

INSTRUCTIONS

for the care and operation of

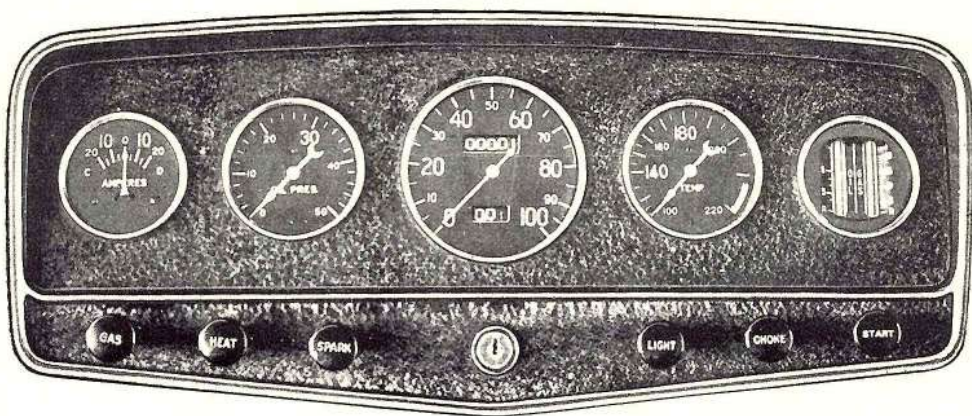
AUBURN

Models 8-98 and 8-98A

FOURTH EDITION



AUBURN AUTOMOBILE COMPANY
AUBURN, INDIANA, U. S. A.



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"BREAKING-IN" YOUR 8-98

This car has been thoroughly checked and adjusted, and is in good running order as it leaves the factory.

It should be carefully handled during the "wearing-in" period.

Care in operation until all parts are thoroughly adjusted and worn to a proper fit, will result in much longer life to the car, and more satisfactory performance.

Handle the car carefully in the first 500 miles of driving and do not speed it to exceed 25 miles per hour during this period.

LICENSE DATA

Number of Cylinders	8
Cylinder Bore	3"
Stroke	4 3/4"
SAE Horse Power Rating	28.8
Developed Horse Power	98
Piston Displacement	268.64 cu. in.
Firing Order	1, 6, 2, 5, 8, 3, 7, 4
Capacity of Crankcase	8 qts.
Capacity of Cooling System	21 qts.
Capacity of Gasoline Tank	20 gal.
Wheel Base	127"

OPERATING INSTRUCTIONS

Starting the Engine: Be sure you have proper amount of oil in crankcase, gasoline in tank, and radiator filled with water. See that gear shift lever is in neutral position.

For most satisfactory operation, use the manifold heat control in starting, as instructed below:

Cold Weather Operation: Draw heat control out to extreme position, thus closing the damper valve in exhaust outlet.

Turn on ignition switch by unlocking Electrolock, turning key one-quarter turn to right. Depress clutch pedal, draw carburetor choke control out to extreme position, and pull start control switch. As soon as engine starts firing, release start control, and push choke control half way in. When engine becomes warm, push choke control entirely in to the off position. Do not use it longer than necessary.

As soon as engine warms to operating temperature, push heat control half way in, and for cold weather city driving it should be kept in this position. For high speed cross country driving, the heat control should be in to the dash, or not over one-third of the way out.

Hot Weather Operation: When first starting the engine in the morning, follow same method described above. The heat control should be used only for fast warming of engine, and should then be pushed in to the dash, or off position for both city and cross country driving.

After engine is warm, do not use choke or heat controls. If the warm engine does not start readily, open the heat control about half way, but do not use the choke.

Starting the Car:

See that the emergency brake lever is in extreme forward position, thus disengaging the brake.

Push the clutch pedal clear down. Move gear shift lever to the left and backward into first speed position. If it does not enter smoothly and easily, release and depress clutch pedal once or twice, and the lever will easily slip into gear.

The pressure on clutch pedal should then be released gradually, at same time increasing engine speed slightly with the foot accelerator, and the car will begin moving forward.

The shift to second speed is made preferably at a speed of six to eight miles. Depress the clutch pedal and move shift lever forward to neutral, then to the right and forward again to second speed position.

Be careful not to move shift lever straight forward through neutral into reverse.

The instant the lever is in gear, re-engage the clutch slowly, at same time accelerating engine slightly.

The shift to third or high speed should be made at from ten to fifteen miles per hour under ordinary conditions. This shift is made in same way, except that the lever is moved straight back into right rear position.

If you have not had experience in driving, you should become thoroughly familiar with the operation of car at low speed before attempting to drive the higher speeds. Practice gear shifting, starting, stopping, steering, turning and backing at a low rate of speed.

To Stop the Car:

Slow down; brake car speed gradually with right foot pedal, slowly bringing car to a stop. When car is nearly stopped, disengage clutch, and move shift lever to neutral position.

Always have gear shift lever in neutral position before re-engaging the clutch.

Set the emergency brake by drawing hand brake lever back as far as possible.

To Stop the Engine:

Shut off the ignition by turning locking cylinder back so the keyway is in vertical position.

To Back the Car:

Do not reverse the direction of car until it has been brought to a complete stop.

When car is at rest and shift lever in neutral position, release the clutch, move shift lever to left, then forward into reverse; engage the clutch. Carefully watch the steering. Do not back rapidly, and be ready to operate clutch and brake pedals instantly.

Free Wheeling:

Should your car be equipped with a Free Wheeling Unit, it will be automatically locked when the car is reversed, and if Free Wheeling is desired when transmission shift is again placed for forward running, it will be nec-

essary to re-engage the Free Wheel Unit by drawing the floorboard lever back to free wheel position.

Shifting the free wheel lever forward locks it, and backward engages it so it is ready for use. In making these shifts, depress clutch pedal.

When Free Wheeling is engaged, the transmission lever may be moved from first to second, and second to third speed positions without depressing clutch pedal.

LIGHTING SYSTEM

The bright head lights are turned on by drawing the light control switch on instrument panel half way out.

To turn on the cowl lights for parking, draw the control out as far as it will go.

