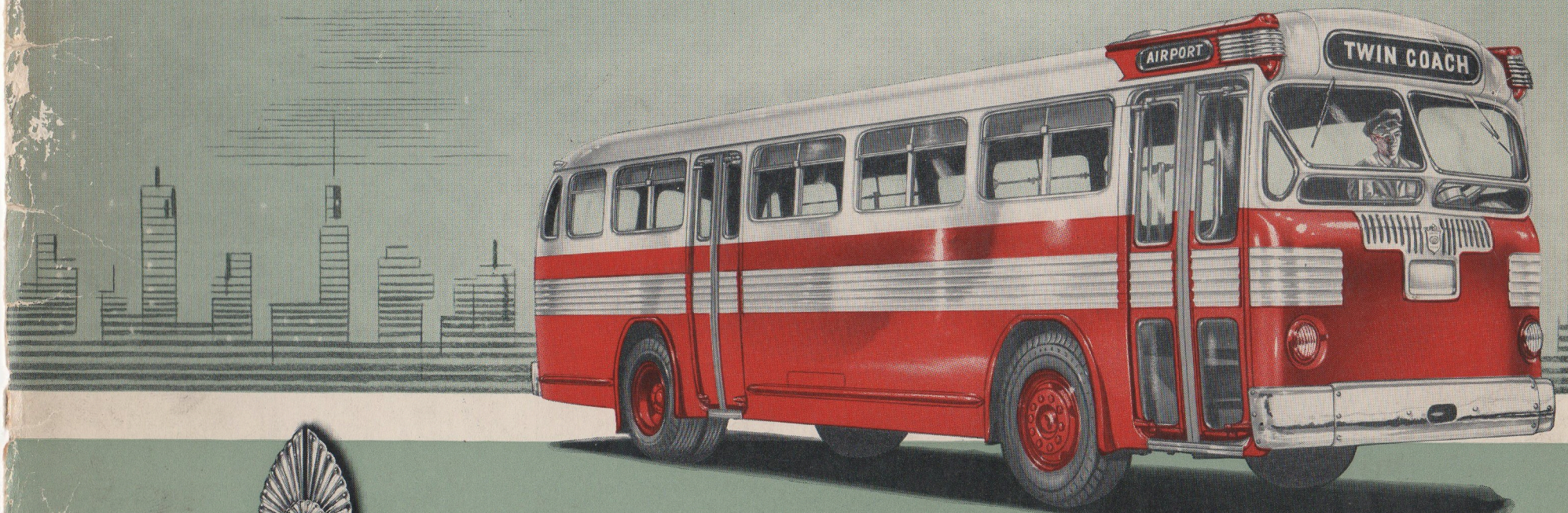
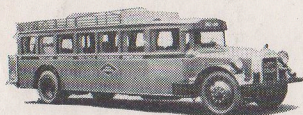


urban type coaches



TWIN COACH COMPANY
KENT, OHIO

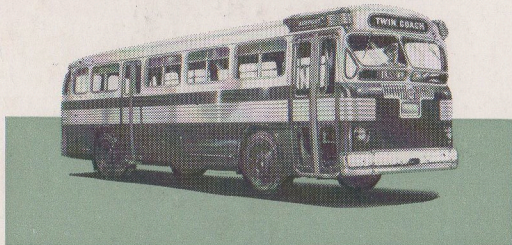
Looking ahead.....



1922 • *first safety coach*



1927 • *first transit type body*



1946 • *first coach with private car riding
comfort and acceleration*

The new line of Twin Coaches reflects our recognition of two important facts:

First—former standards of coach operation are now obsolete as a result of war-accelerated requirements for public transportation.

Second—modern equipment must compete during the coming decade with inevitable advancements in competitive types of public transportation.

Twin Coaches are patterned to meet present and future requirements.

Our design is again based on those proved fundamental axioms of coach design which the Fageol Twin Coach organization recognized and advanced for the benefit of the motor coach industry 25 years ago.

These principles bear repetition: *Power-to-weight ratio . . . smoothness of operation . . . riding qualities . . . styling . . . rider appeal . . . and economy of operation.*

We now offer you a new line of Twin Coaches with advanced design features that will assure exceptional public service and more profitable operation in the competitive decade ahead.

President
TWIN COACH COMPANY

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5

FUNDAMENTAL ENGINEERING

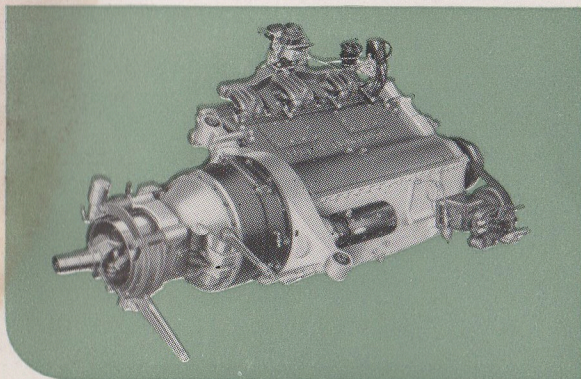
The five fundamental engineering advancements in the new line of Twin Coaches again reflect the basic principles which the Fageol Twin Coach organization has pioneered in the past 25 years:

- Increased horsepower
- Less coach weight per passenger
- Improved performance
- Greater passenger comfort

Complete details on each of these outstanding improvements appear on the following pages of this booklet.

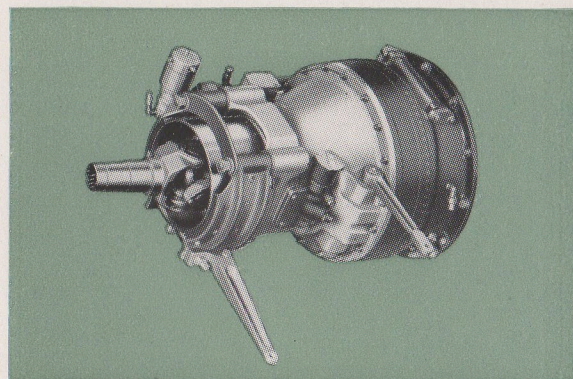


ADVANCEMENTS



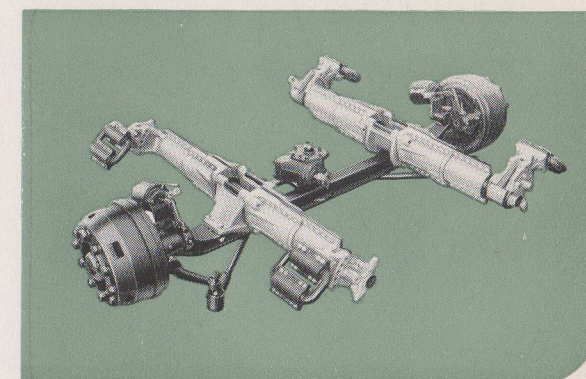
180 H. P. FAGEOL TWIN COACH ENGINE

Increases horsepower output with no increase in engine weight • produces increased power from ordinary fuels and fully utilizes 80 to 90 octane gasoline • produces .445 H.P. for each cubic inch displacement and 1 H.P. for every 4.7 pounds of engine weight • improves gasoline economy.



MATCHED HYDRAULIC TORQUE CONVERTER

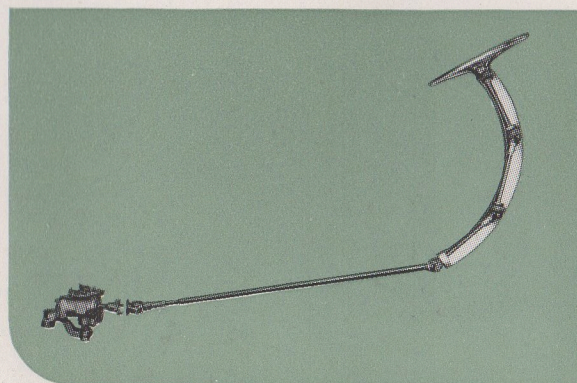
Eliminates gear shift and free wheeling • perfect match between engine and converter accelerates coach like a private car • change over from hydraulic to direct drive is smooth—even at maximum acceleration.



PATENTED TORSILASTIC* RUBBER SPRINGING

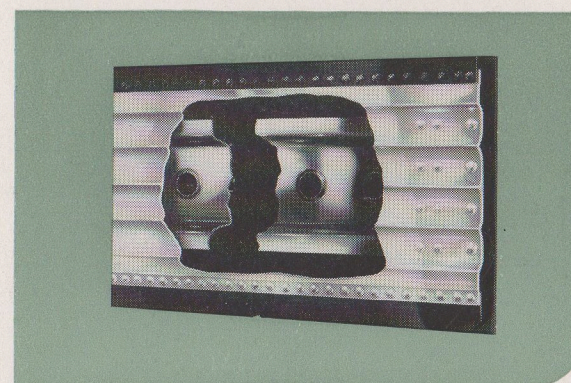
Gives private car riding comfort • requires no lubrication • prolongs spring life • body floats on axles.

*TRADEMARK REG. BY THE B. F. GOODRICH CO.



AXLE-MOUNTED STEERING GEAR

Eliminates road shock from steering wheel • places driver closer to windshield for maximum vision • angles steering wheel at comfortable position for driver.



ALL ALUMINUM ALLOY CONSTRUCTION

Saves weight • cuts operating costs • weight economy combined with improved coach performance makes possible a 40-passenger coach with operating costs no greater than prewar 30-passenger coaches.

PRIVATE CAR PERFORMANCE

More than ever, the ride your company offers the public must compete with private car comfort. But no matter how urgent these requirements may be, they must not be achieved at the expense of operating economy.

Twin Coach meets private car competition squarely by enabling operators to reduce schedule time (when traffic conditions permit) and increase the productivity of equipment. As a result of Twin's private car acceleration, operators can reduce schedule time by 10 to 15%...operate fewer coaches (because 9 new Twins will do the work of 10 prewar coaches) ... and maintain the same scheduled headway. This economical performance results in greater savings due to lower platform costs and a substantial reduction in total investment.

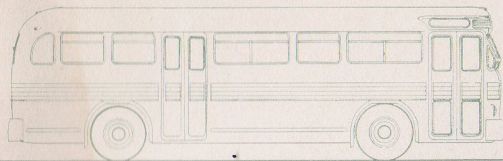
The following tests on a 34-passenger single engine Twin and a 44-passenger dual engine Twin illustrate Twin's amazing acceleration performance.

TWIN COACH ACCELERATION TEST DATA

34-Passenger (Single Engine) and 44-Passenger (Dual Engines) Coaches

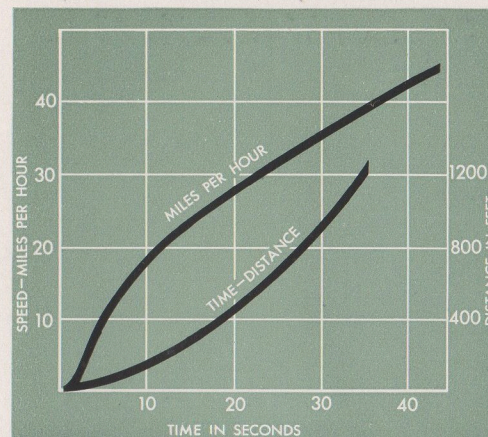
COACH PERFORMANCE ON LEVEL ROADWAY USING STANDARD SERVICE STATION FUEL—74 OCTANE

Model 34-S (SINGLE ENGINE) Rear Axle Gear Ratio— 5-4/6 to 1 Test No.	VEHICLE WEIGHT (lbs.)	SHIFT TO DIRECT DRIVE		500 FEET		1000 FEET		MAX. ACCEL. (M.P.H./Sec.)	AVG. ACCEL. RATE 0 TO 22 M.P.H. (M.P.H./Sec.)
		Time (Sec-onds)	Speed (M.P.H.)	Time (Sec-onds)	Speed (M.P.H.)	Time (Sec-onds)	Speed (M.P.H.)		
1. Empty coach	12,210	9.3	22	17.5	32	27	43	4.4	2.366
2. Seated load (34 Pass.)	17,310	12	22	19.6	29	31.2	37	3.0	1.833
3. 1½ seated load (51 Pass.)	19,860	13.1	22	20.4	28	31.7	35.5	2.8	1.677
4. 100% standee load (68 Pass.)	22,410	15.3	22	21	27	33.8	33.5	2.65	1.437
Model 44-D (DUAL ENGINES) Rear Axle Gear Ratio— 4-1/9 to 1									AVG. ACCEL. RATE 0 to 25 M.P.H. (M.P.H./Sec.)
5. Empty coach (6 Pass.)	15,730	8	29.5	14.2	39	22.3	51	6.6	3.7



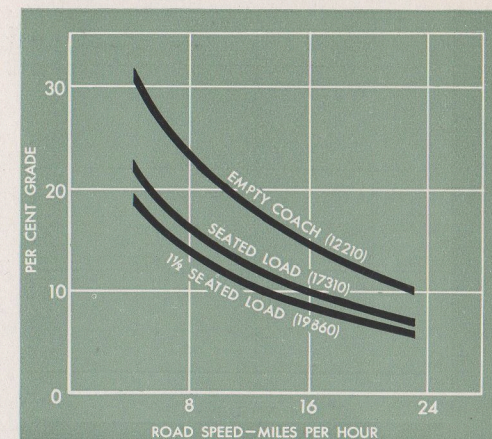
This comparison shows how the performance of several Twin Coach models compare. All models use matched hydraulic torque converters.

ACCELERATION PERFORMANCE
MODEL 345



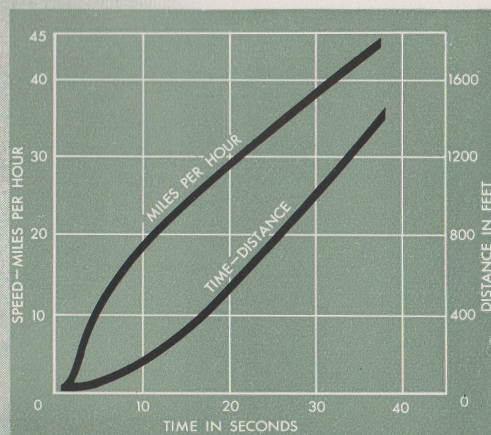
Gross Vehicle Wt. (Seated Load) 17,310 lbs.
Axle Ratio—5 $\frac{1}{4}$ Tire Size—9.00-20
Torque Converter—Spicer 916 Engine—FTC 180

GRADEABILITY & BALANCING ROAD SPEED
MODEL 345



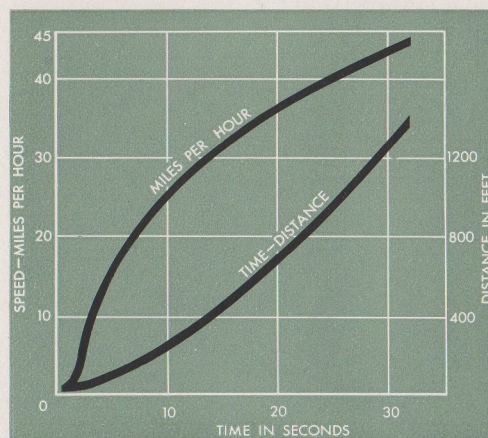
Vehicle Wt. Empty—12,210 lbs.
Axle Ratio—5 $\frac{1}{4}$ Tire Size—9.00-20
Torque Converter—Spicer 916 Engine—FTC 180

ACCELERATION PERFORMANCE
MODEL 415



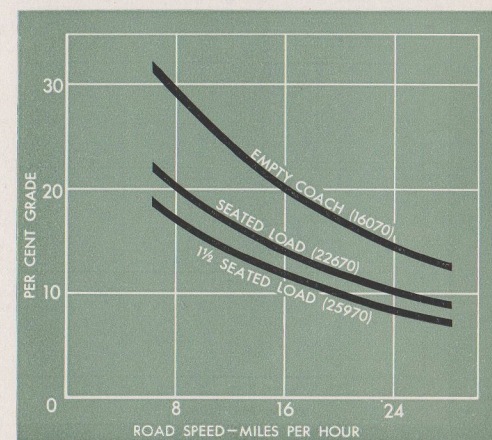
Gross Vehicle Wt. (Seated Load) 20,360 lbs.
Axle Ratio—6 $\frac{1}{4}$ Tire Size—9.00-20
Torque Converter—Spicer 916 Engine—FTC 180

ACCELERATION PERFORMANCE
MODEL 44D



Gross Vehicle Wt. (Seated Load) 22,670 lbs.
Axle Ratio—4 $\frac{1}{2}$ Tire Size—9.00-20
Torque Converter—Spicer 916 Engines—FTC 180 (2 Req'd.)

