

Studebaker SERVICE BULLETIN

SEPTEMBER

NO. 208



1948

DOOR OPENING REAR WEATHERSEAL CONVERTIBLE MODELS

Please record on page 18L of your 1947 Shop Manual.

A new weatherseal for use at the rear of the door opening of 1948 Convertible Models is now available for service. This seal incorporates the use of a lip at the top section to reduce the amount of space between the top of the door weatherseal and the lower section of the weatherseal on the quarter window frame.

When the new rear weatherstrip is used it is necessary to remove the old weatherstrip and fastening clip, Part No. 287756, and install the new weatherstrip with a screw and finish washer.

Parts required to make the change are as follows:

No. Required	Part No.	Part Name
1	289208	Door Rear Weatherstrip, Right
1	289209	Door Rear Weatherstrip, Left
1	633-#6-8U	Screw
1	373-#6U	Washer

Parts are available from your nearest parts depot.

CHECKING CYLINDER DISTORTION

Please record on page 91 of your 1947 Shop Manual.

The following article is reprinted from Motor Service Magazine, May, 1948. The two illustrations are also through the courtesy of Motor Service. The article is principally a summary of a paper delivered by Mr. M. E. Estey of The Perfect Circle Corporation, at a meeting last March of the Society of Automotive Engineers. It discusses and illustrates the importance of correct torquing of cylinder heads. After reading the article, please refer to Service Bulletin No. 187, page 1, where you will find Studebaker recommendations for correct tightening of cylinder head cap screws.

Just how much cylinders are distorted by uneven tightening of cylinder head nuts or by pulling them up too tight has been a much discussed question. The correct answer is "plenty" and it took a special gage and a lot

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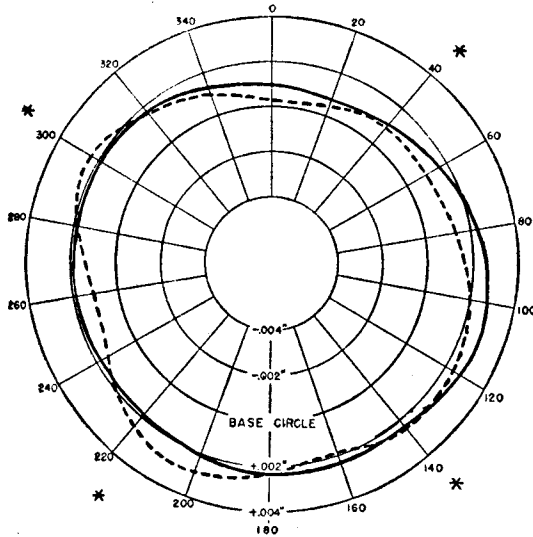
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of research by Melvin E. Estey of the Perfect Circle Corporation to show how much.

Certainly the studies of Mr. Estey should set at rest for all time the arguments of a small group of mechanics who claimed they didn't need a torque wrench but could pull up a series of nuts to the same tightness with a conventional wrench. Even if they could make all the cylinder head nuts equally tight, they could still be wrong, as the results of Mr. Estey's study show that it is not only important that the nuts be pulled up equally tight, but they must also be pulled up to the torque specified by the car factory. If too tight, cylinder distortion and its attendant evils will result.

Mr. Estey, who presented the results of his research at the Society of Automotive Engineers National Passenger Car and Production meeting early in March pointed out that with the present trend toward higher speed and efficiency in automotive engines, pistons, rings, and cylinders must maintain a maximum degree of conformability in the assembled engine in order to cut down losses and get maximum power. In other words, those parts have to work together without altering their shape, in order to keep friction and other losses at a minimum.

With cylinders that are machined truly round and straight without wavy walls and with correctly fitted pistons and rings, this maximum degree of conformability is obtained. That is, the piston assemblies will work correctly in the cylinders. But such perfect conditions are



SHOWING THE SHAPE OF A CYLINDER 1 IN. BELOW THE TOP. THE SOLID LINE SHOWS THE SHAPE WITH CYLINDER HEAD IN PLACE WHILE THE DOTTED LINE IS WITHOUT THE CYLINDER HEAD. CAP SCREWS ARE LOCATED AT POINTS MARKED*

seldom found in actual service, and they are easily changed as the result of operating conditions and careless servicing.

