

# Shop Manual

# 630E

## DUMP TRUCK

SERIAL SUFFIX

**AFE42-M**

**AFE46-U**

and up

# **KOMATSU**®





***Unsafe use of this machine may cause serious injury or death. Operators and maintenance personnel must read and understand this manual before operating or maintaining this machine.***

***This manual should be kept in or near the machine for reference, and periodically reviewed by all personnel who will come into contact with it.***

This material is proprietary to Komatsu America Corp (KAC), and is not to be reproduced, used, or disclosed except in accordance with written authorization from KAC.

It is the policy of the Company to improve products whenever it is possible and practical to do so. The Company reserves the right to make changes or add improvements at any time without incurring any obligation to install such changes on products sold previously.

Because of continuous research and development, periodic revisions may be made to this publication. Customers should contact their local Komatsu distributor for information on the latest revision.

### **CALIFORNIA**

#### **Proposition 65 Warning**

***Diesel engine exhaust, some of its constituents, and certain vehicle components contain or emit chemicals known to the State of California to cause cancer, birth defects or other reproductive harm.***

### **CALIFORNIA**

#### **Proposition 65 Warning**

***Battery posts, terminals and related accessories contain lead and lead compounds, chemicals known to the State of California to cause cancer and birth defects or other reproductive harm. Wash hands after handling.***



### **NON-OEM PARTS IN CRITICAL SYSTEMS**

***For safety reasons, Komatsu America Corp. strongly recommends against the use of non-OEM replacement parts in critical systems of all Komatsu equipment. Critical systems include but are not limited to steering, braking and operator safety systems.***

***Replacement parts manufactured and supplied by unauthorized sources may not be designed, manufactured or assembled to Komatsu's design specifications; accordingly, use of such parts may compromise the safe operation of Komatsu products and place the operator and others in danger should the part fail.***

***Komatsu is also aware of repair companies that will rework or modify an OEM part for reuse in critical systems. Komatsu does not generally authorize such repairs or modifications for the same reasons as noted above.***

***Use of non-OEM parts places full responsibility for the safe performance of the Komatsu product on the supplier and user. Komatsu will not in any case accept responsibility for the failure or performance of non-OEM parts in its products, including any damages or personal injury resulting from such use.***

## EMISSION CONTROL WARRANTY

### EMISSION CONTROL WARRANTY STATEMENT (APPLIES TO CANADA ONLY)

#### 1. Products Warranted

Komatsu America International Company, Komatsu Mining Systems Inc. and Komatsu Utility Corporation (collectively "Komatsu") produce and/or market products under brand names of Komatsu, Dresser, Dressta, Haulpak and Galion. This emissions warranty applies to new engines bearing the Komatsu name installed in these products and used in Canada in machines designed for industrial off-highway use. This warranty applies only to these engines produced on or after January 1, 2000. This warranty will be administered by Komatsu distribution in Canada.

#### 2. Coverage

Komatsu warrants to the ultimate purchaser and each subsequent purchaser that the engine is designed, built and equipped so as to conform, at the time of sale by Komatsu, with all U.S. Federal emission regulations applicable at the time of manufacture and that it is free from defects in workmanship or material which would cause it not to meet these regulations within five years or 3,000 hours of operation, whichever occurs first, as measured from the date of delivery of the engine to the ultimate purchaser.

#### 3. Limitations

Failures, other than those resulting from defects in materials or workmanship, are not covered by this warranty. Komatsu is not responsible for failures or damage resulting from what Komatsu determines to be abuse or neglect, including, but not limited to: operation without adequate coolant or lubricants; over fueling; over speeding; lack of maintenance of lubricating, cooling or intake systems; improper storage, starting, warm-up, run-in or shutdown practices; unauthorized modifications of the engine. Komatsu is also not responsible for failures caused by incorrect fuel or by water, dirt or other contaminants in the fuel. Komatsu is not responsible for non-engine repairs, "downtime" expense, related damage, fines, all business costs or other losses resulting from a warrantable failure.

**KOMATSU IS NOT RESPONSIBLE FOR INCIDENTAL OR CONSEQUENTIAL DAMAGES.**

This warranty, together with the express commercial warranties, are the sole warranties of Komatsu. **THERE ARE NO OTHER WARRANTIES, EXPRESS OR IMPLIED, OR OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE.**

## GARANTIE SUR LE CONTRÔLE DES ÉMISSIONS

### ÉNONCÉ DE GARANTIE SUR LE CONTRÔLE DES ÉMISSIONS (APPLICABLE AU CANADA SEULEMENT):

#### 1. Produits garantis:

Komatsu America International Company, Komatsu Mining Systems Inc. et Komatsu Utility Corporation (collectivement Komatsu) produisent et/ou font la mise en marché de produits portant les noms de marque Komatsu, Dresser, Dressta, Haulpak et Galion. Cette garantie sur les émissions s'applique à tous les nouveaux moteurs portant le nom Komatsu, installés dans ces produits et utilisés au Canada dans des machines conçues pour utilisation industrielle non-routière. Cette garantie s'applique seulement sur les moteurs produits à partir du 1er Janvier 2000. Cette garantie sera administrée par la distribution de Komatsu au Canada.

#### 2. Couverture:

Komatsu garantit à l'acheteur ultime et chaque acheteur subséquent que le moteur est conçu, construit et équipé en toute conformité, au moment de la vente par Komatsu, avec toutes les Réglementations fédérales américaines sur les émissions applicables au moment de la fabrication et qu'il est exempt de défauts de construction ou de matériaux qui auraient pour effet de contrevenir à ces réglementations en dedans de 5 ans ou 3000 heures d'opération, mesuré à partir de la date de livraison du moteur au client ultime.

