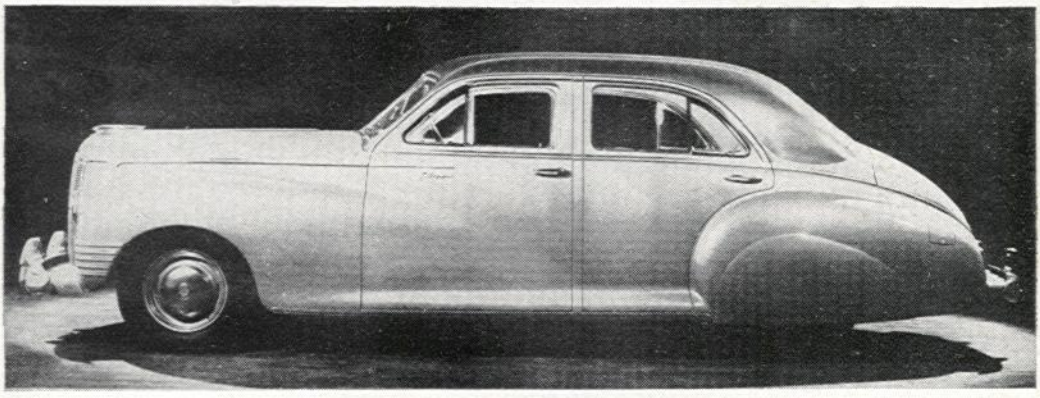
REPAIR and TUNE-UP MANUAL

Illustrated Service Procedure and Specifications for

1942 PACKARD

Models 2000, 2001	Wheelbase 120"
Model 2020	Wheelbase 122"
Models 2021, 2003, 2023, 2006	Wheelbase 127"
Models 2004, 2007	Wheelbase 138-5/32"
Models 2005, 2008	Wheelbase 148"
Models 2000, 2010, 2020	Six
Models 2001, 2001A, 2011, 2021	Eight
Models 2003, 2003A, 2023, 2004, 2005, 20055	Super Eight (160)
Models 2006, 2007, 2008	Super Eight (180)



SPECIFICATIONS

Models 2000, 2020: Six cyl. Bore, 3½"; stroke, 4¼". Piston displacement, 245 cu. in. Compression ratio, standard, 6.71:1. H. P., A.M.A. rating, 29.4; brake, 105.

Models 2001, 2021: Eight cyl. Bore, 3¼"; stroke, 4¼". Piston displacement, 282 cu. in. Compression ratio, standard, 6.85:1. H. P., A.M.A. rating, 33.8; brake, 125.

Models 2003, 2023, 2004, 05, 06, 07, 08: Eight cyl. Bore, 3½"; stroke, 4⅝". Piston displacement, 356 cu. in. Compression ratio, standard, 6.85:1. H. P., A.M.A. rating, 39.2; brake, 165.

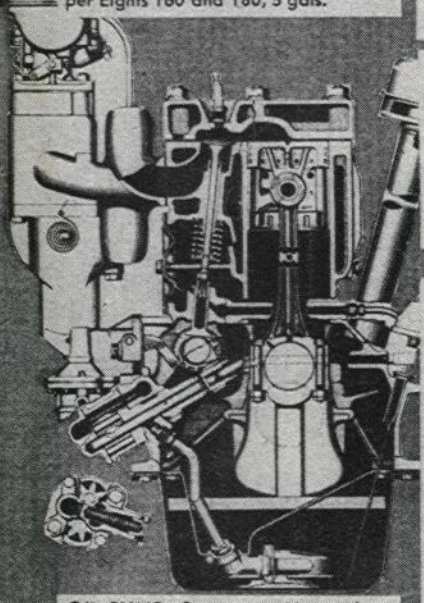
SERIAL NUMBER:

ENGINE NUMBER:

Photographs: Courtesy Packard Motor Car Company

PACKARD, '42 — Engine

COOLING SYSTEM: Capacity—Six, 3½ to 3¾ gals.; Eight, 4¼ gals.; Super Eights 160 and 180, 5 gals.



PISTONS: All models—Aluminum alloy, auto thermic, strut type, cam ground and tin plated. Removed only from top of block.

