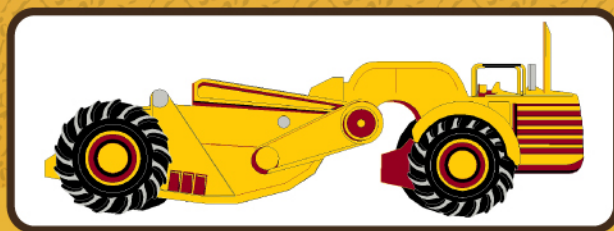
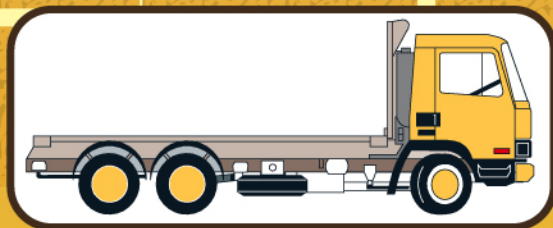
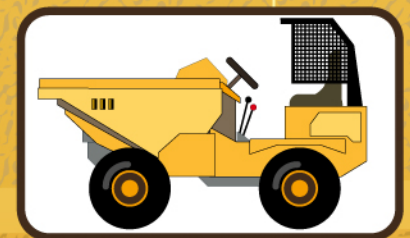
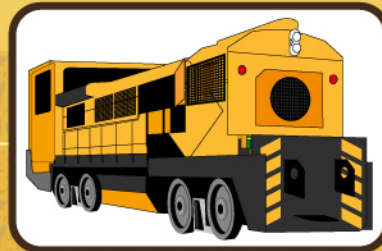
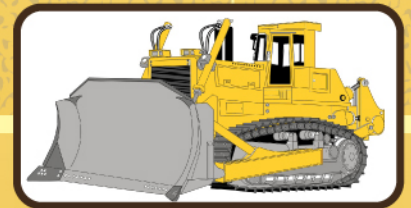
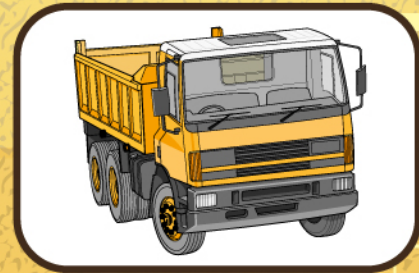


Guidance Notes on Safe Use of Loadshifting Machines for Earth Moving Operations on Construction Sites



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Occupational Safety and Health Branch of
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1 . INTRODUCTION

1.1 In recent years there have been many serious accidents arising from the use of loadshifting machines for earth moving operations on construction sites. The common causes of these accidents are often due to the absence of a safe system of work for the operation, inappropriate selection of equipment, operators being not properly trained and incompetent, poor maintenance of equipment and failure in observing the necessary safety precautions.

1.2 To cope with the Factories and Industrial Undertakings (Loadshifting Machinery) Regulation, the 'Guidance Notes on Safe Use of Earth Moving Machinery' is revised as 'Guidance Notes on Safe Use of Loadshifting Machines for Earth Moving Operations on Construction Sites'.

1.3 Under section 2 of the Factories and Industrial Undertakings (Loadshifting Machinery) Regulation, the responsible person of a loadshifting machine means a person who is having the management or in charge of the machine but does not include a person who operates the machine and, in the case of a loadshifting machine situated on or used in connection with work on a construction site, also means the contractor responsible for the construction site.

1.4 Section 3 of the Factories and Industrial Undertakings (Loadshifting Machinery) Regulation is coming into effect in phases. The responsible person of loadshifting machine should ensure respective machine specified in the Regulation is only operated by a person who:

- (a) has attained the age of 18 years; and
- (b) holds a valid certificate applicable to the type of loadshifting machine to which that machine belongs.

1.5 Under section 4(1) of the Factories and Industrial Undertakings (Loadshifting Machinery) Regulation, it is also the duty of the responsible person of a loadshifting machine to ensure the provision to each of his employees who is instructed (whether directly or indirectly) by him to operate a loadshifting machine of a training course conducted for the type of loadshifting machine to which that machine belongs.

1.6 Under section 4(2) of the Factories and Industrial Undertakings (Loadshifting Machinery) Regulation, in case the employee fails to obtain a certificate after attending the training course, the responsible person of a loadshifting machine shall ensure the provision of an additional training course conducted for the same type of loadshifting machine as the first-mentioned training course for the employee.

