SPRING & SUMMER 1964

KAISER
OWNER'S CLUB
FRAZER

QUARTERLY

DO YOUR CAR WINDOWS LEAK?

USE

WINDSHIELD SEALZIT

SEALZIT REMAINS IN A PLIABLE CONDITION, NEVER BECOMES BRITTLE, OR BREAKS OFF, AND ACTS AS A GLASS AND RUBBER BINDING.

Rubber drawn away from glass allowing water to seep through

Past method of attempting to seal by an overlay which because of vibration and shrinkage will leave the glass and expose the area that leaks

Using 'SEALZIT' the leak is stopped at its source and a definite block of material prevents seepage. Apply with medicine dropper. 'Sealzit' will flow into any crevice where leak might occur.

2 OZ. BOTTLE
WITH APPLICATOR
PART NO. 100051

- EASY TO APPLY
- DRIES QUICKLY
- LASTING RESULTS
- ECONOMICAL

Additional Uses for KF Windshield Sealzit—

1. IGNITION AND WIRING INSULATION
2. WATER HOSE CONNECTION SEAL
3. DOOR STRIPPING ADHESIVE
4. GASKET SEALER
5. BATTERY TERMINAL COATER

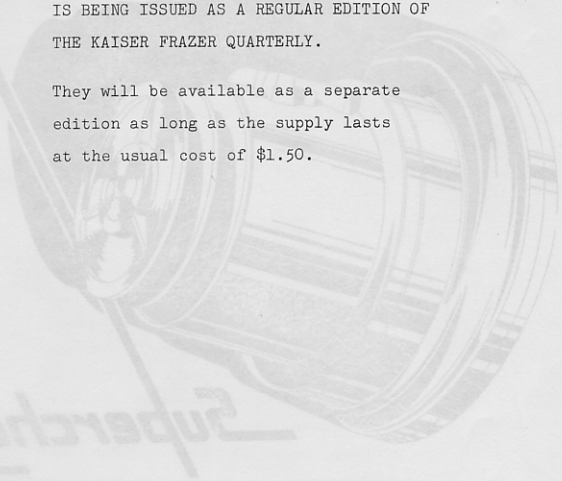
KAISER-FRAZER SALES CORPORATION
KAISER-FRAZER CORPORATION
Willow Run, Michigan, U. S. A.

LITHO IN U. S. A.

THE KAISER FRAZER QUARTERLY JUNE 1964
Volume Four Number Three

THIS COPY OF THE TWO SUPERCHARGER MANUALS IS BEING ISSUED AS A REGULAR EDITION OF THE KAISER FRAZER QUARTERLY.

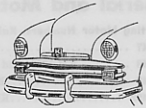
They will be available as a separate edition as long as the supply lasts at the usual cost of $1.50.

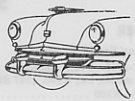


KAISER 1947 thru 1955

Year Identification

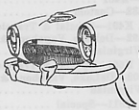

1947-48


1949-50


1951


1952


1953


1954-55

QUICK REFERENCE WORKING SPECIFICATIONS

DISTRIBUTOR

1947-50 ..... Auto-Lite
1951-54 ..... Delco-Remy

Breaker Point Gap (In.)

1947-53 ..... .020
1954—Special ..... .022
1954—Manhattan ..... .016

Cam Angle (Degrees)

1947-50 38
1951-54 31-37
1954—Manhattan 38-45

FIRING ORDER

1947-54 1-5-3-6-2-4

SPARK PLUGS

Year	Type	Gap, inches
1947-48	AL-5R	.032
1949-51	AL-A5	.032
1952-54	AL-A7	.032

IGNITION TIMING

(Spark occurs degrees before T.C.)

1947-48 ..... T.C.
1949-54 ..... 4 degrees

TIMING INDICATOR LOCATION

1947-54 ..... vibration damper

Timing Marks

1947-54 ..... "DC" mark & pointer

VALVES

Seat Angle

1947-54 ..... Exhaust 45, Inlet 30

Operating Tappet Clearance (In.)

Year	Inlet	Exhaust
1947-54	.014 cold	.014 cold

VALVE TIMING (Inlet Opens)

(Degrees before or after T.C.)

1947-54 ..... 10 degrees B.T.C.

TIMING GEAR or CHAIN MARKS

1947-54 ..... 10 pins on chain between sprocket marks

PISTONS

Year	No. of Rings	Material
1947-54	4	Aluminum

Average Clearance (In.)

1947-54 ..... .002

RINGS (Gap Clearance In.)

1947-54 ..... .016

CONNECTING ROD BEARINGS

1947-54 ..... slip-in

Average Oil Clearance (In.)

1947-54 ..... .001-.002

MAIN BEARINGS

Average Oil Clearance (In.)

1947-54 ..... .001-.002

TORQUE WRENCH READINGS (Ft. Lbs.)

Cylinder Head

1947-48 40-50
1949-54 30-35

Rod Bearings

1947-54 40-45

Main Bearings

1947-54 85-95

WHEEL ALIGNMENT

Caster (Degrees)

1947-54 ..... 1 N to 1 P

Camber (Degrees)

1947-54 ..... 0 to ¾ P

Toe-In (Inches)

1947-53 ..... 1/16
1954 ..... ⅛

LUBRICANT CAPACITIES

Engine (Crankcase)

	Refill Qts.
1947-54	5

1947-51—S.A.E. 10W—cold, S.A.E. 20W—hot.
1952-54—S.A.E. 20W—hot or cold.

Transmission (Pts. or Lbs.)

1947-54 ..... 2¼
S.A.E. 80—cold, S.A.E. 90—hot.

Hydramatic Transmission (Qts.)

1951-54 11
Automatic transmission fluid, type A.

Overdrive Unit (Pints)

1947-54 1
S.A.E. 80—cold, S.A.E. 90—hot.

Rear Axle (Pints)

1947-51 3
1952-54 ..... 2½
1947-48—S.A.E. 80 Hy—cold, S.A.E. 90 Hy—hot.
1949-53—S.A.E. 90 hot or cold.

KAISER and FRAZER SPECIFICATIONS

Starting Serial and Motor Numbers

KAISER

Starting Serial Numbers

1947-1953—Prefix indicates year and model, i.e., K100, 1947 Six.

1947—K100 1001
K101—Custom 2000001

1948—K481 1001
K482—Custom 1001

1949, K491—Special & Traveler.1001
K492—DeLuxe, Vagabond & Virginian 1001

1950, K501—Special & Traveler.1001
K502—DeLuxe, Vagabond & Virginian 1001

1951, K511—Special 001001
K512—DeLuxe 001001

1952, K521—DeLuxe & Virginian Special ....1200000 and 1001001
K522 Manhattan & Virginian DeLuxe ....1200000 and 1001001

1953-54, DeLuxe & Manhattan, K001001 and up

Location of Kaiser Serial Numbers

1947-1953—On left front door pillar post.

Starting Motor Numbers, Kaiser

1947 .....K-10001

1948 .....KM-10001 and K-10001

1949—491 .....K-123324

492 .....KM-10001

1950 .....continuation of 1949

1951-1952 .....1100000 and 2000000

1953-54 .....K1-000001

Location of Kaiser Motor Numbers

1947-1953 — Stamped on upper left front side of cylinder block and on plate on left side of cylinder block.

FRAZER

Starting Serial Numbers

First prefix indicates year and model, i.e., F47, 1947 Six. 1947 Serial numbers start 1001 on Six and 1000001 on Manhattan. 1048-1950 Serial numbers start 1001 and 1951 Serial numbers start 001001.

1947, F47—Six 1001
F47C—Manhattan 100000

1948, F485—Six 1001
486—Manhattan 1001

1949, F495—Six 1001
F496—Manhattan 1001

1950, F505—Six 1001
F506—Manhattan 1001

1951, F515—Six 001001
F516—Manhattan 001001

Location of Frazer Serial Numbers

On left front door pillar post.

Starting Motor Numbers, Frazer

1947-1950—Prefix indicates year, i.e., F-47, 1947. 1947-1950 Motor numbers start 1001.

1947—GP or F 1001

1948—F and FM 1001

1949-1950—FM 1001

1951 .....1000001 and 2300000

Location of Frazer Motor Numbers

Stamped on upper left front of cylinder block and plate on left side of cylinder block.

General Specifications

Year	Model	Wheelbase (in.)	Tread (in.) Front	Tread (in.) Rear	Overall Dimensions (in.) Length†	Width	Height■	Shipping Weight* (lb.)	Tire Size (in.)
KAISER									
1946	K-85	117	58	60	203	73	64	.....	6.00-15
1947	K-100	124	58	60	203	73	.....	3305	6.50-15
1948	K481-K482	124	58	60	203	73	65	3302	7.10-15
1949-50	491-492	124	58	60	206	.....	.....	3345	7.10-15
1951	511-512	119	58	59	210	74	.....	3150	6.70-15
1952	521, 522	119	58	59	211	132	.....	.....	6.70-15
1953	531, 532	119	58	59	211	75	60	.....	6.70-15
1954	541, Special 542, Manhattan	118½ 118½	58 58	58⅜ 58¾	213²⁵/₃₂ 215⅝	74⅞ 74⅞	60½ 60¼	3210 3275	6.70x15 6.70x15
FRAZER									
1946-47	F-47	124	58	60	203	73	65	.....	6.50-15
1948	F485, F486	124	58	60	203	73	65	3375	7.10-15
1949-50	495, 496	124	58	60	208	.....	.....	3455	7.10-15
1951	515, 516	124	58	59	211	.....	.....	3535	7.10-15

*—Cheapest 5 pass. 4 door sedan. ■—Road to roof, no load. †—Including bumper and bumper guards.

General Engine Specifications

Year	Model	Number of Cylinders Bore and Stroke	Piston Displacement, Cubic Inches	Compression Ratio (To-1)	Taxable (A.M.A.) Hp.	DEVELOPED HORSE POWER Bare Engine	DEVELOPED HORSE POWER With Accessories	Maximum Torque Ft. Lbs.
KAISER								
1947	K-100, K-101, 6 Cyl.	6-3 5/16 x 4 1/2	226.2	7.30	26.3	100 @ 3600		
1948	K-481, K-482, 6 Cyl.	6-3 5/16 x 4 1/2	226.2	7.30	26.3	100 @ 3600		
1949	K-491, K-492, 6 Cyl.	6-3 5/16 x 4 1/2	226.2	7.30	26.3	100 @ 3600		
1950	K-501, K-502, 6 Cyl.	6-3 5/16 x 4 1/2	226.2	7.30	26.3	100 @ 3600		
1951	K-511, K-512, 6 Cyl.	6-3 5/16 x 4 1/2	226.2	7.30	26.3	115 @ 3650	190 @ 1800	
1952	521, 522, 6 Cyl.	6-3 5/16 x 4 1/2	226.2	7.30	26.30	115 @ 3650	190 @ 1800	
1953-54	531, 532, 541, 542	6-3 5/16 x 4 1/2	226.2	7.3	26.3	118 @ 3650*	200 @ 1800‡	
FRAZER								
1947	F47, F47C, Manhattan	6-3 5/16 x 4 1/2	226.2	7.30	26.3	100 @ 3600	180 @ 1400	
1948	F485, F486, Manhattan	6-3 5/16 x 4 1/2	226.2	7.30	26.3	100 @ 3600	180 @ 1400	
1949	495 Std., 496 Manhattan	6-3 5/16 x 4 1/2	226.2	7.30	26.3	112 @ 3600		
1950	F505 Std., F506 Manhattan	6-3 5/16 x 4 1/2	226.2	7.30	26.3	112 @ 3600		
1951	F515 Std., F516 Manhattan	6-3 5/16 x 4 1/2	226.2	7.30	26.3	115 @ 3650	190 @ 1800	

*—542, 140 @ 3800. ‡—542, 215 @ 2600.

Engine Tune-Up Specifications

Year	Model	SPARK PLUGS Type	SPARK PLUGS Gap	DISTRIBUTOR Point Gap	DISTRIBUTOR Cam Dwell (Deg.)	DISTRIBUTOR Ignition Timing (Deg.)	Ignition Timing Mark and Location	Compression Pressure at R.P.M.	OPERATING TAPPET CLEARANCE Inlet	OPERATING TAPPET CLEARANCE Exhaust	Carburetor Fuel Float Height	Minimum Engine Idle Speed at R.P.M.
KAISER												
1947	K-100, K-101, 6 Cyl.	AL-A5R	.032	.020	38	TC	Dmpr.	120@ †	.014 (c)	.014 (c)	1/16"	550
1948	K-481, K-482, 6 Cyl.	AL-A5	.032	.020	38	4B	Dmpr.	120@ †	.014 (c)	.014 (c)	1/16"	550
1949-1950	K-501, K-502, 6 Cyl.	AL-A5	.032	.020	38	4B	Dmpr.	120@ †	.014 (c)	.014 (c)	1/32"	550
1951	K-511, K-512, 6 Cyl.	AL-A5	.032	.020	31-37	4B	Dmpr.	120@ †	.014 (c)	.014 (c)		550
1952	521, 522, 6 Cyl.	AL-A7	.032	.020	37	4B	Dmpr.	120@ †	.014C	.014C	1/4"	500
1953-54	All, 6 Cyl.	AL-A7	.032	.022△	37■	4B	Dmpr.	120@ †	.014C	.014C		500‡
FRAZER												
1947	F47, F47C, Manhattan	J-7	.032	.020	38	TC	*Dmpr.	120@ †	.010	.014	5/16"	550
1948	F485, F486, Manhattan	AL-A5R	.032	.020	38	TC	Dmpr.	120@ †	.014	.014	5/16"	550
1950	F505 Std., F506 Manhattan	AL-A5	.032	.020	38	4B	Dmpr.	120@ †	.014	.014	1/32"	550
1951	F515 Std., F516 Manhattan	AL-A5G	.032	.020	38	4B	Dmpr.	120@ †	.014(c)	.014(c)		550

AL—Auto-Lite Co. Dmpr.—Vibration damper. (c)—Cold. †—At cranking speed of 70 r.p.m. *—On flywheel before engine No. 17180.
‡—Hydramatic, 450. △—1954, 542-.016. ■—542-45.