PISTON PINS: All models—Floating type. When removing or installing pins heat piston in hot water. Fit pin in rod bushing size to size, no clearance. Pin to Piston—Models Six and Eight, thumb push fit at room temperature (80 to 130 lbs. per sq. in.); models Super Eight 160 and 180, palm push fit in water at 160° F.

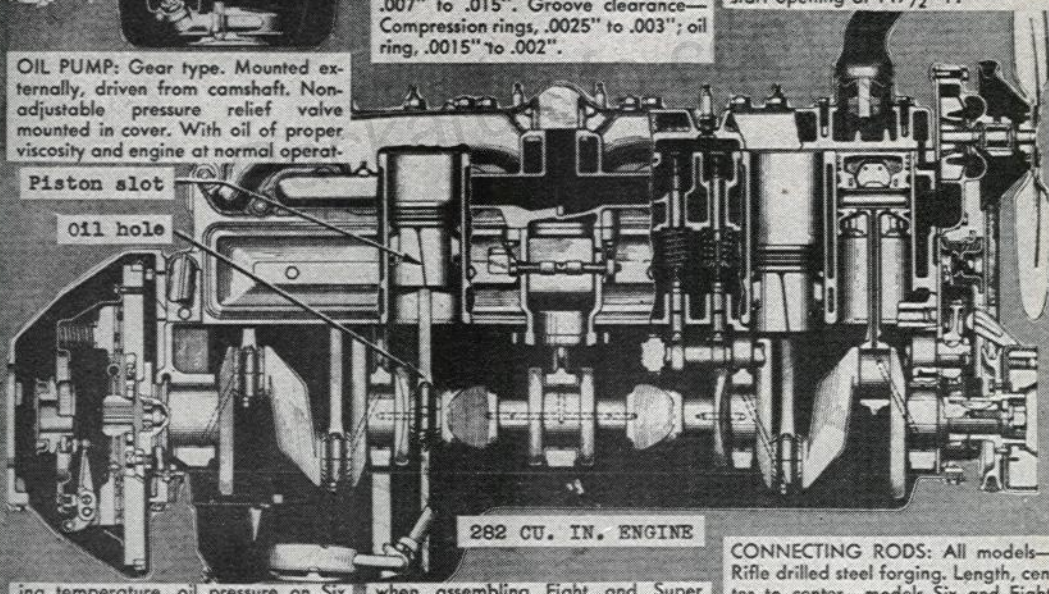
PISTON RINGS: All models — Two compression and one spring expander type oil control ring, all located above piston pin. Width of No. 1 compression ring—Models Six, .093" to .0935"; models Eight, .0925" to .0935"; models Super Eight 160 and 180, .0930" to .0935". Width of No. 2 compression ring—All models, .1235" to .124". Width of oil ring—All models, .186" to .1865". Gap clearance—Compression rings, .007" to .017"; oil ring, .007" to .015". Groove clearance—Compression rings, .0025" to .003"; oil ring, .0015" to .002".

PISTON CLEARANCE: All models—Clearance correct when a scale pull of 12 to 18 lbs. is required to withdraw a

.0015" feeler blade ½" wide, inserted between thrust side of piston and cylinder wall.

THERMOSTAT: Located in cylinder head outlet elbow and designed to start opening at 147½° F.

OIL PUMP: Gear type. Mounted externally, driven from camshaft. Non-adjustable pressure relief valve mounted in cover. With oil of proper viscosity and engine at normal operating temperature, oil pressure on Six and Eight should be 40 lbs. at 45 M.P.H.; on Super Eights 160 and 180, 50 lbs. at 45 M.P.H.



282 CU. IN. ENGINE

OIL PUMP INSTALLATION: On Six and Eight models turn engine until No. 1 piston is 6° to 8° before top center, compression stroke. Install pump with slot, in driving gear, parallel to centerline of camshaft. On Super Eight models 160 and 180 turn engine until No. 1 piston is at top center, compression stroke, and locate slot, in driving gear, parallel to centerline of camshaft. Punch mark on gear should be on top when assembling Eight and Super Eight models; on bottom when assembling Six. Locate distributor in place with rotor in position to fire No. 1 spark plug.