1.7 Under section 4(3) of the Factories and Industrial Undertakings (Loadshifting Machinery) Regulation, the responsible person of a loadshifting machine is not obliged to comply with section 4(1) of the Regulation if the employee holds a valid certificate applicable to the type of loadshifting machine to which that machine belongs.

1.8 Under section 5 of the Factories and Industrial Undertakings (Loadshifting Machinery) Regulation, an employee referred to in section 4(1) of the Regulation is required to attend such training course as may be provided by the responsible person of a loadshifting machine unless he holds a valid certificate applicable to the type of loadshifting machine to which that machine belongs.

1.9 Regulation 45 of the Construction Sites (Safety) Regulations requires that only a trained and competent workman not under 18 years of age is allowed to operate a mechanical equipment inside a construction site. No person under 18 years of age is allowed to give signals to the operator of the equipment.

1.10 Loadshifting machines used on construction sites include any bulldozer, loader, excavator, truck, lorry, compactor, dumper, grader, locomotive and scraper. Amongst the listed loadshifting machines, excavators are lifting appliances in the context of the Factories and Industrial Undertakings (Lifting Appliances and Lifting Gear) Regulations. Excavators should be inspected, thoroughly examined and tested periodically in accordance with the statutory requirements. Figure 1 illustrates the loadshifting machines used on construction sites.

1.11 The Occupational Safety and Health Ordinance (OSHO) and the Factories and Industrial Undertakings Ordinance (FIUO) also impose general duties on employer and contractor with regard to the health and safety at work of their employees at a workplace or in industrial undertakings which cover construction sites. These include the legal requirements to provide their employees with plant and system of work that are, so far as reasonably practicable, safe and without risk to health. The general duties extend to include that the employer and the contractor should provide all necessary information, instruction, training and supervision for operators and workers of loadshifting machines.

1.12 Section 8 of the OSHO and Section 6B of the FIUO also impose duty on an employee, including an operator of a loadshifting machine, to take reasonable care for the health and safety of himself and of other persons who may be affected by his acts or omissions at work.

1.13 This booklet, with details set out from section 2 onwards, aims to provide the essential safety guidelines to the responsible person of loadshifting machines, mechanics, operators and other stakeholders in the construction industry for improving the safety standard in connection with the use of loadshifting machinery. Reference should always be made to individual operation and maintenance manual for handling a specific machine to ensure the safety of the operators and the site personnel working in the vicinity.

1.14 An operator should possess a valid certificate issued by the organizer of a training course for loadshifting machine which evidences that, by virtue of his attendance at the training course designed for that purpose, he is trained and competent to operate a particular type of loadshifting machine. The training course should be a course recognized by the Commissioner for Labour.

1.15 The Factories and Industrial Undertakings (Loadshifting Machinery) Regulation does not apply to a person who operates a truck or lorry if he is the holder of a valid driving licence issued under the Road Traffic Ordinance of the class to which the truck or lorry belongs.

1.16 As the construction, performance, maintenance and operation of the locomotive are distinct from other types of loadshifting machine, part of the guidance notes may not be fully applicable to this type of loadshifting machine. The responsible person, mechanics, operators and other stakeholders of a locomotive should make reference to the manufacturer's specifications, operation and maintenance manuals before using the machine.

1.17 The purpose of this booklet is to provide essential guidelines for safe use of loadshifting machines for earth moving operations on construction sites. Apart from these guidelines, the instructions contained in the manufacturer's specifications and operation and maintenance manuals should also be followed.

1.18 It should be noted that the guidance notes in this booklet should not be regarded as exhausting those matters which need to be covered by the relevant safety legislations, nor are they intended to relieve persons undertaking the work of their statutory responsibilities.