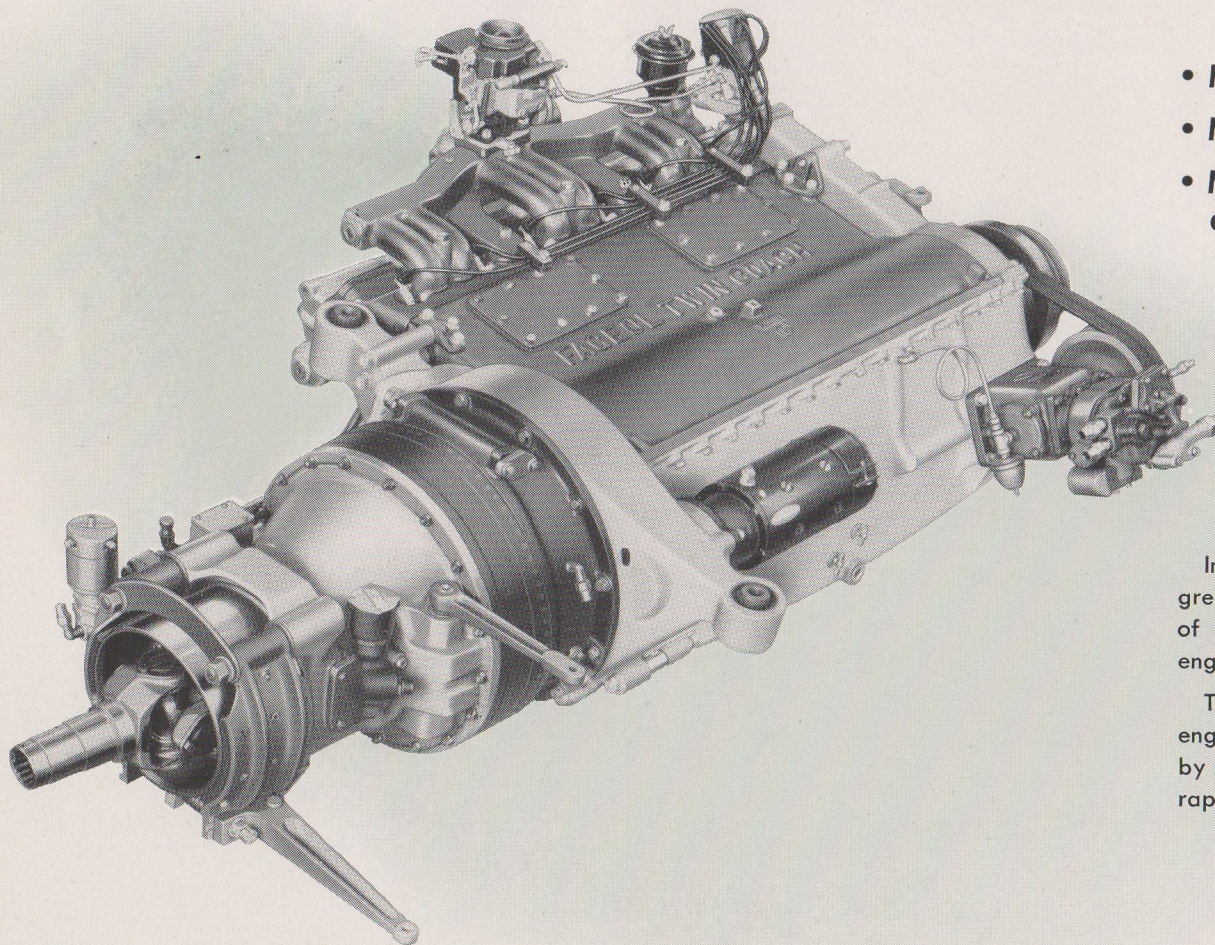
GRADEABILITY & BALANCING ROAD SPEED
MODEL 44D



Vehicle Wt. Empty—16,070 lbs. Passenger Load @ 150 lbs.
Axle Ratio—4 $\frac{1}{2}$ Tire Size—9.00-20
Engines—FTC 180 (2 Req'd.) Torque Converter—Spicer 916

MORE POWER

from the **FAGEOL TWIN COACH ENGINE**



- More power per pound of engine weight.
- More power output from ordinary gasoline.
- More power output through full utilization of 80 to 90 octane gasoline.

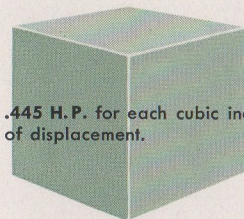
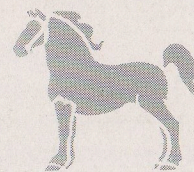
Improved performance . . . lower maintenance cost . . . greater fuel economy—these are the outstanding features of the underfloor-mounted Fageol Twin Coach 180 H.P. engine.

The product of years of developmental work, the FTC 180 engine is designed to meet the special requirements imposed by motor coach operation, such as frequent stops and starts, rapid acceleration, etc.

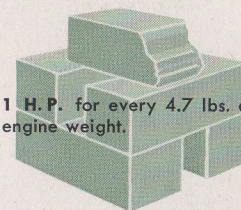
improved basic design

Simple refinements to orthodox design account for the amazing performance of the engine. Highly efficient, it delivers *more power for each cubic inch of displacement and for every pound of engine weight than any other commercial engine.* (1 H.P. for every 4.7 pounds of engine weight . . . 0.445 H.P. for each cubic inch of displacement.)

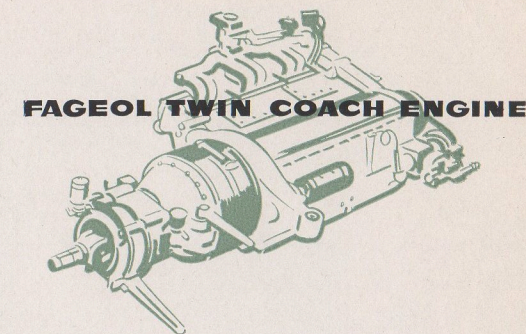
This unequalled power output is the result of several major advancements in engine design that we describe below.



.445 H.P. for each cubic inch of displacement.



1 H.P. for every 4.7 lbs. of engine weight.

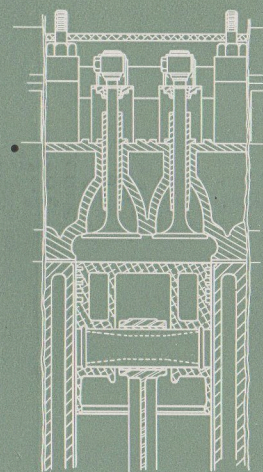


FAGEOL TWIN COACH ENGINE

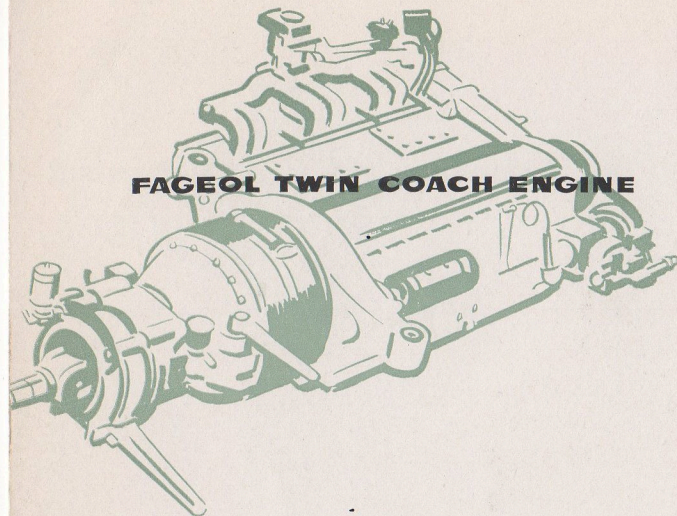
uniform engine temperature

Power costly "hot spots" in the block and head commonly destroy engine efficiency. Inadequate cooling often causes temperatures to rise more than 50° above coolant at critical points in block and head.

The FTC 180 has no "hot spots"; consequently, engine efficiency is higher. Proper cooling holds temperature variation to a 3° *maximum*.



Circulation is full wash, uniform pressure and metered around cylinders . . . valve seats . . . patented combustion chamber . . . intake and exhaust ports.



FAGEOL TWIN COACH ENGINE

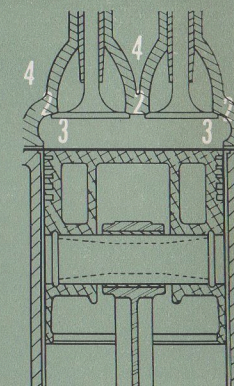
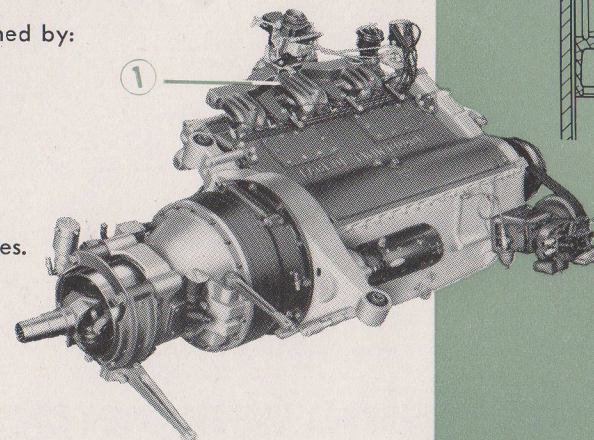
higher volumetric efficiency

Higher volumetric efficiency means "more mixture in cylinders before compression (per cubic inch of displacement)." A concentrated charge produces a more powerful stroke.

The FTC 180 engine has higher volumetric efficiency because positive temperature control prevents pre-expansion of the mixture. This results in a larger, more effective charge.

Positive temperature control is maintained by:

- 1 — Water heated intake manifold.
- 2 — Uniform thickness of inner walls.
- 3 — Fillets and curves instead of edges.
- 4 — Fully cooled exhaust and intake valve seats.



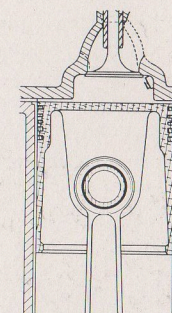
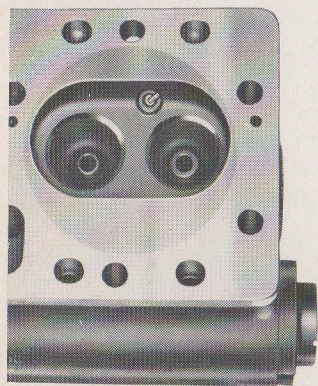
higher compression ratios

For the past 50 years commercial engine designers have sought ways to fully utilize higher compression ratios. But always the same problems: detonation . . . increased bearing loads . . . and the necessity for spark retardation.

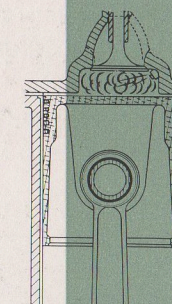
Today Twin Coach has the answer—it's the patented combustion chamber in the FTC 180 engine. Greater power output from higher compression ratios is now possible without increased bearing loads. Power output is smooth . . . velvet-like.

This new principle of combustion chamber design enables the FTC 180 engine to produce *more* power from ordinary octane fuel . . . and to take *full* advantage of 80 to 90 octane gasoline.

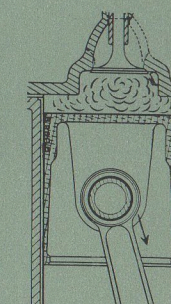
You can readily understand its simple method of operation from the sketches at the right.



1. Combustion chamber is small compared with cylinder bore.



2. Detonation suppression space between piston and cylinder head reduces by one-third area of piston head exposed to explosion . . . cuts bearing loads.

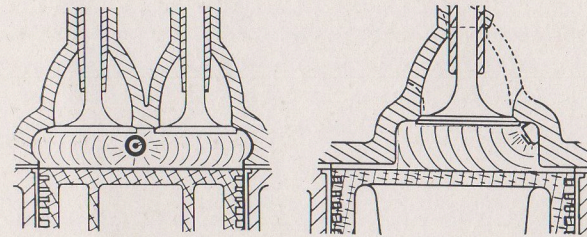


3. Pressure on piston head increases gradually as force expands from chamber . . . reaches maximum force when crank is at point of most effective leverage.

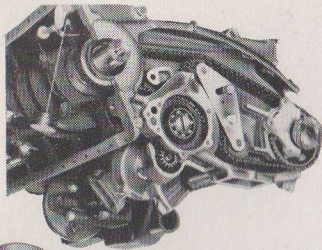
controlled combustion of mixture

Premature ignition of the gaseous charge wastes useful engine power. This occurs when gases ignite from spontaneous combustion before the flame front reaches them.

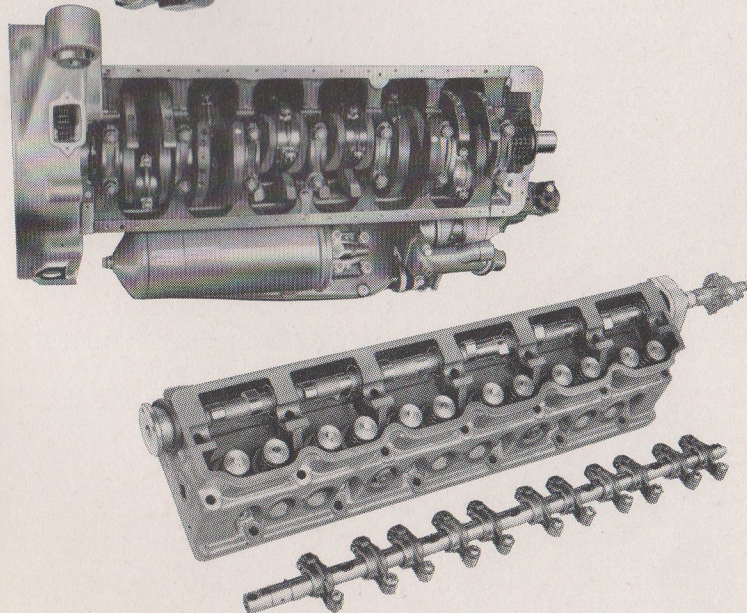
In the FTC 180 engine, however, combustion is *controlled*. The spark plug centers at the hottest part of the patented combustion chamber. High turbulence propels the flame front throughout the charge ... prevents pre-ignition by controlling temperature rise.



These sketches show that the spark plug is midway between ports in combustion chamber ... slightly nearer exhaust port.



lower friction losses



Careful attention to design of reciprocating parts has effected a substantial reduction in friction losses.

