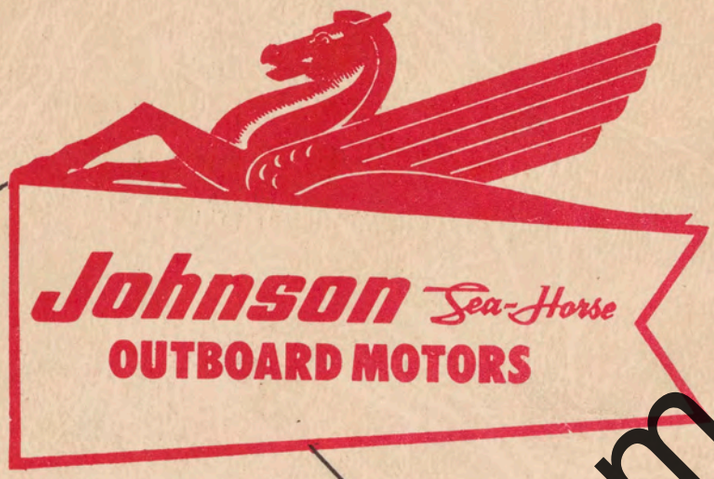
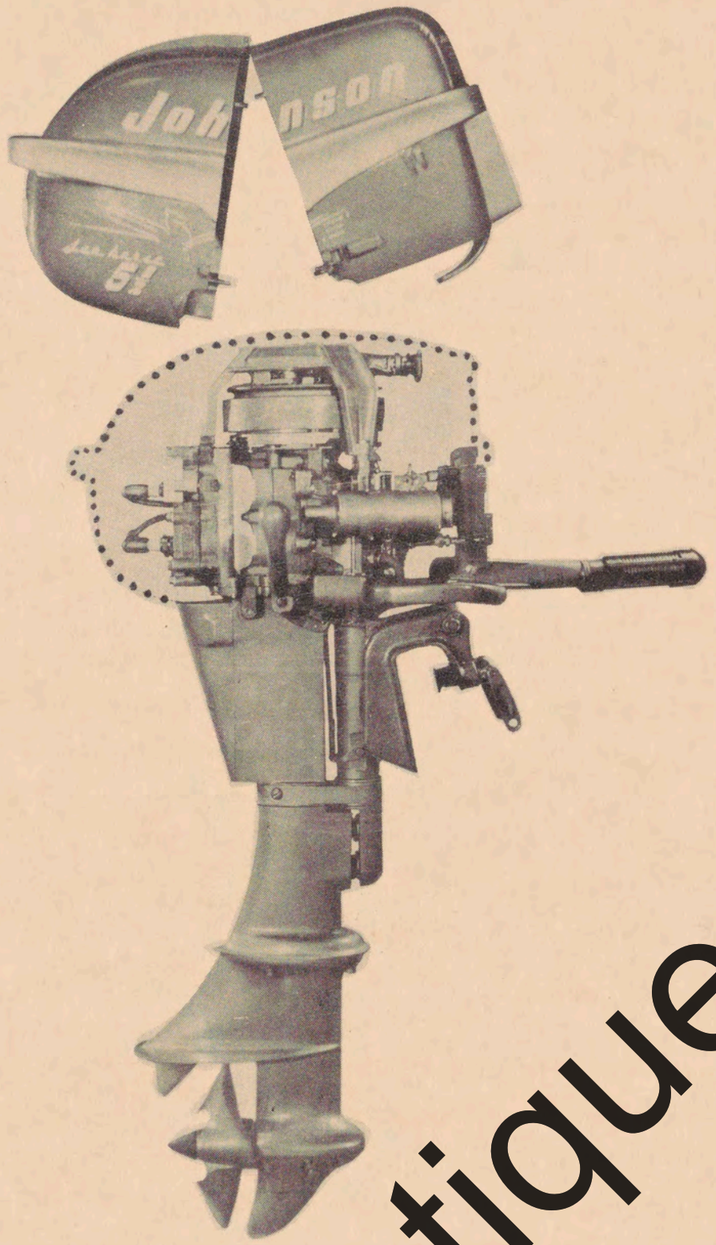


QUIET FACTS

they said it couldn't be done . . . . . .



A Johnson Motors publication introducing the Sea-Horse 5-1/2 and other models in the 1954 Johnson Line.

BUT JOHNSON HAS DONE IT!

DONE WHAT?

ENGINEERED THE QUIETEST OUTBOARD MOTOR IN HISTORY

That's right. The completely NEW Sea-Horse 5½ is

NEW in conception
NEW in design
NEW in performance

This Johnson 'first' is so drastically different, it seems destined to revolutionize the entire outboard industry.

Through a unique approach, Johnson has licked the problem that has haunted motor manufacturers and users since the first outboard was produced. . . .the noise factor.

THIS QUIET FACTS booklet substantiates these statements by telling the hows and whys of the new Sea-Horse 5½. It gives background and technical information behind this achievement of whispering quiet.

In addition, this booklet contains information and specifications on other products in the 1954 Johnson line.

I. THE NEW SEA-HORSE 5-1/2 -- WHAT IS IT?

The Sea-Horse 5½ is the quietest gasoline-powered outboard motor ever offered to the public.

The Sea-Horse 5½ contains more features than ever before have been concentrated in any model outboard by any manufacturer.

The Sea-Horse 5½ has every practical desirable feature known in the outboard industry.

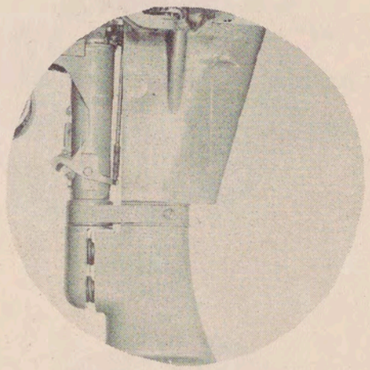
The Sea-Horse 5½ is a NEW motor --- NEW, not a face-lifting version of the Sea-Horse 5, which it supplants in the Johnson Line.