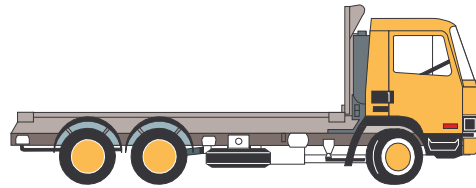
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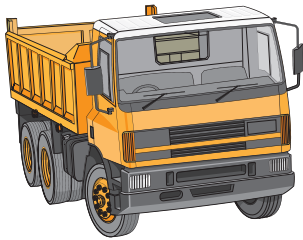
LOADER



EXCAVATOR



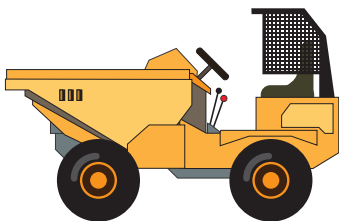
TRUCK



LORRY



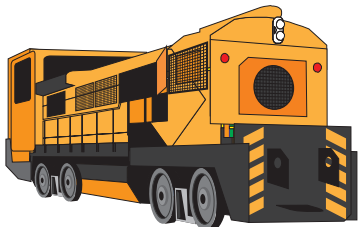
COMPACTOR



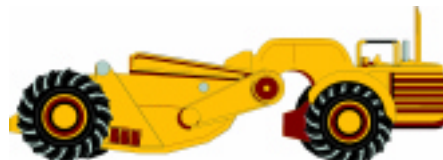
DUMPER



GRADER



LOCOMOTIVE



SCRAPER

Fig.1 The loadshifting machines used on construction sites

2 . SAFE SYSTEM OF WORK

2.1 A safe system of work should be established prior to any earth moving operation involving the use of a loadshifting machine and this system should be followed by all personnel engaged in the operation. The system should be prepared and endorsed by the responsible person of the loadshifting machine under the advice of project engineer, service engineer, mechanic, safety officer and other relevant personnel. In particular, both written and verbal instructions about the safe system of work should be provided to the machine operator prior to the earth moving operation.

2.2 The safe system of work should include the following:

- (a) risk assessment. Before using a specific type of loadshifting machine on a particular site, a risk assessment should be carried out. Limitations in using the plant to suit the particular site conditions and geotechnical parameters should be specified and mutually agreed by a person competent in geotechnics and a person competent in mechanical plant. Such limitations should be understood and observed by all parties concerned;
- (b) planning the operation. This includes identification and description of the earth moving areas, scale and duration of the operation, use of access road and possible route of on site travelling. In particular, the width and gradient of the slope, access road or inclined surface should be properly surveyed before selecting a proper machine to suit the working environment. If the machine, which in particular with an internal combustion engine, has to enter and work in confined areas, the Factories and Industrial Undertakings

(Confined Spaces) Regulation should be followed. Moreover, the weather condition should be taken into consideration to ensure that the operation is not affected by rain, storm or sudden change of weather;

- (c) selection, provision and use of a suitable machine for a particular type of operation. Consideration should be given to the following limitations: the maximum allowable gradient of earth slope to climb, the minimum distance from crawler tracks/wheels to edges of slopes, rolling resistance of rubber-tired plant, traction, and ground conditions at different moisture contents;
- (d) maintenance, inspection, examination and testing of the equipment periodically by a mechanic and service engineer and/or professional engineer;
- (e) provision of operation and maintenance manuals, manufacturer's specifications, and inspection and maintenance log book for the use of mechanic, service engineer or other safety personnel during the periodic maintenance, inspection, examination and test;
- (f) provision and selection of properly trained and competent personnel to operate the machine. The operator should at a minimum possess a valid certificate issued by the organizer of a training course which evidences that, by virtue of his attendance at the training course designed for that purpose, he is trained and competent to operate a particular type of loadshifting machine. The training course should be a course recognized by the Commissioner for Labour;
- (g) adequate supervision by properly trained and competent personnel to execute the rules and precautions stated in the safe system of work. Such

personnel should have the knowledge of the machine and necessary authority to suspend the earth moving operation if a dangerous circumstance arises;

- (h) preventing unauthorized movement or use of machines at all times;
- (i) observing all potential unsafe conditions that may arise during the earth moving operation and introducing preventive measures to ensure the safe operation of the machine at all times. If the machine is operated in special circumstances such as in a congested work environment, close to nearby fixture, at dusk or at night, a banksman should be assigned to give signal to the operator of the machine;
- (j) identification of site personnel to execute the rules and safety precautions, supervise the operation and impose stop work order for a hazardous working condition;
- (k) procedures and safety precautions for loading and unloading the machine on site;
- (l) emergency preparedness, including the arrangement and provision of rescue appliances to recover and restore the equipment; and
- (m) checklists for certain 'dos' and 'don'ts' to be observed for safe operation, maintenance, inspection, testing and examination of the machine.