KAISER and FRAZER SPECIFICATIONS

Engine Overhaul Specifications

Year	Model	Removed From	PISTONS: Piston Skirt Clearances (Maximum) Top	Bottom	Limit	RING GAP CLEARANCES (Maximum): Top Ring	Second Ring	Third Ring	Oil Ring	PISTON PIN: Type	Fit	ROD BEARINGS: Oil Clearance	Wear Limit	Side Play
KAISER														
1947	K-100, K-101, 6 Cyl.	A	.....	.0015	.004	.016	.016	.016	.016	FL	Push	.0005-.0023	.005	.006-.008
1948	K-481, K-482, 6 Cyl.	A	.....	.0015	.004	.016	.016	.016	.016	FL	Push	.0005-.0023	.005	.006-.010
1949	K-491, K-492, 6 Cyl.	A	.....	.0015	.004	.016	.016	.016	.016	FL	Push	.0005-.0023	.005	.006-.010
1950	K-501, K-502, 6 Cyl.	A	.....	.0015	.004	.016	.016	.016	.016	FL	Push	.0005-.0023	.005	.006-.010
1951	K-511, K-512, 6 Cyl.	A	.....	.0015	.004	.016	.016	.016	.016	FL	Push	.0005-.0018	.005	.006-.010
1952	521, 522, 6 Cyl.	A	.0017	.0005	.004	.016	.016	.016	.016	FL	.0002	.0005-.0018	.005	.006-.011
1953-54	All	A	.0017	.0015	.004	.016	.016	.016	.016	FL	.0002	.0005-.0018	.005	.006-.011
FRAZER														
1947	F47, F47C, Manhattan	A	.....	.0015	.004	.016	.016	.016	.016	FL	Push	.0007-.0025	.005	.006-.010
1948	F485, F486, Manhattan	A	.....	.0015	.004	.016	.016	.016	.016	FL	Push	.0005-.0023	.005	.006-.008
1949	495 Standard, 496 Man.	A	.....	.0015	.004	.016	.016	.016	.016	FL	Push	.0005-.0023	.005	.006-.010
1950	F505 Std., F506 Man.	A	.....	.0015	.004	.016	.016	.016	.016	FL	Push	.0005-.0023	.005	.006-.010
1951	F515 Std., F516 Man.	A	.....	.0015	.004	.016	.016	.016	.016	FL	Push	.0005-.0018	.005	.006-.010

FL—Floating. A—Pistons removed from above.

Dimensions of Valves

Year	Model	Overall Length: Inlet	Exhaust	Head Diameter: Inlet	Exhaust	Seat Angle (deg.): Inlet	Exhaust	Stem Diameter: Inlet	Exhaust	Key Type	O.D. of Seat Insert: Inlet	Exhaust
KAISER												
1946-47	K85, K100	5.015	5.344	1.515	1.375	30	45	.341	.339	*split lock	.....	.....
1948-49	Series—All	5.187	5.187	1.515	1.328	30	45	.341	.339	*split lock	.....	.....
1950	491, 492	5.188	5.188	1.516	1.328	30	45	.341	.339	*split lock	.....	.....
1951	511, 512	5.190	5.200	1.520	1.298	30	45	.341	.339	*split lock	.....	.....
1952	521, 522, 6 cyl.	5.190	5.200	1.520	1.328	30	45	.341	.339	*split lock	.....	.....
1953-54	All	5.190	5.200	1.520	1.328	30	45	.341	.339	*split lock	.....	.....
FRAZER												
1946-47	F47	5.015	5.16	1.515	1.328	30	45	.341	.339	*split lock	.....	.....
1948-49	Series—All	5.187	5.187	1.515	1.328	30	45	.341	.338	*split lock	.....	.....
1950	1951	5.188	5.188	1.516	1.328	30	45	.341	.339	*split lock	.....	.....
1951	515, 516	5.190	5.200	1.520	1.298	30	45	.341	.339	*split lock	.....	.....

* Drilled stem or (pin type) used on some.

and Wear Limit Table

CRANKSHAFT		VALVES									OPERATING OIL PRESSURE			
Main Bearing Oil Clearance	Shaft End Play	Spring Tension (Maximum) Inlet	Exhaust	Low Limit	Guide Clearance	Seat Angle Inlet	Exhaust	Valve Timing, Inlet Valve Opens (Deg.)	Camshaft Drive	Gear Marks	Pounds At M.P.H.	Low Limit■	Model	Year
KAISER														
.002	.004–.006	110@1.306	110@1.306	100	.0008–.0026	30°	45°	10B	Chain †SP		35@30	15	K-100, K-101, 6 Cyl.	1947
.0015–.0020	.004–.006	113@1.3125	113@1.3125	100	.0032–.0050	30°	45°	10B	Chain †SP		35@30	15	K-481, K-482, 6 Cyl.	1948
.0015–.0020	.004–.006	113@1.3125	113@1.3125	100	.0032–.0050	30°	45°	10B	Chain †SP		35@30	15	K-491, K-492, 6 Cyl.	1949
.0015–.0020	.004–.006	113@1.3125	113@1.3125	100	.0032–.0050	30°	45°	10B	Chain †SP		35@30	15	K-501, K-502, 6 Cyl.	1950
.0007–.0020	.002–.006	113@1.312	113@1.312	100	.0032–.0050	30°	45°	10B	Chain †SP		35@30	15	K-511, K-512, 6 Cyl.	1951
.....	.002–.006	118	118	.....	.0032–.005	30°	45°	10B	Chain †SP		35@30	.....	521, 522, 6 Cyl.	1952
.0007–.0020	.002–.006	118@1.312	118@1.312	.....	.0032–.005	30°	45°	10B	Chain †SP		35@30	.....	All	1953–54
FRAZER														
.0015–.002	.004–.006	113@1.306	113@1.306	100	.0008–.0026	30°	45°	10B	Chain †SP		35@30	25	F47, F47C, Manhattan	1947
.0005–.002	.004–.006	110@1.306	110@1.306	100	.0008–.0026	30°	45°	10B	Chain †SP		35@30	25	F485, F486, Manhattan	1948
.0015–.0020	.004–.006	113@1.3125	113@1.3125	100	.0032–.0050	30°	45°	10B	Chain †SP		35@30	25	495 Standard, 496 Man.	1949
.0015–.0020	.004–.006	113@1.3125	113@1.3125	100	.0032–.0050	30°	45°	10B	Chain †SP		35@30	25	F505 Std., F506 Man.	1950
.0007–.0020	.002–.006	118@1.312	118@1.312	100	.0032–.0050	30°	45°	10B	Chain †SP		35@30	25	F515 Std., F516 Man.	1951

B—Before top center. ■—Car may be operated safely at lower oil pressures but low pressure indicates malfunction which should be corrected.
†—10 pins on chain between sprocket marks. SP—Sprockets.

Pistons and Piston Pins

Year	Model	PISTONS Diameter	Material	Type	No. of Rings	PISTON PINS Length	Diameter	How Held
KAISER								
1946 to 48	Series—All	3.3125	Alum.	.....	4	$2\frac{13}{16}$	.859	F
1949	491-492	3.3125	Alum.	Ss	4	$2\frac{13}{16}$	.8593	F
1950	491-492	3.3125	Alum.	Sp	4	$2\frac{13}{16}$	.8594	F
1951	511, 512	3.3125	Alum.	.....	4	$2\frac{25}{32}$	.8592	F
1952	521, 522, 6 cyl.	3.3125	Alum. Alloy	Ts	4	2.780	.8592	F
1953–54	All, 6 cyl.	3.3125	Alum. Alloy	Ts	4	2.780	.8592	F
FRAZER								
1947 to 50	Series—All	3.3125	Alum.	.....	4	2.8125	.859	F
1951	515, 516	3.3125	Alum.	.....	4	2.780	.8592	F

Ts—T-slot. Alum.—Aluminum.

KAISER and FRAZER SPECIFICATIONS

Crankshaft Bearing Journal Sizes

Year	Model	Connecting Rod Journals		Main Bearing Journals				
		Diameter	Length	No. 1 Diameter	No. 2 Diameter	No. 3 Diameter	No. 4 Diameter	No. 5 Diameter
KAISER								
1947 to 51	Series—All	2.0619–2.0627	1.3125	2.3744–2.3752	2.3744–2.3752	2.3744–2.3752	2.3744–2.3752	
1952	521, 522, 6 cyl.	2.0619–2.0627		2.3744–2.3752	2.3744–2.3752	2.3744–2.3752	2.3744–2.3752	
1953–54	All, 6 cyl.	2.0623		2.375–1.062	2.375–1.250	2.375–1.250	2.375–1.321	
FRAZER								
1947 to 51	Series—All	2.0619–2.0627	1.3125	2.3744–2.3752	2.3744–2.3752	2.3744–2.3752	2.3744–2.3752	

Piston Ring Dimensions

Year	Model	Cylinder Bore	TOP RING			SECOND RING			THIRD RING			OIL RING		
			Width	Gap	Depth	Width	Gap	Depth	Width	Gap	Depth	Width	Gap	Depth
KAISER														
1947–50	K100, 481, 482, 491, 492	3 5/16	3/32	.016	.161	3/32	.016	.161	5/32	.016	.147	5/32	.016	.147
1951	511, 512	3 5/16	3/32	.016	.164	3/32	.016	.164	5/32	.016	.149	5/32	.016	.149
1952	521, 522, 6 Cyl.	3 5/16	.093	.016	.176	.093	.016	.176	.15475	.016	.182	.15475	.016	.182
1953–54	All	3 5/16	.093	.016	.161	.093	.016	.161	.15475	.016	.147	.15475	.016	.147
FRAZER														
1947–48	F47, F485, F486	3 5/16	3/32	.012	.147	3/32	.012	.147	5/32	.012	.147	5/32	.012	.147
1949–50	495, 496	3 5/16	3/32	.011	.161	3/32	.011	.161	5/32	.011	.147	5/32	.011	.147
1951	515, 516	3 5/16	3/32	.012	.164	3/32	.012	.164	5/32	.012	.149	5/32	.012	.149

Brake Data

Year	Model	Make	Lining Type	R=Riveted B=Bonded	Drum Diameter	Lining			Clearance	
						Length	Width	Thickness	Toe	Heel
KAISER										
1946–47	K-85, K-101	Ben	M	R	10	22 1/4	1 3/4	13/64	.010	.010
1948 to 51	Series—All	Ben	M	R	11	22 1/4	2	13/64	.010	
1952 to 54	All	Ben	M	R	11	22 1/4	2	3/16	.010	.010
FRAZER										
1946–47	F47	Ben		R	11	22 1/4	2	13/64	.010	.010
1948	F485-486	Ben	M	R	11	22	2	13/64	.008	.008
1949 to 51	Series—All	Ben	M	R	11	22	2	13/64	.010	.010

M—Moulded. Ben—Bendix.

Tension Wrench Specifications

Year	Model	Cylinder Head Lbs.-Ft.	Cylinder Head Thread	Spark Plug Lbs.-Ft.	Spark Plug Thread	Connecting Rod Bolts or Nuts Lbs.-Ft.	Connecting Rod Bolts or Nuts Thread	Main Bearing Bolt Lbs.-Ft.	Main Bearing Bolt Thread	Flywheel Bolts Lbs.-Ft.	Flywheel Bolts Thread	Vibration Damper Bolts Lbs.-Ft.	Vibration Damper Bolts Thread
FRAZER													
1947 to 51	All	30-35	.....	24-30	14 mm	40-45	.....	85-95	.....	35-40	.....	100-130	.....
KAISER													
1947 to 49	All	40-50	.....	5-10	14 mm	40-45	.....	85-95	.....	35-40	.....	100-130	.....
1950-54	All	30-35	.....	24-30	14 mm	40-45	.....	85-95	.....	35-40	.....	100-130	.....

Cooling System

CAR AND YEAR	MODEL	Capacity Qts.	Quarts of Methanol Base Anti-Freeze (For Protection to Temperature Shown Below) 3	4	5	6	7	8	9	Quarts of Ethylene Glycol (For Protection to Temperature Shown Below) 3	4	5	6	7	8	9	Quarts of Denatured Alcohol—188 Proof (For Protection to Temperature Shown Below) 3	4	5	6	7	8	9
KAISER																							
1946-48	K-100	15	11	1	2	2	4	4	....	16	8	0	1	2	2	6	4	....	10	2	0	1	0	2	0	3	0 ....
1948-54	All Models	13½	9	3	1	7	3	4	....	15	6	5	1	8	3	4	5	....	10	....	0	1	0	2	0	3	0 ....
FRAZER																							
1946-48	F-47	15	11	1	2	2	4	4	....	16	8	0	1	2	2	6	4	....	10	2	0	1	0	2	0	3	0 ....
1949-51	495-496, 515, 516	13½	9	3	1	7	3	4	....	15	6	5	1	8	3	4	5	....	10	....	0	1	0	2	0	3	0 ....

Distributors

Year	Model	Distributor Model Number	Cam Angle (deg.)	Direction of Rotation C=Clockwise CC=Counter Clockwise at Cam End	Breaker Arm Spring Tension	Breaker Point Gap (inches)	Engine R.P.M. when Cent. Advance Starts	Max. Cent. Advance in Engine Deg. at Stated Engine R.P.M.	Vacuum In (inches) of Mercury at which Vacuum Unit Starts	Max. Advance in Engine Deg. at Stated Vacuum	Vacuum Unit Number
KAISER											
1947-48	K100, K101, K481, K482	IGS-4211	38	CC	17-20	.018-.022	700	10@1700	8	7.5@14	.....
1949-50	K491, 492, K501, 502	IGS-4214	38	CC	17-20	.018-.022	650	9@1675	10	5@15	.....
1952	521, 6 cyl.	1110224	31-37	CC	17-21	.020	500	18@3200	9-11	12	.....
	522, 6 cyl.	1110224	31-37	CC	17-21	.020	500	18@3450	9-11	12	.....
1953-54	All	1110224‡	31-37†	C	17-21	.022■	600*	‡20@3200	9-11	12@15	.....
FRAZER											
1947-48	F47, F47C, 485, 486	IGS-4211	38	CC	17-20	.018-.022	700	10@1700	8	7.5@14	.....
1949 to 51	F49, 505, 506, 515, 516	IGS-4214	38	CC	17-20	.018-.022	650	9@1675	10	5@15	.....

‡—542-1110238. †—542-38-45. ■—542-.016. *—1954, 545-360; 542-325.
‡—1954, 542, 20 @ 1000; 545, 20 @ 1600.

KAISER and FRAZER SPECIFICATIONS

Generators

Year	Model	Generator Number	Field Current at 6 Volts (amps.)	Maximum Safe Output			Brush Spring Tension (oz.)	Voltage Regulator Number
				Volts	Amperes	R.P.M.		
KAISER								
1947 to 50	All	GDZ-4818-A	1.3-1.5	8.0	35	2000	35-53	VRP-4004-F-2
1951	K-511, 512	1102733	1.75-1.9	7.2	41	2050	24.32	1118302
1952	521, 522, 6 cyl.	1102782	1.75-1.9	6.7	45	2400	28	1118392
1953-54	All	1102782	1.75-1.9	6.7	45	2400	28	1118392
FRAZER								
1947 to 51	Series—All	GDZ-4818-A	1.3-1.5	8.0	35	2000	35-53	VRP-4004-F-2

Voltage Regulators

Year	Model	Regulator Number	Grounded P=Positive N=Negative	Voltage Control		Current Control		Cut-Out Relay		
				Air Gap Points Closed	Voltage Setting Hot	Air Gap Points Closed	Current Set Hot	Point Gap	Air Gap	Closing Volt
KAISER										
1947 to 50	Series—All	VRP- 4004-F-2	P	.052	7.2	.052	34-36	.015	.034	6.4-7.0
1951	511, 512	1118302	P	.075	7.7	.075	32-40	.020	.020	5.9-6.8
1952	521, 522, 6 cyl.	1118392	P	.075	7.2-7.5	.075	39.41	.020	.020	6.4-7.0
1953	531, 532	1118392	P	.075	7.2-7.6	.075	40-46	.020	.020	5.9-6.7
1954	All	1118842	P	.075	7.2-7.6	.075	40-46	.020	.020	5.9-6.7
FRAZER										
1947 to 50	F-47, F485, 486, 505, 506	VRP-4004-F-2	P	.052	7.2	.052	34-36	.015	.034	6.4-7.0
1951	F515, 516	VRP-6001-A	P	.050	7.35	.050	34-36	.015	.032	6.4-7.0

Starters

Year	Model	Unit Model Number	Spring Tension (oz.)	STARTER						Direction of Rotation Viewed from Drive End C=Clockwise CC=Counter-clockwise
				Lock Test			No Load			
				Volts	Amperes	Torque, (lbs. ft.)	Volts	Amperes	R.P.M.	
KAISER										
1947-48	K-100, 101, 481, 482	MAW-4043	42-53	2.0	335	6	5.0	65	4300	C
1949-50	K-49, 501, 502	MAW-4054	42-53	2.0	335	6	5.0	65	4300	C
1951	Standard	1107087	22-32	3.70	525	12	5.0	70	5000	C
	Hydramatic	1107088	22-32	3.70	525	12	5.0	70	5000	C
1952	521, 522, 6 cyl.	1107087	24-28	3.4	525	12	5.0	70	5000	C
1953-54	All	1107125†	24-28	3.25	550	12	5.65	70	5500	C
FRAZER										
1947-48	F47, 485, 486	MAW-4043	42-53	2.0	335	6	5.0	65	4300	C
1949 to 51	F49, 505, 506, 515, 516	MAW-4054	42-53	2.0	335	6	5.0	65	4300	C

†— 1107126—Hydramatic.