The dimmer lights are operated by depressing the floor board switch, to left of clutch pedal, with the foot. By depressing it again the lights will be changed from dim to bright.

The instrument panel light is controlled by a switch under edge of instrument board.

COOLING SYSTEM

Capacity: 21 quarts.

The system should be inspected at intervals and water added if necessary. Use soft water when possible.

To drain water, open drain cock on outlet pipe at lower part of radiator which can be reached with a screwdriver by lifting up side of hood. If car is to be unused for any length of time, or is to stand idle in extreme cold weather, the system should be drained. Run the engine for a short time after drain cock has stopped dripping to insure complete drainage.

Use Anti-freeze solutions in freezing temperatures. If denatured alcohol is used, test the mixture frequently with a hydrometer, and add alcohol as needed.

Anti-freeze solutions should be drawn out on arrival of warm weather.

Do not pour cold water into an empty or partly empty radiator while engine is hot, as it might cause serious damage.

Fan: The fan is equipped with an oil reservoir with a special pumping device, which supplies constant lubrication to bearings. Remove the plug in fan and pour engine oil into the reservoir. Turn the hub so filler hole is at bottom and all superfluous oil will drain out to a fixed level.

One filling should be enough for 10,000 miles.

Waterpump: The waterpump on engine which forces circulation of water through the cooling system is fitted with a grease cup for lubrication. It requires a special lubricant which your dealer can supply.

ENGINE

Proper care of engine is of the utmost importance. Its life is almost entirely dependent upon the treatment it receives from the beginning of its operation.

With reasonable care and adjustments when necessary it should give a long term of satisfactory service without need of major repairs.

When adjustments or repairs are needed it is important that the work be done only by experienced competent mechanics. You should consult your Auburn dealer, who is equipped to properly service your engine.

Remember that modern conditions of higher engine temperatures, higher speed operation, and short distance driving in unfavorable climatic conditions have a tendency to greatly increase the fluidity and consumption of engine oils. The presence of corrosive sulphur in gasoline has a damaging effect on bearings and wearing surfaces. The use of improper oil will develop a carbon residue causing piston rings to stick and act as reamers to cut the polished surfaces of cylinder walls and permit passage of an excessive amount of oil to the combustion chamber, and will also cause oil dilution.

Engine oils must be selected according to viscosity recommendations and the engine must be operated with as lean a fuel mixture as possible.

Periodic changing of oil and careful flushing of crankcase and lubricating system will prolong the life of bearings and rings, prevent undue wear on cylinder walls, and give more dependable operation.

It is natural to expect some oil consumption. Our engine is designed on the principle that it is better to use a little more oil than to have to buy expensive parts.

The use of proper lubricants with additions and changes whenever necessary will be an economical item of maintenance, and you will be repaid many times over by long wear and good service.

IMPORTANT PRECAUTIONS

1. Watch the oil pressure. Never operate the engine unless correct pressure is registered on oil gauge.
2. Should you hear any unusual knocks or noises, stop the engine at once and locate the cause before continuing its operation.
3. Never race the engine at high speed during the warming-up period, or when it is not under load.
4. Keep ignition system in good order.
5. Use the choke as sparingly as possible when starting the engine in order to reduce crankcase dilution and its hazards.
6. Avoid over-rich carburetor adjustments.

CLEARANCES

Pistons: Length $3\frac{3}{4}$ ". Clearance at top .016" to .019". At bottom .0015" to .002".

Piston Rings: Compression rings should have .0015" to .003", and the oil rings .0015" to .003" side clearance between ring and grooves. The gaps between ends of rings should be .006" to .012" on compression rings, .010" to .018" on 3/16" oil ring, and .007" to .015" on the 1/8" oil ring. The grooves must be cleaned before fitting in new rings.

Main Bearings: Proper clearance between main bearings and crankshaft is .002" to .00325". After wear of .003" or more the bearings should

be adjusted. End clearance of center or thrust bearing should be from .003" to .008".

Connecting Rod Bearings: Clearance between connecting rod bearing and crankshaft is .0015" to .003". Side clearance should be from .004" to .008". They should be adjusted when wear of .004" or more has taken place.

Camshaft Bearings: New camshaft bearings should be fitted with .002" to .003" clearance between shaft and front bearing, and .0017" to .0047" on all others.

Valves: In valve adjustments the clearance between end of valve and head of adjusting screw on valve tappet should be not less than .006" nor more than .008" with engine warm. They should be set one cylinder at a time with piston on top dead center at end of compression stroke.

Spark Plugs: The gap clearance between points should be .026 to .028".

LUBRICATION

Oil Pressure: The oil pressure will vary with viscosity of the oil. With engine idling and oil in good condition, the pressure should be at least five pounds. When engine is cold the pressure runs high until oil thins down. The maximum pressure should be 40 to 60 pounds at car speed of 40 miles per hour.

About 8 quarts are required to fill to high level. Do not carry oil above the high mark.

The oil should be drained from reservoir and replaced with fresh supply every 500 miles unless the oil has lost its viscosity before that time, in which case it should be changed oftener.

The oil strainer can be removed for cleaning.

LUBRICATION RECOMMENDATIONS

In selecting the correct grade of engine oil, all factors in connection with design and operations of engine under all conditions have been given consideration.

Our Engineers recommend a high quality oil of the body and character of Gargoyle Mobiloil "BB" for temperatures down to 32 degrees Fahrenheit. Temperatures below 32 degrees Fahrenheit we recommend Gargoyle Mobiloil Arctic. These recommendations come within the range of S.A.E. Viscosity Number 40 down to 32 degrees Fahrenheit. S.A.E. Viscosity Number 20 for 32 degrees Fahrenheit and lower.

When doing considerable high speed driving for long distances at temperatures between 15 and 32 degrees Fahrenheit, we recommend an oil such as Mobiloil A, or an equivalent coming in range of S.A.E. Viscosity Number 30.

In specifying these viscosity numbers, however, it does not necessarily imply that every oil bearing these numbers would have our specific approval.

