BOLT AND NUT TIGHTENING SPECIFICATIONS—Continued

CHASSIS SPECIFICATIONS

	Application	Size	Desired Wrench Torque in Lb. Ft.
1.	Carburetor to Manifold Nuts—L-40	5/16	11–14
2.	Generator to Bracket Bolt and Nuts	5/16	14–18
3.	Propeller Shaft Flange Bolts	5/16	18–22
4.	Support Arm Brackets to Frame Bolt and Nuts	5/16	11–14
5.	Carburetor to Manifold Nuts—F and G-40	3/8	11–14
6.	Body Bolts—F-40	3/8	25–30
7.	Differential to Axle Housing Bolts	3/8	30–35
8.	Fuel Pump to Block Bolts	3/8	30–35
9.	Knuckle Support Clamp Bolt and Nut	3/8	22–26
10.	Rear Brake to Axle Housing Nuts	3/8	25–30
11.	Body Bolts F and G and L-40	7/16	25–30
12.	Clutch and Brake Pedal Shank Nut	3/8	18–20
13.	Front Brake to Steering Knuckle Bolt and Nuts	7/16	35–40
14.	Front Motor Mounting to Frame Bolts	7/16	25–30 or 30–35
15.	Lower Control Arm Shaft to Frame Bolt and Nuts	7/16	55–60
16.	Starter to Housing Bolts	7/16	30–35
17.	Front Shock to Frame Bolt and Nuts	1/2	65–70
18.	Radiator Center Mounting Nut	1/2	25–30
19.	Rear Motor Mounting to Clutch Housing Bolts	1/2	45–50
20.	Rear Shock Link to Arm Nut	1/2	18–22
21.	Rear Spring Clamp Bolt—Upper and Lower	1/2	30–35
22.	Steering Wheel Nut	1/2	15–20 and stake
23.	Wheel Nuts—Right and Left Hand	1/2	67–70
24.	Rear Shock to Axle Bolt and Nuts	9/16	70–75
25.	Rear Support Arm Pivot Bolt and Nuts	9/16	100–110
26.	Rear Axle Clips	5/8	70–80
27.	Track Bar Nuts	5/8	135–140
28.	Pitman Arm Nut	3/4	60–70
29.	Spark Plugs	14 mm.	28–35
30.	Idler Arm Bushing	Formed	100 Min.
31.	Knuckle Support Bushing in Support	Formed	145–155
32.	Upper Pivot Bushing in Front Shock	Formed	85–95
33.	Front Wheel Spindle Nuts	3/4	25–30
34.	Bolts Used in Conjunction With Spring Nuts	All	4–6

NOTE: Do not tighten flat sheet metal nuts sufficiently to flatten them. Only tighten enough to partly flatten.

LUBRICATION

Very often one of the most important service operations, "lubrication," is neglected, with consequent reduced car life.

Suitable provision has been made in the design of Oldsmobile cars whereby lubricant can be supplied to the various moving parts, and the information contained in this chapter shows how and when best to apply the lubricant to the various units of the automobile.

Lubricants are much cheaper than repair bills and should be applied regularly if the maximum useful service is to be expected from the car. To this end, therefore, it is important that the proper grades of lubricants be used in accordance with a definite schedule.

ENGINE LUBRICATION

All of the vital working parts of the engine proper are lubricated by the oil in the crankcase which is constantly being circulated through the engine by the oiling system. As the power and speed of engines have increased, a greater need has developed for better lubrication that will positively protect the hundreds of tight-fitting and fast-moving engine parts.

Engine Oil Recommendations

Today, engine lubricants, in place of being referred to as either heavy, medium or light grade, are classified according to number. The number system, known as the S.A.E. Viscosity Number System, classifies lubricants in terms of viscosity or fluidity. (S.A.E. spelled out is "Society of Automotive Engineers.") Lubricants of low number designation, such as S.A.E. 10, flow more readily than lubricants designated as S.A.E. 20 or 30. The S.A.E. number refers to viscosity alone. These numbers in no way refer to the quality or other characteristics of lubricants.

