

# MAINTENANCE MANUAL

## 1/2 TON 4 x 4 CHASSIS

# DODGE TRUCKS

built for

# UNITED STATES ARMY

**Contract Number W398-QM-9388**

**Beginning Dodge Serial Number 8,676,901**

<u>Model</u>	<u>Type of Vehicle</u>	<u>U. S. A. Registration Numbers-</u>
WC-12-USA	Closed Cab and Pick-up	226219 to 227043 (Incl.) and 231275 to 232274 (Incl.)
WC-13-USA	Bucket Seat and Pick-up	229818 to 230130 (Incl.) and 232275 to 233206 (Incl.)
WC-15-USA	Command Reconnaissance	2027938 to 2029143 (Incl.)
WC-16-USA	Radio	607239 to 607383 (Incl.) and 607687 to 607943 (Incl.)
WC-18-USA	Ambulance	74242 to 74631 (Incl.) and 74733 to 75027 (Incl.)

**CHRYSLER CORPORATION**  
**Dodge Division • Detroit, Michigan**

**TM 10-1209**

**WAR DEPARTMENT**

Washington, August 18, 1941

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By order of the Secretary of War:

G. C. Marshall  
Chief of Staff

Official:

E. S. Adams  
Major General  
The Adjutant General

# INSTRUCTION MANUAL FOR UNITED STATES ARMY DODGE 4 x 4 TRUCKS

## FOREWORD

**T**WO objectives have been considered in the preparation of this manual.

- 1. OPERATION AND CARE OF THE TRUCK:** The manual contains practical and useful operating instructions and maintenance suggestions for the guidance of **DRIVERS** responsible for the operation of Dodge 4 x 4 Army Trucks. This information is written with the aim of promoting uninterrupted truck performance under different driving conditions encountered in Army Maneuvers.
- 2. REPAIRING THE TRUCK:** The manual contains practical and workable mechanical instructions adequately illustrated with "action" pictures and "exploded" views. This information is for the use of the **MECHANIC** whose responsibility is to keep the truck in operation. The "Service Diagnosis" charts will also help the mechanic to analyze his problems before attempting a solution.

The contents of the manual are arranged in group sequence as indicated in the index in the right-hand margin of this page. Each group is divided into "Subjects" or Service Operations which are numbered consecutively throughout the manual. These subject numbers are used in order to make quick reference to related subjects. For example, in the Front Axle group, Subject 32, on page 18, refers to several other subjects which are related to the procedure of removing and installing a front axle housing.

The last group of the manual entitled "Service Standards" is a tabulated summary of adjustment specifications, dimensions of parts and name and type of units built by other manufacturers.

Special service tools mentioned throughout the manual are obtainable from the Miller Tool & Manufacturing Company, Detroit, Michigan.