MAIN BEARINGS: All models—Steel back, babbitt lined, replaceable precision shell type. Not adjustable. Replaced without removing crankshaft. Radial clearance, .0005" to .0015". End play, .003" to .008". Bearing thrust—models Six, on No. 1 bearing; models Eight and Super Eight 160 and 180, on center bearing. Bearing cap tension, 82 to 85 ft. lbs.

CONNECTING RODS: All models—Rifle drilled steel forging. Length, center to center—models Six and Eight, 7-11/16"; models Super Eight 160 and 180, 9¼". Weight—models Six and Eight, 1 lb., 15.6 oz.; models Super Eight 160 and 180, 2 lbs., 7 oz. Install rod with oil hole, at crank pin end, facing camshaft.

CONNECTING ROD BEARINGS: All models—Steel back, babbitt lined, replaceable precision shell type. Not adjustable. Radial clearance, .0005" to .0015". Side play, .004" to .010". Cap nut tension—model Six and Eight, 45 to 46 ft. lbs.; models Super Eight 160 and 180, 56 to 58 ft. lbs.

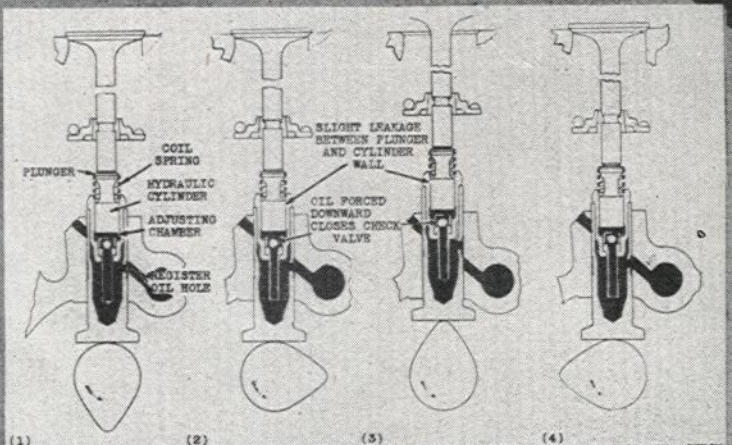
VALVES: All models—Seat angle, inlet, 30°; exhaust, 45°.

VALVE GUIDES: Press fit in block and straight reamed. Stem to guide clearance—Models Six and Eight, inlet, .0025"; exhaust, .0045". Models Super Eight 160 and 180, inlet, .002"; exhaust, .004".

VALVE SPRING LOAD: Models Six and Eight—Spring compressed to 1-5/8" length (valve closed), 52 to 57 lbs.; compressed to 1-5/16" length (valve open), 119 to 129 lbs. Models Super Eight 160 and 180—Spring compressed to 1¾" length (valve closed), 60 to 66 lbs.; compressed to 1-13/32" (valve open), 135 to 145 lbs.

VALVE TAPPET RUNNING CLEARANCE: Models Six and Eight—Inlet, .007"; exhaust, .010" (warm setting). Tappet screws are of self locking type in mushroom tappets. Models Super Eight 160 and 180 automatic take up.

VALVE TAPPET CLEARANCE FOR TIMING: Models Six and Eight—Inlet, .0125"; exhaust, .015". Models Super Eight 160 and 180 no manual setting.