SPECIFICATIONS KAISER and FRAZER

Fan, Generator Belts and Radiator Hose

Year	Model	Fan Belt: Angle of "V" (deg.)	Fan Belt: Length O.C.	Fan Belt: Width Max.	Generator Belt Not Used: Angle of "V" (deg.)	Generator Belt Not Used: Length O.C.	Generator Belt Not Used: Widtl. Max.	Upper Hose: Type	Upper Hose: Inside Diam.	Upper Hose: Length	Lower Hose: Type	Lower Hose: Inside Diam.	Lower Hose: Length
KAISER													
1947–48	All	45	43 3/16	3/8				curved	1 1/2		straight	1 1/2	2 5/8
1949 to 51	All	45	43 3/16	3/8				straight	1 1/2	7 1/2	straight	1 1/2	2 7/8
1952	521, 522. 6 cyl.	36	41	3/8				curved	1 1/2		curved	1 1/2	
1953–54	All	36	41	3/8				curved	1 1/2		curved	1 1/2	
FRAZER													
1947–48	Series—All	45	43 3/16	3/8				curved	1 1/2		straight	1 1/2	2 3/4
1949 to 51	Series—All	45	43 3/16	3/8				straight	1 1/2	7 1/2	straight	1 1/2	2 1/2–6

N—NEGATIVE

Front Wheel Alignment

P—POSITIVE

Year	Model	Caster (deg.)	Camber (deg.)	King Pin Inclination (deg.)	Toe-In (inches)	Turning Radius: Inner	Turning Radius: Outer
KAISER							
1947–52	All	1N to 1P	0 to 3/4P	5 1/2	0 to 1/16	22	20
1953–54	All	1N to 1P	0 to 3/4P	5 1/2	0 to 1/16	20	17
FRAZER							
1947–48	F47, F485, F486	1N to 1P	0 to 3/4P	5 1/2 to 6	0 to 1/16	23	20
1949–51	All	1N to 1P	0 to 3/4P	4 3/4 to 5 3/4	0 to 1/16		

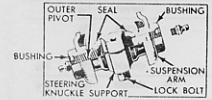
FRONT SUSPENSION

The front suspension on all Frazer and Kaiser cars is the short and long arm type, commonly referred to as the S.L.A. type suspension.

Steering Geometry, Caster, Camber and Toe-In

Before adjusting caster and camber on either side, check and note all angles.

Caster and camber are controlled by an eccentric pin in the outer end of the upper support arm.



Section thru the knuckle support showing the eccentric pin

To correct caster, loosen the clamp bolt in the upper end of the knuckle support. Remove the grease fitting from the forward pivot bushing and, using an Allen wrench, turn pin in a clockwise direction to increase or counter-clockwise to decrease caster.

When it is found that the specified angle for camber cannot be obtained, shims may be installed between the upper inner pivot shaft and the shock absorber support. To make this adjustment, loosen both bolts that attach the pivot shaft to the cross member, and install shims under both bolts to decrease camber or remove to increase.

Front suspension 1953 Kaiser

In the event of negative camber with the pivot pin turned to highest obtainable adjustment and no shims are found, check for a bent or distorted steering knuckle.

Toe-in is adjusted by means of a cross tube, connecting two tie rod ends, one at the idler arm and the other at the wheel.

To adjust toe-in, loosen the clamps at both ends and turn the cross tube.

Toe-in should be adjusted after all other steering angles have been corrected.

Intermediate Steering Arm

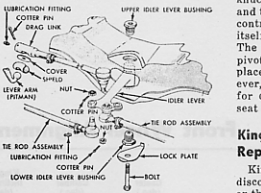
The intermediate steering arm, commonly referred to as the idler arm, can be rebuilt on all Frazer and Kaiser models.

When rebuilding the idler arm on any model 1947 to 1950, use the specified parts for that year.

In cases where the arm must be replaced, use the improved arm which is standard on the 1951 models.

Drag Link

Only one end of the drag link can be rebuilt (pitman arm end), the other end must be replaced.



Steering linkage—showing drag link, idler arm and related parts

Replacement of Front Coil Spring and other Suspension Parts

Before replacing a front spring it is wise to determine the condition of the upper and lower pivot pin and bushings, as the procedure will depend on which parts must be replaced.

If any pins need replacing, disconnect system at the defective pin. If all parts are found in good condition and only the coil spring needs replacing, the procedure is as follows: Place a roller jack under the lower arm inner shaft. Disconnect the torsion bar and shock absorber. Remove the four bolts holding the lower control arm inner shaft to the cross member. Then lower the jack until the spring can be removed. Reinstall the spring and jack the arm into place, using a suitable drift pin to align the bolt holes in the pivot shaft with the holes in the cross member. Reconnect the shock and torsion bar.

Upper Control Pin

Jack the car under the lower A frame. Loosen clamp bolts of the upper portion of the knuckle support, remove the front bushing and then the back bushing. Now the pin can be removed. When the eccentric pin is replaced, make certain that the pin is properly centered in the knuckle support and is in the full camber position (facing outward).

The upper pivot pin on all models has a thread with two starts.

Lower Control Pin

Jack the car under the lower A frame.

Remove the nut on rearward side of the lower control arm. Now, working at the forward side, remove the pivot bolt and then the bushing.

When replacing the bushing in the knuckle support, screw in from the rear and tighten. The pin is screwed into the control arm and the knuckle support itself is centered between the two arms. The outer pin and bushing, or inner pivot shaft and bushing, can be replaced on the lower control arm. However, the control arm should be checked for distortion. The new bushing must seat tightly in the arm.

King Pin and Bushing Replacement

King pins can be replaced without disconnecting the hydraulic brake hose, or the brake mechanism on the backing plate.

Remove wheel, hub and drum assembly and backing plate. Using a piece of wire, hook the backing plate to the frame.

Using a sharp punch, drive a hole through the upper welch plug and pry the upper welch plug out from off the top of the king pin.

Drive the king pin lock pin out toward the rear of the car and the king pin can then be driven out through the bottom, carrying with it the lower welch plug.

1947 AND EARLY 1948 MODELS

These models were fitted with needle bearings at the upper and lower end of the king pin.

On these models, carry the spindle to the bench and drive out the needle bearing from the top and bottom yoke of the steering knuckle. Install the new

needle bearing, using a press rather than a driver if a press is available.

If the needle bearings must be driven into place, do it very carefully so as not to distort the bearing cage.

LATE 1948 MODELS

On the late 1948 models, the king pin was fitted with pressed-in bushings.

Remove the knuckle to the bench and drive out the bushings found in the upper and lower yoke of the knuckle.

Install new bushings, driving them in place into the yoke of the steering knuckle.

These bushings require reaming or honing to give a good fit on the king pin.

After fitting the bushings, reverse the procedure to reinstall the king pin.

1949 THROUGH 1954 MODELS

These models are fitted with full floating king pin bushings.

Remove the spindle to the bench and, using the thumb, push out the floating steel bushing.

The new bushing can be pushed in readily with the fingers.

Before installing the new floating bushing, look over the bore of the king pin in the knuckle; it should be perfectly smooth and free of scratches. If it is roughed up too badly, it will be necessary to replace the full floating bushing with a pressed-in bronze bushing. If pressed-in bronze bushings are used, they must be reamed or honed to fit the king pin. Where the knuckle is found to be smooth and free of scratches simply insert with the fingers the full floating bushing and reinstall the king pin, reversing the instructions which removed it.

Replacement of Steering Knuckle

The procedure for replacing the steering knuckle (spindle) is exactly the same as that given for the king pin.

STEERING GEAR

There are four different types of steering gears used and they are all of the Gemmer, worm, and roller type, differing mainly in the housing and mounting.

Steering Mechanism Adjustment

1—Disconnect the pitman arm from the drag link.

2—Adjust the steering gear housing assembly.

a—Check the steering gear worm shaft bearings for end play and, if any end play exists, remove the four cap screws which hold the bottom cover plate and remove one shim at a time until there is zero play in the worm bearings without having a definite preload.

A one-pound pull should be required on a spring scale to turn the steering wheel with the worm bearings properly adjusted.

b—Adjust the mesh of the worm and roller tooth by loosening the jam nut and tightening the adjusting screw until there is zero lash with the steering wheel in the mid position of its travel. Tighten the lock nut.

3—Reconnect the pitman arm to the drag link.

4—Loosen the drag link clamp screw and adjust the drag link so that, with the steering wheel in the mid position of its travel, the intermediate steering arm is exactly centered with relation to the length of the car. That is, the intermediate steering arm should point exactly forward and back. Tighten the jam nut.

5—Loosen the tie-rod clamp screws on the right side tie rod and, with the steering wheel in the mid position of its travel, adjust the tie rod so that one-half of the total toe-in is contained in the right wheel. Tighten the clamp bolt.

6—Loosen the clamp bolts on the left tie rod and adjust the tie rod so that the balance of the toe-in is contained in the left front wheel. Tighten the clamp bolts.

Now turn the steering wheel from one extreme to the other to check for looseness or binding.

BRAKES

All Frazer and Kaiser cars are equipped with Bendix hydraulic self-centering shoes.

All brake adjusting procedure is given in the brake section earlier in this manual, see index.

Removal of Master Cylinder

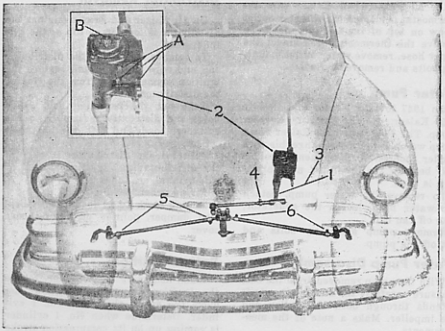
ALL FRAZERS AND KAISERS THROUGH 1950

Disconnect the brake line from the front of the master cylinder, disconnect the push rod from the pedal lever, take out the bolts which hold the master cylinder to the frame bracket and lower the master cylinder.

1951 THROUGH 1954 KAISERS

On these models the master cylinder is bored to accommodate both the clutch and brake pedals, and both the clutch and brake pedal shafts must be removed to take out the master cylinder.

continued



Steering mechanism—typical of all models

KAISER and FRAZER 1947 thru 1954

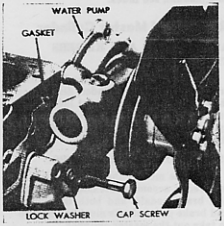
BRAKES—*continued*

Disconnect the brake lines and the master cylinder push rod from the brake pedal.

Unbolt and remove the brake and clutch pedals.

Leave the pedals hanging up in the body.

Remove the bolt which holds the master cylinder to the frame bracket. This bolt is somewhat difficult of access but can be reached from underneath the car.



Water pump installation

COOLING SYSTEM

On all Frazer and Kaiser cars the thermostat is located in the water outlet elbow on top of the cylinder head. To remove the thermostat, disconnect the upper hose, remove water outlet mounting bolts and remove thermostat.

Water Pump

On 1947 to 1951 Frazer and 1947 to 1950 Kaiser, use the same type water pump. The 1951 thru 1954 Kaiser has a pump which is not interchangeable with earlier models. A permanently sealed ball bearing that requires no lubrication is used.

To remove the water pump, detach the water hose, loosen the generator, take off fan belt.

Remove pump attaching bolts and lift off the pump.

Water Pump Disassembly

With the pump removed from the car, measure carefully the amount the shaft extends through both the pulley and the impeller. Make a note of the measurements.

Now detach the fan and the pulley from the fan hub. Remove pulley with a puller or press since it is pressed on.

Take off the cover plate and gasket, and, using a special puller, take the pump propeller off the shaft.

Take out the shaft retaining ring and remove the shaft and bearing assembly from the pump body. Inspection of the pump should reveal no scratches on the sealed surface nor any particular corrosion. If any is found and the sealing surface is pitted or corroded, it may be necessary to install a new impeller and a new pump body.

It is generally recommended that when the pump is disassembled a new shaft and bearing assembly be used.

If, on using the new shaft and bearing assembly, it is found that the fan hub fits easily on the shaft, a new hub should be used since this hub is a pressed fit.

Radiator Core Removal

Disconnect water hoses.

Detach six bolts holding radiator to frame.

Remove the radiator by lifting up and out.

ELECTRICAL SYSTEM

All Kaiser-Frazer models use a 6-volt electrical system.

Distributor Removal

On all Kaiser and Frazer engines the distributor is located on top of the cylinder head.

To remove it, detach the distributor cap and wire assembly and remove the ignition primary wire from the side of the distributor.

Take out the retaining bolt which holds the distributor assembly to the cylinder head and lift the distributor off.

All service on distributors is given in the distributor and ignition section of this manual, see index.

Firing order: 1-5-3-6-2-4.

Timing mark (d.c.) located on vibration damper, pointer on timing case cover.

Retime Ignition

When necessary to completely retime the ignition, proceed as follows: Remove the spark plug from No. 1 cylinder. Determine when No. 1 cylinder is coming up on its compression stroke by placing the thumb in the spark plug hole and, as that cylinder starts compression, air will be squeezed by the thumb. Stop cranking the engine at this point and then turn it very slowly to bring the ignition timing mark under its pointer. When the turning mark comes under the pointer, No. 1 cylinder is in the firing position.

Remove the cap from the distributor and loosen the distributor clamp screw.

Rotate the body of the distributor just sufficiently so that the breaker points are just at the point of breaking.

It may be necessary to remove the rotor in order to get a good, clear look at the breaker points. Lock the distributor in this position.

Replace the rotor on the distributor and carefully mark on the outside of the distributor the position of the tip of the rotor. Now remove the wires from the distributor cap and place the cap on the distributor. Put the wire from No. 1 spark plug into the wire socket of the distributor cap just above the mark made on the outside of the distributor which indicates the position of the tip of the rotor.

The balance of the wires are placed in the cap according to the firing order of the ignition and in the direction of distributor rotation. Both the firing order and distributor rotation are given in this engine electrical section.