#### 3. Limitations:

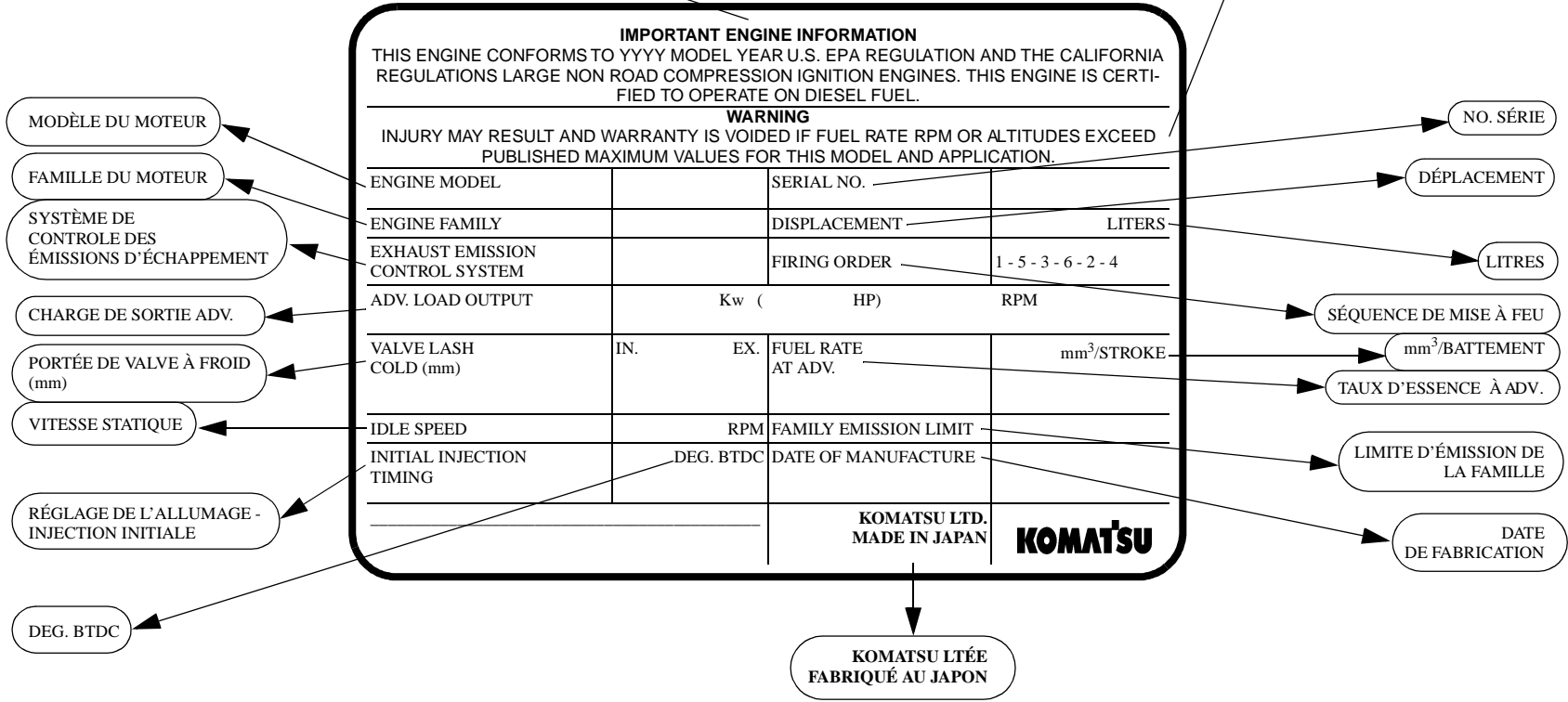
Les bris, autres que ceux résultant de défauts de matériaux ou de construction, ne sont pas couverts par cette Garantie. Komatsu n'est pas responsable pour bris ou dommages résultant de ce que Komatsu détermine comme étant de l'abus ou négligence, incluant mais ne se limitant pas à: l'opération sans lubrifiants ou agent refroidissants adéquats; la suralimentation d'essence; la survitesse; le manque d'entretien des systèmes de lubrification, de refroidissement ou d'entrée; de pratiques non-propices d'entreposage, de mise en marche, de réchauffement, de conditionnement ou d'arrêt; les modifications non-autorisées du moteur. De plus, Komatsu n'est pas responsable de bris causés par de l'essence inadéquate ou de l'eau, des saletés ou autres contaminants dans l'essence. Komatsu n'est pas responsable des réparations non-relées au moteur, des dépenses encourues suite aux temps d'arrêts, des dommages relatifs, amendes, et de tout autre coût d'affaires ou autres pertes résultant d'un bris couvert par la garantie.

**KOMATSU N'EST PAS RESPONSABLE DES INCIDENTS OU DOMMAGES CONSÉQUENTS.**

Cette garantie, ainsi que les garanties expresses commerciales, sont les seules garanties de Komatsu. **IL N'Y A AUCUNE AUTRE GARANTIE, EXPRESSE OU SOUS-ENTENDUE, MARCHANDABLE OU PROPICE A UNE UTILISATION PARTICULIÈRE.**

**INFORMATION IMPORTANTE SUR LE MOTEUR**  
 CE MOTEUR EST CONFORME AUX NORMES AMÉRICAINES DEL'EPA (ANNÉE DU MODÈLE) ET DE LA CALIFORNIE POUR LES MOTEURS LARGES NON-ROUTIERS A IGNITION PAR COMPRESSION. CE MOTEUR EST CERTIFIÉ POUR OPERATION À ESSENCE DIÉSEL.