2.3 The safe system of work should be published in simple language so that everyone can read and understand it. It should be distributed to site personnel responsible for the earth moving operation, including the operator.

3 . SELECTION OF MACHINE

3.1 It is important to choose a proper loadshifting machine for a certain type of earth moving work. Factors such as whether a new or used machine, its size and model, whether rubber or track mounting, country of origin, availability of local agent, maintenance support to meet the working condition and environment, etc. should be taken into consideration in the selection process.

3.2 The machine so selected should be:

- (a) of suitable capacity and power for the nature, quantities and scale of the earth moving work;
- (b) of good mechanical condition and properly fitted with all necessary safety devices, protection system and correct tread fittings. The safety and protection system should include roll over protection structure, dead-man control, reverse warning device and amber flashing lights;
- (c) thoroughly inspected and maintained by a mechanic in accordance with the manufacturer's operation and maintenance manual;
- (d) tested and examined periodically by service engineers in accordance with the requirements set in the manufacturer's specifications; and
- (e) accompanied with an inspection or maintenance log book as well as test record irrespective of whether the machine is new or used.

3.3 It is important that whenever a machine is required to work on a slope or travel on an inclined road, the slope limit of the machine should be checked. The machine should be equipped with a roll over protection structure and a seat belt as shown in Figure 2 for the safety of the operator.



Fig.2 A loadshifting machine with roll over protection structure and a seat belt

4 . ON SITE INSPECTION AND MAINTENANCE

4.1 When the loadshifting machine arrives on site, the operator and mechanic should walk around the machine, check it carefully according to the checklist of the machine after it is unloaded. The parts requiring particular attention vary with the type of machine, the work it is doing, and often with the service history of the particular unit. The following parts of the machine often require particular attention and frequent inspections:

Tyres

If the machine has tyres, the correct pattern and direction of the tread and proper pressure are of the first importance. They should be checked to see if they are suitable for the ground conditions in accordance with the manufacturer's recommendation. Tyres should be inspected for cuts, tears, and worn tread.

Tracks

Track tension can be checked only if the machine is reasonably clean, and was moving forward when stopped for parking. There should be a slight sag on each side of the carrier roller. A track will wear rapidly if it is too tight or too loose. It may also come off if it is too loose.

Working Tool

The bucket, blade, edge, tooth or other parts that are forced through soil or rock during earth moving are subject to wear and tear due to abrasion and impact action. The operator should be alert to report excessive wear and any breakage of these cutting parts. Excessive wear and a break in the working tool usually cause the metal part or structure behind them some tears and bends, which make rebuilding difficult.

Linkage

Each hinge is a point where lubrication is probably required, and where a pin may loosen and come out. Steering linkage acting on the wheels is subject to damage from collision with rocks or

other objects. Check for slackness in the steering and lever controls and worn brake pedals and rectify and replace as necessary.

Leaks

Surfaces of the machine, and the ground under it, should be inspected for evidence of leakage of lubricating or hydraulic oil, or coolant (Figure 3). In the hydraulic system, leaks are usually at joints. If the hose itself starts to exude oil, it should be replaced immediately. Leakage for fuel oil and air-system should also be inspected. Any evidence of leak should be investigated and rectified with defective parts replaced immediately.

Radiator

The fluid levels should be checked at the beginning of each shift. The radiator should be filled to within a few inches of the filler cap. For engine with an auxiliary container for coolant, the level of the coolant should be maintained within the upper and lower levels as indicated or in accordance with the manufacturer's instruction manual. Never loosen the filler cap of the radiator until the engine is cooled down.

Reservoirs

Almost any piece of equipment has one or more fluid reservoirs whose level is checked by a dip stick, usually while the engine is shut off (Figure 4). There is always a dip stick for the engine. The operator must be sure to use it, and add oil if necessary, before starting. The tank for hydraulic system should be checked either by a sight gauge, a dip stick or a look through the filler cap opening, after it has been depressurized and cooled down. Air reservoirs (or air-vessels) should be regularly drained to remove condensation water to maintain their efficiency.

Air Cleaner

Open and check the presence of trash in the air cleaner. Remove any trash and replace worn out parts. Keep the air cleaner in a serviceable condition at all time.

Roll Over Protection Structure

Look for any loose or damaged bolts. Replace damaged bolts or missing bolts with original equipment parts only. Replace the structure mounting supports if the structure rattles or makes a noise when the machine is operated on a rough surface.