**CHRYSLER CORPORATION**

*Dodge Division*

**DETROIT, MICHIGAN**

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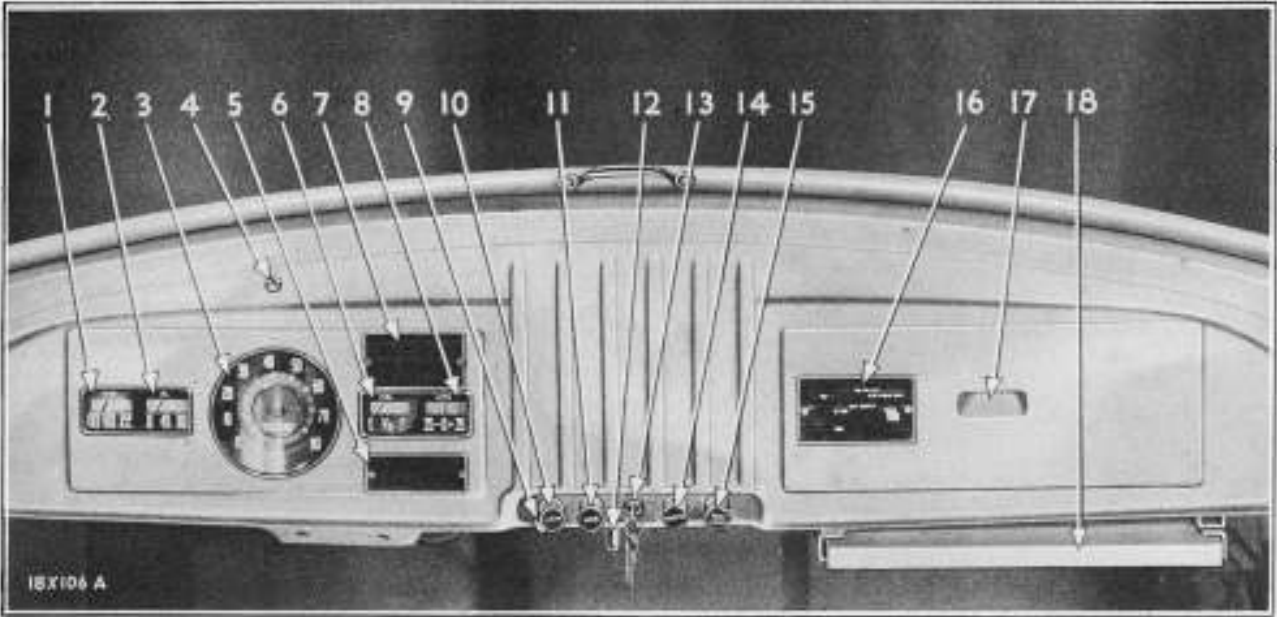


Fig. 1—Instrument Panel



Fig. 2—Front Compartment

# OPERATING INSTRUCTIONS

It is important that the driver learn the location of each control lever, pedal and button before driving; then he will find the driving easier than trying to develop such knowledge while driving.

## THE CONTROLS

The accompanying illustrations (Figs. 1 and 2) show the location of each control. By knowing the purpose of each control and how to use it, the driver who is unaccustomed to driving a Dodge 4 x 4 Army Truck will find it easier to follow the "Operating Instructions" contained in this section of the Manual.

### 1—Ignition Lock Switch

The ignition lock switch (13, Fig. 1), can be operated only when the key is inserted and turned to the right (clockwise). In this position the ignition and fuel gauge circuits are connected. The key cannot be removed unless the thumb piece of the key is vertical.

#### Keys

When the truck is shipped three identical keys are placed in a bag attached to the steering column. These keys will fit all locks used on the vehicle.

### 2—Choke Control

The choke control button, (11, Fig. 1), is closed when the control button is pulled "out" to the limit of its travel. Pull the choke control "out" when starting a cold engine and gradually push it in as the engine becomes warm. Always run the engine with the choke button pushed in after the engine has reached normal operating temperature. Excessive use of the choke causes a flooding condition in the engine and excess fuel

works its way past the pistons into the crankcase diluting the engine oil. It also increases fuel consumption unnecessarily.

### 3—Hand Throttle

The hand throttle control button, (14, Fig. 1), is for use when starting the engine. It can also be used when starting the truck on steep hills where both feet are necessary to operate clutch and brake pedals. Pulling the button outward opens the throttle.

### 4—Accelerator Pedal

The accelerator pedal, (9, Fig. 2), is used to control engine speed with the foot while driving the truck.

### 5—Starter Pedal Button

This foot button (8, Fig. 2), is for operation of the starting motor which cranks the engine. It is located above the accelerator pedal so that it can be easily reached for starting the engine.

*CAUTION: Do not press the starter pedal with the gearshift lever in gear or while the engine is running. See Subject 20.*

### 6—Clutch Pedal

Pressing the clutch pedal (4, Fig. 2), down to the floor board, disengages the clutch so that the transmission gears may be shifted.

### 7—Transmission Gearshift Lever

This lever (6, Fig. 2), controls the shifting of all gears in the transmission. The diagram in the illustration shows the different positions of the lever for various gear selections in the transmission.