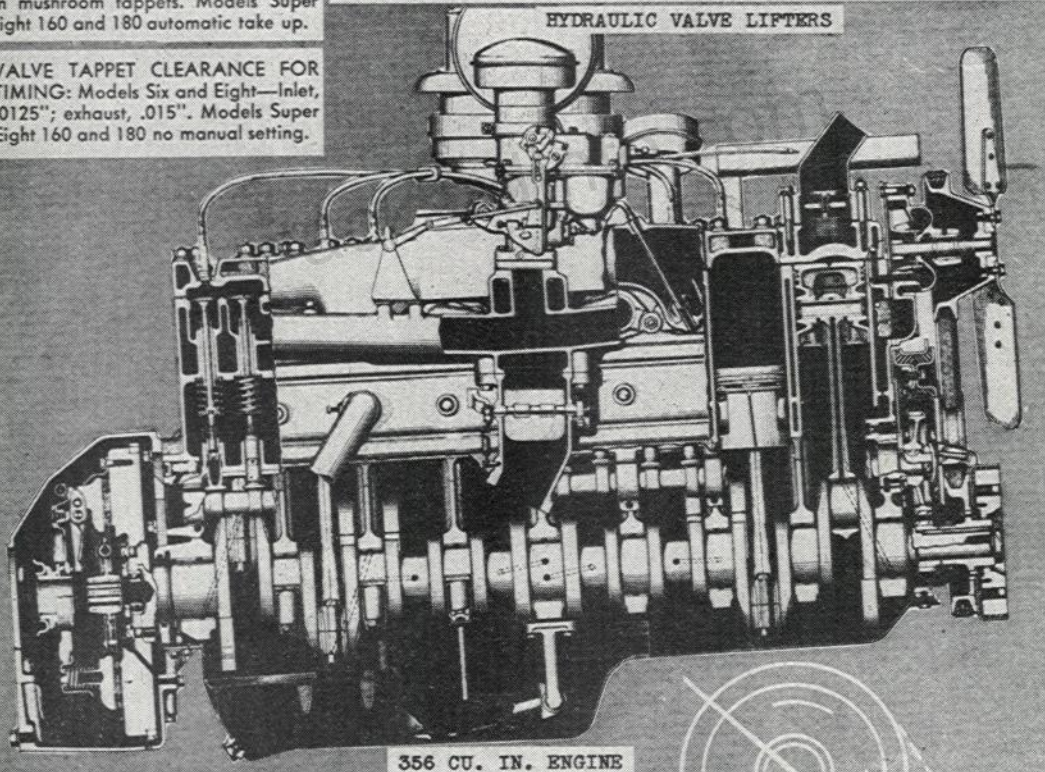
(1) ADJUSTING CHAMBER "L" IS FILLED WITH OIL -- WITH PLUNGER AGAINST VALVE STEM. CHECK BALL IS CLOSED, READY FOR OPENING PART OF CYCLE.

(2) VALVE IS BEING LIFTED AND VERY SLOW LEAKAGE FROM ADJUSTING CHAMBER HAS BEGUN.

(3) VALVE AT MAXIMUM LIFT WITH NO FURTHER CHANGE IN ACTION OF LIFTER -- SLOW LEAKAGE CONTINUES.

(4) VALVE JUST CLOSED, CHECK BALL OFF SEAT AND LEAKAGE WHICH HAS OCCURED DURING CYCLE IS BEING REPLENTISHED WITH CONTACT MAINTAINED BETWEEN PLUNGER AND VALVE STEM.

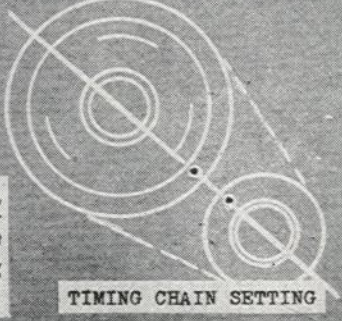
HYDRAULIC VALVE LIFTERS



356 CU. IN. ENGINE

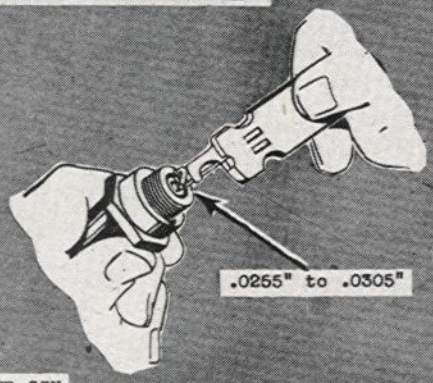
LUBRICATION: Capacity — Models Six, 5 qts.; Eight, 5½ qts.; Super Eight 160 and 180, 7 qts. Average temperature 90° F. or above, S.A.E. 40. Between 32° and 90° F., S.A.E. 30. Between 10° and 32° F., 20W. Between 10° above and 10° F. below zero, 10W. Lower than 10° F. below zero, 10W plus 10% kerosene.

CAMSHAFT BEARINGS: Models Six, four; models Eight, five; models Super Eight 160 and 180, eight camshaft bearings. All steel back, babbitt lined, not adjustable. Radial clearance, .001" to .003". End play, .0025" to .006".