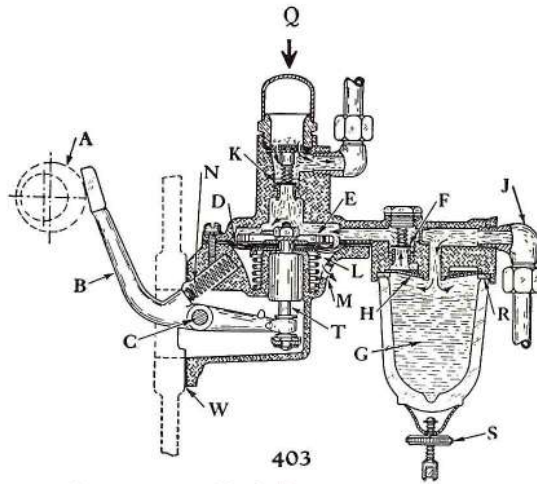
If correct lubricant is used and careful attention given to draining instructions, the engine should operate perfectly.

FUEL SYSTEM

The Gasoline Tank holds approximately 20 gallons.

The bottom drain plug should be removed occasionally and the accumulated water and sediment flushed out.

Gasoline from the supply tank is drawn to carburetor by a Stewart-Warner Fuel Pump. This pump is actuated by the engine camshaft and should give continuous service as it requires no lubrication. Should any new parts be needed, consult your dealer.



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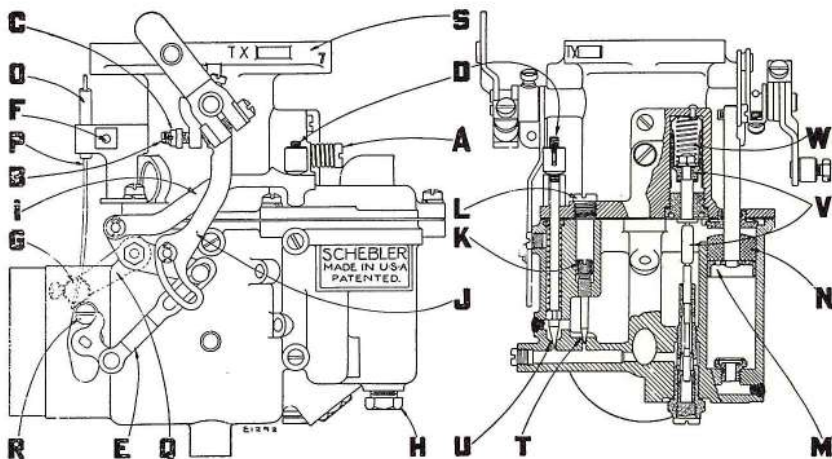
Fuel Pump

CARBURETOR

If the manifold heat control is used as directed, the carburetor choke will not need to be used more than a few minutes, even when the weather is extremely cold.

The choke control should be pulled all the way out for starting, and as soon as engine starts should be pushed in about $\frac{1}{4}$ ", and gradually pushed entirely in as the engine warms and runs smoothly. **When engine is hot do not use the control.** Excessive use of choke dilutes the engine oil and causes rapid wear on pistons, piston pins, cylinders and bearings.

Use the choke only when necessary.



GASOLINE TELEGAGE

The gasoline gauge on instrument board indicates amount of fuel in rear tank, allowance being made for a reserve of approximately one gallon.

It is operated by the weight of the gasoline pressure on a column of air, which causes the red liquid in gauge head to rise or fall.

If gauge does not register correctly, it may be due to leaky connections or liquid in the line running from gasoline tank to gauge. You should call upon your Auburn Service Station and have the trouble located and adjusted.

OIL LEVEL TELEGAGE

This gauge operates on same principle as the gasoline gauge, and adjustments are made in same manner.

The colored liquids used in the oil and gasoline Telegage heads are selected because of their specific gravity and other characteristics, and can be secured from any Auburn dealer.

No other liquid will answer the purpose.

A red liquid is required for the gasoline gauge, and a green liquid for the oil level gauge.

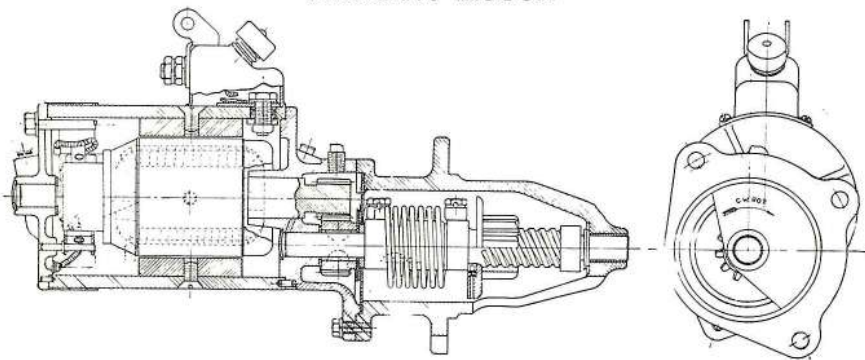
DELCO-REMY ELECTRICAL SYSTEM

The Electrical System is 6-volt, one wire, so called because one-half of the circuit is through metal part of chassis, and the other half through wiring.

The generator, starting motor, distributor and coil are made by Delco-Remy Corporation of Anderson, Indiana, and are serviced through United Motors Service and their authorized representatives.

