

1275
206-02

**Instruction Manual
and Lubrication Chart**

for

**Model M-1-4-214 Truck
Model M-2-4-233 Truck**
(4 x 4)

built for the

United States Marine Corps

by

INTERNATIONAL HARVESTER COMPANY

180 NORTH MICHIGAN AVE. CHICAGO, ILLINOIS, U.S.A.

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To Prepare Truck for Service

Radiator

Fill radiator with clean, soft water until water comes out of overflow pipe. Under no circumstances should cold water be poured into radiator when engine is hot.

During cold weather cover the lower portion of the radiator sufficiently to maintain an engine operating temperature of 160° to 180° F. For continuous cold weather use solutions having a low freezing point.

Fuel Tank

Never fill tank while engine is running or when an open flame is near. Keep filling spout in contact with metal of tank when pouring in fuel to avoid the possibility of an electric spark igniting the gas. *Caution:* Do not light matches near gasoline, as the air within a radius of several feet is permeated with a highly explosive vapor.

Engine Oil

Be sure that lubricating oil in crankcase is up to the "Full" mark on oil level gauge located on left side of crankcase between generator and starting motor. When testing oil level, the gauge should be withdrawn and wiped clean; then inserted all the way and withdrawn for a true reading. Never test oil level while engine is running. Use only a good grade of engine oil. Never use dirty oil or oil of inferior quality. (See *Lubrication Chart*.)

Battery

Be sure water level is $\frac{3}{8}$ " above separators and plates. Use only pure distilled water. (See page 16.)

Tires

Examine tires and be sure they have the proper air pressure. Be sure tire valve caps are in place and screwed tight.

Hydraulic Brake Master Cylinder

Be sure fluid level is within $\frac{3}{8}$ " from bottom of filler neck. *Always use Genuine "Lockheed" fluid.*

Unit Capacities

Engine Oil (refill).....	5	Quarts
Transmission Oil.....	5½	Pints
Transfer Case Oil.....	4	Pints
Differential Oil {Front Axle	5	Pints
{Rear Axle	5	Pints
Cooling System.....	17	Quarts
Fuel Tank {Model.....	14	Gallons
{Model.....	17	Gallons

Green Diamond Engines

IHC Model "GRD-214"— $3\frac{5}{16} \times 4\frac{1}{8}$ "

IHC Model "GRD-233"— $3\frac{5}{16} \times 4\frac{1}{2}$ "

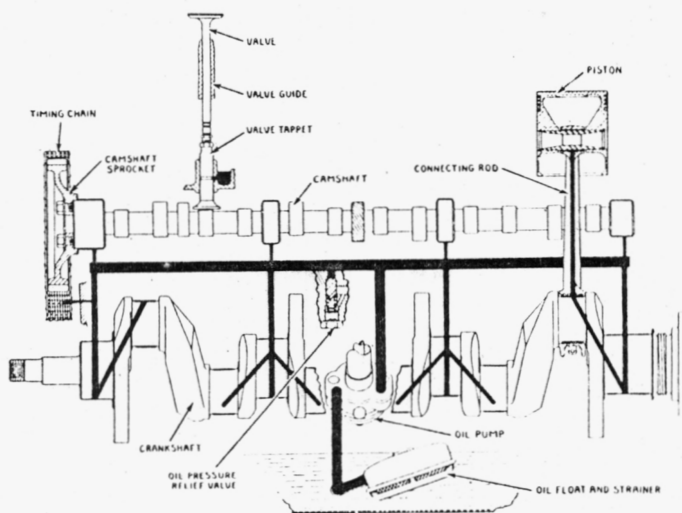
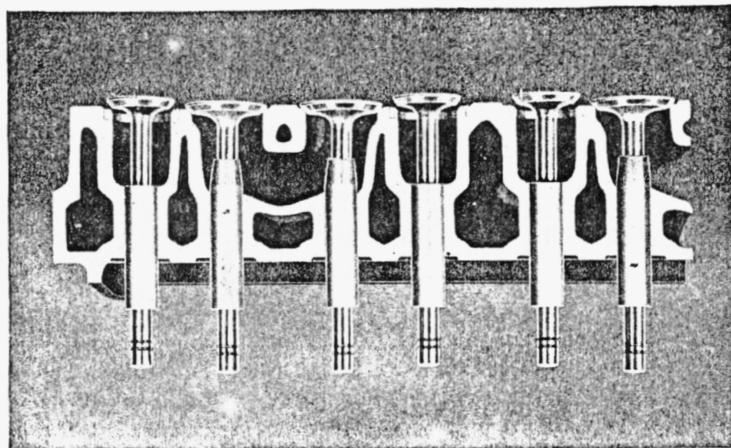


Diagram shows flow of oil through engine.

The powerful 6-cylinder Green Diamond Engines have full-pressure lubrication obtained by a force-feed system. Oil is pumped through drilled passages and is safeguarded from dirt by a floating-type oil intake. Oil pressure on gauge at idling speed (200 to 300 r.p.m.) should read between 5 to 10 pounds when oil is hot. Maximum pressure is set at the factory to read between 25 to 30 pounds (500 to 600 r.p.m.). Oil pressure is controlled by a non-adjustable relief valve located on distributor side of crankcase. An efficient *oil filter* is provided and it is *very important* to replace filter cartridge when oil becomes a smoky or dark color. To replace old cartridge, remove filter top cover and take out dirty filter. Always use a new cartridge for replacement.

Green Diamond Engines



This cross section through part of the Green Diamond engine block shows the large water passages which completely surround intake and exhaust-valve ports; the large exhaust-valve ports which facilitate the escape of hot exhaust gases; the heavy-duty, truck-type intake and exhaust valves with full-size stems; and the hardened exhaust-valve seat inserts.

VALVE TAPPET ADJUSTMENT

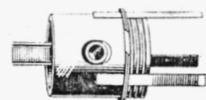
Proper clearance is .015" to .017" for intake and exhaust valves when engine is hot, or .018" to .020" when engine is cold.

Caution: Settings closer than mentioned above will result in short valve life.

Pistons, Rings, Pins

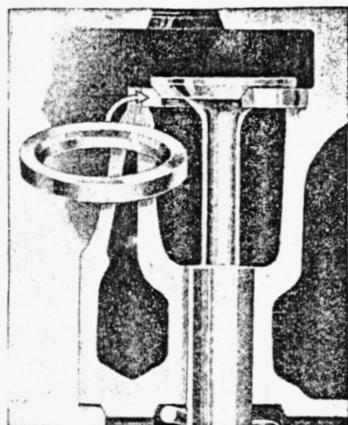
Pistons are long-skirted, have 4 rings and are removable through top of cylinder block.

