SERVICE MANAGERS' PERSONAL COPY

PACKARD SERVICE LETTER

VOL. 9 No. 18 SEPTEMBER 15, 1935

SERVICE MEETING

A Service Meeting will be held at the Factory in Detroit on Thursday and Friday, October 24th and 25th.

The program will consist of a thorough discussion of the mechanical repairs and adjustments of both the larger Packard cars and the One Twenty. Merchandising service for profit will receive special attention.

Packard Service Policy toward owners will be clearly outlined, and the rules and routine for the handling of all problems dealing with material and labor adjustments, between Factory and Distributers and Dealers will be described. There will be opportunity for discussion of individual problems with the various department heads of the Service Division. Everyone will see the factory.

Those wishing to drive home should arrange well in advance for their cars so that no time need be taken from the meeting for these details. Driveaways will start immediately after noon of the second day—Friday.

Service men, from both Distributers and Dealers will gain much from attendance at this meeting.

Reservations will be made at the Statler Hotel. In your letter specify whether single or double room is desired and give names of those who will attend.

STANDARD SIZES AND ADJUSTMENTS

14TH SERIES

Model	1400-1-2	1403-4-5	1407-8
BRAKE			
Clearance around Drum	Free	Free	Free
Lining Size—Front Left	15⅛" x 1¾" x ¼"	15⅛" x 1¾" x ¼"	16⅛" x 1⅞" x ¼"
Lining Size—All Others	15⅛" x 2¼" x ¼"	15⅛" x 2¼" x ¼"	16⅛" x 2½" x ¼"
No. of Linings per Car	8	8	8
CLUTCH			
No. of Driven Plates	1	1	1
Lining—Hyco—Size	7" x 12"	7" x 12"	7" x 12"
Clearance Hub to Clutch Shaft	No Perceptible Back Lash—All Models		
Clutch Spring Load	125 Lbs. at 1 $\frac{9}{16}$"	Inner—50 Lbs. at 1 $\frac{9}{16}$" Outer—100 Lbs. at 1 $\frac{9}{16}$"	Inner—50 Lbs. at 1 $\frac{9}{16}$" Outer—115 Lbs. at 1 $\frac{9}{16}$"
Clearance Pedal to Toeboard	1"	1"	1"
COOLING SYSTEM			
Capacity in Gallons	5	5½	10
Gravity Flow per Minute—Min.	30 Gal.	30 Gal.	50 Gal.
Clearance Fan to Radiator Core	$\frac{13}{16}$"	⅞"	$\frac{13}{16}$"
Thermostat Valve Starts to Open at	155 Deg.	155 Deg.	155 Deg.
Fan Belt—Two Used per Motor—45 Deg. Vee	39⅜"	39⅜"	49½"
Range of Adjustment	¾"	¾"	¾"

