, or foreign objects from the throat, etc.
- Perform artificial respiration: for adults, blow every 3-4 seconds; for children, blow every 2-3 seconds
- If the pulse and heart are not beating, perform CPR

- If the victim stops breathing and the pulse and heart are not beating, perform both artificial respiration and CPR for resuscitation
- Perform CPR: press the sternum continuously every half second for 15 times each set
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**Stopping bleeding indirectly: use the method of pressing the artery where it passes over a hard surface**

**Stopping bleeding with a tourniquet: for severe injuries (arterial wounds), where blood spurts out in jets with each heartbeat, and the blood is bright red, a tourniquet is most useful**

## 7. Traffic Culture

- Concept of traffic culture: a set of behaviors, adherence to traffic laws, and ethical standards when participating in traffic
- Traffic culture is implemented through two factors:
  - Legal compliance when participating in traffic
  - Community responsibility when participating in traffic

### Legal compliance when participating in traffic

- Adhere to traffic laws, be a model and self-conscious in compliance

### Community responsibility when participating in traffic

- Assist others in need while participating in traffic, provide first aid to the injured
- Actively help the elderly, weak, and children cross the road
- Criticize and prevent traffic violations
- Timely report and inform relevant authorities about road and vehicle issues to promptly address them

## II. LABOR SAFETY IN VEHICLE REPAIR AND MAINTENANCE

### 1. Factors causing accidents in vehicle repair and maintenance

#### 1.1. Accidents due to human factors

- Accidents can occur due to improper use of machines or tools, improper clothing, or lack of caution by technicians.

#### 1.2. Accidents due to physical factors

- Accidents occur due to damaged machines or tools, inconsistency in safety equipment, or poor working environment.

## 2. Safety attire for automobile repair

### 2.1. Work clothing

- To avoid accidents, choose sturdy and well-fitting work clothes that support the job. Avoid work clothes with belts, zippers, and loose buttons, as they can cause damage to the vehicle during work.
- As a safety measure to prevent accidents and fires, avoid exposing bare skin.

### 2.2. Safety shoes

- Always wear safety shoes when working. Wearing slippers or sports shoes is dangerous as they can easily slip and reduce work efficiency. They also pose a risk of injury from falling objects.

### 2.3. Protective gloves

- Wear gloves when lifting heavy objects or removing exhaust pipes or similar items. However, wearing gloves for routine maintenance work is not always necessary.
- The decision to wear gloves should depend on the type of work you plan to do.

## 3. Safety in the automobile repair workshop

- Always keep the workplace clean to protect yourself and others from injury:
  - Do not leave tools or parts on the floor where you or someone else might step on them. Get into the habit of placing them on a workbench or rack.
  - Immediately clean up any spilled fuel, oil, or grease to prevent slipping.
  - Avoid awkward postures while working as it affects work efficiency and can cause falls and injuries.
  - Be especially careful when working with heavy objects as they can cause injuries if they fall on your feet. Also, remember that lifting objects that are too heavy can cause back pain.
  - When moving from one position to another in the workplace, follow the designated pathways.
- Do not use flammable materials near switches, switchboards, or electric motors as they can easily catch fire.

## 4. Electrical safety in the automobile repair workshop

- Errors when working with electrical equipment can cause short circuits and fires. Therefore, learn how to use them correctly and carefully follow these precautions:

- If you detect any abnormalities in electrical equipment, immediately turn off the switch and contact the manager/supervisor.
- In case of a short circuit or fire in the electrical circuit, turn off the switch before extinguishing the fire.
- Report any incorrect wiring or improperly installed electrical equipment to the manager/supervisor.
- Report any blown fuses to the manager as a blown fuse indicates a short circuit somewhere.
- Never do the following as they are particularly dangerous:
  - Do not go near exposed or broken electrical wires.
  - To avoid electric shock, never touch any electrical equipment with wet hands.
  - Never touch a switch labeled "do not operate."
  - When unplugging, do not pull the wire; pull the plug itself.
  - Do not run electrical wires through wet or oil-soaked areas, over hot surfaces, or around sharp corners.
  - Do not use flammable materials near switches, switchboards, or electric motors as they easily spark.

