

Jeep® Gladiator

OWNER'S MANUAL

SERIES J-200
SERIES J-300
2WD MODELS
4WD MODELS

OM-1040

Jeep[®] GLADIATOR

Owners Manual

SERIES J-200 and J-300

2-WHEEL-DRIVE and 4-WHEEL-DRIVE MODELS

KAISER Jeep CORPORATION

TOLEDO 1, OHIO, U. S. A.

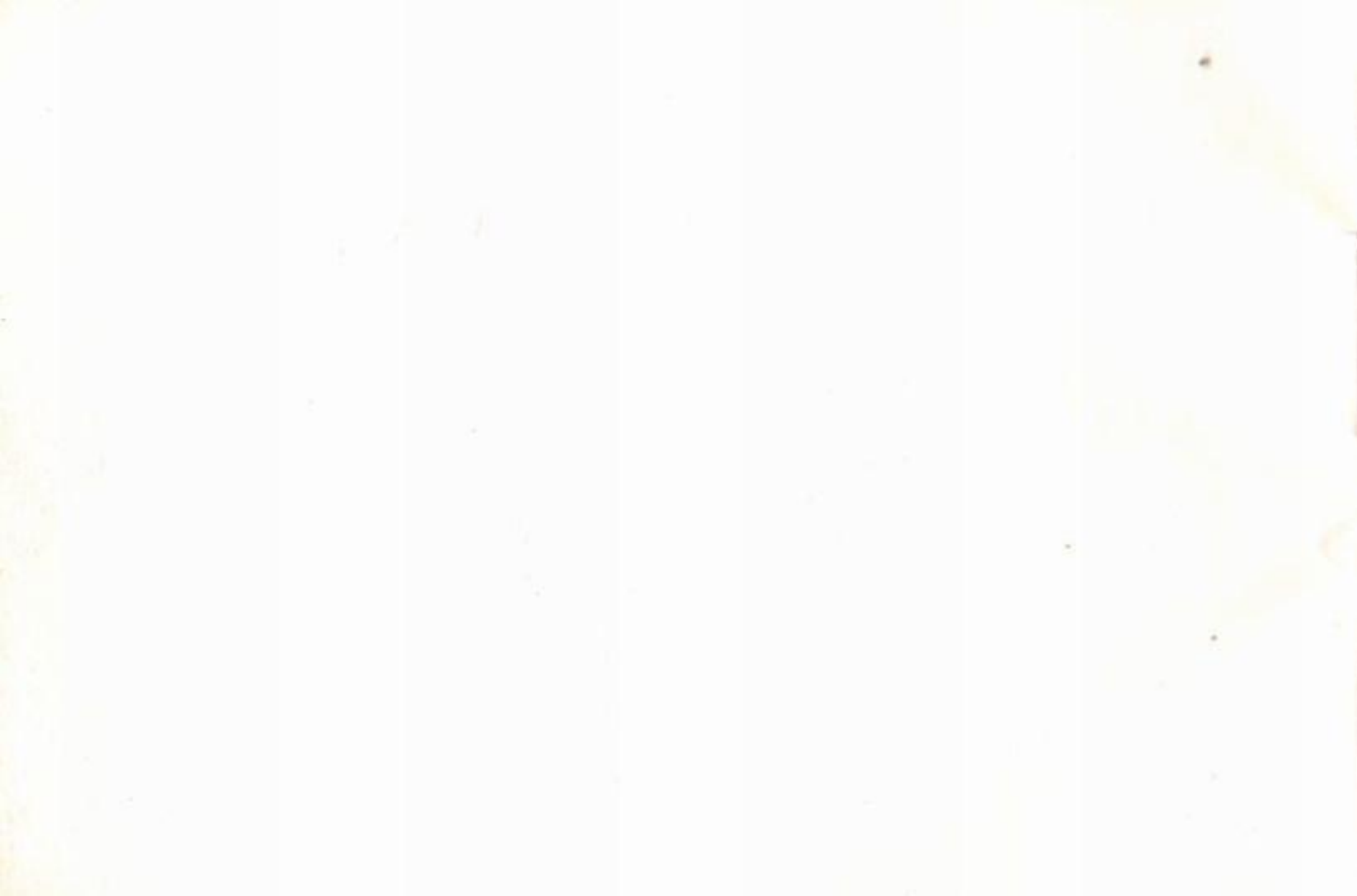


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MANUFACTURER'S WARRANTY

The warranty set forth below is the only warranty, expressed or implied, under which KAISER Jeep CORPORATION sells motor vehicles. This warranty also has been adopted as the exclusive warranty, expressed or implied, of KAISER Jeep SALES CORPORATION and the other authorized distributors of KAISER Jeep CORPORATION, and has been extended by them to their authorized Jeep dealers.

"KAISER Jeep CORPORATION, Toledo, Ohio, U.S.A., warrants each new motor vehicle manufactured by it, to be free from defects in material and workmanship under normal use and service, its obligation under this Warranty being limited to making good at its factory any part or parts thereof, including all equipment or trade accessories (except tires) supplied by it, which shall, within ninety (90) days after making delivery of such vehicle to the original purchaser or before such vehicle has been driven 4000 miles [6,400 km.], whichever event shall first occur, be returned to it with transportation charges prepaid, and which its examination shall disclose to its satisfaction to have been thus defective.

"As a limitation on the foregoing, KAISER Jeep CORPORATION shall have no obligation thereunder with respect to any vehicle which shall have been repaired or altered outside of an Authorized 'Jeep' Dealership in any way so as, in the judgement of KAISER Jeep CORPORATION to affect its stability or reliability, nor which has been subject to misuse, negligence or accident."

The above warranty is in lieu of any implied warranties of merchantability and fitness, and other warranties, expressed or implied, by KAISER Jeep CORPORATION, KAISER Jeep SALES CORPORATION, and the other authorized distributors of KAISER Jeep CORPORATION.

KAISER Jeep CORPORATION

NOTE — KAISER Jeep CORPORATION reserves the right at any time or times to revise, modify, discontinue or change any models of its vehicles, or any part or parts thereof, without notice; and, without it or the Seller incurring any liability or obligation to the Purchaser.

Dear Owner:

Welcome to the family of satisfied 'Jeep' vehicle owners. We pledge ourselves to serve you with satisfaction.

Your 'Jeep' vehicle has been thoroughly tested and inspected to ensure that properly maintained it will give you many miles of satisfactory service. Your 'Jeep' dealer is interested in your continued satisfaction and will be glad to cooperate with you in providing the proper maintenance for your 'Jeep' vehicle.

You will receive from your dealer an Owner's Service Policy which has a 1000-mile Inspection Coupon attached, and an Owner's Identification Card.

Read your Owner's Service Policy carefully and completely. It describes the service which your 'Jeep' dealer will furnish as part of his sales contract with you. Ask your dealer to explain any points that are not clear to you.

Have your dealer fill out both your Owner's Identification Card and also the 1000-mile Inspection Coupon.

Keep both your identification card and your service policy in your 'Jeep' vehicle glove compartment at all times so that your policy and your identification are always available.

Our first gesture of service is this owner's manual. Read it carefully so that you will be familiar with the instruments, controls, and correct operation of your 'Jeep' vehicle.

SPECIFICATIONS

VEHICLE CODE	MODEL	TYPE	ENGINE
2306F	J-200 2WD	Truck, Cab and Chassis, 4,000 lbs. GVW	Tornado OHC
2306A	J-210 2WD	Truck, Cab and Chassis, 5,600 lbs. GVW	Tornado OHC
2306B	J-220 2WD	Truck, Cab and Chassis, 6,600 lbs. GVW	Tornado OHC
2306D*	J-230 2WD	Truck, Cab and Chassis, 8,600 lbs. GVW	Tornado OHC
3306E	J-300 2WD	Truck, Cab and Chassis, 5,000 lbs. GVW	Tornado OHC
3306B	J-310 2WD	Truck, Cab and Chassis, 6,600 lbs. GVW	Tornado OHC
3306C	J-320 2WD	Truck, Cab and Chassis, 7,600 lbs. GVW	Tornado OHC
3306D*	J-330 2WD	Truck, Cab and Chassis, 8,600 lbs. GVW	Tornado OHC
2406F	J-200 4WD	Truck, Cab and Chassis, 4,000 lbs. GVW	Tornado OHC
2406A	J-210 4WD	Truck, Cab and Chassis, 5,600 lbs. GVW	Tornado OHC
2406B	J-220 4WD	Truck, Cab and Chassis, 6,600 lbs. GVW	Tornado OHC
2406D*	J-230 4WD	Truck, Cab and Chassis, 8,600 lbs. GVW	Tornado OHC
3406E	J-300 4WD	Truck, Cab and Chassis, 5,000 lbs. GVW	Tornado OHC
3406B	J-310 4WD	Truck, Cab and Chassis, 6,600 lbs. GVW	Tornado OHC
3406C	J-320 4WD	Truck, Cab and Chassis, 7,600 lbs. GVW	Tornado OHC
3406D*	J-330 4WD	Truck, Cab and Chassis, 8,600 lbs. GVW	Tornado OHC

*Dual Rear Wheels.

Engine:

	OHC	Metric
Type	6	
Number of Cylinders	3 ¹¹ / ₁₆ "	84.93 mm.
Bore	4 ¹ / ₈ "	111.12 mm.
Stroke	230 cu. in.	3.77 ltr.
Displacement	5 ¹ / ₈ " BTC	
Ignition Timing	8.5:1	
Compression Ratio	145-155 psi.	10.1 ± 10.8 kg-cm ²
Compression Pressure	140 at 4000 rpm.	
Horsepower (max. brake)	26.77	
Horsepower (SAE)	210 lb.-ft. at 1750 rpm.	29 kg.-m.
Torque (max.)	120"	304.8 cm.
Wheelbase — J-200	126"	320.0 cm.
— J-300	63 ¹ / ₄ "	161.3 cm.
Tread — Front	63 ¹ / ₄ "	161.9 cm.
— Rear	72 ¹ / ₄ "	183.5 cm.
— Rear (Dual Wheel)	8 ¹ / ₄ "	22.2 cm.
Road Clearance	70"	177.8 cm.
Height (Overall)	193 ³ / ₈ "	491 cm.
Length (Overall) — J-200 — Thriftside	193 ³¹ / ₁₆ "	492 cm.
— Townside	196 ³ / ₈ "	500 cm.
— Platform, Stake	205 ³ / ₈ "	521 cm.
— J-300 — Thriftside	205 ³¹ / ₁₆ "	522 cm.
— Townside	208"	528 cm.
— Platform, Stake		
Width (Overall):		
— all except dual rear wheel	78 ³ / ₈ "	200.4 cm.
— dual rear wheel	91 ¹ / ₈ "	233.3 cm.

Capacities:

	U. S.	Imperial	Metric
Fuel Tank	20 gal.	16.7 gal.	75.7 ltr.
Cooling System (without heater)	11 qt.	9 qt.	10.4 ltr.
Cooling System (with heater)	12 qt.	10 qt.	11.4 ltr.

Vehicle Weights — see page 79.

GETTING ACQUAINTED WITH YOUR 'JEEP' VEHICLE

General Information

This Owner's Manual is divided into four sections, containing information about your 'Jeep' vehicle.

The first section will acquaint you with specifications, model designations and serial numbers, instruments, and controls.

The second section describes proper operation including the all-important break-in period.

The third section covers lubricating procedures and recommendations as well as periodic maintenance requirements.

The fourth sections explains the functions of your 'Jeep' vehicle's systems and components and also describes minor adjustments and minor service and maintenance procedures.

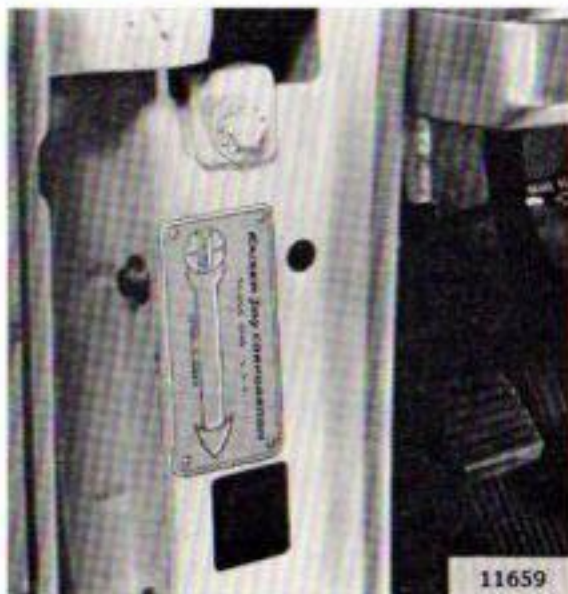
Proper servicing of your 'Jeep' vehicle at the recommended frequencies is most important to assure satisfaction throughout your tenure of ownership. Be sure to take it to an Authorized 'Jeep' Dealer's Service Department at the periods designated in the "Preventive Maintenance Schedule" (page 41) for all maintenance operations indicated at each specified interval. If service for your vehicle is required at any other time, contact your Authorized 'Jeep' Dealer's Service Department. His service technicians will be most familiar with your 'Jeep' vehicle and with all of the latest factory repair recommendations.

All the information given in this owner's manual consists of factory recommendations that should be used as a guide for properly operating and maintaining your 'Jeep' vehicle.

Vehicle Serial Number

The vehicle serial number is stamped on a metal plate. This plate is located at the left front door pillar.

The vehicle serial number will consist of a vehicle code prefix followed by a five-digit serial number. (Vehicle code prefixes are given on page 6.) For example: 2406A-10000.



VEHICLE SERIAL NUMBER

For your ready reference, record your vehicle serial number here including the code prefix:

Engine Serial Number

The engine serial number is stamped near the right front corner of the cylinder block. The engine has a prefix followed by a five-digit serial number. The prefix will read ND60C, TD60C, or AD60C depending on model and equipment. For example: ND60C-10000.



ENGINE SERIAL NUMBER

For ready reference, record your engine serial number here including prefix:

Keys and Locks

When you receive the keys to your new 'Jeep' vehicle, record the key number, and put it in a safe, convenient place. If your keys should become lost, your 'Jeep' dealer or any competent locksmith can replace the keys from this number. 1 1 1 1 1 1 1



INSTRUMENTS

The operational instruments are conveniently grouped where they can be easily seen on the instrument panel. Each of the gauges and warning lights indicates a critical function of the vehicle and warns of impending trouble in advance. Knowing the function of these gauges and warning lights and observing them occasionally while driving or while the engine is running can enable you to prevent service problems that could result in expensive repairs.

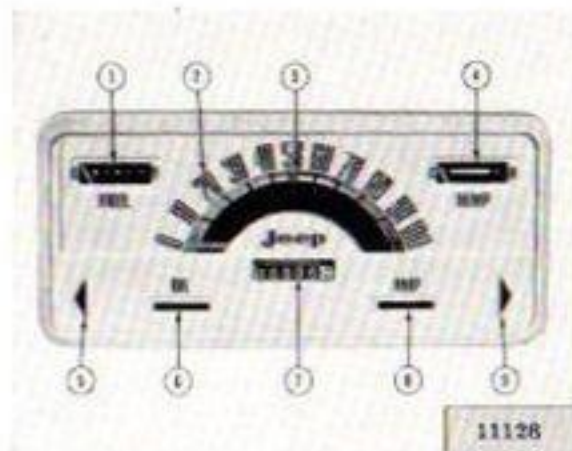


FIG. 1—INSTRUMENTS

- | | |
|----------------------------|-------------------------------|
| 1—Fuel Gauge | 5—Turn Signal Indicator-Left |
| 2—Speedometer | 6—Oil Pressure Indicator |
| 3—Headlight Beam Indicator | 7—Odometer |
| 4—Temperature Gauge | 8—Battery Charge Indicator |
| | 9—Turn Signal Indicator-Right |

Speedometer

The speedometer sweep hand indicates vehicle speed in miles per hour. The odometer registers accumulated mileage traveled. The right-hand numeral of the odometer indicates tenths of a mile.

"Oil" Warning Light

A ruby-red lamp will light to indicate when the engine oil is not being pumped at sufficient pressure to reach the places that need lubrication. When the ignition key is turned on but the engine is not running, or when the engine is running at idle speed, this light will show red; however it does not indicate a malfunction. If it lights when the engine

is running above idle speed, shut the engine off immediately.

"Amp" Warning Light

A ruby-red lamp will light to indicate that for some reason the alternator is not properly recharging the battery. When the ignition key is turned on but the engine is not running, this light will show red without meaning anything is wrong. If it lights when the engine is running, have the charging circuit checked as soon as possible or the battery will soon go dead. If this light comes on and stays on while driving, promptly determine and correct the difficulty.

"Fuel" Gauge

This gauge indicates how much fuel is in the fuel tank. The pointer will drop back to the E (empty) mark when the ignition switch is turned off. It may take a moment for the gauge to record when the ignition switch is again turned on. It is normal for the pointer to fluctuate at times as the vehicle is driven over rough terrain.

"Temp" Gauge

The temperature gauge registers the temperature of the solution in the cooling system. If the needle of the gauge swings far into the H (hot) zone, it means the engine is running dangerously hot. Stop

and investigate. See "Cooling System."

Whatever the trouble is, don't drive on until it has been corrected or damage may result.

CAUTION. Always remove the radiator cap slowly to avoid possible injury from escaping steam or hot water. Never add water when the engine has overheated; allow the engine to cool first.

Headlight Beam Indicator

A ruby-red light glows when the headlights are on high beam and warns that your lights may be shining into the eyes of oncoming drivers. When the dimmer switch is pushed once, the headlights will switch back to low beam and the indicator light will go off.

Turn Signal Indicator

The turn signal switch and lever is located on the steering column. The up position of the lever signals a right turn, and the green turn signal indicator light located on the right-hand side of the instrument cluster will flash; the down position of the lever signals a left turn, and the green turn signal indicator light located on the left-hand side of the instrument cluster will flash. When the turn is completed and the vehicle is again going straight ahead, the self-cancelling switch will turn off the lights as the lever automatically snaps back to centered position.

SWITCHES AND CONTROLS

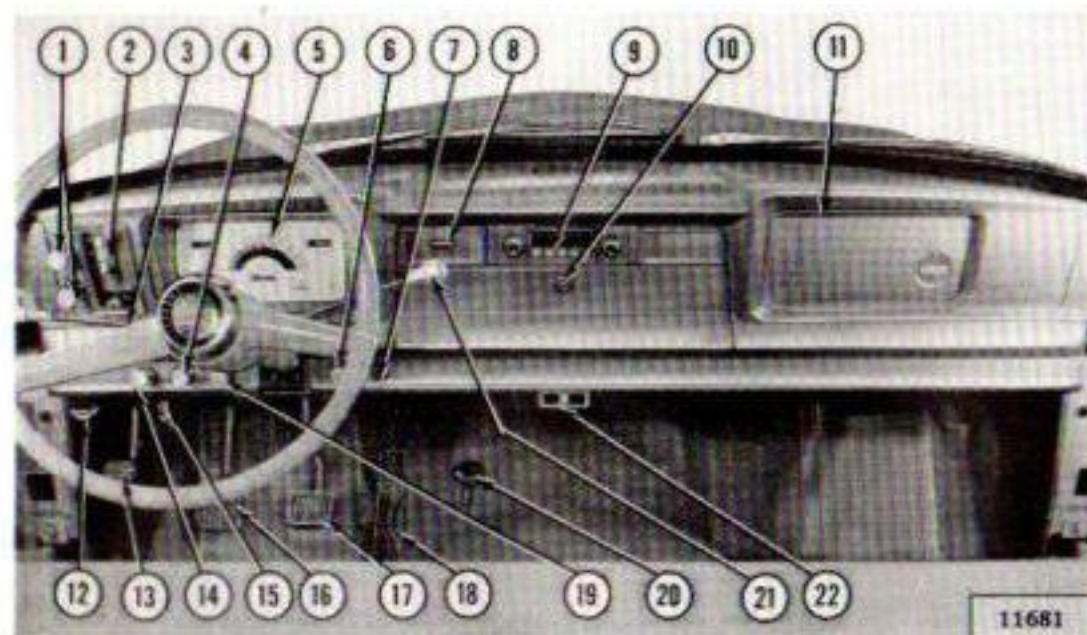


FIG. 2—SWITCHES AND CONTROLS

- 1—Vent Controls
 - 2—Heater Controls*
 - 3—Turn Signal Lever
 - 4—Choke Control
 - 5—Instrument Cluster
 - 6—Cigarette Lighter*
 - 7—Ignition and Starter Switch
 - 8—Ash Tray
 - 9—Radio*
 - 10—Glove Box
 - 11—Radio Speaker*
 - 12—Parking Brake Release Control
 - 13—Parking Brake Pedal
 - 14—Light Switch
 - 15—Headlight Dimmer Switch
 - 16—Clutch Pedal*
 - 17—Brake Pedal
 - 18—Accelerator Pedal
 - 19—Windshield Wiper and Washer Control*
 - 20—Four Wheel Drive Control*
 - 21—Gear Shift Control
 - 22—4WD Indicator Lights*
- *On applicable models only.

Ignition and Starter Switch

The ignition and starting motor switch are integral. Turn the key to the extreme right (clockwise) to connect the ignition and crank the engine. When the engine starts, immediately release the key as it is spring loaded to automatically return

to the "on" position. Avoid turning the key to the "start" position when the engine is running.

To supply electric current from the battery to operate the heater and other accessories when the engine is not running, turn the key to the extreme left (counterclockwise) position.

Light Switch

The light switch regulates the lighting by being pulled, pushed or rotated.

The switch has three push-pull positions. With the control knob pushed all the way in, all lights are off. Pulling the control knob out half way operates parking lights. Pulling the control knob out all the way operates the headlights. Both these positions also operate the tail lights and the instrument cluster light.

Rotating the knob clockwise will progressively dim the instrument cluster light.

Rotating the knob fully counterclockwise will turn on the dome light.

