

REPAIR and TUNE-UP MANUAL

Illustrated Service Procedure and Specifications for

1939 OVERLAND

SPECIFICATIONS

Model "39" 1939

Series "39"

Wheelbase 102"

1939 Models

SEDANS: Speedway Two Door, Speedway Special Two Door, De Luxe Two Door, Speedway Four Door, Speedway Special Four Door, De Luxe Four Door.

COUPES: Speedway Coupe, Speedway Special Coupe, De Luxe Coupe.

SERIAL NUMBER: Located on plate on front of front frame cross member and on right side of cowl under hood.

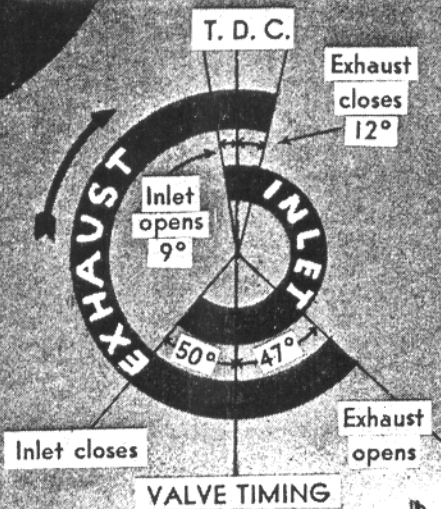
MOTOR NUMBER: Located right side of block at No. 1 cylinder.

1939 Motor

SERIES "39": Four cylinder. Bore, $3\frac{1}{8}$ "; stroke, $4\frac{3}{8}$ ". Piston displacement, 134.2 cu. in. Compression ratio, 6.35:1. Compression pressure, 112 lbs. at 185 R.P.M. H.P., 61 at 3600; taxable, 15.63.

OVERLAND, '39 — MOTOR

Firing Order, 1-3-4-2.



VALVE CLEARANCE FOR CHECKING TIMING: Inlet and exhaust, .020".
VALVE TIMING: Adjust inlet valve in No. 1 cylinder to .020" clearance (T. D. C. of compression stroke, No. 1 cylinder, cold engine). Crank engine until No. 4 piston is approaching T. D. C. on compression stroke. Stop when mark "I. O." on flywheel is in register with pointed end of timing indicator in left top side of flywheel housing. At this point No. 1 inlet valve tappet should just contact end of valve stem (zero clearance). A slight variation in either way not to exceed 1/4" flywheel travel is permissible.

ENGINE MOUNTING ADJUSTMENT: Front mounting adjustment is controlled by the lower nut. Nut should be turned up until lower snubbing rubber expands about 1/8", or is compressed enough so that it is hard to turn nut with thumb and two fingers. The same adjustment applies to rear mounting except that the upper nut controls tension of the snubbing rubber.

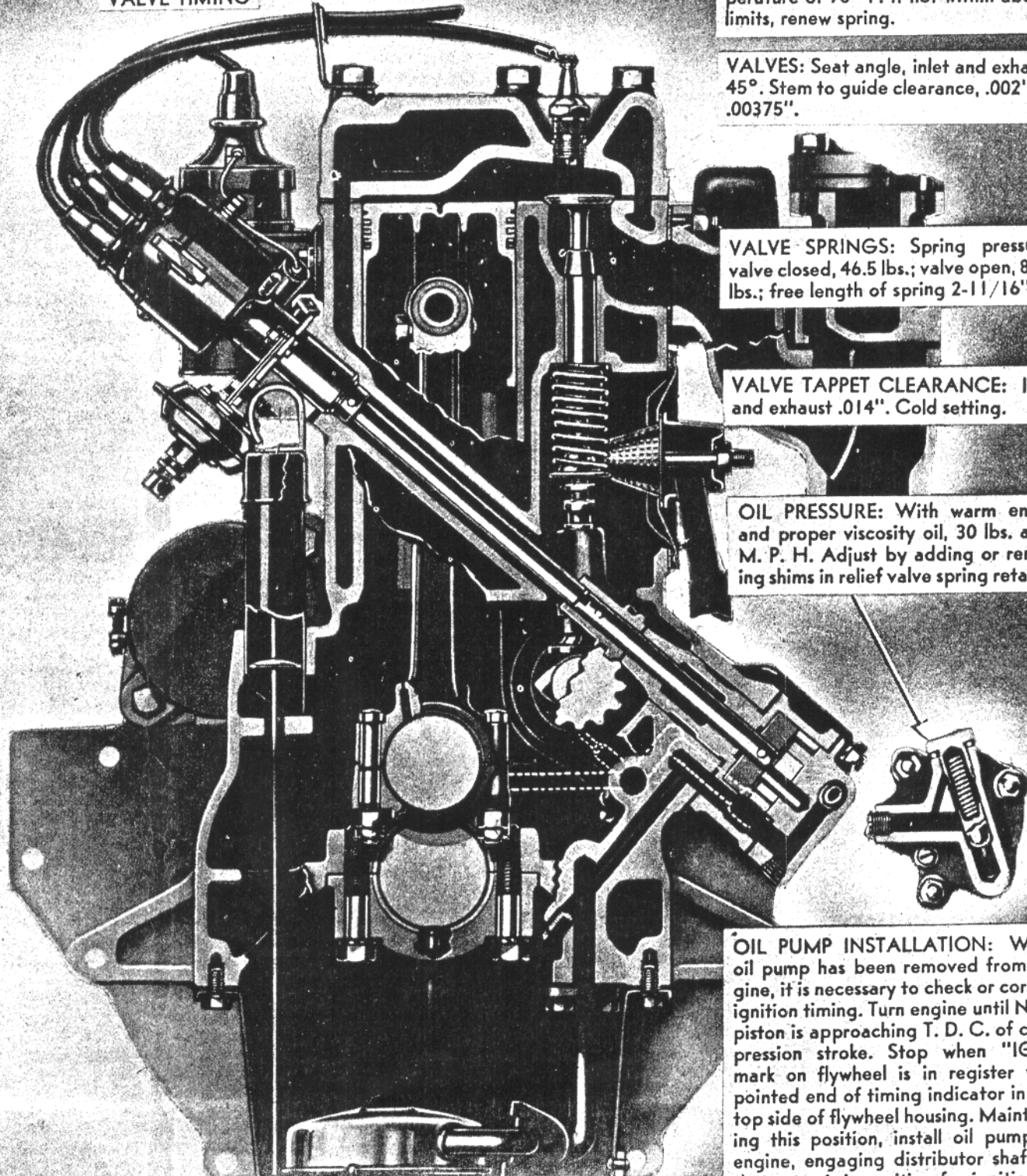
MANIFOLD AUTOMATIC HEAT CONTROL: Tension of manifold thermostatic spring should be adjusted from 8 to 10 inch ounces at room temperature of 70° F. If not within above limits, renew spring.