TIMING CHAIN SETTING

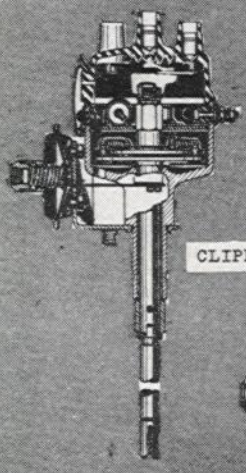
PACKARD, '42 — Tune-up



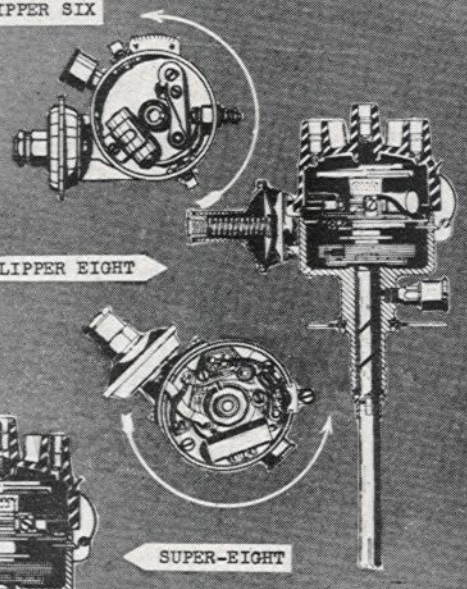
FIRING ORDER—SIX: 1-5-3-6-2-4.

FIRING ORDER—ALL EIGHT MODELS: 1-6-2-5-8-3-7-4.

SPARK PLUG GAP: All models—.0255" to .0305". Use round gage and adjust by bending side electrode only.



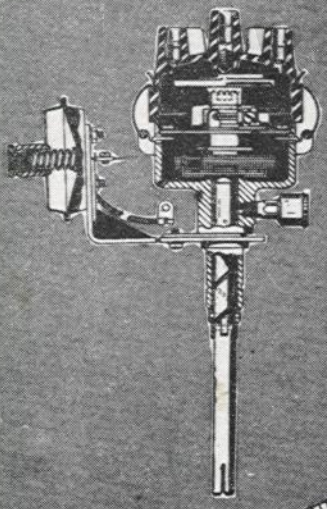
CLIPPER SIX



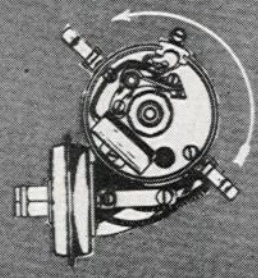
CLIPPER EIGHT

DISTRIBUTOR—SIX (AUTO-LITE IGC-4505): Breaker arm point gap, .020". Cam angle, 38°. Breaker arm spring tension, 19 to 23 oz. Automatic advance starts at 300 R.P.M. (dist.). Full advance, 9.5° at 1600 R.P.M. (dist.). Vacuum advance starts at 6" (of mercury). Full advance 7.5° at 17" (of mercury).

DISTRIBUTOR—EIGHT (AUTO-LITE IGP-4502A): Breaker arm point gap, .017". Cam angle, 27°. Breaker arm spring tension, 19 to 23 oz. Automatic advance starts at 325 R.P.M. (dist.). Full advance 10.75° at 1550 R.P.M. (dist.). Vacuum advance starts at 10" (of mercury). Full advance 6° at 17" (of mercury).

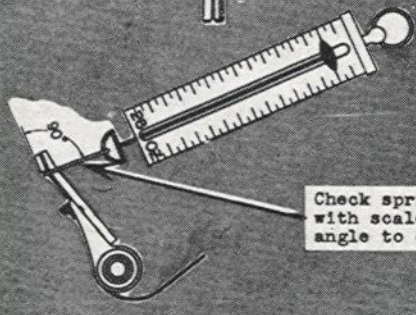


SUPER-EIGHT



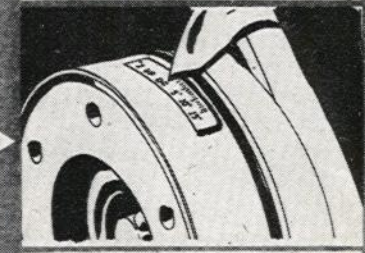
DISTRIBUTOR—SUPER EIGHT (AUTO-LITE IGT-4102): Breaker arm point gap, .017". Cam angle, 27°. Breaker arm spring tension, 19 to 23 oz. Automatic advance starts at 250 R.P.M. (dist.). Full advance, 11.5° at 1800 R.P.M. (dist.). Vacuum advance starts at 7" (of mercury). Full advance 5.5° at 16" (of mercury).