4-Wheel-Drive Indicator Lights

All 4-wheel-drive vehicles have drive indicator lights mounted on the lower edge of the instrument panel at the center of the vehicle. These lights indicate which transfer case gears are engaged at any particular time. The number and type of lights varies with vehicle equipment as follows:

- Standard equipped vehicles have two drive indicator lights; "4 wheel drive" and "neutral". The "4 wheel drive" light comes on when the transfer case shift lever is in either high or low range 4-wheel drive; the "neutral" light when in neutral. No light is on when the vehicle is in 2-wheel drive.
- Option equipped vehicles have four drive indicator lights; "4 wheel drive", "2 wheel drive", "neutral" and "4 w. d. low". These lights in-

dicating the four driving positions of the transfer case shift lever. A toggle switch, located at the left of the lights, will turn off all four lights.

NOTE: OBSERVANCE OF THE INDICATOR LIGHTS WHEN SHIFTING THE TRANSFER CASE IS VERY IMPORTANT. A THOROUGH UNDERSTANDING, AND THE APPLICATION OF "TRANSFER CASE SHIFT TECHNIQUES" APPEARING ON PAGE 24 IS REQUIRED TO ASSURE THE PROPER OPERATION OF YOUR VEHICLE.

Parking Brake Controls

To apply the parking brake, step on the parking brake pedal which is suspended from the instrument panel. It will lock in place automatically once pres-

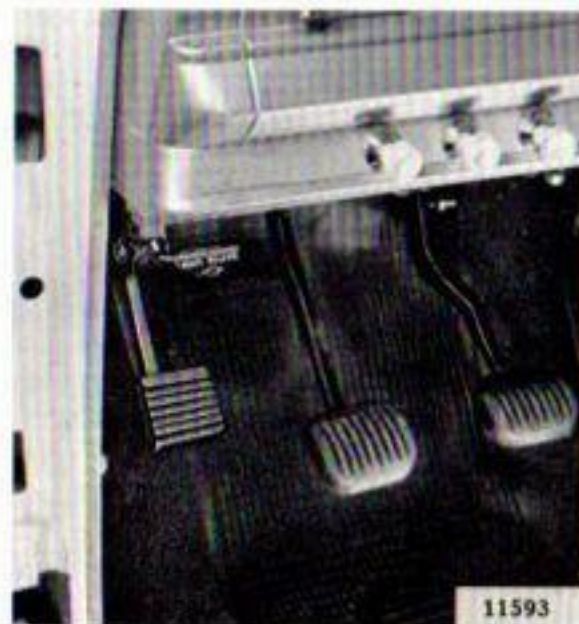


FIG. 3—PARKING BRAKE CONTROLS

sure is applied. To release the brake, lift up on the parking brake release lever located immediately under the instrument panel in line with the parking brake pedal.

If your vehicle is equipped with the optional parking brake warning light, the special ruby-red colored light located on the instrument cluster will light whenever the parking brake is engaged and the ignition turned on, as a reminder to release the brake.

Windshield Wiper and Washer Control

Your vehicle may be equipped with either a single speed electric windshield wiper, or the optional two speed wiper with washer. In either case,



FIG. 4 TWO SPEED WINDSHIELD WIPER AND WASHER CONTROL

the wipers are operated by turning the control knob in a clockwise direction. On the two speed wiper control, the first stop position as you turn the knob clockwise will operate the wipers at low speed; the second position at high speed. To operate the windshield washers on vehicles so equipped, push in the button located in the center of the wiper control knob. If the washer button is pushed when the wipers are not in operation, the wipers will automatically turn on in conjunction with the washer operation.

The windshield washer solution container is located under the hood. This container must be refilled periodically with water and, if desired, a washer solvent. Also, when the temperature drops below freezing, washer solution must be used to prevent freezing and damaging the container.

Door Locks

To lock and unlock the doors from the outside, use the ignition key. To lock the doors from the inside, first make sure the doors are securely closed, then press down on the locking button. To unlock the doors from the inside, pull back on the conventional type release handles.

Hood Latch

The hood lock release latch is located back of the radiator grill, a little to the right of center.



FIG. 5—HOOD RELEASE LATCH

To release the latch, reach through the grill and pull forward on the latch. With the latch released, lift up on the hood.

Ventilation

It is not good practice to ride in any vehicle with all windows and vents closed. The body of your 'Jeep' vehicle is ventilated for comfort and safety through two side ventilators, adjustable ventilating windows in the doors, standard door windows.

The side ventilators are operated by two control knobs located on the left side of the instrument panel, which control air flow to the passenger compartment. Pull the controls out to open the ventilators. The upper knob controls the left side ventilator, the lower knob the right.

To open the ventilating windows in the doors,

lift the lever to the vertical position and push out.

The door windows raise and lower with hand cranks in the conventional manner.



FIG. 6—SEAT ADJUSTMENT

Driver's Seat Adjustment

The driver's seat may be quickly adjusted to the most comfortable driving position by moving to the left the lever located at the lower left front edge of the seat, allowing the seat to be moved forward or rearward. Releasing the lever will lock the seat in the desired position.

Cigar Lighter

A cigar lighter (optional equipment) is conveniently located on the instrument panel. When the lighter is pushed in, the lighter element is heated. When properly heated for use, it automatically clicks out.

Radio

The optional, push-button radio is located in the center of the dash, with the speaker located in the right-hand side of the dash. The on-off, volume control knob for the radio is located to the right of the radio dial, and the manual tuner for station selection is located to the left of the dial. Immediately below the dial are the push buttons that enable the selection of five radio stations. To set the desired radio stations to work in conjunction with the push buttons, first warm up the radio for ten minutes. Then pull out the left hand push button, and tune in the desired radio station nearest the left of the dial with the manual tuner. Then push the button all the way in. The first button will now select that station. Repeat this process with the remaining four buttons.

Heater Controls

Heater controls are grouped together to the left of the instrument cluster. The controls consist of three push buttons, a sliding lever, and a rotating switch knob, all of which are labeled for ease and convenience of operation. With the "Off" push button depressed, the heater system will not operate. The "Air" push button directs outside air over the heater coils and to the heater outlets under the dash near the floor board. The "Def" push button directs the heated air to the outlets on top of the instrument panel to defrost the



FIG. 7—HEATER CONTROLS

windshield. The temperature of the heated air can be regulated by the sliding lever located to the right of the push buttons. The temperature is raised as the lever is moved downwards. To increase the volume of air emitted at the outlets, a blower is included in the heater system, and controlled by the rotating switch labeled "Blower". This switch can be set in four positions, as marked: "Off", "Low", "Med", or "High". Do not operate

the blower with the "Off" push button depressed.

In vehicles equipped with a heater, additional ventilation in warm weather can be achieved by

depressing the "Air" push button, and setting the sliding lever to its top position. The blower can be used to increase the volume of outside air.

OPERATING YOUR 'JEEP' VEHICLE

Proper Break-In

By taking a few reasonable precautions during the first few miles of driving and by giving your vehicle an opportunity to properly "break-in", operation and life of the working parts of your 'Jeep' vehicle will be greatly improved.

The parts of your new 'Jeep' vehicle are precision fitted. Close limits are maintained throughout. Therefore certain speed limits should be observed to "break-in" the engine.

After engine warm-up, do not exceed:

40 mph. [65 kph.]	0 to 300 miles [500 km.]
50 mph. [80 kph.]	300 to 800 miles [1,300 km.]
60 mph. [95 kph.]	800 to 1200 miles [2,000 km.]

The crankcase is filled at the factory with oil of the proper viscosity for the "break-in" period. This special oil should be drained at 500 miles [800 km.] and replaced with engine oil of the viscosity recommended in the Lubrication Section.

During the first 1000 miles [1,600 km.] of operation be alert for any indication of overheating in any component of the vehicle.

Be sure to have your 'Jeep' dealer inspect your 'Jeep' vehicle at the end of 1000 miles [1,600 km.].

Carbon Monoxide

Carbon monoxide is a deadly gas. It has no odor, no taste, no color. It is in the exhaust fumes of all gasoline engines. Never start an engine in a closed garage. Always open the doors wide before starting the engine. Keep them open wide as long as the engine is running.

Making the Vehicle Ready

- Fill the radiator.
- Put gasoline in the tank.
- Fill the oil reservoir through the filler pipe until the oil indicator stick registers FULL. See Lubrication Section.
- Give the vehicle a complete lubrication covering all the items in the Lubrication Section.
- See that all tires have the proper pressure.

Powr-Lok Rear Axle

The optional Powr-Lok rear axle gives a constant driving force to both rear wheels. This is especially helpful during slippery driving conditions. With

both rear wheels on a slippery surface, a light application of the accelerator pedal will supply maximum traction. When starting with only one rear wheel on an excessively slippery surface, slight application of the parking brake may be necessary to gain maximum traction.

Starting the Engine

- Two types of transmissions are available, standard and automatic. With standard transmission, fully depress the clutch pedal and move the shift lever to the neutral position. With automatic transmission, move the selector lever to either the neutral "N" or the park "P" position.
- Insert the ignition key in the ignition and starter switch.
- If the engine is cold pull the choke knob all the way out. If the engine is warm, pull the choke knob out partially, as required. Turn the ignition key clockwise to the extreme right. Hold it there until the engine starts; then release the key. After the engine starts, adjust the choke knob in or out, as required, to keep the engine running smoothly. As soon as the engine reaches operating temperature, push the choke knob all the way in. Special instructions for starting the engine in cold or hot weather are given on pages 20 and 21.
- If the engine fails to start in 30 seconds, release the key and wait about one minute before again attempting to start the engine. If the engine fails to start in two or three attempts, consult the Emergency Chart at the end of this section.

OPERATION—MANUAL TRANSMISSION

Driving the Vehicle

Start the vehicle in motion in the conventional manner by depressing the clutch pedal, shifting into low gear, releasing the clutch pedal and depressing the accelerator pedal. Shift into second and high gears in the same manner.

Never attempt to shift to a lower gear with the vehicle traveling at a high rate of speed. Always

have the vehicle at a standstill when shifting into reverse.

The shift pattern of the optional 4-speed transmission is embossed on the shift lever knob.

Avoid the practice of resting the foot on the clutch pedal while driving and do not slip the clutch excessively instead of shifting gears. Slipping the clutch causes excessive heat, with the result that the clutch is finally made inoperative.

Towing the Vehicle

If your 'Jeep' vehicle is equipped with 4-wheel-drive, the vehicle may be towed forward in the normal manner without damage to the 4-wheel-drive mechanism. The transmission gears must be in their neutral position, and the transfer case gears in 2-wheel drive.

Should it be necessary, however, to lift the rear wheels and tow the vehicle in reverse, be sure to remove the front axle shaft driving flanges to prevent the front differential from rotating.

Should the driving flanges be removed, a cover should be improvised that will prevent dirt from entering the wheel bearings.

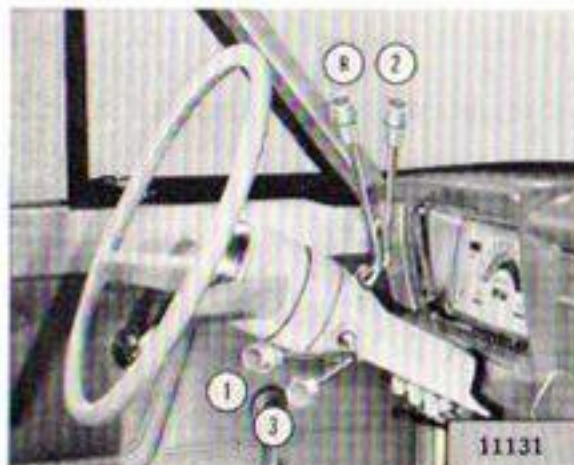


FIG. 8—SHIFT PATTERN

OPERATION—AUTOMATIC TRANSMISSION

Driving the Vehicle

Start the vehicle in motion by moving the transmission selector lever to drive "D" position, and **then** depress on the accelerator.



FIG. 9—AUTOMATIC TRANSMISSION

Low "L" range should be used only for hard pulling at low speeds such as when traveling in mud, sand, snow, going up or down steep grades, and when traffic signs call for the use of first or second gear. Shifting the selector lever from "L"

to "D" is possible at moderate speeds. Shifting from "D" to "L" should be made only with the vehicle stopped.

To rock the vehicle, in an effort to get free from snow, sand, etc., you can repeatedly move the transmission lever between low "L" and reverse "R", maintaining a very slight amount of pressure on the accelerator. As a general practice, however, never shift gears so as to change the direction of movement while the vehicle is moving.

Always move the selector lever to the park "P" position and engage the parking brake when parking the vehicle. Never move the selector lever to the park "P" position while the vehicle is in motion.

Pushing the Vehicle

Should it be necessary to push the vehicle to start the engine, move the transmission control lever to the neutral position. When the vehicle reaches a speed of approximately 20 mph. [30 kph.], turn the ignition on and move the control lever to the drive position. It is recommended that the vehicle be pushed rather than towed because the vehicle will attain considerable speed as soon as the engine starts unless the brakes are applied immediately.

Towing the Vehicle

If the transmission on a 2-wheel-drive vehicle is inoperative, the vehicle should be towed with the rear end raised, or the driveshaft removed.

If a vehicle equipped with 4-wheel-drive is to be towed, the rear end should be raised and the

front axle shaft driving flanges removed to prevent the front differential from rotating. Should the driving flanges be removed, a cover should be improvised that will prevent dirt from entering the wheel bearings.

Do not tow the vehicle in excess of 40 mph. [65 kph.].

COLD WEATHER OPERATION

Cold Weather Cautions

Cold weather can present many problems if a vehicle is not properly maintained; however, your 'Jeep' vehicle will be dependable in cold weather if given a minimum amount of attention.

- The cooling system must be protected against freezing by the use of antifreeze solutions or drained when not in use (see "Cooling System").
- Light oil should be used in the engine (see "Engine Lubrication").
- The battery should be kept fully charged to provide the additional power necessary to crank a cold engine and furnish a good spark. A discharged battery will freeze in extremely cold weather which will make battery replacement necessary.
- The carburetor, fuel pump and fuel tank should

be kept free from water which will freeze and restrict fuel flow.

- The ignition system should be kept in good condition.

Cold Weather Starting

Assuming that the above items have been given normal attention, the engine should start promptly, even in extremely cold weather, if the following procedure is used.

- To lessen the load on the starter, release the transmission by depressing the clutch pedal.
- Shut off lights, heater, radio, and other electrical accessories before starting. This will ensure maximum voltage available for both the starting motor and the ignition system.
- Pull the hand choke control all the way out before starting. After the engine has started,

push the hand choke control part of the way in until the engine has reached normal operating temperature. When the "temp" gauge needle rises, push the hand choke control all the way in for better fuel economy.

- Before turning the ignition key to "start", pump the accelerator pedal one or two times.
- When the starter is engaged, the accelerator should be held about half way down.

HOT WEATHER OPERATION

Hot Weather Cautions

Hot weather does not generally present as many problems as cold weather; however, a little special attention will pay dividends in the form of economy and convenience.

- Check the radiator regularly for sufficient coolant as the rate of evaporation is higher in hot weather.
- Make sure the fan belt is in good condition and properly adjusted.
- Keep the radiator area free of bugs and other things that restrict air circulation.
- Have the water level in the battery checked at 10-day intervals, or oftener if necessary.
- Starting a cool engine in hot weather does not

present a problem and the procedure outlined under "Starting the Engine" should be followed.

Starting Flooded Engine

A hot engine is easily flooded and may start hard. If the carburetor is flooded proceed as follows:

- Turn on the ignition.
- Depress accelerator treadle to the floor and hold in this position until engine starts. (Do not pump the pedal.)
- DO NOT pull choke knob out.
- Engage starter.
- When engine starts, release starter and accelerator treadle.

EMERGENCY CHART

No adjustment should be made, or any parts tampered with, until the cause of the trouble is ascertained, otherwise adjustments which are properly made may be destroyed. The trouble should first be analyzed.

Starting Motor Will Not Turn Engine

	See Paragraph	Page
Battery Discharged	Battery	53
Battery connections dirty or loose	Battery	53
Battery cables defective	Battery	53
Battery cable connections loose at ground or starting motor solenoid	Starting Motor	59
Solenoid wire connections loose at solenoid, starting motor, voltage regulator, or ignition switch	Starting Motor	59
Solenoid wires broken	Starting Motor	59
Starting motor inoperative	Starting Motor	59

Engine Fails to Start

No fuel	Fuel Gauge	10
No fuel to carburetor	Fuel System	45
Cylinder or manifold flooded	Fuel System	45
Moisture and dirt on ignition system	Ignition Wiring	55
Engine needs choking	Starting the Engine	17
Plugged exhaust system	Exhaust System	48

Engine Stops

	See Paragraph	Page
Lack of fuel	Fuel Gauge	10
Lack of oil	Engine Lubrication	30
Disconnected ignition wire	Ignition Wiring	55
Carburetor flooding	Fuel System	45
	Carburetor	46
Engine overheated	Cooling System	49
Distributor breaker points dirty or pitted	Distributor	55
Vapor lock	Fuel System	45

Engine Misses at All Speeds

Faulty ignition wiring	Ignition Wiring	55
Fouled spark plugs	Spark Plugs	58
Spark plug points improperly set	Spark Plugs	58
Spark plug porcelains dirty	Spark Plugs	58
Distributor faulty	Distributor	55
Water in fuel	Fuel Tank	48
Engine overheated	Cooling System	49

Popping Back Through Carburetor

Dirt in carburetor	Fuel Pump	48
Water in fuel	Fuel Tank	48
Incorrect ignition timing	Ignition Timing	57
Spark plug wires connected to incorrect plugs	Ignition Wiring	55
Inlet valves holding open	Engine Compression	45

Engine Overheating

Low engine oil level	Engine Lubrication	30
Low coolant level	Radiator Pressure Cap	50

	See Paragraph	Page
Fan belt slipping.....	Fan Belt	51
Clogged radiator core.....	Radiator	49
Faulty thermostat.....	Thermostat	50
Improper ignition timing.....	Ignition Timing	57

Engine Misses at Low Speeds

Intermittent flow of fuel.....	Fuel System	45
	Distributor	55
Poor ignition.....	Spark Plugs	58
	Ignition Wiring	55
Distributor point improperly adjusted or making poor contact.....	Distributor	55
Incorrect timing.....	Ignition Timing	57
Spark plug point improperly set.....	Spark Plugs	58

	See Paragraph	Page
Poor compression.....	Engine Compression	45
Air leak at carburetor gasket.....	Carburetor	46

Loss of Power

Ignition improperly timed.....	Ignition Timing	57
Lack of fuel.....	Fuel System	45
	Fuel Pump	48
Carburetor flooding.....	Fuel System	45
	Fuel Pump	48
Dragging brakes.....	Brake Adjustment	68
Engine overheated.....	Cooling System	49
Poor compression.....	Engine Compression	45
Improper valve timing.....	Adjust Valve Lash	45
Clutch slipping.....	Clutch	62
Exhaust system obstructed.....	Exhaust System	48

4-WHEEL DRIVE

If your vehicle is equipped with 4-wheel drive, your new 'Jeep' vehicle has the ability to go through conditions of adverse weather and difficult terrain. It will do its job faithfully and well if you know how to handle the controls properly. Follow these recommended practices and you will enjoy safe and economical operation.

What is 4-Wheel Drive?

All four wheels of your 'Jeep' vehicle can exert driving force to the ground. A conventional vehicle is driven by the two rear wheels alone. The front wheels are merely pushed along by the rear wheels.

Your 'Jeep' vehicle, when in 4-wheel drive, is propelled by all four wheels; the rear wheels are pushing and the front wheels are pulling. This gives you four points of power and traction.

How 4-Wheel Drive Works

Engine power is transmitted to all four wheels of your 'Jeep' vehicle by using "live" front and rear axles. The front axle is driven by a drive shaft and differential in the same manner as the rear axle. Power from the engine is delivered to the transmission and transfer case, which in turn drive both the front and rear wheels.

Transfer Case

The transfer case operates like a second transmission. The transfer case shift lever provides a

choice of 2-wheel drive or 4-wheel drive. The shift lever also provides a 4-wheel drive low gear, and a power-take-off position (neutral) for use when stationary power is required. The gearshift lever positions are identified by a decal on the inside of the glove compartment door. The standard synchromesh transmission shift pattern, or automatic shift lever positions, are used in the normal fashion in either 2-wheel or 4-wheel drive operation.

Transfer Case Shift Lever Positions

The transfer case shift lever has four positions: 4WD High, 2WD, Neutral, and 4WD Low. The forward position of the lever (4WD High) provides high range 4-wheel drive. The first rear position (2WD) disengages the 4-wheel drive and allows the rear wheels only to drive for regular highway and city road travel. The second rear position (Neutral) disengages all power to the wheels and is used for stationary power-take-off operations. The last rear position (4WD Low) provides low range 4-wheel drive for the toughest going.

Transfer Case Shift Techniques

The following techniques apply to all vehicles.

- Shift the transfer case shift lever with a steady, but not too excessive, force.
- Never attempt shifting the transfer case while in a turn.
- Although the shift between 2WD and 4WD High may be made at any vehicle speed, the beginner may find the shift easier to make at low vehicle speeds and with the transmission in low or second gear.

- The shift from 2WD to 4WD High, or from 4WD High to 2WD, should be made with power. This means the vehicle should be moving, the accelerator pedal depressed, and without depressing the clutch pedal. If the shift is not readily accomplished, decelerate and reaccelerate the vehicle slightly while maintaining a steady pressure on the shift lever.
- When shifting into 4WD, always observe the "4 wheel drive" indicator light. If the light is not on, the transfer case is not in 4WD.

NOTE: THIS IS EXTREMELY IMPORTANT WHENEVER SHIFTING TO 4WD-LOW POSITION AS IT IS POSSIBLE TO MOVE THE VEHICLE WITHOUT THE TRANSFER CASE BEING ENGAGED IN 4WD-LOW. THE LIGHTED CONDITION OF THE 4WD INDICATOR LIGHT IS THE ONLY FULL ASSURANCE THAT THE TRANSFER CASE IS FULLY ENGAGED IN 4WD POSITIONS.

The following techniques apply to vehicles with standard transmission.