Because of the close relationship of engine lubricants to easy starting at all temperatures, minimum engine wear and economy, it is important that the recommendations made in this chapter on lubrication and on the lubrication chart included with this manual be followed.

The oil refiners or marketers supplying the lubricant are responsible for the quality of their product. Their reputation is the car owner's best assurance of receiving quality products from them.

Break-In Oils—"Break-In" Oil or compounds are entirely unnecessary. They should not be used under any circumstances unless the supplier can furnish satisfactory proof that the compound contains no harmful ingredients.

Lubrication First 1,000 Miles—During the first 1,000 miles, 20-W oil should be used in the crankcase both summer and winter.

At the end of the first 1,000 miles, drain the crankcase—when hot—and refill to the proper level.

Lubrication After 1,000 Miles—After the first 1,000 miles, the lubrication chart in connection with this chapter should be followed.

Fall—Winter—Spring

During the colder months of the year, an oil that will permit easy starting, at the lowest atmospheric temperature which is likely to be encountered, should be used.

The same consideration that guides one in determining the strength of anti-

freezing solution for protection throughout the winter must be used as a guide in selecting crankcase oil. When the crankcase is drained and refilled, oil should be selected, not on the basis of the existing atmospheric temperature at the time of change, but on the anticipated minimum temperature for the period during which the oil is to be used. Unless the crankcase oil is selected on the basis of the viscosity or fluidity at the anticipated minimum temperature, difficulty in starting will be experienced at each sudden drop in temperature.

The viscosity grade of crankcase oil will, therefore, depend upon the climatic conditions under which the car is operated. The grades best suited for use in the car at the various temperatures are shown in the following table.

If you anticipate that the minimum atmospheric temperature will be	Use the Grade Indicated
Not lower than 32° F	20-W or SAE 20
As low as plus 10° F	20-W
As low as minus 10° F	10-W
Below minus 10° F	10-W plus 10% kerosene

10-W oil, plus 10% kerosene, is recommended only for those territories where the temperature falls below minus (—) 10° F. for protracted periods.

Summer

Use SAE 20 or 20-W oil for summer; for temperatures above 90° use SAE 30.

Maintaining Oil Level:

The oil gauge rod, Fig. 1, is marked "Full" and "Add Oil."

The oil level should be maintained between these two lines, neither going above the "Full" line nor under the "Add Oil" line. Check the oil level frequently and

Fig. 1. Oil Level Stick

add oil when necessary. It is good economy to let the oil level approach the "Add Oil" mark before having your oil changed. Always be sure the crankcase is full before starting out on a long drive.

The oil reservoir section of the oil pan has been made smaller which reduces the oil capacity of the "F," "G" and "L" engines. The oil level, however, remains the same as formerly.

Crankcase capacity—"F" and "G"—5 quarts; "L"—6 quarts.

When to Change Crankcase Oil

Improved oils, changed driving conditions, and improvements in engines, such as the crankcase ventilating system, have greatly lengthened the life of good lubricating oils. However, to insure continuation of best performance, low maintenance cost and long engine life, it is necessary to change the crankcase oil whenever it becomes contaminated with harmful foreign materials. Under normal driving conditions draining the crankcase and replacing with fresh oil every 1,000 miles should be satisfactory. Under adverse driving conditions it may become necessary to drain the crankcase oil more frequently.

Driving over dusty roads or through dust storms introduces abrasive material

into the engine. Air cleaners decrease amount of dust that may enter crankcase; however, if oil becomes contaminated, it should be drained promptly to prevent harmful engine wear. The frequency of draining depends upon severity of dust conditions and no definite draining periods can be recommended.

Short runs in cold weather, such as city driving, do not permit thorough warming up of engine and water may accumulate in crankcase from condensation of moisture produced by burning of fuel. Water in crankcase may freeze and interfere with proper oil circulation. It also promotes rusting and may cause clogging of oil screens and passages. Under normal driving conditions this water is removed by crankcase ventilator, but if water accumulates, it should be removed by draining crankcase as frequently as may be required.

