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Gas Mileage Found to Depend on Driver

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This article by Mr. Watts seems timely and is being passed on to you for your information.

How many miles do you average on a gallon of gasoline? That has been a major question with car owners almost since the beginning of motoring.

Recently, a group of automotive engineers from out Boston way, who are members of the New England section of the Society of Automotive Engineers, decided to conduct an experiment on gasoline mileage.

After their tests they were in pretty general agreement that the motorist himself and not any individual automobile is the best subject on which to practice gasoline economy.

The New Englanders had agreed that two identical cars—as much alike as mass production methods can make them—will vary greatly in gasoline consumption. One may give 18 miles a gallon and the other as little as 10 to 12. But why? The engineers decided to find out.

One of three low-priced cars was selected for the test. It had about 5,000 miles on the speedometer. To prevent tampering on the part of any of the contestants the engine and hood were sealed.

On the car was mounted a gasoline "flow meter," a device for measuring the flow of gasoline into the carburetor of 100ths of a gallon.

A 5-MILE COURSE

The next step was to lay out a five-mile course over roads that were both level and hilly. Four "stop" signs were posted at various points on the route.

The final step was to prepare a set of rules that would require all contestants to drive the car the same —as nearly as possible. There was to be no coasting. Each person was to drive the same car over the course, under similar conditions, the same weather, the same temperature conditions. An observer rode with each driver.

The results were almost fantastic. Among the 22 auto engineers who participated in the run the gasoline mileages varied from 11.4 to 19.8 miles per gallon.

The experiment led to only one conclusion. There apparently are some drivers who have a pickpocket's touch to their toes. Others are either "leadfooted" or always have the itch to get some-place in a hurry in their automobile.

So—if your gasoline mileage is poor, maybe YOU had better investigate your driving.

Gas Economy

There have been reports of gas mileage complaints which actually should not be classified as gas mileage complaints, but driving habit or driving condition complaints instead.

Test reports show that cars in normal satisfactory operating condition will give good gas economy at 20, 30 or 40 miles per hour, yet the economy drops off sharply between 40 and 50 miles per hour. In fact, in some cases the gas economy is as much as almost 2 miles per gallon better at 40 m.p.h. than at 50 m.p.h. The gas economy drops off approximately another 2 miles per gallon when driving at 60 m.p.h. and another 2 miles per gallon at 70 m.p.h. Although the gas consumption will vary somewhat between different cars, this indicates a trend that gas consumption increases sharply at high speeds.

By the same token, the gas economy drops off sharply due to frequent stops and starts and especially sudden acceleration.

Before any operations are performed to correct a gas mileage complaint condition, it should be definitely determined whether it is a bona fide gas mileage complaint, or if it is caused by the driving habits or specific driving conditions of this particular car and owner.

A gasometer (gas mileage tester) test should be performed with the owner driving in his usual manner over the same course he usually travels. Then the car should be tested on the open highway at moderate speeds to determine if it is the specific driving or traffic condition that causes excessive gas consumption. Then the serviceman should drive the car to determine if it is the owner's driving habits which may cause excessive gas consumption.

If it has been established that the car does not give standard or average gas mileage, an engine diagnosis should be performed to determine the cause of excessive gas consumption. Remember good compression and good ignition are just as important to good performance and gas economy as is carburetion. Be sure to test the compression and ignition system. Be sure the ignition timing is properly set and that the centrifugal and vacuum advance mechanisms are operating satisfactorily. Perform a combustion analysis to determine if the carburetor or fuel system is at fault.

If the cause of the gas mileage complaint has been isolated to the carburetor, the carburetor may be reconditioned as described in the Service Manual, paying particular attention to the following items:

(1) Inspect and adjust the float level. Be sure the float is not leaking. (This can be determined by shaking the float and listening for gasoline splashing around inside the float.)

(2) Carefully inspect the float needle valve and seat. Install a new valve and seat if worn, or if ridges or marks are noticed on the valve or seat.