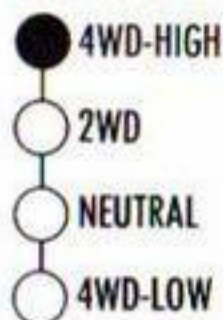
- The shift from 2WD into neutral, or from neutral into 2WD, may be made at any time. However, the shift will be easier if the vehicle is in motion.
- The shift into 4WD Low should be made with a vehicle speed of 1 to 5 mph. After passing the neutral position, depress the clutch pedal and pull the shift lever to the rear until the "4 wheel drive" indicator light goes on.
- The shift out of 4WD Low can be made at any vehicle speed. Depress the clutch pedal and push the shift lever until the neutral position

is reached. Then release the clutch pedal and shift into the desired high range.

The following techniques apply to vehicles equipped with automatic transmission.

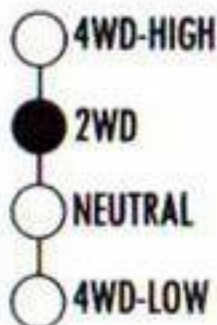
- When shifting into, out of, or through neutral, or into or out of 4WD Low, first stop the vehicle and shift the automatic transmission into neutral. Then make the transfer case shift desired.

Transfer Case Shifting



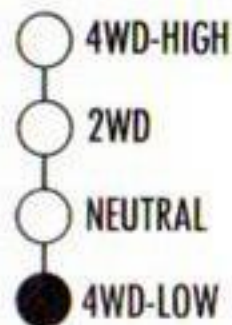
11157

- To shift from 2-wheel drive into 4-wheel drive high range maintain vehicle speed with power and move the transfer case shift lever forward until the indicator light is on.



11155

- To shift from 4-wheel-drive high range into 2-wheel drive maintain vehicle speed with power and move the transfer case shift lever to the first rear position.

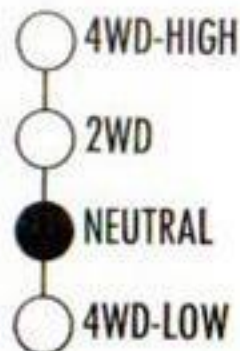


11156

- *To shift from 4-wheel-drive high range or from 2-wheel drive into 4-wheel-drive low range* slow the vehicle to 1 to 5 mph. Then, while moving the shift lever to the rear, depress the clutch pedal after passing the neutral position and move the shift lever to the rear until the 4WD indicator light goes on. Release the clutch pedal.

(See Transfer Case Shift Techniques for automatic transmissions.)

- *To shift from 4-wheel-drive low range into 2-wheel drive or 4-wheel-drive high range* depress the clutch pedal, then move the shift lever to the neutral position. Release the clutch pedal and move the shift lever forward into 2-wheel drive or 4-wheel drive high range. This shift may be made at any vehicle speed. (See Transfer Case Shift Techniques for automatic transmission.)



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- *The neutral position* disengages all power from the wheels. The shift from 2-wheel drive or 4-wheel drive high range into neutral may be made at any time. Make the shift from 4-wheel drive low into neutral

with the clutch pedal depressed. (See Transfer Case Shift Techniques for automatic transmission.)

When to Use 4-Wheel-Drive

Four-wheel-drive should be used to provide additional traction and lower gearing for use on difficult terrain, and to provide low-speed pulling power for industrial and agricultural use. Four-wheel-drive should only be used when greater traction and power are required than that provided by the standard transmission low gear. Use it off the road when you need it. Use it in snow. Use it to get heavy trailers rolling and for pulling agricultural implements. Use it on ice, hills, mud, sand, and whenever normal 2-wheel-drive traction won't do the job.

When Not to Use 4-Wheel-Drive

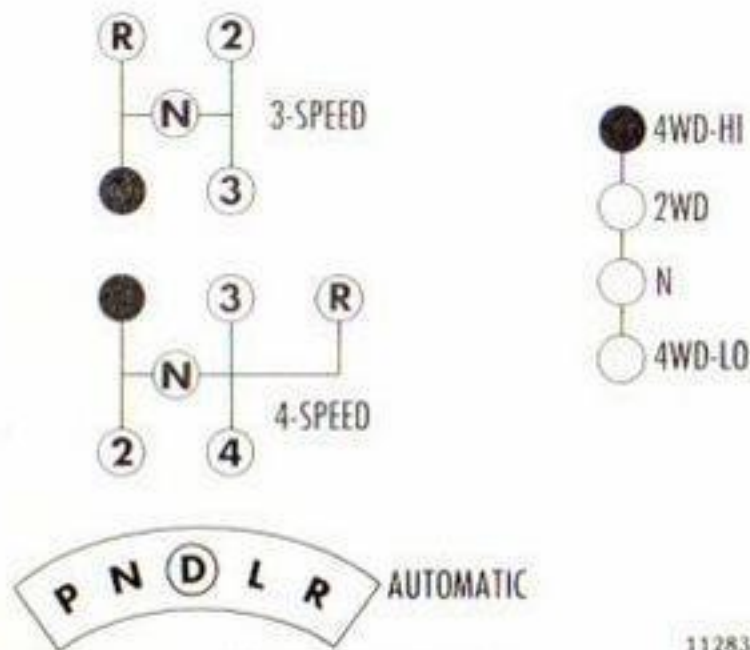
Four-wheel-drive should not be used for normal driving on hard-surfaced roads. The additional tractive effort it provides is not needed under such conditions. Prolonged use of 4-wheel drive on hard-surfaced roads may occasionally cause temporary difficulty in shifting out of 4-wheel-drive. This is due to a build-up of torsional stress in the drive train and is caused by the normal variations in tire diameters under different load conditions.

To relieve this build-up, simply drive the vehicle in reverse for several feet or drive off the hard surface momentarily to allow tire slippage.

DRIVING TECHNIQUES IN 4-WHEEL DRIVE

Through Mud, Snow and Sand

When going through mud, snow and sand without a load, shift the transfer case into 4-wheel-drive high range, and the standard transmission into first gear or automatic transmission into drive "D". 4-wheel-drive low range is not necessary in such conditions unless a load is being pulled by the vehicle or unless it is desired to proceed



Mud, Snow and Sand

11283

more slowly due to changing road conditions. Don't shift into any lower gear than is necessary to maintain headway. Try to keep a constant engine speed. Over-revving the engine will cause the wheels to start spinning and traction will be lost. Tire pressure may be reduced to about 10 psi. [0,7 kg-cm²] if additional flotation is required.

CAUTION — Through Sand, Mud, or Water

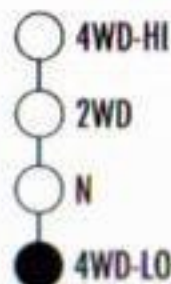
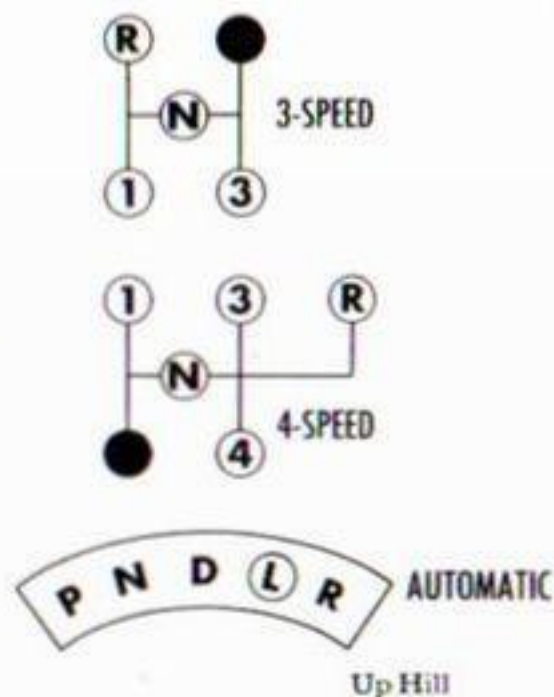
A 'Jeep' vehicle may on occasion be driven up to the hubs in sand, mud, or water. As soon as possible thereafter, clean the brake drums to prevent any abrasive material that may have entered from wearing the brake linings.

Up Hill

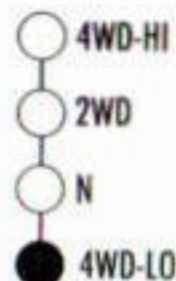
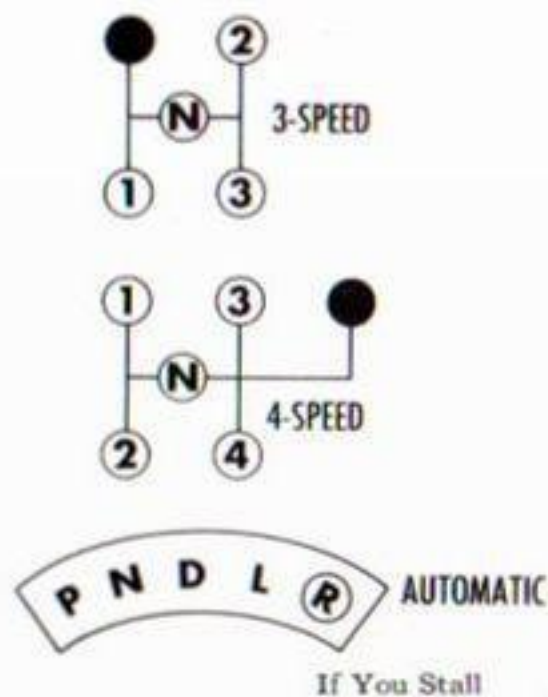
When climbing a steep hill, shift the transfer case into 4-wheel-drive low range, and the standard transmission into second gear or the automatic transmission into low "L". Drop down to first gear (standard transmission) only when it is apparent that the steepness of the ascent requires the lowest gear to maintain headway.

Getting Over the Hump

"Walk" the vehicle up the last few feet. If the wheels start to slip with only a few feet of the ascent



11160



11161

remaining, headway may be maintained by swinging the front wheels sharply left and right. This will provide fresh "bite" into the surface and will usually result in enough traction to complete the climb.

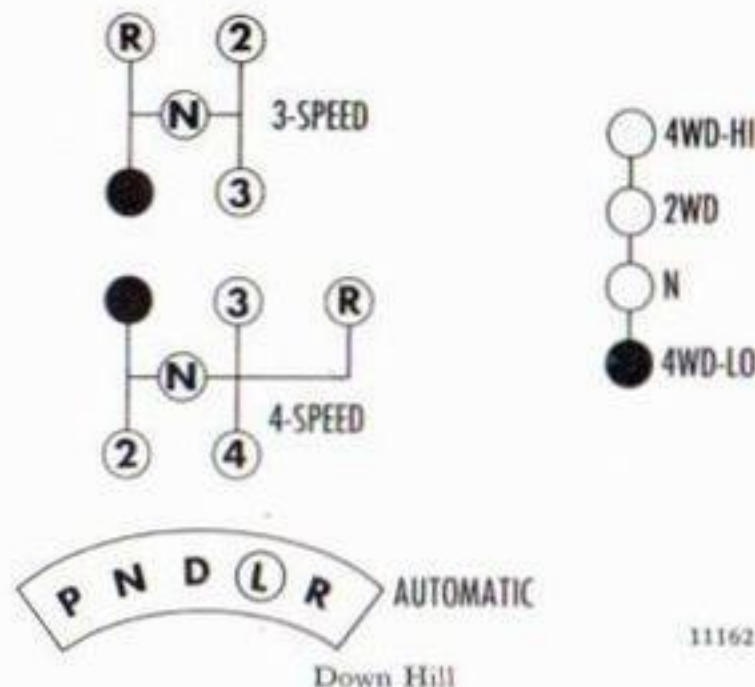
If You Stall

If the vehicle stalls or loses headway when climbing a steep hill, make a fast shift to reverse or first gear. Don't leave clutch pedal depressed after shift has been completed. Engine compression will hold the vehicle on the hill. Don't try to back down

with the clutch released and only the brakes holding the vehicle. By shifting into reverse you can start the engine without depressing the clutch. The vehicle will move backward as the starter is engaged. When the engine starts, control your downward speed with the accelerator and brake.

Down Hill

Your 4-wheel-drive vehicle can proceed in safety down a grade which could not be negotiated safely by a conventional 2-wheel-drive vehicle. Shift the transfer case to 4-wheel-drive low range, and first gear (standard transmission) or low "L" (auto-



11162

matic transmission). Let the vehicle go slowly down the hill with all four wheels turning against engine compression. This will permit you to control the vehicle's speed and direction.

WARNING — Across Slopes

Avoid this situation! Your 'Jeep' vehicle will

seldom encounter a hill which it cannot negotiate directly. However, natural obstacles may make it necessary to travel diagonally up or down the hill. The danger lies in losing traction and slipping sideways with the possibility of tipping.

When necessary, choose as mild an angle as possible, keep moving, and make your turns quickly.

WE REPEAT — DON'T TRAVEL DIAGONALLY ACROSS A HILL UNLESS ABSOLUTELY NECESSARY.

Safety and 4-Wheel-Drive

Your 'Jeep' vehicle has sufficient power and traction to take you safely through conditions which would be hazardous or impossible for conventional vehicles. 'Jeep' 4-wheel drive is a powerful, useful tool that will perform many difficult tasks, but it must be used with common sense and caution. Don't take unnecessary risks and don't attempt the impossible.

Knowledge of your vehicle and its abilities is your best insurance. Know your vehicle; use it wisely; and you will enjoy safe, economical, and faithful service.

LUBRICATING YOUR 'JEEP' VEHICLE

Regular application of high-grade lubricants when operating your 'Jeep' vehicle is especially important because of the diversified type of service it performs. The amount of trouble-free service you receive will be in proportion to the care given.

The type of service performed determines the frequency of lubrication. Vehicles operating principally on gravel or dusty roads and through extended rainy seasons may need lubrication attention more frequently and should be serviced as required. In dusty territories, the air cleaner should be cleaned often. Under extreme conditions, once a day cleaning may be necessary.

Engine Lubrication

The engine is lubricated with a force-feed continuous circulating system. A gear type pump circulates the oil.

The quantity of oil in the crankcase is measured by a bayonet type oil level indicator located on the left side of the engine. Whenever the oil level is below the "Add 1-Qt." mark, add sufficient oil to bring the level near or to the "FULL" mark but do not fill above this mark.

The crankcase is filled at the factory with oil of the proper viscosity for the "break-in" period of 500 miles [800 km.].

Change the engine oil at 500 miles [800 km.], at

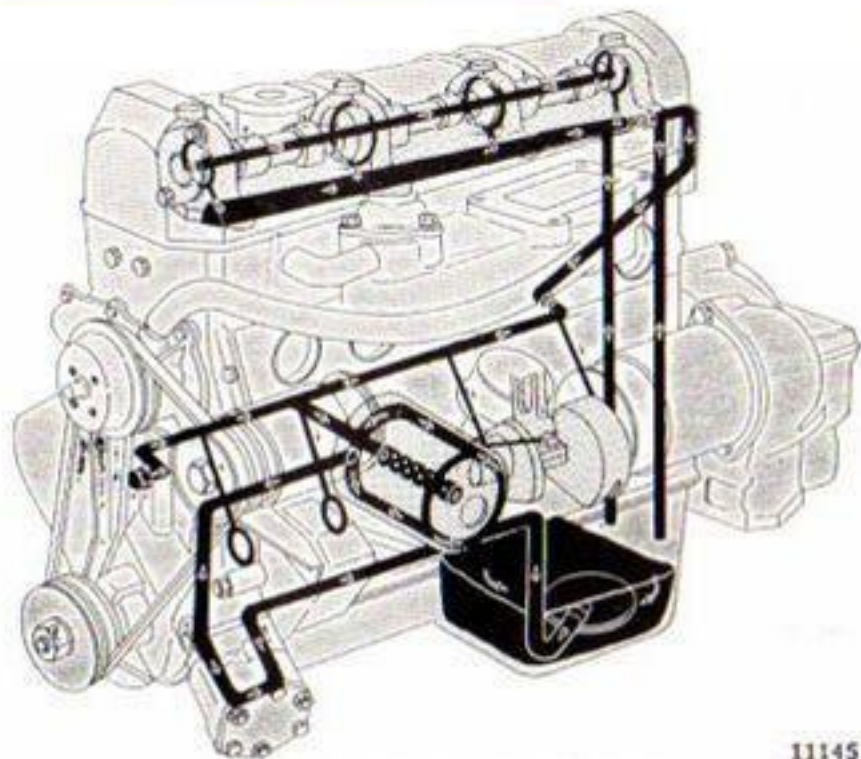


FIG. 10—ENGINE LUBRICATION

11145

6000 miles [9,600 km.], and then every 6000 miles of normal highway driving. Under more severe service, change the oil more often.

Common short trip, stop-and-go driving is the most severe and becomes intensified even more in cold weather. In contrast, constant-speed driving on highways is the least severe.

Always drain while crankcase oil is hot as suspended dirt and contaminants will more likely be held in suspension and, therefore, drain out more completely.

- Position drain receptacle under plug.
- Remove drain plug using correct size wrench. Be careful of hot oil.
- Clean drain plug. Inspect and replace gasket if deteriorated.
- When oil has drained, replace and tighten drain plug.
- Check for presence of excess water in the oil that might indicate an internal leak from the cooling system.

After draining refill with fresh oil. Add an additional quart if the oil filter has also been drained.

Lubrication Charts

The lubrication illustrations on the following pages are prepared as a guide to the location of some of the major lubrication points as indicated on the charts accompanying them. The chassis shown is a composite and may not necessarily reflect any particular vehicle in all details. Text should be carefully read for other points not indicated on the charts.

Engine Oil Classifications

The American Petroleum Institute uses a system of classifying engine oils according to type of service. These designations are:

ML — light and favorable service.

MM — moderate to severe service.

MS — most severe service.

Depending upon the conditions of operations, either MM or MS grade is recommended for 'Jeep' vehicles.

It is also necessary to specify the SAE number in addition to the above classification.

Chassis Lubrication

Certain chassis lubricating points have been pre-packed at the factory and are designed for 30,000 mile service before needing additional lubrication. This is true of all points on the tie rod, drag link (steering connecting link), and suspension points. Other points, however, on both chassis and engine, should be serviced at periodic intervals. All chassis lubricating points, whether long-life or conventional, have standard grease gun fittings. Refer to the Lubrication Chart and Preventive Maintenance Schedule for specific lubrication points and lubrication time intervals. It is not

(Text continued on page 36)

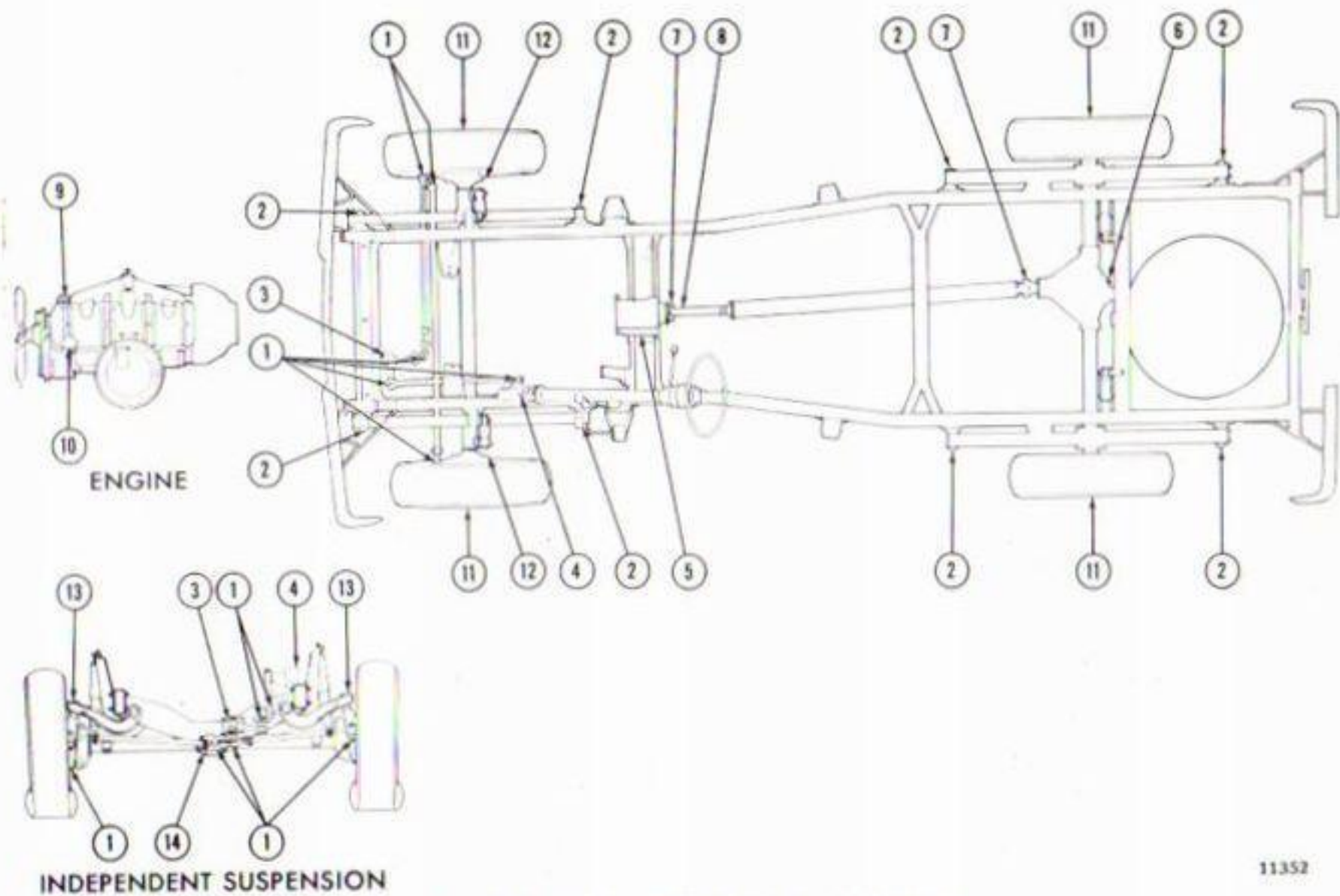


FIG. 11—LUBRICATION CHART—2-WHEEL DRIVE

11352

CHART NO.	ITEM TO BE LUBRICATED	MAINTENANCE OPERATION INTERVAL	QUANTITY			LUBRICANT		
			U.S.	Imperial	Metric	Type	Grade	
							Summer	Winter
1.	Steering Linkage (Tie Rod and Drag Link Sockets)	C	As Required			*934571	—	—
2.	Spring Shackles and Pivot Bolt Bushings (Bronze type with lube fittings only)	A	As Required			Chassis Lubricant	No. 1	No. 0
3.	Steering Bell Crank	C	As Required			Chassis Lubricant	No. 1	No. 0
4.	Steering Gear	A	As Required			MIL-L-2105-B	SAE-80	SAE-80
5.	Transmission	A (Check) C (Change)	2 1/4 pt.	2 1/4 pt.	1.2 ltr.	GL-4	SAE-90	SAE-90
	3-Speed		6 1/2 pt.	5 1/2 pt.	3.7 ltr.	GL-4	SAE-90	SAE-90
	4-Speed		8 1/2 qt.	7 qt.	8.0 ltr.	GM type A Armour	—	—
	Automatic					Institute Qual. AQ-ATF		
6.	Differential	A (Check) C (Change)	3 pt.	2 1/4 pt.	1.3 ltr.	**MIL-L-2105-B	SAE-80	SAE-80
	Model 44		3 pt.	2 1/4 pt.	1.3 ltr.	**MIL-L-2105-B	SAE-80	SAE-80
	Model 53		6 1/2 pt.	5 1/2 pt.	3.7 ltr.	**MIL-L-2105-B	SAE-80	SAE-80
	Model 70							
7.	Propeller Shaft Universal Joints	C	As Required			*934188	—	—
8.	Propeller Shaft Slip Joint	C	As Required			*934190	—	—
9.	Distributor	C At each Breaker Point Replacement	As Required			Lithium Filled Grease	Soft	Soft
	Housing		As Required			Cam Lubricant	—	—
	Cam		As Required			Engine Oil	Same as Engine	Same as Engine
	Wick		As Required			Engine Oil	—	—
10.	Engine	A	***5 qt.	4 1/2 qt.	4.7 ltr.			
11.	Wheel Bearings	C	As Required			MIL-G-10924	No. 2	No. 2
	Front		As Required			Wheel Bearing Lubricant	—	—
	Rear		As Required					
12.	King Pin Bushing (Solid Axle Only)	A	As Required			Chassis Lubricant	No. 1	No. 0
	King Pin Bearing Housing (Independent Front Suspension)	A (Check) C (Change)	As Required			MIL-G-10924	—	—
13.	Upper Suspension Ball Joint	C	As Required			*934570	—	—
14.	Independent Suspension Center Universal Joint	C	As Required			*934188	—	—

* Special Lubricant - See Text.

