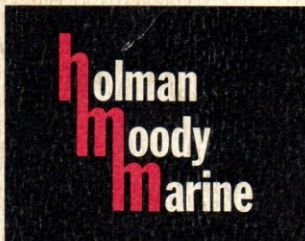
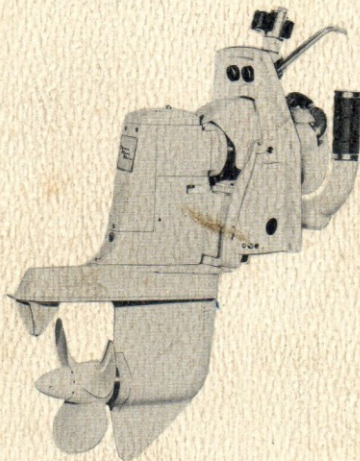


PRICE \$1.00



OWNER'S MANUAL
SERIES 200 OUTBOARD DRIVE



ELECTRICAL SYSTEM not under warranty if failure due to water.

COMPETITION PROVEN

MUNICIPAL AIRPORT, CHARLOTTE, NORTH CAROLINA

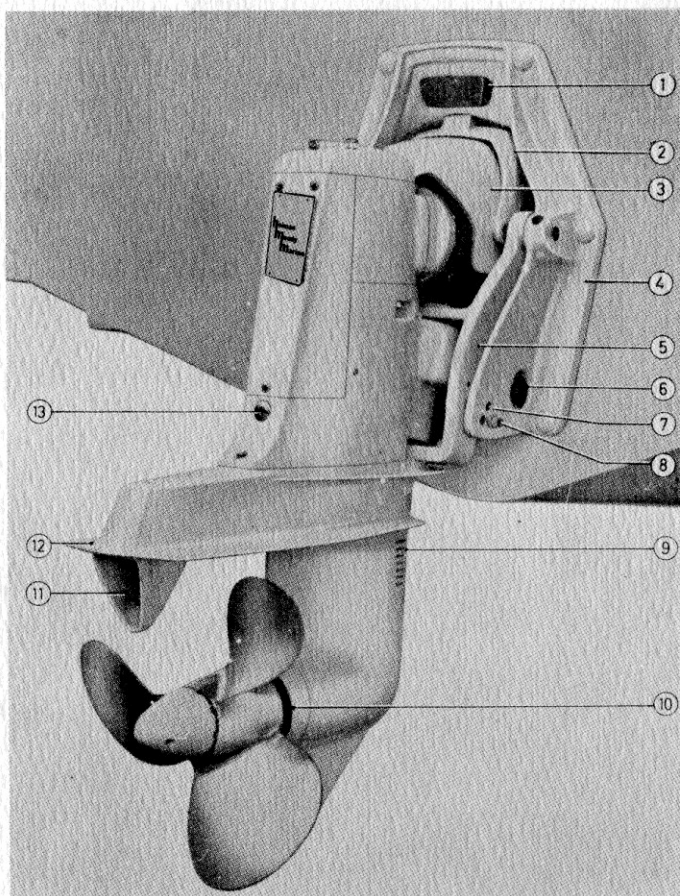


Fig. 1. Holman & Moody Series 200 Outdrive

- | | |
|--|------------------------------|
| 1. Tip-up bumper block | 7. Hole for retainer bracket |
| 2. Steering yoke | 8. Locating pin |
| 3. Steering casing | 9. Cooling water intake |
| 4. Transom shield | 10. Zinc ring |
| 5. Pivot yoke | 11. Exhaust outlet |
| 6. Bypass for cooling water
(not on AQ 110) | 12. Cavitation plate |
| | 13. Oil filling |

Dear Owner:

The outdrive unit you have just purchased is designed and built from the finest material available. We urge you to read this manual thoroughly and follow the instructions outlined within, so as to assure you of excellent performance and long unit life. We hope that you will have many hours of pleasure with your total performance drive assembly.

Sincerely,

John Holman

President,

Holman & Moody
Marine Corporation
Municipal Airport,
Charlotte, North Carolina 28208

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DESCRIPTION

The Series 200 Outdrive consists of an outboard drive and pivot yoke designed for assembly on the outside of a boat transom. The drive functions as propeller gearing for the engine which is mounted in the boat. The outdrive and the after end of the engine are mounted to the transom shield by means of vibration dampening rubber rings fitted in the transom shield.

Power from the engine is transmitted through the medium of a double universal joint so that the drive can be pivoted both vertically and horizontally. The drive includes taper gears for forward, reverse and neutral.

The shift mechanism consists of a patented cone clutch, of the "Silent Shift" type. The mechanism is fitted with self-adjusting friction cones and servo disengagement and is easy to operate as well as silent in engagement.

This mechanism is actuated by a single lever control which is synchronized with the engine throttle control system.