Seat and Seat Belt

Inspect condition of seat, seat belt and associated mounting hardware. Replace any damaged or worn parts.

Battery

Check condition of battery, including connections, level of electrolyte, and leakage.

Reverse Warning Signals

Check both audible alarm and flashing light warning signals on the machine.

Other safety features

Check control buttons, lights and mirrors.

4.2 It is important to note that all routine inspections and maintenance work should be done with all attachments and working tools being completely lowered on ground surface or otherwise firmly supported by safety bars.



Fig.3 Check for leakage of lubricating or hydraulic oil, or coolant

5 . SAFE OPERATION

5.1 The following safe precautions summarize essential requirements to use and operate a loadshifting machine. In any case, site safety personnel should make reference to the safety notes in the operation and maintenance manual to get a complete picture of the machine before it is put into service.

Site preparations

5.2 Before any earth moving operation is commenced, site personnel should carry out site preparations for safe operation of the loadshifting machine. The following safety measures should be observed:

- (a) provision of temporary fencings and warnings at edges of embankments, excavations and pits against risks of roll over;
- (b) provision of goal posts and warning signs in the vicinity of overhead power lines;
- (c) arrangement of site traffic controls;
- (d) provision of adequate site access roads;
- (e) provision of safety system for other site vehicles, such as provision of flashing lights or flags for smaller vehicles in large earth moving site;
- (f) provision of safety measures for dumping pits, such as installation of stop logs to rear wheels of dumpers; and
- (g) provision of protective equipment for banksmen and any ground persons assisting in the earth moving operation, such as reflective vests and communication means.

Prepare for safe operation

5.3 Before starting the engine of the machine, the operator or mechanic should pay attention to the following:

- (a) inspect for any evidence of physical damage such as cracking, bending or deformation of plates or welds;
- (b) check the level of all fluids in the brake, transmission, power steering, engine coolant and hydraulic system. Fill low reservoirs only to proper level;
- (c) check various systems for leaks. Inspect all plugs, filler caps and fittings for tell-tale signs of leaks;
- (d) before starting the machine, check all controls such as forward and reverse, steering, transmission, and all operating and shut-down controls;
- (e) before beginning operation, thoroughly check the area of earth moving operation, its gradients, the condition of access road, nearby trenches, lightpoles, tiles, overhead or underground cables, drop-off or overhead obstacles. Other site activities in the vicinity should be checked as well;
- (f) when the machine is intended to operate on steep slopes or move on inclined road, the machine must be installed with roll over protection structure and seat belt to reduce the hazard to the operating personnel; and
- (g) if an unsafe condition cannot be remedied immediately, notify the supervisor and tag the machine on the start switch and/or other appropriate and prominent position.

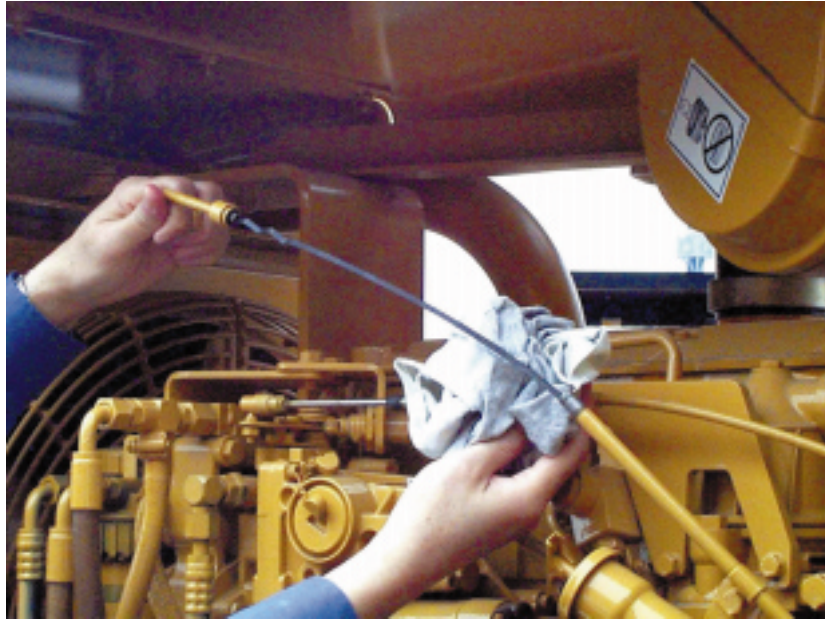


Fig.4 Check the level of all fluids in the brake, transmission, power steering, engine coolant and hydraulic system