IGNITION TIMING: Set distributor so rotor is in position to fire No. 1 spark plug when No. 1 piston, in Six and Super Eight model engines, is 4° before top dead center; No. 1 piston, in model Eight engines, is 5° before top dead center of compression stroke. Timing



Check spring tension with scale pull at right angle to contact face

TIMING MARKS

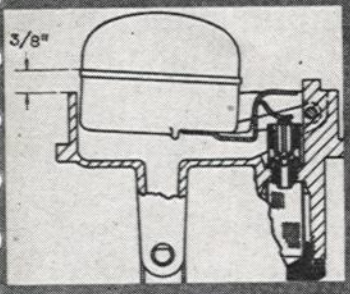


mark "1 UP DC", on vibration damper, indicates top dead center position. One degree marks are also provided. When motor is turned until specified mark on damper is in register with pointer, the desired setting can be obtained. For more accurate ignition setting, a timing light is recommended.

Tune-up — PACKARD, '42

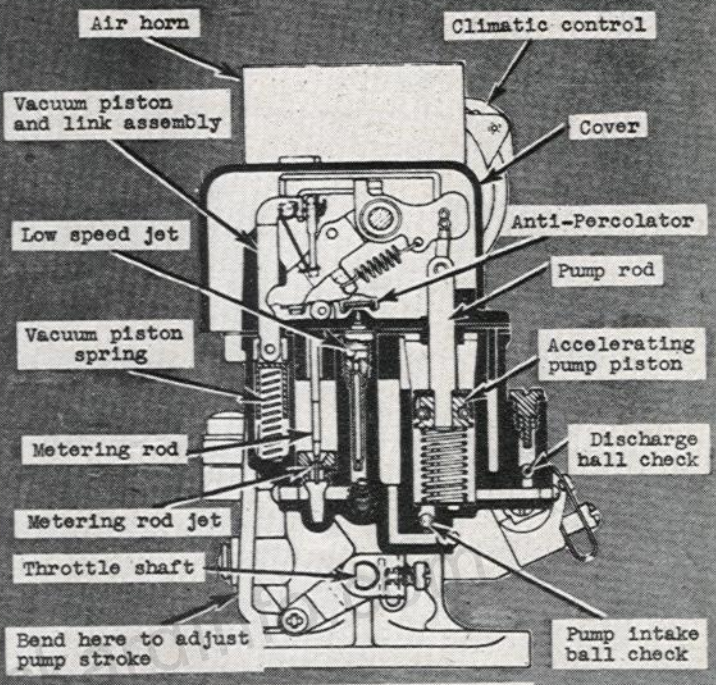
CARBURETOR—SIX (CARTER WAI-530-S).

FLOAT LEVEL: With float bowl cover assembly inverted, vertical distance from top of projection on bowl cover to top of soldered seam at front end of float should be 3/8", with needle seated. Adjust by bending lip, on float, which



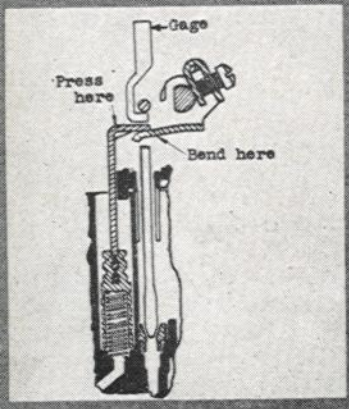
contacts needle. When holding bowl cover in normal position, free end of float should have minimum drop of 1/2". Adjust by bending two small float-stop lips at anchored end of float.