The outdrive unit housing and the transom shield are made of a special light alloy with outstanding anti-corrosion properties. A zinc ring is fitted to the lower gear housing just forward of the propeller in order to combat corrosion caused by galvanic currents.

The transom shield contains all the connections and pipe lines for the engine cooling water intake, exhaust and cooling water outlet and control cable for the shift mechanism. This facilitates installation considerably since it is necessary to cut only one hole in the transom for the transom shield. The exhaust gases from the engine are taken through the outdrive unit and pass out under the rear edge of the cavitation plate. On the lower front edge of the gear housing there is a gill shaped strainer for engine cooling water intake. The lift device for the outdrive unit is mounted in the transom shield on the inboard side of the transom.

POWER TRANSMISSION

Power from the engine is transmitted through the flywheel vibration damper, the adapter shaft and the double universal joint. From the universal joint the power is transmitted to the input gear which is in constant mesh with the forward and reverse gears. The forward and reverse gears are carried in the upper bearing housing in such a way as to allow them to rotate independently of the vertical shaft. Riding between the gears is a cone clutch engaging sleeve which when engaged with the cone on either the forward or reverse gear causes rotation of the vertical shaft in either direction. The lower end of the vertical shaft drives the propeller shaft through the propeller gearing.

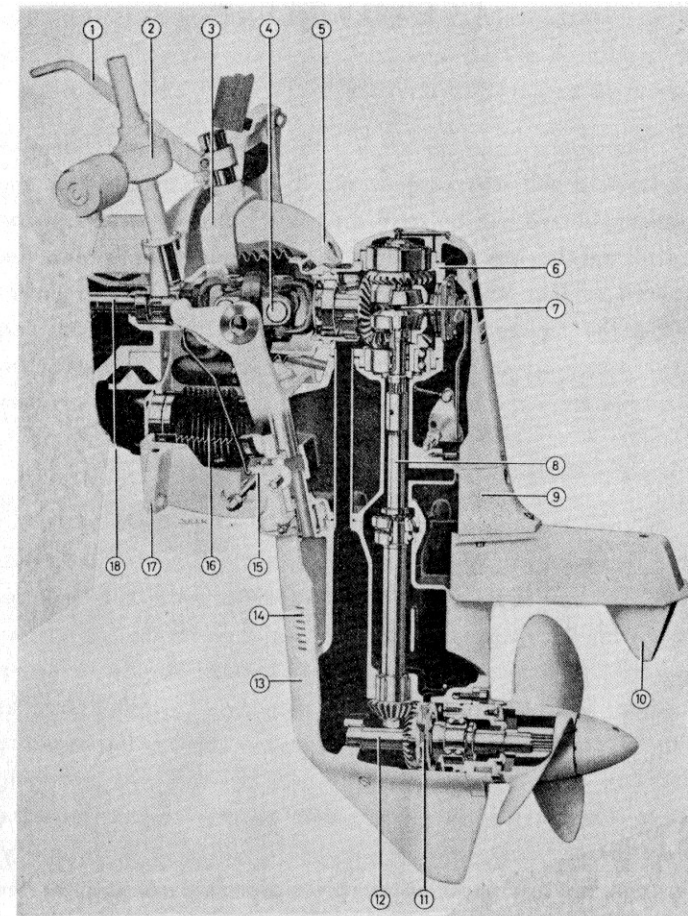


Fig. 2. Cross-section through the Holman & Moody Series 200 Outdrive

- | | | |
|-----------------------|---------------------------|--------------------------------|
| 1. Steering rod | 7. Silent shift mechanism | 13. Lower gear housing |
| 2. Lift device | 8. Vertical countershaft | 14. Cooling water intake |
| 3. Steering yoke | 9. Intermediate housing | 15. Retaining pawl |
| 4. Universal joint | 10. Exhaust outlet | 16. Bellows for exhaust system |
| 5. Steering casing | 11. Oil pump | 17. Mounting collar |
| 6. Upper gear housing | 12. Propeller shaft | 18. Drive shaft |

MANEUVERING

The upper countershaft is fitted with a thread between the forward and reverse gear and it is on this thread that the engaging sleeve can be moved up and down by means of the control mechanism. Both ends of the engaging sleeve are tapered so that when the sleeve is moved upwards or downwards, the tapered surfaces engage with the corresponding tapers which are screwed on to the forward and reverse gears. Since the engaging sleeve is carried on the thread of the countershaft, increased transmission torque from the engine assists in more positive engagement of the tapers.