STANDARD SIZES AND ADJUSTMENTS—Continued

Model	1400-1-2	1403-4-5	1407-8
GASOLINE SYSTEM			
Capacity of Tank in Gallons	25	25	30
Carburetor Make and Type	Packard-Stromberg Duplex Down-Draft—All Models		
Gasoline Feed	Mechanical Fuel Pump	Mechanical Fuel Pump	Mechanical Fuel Pump
ELECTRICAL			
Generator Charging Rate—Hot	Twenty-four to Twenty-seven Amperes—All Models		
Battery Capacity in Ampere Hours	One Hundred and Forty-four—All Models		
Hydrometer reading fully charged	1250		
LAMP BULBS Headlight	2-Filament 32-32 Candlepower—All Models		
Stoplight	Standard Single Contact 15 Candlepower—All Models		
Domelight	Standard Single Contact 6 Candlepower—All Models		
Instrument Board Pilot	Special Single Contact 1 Candlepower—All Models		
All Others	Standard Single Contact 3 Candlepower—All Models		
Spark Timing—Full Advance Occurs	6° B. T. D. C.	6° B. T. D. C.	6° B. T. D. C.
Breaker Point Gap	.018 to .022 of an Inch—All Models		
Spark Plug Gap	.028 to .030 of an Inch—All Models		
Generator Fuse	3 Amperes—¼″ x ⅝″ in Size—All Models		
Body Wiring Fuse	20 Amperes—$\frac{13}{32}$″ x 1½″—All Models		
MOTOR			
Compression	110	110	110
Firing Order	1-6-2-5-8-3-7-4	1-6-2-5-8-3-7-4	1R-6L-5R-2L-3R-4L 6R-1L-2R-5L-4R-3L
Clearance Bearing to Crankpin	.0017—.0022		
End Play Connecting Rod on Crankshaft	Minimum .003″	Minimum .003″	Minimum .008″
End Play Con. Rod on Piston Pin—Nominal	⅛″	⅛″	$\frac{3}{16}$″
Diameter of Crankpins	2.1875″	2.1875″	2½″
Clearance on All Main Bearings	Minimum—.001 of an Inch—All Models		
End Play Crankshaft on Main Thrust Bearing	Minimum—.003 of an Inch—All Models		
Diameter of Main Journals	2.625″	2.625″	2¾″
Diameter Cylinder Bore—Standard	3 $\frac{3}{16}$″	3½″	3 $\frac{7}{16}$″
Reground Oversizes	.005 to .045 oversize at our option—All Models		
Diameter of Piston Pin	⅞″	⅞″	⅞″
Oversizes	.003″-.006″ over Standard—All Models		
Piston—Install in Motor	Slots on Valve Side	Slots on Valve Side	Slots on Valve Side
Width of Ring Groove	Comp. ⅛″ Oil $\frac{3}{32}$″	Comp. ⅛″ Oil $\frac{3}{32}$″	Comp. ⅛″ Oil $\frac{3}{32}$″
Depth of Groove—Oil	.157″	.157″	.158″
Clearance Piston Skirt to Cylinder Wall	Minimum .0015″	Minimum .0015″	Minimum .0015″
Piston Ring Gap Compressed to Cylinder Diameter	.007″ Minimum—All Models		
Pressure Required to Close Ring to Correct Gap	Comp. 6¼ Lbs. Oil 4½-7½ Lbs.	Comp. 6¾ Lbs. Oil 4½-7½ Lbs.	Comp. 6½ Lbs. Oil 4½-7½ Lbs.
Piston Sizes	Standard .003″ .005″ .010″ .015″ .020″ .025″ .030″ .035″ .045″ over	Standard .003″ .005″ .010″ .015″ .020″ .025″ .030″ .035″ .045″ over	Standard .003″ .005″ .010″ .015″ .020″ .030″ .045″ over
Clearance to Push Rods—Motor Warm Ex.	.006″	.006″	Automatic Takeup
Clearance to Push Rods—Motor Warm In.	.004″	.004″	Automatic Takeup
Width of Contact of Valve Seat	Eight Hundred Eighty-three Ten-thousandths		.062″
Clearance between Valve Stem and Guide	Inlet—Minimum—.0025″ Outlet—Minimum—.0045″	Same Same	.0025″ .005″
Tension of Valve Springs	73 Lbs. at 3 $\frac{1}{16}$″	73 Lbs. at 3 $\frac{1}{16}$″	70 Lbs. at 2 $\frac{7}{32}$″
Oil Pump Pressure at 1000 R. P. M.	Minimum—35 Lbs.—All Models		
Crankcase Oil Capacity	8 Qts.	9½ Qts.	10 Qts.

