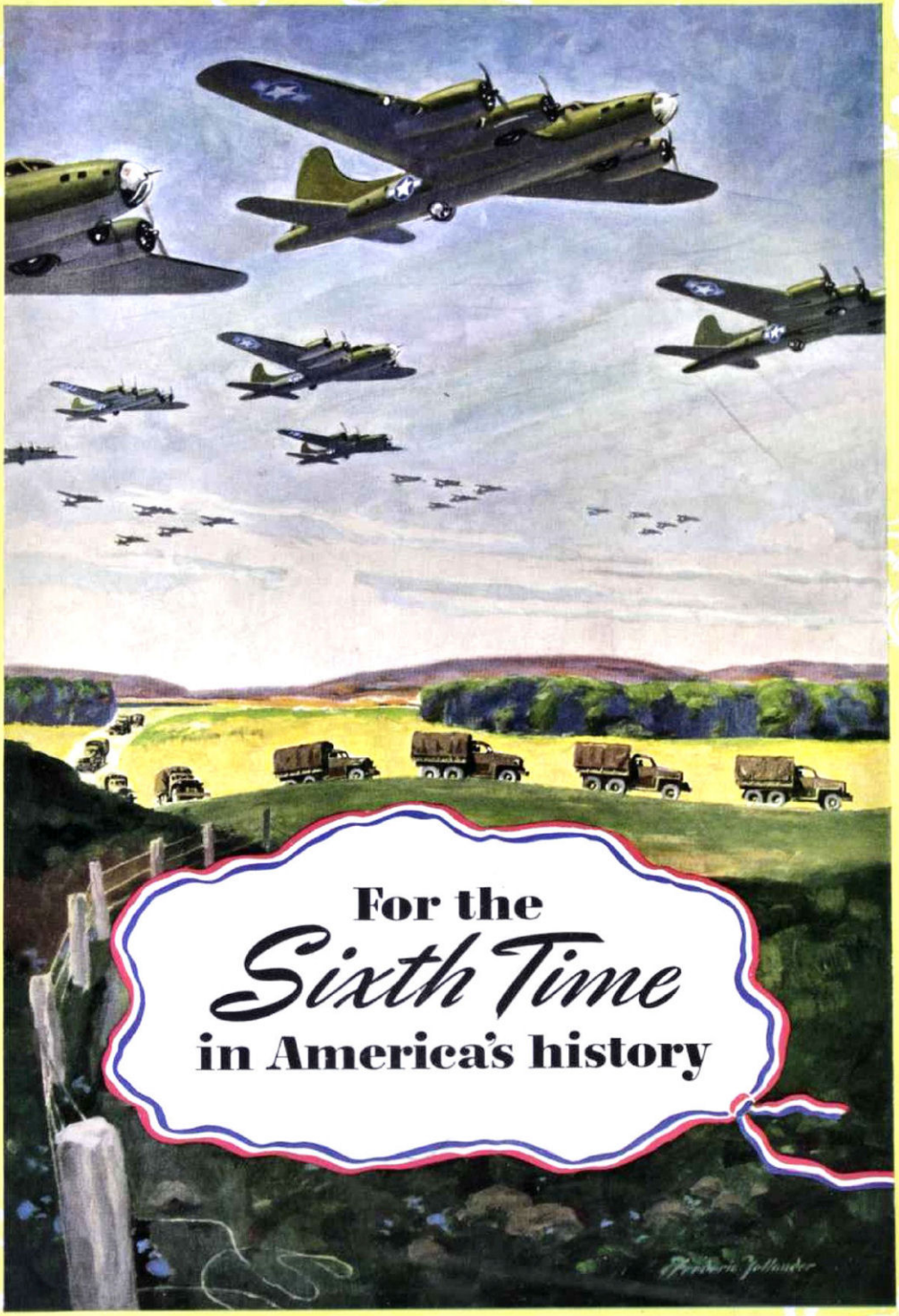
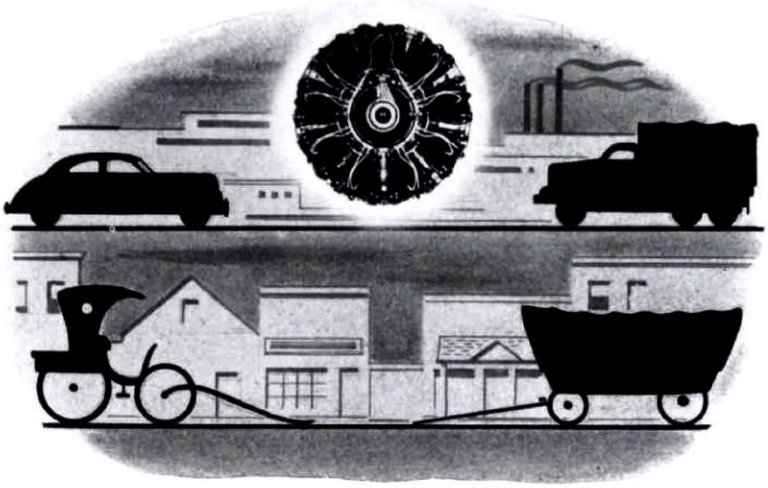

For the
Sixth Time
in America's history

This booklet has been produced in conformity with Government regulations for saving paper.

For the

SIXTH TIME IN AMERICA'S HISTORY



INTRODUCTION

For the sixth time in America's history it has been Studebaker's privilege to serve our government during a military emergency. On the first occasion, in 1857, the Studebaker brothers had just five years of manufacturing experience to offer. But the 100 wagons they built and delivered three months ahead of schedule carried supplies for Federal troops into an almost trackless West.

Then came the Civil War, the Indian campaigns, the war with Spain, World War I, and now World War II. Today as yesterday, military achievement is linked inextricably with transportation.

In this war, air power joins ground and naval power in shaping the pattern of victory. Studebaker-built Wright Cyclone engines and heavy-duty military trucks are contributing outstandingly to the might of the United Nations in the skies and on land. With a background of 92 years of skilled craftsmanship and modern manufacturing methods, Studebaker feels both pride and a deep sense of obligation for the range and importance of its war assignments.

This booklet pictures some of these activities.

STUDEBAKER

THE STUDEBAKER CORPORATION, SOUTH BEND, INDIANA

FLYING FORTRESS

Day after day America has read of the exploits of Flying Fortress crews.

A Fortress named *Banshee* was credited with dropping the first American bomb over Germany. *Suzy-Q* became an epic name in the Pacific war. She fought nearly a year without letting any of her crew become injured. Once she came in low over Rabaul and bombed the docks. The ack-ack was bursting all around, but she left her targets burning. Then her crew spotted a Jap military camp and tossed out some little four-pound incendiaries. More flames! A Jap battery opened up on them from the top of a nearby hill. The *Suzy-Q* came in low and finished off the battery. Heading for home she strafed another enemy base at Gasmata. All of this took a lot of gas—too much for the return trip to home base. So she came to earth in a pock-patched stretch of bushland on the northern tip of Australia. After four almost foodless days for her crew she took off in a short clearing less than half the length of her normal runway. By opening up the throttle and keeping her brakes set until she quivered like a race horse at the post her pilot sent her shooting into the air like a rubber band. And there are thousands of other famous names such as *Flying Sweet Pea, Jack the Ripper, Alexander the Swoose, Phyllis, Dry Martini, Thumper, Thunderbird, Memphis Belle* and *Johnny Reb*. The symbol of the American eagle has acquired new wings in this war.

The Fortress was first among four-engined bombers. In its first stage of development there was no idea of building a bomber at all, but of producing a fast, single-engined passenger and mail-carrying monoplane. Such a plane took to the skies in 1931 and set remarkable performance records on the Salt Lake City-Cheyenne air route. Step by step from that plane various larger models were developed by engineers of the Boeing Aircraft Company until a real "battleship of the skies" first took flight in 1934.

When war came to America our aircraft companies had developed many fine planes. But there had not been opportunity to manufacture them in large quantities. It was at this point that the automobile industry was able to offer an important contribution. For many years automobiles had been built on a quantity basis and with a very high degree of precision.