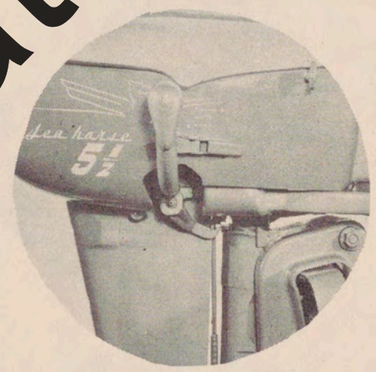
(The numerical designation 5½ represents O.M.C.-rated horsepower. The Sea-Horse 5½ is a 5½-horsepower motor.)

Sweeping statements? YES! We'll have to substantiate them? SURE! That's the reason the Johnson engineering staff and publicity section have collaborated in preparing QUIET FACTS.

II. FEATURES -- What do we mean?

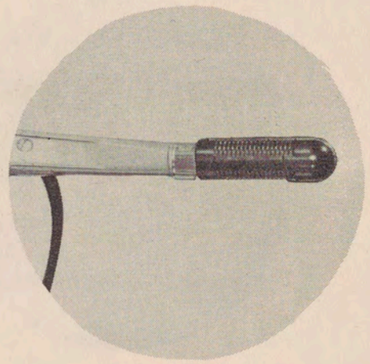
Outstanding is the cushion-drive mounting -- the revolutionary new design which silences the Sea-Horse 5½.

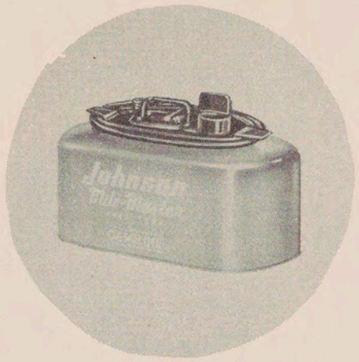




Full gear range, forward, neutral and reverse.

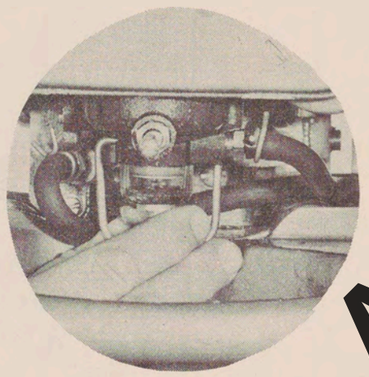
Synchro twist-grip speed control, of the same type available in previous years on Johnson 10 and 25-h.p. motors.



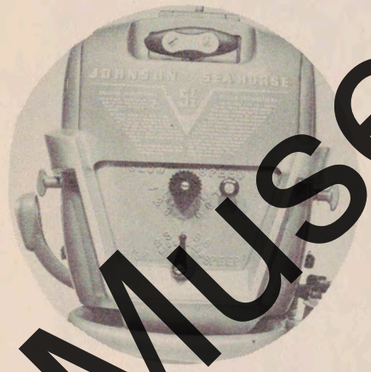


Separate plug-in fuel tank (4 gal.), the Mile-Master, of the same type used on 10 and 25-horsepower motors. Advantages are greatly extended cruising range with elimination of necessity for refueling afloat.

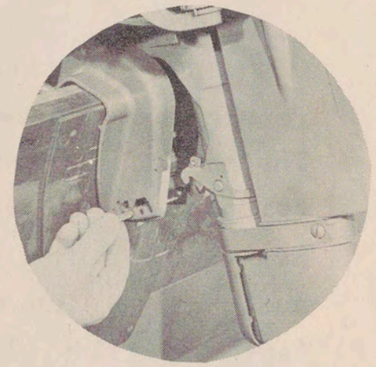
Up-and-off motor hood -- one-second access to spark plugs and entire back half of engine; two thumb-screw connections and entire hood is removable.



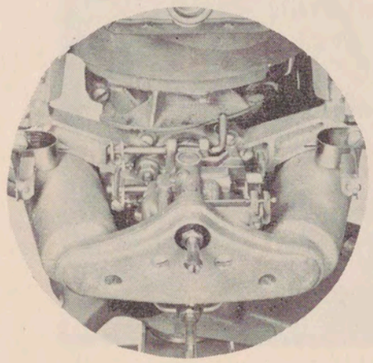
New carburetion system which gives added power and smoother acceleration throughout the speed range. Employs reef valves and automotive-type choke.



inger-spread dial control -- all adjustment knobs are concentrated on face of motor in convenient reach of operator.



uick-set tilt adjustment -- speedier transom-angle adjustment for best performance.