How to Remove Rings



Removing Piston Rings.

Place three metal strips under top piston ring having two strips set a short distance from gap in ring and have third strip set directly opposite gap. This spreads ring evenly all the way around, thus allowing ring to be removed without breaking. Take off all rings in the same manner. After rings are removed, clean out all carbon in ring grooves on piston as it will be impossible to fit new rings if carbon is allowed to remain in grooves.



Frequent valve grinding is unnecessary and valve-seat burning is retarded by the use of hardened exhaust-valve seat inserts.

How to Fit New Rings

New rings should be fitted into the cylinders before trying to place them on the pistons. When fitting new rings in the cylinder put the piston in the cylinder ahead of the rings. Push the rings against the top of the piston. This will prevent them from being out of square with cylinder bore, and a false reading of the gap clearance will be avoided. When the rings are square, both oil and compression rings should have a gap clearance of .007" to .015". Side clearance between rings and grooves in piston should be .001" to .0025" for oil control ring and .0015" to .003" for compression rings.

How to Fit New Pin

Pin is held in place by a snap ring at each end. Piston pin should be palm-push fit, at normal room temperature (70° F.).

NOTE: It is very important when reaming bearings in the piston pin bosses, to see that holes are reamed smoothly and in perfect alignment, so pin will fit properly.



Fitting Piston Pin.

Green Diamond Engines

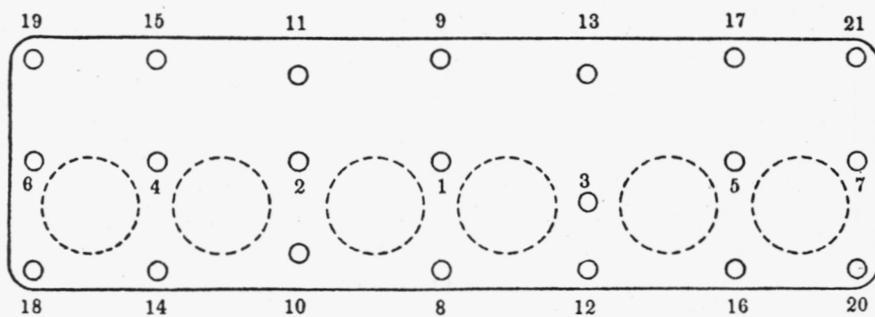
Cylinder Head and Gasket

How to Remove

Drain the water and disconnect upper hose at radiator. Disconnect spark plug cables at spark plugs and heat indicator cable at engine unit. Remove cylinder head capscrews and lift off the horn and spark plug cable brackets. Do not drive a chisel or screw driver between cylinder head and block.

How to Replace

Always use a *new* gasket and cover it on both sides with cup grease or a suitable sealing compound. Place gasket on cylinder block, smooth side up as stamped on gasket, and press down carefully. Tighten capscrews in center of head first, working both ways towards the ends as illustrated below. *Fill radiator with clean, soft water.* Run engine a few minutes and again tighten capscrews firmly and uniformly.



When replacing gasket and cylinder head, tighten capscrews firmly and uniformly in the order shown.

Connecting Rods

Connecting rods and piston assemblies are removed through the top of block. Cylinder numbers are stamped on a flat space on rod and cap, and rods should always be assembled with these numbers toward camshaft side of crankcase. No shims are used on connecting rods.



Easily replaced, precision-type, steel-backed, bab-bitt-lined main and connecting-rod bearings with large area are employed, assuring ample capacity and proper oil control.

Connecting-Rod Bearings

The factory setting for clearance between the connecting-rod bearing and crankshaft is .001" to .0025". A side clearance of .005" to .009" is allowed.

The connecting rods are not fitted with shims.

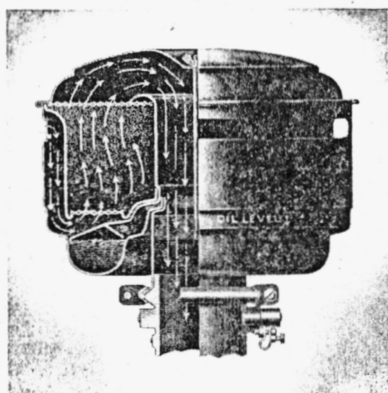
Bearing wear can be remedied only by installing new bearings. Connecting rod or cap should never be filed to adjust bearings.

Main Bearings

Numbers stamped on bearing cap bosses indicate position for installation. Number should face camshaft side of crankcase. The small tongues on main bearings should fit snugly into grooves in crankcase and main bearing caps.

Camshaft Bearings

Only the front bearing is replaceable, the second, third and rear bearings are integral with the crankcase.

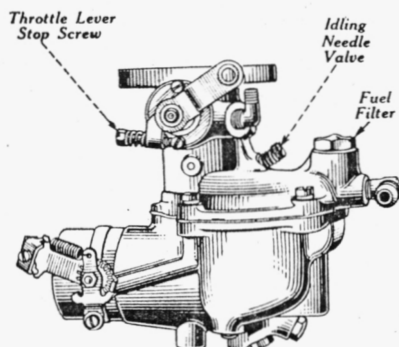


Air Cleaner—Oil-Bath Type.

Air Cleaner

An efficient oil-bath air cleaner which keeps dirt and grit out of the engine is securely fastened to the carburetor by a dustproof, V-type seal. Remove the filter element every 5000 miles or oftener under severe dust conditions and wash in kerosene. Be sure all kerosene has drained from filter element before reassembling. Never allow dirt level in oil sump to reach underside of baffle. Clean out oil sump and refill to indicated level with clean engine oil. For warm climate use SAE-40 or SAE-50 and for cold climate use SAE-20 or SAE-30.

Carburetor (Zenith)



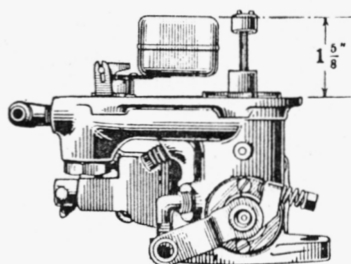
Fuel Filter:

The filter in carburetor should be removed and periodically cleaned. To clean filter, remove filter head and element. The sump may then be cleaned with a small clean cloth. Remove the element from head. This allows individual washers to be slightly separated from each other so that all dirt can be blown from the element. Use only moderate air pressure when blowing dirt from element.

Idling Adjustment:

Start engine and run until thoroughly warm.