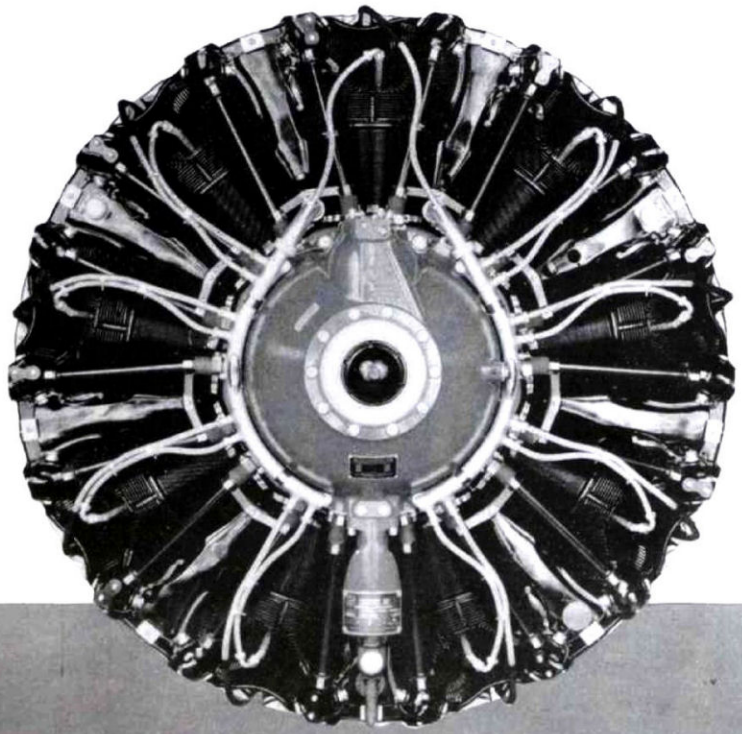
One important Studebaker resource was the large group of veteran workers in the company's employ. Prior to the war the average worker, from sweeper to executive, had been working with the company more than 13 years.

Studebaker's first assignment was to build a 14-cylinder aircraft engine, and for this purpose three new plants were constructed in South Bend, Fort Wayne, and Chicago—localities where minimum shifting of population would be necessary in order to obtain sufficient labor. Then, as the war strategy suddenly changed to place major emphasis upon production of the Fortress, Studebaker was asked to suspend plans for making a 14-cylinder engine and to build instead the 9-cylinder Wright Cyclone engine for the now famous B-17.

It takes a lot of power to operate a Flying Fortress—power of the kind that lifted the *Suzy-Q* into the sky from a small clearing in the Australian bushland. This power comes from four of these Cyclone engines; tens of thousands of them have been built by Studebaker.

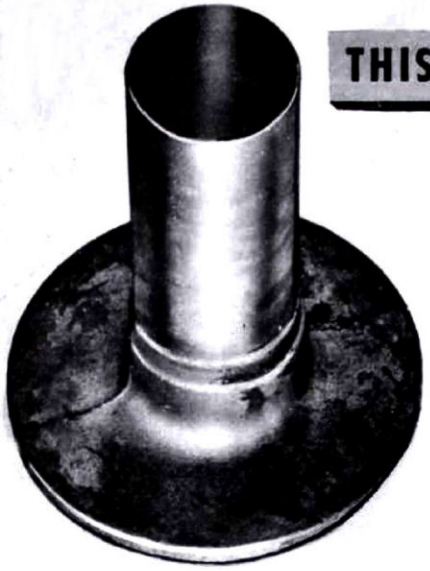
The power of these engines is combined with amazingly light weight. Each engine is about five feet in diameter, weighs 1,315 pounds and contains about 8,000 highly finished pieces. It develops more than 1,200 horsepower, or in other words has a weight ratio of 1.05 pounds per horsepower as compared with six to ten pounds per horsepower for the average automobile engine. Another interesting comparison is that it develops about 139 horsepower in each cylinder, which is more than the total output of most automobile engines. Since four of these engines are installed in each Fortress it is driven by 4,800 horsepower, or roughly the combined power of sixty average automobiles. This is the power which drives 25 tons through the air at speeds above 300 miles per hour and at altitudes five to six miles above the earth.

All parts of the Cyclone engine must be manufactured with extreme precision and uniformity. In fact, any part of any one engine must fit interchangeably into any other engine, for quick repairs are important. Often under actual service conditions damaged engines serve as stocks of repair parts for others. To make the 8,000 pieces in each engine requires more than 80,000 separate machining operations and 50,000 different inspections.

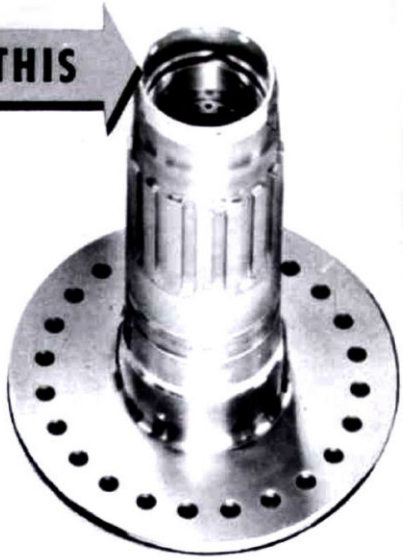


Awarded to Aviation Division

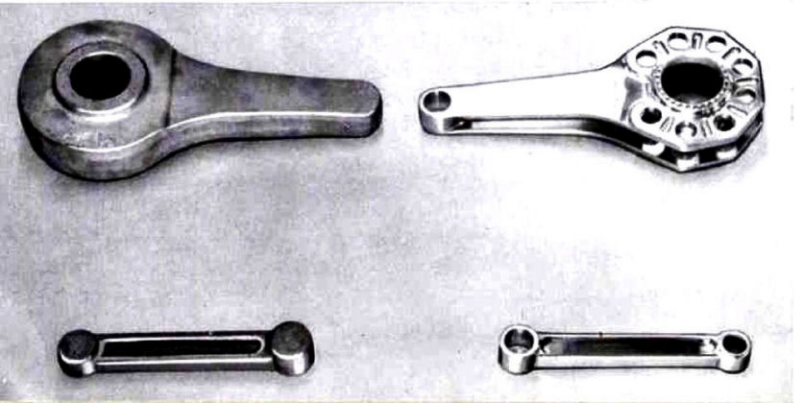
THIS + 73 OPERATIONS = THIS



At the left is the rough steel forging for a Studebaker-built Cyclone engine propeller shaft. At the right is the finished shaft ready to move on to the engine assembly line. The 73 machining operations have not only transformed a crude chunk of metal into a highly finished piece of machinery, but have reduced the weight from 88 pounds to 29!

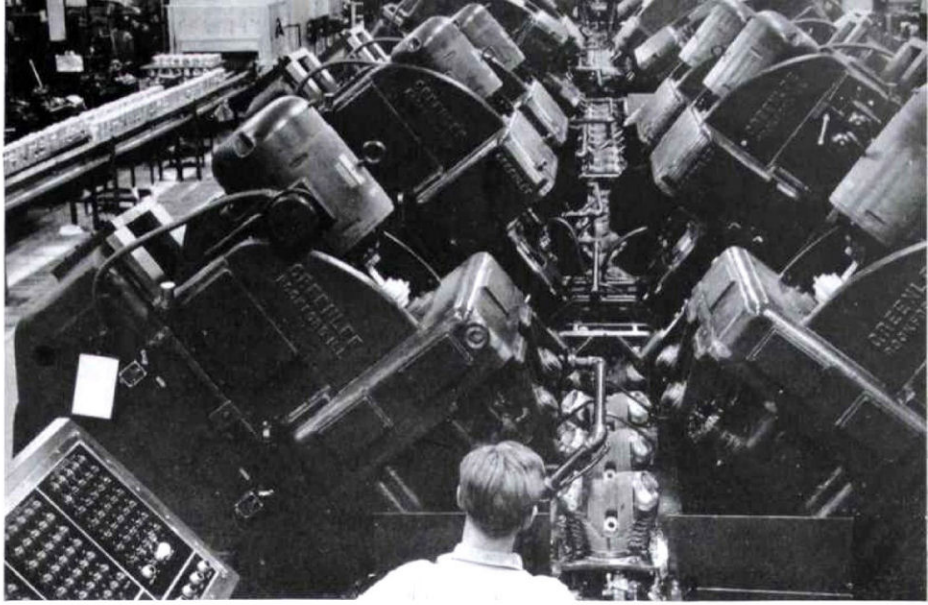


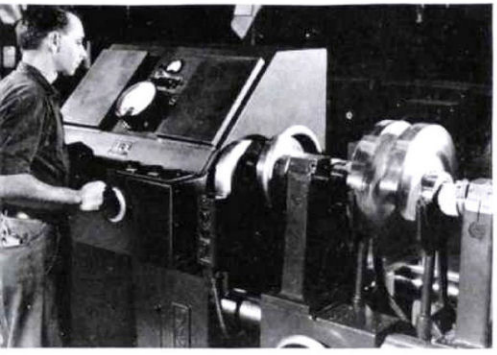
The crankshaft is one of the most critical parts of the engine. Surfaces must be flawless. Any roughness may lead to concentration of stress and possible breakdown. It takes 342 operations to produce the finished crankshaft and counterweights.