As the ignition is now timed close enough that the engine will start, start the engine and let it run until it is thoroughly warmed up. For final adjustment of the ignition follow the following paragraph.

Adjust Ignition Timing

Following the sequence of the ignition firing order, remove every other wire from its spark plug and ground the wire against the cylinder head. Now start the engine and run it on half of its cylinders.

Prop the throttle open so that the engine will run well over idle speed. Thirty mph engine speed is about right.

Now loosen the clamp screw on the distributor and turn the distributor body in a clockwise direction until the engine begins to slow down. Carefully mark this position with a scribe. Now turn the distributor in a counterclockwise direction. The engine will speed up somewhat and then begin to slow down. At the point where the engine again slows down, make another mark with a scribe. Now turn the distributor body again in a clockwise direction and set it midway between the two scribe marks.

Secure the distributor clamp screw.

Replace the wires on the spark plugs.

The above method of adjusting

tion timing has proved very successful for shops which are not equipped with neon timing light.

If a neon timing light is available, by all means use it, following the instructions of the manufacturer of the timing light.

Removal of Generator Assembly

On all Kaiser and Frazer models the generator is swivel mounted on the side of the block.

To remove the generator, first detach the wires, then take out the bolt which holds the tension bar to the top of the distributor and slack off the belt, sliding the belt off of the pulley.

Remove the front and back swivel bolt which holds the generator to the swivel bracket and lift off the generator.

All service on generators is given in the generator and regulator section earlier in this manual, see index.

FUEL SYSTEM

Fuel Pump Removal

The fuel pumps on Kaiser and Frazer cars are either single or double diaphragm. The double diaphragm type is mounted on the right forward side of the engine.

The single type fuel pumps have two locations. On some models the single action pump is mounted on the right side of the engine block and the pump arm is set below the camshaft. On another type the fuel pump is mounted on the right side at the rear of the engine block, and on this type the cam arm is located above the camshaft.

To take off the fuel pump, detach the fuel and vacuum lines which lead to it, remove the two mounting bolts and lift off the pump. Access to the bolts is from the engine compartment.

Carburetor Assembly

1947 AND 1948 MODELS

These models use a single throat downdraft Carter carburetor.

1949 THROUGH 1954 MODELS

These models use a dual downdraft Carter carburetor.

Service instructions for both of these carburetors are given in the Carter carburetor section ealier in this manual, see index.

SUPERCHARGER

Starting with 1954 production, Manhattan models are fitted with a McCullough Supercharger as optional equipment.

At the time of going to press there was no service information available on the McCullough Supercharger. However, the accompanying cross section view of the supercharger is to some extent self-explanatory.

Service on supercharger engines is exactly the same as that on the earlier engines.

Function of the McCullough Supercharger

The McCullough Supercharger differs from standard centrifugal superchargers in that it is designed to maintain 5 pounds pressure above atmosphere in the chamber which contains the carburetor.

Effectively then, the carburetor is under 5 additional pounds pressure at all times.

The effect of this is to keep the intake throat of the carburetor under higher than normal pressure.

The carburetor used with the supercharger models is calibrated to function under conditions of this extra pressure.

Fuel Tank Removal

Remove the fuel tank, detach the flexible connection which connects the tank with the filler neck under the fender.

Place a jack with a wooden block on top of it under the tank and remove the T bolts which hold the straps and support the tank.

Disconnect the gas line and slowly lower the tank until the gage wire is accessible. Remove the gage wire and lower the tank to the floor.

ENGINE

Engine Interchangeability

On 1947 to 1950 Kaiser models and 1947 to 1951 Frazer models, engines are interchangeable.

The 1951 thru 1954 Kaiser engine will not interchange with any model.

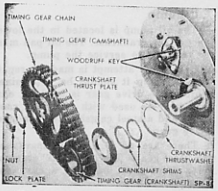
Vibration Damper

On all 1947 to 1949 early models the vibration damper can be removed, without removing the radiator.

All 1949 to current models the radiator must be removed. It is advisable to remove the radiator in any case to prevent accidental damage to the water tubes.

Engine Manifold

The intake and exhaust manifolds



Timing gears and chain-exploded view

are located on the right side of the engine block.

The manifold is attached to the engine block by 11 studs, washers and nuts. A heat riser valve is incorporated in the exhaust manifold to regulate exhaust gases by-passed around the intake manifold.

To remove the manifolds, detach the exhaust manifold at the exhaust pipe flange, remove all connections to the carburetor and the intake manifold. remove the bolts which hold the manifold to the cylinder block and lift off the manifold.

Removal of Cylinder Head

Detach the upper radiator hose and remove the distributor.

Remove all carburetor and vacuum lines which pass over the cylinder head. Remove the bolts which hold the cylinder head to the block and lift off the head.

The cylinder head nuts should be tight to 30-35 foot pounds torque when reinstalling the head.

CYLINDER HEAD NUT TIGHTENING SEQUENCE

KAISER and FRAZER 1947 thru 1954

Removal of Oil Pan

Disconnect the drag link. Loosen motor mounting. Block up the engine to simplify removing front pan bolts.

Remove pan by sliding down, back and out.

Oil Pump

The oil pump is located in the lower part of the crankcase. The oil pan must be removed to service the pump.

Before any attempt is made to repair the oil pump it should be determined which type drive gear is used. A cast iron gear is used with cast iron camshaft and a steel camshaft uses a steel drive gear.

There are no identifying marks on the steel gears. The letter "O" stamped on a drive gear indicates a cast iron gear.

Engine Removal

Remove hood, radiator core, gas line, ignition wires, exhaust pipe and other attaching parts.

Take out mounting bolts and remove engine.

Timing Case Cover Removal

Remove radiator, fan belt and vibration damper. Unbolt timing case cover and lift off.

When reinstalling use a new oil seal, and gasket liberally coated with gasket compound.

Valve Timing and/or Replacement of Timing Gears

The arrangement used on these models is such that unless the chain or sprockets become badly worn or damaged there is very little chance that valve timing will change.

Remove radiator and timing case.

Take off camshaft retaining nut, remove camshaft, and crankshaft sprockets together with chain as a unit.

Set up the new sprockets and chain on a bench in the position that they occupy on the car and arrange the chain so that there are ten pins of the timing chain between the marks on the camshaft sprocket and crankshaft sprocket, counting the pin at each mark.

Retaining this position of the sprockets and chain tentatively, set the assembly against its relative shafts and note the position of keyways.

Now set the keys on the shafts so that they will enter the keyway in the sprocket without difficulty.

Note: Great care should be used to align the keys and keyways perfectly, since the sprockets are a tight fit on the shaft and it is very difficult to correct for misalignment when the gears are started on the shaft.

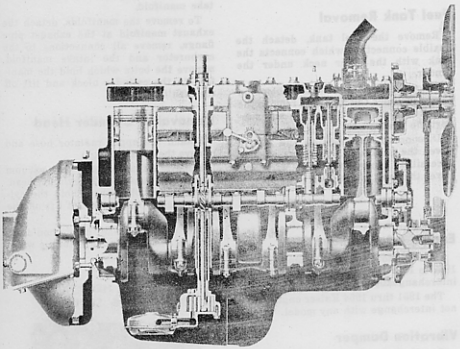
Force sprockets up on the shafts, alternating one and then the other until they are firmly seated. Tighten camshaft retaining nut.

Rotate the crankshaft two full revolutions until the crankshaft sprocket again assumes the checking position.

Be certain that there are ten pins in the timing chain, between the mark on the crankshaft sprocket and the mark on the camshaft sprocket.

With the timing chain set up in this manner the valves are correctly timed regardless of which piston is at top dead center.

It will be necessary to retime the ignition after resetting the valve timing.



Section view—engine typical of Kaiser-Frazer

ENGINE INTERNAL

Removal of Rod Piston Assemblies

Remove the head of oil pan as outlined under the paragraphs devoted to the head of the oil pan.

Selecting the rod bearings which are down, carefully mark the caps and the bottom of the rod so that they can be returned to the position from which they were removed.

It is customary to mark rod bearings and caps on the camshaft side of the engine.

With a ridge reamer remove the ridge from the top of the cylinder bore on the pistons which are in the down position. From underneath the car remove the rod bearing cap from the bottom of the rods which are down and push the rod and piston assembly up out of the top of the bore.

Turn the crankshaft until another pair of the pistons are down and repeat the above procedure.

As soon as the piston and rod assemblies have been pushed up out of the bore, replace the cap on the bottom of the rod so that it does not get mixed up or lost.

ssembly Pistons to Rods

The piston is assembled to the rod so that the oil spit hole in the rod is opposite to the T slot in the piston.

Installing the Rod and Piston Assembly in the Engine

Pistons are installed in the cylinder bore so that the T slot of the piston faces away from the camshaft.

Fitting Pistons in the Cylinder Bore

When fitting pistons bear in mind that, unless the cylinder has been bored, there is a good chance that it is tapered, particularly if it has considerable mileage on it.

Remember, then, that the piston may go readily in the upper part of the bore but that it must be fitted at the tightest part of the bore down at the bottom.

Refer to the engine overhaul and wear limit tables at the beginning of the Kaiser-Frazer section which gives the running clearance of the piston.

Select a feeler ribbon longer than the cylinder bore and very slightly thinner, say .0005 thinner, than the running clearance and insert this feeler ribbon into the cylinder bore.

Insert it on either side but not fore and aft.

Grasp the piston and connecting rod by the rod and push the piston upside down into the cylinder bore. It should "go" the full length of the bore on the feeler ribbon.

Lift out the piston and rod and then select the feeler ribbon whose thickness is approximately .001 thicker than the running clearance and put this down into the cylinder bore. Now try the piston; on this ribbon it should "not go."

Bear in mind that the ring lands of the piston will start since they are much smaller than the skirt of the piston.

If the cylinder is much tapered, the top of the skirt may start, but it should "not go" the full length of the bore on a ribbon whose size is .001 thicker than the running clearance of the piston.

The above method is the machinist's familiar "go"-"not go" method of fitting.

Rod Bearings

The connecting rod bearings are of the slip-in type fitted with a tang at the parting line to maintain their position.

The oil holes and tang for bearings

Checking Piston Fit Using Feeler Gage

1, 3 and 5 rods are opposite 2, 4 and 6. Therefore they are not interchangeable.

Installing and/or Adjusting Rod Bearings

Remove the rod bearing cap and the lower bearing shell and insert a piece of shim stock approximately one-half square inch on top of the bearing shell. Select the shim to start, say .003 inch.

Button up the bearing with the shim on top of the bearing and try the crankshaft for binding.

If the crankshaft binds on .003 shim, the rod bearing needs very little adjusting. However, if the shaft does not bind, try a thicker shim and keep continuing with thicker shims until the shaft binds.

The thickness of the shim which just barely binds the crankshaft is the oil clearance of the bearing.

Now select a feathered or tapered type shim whose thickest portion is just a little thinner than the thickness of the shim which bound the shaft. Insert this shim between the bearing and the bearing cap. Button up the bearing with the shim in place and try the crankshaft for binding.

Replacing and/or Adjusting Main Bearings

To replace the main bearings, remove the oil pan and the rear main bearing filler cap.

Loosen all of the main bearing caps about four turns and remove the cap from the bearing to be replaced.

Look up alongside of the crankcase and see which side of the bearing has the tang and push the upper half of the bearing out from the opposite side so that it rotates around the crankshaft.

Carefully mike the crankshaft to determine if there is any wear and, if it is decided to replace the old main bearing or if a proper undersized bearing cannot be secured, the bearings may be adjusted as follows: Replace the upper half of the main bearing and install the lower half in the main bearing cap. Secure a piece of shim stock about one-half square inch, say .003 inch thick, and set it on top of the lower bearing shell and put the cap back up into place, bolting it up securely. Try the crankshaft for binding. If the crankshaft binds tightly, use a thinner shim. If the crankshaft turns freely on the first shim, keep trying progressively thicker shims until the shim is arrived at which just barely binds the crankshaft. The thickness of this shim is the oil clearance of the bearing.

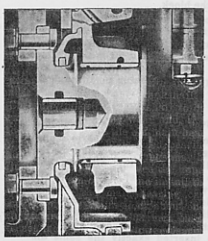
Select a feather or taper type shim whose thickest portion is just a little thinner, say .001 inch thinner than the thickness of the shim which bound the shaft.

Insert this shim between the lower bearing shell and the bearing cap. Button the shaft up into place and torque the bearing. Try the crankshaft for binding and if it does not bind loosen the main bearing caps about four turns and move to the next main bearing to be adjusted or replaced.

Rear Main Bearing Oil Seal

A cork seal is used to prevent oil escaping from the crankcase onto the clutch and flywheel. To replace the lower half of this oil seal remove the rear main bearing cap, and the old oil seal.

continued



Rear main bearing. Note oil seals and location of camshaft welch plug

KAISER and FRAZER 1947 thru 1954

OIL SEAL—*continued*

Install the new oil seal in the main bearing cap so the cork protrudes slightly above the cap. Bolt the cap in place and torque it approximately 60 foot pounds and immediately take it down again.

If the protruding part of the cork has "riveted over," cut off the riveted portion with a razor blade and again bolt the cap into place.

Repeat this operation until the main bearing cap sets firmly in the block, without riveting over the new portion of the oil seal.

To replace the upper oil seal, it is necessary to remove the engine and crankshaft.

VALVE SYSTEM

All Frazer and Kaiser engines are of the in-line "L" head type. The valves, springs and guides are positioned in the cylinder block.

Valve seats are on top of engine block, with stem protruding down through the guide and into the tappet chamber.

Removal of Valve Assembly

To remove the valve assembly, first remove the cylinder head and the valve chamber side covers.

Selecting the valves which are down, raise the spring with a valve spring lifter and remove the key from the bottom of the valve stem.

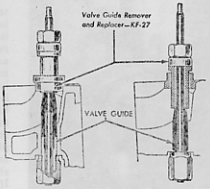
Release the spring compressor and the valve can be pulled up through the top of the block.

If too much resistance is encountered in pulling the valve up, push it back down again and, using a good solvent, dissolve the gum and tar which formed on the bottom of the valve stem, preventing it from coming up through the guide.

Replacement of Valve Guides

Whenever it is determined to replace valve guides, on Frazer and Kaiser, carefully measure the distance from the top of the cylinder block to the edge of the valve guide before removing the old guide. The measurement should be carefully noted for both intake and the exhaust valve guides so a new guide can be inserted exactly the same distance from the top of the block as the old guide.

The data table at the beginning of this Kaiser-Frazer section gives the diameter of valve stems for all models.



Installing valve guide

Valve guides are removed with a special puller.

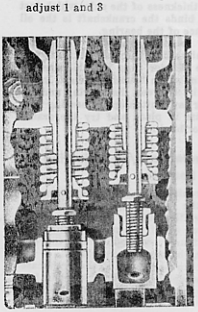
Install a new guide so that the tapered end of the guide will be toward the cylinder head.