Under the head of servicing comes, of course, the tightening of the cylinder head nuts and by means of the contour gage it was determined that with 55 ft./lbs. of torque on the cylinder head cap screws, cylinder radius at a level 1/2 in. from the top of the cylinder increased a maximum of .0007 in. Raising the torque to 85 ft./lbs. increased the radius to .001 in. On this particular engine the radius

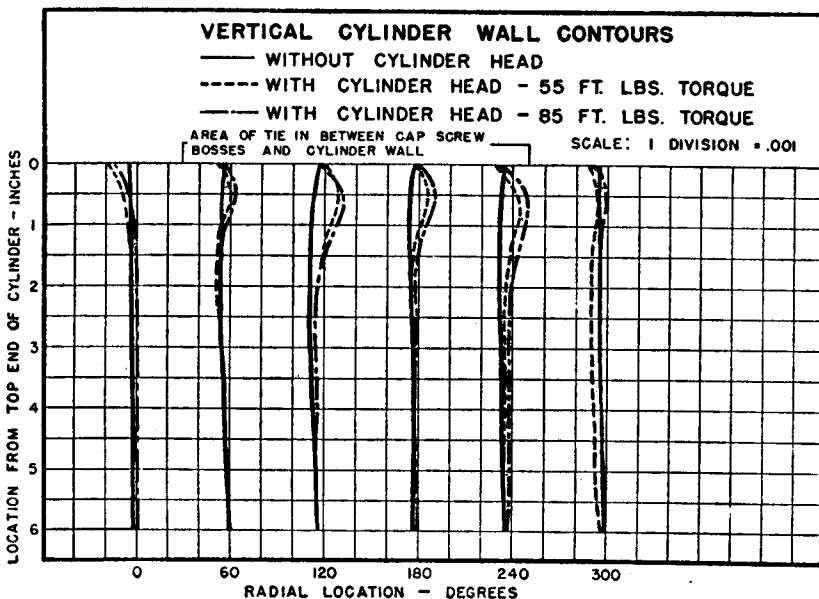
increased about the same amount all around the cylinder and consequently the diameter would have increased .002 in. Obviously a mechanic, no matter how skilled at getting equal tension on cap screws and studs, could not tell whether there was too much or too little tension.

Of course, the familiar dial gage or inside mike will measure cylinder diameter at any point in a cylinder. But it does not determine whether the center line of the cylinder is straight. However, with the contour gage devised by Mr. Estey the shape of the cylinder is determined. It accomplishes this by measuring the radius of the cylinder rather than the diameter. To do this, it is, of course, necessary to establish a center line through the cylinder. From measurements taken up and down the length of the cylinder it is possible to determine the shape. By cutting disks based on the measurements and then assembling the disks in correct relation to each other, it is possible to build a form conforming to the shape of the cylinder. The contour gage is for research and experimental work only and not for service work, Mr. Estey emphasizes.

One of the interesting studies made with the contour gage was to discover the cause of the appearance of brown patches on the cylinder wall. This condition has generally been noted in engines consuming a lot of oil. Measurements were taken without the cylinder head in place, and it was found that the cylinders were comparatively round. However, with the head in place, it was found that at the brown area cylinder radius had increased .0006 in. to .0007 in. Above the brown areas the radius had decreased approximately the same amount. It was therefore apparent that the difficulty was the result in cylinder distortion, and further checking showed that as cylinder head cap screw torque was increased the distortion increased. The condition became still worse as the temperature of the block was raised.

From the foregoing and other checks made with the contour gage, it is apparent that piston rings have a rough road to travel when the tightening of cylinder head nuts is improperly performed.

There are many things the service man can do to keep cylinder distortion to a minimum. The most important is to use a torque wrench and pull up the cylinder head nuts to equal tension and also the specific tension following the tightening sequence recommended by the car manufacturer.* When reconditioning cylinders, it is also important that only light cuts be taken and that not too much metal be removed.