At top of photo (left) are shown the forging and completed master rod. Just below them, "before" and "after" views of the articulated rod. These rods perform the same function as do connecting rods in automobile engines.

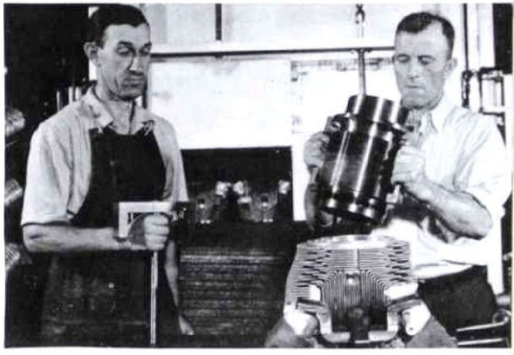
This huge machine, designed by Greenlee Bros., Studebaker, and the Wright Aeronautical Corporation, handles 135 cylinder heads at one time. It performs 168 different operations, including drilling, reaming, tapping, and milling. Cylinder heads are automatically moved and located. The machine is more than 175 feet long and has 50 operating stations. This Greenlee is just one of the many new machines which makes possible the production of aircraft engines in quantities unheard of before the war.

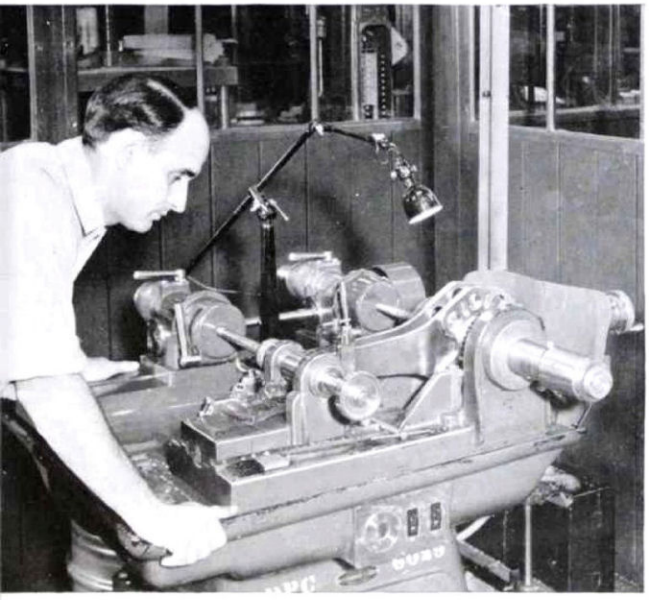




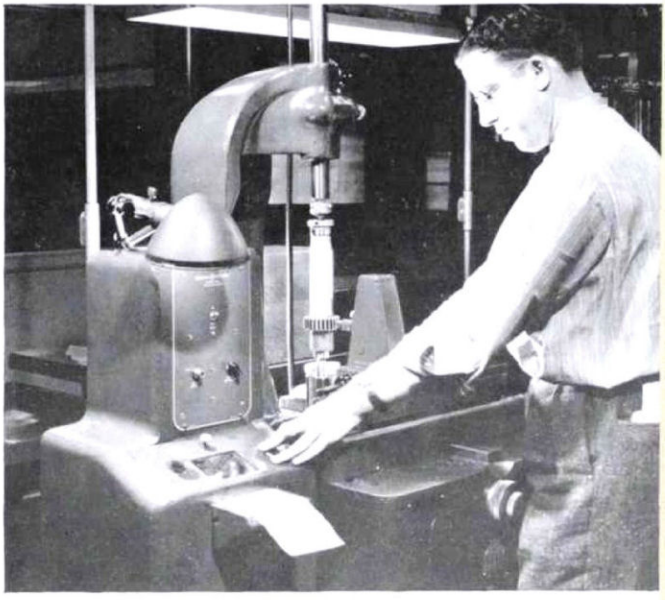
The crankshaft, which converts reciprocal power into rotary motion and which is subjected to terrific twisting and pounding, is dynamically balanced within extremely close tolerances.

Cylinder head is expanded by 600-degree heat, then threaded to cold cylinder barrel. As head cools, it shrinks and clamps itself tightly to barrel.





To assure perfect alignment of the two bearings in a master rod, the final operation is performed on an extremely accurate diamond boring machine.



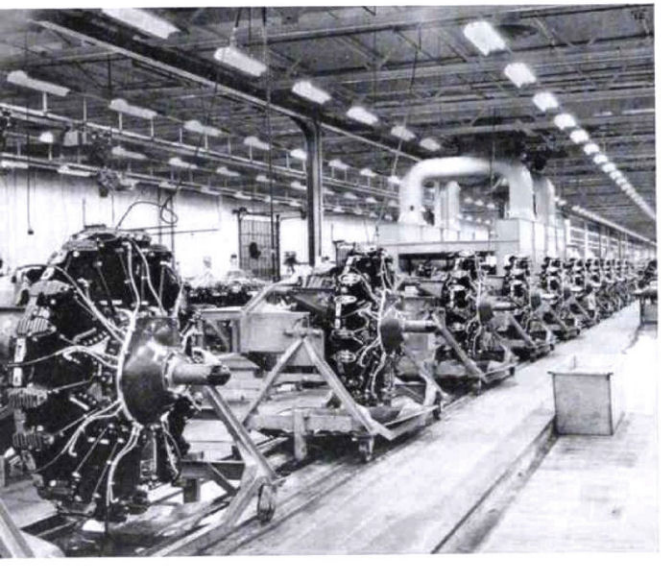
Checking involute of gear teeth is only one of 50,000 inspections to which the 8,000 pieces of every engine are subjected.

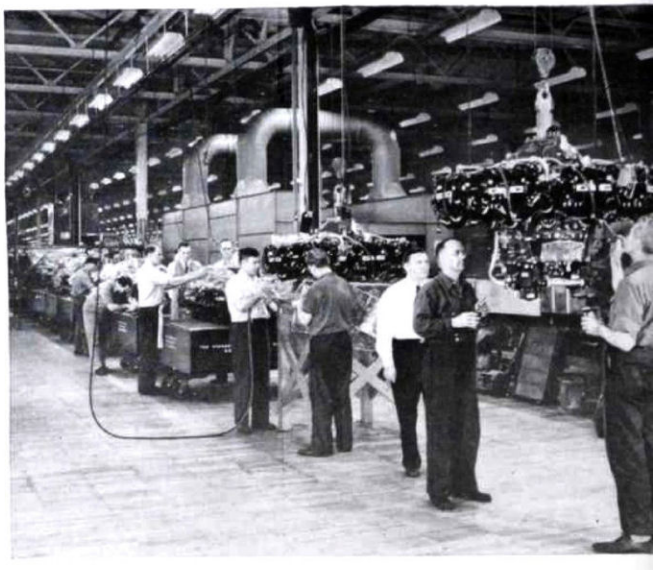
All engines are put through operational tests in special cells constructed for this purpose. The first of such tests, known as the "green" test, subjects the engine to a four-hour run over a normal range of speeds and loads.

In this photo, workmen are mounting a wooden propeller or "club" to an engine about to begin the test. A "club" is used instead of a regular flight propeller because it has been so designed that it will provide proper cooling for the engine while undergoing test in a stationary position.

Upon completing the test, the engine is returned to the assembly department, torn down, and every part thoroughly inspected. After inspection, the engine is re-assembled and given a final run. Upon passing this test successfully, it is prepared for shipment.

If, after its green test, an engine should reveal any defective units, new parts are installed and an additional penalty test run is made. Only after the engine has passed both the penalty and final tests is it considered satisfactory for shipment.





Engines shown at the left have just been returned from the test cells after their final run and are about to be prepared for shipment. Photo at right shows the shipping line. Dehydrating material is placed at several locations around the engine to absorb any moisture that may be present. The engine then is inclosed in a moisture-proof pliofilm bag which is sealed with heat as the air is pumped out. Finally the engine is crated in a sturdy wooden box and is ready for shipment.