Close throttle and set stop screw on throttle lever so that engine will run sufficiently fast to keep it from stalling. Turn in or out on idling needle valve until engine fires evenly and without galloping or skipping. Then back off on stop screw until desired idling speed is obtained.



Float Level Adjustment:

For good performance, a float level of $1\frac{5}{8}$ " (with an allowable variation of $\frac{3}{64}$ ") should be maintained. This measurement should be taken on side of float opposite the intake needle and measured from bottom of float to machined surface of bowl cover, with gasket removed.

Choke Control

When engine starts, choke button should be pushed in to its best running position, and all the way in as soon as engine is warm enough to permit it. *Caution: If choke is not properly used, engine can be seriously injured by allowing unburned gasoline to leak down past the pistons, thus thinning the engine lubricating oil to a degree where its value as a protecting film between moving parts is entirely destroyed. Because of this, it is recommended that new oil be used more often in very cold weather.*

In extremely cold weather, the most successful starting method is as follows:

- (a) Pump the accelerator pedal three or four full strokes.
- (b) Pull out the choke button full distance.
- (c) Turn switch key to "On" position.
- (d) Push clutch pedal forward.
- (e) Pull throttle button $\frac{1}{3}$ open.
- (f) Step on starter pedal and hold in engagement until engine starts. *Caution: Do not run starting motor for more than approximately 30 seconds at any one time.*
- (g) When engine starts, partially close throttle button to fast idle.
- (h) When engine warms up, gradually push in choke button.

Fuel Pump Filter Screen

The filter glass bowl and filter screen should be removed and periodically cleaned.

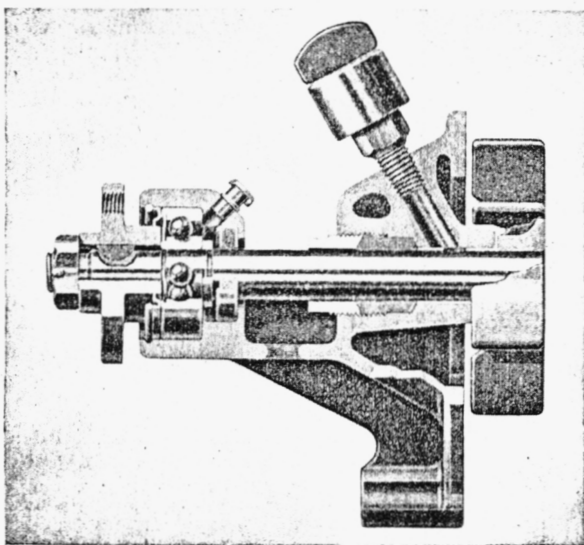
To Clean: Loosen thumb screw on bottom of filter and remove filter glass bowl and filter screen. Wash filter bowl in kerosene. The sediment can be removed from the filter screen with a blast of air.

When assembling be sure that cork gasket is in place and thumb screw is tight. A leak at the cork gasket will cause erratic action of the pump and retard delivery of fuel to the carburetor.

When a new cork gasket is used, soak it in light engine oil before assembling.

Water Pump Packing Nut Adjustment

A water leak at the pump shaft is usually caused from neglecting to regularly turn down the grease cup. If the leak is not stopped by turning down the grease cup, the packing nut should be tightened. Packing nut should not be tightened to a point that will cause binding of the pump shaft. When packing nut has reached the limit of its travel, new packing should be installed.



The impeller shaft of the centrifugal-type water pump is chromium plated to resist corrosion and is supported on a sturdy ball bearing, sealed at both ends to retain lubricant and exclude dust and dirt. The pump has a capacity of 80 gallons of water a minute at 3,500 engine r.p.m.

Fan Belt Adjustment

Tension of belt should be examined periodically. The proper tension is obtained when belt can be depressed approximately $\frac{1}{2}$ " on center of section between fan pulley and generator.

To adjust the belt, loosen generator mounting capscrews and generator brace cap-screw, then move generator in or out as required. After adjustment has been made, be sure to tighten the capscrews.

Radiator

Drain the radiator and flush with fresh water twice a year, or oftener, to remove rust and other foreign deposits. In order to completely drain water from the cooling system, it is necessary to open drain cock on the left-hand side of cylinder block, between the generator and the distributor. Chemical mixtures should not be used in attempting to stop radiator leaks. During cold weather cover the lower portion of the radiator sufficiently to maintain an engine operating temperature of 160° to 180° F.

Anti-Freezing Solutions

For continuous cold weather use solutions having a low freezing point. Do not use calcium chloride or salt solutions.

If a solution of alcohol and water is used, keep adding a small amount of alcohol from time to time to compensate for evaporation.

To Clean: After anti-freezing solutions have been removed, fill radiator with a hot solution of lye water the strength of one pound of lye to six gallons of water. Run engine for about ten minutes, then drain solution and thoroughly flush system.

Properties of Anti-Freezing Solutions

% By Volume	Denatured Alcohol			Menthanol (Wood Alcohol)			Distilled Glycerine			Ethylene Glycol (Prestone)		
	Freezing Point		Specific Gravity	Freezing Point		Specific Gravity	Freezing Point		Specific Gravity	Freezing Point		Specific Gravity
	°C.	°F.		°C.	°F.		°C.	°F.		°C.	°F.	
0%	0	32	1.000	0	32	1.000	0	32	1.000	0	32	1.000
10%	-3	27	.988	-5	23	.987	-2	29	1.029	-3	26	1.016
20%	-7	19	.978	-12	10	.975	-6	21	1.057	-9	16	1.031
30%	-12	10	.968	-19	-2	.963	-11	12	1.085	-16	3	1.045
40%	-19	-2	.957	-29	-20	.952	-18	0	1.112	-24	-11	1.058
50%	-28	-18	.943	-40	-40	.937	-26	15	1.140	-35	-31	1.070

Clutch Pedal Adjustment

⚠ *Keep foot off the clutch pedal except to shift gears or when truck is brought to a stop.*

The correct clearance, or free travel, of the clutch pedal is from $1\frac{3}{4}$ " to 2", that is—when clutch pedal is depressed, there should be from $1\frac{3}{4}$ " to 2" movement in the pedal before clutch starts to disengage.

The pedal should be checked occasionally and adjusted whenever free travel has been reduced to 1" or less.

To adjust the clutch pedal, remove clevis pin from pedal rod and turn adjustable yoke.

Propeller Shafts and Universal Joints

Disassembly can be made by removing four screws holding the yoke and trunnion bearings.

It is extremely important that the individual trunnion bearings be reassembled on the same journals from which they were originally removed, and it is advisable to wire them in place while other service operations are being performed.