VALVES: Seat angle, inlet and exhaust 45°. Stem to guide clearance, .002" to .00375".

VALVE SPRINGS: Spring pressure, valve closed, 46.5 lbs.; valve open, 85.5 lbs.; free length of spring 2-11/16".

VALVE TAPPET CLEARANCE: Inlet and exhaust .014". Cold setting.

OIL PRESSURE: With warm engine and proper viscosity oil, 30 lbs. at 30 M. P. H. Adjust by adding or removing shims in relief valve spring retainer.



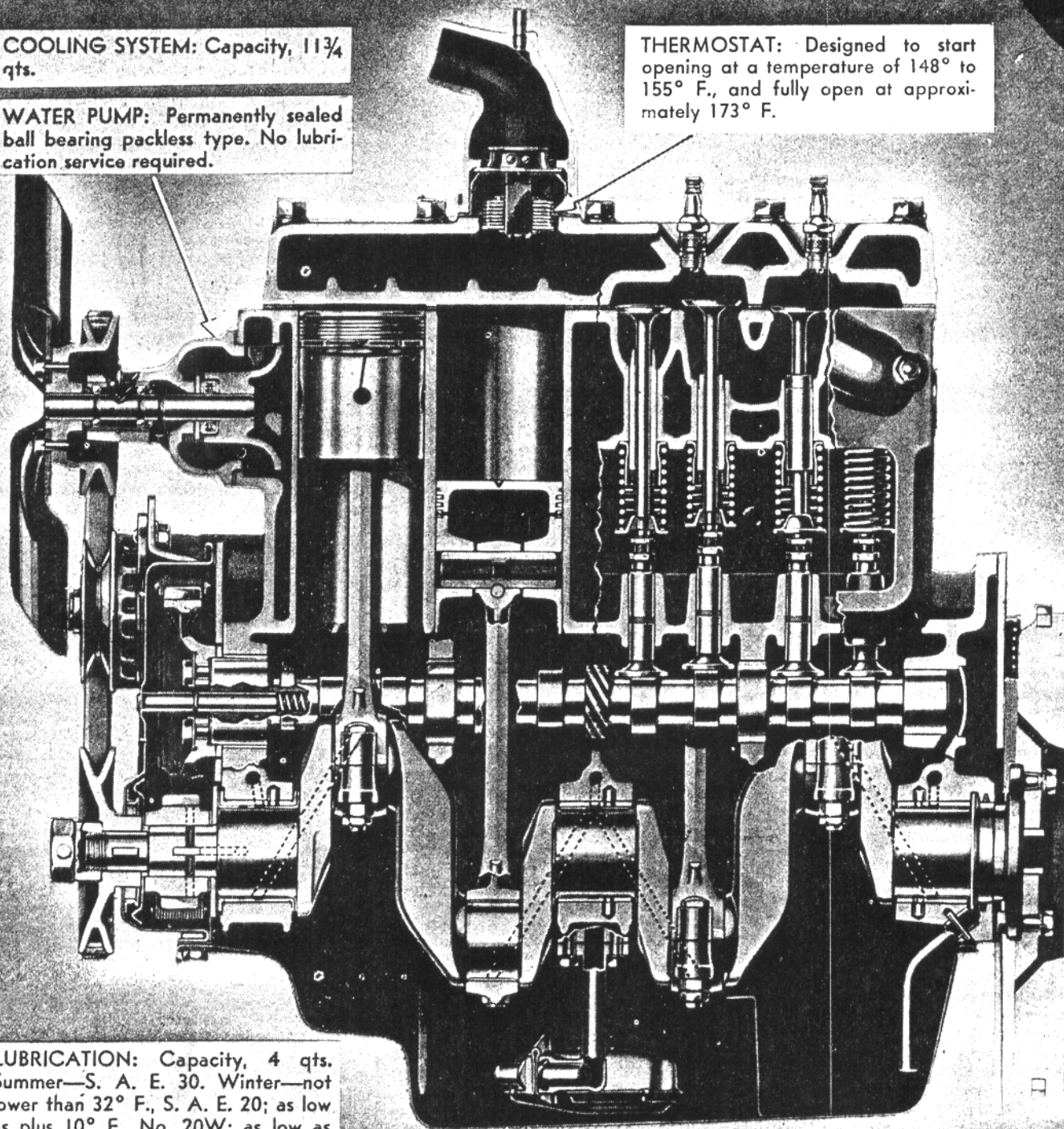
OIL PUMP INSTALLATION: When oil pump has been removed from engine, it is necessary to check or correct ignition timing. Turn engine until No. 1 piston is approaching T. D. C. of compression stroke. Stop when "IGN" mark on flywheel is in register with pointed end of timing indicator in left top side of flywheel housing. Maintaining this position, install oil pump to engine, engaging distributor shaft so

MOTOR — OVERLAND, '39

COOLING SYSTEM: Capacity, 11¾ qts.

WATER PUMP: Permanently sealed ball bearing packless type. No lubrication service required.

THERMOSTAT: Designed to start opening at a temperature of 148° to 155° F., and fully open at approximately 173° F.



LUBRICATION: Capacity, 4 qts. Summer—S. A. E. 30. Winter—not lower than 32° F., S. A. E. 20; as low as plus 10° F., No. 20W; as low as minus 10° F., No. 10W.

PISTONS: Aluminum alloy, "T" slot; cam ground tin plated. Remove from top.

PISTON CLEARANCE: Micrometer measurement .002" to .0025". Checked with .0025" x ¾" ribbon gauge inserted at thrust side of piston; pull of 5 to 10 lbs. required to withdraw at room temperature of 70° F.