PACIFIC COAST PLANT GROOMS ENGINES FOR WAR

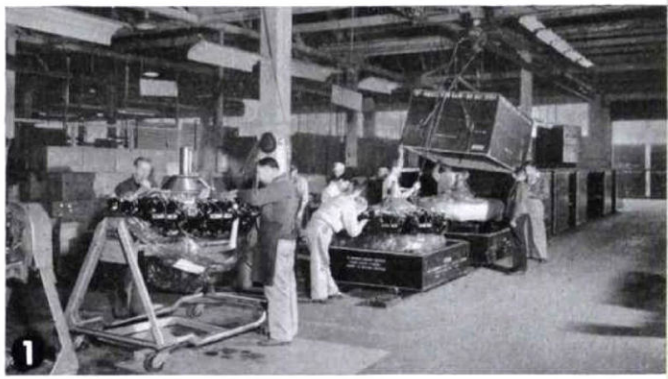
Some of the engines produced in South Bend are shipped to Studebaker's Los Angeles plant where, in normal times, Studebaker Champions, Commanders, and Presidents are assembled for distribution through the Pacific Coast area.

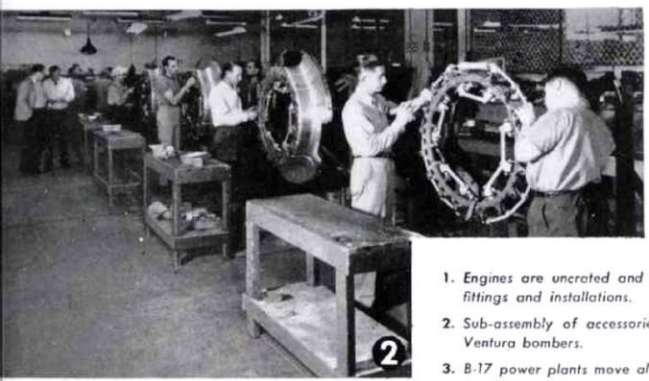
Today this assembly center is engaged in operations the volume of which is far in excess of anything approached even during peacetime boom years. Here are prepared for installation not only engines for Flying Fortresses, but also power plants for the Navy's hard-hitting Ventura bombers produced by Lockheed.

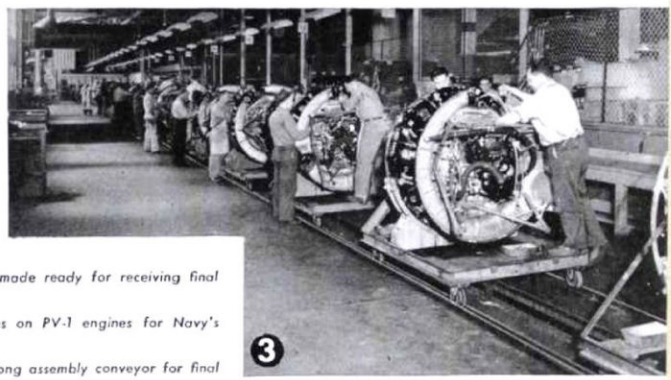
Before the engines can be bolted into their positions in the bombers, a number of preparatory steps must be taken. Engines must be affixed to engine mounts. Nacelles and cowlings must be assembled. Metal tubing for fuel connections and oil lines must be fabricated and installed. These and similar operations take place in Studebaker's west coast factory.

The plant functions, in brief, as a liaison between engine builders and bombing plane manufacturers. Like all the other Studebaker factories, it flies the Army-Navy "E" flag for production achievement.

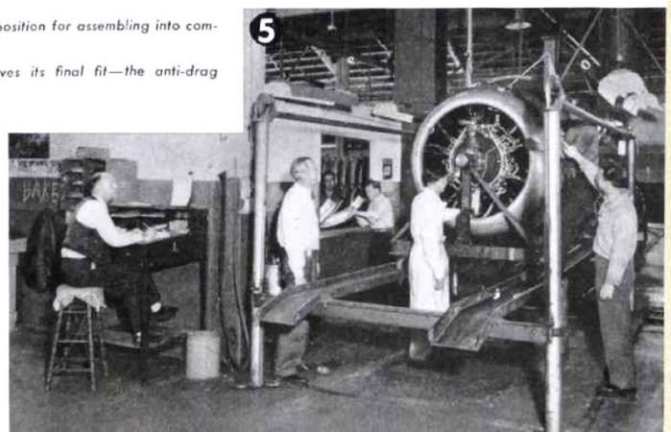
Awarded to The Studebaker Pacific Corp.







1. *Engines are uncrated and made ready for receiving final fittings and installations.*
2. *Sub-assembly of accessories on PV-1 engines for Navy's Ventura bombers.*
3. *B-17 power plants move along assembly conveyor for final installations.*
4. *Workers hoist engine into position for assembling into completed power plant.*
5. *Here a power plant receives its final fit—the anti-drag cowling.*



HEAVY DUTY

Speeding troops and supplies to battle areas throughout the world are Studebaker heavy-duty military trucks. Built to perform in temperatures ranging from sixty degrees below zero to blistering desert heat, these trucks have taken part in many United Nations military operations.

One of the first trucks to be built to Government specifications after the United States entered the war was the Studebaker two-and-one-half ton truck. It has become known as the US 6x6 and 6x4. The 6x6 has three axles with power applied to all wheels. The two rear axles have dual wheels. An almost crawling traction is obtained from the ten tires. In the 6x4 model only the two rear axles transmit power from four hubs and eight wheels.

ARMY E NAVY

Awarded to Automotive Division

MILITARY TRUCKS

Awaiting shipment are these Studebaker military trucks—part of one day's production.

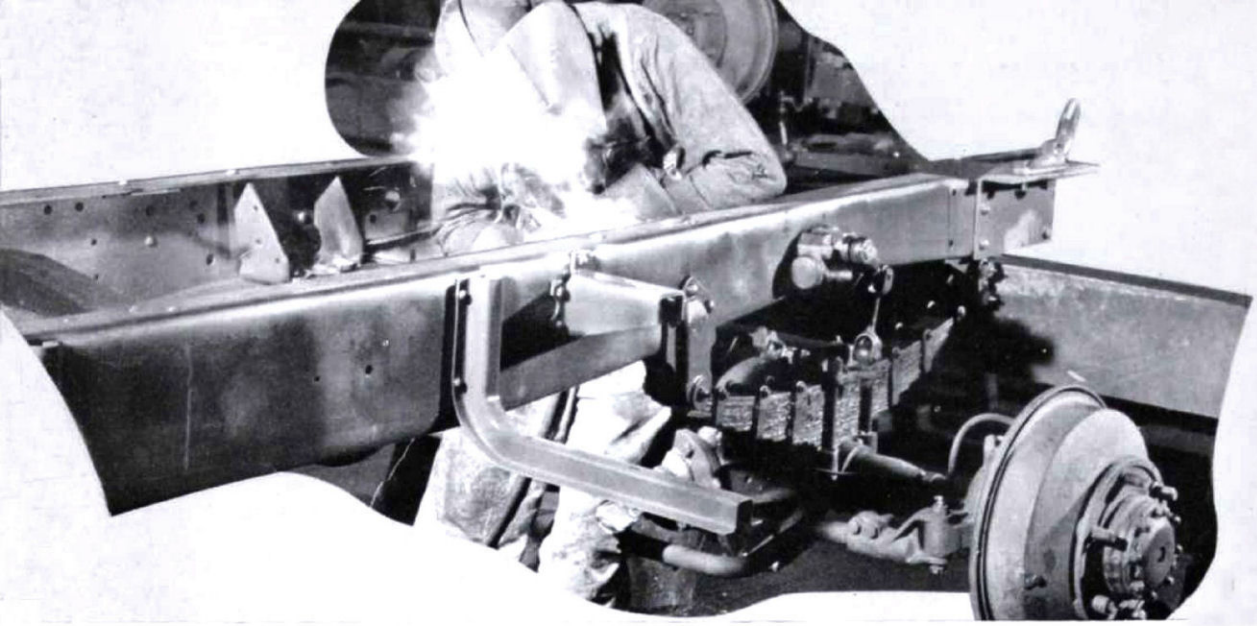
Best known, perhaps, are those trucks equipped with standard cargo bodies. But the rugged Studebaker truck chassis often enters war operations rigged out with any one of a number of less familiar body types designed for a variety of purposes. Sometimes it becomes a refrigerator truck for hauling food to troops or supply depots. On occasion it becomes a mobile machine shop fully equipped to handle emergency repairs under field conditions. Often it appears as a tank truck capable of carrying hundreds of gallons of fuel. It has even served as a gun carrier. At the request of the Russian government, a side-dump truck for specialized work in the Soviet Union was designed and produced by Studebaker engineers working jointly with Army experts. Conventional dump trucks and tractor types are still other models which Studebaker has produced.

Heavy-duty military trucks are designed primarily for cross-country terrain where roads may be nonexistent or mere ruts. They are geared to climb grades as steep as 65%. Ordinary mud doesn't stop them, and they can slosh over rough country where commercial trucks would falter and bog down.