**AVERTISSEMENT**  
 DES BLESSURES PEUVENT RÉsulTER ET LA GARANTIE S'ANNULER SI LES RPM DU TAUX D'ESSENCE OU L'ALTITUDE EXCÈDENT LES VALEURS MAXIMALES PUBLIÉES POUR CE MODÈLE ET SON APPLICATION.



**ENGINE DATAPLATE - ENGLISH / FRENCH**

## FOREWORD

This Service Manual is written for use by the service technician and is designed to help the technician become fully knowledgeable of the truck and all its systems in order to keep it running and in production. All maintenance personnel should read and understand the materials in this manual before performing maintenance and/or operational checks on the truck. All safety notices, warnings and cautions should be understood and followed when accomplishing repairs on the truck.

The first section covers component descriptions, truck specifications and safe work practices, as well as other general information. The major portion of the manual pertains to disassembly, service and reassembly. Each major serviceable area is dealt with individually. For example: The disassembly, service and reassembly of the radiator group is discussed as a unit. The same is true of the engine and engine accessories, and so on through the entire mechanical detail of the truck. Disassembly should be carried only as far as necessary to accomplish needed repairs.

The illustrations used in this manual are, at times, typical of the component shown and may not necessarily depict a specific model.

This manual shows dimensioning of U.S. standard and metric (SI) units throughout and all references to "Right", "Left", "Front", or "Rear" are made with respect to the operator's normal seated position, unless specifically stated otherwise.

Standard torque requirements are shown in torque charts in the general information section and individual torques are provided in the text in bold face type, such as 100 ft.lbs. (135 N.m) torque. All torque specifications have  $\pm 10\%$  tolerance unless otherwise specified.

A Product Identification plate is normally located on the truck frame in front of the right side front wheel and designates the Truck Model Number, Product Identification Number (vehicle serial number), and Maximum G.V.W. (Gross Vehicle Weight) rating.

The HAULPAK® Model designation consists of three numbers and one letter (i.e. 630E). The three numbers represent the basic truck model. The letter "M" designates a Mechanical drive and the letter "E" designates an Electrical propulsion system.

The Product Identification Number (vehicle serial number) contains information which will identify the original manufacturing bill of material for this unit. This complete number will be necessary for proper ordering of many service parts and/or warranty consideration.

The Gross Vehicle Weight (GVW) is what determines the load on the drive train, frame, tires, and other components. The vehicle design and application guidelines are sensitive to the total maximum Gross Vehicle Weight (GVW) and this means the total weight: the Empty Vehicle Weight + the fuel & lubricants + the payload.

To determine allowable payload:

Service all lubricants for proper level and fill fuel tank of empty truck (which includes all accessories, body liners, tailgates, etc.) and then weigh truck.

Record this value and subtract from the GVW rating. The result is the allowable payload.

*NOTE: Accumulations of mud, frozen material, etc. become a part of the GVW and reduces allowable payload. To maximize payload and to keep from exceeding the GVW rating, these accumulations should be removed as often as practical.*

**Exceeding the allowable payload will reduce expected life of truck components.**

For Model 630E HAULPAK® Trucks, optional heavy duty components may be required to utilize the 630,000 lbs. (286 020 kg) GVW. Contact factory if clarification is needed.



*This “ALERT” symbol is used with the signal words, “CAUTION”, “DANGER”, and “WARNING” in this manual to alert the reader to hazards arising from improper operating and maintenance practices.*



*“DANGER” identifies a specific potential hazard WHICH WILL RESULT in either INJURY OR DEATH if proper precautions are not taken.*



*“WARNING” identifies a specific potential hazard WHICH MAY RESULT in either INJURY OR DEATH if proper precautions are not taken.*