*CAUTION: Do not attempt to start the engine unless the gearshift lever is in neutral*

Fig. 1—Instrument Panel

- |   |                                       |
|---|---------------------------------------|
| 1—Heat indicator                        | 10—Service and black-out light switch |
| 2—Oil pressure gauge                    | 11—Carburetor choke control button    |
| 3—Speedometer                           | 12—Cowl ventilator handle             |
| 4—Headlight bright beam indicator light | 13—Ignition lock switch               |
| 5—Transmission shift diagram plate      | 14—Throttle control button            |
| 6—Fuel gauge                            | 15—Instrument panel light switch      |
| 7—Speed caution plate                   | 16—Serial number plate                |
| 8—Ammeter                               | 17—Compartment door                   |
| 9—Service light lock-out button         | 18—Map board                          |

Fig. 2—Front Compartment

- |                                      |
|--------------------------------------|
| 1—Windshield wiper control knobs     |
| 2—Windshield adjusting arm lock nuts |
| 3—Horn button                        |
| 4—Clutch pedal                       |
| 5—Brake pedal                        |
| 6—Transmission gearshift lever       |
| 7—Headlight beam control foot switch |
| 8—Starter pedal button               |
| 9—Accelerator pedal                  |
| 10—Hand brake lever                  |
| 11—Transfer case control hand lever  |

## 4—OPERATING INSTRUCTIONS

## U. S. ARMY INSTRUCTION MANUAL

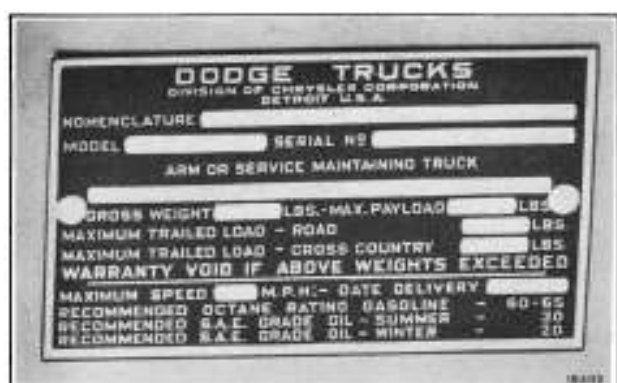


Fig. 3—Chassis Serial Number Plate

Attached to compartment door on instrument panel. Plate also contains other useful truck information.

position. See Subject 21 for further explanation of the gearshift lever.

### 8—Transfer Case Lever

This lever, (11, Fig. 2), is used to shift gears in the transfer case. When the lever is in the rear position (nearest the seat) the truck is in "four wheel drive." When the lever is in the forward position, the front axle is disengaged and engine power is applied only to the rear axle. See Subject 23.

### 9—Hand Brake Lever

The hand brake (10, Fig. 2), is used principally for holding the truck while parked. When parking on a grade, turn the front wheels off the straight-ahead position. The hand brake is released when the lever is in the extreme forward position and applied when moved back toward the seat. When pulled back, the lever will lock in position but may be released by pressing the release button (on top of the lever) down and pushing the lever forward.

### 10—Brake Pedal

The brake pedal, (5, Fig. 2), is used to slow down or stop the vehicle. See Subject 27.

### 11—Black-out Light Switch

All service lights and black-out lights are controlled by this switch (10, Fig. 1). When the switch is pulled out to the first position, the black-out lights, consisting of black-out headlights and black-out tail lights, are turned on, and the black-out signal light is operative.

By depressing the lock-out button, (9, Fig. 1), and pulling the switch to the second position, the service lights are turned on. In this position the service headlights and tail lights are turned on, the service stop light is operative and the instrument panel lights may be turned on or off by a separate switch. By pulling the switch to the third position, only the service stop light is operative.