Valve Adjustment Sequence

In order to insure that the lifter is not on the ramp of the cam, the following is the factory recommended adjusting sequence for valves. The word "open" in the following sequence means wide open:

With numbers 1 and 3 open, adjust 10 and 12
With numbers 8 and 9 open, adjust 4 and 5
With numbers 2 and 6 open, adjust 7 and 11
With numbers 10 and 12 open, adjust 1 and 3
With numbers 4 and 5 open, adjust 8 and 9
With numbers 7 and 11 open, adjust 2 and 6

By following this sequence there is little danger of the lifter being partly up the ramp so as to spoil the adjustment.



Valve operating mechanism

CLUTCH ASSEMBLY

Clutch Pedal Adjustment

Adjust the link which connects the clutch pedal to the throw-out arm so that there is about one-half to one inch free play of the clutch pedal, measured at the toe board, before the throw-out bearing strikes the clutch fingers.

Removal of Clutch Assembly from the Car

Remove the transmission assembly (see transmission removal) and detach the clutch throw-out lever from the clutch pedal.

Remove the pan from under the clutch and, reaching up from the bottom, remove the clutch-to-flywheel bolts a little at a time so as not to spring the clutch cover until all the pressure is taken off the pressure plate. Then complete the removal of each of the bolts and lower the clutch assembly through the bottom of the flywheel housing.

All clutch service is given in the clutch section earlier in this manual, see index.

Replacing the Clutch Assembly

To replace the clutch assembly, a pilot shaft is needed to make sure the clutch disc is centered on the flywheel so that the transmission main driveshaft will enter the clutch disc and flywheel without undue binding or strain. If no pilot shaft is available, it is a good idea to remove the spline shaft from the front of the transmission and use it for a pilot shaft. As a matter of fact, this is the best possible pilot shaft since it is the shaft which must be entered into the clutch in order to remount the transmission.

Lay the clutch disc on top of the pressure plate assembly and start them up through the bottom of the flywheel housing and hold them up against the flywheel with one hand.

With the other hand, push the pilot shaft through the clutch hole so that it engages the center of the clutch disc, enter the splines of the shaft into the

female splines in the disc and make certain that the pilot on the front of the shaft is firmly entered in the flywheel pilot.

This will center the clutch disc on the flywheel and the pressure plate may now be bolted up to the flywheel. Tighten the pressure plate bolts a little at a time so as not to strain the cover assembly.

STANDARD TRANSMISSION

The transmission is a synchromesh three speed forward type which incorporates a synchronizing unit and constant mesh of the cluster gear to provide smooth shifting for second and high gear.

Transmission Removal

1947-48 MODELS

Drain the transmission and disconnect the gear shift rod of the outer shifting levers on the transmission case. Disconnect the front propeller shaft at the front companion flange and move it away from the rear of the transmission. Disconnect the speedometer cable.

Support the rear of the engine on a jack and remove the four engine rear support insulator cross member bolts.

Loosen the four bolts which hold the transmission to the clutch housing and remove the two bolts at the bottom of the case and raise the rear of the engine sufficiently to provide clearance between the cross member and the transmission so that the transmission can be removed. Remove the attaching bolts at the top of the case and work the transmission loose, sliding it back over the frame cross member.

1949 THROUGH 1954 MODELS

Drain the transmission and disconnect the gear shift rods at the outer levers on the transmission case.

Disconnect the front universal joint and slide the joint away from the transmission.

Disconnect the speedometer cable and the hand brake front cable so that they can be pulled away from the engine rear support cross member.

Disconnect the brake master cylinder operating rod at the bracket pedal clevis and remove the rod on Frazer models.

Support the rear of the engine on a jack. Take a load on the jack and remove the engine rear support cross member. This is done by first removing the two bolts which attach the support member to the transmission and the eight bolts which hold the cross member to the frame. The cross member can then be lowered.

Support the transmission and remove the four bolts which attach the transmission to the clutch housing.

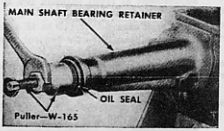
The transmission can then be worked loose and removed.

Transmission Overhaul

Lock the transmission in two gears to prevent the main shaft from turning.

Pull off the companion flange. Withdraw the mainshaft from the rear of the case being careful not to damage the synchronizer.

Remove the synchronizer unit snap



Removing mainshaft oil seal

ring from the front of the mainshaft thus releasing the synchronizer assembly, second speed gear and the low-reverse gear from the shaft.

Remove the counter shaft locking plate and using a dummy shaft (or on arbor 6 7/16 in. long and ¾ in. in diameter) to hold the needle bearings in place, drive the shaft out to the rear, allowing the cluster gear to lie in the case until the clutch shaft is removed.

Take-off the clutch shaft bearing retainer.

Remove snap ring and pull the clutch shaft out.

Drive reverse idler gear shaft out towards the rear, and remove gear.

Reverse procedure to reassemble.

Removing idler gear shaft lock plate

Note: The end play of the countershaft should be checked between the thrust washer and the case at the rear end, the washer should be chosen to hold the end play between .002 in. and .008 in.

The end play of the second speed gear should be checked between the back of the gear and the butt end of the mainshaft spline. It should not be less than .003 in. nor more than .008 in.

Overdrive

See Overdrive Section.

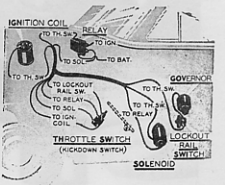
If repairs are to be made on the overdrive only, it is not necessary to dismantle the transmission unless the sun gear or adapter plate is to be removed.

Remove the nut at the end of the overdrive tail shaft and, pull the universal joint flange.

Detach the speedometer pinion.

Disconnect the overdrive case from the transmission and slide the case rearward off the tail shaft.

continued

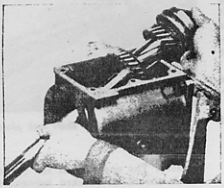


Artists drawing of overdrive wiring circuit

KAISER and FRAZER 1947 thru 1954

OVERDRIVE—*continued*

Service on the overdrive is given in the overdrive section earlier in this manual, see index.



Removing mainshaft assembly from case

Shift Linkage Adjustment—Frazer

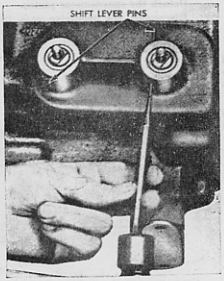
Detach gearshift rod at lower lever on jacket tube and transmission outer shift levers.

Make sure upper shift shaft is operating freely in the bracket. If the shaft is binding loosen the lower and upper bracket and align the jacket tube properly.

Insert a ¼ inch drill rod through the holes in both lever and in the lower bracket.

With the transmission lever in the neutral position, adjust and install shift rods. Loosen other jam nut and align the rod to the bell crank.

Remove drill rod from levers.



Removing shift lever shaft pins

Shift Linkage Adjustment—Kaiser

Set the selector lever in neutral position. Loosen both shift lever trunnion lock nuts.

Remove grease cap and insert special gauge KF-69 in housing. Without moving the levers tighten the lock nuts against trunnion block.

Remove gauge from housing and press cap back into position.

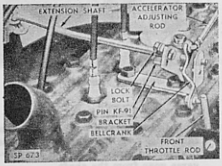
Throttle Control Linkage Adjustment—Hydramatic

Detach transmission, rear throttle rod (long lever) at the control lever.

Loosen lock nut at carburetor extension shaft. At upper bell crank and bracket install special pin in alignment holes.

Install similar pin through lower bell crank and bracket. When it is found that the pin holes do not align, make adjustment at front throttle rod to allow pin to enter without binding.

Tighten clamp bolt (12 to 15 pounds in transmission throttle control lever).

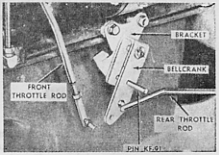


Adjusting pin KF-91 installed in upper bell crank

To determine the correct position of this lever. Place special checking gage at rear of transmission flat against the case with the edge of gage flush against the side cover flange. With lever towards rear of transmission held against its stop, move the gage upward and align the slot in gage with a clevis pin inserted in the lever.

The throttle control lever inward face (toward transmission) should just contact the outer face of the gage. When it is found that the slot in the gage will not align with the clevis pin in the lever, use special bending tool to align slot with clevis pin.

Connect rear throttle rod.



Adjusting pin KF-91 installed in lower bell crank

Adjust rear throttle rod trunnion (towards rear) so control lever seats lightly against stop inside case. Back off two full turns to shorten rod.

Remove both aligning clevis pins.

Adjust accelerator rod so accelerator pedal clears floor mat ¼ inch.

Selector Lever Linkage Adjustment—Hydramatic

On Kaiser cars only tighten the gearshift control shaft upper bracket clamp screw while selector lever is held in "Lo" position. No service is required at this location on Frazer cars.

Loosen the lock nut on the control rod trunnion. Move the transmission shift lever in "LO" position, turn inner lock nut finger flush against trunnion. Turn lock nut one full turn to lengthen rod. Careful not to change adjustment tighten lock nut.

UNIVERSAL JOINT AND DRIVE LINE

Cross and bearing type universal joints and ball and trunnion type are used on Kaiser-Frazer.

These universal joints were mixed in production.

Removal of Drive Shaft and/or Universal Joints

CROSS AND BEARING TYPE JOINTS

Remove the nuts which hold the cross bearings to the rear axle pinion flange

and the nuts which hold the cross bearing to the transmission rear flange and, if the model is equipped with a center bearing, remove the bolts which hold the center bearing pillow block to the cross member and pull out the shaft assembly together with the center bearing.

The universal joints can then be separated on the bench.

The procedure is as follows: Remove the lock rings which hold the bearings to the universal joint yokes and press one of the bearings through to the opposite side which will cause the cross to push the bearing out the opposite side.

Once the bearing is removed from one side, it is a simple matter to press the cross back across to the other side which will force the other bearing out.

Repeat on all of the universals.

On models fitted with a center bearing, the disassembly of the center universal joint is exactly the same as the front and rear joints.

On Frazer cars the center bearing is held by a long narrow pillow block which is bolted to the cross member on both sides.

PIN AND TRUNNION TYPE UNIVERSAL JOINTS

To remove the pin and trunnion type universal joints, detach the flanges at the rear axle pinion and also at the transmission pinion and remove the center bearing pillow block if one is used. The universal joint and drive line assembly can then be pulled out from under the car.

Disassemble this type of universal joint by pushing the housing back on to the driveshaft after the grease boot has been removed, which will release the ball and needle bearing assemblies from the end of the pin.

To take the pin out of the ball stud requires a driver or a press.

REAR AXLE ASSEMBLY

A spicer type hypoid semi-floating rear axle assembly with Hotchkiss drive is used on all models.

There have been two different types rear assemblies on Frazer and Kaiser cars. The difference being in the ring gear and pinion, housing shape, and cover.

Complete service on the rear axle assembly including the replacement of all oil seals, bearings, axle shaft, ring gear and pinion is given in the rear axle section earlier in this manual, see index.

Removal of the Rear Axle Assembly from the Car

Jack up the car and take its weight on stands on the frame in front of the rear springs.

Disconnect all brake lines and cables to the rear axle and disconnect the shock absorbers.

Split the rear spring shackles and remove the nuts from the U bolts which hold the spring to the rear axle.

Detach the rear universal joint from the pinion flange and, if the car is raised up high enough, the rear axle can be rolled out on its own wheels.

If it is impractical to raise the car to this height, remove the wheels and lower the axle so that it can be slid out from under the car.

REAR SPRING

The rear springs on all Frazer and Kaiser cars are of the semi-elliptual type.

Removal of Rear Spring

Remove shackle self locking nuts and link, remove shackle and rubber bushings.

Detach front hanger bolt and bushing.

Detach lower end of shock absorber front spring plate.

Take-off the U clamp bolts and remove spring.

Important Note

When installing rear spring always install the short end forward.

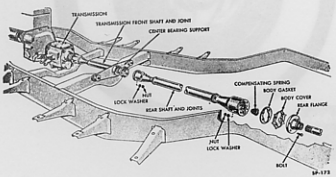
Removal of Rear Shock Absorbers

The rear shock absorbers are held in rubber bushings to studs at the top and bottom. Simply remove the nuts and the shock absorber can be lifted off.

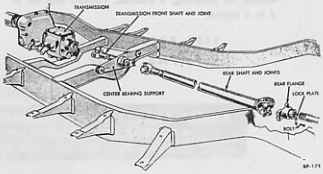
Service on Shock Absorbers

To properly service a shock absorber, highly specialized equipment is needed and if this equipment is not available, it is not recommended that the shock absorber be serviced in any way.

If the shock is inefficient or inoperative, it should be replaced with a new or rebuilt one.



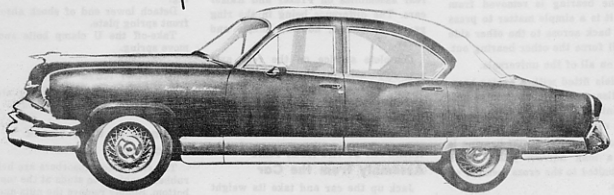
Propeller shaft installation with Ball and Trunnion Type Universal Joints (Late models)



Propeller shaft installation with Cross Type Universal Joints (Early models)

Wire Spoke
WHEEL COVER

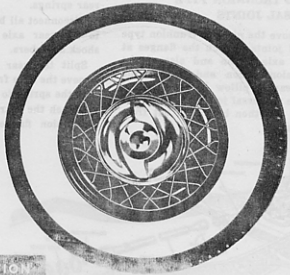
• NEWEST • SMARTEST
• MOST ECONOMICAL
WIRE WHEEL CONVERSION



New wire wheel beauty at a price owners can afford. Carefully designed to retain authentic wire wheel appearance. Chrome finished plus baked lacquer protective coating to meet factory specifications. Easily cleaned with a soft brush.

SPECIFICATIONS

All welded 36 spoke construction with simulated spinner type hub cover. Attached to 15" wheel with steel clips. Cannot fall off, but can be quickly removed for cleaning, if desired. Packed one set of 4 to a carton.



LIST PRICE $36.50
Part No. 100327

KAISER-FRAZER SALES CORPORATION
KAISER-FRAZER CORPORATION
Willow Run, Southern Michigan

*Indicates a part which is interchangeable with other models and makes

Front Suspension

See Fig. 1

1 FRONT WHEEL INNER SEAL
212011—1947-54 .....

2 FRONT WHEEL BEARING
201163—1947-48, cone in .....
204034—1949-54, cone in .....
201165—1947-48, cone out....
204036—1949-54, cone out ....
201162—1947-48, cup in .....
204035—1949-54, cup in .....
201164—1947-48, cup out ....
204037—1949-54, cup out .....

3 SHOCK ABSORBER
205577—1947-48, all models...
205577—1949-50, all models, except conv. .....
205726—1949, model 492, conv.
208563—1951 only, all models
213611—1952-54, stamped 738173 .....

4 SEAT, SPRING, Upper
204357—1947-54 .....

5 INSULATOR, SPRING, Upper
201112—1947-54, all mod.....

6 RETAINER, SHOCK ABSORBER CUSHION
201015—1942-54, all models, 13 32 in. I.D. .....

7 CUSHION, SHOCK ABSORBER
201014—1947-48, all mod.....
206651—1949-54, all mod.....

8 SUPPORT, SHOCK CUSHION
204854—1947-48, all mod.....
204854—1949-54, all mod.....

9 INSULATOR, SPRING, Lower
202245—1947-48, all mod.....
204355—1949-54, all mod.....

10 SEAT, SHOCK CUSHION, Lower
201491—1947-54, all mod.....

11 ARM, SUSPENSION, Upper
201096—1947-52, all mod.....
214297—1953-54, ...

12 KIT, UPPER ARM PIVOT, Inner
205780—1949-50, all mod.....
208591—1951-52, all mod.....
214311—1953-54 .....

13* KIT, UPPER ARM PIVOT, Outer
205779—1947-54, all mod.....