Sturdiness, power, load capacity—these are the qualities built into military trucks and which make them such important units in the United Nations' battle against the Axis. Thousands of Studebaker trucks in widely separated countries all over the world—in Africa, Russia, Australia, India, China, Iran, South America—are doing their share in assuring tomorrow's victory.

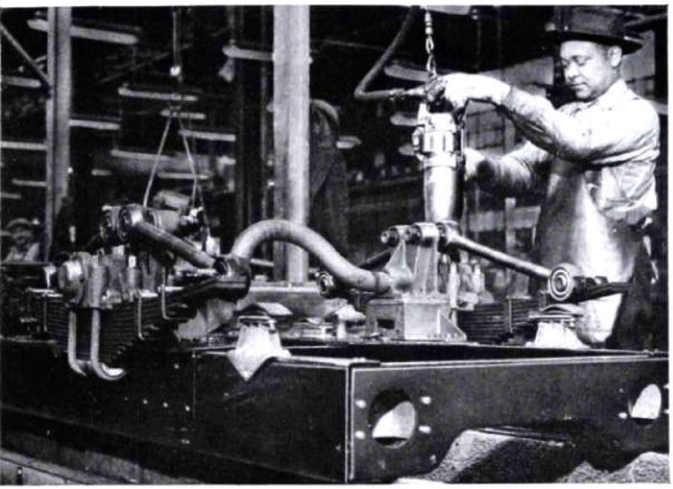
Mile after mile, over all kinds of terrain, trucks are subjected to gruelling tests.

Mud doesn't stop them. Trucks for military service must get through areas like this.

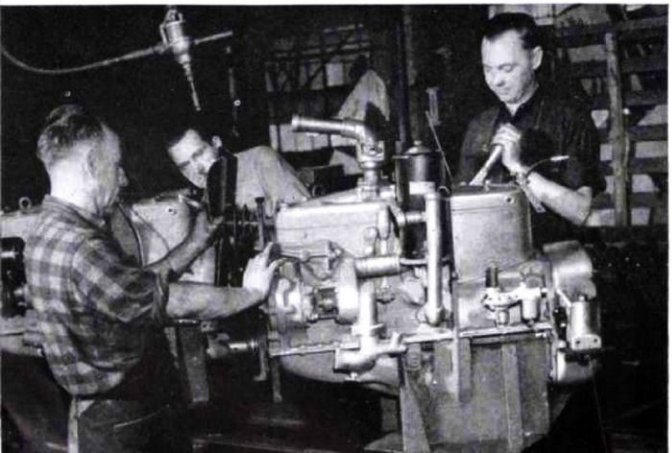


Small parts are welded to frame in early stages of truck assembly. Sturdy frames such as the one pictured here make possible the heavy load capacities which modern mechanized war demands.

Axles and springs drop into position as truck frame moves down assembly line. Studebaker trucks are built in plant where passenger and commercial cars were formerly assembled.

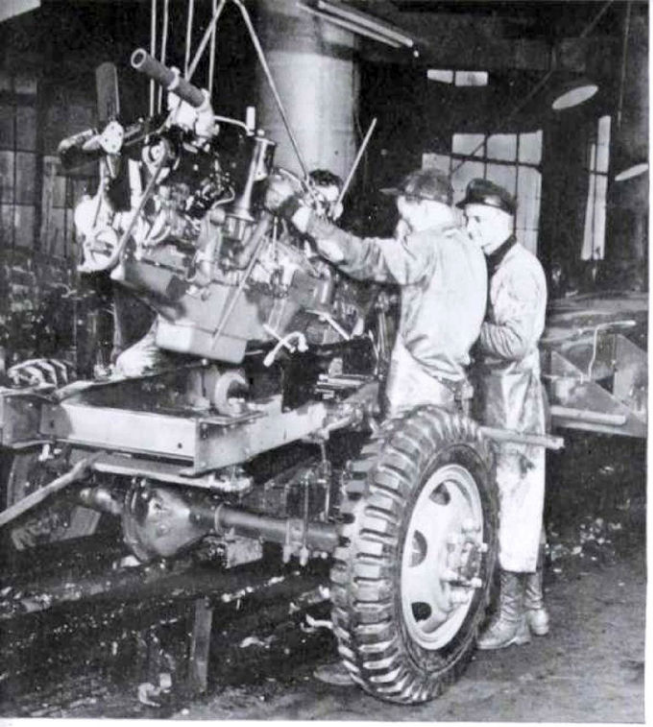


Fan and other parts are installed on truck engines as they start trip along conveyor line. Installation of transmission at end of this line will complete engine assembly.

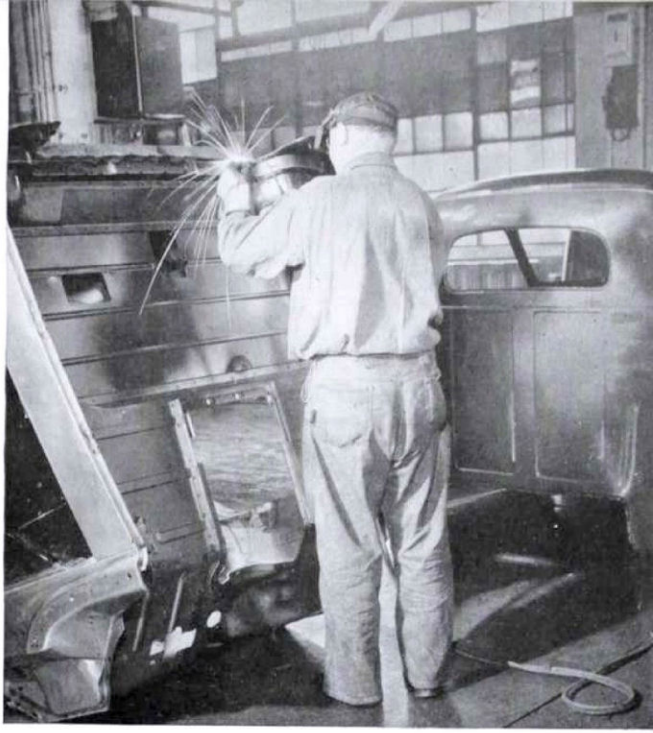


Trucks are the stubborn workers, the speeded-up mule power of this war. Their operation may seem less dramatic than that of planes or attack units on the ground. Nevertheless, by hauling supplies over seemingly impossible terrain they make possible the operation of other mechanized military equipment. A bomber pilot in Italy recently expressed unrestrained amazement that such haulage could be maintained over shell-torn ground churned into a sea of putty-like mud by weeks of rain.

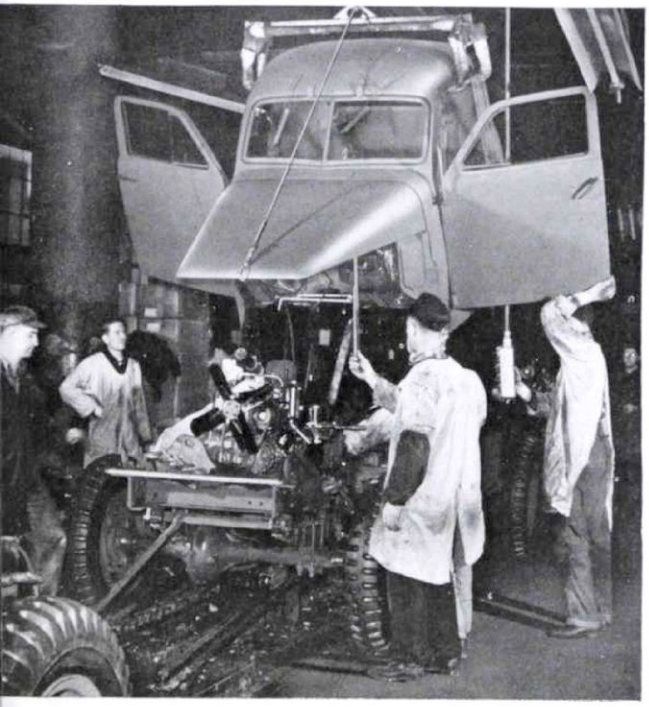
For every man sent into a battle area overseas, 7½ tons of supplies must be transported, and it takes one ton of material a month to keep him there. Trucks not only help move such supplies to shipping points; they are often the only means of getting material to fighting areas after they reach foreign shores.



Engine is lowered into place, will soon propel vehicle from the end of assembly line.