### 12—Headlight Beam Control Switch

This foot switch, (7, Fig. 2), controls the high and low beams of the service headlights. (The switch operates only when the service headlights are turned on by the hand operated switch on the instrument panel.) Press the button with the foot to raise or lower the headlight beams. The switch locks each time the button is pressed. A red indicator, (4, Fig. 1), on the instrument panel is illuminated only when the high beam is turned on.

### 13—Black-out Lights

The black-out light lenses contain openings (Fig. 4), which cause the black-out light to appear as two lights when viewed from distances of 75 feet or less, by separating the source of light into two beams. When viewed from distances greater than 75 feet, however, the black-out light appears as one light.

The openings provided in the black-out light lens permit the driver of a vehicle to gauge the distance between him and another vehicle, when the black-out lights are in use. When the black-out light of a vehicle appears as two lights, the driver should proceed with caution, so that an emergency stop can be made, if necessary, in 75 feet or less.

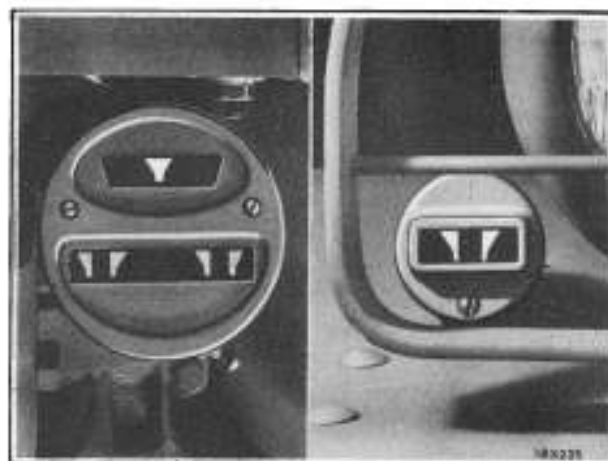


Fig. 4—Black-out Lights

### 14—Oil Pressure Gauge

The oil pressure gauge, (2, Fig. 1), should register about 15 pounds pressure when the engine is running at slow idle speed, but at speeds above 20 miles per hour, the gauge should show from 30 to 45 pounds pressure.

If the gauge registers too low a pressure, especially at speeds above 20 miles per hour, or fluctuates between 0 and 45 pounds (except at slow engine speed) check the engine oil level immediately. If the engine oil is at the proper level and the gauge still registers too low a pressure, or none at all, report the condition at once to the motor officer.

### 15—Ammeter

The ammeter, (8, Fig. 1), registers the amount of electricity flowing into or out of the battery. It indicates the charging condition of the generator and the consumption of electricity in the system. When the electrical units are drawing more electricity than the generator is charging, the pointer on the ammeter will be on the negative (—) side of zero and when charging more than is being consumed, the pointer will be on the positive (+) side of zero. Electricity consumed by the starting motor is not registered by the ammeter. If, when all electrical units are switched off, the ammeter pointer registers on the negative (—) side of zero there is a leakage of electricity somewhere in the system, and the condition should be corrected at once.

While driving the truck, the ammeter hand may gradually approach zero. This indicates that the battery requires less current at that time and the voltage regulator is preventing overcharging. The ammeter should not show more than 10 ampere charge above 30 m.p.h. after the first 30 minutes of continuous driving. If it shows more than 10 amperes, with battery specific gravity of 1.275 or higher, the voltage regulator unit should be checked.

### 16—Heat Indicator

The heat indicator, (1, Fig. 1), shows the temperature of the water in the engine above 100° F. Never warm the engine quickly by running it fast just after starting. When driving, glance at the heat indicator occasionally to see that it does not register too hot. If it registers 200 degrees or more, the engine is too hot and should be stopped. Usually this is caused by

