

Christie & Thomson, Inc.
TECHNICAL BULLETIN

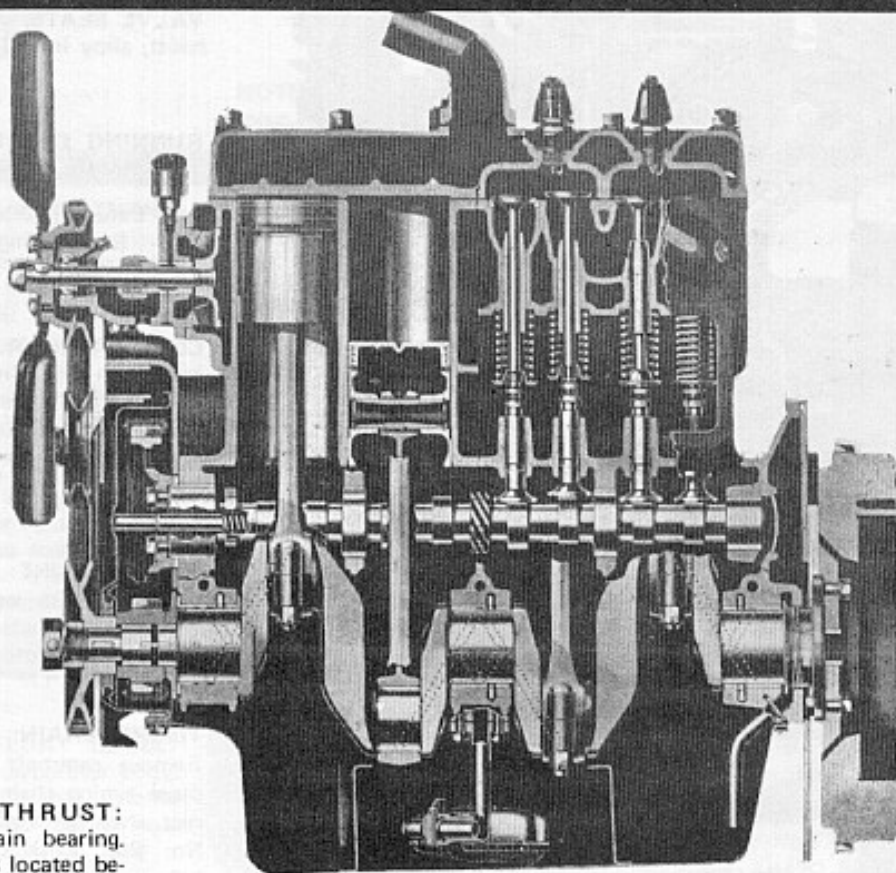
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Illustrated Service Procedure and Specifications for Willys 77, 1935



CRANKSHAFT THRUST:

Taken on front main bearing. Adjustable by shims located between crankshaft thrust washer and shoulder of shaft. Recommended endplay, .004" to .006".

MAIN BEARINGS: Inter-changeable steel back type. Clearance, .002"

LUBRICATION: Capacity 4 qts. Summer, 40° F. and above, S. A. E. 30. Winter, 15° above to 40°, S. A. E. 20 W. Extreme cold, S. A. E. 10 W.