Equal thicknesses of metal at all vital points has eliminated distortion due to unequal expansion and contraction of metal sections. This uniformity assures alignment and minimizes friction loss.

The extremely rigid crankshaft prevents friction loss due to misalignment (the shaft is stressed for engine speeds of 4000 R.P.M., although the FTC 180 engine normally operates at not more than 2400 R.P.M.) It is fully counterbalanced ... equipped with a rubber dampener.

A four strand roller chain is used for the camshaft and accessory drive, together with ball and roller bearing mounted sprockets. This helps to reduce friction losses.

To reduce friction in the cylinder head, the camshaft turns in seven align bored bearings, submerged in oil. Rocker arms have ground and hardened rollers with ball joint valve pushers.



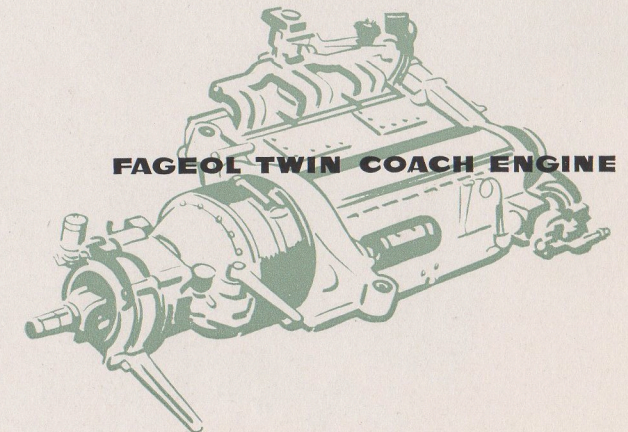
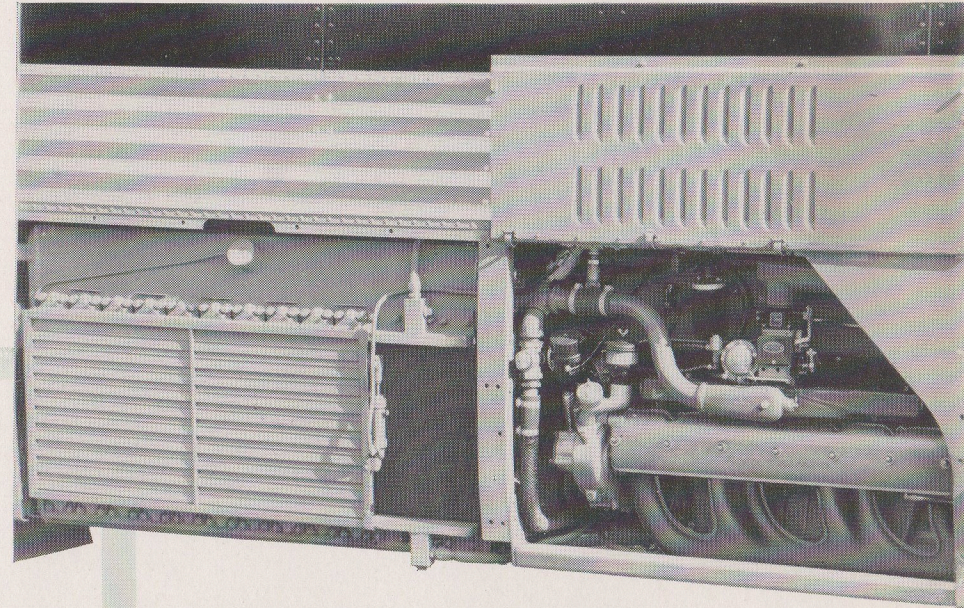
underfloor engine mounting

In single engine Twin Coaches, the engine mounts under the floor on the left side of the coach, ahead of the rear wheels. Cylinder bores are inclined at 10° from the horizontal, toward the outside of the body. This facilitates oil drainage and ready accessibility to parts for inspection and routine maintenance.

When dual engines are used, they mount in corresponding positions on the left and right sides of the coach.

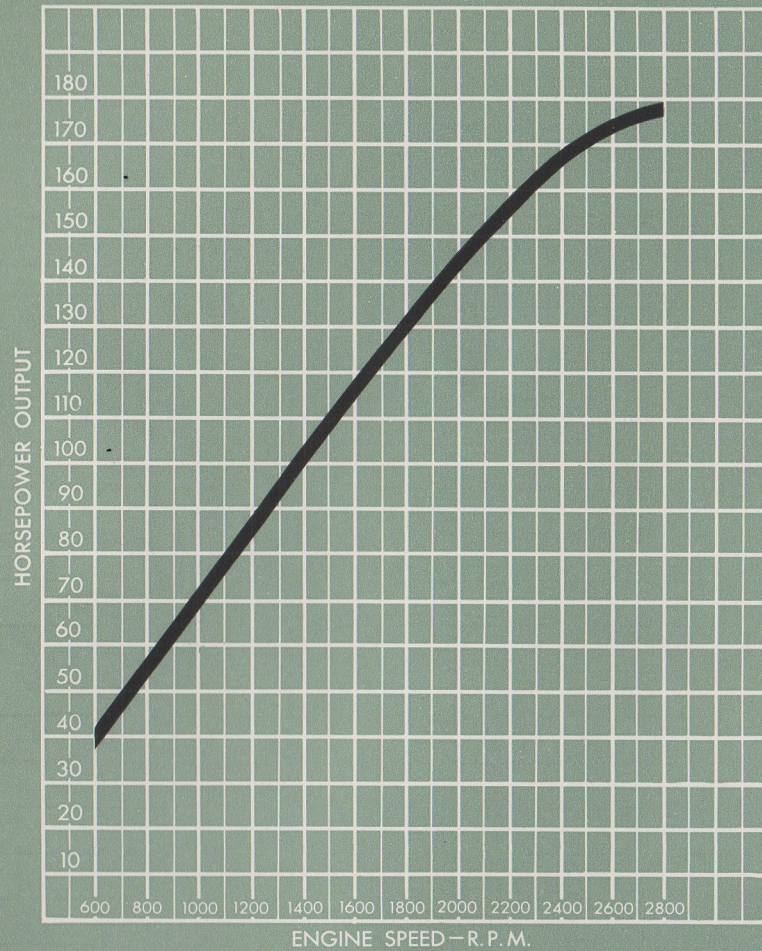
ENGINE CHARACTERISTICS

Number of cylinders	6
Bore	4 $\frac{1}{4}$ "
Stroke	4 $\frac{3}{4}$ "
Displacement	404 cu. in.
N.A.C.C., H.P.	43.3
Brake H.P.	180 at 2800 R.P.M.
Maximum torque	379 ft. lbs. at 1600 R.P.M.
Compression ratio	8:1
Lb. engine weight / H.P.	4.7 lbs.
H.P. / cu. in. cylinder displacement	0.445 H.P.



FAGEOL TWIN COACH ENGINE

BRAKE HORSEPOWER



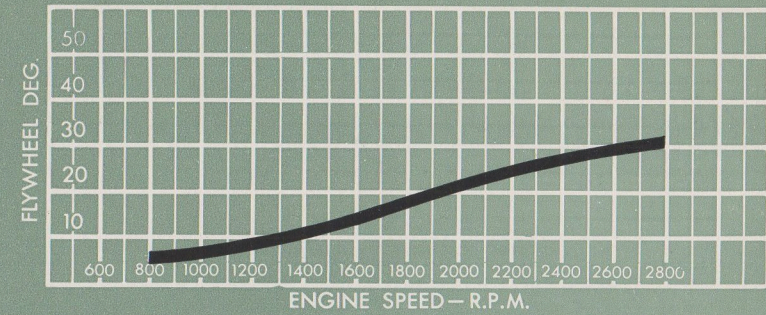
SAE GASOLINE ENGINE TEST

No. Cyl., 6; Bore, 4 $\frac{1}{4}$ "; Stroke, 4 $\frac{3}{4}$ "; Displ., 404 cu. in.; Comp. Ratio, 8:1; Octane No. 80

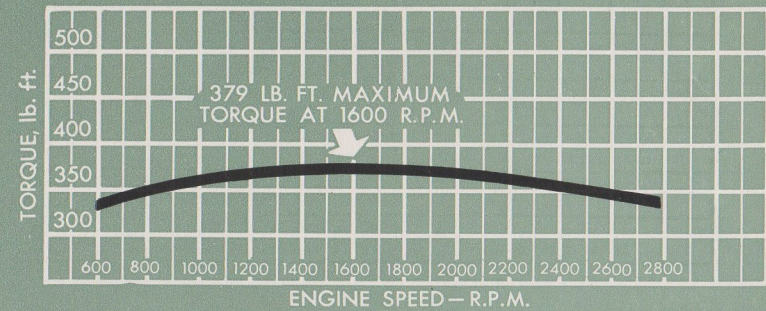
NOTE:

As a result of improved combustion principles, horsepower, torque and fuel economy have increased 30 to 40% over prewar engines.

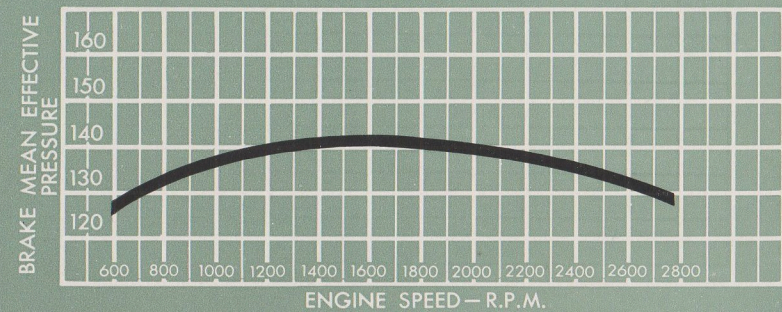
SPARK



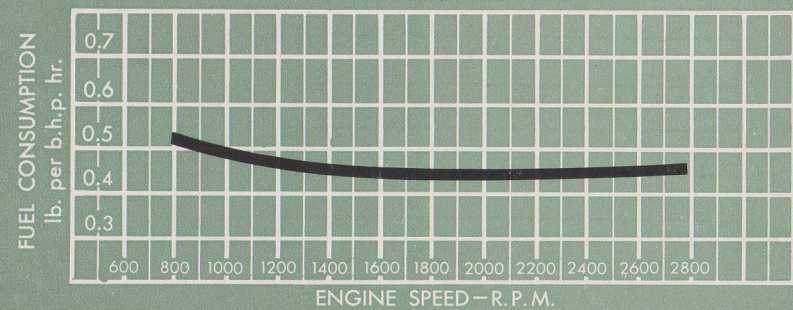
TORQUE



B.M.E.P.



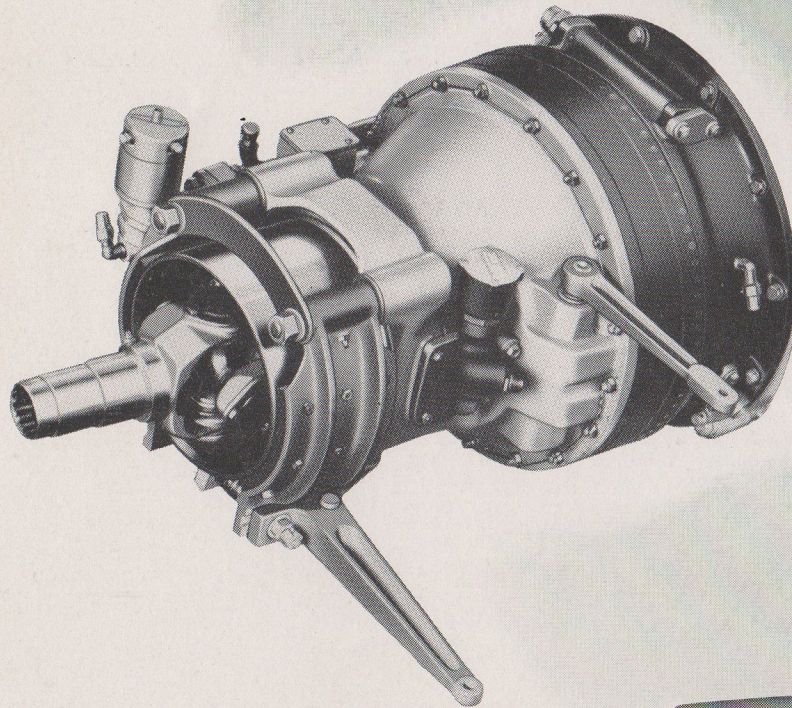
FUEL ECONOMY



AUTOMATIC OPERATION.....

from MATCHED HYDRAULIC TORQUE CONVERSION

One of the major advancements in Twin Coaches is the Twin Coach-Spicer matched hydraulic torque converter. The outstanding performance of the converter is due to the *efficient match between converter and engine.*

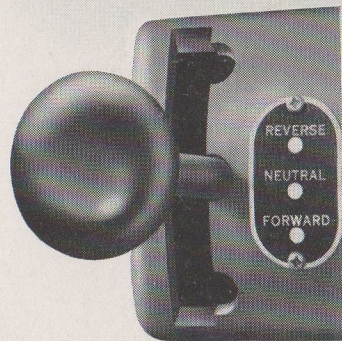


eliminates gear shift

By eliminating the gear shift, the driver is free to concentrate on other phases of coach operation.

For selection of direction of coach movement, the driver has a 3-position selector lever: forward . . . neutral . . . reverse. For forward motion, he makes only an original setting. The lever requires no further adjustment, regardless of stops and starts, until direction of coach travel is reversed.

direction selector



reverse

neutral

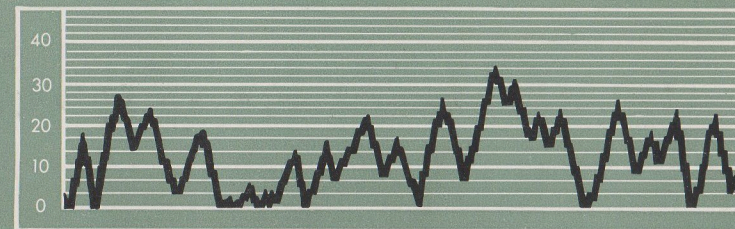
forward

sustains acceleration

Drivers meet schedules easily because there's no lost time in building up speed between stops. Acceleration is both rapid and *sustained*.

After the driver depresses the acceleration pedal, the new Twin Coach gains speed smoothly . . . *automatically*. When a predetermined, governed engine speed is attained, the drive automatically changes from hydraulic to direct drive. During acceleration, the rate of variation of speed is automatically regulated by gradeability requirements. The driver doesn't have to think about controlling amount of throttle to compensate for road conditions.

COACH SPEED—M.P.H.



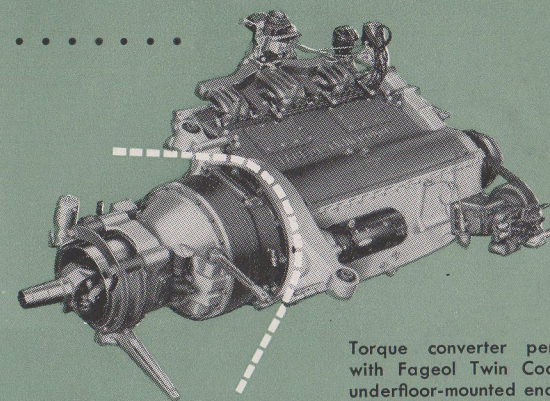
TYPICAL SPEED TIME CURVE

(one mile operation)

reduces schedule time

Since there is no lost time due to dragging along in low gears, operators can reduce schedule time. Twin's rapid acceleration enables operators to cut schedule time from 10 to 15% (whenever traffic conditions permit) without increasing maximum speed.