** For Power-Lok differential use only 'Jeep' Power-Lok Differential Oil, Part No. 94557.

*** When oil filter is changed at the same time, add one quart.

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Above 90°F
SAE-30

+10°F to 90°F
SAE-20W or 10W30

-10°F to +10°F
SAE-10W

Below -10°F
SAE-5W

J-200, J-300, 2WD

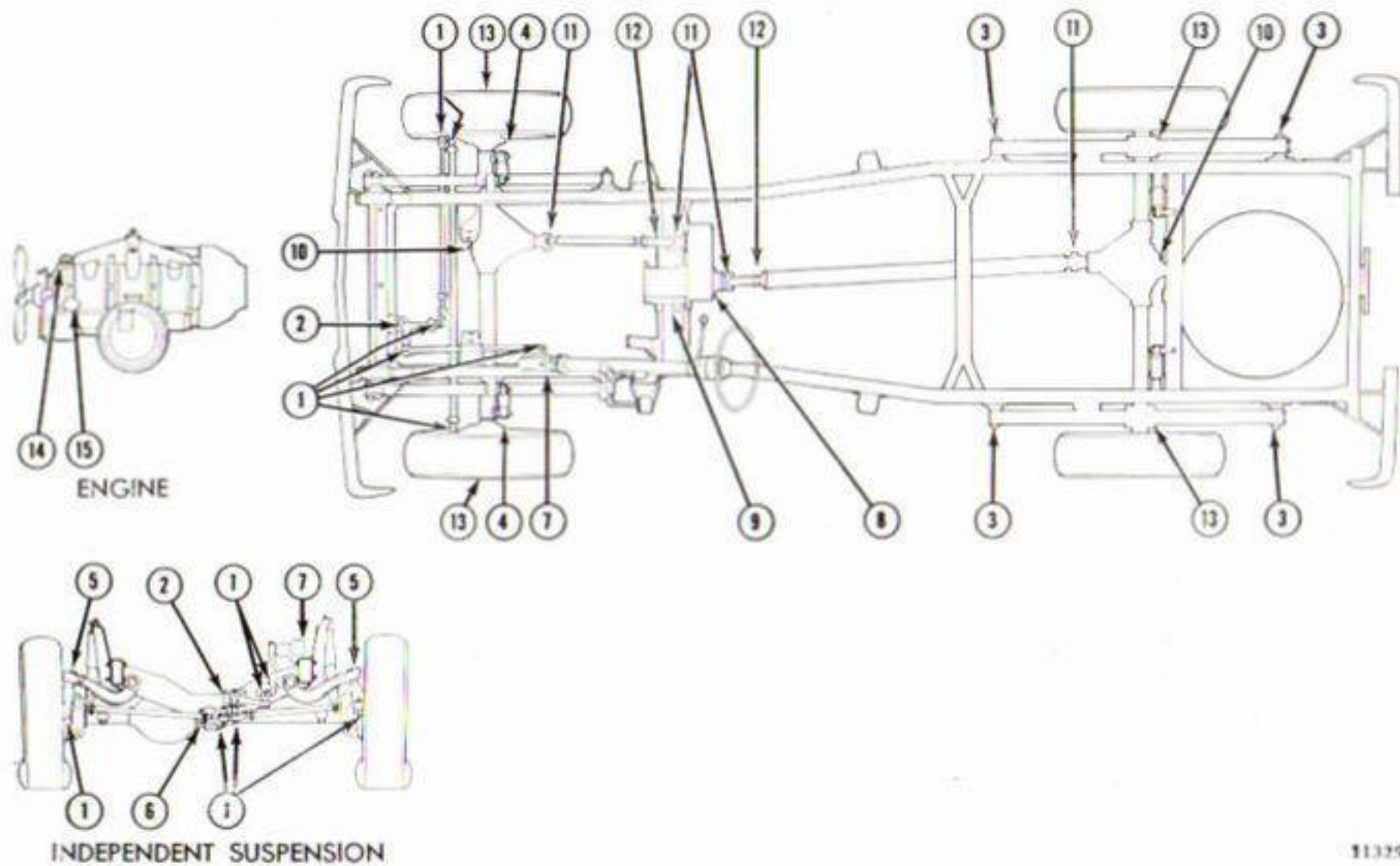


FIG. 12—LUBRICATION CHART—4-WHEEL DRIVE

11325

CHART NO.	ITEM TO BE LUBRICATED	MAINTENANCE OPERATION INTERVAL	QUANTITY			LUBRICANT		
			U.S.	Imperial	Metric	Type	Grade	
							Summer	Winter
1.	Steering Linkage Ball Joints	C	As required			*934571	—	—
2.	Steering Bell Crank	C	As required			Chassis Lubricant	No. 1	No. 0
3.	Spring Shackles and Pivot Bolts (Bronze)	A	As required			Chassis Lubricant	No. 1	No. 0
4.	Front Axle King Pin Bearing Housing	A (Check) C (Change)	As required			MIL-G-10924	—	—
5.	Upper Suspension Ball Joint	C	As required			*934570	—	—
6.	Independent Suspension Center Universal Joint	C	As required			*934188	—	—
7.	Steering Gear Housing	A	As required			MIL-L-2105-B	SAE-80	SAE-80
8.	Transfer Case	A (Check) C (Change)	3 1/4 pt.	3 pt.	1.3 ltr.	GL-4	SAE-90	SAE-90
9.	Transmission	A (Check) C (Change)	2 3/4 pt.	2 1/4 pt.	1.2 ltr.	GL-4	SAE-90	SAE-90
	Standard	A (Check) C (Change)	6 1/2 pt.	5 1/2 pt.	3.7 ltr.	GL-4	SAE-90	SAE-90
	4-Speed	A (Check) C (Change)	8 1/2 qt.	7 qt.	8.0 ltr.	GM type A Armour	—	—
10.	Automatic Differential	A (Check) C (Change)	3 pt.	2 1/2 pt.	1.3 ltr.	Institute Qual. AQ-ATF	SAE-80	SAE-80
	Front	A (Check) C (Change)	3 pt.	2 1/2 pt.	1.3 ltr.	MIL-L-2105-B	SAE-80	SAE-80
	Rear (Standard)*	A (Check) C (Change)	3 pt.	2 1/2 pt.	1.3 ltr.	MIL-L-2105-B	SAE-80	SAE-80
	Rear (Power-Lok)*	A (Check) C (Change)	3 pt.	2 1/2 pt.	1.3 ltr.	*94557	—	—
11.	Propeller Shaft Universal Joints	C	As required			*934188	—	—
12.	Propeller Shaft Slip Yokes	C	As required			*934190	—	—
13.	Wheel Bearings	C	As required			MIL-G-10924	—	—
	Front	C	As required			Wheel Bearing Lubricant	No. 2	No. 2
	Rear	C	As required			Lithium Filled Grease	Soft	Soft
14.	Ignition Distributor Housing	C	As required			Cam Lubricant	—	—
	Cam	(At each Breaker Point Replacement)	As required			Engine Oil	Same as Engine	
	Wick	(At each Breaker Point Replacement)	As required					
15.	Engine	A	**5 qt.	4 1/4 qt.	4.7 ltr.	Engine Oil	***	***

* Capacity of the rear axle differential on dual-rear-wheel models is 6 1/2 pt., 5 1/2 pt., 3.7 ltr.

* Special Lubricant. See Text.

** When oil filter is changed at the same time, add one quart.

*** Above 90°F
SAE-30

+10°F to 90°F
SAE-20W or 10W30

-10°F to +10°F
SAE-10W

Below -10°F
SAE-5W

J-200, J-300-4WD

necessary to disassemble pre-packed joints to lubricate them. Merely add new lubricant, using the lubrication fittings, until new lubricant comes out of the joint indicating all old lubricant has been removed.

Long-Life Lubricants

Special long-life lubricants are required for some lubrication points designed for 30,000 mile service. These lubricants are as follows:

- 'Jeep' tie rod socket lubricant, Part No. 934571 furnished in 5 pound cans.
- 'Jeep' upper suspension ball joint lubricant, Part No. 934570, furnished in 5 pound cans.
- 'Jeep' propeller shaft universal joint lubricant, Part No. 934188, furnished in 5 pound cans.
- 'Jeep' propeller shaft spline lubricant, Part No. 934190, furnished in one pound cans.

Spring Shackles and Pivot Bolts

The spring shackles and pivot bolts on some vehicles are bronze bushed and are equipped with lubrication fittings. Lubricate each 6000 miles [9.600 km.]. Other vehicles are equipped with rubber bushings and are not lubricated.

Oil Filter

All vehicles are equipped with an oil filter. The unit should be serviced at the end of the first 2000 miles [3.200 km.]. Thereafter, service the unit in

accordance with preventive maintenance schedule "A" by replacing the unit.

To replace the unit, first remove the old unit by rotating it counterclockwise. Then oil the gasket, on the base of new unit, with engine oil. Screw on the new filter until the gasket contacts the engine mounting, then tighten at least one-half turn by hand. Turn by hand only — use no tools.

Always drain the filter at each engine change to prevent the old oil contained in the filter from mixing with and contaminating the new oil.

Oil Bath Air Cleaner

The optional oil bath air cleaner thoroughly removes dust from the air before it enters the carburetor. For efficient operation, the cleaner must be serviced at regular intervals.

Care of the air cleaner is extremely vital to the life of the engine. Pay particular attention to the amount of dust and dirt in the air taken into the engine through the air cleaner. When dust is not noticeable in the air, service the air cleaner each 6000 miles [9.600 km.]. Whenever the air is noticeably dusty (for example when the vehicle is driven on secondary roads or through fields) then service the air cleaner more frequently. Under extreme continually dusty and dirty conditions where the vehicle operates in clouds of dust and dirt, service the air cleaner daily.

To service the air cleaner, unscrew the wing nut from the top of the air cleaner and lift it off the

carburetor. Lift the cover and filter element off the oil sump. Clean the inside surface of the sump and refill to indicated oil level with new oil of the same viscosity as is recommended for the engine. Wash filter element in kerosene and drain. Reassemble the air cleaner and install on carburetor.

Dry Type Air Cleaner

Some vehicles are equipped with a dry type air cleaner. Every 6000 miles [9.600 km.], and oftener when the air is noticeably dusty, remove the cartridge and wash with water and detergent only. Rinse and dry. **Do not oil** cartridge. Install new cartridge after 5 cleanings.

Distributor

Every 30,000 miles [48.000 km.], repack the ignition distributor housing with lubricant. A removable lubrication plug is located on the side of the distributor housing.

Whenever the breaker points are replaced, saturate the felt wick in the top of the cam with medium engine oil, and coat the cam with a thin film of cam lubricant.

Steering Gear

Check the lubricant level in the steering gear housing at each 6000 miles [9.600 km.], to be sure that the lubricant is at filler plug opening level. Should lubricant be required, fill the housing slowly with a hand compressor. Do not overlook replacing the filler plug.

Propeller Shafts

Lubricate the propeller shaft universal joints and slip joints every 30,000 miles [48.000 km.]. Use a hand compressor to lubricate the universal joints. Clean the splines of the slip joint and apply lubricant liberally.

Front Axle Steering Knuckles

Check the lubricant level in steering knuckle housings every 6000 miles [9.600 km.] on all 4-wheel-drive vehicles, and on 2-wheel-drive vehicles equipped with independent front suspension. Keep lubricant at filler plug level. Change the lubricant every 30,000 miles [48.000 km.].

Lubricate the king pin bushings on 2-wheel-drive vehicles with standard suspension every 6000 miles [9.600 km.].

Independent Front Suspension

Each 30,000 miles [48.000 km.] lubricate the front axle shaft center universal joint on 4-wheel-drive vehicles equipped with independent front suspension. Remove the rubber boot at the center joint to obtain access to the lubrication fitting.

The front axle tube center hinge joint, on all vehicles equipped with independent front suspension, is rubber bushed and requires no lubrication.

Lubricate the upper suspension ball joints every 30,000 miles [48.000 km.].

Wheel Bearings

Each 30,000 miles [48,000 km.] remove, clean, inspect, and repack the front wheel bearings.

The rear wheel bearings are equipped with lubrication fittings. Above each lubrication fitting is a vent opening through the housing. Lubricate every 30,000 miles [48,000 km.].

Use a hand compressor and wheel bearing grease, forcing the grease through the lubrication fitting until it flows from the vent. Vent should be kept unobstructed or grease will back up into the brakes. Do not add grease after it flows from the vent for it may be forced through the wheel keyway onto the outside of the wheel and possibly onto the brakes.

Sodium-base lubricant is used at the factory for initial fill of rear wheel bearings. When sodium-base and lithium-base lubricants are mixed, the result is a thinned-out mixture that can bleed through the seals. It is therefore important that wheel bearing lubricant with the correct base be used.

Should oil leaks occur at rear wheel bearings, the leaks may be caused by a mixture of the two types of lubricants. In such cases, the wheel bearings should be thoroughly cleaned to completely remove the old lubricant, relubricated and reinstalled.

Brake Master Cylinder

Check the fluid level in the brake master cylinder every 6000 miles [9,600 km.]. This is the master cylinder located on the firewall nearest the center of the car. Wipe clean the top of the filler cap and

also the housing area around it. Replenish the brake fluid to a level $\frac{1}{2}$ " [1,3 cm.] below the top of the fill hole. Use only heavy-duty brake fluid conforming to specification SAE-70-R3. Be sure to handle the brake fluid in clean dispensers and containers that will not introduce even the slightest amount of other liquids. Replace and tighten the filler cap.

Hydraulic Clutch Master Cylinder

The hydraulic clutch master cylinder is mounted on the firewall, outboard of the brake master cylinder. The same service recommendations and precautions apply to the clutch master cylinder as do to the brake master cylinder.

Choke Control

Lubricate the exterior surfaces of the flexible conduit with penetrating oil every 12,000 miles [15,200 km.].

Transmission

Maintain the lubricant at filler plug level. To assure this, check the level each 6000 miles [9,600 km.] and add lubricant when necessary. Drain and refill at each 30,000 miles [48,000 km.].

Automatic Transmission

The automatic transmission oil filler tube and dip stick are located at the right rear of the engine.

Maintain the transmission oil level at the full mark on the dip stick. To assure this, check the level each 6000 miles [9,600 km.] and add oil when necessary. Drain and refill at each 30,000 miles [48,000 km.]. Use only transmission oil conforming to G.M. Type A-Armour Institute Qual. AQ-ATF.

Transfer Case

Maintain the lubricant at filler plug level. To assure this, check the level each 6000 miles [9,600 km.] and add lubricant when necessary. Drain and refill at each 30,000 miles [48,000 km.].

Differential

Check the level in the differential housing every 6000 miles [9,600 km.] to be sure that the housing is filled to the level of the filler plug opening. Drain and refill the housing every 30,000 miles [48,000 km.]. Do not mix different types of lubricants. Use a light engine oil or light flushing oil to clean out the housing (except on Powr-Lok differentials). Do not use water, steam, kerosene, or gasoline for flushing.

Powr-Lok Differential

Some vehicles are equipped with locking differential (optional equipment). Locking differentials may be identified by the metal caution tag installed under one of the gear cover screw heads. The tag reads "USE LIMITED SLIP DIFF. LUBE ONLY".



FIG. 13—POWR-LOK DIFFERENTIAL

- 1—Ratio tag
- 2—Powr-Lok tag

Ordinary lubricants **must not** be used in the locking differential. Use only 'Jeep' Powr-Lok Differential Oil, Part No. 94557, furnished in pint cans.

Do not flush the Powr-Lok differential. The use of cleaning solvents of any kind is not recommended.

Power Steering

On vehicles so equipped, the power steering reservoir should be checked at 6000 mile [9,600 km.] intervals. Do this by removing the filler cap located on top of the power steering pump. Maintain the fluid level in the reservoir half way up the filler

neck. Automatic Transmission Fluid, Type A, should be used whenever adding fluid to the power steering system.

Power Brake Reservoir

Service recommendations for the power brake reservoir are the same as those for the brake master cylinder.

Body

At each 6000 miles [9,600 km.] use a greasless lubricant sparingly on the door lock striker plates. Also sparingly lubricate the door locks. At each 12,000 miles [19,200 km.] lubricate the following: door and window weatherstrips; door latch rotors; door and hood hinge pivots; tail gate hinge; glove compartment door latch; heater controls; and windshield wiper and washer controls.

PARTS REQUIRING NO LUBRICATION

Springs

The vehicle springs and torsion bars do not require lubrication. Springs leaves are coated at assembly with a long-lasting special lubricant which is designed to last the life of the springs. Spraying with lubricant has a tendency to wash this special lubricant from between the spring leaves.

Water Pump and Clutch

The water pump bearing and clutch release bearing are prelubricated for life when manufactured and cannot be relubricated.

Starting Motor

The starting motor bearings are lubricated at assembly and require no further lubrication between starting motor overhauls.

Alternator

The alternator bearings are lubricated at assembly and require no further lubrication.

Shock Absorbers

The hydraulic direct-action shock absorbers are permanently sealed and require no periodic lubrication service. Also the shock absorber mounting bushings are not to be lubricated.

PREVENTIVE MAINTENANCE SCHEDULE

In order to maintain your vehicle in top condition, permit your dealer to perform the following operation at the vehicle mileage shown. One thousand miles equals [1.600 km.].

ODOMETER READING		MAINTENANCE OPERATIONS
500		Change engine oil
1,000		1000 Mile inspection
6,000		Maintenance Operation A
12,000	36,000	Maintenance Operation A & B
18,000	42,000	Maintenance Operation A
24,000	48,000	Maintenance Operation A & B
30,000		Maintenance Operation A & C
	54,000	Maintenance Operation A
	60,000	Maintenance Operation A B C

When vehicles are driven primarily in abnormally dusty or wet and dirty areas, it becomes increasingly important to perform these services more frequently. Under these conditions, no definite interval can be recommended because of the great variety of uses and conditions of use.