PISTON PINS: Anchored in rod with clamp bolt. Recommended clearance in piston boss .0001" to .0009", or light thumb-push fit at room temperature of 70° F.

CONNECTING RODS: Offset at lower end. Install with short side of

CONNECTING ROD BEARINGS: Spun type, integral with rod and cap. Clearance .001" to .0025"; endplay .004" to .009".

PISTON RINGS: Two 3/32" compression; one 3/16" oil control ring. Gap clearance, .008" to .013".

Face of compression rings tapered .0005". The letters "TOP" on upper edge of ring indicate proper installation.

MAIN BEARINGS: Interchangeable, steel-back babbitt lined precision type. Clearance .001" to .0025". Thrust taken on front bearing. Adjustable by chime located between thrust

TIMING CHAIN SETTING

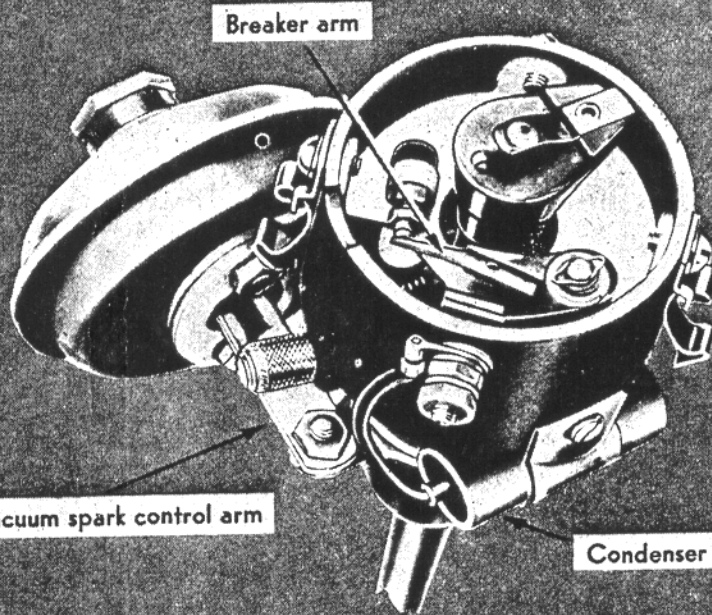
OVERLAND, '39 — TUNE-UP

IGNITION

Firing Order, 1-3-4-2.

Spark plug gap, .025".

Contact point gap, .020".



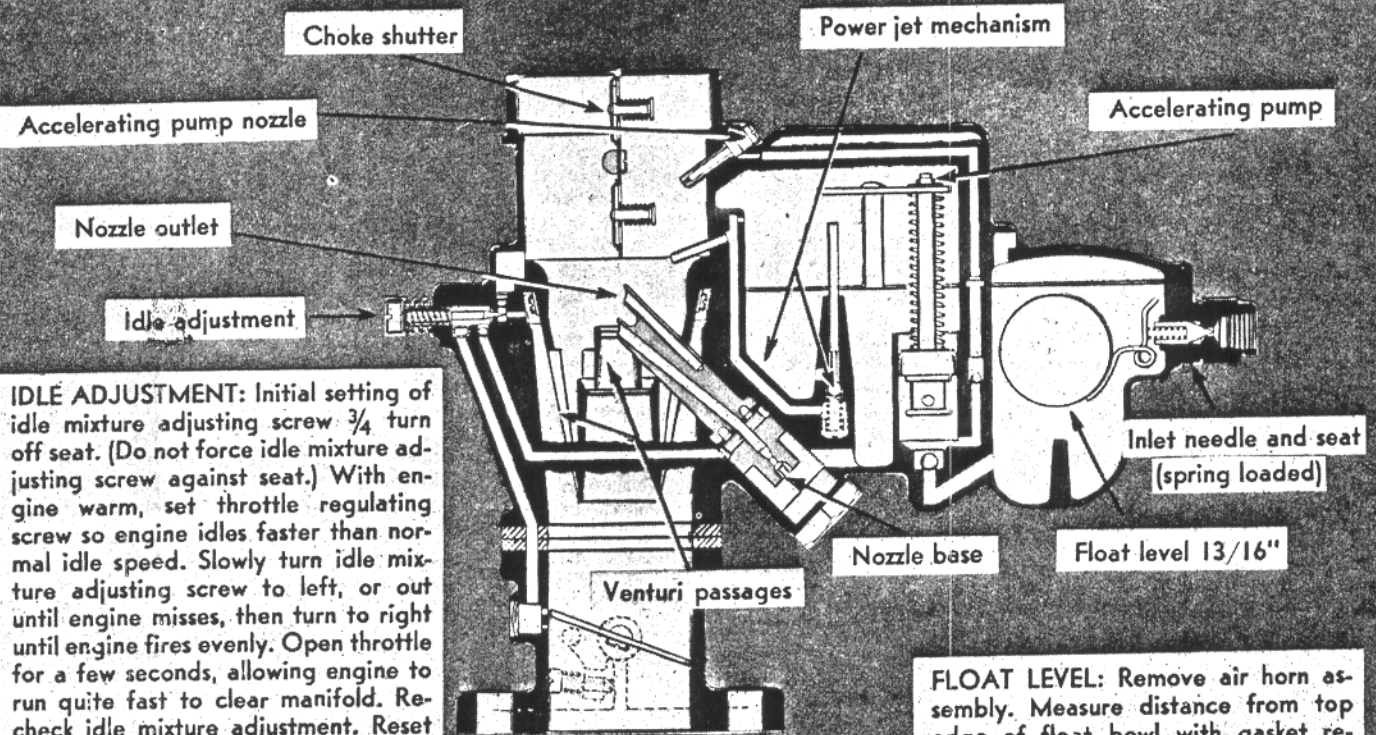
IGNITION TIMING: Turn engine until No. 1 piston is approaching T. D. C. of compression stroke. Stop when "IGN" mark on flywheel is in register with pointed end of indicator in left side of flywheel housing. Locate distributor so that points just break contact and rotor in position for ignition at No. 1 spark plug.