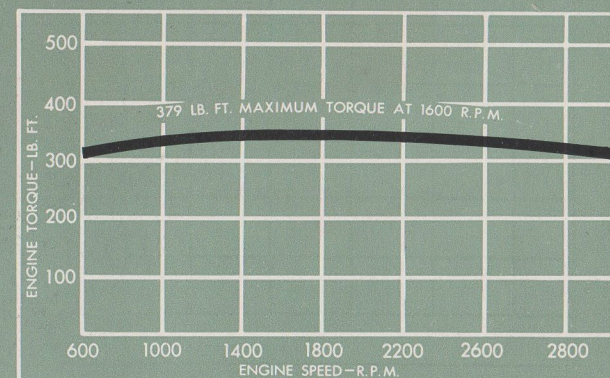
In addition to this improvement in passenger service, it is possible that 9 new Twins will do the work of 10 prewar coaches . . . still maintain scheduled headways . . . and save on lower platform costs.



Torque converter perfectly mates with Fageol Twin Coach 180 H.P. underfloor-mounted engine.

prevents free wheeling

A special device on the converter assures engine compression braking under all conditions of operation when the throttle is released. This naturally increases service brake life and provides an important safety feature to control the coach.



Smooth flow of output power from converter amplifies flat torque characteristics of engine.

PRACTICAL *STYLING*

attracts revenue . . .

and builds civic pride

The new line of Twin Coaches attracts increased revenue with the simplicity and grace of body styling and color schemes. Your passenger public quickly recognizes them as modern equipment that is a part of civic improvement programs.

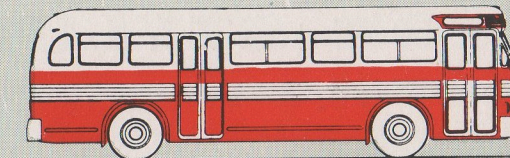
Color and body styling are most effective when they are simple. That's why Twin's modern design attracts so much passenger attention. Letters we receive from operators describe mounting civic pride wherever Twins are used.



Model 41-S Twin Coach

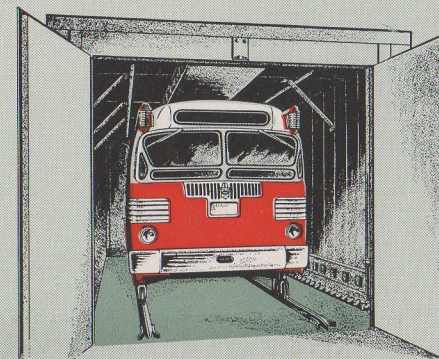
simplified paint design

Twin's beauty has another important purpose: *simplified maintenance*. Notice how the color separates into clean-cut panels for simplified re-painting.



durable finish

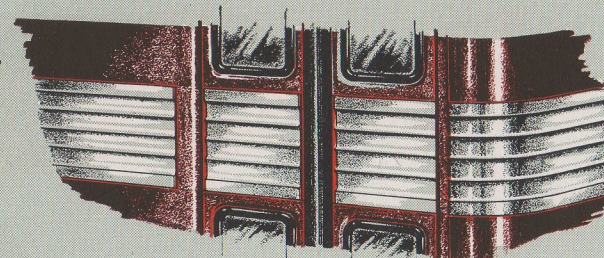
Brilliant, high luster enamels give Twin Coach its sparkling beauty. Protective coats of zinc chromate and finish color coats are bonded to body metal by baking in infra-red circulating ovens.



tarnish-proof aluminum

Attractive satin-finish aluminum trim adds to Twin's color appeal. Notice the striking aluminum belt extrusion. It will always glitter . . . stay bright . . . because it is chemically treated by the aluminizing process.

Bumpers, grille work, window trim—all bright work—stay bright because they are tarnish-proof.

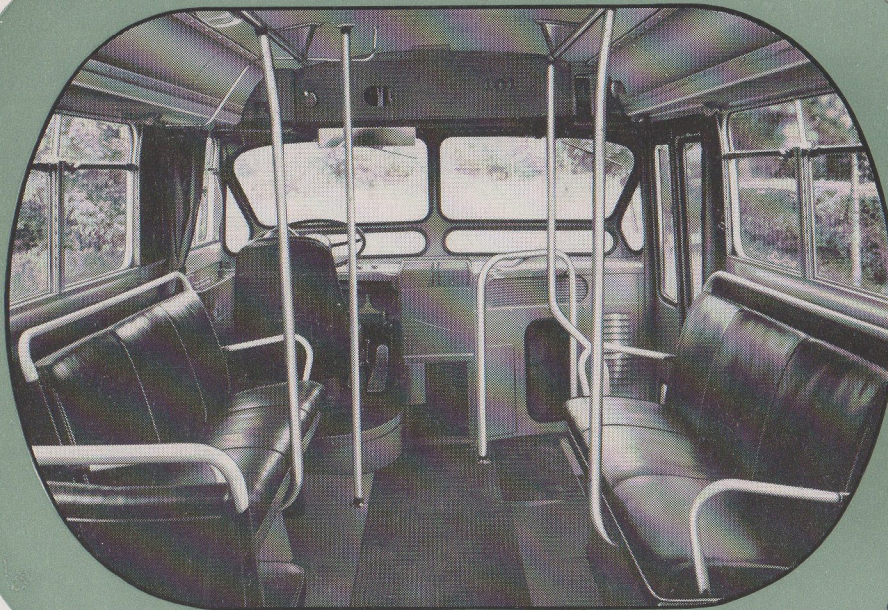


Attractive

INTERIOR STYLING AND APPOINTMENTS

For years, Twin Coach has maintained that public transportation involves far more than merely providing a ride. We believe that transportation service must also include passenger comfort on an ever increasing scale. When the ride is outstanding, your service is recognized and revenues increase.

Twin Coach interior styling and appointments are designed to make your passengers' ride as pleasant as possible.

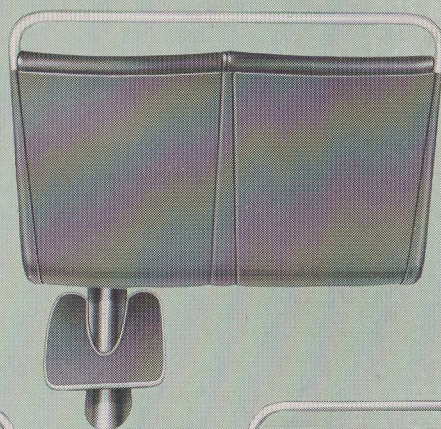




..... comfortable, sturdy seats

We have designed Twin Coach seats for maximum passenger comfort and upkeep convenience in maintaining high standards of floor cleanliness. The outboard end of the 34" seat mounts to the coach sidewall. A combination pedestal-footrest supports the aisle end of the seat.

Notice the unobstructed area beneath the seat for greater foot space . . . and for ease in cleaning the floor. High-grade leather or mohair upholstered cushions are supported by a strong, rigid, pressed and welded sheet steel frame. Metal parts are painted to harmonize with interior color schemes. For convenience and flexibility, the plastic covered top rail is removable.



..... good housekeeping floor

The specially designed floor has a gradual radius to the center aisle of the coach (4" below sidewall floor strip). Paper and debris gradually shift to center of aisle, where they can be swept out in a few seconds.

Standard floor covering is molded-back Rub-Bub* with ribbed aisle tread (plain under seats). There is a cover along the sidewall and around wheel housings to simplify cleaning. And to simplify cleaning still more, you can flush the coach out in a few minutes because the water runs out front or exit doors.

* TRADEMARK REG. BY SAMUEL MOORE & CO.



greater standee vision

Higher side windows and a specially designed windshield increase standee vision to 62" forward and to the sides. Complete details on the construction of the front windshield appear on page 33; details of the side windows are on page 41.

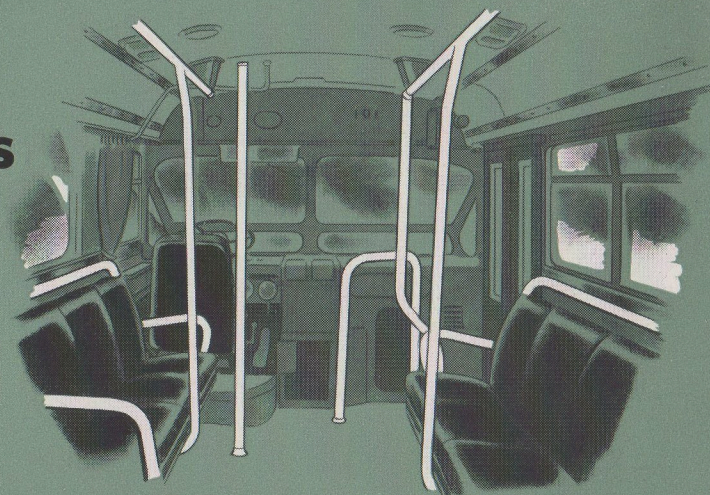
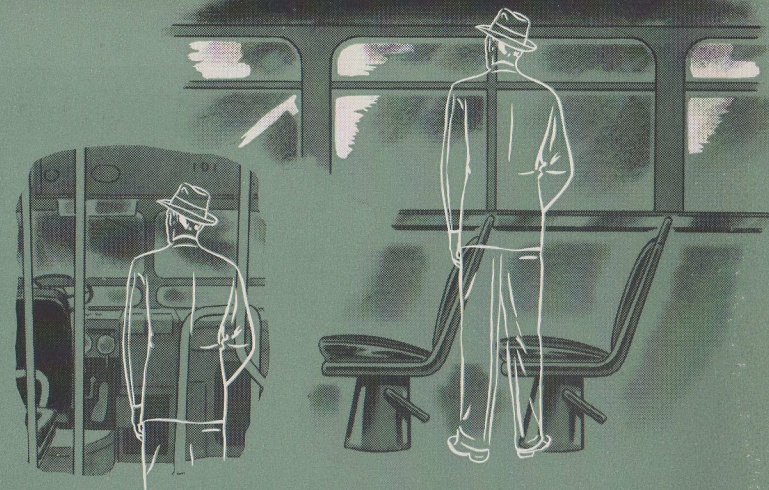
colorful stanchions and grab rails

Rub-Bub plastic coated tubing is used for stanchions and grab rails. Optional colors harmonize with the coach's interior trim. Stainless steel stanchions are optional.

lower noise level

In order to provide a quieter, more comfortable ride, we have made the interior of Twin Coaches as quiet as the average private car.

A major reduction in noise level has been accomplished through the use of sound-proof roof panels . . . rattle-proof doors and windows . . . squeakless springs . . . fireproof plywood flooring to deaden engine noise . . . and by eliminating incidental metal resonance.



uniform heating and ventilation

The heating and ventilating system in Twin Coaches assures complete passenger comfort, regardless of weather conditions. During cold weather there is an abundant supply of continuously circulating no-draft warm and fresh air.

Twin Coaches are free of nauseous fumes because fumes are eliminated at the source. A special Fageol DeGasser* unit on the engine makes it impossible for rich gasoline mixtures to build up during coach deceleration periods.

This cutaway view of a 41-passenger Twin Coach clearly shows

how warm and fresh air circulate. Fresh air enters the coach through louvers on both sides of the destination sign and is forced back through coach body.

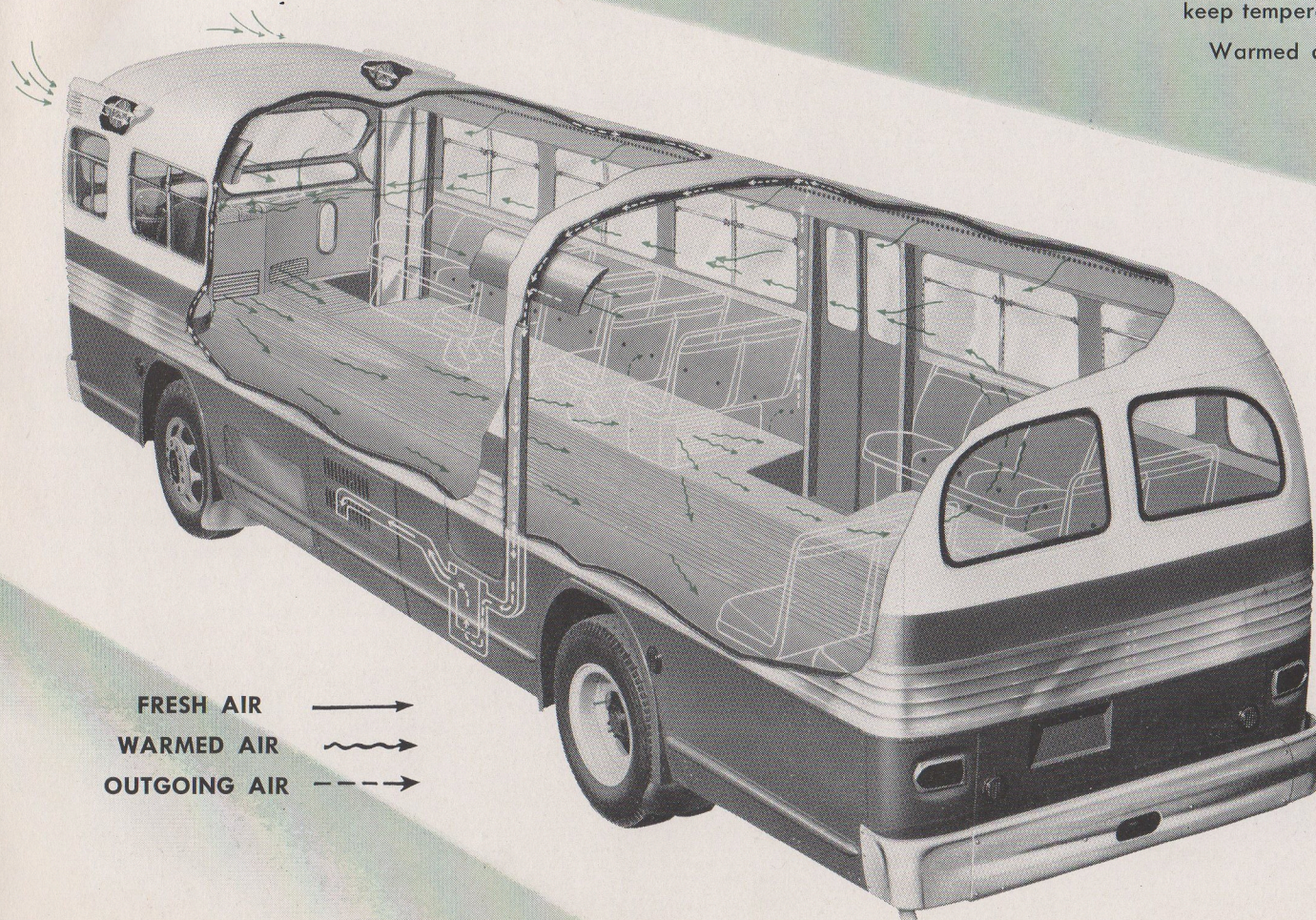
The air is then drawn forward into heaters at forward end of coach. Warmed air from the heater is then dispersed throughout the coach. A separate vent in the heater warms the driver's compartment.

A booster heater (amidships in the coach) reinforces warmed air circulation for rear of coach area. Again, there is full dispersal to keep temperatures uniform.

Warmed air flows upward at rear of coach, following body contours. Then it mixes with incoming air and repeats heating cycle.

Air is continuously drawn out of the coach by engine suction through small perforations in side walls. The Fageol Twin Coach engine draws air from a tube that connects to an air filter. Another tube connects the filter to the space between inside and outside body panels. Thus, the engine draws air out of the coach through side panels, into the top of the coach, then through an air filter into the carburetor.