Caution: In reassembling complete assemblies, be sure that the splined stub is entered in the slip yoke so as to bring the trunnions of the yoke on rear end of shaft parallel with the trunnions of the slip yoke on the front joint.

Chassis Springs

Spring breakage can be materially reduced by keeping spring "U" bolts and clips tight and lubricating the spring leaves and shackle pins freely. Examine the spring "U" bolts and rebound clips, and periodically tighten the nuts. Use engine oil and paint edges of springs with a stiff brush or use a spray gun every 1000 miles.

Lovejoy Shock Absorbers

Always use Genuine Lovejoy Shock Absorber Fluid.

Check the fluid level every 10,000 miles. Fluid must be kept up to bottom of filler plug hole. A leak will cause shortage of fluid, which can easily be determined by disconnecting the arm linkage and pulling the arm down. If the arm moves easily a part of the stroke, then comes to a stop and moves slowly for the remainder of the stroke, there is not enough fluid in the absorber.

When replenishing fluid, wipe around filler opening before removing plug in order to remove all dirt; should dirt enter, a complete disassembly will be necessary to remove all trace of dirt. Disconnect link between axle and absorber arm. Fill absorber to proper level, moving arm up and down several times, forcing out any air in the cylinder. Add fluid and repeat operations until no more can be added.

Wheel Bearing Adjustment

Jack up wheels. Remove axle shaft (wheel driving flange on front axle). Free the wheel bearing nut from lock and remove. Tighten inner nut until wheel binds slightly, rotating wheel at the same time to make sure that all surfaces are in proper contact. Back off inner nut about one-sixth turn and insert steel stamping lock. Replace outer nut, tighten and lock securely in place.

⚠ *Be sure brakes are not dragging, before making wheel bearing adjustments.*

Hydraulic Brake Adjustment

The efficient hydraulic system consists of a compensating type master cylinder, individual wheel cylinders, tubing, flexible hose, brackets and unions. The cylinders are fitted with pistons all of which are provided with cup packing for sealing against loss of fluid.

Inspect master cylinder each 1000 miles for correct fluid level. Fluid should be within $\frac{3}{8}$ " from bottom of filler neck. Do not fill supply tank to top of filler neck.

Always use Genuine "Lockheed" fluid. The use of other than Genuine "Lockheed" fluid or the introduction of mineral base oil into the system will cause rubber parts to swell and become inoperative.

Caution: When removing supply tank filler cap, extreme care must be used to prevent dirt from entering master cylinder.

Brake Pedal

When brake control system is in release position, foot brake pedal should have $\frac{1}{4}$ " free travel before the pressure stroke starts. This free travel is required to prevent blocking of bypass port in master cylinder. Should the bypass port become blocked, brakes will drag due to pressure building up in the system.

Bleeding the Lines

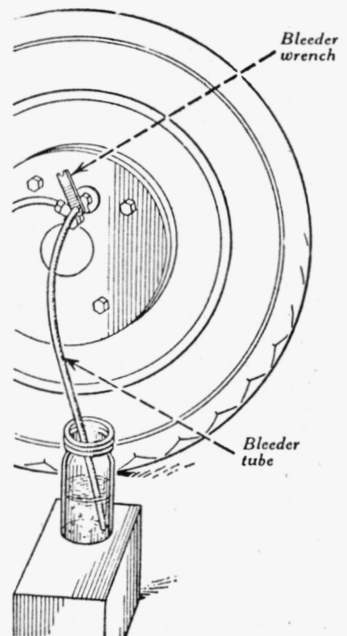
Any air inside the hydraulic system must be removed. Whenever a line has been disconnected at master cylinder, the entire system must be bled at all four wheels until all air is completely expelled. When a line has been disconnected at any wheel cylinder both wheel cylinders must be bled.

Air in the system will cause a springy, rubbery action of the brake pedal. Should a sufficient quantity be introduced into the system, the brake pedal will go to the toeboard under normal pressure.

Fill master cylinder supply tank with Genuine "Lockheed" fluid and see that it is kept at least half full during entire bleeding operation.

Remove slotted screw from end of bleeder connection and attach bleeder tube. (See illustration on following page.) Allow tube to hang in a clean container, such as a pint glass jar. Unscrew bleeder connection three-quarters of a turn and depress brake pedal by hand, allowing pedal to return slowly. Pumping the brake pedal forces fluid out into glass jar and carries with it any air which might be present in the system. Watch flow of fluid from tube, the end of which should be kept below surface of fluid in glass jar, and when all air bubbles cease to appear or when stream is a solid fluid mass, close bleeder connection.

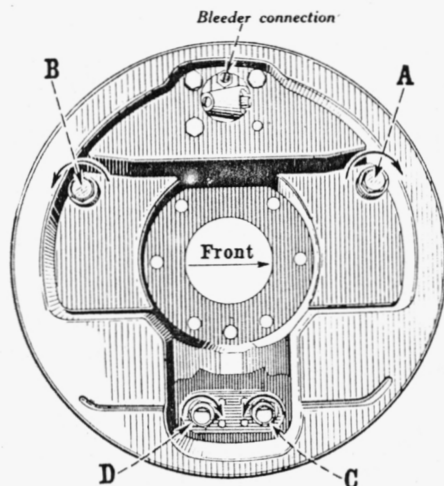
Fluid withdrawn in "bleeding" operation should not be used again. Fluid should be replenished in supply tank after each cylinder is bled. Should supply tank be drained during bleeding operation, air will enter the system and rebleeding will then be necessary.



Hydraulic Brake Adjustment

Adjustment for Wear

1. Be sure that foot pedal and hand brake lever are in fully released position.
2. Jack up truck until one wheel is free from floor.
3. Rotate cam adjustment (A) in the direction indicated by arrow until the forward shoe contacts the brake drum and a definite brake drag is felt when wheel is being pulled over by hand.
4. Back off adjustment (A) until the wheel is just free.
5. Rotate cam adjustment (B) in the direction indicated by arrow until the rear shoe contacts the brake drum and a definite brake drag is felt when wheel is being pulled over by hand.
6. Back off adjustment (B) until the wheel is just free.
7. Make this adjustment at each wheel.