Ignition is set on T. D. C. with automatic spark control at rest. It is important when checking or setting ignition timing that all back lash in distributor mechanism be eliminated by exerting finger pressure on rotor in clock-wise direction. Make sure that vacuum control mechanism has free movement and is not stuck in advanced position.

To advance or retard ignition timing loosen clamp screw holding distributor arm to distributor. To advance, rotate distributor body clock-wise; retard, counter-clockwise.

Rotation, counter-clockwise.

CARBURETOR



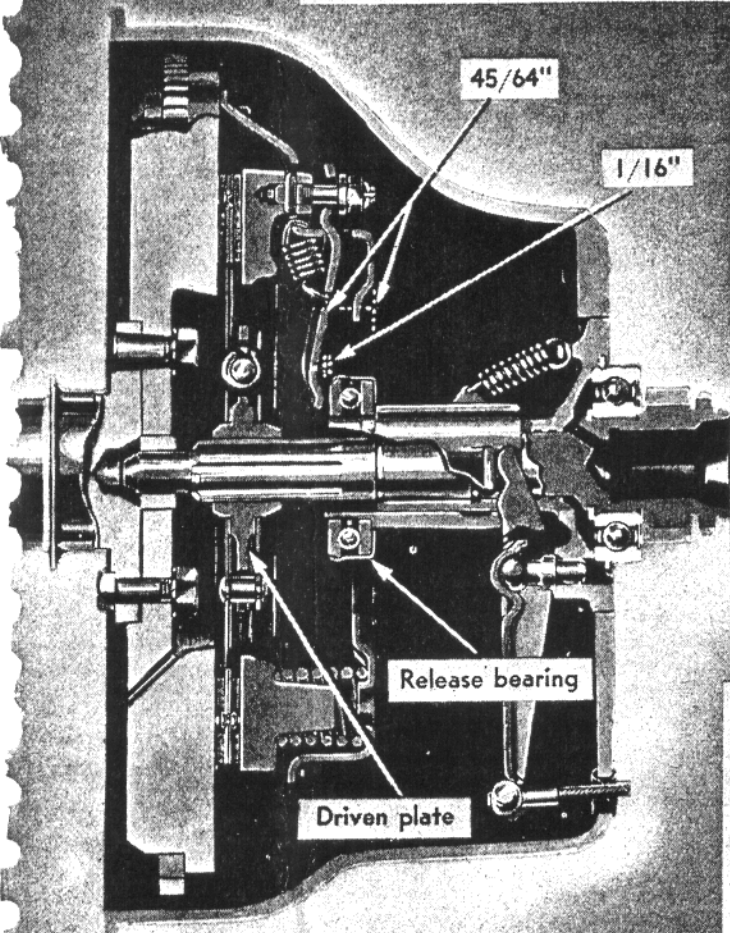
IDLE ADJUSTMENT: Initial setting of idle mixture adjusting screw $\frac{3}{4}$ turn off seat. (Do not force idle mixture adjusting screw against seat.) With engine warm, set throttle regulating screw so engine idles faster than normal idle speed. Slowly turn idle mixture adjusting screw to left, or out until engine misses, then turn to right until engine fires evenly. Open throttle for a few seconds, allowing engine to run quite fast to clear manifold. Recheck idle mixture adjustment. Reset throttle regulating screw so engine idles approximately 7 M. P. H.

FLOAT LEVEL: Remove air horn assembly. Measure distance from top edge of float bowl with gasket removed to fuel level. Adjust by bending float lever.

TILLOTSON, MODEL U-1B

Note: A high altitude nozzle base

CLUTCH, TRANSMISSION — OVERLAND, '39



CLUTCH ADJUSTMENT: Release bearing and clutch pedal must be in their proper positions. No adjustment of clutch proper is required to compensate for lining wear. A clearance of approximately $1/16''$ should be maintained between release levers and release bearing. To obtain this clearance, clutch pedal should be against underside of toe board, then length of clutch control cable adjusted so that pedal has free movement, or lash, of from $3/4''$ to $1''$ before resistance of clutch spring is felt.

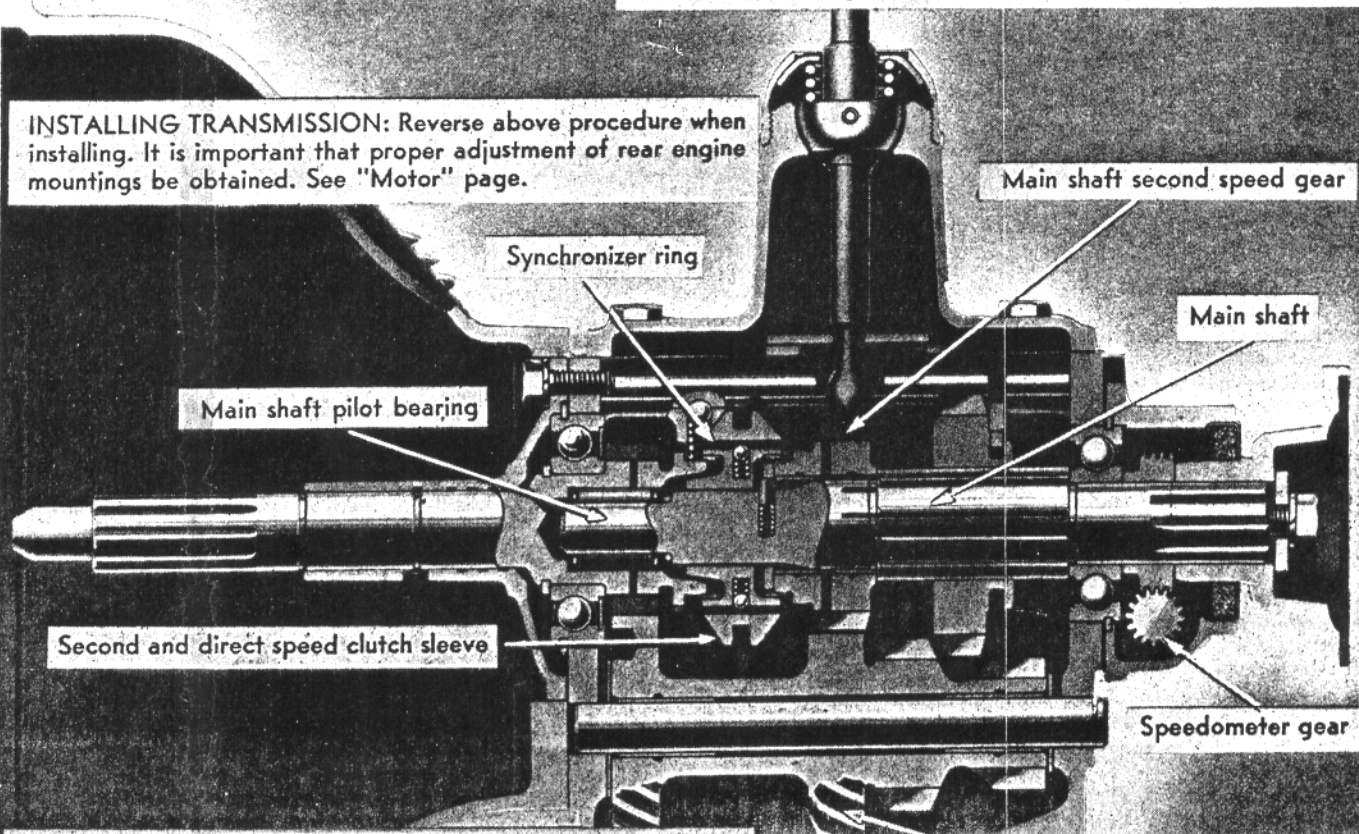
If for any reason clutch is disassembled, when re-assembling, the three release levers must make simultaneous contact on release bearing and the distance from release levers to rear face of clutch back plate be $45/64''$. Adjustment accomplished by means of nuts on each release lever. When pedal is released and clutch engaged there should be approximately $1/16''$ clearance between front face of release bearing and end of levers.