14 KIT, KNUCKLE REPAIR
205777—1947-54, all mod. ....

15 BUMPER, UPPER ARM
207143—1947-54, all mod.....

16 BUMPER, LOWER ARM
202948—1947-54, all mod.....

17 KNUCKLE, STEERING, Left
201129—1947-49, all mod.....
205152—1950-54, all mod.....

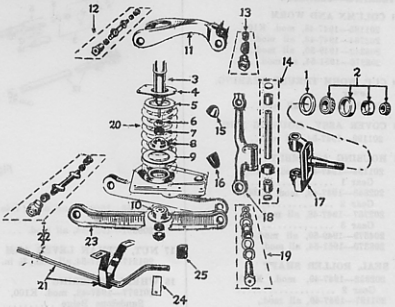


Fig. 1—Front Suspension

18 SUPPORT, KNUCKLE
201119—1947-54, R* .....

19 KIT, LOWER ARM PIVOT, Outer
205781—1947-54, all mod.....

20 SPRING, FRONT COIL
201111—1947-48, all mod.....
204354—1949, all mod. .....
206363—1950-53, all mod.,* early cars .....
208368—1953-54 .....
215838—1954, K545 .....

21 BAR, SWAY ELIMINATOR
201114—1947-48, all mod.....
205305—1949-54, all mod.....

22 KIT, LOWER ARM PIVOT, Inner
205782—1947-54, all mod.....

23 ARM, LOWER
201103—1947-48, all mod., R*.
204351—1949-52, all mod., R*.
214285—1953-54 .....

24 RETAINER, SWAY ELIMINATOR, Outer
201015—1947-48, all mod.....
204359—1949-51, all mod.....
213132—1952-54 .....

25 CUSHION, SWAY ELIMINATOR, Outer
201014—1948-48, all mod.....
204358—1949-54, all mod.....

Steering

See Fig. 2

STEERING GEAR ASSY.
202756—1947-48 .....
204281—1949-50 .....
208369—1951-54 .....

*Opposite side one part number higher.

1 LOCKPLATE, SHAFT AND ROLLER
201199—1947-54, all mod.....

2 PLUG, SHAFT AND ROLLER, OIL
201204—1947-54, all mod.....

3 COVER, SHAFT AND ROLLER
201202—1947-48, mod. K100, Gears 1, 2 .....
202761—1947-54, all mod., Gear 3 .....

4 THRUSTWASHER, SHAFT AND ROLLER
201201—1947-48, mod. K100, Gears 1, 2 .....
202760—1947-54, all mod., Gear 3 .....

5 SCREW, ROLLER SHAFT ADJUSTING
201198—1947-54, all mod.....

6 GASKET, SHAFT COVER
201203—1947-54, all mod.....

7 SHAFT AND ROLLER
201195—1947-48, mod. K100, Gear 1 .....
202851—1947-48, mod. K100, Gear 2 .....
202759—1947-48, all mod., Gear 3; 1949-50, all mod...
214419—1951-54, all mod.....

8 BUSHING, ROLLER SHAFT
201196—1947-48, mod. K100, Gears 1, 3; 1949-54, all mod.
202849—1947-48, mod. K100, Gear 2 .....

9 CUP, WORM THRUST BEARING, Upper
201188—1947-54, all mod.....

10 ROLLER AND CAGE, WORM THRUST BEARING
201187—1947-54, all mod.....

continued

STEERING—*continued*

11 COLUMN AND WORM
201185—1947-48, mod. K100
202764—1947-48, all mod.
205342—1949-50, all mod.
208376—1951-54, all mod.

14 CUP, WORM THRUST BEARING, Lower
201189—1947-54, all mod.

13 COVER ASSY., HOUSING END
201193—1947-54, all mod.

14 HOUSING ASSEMBLY
201184—1947-48, mod. K100, Gear 1
202848—1947-48, mod. K100, Gear 2
202757—1947-48, all mod., Gear 3
204379—1949-50, all mod.
208370—1951-54, all mod.

15 SEAL, ROLLER SHAFT
202852—1947-49, mod. K100, Gear 2
201197—1947-49, all mod., Gears 1, 3; 1949-54, all mod.

16 ARM, PITMAN
201215—1947-48, mod. K100, K101, Gears 1, 2
202674—1947-48, all mod., Gear 3; 1949, all mod., early cars

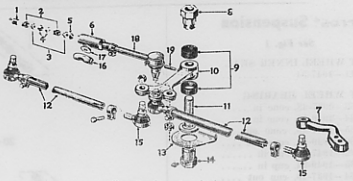


Fig. 3—Steering Linkage

205755—1949-50, all mod., late cars
208391—1951-54, all mod.

17 NUT, PITMAN LEVER ARM
201217—1947-54, all mod., ⅞ in.

18 WHEEL, STEERING
201977—1947-48, mod. K100, Sandstone Beige
205356—1949-50, all mod. Black
208390—1951-54, all mod. Starlight Pearl

Note: Wheel numbers vary with different colors.

19 HORN BLOWING RING
204531—1949-50, 2 spokes
204532—1949-50
207770—1951-54, Rd Bosses
212658—1951-54, Oval Bosses.

Steering Linkage

See Fig. 3

1 PLUG, DRAG LINK SOCKET
202078—1947-54, all mod.

2 SPRING, DRAG LINK SOCKET
201225—1947-54, all mod.

3 BUMPER, DRAG LINK SOCKET
201224—1947-54, all mod.

4 BEARING, DRAG LINK SOCKET
201223—1947-54, all mod.

5 SEAT, DRAG LINK SOCKET
201222—1947-54, all mod.

6 SOCKET, DRAG LINK END
201220—1947-48, Model K100, early cars
202077—1947-53, late cars
201256—1950-54, drag link end, all models

7 STEERING ARM
201238—1947 early right*
203253—1947-54, right*

8 BUSHING, IDLE LEVER (Upper)
201233—1947-50—all mod.
207225—1951-54

9 SEAL, IDLE LEVER
201232—1947-50, all mod. Part not listed for 1951 models

10 LEVER, IDLER
201229—1947-48, Model K100 early cars
212890—1947-48, all models late cars, 1949, all models early cars
212890—1949-50, all models late cars
207223—1951-54, all mod.

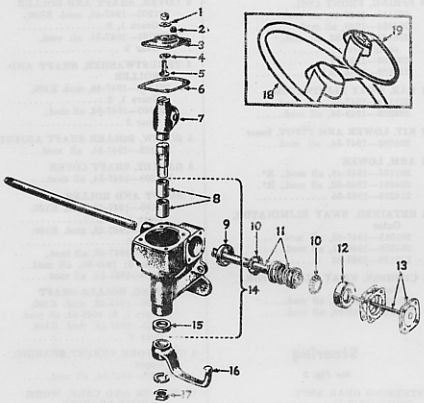


Fig. 4—Steering Gear

11 KIT, IDLER LEVER PIN
205784—1947-50, all mod.....
212890—1951-54, all mod.....

12 TIE ROD ASSY.
201235—1947-54, all mod.....

13 LOCKPLATE IDLER LEVER BUSHING
203944—1947-50, all mod.....
207226—1951-54, all mod.....

14 BUSHING, IDLER LEVER, Lower
201234—1947-50, all mod.....
207224—1951-54, all mod.....

15 END KIT, TIE ROD
205783—1947-54, all mod.....

16 SHIELD, DRAG LINK
201520—1947-54, all mod.....

17 COVER, DRAG LINK
201519—1947-54, all mod.....

COVER, IDLE LEVER
201219—1947-54, all mod.....

18 LINK ASSEMBLY, DRAG
201218—1947-48, Model F47, early cars .....
205756—1947-48, all models, late cars; 1949, all models, early cars .....
202854—1947-48, Models K100, K101 .....
205756—1949-50, all models, late cars .....
209725—1951 .....
212387—1951-54 .....

19 LOCKPIN, IDLE LEVER
203003—1947-48, all models, 23/64-in. dia. .....
206194—1947-48, all models, ⅜-in. dia.; 1949, all models, small dia. .....
206194—1949, all models, large dia. .....
203002—1950-54, small diam..
206194—1950-54, large diam...

Brakes

See Fig. 4

1 WHEEL
214409—1947-54 .....

REAR AXLE OIL SEALS
200378—1947-54, inner .....
200386—1947-50, outer .....
200435—1947-54, out-gasket ..
207241—1941-54, outer .....

FRONT WHEEL SEAL
212011—1947-54, inner .....

2 HUB & DRUM
201152—1947-48, front; studs.
203123—1947-48, front; bolts.
204632—1949-50, front; studs
204633—1949-50, front; bolts, 1951-53 .....
201154—1947-50, rear; studs..
203125—1947-50, rear; bolts..
207340—1951-54, rear ..

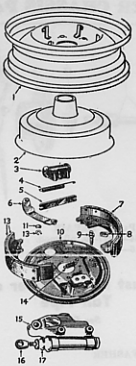


Fig. 4—Brake Parts

3★ CYLINDER, FRONT WHEEL
200197—1947-54, R* .....

REPAIR KIT, FRONT WHEEL CYLINDER
201044—1947-54 .....

★ CYLINDER, REAR WHEEL
200199—1947-54, all mod.....

REPAIR KIT, REAR WHEEL CYLINDER
201043—1947-54 .....

4 SPRINGS, PULL BACK, Cylinder End
200188—1947-54, all mod.....

5 LINK, HAND BRAKE LEVER
200194—1947-54, all mod.....

6 LEVER, HAND BRAKE
200190—1947-54, R* .....

7★ LINING SET
200181—1947-54, all mod., std.
203091—1947-54, all mod., .030 oversize .....

8 CLIP, HOLD DOWN
200187—1947-54, all mod.....

9 CAM, ADJUSTING
203284—1947-54, all mod.....

10 PLATE, SUPPORT, Front
200176—1947-54, R* .....

PLATE, SUPPORT, Rear
200178—1947-50, R* .....
208467—1951-54, R* .....
*Opposite side one part number higher.

11 RETAINER, HAND BRAKE
200192—1947-54, all mod.....

12 SPRINGWASHER
200193—1947-54, all mod.....

13 SHOE SET, 4 Shoes and Lining
200180—1947-54, all mod., std.
203090—1947-54, all mod., .030 oversize .....

14 SPRING, PULL BACK, Anchor End
200189—1947-54, all mod.....

15 CYLINDER, MASTER
213287—1947-50, all mod.....
208469—1951-54, all mod.....

REPAIR KIT, MASTER CYLINDER
203338—1947-50 .....
208486—1951-54 .....

16 ROD, PISTON PUSH, Cast Iron Cyl.
201628—1947-48, all mod.....
203336—1949-50, all mod.....
208476—1951-54, all mod.....

17★ BOOT, CYLINDER
201629—1947-48, all mod., iron cyl. .....
203337—1949-50, all mod., aluminum cyl. .....
208478—1951-54, all mod.....

Cooling System

See Fig. 6

RADIATOR ASSY.
202906—1947-48, all mod.....
204360—1949-50, all mod.....
207531—1951-54, all mod. ...

CAP, FILLER
204639—1947-48, all models ..
204406—1947-54, all mod. ....

THERMOSTAT
214063—1947-54, all models, std. .....
214064—1947-54, all models, permanent anti-freeze .....

RING, ADAPTER
200161—1947-54, all mod. ....

HOSE, RADIATOR
200452—1947-48, all models inlet .....
204412—1949, all models inlet .....
200451—1947-50, all models, outlet .....
215009—1951-53, inlet .....
215719—1954, K545, inlet ....
215720—1951, K545, outlet ...

CLAMP HOSE
202128—1947-54, all models, 1⅞ in. .....

ELBOW, WATER OUTLET
204402—1947-54, all mod. ...

GAUGE, WATER TEMPERATURE Engine Unit
205596—1947-48, all models...
205596—1949-50, all models..
207417—1951-54, all mod.

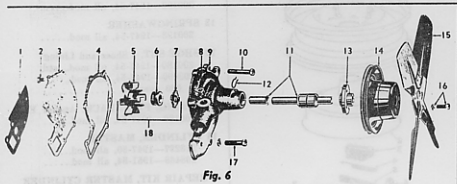


Fig. 6

COOLING SYSTEM—continued

PUMP ASSEMBLY, WATER
200147—1947-50, all mod. ....
215006—1951-54, all mod. ....

1 GASKET, PUMP TO BLOCK
200148—1947-50, all mod. ....
207433—1951-54, all mod. ....

2 BOLT, COVER
208—1947-54, all mod. .....

3 COVER, PUMP
200156—1947-50, all mod. ....
207441—1951-54, all mod. ....

4 GASKET, COVER
200157—1947-50, all mod. ....
207442—1951-54, all mod. ....

5 IMPELLER
202823—1947-50, all mod. ....
207439—1951-54, all mod. ....

6 SEAL, PUMP SHAFT
200153—1947-50, all mod. ....
207440—1951-54, all mod. ....

7 WASHER, PUMP SHAFT Carbon
202771—1947-50, all mod. ....

8 PLUG, PUMP BODY
200061—1947-50, all mod. ....
207435—1951-54, all mod. ....

9 BODY, PUMP
200149—1947-50, all mod. ....
207434—1951-54, all mod. ....

10 BOLT, PUMP
212—1947-50, all models .....
717—1951-54, all models ....

11 SHAFT AND SLEEVE, PUMP
202822—1947-50, all mod.
207436—1951-54, all mod.

12 SNAP RING, PUMP SHAFT
200154—1947-50, all mod.
207437—1951-54, all mod.

13 HUB, PUMP PULLEY
200146—1947-54, all mod.

14 PULLEY, PUMP
200145—1947-50
207430—1951-54

15 BLADE, FAN
200144—1947-50, all mod. ....
207429—1951-54, all mod. ....

16 BOLT, FAN
See Item 10

17 BOLT, PUMP
See Item 10

18 KIT, PUMP REPAIR
204484—1947-50, all mod. ....
208216—1951-54, all mod. ....

Exhaust Pipe, Muffler and Tail Pipe

See Fig. 7

1 NUT

2 LOCKWASHER

3 INSULATOR, CLAMP TO BRACKET
203134—1947-50, all mod. .....
Part not listed for 1951.....

4 BOLT, LAMP
296—1947-50, all mod. .....

5 CLAMP, TAIL PIPE TO FRAME
203133—1947-48, all mod. .....
203385—1947-48, mod. F486; 1949, all mod. .....
200438—1949-50, mod. 492 (conv.) .....
207516—1951-52, all mod.
214253—1953-54 .....

6 MUFFLER
200440—1947-48, all mod.
204785—1949-50, mod. 491 (single manifold) .....
205711—1949-50, mod. 492 (conv.) .....
203382—1947-48, mod. F486 1949-50, all mod. (ex. conv., dual manifold) .....
212315—1951, all mod. .....
212315—1951-52 .....
214249—1953-54 .....