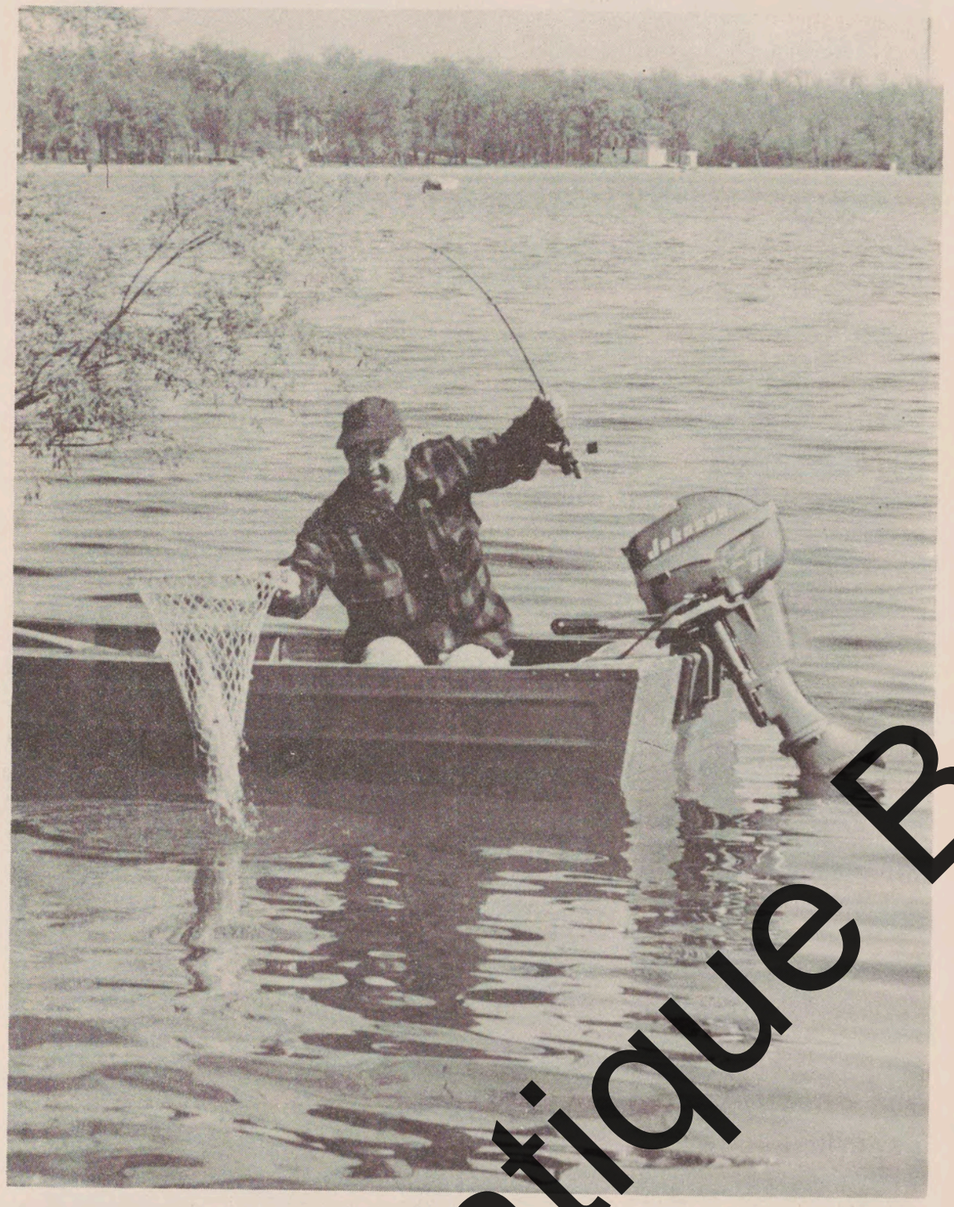
Air intake silencing chamber to muffle high-intensity engine noise.

These features all are new in the Sea-Horse 5½, in the sense that they represent an addition or improvement over the Sea-Horse 5. Some, notably the truly quiet cushion-drive, are completely new in the outboard field.

Bore and stroke (1-15/16 in. and 1-1/2 in., respectively) remain the same as in the Sea-Horse 5. The extra half-horsepower results from the improved carburetion system. Starting, cooling and ignition systems are the same as in other current Johnson outboards. Also retained in the Sea-Horse 5½ is the 'automatic slip clutch' which eliminates necessity for shear-pins.

Adoption of reverse gear eliminates necessity for turning the motor completely around (360-degree turning radius). The Sea-Horse 5½ has a turning radius of 120 degree -- fully adequate for all purposes. Tilting radius to clear obstacles is 70 degrees.

Two snap-connections and the cover of the Sea-Horse 5½ lifts up instantly - easily.



Kitten quiet, the Sea-Horse 5½ will continue to be the world's favorite fishin' motor that the Johnson 5 was.

III. SILENCE, NOISE AND THE SOUNDING BOARD.

We SAY we've built a truly quiet motor. WHY IS IT QUIET?

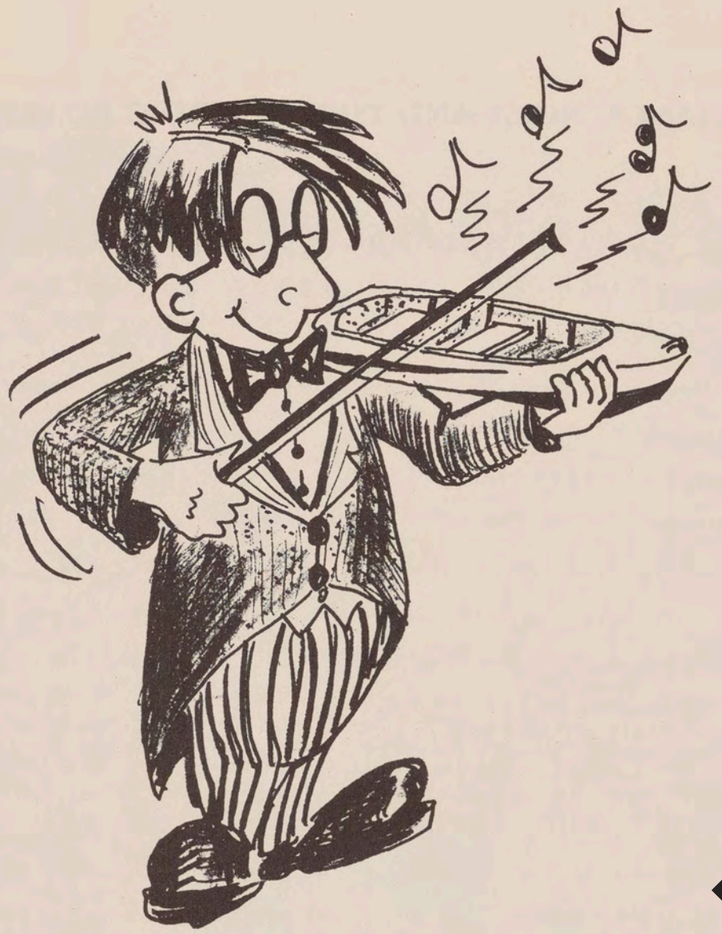
Previous steps to quiet outboards have been concerned with muffling the sound at its source, as in underwater exhaust and air intake (carburetor) silencers. These have contributed to reduction of sound, but none has succeeded in quieting the motor to the extent where normal conversation is possible -- or any conversation by boat occupants, without materially reducing the speed of the motor. Nor has any brought relief to the sleep-shattered inhabitants of river and lake shores when outward-bound-at-dawn fishermen take off on their quest.