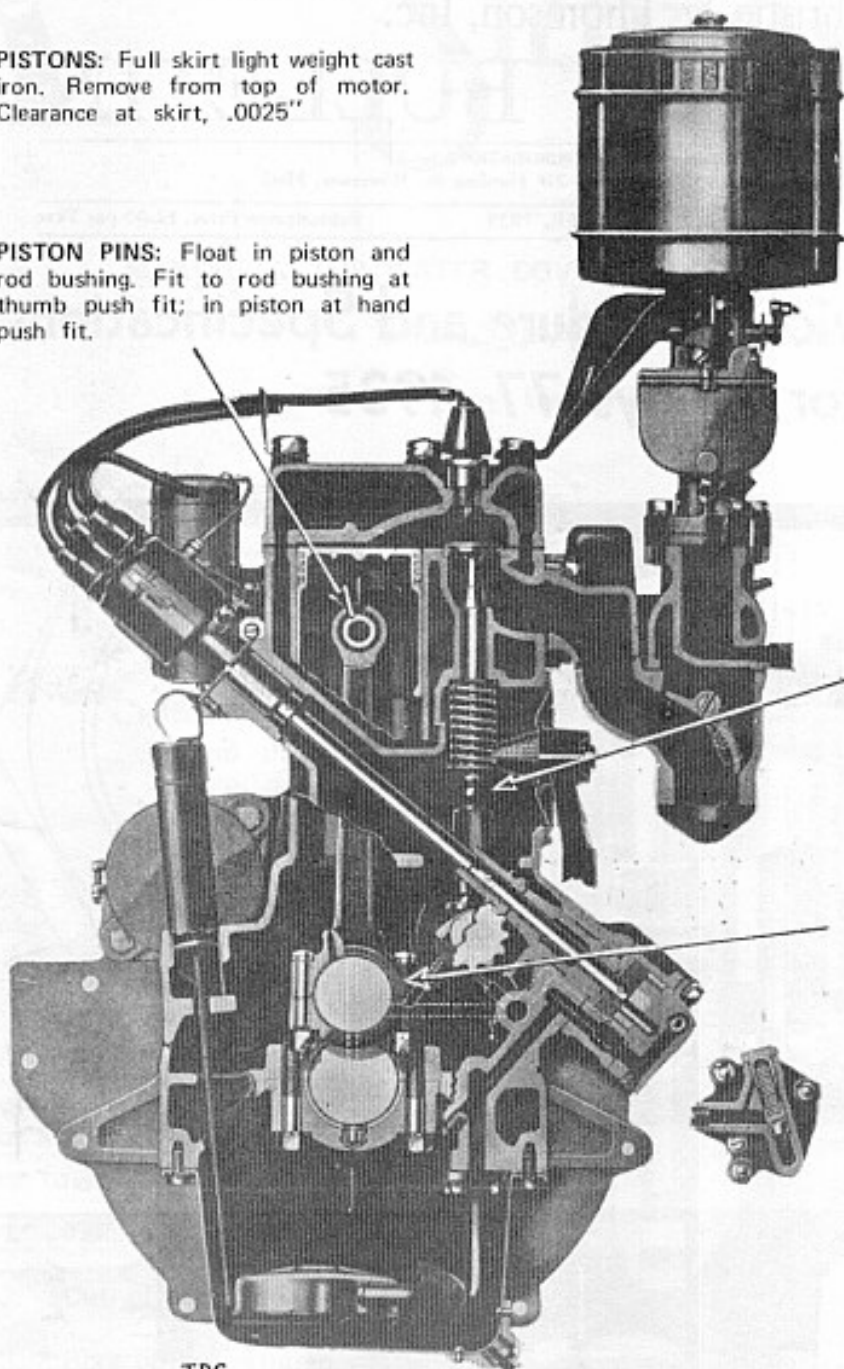
CONNECTING ROD BEARINGS: Spun type, integral with rod and cap. Clearance on crank pin, .002" with from .006" to .008" side clearance.

SPECIFICATIONS:

WILLYS 77, 1935: Four cyl., bore 3-1/8", stroke 4-3/8". Piston displacement, 134.2 cu. in., H.P., 48 at 3200. Compression ratio, 5.13:1. Compression pressure, 83 lbs. at 125 R.P.M.

PISTONS: Full skirt light weight cast iron. Remove from top of motor. Clearance at skirt, .0025"

PISTON PINS: Float in piston and rod bushing. Fit to rod bushing at thumb push fit; in piston at hand push fit.



Firing order, 1-3-4-2

VALVES: Head diameter; intake 1-17/32", exhaust 1-15/32". Stem diameter; intake .372", exhaust .371". Guide clearance; intake .003", exhaust .004".

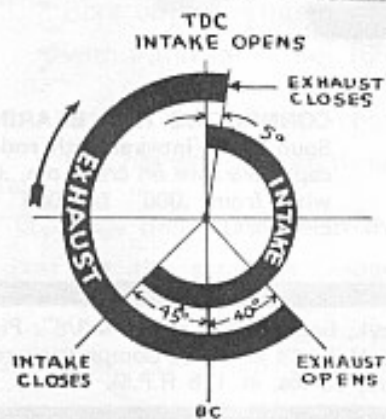
VALVE SEATS: Angle, 45°. Exhaust, alloy inserts.