Maintenance Operations "A" (6,000 Miles)

Change Engine Oil
 Replace Engine Oil Filter
 Clean Positive Crankcase Ventilating Valve and Breather
 Check Transmission and Transfer Case Lubricant Level

Check Differential Lubricant Level
 Check Steering Gear Lubricant Level
 Check Power Steering Fluid Level
 Check Lights & Controls
 Check Front Axle Universal Joint Level
 Lubricate Bronze Type Spring Shackles (H.D. Trucks)
 Lubricate 2-Wheel-Drive Tubular Front Axle King Pin Bushings
 Check Cooling System for Leaks
 Lubricate Door Latch Striker Plates
 Lubricate Door Locks
 Check Brake Master Cylinder Level
 Check Clutch Master Cylinder Level
 Clean and Insepct Air Cleaner
 Tune Engine
 Rotate Tires
 Adjust Clutch
 Adjust Brakes
 Adjust Fan Belt
 Clean Exterior of Radiator

Maintenance Operations "B" (12,000 Miles)

Clean Body & Door Drain Holes
 Lubricate Door & Window Weatherstrips
 Lubricate Door Latch Rotors
 Lubricate Tailgate Hinges
 Lubricate Door, Hood Hinge Pivots

Lubricate Glove Compartment Door Latch
Lubricate Heater Controls
Lubricate Windshield Wiper and Washer Controls

Align Headlights

Check Brake Linings
Check Exhaust System for Leaks
Check Rear Axle U-Bolt Torque
Check Shock Absorber Mountings and Bushings
Check Front and Rear Spring Bushings

Adjust Automatic Transmission Bands
Adjust Automatic Transmission Linkage

Check Independent Suspension "U" Bolt Torque
at Cross Member

Change Spark Plugs
Check Charging and Starting Circuits

Maintenance Operations "C"(30,000 Miles) "Major Chassis Lubrication"

Lubricate Upper Suspension Ball Joint
Lubricate Steering Linkage
Lubricate Propeller Shaft Universal Joints
Lubricate Propeller Shaft Slip Joints
Change Transmission Lube
Change Transfer Case Lube
Change Differential Lube
Lubricate Independent Suspension Center Joint
Change Front Axle Universal Joint Lubricant
Lubricate Upper Control Arm Pivot Rubbers
Lubricate Steering Bell Crank
Lubricate Rear Axle Wheel Bearings
Clean, Repack & Adjust Front Wheel Bearings
Lubricate Distributor

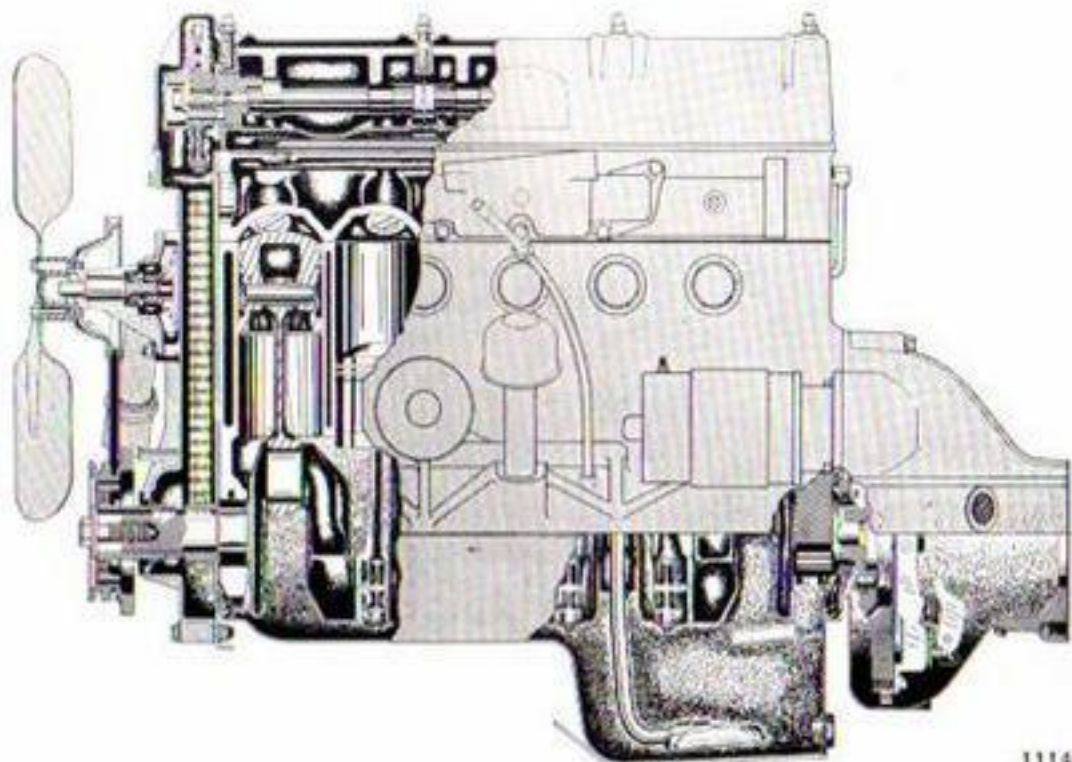
MAINTAINING YOUR 'JEEP' VEHICLE

Periodic Inspection

Proper maintenance of your 'Jeep' vehicle demands that it be given a thorough service inspection at each 1000 miles [1.600 km.] of operation. Such an inspection consists of a careful road test and examination by a competent service technician

to locate and analyze any small faults that may have developed. The prompt correction of minor faults thus discovered will go far toward holding down maintenance expense and costly delays in operation.

Your 'Jeep' dealer is vitally interested in your



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FIG. 14—TORNADO OHC ENGINE

'Jeep' vehicle and it will pay you to have him regularly inspect it. 'Jeep' dealers' service technicians have the advantage of complete factory specifications covering the vehicle as well as bulletins which are sent out by the factory.

The following paragraphs outline methods of making minor adjustments and also suggestions covering preventive maintenance. Should major repair work be necessary, consult your 'Jeep' dealer.

Engine

Your new 'Jeep' vehicle is equipped with the newly designed 'Jeep' Tornado OHC engine. This engine is built for long, trouble-free operating life. Its rugged simple design reduces repair time. All engine accessories are located at or near the top of the engine for easy access.

The overhead camshaft design eliminates most of the conventional valve train components allowing more dependable valve action and reducing the number of parts subject to wear. The engine's efficient cooling system, spheroidal combustion chambers, and Tuftrided crankshaft all contribute to longer engine life and lower operating costs.

Engine Tune-up

For best performance and dependability, the engine should have a tune-up every 6,000 miles [9,600 km.] of operation.

Proper tune-up procedure should include the following:

- Clean and tighten the battery cable terminals, the battery ground connection and ground strap.
- Remove the spark plugs, clean them thoroughly and space the electrodes to .030" [0,76 mm.] gap.
- Remove the distributor cap and adjust the contact points. Adjust the points to .020" [0,51 mm.] gap.
- Check the ignition timing. See Ignition Timing.
- Check the valve lash. See Adjusting Valve Lash.
- Clean the fuel pump filter screen and check the fuel line connections.
- Remove and clean positive crankcase ventilating valve and tubes; if valve will not clean, replace with new one. See Positive Crankcase Ventilation.
- Start the engine and allow it to run until thoroughly warm; then set the carburetor throttle adjusting screw so the engine will idle at 590 - 600 rpm. If the carburetor is equipped with an automatic choke, remove the air cleaner before starting the engine, and check that the butterfly valves open as the engine warms.
- Adjust the carburetor low speed idle screws so that the engine will idle smoothly.

Should the engine fail to perform satisfactorily and the trouble definitely traced to the carburetor, consult your 'Jeep' vehicle dealer. Carburetor service is specialized and should not be undertaken unless the unit is thoroughly understood.

Engine Compression

Correct engine compression is necessary for proper operation of the engine. Testing the engine compression requires special tools and skill. Poor compression can result in loss of engine power and misfiring of the engine at low speeds. Poor compression can result from insufficient valve lash, a faulty cylinder head gasket, one or more improperly fitted pistons or piston rings, or improper seating of the valves. To adjust the valves, see **Adjust Valve Lash**. To correct all other causes of poor compression, see your 'Jeep' dealer.

Adjusting Valve Lash

The valve lash should be set as follows:

Intake Valves.....	.008" [0,20 mm.]
Exhaust Valves.....	.008" [0,20 mm.]

Use care in making this adjustment that the measurements are accurate by using feeler gauges and making sure the rocker arms are resting against the lowest surface of the camshaft cam.

Engine Mountings

The rubber engine mountings, which are attached to the frame side rail brackets and to the support plate, prevent fore-and-aft motion of the engine, yet allow free sidewise and vertical oscillation which neutralizes vibration at the source. Keep the mountings tight. A loose engine may cause vibration, clutch chatter or high fuel level in the carburetor.

Positive Crankcase Ventilation

The crankcase ventilating system substantially reduces vehicle emissions to the atmosphere and provides thorough, positive ventilation which reduces formation of sludge in the crankcase. The positive crankcase ventilating valve is located at the base of the carburetor. This valve is easily removable for cleaning purposes. To clean it, dip it in solvent, and blow compressed air through the small end; this is the end that normally tends to accumulate deposits. Check the oil filter cap gasket to make sure it is providing a tight seal of the system. Check the breather cap located on the left side of the cylinder block; clean in solvent if necessary. The positive crankcase ventilating system should be serviced at every engine tune-up.

FUEL SYSTEM

The fuel system consists of the fuel tank, fuel lines, fuel pump, carburetor and air cleaner.

Care and maintenance of the air cleaner is covered in the lubrication section.

The most important maintenance attention is to keep the system clean and free of water, also periodically to inspect for leaks.

Should the engine fail to start when cranked by the starting motor, the trouble may be in the fuel system. To locate the trouble, first check the fuel gauge to be sure the fuel tank is not empty. If

the fuel tank is not empty, check further to see if fuel is reaching the carburetor. Disconnect the fuel line at the carburetor. Place a container under the open line and briefly crank the engine with the starting motor. If fuel spurts from the end of the line, the fuel lines are clean and the fuel pump is operating properly.

If no fuel leaves the disconnected fuel line, the trouble is in the fuel lines or fuel pump. Clean the fuel pump filtering screen. (See Fuel Pump). Check fuel lines for kinks or sharp bends. If upon re-checking no fuel leaves the disconnected fuel line, see your 'Jeep' dealer.

If fuel is reaching the carburetor, the cylinders or manifold may be flooded with fuel. Flooding can usually be detected by a strong odor of fuel at the tail pipe or engine. Flooding is often the result of excessive use of the choke control while attempting to start the engine, or repeated operation of the accelerator pedal before attempting to start the engine. To eliminate flooding, push the choke control all the way in, hold the accelerator pedal all the way down, and crank the engine with the starting motor.

If fuel is reaching the carburetor, the engine is not flooded, the engine electrical system is operating properly, and the engine will not start, see your 'Jeep' dealer.

Should the engine stop when it is hot, the trouble may be caused by vapor lock. Vapor lock is the vaporization of the fuel before it enters the carburetor. Allow the engine to cool, then restart it. If vapor lock reoccurs, see your 'Jeep' dealer.

Should the vehicle be stored for an extended period, the fuel system including the carburetor, should be completely drained. This will avoid oxidation of the fuel, resulting in the formation of gum in the units of the system.

Gum formation is similar to hard varnish and can cause trouble. It may cause the fuel pump valves or the carburetor float valve to become stuck or possibly block the filter screen. Gum formation can be dissolved by acetone, obtainable in most drug stores, or a good commercial fuel system solvent.

In extreme cases, it will be necessary to disassemble and clean the fuel system, however, often one pint of acetone placed in the fuel tank with about one gallon of gasoline will dissolve any deposits as it passes through the system with the gasoline.

Carburetor

The carburetor is a precision instrument designed to deliver the proper fuel and air mixtures at all engine speeds.

Carburetor parts wear little. The chief cause of faulty carburetor operation is the accumulation of dirt and water. Usually a poor engine performance is not caused by the carburetor. Do not disturb the carburetor until it is proven that the trouble is not elsewhere. Should the carburetor be at fault, consult your 'Jeep' dealer.

The carburetor is the dual downdraft type. It is provided with two idle adjustment screws, and

a throttle stop screw. The carburetor is available with or without the automatic choke feature.

Before adjusting the carburetor, level the vehicle. Then idle the engine. **LIGHTLY** seat both idle adjusting needles and back them off one half turn. Run the engine at fast idle until operating temperature reaches normal. Adjust throttle stop screw to idle the engine at 590-600 rpm.

Set each idle adjusting needle to obtain the smoothest running and the maximum speed. If necessary, reset the throttle stop screw to obtain speed of 590-600 rpm. and recheck idle adjusting needles.

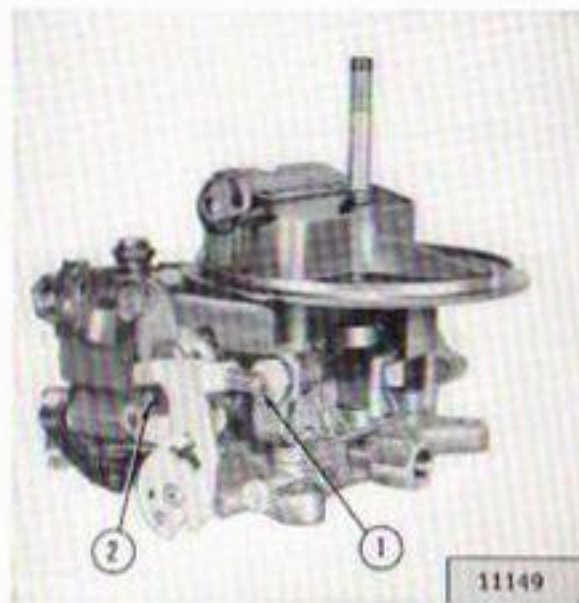


FIG. 15—CARBURETOR

1—Throttle Stop Screw

2—Idle Adjustment Screw

On carburetors equipped with an automatic choke, the operation of the choke can be checked by observing the movement of the butterfly valve in the carburetor throat as the engine warms. With the engine cold, remove the air cleaner so you can see into the carburetor. Start the engine, and check to see that the valves open as the engine warms. More or less choking can be obtained by rotating the choke housing one or two notches from the index position. Adjustment should be made with the engine cold. If the trouble persists, consult your 'Jeep' dealer.

Lack of gasoline in the carburetor may be caused by the following conditions:

- Gasoline tank empty.
- Leaking tube or connections.
- Bent or kinked tubing.
- Sediment chamber cover on fuel pump loose.
- Clogged (or frozen) fuel lines.
- Dirty screen.
- Carburetor inlet valve stuck.

Should the carburetor flood (too much gasoline), check the unit to make certain that the needle valve is seating properly and that the float is not stuck.

An air leak in the carburetor gasket can cause the engine to misfire at low speeds. Replace faulty gaskets. Make sure the carburetor attaching bolts are tight at all times.

Fuel Pump

The fuel pump is of the diaphragm type operated from an eccentric on the camshaft.

The pump draws gasoline from the fuel tank, through a filtering screen, and forces it to the carburetor.



FIG. 16—FUEL PUMP

1—Fuel Inlet

2—Fuel Outlet

CAUTION: Do not attempt repairs which require disassembling of the fuel and vacuum pump

other than cleaning, as special care is required. It is recommended that all fuel pump trouble be taken up with your 'Jeep' dealer.

Fuel Tank

When filling the tank, use care that no foreign matter or water enters. The fuel intake line in the tank is equipped with the latest type of fuel filter. This filter element resists the passage of both water and dirt. Once each spring and fall, when the fuel level in the tank is low, disconnect the fuel line at the fuel pump inlet and blow the line out with compressed air. This will clean the sediment from the filter. After blowing out the line and filter, drain the tank by removing the drain plug in the bottom. This will remove any sediment which may have accumulated.

EXHAUST SYSTEM

The exhaust system consists of the exhaust pipe, muffler, tail pipe, and support straps. Periodically check the system for dents, rust, and loose or broken support straps. A severe dent in any part of the system can cause loss of engine power. Complete stoppage of the system caused by a severe dent, or by a plugged tail pipe, can make the engine inoperative.

COOLING SYSTEM

The purpose of the cooling system is to maintain the most efficient engine operating temperature under all driving conditions. The coolant in the water passages of the cylinder head and cylinder block absorbs heat generated in the engine. The water pump circulates the coolant through the radiator, where the coolant is cooled by the air stream from the fan. The radiator pressure cap, in addition to providing a seal for the radiator filler neck opening, also controls the pressure in the system.

The thermostat controls engine temperature by controlling the flow of coolant.

Maintenance information on the cooling system components is given in the following pages.

The cooling system should be flushed twice a year and checked for leaks, preferably in the spring, and fall at the time of changing the antifreeze. Always correct any cooling system leaks before installing antifreeze. A corrosion inhibitor should be used in the cooling system to prevent the formation of rust and scale. A quality-brand antifreeze will contain a corrosion inhibitor. When the antifreeze is drained in the spring, a corrosion inhibitor should be added with the water.

Should the temperature gauge indicate that the engine is hot, stop the engine and investigate. Make the following checks in the order given by

referring to the appropriate paragraphs.

- Check oil level in engine crankcase.
- Check coolant level after removing radiator pressure cap.
- Check for slipping fan belt.
- Check for a clogged radiator.
- Check for a faulty thermostat.
- Check for improper ignition timing.

Radiator

Maintenance of the radiator consists of keeping the exterior of the radiator core clean, the interior free from rust and scale, and the radiator free from leaks. The exterior of the radiator core should be cleaned and the radiator inspected for leaks each 6000 miles [9.600 km.] of normal service of the vehicle.

Cleaning should be performed by blowing out with air stream or water stream directed from the rear of the radiator. A visual inspection is not sufficient as the accumulation of small particles of foreign material on the core surfaces can restrict cooling without closing the core openings. Examine the radiator carefully for leaks before and after cleaning.

Radiator Hoses

Examine hoses spring and fall for possible need of replacement or tightening. If hoses are collapsed, cracked, or indicate a soft condition on the inside they should be replaced.

When installing hose, clean the pipe connections and apply a thin layer of non-hardening sealing compound. Hose clamps should be properly located over the connections to provide secure fastening. The pressurized cooling system can blow off improperly installed hoses.

Radiator Pressure Cap

The pressure cap helps to prevent loss of coolant by evaporation. The pressure cap, which maintains pressure in the cooling system, makes the engine

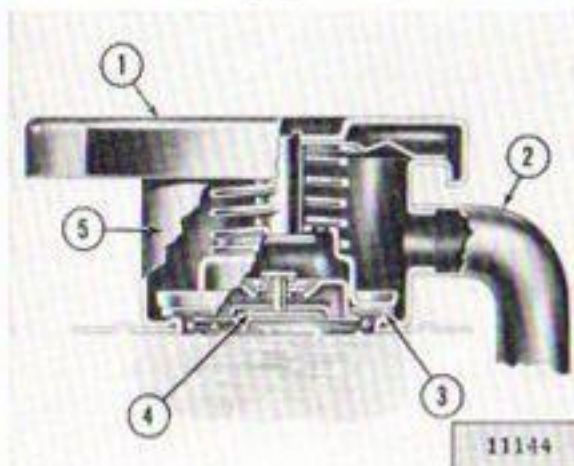


FIG. 17—RADIATOR CAP

- | | |
|-------------------|------------------------|
| 1—Pressurized Cap | 4—Vacuum Release Valve |
| 2—Overflow Tube | 5—Radiator Neck |
| 3—Pressure Seal | |

more efficient by permitting a slightly higher operating temperature. Vacuum in the radiator is relieved by a valve in the cap which opens at $\frac{1}{2}$ to 1 psi, [0,035 a 0,070 kg-cm²] vacuum.

To remove the radiator pressure cap when the engine coolant temperature is high or boiling, place a cloth over the pressure cap and turn counter-clockwise about $\frac{1}{4}$ turn until the first (pressure release) stop is reached. Keep the cap in this position until all pressure is released. Then, push cap down and turn still further until cap can be removed.

To install the pressure cap, place it in position and turn it clockwise as far as it will go.

Should replacement of the pressure cap become necessary, the replacement cap should have the same pressure rating as the original cap. Never replace it with the nonpressure type.

Draining Cooling System

To completely drain the cooling system, remove the pressure cap and open both drain cocks. One drain cock is located at the bottom edge of the radiator. The other drain cock is in the cylinder block directly behind the starter.

Remove the radiator cap to break any vacuum which might prevent thorough draining.

Thermostat

The cooling system is designed to provide adequate cooling under most adverse conditions. However, it is necessary to employ some advice to provide quick warming and to prevent overcooling during normal operation. Automatic control of engine operating temperature is provided by a water flow control thermostat installed in the

water outlet at the front of the engine cylinder head. The thermostat is a heat-operated valve. It should always be maintained in working order and the vehicle should never be driven without one installed as there would then be no control of engine temperature. The temperature at which the thermostat opens is preset and cannot be altered. If the thermostat is faulty, it must be replaced. Should sudden heating of the cooling system occur, the thermostat should be checked first. As a check, remove the thermostat and if overheating is eliminated, install a new one of the same type and rating.

A high temperature thermostat is available as optional equipment. Whenever this thermostat is installed, the only antifreeze recommended for the cooling system is ethylene-glycol base antifreeze.

Water Pump

The water pump is a centrifugal impeller type.

The sealed type double-row ball bearing is integral with the shaft and is prelubricated at the time of assembly with a special high melting point grease, so requires no lubrication.

The pump is designed to give maximum service without adjustments. Should trouble develop, consult your 'Jeep' dealer.

Fan Belt

The fan and alternator (and power steering pump on vehicles so equipped), are driven by a V-belt. The drive of the V-belt is on the sides of the V. A fan belt that is too tight will cause rapid wear

of the alternator and water pump bearings. If the belt is too loose, it may slip preventing the water pump from properly cooling the engine or the alternator from properly charging the electrical circuit. The fan belt is properly adjusted when it can be deflected $\frac{1}{2}$ " [13 mm.] with strong thumb pressure midway between the fan and alternator pulleys. Check this adjustment and inspect the condition of the fan belt at each engine lubrication period. It is good preventive maintenance to replace a badly frayed, worn, or cracked fan belt before it breaks in operation.

To replace the fan belt, loosen the attaching bolts at each alternator brace-to-engine mounting and pivot the alternator toward the engine to gain slack needed to install the new belt. Remove the old belt. Position the new belt over the fan pulley, over the crankshaft pulley, then over the alternator pulley. Pull the alternator away from the engine until the belt tension is firm. Then tighten the alternator mounting bolts and check the tension as indicated above. Reset the alternator as necessary for correct belt tension. Finally, if a torque wrench is available, torque the alternator pivot bolt to 40-45 lb-ft. [5,5-6,2 kg-m.] and the brace bolts to 12-15 lb-ft. [1,6-2,0 kg-m.].

Cold Weather Precautions

In regions where winter temperatures can be expected to drop below 32°F. [0°C.] precautions must be taken to prevent freezing of the water in the cooling system. Without the protection of

sufficient antifreeze solution added to it, water in the cooling system will freeze and expand, possibly bursting the radiator and the cylinder block.

It is important that the cooling system be made leak-proof before installing any antifreeze solution. Be sure that hose connections are tight and that the hoses are in good condition. Should there be doubt regarding the condition of either radiator hoses or heater hoses, replace them.