Heaters have individual switches on the driver's control panel and are thermostatically controlled.



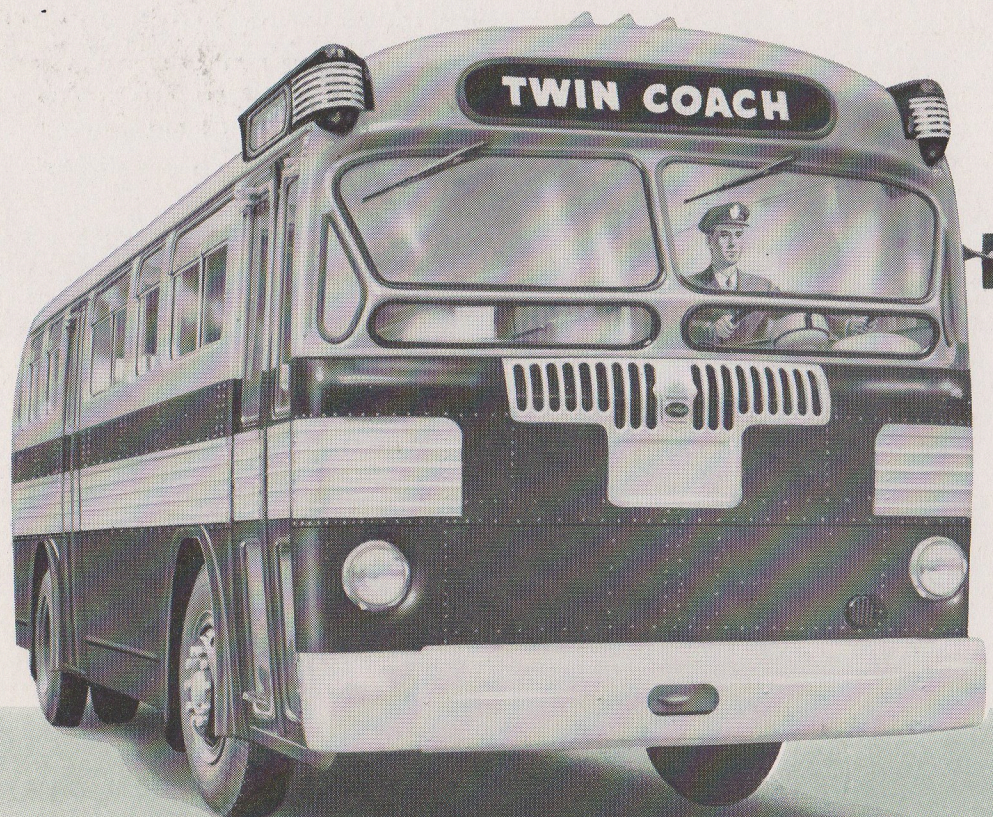
FRESH AIR ———→
WARMED AIR ~~~~~→
OUTGOING AIR - - - - -→

*TRADEMARK REG. BY R. D. FAGEOL CO.

5 standard models

34-S	34-passenger	}	180 H.P. (single engine)
38-S	37-passenger		
41-S	40-passenger		
44-S	44-passenger		
44-D	44-passenger	}	360 H.P. (dual engines)

Seating capacities indicated are for coaches with an exit door.



The new line of Twin Coaches meets the requirements for every type of operation. Models 34-S and 38-S are single engine coaches designed for average operating conditions, and for light or feeder line service. The 41-S and 44-S models are designed for service on heavy lines . . . but due to their economy of operation, you can afford to carry extra seats around during off-peak periods in order to meet the heavier demands of peak-load hours.

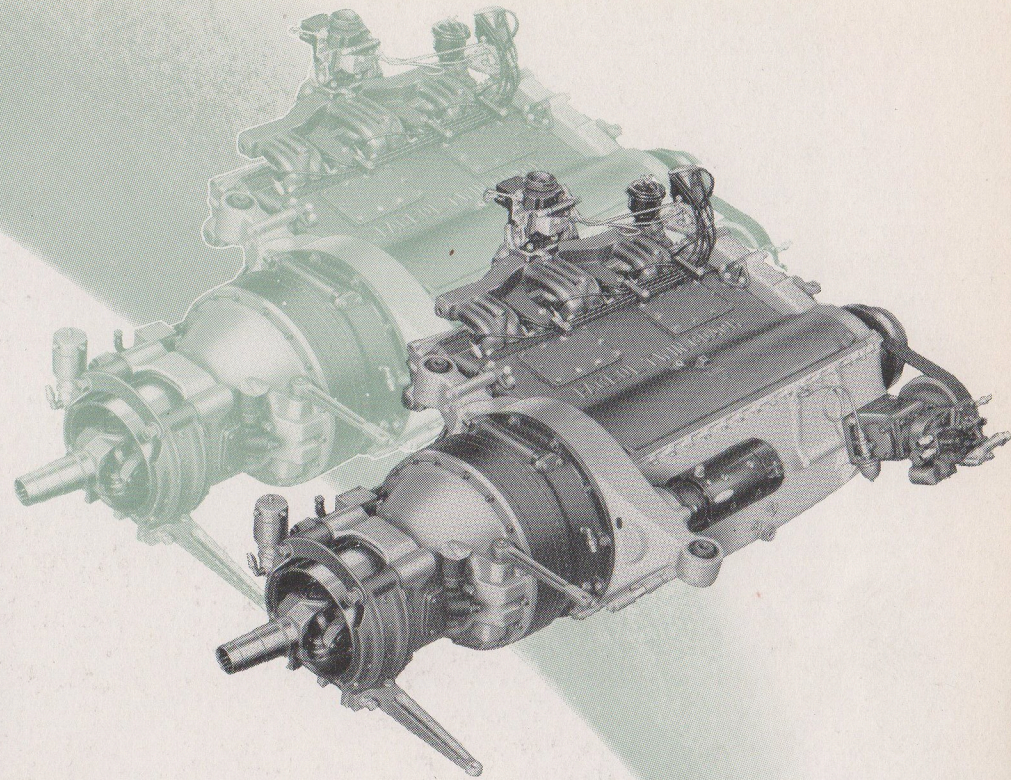
Extensive accelerometer tests and actual operation on all types of properties have proved that a single engine Twin Coach with its matched torque converter has unequalled acceleration and hill performance. We recommend the single engine Twin for all operations where traffic and other conditions make it impossible to take advantage of higher schedule speeds.

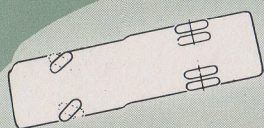
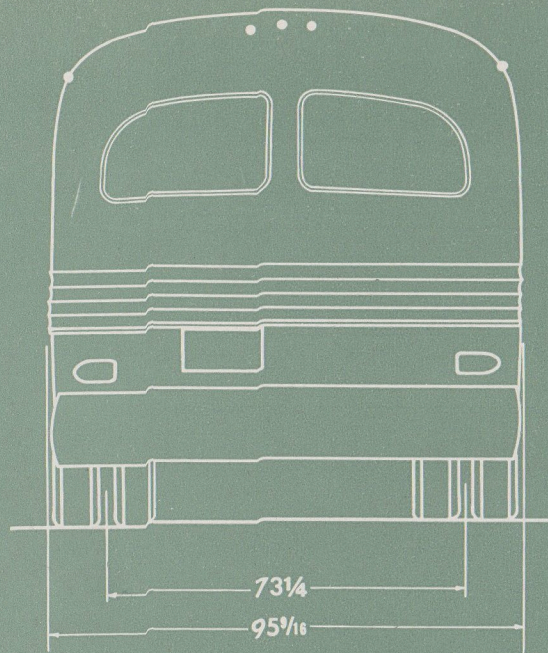
Powerful dual engine models have double the horsepower for fast moving freeway routes . . . and for hilly, difficult runs. Operators agree that their performance is so outstanding there is no standard of comparison.

STANDARDIZED CONSTRUCTION

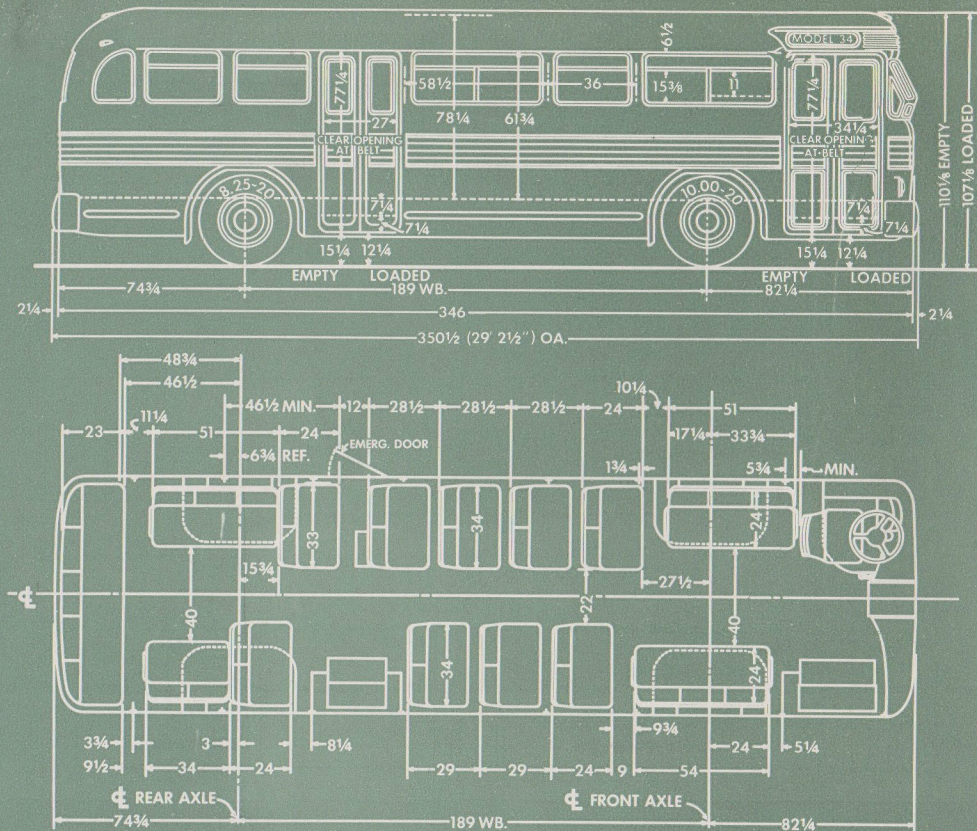
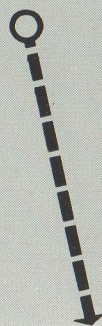
All five standard Twin Coach models are powered by the same standard 180 H.P. Fageol Twin Coach engine. *There is complete interchangeability of engines.*

Standardized, precision formed construction also simplifies replacement parts inventories. Body extrusions (carlines, chassis trusses, window sash, door frames, bumpers, etc.) and stampings are fully interchangeable between models.





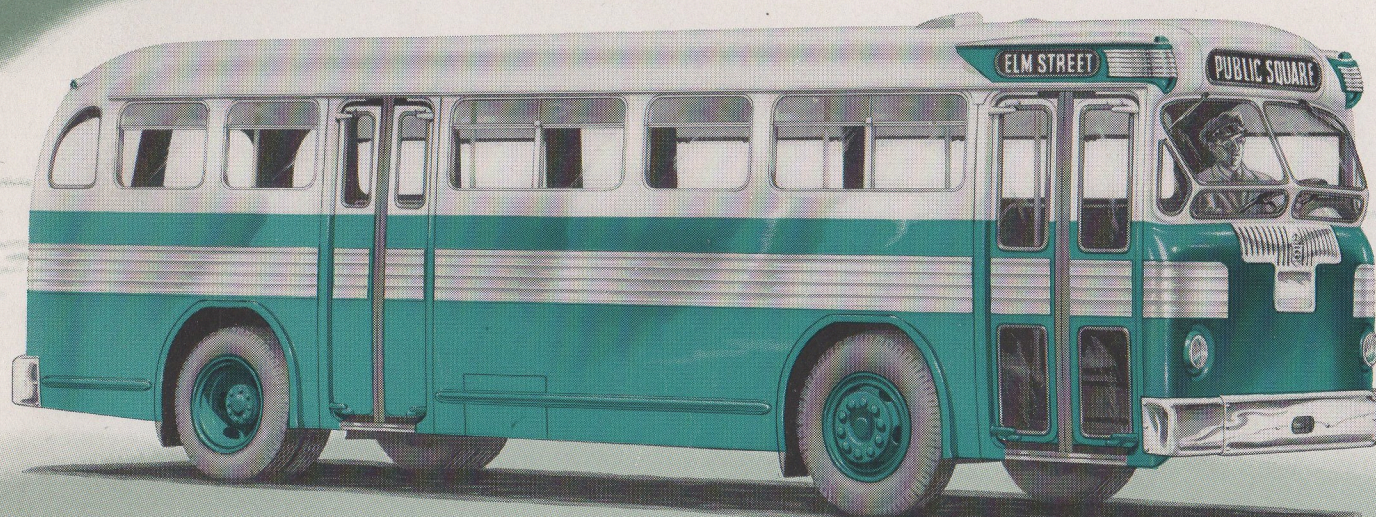
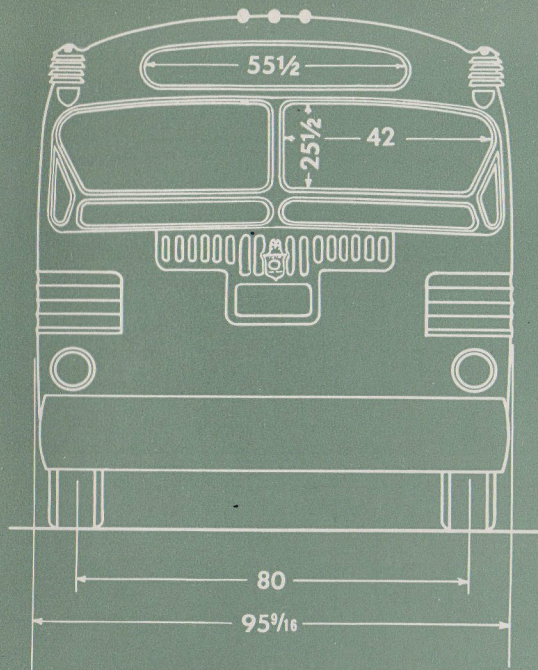
TURNING RADIUS
35' 5"

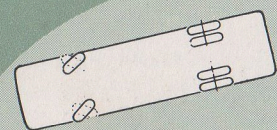
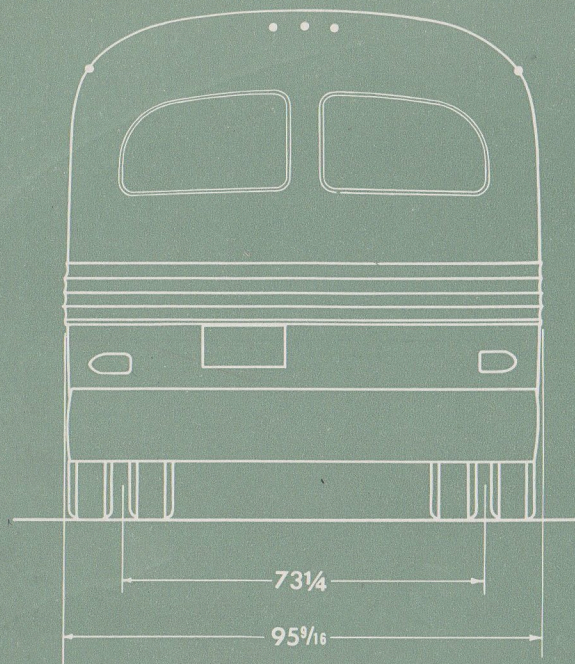