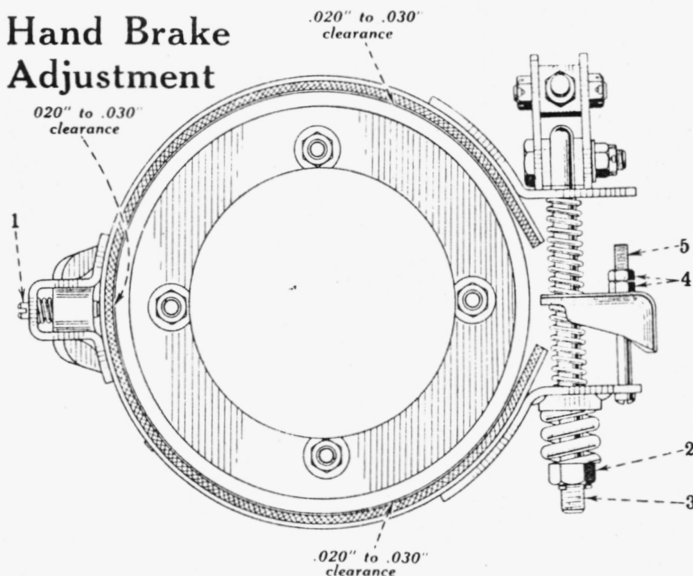
Major Adjustments

When installing new shoes or linings, or when adjustments for wear do not produce desired results, proceed as follows:

Note: Perform the following operations at each of the wheels, front and rear.

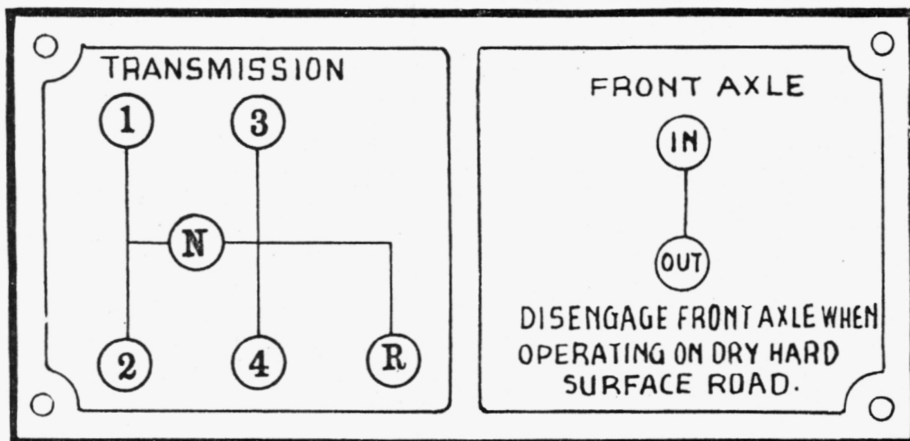
1. Remove brake and drum feeler gauge hole cover.
2. Insert a .010" feeler gauge between the drum and lining at approximately $1\frac{1}{2}$ " from end of lining at wheel cylinder end of the forward shoe.
3. Rotate cam adjustment (A) in direction of arrow until .010" feeler gauge is snug.
4. Repeat operation 3 at (B) for adjustment of rear, or reverse, shoe.
5. Insert a .005" feeler gauge between the lining and drum at approximately $1\frac{1}{2}$ " from end of lining at anchor pin end of the forward shoe. Loosen locknut and rotate anchor (C) in direction of arrow until .005" feeler gauge is snug. *Tighten locknut.*
6. Repeat operation 5 on rear, or reverse, shoe at (D).
7. Recheck clearance to .010" at adjusting ends (A and B) and .005" at anchor ends (C and D). Correct if necessary.
8. Install feeler gauge hole covers.

Hand Brake Adjustment

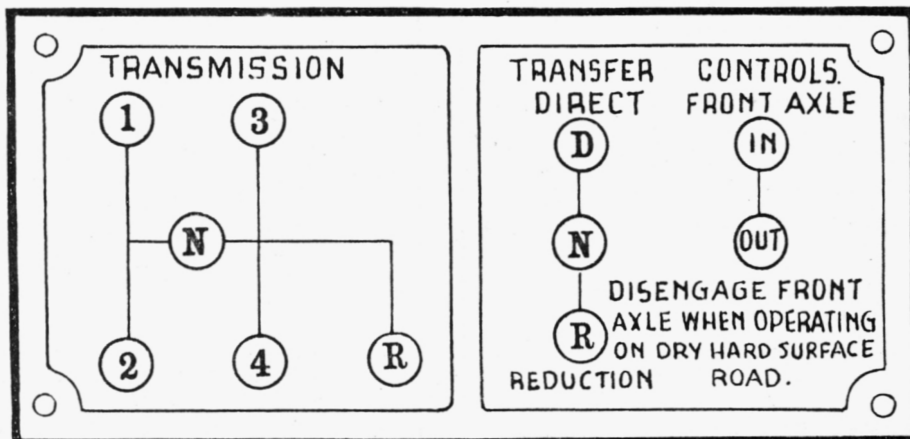


Adjustments are made by first setting hand brake lever in extreme forward position. Then turn brake band anchor adjusting screw (1) to give .020" to .030" clearance between drum and lining. Anchor band bracket should move freely on anchor bracket while operating the brake. Then turn nut (2) on adjusting screw (3) until the upper half and lower half of brake band has .020" to .030" clearance between lining and drum. Next tighten nuts (4) on adjusting screw bracket bolt (5) as much as possible without upsetting the drum-to-lining clearance obtained by adjusting screw nut (2). *Be sure to lock all adjustments.*

Transmission and Transfer Case Control



For Model M-1-4-214 truck.



For Model M-2-4-233 truck.

Storage Battery

Examine the battery at least twice a month in summer and once a month in winter to see that the solution is kept to the proper level.

The electrolyte in each cell should be $\frac{3}{8}$ " above the separators and plates. When the electrolyte is below this level, pure distilled water should be added, using a clean syringe. Acid or electrolyte should never be added except by a skilled battery man.

Under no circumstances add any special battery "dopes," solutions or powders.

Test specific gravity of the electrolyte in each cell at least once a month with a hydrometer. A hydrometer reading of 1.270 to 1.285 indicates a full charge. Never allow the battery to fall below 1.225, which indicates half discharged. A discharged battery will freeze at temperatures as high as 20° F. above zero. A fully charged battery will withstand temperatures as low as 45° F. to 50° F. below zero.

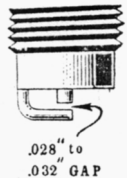
Battery cable terminals must be clean and tight. Use hot water for removing terminal corrosion and for cleaning top of battery. Brighten terminal contact surface with wire wool, apply a light coat of vaseline, and reassemble. Be sure terminals are clamped tightly and that battery is clamped securely in the battery box.