They have failed because none attacked the problem of outboard noise at its primary cause -- the sounding-board qualities of a boat with motor attached.

Now let's discuss outboards and violins. Both have sounding boards.

Webster defines a sounding board:

"A resonant board, as the belly of a violin, so placed as to reinforce tones by sympathetic vibration."



Boats are sounding boards.

Let's apply this to an outboard motor and boat. The boat is the violin, or sounding board; the motor is the string whose vibrations are simplified as they are transmitted to the boat.

When a violin string is twanged, the vibrations are picked up in the hollow shell, amplified and given depth of tone. Separate the string from the violin shell, twang it -- and the sound scarcely is audible.

In the case of outboards, the ideal solution is to separate the motor from the sounding board. Obviously an outboard can't run in a disembodied position; there must be a connection with the boat. The more rigid the connection, the greater the vibration transmitted to the boat and consequently the greater the sound.

The practical solution, then, is in obtaining a fully flexible contact between the motor and the boat. Johnson engineers achieved this by cushion drive mounting -- the intrusion of a cushioning framework to absorb vibrations.

In the Sea-Horse 5½ they have attained "true quiet" by utilizing the sounding-board principle -- by minimizing the "sympathetic vibration" which produces the noise.

IV. QUIET FACTS - NOT "SILENT".

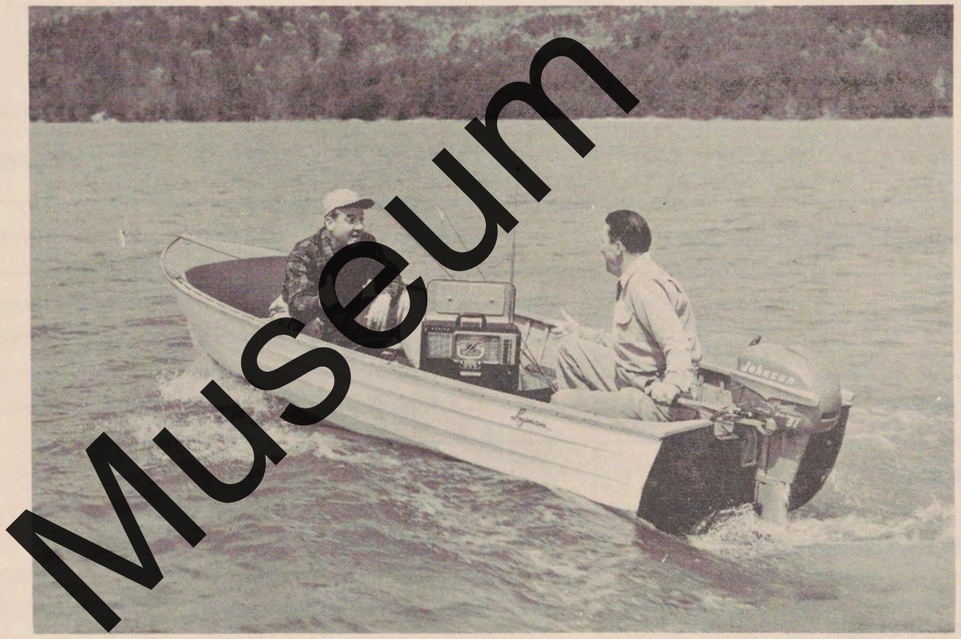
It would have been euphonious and somewhat sensational to have spoken of the new Johnson 5½ as the 'silent Sea-Horse'.

But it wouldn't have been accurate. The word 'silent' is too restrictive. The Johnson 5½ is the quietest outboard ever put on the market - normal conversation is possible at full throttle, baseball fans may keep up with their team's progress by portable radio while trolling, and the slap of waves is audible over the purr of the motor.

But the purr is still there -- so we can't call it silent.

The word 'quiet' has greater latitude, and in the past has been applied in varying degrees of accuracy, and chiefly in a relative sense. After a day in a boiler factory, the sound of your 10-year-old banging away at his drum may seem relatively quiet.

In the case of the Sea-Horse 5½, no boiler-factory comparison is needed. It's 'truly quiet'.



Listen to your favorite ball game.

V. EVOLUTION OF OUTBOARD QUIET

While the Sea-Horse 5½ is revolutionary in design, the development of quiet in outboard motors has been an evolutionary process.

First major step was in the early 1920s when an above-water muffler corralled much of the staccato bark of the engine at its source. In 1928 Johnson engineers put a more definite quietus in effect by running the exhaust outlet down through the water.