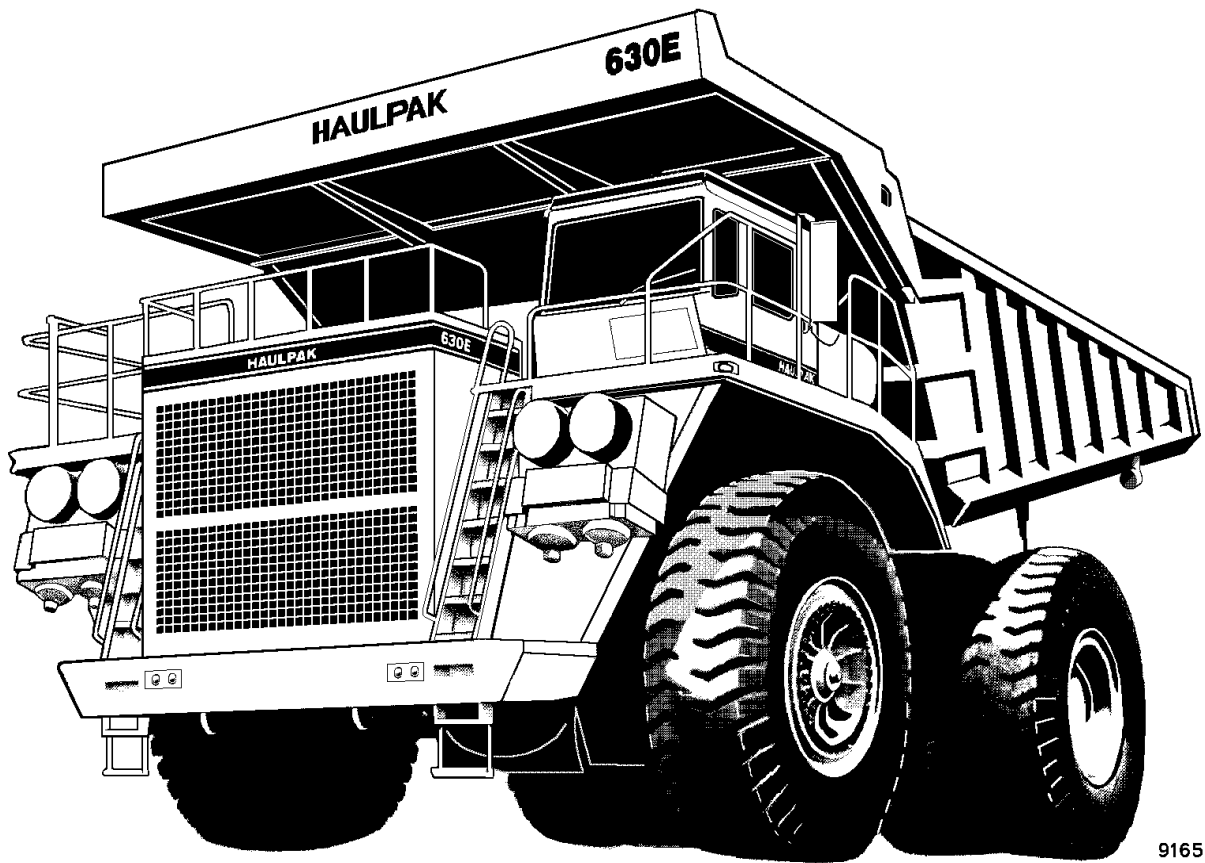


*“CAUTION” is used for general reminders of proper safety practices  
OR  
to direct the reader’s attention to avoid unsafe or improper practices which may result in damage to the equipment.*



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## KOMATSU 630E HAULPAK TRUCK

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**GENERAL INFORMATION**

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# NOTES

## MAJOR COMPONENT DESCRIPTION

### ENGINE

The 630E HAULPAK<sup>®</sup> is powered by a Detroit Diesel 16V-149TIB engine rated at 1800 HP (1342 kW) or a Cummins KTTA 50-C engine rated at 1800HP (1342 kW). Other engines may be specified as **optional** equipment.

### ALTERNATOR

The diesel engine drives an alternator mounted in-line with the engine. The alternating current (AC) output of the alternator is rectified to direct current (DC) and sent to the DC drive wheel motors.

### WHEEL MOTORS (GE 776)

The output of the alternator supplies electrical energy to the two wheel motors attached to the rear axle housing. The two wheel motors convert electrical energy back to mechanical energy through built-in gear trains within the wheel motor assembly. The direction of the wheel motors is controlled by a forward or reverse hand selector switch located on a console to the right side of the operator. The **GE788** wheel motor may be specified as **optional** equipment.

### BLOWER

The blower supplies cooling air for the alternator, rectifiers, and both wheel motors. The air is then exhausted to the atmosphere through the wheel motors.

### OPERATOR'S CAB

The HAULPAK<sup>®</sup> Operator's Cab has been engineered for operator comfort and to allow for efficient and safe operation of the truck. The cab is rubber mounted to reduce noise and vibration. It includes a tinted safety-glass windshield and sliding side windows for excellent visibility, a deluxe interior, controls mounted within easy reach of the operator, and an instrument panel which provides the operator with all instruments and gauges which are necessary to control and monitor the truck's operating systems.

### POWER STEERING

The HAULPAK<sup>®</sup> truck is equipped with a full time power steering system which provides positive steering control with a minimum of effort by the operator. The system includes nitrogen-charged accumulators which automatically provide emergency power if the steering hydraulic pressure is reduced below an established minimum.

### DYNAMIC RETARDING

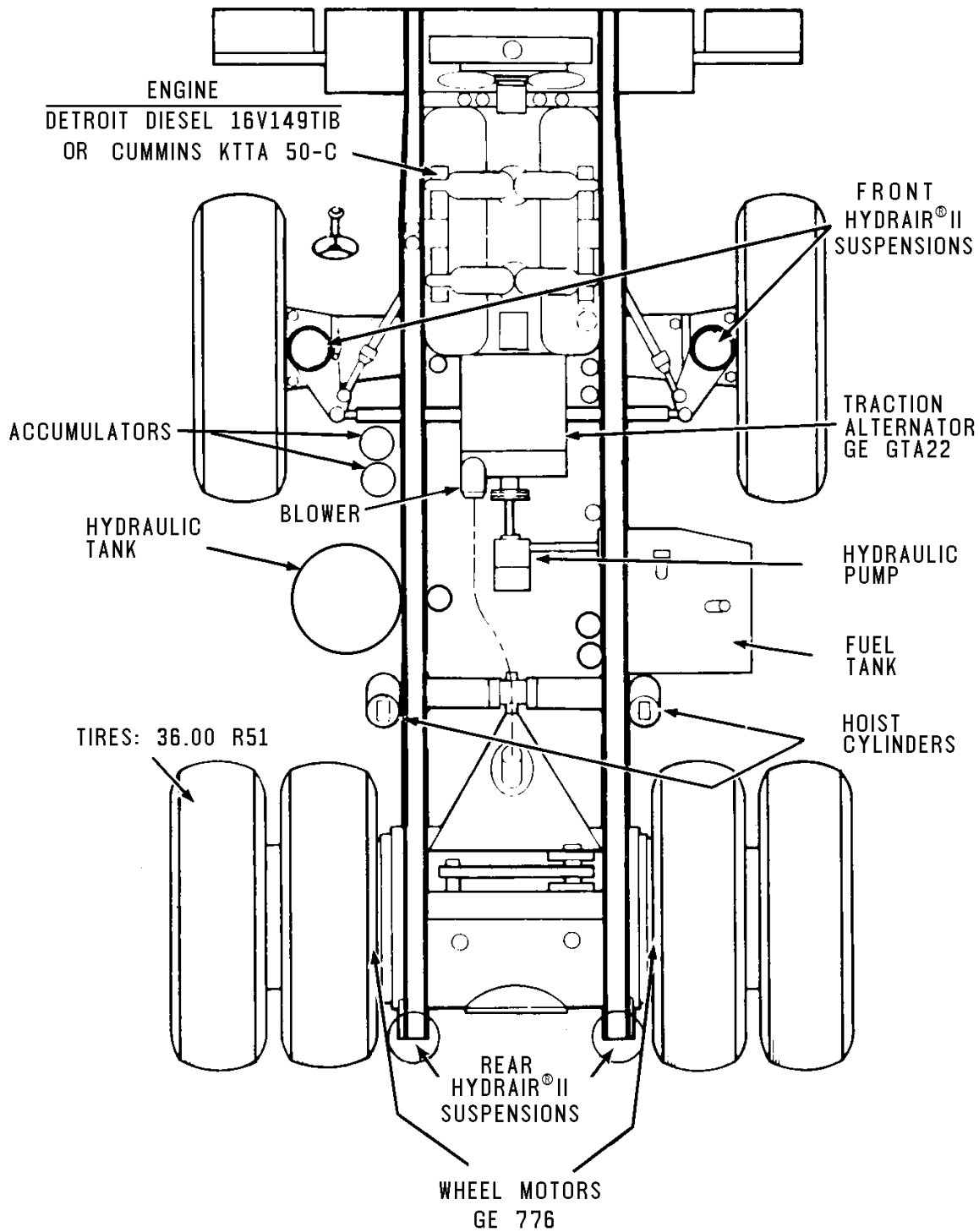
The dynamic retarding is used to slow the truck during normal operation or control speed coming down a grade. The dynamic retarding ability of the DC electric system is controlled by the operator through the activation of the retarder pedal in the operators cab and by setting the RSC (Retarder Speed Control). Dynamic Retarding is automatically activated if truck goes to a preset overspeed setting.