7 CLAMP, MUFFLER TO FRAME BRACKET
201386—1947-48, mod. K100, K101 (early cars) .....
203129—1947-48, all mod., late
203383—1949-50, all mod. ....

8 SPACER, CLAMP TO INSULATTR
203131—1947-50, all mod. .....

9 BRACKET
201376—1947-49, all mod. ....

10 FLATWASHER, INSULATOR

11 CLAMP, EXHAUST PIPE TO MUFFLER
200439—1947-50, all mod. ....
206851—1951-54, all mod. ...

12 CLAMP, EXHAUST PIPE HANGER
200438—1947-54, all mod. ....

13 BOLT, HANGER TO CLUTCH HOUSING

14 HANGER, EXHAUST PIPE TO CLUTCH HOUSING
201377—1947-48, mod. K100 ..

15 HANGER, EXHAUST PIPE TO CLUTCH HOUSING
202782—1947-48, all mod.; 1949-50, mod. 491 (single manifold) .....
203381—1947-50, all mod. (dual manifold) .....
207512—1951-54, all mod.....

16 GASKET, EXHAUST FLANGE
201852—1947-54, all mod.....

17 PIPE, EXHAUST
200211—1947-48, mod. F47 (front outlet manifold).....

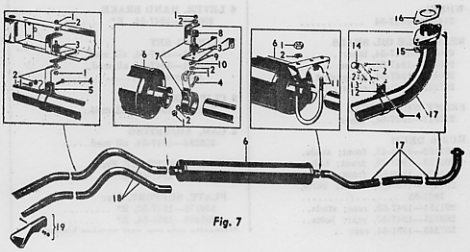


Fig. 7

201547—1947-48, all mod. (rear outlet manifold) .....
208459—1949-50, all mod. (dual manifold) .....
204783—1949-50, mod. 491 (single manifold) .....
207511—1951-54, w/std. shift..
216206—1951-54, w/Hydra....

18 PIPE, TAIL
200442—1947-48, all mod.....
204786—1949-50, all mod. (ex. conv.) .....
205712—1949-50, mod. 492 (conv.) .....
207514—1951-52, use with muffler 17¼-in. body, all mod...
212316—1951-52, use with muffler 22¾-in. body.....
214250—1953-54 .....

19 DEFLECTOR
200023—1947-54, all mod. (flat type) .....
204787—1949-54, all mod. (round type) .....

TAIL PIPE SUPPORT, at Frame "X" Member
214251—1953-54 .....

CLAMP, TAIL PIPE TO SUPPORT
214252—1953-54 .....

Carburetor and Fuel Pump

Not Illustrated

CARBURETOR
204108—1947-49, all models (6228A or 8B, single).....
206171—1948-50, all models (6855A or 723S, dual).....
208582—1951-52, all models (781S, dual) .....
215018—1953-54 .....

KIT, CARBURETOR REPAIR
204105—1947-49, all models (6228A or 8B, single).....
203850—1948-50, all models (6855A, dual) .....
209511—1951-52, all models (781S, dual) .....

PUMP, FUEL
200281—1947-48, Model K100 (rear of motor).....
201509—1947-48, Model K100 (front of motor).....
207446—1951-54, all mod.....
213138—1948-54 .....
213139—1952-54, Models 522, 530 & 532.....

KIT, PUMP REPAIR
201782—1947-48, Model F47 (Pump 200281) .....
201784—1947-48, Models F47, F47C (Pump 201509).....
208659—1947-50, all models (Pump 202319) .....
208659—1951-52, all mod.....
214312—1952, AC pump type 9748 .....
214313—1952-54, 521-531 Type 9616 .....
214315—1952-54, 522-530-532 Type 9617 .....
213157—1952-54, 521-531 M808SA .....
213156—1952-54, 522-532 M998S .....
214316—1952-54, 521-522-531 (9616) .....
214317—1952-54, 522-530-532 (9617) .....

Engine Parts

See Fig. 8

1 CLEANER, AIR
200618—1947-48, all models; 1949, Model 491.....
200778—1948-50—Models 491, 492 (dual manifold) .....
207510—1951-52, all models...
214257—1953 .....
215847—1954 K548 .....

2 ADAPTER, DISTRIBUTOR MOUNTING
200162—1947-50, all mod.....
215024—1951-54, all mod.....

3★ COIL, IGNITION
200256—1947-48, all mod.....
204932—1949-50, all mod.....
208293—1951-54, all mod.....

4 to 8 Cable Set, IGNITION
206404—1947-52, all mod.....
214081—1953-54 .....

9★ DISTRIBUTOR
200622—1947-48, all mod.....
204757—1949-50, all mod.....
208252—1951-54, all mod.....

★ CONDENSER
200959—1947-50, all mod.....
208275—1951-54, all mod.....

★ POINT SET
200953—1947-50, all mod.....
208520—1951-54, all mod.....

PLATE ASSY., BREAKER
200949—1947-48, all mod.....
204758—1949-50, all mod.....
208261—1951-54, all mod.....

10 OIL FILTER
215015—1947-54, all mod.....

ELEMENT, OIL FILTER
200136—1947-54, all mod.....

11 TUBE ASSY., OIL FILTER INLET
200241—1947-54, all mod.....

12 ELBOW, OIL FILTER INLET TUBE
202123—1947-54, all mod.....

13 ELBOW, OIL FILTER OUTLET TUBE
See item 12

14 TUBE ASSY., OIL FILTER OUTLET
200282—1947-54, all mod.....

15 BRACKET, AIR CLEANER SUPPORT
201566—1947-50, all mod single manifold .....
203373—1949-50, Models 491, 492, dual manifold .....

15 BRACKET, AIR CLEANER SUPPOR
208585—1951-54, all mod.....

16★ SPARK PLUG
201230—1948-54, all mod.....

17 GAUGE, OIL DEPTH
200262—1947-50, all mod.....
212327—1951-54, all mod.....

18 CAP, OIL FILLER
200261—1947-54, all mod.....

19 TUBE, OIL FILLER
200258—1947-54, all mod.....

20 ELBOW, WATER OUTLET
204402—1947-54, all mod.....

21 GASKET, WATER OUTLET ELBOW
200336—1947-54, all mod.....

22 THERMOSTAT
214063—1947-54, 151 deg.....
214064—1947-54, 170 deg.....

23 ADAPTER RING, THERMOSTAT
200161—1947-54, all mod.....

24 HEAD, CYLINDER
200057—1947-50, all mod. ex. 491, 501 .....
200790—1949-50, Models 491, 501 .....
207353—1951-54, all mod.....

25 GASKET, CYLINDER HEAD
200062—1947-52, all mod.....
214125—1953-54 .....

26 BLOCK ASSY., CYLINDER
200051—1947-48, Model K100, fuel pump at rear.....
201946—1947-50, all mod., fuel pump at rear.....
207289—1951-54, all mod.....

27 GASKET, WATER PUMP TO BLOCK
200148—1947-50, all mod.....
207433—1951-54, all mod.....

28 PUMP, WATER
200147—1947-50, all mod.....
215006—1951-54, all mod.....

29 PULLEY, FAN
200145—1947-50, all mod.....
207430—1951-54, all mod.....

30 BELT, FAN
200444—1947-48, Model K100, 42 in. .....
203950—1947-50, all mod., 43 in. .....
205739—1949-50, Models 491, 501, 492, 502, 44 in.....
207431—1951-54, all mod., 40 in. .....

31 LINK, GENERATOR ADJUSTING
200171—1947-50, all mod., 35 amp. generator .....
205740—1949-50, Models 491, 501, 492, 502; 45 amp. generator .....
207447—1951-54, all mod.....

32★ GENERATOR
200170—1947-50, 35 amp.....
205747—1949-50, Models 491, 501, 492, 502; 45 amp.....

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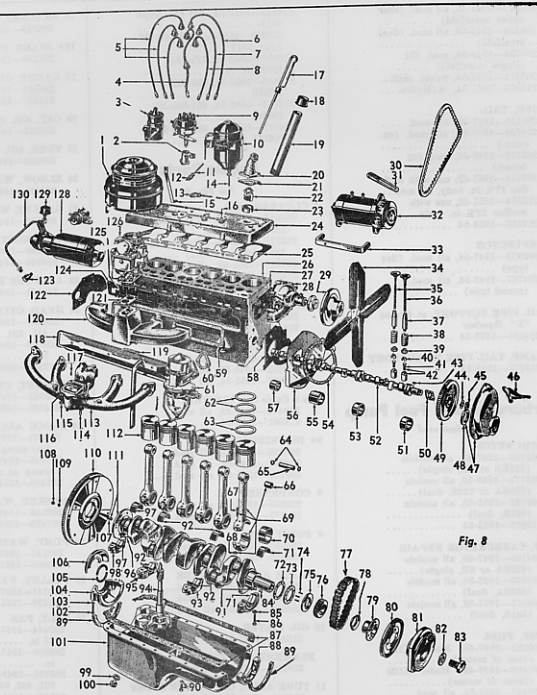

Fig. 8

ENGINE PARTS—*continued*

208297—1951, 45 amp. .....
213808—1952-54 .....

33 BRACKET, GENERATOR MOUNTING

200173—1947-50, all mod., 35 amp. generator .....
205742—1949-50, Models 491, 501, 492, 502; 45 amp. generator .....
207448—1951-54, all mod., 45 amp. generator .....

★ **BRUSH SET, GENERATOR**

201440—1947-50, all mod., 35 amp. generator .....
205857—1949-50, Models 491, 501, 492, 502, all mod., 45 amp. generator .....
208595—1951-54, all mod., 45 amp. generator .....
213855—1953-54 .....

★ **ARMATURE GENERATOR**

201444—1947-50, all mod., 35 amp. generator .....
205851—1949-50, Models 491, 492; 45 amp. generator .....
208298—1951, all mod., 45 amp. generator .....
213809—1952-54 .....

34 FAN
200144—1947-50, all mod.....
207429—1951-53, all mod.....
215895—1954, K545 .....

35 VALVE, EXHAUST
200131—1947-48, all models, pin type lock.....
203326—1947-48, Models 481, 482; split type lock, 1949-54, all models .....

36 VALVE INTAKE
200130—1947-48, all models, pin type lock .....
203325—1947-48, Models 481, 482; split type lock, 1949, 54, all models .....

37 GUIDE, VALVE
205701—1947-49, std. .....
205702—1949-54, all mod., marked "A" .0005.....
205703—1949-54, all mod., marked "L" .0055.....

38 SPRING, VALVE
200133—1947-54, all mod.....

39 RETAINER, VALVE SPRING
200134—1947-48, all models, pin type lock .....
203327—1947-48, all models, split type lock, 1949-54, all models .....

40 LOCK, SPRING RETAINER...

41 SCREW, TAPPET
200138—1947-49, all mod., adjustable .....
204029—1949-50, all models, self-adjusting .....
207172—1951-54, all mod., 27/32 in. long.....
207256—1951-54, all mod., 29/32 in. long.....

42 TAPPET ASSY., VALVE
200137—1947-50, all mod., std., adjustable .....
204024—1949-50, all models, std., self-locking .....
207171—1951-54, all mod., steel camshaft .....
207171—1951-54, all mod., cast iron camshaft .....

43 KEY, TIMING GEAR
823—1947-50, all mod.....
823—1951-54, all mod.....

, LOCK, TIMING GEAR NUT
200121—1947-54, all mod.....

45 NUT, TIMING GEAR
200122—1947-54, all mod.....

46 POINTER, TIMING
201939—1947-50, all mod.....
200158—1947-50, all mod., on damper 3 13/32 in.....
207411—1951-54, all mod., on damper .....

47 COVER ASSY., TIMING CHAIN
200126—1947-54, all mod.....

48 SEAL, CRANKSHAFT OIL
200129—1947-54, all mod.....

49★ GEAR, TIMING CAMSHAFT
200119—1947-54, all mod.....

50 THRUST PLATE, CAMSHAFT
200114—1947-54, all mod.....

51 BEARING, CAMSHAFT No. 1
200115—1947-54, all mod.....

52★ CAMSHAFT
200113—1947-48, all models, fuel pump at rear .....
205792—1949-50, Models 491, 501 .....

52★ CAMSHAFT
203017—1947-54, cast iron, all models, fuel pump at front.
203017—1951-54, steel .....

53 BEARING, CAMSHAFT No. 2
200116—1947-54, all mod.....

54 GASKET, TIMING CHAIN COVER
200128—1947-54, all mod.....

55 BEARING, CAMSHAFT No. 3
200117—1947-54, all mod.....

56 PLATE, FRONT END CYLINDER BLOCK
203889—1947-50, all models...
213395—1951-54 .....

57 BEARING, CAMSHAFT No. 4
200118—1947-54, all mod.....

58 GASKET, BLOCK FRONT END PLATE
203890—1947-54, all mod.....

59 GASKET, TAPPET COVER
200143—1947-54, all mod.....

60 GASKET, FUEL PUMP TO BLOCK
200283—1947-54, all mod.....

61★ PUMP, FUEL
200281—1947-48, Model K100, pump in rear .....
201509—1947-49, Model K100, pump in front .....
213138—1947-54 .....
213139—1952-54, 522-530-532..

62-63 RING SET, PISTON
203145—1947-51, all mod., std. to .009 in. .....
213951—1952-54 .....
Note: Oversizes available.

64 RING, PISTON PIN RETAINING
200110—1947-54, all mod.....

65 PIN, PISTON
200109—1947-54, std. .....

66 BUSHING, CONNECTING ROD
200107—1947-54, all mod.....

67 BOLT, CONNECTING ROD
203309—1947-48, Models 481, 482; 1949-54, all models.....

68 LOCKNUT, CONNECTING ROD
203310—1947-48, Models 481, 482; 1949-54, all models.....

69★ ROD ASSY., CONNECTING
200101—1947-54, all mod., rods 1, 3, 5 .....
200102—1947-54, all mod., rods 2, 4, 6 .....

70 BEARING SET, CONNECTING ROD
Upper or Lower
212996—1947-54, all mod., rods 1, 3, 5, std. .....
212997—1947-54, all mod., rods 2, 4, 6, std. .....
213266—1952-54, No. 1, 3 & 5 .020 in. undersize .....
213267—1952-54, No. 2, 4 & 6 .020 in. undersize .....

71 BEARING, CRANKSHAFT MAIN No. 1
200070—1947-48, all models, with flange .....
202686—1947-54, all models, without flange .....
213264—1952-54, .020 undersize

72 THRUST WASHER, CRANKSHAFT
200065—1947-50, all models, flange .....
Note: Not listed for 1951.

73 THRUST WASHER, CRANKSHAFT
202685—1947-50, all models, without flange .....
Note: Not listed for 1951.

74 PIN
202684—1947-50, all models...
Note: Not listed for 1951.

75 THRUST PLATE, CRANKSHAFT
200066—1947-50, all models...
Note: Not listed for 1951.

76★ GEAR, CRANKSHAFT TIMING
200083—1947-50, all models...
207170—1951-54, all models...

77★ CHAIN, TIMING GEAR
200123—1947-54, all models...