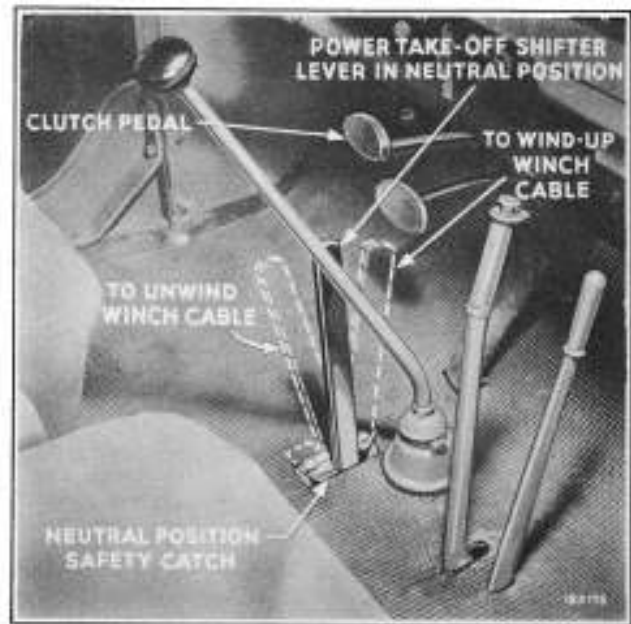


Fig. 5—Power Take-off Shifter Lever in Front Compartment

insufficient water in the radiator, broken or loose fan belt. Whatever the cause of overheating may be, have the condition corrected before driving the truck.

### 17—Fuel Gauge

The fuel gauge, (6, Fig. 1), operates when the ignition switch key is turned to the right (clockwise). It is electrically operated and indicates the level of the fuel in the tank. The letter "E" means empty, the letter "F" means full and "½" sign means half full.

### 18—Winch

The winch on the front of trucks so equipped operates by power from the truck engine. This power is transmitted through the truck transmission into a power take-off control unit, mounted on the side of the transmission. This control unit can be shifted by the lever illustrated in Fig. 5 from neutral position to wind-up or unwind the cable *when the truck clutch pedal is depressed*. Power is transmitted to the winch (from the control unit) through a propeller shaft having two universal joints, one at each end of the shaft.

#### To Operate Winch

**CAUTION:** Always place the transmission gearshift lever in neutral and depress the truck clutch pedal before shifting the winch control unit.

**To Hook On:** Disengage the clutch shifter fork handle at the winch by means of the short hand lever illustrated in Fig. 6 and pull out the cable. (If cable is under a strain depress truck clutch pedal and move power take-off shifter lever to rear position after lifting safety catch on floor board, and use engine power to relieve strain on cable.)

**To Pull:** Engage clutch shifter fork as illustrated in Fig. 6 and depress truck clutch pedal, shift control lever to forward position (Fig. 5), after lifting safety catch on floor board. Then release truck clutch pedal.

**CAUTION:** When using winch, operate the engine at a reasonable speed. High engine



Fig. 6—Winch Clutch Shifter Fork Handle Positions

speeds are liable to damage the winch mechanism or cause other serious trouble.

**To Stop:** Depress truck clutch pedal and shift control lever into neutral.

**To Unwind Cable:** Depress truck clutch pedal, lift safety catch on floor board, shift control lever to rear position as illustrated in Fig. 5 and release truck clutch pedal.

## OPERATING THE TRUCK

### 19—Breaking-in Speeds

The life of a truck depends largely upon the care it receives during the first 500 to 1500 miles of operation.

New engines should never be run at speeds equivalent to a truck speed of more than 25 miles per hour in direct drive during the first 500 miles of operation. During the next 1500 miles the speed may be gradually increased to complete the "breaking in" process. The truck must not be driven at continued full speed nor should it be subjected to heavy load pulls during the first 2000 miles. Maximum power and speed should not be required from the truck until after it has been driven about 2000 miles. This mileage is necessary to make sure of all internal friction of the engine being minimized.

When starting any cold engine (whether new or not), care should be exercised during the warm-up period because lubrication is not as efficient when the engine is cold. Drive slowly until normal operating temperature is reached. The cause of damage to bearings and pistons in new engines as well as in engines operated at subnormal temperatures is due principally to extreme high temperatures of the frictional surfaces.