Operation

5.4 During the operation of the machine, the following precautions should be adopted by the operator:

- (a) walk around the machine once more just prior to mounting it. Check for people and objects that might be in the way;
- (b) just before starting, check all controls such as forward and reverse, steering and transmission to ensure they are in the correct start-up position. The parking brake should be applied during the start-up operation;
- (c) check for proper functioning of all operating and shut-down controls;

- (d) after starting the engine, check gauges, instruments and warning lights, all controls and all warning and safety devices and indicators. Check operation of service and parking brakes on level ground if possible according to the manufacturer's instructions. Particular attention should be focused on abnormal noise, undue vibration and smell;
- (e) check service brakes in both forward and reverse operation on level ground according to the manufacturer's instructions;
- (f) when operating a machine, always stay in the operator's station and fasten the seat belt if so provided. Never mount or dismount a machine unless it is stationary. If the machine is equipped with a cabin, ensure that the cabin door is securely closed;
- (g) always operate the machine slowly until fully familiarized with its control;
- (h) prevent asphyxiation. If you must operate in a building or other enclosed areas, be sure that there is sufficient ventilation in that area for effective dispersion of the engine exhaust. If your machine is equipped with an enclosed cabin, be certain there is adequate ventilation;
- (i) when working on slopes, avoid sidehill travel whenever possible. The danger of sliding and tipping during sidehill travel is always present regardless of how heavy or stable your machine may appear to be. Figure 5 illustrates the sidehill travel of a compactor;

- (j) always fasten the seat belt if your machine is equipped with a roll over protection structure;
- (k) when climbing or descending a steep slope, always select the proper gear before proceeding to the slope to assure adequate power or engine braking. If your machine has a gear shift, select a low gear. If your machine has a hydrostatic drive, the speed control should be in the slow travel position, close to neutral. Never engage in the fully displace position;
- (l) when climbing or descending a slope, on machine that has a gear shift and a hydrostatic control, both controls must be in their slow travel position. Always be sure that manually operated gear type transmissions are fully engaged before proceeding to the slope;
- (m) avoid operating the machine too close to an overhang, deep ditch or hole and be alert to potential caving edges, falling rocks and slides, rough terrain, obstacles and overhead lines;
- (n) in case of restriction of the view of the operator, do not operate the machine unless a banksman is available for giving signals for safe operation;
- (o) under wet or rainy conditions when the ground became too slippery for the machine, stop the earth moving operation;
- (p) never operate the machine in any place of inadequate lighting. Adequate lighting should be arranged in confined areas and during operation at night time;

- (q) never leave the machine while the engine is running and ignition key is on the machine; and
- (r) never use the machine for any purposes other than it is designed for.



Fig . 5 When working on slope, avoid sidehill travel

Parking

5.5 Having finished the earth moving operation, the machine should be stationed in a place off the work area or access road. The following points should be noted:

- (a) park on level ground, with the parking brake firmly applied and blocked by suitable wedges, where appropriate. For wheeled machine, the wheels should be chocked by suitable wedges and never chock the wheels with rocks. Avoid parking near edges of slopes and excavations;

- (b) lower the attachments or working tools to the ground (Figure 6); and
- (c) remove the ignition key and hand it back to the site personnel for safe custody.



Fig.6 Park on level ground and with attachment on ground

6 . RESPONSIBLE PERSON

6.1 The responsible person of a loadshifting machine should ensure that the machine is of good mechanical construction and free from patent defects before the machine is used for earth moving operation. He should ensure that the machine is maintained to its efficient state by his service engineer and mechanic in accordance with the manufacturer's specifications. In the case where excavators are used, the owner should also ensure that the machines are inspected, thoroughly examined and tested periodically in accordance with the Factories and Industrial Undertakings (Lifting Appliances and Lifting Gear) Regulations.

6.2 Tests for service and parking brakes, steering alignment, check for pump efficiency, travel speed test and tests for hydraulic pressure of the power system should be conducted in the workshop within the maintenance intervals and also after repair in accordance with the manufacturer's instructions. A systematic recording of all tests and servicing data and periods should be kept and available for reference.