The base for the two most common antifreeze solutions is either methyl alcohol or ethylene glycol. Do not mix these two types in the cooling system as a hydrometer will not give an accurate reading of the mixture.

Methyl alcohol has a lower evaporation point than ethylene glycol. For this reason, when alcohol base solution is used it should be checked at least once a week. Use of ethylene glycol (permanent) is mandatory when a high-temperature thermostat has been installed.

Immediately after adding antifreeze, run the engine a few moments to thoroughly mix the solution.

The following tables show the degree of protection obtained from adding different amounts of antifreeze.

Antifreeze Chart

ANTIFREEZE			PROTECTION TO TEMPERATURE SHOWN			
Quarts U. S.	Quarts Imperial	Liters	Methyl Alcohol Fahr.	Methyl Alcohol Cent.	Ethylene Glycol Fahr.	Ethylene Glycol Cent.
11-Quart System						
2	1 $\frac{1}{2}$	2	13°	-10.5°	18°	-7.6°
3	2 $\frac{1}{2}$	2 $\frac{3}{4}$	0°	-17.7°	8°	-13.3°
4	3 $\frac{1}{2}$	3 $\frac{3}{4}$	-18°	-27.7°	-6°	-21.1°
5	4 $\frac{1}{4}$	4 $\frac{3}{4}$	-38°	-38.8°	-23°	-30.5°
6	5	5 $\frac{1}{2}$	...	...	-47°	-43.8°
12-Quart System						
2	1 $\frac{1}{2}$	2	15°	-9.5°	19°	-7.2°
3	2 $\frac{1}{2}$	2 $\frac{3}{4}$	3°	-16.1°	10°	-12.2°
4	3 $\frac{1}{2}$	3 $\frac{3}{4}$	-12°	-24.4°	0°	-17.7°
5	4 $\frac{1}{4}$	4 $\frac{3}{4}$	-31°	-35.0°	-15°	-26.1°
6	5	5 $\frac{1}{2}$	-59°	-35.5°	-34°	-36.6°

ELECTRICAL SYSTEM

The electrical system consists of four separate groupings: current supply, starting, ignition and lighting.

The current supply group furnishes current to operate the other three groups. The battery furnishes current when starting the engine or operating at idling speed. The alternator furnishes current (both to operate the other groups and to recharge the battery) when the engine is operating (including idle speeds with a normal electrical load). The voltage regulator controls the output voltage of the alternator. The alternator is self-limiting with respect to current. Accessories, such as heaters and radios, obtain their current supply through the ignition switch.

The starting group cranks the engine for starting. The starting switch energizes the starting motor solenoid. The solenoid is an electrical switch for the starting motor which automatically "kicks-out" when the engine starts. The starting motor drives the engine fly-wheel.

The ignition group furnishes the spark to the combustion chamber to ignite the fuel mixture. The ignition switch opens and closes the circuit. The ignition coil induces high secondary voltage. The distributor makes and breaks the primary circuit and distributes the high tension current in the secondary circuit. The spark plugs provide the spark to the combustion chamber. The high tension wiring is an important part of this system.

The lighting group consists of the lighting switches, lamp bulbs, and their sockets, and wiring.

Maintenance information on the components of the electrical system are given in this section of the manual.

Your 'Jeep' vehicle has a 12-volt electrical system. Use caution around the high voltage of the 12-volt system as accidental short circuits are capable of damaging electrical units. Also, arcs around the 12-volt battery are apt to ignite any gas that may be escaping from it.

All electrical contact points should be checked regularly for secure and corrosion-free connections.

Battery

The battery is 12-volt, 50 hour capacity.

Keep the two wing nuts on the hold-down frame

snug but tighten only with finger pressure, never with wrench or pliers. This precaution will avoid excessive pressure on the battery case.

Keep the battery terminals and cables clean and tight. A light coat of chassis lubricant applied at the terminals will reduce corrosion. Occasional cleansing around the terminals with soda solution or ammonia will prevent accumulation of corrosive deposits. Do not allow either soda or ammonia to get into the battery cells. Keep the cell caps in place and sealed during the cleaning.

Check the battery every 1000 miles [1,600 km.] with a hydrometer and at the same time check the electrolyte level in each cell; add distilled water to maintain the solution level $\frac{3}{8}$ " [9,52 mm.] above the plates. Avoid overfilling and do not fail to replace the filler caps and tighten securely. If the plates are exposed for any length of time, they can be seriously damaged, therefore, it is important to add enough water to keep the plates covered.

A hydrometer reading of 1.260 indicates that the battery is fully charged. Should the reading fall below 1.225 it will be necessary to recharge it or else use the lights and starting motor sparingly until the battery has had an opportunity to build itself up again.

Should the engine not turn over when the ignition key is turned to the start position, the battery may be discharged. If so, lights will be dim and the horn will have a weak tone or none at all.

The engine also will not turn over if the battery cables are broken or defective or if the cable connec-

tions at the starting motor solenoid or at ground are loose. Defective cables must be replaced; loose connections cleaned and tightened.

WARNING: Do not allow flames or sparks to be brought near the vent openings of the battery since hydrogen gas, produced in the course of the battery's normal operation in the vehicle, may be present in the battery and might explode. The liquid in the battery is a solution of sulphuric acid which, if accidentally spilled on the skin or splattered in the eyes should, as a first-aid measure, be flushed away promptly with quantities of clear water only. Seek medical aid if discomfort continues. If acid is spilled on the clothes, wet thoroughly with a weak solution of ammonia or with sodium bicarbonate or baking soda dissolved in water.

Engine Ground Strap

The rubber engine mountings insulate the engine from the frame. To assure a positive electrical connection between the engine and the frame, a ground strap is provided at the front engine support.

The attaching screws must be kept tight and the connections clean. A loose or poor connection may result in hard engine starting, low charging rate of the alternator or sluggish operation of the starting motor.

Alternator

Your 'Jeep' vehicle is equipped with a modern, self-limiting, high-output alternator. The alternator

produces a charging current whenever the engine is operating, which should be sufficient to continuously charge the battery under normal electrical loads. The alternator has sealed bearings that require no lubrication, and will seldom need service except for an occasional check of the charging circuit by an experienced technician. Your 'Jeep' dealer has the modern electrical equipment at his disposal with which to perform this check, which should be done at 12,000 mile [19,200 km.] intervals with one exception. At any time the 'AMP' warning light indicates "no charge" when the engine is running, check the charging circuit and correct the fault as soon as possible.

The 'AMP' warning light gives its own warning of a burned-out bulb as normally it should flash intermittently each time the engine is started.

CAUTION: Due to the characteristics of an alternator, charging circuit servicing can be dangerous to the vehicle's electrical system, the alternator itself, and even the individual, if left in the hands of the inexperienced worker. Particularly important is the polarity of the alternator and battery: that these polarities match-up, and that any booster battery or charging battery attached to the vehicle's battery be attached positive to positive and negative to negative, otherwise there is a danger of burning out the diodes in the alternator or the wiring. It is best to leave all such servicing to the trained technician at your 'Jeep' dealer.

Voltage Regulator

The voltage regulator used in conjunction with

the alternator is a sealed, transistor type. Because the alternator is self-limiting with respect to current, and can therefore never over-heat itself, the voltage regulator need only control the voltage produced by the alternator. It does this through the use of transistors. Because servicing of the voltage regulator should be a very rare occurrence, the unit is sealed, and must be replaced rather than repaired if trouble should develop. Whenever there is any indication that service to the charging circuit may be needed, consult your 'Jeep' dealer.

Ignition Wiring

The ignition wiring includes the wires or cables between the spark plugs, the distributor and the ignition coil. The connections should be kept clean and tight. The ignition wiring should be cleaned periodically by wiping with a dry cloth. The insulation should be examined once a year. If the insulation has become hard and brittle, the ignition wiring should be replaced.

Should the engine fail to start, especially in wet weather, the trouble may be caused by dirt and moisture on the ignition cables, spark plugs, and distributor cap. Clean and dry them with a clean cloth. Then start the engine.

Distributor

The distributor delivers the spark to the right cylinder at the right time. It is of dust-proof construction and is operated by a coupling on the oil pump shaft. A mechanical breaker, built in the

distributor, opens and closes the primary circuit.

The distributor cap should be kept clean for efficient operation. It should be inspected periodically for cracks, carbon runners, evidence of arcing and badly corroded high tension terminals. If any of these conditions exist, the cap should be replaced.

Inspect the distributor rotor for cracks or evidence of excessive burning at the end of the metal strip. After a rotor has had normal use, the end of the metal strip will become burned. If burning is found on top of the rotor, it indicates the rotor is too short and should be replaced. Usually when this condition is found, the distributor cap segment will be burned on the horizontal face and the cap should also be replaced.

Correct distributor point gap is very important. Dirty, burned or pitted points may cause misfiring. Points set too close together or too far apart can also cause the engine to misfire. The distributor points are cleaned and adjusted as part of a good engine tune-up. If their condition is questioned, separate the points and inspect them for being pitted or badly burned. Clean the points with a breaker point file. If the points do not clean up with a few strokes of the file they should be replaced.

Should new contact points be installed they should be aligned so as to make contact at the center of the contact surfaces. Bend the stationary contact bracket to secure correct alignment and then check the gap and timing.

To check the distributor point gap, crank the engine or place transmission in high gear and rock the vehicle forward enough to place the movable

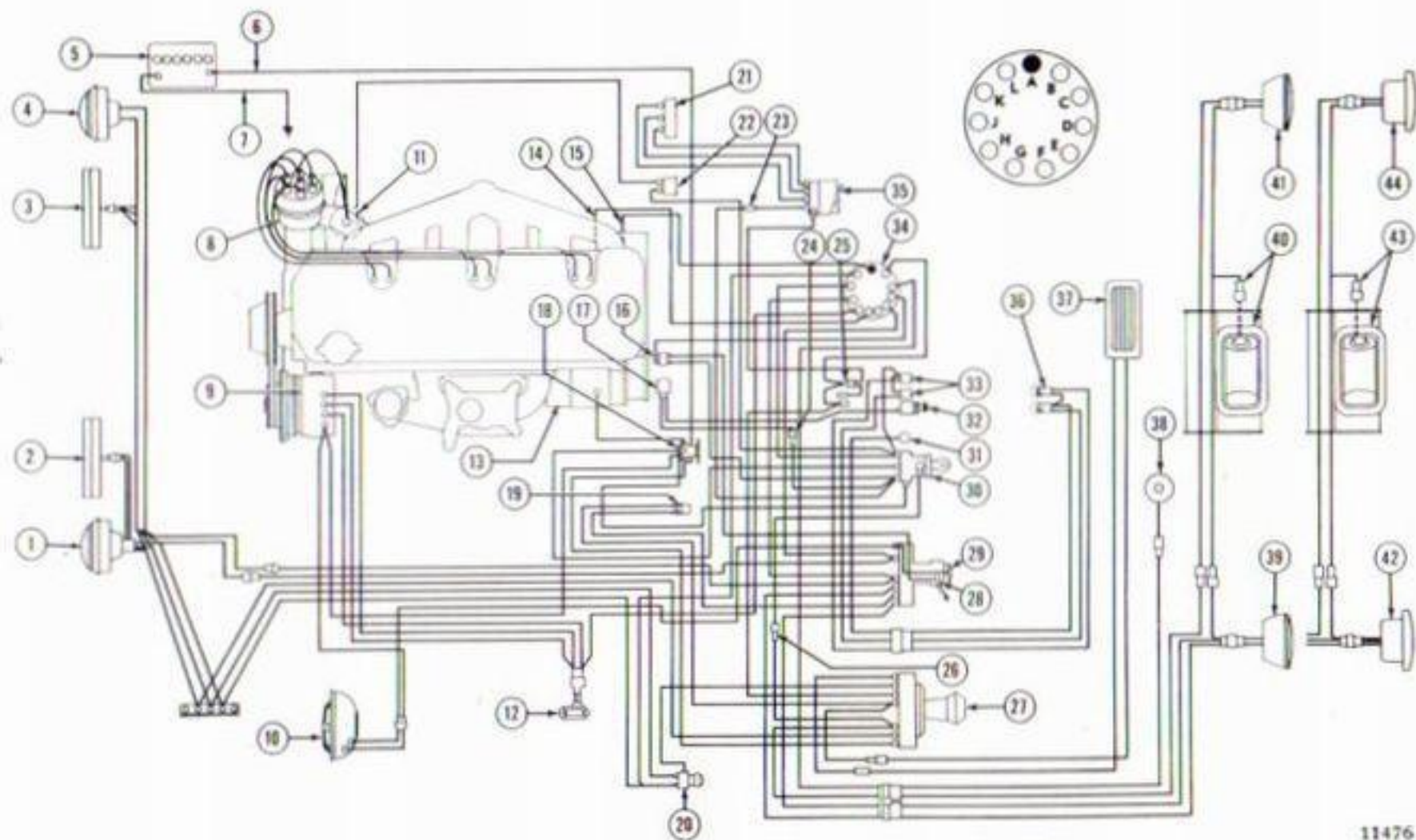


FIG. 18—WIRING DIAGRAM, J-200 and J-300 VEHICLES

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LEGEND FOR FIG. 18

- 1—Left Headlamp
- 2—Left Parking and Signal Lamp
- 3—Right Parking and Signal Lamp
- 4—Right Headlamp
- 5—Battery
- 6—Positive Cable
- 7—Negative Cable to Ground
- 8—Ignition Distributor
- 9—Alternator
- 10—Horn
- 11—Ignition Coil
- 12—Voltage Regulator
- 13—Starting Motor
- 14—Oil Pressure Sending Unit
- 15—Temperature Sending Unit
- 16—Flasher
- 17—Windshield Wiper Motor
- 18—Starting Motor Solenoid
- 19—Stop Light Switch
- 20—Foot Dimmer Switch
- 21—Heater
- 22—Ballast
- 23—Fuse
- 24—Fuse
- 25—Connector
- 26—Connector
- 27—Main Light Switch
- 28—Directional Signal Switch
- 29—Horn Button
- 30—Ignition and Starter Switch
- 31—Ground
- 32—Windshield Wiper Switch
- 33—4WD Indicator Lights
- 34—Instrument Cluster
 - A—Temperature Gauge
 - B—Cluster Lights
 - C—Fuel Gauge
 - D—Ground
 - E—Left Turn
 - F—Auxiliary
 - G—Oil Pressure Indicator
 - H—Charging Indicator
 - J—Right Turn Indicator
 - K—Ignition Feed
 - L—High Beam Indicator
- 35—Heater Controls
- 36—4WD Indicator Switches
- 37—Dome Lamp
- 38—Fuel Gauge Tank Unit
- 39—Left Tail and Stop Lamp—Townside
- 40—License Plate Lamp—Townside
- 41—Right Tail and Stop Lamp—Townside
- 42—Left Tail and Stop Lamp—Thriftside
- 43—License Plate Lamp—Thriftside
- 44—Right Tail and Stop Lamp—Thriftside

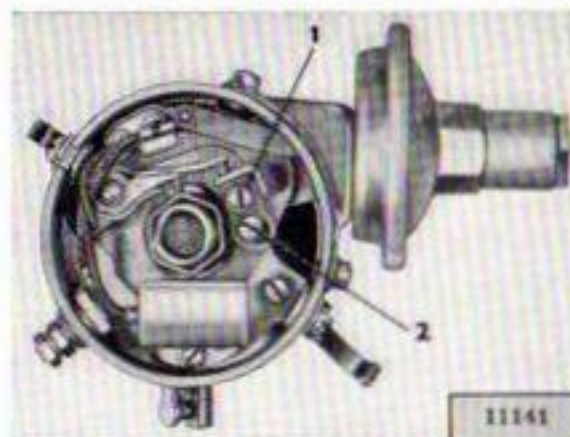


FIG. 19—DISTRIBUTOR

1—Lock Screw

2—Adjusting Screw

point cam follower on the peak of the cam and check the point opening, using a feeler gauge. Correct adjustment is .020" [0,51 mm.]. If necessary to adjust the points, loosen the stationary point lock screw and turn the eccentric screw as necessary. Tighten lock screw and re-check point opening. Install rotor, reassemble distributor cap and spark plug wires and make sure all terminals of primary wire at ignition coil and distributor are clean and tight.

Ignition Timing

To set the timing, remove all the spark plugs except No. 1. Rotate the crankshaft until No. 1 piston is coming up on the compression stroke. This can be determined by resistance in the cylinder.

Remove the spark plug and continue to turn

the crankshaft slowly until the 5° before top center mark is reached. This places the piston in the correct position to set the ignition timing.

Loosen the distributor clamp and rotate the distributor assembly until the distributor rotor arm points to No. 1 terminal in the distributor cap and the distributor points just start to break. To advance the timing turn the distributor in a clockwise direction, to retard it, turn in a counter-clockwise direction. Tighten the clamp screw firmly but do not over-tighten it.

After setting the timing, revolve the crankshaft two complete turns to make sure all backlash is eliminated. Again check the timing to the " 5° BTC" mark.

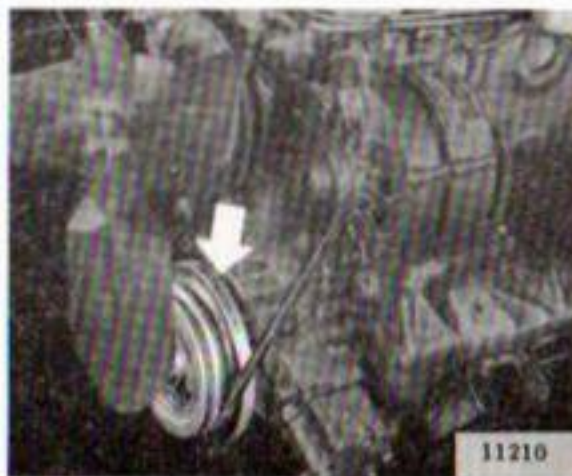


FIG. 20—TIMING MARKS

Ignition must be accurately set to obtain maximum engine efficiency. The above information

is given only to enable the operator to place the vehicle back in service should trouble develop. At the first opportunity, have your 'Jeep' dealer check the setting with a neon timing lamp. When a timing light is used, the timing mark should read 5° BTC with the vacuum disconnected; 18° - 20° BTC with the vacuum line connected and the engine at idle. This lamp can also be used to check the automatic spark advance operation by accelerating the engine.

Spark Plugs

CAUTION: Never disconnect spark plug cables from the spark plugs by pulling on the cables. Instead, grasp the boot on the end of the cable, give the boot a twist and pull it off the spark plug.

Spark plugs in any vehicle are expendable. They require occasional examination, adjustment, cleaning, and eventually replacement. Old spark plugs reduce your engine efficiency and economy. Replace them when inspection indicates the old plugs cannot be reconditioned.

Keep spark plug electrodes, terminals and porcelains clean. Fouled spark plugs can cause the engine to misfire. Dirty porcelains can cause hard engine starting, especially in damp weather. If porcelain insulator is cracked, install a new plug.

The spark plug electrode gap should be set at .030" [0,76 mm.]. Too wide gap will cause misfiring at high speeds and when operating with wide open throttle, while a small gap causes poor idling. Uniform gap setting assures smooth engine operation.



FIG. 21—SETTING GAP

It is recommended that spark plugs be replaced at intervals of each 12,000 miles [19,200 km.] of service since the spark loses intensity because of erosion of the electrodes.

Starting Motor

The starting motor is equipped with sealed type bearings and requires no lubrication. The starting circuit should be checked periodically. The starting circuit includes the starting motor solenoid and wires to the battery, voltage regulator, and ignition switch. All connections should be clean and tight. Insulation on the wires should not be worn or damaged.

If the starting motor will not turn the engine, although the light and horn operate properly, check the starting circuit. A "click" from the starter solenoid, when the ignition key is turned

to the start position, indicates that wiring in the starter circuit is properly installed. If the wiring is clean and tightly installed, the trouble is probably in the starter itself and should be referred to your 'Jeep' dealer.

Bendix Drive

The starter motor is equipped with Bendix Folo-Thru drive which is designed to overcome premature demeshing of the drive pinion from the flywheel ring gear until a predetermined engine speed is reached.

No adjustment or repairs are possible on this unit and a new Bendix Drive must be installed if trouble develops.

LIGHTING SYSTEM

The wiring of the lighting system is shown in the wiring diagram. The lighting circuit is protected by an overload circuit breaker which is integral with the main light switch and no replaceable fuse is used. The circuit breaker clicks on and off in the event of a short circuit in the wiring.

The upper and lower headlight beams are controlled by a foot switch located on the toe board at the left of the clutch pedal.

Main Light Switch

Should it be necessary to install a new light switch, a simple connection between the switch

and the wiring harness correctly installs all wires to their correct terminals.

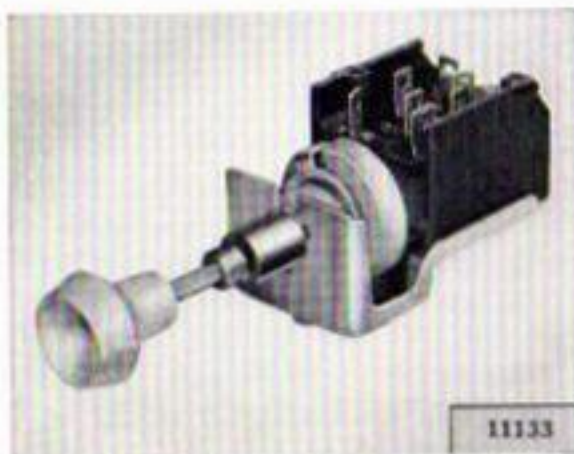


FIG. 22—MAIN LIGHT SWITCH

To remove the switch, pull the control knob out to the "headlight" position, push in on the release button located on the bottom of the light switch, and withdraw the shaft and knob assembly. The retaining nut may then be removed with a spanner wrench, and the switch removed through the rear of the instrument panel.