Spark Plugs

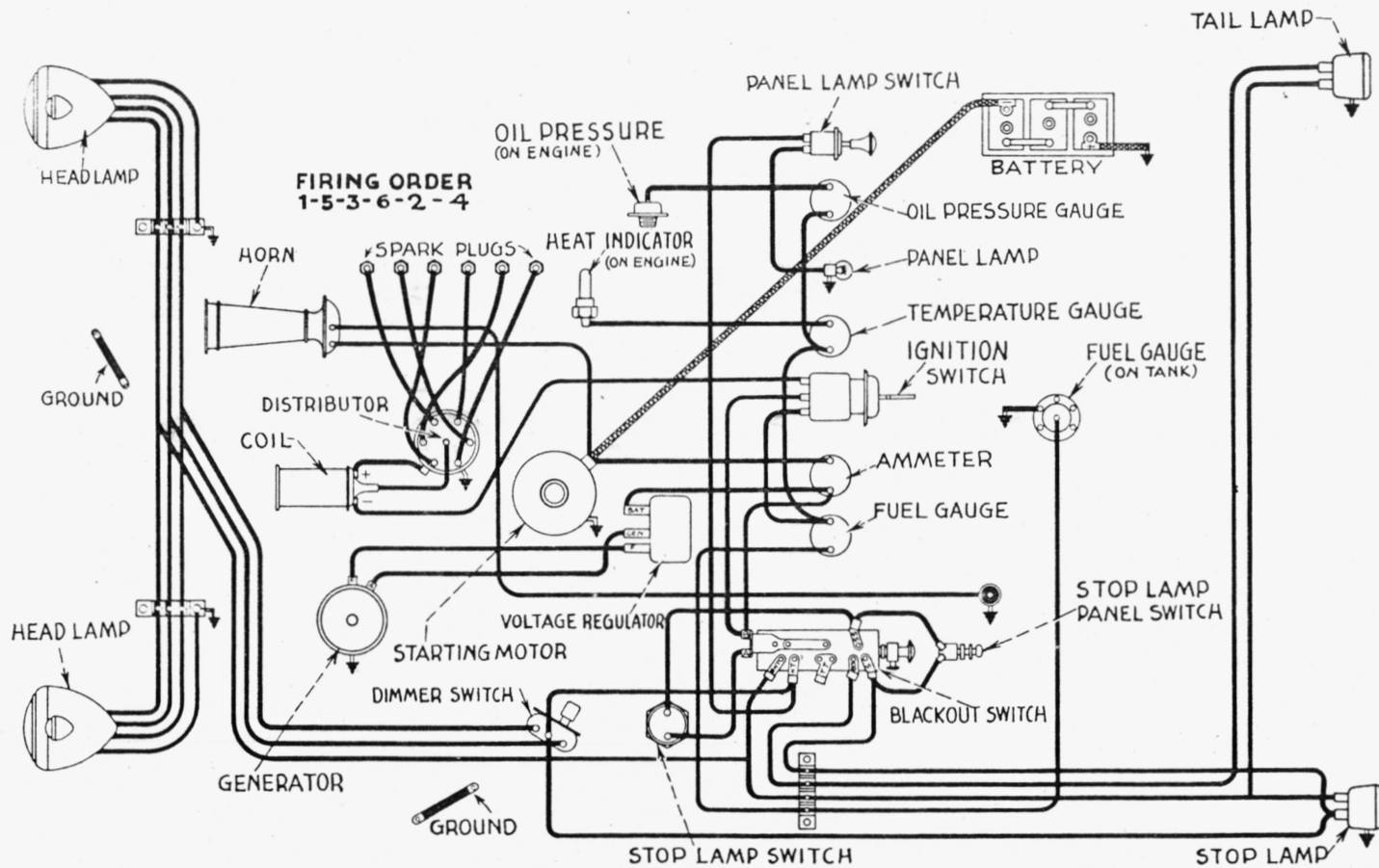
Keep spark plugs free from carbon. Gap between points should be set at .028" to .032".

(Be accurate—use a round wire feeler gauge!)

When changing the gap, always bend the outer electrode, never bend the center electrode.



Wiring Diagram



Brief Instructions Pertaining to Ignition, Starting and Lighting Units

 (See illustration on opposite page)

If the engine runs but misses at times, look for:

- WIRING—(A) Battery terminals loose or corroded.
(B) High-tension cable grounded or loosely connected.
(C) Low-tension cable grounded or loosely connected.

DISTRIBUTOR—Contact points not set right.

SPARK PLUG gap should be from .028" to .032". If misfiring is not confined to one cylinder, have coil tested, wiring checked, and distributor inspected. If engine misses regularly on one cylinder, the trouble is usually due to the spark plug in that cylinder being dirty, broken, or improperly adjusted.

If the starting motor turns the engine but no spark or a weak spark is obtained at the spark plug, look for:

- WIRING—High-tension cables leading to spark plugs may be grounded or loosely connected.
(B) High-tension cable may be grounded or loosely connected.
(C) Low-tension cable may be grounded or loosely connected.

DISTRIBUTOR—Contact points either do not open or do not close. Gap should be from .018" to .024".

IGNITION SWITCH—Does not make contact.

WEAK BATTERY—Low voltage will give weak spark.

STARTING MOTOR—Examine all cable connections between battery and starting motor. Connections must be clean and tight.

If the starting motor will not turn over or turns slowly when starting switch is closed, look for:

BATTERY—Weak or completely discharged.

WIRING—Loose or dirty battery connections. See that all cable connections between battery and starting motor are clean and tight.

STARTING SWITCH—Contact points burned or cables loose on terminal posts.

If ammeter does not show that generator is charging, look for:

GENERATOR—Commutator and brushes dirty or greasy. To clean use No. 00 sandpaper.

WIRING—Cable connections at ammeter may be grounded or loosely connected. Also check cable connections at starting switch and battery.

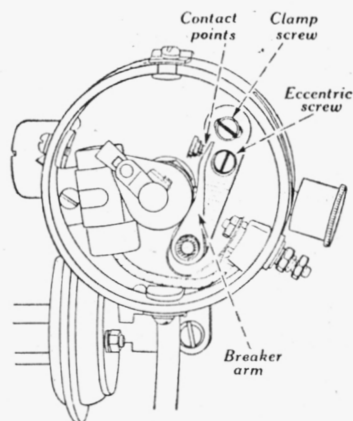
REGULATOR—if the trouble is within the regulator unit, it will not usually hinder an operator from reaching a service station for a check of the unit.

Check the Regulator to determine whether it is properly connected to a good ground.

If the polarity of the generator is reversed, the cut-out relay contacts will vibrate and burn. (See page 17.)