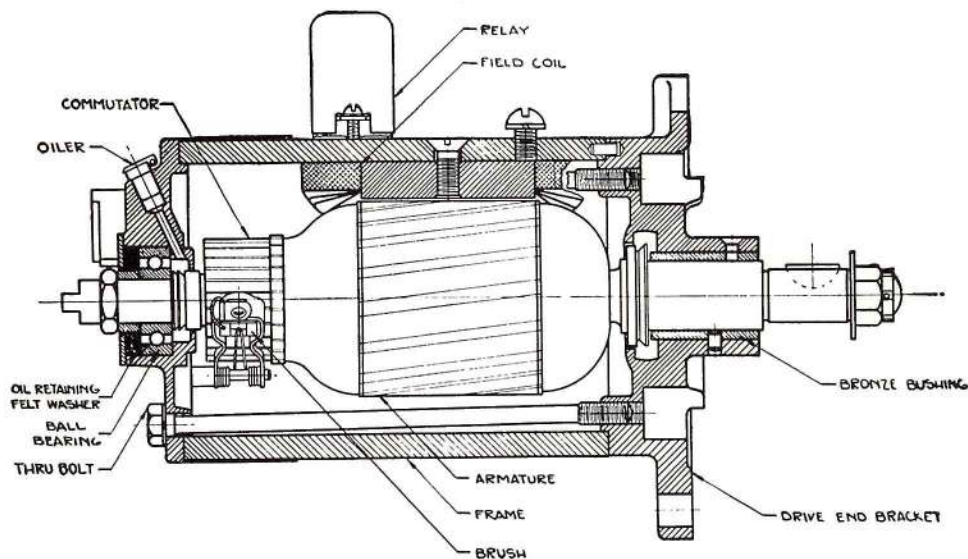
This equipment is guaranteed by the manufacturer, and all claims under warranty should be made to nearest United Motors Service Authorized Representative.

STARTING MOTOR



Rotation clockwise, viewing drive end. Brush spring tension 24 to 28 ounces. Bendix drive. Every 1000 miles add a few drops of engine oil into the hinge cap oilers on commutator end bracket and gear case.

GENERATOR

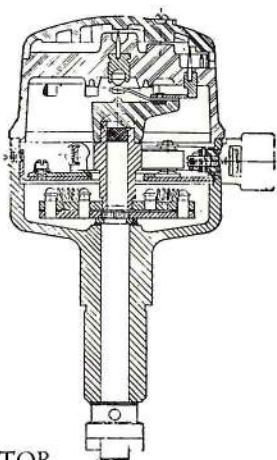
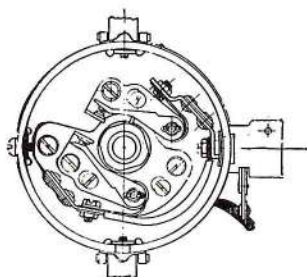


The rotation of generator, viewing drive end, is clockwise. The charging rate is governed by position of third brush.

The maximum cold output with thermostat closed is 19 to 21 amperes, and the maximum hot output with thermostat open is 9 to 12 amperes.

Brush spring tension, 14 to 18 ounces.

Add a few drops of good grade engine oil in hinge cap oilers on both end brackets every 1000 miles.



IGNITION DISTRIBUTOR

IGNITION DISTRIBUTOR

Rotation, counter-clockwise, viewed from top. Contact point separation .018" to .024". Contact spring tension, 17 to 21 ounces. Automatic advance starts at 500 RPM and is 24 degrees maximum at 2600 RPM of engine. Vaseline should be applied to face of breaker cam, wick below rotor and breaker arm pivots should be oiled every 1000 miles.

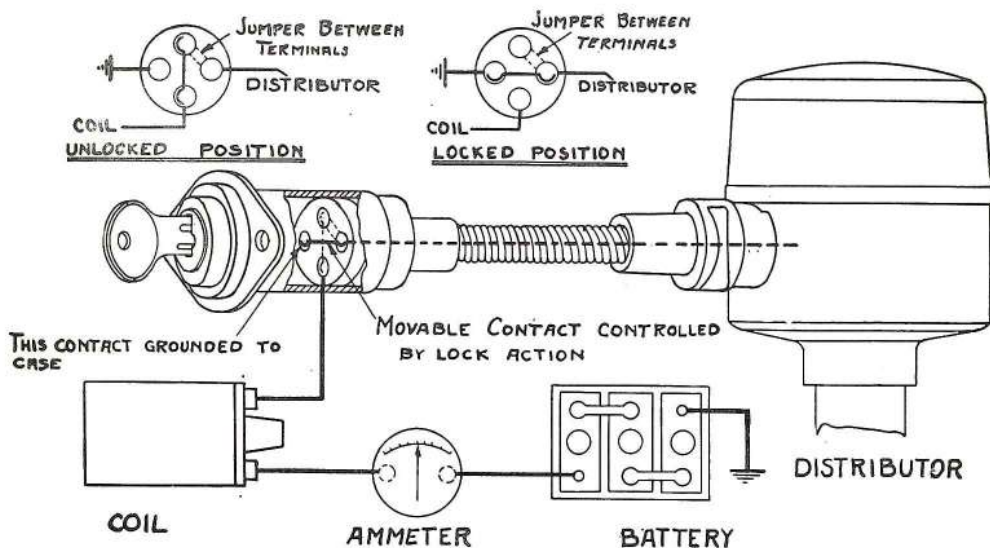
The grease cup should be turned down every 1000 miles and filled with good grade of medium cup grease.

Should breaker arms require synchronizing, call on any Auburn Service Station or authorized representative of United Motors Service.

ELECTROLOCK

The Ignition Switch Electrolock is approved by the Underwriters Laboratories.

When Keyway is in vertical position, the ignition is shut off and car is locked. To unlock, give key $\frac{1}{4}$ turn to right, which closes the ignition switch. To lock Electrolock, turn cylinder back so the keyway is in a vertical position.



LUBRICATION

This model is equipped with the Bijur System of Automatic Chassis Lubrication, which feeds oil to nine important chassis points, and which is explained on page 13.

Please note below data on additional lubrication points not serviced by the automatic system, and which are also treated under their respective headings. It is of utmost importance to use correct quality lubricants at proper intervals. See your dealer for this important service.

Engine: The crankcase should be drained and refilled every 500 miles or oftener if necessary. Capacity about 8 quarts. See page 6.

Water Pump: The grease cup on waterpump must be kept filled with Waterproof Grease and the cup should be given a full turn frequently. Your dealer can supply the proper grease and one-half ounce is enough for one filling.

Fan: Use engine oil in fan hub as indicated on page 4.

Generator: Every 1000 miles add 8 to 10 drops of good grade light engine oil in hinge cap oilers mounted on front and rear.

Starting Motor: Every 1000 miles add 8 to 10 drops good grade light engine oil in the hinge cap oilers.

Distributor: Keep grease cup filled with good clean medium cup grease and give the cap several turns every 1000 miles.