Headlight Aiming

Correct head lamp aiming is important to provide maximum road visibility and safety. To aim the head lamps, a darkened area with a light colored wall is required. The vehicle must be placed on a flat, level surface; square with the wall; and with the head lamps 25 feet [7.6 m.] from the wall,

Fig. 23. Inflate tires to recommended pressure. Rock vehicle from side to side to equalize springs and shock absorbers.

Place a vertical centerline on the wall in line with the center of the vehicle. Place two vertical black lines on the wall, one on each side of the centerline, at a distance equal to the lamp centers. Measure the distance from the floor to the center of each head lamp and place a horizontal black line on the wall corresponding to these measurements.

Cover the lamp not being aimed. Aim on the

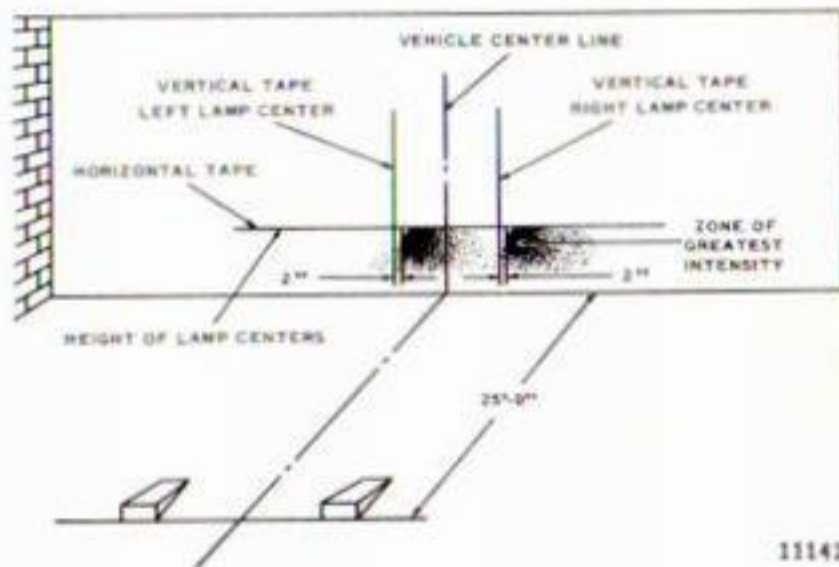


FIG. 23—HEADLIGHT AIMING CHART

lower head lamp beam. The top edge of the high intensity portion of the lower beam should be even with the horizontal line; the left edge should be 2 inches [5 cm.] to the right of the lamp center-line.

If the aim is incorrect, remove the head lamp door screw and remove the door. Adjust the vertical and horizontal aiming screws in the mounting ring until the beam is correctly aimed. Always bring the beam into final position by turning the aiming screws clockwise so that the sealed beam unit is held under proper tension when the operation is completed. Replace the head lamp door.

Cover the head lamp just aimed, and follow the same procedure for the opposite lamp.

Lighting System Checks

If headlights flicker on and off intermittently, the electrical system is overloaded. See your 'Jeep' dealer immediately to correct the condition.

If, when signalling a turn, the indicator light comes on but does not flash, a burned out signal or stop lamp bulb or a malfunctioning flasher is indicated.

If, when signalling a turn, the indicator light does not operate, a burned out indicator bulb or malfunctioning flasher is indicated.

Lamp Bulb Trade Numbers

The following bulb and fuse trade numbers should be used for replacements.

Front Lamps:	
Headlamp	6012
Parking and Directional Signal	1034
Rear Lamps:	
Stop, Tail and Directional Signal	1034
License Lamp	67
*Backup	1073
Indicator Lamps:	
High Beam	158
Directional Signal	158
Temperature	158
Charge	158
Oil Pressure	158
Panel	158
Vehicle Interior:	
Dome	212
Transfer Case Indicator	53
*Column Light (Automatic Transmission)	53
*Heater Quadrant	1816
*Radio	1892
Compass	53
*Clock	57
*Glove Box	1891
*Brake Warning	257
Ignition Switch	1445
Directional Signal Flasher Type	AP273S
Fuse Data:	
Directional Signal	9 Amp.
*Radio	2 Amp.
*Heater	14 Amp.
*Backup Light	9 Amp.
*Clock	2 Amp.
*Brake Warning	9 Amp.
Transfer Case Indicator	9 Amp.
*Optional Equipment.	

DRIVING COMPONENTS

The driving components transmit the engine's power to the wheels of the vehicle. The various options available with 'Jeep' vehicles make possible three different transmissions: an automatic transmission; a 3-speed synchromesh transmission; and a 4-speed synchromesh transmission. All 4-wheel-drive vehicles are equipped with a dual range transfer case.

On a vehicle equipped with a manual transmission, the clutch interrupts the flow of power when shifting gears. The transmission provides a series of gear ratios which enable the engine to start the vehicle from a standing position, while providing efficient operation at normal operating speeds.

On vehicles equipped with automatic transmission, the need for a clutch is eliminated, as the transmission automatically changes gear ratios in accordance with engine speed and the speed of the vehicle.

The propeller shaft transmits the power from the transmission or transfer case to the axle differential, which transmits it to the axle shafts. The axle shafts drive the wheels. The springs (or torsion bars, in the case of a vehicle equipped with independent front suspension) connect the axle to the vehicle frame, and the shock absorbers soften the ride. The brakes provide a means of rapidly slowing or stopping the vehicle when desired. On

vehicles equipped with power brakes, braking effort is reduced to but a light touch on the brake pedal.

Maintenance information is given on the following pages.

Clutch

The clutch is a single plate, dry disc type. It provides smooth engagement of the engine power to the wheels. To ensure that engine movement is not transmitted to the clutch pedal, and to ease pedal operation, the pedal operates the clutch through a hydraulic linkage. An overcenter spring located at the upper end of the clutch pedal assembly reduces the effort required to operate the clutch pedal. The clutch consists of a pressure plate assembly with pressure springs and release levers, and a driven plate assembly with spring center vibration neutralizers and two flexible



FIG. 24—CLUTCH PEDAL ADJUSTMENT

facings. The hydraulic system includes a master cylinder and reservoir mounted on the firewall, and a slave cylinder connected to the clutch housing.

Clutch pedal travel is adjusted by an adjusting nut located on the top of the clutch pedal support bracket. The clutch pedal should be set so it has no free play. To make this adjustment, set the



FIG. 25—CLUTCH FREE PLAY ADJUSTMENT

adjusting nut so the forward end of the push rod just touches the master cylinder piston, with the piston bottomed against the back of the master cylinder.

Clutch bearing free-play is adjusted with the adjusting yoke on the slave cylinder push rod. To set this adjustment, unhook the return spring, remove clevis pin, and push the slave cylinder

push rod as far forward as it will go. Hold this position. Move the clutch cross shaft lever to obtain zero free-play between the clutch bearing and the clutch plate levers. Then turn the yoke until the clevis fits through the clutch cross-shaft lever, and install the clevis pin. Again remove the clevis pin, turn the yoke two or three turns to *shorten* the push rod. Then reinstall the clevis pin and return spring. The clutch bearing free-play should now be correctly set.

Manual Transmission

The standard transmission is a three-speed synchromesh unit with remote control steering-post shift. It is bolted to the rear of the flywheel bell housing and is supported on a rubber insulator at the center frame cross member which forms the engine support.

If the shift is not smooth and positive, correction can usually be made in the following manner. First, place the gear shift lever in the neutral position, then remove the shift rod clevis pins at the gear shift levers at the base of the steering column. Next, make sure the transmission gears are in the neutral position. The gears are in neutral when the two control levers on the side of the transmission are in such a position that either of the levers can be freely moved while the other remains stationary.

Slip a piece of $\frac{3}{16}$ " [4,76 mm.] snug fitting rod (or a $\frac{3}{16}$ " drill) through the holes in the gearshift levers

to assure the correct neutral position of the shift mechanism.

So adjust the shift rod yokes that the clevis pins can be slipped freely into place without moving the control levers on the transmission. Then pull out the alignment rod.

Should unsatisfactory shifting remain after making these adjustments, it is advisable to consult your 'Jeep' dealer.

The optional 4-speed transmission is operated by a floor mounted cane shift lever. Where important differences occur between the standard and the 4-speed transmissions, these differences are described separately throughout this Owner's Manual.

Automatic Transmission

The automatic transmission and torque converter assembly are bolted to the crankcase adapter at the rear of the engine and is supported on a rubber insulator at the frame center cross member. The transmission is shifted by means of a lever on the left side of the transmission. This lever is connected by means of rods to the control lever mounted on the steering column.

The control lever also actuates an electrical switch which permits starting the engine only when the control lever is in neutral or park positions. An electrical switch mounted on the accelerator linkage actuates the "kickdown" feature of the transmission when the accelerator is pressed to the floor.

Preventive maintenance consists of adjusting

the bands after the first 1000 miles [1.600 km.] of operation, and at every 12,000 miles [19.200 km.] thereafter; and checking the oil level every 6000 miles [9.600 km.] and changing the oil every 30,000 miles [48.000 km.].

If difficult shifting is encountered, correction can usually be made by adjusting the shift linkage. An adjusting block connects the linkage to the control lever at the lower end of the steering column. To adjust the linkage, proceed as follows:

- Disconnect the adjusting block from the control lever.
- Move the transmission selector lever to the "P" (park) position.
- Pull up on the shift linkage as far as possible.
- Position the adjusting block on the linkage rod so that the adjusting block pin will slip freely into the hole in the control lever. Connect the adjusting block to the control lever.
- Check the adjustment for all selector lever positions. If necessary, readjust the linkage.

Transfer Case

All 4-wheel-drive vehicles are equipped with a transfer case with floor mounted shift lever. The transfer case is an auxiliary unit mounted at the rear of the transmission.

If difficult shifting is encountered, correction can usually be made by adjusting the shift linkage. An adjustable link is provided on the right side of the transmission.

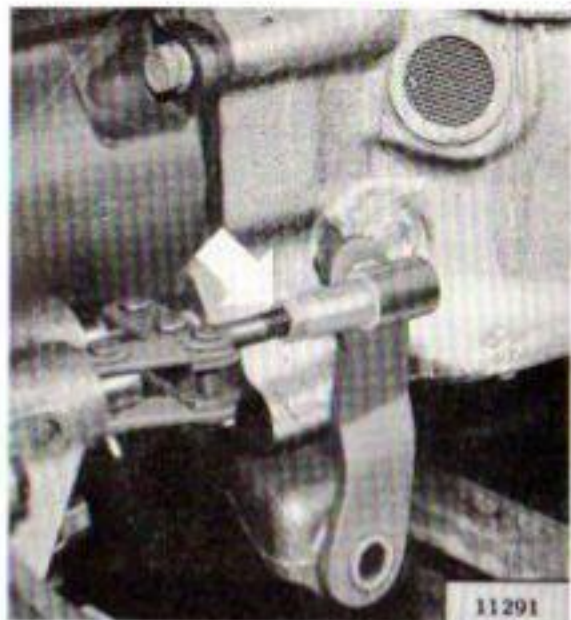


FIG. 26—ADJUSTING LINK

To adjust the shift linkage, proceed as follows:

- Disconnect the adjustable link.

- Position the transfer case shift rods located at the front of the unit. Pull both shift rods out to the last detent position. Make sure the detents are fully seated.
- Position the transfer case shift lever in the forward position, with $\frac{3}{4}$ " [19 mm.] clearance between the shift lever knob and the floor pan.
- With the shift rods and shift lever positioned as above, adjust and install the adjustable link.

Should unsatisfactory shifting remain after making these adjustments, it is advisable to consult your 'Jeep' dealer.

Propeller Shaft

The drive from the transmission to the rear axle on 2-wheel-drive vehicles, or from the transfer case to the front and rear axles on 4-wheel-drive vehicles, is completed through propeller shafts which are each equipped with two universal joints. Splined slip joints at the transmission or transfer case end of the shafts allow for variations in dis-

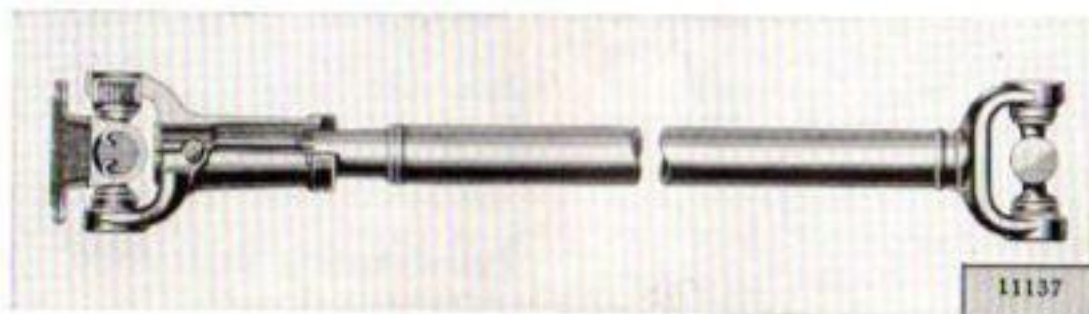


FIG. 27—PROPELLER SHAFT

tance between the transmission or transfer case and the axles due to spring action.

The journal trunnion and needle bearings are the only parts subject to wear, and should it become necessary to replace these parts, the propeller shafts must be removed from the vehicle to make replacement. When reinstalling, note that the splines are to be assembled so the yokes of the universal joints at the front and rear are parallel, avoiding vibration. The U-type attaching bolt nuts should be tightened evenly with approximately the same pressure on each nut.

Front Axle

If your 'Jeep' vehicle is equipped with independent front suspension, your front axle is "split" in two — the right and left portions being connected by a trunnion with a hinge.

On all vehicles, the front axle is a full-floating type. The load is carried on thrust type ball bearings at each spindle and on tapered roller bearings at the wheel.

All 4-wheel-drive vehicles, and 2-wheel-drive vehicles with independent front suspension, have spherical steering knuckles. Solid front axles on 2-wheel-drive vehicles have conventional king pin type steering knuckles.

On 4-wheel-drive vehicles, the front axle is a live driving unit with hypoid drive gears, and with axle shaft universal joints contained in the spherical steering knuckles. Axle shafts on 4-wheel-drive vehicles equipped with independent front sus-

pension also have a universal joint at the "split" in the axle.

The differential is mounted in a housing similar to that used in the rear axle, except the drive pinion shaft is toward the rear of the front and to the right of the center of the axle. This design allows placing the front propeller shaft along the right side of the engine oil pan without reducing the road clearance under the engine.

Rear Axle

The standard rear axle is the semifloating type. The end float of the axle shafts is adjusted by shims placed between the brake backing plates and the axle flanges.

To remove a shaft for replacement, first remove the hub cap, cotter pin and shaft nut. Use a wheel puller to remove the wheel hub. Remove the bolts attaching the brake dust shield and brake assembly. Remove the shield, gasket, grease retainer, brake assembly and bearing. Pull out the shaft, using care not to lose the bearing adjustment shims or to damage the inner oil seal.

Should the end of a broken shaft be inside the axle housing, the broken end can usually be removed by making a loop in a piece of wire, working the loop over the end of the shaft, and pulling the shaft from the housing with the wire.

When the shaft is replaced, adjust the bearings.

Full-Floating Rear Axle

On dual-rear-wheel models, each axle shaft is full floating and the dual wheels are carried on two

opposed tapered roller bearings at each wheel. The full-floating construction allows easy removal of axle shafts without removing the truck load or jacking up the rear wheel.

Axle shaft removal is accomplished by removing the bolts and lockwashers which attach the axle shaft flange to the wheel hub and then pulling the axle shaft from the housing.

Before installing an axle shaft, thoroughly clean both the axle shaft flange and the end of the wheel hub as any lubricant on these surfaces tends to allow the axle shaft flange bolts to loosen.

Place a new gasket over the axle shaft and push the shaft into the housing until the splines enter the differential side gear. Insert two bolts (first see NOTE below) through opposed holes in the flange and gasket and start the bolts into the hub. Install the remaining bolts and tighten them alternately. The bolts should finally be torqued to 200 lb-ft. [27,7 kg-m.].

NOTE: To prevent lubricant leaking through the axle shaft flange bolts, a small amount of Permatex (or equivalent) should be applied to the bolt threads. Avoid too heavy an application where the sealer will be squeezed out as the bolt is installed. This excess sealer may get between the axle shaft flange and the hub and thereby destroy the sealing of the axle shaft flange to the hub gasket.

Powr-Lok Rear Axle

Whenever a vehicle with Powr-Lok differential has one wheel jacked up, extreme care must be

exercised to be sure the transmission is in the neutral position whenever the engine is started. If the transmission is in gear, and the engine is started, under certain conditions the power might be transmitted to the rear wheel still on the ground, moving the vehicle off the jack.

STEERING SYSTEM

The steering system requires little attention other than proper lubrication and the maintenance of correct wheel alignment.

Incorrect alignment of the front wheels may be caused by striking curbs or other obstructions. Looseness through the steering system will also affect alignment. It is impossible to obtain satisfactory alignment without first adjusting various connections including front wheel bearings.

Before checking or adjusting front end alignment on vehicles equipped with independent front suspension, both sections of the "split" front axle must be perfectly horizontal. Level adjustment is made with the adjusting bolt at the frame end of the torsion bar.

Correct toe-in of the front wheels is $\frac{3}{64}$ " to $\frac{3}{32}$ " [1,2 a 2,4 mm.] which must be accurately measured for satisfactory front tire wear and steering. The best method of checking wheel alignment is by use of a wheel alignment fixture which is available in most well equipped shops. Toe-in cannot be accurately measured by using a straight edge along

the sides of the wheels. Toe-in is adjusted by lengthening or shortening the steering tie rod.

Periodic inspection and tightening of the steering parts will aid greatly in maintaining alignment. Keep the steering connecting rod ball joints snug but not tight; they must operate freely without lost motion. Keep the steering gear arm tight on the lever shaft and the steering housing bracket tight on the frame.

Do not tighten the steering gear to dampen out steering gear trouble. Should trouble develop, consult your 'Jeep' dealer.

Power Steering

Power steering is optional equipment. This system uses hydraulic pressure to assist in turning the front wheels. The hydraulic pressure is supplied by a pump mounted at the left front of the engine. The pump is operated by a belt to the engine crankshaft pulley. The system also includes a control valve and a power cylinder in the steering linkage. Should the power steering fail for any reason, the vehicle's regular steering system will still be operational. Should trouble develop in power steering, consult your 'Jeep' dealer.

BRAKES

The parking brake is mechanically controlled, through cables, which operate the rear brakes, or the optional transmission parking brake.

The foot brakes are hydraulically actuated in all four wheels. They are of the floating shoe, self-centralizing type and have chrome-nickel alloy drums.

In operation, pressure is applied to the hydraulic liquid in the master cylinder through the foot pedal, forcing the liquid through the lines and into the wheel cylinders. The pressure forces the pistons outward in the wheel cylinders, expanding the brake shoes against the drums. As the pedal is further depressed, higher pressure is built up within the hydraulic system, causing the brake shoes to exert greater pressure against the drum.

As the brake pedal is released, the brake shoe returns springs pull the shoes together forcing the fluid out of the cylinders and back into the lines toward the master cylinder.

The hydraulic brake system must be bled whenever a fluid line is disconnected or air enters the system due to low fluid level in the master cylinder reservoir. Air in the system will be indicated by a "spongy" pedal. Air trapped in the system is compressible and does not permit pressure, applied to the brake pedal, to be transmitted solidly to the brake shoes. Should bleeding be required, consult your 'Jeep' dealer.

Brake Shoe Adjustment

When the brake linings become worn, the effective brake pedal travel is reduced. The effective travel may be restored by adjusting the brake shoes.

Before adjusting the brakes, check the spring

clip nuts, brake dust shield to axle flange bolts, and wheel bearing adjustments because any looseness in these parts will cause grabby or erratic brake action.

Release the parking brake. Be sure the brake pedal returns freely to the released position. Also make sure that the pedal has approximately $\frac{1}{2}$ " [1.27 cm.] free travel without moving the master cylinder piston, which is necessary to prevent the brakes from dragging due to expansion of the hydraulic fluid.

Brake adjustment is accomplished as follows:

- Centralize the brake shoes in the drums by making a hard brake application and releasing the pedal.

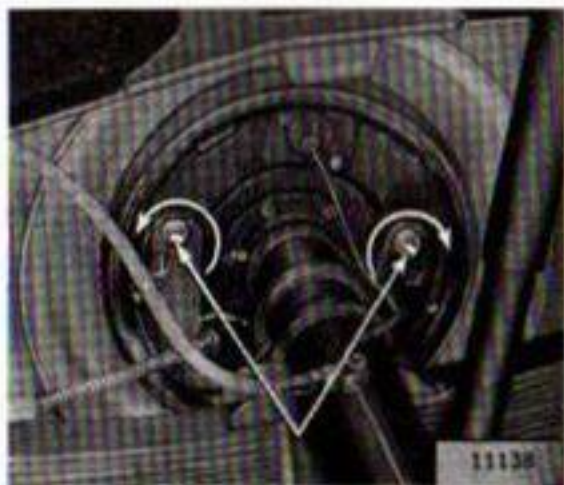


FIG. 28—BRAKE ADJUSTMENT

- Jack up all four wheels in a safe manner.
- At each left front and left rear wheel turn the

forward shoe adjusting cam clockwise until the shoe is tight against the drum. Turn the cam in the opposite direction until the wheel rotates freely without brake drag. Turn the rear shoe adjusting cam counterclockwise until the shoe is tight against the drum, then turn the cam in the opposite direction until the wheel rotates freely without drag.

- At each right front and right rear wheel turn the forward shoe adjusting cam counterclockwise until the shoe is tight against the drum, then turn the cam in the opposite direction until the wheel rotates freely without drag.
- Remove the jacks.

The brake shoes are self-centralizing so no anchor adjustments are required, also, as the fluid pressure is equal in all parts of the system the brakes are self-equalizing.

Dual-Rear-Wheel Brakes

Duo-servo, single anchor brakes are used at all wheels of the dual-rear-wheel models. Brake shoes are adjusted by turning a starwheel in the brake assembly. The starwheel is made accessible by removing a dust clip on the back of the brake backing plate. Use a suitable tool inserted through the access hole to turn the starwheel. Raise the handle of the tool to tighten the shoes against the brake drum. When the brake shoes are tight against the drum, back off the starwheel until the vehicle wheel rotates freely without brake drag. Replace the dust clip.