(3) Carefully inspect the metering rods and main metering jets. Install new metering rods if they are bent or worn. Install new jets if they are corroded or worn.

(4) Accurately adjust the metering rods.

(5) Be sure the climatic control is operating properly and is properly adjusted to "index."

(6) Be sure the air cleaner is cleaned and reoiled. Be sure the air cleaner restriction is not excessive.

(7) Retest the carburetor performance using a combustion tester.

(8) In most cases the gas economy may be further improved by installing *one size* lean metering rods, without sacrificing performance.

(9) On an extremely bad gas mileage complaint when it is absolutely necessary to obtain a still better gas mileage to satisfy the owner, *two sizes* lean metering rods may be installed, *provided, the car is not driven at sustained high speeds. Two sizes* lean metering rods may effect the engine performance and should be used *only* in "extreme cases."

All this may be done to improve gas mileage, but remember, good compression, good ignition, good carburetion and good driving habits are needed to obtain good gas mileage.

A test was run recently at the proving ground to determine gas mileage at various air temperatures, and the results are as follows:

Test 1 25° F / Test 2 91° F — At 20 m.p.h., an increase of 5.15 miles per gallon was obtained at 91° F.

Test 1 25° F / Test 2 91° F — At 40 m.p.h., an increase of 3.30 miles per gallon was obtained at 91° F.

Test 1 25° F / Test 2 91° F — at 70 m.p.h., an increase of 2.30 miles per gallon was obtained at 91° F.

It is important to maintain warm under bonnet temperature during winter driving. Whenever possible, use a high degree thermostat and radiator winter front cover.

Water Leaks

Mayfair

Several reports have been received of water leaks at the front of the roof on the Mayfairs.

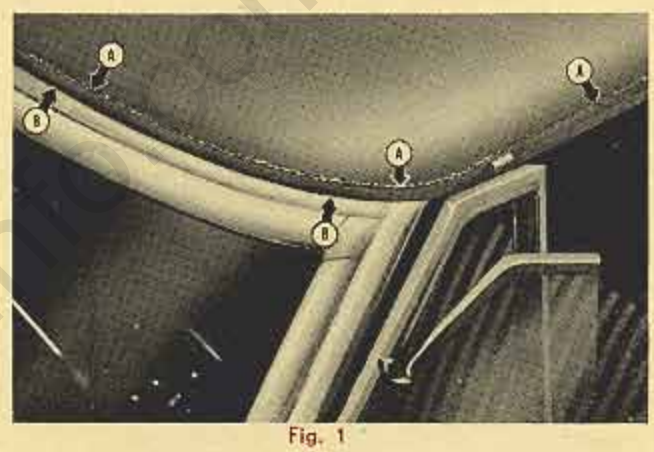

Fig. 1

The leaks are generally located at the seal where the roof panel joins the upper side of the drip moulding (gutter). See "A," Fig. 1. Another leak may be located between the drip moulding and the upper windshield header above the chrome mouldings. See "B," Fig. 1. Also where the roof panel, drip moulding and windshield header is welded together and sealed as indicated by the arrows. See "C," Fig. 2.

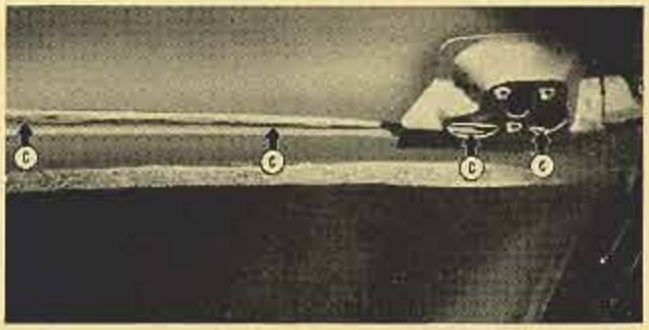

Fig. 2

The sealer that is used in production is available to the field as follows:

Part No.		
436274	Sealer	Quarts
436276	Sealer	6 oz. tubes

Note: The sealer can be thinned with naptha so it can be used in a pressure gun or a pump type oil can.