Avoid premature engine wear by giving the engine a chance to reach its normal operating temperature before subjecting it to heavy loads or maximum speed.

### 20—Starting the Engine

Before starting the engine, make sure that the transmission gearshift lever is in neutral position.

If the engine is cold proceed as follows:

- (a) Disengage the clutch.
- (b) Pull out choke button full distance of its travel.
- (c) Turn on ignition (turn key to right, clockwise) and step on starter pedal, keeping it engaged until engine starts. After engine starts, gradually push in choke button to give proper operation.

Under extreme cold starting conditions it is advisable, to insure good starting, to pull out the hand throttle control button to give approximately one-third throttle opening.

**CAUTION:** Do not pump the foot accelerator before or during starting, as this will cause difficult starting.

If the engine is warm proceed as follows:

- (a) Disengage the clutch.

- (b) Turn on ignition switch and step on starter pedal, keeping it engaged until the engine starts.

Under extreme hot starting conditions it is advisable, to pull out the hand throttle to give approximately one-third throttle opening.

**CAUTION:** Do not pump the foot accelerator before or during starting as this will cause difficult starting.

## 21—Driving the Truck

The position of the transfer case control lever, (11, Fig. 2), does not alter the following recommended procedure of shifting transmission gears when driving the truck. See Subject 23 for instructions covering the engagement and disengagement of front wheel drive by use of the transfer case control lever.

- (a) Press the clutch pedal, (4, Fig. 2), down to the floor, then move the transmission gear shifting lever to 1st or 2nd speed forward position, (6, Fig. 2), depending on the condition of the terrain. Next, press the accelerator, (9, Fig. 2), to speed up the engine a little and at the same time gradually relieve pressure on the clutch pedal. This engages the clutch and starts the truck moving. When the clutch is fully engaged (no pressure on the foot pedal), press the accelerator until the vehicle attains the desired road speed.
- (b) With the vehicle in motion, press the clutch pedal to the floor and release the accelerator at the same time. Then move the transmission gearshift lever to neutral position and relieve pressure on the clutch pedal to allow the clutch to engage, leaving the gearshift lever in neutral. This synchronizes the engine and transmission speeds. Next, depress the clutch pedal and move the gearshift lever to the next higher speed position, engage the clutch and press the accelerator.
- Shifting transmission gears by this method is known as "double-clutching." With a little practice, the average driver can accomplish an easy, smooth and noiseless shift in any transmission gear position.
- (c) To shift into reverse, depress the clutch pedal and move the gearshift lever to the position shown at 6, Fig. 2. Then release the clutch pedal, and press the accelerator

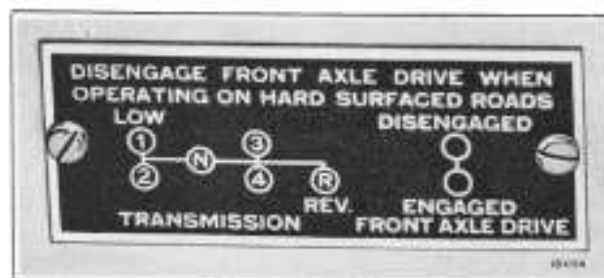


Fig. 7—Transmission and Transfer Case Shift Diagram Plate

pedal at the same time until the desired speed is attained.

Transmission gearshift lever positions are shown on a plate which is attached to the instrument panel. This plate is shown in Fig. 7.

## 22—Maximum Permissible Road Speeds

Dodge Army trucks are equipped with a governor which limits the maximum permissible road speed of the vehicle. The maximum permissible speed depends on the position of the transmission gearshift lever, as indicated on the plate shown in Fig. 8. This plate is attached to the instrument panel of the vehicle.

**CAUTION:** Do not permit the truck to exceed maximum road speeds in any gear when driving downhill, because excessive engine speed developed under such conditions is apt to cause damage to engine bearings, pistons, valves, etc.