6.3 The service and maintenance records and essential safety precaution notes should be provided and accompany the machine for the reference of the hirer and operator.

6.4 The responsible person of a loadshifting machine should provide information concerning the dimensions, weight, and configuration of the machine for loading and unloading, and in case of mishap, the recovery procedure.

6.5 The responsible person of a loadshifting machine should ensure the provision to each of his employees who is instructed (whether directly or indirectly) by him to operate a loadshifting machine of a training course conducted for the type of loadshifting machine to which that machine belongs.

6.6 A safe system of work should also be drawn up by the responsible person of the loadshifting machine to ensure the safety of the earth moving operation. It should be distributed to all relevant personnel within the site. The steps, such as briefing, tool box talks and coaching, should be taken to ensure that the safe system of work is fully understood by all relevant personnel.

6.7 The responsible person of a loadshifting machine should exercise control over the following areas:

- (a) never allow any person to operate the machine unless he is holding a valid certificate applicable to the type of loadshifting machine to which that machine belongs, and that the person aforesaid is authorized to operate the machine. Preferably, the authorization should be in written form;
- (b) never allow other personnel to ride on the machine unless appropriate seating is provided and only if authorized to do so;
- (c) never allow the machine to perform operation which is not specified by the manufacturer;

- (d) circle off a parking area for the machine when it is not in use. Park in an off the road area, out of traffic. If the machine has to be parked in a traffic lane, use the appropriate barriers, lights and warning signal to warn the approaching traffic;
- (e) the parking area should be of level ground whenever possible. Ensure that the machine is provided with safety blocks and the parking brake is firmly applied; and
- (f) so far as is reasonably practicable, the traffic area and the working area should be properly demarcated and erected with suitable barriers to provide physical protection to workers.

6.8 Loading and unloading machines always involve potential hazards. The responsible person of a loadshifting machine should develop a method statement for the correct loading and unloading for the machine in the site. The procedure recommended by the manufacturer should always be followed.

7 . COMPETENCE OF MECHANIC

7.1 The mechanic for inspection and maintenance of loadshifting machines should receive the necessary training both in safety knowledge and precautions. He should be fully familiar with the following aspects of knowledge and skill:

- (a) the understanding and application of the local safety regulations such as the Construction Sites (Safety) Regulations, the Factories and Industrial Undertakings (Loadshifting Machinery) Regulation, the Factories and Industrial Undertakings (Lifting Appliances and Lifting Gear) Regulations, and the general duties provisions of the Occupational Safety and Health Ordinance and Factories and Industrial Undertakings Ordinance;
- (b) precautions to be observed when operating loadshifting machines and attachments, and the safe and proper handling of all hydraulic tools, air tools, special tools and equipment;
- (c) location of master switches and methods of immobilizing machinery, including the type of earth-moving base and equipment;
- (d) dangers associated with high pressure systems;
- (e) safe method of dismantling wheels and the use of a protective cage during inflation of tyres and hydro-inflation, etc.;
- (f) the skill of using hand tools and power tool as applied to maintenance and servicing requirements;

- (g) the requirements and technicalities of scheduled servicing, routine repairs and maintenance on sites, and major workshop repairs and overhauls. This includes the checking of the correct functioning of ancillary systems, the steering wheel alignment, the experience of assisting in the recovery of damaged machines and use of instrument for fault diagnosis, and the application of the lubrication charts and use of maintenance and lubrication manuals; and
- (h) all safety rules and precautions as defined in the operation and maintenance manual and, in particular, the maintenance intervals of the machine he is responsible for on-site maintenance.

7.2 The mechanic should be able to conduct simple tests on site according to the manufacturer's specifications, including service and parking brakes, steering mechanism, and safety switches and interlocks. He should keep a record of service of the machine and make available for inspection by site personnel. He should be capable of preparing simple technical reports outlining the main findings and the cause of the accident.

8. COMPETENCE OF OPERATOR

8.1 The operator should be at least 18 years old and have reasonable degree of both physical and mental fitness.

8.2 The operator should be able to understand what is involved in safe operation. He should be able to understand and read instructions, signs, charts and manuals.