RUNNING CLEARANCE:
Intake, .004"
Exhaust, .006"
(hot setting)

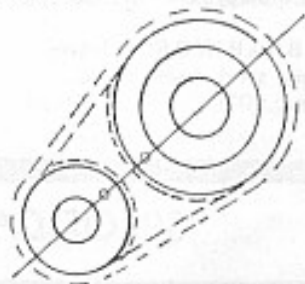
CONNECTING RODS: Offset at crank pin end. Install with short side of offset toward nearest main bearing, and oil spray hole toward right side of motor.

OIL PRESSURE: 30 lbs. at 30 M. P. H. with warm oil.

TIMING CHAIN: Not adjustable. Remove camshaft sprocket to replace timing chain. Timing is correct when, with pistons No. 1 and No. 4 at T. D. C., a line drawn between sprocket centers cuts through timing marks on both sprockets.



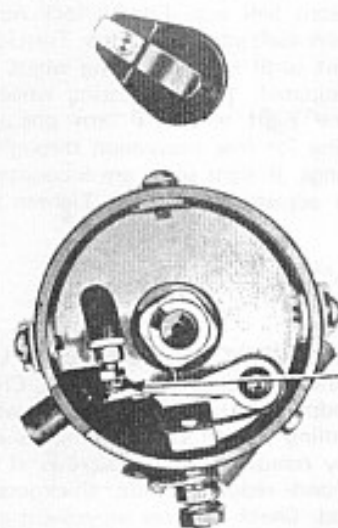
VALVE TIMING: Clearance for checking, intake valve No. 1 cyl., .010". No. 1 intake valve should just start to open when "I-O" mark on flywheel registers with pointed end of timing inspection hole cover screw in flywheel housing. **NOTE**—"I-O" mark is also T. D. C. mark for pistons No. 1 and No. 4.



IGNITION

Firing order, 1-3-4-2

IGNITION TIMING: Flywheel marked for ignition timing by symbol "IGN" on flywheel rim. Indicator peephole located left and top of flywheel housing. Locate distributor so that spark occurs for ignition at No. 1 spark plug when "IGN" mark is in register with pointed end of inspection plate screw. Timing is 4° , plus or minus 1° , before T.D.C. When checking or setting timing exert slight pressure on rotor of distributor against rotation to eliminate back lash.



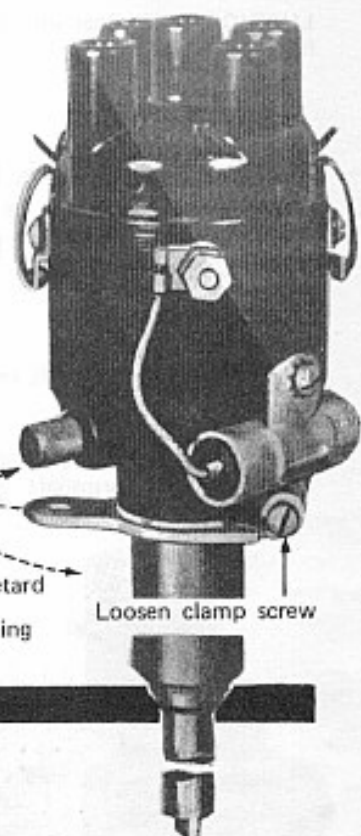
Contact point gap, .018"

Spark plug gap, .025"



Advance

Retard



Loosen clamp screw

NOTE—If oil pump is removed, ignition timing must be re-set,

CARBURETOR ADJUSTMENT:

Turn idle adjusting screw clockwise until it rests lightly on seat, then turn counter-clockwise $1\frac{1}{2}$ turns, to initial setting. Start motor and adjust throttle stop screw that motor runs at fair idle speed. Slowly turn idle mixture adjusting screw counter-clockwise until motor hesitates from too lean mixture. Turn adjusting screw in opposite direction until motor runs smoothly. Accelerate motor and then let it come to idle for re-check of idle mixture. Complete adjustment by turning throttle stop to position where motor will idle at car speed of 7 M.P.H. in high gear.