## 5. Preventive activities in the workshop

- In preventive activities, technicians will share near-miss experiences they have encountered in their daily work. They will describe these near-miss incidents to others to help them avoid similar risks. They will then analyze the factors that led to these dangerous situations and take necessary measures to create a safe working environment.
  - If you encounter any situation like this, do the following:
    - First, report the issue to the manager/supervisor.
    - Report what happened.
    - Have everyone carefully consider the issue.
    - Have everyone consider the necessary measures to take.
    - Record all of the above and post the list where everyone can see it.
- In a typical day, the automobile repair workshop provides many services to customers, such as maintenance or tire repair.
- When providing these services, you need to perform tasks such as draining fuel from the vehicle and handling hazardous materials. These tasks can pose many risks to you and your colleagues.
- Risks such as fire and explosion can cause serious injuries, even affecting your life. When working under the vehicle, you risk being crushed if the vehicle falls off the support. You may also come into contact with many hazardous substances such as waste oil and cleaning agents, as well as the pressure from compressed air released from the tires.
- This information sheet provides practical guidance in certain situations to minimize the risk of workplace accidents and occupational diseases. Remember that, in addition to the risks we mention, you may encounter many other risks. In certain situations, additional



preventive measures may be required, such as during pregnancy. Therefore, before starting any job, stop and ask yourself:

- How will you perform that task?
  - Do you have sufficient knowledge to always work safely and ensure health?
- All workers must be informed and trained about potential risks and regulations to ensure the safety system in the repair workshop.
- Refer to some preventive measures when facing certain risks.
- Additionally, contact the labor inspection agency or local occupational safety and health unit to help you understand potential risks and necessary preventive measures.

#### A. TIRE REPAIR

- You can suffer serious injuries when repairing or replacing tires. Workplace accidents occur not only from the vehicle falling off poor-quality supports and injuring workers but also from tire explosions. When a tire explodes, the energy from the compressed air will violently discharge towards the worker.
- Use a long enough air hose to help you maintain a distance from the tire in case of an explosion. If the tire explodes, you will not be affected by the explosion pressure.
- The hoses should be equipped with quick-release couplings at both the tire end and the operator's position to ensure the coupling does not get stuck at the operator's position, and air pressure can be safely released at the working position. Inflate the tire in a cage or secure it to the ground or use restraining devices. In the event of an explosion, these devices will help contain tire fragments and other parts.
- Equip the air hose with a pressure gauge to ensure the tire does not overinflate.
- Multi-piece rims and split rims must be assembled with maximum caution, and besides the occupational safety system, you should follow the manufacturer's instructions.

#### B. FIRE AND EXPLOSION

- Fire and explosion are very common in automobile repair workshops. As a result, the repair shop can be damaged, and workers can suffer serious injuries or even death.
- Three elements cause a fire: oxygen, an ignition source (heat), and flammable materials (fuel). All three elements are present in the repair workshop, so workers need to adhere to the safety system to ensure these elements do not combine.
- Store flammable substances (gasoline, cleaning agents, etc.) in minimal quantities to reduce the risk of fire.
- Store flammable liquids in stable, sealed containers to prevent leaks and the spread of flammable gases.
- Store gas cylinders outside the workshop in a safety cage to ensure gas leaks are dissipated.
- Never use thinners, paint, or gasoline to burn waste as gasoline vapors can ignite instantly and uncontrollably, causing injury.
- Perform heat-generating tasks (welding and cutting) away from flammable materials to prevent heat from igniting flammable materials.