Universal Joint: Pack both joints with high grade, fibrous, non-fluid grease whenever needed. It is recommended that the lubricant in joints be checked every 1000 miles. See page 16.

Steering Gear: Keep the housing filled with proper lubricants as explained on page 15.

Drag Link and Front Axle Tie Rod: Fill the Alemite fittings with good clean cup grease every 500 miles, or oftener if necessary.

Wheel Bearings: Clean and pack with good, clean cup grease at least twice a year.

Transmission and Free Wheel Unit: Any good grade of transmission fluid oil is recommended for use in these units.

Differential: Any good differential fluid oil is recommended for use in this unit. However, a high grade lead soap base lubricant which prolongs the life of gear teeth may be used if desired.

The oil must always be kept up to the level of the oil filler ports in Transmission, Free Wheel Unit and Differential housings. The oil level in these housings should be checked every three months, and oil added if necessary. Any Auburn Distributor and Dealer can supply you with the proper kind of lubricant for these units.

In addition to above, oil all Brake Rod Connections, Yokes and Levers with hand oil can once every 1000 miles.

Occasionally use penetrating oil on Door Locks, Hinges, Strikers and Dove Tails.

CHASSIS LUBRICATION

This model is equipped with the Bijur Continuous System of Automatic Chassis Lubrication, which operates constantly while the car is running, and supplies to each bearing the correct amount of oil under all driving conditions, this amount being determined by the pump output which is automatically controlled by vacuum from intake manifold of engine.

If for any reason the system does not function properly, call upon your Auburn Service Station for a check-up.

The system supplies oil to the following chassis bearings:

Front Axle King Pins	2 points
Front Spring Front Eye	2 points
Rear Spring Front End	2 points
Rear Spring Shackles	2 points
Clutch Throwout Bearing	1 point

To insure proper operation of the System it is necessary to use the oil recommended by Auburn Automobile Company. This Auburn Chassis Lubricant has the necessary penetrating and water excluding properties, is anti-corrosive, free from gumming, has high lubricating value, and will remain fluid in cold weather. Therefore it is important that only this specially prepared lubricant be used. This special Auburn Chassis Lubricant can be supplied to you in sealed containers by any Auburn dealer.

CLUTCH

The presence of grease on the friction facings will cause clutch to chatter and grab when engaged, or will slip at high speeds. When this condition exists, the facings must be cleaned with a cloth saturated with naphtha, and afterwards lightly scrubbed with fine sandpaper. If facings are oil soaked they should be replaced. Use only the moulded asbestos friction facings, which are specially designed for this clutch, and which can be supplied by your dealer. Substitutes will not be satisfactory.

Keep the clutch pedal and all its release linkage well lubricated to insure freedom of operating parts.

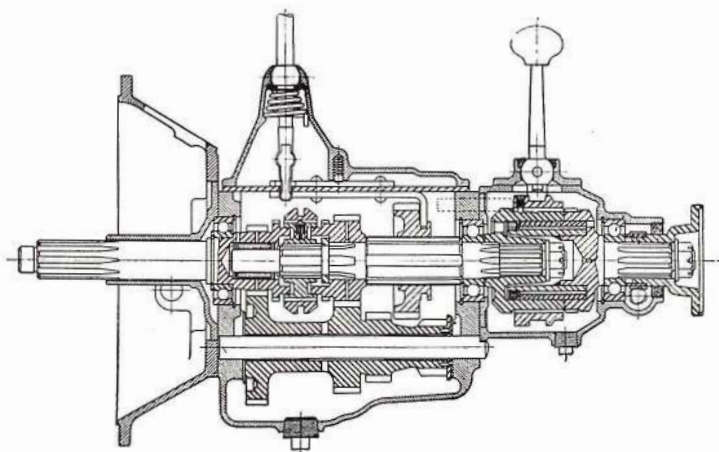
Make certain that at all times there is at least one inch free movement between clutch pedal and floorboard. As normal clutch wear occurs this amount decreases, and unless corrected will allow clutch slippage with ruinous results.

Pedal adjustment should be checked frequently.

Do not rest your foot on the clutch pedal while driving.

TRANSMISSION

The Silent-Mesh, Synchronized Gear Transmission, used on this model provides three speeds forward and one reverse.



The oil filler port is on left side of transmission case below center at rear. Remove the plug and fill to the level of this opening. See page 12.

Should your 8-98 be one of the "Free-Wheeling" models, you will note this unit mounted on rear end of transmission with a hand lever projecting through floorboard within easy reach. This lever has two positions, forward and back. When moved to forward position the action is locked out and will remain so until moved to rear position when you have "free-wheeling" in all three speeds forward, and along with it the ease of shifting without disengaging clutch from first to second and second to third.

To shift from the positive drive locked position to free wheel position, let up momentarily on accelerator pedal which relieves the load on the driving side of the gear, then draw free wheel lever back and the sleeve will easily slip into Free Wheel position.