78 SLINGER, CRANKSHAFT OIL
200069—1947-54, all models...

79 HUB, CRANKSHAFT PULLEY
200086—1947-49, all models...

80 PULLEY, CRANKSHAFT
200085—1947-50, all models...
Note: Items 79, 80, not listed for 1951.

81 DAMPER, VIBRATION
200082—1947-50, all models...
216078—1951-54, all models...

82 LOCK WASHER
200—1947-50, all models.....
Note: Not listed for 1951.

83 BOLT, VIBRATION DAMPER
208—1947-50, all models.....
888—1951-54, all models.....

84 KEY, CRANKSHAFT, PULLEY HUB
200087—1947-50, all models...
822—1951-54 .....

continued

ENGINE PARTS—*continued*

85 FLAT WASHER
200081—1947-54, all models...

86 BOLT, MAIN BEARING CAP
200079—1947-49, all mod., 1, 2 and 3 caps .....
200080—1947-49, 4 caps.....
207155—1950-54, No. 1 cap...
207155—1950-54, No. 2 cap...
207156—1950-54, No. 3 cap...
207155—1951-54, No. 4 cap...

87 GASKET, OIL PAN SIDE
200266—1947-50, all models...
207186—1951-54, all models...

88 BLOCK, FRONT CRANKSHAFT BEARING FILLER
200090—1947-50, all models...
207181—1951-54, all models...

89 GASKET, OIL PAN END
200267—1947-54, all models...

90 BOLT ....

91 KEY, CRANKSHAFT TIMING GEAR
200084—1947-50, all models...
822—1951-54, all models.....

92 BEARING, CRANKSHAFT MAIN No. 2 AND 3
200071—1947-54, all models...
Note: See note item 71.
200341—1952-54, .020 undersize

93 CAP, MAIN BEARING No. 1 AND 2
202689—1947-48, cap No. 1... ....
Note: Serviced only with engine block.
204641—1947-48, cap No. 2...
Note: 1949 cap No. 1 furnished with block only.
207151—1951, cap No. 1 ....
207152—1952, cap No. 2 ....

94 PUMP, OIL, Less Float
200240—1947-50, all models...
207183—1951-54, all models...

95 CAP, MAIN BEARING No. 3
204645—1947-50, all models...
207153—1951, all models..... ....

96 BOLT
200098—1947-54, all models...

97 BEARING, CRANKSHAFT MAIN No. 4
200072—1947-50, all models...
207242—1951-54, all models...
213265—1952-54, .020 undersize

98 CAP, MAIN BEARING No. 4
204649—1947-49, all models...
Part not listed for 1950-51....

99 GASKET, OIL PAN DRAIN PLUG
200269—1947-54, all mod.....

100 PLUG, OIL PAN DRAIN
200268—1947-48, all mod.....
212954—1951-54 .....

101 PAN, OIL
201961—1947-50, all mod.....
207185—1951-54, all mod.....

102 BOLT, REAR BEARING FILLER BLOCK
200094—1947-50, all mod.....
200091—1951-54, front all mod.
735—1951-54, rear .....

103 LOCK WASHER

104 BLOCK, REAR BEARING FILLER
200093—1947-49, all mod.....
207147—1950-54, all mod.....

105 OIL SEAL, REAR BEARING FILLER BLOCK
204654—1947-54, all mod.....

107 BUSHING, CRANKSHAFT PILOT
200064—1947-54, less Hydra-matic .....
209228—1951-54, with Hydra-matic .....

108 NUT

109 LOCK WASHER .....

110 FLYWHEEL ASSY.
200097—1947-50, all models ex. 491 .....
205791—1949-50, Models 491, 501 .....
207149—1951-54, less Hydra-matic .....
209001—1951-54, with Hydra-matic .....

RING GEAR, FLYWHEEL
200100—1947-50, all mod.....
207150—1951-54, all mod.....

111★ CRANKSHAFT ASSY.
200065—1947-50, all mod.....
207146—1951-54, less Hydra-matic .....
209227—1951-54, with Hydra-matic .....

112★ PISTON
201947—1947-50, all mod.....
207247—1951-54, all mod.....

113 MANIFOLD ASSY., EXHAUST
200310—1947-48, Model K100..
201965—1947-48, all models 1949, Model 491, single.....
203374—1947-48, Model 486; 1949-52, all models, dual....
214247—1953-54 .....

114 STUD, EXHAUST, PIPE TO MANIFOLD
201970—1947-48, Model K100
201855—1947-54, all mod.....

115 NUT, INTAKE TO EXHAUST MANIFOLDS
200278—1947-48, all models; 1949, Model 491, single.....
203353—1947-54, all models, dual .....

116 FLAT WASHER

117 STUD
200276—1947-48, all models; 1949, Model 491, single.....
205510—1949-54, all models, dual .....

118 COVER, VALVE TAPPET
200140—1947-48, all models.
204112—1949-54, all models..

119 GASKET
200319—1947-48, all models; 1949, Model 491, single.....
203376—1949-52, all models, dual .....
214121—1953-54 .....

120 MANIFOLD ASSY., INTAKE
200274—1947-48, all models; 1949, Model 491, single.....
203351—1949-51, all models, dual .....
207428—1951-52 .....
214120—1953-54 .....

121 GASKET
200437—1947-48, all models...
203355—1949-54, all models...

122 PLATE, CYLINDER HEAD BLOCK END, Rear
200055—1947-50, all mod.....

123 ELBOW, OIL PRESSURE GAUGE TUBE ENGINE UNIT
202126—1947-50, Models 491, 501, 492, 502.....

124 GASKET
200279—1947-54, all mod.....

125 STUD
200322—1947-48, all models...
205510—1949-51, all models...

126 CARBURETOR
Note: See carburetor list.

127★ SOLENOID, STARTING MOTOR
201424—1947-48, all models...
204752—1949-54, all models...

128★ MOTOR, STARTING
200620—1947-48, all models...
208233—1951-54, less Hydra-matic .....
209293—1951-54, with Hydra-matic .....
213997—1953-54, w/folo-thru type drive .....

★ ARMATURE
201412—1947-49, all models...
208235—1950-54, all models...

★ BRUSH SET
201406—1947-49, all models...

BRUSH
208594—1950-54, all models, Bendix drive complete.....
213622—1953-54, folo-thru type drive .....

129 GAUGE, OIL PRESSURE, Engine Unit
201540—1947-48, Models K100, 101, 481, 482.....
203505—1947-48, Models 491, 492 .....
207415—1950-51, all models...

130 TUBE ASSY., OIL PRESSURE GAUGE, Engine Unit
203252—1947-49, all models...

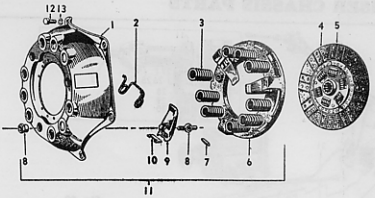

Fig. 9—Clutch

Clutch

See Fig. 9

★ COVER ASSEMBLY, PRESSURE PLATE
200204—1947-50, all models, 9 springs
202971—1947-50, all models, 3 springs
205837—1949-50, model 491, 9 springs
208630—1951-54, all models, 9 springs
207333—1951-54, all models, 3 springs

1★ COVER, PRESSURE PLATE
200213—1947-54, all models, 9 springs
205840—1949-50, model 491, 9 springs
202973—1947-54, all models, 3 springs

2 SPRING, PRESSURE PLATE LEVER
200212—1947-51, all models, 9 springs
202975—1947-51, all models, 3 springs

3 SPRING, PRESSURE PLATE
200206—1947-54, all models, 9 springs
205839—1949-50, model 491, 9 springs
202980—1947-50, all models, 3 springs
202976—1951-54, all models, 3 springs

4 FACING SET
200201—1947-54, all models, 9 springs
205836—1949-50, model 491, 9 springs
202981—1947-54, all models, 3 springs

5★ DISC AND FACINGS
206428—1947-49, all models, 9 springs
206429—1949-50, model 492, 9 springs
205835—1949-50, model 491, 9 springs, overdrive
206498—1947-50, all models, 3 springs
213068—1951-54, with overdrive

6★ PLATE, PRESSURE
200205—1947-50, all models, 9 springs
202972—1947-50, all models, 3 springs
205838—1949-50, model 491, 9 springs
208631—1951-54, all models, 9 springs
207334—1951-54, all models, 3 springs

7 PIN, PRESSURE PLATE LEVER
200209—1947-54, all models, 9 springs
202975—1947-54, all models, 3 springs

8 EYEBOLT AND NUT ASSEMBLY, PRESSURE LEVER
200210—1947-54, all models, 9 springs
202978—1947-54, all models, 3 springs, nut

9 LEVER, PRESSURE PLATE
200207—1947-54, all models, 9 springs
205841—1949, model 491, 9 springs
202974—1947-54, all models, 3 springs

10 STRUT, PRESSURE PLATE
200208—1947-54, all models...

11 PLATE ASSEMBLY, PRESSURE
Note: See top of clutch list.

12 BOLT, PRESSURE PLATE

13 LOCKWASHER, PRESSURE PLATE

★ BEARING AND SLEEVE, RELEASE
207257—1947-50, all models...
207257—1951-54, all models...

★ BEARING, RELEASE
205745—1947-54, all models...

★ FORK, RELEASE
200215—1947-54, all models...

SHAFT, CLUTCH RELEASE FORK
200218—1947-48, all models...
204230—1949-50, all models...
207928—1951-54, all models...

PEDAL CLUTCH
201063—1947-48, all models...
204231—1949-50, all models ex. conv.
207929—1951-52, all models...
218135—1953-54 ...

SPRING, PEDAL RETURN
201853—1947-48, all models...
204234—1949-50, all models...
207930—1951-54, all models...

Gear Shift Linkage

Standard Transmission

See Fig. 10

1 BRACKET, SHAFT LOWER
201260—1947-48, all models, incl. cap and pin...
204295—1949-50, all models...

2 SPRING, SHAFT LOWER BRACKET
204290—1949-50, all models...
207991—1951-54, all models...

3 ROD, LOW AND REVERSE, Upper
201261—1947-48, all models...
204297—1949-50, all models...
208004—1951-54, all models...

4 LEVER, LOW AND REVERSE, Lower
201253—1947-48, all models...
204293—1949-50, all models...
207996—1951-54, all models...

5 INSULATOR, LEVER, Lower
201517—1947-50, all models...
206649—1951-54, all models...

6 FLATWASHER, ROD INSULATOR

7 SPRINGWASHER, ROD INSULATOR

8 OILER, LEVER, Lower
202121—1947-50, all models...
Part not listed for 1951.

9 PIN, SHAFT, Lower
201511—1947-51, all models...
Part not listed for 1951.

10 COVER
201514—1947-50, all models...
208002—1951-54, all models...

11 SHAFT
201251—1947-48, all models...
204285—1949-50, all models...
207990—1951-54, all models...

12 LEVER, SECOND AND HIGH, Lower
201258—1947-48 and 1950, all models
207999—1951-54, all models...

13 ROD, SECOND AND HIGH, Upper
202320—1947-48, all models...
204288—1949-50, all models...

13 ROD, SECOND AND HIGH, Upper
208005—1951-54, all models...

continue

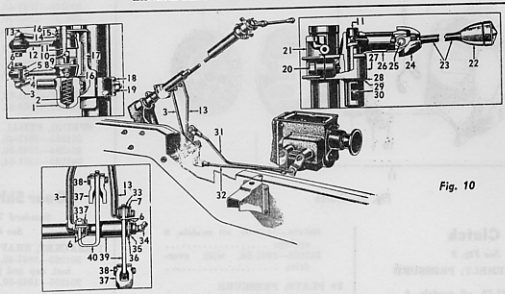

Fig. 10

GEAR SHIFT LINKAGE—*continued*

14 RETAINER, LEVER SEAL, Lower
201513—1947-50, all models...
Part not listed for 1951.

15 SEAL, LEVER, Lower
201512—1947-54, all models...
207266—1951-54, all models...

16 SPRINGWASHER, LEVER
201515—1947-50, all models...
Part not listed for 1951.

17 RETAINER, LEVER, Lower
201516—1947-48, all models...
205300—1949-50, all models...
Part not listed for 1951.

18 CAP, BRACKET, Lower
204296—1949-50, all models...
Part not listed for 1951.

19 BOLT, BRACKET CAP
587—1947-50, all models.....
Bolt not listed for 1951.

20 BOLT, UPPER BRACKET
735—1947-50, all models.....
Part not listed for 1951.

21 CAP, UPPER BRACKET
204292—1949-50, all models...
Part not listed for 1951.

22 KNOB, LEVER
201933—1947-48, all models, sandstone beige .....
205172—1949-50, Model 491, starlight pearl .....
207989—1951-54, all models...

23 LEVER, UPPER
201931—1947-48, all models...
204264—1949-50, all models...
207985—1951-54, all models...

24 CAP, LEVER
204265—1947-50, all models...

25 PIN, LEVER
201242—1947-50, all models...
207987—1951-54, all models...

27 BRACKET, SHAFT, Upper
201245—1947-48, all models...
204291—1949-50, all models...
Part not listed for 1951.

28 FLATWASHER

29 SNAP RING, GUIDE
204288—1949, all models, .042
205402—1949-50, all models, .062 .....
Part not listed for 1951.

30 PIN, SHAFT TO GUIDE
201511—1947-50, all models...

31 ROD, LOW AND REVERSE, Lower
204301—1949-50, all models...

32 ROD, SECOND AND HIGH, Lower
204302—1949-50, all models...

33 INSULATOR, ROD
206649—1949-50, all models...

34 OILER, ROD BELLCRANK
202121—1949-50, all models...
Part not listed for 1951.

35 SNAP RING, BELLCRANK
204304—1949-50, all models...
Part not listed for 1951.

36 THRUSTWASHER, BELLCRANK ROD
206120—1949-50, all models...
Part not listed for 1951.

37 CLEVIS, LOWER ROD
205340—1947-48, all models...
205340—1949-50, all models...

38 PIN, CLEVIS LOWER ROD
200239—1947-50, all models...

39 BELLCRANK ROD, SECOND AND HIGH
202321—1947-48, all models...
204410—1949-50, all models...

40 BELLCRANK ROD, LOW AND REVERSE
204303—1949-50, all models...

Standard Transmission

See Fig. 11, Page 511

1 COVER, CASE
201272—1947-54, all models...

2 GASKET, CASE COVER
201275—1947-54, all models...

3★ GEAR, LOW AND REVERSE
201300—1947-54, all models...

4★ GEAR, SECOND SPEED IDLER
201299—1947-54, all models...

5 RING, SECOND AND HIGH BLOCKING
201298—1947-54, all models...

6 SNAP RING, SHIFTING PLATE
201297—1947-54, all models...

7 HUB, SECOND AND HIGH SYN. CHRONIZER
201294—1947-54, all models...

8 PLATE, SECOND AND HIGH SYN. CHRONIZER SHIFTING
201296—1947-54, all models...

9 SLEEVE, SECOND AND HIGH SYN. CHRONIZER
201295—1947-54, all models...

10 SYNCHRONIZER, SECOND AND HIGH
201293—1947-54, all models...

11★ BEARING, MAIN SHAFT ROLLER
201292—1947-54, all models...

12★ SHAFT, MAIN
201288—1947-49, all models, ex. 491, complete .....
201290—1947-50, all models, ex. 491, shaft only.....