### BRAKE SYSTEM

The braking system consists of an all hydraulic actuation system. Depressing the brake pedal actuates wheel-speed single disc front brakes and armature-speed dual disc rear brakes. The brakes can also be activated by operating a switch on the instrument panel as described later in this manual. The brakes will be applied automatically if system pressure decreases below a preset minimum.

### SUSPENSION

HYDRAIR<sup>®</sup> II suspension cylinders located at each wheel provide a smooth and comfortable ride for the operator and dampens shock loads to the chassis during loading and operation.



## 630E MAJOR COMPONENTS

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# SPECIFICATIONS

The SPECIFICATIONS listed on these pages cover standard production. When **Optional** equipment is selected, some of these specifications and/or capacities may change.

## ENGINES (Standard Options)

### Cummins KTTA 50-C

Number of Cylinders . . . . . 16  
Operating Cycle . . . . . 4-Stroke  
Rated Brake HP 1800 HP (1342 kW) @ 1900 RPM  
Flywheel HP 1704 HP (1271 kW) @ 1900 RPM  
Weight (Dry) . . . . . 10,895 lbs. (4942 kg)

### Detroit Diesel 16V-149TIB

Number of Cylinders . . . . . 16  
Operating Cycle . . . . . 2-Stroke  
Rated Brake HP . 1800 HP (1342 kW) @ 1900 RPM  
Flywheel HP 1704 HP (1271 kW) @ 1900 RPM  
Weight (Dry) . . . . . 11,210 lbs. (5085 kg)

## ELECTRIC DRIVE SYSTEM

### STATEX III AC/DC Current

Alternator . . . . . General Electric GTA - 22  
Motorized Wheels . . . . . General Electric  
776 Gear Ratio . . . . . 28.85:1  
Maximum Speed . . . . . 34.0 MPH (54.7 km/h)  
788 (Optional) Gear Ratio . . . . . 26.14:1  
Maximum Speed . . . . . 34.4 MPH (55.4 km/h)

## DYNAMIC RETARDING

Electric Dynamic Retarding . . . . . Standard  
Maximum Retarding . . . . . 2677 HP (1996 kW)  
Optional . . . . . 3700 HP (2759 kW)  
With . . . . . Continuous Rated Blown Grids  
. . . . . Extended Range Retarding  
. . . . . Reverse Retarding

## BATTERY ELECTRIC SYSTEM

Batteries . . . . . Two 12 Volt Batteries in Series  
. . . . . 140 Ampere-Hour Capacity  
With Disconnect Switch  
Alternator . . . . . 24 Volt, 140 Ampere Output  
Lighting . . . . . 24 Volt

## SERVICE CAPACITIES

	U.S. Gallons	Liters
Crankcase (Includes lube oil filters)		
Detroit Diesel . . . . . 52.5 . . . . .	199	
Cummins . . . . . 56.6 . . . . .	214	
Cooling System . . . . . 83 . . . . .	314	
Fuel . . . . . 850 . . . . .	3217	
Hydraulic System . . . . . 134 . . . . .	507	
Whl. Motor Gear Box . . . . . 4.5/Whl. . . . .	17/Whl.	