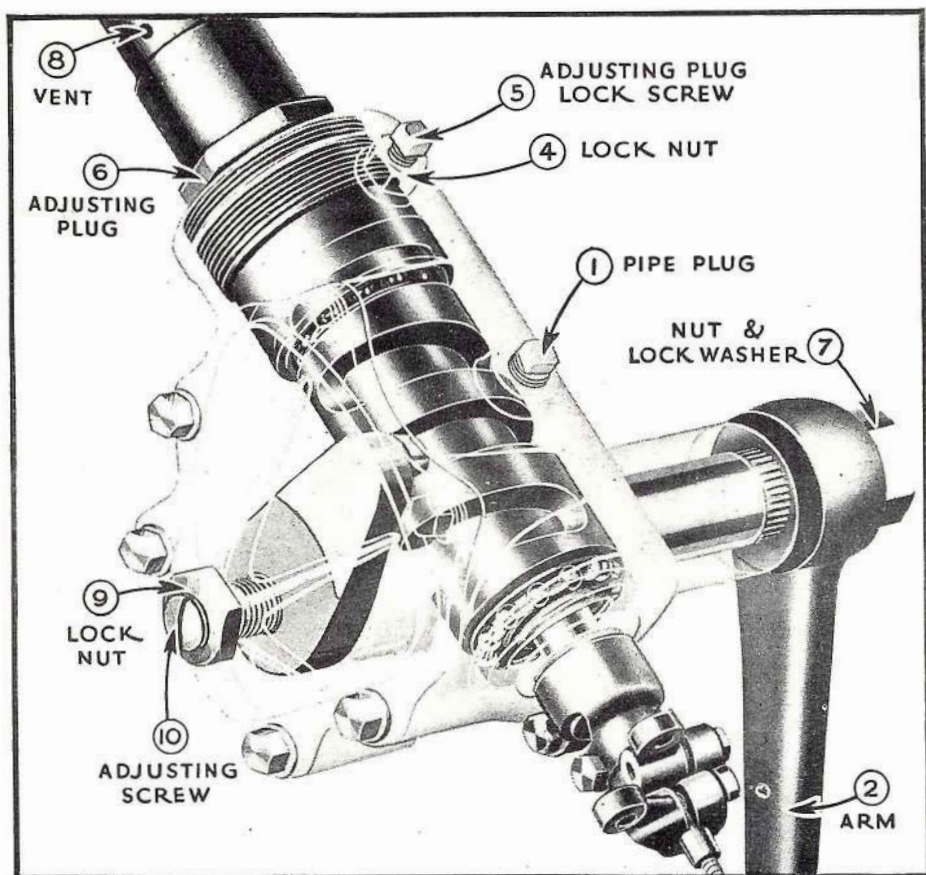
To shift from free wheeling to positive drive, it is important that the speeds of the driving and driven members be approximately the same. Step on the accelerator until the engine is brought up to a speed at which it will drive the car, and the shift can be made easily and quietly. With engine idling and car traveling at higher speeds the shift cannot be made without clashing gears, which may result in damage to the parts.

Use in this unit the same lubricants recommended for the transmission, keeping it filled to the level of oil filler port on left side.

STEERING GEAR

The steering gear is known as the cam and lever type. The Timken roller bearing mounted stud provides a rolling instead of sliding action in the groove, resulting in easy steering, and practically eliminating adjustment due to wear.

Should steering gear adjustments be required, consult your Service Station, but unless absolutely necessary the factory adjustment should not be disturbed.



Lubrication is the most important factor in maintaining the steering gear at its highest efficiency, and preventing wear and rattle.

At every 1000 mile intervals remove pipe plug (1) and fill housing completely with an approved lubricant. Fill slowly to allow air to escape through vent hole above adjusting nut (6). After this is done replace pipe plug (1).

To provide both lubricating and cushioning qualities requires a heavy grease of a fibrous nature.

UNIVERSAL JOINT

The ball-bearing universal joints require very little attention aside from lubrication, which is vitally important.

The correct lubricant is a fibrous non-fluid grease, especially developed for this purpose.

Do not over-grease as this will cause failure of dust covers. If cover is filled, or over-loaded, the grease will be thrown to one side, breaking down the cover and throwing driveshaft out of balance.

One to one and one-half ounce of grease is correct quantity for a joint when first assembled on car, and should enable it to run many thousand miles.

If dust cover is destroyed through over greasing, the joint must be dis-assembled and thoroughly cleaned before replacing cover.

The bolts attaching housing to flange must be kept tight to keep grease from being thrown out.

Inspect the joints at least twice a year and in regreasing do not use more than one-half to one ounce per joint if dust cover is in good condition.

FRONT AXLE

The front wheels should be kept in proper alignment to prevent hard steering and excessive tire wear. The proper caster angle of front axle should be maintained. Your Auburn dealer will have the necessary gauges, and you should have these features checked at intervals and adjustments made when needed.

REAR AXLE

This unit will require little attention other than to see that the lubricant level is maintained. Should adjustments be required call on your regular dealer's Service Station.

The lubricant level is checked by removing the pipe plug on differential housing. The lubricant must be kept to this level, and must be of correct quality. The level should be checked every three months, and oil added if necessary. See page 12.

Auburn dealers will be able to supply correct lubricants for your rear axle housing.

WHEEL BEARINGS

All wheel bearings should be removed for a thorough cleaning, greasing and readjusting twice a year, or oftener if the service is severe.

At least once a year they should be boiled in washing soda and water.

When thoroughly cleaned and dried, cover them with a good grade of clean cup grease, free from acids or solids.

Pack bearing cages with grease and reassemble. Be sure that lock washers, nuts and cotter pins are securely in place.

Wheel bearings must not be adjusted too tightly.

AUBURN STEELDRAULIC BRAKES

After the first 500 miles of service, you should have your Service Station check the brakes for correct clearance, also have brake adjustments made when necessary.

All mechanical joints throughout the hook-up should be oiled at intervals. The anti-rattle brackets on pull rods should be cleaned and greased whenever brakes are adjusted.

See that grease or oil does not come in contact with bearing surface of linings. Should this occur it is necessary to wash the grease from lining with clean gasoline, using a stiff wire brush to remove heavy particles, then blow with air to clean and dry. After thoroughly dried, go over the linings with a coarse file or coarse sandpaper.

The brake bands are equipped with special type low friction moulded linings which are not affected by atmospheric changes, will give long service and greatly resist the absorption of grease and oil.

When linings need replacement, due to wear or damage, use only the standard moulded type supplied by the Auburn Automobile Company. Owing to the need of special treatment and equipment in relining the bands.

we recommend our special exchange policy on Brake Bands, which your dealer can quote you.

The Steeldraulic brakes on all four wheels are also actuated by an emergency brake lever alongside shifting lever when conditions necessitate its use.

SHOCK ABSORBERS

The Lovejoy Hydraulic Shock Absorbers are double action rebound control, resisting spring action in both directions, and working against rebound of body or chassis. The resistance is caused by the piston pumping oil through a variable valve.

The oil used is a special low viscosity oil that will remain fluid at temperatures as low as -40° F. The same oil is used for winter and summer. This special oil, only, should be used, and it can be obtained from Auburn dealers, or from United Motors Service Stations. It is supplied in half gallon cans, which is more than required to fill a complete set.