Note—When replacing driven plate, make sure side of plate with longest hub end is to the rear.

TRANSMISSION AND CLUTCH REMOVAL: Disconnect battery. Remove front seat cushion and place protective covering over door trim. Remove gear shift lever by unscrewing retaining collar at bottom of lever. Remove mat and pull up on accelerating pedal rod to disengage rod from rubber socket. Remove right, and center toe boards. Loosen radiator hold down nuts and radiator to body brace, to permit fan clearance when engine is tilted forward. Disconnect propeller shaft at front end. Disconnect speedometer cable. Remove lower nuts from rear mounting bolts at rear of transmission and jack up rear of engine with board between jack and oil pan, until mounting bracket can be removed. Raise transmission until it clears cross member. Remove bell housing to engine bolts. Remove transmission from top.

Note—If aligning bolts are driven in from the rear, reverse them and drive in from the front, which will hold engine plate in position and make bell housing assembling easier. Not necessary to remove bell housing if transmission only is to be removed.

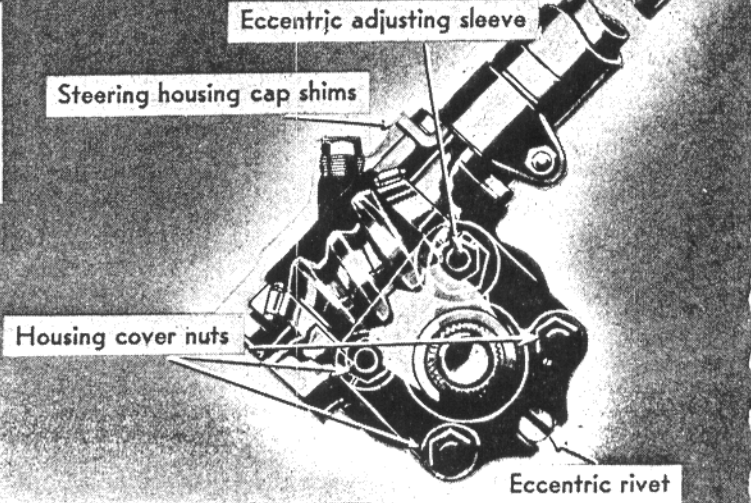
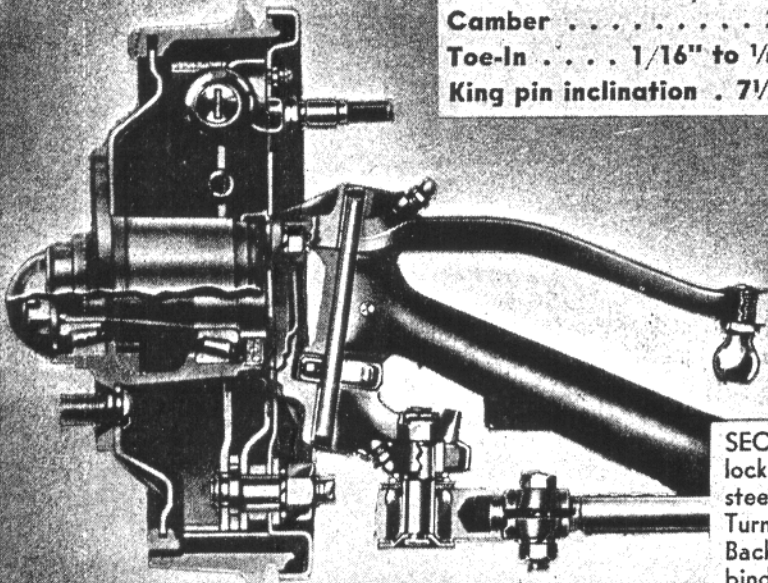
INSTALLING TRANSMISSION: Reverse above procedure when installing. It is important that proper adjustment of rear engine mountings be obtained. See "Motor" page.



OVERLAND, '39 — STEERING, AXLES

SPECIFICATIONS

Caster Angle 3°
 Camber 2°
 Toe-in 1/16" to 1/8"
 King pin inclination . 7 1/2°



SECTOR SHAFT ENDPLAY: Loosen lock nut of adjustment screw at side of steering gear housing next to engine. Turn until tight against end of shaft. Back screw off just enough to relieve bind and tighten lock nut.