GRAPHIC ILLUSTRATION OF WHAT HAPPENS WHEN CAPS SCREWS ARE TOO TIGHT. NOTE THAT THE AMOUNT OF DISTORTION VARIES AROUND THE BLOCK

If the cylinder walls are too thin, the block will be weakened and distortion will result.

Of equal importance is to keep the water jackets clean. If rust and scale clog the water jacket, uneven cooling will result. And that means cylinder distortion.

* Italics ours. See Service Bulletin No. 187, page 1, for Studebaker procedure.

ACID COOLING SYSTEM

Studebaker Cooling System Rust Inhibitor should be carried in the radiator of every one of your customer's cars when the alkalinity of the coolant drops below 7.3 on the Ph scale, as described in Service Bulletin No. 199, page 3. As stated there, with the aid of Ph-paper (secured from any chemical supply house or through your druggist), it takes less than a minute to dip the sensitized paper in the coolant and notice the color indication of the wet end of the paper. If the paper is red to blue, the coolant is on the acid side; if it is from blue to green, the coolant is alkaline. Making this test in the owner's presence is convincing proof of the condition of his car's cooling system.

An acid solution--regardless of what inhibitors, antifreezes, or other chemicals may be included in the cooling system at the time of the test--is harmful to all the metal parts with which the coolant comes in contact.

An acid cooling system should immediately be protected with *Studebaker Cooling System Rust Inhibitor*. It is best, of course, to flush such a system and refill it before installing the inhibitor. Drained permanent-type antifreeze may be stored and reused (if clean). Installation of *Studebaker Rust Inhibitor* will maintain its alkalinity. The inhibiting properties of the permanent type antifreezes do not generally last into the second season of use and it is always safest in cases where these antifreezes are used again to add rust inhibitor.

Cooling systems which are in need of cleaning can usually be detected when checking the coolant level. This is an opportunity to sell your customer a good radiator cleansing using *Studebaker Cooling System Gleaner* which acts as a solvent to remove rust, scale, oil, and grease deposits *safely*, without injury to radiator, engine, or hose.

If the radiator is in need of added coolant, a small leak may be noticed at the hoses or evidence of seepage at the radiator core, upper tank seams, or elsewhere on the outside of the system. Such small leaks can be satisfactorily stopped with an application of *Studebaker*

Radiator Seal which seeks out the small leaks and seals them but does not clog water passages or interfere in any way with the action of any type of accepted antifreeze or rust inhibitor.

Although these supplies are inexpensive, their combined gross sales volume will be found well worth while.

PUT THE PRESSURE ON CORRECT TIRE PRESSURES

According to recent surveys conducted by The Rubber Manufacturers Association "improper tire inflation has resulted in an untold number of premature tire failures and a waste of millions of dollars of car owners' money."

While carelessness on the part of owners and service station attendants is the cause of much of the improper tire inflation found, a large part of it is the result of misinformation and the use of inaccurate air pressure gages.

Studebaker dealers are in an excellent position to impress upon Studebaker owners the importance of correct tire inflation and also to see to it that every car which enters the service department is not permitted to leave until tire inflation has been checked and corrected if necessary.

Customers taking delivery of new cars and those whose cars are in for service should be told clearly that only the factory recommended inflation pressures will give them maximum tire life. The acceleration of wear and danger of blow-outs resulting from under-inflation and the waste of rubber and danger of skids on wet pavement caused by over-inflation should be clearly explained to owners whose tires show signs of either of these improper inflation habits. Underinflation is indicated by tires whose shoulders are abnormally worn, while overinflation causes abnormal wear of the center treads.