## 23—Driving the Truck in Four Wheel Drive (Front Axle Engaged)

The purpose of Four Wheel Drive is to permit maximum traction at all four wheels when driving on icy roads, through snow or mud or over rough unimproved terrain. On smooth, level, hard surfaced roads, and all ordinary conditions, the front axle drive should be *disengaged*.

— CAUTION —				
MAX. PERMISSIBLE ROAD SPEEDS				
TRANSMISSION				
4TH	3RD	2ND	1ST	REV.
55	33	18	9	7
DODGE TRUCKS				
BUILT BY CHRYSLER CORPORATION				
DETROIT, U.S.A.				

Fig. 8—Maximum Permissible Road Speeds Caution Plate

It is recommended that Four Wheel Drive (front axle engaged) be used below speeds of 25 miles per hour when driving conditions are such that maximum traction is needed at all four wheels. At higher speeds (above 25 miles per hour) the front axle should be disengaged and the driving force applied only to the rear wheels.

The control lever for engaging and disengaging the front axle drive is located in the driver's compartment, (11, Fig. 2). This lever operates the gears in a transfer case at the rear of the transmission. When the lever is moved to the forward position, the front axle is disengaged; when moved to the rearward position, the front axle is engaged for Four Wheel Drive. The positions of the control lever are shown on the plate illustrated in Fig. 7.

When shifting gears in the transfer case to engage or disengage Four Wheel Drive, the vehicle should be moving at a speed not exceeding 25 miles per hour. Shift the control lever in the desired direction with the clutch engaged and with the engine under mild acceleration. If resistance is felt mid-way in the shift, let up on the foot accelerator and complete the shift.

#### 24—Driving Up or Down Steep Grades

When driving down a steep grade, shift into lower transmission gear ratios to cause the truck to drive the engine instead of the engine driving the truck. This will reduce the amount of brake application required. It may be necessary on very steep and long down-grades, to shift the transmission to second speed in order to have the engine hold the truck speed low enough for safety. Continuous or long time application of the brakes is not good practice, because it causes excessive wear of the linings.

When driving upgrade, some drivers have an inclination to try to reach the top without shifting gears. This is not good practice because the engine and drive mechanism is put under great strain unnecessarily and the speed of the truck is reduced.

The governor limits the speed of the engine to its maximum power. Therefore, to negotiate a hill at the highest speed with least load on the engine, shift the transmission gears to the next lower gear when the engine or truck speed begins to decrease by the "double clutch" method.

This will permit driving the truck at the maximum possible governed speed up a hill or through soft surface road.

To shift to lower gears with the vehicle in motion, by the "double clutch" method, proceed as follows:

- (a) Disengage the clutch and move the gear-shift lever to neutral position.
- (b) Engage the clutch and accelerate the engine sufficiently to increase the engine speed so that the transmission gears can be meshed in the next lower gear without clashing.
- (c) Then disengage the clutch and shift into the next lower gear. Practice will soon reveal how much the engine should be accelerated in step (b) in order to accomplish a smooth, silent shift to lower gears.

#### 25—Sand and Gravel

Drive slowly in loose dry sand or fresh thick gravel, even though the engine will propel the truck at a higher speed, because difficulty may be encountered in steering the truck due to the wheels sliding.

Loose sand or gravel under the tires is dangerous when rolled by the force of the truck. When approaching a sand or loose gravel road, slow down, because after driving on a smooth, hard-surfaced road, the truck will be moving too fast for good steering control on the soft road.

Some types of road have a strip of fresh loose gravel on one side and hard smooth surface on the other side. *Never drive into such a road surface at high speed.* The soft surface material has a tendency to pull the truck farther toward the side on which the soft material is laid.

When starting the trunk in sand or loose gravel, release pressure on the clutch pedal slowly so as not to spin the wheels. Spinning the wheels causes them to work their way down into soft road surfaces and wears the tire unnecessarily.

#### 26—Soft Terrain and Deep Mud

When a truck becomes mired in soft terrain or deep mud good judgment should be used if any attempt is made to drive the vehicle out under