During winter months light or low viscosity oils are required to obtain easy starting. Therefore, at beginning of winter season, crankcase should be drained and refilled with oil of proper viscosity for winter use. On continuous hard driving, these light oils may thicken and cause starting trouble. More frequent oil changes may therefore be required during winter months, and a drainage period of 1,000 miles for cars subjected to high speed driving conditions may be desirable, but, under very severe conditions, more frequent draining may be required to prevent starting troubles due to thickened oil.

It is always best to drain crankcase after engine has reached normal operating temperature. The benefit of draining is, to a large extent, lost if crankcase is drained when engine is cold, as some of the suspended foreign material will cling to the sides of oil pan and will not drain out readily with slower moving oil.

Crankcase Ventilator

The crankcase in all models is provided with a ventilating system to prevent harmful dilution of the engine oil by water and fuel under normal driving conditions. This system utilizes the crankshaft with its counter-weights as a blower to force the vapors consisting of fuel and water from the crankcase.

CHASSIS LUBRICATION

The lubrication chart enclosed with this manual indicates the points requiring lubrication, the recommended intervals and the kind of lubricant to be used. It should be realized that oily surfaces quickly collect dirt, which, if reaching the various wearing parts, will cause premature wear. It is advisable, therefore, to keep all points of lubrication as free from dirt as possible.

In addition to the regular chassis lubrication every 1,000 miles, the following units should be lubricated at specified intervals as shown below and on the lubrication chart.

Transmission—Remove the filler cap in the transmission case and fill to the level of the opening with an oil conforming in viscosity with SAE No. 80 or SAE No. 90. Check the level of oil frequently. Capacity—2 pounds (Six and Eight cylinder).

Rear Axle Lubrication—The rear axle of all models is equipped with a HYPOID gear and pinion. It must be lubricated with SAE 90 Passenger Car Duty HYPOID GEAR LUBRICANT.

The rear axle should be drained, flushed and refilled with 2½ pounds of fresh HYPOID lubricant in the spring and fall of the year. In addition to the seasonal changes, the rear axle should be drained every 10,000 miles if the car is used in service where high mileage is obtained under high speed driving conditions. Un-

der normal circumstances, no lubricant need be added between draining periods, but lubricant level should be checked every 1,000 miles as a safety measure.

In localities where the temperature does not fall below minus 10° F., SAE 90 Passenger Car Duty HYPOID LUBRICANT is recommended for use both in winter and summer. SAE 80 Passenger Car Duty HYPOID is recommended for use during the winter months in localities where the temperature drops below —10° F.

It is extremely important that only Passenger Car Duty HYPOID lubricants having the properties and characteristics necessary for the satisfactory lubrication of hypoid gears be used in the rear axle of the car.

The rear wheel bearings are of the shielded type, filled with lubricant when assembled, and need no further lubrication.

Steering Gear—Remove plug in housing and replenish, if necessary, with steering gear lubricant each 5,000 miles. Do not drain, as this unit is filled with an all-season lubricant at the factory.

Universal Joint Lubrication—The needle bearings at the transmission and the rear axle end of the propeller shafts are prepacked with lubricant at the time of their manufacture; therefore, no attention need be given these bearings so far as lubrication is concerned.

Front Wheel Bearing Lubrication—The front wheel bearings should be lubricated every 5,000 miles. Approximately one tablespoonful of wheel bearing, high melting point grease should be spread throughout the ball bearings when they are reinstalled. An excessive amount of grease should not be used, due to the possibilities of the lubricant getting into the brake drums.