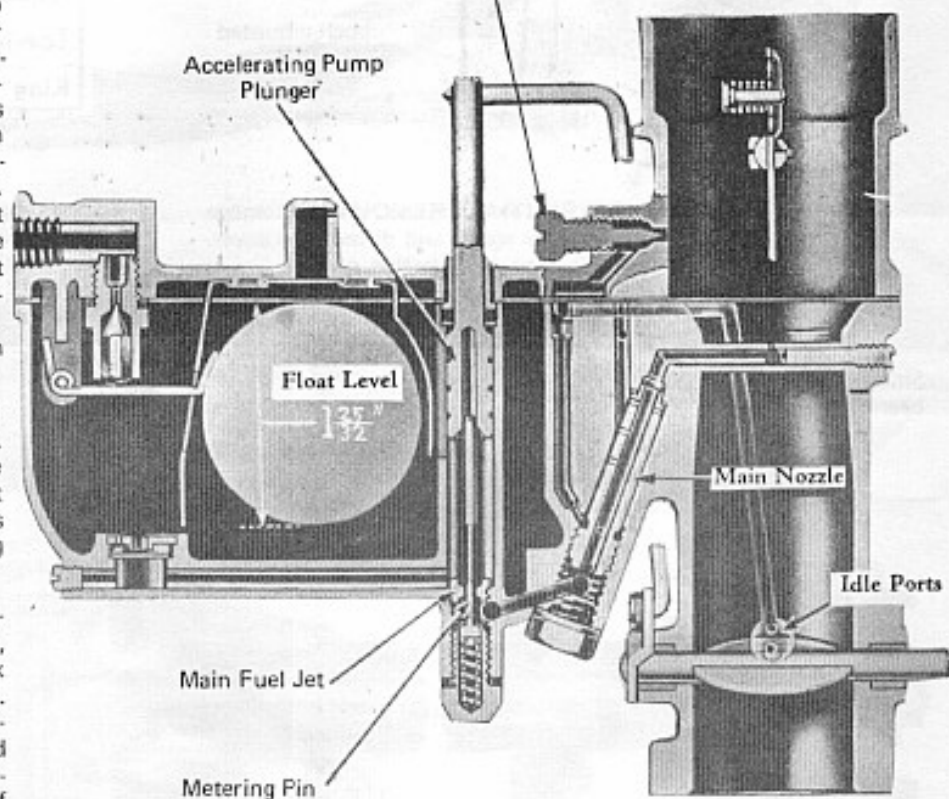
TO CHECK FLOAT LEVEL:

Remove upper carburetor body. Set float level so that distance measured from bottom of float to face of carburetor body is $1 - \frac{25}{32}$ ", float lever holding needle on seat.

MAIN FUEL JET: If performance indicates rich mixture, remove metering pin and check main fuel jet with a size 42 drill. If drill passes through jet without forcing, it has been enlarged or is over-size and should be replaced with "standard" jet. If drill will not pass through, jet size is correct, and metering pin may be installed or replaced with "over-size" as conditions warrant.