STANDARD SIZES AND ADJUSTMENTS—Continued

Model	1400-1-2	1403-4-5	1407-8
MOTOR—Cont.			
Rod Clearance to Surface Oil in Crankcase	1 11/16″	1 11/16″	Front 2 1/8″ Rear 1 7/16″
Valve Timing	00's on Crankshaft and Camshaft Sprockets Should be Nearest together and Line up on Each Side of Center	00's on Crankshaft and Camshaft Sprockets Should be Nearest together and Line up on Each Side of Center	00's on Crankshaft and Camshaft Sprockets Should be Nearest together on Center Line
REAR AXLE			
Oil Capacity	Six Pints—All Models		
Backlash Between Driving Gear and Pinion—Minimum	Four Thousandths of an Inch—All Models		
STEERING			
Front Wheel Camber	1 Deg.	1 Deg.	1 Deg.
Front Wheel Caster	1½ Deg.	1½ Deg.	1½ Deg.
Front Wheel Toe-in	1/16″	1/16″	1/16″
Front Wheel Bearing Adjustment	Tighten Nut as Tight as Possible and Back off ½ Turn or More and Lock		
Recommended Tire Pressure	40 Lbs.	40 Lbs.	40 Lbs.
Shock Absorber Valving—Standard 5-Passenger Sedan For Other Body Types See Service Parts List	**1400-1401** Front Rebound—5GR Front Compression—GO Front Static—O—7+ Rear Rebound—5L Rear Compression—GO Rear Static—OA+	**1403** 2CH E2 O—7+ 1L GI O—A+	**1407** / **1407 De Luxe** 2CH / 2CH E4 / E3 2—7+ / 2—7+ 5GR / 5HT GI / GI I—7+ / I—7
TRANSMISSION			
Oil Capacity	Four and One-half Pints—All Models		
Ratio to Rear Wheels in Direct Drive	5.07 4.36 4.69—Std.	4.06 4.41—Std. 4.69 5.07	4.06 4.41—Std. 4.69 5.07
In Second	7.63 6.65 7.15	6.21 6.74 7.15 7.63	6.21 6.74 7.15 7.63
In First	12.49 10.71 11.53	10.01 10.86 11.53 12.49	10.01 10.86 11.53 12.49
In Reverse	14.61 12.56 13.5	11.72 12.71 13.5 14.61	11.72 12.71 13.5 14.61
Backlash Between Gears Not Always in Mesh—Minimum	Four Thousandths of an Inch—All Models		
UNIVERSAL JOINT			
Assembling Universal Joints	Arrows on Shaft and Universal Joint Sleeve Must be in Line.—All Models		

STANDARD SIZES AND ADJUSTMENTS

MODEL 120-B

BRAKES	
Clearance around Drum	.010″
Length of Lining	13″
Make of Lining—Primary	U. S. Asb. No. 714
Make of Lining—Secondary	U. S. Asb. No. 589
Width and Thickness	1¾″ x 3/16″
Number per Vehicle	8
Setting Hand Brake	3/16″ Free Travel with Brake Released

CLUTCH	
Number of Driving Surfaces	2
Size of Driven Facing	6″ x 10″ x .137″
Clearance of Hub on Clutch Shaft	No Perceptible Backlash
Total Cluch Tension	1035 Lbs.
Number of Springs	9
Tension of Springs	115 Lbs. at 1 5/16″
Clutch Pedal to Toeboard Clearance—Clutch Engaged	½″
Free Movement of Pedal	2″

STANDARD SIZES AND ADJUSTMENTS—Continued

ELECTRICAL SYSTEM

Generator Charging Rate—Cold	23
Battery Capacity	17 Plate—110 Ampere Hours
Lamp Bulbs—Headlamp	32-32 Candlepower
—Dimmer	1 Candlepower
—Instrument Board	3 Candlepower
—Stop	15 Candlepower
—Tail	3 Candlepower
—Dome	6 Candlepower
Spark Timing—Advance Occurs	7° B. T. D. C.
Breaker Point Gap	.018″ to .022″
Spark Plug Gap	.028″ to .030″