MODEL 34-S

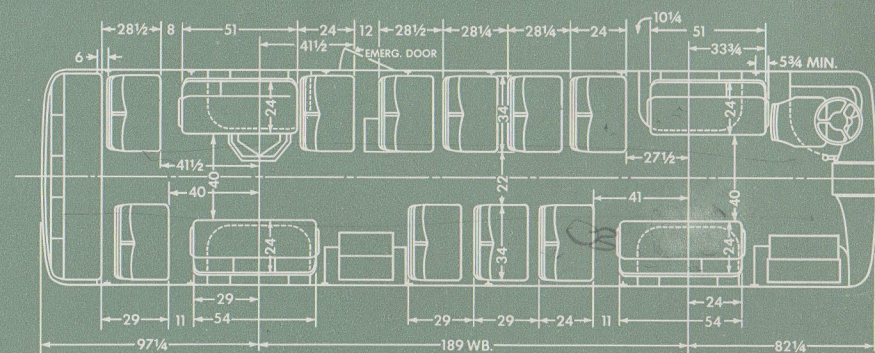
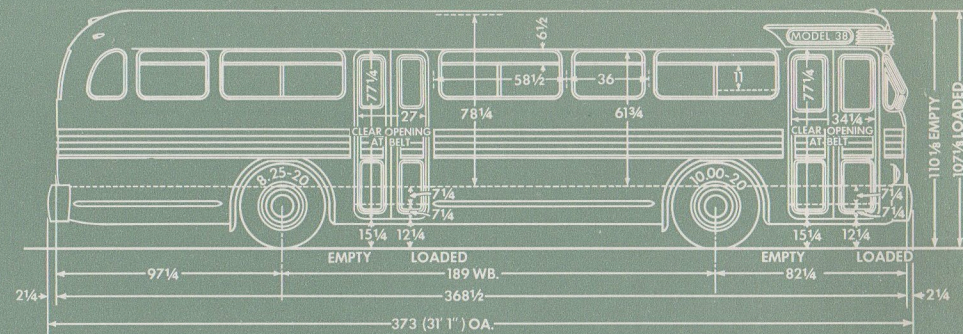
34 passengers

Unladen Weight	12,210 lbs.
Power Output	180 H.P.
Weight per Horsepower	67.8 lbs.





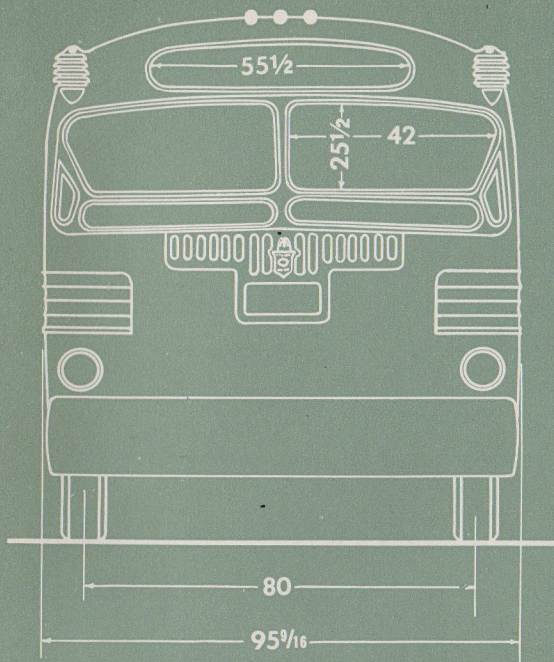
TURNING RADIUS
35' 5"



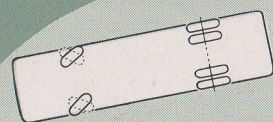
MODEL 38-S

37 passengers

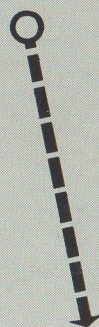
Unladen Weight.	12,880 lbs.
Power Output	180 H.P.
Weight per Horsepower	71.5 lbs.





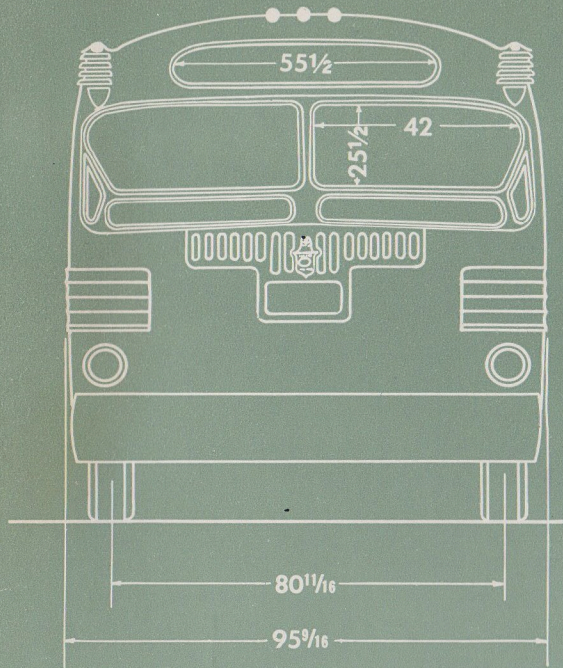


TURNING RADIUS
39' 11"



44 passengers

	44-S	44-D
Unladen Weight.	14,300 lbs.	16,000 lbs.
Power Output	180 H.P.	360 H.P.
Weight per Horsepower	79.4 lbs.	44.4 lbs.



FORWARD BODY FEATURES



construction

All aluminum alloy construction used throughout Twin Coaches is similar to aircraft design. It eliminates excessive dead weight . . . increases fuel economy . . . lowers maintenance costs . . . and improves coach handling characteristics and performance.

Twin's semi-monocoque construction distributes operational stresses between body panels and structural members. This type of design improves weight economy without sacrificing important strength standards for safety.

Aluminum alloy extrusions are used extensively throughout the coach to assure a maximum factor of safety at all critical points.

As a result of mass production, precision tooling methods, there is complete interchangeability of parts between all models, regardless of passenger capacity. Operators can repair damaged coaches in an unbelievably short time. Replacement parts stocks are simplified and smaller.

The channel-type bumpers are constructed of strong heat-treated aluminum alloy. They are backed up with spring steel to increase strength and cushion coach body against shocks.

wide-angle vision windshield

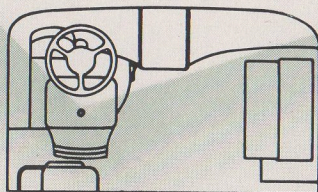


Twin's new type of windshield assures two distinct types of vision. The upper windshield provides full driving vision, including comfortable driver's vision of traffic lights. The lower windshield gives safer vision of pedestrians.

We designed the windshield with an outward angle in order to locate the steering wheel farther forward . . . to increase the driver's vision downward at much closer range. And to take full advantage of this design, we mounted the driver's seat on a raised platform to increase pedestrian vision still more.

The two smaller panels greatly increase side vision.

All glass mounts in molded leak-proof rubber. Two independent windshield wipers—with individual controls—and an efficient defroster assure safe vision in inclement weather. With individual controls, the wipers may be compensated for variables, such as resistance due to wind direction and unequal snow accumulation.



improved driver's compartment



Due to elimination of gear shift, driver has only throttle and brake pedals to operate. The small converter direction lever is located at the right of the wheel. Driver's hands are free at all times to control movement of coach. In addition to full visibility to the front, sides and rear, we have provided greater convenience and comfort for the driver.

Steering wheel-instruments-electrical controls—The curved steering post design slants the wheel at a restful driving angle. Aircraft-type indirectly lighted instruments are placed to the left of the steering wheel for clearer visibility. Electrical controls are installed on a panel to the driver's left, within easy reach, in a position that doesn't interfere with handling the coach.

Seat—Mounted on a raised platform for better all-around vision, the driver's seat is exceptionally well shaped. There are seven individual adjustments to suit any driver's needs.

Locker—We have provided a roomy (5" x 25" x 20") driver's locker immediately below the electrical control panel at the left. It accommodates the driver's coat, lunch box and items of equipment.

Ventilation-heating—For comfort in cold weather, the driver has a separate hot air outlet from the forward heater. In warm weather, an individual air vent supplies him with cool fresh air.

Working shelf—The working shelf to the right of the driver's position is available for change trays, packages, etc. A built-in fire axe and extinguisher case is located in the front housing to the right of his compartment.

Fare box—There is solid mounting for all types of fare boxes, with plug-in type receptacles for lighting and power.

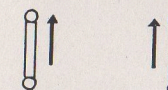
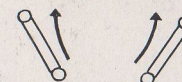
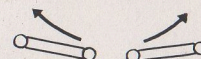
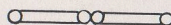
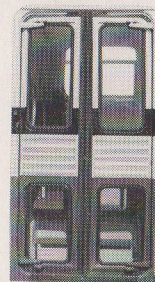
Mirrors—Three conveniently placed rear-vision mirrors assure full vision of coach interior, door stepwells and exterior of left-hand side of coach.



DOOR IMPROVEMENTS

here's how the offset hinge works

Door movement is crosswise and back . . . doors open with inside panel out . . . operation is smooth and noiseless.



Doors that open to a billion dollar annual business have to be good. Passengers pass through them coming and going. So, there's a double opportunity to create profitable impressions.

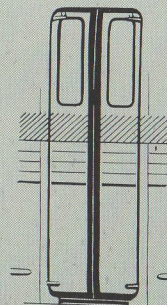
Doors affect many elements of coach operation—safety . . . maintenance . . . appearance . . . even comfort. In Twin Coaches, a new type of hinge accounts for 10 improvements.



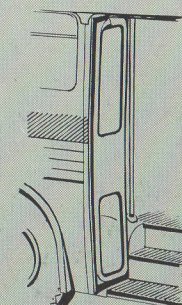
DIRT-FREE SURFACE . . . Clean side is passenger side when open. Prevents soiled clothes from water and dirt on external panels.



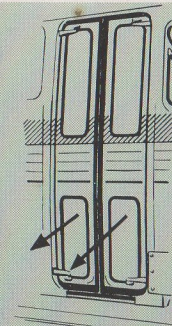
3 COMFORTABLE STEPS . . . New type door hinging makes possible 3 comfortable steps at front and rear doors.



RATTLE-PROOF . . . All-around rubber eliminates rattles. Helps give quiet, private car ride.



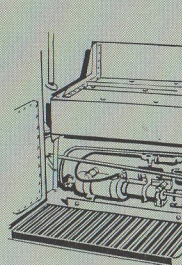
INWARD OPENING . . . Doors don't project beyond edge of coach. Fewer damaged doors . . . lower maintenance cost.



DRIVER VISION . . . Large glass panels give driver wide, clear vision at loading zone.



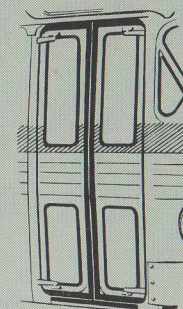
PASSENGER SAFETY . . . Doors fold away from both incoming and outgoing passengers.



ACCESSIBLE DOOR ENGINE . . . Conveniently mounted behind middle step. Hinged step for quick maintenance.



SIMPLE CONSTRUCTION . . . Upper and lower panels made from identical stampings. Easy maintenance.



IMPROVED APPEARANCE . . . Simplified two-panel construction blends with over-all coach beauty.



DOOR CLEARANCE . . . Curved panel construction increases doorway area.

LOWER BODY FEATURES

construction

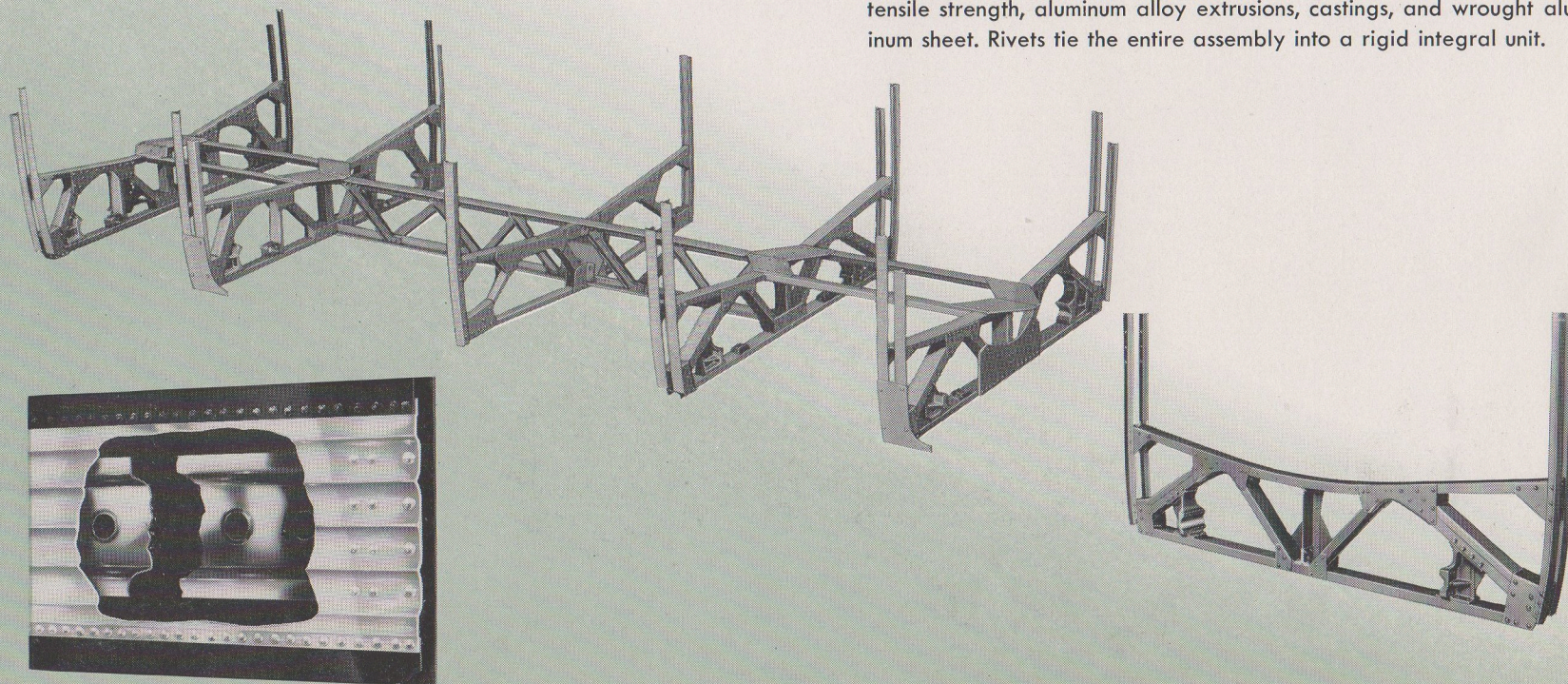
Through the use of semi-monocoque aluminum alloy construction, axle loading is distributed throughout the entire body structure.

At the front and rear of each axle there is a fabricated aluminum alloy transverse truss member. Between the axles there are similar trusses, as required, to strengthen the body of larger coach models.

These trusses are joined together with a longitudinal deep fabricated truss that extends between axles. All transverse trusses connect to the strong aluminum belt extrusion by means of Tee shaped extrusions.

The belt extrusion, combined with its reinforcing inside channel, provides excellent collision protection at seat level to passengers.