PUMP ADJUSTMENT: With throttle valve seated and connector link in place, pump plunger should travel 16/64" from closed to wide open position. Adjust by bending throttle connector rod at lower angle.



SIX CYLINDER—CARTER WAI-530-S.

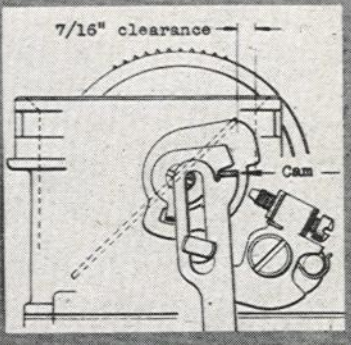
METERING ROD ADJUSTMENT: Correct setting of metering rod is important and must be made after pump adjustment. Insert gage (Carter tool No. T109-102) in place of metering rod, seating tapered end in metering rod jet. Hold gage vertical to insure seating. With throttle valve seated, press down lightly on piston link directly over piston. There should be less than .005" clearance between metering rod pin and shoulder in notch of gage. Gage must not drag on pin. Adjust by bending lip on piston link so that it contacts pump arm. Remove gage and install metering rod and disk.



ANTI-PERCOLATOR ADJUSTMENT: Crack throttle valve .030" by placing gage (Carter tool No. T109-29) between valve and bore of carburetor (side opposite port). Bend rocker arm (using tool T109-105) until there is .005" to .015" between rocker arm and pump arm.

FAST IDLE ADJUSTMENT: With fast idle cam held in normal idle position, tighten throttle lever adjusting screw until it just seats against cam. Hold throttle lever closed and pull cam back until first (lower) step on cam is against (not on) set screw. There should be 5/8" clearance between inside wall of air horn and lower edge of choke valve. Use gage No. T109-85. Adjust by bending at offset portion of fast idle link. Use tool No. T109-41.

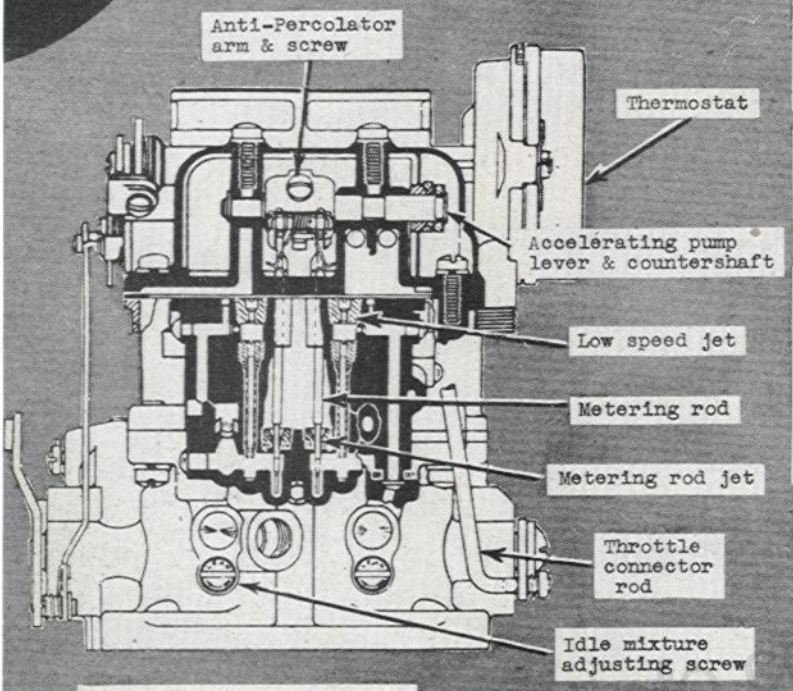
UNLOADER ADJUSTMENT: With throttle valve wide open there should be 7/16" clearance between lower edge of choke valve and inner wall of



air horn. Use gage (tool No. T109-81). Adjust by bending cam, on throttle lever, with tool No. T109-41.