ECCENTRIC RIVET: Provides adjustment of housing cover to centralize gear and obtain equal lash at each side of high point of worm and gear. Turn steering wheel 1/3 revolution to right of high point (mid-position, wheels straight ahead), and check lash at drop arm. Then turn 2/3 revolution in opposite direction and check lash of drop arm. Lash should be equal at each position, 1/3 revolution from mid-position. To adjust, loosen housing cover stud nuts and eccentric sleeve jam nut. If lash is more at left, turn eccentric rivet counter-clockwise. If more at right, turn eccentric rivet clockwise. After completing adjustment, check steering gear for mid-position lash. If excessive, adjust as outlined under "Mesh of Worm and Gear."

STEERING WORM SHAFT ADJUSTMENT: Adjust by means of shims located between steering gear housing and housing cap. To adjust, loosen clamp at lower end of jacket tube and move clamp up about 3/8". Loosen instrument board bracket clamp bolt. Work jacket down until lower end contacts steering gear housing cap. Remove housing cap retaining cap screws. Work jacket tube and housing cap up until jacket tube contacts steering wheel hub. Remove required number of shims to eliminate endplay. When correctly adjusted wheel should turn through its range without stiffness or tight spots. Return jacket tube to normal position and tighten clamps.

MESH OF WORM AND GEAR: Adjustment controlled by action of eccentric adjusting sleeve on housing cover. To adjust, set front wheels straight ahead, with steering gear in mid-position. Disconnect drag link at drop arm. Loosen three housing cover stud nuts and eccentric adjusting sleeve jam nut. Turn eccentric adjusting sleeve clockwise, checking amount of lost motion in ball drop arm; adjust to point where lash can just be felt. Always finish movement of eccentric sleeve in clockwise direction. Turn steering wheel through full travel to test for free operation. Tighten eccentric sleeve jam nut and cover nuts securely.

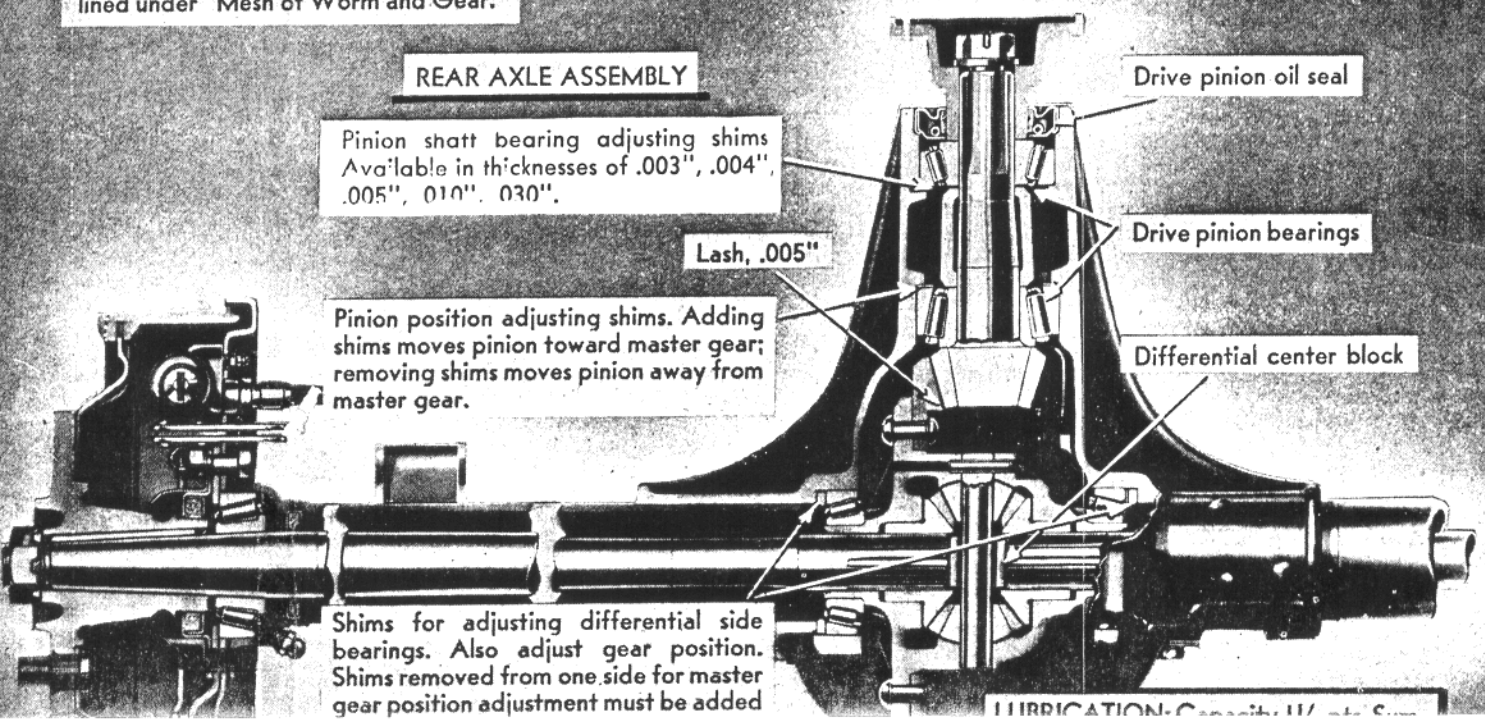
REAR AXLE ASSEMBLY

Pinion shaft bearing adjusting shims Available in thicknesses of .003", .004", .005", .010", .030".

Lash, .005"

Pinion position adjusting shims. Adding shims moves pinion toward master gear; removing shims moves pinion away from master gear.