The entire lower body structure is composed of heat treated, high tensile strength, aluminum alloy extrusions, castings, and wrought aluminum sheet. Rivets tie the entire assembly into a rigid integral unit.

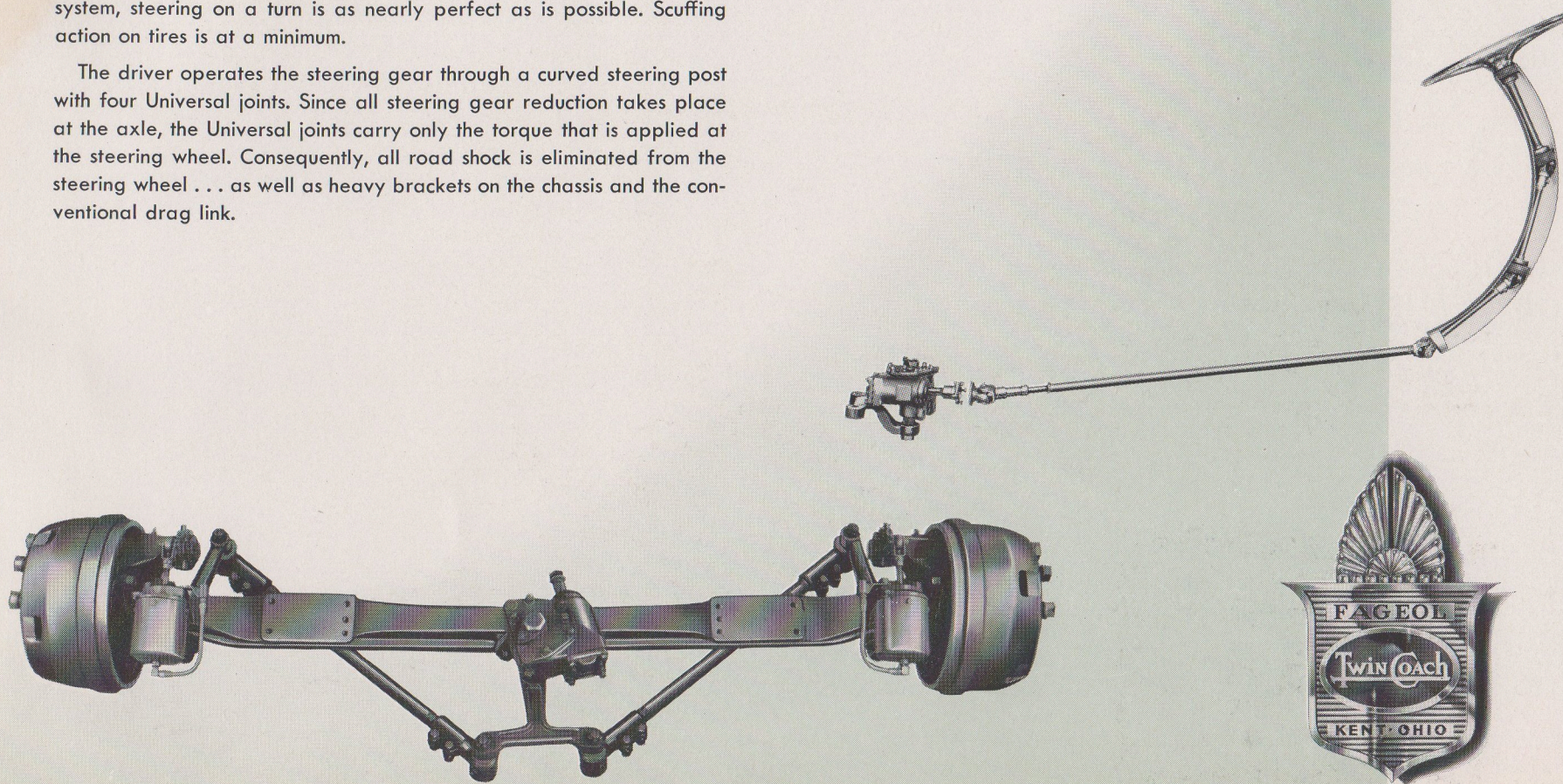


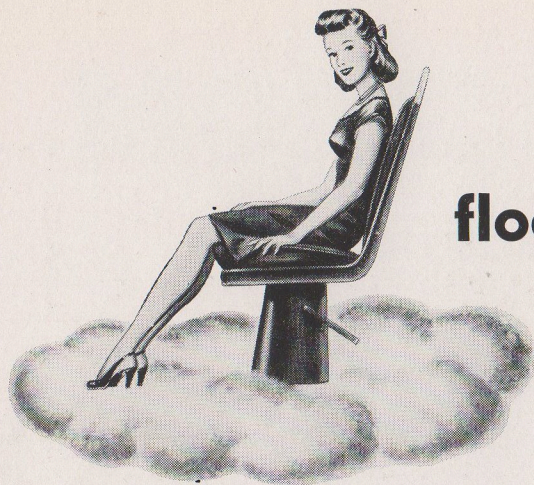
axle-mounted steering gear

Elimination of road shock from the steering wheel . . . and placement of the wheel closer to the front of the coach—these are the results of Twin's axle-mounted steering gear.

The steering gear mounts directly on the center beam of the front axle. Tie rods connect to a Tee shaped Pitman arm on the steering mechanism. Due to the angularity of the tie rods and the general geometry of the system, steering on a turn is as nearly perfect as is possible. Scuffing action on tires is at a minimum.

The driver operates the steering gear through a curved steering post with four Universal joints. Since all steering gear reduction takes place at the axle, the Universal joints carry only the torque that is applied at the steering wheel. Consequently, all road shock is eliminated from the steering wheel . . . as well as heavy brackets on the chassis and the conventional drag link.





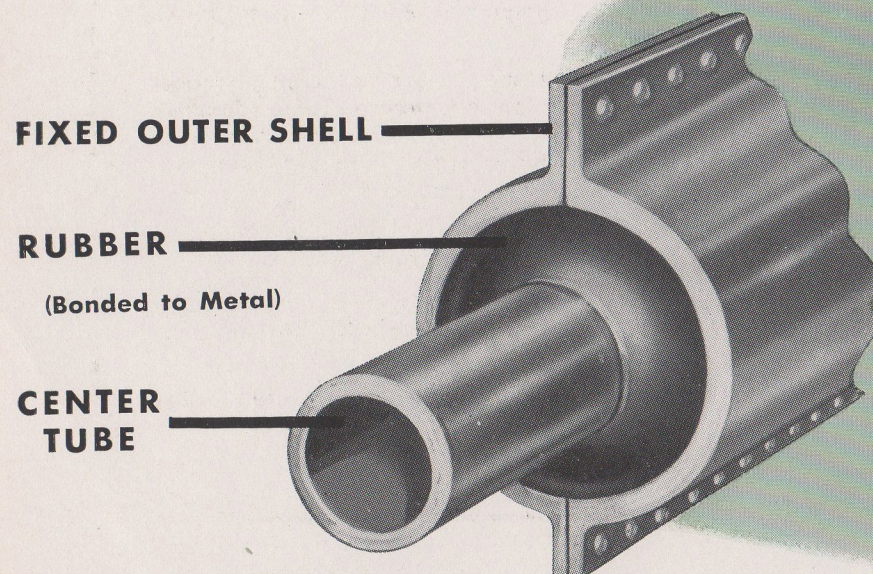
floating rubber suspension

One of the outstanding features of modern Twin Coaches is TORSILASTIC RUBBER SPRING SUSPENSION—another major coach improvement.

This new method of coach suspension raises passenger comfort to a higher level, comparable to private car riding comfort. It eliminates squeaks and rattles . . . provides a soft, elastic ride.

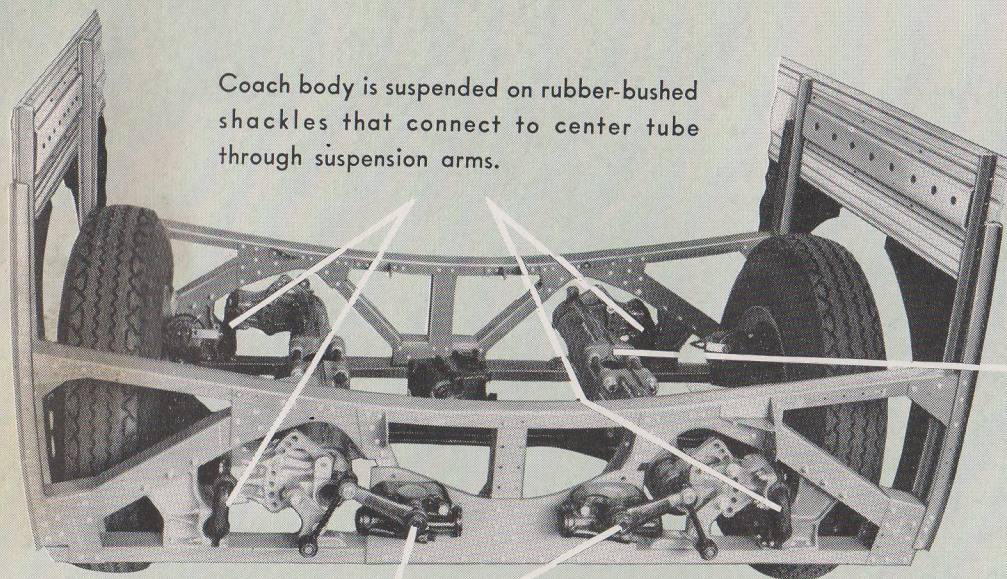
Torsilastic rubber springing requires no lubrication . . . greatly increases normal life expectancy over conventional suspension systems. Maintenance cost drops because there is no wearing action from dirt, water or mud.

Improved spring suspension is one of many Twin Coach features that increase rider appeal and cut your maintenance expense.



simple, easy-to-understand principle

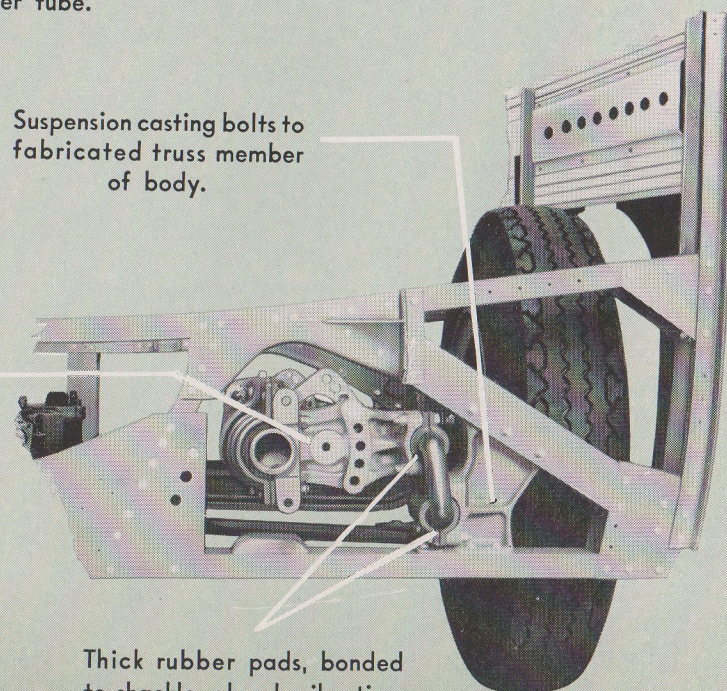
Torsilastic rubber springing uses rubber as a torsion member. It consists of a steel center tube enclosed in a steel shell with rubber between them, bonded to the metal. The outer shell remains fixed (it bolts to axle), while the center tube turns (torsion) slightly due to weight exerted by the coach. Springing takes place through the flowing movement of rubber.



Coach body is suspended on rubber-bushed shackles that connect to center tube through suspension arms.

Outer shell remains fixed ... bolts to axle.

Shock absorbers dampen motion of center tube.



Suspension casting bolts to fabricated truss member of body.

End-on view (shock absorber removed) shows suspension arm that transmits body movement to center tube.

Thick rubber pads, bonded to shackle, absorb vibration.

ADVANTAGES OF TORSILASTIC RUBBER SPRINGING

Entire chassis floats in a rubber cushion. Rubber-bushed shackles create a hammock effect ... permit coach to float slightly in all directions.

Body has greater resistance to roll and sway than is possible with any other suspension method of the same spring rate.

Rubber absorbs vibration and road shock that normally telegraphs to the body.

Completely eliminates spring lubrication.

Provides longer life because rubber has greater capacity for overloading. Also, there is no abrasion, rusting or wearing action from dirt, road salt, water or mud.

Lowers noise level and eliminates squeaks and rattles.

Eliminates danger of sudden failure always present with conventional springs.

Utilizes clean, lightweight, simple design.

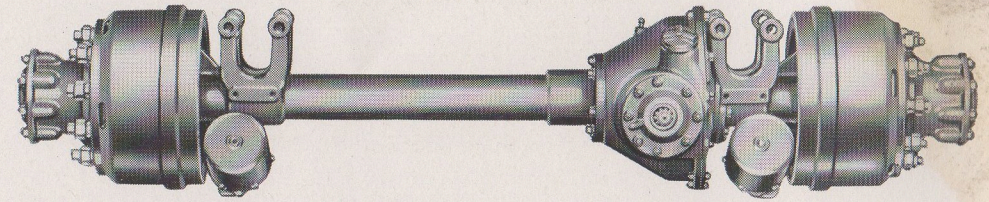
efficient power application

Power from the hydraulic torque converter is applied to the rear axle with minimum drive shaft angularity. Due to the in-line location of the torque converter, the maximum angularity under normal conditions is only 2° .

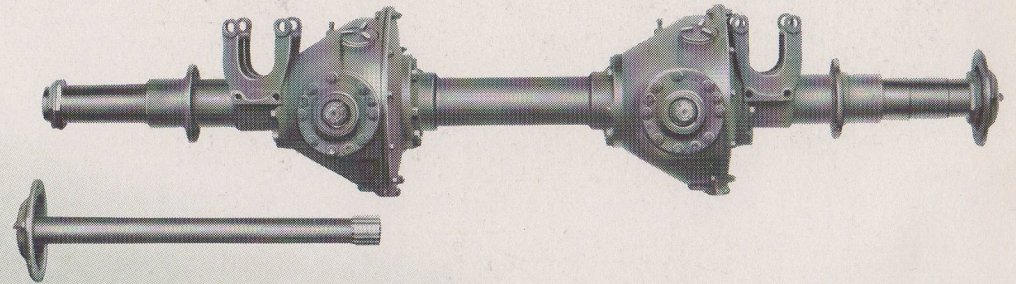
Axles are forged from high grade steel. Hubs are made of malleable iron.

In coaches using a single engine, the single bowl rear axle (with differential in bowl) is used. Dual engine coaches employ dual bowl rear axles, with each engine driving a rear wheel separately. Differential is eliminated.

To assure fleet owners maximum interchangeability of axle parts, the dual bowl axle consists of essentially the same standard parts used in the single bowl axle. Heavy-duty, full-floating hypoid gears are used in all axle bowls.



Single engine Twin Coach rear axle.