See new Spec Sheet

	SEA-HORSE 25	SEA-HORSE 10	SEA-HORSE 5-1/2	SEA-HORSE 3
OBC CERTIFIED BRAKE H.P.	25 HORSEPOWER	10 HORSEPOWER	5½ HORSEPOWER	3 HORSEPOWER
WEIGHT	98 LBS. (LONG MODEL, 100 LBS.) MILE-MASTER FUEL TANK, 13 LBS.	60 LBS. (LONG MODEL, 61-1/2 LBS.) MILE-MASTER FUEL TANK, 13 LBS.	48-1/2 LBS. (LONG MODEL, 49-1/2 LBS.) MILE-MASTER FUEL TANK, 13 LBS.	32 LBS. (LONG MODEL, 32½ LBS.
LENGTH	46-5/16 IN. (LONG MODEL, 51-5/16 IN.)	42-9/32 IN. (LONG MODEL, 47-9/32 IN.)	39-7/8 IN. (LONG MODEL, 44-1/2 IN.)	37-5/16 IN. (LONG MODEL, 42-5/16 IN.)
WIDTH	12-5/32 IN.	10-25/32 IN.	9-1/4 IN.	9¼ IN.
STERN HEIGHT	15 IN. (LONG MODEL, 20 IN.)	15 IN. (LONG MODEL, 20 IN.)	15 IN. (LONG MODEL, 20 IN.)	15 IN., (LONG MODEL, 20 IN.)
PROPELLER	3-BLADE RUBBER-FLOATED ALUMINUM, 10.3/8 IN. DIAMETER, 12-1/2 IN. PITCH	3-BLADE RUBBER-FLOATED ALUMINUM, 9 IN. DIAMETER, 8 IN. PITCH	2-BLADE ALUMINUM BRONZE BUSHED, WEEDLESS DESIGN, 8" DIAMETER, 7¼" PITCH.	3-BLADE ALUMINUM BRONZE BUSHED, WEEDLESS DESIGN, 6½" DIA., 5¼" PITCH.
BORE AND STROKE	BORE, 2-7/8 IN.; STROKE, 2-3/4 IN.	BORE, 2-3/8 IN.; STROKE, 2-3/8 IN.	BORE 1.15/16", STROKE, 1-1/2".	BORE, 1-9/16 IN.; STROKE, 1-3/8 IN.
PISTON DISPLACEMENT	35.7 CUBIC INCHES.	16.6 CUBIC INCHES.	8.84 CUBIC INCHES	5.28 CUBIC INCHES.
GEAR REDUCTION	12 TO 21	12 TO 21	12 TO 21	12 TO 20.
MOTOR REVOLUTIONS	4,000 - 5,000 PER MINUTE	4,000 - 5,000 PER MINUTE.	3,500 - 4,500 PER MINUTE.	3,500 TO 4,500 PER MINUTE
FUEL CAPACITY	SEPARATE 6-GAL. MILE-MASTER FUEL TANK.	SEPARATE 6-GAL. MILE-MASTER FUEL TANK.	SEPARATE 4-GAL. MILE-MASTER FUEL TANK	4.88 PINTS.
DRIVE	GEAR SHIFT -- NEUTRAL, FORWARD, REVERSE.	GEAR SHIFT -- NEUTRAL, FORWARD, REVERSE.	GEAR SHIFT -- NEUTRAL, FORWARD, REVERSE.	FULL PIVOT REVERSE.
SPEED CONTROL	TWIST GRIP ON THE STEERING HANDLE SYNCHRONIZES SPARK AND THROTTLE.	TWIST GRIP ON THE STEERING HANDLE SYNCHRONIZES SPARK AND THROTTLE.	TWIST GRIP ON THE STEERING HANDLE SYNCHRONIZES SPARK AND THROTTLE.	SPARK AND THROTTLE ARE SYNCHRONIZED IN ONE LEVER.
SPEED RANGE	SLOW TROLLING TO OVER 20 M.P.H.	SLOW TROLLING TO OVER 20 M.P.H.	SLOW TROLLING TO 12 M.P.H.	SLOW TROLLING TO 8½ M.P.H.
BOATS	LARGE, HEAVY OUTBOARD BOATS AND FAST RUNABOUTS. CRUISERS. AUXILIARY POWER.	LARGE OUTBOARD BOATS. FAST RUNABOUTS. CRUISERS. AUXILIARY POWER.	LARGE CANOES. OUTBOARD BOATS, FAMILY BOATS AND DINGHIES. AUXILIARY POWER.	ANY CANOE. OUTBOARD BOATS, FAMILY BOATS AND DINGHIES.

These moves were concerned with stifling normal noise emanating from the power head. The next important step involved a different approach -- vibration.

In the late 1930s outboard engineers set out to overcome 'sting' in the steering arm -- constant vibration that kept the operator's muscles aquiver. In conquering the quiver, Johnson reduced sound as an accidental by-product.

Essentially, the cure for steering-arm quiver involved placing rubber sleeves between the swivel bracket (firmly attached to the boat) and the drive shaft casing (linked to power head and propeller) which pivoted in the bracket.

This rubber cushioning, described in the Johnson Service Manual as 'reducing transmission of torque impulses', performed the dual service of easing vibration 'sting' in the steering arm, and of absorbing some of the vibration-sound before it reached the boat.

Rubber Sleeves cured "Quiver".

While the decrease in motor noise was a by-product, it merits careful notice because of its future role in the evolution of quieter outboards. It marks the first conscious effort to separate the boat from the motor -- to attain flexible, cushioning contact between the vibrating unit and the sounding board.

With introduction of its Sea-Horse 10 in 1949, the Johnson firm carried vibration-reduction a step further. Cushioning was utilized on either side of the power head at the point of contact with the drive shaft casing. Thus there were two sets of vibration-absorbing devices -- one between the power head and the drive shaft casing, the second between the drive shaft casing and the swivel bracket.

In the same model, Johnson placed an all-over engine hood on rubber mountings for additional cushioning. The all-over hood itself, of course, tended to confine and muffle sound.

In 1952 another sound-reduction device appeared in the Johnson line. The Sea-Horse 3, a new motor replacing the 2½, contained a so-called 'resonating silencer' -- a cylinder which muted motor sound ordinarily discharged through carburetion air inlets.

Contributing to the research was knowledge gained in work for the armed forces during World War II. Johnson's engineering facilities developed experimental quiet outboards by adding various sound-quelling contrivances to the conventional design -- but from a consumer-sale standpoint they were completely out of the question. The very devices that made the outboards silent also made them too weighty and unwieldy for public use.

As one Johnson engineer expressed it: 'We achieved a quiet motor by impractical methods.'

That's the story of the evolution of quiet in outboard motors -- up to development of the Sea-Horse 5½, an entirely new concept in basic outboard construction.