- Clean up oil spills, dispose of oil filters, rags, and paper in fireproof containers, such as metal containers with lids, as good hygiene reduces the risk of fire and explosion.
- To minimize fire risk, when draining fuel from the vehicle, use a fuel extraction pump. This device helps reduce flammable gasoline vapors in the air and has a suitable container to store the fuel.
- Disconnect the vehicle's battery to separate the ignition source.
- Use grounding devices for both the vehicle and the fuel extraction pump to eliminate static electricity, which is considered an ignition source.
- Always have foam and powder fire extinguishers in the workshop and ensure you know how to use them to quickly extinguish fires and prevent the fire from spreading at the workplace.
- Work in a well-ventilated area to prevent the buildup of explosive pressure in case of an explosion.
- Inform colleagues about your work to avoid unnecessary contact.
- Besides the preventive measures mentioned, if you have to drain fuel without a pump, ensure that:
  - Use a siphon or hand-operated pump (non-electric) to safely transfer fuel from both ends of the hose to reduce the risk of spills and static discharge.
  - Use grounding wires to connect the vehicle frame and container to the ground to eliminate static electricity, which is considered an ignition source.
  - Use sturdy, sealed metal containers to reduce the risk of fuel spills and prevent gasoline vapors from spreading.

### C. WORKING UNDER VEHICLES/TRAILERS

- When working under vehicles, trailers, or the cabs of vehicles, you can be in danger. If these vehicles are unstable or not properly supported, their weight can crush you while you are working underneath.
- Use proper equipment to support the vehicle, such as a vehicle jack or axle stand. Vehicles not supported by suitable equipment can fall and crush you.
- Place the jack and axle stand on solid parts of the vehicle to prevent the vehicle from collapsing on the equipment and workers underneath.
- Ensure that the parking brake is engaged and the wheels are chocked on a flat surface to prevent the vehicle from moving and falling off the supports.
- Ensure that the axle lock is correctly installed (no bolts or screws) to keep the axle stand at the correct height.
- Use a jack or axle stand on a flat surface to ensure that the tools do not slip or tilt.
- When using a two-post lift for a car:
  - Lift the vehicle about 1 meter off the ground.
  - Ensure that the lift pads are correctly positioned.
  - Shake the vehicle before lifting the lift higher to ensure that the vehicle is balanced and stable on the lift before you start working underneath.
- Before moving heavy parts of the vehicle, ensure that the movement does not affect the stability of the vehicle to prevent the vehicle from falling off the lift.

- When working with trailer beds or vehicle cabs, ensure that additional support tools are available to prevent the trailer or cab from falling and crushing the worker. The lift cannot ensure load stability when the worker is underneath.

#### D. HAZARDOUS SUBSTANCES

- During vehicle maintenance and repair, you come into contact with many hazardous substances, such as waste oil, cleaning agents, gasoline, diesel, and gases in the air conditioning system, batteries, etc. You need to control exposure to these substances to avoid eye and respiratory irritation and the risk of lung diseases.
- Do not operate the engine near the repair workshop to avoid toxic emissions reaching harmful levels.
- If you must operate the vehicle, minimize the operating time and use an exhaust extraction system to eliminate exhaust fumes from the workshop. If there is no exhaust extraction system, open doors and windows to create airflow and reduce exhaust fumes accumulation and exposure.
- When draining waste oil:
  - Use a collection system.
  - Wear chemical-resistant gloves (nitrile).
  - Wash hands frequently.
  - Use hand cream to reduce the risk of dermatitis and skin cancers.
- Some car parts contain asbestos (a fibrous material). If inhaled, you can develop respiratory diseases such as lung cancer. Asbestos is found in brake systems, clutches, heat shields, and seals. Even if your country bans asbestos, old car parts may still contain it. Therefore, always assume that car parts contain asbestos unless you are certain that asbestos is not present.
- When cleaning wheels and brake components, use a vacuum cleaner with an appropriate filter (as asbestos dust can pass through most regular filters). If there is no specialized vacuum cleaner, use a wet rag to clean the drum and casing, immediately place the rag in a plastic bag after cleaning, and follow national disposal guidelines. Do not use compressed air to blow dust or hit the brake drum with a hammer as these methods will disperse asbestos dust into the air you breathe.