8.3 According to Section 5 of the Factories and Industrial Undertakings (Loadshifting Machinery) Regulation, the operator is required to attend the training for the particular type of loadshifting machine. An operator should possess a valid certificate issued by the organizer of a training course which evidences that, by virtue of his attendance at the training course designed for that purposes, he is trained and competent to operate a particular type of loadshifting machine. The training course should be a course recognized by the Commissioner for Labour (Section 2 of the Factories and Industrial Undertakings (Loadshifting Machinery) Regulation). After the completion of the training, the operator should be able to understand and appreciate the following:

- (a) overview of legislative provisions, including:
 - Occupational Safety and Health Ordinance;
 - Factories and Industrial Undertakings Ordinance (including General Duties provisions);
 - Factories and Industrial Undertakings (Loadshifting Machinery) Regulation;
 - Other relevant subsidiary regulations such as
 - Construction Sites (Safety) Regulations (including Part VA),

- Factories and Industrial Undertakings (Lifting Appliances and Lifting Gear) Regulations,
 - Factories and Industrial Undertakings (Electricity) Regulations,
 - Factories and Industrial Undertakings (Safety Management) Regulation,
 - Factories and Industrial Undertakings (Gas Welding and Flame Cutting) Regulation,
 - Factories and Industrial Undertakings (Confined Spaces) Regulation; and
- Any relevant Codes of Practice, and any other applicable safety legislation.
- (b) detailed construction, performance, maintenance and operation of the type of loadshifting machine;
- (c) potential hazards associated with the operation of loadshifting machines including the striking and trapping hazards by the machines;
- (d) possible causes of and prevention strategies for common accidents associated with the operation of loadshifting machines;
- (e) basic operating skills for that type of loadshifting machines (except Locomotive), including:
- Conduct routine checks;
 - Plan work;
 - Check controls and equipment;
 - Shift load (not applicable for compactor);
 - Shut down machine; and
 - Secure site.

Depending on the types of loadshifting machines, some of the skills described in above may not be applicable.

As locomotive is fundamentally distinct from other types of loadshifting machines, the organizer of the training course should develop the training course for basic operating skills of the locomotive with reference to the manufacturer's specifications and operation/maintenance manuals; and

- (f) safety attitude to safeguard themselves as operators of loadshifting machines and other workers while operating the loadshifting machines.

8.4 The Factories and Industrial Undertakings (Loadshifting Machinery) Regulation does not apply to a person who operates a truck or lorry if he is the holder of a valid driving licence issued under the Road Traffic Ordinance of the class to which the truck or lorry belongs.

9 . SAFETY NOTES

9.1 It is important to ensure that the loadshifting machine is operated safely. Re-emphasis on **SAFETY** is the most important aspect of training and machine operation. Some typical subjects are:

- (a) regarding the machine, including chocking the wheels, parking etc.;
- (b) regarding the site, including do not work on a machine on a slope which is liable to collapse and slide;
- (c) do not work above or under overhanging embankments or undercut with potential hazard of collapse;
- (d) ensure buckets, blades and any sharp attachment to be lowered to ground after completing the work;
- (e) watch for trees and branches and overhead lines;
- (f) ensure all safety devices are always intact and fully operational, including, for example, emergency brakes and steering, reverse alarms, headlights, and roll over protection structure and seat belt;
- (g) greasing and other servicing or repair work should not be carried out when the engine is running;
- (h) identification and observation of safety signs, notices and symbols; and
- (i) the machine should be repaired by competent mechanic and service engineer and only genuine spare parts should be used.

9.2 Operator, mechanic and site personnel working in connection with earth moving work should be reminded of the context of '**SAFETY**' from time to time to ensure the safety of their own and the safety of other personnel working within the vicinity.

ENQUIRIES

If you wish to obtain further information about this booklet or require advice on occupational safety and health, please contact the Occupational Safety and Health Branch of the Labour Department by:

Telephone : 2559 2297 (auto-recording after office hours)

Fax : 2915 1410

E-mail : enquiry@labour.gov.hk

Information on the services offered by the Labour Department and on major labour legislation can also be found by visiting our Home Page at <http://www.labour.gov.hk>.

You can also obtain information on the various services provided by the Occupational Safety and Health Council through its telephone hotline at 2739 9000.

COMPLAINTS

If you have any complaints about unsafe workplaces and practices, please call the Labour Department's occupational safety and health complaint hotline at 2542 2172. All complaints will be treated in the strictest confidence.



**Occupational Safety and Health Branch
Labour Department**

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