FIG. 29—BRAKE ADJUSTMENT
DUAL-REAR-WHEEL MODELS

Brake Maintenance

Keep brakes free of grease and oil as they cannot be expected to work well when little braking friction can be obtained between the linings and drums.

The wheel bearings should be lubricated only with wheel bearing grease, also use care that excessive lubricant is not put into the wheel bearings or the differential.

When wheels are removed, wash out the drums with solvent to remove all grease and dirt. Should there be any grease on the brakes, wash them thoroughly. It will be necessary to replace the brake lining should it become thoroughly saturated with lubricant.

Should either the foot or hand brakes require relining or should it be necessary to make a major adjustment, contact your 'Jeep' dealer.

Should the vehicle be driven up to the hubs in sand, mud or water, the wheels should be removed as soon as possible and all foreign matter removed from the brake drums and linings.

Types of Parking Brakes

Conventional cable-to-rear-wheel parking brakes are standard equipment. Transmission parking brakes are optional equipment. Both types are operated by a foot pedal at the left of the driver's compartment.

Parking Brake Adjustment

The parking brake system should be adjusted only after the foot brakes have been adjusted. Loosen the locknut on the brake cable adjusting



FIG. 30—PARKING BRAKE ADJUSTMENT

rod and tighten the adjustment until a slight drag is felt at the rear wheels. Then back off the adjustment until the wheels are free from drag, and relock the adjusting nut. Apply and release the brake and again check the rear wheels. They must be free from drag.

Transmission Parking Brake

Vehicles equipped with transmission parking brake have a brake drum located between the transfer case and the rear propeller shaft instead of the conventional cable-to-rear-wheel hand brake. Braking friction is applied on the drive line and has the gear reduction through the rear axle differential as an added advantage for holding the vehicle.

Transmission Parking Brake Adjustment

Make sure that the brake pedal is fully released. Give due attention to the cable and opening linkage to see that they do not bind. Should cable fail to slide freely in conduit, remove and lubricate it. Rotate the brake drum until one pair of the three sets of holes are opposite the two starwheels in the brake. Use the edge of the holes as a fulcrum for a suitable adjusting tool or a screw driver, rotate each starwheel by moving the handle of the tool away from the center of the drive shaft until the shoes are snug in the drum. Back off seven notches on each starwheel to secure the correct running clearance between the shoes and the drum.

Should the parking brake require relining or should it be necessary to make a major adjustment, contact your 'Jeep' vehicle dealer.

Power Brakes

The power unit is vacuum operated, utilizing intake manifold vacuum to reduce the brake pedal effort required of the driver. If the power unit for any reason should fail to operate, the brakes can be applied without the power assist. Minor brake adjustments and service to the brake hydraulic system remains the same as for a vehicle without the power unit. If trouble should develop in the power brake system, consult your 'Jeep' dealer.

WHEELS AND TIRES

Front Wheel Bearings

Each front wheel is mounted on two opposed tapered roller bearings. These bearings are adjustable for wear and their satisfactory operation and long life depends upon periodic attention and correct lubrication.

Loose front wheel bearings may cause excessive wear and will affect front wheel alignment. If the bearing adjustment is too tight, the rollers may break or become overheated.

To check the adjustment, first raise the front of the vehicle so the tires clear the floor. Check

the brakes to be sure they are free and fully released. With the hands, check the sidewise shake of the wheel. If the bearings are correctly adjusted, shake of the wheel will be just perceptible and the wheel will turn freely with no drag.

Front Wheel Bearing Adjustment

Should the test indicate that adjustment is necessary, remove the hub cap, grease cap, and the cotter pin from the adjusting nut. Spin the wheel and while it is turning very slowly, tighten the adjusting nut until a slight braking effect on the turning wheel is noticed. Then back off the adjusting nut to the nearest cotter pin hole and install a cotter pin. Be sure the wheel turns freely without bind or without side shake.

Maintenance of Front Wheel Bearings

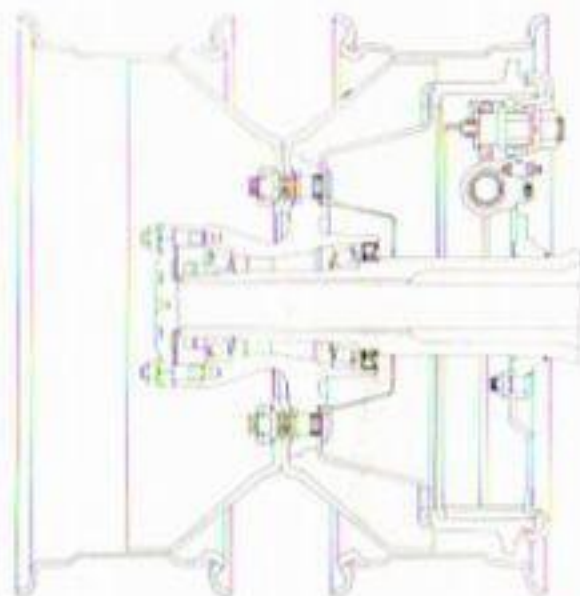
To ensure long service, lubricate and adjust the front wheel bearings as follows:

The bearings should be given more than a casual cleaning. Use a clean stiff brush and suitable grease solvent to remove all particles of old lubricant from the bearings and hubs. After the bearings are thoroughly cleaned, inspect them for pitted races and rollers and check the hub oil seals.

Repack the bearing cones and rollers with the recommended lubricant (see Lubrication Section) and reassemble in the reverse order of dismantling. Adjust them as directed above.

Dual-Rear-Wheel Models

Standard vehicles have a full-floating front axle and a semifloating rear axle. Dual-rear-wheel models have front and rear full-floating axles. The information preceding this paragraph on front wheel bearings for full-floating axles applies, therefore, to both front and rear wheel bearings on the dual-rear-wheel models. The information following on rear wheel bearings applies to standard models only.



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FIG. 31—DUAL REAR WHEEL

Rear Wheel Bearings

Each rear wheel is carried on a single tapered roller bearing which is adjusted by shims which in

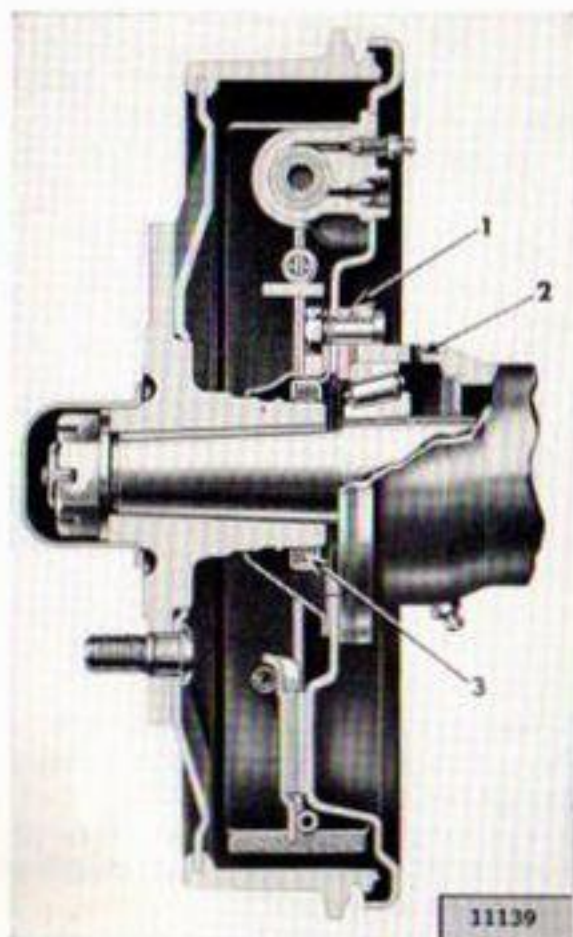


FIG. 32—REAR WHEEL HUB

- 1—Shims
- 2—Vent Hole
- 3—Grease Seal

original assembly are placed between the right brake backing plate and the axle flange.

Check the wheel bearing adjustment in the same

manner as the front wheel. Should the check determine that adjustment is required, remove the hub cap; remove the cotter pin, the axle shaft nut and use a wheel puller to remove the wheel hub. Remove the bolts holding the brake dust shield, the grease and bearing retainer and the brake assembly.

One set of shims only is used in production to adjust both axle shafts. Adjust the bearings to provide .001" to .006" [0,0254 a 0,1524 mm.] end float of the shafts. While shims are ordinarily placed back of one bearing only it is in order to add shims at the opposite flange should they be required to correctly adjust a new bearing or axle shaft. Examine the grease retainer to be sure it is serviceable; install a new one if in doubt, and reassemble.

Maintenance of Rear Wheel Bearings

Should it be necessary to adjust the bearings, clean them thoroughly and repack them with the recommended lubricant. Should the bearings be removed for any reason, it is advisable to install new oil seals to guard against leakage of lubricant.

Mounting and Dismounting Wheels

The wheel mounting nuts and studs on both left wheels have left-hand threads to prevent them from being loosened by wheel action. The studs are identified by an "L" stamped on the end. The left-hand threaded nuts are identified by a groove cut around the hexagonal faces, or by

L-E-F-T stamped on the face of each nut.

Left-hand nuts must be turned to the **RIGHT** to be removed and right-hand nuts turned to the **LEFT** to be removed.

Use the following procedure to dismount and mount wheels.

- Set hand brake. Block the wheels if on a grade.
- Remove the spare tire from under the rear of the car by removing the bolt that holds firm the spare tire retaining bracket.
- Place jack under the bumper in line with the wheel. Direction of movement of the jack is controlled by a lever on the jack housing. Lift the lever when the jack is to be raised, push the lever down when the jack is to be lowered. Raise the jack until it is in contact with the bumper, but do not raise the vehicle.
- Remove the wheel cover if the vehicle is so equipped. Loosen wheel nuts before raising vehicle.
- Raise the vehicle until the tire is off the ground. Remove nuts and wheel.
- When mounting the wheel on the vehicle, first place the wheel on the stud and replace the stud nuts. Tighten the nuts enough to hold the wheel in proper position. When tightening stud nuts, alternately tighten opposite stud nuts to prevent wheel runout.
- Lower the vehicle and remove the jack. Tighten the nuts securely. Replace wheel covers.

Tires

Tire pressure, tire rotation, wheel balance, and wheel alignment are the four vital factors that influence the extent of tire life and the ease and

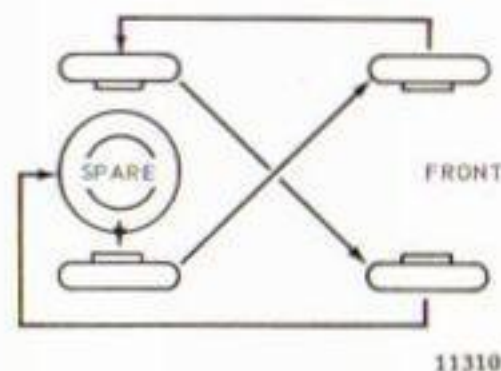


FIG. 33—TIRE ROTATION

safety of vehicle control. Four of the most common tire trouble are:

- Excessive wear around the outer edges resulting from under-inflation.
- Excessive wear in the center of the tread resulting from over-inflation.
- Tire tread worn on one side indicating wheels need realigning.
- Cuplike depressions on one side of the tread indicating wheels need balancing.

The recommended pressures for all tires are as follows:

Tire Size	Ply		Pressure			
			Front		Rear	
			psi	kg/cm ²	psi	kg/cm ²
7.00-16	6		30	2.11	45	3.16
7.00-16	6	Dual	45	3.16	45	3.16
7.50-16	6		30	2.11	45	3.16
6.70-15	4	Tubeless	26	1.82	26	1.82
7.10-15	4	Tubeless	26	1.82	26	1.82
7.60-15	4	Tubeless	27	1.89	27	1.89

If your 'Jeep' vehicle is equipped with tire sizes other than those listed here, ask your 'Jeep' dealer to recommend correct tire pressures.

The importance of correct tire inflation cannot be over-emphasized. To secure maximum tire life and most efficient vehicle operation, it is imperative that these pressures be maintained for all normal vehicle operation.

Valve caps should always be used. They should be free of dents and damaged threads. Valve caps protect valve cores by keeping out dust, dirt and moisture.

Cross-switch the tires every 6000 miles [9.600 km.]. This practice will even out differences in wear and make a set of tires last longer than they would without cross switching. Refer to Fig. 33 for the recommended rotation method. When a method of tire rotation is selected, it should be used consistently or the full benefits of tire rotation may be lost.

Drop Center Rim

Rear wheels on all models except dual-rear-wheel models are mounted on drop center rims.

To remove a tire from a drop center rim, first deflate completely and then force the tire away from the rim throughout the entire circumference until the bead falls into the center of wheel rim, then with a heavy screw driver or tire removing tool, used opposite the valve, remove one side of the tire at a time and remove the inner tube.

Installation of a tire is made in the same manner by first dropping one side of the tire into the center of the rim and with a tire tool, spring the bead over the rim, using care not to damage the inner tube.

When mounting the wheel, alternately tighten opposite stud nuts to prevent wheel wobble. After nuts have been tightened with the wheel jacked up, lower the jack so wheel rests on the floor and retighten the nuts.

Semi-Drop Center Rim

Rear wheels on all dual-rear-wheel models are mounted on semi-drop center rims.

To remove a tire from a semi-drop center rim, first deflate completely and then force the tire away from the rim throughout the entire circumference until the lock ring is loosened. Using the slot near the split in the lock ring as a starting point, spring the lock ring off the wheel rim with a suitable tool. Remove the tire from the rim and remove the inner tube.

Installation of a tire on a semi-drop center rim is made in the same manner as removal. First drop the tire onto the rim, and with a tire iron or heavy screw driver, spring the lock ring over the wheel rim. Before fully inflating the tire, test the seating of the lock ring as outlined.

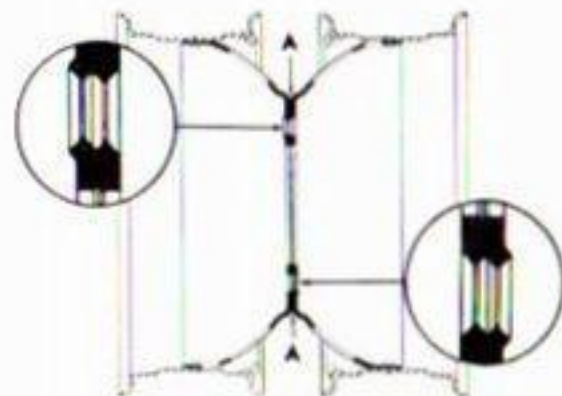
WARNING: Tires with 45 pounds pressure can be dangerous if improperly installed. It is recommended that, after installation of the tire on the rim, the tire be partially inflated, then completely deflated. Next, check the lock ring for proper seating. Turn the wheel so the lock ring is down, then inflate the tire to the correct pressure.

When mounting the wheel, alternately tighten opposite stud nuts to prevent wheel wobble. After the nuts have been tightened, lower the jack so the wheel rests on the ground and retighten the nuts.

Mounting Dual Rear Wheels

There is a correct and an incorrect way to mount the outer rear wheels on dual rear wheel vehicles. Incorrect mounting can cause wheel stud fracture under certain load and operating conditions. It is important that the outer rear wheels always be remounted in the correct manner:

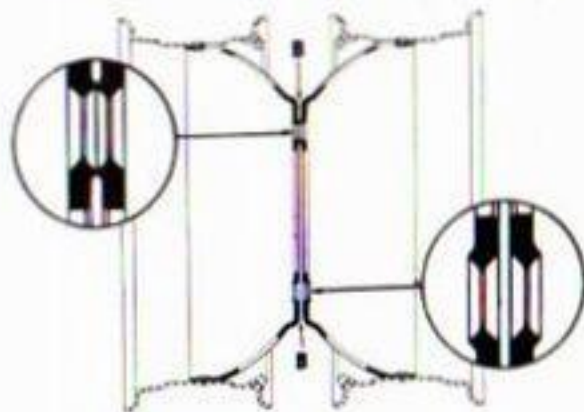
- Examine the wheels and note that three of the stud holes are provided with a lip projected toward the inside of the wheel and the alternate three holes have the same lip projected toward the outside of the wheel.



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FIG. 34—CORRECT INSTALLATION

- To properly install, place the outer wheel on the inner wheel so the direction of the lips at each stud hole correspond as shown in Fig. 34. If installed as indicated, there will be no space between the two wheel mating surfaces at



10232

FIG. 35—INCORRECT INSTALLATION

point A, when the nuts are properly torqued on the studs. If outer wheels are improperly installed there will be gaps between the mating surfaces as indicated at point B, Fig. 35.

- Once sure the wheels are properly mated, torque the wheel nuts to 200 lb-ft. [27 kg-m.].

SUSPENSION

Springs and Shackles

'Jeep' vehicles equipped with independent front suspension have torsion bar type front suspension at the front and leaf type springs at the rear. 'Jeep' vehicles equipped with solid front suspension have leaf type springs at both front and rear.

Should independent front suspension require service, consult your 'Jeep' dealer.

The springs should be periodically examined for broken or shifted leaves, loose or missing rebound clips, angle of the spring shackles and the position of the springs on the axle saddles. Springs with shifted leaves do not have their normal strength. Missing rebound clips may permit the leaves to fan out or break on rebound. Broken leaves may make the vehicle hard to handle or permit the axle to shift out of line. Keep the spring attaching bolts tight.

Shock Absorbers

The shock absorbers are of the direct action type giving two-way control, however, they are

not adjustable. They dampen spring action, as the vehicle passes over irregularities in the road.

The shock absorbers are mounted on rubber bushings at both top and bottom. Should squeaks occur in the bushings, add a flat washer on the mounting pins to place the bushings under greater pressure and prevent movement between the rubber and metal parts.

DO NOT USE mineral oil to remove squeaks.

BODY

Seat Fabric Care

The seat in your 'Jeep' vehicle is covered either in vinyl fabric, or a combination of vinyl and woven fabrics. Vinyl fabric can be cleaned by washing with mild soap and water. **DO NOT USE** a volatile type cleaner on vinyl fabric. The woven fabric may be cleaned with a good quality upholstery cleaner. Follow directions furnished by the manufacturer.

Paint Care

Frequent washing with clear water and polishing with a soft cloth or chamois will preserve the original luster of the finish. Always use cold water in washing the vehicle. Never wash it in the direct rays of the hot sun and always wait until the sheet metal surfaces are cooled before washing.

If the exterior finish becomes extremely dirty,

and especially when the dirt is allowed to remain for some time, it may remain dull even after washing. Dullness may also be caused by slight oxidation of the finish due to chemical action of the elements.

All that is needed to remove the dullness, bringing back the original luster, is a small amount of good polish. Rub the polish lightly until dry to eliminate a damp surface which will collect dust.

Oxidation of the finish will be reduced to a minimum by periodic application of a good-quality wax.

Chrome Care

The chromium plated parts on your vehicle are protected by a special corrosion inhibiting metal wax.

To retain the wax protection, use only water when cleaning chrome plated parts. Do not use an abrasive or strong cleaning materials such as chrome polish, steel wool or scouring powder.

Periodically, clean the chrome surfaces and re-coat them with a good quality wax. Rust, which may result from surface damage, should immediately be removed and the damaged surfaces reprotected with wax.

Vehicle Weights

Approximate vehicle weights for each body style applicable to vehicles coded on Page 6.

Vehicle Code***

	<u>Thrifside</u>				<u>Townside</u>			
	Shipping*		Curb**		Shipping*		Curb**	
	Pound	Kilogram	Pound	Kilogram	Pound	Kilogram	Pound	Kilogram
2306F	3196	1450	3331	1511	3304	1498	3439	1560
2306A	3236	1468	3371	1529	3344	1517	3479	1578
2306B	3319	1505	3454	1566	3427	1554	3562	1615
2306E	3263	1480	3398	1541	3371	1529	3506	1590
2306B	3387	1536	3522	1597	3495	1585	3630	1646
2306C	3488	1582	3623	1643	3596	1631	3731	1692
2406F	3415	1549	3550	1610	3523	1598	3658	1659
2406A	3455	1567	3590	1628	3563	1616	3698	1677
2406B	3538	1605	3673	1666	3646	1653	3781	1715
2406E	3472	1575	3607	1636	3580	1624	3715	1685
2406B	3596	1631	3731	1692	3704	1680	3839	1741
2406C	3697	1677	3832	1738	3805	1726	3940	1787

Vehicle Code***

	<u>Platform</u>				<u>Stake</u>			
	Shipping*		Curb**		Shipping*		Curb**	
	Pound	Kilogram	Pound	Kilogram	Pound	Kilogram	Pound	Kilogram
2306B	3524	1598	3659	1660	3680	1669	3815	1685
2306D	4155	1885	4290	1946	4325	1962	4460	2023
2306B	3603	1634	3738	1695	3771	1710	3906	1772
2306C	3704	1680	3839	1741	3872	1756	4007	1817
2306D	4229	1918	4364	1979	4411	2001	4546	2062
2406B	3743	1698	3878	1759	3899	1768	4034	1830
2406D	4364	1979	4499	2041	4534	2057	4669	2118
2406B	3812	1729	3947	1790	3980	1805	4115	1866
2406C	3913	1775	4048	1836	4081	1851	4216	1912
2406D	4438	2013	4573	2074	4620	2095	4755	2157

All Models — Add

	Shipping*		Curb**	
	Pound	Kilogram	Pound	Kilogram
Automatic Transmission	76	34.4	87	39.4
Four Speed Transmission	76	34.4	87	39.4
Power Steering	20	9.0	20	9.0
Power Brakes	13	5.9	13	5.9
Heater	32	14.5	34	15.4
Directional Signals	2	0.9	2	0.9
Radio and Antenna	7	3.1	7	3.1
Oil Filter	6	2.7	7	3.1

*Less Fuel and Water

**Including Fuel and Water

***See Page 6 for vehicle code identification

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