What You Can Do To Protect Your Customers' Tires

1. Use only accurate tire gages. Keep a master gage on hand and check all your air pressure gages regularly.
2. Check tire pressures only with tires cool. Do not let out air ("bleed tires") from hot tires which give high pressure readings.
3. Check tire pressures before adding air. This may uncover a slow leak if one tire shows consistently greater loss of pressure compared to the rest of the tires on the car.
4. Inflate only to factory recommended pressures. On Studebaker models these pressures are:

TIRE
SIZE

CHAMPION (6G-7G)

5.50x15 30 lbs. front; 28 lbs. rear
 5.50x16 30 lbs. front; 28 lbs. rear
 6.00x15 28 lbs. front; 26 lbs. rear

COMMANDER (14A-15A)

6.50x15 26 lbs. front; 22 lbs. rear

5. Inflate the spare tire to correct pressure.
6. Replace valve caps; they protect the valve and help seal in the air. If valve cap is missing, notify the owner and sell him a replacement cap.
7. Check tread of all tires for signs of uneven wear and explain to the owner what such uneven wear indicates. See the chart mailed last January entitled "Shop Information Covering Maintenance Procedures Affecting Tire Life."
8. Remove foreign objects from the tread. This may prevent a failure of the tire many miles later.

**SPRING LEAF (ROTO)
BEARINGS AVAILABLE**

Please record on page 162 on your 1947 Shop Manual.

Special spring leaf (Roto) bearings are now available from branch parts depots for installation as an accessory on 6G, 7G, 14A, 15A, and prior production models.

Spring leaf (Roto) bearings are to be sold only as an accessory to those customers who desire a freedom from the usual servicing requirements of their standard chassis spring. It should be made clear to customers that *they do not need* to purchase spring leaf (Roto) bearings in order to obtain normal use and service from their standard chassis springs.

These bearings provide a special bearing surface between the spring leaves, resulting in peak resiliency and even keel. They permit smooth interleaf movement, thus minimizing any front end harshness, spring squeaks, or bumps and thumps caused by pavement expansion strips, holes, and ruts.

The use of these bearings creates a gap between the leaves which act as a lubrication reservoir. When the springs are lubricated the reservoir is filled.

Installation

UNCOVERED SPRINGS Spring leaf bearings are quickly installed on cars with uncovered springs by spreading the leaves with a spreader sufficiently to insert a set of bearings about one inch from the tip of each end of the three

longest leaves. Some customers require or desire the bearings only in rear springs, while others want them in the front spring or springs, as well. This is a matter of personal choice on the part of the owner as to the degree of deviation from his present riding characteristics he desires.

On all Studebaker Planar-equipped cars no less than two bearings should be installed at each end of the front spring.

COVERED REAR SPRINGS Installation of Roto bearings in covered rear springs requires removal of the rear spring, cover, and canvas liner. Remove the rebound clips and disassemble the spring discarding the wood liners.

Reassemble the spring and insert the bearings between the four longest leaves. Reassemble the spring and cover assembly, using a new canvas liner if necessary. Lubricate the spring, and reinstall on the car.

COVERED FRONT SPRINGS Covered front springs of the Planar type should be entirely removed from the car, the cover carefully removed, the canvas removed, and the wood flexoliners discarded. The spring should be thoroughly cleaned, spring leaf bearings inserted, spring reassembled, lubricated, and the cover carefully replaced. Use a new canvas cover, if necessary, when reassembling the spring and covers. After such an operation, front wheel alignment and camber should be checked and corrected if necessary, and another front end alignment check made after 1000 to 1500 miles of operation with the spring leaf bearings.

**NUMBER OF BEARINGS PER SPRING RECOMMENDED
FOR STUDEBAKER PASSENGER CARS**

<u>Model</u>	<u>Front Spring</u>	<u>Two Rear Springs</u>	<u>Total</u>
6G and 7G Champions	14 (Planar)	12	26
14A and 15A Commanders	16 (Planar)	12	28
Older Models			
With Spring Covers	Up to 16	Up to 16	Up to 32
Without Spring Covers			
Light Cars (Champion)	Up to 14	Up to 16	Up to 30
Heavy Cars (Comm. & Pres.)	Up to 16	Up to 20	Up to 36

ORDER PART NO. 514163 ROTO SPRING BEARING,
LIST PRICE 35¢ EA.