VI. RESEARCH

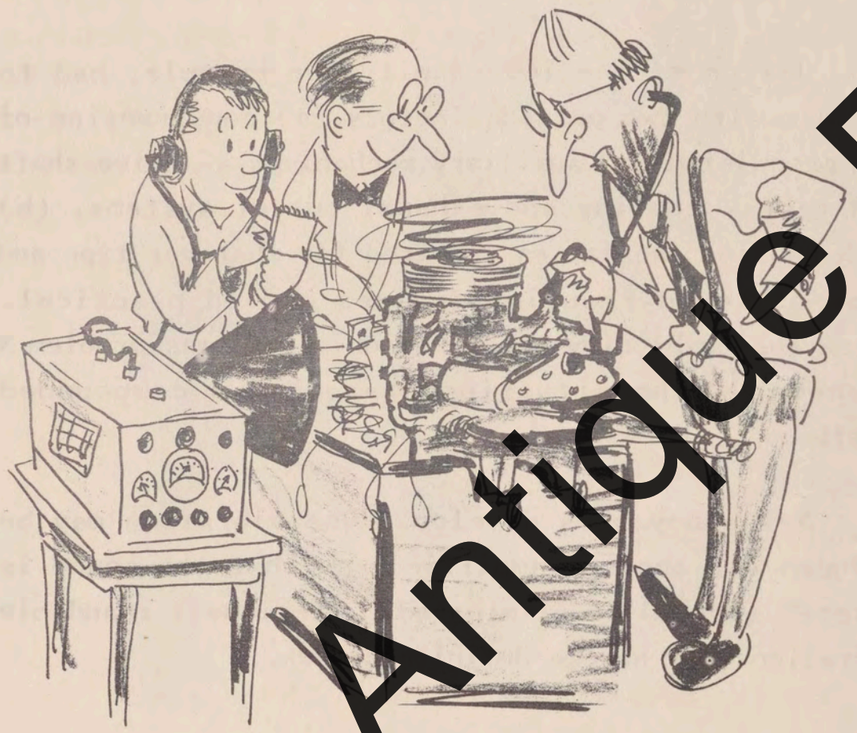
> It may appear easy to evolve a new-type lower unit and place a number of springs, cushions and other gadgets in an outboard -- the hard fact is that it took nearly three years of experimental research to bring the reversed-sounding-board principle to a point of mechanical practicality where engineers and manufacturing experts could begin to talk about actual production.

Design of the lower unit, for example, had to conform with two outside factors (a) construction of the propulsion and auxiliary mechanisms -- drive shaft and gears, cooling and exhaust outlet systems, (b) with housing facilities required for whatever type and size of sound-reducing devices proved practical. Since the cushioning construction itself was problem X unknown -- the situation presented a compounded riddle.

New annoyances develop. One vibration may be reduced and another amplified, so that the sound is altered instead of eliminated. Previously inaudible vibrations may become definite sounds.

In designing the Sea-Horse 5½, Johnson engineers began with a determination that a really quiet motor was needed, and with the realization that such devices as underwater exhaust and carburetor air intake silencers had been exploited to near the limit.

All lessons of the past, particularly the by-product silencing which resulted from steps to cure quiver in the steering arm, were applied in developing the new motor's cushion drive.



VII. THE JOHNSON LINE FOR 1954

The Johnson line for 1954 includes the 3, 5½, 10 and 25-horsepower outboard motors; Ship-Master remote controls in both single and twin-engine installation, and a new accessory fuel pump for Sea-Horse 25s to facilitate their use with built-in gasoline tanks in long range craft such as cruisers.

SEA-HORSE 10

The Sea-Horse 10 has been redesigned to include the carburetor air intake silencer which has been a Sea-Horse 3 feature since 1952 (and also is on the new Sea-Horse 5½). This silencer makes the 1954 Sea-Horse 10 considerably quieter than previous models.

The 1954 Sea-Horse 10 also has the new 'up-and-off' hood. This permits swift complete removal of the hood. If complete removal is unnecessary, one-second access to spark plugs is afforded by the snap-release on the back half of the hood.

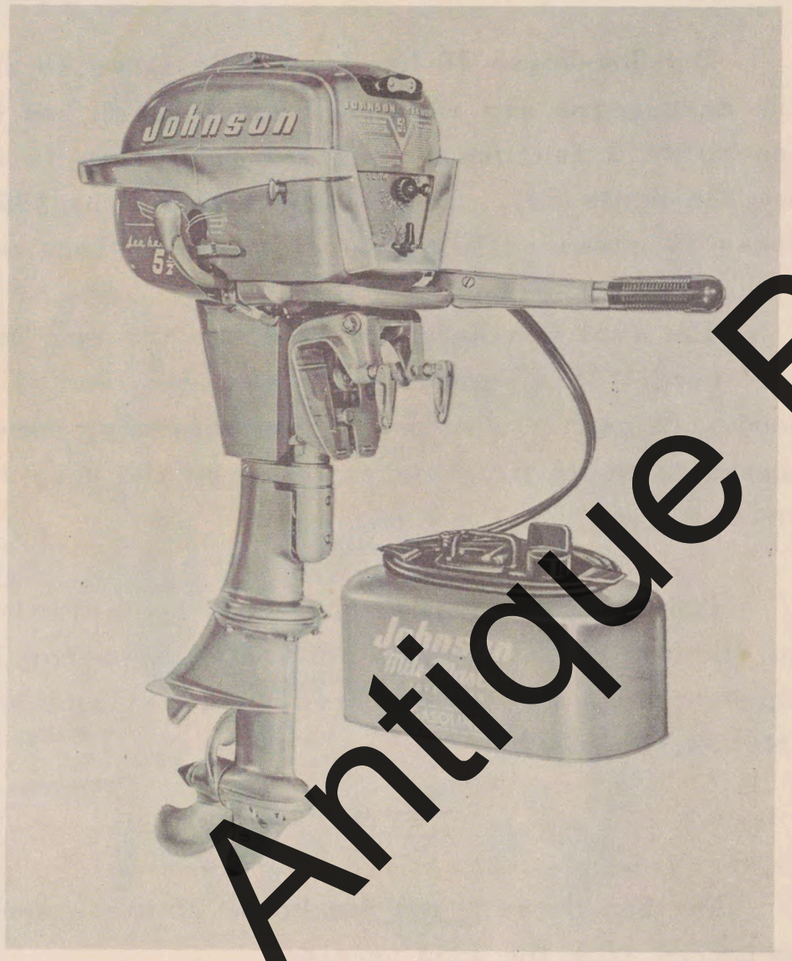
Position of the gear-shift has been standardized on the right (starboard) side of the motor in the three models having forward, neutral and reverse (the 5½, 10 and 25).