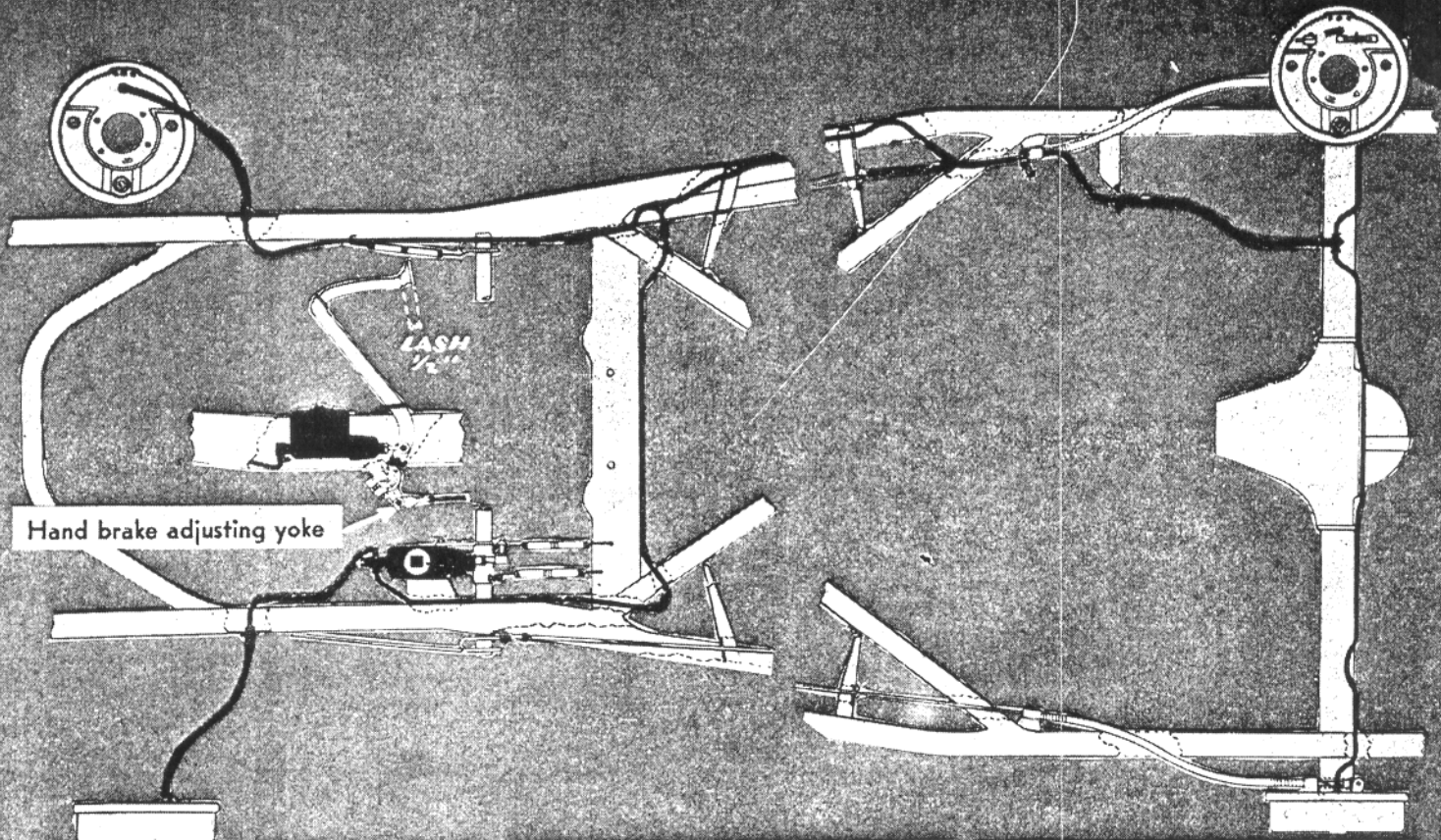
Shims for adjusting differential side bearings. Also adjust gear position. Shims removed from one side for master gear position adjustment must be added



Drive pinion oil seal

Drive pinion bearings

Differential center block



Hand brake adjusting yoke

PEDAL ADJUSTMENT: Correct when pedal has $\frac{1}{2}$ " free movement before master cylinder piston starts to move. Adjust by loosening lock nut on master cylinder eye bolt and turning larger adjusting nut to obtain desired setting.

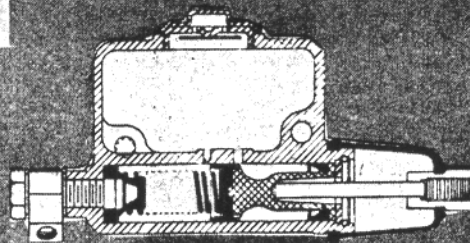
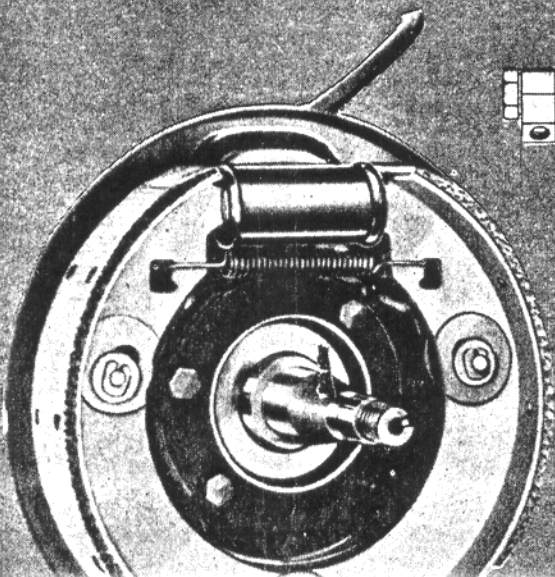
SHOE ADJUSTMENT (MINOR): Raise four wheels clear of floor. Move hand brake lever to full released position. Be sure brake pedal returns freely to full release position. Turn shoe adjusting cam until shoe contacts drum. Back off adjustment until drum is just free of drag. Make adjustment at each cam. Tension of friction spring automatically keeps cam locked in position.

SHOE ADJUSTMENT (MAJOR): Dummy drum or brake gauge not required. When minor adjustment fails, or shoes are relined, adjustment of anchor pin necessary to re-locate shoes within drum. With drum or brake gauge in place, loosen eccentric anchor pin lock nut at rear of backing plate. Adjust by turning eccentric anchor and shoe adjustment cam until shoes are set to proper clearance, as determined by feeler gauges. Recommended shoe setting is .006" at heel or lower end, and .010" at the toe or upper end. Tighten anchor pin lock nuts securely after adjustment.