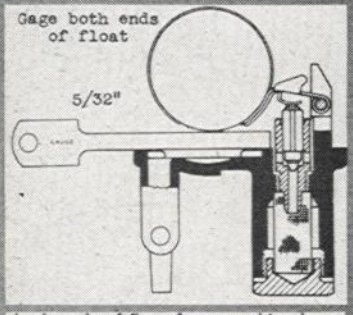
LOCK-OUT ADJUSTMENT: With throttle and choke valves wide open, choke should lock in wide open position. Adjust by bending lip at lower end of fast idle link, to give 1/32" clearance between lip and throttle lever lock, with throttle and choke valves held wide open.

PACKARD, '42 — Tune-up



EIGHT AND SUPER EIGHT MODELS —CARTER WDO-512-S AND WDO-531-S

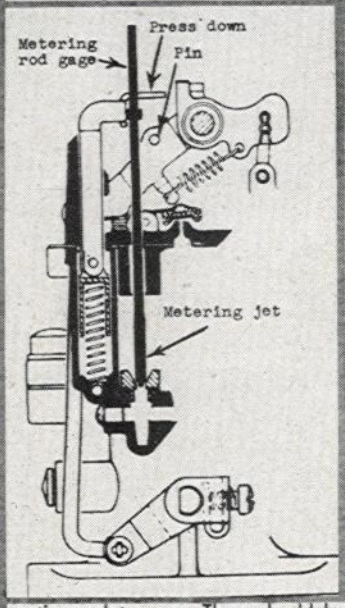
FLOAT LEVEL: Set float level to 5/32". Use gage No. T109-154 and gage



both ends of float from machined surface of casting.

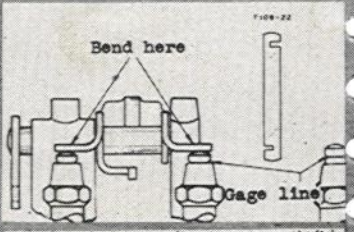
PUMP ADJUSTMENT: With pump connector link in inner hole in pump arm, and throttle adjustment screw backed out, pump plunger should travel 7/32" from closed to wide open position in 512S or 13/32" in 531S. Adjust by bending throttle connector rod at lower angle with tool No. T109-75.

METERING ROD ADJUSTMENT: Insert metering rod gage (Carter tool No. T109-113) in place of metering rods. Be sure gage seats in metering rod jet, after backing out throttle lever adjusting screw so throttle valves seat. Install metering rod pin in vacuum piston link. Press lightly on vacuum piston link until lip or link contacts tongue on



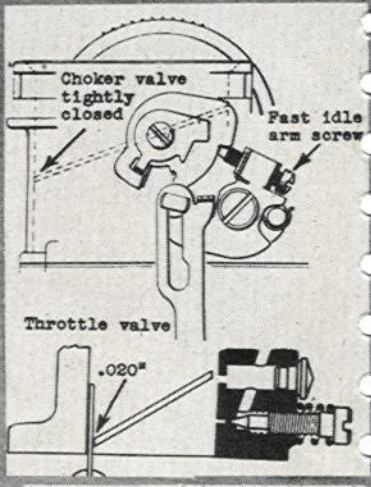
anti-percolator arm. There should be less than .005" clearance between metering rod pin and shoulder of notch in gage. Adjust by bending lower tongue of anti-percolator arm. Remove gage and metering rod pin and install metering rods, disks, metering rod spring, pin and pin spring. Hook metering spring on metering rods. See that vacuum piston link and metering rods move up and down freely without binding in any position.

ANTI-PERCOLATOR ADJUSTMENT: Anti-percolator should be checked after metering rod setting and installation of metering rods on carburetor and metering rods or pump adjustments should not be disturbed. Back



out throttle lever adjusting screw. With throttle valves tightly closed insert .015" feeler gage between anti-percolator stem and lip on anti-percolator arm and adjust lips on anti-percolator arm to depress anti-percolator stem so indicator line is flush with top of anti-percolator plug. Since there are two anti-percolator units on these carburetors, an even adjustment on both lips is very important.

FAST IDLE ADJUSTMENT: Hold choker valve closed tight and adjust fast idle arm screw to give .020" opening



between edge of throttle valve and bore of carburetor, side opposite port.

UNLOADER ADJUSTMENT: With throttle valve wide open, there should be 11/64" clearance between upper edge of choke valve and inner wall of air horn. (Use gage No. T109-166.) Adjust by bending lip on fast idle connector link.