—— ◈ ——

The Sea-Horse 3 and Sea-Horse 25 are essentially unchanged from the 1953 version.

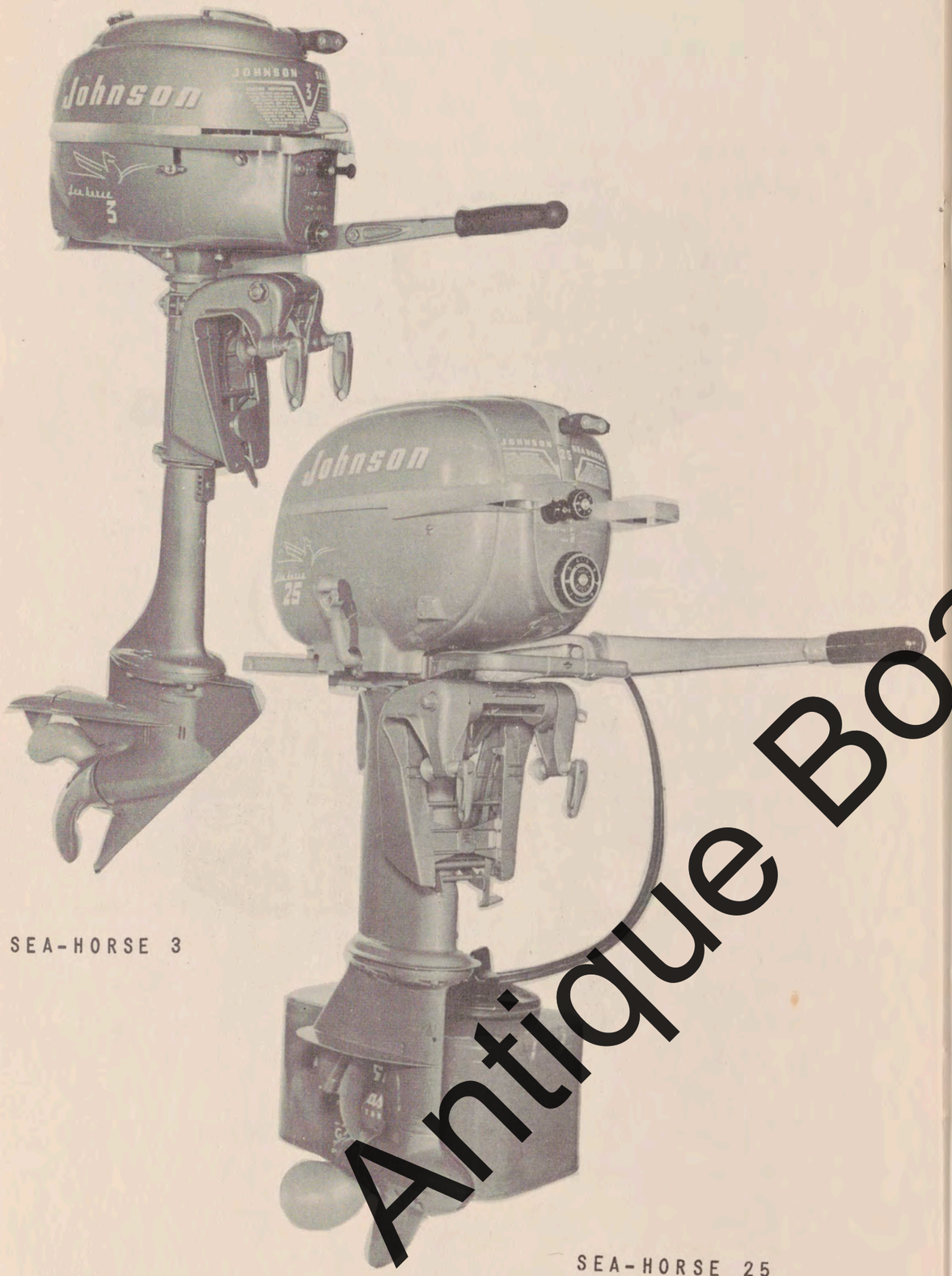
MILE-MASTER FUEL TANK

Plug-in Mile-Master fuel tanks are interchangeable. The 6-gallon tank supplied with 10 and 25-h.p. motors may be plugged into the new Sea-Horse 5½; the 4-gallon tank of the 5½ may be used with the larger motors.



New 1954 Sea-Horse 5½

New 1954 Sea-Horse 10



SEA-HORSE 3

SEA-HORSE 25

VIII. NEW IN JOHNSON ACCESSORIES

NEW FUEL PUMP UNIT

With the rising popularity of outboard cruisers, many owners are adopting built-in fuel tanks for extended trips.

Johnson, to meet this demand, has developed a special accessory fuel pump unit for 25-h.p. motors used with built-in tanks. The diaphragm-type pressure-vacuum pump mounts on the engine, and is fed through flexible tubing from a primer-and-filter unit on the boat transom. The filter connects with the built-in tank by 3/8 in. copper tubing.

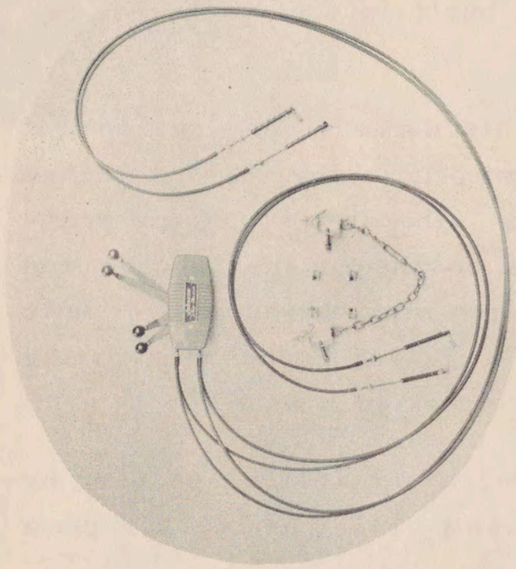
Operation is simple; after initial priming by plunger in the primer-and-filter unit, the pump automatically draws fuel into the carburetor.