Should the shock absorbers become noisy, consult your dealer, or any United Motors Service Station.

TOPS

Our Phaeton and Cabriolet Top Frames are an exclusive Auburn feature, and can easily and quickly be raised and lowered by one person.

TO LOWER PHAETON TOP

1. Unhook all snap fasteners; remove the top hold-down straps from the recess in side of body, placing them across the sides of rear seat toward inside of body.
2. At the top of the removable center body pillars will be found one acorn head screw which should be removed on both sides of car.
3. A similar screw is located at base of number three bow top folding hinges. Remove this screw on both sides of car.
4. Open both rear doors and lower glass.
5. Loosen the lock nuts and wing screws which fasten front top bow to windshield frame.
6. Lift the front section of top and number 2 bow, pushing directly back toward rear of car and folding it down.
7. Carefully remove all top material from between slat irons and bows to prevent chafing. Run the hold-down straps through footman loop on each side rail and fasten top securely in place.
8. Fold the top material in uniform shape up against rear side of bows and pull the boot on over the top, securing all snap fasteners.
9. Remove the center pillars by unscrewing the acorn screws at base of each pillar, store the pillars in the compartment from which top boot was removed.

TO RAISE PHAETON TOP

1. Replace the center pillars, being sure they are tightened properly.
2. Remove top boot and unfasten hold-down straps.
3. Standing in rear compartment with both doors open, raise number 3 bow forward and up evenly in the same motion.
4. Sit down in compartment and bring top forward to correct position on windshield frame. Replace and secure all wing nuts, lock nuts and acorn

head screws that were removed or loosened in lowering top.

5. Rehook all snap fasteners.

TO LOWER CABRIOLET TOP

1. Loosen the snap fasteners all the way around.
2. Remove the acorn head screw from No. 2 bow hinge on each side.
3. Break the joints of prop irons on each side.
4. First loosen the lock nuts, then the wing screws that hold top to windshield.
5. Break back the top and lay it back in position. Pull out all top material from between the slat irons. Fasten top in place with the hold-down straps.
6. Fit the boot over the folded top and strap it down.

TO RAISE CABRIOLET TOP

Remove the boot, loosen hold-down straps, and lift the top up.

Get inside, take hold of front header, lift up and draw top forward in place and close the joints.

Refasten top in place with acorn head screws and clamp it fast to windshield. Rehook all snap fasteners.

NOTE: Special care must be taken in folding tops down to see that no top material is left between any part of the slat iron, as the weight of the top will press on it and injure the fabric, and will eventually cut through it.

The top boot is fitted to each individual top and if above instructions are used when lowering top the boot should fit perfectly.

GENERAL CARE OF PHAETON AND CABRIOLET TOPS

Never fold the top back while damp. Dust or dirt on the top can be removed with a sponge and soapsuds, using pure linseed oil soap, rinsing off with clean water when done, and drying with a chamois. Do not allow suds to remain on the top or finish of the car.

If top is badly soiled with dirt or grease, it can be cleaned with art gum, French Chalk, or a weak Oakite Solution.

Do not use cleaning fluids which are similar in nature and of same action as gasoline. They would remove the dirt and grease, but would be injurious to the combining compound of the top material, causing separation of fabrics and destroying the protection of the top.

CHROMIUM PLATING

Our Chromium finish undergoes constant durability tests. It does not tarnish, but it should be kept clean and should have a careful washing and drying whenever car is washed.

The calcium chloride treatment used on streets and highways for melting snow and laying dust, is especially harmful to chromium. If your car is driven over roads which have undergone this treatment, you should carefully wash the chromium promptly afterward to prevent harmful chemical action.

MAINTAIN AIR PRESSURE IN TIRES

Check the air pressure in tires every week. Air pressure recommendations are always minimum and proper inflation must be maintained to prevent tire troubles and reduced mileage.

If a valve inside leaks, replace it with a new one.

After inflation, apply the small valve cap, screwing it down tightly with fingers. It protects the inside valve and serves as a double seat to prevent air leakage.

Recommended inflation for this model is 32 pounds, front and rear, and never to exceed 35 pounds.

DETECTING DIFFICULTIES

ELECTRIC CRANKING FAILS.

1. Loose Battery Connections. Battery terminals are subject to corrosion that usually takes place between battery post and terminal where it can not be seen. Therefore, when testing for a loose connection, remove terminal from post and thoroughly wipe off both post and terminal. Replace terminal by again clamping it tightly to the post. A sudden dimming of the lights when starter button is drawn out usually indicates a broken or loose battery terminal.

2. Depleted Battery. Dim lights with failure to crank usually indicate a run-down battery.

3. Starting motor brushes making faulty commutator contact.

4. Seized motor bearings or transmission gears engaged.

FAILURE OF ENGINE TO START

1. Switch not turned on.

2. No gasoline.

3. Water in gasoline, or poor grade of gasoline in cold weather.

4. Weak ignition.

5. Contact points in distributor head out of adjustment.

6. Open circuit in the ignition resistance unit. Resistance coil may be disconnected or broken.

7. Water on coil, distributor or spark plug terminals.

8. Spark plugs improperly adjusted. Clean and set to gap gauge mounted on distributor wrench.

9. Over-rich mixture, or what is commonly called "Carburetor Flooding" caused by continued use of choke. If there is good, clean gasoline in carburetor and a good spark at the plugs, engine will start if properly handled.

ENGINE STOPS

1. Lack of gasoline. A popping or choking usually precedes final stopping of engine when gasoline ceases to flow into carburetor.

2. Vents in main gasoline supply tank at rear may be clogged. (Vents are in upper end of gauge tube).

3. Disconnected spark plug terminals or other loose electrical connections between distributor head to coil or spark plugs.

4. Contact arm adjustment loose.
5. Engine out of oil, usually indicated by a knocking in the engine followed by an abrupt stop. If this occurs, do not attempt to use the electric starter or hand crank. Let the engine cool off. This usually is a serious matter, and the engine should have the attention of a good mechanic before attempting to put the car into service again. This condition may be the result of a sudden loss of water from the circulating system. Should this be the case DO NOT pour a fresh supply of water into radiator until engine has had ample time to cool off thoroughly.