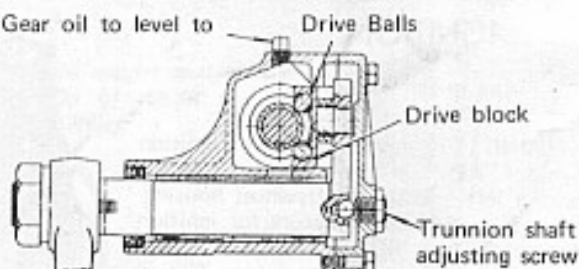
CARBURETOR

Idle Mixture Adjusting Screw

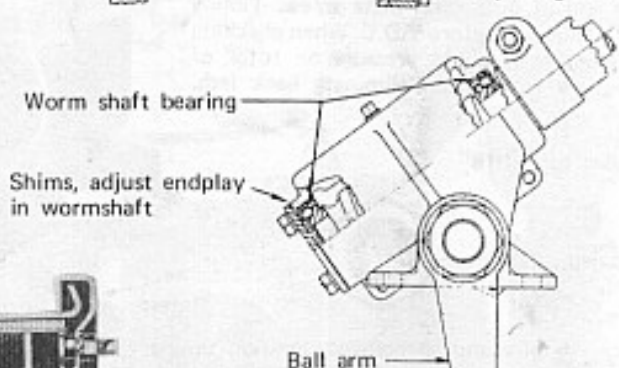


WILLYS 77---1935 STEERING - AXLES

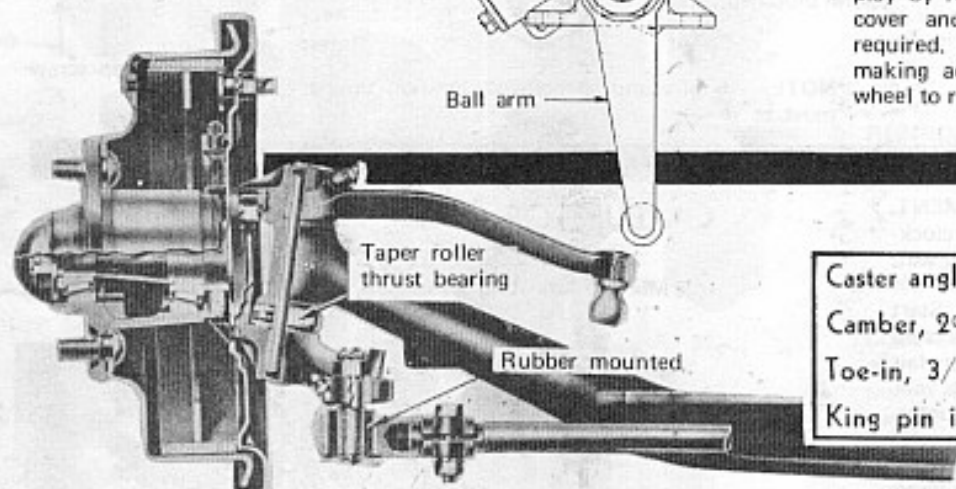
LUBRICATION: Gear oil to level to filler plug hole.



TO REMOVE LASH BETWEEN DRIVE BLOCK AND WORM: Disconnect drag link from ball arm. Loosen lock nut of trunion shaft adjusting screw. Turn screw to right until excess steering wheel lash is eliminated. Rotate steering wheel to extreme right and left turn positions, checking for free movement through entire range. If tight spots are encountered, loosen adjustment slightly. Tighten lock nut.



TO REMOVE WORM SHAFT ENDPLAY: Disconnect drag link at ball arm. Check for endplay by grasping steering wheel and pulling up and down. Eliminate endplay by removing four capscrews at end cover and reducing shim thickness as required. Check for free movement after making adjustment by turning steering wheel to right and left extremes.



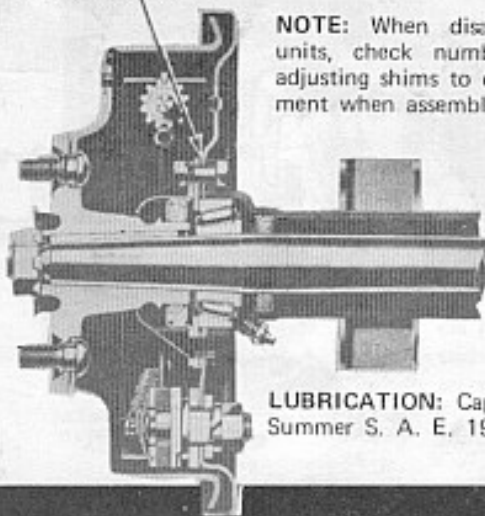
Caster angle, $1\ 1/2^\circ$.
 Camber, 2° .
 Toe-in, $3/32''$.
 King pin inclination, $7\ 1/2^\circ$.

DIFFERENTIAL REMOVAL: Remove wheels, axle shafts and differential cover. Bearing caps at each side of differential are next removed and shims at right side of case taken out first. Left side shims are then easily removed after which assembly will slip out.

PINION SHAFT: Drop propellor shaft and remove front pinion bearing retainer screws. Pinion and carrier will remove as a unit.

Shims for axle shaft bearing adjustment

NOTE: When disassembling rear axle units, check number and location of adjusting shims to obtain correct adjustment when assembling.



LUBRICATION: Capacity, 1 pt., semi-fluid gear oil. Summer S. A. E. 190, Winter, S. A. E. 160.