Distributor

Vacuum-controlled spark is combined with this centrifugal-automatic type distributor to obtain greater economy and improved engine performance. The centrifugal spark mechanism is calibrated to give the proper spark advance for full load, wide-open throttle requirements.



Distributor Contact Points

Adjustment of contact points can be made as follows:

Crank engine slowly until breaker arm rests on high points of cam lobe.

Loosen breaker arm clamp screw with screw driver and turn eccentric screw until there is from .018" to .024" gap between contact points. *Be accurate—use a feeler gauge!*

After adjustment has been made, be sure to tighten clamp screw.

Ignition Timing

Before attempting ignition timing, see that gap between distributor breaker points is between .018" to .024". Points must be clean, free from pits and seating squarely on each other.

Remove number one spark plug (radiator end). Crank engine by hand until number one piston is coming up on compression stroke. This can be determined by holding thumb over spark plug hole. When piston is coming up on compression stroke, a strong pressure will be felt, forcing thumb away from hole. Continue to turn crank slowly until timing notch on crankshaft pulley is directly in line with the timing pointer on gear case cover. If by chance, when cranking, the notch is turned beyond pointer, start over by cranking engine until number one piston is again coming up on the compression stroke; continuing to crank until the notch and pointer are directly in line. This will prevent backlash from affecting the timing.

Remove distributor cap and spark plug cables. Be sure that the distributor advance indicator is on the zero mark. Next loosen distributor clamp screw and turn distributor body clockwise until contact points just start to separate, with the breaker arm rubbing block on lead side of cam lobe. Lock distributor in this position by tightening the clamp screw. When turning the distributor body, lightly press the rotor in opposite direction of rotation so as to take up all backlash in the distributor drive. Replace the distributor cap.

The distributor is now in firing position for number one cylinder and number one spark plug cable must be assembled in the distributor cap in the terminal hole directly above the rotor arm. The firing order is 1-5-3-6-2-4 and spark plug cables must be assembled in the distributor cap in this order in a counter-clockwise rotation.

To recheck timing, turn on ignition switch and slowly crank engine until number one piston is coming up on the compression stroke. Hold the plug end of number one spark plug cable $\frac{1}{4}$ " from cylinder head and continue cranking very slowly until a spark occurs. At this point, timing notch on pulley should be directly opposite timing pointer on gear case cover; if not in line when spark occurs, distributor must be reset.

If fuel of a high anti-knock value is used regularly, slightly more economy can be obtained by advancing spark timing from the normal setting, which is zero on distributor adjustment indicator. If low-grade fuel, or fuel low in anti-knock value, is used regularly, it may be necessary to slightly retard spark from the normal setting.

NOTE: When the oil pump has been removed from the engine, it will be necessary to remove the ignition distributor, before reinstalling the pump assembly. This is required to assure proper alignment of the distributor shaft with the oil pump shaft. Also it will be necessary to retune the ignition.

Generator and Regulators

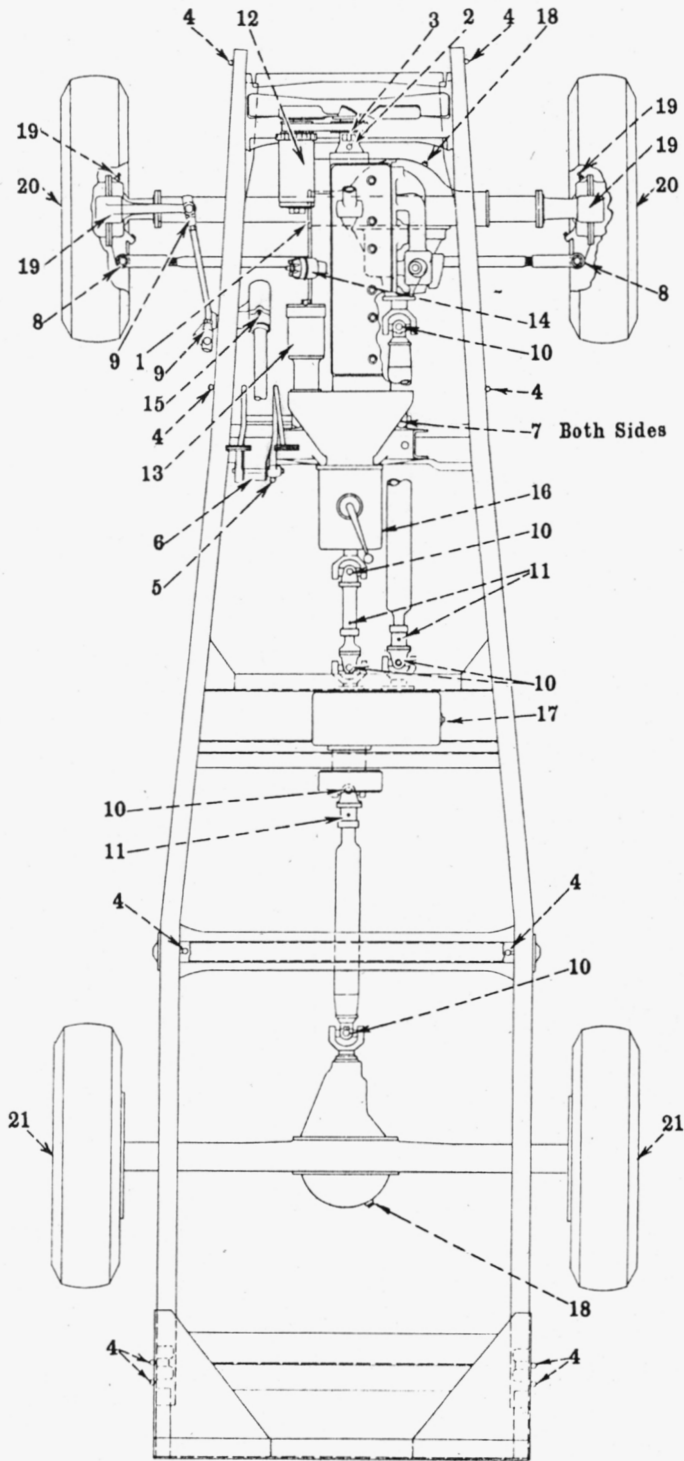
A 6-volt, 28 to 30-ampere, shunt-wound Delco-Remy generator is provided and is current-and-voltage controlled. Regulators are mounted on one base but operate independently to maintain the output and voltage within specified limits. Shunt-wound generator output can be changed only through adjustment of the regulators. If regulator or generator wires are disconnected, or when changing battery, observe the following instructions in order to avoid the possibility of reversing polarity of the generator: See that the *positive* side of battery is grounded. Cable from "F" terminal on generator must be connected to "F" terminal on regulator. Cable from "A" terminal on generator must be connected to "GEN" terminal on regulator. Cable from "Bat" terminal on regulator must be connected to *ammeter*. (See Wiring Diagram on page 14.) Then, *before starting* the engine, momentarily connect a lead (or screw driver) from "GEN" to "Bat" terminals on the regulator. The surge of the battery current to the generator will correctly polarize the generator.