REASONS FOR ENGINE MISSING

1. Short-circuited or dirty spark plug or plug out of adjustment.
2. Partially short-circuited or broken secondary terminals. These are the wires running from distributor head to spark plugs.
3. Poor contact between the various ends and clips of wires.
4. Loss of compression in one or more cylinders. Valves may be stuck in their guides. Valves may need regrinding or reseating. A valve spring may be broken or the adjustment of a tappet may have become loosened to a point where the tappet is either holding the valve open continually or not raising the valve off the seat at all. An inspection of all tappet clearances will show this at once.
5. Air leaks around inlet manifold, or float stuck in carburetor bowl.
6. Improper functioning of gasoline supply system.

ENGINE KNOCKS

1. Connecting rod bearings loose. Loose bearings give a light knock at high speed or when under a heavy pull. If this is the trouble, go to your dealer for assistance. Do not attempt to make major adjustments of this kind unless you are skilled in motor mechanics.
2. Loose main bearing. This can be distinguished from a loose connecting rod bearing by a heavy pounding under low engine speed or a heavy pull.
3. Too rich a mixture. See that dash carburetor adjustments are in "lean" position.
4. Carbon in cylinders, due to the use of improper oil. Have carbon cleaned out. Wash out present engine oil in reservoir and begin using an oil of better quality.
5. Worn valve tappet (light tapping sound). Tappet adjustments loose.

ENGINE RUNS BUT WILL NOT PULL ON GRADE, OR HEAVY ROADS

1. Loss of compression due to leaky valves. This is usually due to running with too rich a mixture, or too much oil may have caused valve seats to become gummed up.
2. Too rich a mixture through some trouble in the carburetor—flooding in all probability, due to grit or foreign matter getting under the float valve seat.

3. Float in carburetor sticking.
4. Late ignition.
5. Cold engine. Improper vaporization is usually the result of a combination of cold and a poor grade of gasoline. This applies only to extremely cold weather and should prevail only for a few minutes when first starting out when engine is thoroughly chilled.
6. Lack of water in radiator or proper amount of oil in the engine.
7. Improper flow of gasoline to carburetor, usually caused by some foreign matter getting into gasoline line, and made known by "spitting back" through the carburetor, especially when you open the throttle.

ENGINE OVERHEATS

Stop Engine immediately and investigate when this condition prevails. Some of the causes are as follows:

1. Low supply of water.
2. Carburetor choke improperly set.
3. Lack of engine oil.
4. Improper ignition timing.
5. Loose or broken fan belt.
6. Cylinders carbonized.

ORDERING PARTS

When in need of parts for your car, purchase them from Authorized Auburn Dealers, who carry in stock genuine Auburn parts. Should the dealer not have a needed part in stock, a wire from him to our Parts Department at Auburn, Indiana, will insure prompt shipment.

All orders, or correspondence regarding parts, should, without fail, include a careful description of what is wanted, with part number if possible, also model and serial number of car, to assist our Parts Department in filling the order correctly.

All orders must state plainly where and to whom parts are to be shipped, also whether shipment should be made by Parcel Post, Express, or Freight. In the absence of this information we shall use our own judgment.

RETURNING PARTS

Parts to be returned to factory for inspection must be returned through your regular dealer, who has on hand special forms, and can supply the information necessary for final disposition of such shipments. Serial number and mileage of car must be given, and if parts are claimed to be defective the alleged defect must be specified. No adjustment will be made on parts worn out in long service, or which have been broken or damaged by accident or abuse.

Parts must be carefully packed to prevent damage in shipment, and shipper's name and address must appear on outside of package.

Transportation charges must be prepaid.

STANDARD WARRANTY

Should the parts of any new automobile manufactured by us prove defective in workmanship or material, under normal use, within ninety days after the shipment thereof from our factory, and such defective part be returned to us at our factory in Auburn, Indiana, within said time, transportation charges paid, we will deliver to the purchaser, f.o.b. Auburn, Indiana, a new part in lieu of such returned part, providing the returned part be determined by us to have been defective in material and workmanship.

We make no warranty with respect to tires, rims, ignition apparatus, horns or other signaling devices, starting devices, generators, batteries, speedometers or other accessories, or with respect to used or second hand cars, nor are we responsible for any warranties or agreements made by our dealers. In no case will we pay any bills for repairs made outside our factory, nor shall the above agreements apply to any automobile which may be in any way altered or repaired outside our factory, nor to any defects developed by misuse, negligence or accident.

Except as above expressly provided, no warranty or guarantee of the quality of any automobile manufactured by us, or the parts thereof, or any parts, accessories or repairs, or of the other materials or workmanship therein, or of the suitability thereof for the purpose intended, or the freedom thereof from defects, latent or patent, is made or given, nor shall any such warranty or guaranty ever arise by implication of law or otherwise.

AUBURN AUTOMOBILE COMPANY

Auburn, Indiana, U.S.A.

RECOMMENDED AUBURN ACCESSORIES

AUBURN PILOT-RAY ROAD LIGHT—Mounted between and below the headlamps, this light automatically turns with the wheels and lights turns *before* they are made. A practical and beautiful accessory.

SPOT LIGHT—(Inner Control)—Mounted to the front pillar post, controlled from the driver's seat, throws a powerful beam in any direction.

TIRE MIRROR—(Lock-On Type)—For mounting on spare tires carried in fender wells.

AUTO WATCH OR CLOCK—Rear view mirror inset type, for header board mounting.

TRUNKS—Auburn designed trunks are standard. Suitcase and hatbox equipment to fit these trunks is available.

WINTERFRONT—Specially designed and built into the radiator shell. Automatically controlled by thermostat, remaining closed until fluid in radiator warms to approximately 140 degrees.

CHROMIUM POLISH—Polish made to Auburn Specifications will maintain the original lustre of the bright work.

METAL TIRE COVERS—Painted to match the body.

MISCELLANEOUS—Numerous smaller items are also available, such as Onyx shifting lever heads, dust cloths, etc.

See your Auburn dealer for catalog of
Factory Recommended Accessories.