The procedure for sealing these leaks is as follows:

1. Remove the windshield upper finishing mouldings, rear view mirror and the two sun visors; loosen the front of the headlining and fasten it back out of the way.

2. Seal the edges of the roof panel and drip moulding where they are welded to the windshield header. Be sure to seal all the way across even back of the sun visor brackets. See "C," Fig. 2.

3. Remove any loose seal and reseal any necessary places, pin holes, etc., on the outside where the roof panel and drip moulding join as indicated by arrows "A," Fig. 1.

4. To properly seal between the drip moulding and the windshield header, the chrome moulding on the drip moulding will have to be removed. Remove the three clips located, one in the center above the windshield, and one on each side just above the vent windows. Pry the chrome mouldings up from the lower side and remove them from the drip moulding.

Note: The mouldings will probably be damaged beyond using again, so it is suggested a few of the following be carried in stock:

Part No. 435368 Roof rain gutter moulding cover (Front Right)

Part No. 437159 Roof rain gutter moulding cover (Front Left)

Part No. 435714 Clips

5. Work some sealer well into the opening between the drip moulding and the windshield header all the way across. This can be accomplished by forcing in the sealer "thinned with naptha" with a gun or work the sealer in by hand just as it comes from the can or tube. See "B," Fig. 1.

6. Water test thoroughly before reinstalling the headlining, sun visors, rear view mirrors, and finishing mouldings. Be sure to line up the holes in the headlining for the sun visor, with the holes in the sun visor brackets that are welded to the header. Also line up the rear view mirror bracket holes in the finishing moulding before tightening the moulding.

Radiator Core Circulation

A few reports have been received of engine overheating at fairly low mileage which may occur at high speeds but not at low speeds.

This condition is generally caused by a loss of water after driving at high speeds which in turn is due to the radiator core tubes being plugged at the upper ends.

In two cases it was found that a few metal chips from the cylinder block and cylinder head were lodged in the upper ends of the tubes; in another instance sand and an oil-like substance was found in the ends of the tubes.

Manufacturing has improved the method of cleaning the cylinder block and cylinder heads in production which should eliminate this condition.

When an overheating complaint exists under these conditions it is suggested that a bottle of Packard Sovereign Engine and Radiator Cleaner be used, following the directions on the label, and then reverse flush the engine and radiator core separately.

Radiator Reverse Flushing

Reverse flushing is just what the name implies; flushing in a direction opposite that of the normal flow of water through the cooling system. Reverse-flushing is employed to get behind the deposit and force it out.

First, remove the thermostat, as cold water will cause it to close and will result in building up pressure, which might cause damage. Then remove the upper and lower radiator hose, and replace the radiator cap if it has been removed.

Attach a lead-away hose to the top of the radiator. Attach a piece of new hose to the lower opening of the radiator and insert the flushing gun in this hose.

Connect the water hose of the flushing gun to a water outlet and the air hose to an air line. Turn on the water and, when the radiator is full, turn on the air in short blasts. Allow the radiator to fill between the blasts of air. Continue this flushing until the water from the lead-away hose runs clear. You have now reverse-flushed the radiator and are ready to do the same thing with the cylinder block and cylinder head.

Cylinder Block Reverse Flushing

Attach the lead-away hose to the water pump inlet and a length of new hose to the water outlet at the top of the engine. Insert the flushing gun in the new hose. (Water outlet.)

Turn on the water and, when the jacket is full, turn on the air in short blasts. Continue this sequence until the water from the lead-away hose runs clear.

If the car has a hot water heater, it should be flushed out separately.