## AIR SYSTEM

Compressor Bendix-Westinghouse TU-FLO 501  
Capacity . . . . . 12 ft<sup>3</sup>/min. (0.34 m<sup>3</sup>/min.)  
Starter with Interlock . . . . . Ingersol Rand 815  
. . . . . Optional, Electric Start  
Air Tank Capacity . . . . . 15 cubic feet (425 liters)

## HYDRAULIC SYSTEM

Pump 145 GPM (549 liters/min.) @ 1900 RPM  
Relief Pressure- Hoist . . . . . 2500 psi (17.2 MPa)  
Relief Pressure- Steering 3000 psi (20.7 MPa)  
Hoist . . . . . 3-Stage Hydraulic Twin Cylinders  
Tank . . . . . Non-Pressurized  
Service Capacity . . . . . 134 U.S. Gal. (507 Liters)  
Filtration . . . . . Accessible, Replaceable, Elements  
Suction . . . . . Single, Full Flow, 100 Mesh  
Return . . . . . Full Flow  
Optional Hoist & Steering High Pressure Filter  
. . . . . Full Flow, 7 Micron

## SERVICE BRAKES

Actuation . . . . . All Hydraulic  
 . . . . . (Front)(Rear)  
 Type . . . . . Single DiscDual Disc  
 . . . . . Wheel SpeedArmature Speed

## STEERING

Turning Circle (SAE) . . . . . 80 ft. (24.4 m)  
 Emergency Power Steering With Accumulators

## DUMP BODY

Capacity:  
 Struck . . . . . 101 yds<sup>3</sup>77 m<sup>3</sup>  
 Heaped @ 2:1 (SAE) . . . . . 135 yds<sup>3</sup> 103 m<sup>3</sup>  
 Width (Inside) . . . . . 20 ft. 7 in. (6.27 m)  
 Depth . . . . . 7 ft. 8 in. (2.35 m)  
 Loading Height . . . . . 18 ft. 9 in. (5.71 m)  
 Dumping Angle . . . . . 45°

## TIRES

Radial Tires (standard) . . . . . 36.00 R51  
 Rock Service, Deep Tread . . . . . Tubeless  
 Tire Rims . . . . . Separable  
 Tires and Rims . . . . . Interchangeable

## WEIGHT DISTRIBUTION

### EMPTY

	Pounds	Kilograms
Front Axle . . . . .	117,150	53 138
Rear Axle . . . . .	122,650	55 633
Total . . . . .	239,800	108 771

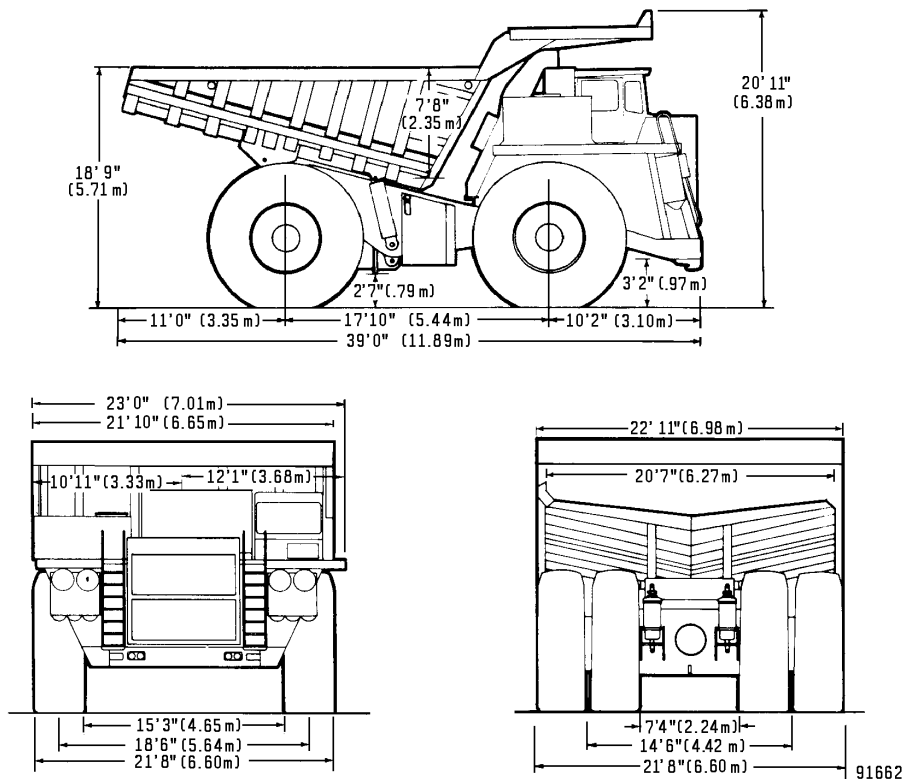
### LOADED

Front Axle . . . . .	206,600	93 712
Rear Axle . . . . .	413,200	187 424
Total * . . . . .	619,800	281 136

\* Not to exceed 630,000 lbs. (285 763 kg) **including options, fuel and payload.**

**Optional** heavy duty components may be required to utilize this Gross Vehicle Weight limit. Contact Haulpak Division if clarification is required.

## OVERALL TRUCK DIMENSIONS



All dimensions are with 101/135 cu.yd. (77/103 m<sup>3</sup>) body, 36.00 R51 tires, and 776 wheel motors.



## GENERAL SAFETY AND OPERATION

Safety records of most organizations will show that the greatest percentage of accidents are caused by unsafe acts of persons. The remainder are caused by unsafe mechanical or physical conditions. Report all unsafe conditions to the proper authority.

The following safety rules are provided as a guide for the HAULPAK® operator. However, local conditions and regulations may add many more to this list.

### SAFETY IS THINKING AHEAD

**Prevention** is the best safety program. Potential accidents can be prevented by knowing the employer's safety requirements, all necessary job site regulations, as well as use and care of the safety equipment on the HAULPAK® truck. Only qualified operators or technicians should attempt to operate the HAULPAK®.