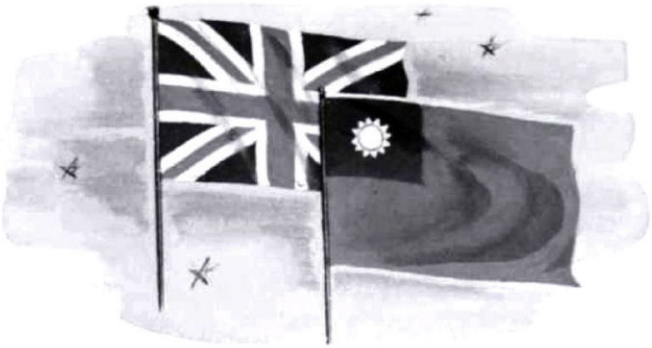


Top, back, and bottom sections of truck cab are gas-welded into single unit in former passenger car body plant.



Cab is dropped into position as truck nears end of final assembly line.

"Take 'er away!" Truck will now undergo performance tests on traction dynamometer.



Parts for Trucks on Foreign Fields

More than 900 tons of replacement parts are shipped out every week for servicing the thousands of Studebaker trucks in all parts of the world.

To make sure that no such dilemma occurs as that pictured in the center of this page, every repair part is accurately identified by tag, name, and number.

Orders for parts may call for a few items to as many as ten thousand identical pieces. But regardless of the quantity, each part is carefully selected, processed in washer-dryer ovens to remove all dirt and grease, and dipped in a rust-proof liquid which is baked into a protective shield.

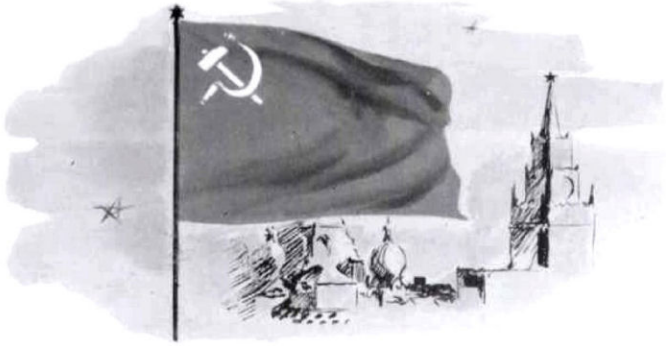
Extremely small parts are shipped loose in watertight containers. Larger parts are "mold-wrapped" with special no-oxide cloth which prevents air and moisture from reaching them. The completed packages are then dipped in liquid wax to provide still further protection to the contents inside.

Studebaker's packaging and shipping methods are being constantly improved. By means of new techniques, for example, the number of cubic feet required for shipping a truck overseas has been reduced from 878 to 389—a decrease of 55%!

"Mold wrapping" a cluster gear reveals how carefully truck parts are protected against rust and corrosion for shipment overseas.

Spare truck parts arriving in packaging department. Each part has been weatherproofed by anti-corrosion coating.

Dipping packages in liquid wax gives added protection to the truck parts inside.



Trucks for Russia

Final orders are issued to Russian soldiers in Iran before they drive Studebaker trucks to supply bases of the U.S.S.R.

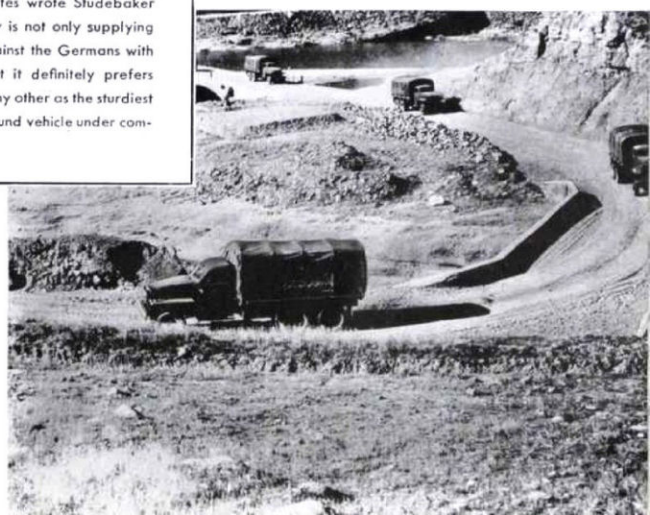
Red Army officer gives engine final once-over before vehicle starts out for Soviet military base.

A large number of Studebaker military trucks have gone to Russia via Lend-Lease. These trucks played key roles in the sensational campaigns of the Ukrainian Army. An American correspondent writing of Marshal Ivan Koniev's smashing drive through the Ukraine, commented: "Wherever possible, Koniev uses Studebaker trucks, for whose six wheels, four gears and sturdiness Red officers profess high regard."

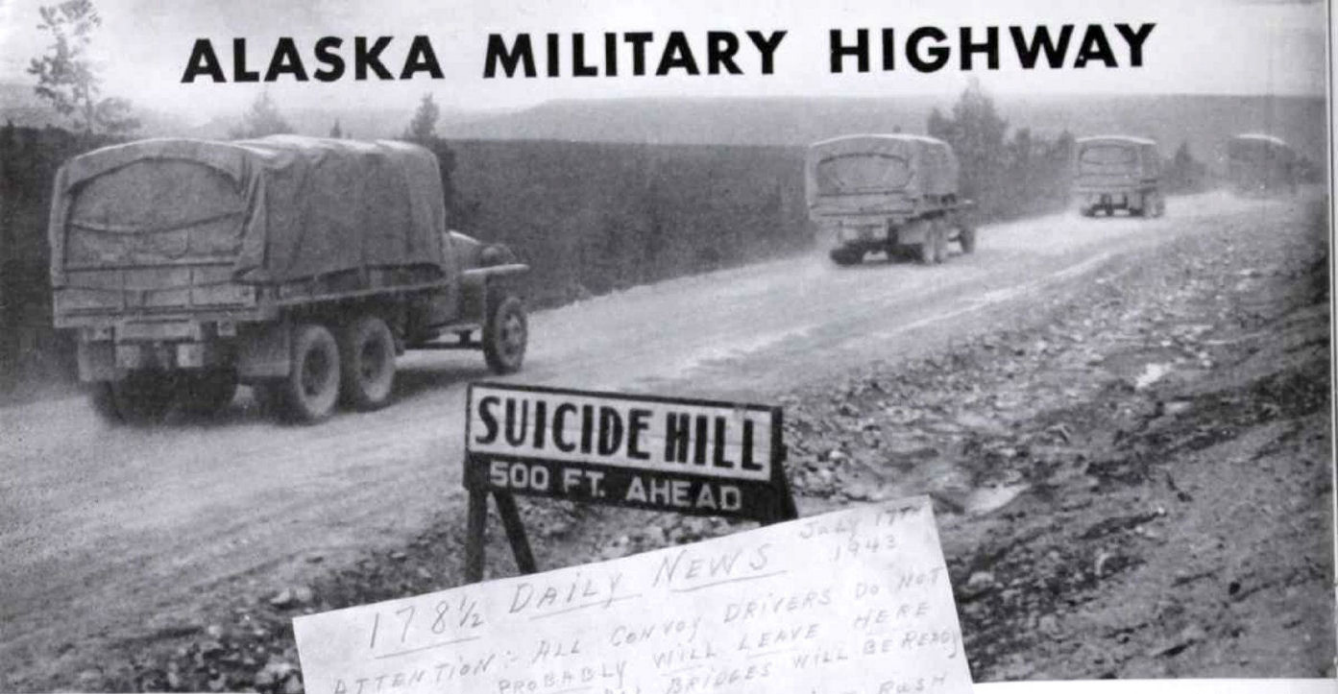
Another American correspondent on his return to the United States wrote Studebaker that "the Russian army is not only supplying its great offensive against the Germans with Studebaker trucks, but it definitely prefers Studebaker trucks to any other as the sturdiest and most useful all-around vehicle under combat conditions."

"All set!" smiles this soldier of the Red Army. Five-pointed star with hammer and sickle insigne may be seen on his cap.