Starting Motor

The starting motor is of the overrunning clutch drive type—manually operated. Do not run motor more than 30 seconds at any one time.

See Lubrication Chart on page 19.

Lubrication Chart



1 Use only high-quality lubricating oils and grease.

Key to Lubrication Chart on Opposite Page

Paragraphs are numbered to correspond with numbers on illustration

When oil becomes a smoky or dark color, replace cartridge in oil filter. When oil becomes thin, drain and refill with new high-grade oil. Keep oil to proper level. (Capacity is 6 quarts.)
Note: Cold weather requires new oil more often because of using choke, which thins the oil.

The selection of a WINTER engine oil should be based on the lowest anticipated atmospheric temperature, while the selection of a SUMMER oil should be based on the highest temperature expected during the day.

1. Engine (check daily).....
- | | |
|--|---------------------------------|
| Temperatures above 90 degrees (F.): | |
| Moderate service..... | SAE-30 or 40 |
| Severe or high-speed service..... | SAE-40 or 50 |
| Temperatures down to 32 degrees above zero (F.)..... | SAE-30 |
| Temperatures down to 10 degrees above zero (F.)..... | SAE-20W |
| Temperatures down to 10 degrees below zero (F.)..... | SAE-10W |
| Temperatures below 10 degrees below zero (F.)..... | *SAE-10W diluted with kerosene. |

*SAE-10W oil may be diluted with colorless refined kerosene up to 30%. The kerosene should be mixed thoroughly with the oil before adding to the engine.

Every 500 Miles

2. Water Pump Shaft..... Fill grease cup with a good grade of WATER PUMP GREASE and turn down one-half turn.
3. Fan Front Bearing..... { 8 drops of light ENGINE OIL in oiler (for radio car, add 20 to 25 drops of light engine oil every 1000 miles).

Every 500 to 1,000 Miles

4. Spring Pins.....
5. Brake Pedal.....
6. Clutch and Brake Pedal Bracket.....
7. Clutch Release Fork Shaft.....
8. Tie Rod Ends.....
9. Drag Link Ball Joints.....
10. Propeller Shaft Universal Joints.....
11. Propeller Shaft Slip Yoke.....
12. Generator.....
13. Starting Motor.....
14. Distributor.....
15. Steering Gear Case.....
16. Transmission (capacity, 5½ pints).....
17. Transfer Case (capacity, 4 pints).....
18. Differential (capacity, 5 pints).....
19. Front Axle Universal Joint Bearings.....
- Use a VISCOUS CHASSIS LUBRICANT or SAE-140 GEAR OIL.
- Use a VISCOUS CHASSIS LUBRICANT or SAE-140 GEAR OIL. Remove grease plug, insert grease fitting and fill with lubricant. Replace grease plug.
- 4 to 5 drops of light ENGINE OIL in oilers. For radio car generator, fill grease cups with a high melting point ball bearing grease and turn down one full turn every 5000 miles.
- Fill grease cup with a VISCOUS CHASSIS LUBRICANT and turn down one turn. Apply one drop of light ENGINE OIL to breaker arm pivot and to felt wick under rotor. Apply a thin coat of VASELINE to breaker arm rubbing block.
- Use GEAR OIL.
- Use E.P. GEAR OIL. Inspect every 1,000 miles and keep oil up to level of filler plug.
- Drain and flush with flushing oil and refill with new oil every 10,000 miles. For warm climate use SAE-140 and for cold climate use SAE-90.
- Fill housing until surplus grease escapes from vent holes in pressure gun fitting. Use a semi-fluid grease having the following specifications:

	For Cold Climate	For Warm Climate
Soap Base	Soda	Soda
Percent Soap Average.....	5.00	6.75
Percent Oil Average.....	93.00	91.00
S.U. Viscosity of Oil.....	175 at 210	175 at 210
Average Penetration.....	415	315
Free Organic Acid (Maximum).....	0.10%	0.20%
Temperature Usable.....	300	325

Every 10,000 Miles

20. Front Wheel Bearings.....
21. Rear Wheel Bearings.....
- Remove wheels, clean hubs and repack with SHORT FIBER WHEEL BEARING GREASE.

Important Instructions for Storing a Truck

When a truck is not to be used for a period of time, it should be placed in a dry and protected place and the following procedure should be observed:

1. Wash the truck and completely lubricate the chassis (refer to lubrication chart).
2. Drain the engine oil, flush system and refill with new oil. Run the engine until the oil is thoroughly circulated.
3. *Caution: Drain the fuel tank, fuel lines, fuel pump and carburetor fuel bowl. Run engine until carburetor is dry. Remove carburetor main jet and accelerating jet plug and drain. If gasoline is allowed to remain in the fuel system a gummy substance will form in the carburetor jets and passages, causing serious trouble.*
4. Remove storage battery and put in a dry place.
5. Drain and flush radiator and cooling system. BE SURE all drain cocks are open.
6. After the engine has become cold, remove the spark plugs and pour a small quantity of SAE-50 engine oil in each cylinder through the plug holes. Then turn the engine over by hand a few times to thoroughly distribute the heavy oil over the pistons and cylinder walls. BE SURE to replace spark plugs.
7. Clean air cleaner and refill to indicated level with new oil.
8. Be sure hydraulic brake fluid system is full.
9. Block up truck so that weight is off the tires.

The following procedure should be followed when a truck is returned to service:

1. Close drain cocks and fill cooling system with water (use anti-freeze if required). Check all hose and water pump connections for water leaks.
 2. Fill fuel tank and check condition of fuel filter glass bowl gasket. Gasket must form a good seal or pump will not supply fuel to carburetor.
 3. Install storage battery.
 4. Check level of oil in air cleaner.
 5. Check oil level in engine. Remove spark plugs and pour a small quantity of light engine oil in each cylinder through spark plug holes. Turn engine over by hand a few times and then replace spark plugs.
 6. Check fluid level in brake master cylinder.
 7. Check oil level in transmission, transfer case, axles and any auxiliary unit.
 8. Check air pressure in all tires.
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