SHIP-MASTER REMOTE CONTROLS

Ship-Master throttle-and-shift remote controls were introduced a year ago with two cables of equal length in the single-engine installation.

To conform more adequately with requirements of the outboarding public, throttle and shift cables will, in the future, be listed separately from the control and will be available in each foot-length between 5 and 17 feet (5 ft., 6 ft., 7 ft., etc., up to 17 ft.).

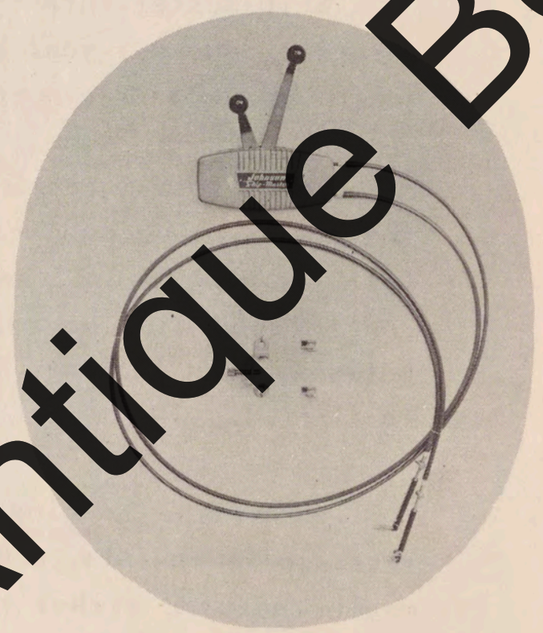
Also, the terminal cable connections will be reversible; that is, a 6-and-7 ft. cable combination may be adapted either to a right-hand or left-hand drive boat.



Dual Control Cables

The owner of a runabout with right-hand drive, for example, may require a 7-ft. gear-shift cable and an 8-ft. throttle cable. The same craft with a left-hand mount would require reversed lengths of cables. With cables in each foot-length available both for single and twin-engine installation, excess footage on one cable or the other is eliminated.

Where cables in excess of 17 ft. are required, these may be obtained on special order.



Single Control Cables

IX. WHERE DO WE GO FROM HERE?

Recreation-minded America is more water-conscious than ever before. This is reflected in boat and motor sales in all categories of size and power.

Despite an increasingly heavy demand in recent years for larger-horsepower motors (10 to 25 h.p.) the market for lighter outboards has remained undiminished.

Commercial usage of outboards (commercial fishing, logging, construction work boats, soil and stream conservation activities, etc.) likewise is on the increase -- here, again, the larger motors are an important factor.

More and more the outboard boat is becoming a family vehicle. Cruises, both individually and in groups, are increasing in number and extent.

The market for outboard cabin cruisers is surpassing even the most optimistic expectations of the industry. More than 50 boat manufacturers now are making this type of cabin craft. The heavy demand for 25-h.p. motors and marine accessories is partly due to cruiser popularity.

Johnson's outboard production is -- and long has been -- the largest of any manufacturer. In November of 1952 Johnson became the first outboard manufacturer to reach the million-motor mark in production. Johnson's 1953 output will be 50 per cent or more in excess of that in 1952. Even with this increase, output is as yet insufficient to meet demand.

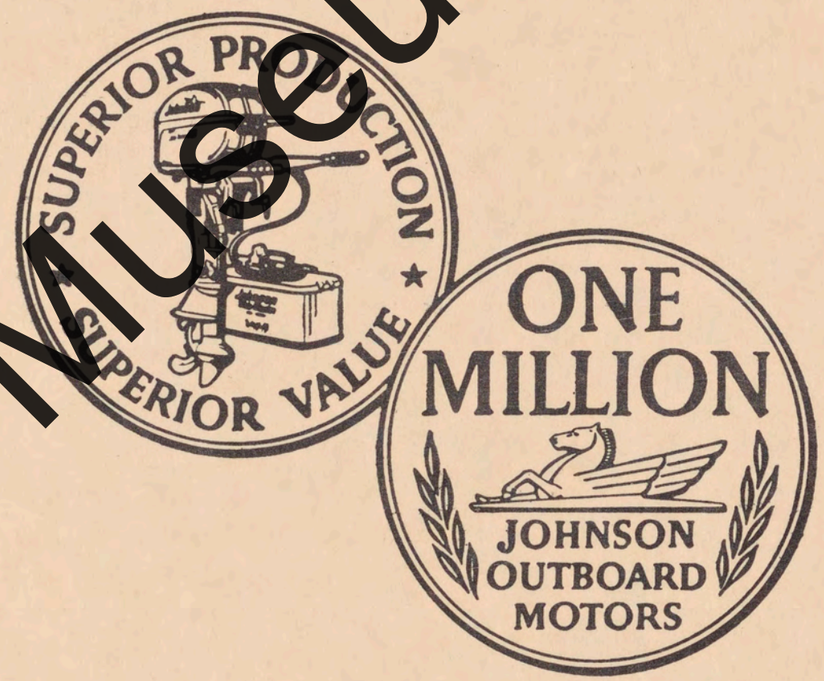
The outboard motor is becoming an essential in the American family picture -- just as automobiles and automatic refrigeration and central heating have graduated from the 'luxury' class.

It is up to the outboard manufacturer, in turn, to supply the American family with constantly-improved products.

Development of Johnson's 'truly quiet' Sea-Horse 5½ is a long forward stride in that direction.

If you desire further information or photos, please write, phone or wire:

Don Cullimore or E.L. (Buck) Rogers, Publicity,
Johnson Motors, Waukegan, Illinois.



The ONLY Manufacturer Who Has Built a MILLION Outboard Motors