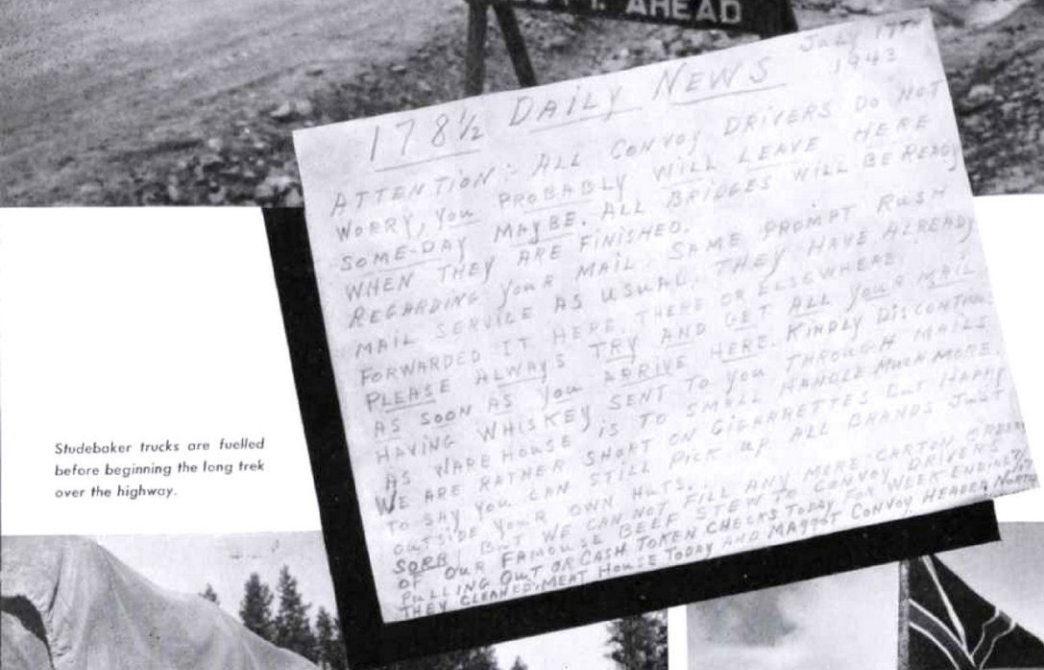
From a Persian Gulf port, a Studebaker convoy rolls through Iranian desert to southern Russia.



ALASKA MILITARY HIGHWAY



Winding its way 1,671 miles from Dawson Creek, British Columbia, to Fairbanks, Alaska, is the mighty Alaska Military Highway — one of North America's greatest engineering feats. Studebaker trucks haul the bulk of the freight moving over this highway.



Studebaker trucks are fuelled before beginning the long trek over the highway.

Ready to start are these drivers as they line up informally to receive final instructions.

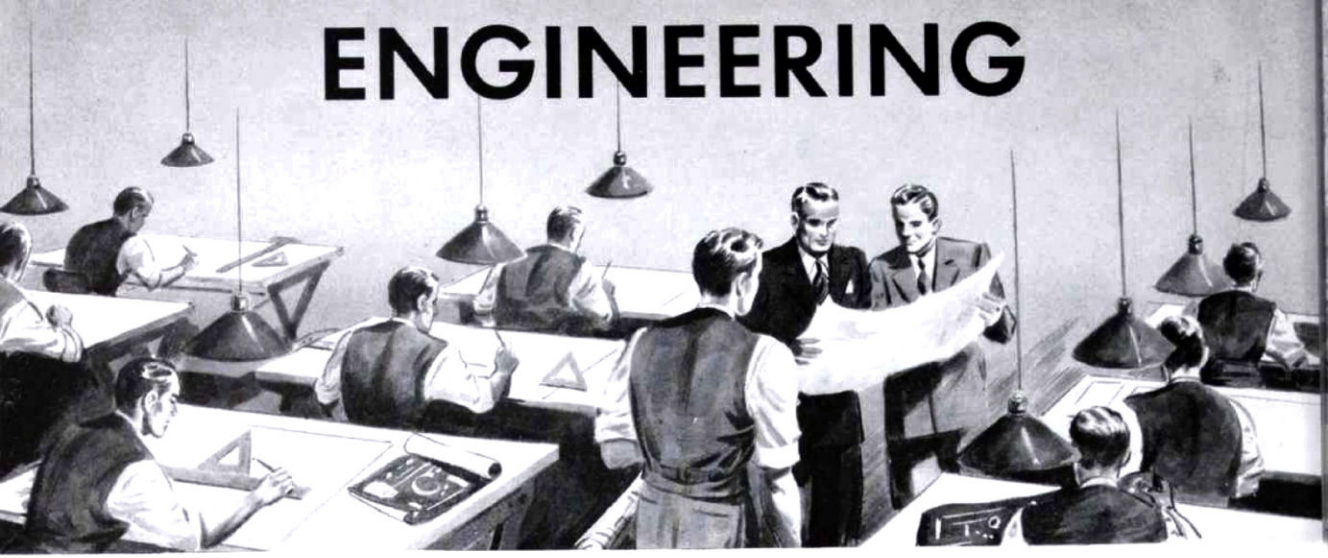
"I'll be seein' you," waves one of the drivers as he steps into the truck cab.

Drivers wear masks to protect themselves against the stifling dust during the summer season.

Studebaker convoy en route to Whitehorse, midway terminal of the route, shown just above Dawson Creek.

End of the journey! Shipments of oil are checked upon their arrival.

ENGINEERING



In Studebaker's engineering laboratories work never stops in re-designing, improving, testing, trying out new devices, new combinations.

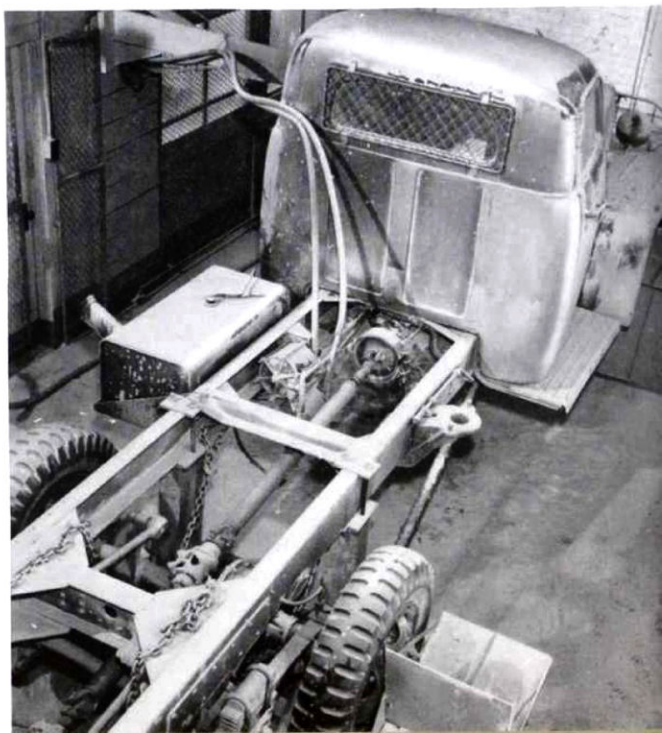
Here in peacetime originated such Studebaker "firsts" as "planar" wheel suspension, automatic hill-holder, carburetor silencer, automatic vacuum spark control, and many other automobile improvements. Here in wartime are produced "firsts" designed to increase the efficiency of American transportation and war materiel. However, because of the secret or confidential nature of most of the work in progress, little can be told of what is actually going on.

Studebaker engineers also are active on the Company's great 800-acre proving grounds, conducting tests for the Army Ordnance Department on all types of vehicles.

The pictures on this and the adjoining page will give some idea of the variety of activities in which Studebaker designers, research men, and engineers are engaged.

COLD ROOM. *Temperatures 60 to 70 degrees below zero reveal how trucks will behave in Arctic cold.*

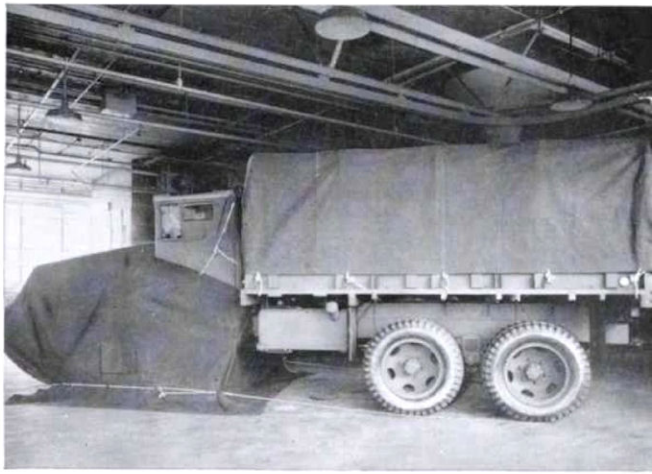
DUST CHAMBER. *Trucks are subjected to swirling desert sand to determine best dust-protection methods.*