#### Safe practices start before the operator gets to the equipment!

1. Wear the proper clothing. Loose fitting clothing, unbuttoned sleeves and jackets, jewelry, etc., can catch on a protrusion and cause a potential hazard.
2. Always use the personal safety equipment provided for the operator such as hard hat, safety shoes, safety glasses or goggles. There are some conditions when protective hearing devices should also be worn for operator safety.

### PREPARING FOR OPERATION

The safest trucks are those which have been properly prepared for operation. At the beginning of each shift, a careful check of the truck should be made before the operator attempts engine start-up.

1. When walking to and from the truck, BE ALERT, remain a safe distance from all other machines even if the operator is visible.
2. Check for any oil or coolant leaks. When checking coolant in radiator, use coolant level sight gauge (if equipped). If necessary to remove radiator cap, shut down engine, and relieve coolant pressure SLOWLY before removing radiator cap.



***If engine has been running, allow coolant to cool, before removing the fill cap or draining radiator. Serious burns may result if coolant is not allowed to cool.***

***Any operating fluid, such as hydraulic oil, or engine coolant escaping under pressure, can have sufficient force to enter a person's body by penetrating the skin and cause serious injury and possibly death, if proper medical treatment by a physician who is familiar with this type of injury is not received immediately.***

3. Check tires for cuts, damage or "bubbles". Check tires for proper inflation before beginning shift and periodically during shift. If tire is warm from operation, **allow tire to cool before adjusting tire pressure**. If inflation is needed, use an air chuck with extension hose clipped on the tire inflation valve to allow service from behind the tread of the tire and away from front of wheel.



***Do not stand in front of rim and locking ring when inflating tire.***

4. Visually inspect all headlights, worklights and taillights and safety equipment for external damage from rocks or misuse. Make sure lenses are clean.
5. Always use hand rails and ladder when mounting or dismounting from the truck. Clean your shoes, ladder, and hand rails of all accumulations, such as ice, snow, oil, or mud before climbing.



***Always mount and dismount the truck facing the truck. Never attempt to mount or dismount the truck while it is in motion.***

6. Check the deck areas for debris, loose hardware or tools. Become familiar with all protective equipment devices on the truck and insure that these items (anti-skid material, grab bars, seat belts, etc.) are securely in place.

7. Read and understand the contents of the Operator's Handbook. Give particular attention to safety material and operating instructions. Read and understand CAUTION and WARNING decals in the operator's cab.
8. Become thoroughly acquainted with all gauges, instruments and controls. Be familiar with all brake and steering system controls and warning devices, road speeds, and loading capabilities, before operating the truck.
9. Keep all unauthorized reading material out of truck cab.
10. Dirt or trash buildup, specifically in the operator's cab, should be cleared. Do not carry tools or supplies in cab of truck or on the deck.
11. Insure steering wheel, controls and pedals are free of any oil, grease or mud.
12. Insure headlights, worklights and taillights are in proper working order.
13. Insure windshield and all cab windows are clean and unbroken. Good visibility may prevent an accident.
14. Check operation of windshield wiper, condition of wiper blades, and windshield washer reservoir for fluid level.
15. Insure adequate ventilation before start-up if the truck is in an enclosure.  
**Exhaust fumes are dangerous!**

## ENGINE START-UP SAFETY PRACTICES

1. Insure all personnel are clear of truck before starting engine. Always sound the horn as a warning before actuating any operational controls.
2. Check and insure Selector Switch is in "Neutral" before starting.
3. If truck is equipped with auxiliary cold weather heater system(s), do not attempt to start engine while heaters are in operation.  
*Damage to coolant heaters will result.*

*NOTE: If truck is equipped with HMS control system, refer to Operator Handbook for starting procedures*

4. The keyswitch is a three position (Off, Run, Start) switch. When switch is rotated one position clockwise, it is in the "Run" position and all electrical circuits (except "Start") are activated. With Selector Switch in "Neutral", rotate keyswitch fully clockwise to "Start" position and hold this position until engine starts. "Start" position is spring loaded to return to "Run" when key is released.

*NOTE: If truck is equipped with the Cummins Engine Pre-lube System, a noticeable time delay will occur (while engine lube oil passages are being filled) before starter engagement and engine cranking will begin. The colder the engine oil temperature, the longer the time delay will be. In addition, if truck is also equipped with Engine Starting Aid for cold weather starting, the Engine Pre-lube System should be engaged FIRST for 5-10 seconds, or until starter is engaged, BEFORE activating the Engine Starting Aid.*



***Starting fluid is extremely volatile and flammable!  
Use with extreme care.***

If truck is equipped with optional Engine Starting Aid and ambient temperature is below 50°F (10°C), turn the keyswitch to the "Start" position, and while cranking engine, move the Engine Starting Aid switch to the "On" position for three (3) seconds **MAXIMUM**; then release Engine Starting Aid. If engine does not start, wait at least fifteen (15) seconds before repeating the procedure.

**Do not crank an electric starter for more than 30 seconds.**

Allow at least two minutes for starter cooling before attempting to start engine again.  
*Severe damage to starter motor can result from overheating.*

## AFTER ENGINE HAS STARTED

1. Become thoroughly familiar with steering and emergency controls. After engine has started and low pressure and warning systems are normal, test the truck steering in extreme right and left directions. If the steering system is not operating properly, shut engine down immediately. Determine the steering system problem and have repairs made before resuming operation.
2. Operate each of the truck's brake circuits at least twice **prior to operating and moving** the truck. These circuits include individual activation from the operator's cab of the service brake, parking brake, and brake lock (also emergency brake, if equipped). With the engine running and with the hydraulic circuit fully charged, activate each circuit individually. If any application or release of any brake circuit appears sluggish or improper, or if warning alarms are activated on application or release, shut the engine down and notify maintenance personnel. **Do not operate truck until brake circuit in question is fully operational.**
3. Check gauges, warning lights and instruments before moving the truck to insure proper system operation and proper instrument functioning. Give special attention to braking and steering circuit hydraulic warning lights. If warning lights come on, shut down the engine immediately and determine the cause.
4. Insure headlights, worklights and taillights are in proper working order. Good visibility may prevent an accident. Check operation of windshield wiper.
5. When truck body is in dump position, do not allow anyone beneath it unless body-up retaining pin or cable is in place.
6. Do not use the fire extinguisher for any purpose other than putting out a fire! If extinguisher is discharged, report the occurrence, so the used unit can be refilled or replaced.
7. Do not leave truck unattended while engine is running. Shut down engine before getting out of cab.