Another important item with reference to overheating is to make sure the lower radiator hose is not soft or kinked, thus restricting the water circulation. The hose must be tight and sealed properly so it will not leak or allow air to be drawn in. If air is drawn in at the bottom hose, the water will be thrown out of the cooling system through the radiator cap or overflow pipe in a short time.

Ultramatic Diagnosis

Reports have been received from owners, where they justifiably felt they had paid for work that wasn't necessary, because it had been improperly diagnosed.

This can be very trying and costly to the owner. A typical case was reported where the owner had complained of the car hesitating in high range. This complaint had gone on for about 6 months, the carburetor had been adjusted several times, and had been taken off and cleaned once. The motor had been tuned and the valves ground.

The trouble was finally traced to the reverse piston in the Ultramatic drive where the seals were out of the grooves in the piston. The oil pressure was leaking past the seals of the reverse piston and out through the vent, thus robbing the pressure to the high range clutch.

If a pressure test, road test and stall torque test had been made, the trouble could have been diagnosed quickly. The high range clutch was badly burned, as the result, from driving the car under this condition.

Ultramatic complaints should be diagnosed as follows:

Use "PACKARD ULTRAMATIC DRIVE DIAGNOSIS AND TEST" form.

1. Get the complete story from the owner.
2. Check the fluid level, notice condition of the fluid, and check for leaks.

AFTER STARTING THE ENGINE

3. Check engine speed in high range (warm) "slow idle."
4. Check high range, low range, reverse engagement and disengagement. Check creeping in all ranges.
5. Stall torque test, high range and low range.

ROAD TEST

(With the owner, if necessary, to get to the trouble he is complaining of.)

Check:

6. High range acceleration in converter.
7. Direct drive clutch engagement at light throttle.
8. Direct drive clutch disengagement on deceleration.
9. Direct drive clutch disengagement on quick stops.
10. Direct drive clutch engagement at half throttle.
11. Kick-down.
12. Shift from low to high range at 25 m.p.h.
13. Shift from high to low range at part throttle at 15 m.p.h.
14. Operation in high range.
15. Operation in low range.
16. Operation in reverse range.

PRESSURE TEST

Test:	*Lbs. p.s.i.*	*Lbs. p.s.i.*
17. Front pump regulated	At 600 r.p.m.	Maximum
18. High range clutch	Closed throttle	Wide open
19. Front pump relief boost	At 600 r.p.m.	In reverse
20. Governor pressure	At 15 m.p.h.	At 56 m.p.h.
21. Direct drive clutch	Light throttle	Wide open
22. Converter inlet	In converter	In direct
23. Throttle valve	Closed throttle—	Kick-down
	Wide open	
24. Low range	Closed throttle	Wide open
25. Reverse	At 1500 r.p.m.	

26. Check all selector, accelerator, and throttle linkage for proper adjustment.

In a few instances a trouble may show up only when cold; in that case, the owner should leave his car so the tests can be made under these conditions.

After these tests and adjustments are made, the trouble encountered by the owner should be easily and properly diagnosed.

Front Shock Adsorber

(Delco)

A few cases have been reported, on cars equipped with Delco shock absorbers, where the shoulder of the piston rod on the shock absorber has forced its way through the hole in the grommet retainer.

A small washer part number 443053 is now available to correct this condition. The washer can be installed as follows: Remove the two nuts from the bottom of the shock absorber and the one at the top. This allows the shock absorber and retainer, which is still attached, to drop through the opening in the lower support arm. Place the washer against the shoulder of the piston rod as illustrated. It may also be necessary to install a new grommet retainer.

This condition has been corrected in production.

Hydraulic Window Kit Change

The article "Glass Breakage, Hydraulic Windows" in the Service Counselor Vol. 25, No. 8, August 1951, states "Put a dab of Lubriplate on the felt end of the bracket where it contacts the regulator frame."

It is found that the window operation is smoother without the felt. Please remove the felts before installing the anti-rattle bracket but be sure to put a dab of Lubriplate on the end of the bracket.

This change has been made in production.

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