ON AND ON! *Studebaker military trucks undergo countless punishing runs.*

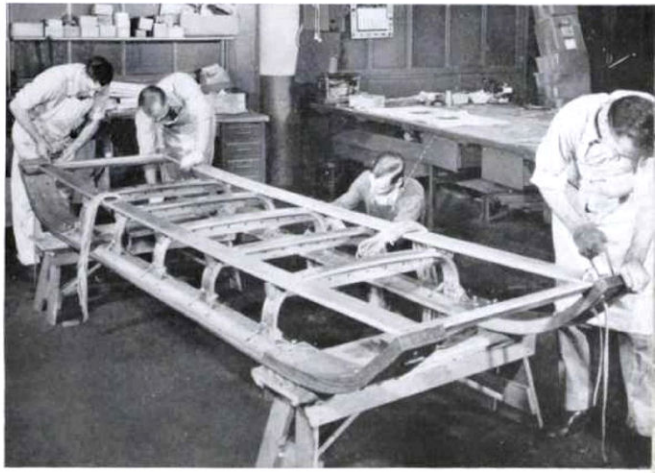
ARMY'S M-8. *This armored carrier is one of many Army vehicles tested on Studebaker proving grounds.*

CAMERA HEATER. *Heating device developed by Studebaker enables motion picture cameras to operate in coldest weather.*



ENGINE HEATER. *This heating installation permits engines to start promptly in severe cold weather.*

RADIO INTERFERENCE SUPPRESSION. *In special rooms, trucks are checked for interferences affecting radio installations.*



SLEDS. *For use over snow terrain, wooden sleds are built for the Army. Parts are lashed together with rawhide.*

FIELD ORGANIZATION AND DEALERS

They Cooperate to Meet New Wartime Transportation Problems

In 1917, less than 5,000,000 motor vehicles were registered in the United States; by 1941, the number had grown to 34,000,000. So dependent had the country become upon highway vehicles—automobiles, trucks, and buses—that thousands of communities, many of them sites of important war plants, were served by no other means of transportation.

Careful studies revealed that it would be necessary to keep at least 20,000,000 cars operating to prevent serious transportation shortages.

When the manufacture of new cars was stopped early in 1942, and the sales of all new cars placed under strict rationing regulations, possibilities of a national transportation crisis developed. Automobile manufacturers, including Studebaker, were already engaged in war production; but there was a continuing responsibility for transportation on the home front shared with thousands of automobile dealers and their employees representing the retail facilities of the industry. Upon them the country would depend largely for the storage and handling of rationed cars, used cars, maintenance service, and repair parts.

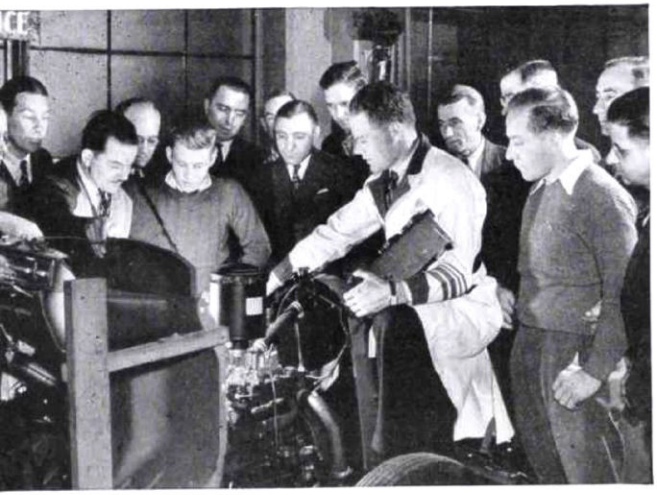
Studebaker took steps promptly to distribute its limited stock of new cars equitably through an allotment plan adopted when limitations were placed on passenger car manufacture. Then Studebaker representatives undertook to help each dealer organize his business for operation under wartime conditions. Most dealers continued serving their communities in their own natural fields of operation. Emphasis was placed upon increasing the effectiveness of service facilities. Some dealers, however, engaged in the manufacture of war materials in addition to their normal activities.

Everywhere there was an increased demand for technical information. Such data was needed to save tires and fuel, and to keep vehicles properly serviced and repaired. The distribution of one Studebaker booklet containing suggestions for car owners reached 3,750,000—about one for every 36 persons in the United States—and much of this information found its way into public and vocational schools for timely reference and instructional use.

Postwar planning is being given more and more attention, but is never permitted to overshadow the main objective of the moment: to win the war and to win it as quickly as possible.

Pictured here are some of the wartime services of the Studebaker Sales Department and dealer organization.

New cars were rationed for essential war workers and services. Here is part of a fleet of new 1942 Studebaker Champions delivered to the New York police department early in 1943.

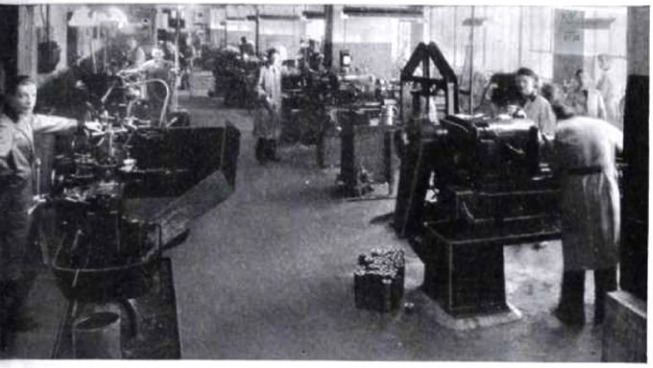


Service schools offer special training for wartime maintenance problems—making old equipment perform efficiently and saving replacement parts through repair wherever possible.

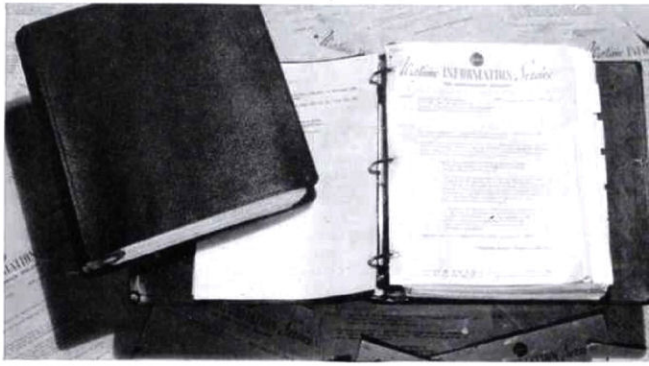
With husbands away or working longer hours, women became the maintenance supervisors for many a family car. Studebaker service men explain to them what services are required and why.

"Food deliveries are "musts" at any time. Studebaker's wartime program for dealers and truck operators contributed substantially in maintaining deliveries of this kind in the face of countless other war demands.

Members of Studebaker's Bureau of Wartime Information Service check data teletyped by the Washington office. Data may pertain to rationing, man power, maximum prices, loans and credit, or to other dealer wartime problems.



Some Studebaker dealers have found it possible to undertake the manufacture of war equipment in addition to maintaining car and truck servicing facilities.



Bulletins and interpretive literature like this are sent to dealers almost daily by Studebaker. This information keeps them fully informed of any governmental actions affecting their business.

Dealers converted their offices and showrooms into "Information Centers" and assisted thousands of essential truck operators to register their vehicles with the Government to obtain authorization for carrying on vital haulage.

"Save" has become the wartime slogan of the home front. But how? It takes information to get the most fuel and tire mileage from cars and trucks. Such information has been made available by Studebaker in booklets and folders—in form not too technical to be practical and useful to the average individual.

TRAINING

Service Division Trains Civilian and Army Personnel in Maintenance

Training personnel in the maintenance of automotive vehicles in both civilian and military use is a major wartime activity of Studebaker's service division.

To keep vehicles in action on the home front, frequent instruction clinics are held in the Studebaker Service School. Here come executives and supervisors who, because of the loss of key men and skilled mechanics, must themselves become thoroughly familiar with maintenance and shop practices. These men thus become qualified to instruct, train, and develop new help to keep the nation's automotive transportation at maximum efficiency.

Many Studebaker instructors are helping to train Army personnel, both in the field and in special classes held at South Bend, to service the vehicles built for military use. These trainees will in turn teach others. Studebaker service experts can be found in the war zones, along the Alaska Military Highway, in short, practically wherever Studebaker carriers are in action.

The preparation of operating and servicing manuals is still another important activity. Scores of thousands of these instruction books have been sent out so that drivers and mechanics could become intimate with the engineering principles, performance, and upkeep of Studebaker vehicles.

Idle cars and trucks contribute nothing to the war effort. The Service Division is doing everything it can to see that all Studebaker vehicles do their jobs and do them well.

Thousands of manuals for Studebaker vehicles in military service have been distributed. Here a sergeant is doing some "home work."

Clinics for civilians are held frequently in Studebaker plant. Carburetors hold interest of this group.

Chinese Army officers learn maintenance in Studebaker factories. They are eager students.

Army men study Studebaker engine in Army service school in South Bend.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WIN

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