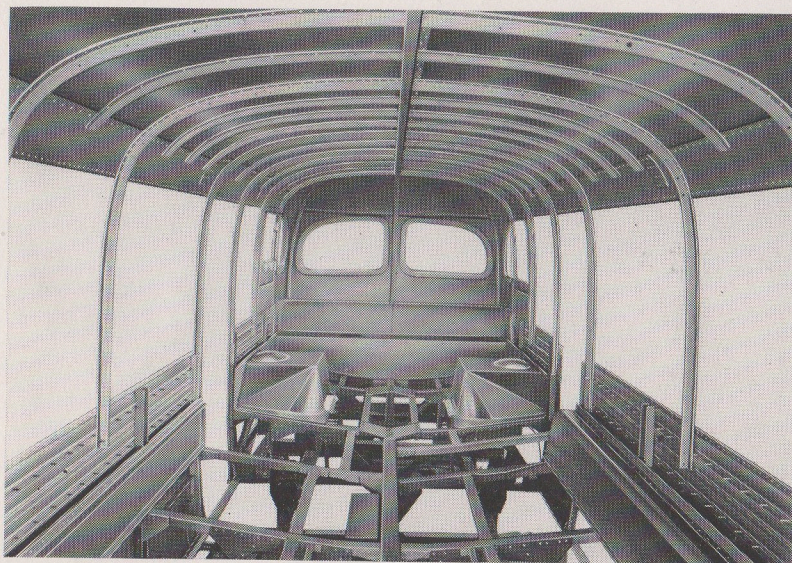


Dual engine Twin Coach rear axle.

UPPER AND REAR BODY FEATURES

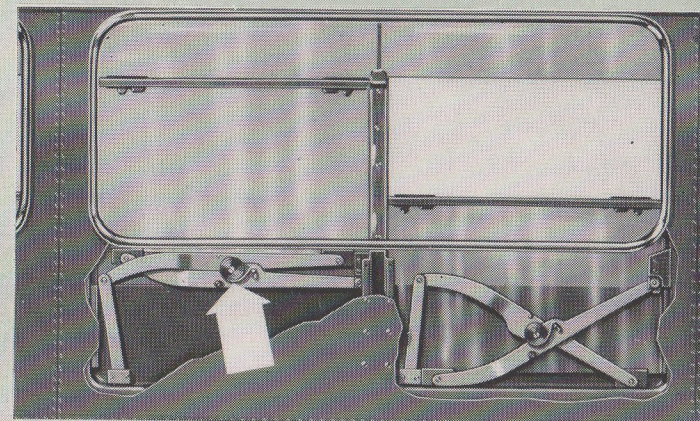
construction

High tensile strength, heat-treated, extruded aluminum alloy carlines form the basic upper body structure. These carlines are spaced and braced by large header plates and one piece window stampings which extend from the top of the lower belt rail (at automotive bumper level) to the top of the roof panel assembly. Carline extrusions have large radii for rigidity in the upper structure.



improved rear vision

Windows in the rear of Twin Coaches have two unusually large laminated sheet safety-glass panels. Driver vision to the rear is extremely wide angle.



easy movement, positive latching side windows

Twin's special design for side windows assures positive latching . . . easy movement . . . permanent alignment . . . minimum maintenance cost.

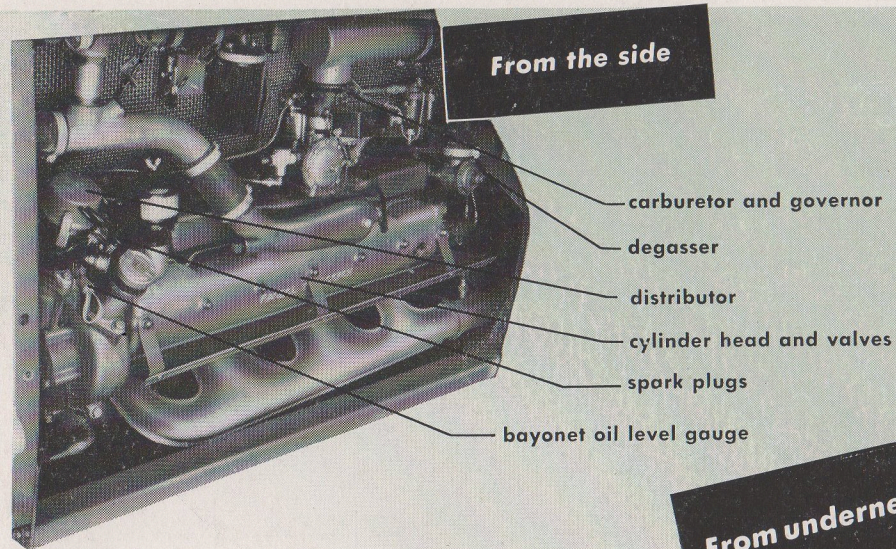
The balanced windows are drop-type, actuated by Twin's simplified spring loaded mechanism. A fixed panel forms the upper part of the window. The movable lower panel is unframed, with an extruded aluminum latch rail at the top which engages stainless steel racks in the frame.

As a result of careful designing, the window mechanism has long life . . . freedom from rattles . . . and ease of maintenance. Expensive, unsightly exterior window guard rails are eliminated with drop-type windows.

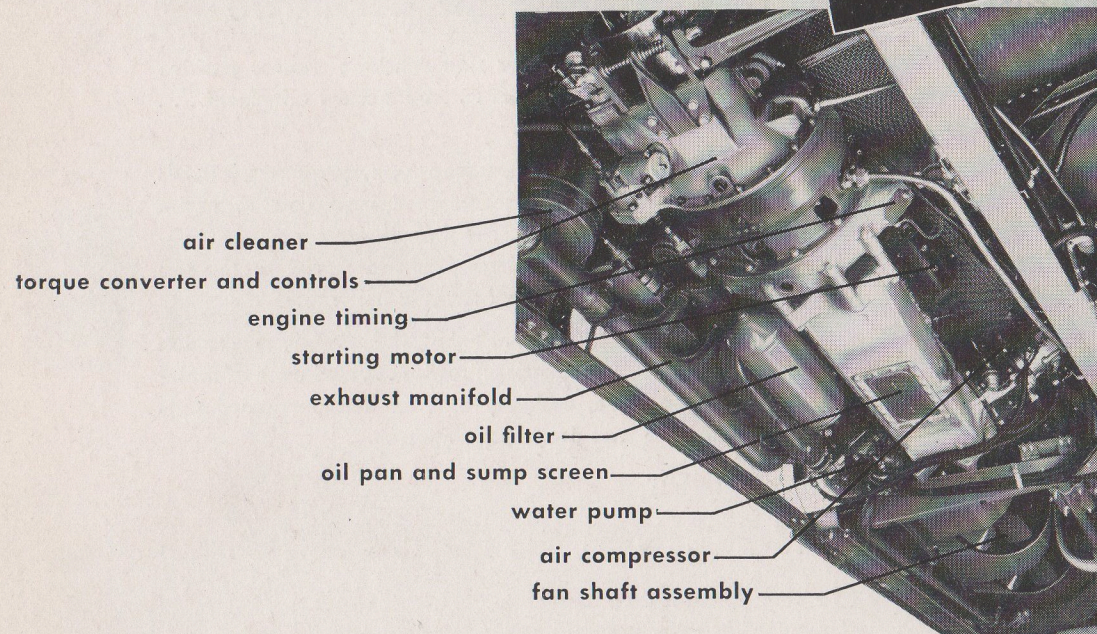
effective drip ledge

To provide protection for passengers from water running off the roof in rainy weather, we employ an effective drip ledge. It is a trough section that runs continuously along the coach side directly above windows and over door openings.

EASY MAINTENANCE OF



From underneath



engine accessibility

Fageol Twin Coach engine accessibility reduces shop time . . . cuts service costs . . . and increases the monthly revenue mileage of Twin Coaches. Underfloor-mounted, this efficient engine is easily serviced from the side and from under the coach.

A hinged engine compartment door exposes points of routine checkup, such as carburetor, distributor, etc. And for easy beneath-the-coach maintenance, filters, pumps, air compressor and fan shaft drive are readily accessible—and removable—without obstructions.

The photographs at the left show how easily points of routine maintenance may be serviced.

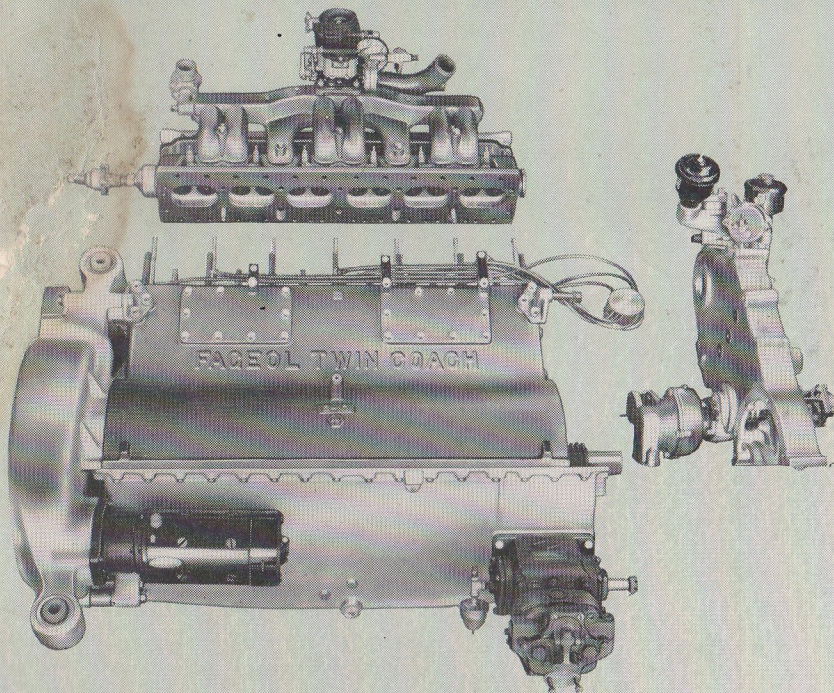
air system

A Bendix-Westinghouse air compressor mounts directly on the crankcase. It is automatically lubricated by the engine lubrication system . . . automatically cooled by the engine cooling system.

fuel pump

The fuel pump is located in the bottom of the rear-mounted 80 to 125 gallon gasoline tank. For routine inspection and service operations, the pump can be removed easily through top of the tank.

ENGINE AND AUXILIARIES



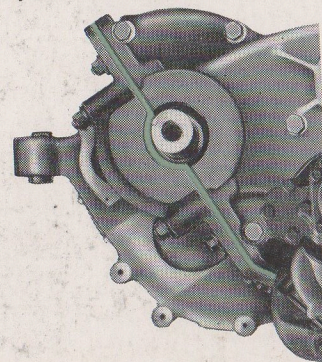
valve-in-head construction

The Fageol Twin Coach 180 H.P. engine consists of three basic units: cylinder head; engine block; chain housing. Although there is seldom, if ever, a need to remove the bell housing, it can be removed easily from the block also.

When mounted in Twin Coaches, the engine's cylinders are inclined 10 degrees from horizontal. And since valves are in the head, this reduces maintenance operations to a few hours time. The removable head is quickly replaced (from the side of the coach) with a spare head when valve grinding becomes necessary. With the head and oil pan removed, mechanics rapidly replace rings, pistons, hand-removable cylinder sleeves and bearings.

oil pan

The oil pan bolts to the crankcase at an angle which facilitates its removal for inspection of main bearings. A separate removable cover plate over the sump screen enables mechanics to clean the screen without removing the oil pan.



battery

An oversize battery mounts amidships on a sliding tray on the right side of the coach. A hinged door with snap latch simplifies battery service.

PLANNED MAINTENANCE INSTRUCTION



As part of its over-all service program for operators, Twin Coach Company conducts an intensified Planned Maintenance School at the Kent, Ohio, plant. This five day course of instruction gives an operator's key maintenance personnel a complete understanding of the maintenance program recommended by Twin Coach.

Conducted by the service department, the course includes general construction of the coach in addition to normal maintenance features. Classroom instruction, combined with shop work on cutaway models, covers the FTC 180 engine, matched hydraulic torque converter, rear and front axles, Torsilastic rubber spring suspension, steering gear assembly, air and electrical systems and coach body construction.

Complete information on the school will be forwarded to any transit operator upon request. Just write, requesting a copy of Booklet 4000, "Twin Coach Planned Maintenance School."



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CANADIAN DIVISION

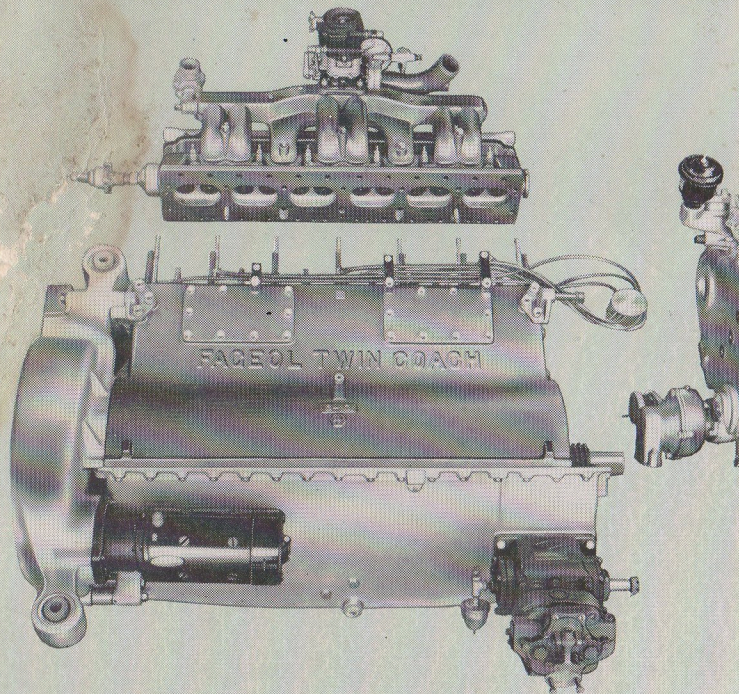
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Kent, Ohio

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ENGINE AND AUXILIAR



valve-in-head construction

The Fageol Twin Coach 180 H.P. engine consists of basic units: cylinder head; engine block; chain hoist. Although there is seldom, if ever, a need to remove the head, it can be removed easily from the block also.

When mounted in Twin Coaches, the engine's cylinders are inclined 10 degrees from horizontal. And since the valves are in the head, this reduces maintenance operation to a few hours time. The removable head is quickly reattached (from the side of the coach) with a spare head when grinding becomes necessary. With the head and cylinder removed, mechanics rapidly replace rings, pistons, removable cylinder sleeves and bearings.

TWIN COACHES

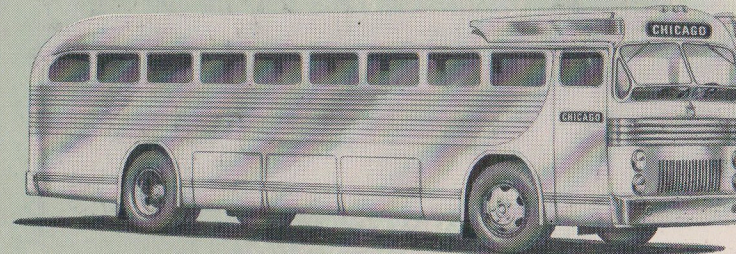
...for every type of transit service



Super Twin



Trolley Coach



43-B

Highway Luxury Liner

In addition to the six standard models described in this booklet, Twin Coach also manufactures Super Twins and Trolley Coaches for urban service.

For intercity operations, Twin Coach produces Highway Luxury Liners.

All Twin Coach equipment utilizes the same construction and mechanical features which this booklet describes. Super Twins and Intercity Highway Luxury Liners are powered with dual Fageol Twin Coach engines that develop 360 H.P. Together, these engines double the power output of prewar power plants without increasing engine weight. Matched hydraulic torque converters eliminate gear shifting and provide smooth, sustained acceleration.



TWIN COACH COMPANY
KENT, OHIO

.....

Plants at Kent and Buffalo

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