MOTOR

Compression at 125 r.p.m.	110 Lbs.
Firing Order	1-6-2-5-8-3-7-4
Front End Chain	1¼″ Wide, ⅜″ Pitch—58 Links
Front End Chain Adjustment	Non-adjustable
Camshaft End Thrust	.002″—.004″
Camshaft Bearing Clearance	.001″—.003″
Piston Pin fit in Fiston	Palm Push Fit at 160° Heat
Clearance Bearing to Crankpin	.0015″
End Play Connecting Rod on Crankshaft	.004″—.010″
Connecting Rod Assembled	Oil Hole Toward Camshaft
Diameter of Crankpin	2 3/32″
Clearance on all Main Bearings	.001″—.003″
Crankshaft End Play	.003″—.008″
Diameter of Main Journals	2¾″
Length of Main Bearings—No. 1	1 3/8″
—No. 2	1 7/32″
—No. 3	1 13/32″
—No. 4	1 7/32″
—No. 5	2 1/16″
Diameter of Cylinder Bore—Std.	3¼″
Diameter of Fiston Fin	7/8″
Piston Pin Oversizes	.003″—.006″
Piston—Install in Motor	Slot Toward Valves
Width of Ring—Compression	1/8″
—Oil	3/16″
Clearance—Fiston to Cylinder Wall	.0015″ Minimum
Ring Gap—Compression	.007″—.012″
—Oil	.007″—.015″
Pressure required to close Ring to Correct Gap	10 Lbs.
Fiston Sizes	Standard .005″ .010″ .020″ .030″ .040″ over
Valve Clearance to Push Rods	In. .007″—Motor Warm Ex. .010″—Motor Warm
Valve Stem Clearance at Bottom of Guide	.0005″—.00175″
Valve Lift	.300″
Tension of Valve Springs—Valve Closed	40 Lbs.
Oil Pump Pressure—Normal	35 Lbs.
Crankcase Oil Capacity	7 Qts.

MOTOR—Continued

Valve Timing—Inlet Opens	5° B. T. D. C.
—Inlet Closes	39° A. L. D. C.
—Exhaust Opens	45° B. L. D. C.
—Exhaust Closes	5° A. T. D. C.
Setting Camshaft	00's on Crankshaft and Camshaft Sprockets Should Be Nearest Together and Line Up

REAR AXLE

Tread	60″
Oil Capacity	4¼ Pints
Backlash—Driving Gear to Finion	.003″—.005″

SPRINGS

Front—Coil	5¼″ Dia.—1450 Lb. Load x 75 Rate
Rear—Semi-Elliptic Leaf	54 x 1¾″ Load Rate Touring Sedan —1150 x 125 5-Passenger Sedan —1100 x 125 Touring Coupe —1100 x 125 Sport Coupe — 950 x 125 Club Sedan —1100 x 125 Com. Coupe — 950 x 125 Convertible Coupe — 950 x 125

STEERING

Front Wheel Camber	1°
Front Wheel Toe-in	0″ to 1/8″
Front Wheel Caster	2°
Front Wheel Tread	59″
Minimum Turning Radius	19½′
Front Wheel Bearing Adjustment	Tighten Nut as Tight As Possible, Back Off One-half a Turn and Lock
Recommended Tire Pressure—except Convertible Coupe	24 Lbs.
Recommended Tire Pressure—Convertible Coupe	22 Lbs.
Shock Absorber Adjustment	Fixed

TRANSMISSION

Oil Capacity	1 Quart
Ratio to Rear Wheels—High	4.09 to 1
—Second	6.25 to 1
—First	9.92 to 1
—Reverse	12.98 to 1
Backlash—Clutch to Rear Wheels	Maximum .003″

COOLING SYSTEM

Capacity	18 Quarts
Gravity Flow per Minute	25.8 Gallons
Clearance Fan to Radiator Core	13/32″
Thermostat Valve Starts to Open at	145° to 150°
Fan Belt	42° Vee Type
Length and Width	42 3/8″ x ¾″
Fan Belt Adjustment	Loosen Upper Generator Support and Swing Generator
Range of Adjustment	1½″

GASOLINE SYSTEM

Tank Capacity	20 Gallons
Inside Diameter of Carburetor Throat (each barrel)	1 3/16″

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