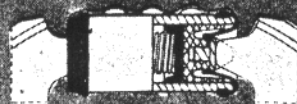
BLEEDING: If air gets into brake system, it will be necessary to bleed all lines to secure proper operation. When line is disconnected at master cylinder, all four wheels must be bled. If one wheel cylinder line is disconnected, that wheel only must be bled.

To bleed, make sure master cylinder is full of fluid. Remove bleeder screw at wheel cylinder and attach drain tube. Bleeder tube should hang in clean glass jar with free end submerged in brake fluid. Open bleeder valve $\frac{3}{4}$ turn. Depress pedal slowly and allow to return slowly. Continue this operation until fluid entering jar is solid stream free of air bubbles.

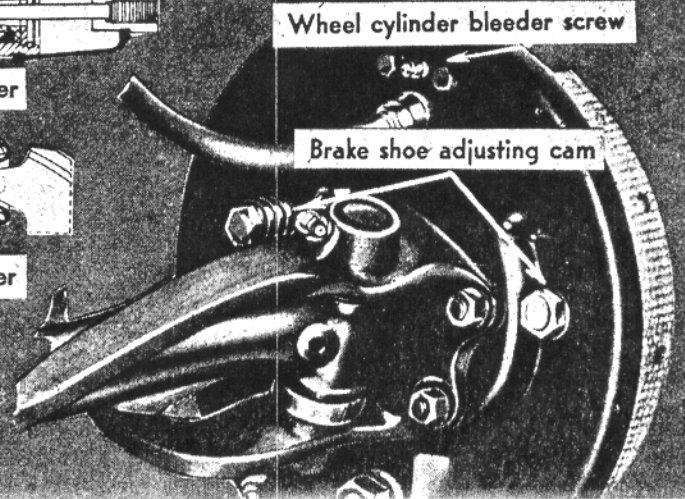
Note—Level of fluid in master cylinder should be up at all times during bleeding operation. Fill reservoir after bleeding is completed. Use new fluid only.



Master cylinder



Wheel cylinder



Wheel cylinder bleeder screw

Brake shoe adjusting cam

OVERLAND, '39

Cylinder Head: As precaution against water leaking into combustion chambers, leaking head gasket and valve seat distortion, tighten cylinder head bolts with equal tension in the sequence given below. Begin with No. 1.

15	9	3	7	13
10	5	1	4	12
11	6	2	8	14

Fan and Generator Belt Adjustment: Loosen generator adjusting brace bolt and move generator outward or away from engine. Adjust tension of belt so fan can be revolved with the fingers with very little effort without moving the belt.

Hydraulic Shock Absorbers: Capacity, front 3 3/4 oz.; rear 4 1/2 oz. Service once a year or every 5,000 miles.

Universal Joints: Repack universals each 20,000 miles, using a good grade universal joint grease. Capacity 1 1/2 oz. When lubricating, care should be taken not to pack them full and cause the leather boot to swell. Too much lubrication will cause the leather boot to break because of the action of trunnions.

Lubrication of Hand Brake Cables: Loosen cable conduit clamp at brake dust shield. Remove front clamp screw, and slide conduit toward cross shaft. Apply graphite grease to cables and return conduit to original position. Tighten clamps.

Axle Shaft Removal: Remove wheel. Pull hub and brake drum assembly. Remove brake dust shield, grease retainer, bearing retainer and brake assembly. Pull out axle shaft. Do not lose adjustment shims.

To Remove Differential: Remove axle shafts. Remove differential housing covers. Mark and remove bearing caps at each side of differential. Remove spacing shims. Care should be exercised when removing shims to keep packs separate, so that they can be reinstalled in the same relative position. Remove differential.

Pinion Removal: Remove universal joint companion flange. With brass drift, drive pinion shaft out through differential housing from the front. Drive front pinion shaft bearing assembly and oil seal out through front of housing, using clearance notches in housing. Rear bearing cone may be driven out in same manner from the front. Note location and thickness of shims removed.

Installing Pinion Gear or Pinion Shaft Bearing: When installing pinion gear or pinion shaft bearings, the positioning shims between front face of rear pinion bearing cup and shoulder in housing should be reassembled just as they were removed.

The number of shims required between front bearing cone and spacer determine pinion shaft bearing adjustment, correct shim thickness may be checked as follows:

Assemble pinion shaft rear bearing cup in housing, using same shim thickness at back of cup as when removed. Assemble pinion shaft with rear bearing cone and rollers into housing. Slip bearing spacer and bearing shims on pinion shaft, using same shim thickness as when removed. Place front bearing and cup on shaft and drive into place against shims in front of spacer. Using a short spacer made of piece of pipe of proper size placed over end of pinion shaft, pull front bearing cone up tight against bearing spacer with companion flange nut. If shaft turns hard or binds, add shims as required to adjust. Adjustment is correct when 2 1/2 lbs. pull on 10" leverage is required to turn pinion shaft.

Air Cleaner: Clean element every 2,000 miles under normal dust conditions. Wash copper gauge element in kerosene, dry and dip in clean engine oil, allowing excess oil to drip off before reassembling. Keep felt pad at top of cleaner free of oil.

Head Lamp Lense Removal: Hold lense with one hand and insert a pointed tool in notch at bottom of lamp body. Pry one end of retaining ring until end of ring can be grasped. Pull ring from lamp body.

Water Pump: New type water pump has a spring-loaded soft rubber seal. It is, therefore, important that no kerosene be used in cooling system, or any anti-freeze which contains mineral oil to retard alcohol evaporation. These solutions have a tendency to soften the rubber seal, which will necessitate early replacement.

Dash Heat Indicator, Standard Model: Dash heat indicating unit is a green jewel illuminated by a 1.5 c.p. bulb. When ignition key is turned on, light will burn and stay on as long as engine is operating within normal temperature range. Should light go out it indicates excessive temperature, and trouble should be corrected.

Compression Check: Compression should be checked with compression gauge at starting motor cranking speed of 185 R.P.M. with wide open throttle. Reading obtained will change in relation to altitude at which it is taken as follows: Compression with 6.8 ratio head at sea level, 125 lbs.; at 2,000 ft., 116 lbs.; at 5,000 ft., 103 lbs.

Compression with 6.35 standard head at sea level, 113 lbs.; at 2,000 ft., 106 lbs.; at 5,000 ft., 92 lbs.