Order Data

Spring leaf bearings made by the Roto Bearing Company are sold through your parts depot at the following dealer net prices in lots of 100 or more under Part No. 514163:

Lots of 100 21½¢ each Lots of 600 15½¢ each
 Lots of 300 16½¢ each Lots of 1,000 14¢ each

The bearings are prepacked with seating paste and furnished with clearance gage and instructions.

In addition to the bearings, the following spreader tools may be desired by dealer service departments:

Part No. AC-150 Spring Spreader Tool - 6", 12", 14" or 24" (specify lengths desired) Set of four, any size combination, plus wood cutter -- Dealer Net \$15.00.

Special graphite spring lubricant should be used when reassembling Planar springs or re-packing rear springs after each installation of spring leaf bearings. Parts depots carry the correct specification Studebaker spring packing grease as follows:

Part No. S-639 Spring Packing Lubricant - 25 lb. Container. Dealer net \$3.90

CRANKSHAFT KITS FOR CHAMPION AND COMMANDER TYPE ENGINES

Please record this article on page 91 of 1947 Shop Manual.

In response to inquiries regarding the installation of replacement crankshaft in Champion-type engines 4G-7G inclusive, M5, M15A, 2R5, 2R10 and 2R15 trucks, and Commander-type engines 3A-15A inclusive, K5, K10, K15, M16, 2R16, and 2R17 trucks we are printing below the kits and their component parts available from your nearest parts depot. These are the same kits listed on page 14 of the 1948 Chassis Parts Catalog.

Champion-type Engines

The kit for Champion-type engines is Part No. 515281, Crankshaft Kit, and consists of the following:

Qty.	Part No.	Part Name
1	521525	Crankshaft Assembly
1	521544	Crankshaft Rear Bearing Oil Seal (Brummer)
*2	522144	Crankshaft Rear Bearing Cap Oil Seal (Neoprene)
1	515179	Screw
1	515199	Washer
1	40X408	Washer

*These seals should be discarded if crankshaft is being used in serials prior to Champion Car Serial No. G-284200 and Truck Engine Serial Nos. 1M-178383 (M5) and 2M-12091 (M15A).

Commander-type Engines

The crankshaft kit for Commander-type engines is Part No. 523683 and consists of the

following:

Qty.	Part No.	Part Name
1	523137	Crankshaft Assembly
1	523134	Crankshaft Rear Bearing Oil Seal (Brummer)
*2	522144	Crankshaft Rear Bearing Cap Oil Seal (Neoprene)

*These seals should be discarded if crankshaft is being used in passenger car engines prior to 15A Engine Serial No. H-269723 or truck engines prior to 2R Series.

TRANSMISSION AND DIFFERENTIAL GEAR LUBRICANT DESIGNATIONS

Please record on page 140 of your 1947 Shop Manual.

The official designations for automotive transmission and differential lubricants endorsed by the Lubrication Committee of the American Petroleum Institute are used by a great many lubricating oil marketing companies.

So that you may be familiar with the nomenclature as officially announced by the Institute, we are printing the designations below:

REGULAR-TYPE GEAR LUBRICANTS This term designates gear lubricants generally suitable for use in automotive transmissions* and in most spiral-bevel and worm-gear differentials.

WORM-TYPE GEAR LUBRICANT This term designates gear lubricant generally suitable for use in truck-type worm-gear rear axles under very severe conditions of service.

MILD-TYPE EP (Extreme Pressure) GEAR LUBRICANT This term designates gear lubricants having load-carrying properties suitable for many automotive transmissions* and spiral-bevel differentials under severe conditions of speed and load.

MULTI-PURPOSE-TYPE GEAR LUBRICANT This term designates gear lubricants having load-carrying properties suitable for hypoid-gear and other types of differentials and many transmissions*.

*NOTE.--Transmissions of non-automatic-type require SAE 80,90,140, or 250 viscosity-grade gear lubricants. Automatic or semi-automatic transmissions, fluid couplings, torque converters, and tractor hydraulic systems may require special lubricants.

Gear lubricant specifications on Studebaker lubrication charts are, of course, to be followed in the servicing of all Studebaker vehicles.