## SAFETY PRECAUTIONS DURING TRUCK OPERATION

After the truck engine is started and all systems are functioning properly, the operator must follow all local safety rules to insure safe machine operation.



*If any of the red warning lights come "On" or if any gauge reads in the red area during truck operation, a malfunction is indicated. Stop truck as soon as safety permits, shut down engine if problem indicates and have problem corrected before resuming truck operation.*

*Operating truck with stalled or free spinning wheel motors may cause serious damage to wheel motors! If truck does not begin to move within 10 seconds after depressing throttle pedal (Selector Switch in a drive position), release throttle pedal and allow wheels to regain traction before accelerating engine again.*

At the beginning of each shift, check the **automatic** emergency steering for proper operation. This can be accomplished as follows:

- With engine running and steering system fully charged, no red warning lights or buzzer should be "on" (HMS trucks should have no warnings displayed.).
- Shut down engine and leave keyswitch in "Run" position (leave HMS "On").
- Turn steering wheel one full turn left and right; if front wheels turn, system is operating properly. Restart engine.

*NOTE: **Automatic** Emergency Steering ability is limited by the capacity of the steering accumulators. This function is intended to allow the operator only enough time to steer the HAULPAK® to a safe stop during an emergency situation.*

1. WEAR SEAT BELTS AT ALL TIMES! Operate the truck only while properly seated with seat belt fastened. Keep hands and feet inside the cab compartment while truck is in operation.
2. Do not allow unauthorized personnel to ride in the truck. Only authorized persons are allowed to ride in truck cab, and they should have seat belts fastened. Do not allow anyone to get on or off truck while it is in motion, or to ride on the deck or the ladder of the truck.

3. Do not move truck into or out of a building without a signal person present. Know and obey the hand signal communications between operator and spotter. When other machines and personnel are present, the operator should move in and out of buildings, loading areas and through traffic, under the direction of a signalman. Courtesy at all times is a safety precaution!

Always look to the rear before backing the truck. Watch for and obey ground spotter's hand signals before making any reverse movements. Sound the warning horn (3 blasts). Spotter should have a clear view of the total area at the rear of the truck.

4. Check gauges and instruments frequently during operation for proper readings.

5. DO NOT leave truck unattended while engine is running. Do not allow engine to run at "Idle" for extended periods of time. When parking, always apply parking brake, and park a safe distance from other vehicles, as determined by supervisor.

6. Report immediately to supervisor any conditions on haul road, pit or dump area that may present an operating hazard.

7. Observe all regulations pertaining to the job site's traffic pattern. Be alert to any unusual traffic pattern. Obey the spotter's signals.

8. Match the truck speed to haul road conditions and slow the truck in any congested area. Keep a firm grip on steering wheel at all times.

9. Check parking brake periodically during shift. Use parking brake **ONLY** for parking. Do not use park brake for loading / dumping.

*Do not attempt to apply parking brake while truck is moving!*

**Do not use "Brake Lock" or "Emergency Brake" (if equipped) for parking.**

10. Check brake lock performance periodically for safe loading and dump operation.

11. Proceed slowly on rough terrain to avoid deep ruts or large obstacles. Avoid traveling close to soft edges and the edge of fill area.

12. Truck operation requires concentrated effort by the driver. Avoid distractions of any kind while operating the truck.

13. Keep serviceable fire fighting equipment at hand. If extinguisher is discharged, report the occurrence, so the used unit can be refilled or replaced.

## **WARNING**

***In the event of fire in the tire and wheel area (including brake fires), stay away from the truck at least 8 hours until the tire and wheel are cool. Tire and rim assembly may explode if subjected to excessive heat. Personnel should move to a remote or protected location if sensing excessively hot brakes, smell of burning rubber or evidence of fire near tire and wheel area.***

***If the truck must be approached, such as to fight a fire, those personnel should do so only while facing the tread area of the tire (front or back), unless protected by use of large heavy equipment as a shield. Stay at least 50 ft. (15 m) from the tread of the tire.***

14. Stay alert at all times! In the event of an emergency, be prepared to react quickly and avoid accidents. If an emergency arises, know where to get prompt assistance.

## **LOADING**

1. Pull into the loading area with caution. Remain at a safe distance while truck ahead is being loaded.

2. Do not drive over unprotected power cables.

3. When approaching or leaving a loading area, watch out for other vehicles and for personnel working in the area.

4. When pulling in under a loader or shovel, follow "Spotter" or "Shovel Operator" signals. The truck operator may speed up loading operations by observing the location and loading cycle of the truck being loaded ahead, then follow a similar pattern.

5. When being loaded, operator should stay in truck cab. Place Selector Switch in "Neutral" and apply brake lock with engine running.

## **WARNING**

***If operator must leave truck cab during loading, engine must be shut down and parking brake applied. DO NOT use brake lock or emergency brake (if equipped) for parking.***

***Remain far enough away from truck to avoid being struck by flying material.***

6. When loaded, pull away from shovel as quickly as possible but with extreme caution.