GENERAL BODY LUBRICATION

1. Door lock—The door locks are lubricated when installed at the factory and usually need no attention for the first two years except at the lock bolt oil reservoir felt which should be dampened with machine oil every two months or so. Door Ease may be applied to the lock bolt or striker plate instead of the oil. Both should not be used at the same time.
2. Door hinges—Use engine oil and apply with pressure oil can.
3. Door lock cylinders — Apply a small quantity of powdered graphite.
4. Door check link—Oil at pivot joint and dry graphite on rubber bumper.
5. Door wedge plate and dovetail bumper assembly — An application of Door Ease grease stick is the cleanest and most efficient method of lubricating these parts. Clean off all old grease before applying grease stick. Give the parts a light coating only, as a heavy coating is wasteful and collects grime that may rub off on clothing.
6. Hood hinges—Use light engine oil.
7. Shroud and radiator shell hood lacing —Clean excess oil or grease off the lacing with gasoline and apply Door Ease grease stick.

SPEEDOMETER CABLE LUBRICATION

Speedometer cable should be lubricated at least twice a year or every 5,000 miles.

When lubricating the cables, make sure that all old grease is removed from cable and casing. Apply a thin coating of graphite grease (AC Speedometer Cable Grease No. 846261) to the lower two-thirds of the cable only. This will properly lubricate the upper one-third of the casing, giving an even coating of lubricant the full length of the flexible shaft, without danger of excess grease working up into the speedometer head.

BODY

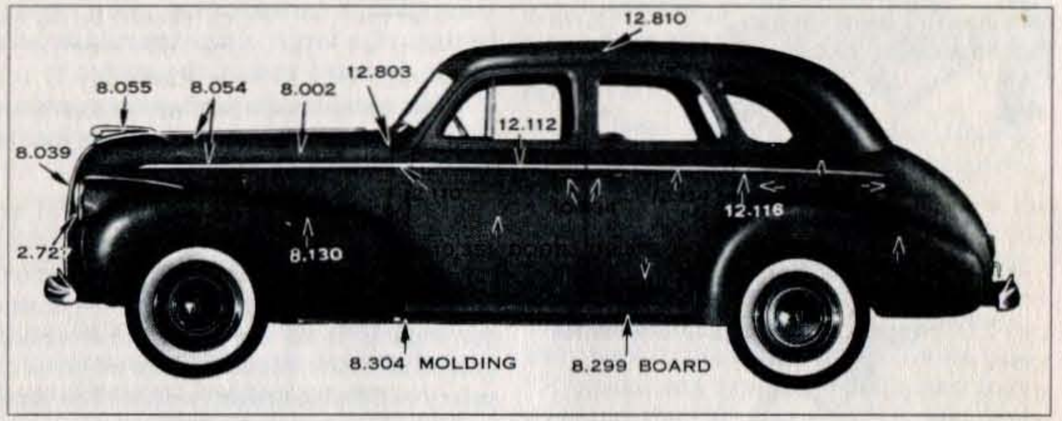

Fig. 2. Body Panels
(Numbers Indicate Parts Group Numbers)

The 1940 Oldsmobile Unisteel bodies including the seat frames (except "L" front seat frame) and shelf boards, are fabricated entirely of steel.

The "F" and "L" model bodies are completely new in size, design details, and appearance. The bodies are more streamlined. The construction of all 1940 bodies assures maximum safety to passengers, and ready accessibility to all parts for servicing. All exterior exposed panels are bonderized and completely insulated on the inside with insulating materials, which, in combination with special ribbing of the flat panels, make the bodies silent and less effected by changes of temperature.

Wide steel main sills provide a strong foundation for the remainder of the body. A metal stamping having deep stamped ribs and further strengthened with metal cross sills spot welded on the underside, form the floor panel. To this panel is electrically welded, the inner and outer cowl, the box shaped center posts, and other body panels and braces. The turret top panel is reinforced from beneath with channel section steel bows that prevent the collapse of the top in case the car is turned upside down. (See "Headlining", page 32, and also page 33.)

All joints are sealed with filler and compound to exclude dust, water and air drafts.

All inner door panel openings on the "F" and "L" are covered with sheet metal covers securely fastened and sealed with compound in order to prevent any moisture reaching the interior trim panels.

The check link of all "F" and "G" body front doors includes a "hold open" feature whereby the door is held open mechanically. (See Fig. 3.)

A "U" shaped drip molding welded to the turret top stamping, extends the length of the body and over the doors and windows, preventing any water drip-