INSTALLING FUEL-VACUUM PUMPS IN 7G CHAMPION MODELS

Please record on page 131 of your 1947 Shop Manual.

On 7G Champion engines an oil gallery passes just below the opening for the fuel pump. It is possible that in some cases the thick, laminated arm of the fuel-vacuum pump will interfere with the oil gallery and will thus be limited in its action.

After removal of the standard fuel pump insert the new fuel pump to see whether the arm interferes with the oil gallery. If such interference is encountered, grind or file a rounded notch in the fuel pump arm at the point of interference. This groove must not be deeper than 3/64".

If the arm still interferes, it will be necessary to remove the same metal from the oil gallery by filing or grinding it after the oil pan has been removed. If it is necessary to file or grind, caution must be used to prevent chips from getting into the engine.

GENERATOR COUPLING WANTED

Any dealer having for sale a Part No. 36769 generator coupling for 1920 to 1927 Big Six and Special Six models is asked to correspond with Mr. T. T. Penrose, Jr., of The Penrose Garage, 151 Saint Paul Street, Burlington, Va.

TRUCK SERVICE ITEMS

BRAKE MASTER CYLINDER-TO-FRONT BRAKE PIPE CLIP - 1949 SERIES TRUCKS

Below is a reprint of Truck Service Letter No. 81 which may now be discarded from your files.

A clip to support the brake master cylinder-to-front brake pipe was added in production beginning with Truck Serial Nos. 2R5-001514 and 2R10-00500.

The purpose of the clip is to reduce possibility of breakage of the pipe and loss of brake fluid. We recommend that this new clip be installed on all trucks before Serial Nos. 2R5-001514 and 2R10-00500.

The clip, Part No. 195567, will be supplied at no cost and is easily installed. In placing your order with your regular parts depot, please mention this Service Bulletin article and list the truck serial numbers for which the clips are being ordered.

To install the clip, first remove the lower steering housing-to-frame bolt. Place the clip over the brake pipe. Insert lower steering

housing-to-frame bolt through the clip and reinstall the bolt, lock washer and nut. Tighten nut securely.

NOTE.--Export dealers concerned have been notified.

SERVICE EQUIPMENT

SUPER-SOAK PARTS WASHER

Mailed with this issue of the Service Bulletin is a catalogue insert sheet describing and illustrating the Super-Soak metal parts washers.

These washers permit the parts to soak in a cold liquid metal cleaning solution on a specially designed tray. After the soaking period the tray is "swished" up and down by an electric motor, thus washing off the dirt and grease loosened by the soaking action. The motor is stopped and the clean parts removed from the tray. The mechanic need never get his hands in the chemical cleaning solution.

Model A has a cleaning tray 18 X 28 inches and can clean up to 140 lbs. of material at a time. Model B has a 18 X 40-inch tray and handles up to 300 lbs. of material.

The cleaners are manufactured and sold by The Super-Soak Company, 1441 South 65th Street, West Allis 14, Wisconsin.

NOTE.--Export dealers may order from The Studebaker Export Corporation.

ELECTRIC IMPACT TOOL

Mailed with this issue of the Service Bulletin is a folder describing and illustrating the new Ingersoll-Rand 4U Electric Impact Tool.

This tool is so designed that its power is converted into rotary impacts, which exert a more powerful turning effect than the constant action of a conventional electric driver of comparable size.

The Model 4U is powered by a "universal" type electric motor taking standard voltage of 110- or 220-volt either AC or DC (25-40-50-60 cycle). The motor is immediately reversible by turning a control which forms the motor end of the tool.

Nearly any type of work calling for running on or removing nuts, screws, etc., up to 3/8" can be performed with this tool without damage to the motor. Even when totally stalled at the spindle, the motor continues to run and will not overload or overheat.

The Ingersoll-Rand 4U Impact Tool is available through local jobbers.

NOTE.--Export dealers may order from The Studebaker Export Corporation.

PRICES CONTAINED HEREIN SUBJECT TO CHANGE WITHOUT NOTICE