When the control lever is moved to the "Forward" position, the engaging sleeve engages with the taper of the lower gear whereby the vertical countershaft is locked in engagement with the gear. The propeller will then rotate for running forward. When the control lever is moved to the reversing position, the engaging sleeve is moved upwards until it engages with the taper on the upper gear, thus producing the opposite direction of rotation. In the neutral position, the engaging sleeve is retained in an intermediate position so that both the gears rotate freely, while the vertical shaft remains stationary. The gearing described above gives standard rotation to the propeller shaft, that is to say a propeller with a left-hand thread. In the case of propeller rotation in the opposite direction, then the upper gear functions as forward gear and the lower as reverse.

When running in reverse, the outboard drive is kept in its normal position by means of a retaining pawl. The design of the retaining pawl is such as to make possible rapid change-

over from forward to reverse without the outboard drive tipping up. When the unit is running forwards, the position of the pawl is such that it does not become engaged when there is contact with the bottom in shallow water. This means that the outboard drive can tip up and thus reduce the risk of considerable damage to the underwater part.

DESCRIPTION

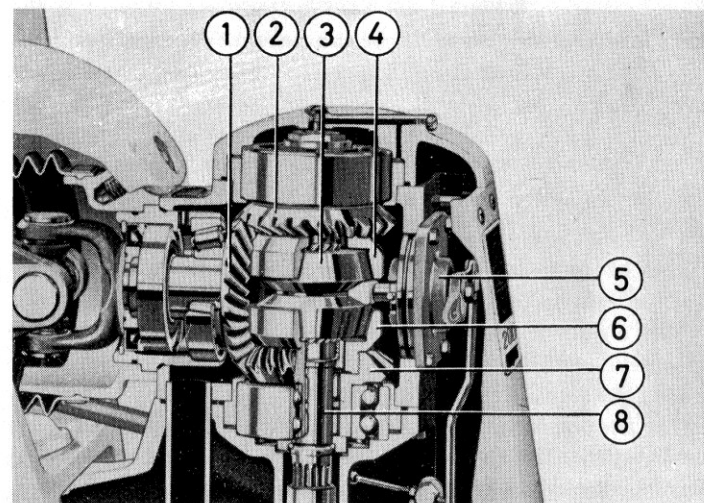


Fig. 3. Upper gear housing.

- | | |
|--------------------|-----------------------|
| 1. Input gear | 5. Control mechanism |
| 2. "Reverse" gear | 6. "Forward" taper |
| 3. Engaging sleeve | 7. "Forward" gear |
| 4. "Reverse" taper | 8. Upper countershaft |

STEERING

The boat is steered by the outboard drive unit. The movements of the steering wheel are transmitted through an internally located steering rod which is fitted on the steering yoke. The action of the steering rod is independent of the degree of tip on the outboard drive. The lower parts of the yoke arms are carried in a steering casing which is, in turn, bolted to the upper part of the outboard drive. The steering angle of the outboard drive is about 30° from the neutral position. Since the direction of the propeller driving force is altered when the drive is turned, this gives the boat excellent steering properties.

LIFT DEVICE

In order to facilitate tipping-up of the outboard drive, it is fitted with an electro-mechanical lift device which is mounted on the inside of the transom shield. The lift device, which is operated from the driving seat, consists of an electric motor which operates a push rod on the pivot yoke through the medium of a worm gear. The push rod first releases the retaining pawl and then lifts the drive to the required tip-up angle or to the fully tipped-up position. When the drive is fully tipped-up, the motor slips for a brief moment and this causes the current in the cables to increase until the relays cut out the motor. When the drive is being lowered, it is automatically centered independent of the position of the steering wheel. The maximum tip-up angle is about 65°. When the drive is again lowered and the lift device has been driven back to its original position, the electric motor slows up after an impulse from the circuit-breaker at the top of the lift device. The outdrive unit may be stopped at any degree of tip-up so that the unit may be run at low speeds when partly tipped-up.

LUBRICATION

The outboard drive is fitted with an oil system which is common to both the upper and the lower gear housing. The oil is circulated to all the gears and the bearings by means of an oil circulation pump which is fitted on the gear in the lower gear housing. The water which flows past the lower part of the outboard drive cools the oil.

A dipstick to check the oil level is fitted in the cover above the upper housing. The oil level is checked with the outboard drive in the driving position. The double universal joint is lubricated for life and requires no periodical servicing.

RUNNING OPERATION

The procedures described below apply to the Morse M1 and MT single lever controls with synchronized throttle and shift systems. The control is fitted with a disengaging system for the shift cable in order to allow operation of the throttle lever independently from the shift mechanism. On the MT control this disengaging system is operated by pulling the control lever sideways while in the neutral position and then pushing it forward. The M1 control has a round button that may be pulled to obtain the same results.

To re-engage the shift mechanism, move the lever back to the neutral position and the shift mechanism will automatically re-engage. From then on the lever actuates both the throttle and the shift mechanism. Both control heads employ a delay device on the throttle cable which allows the outdrive unit to shift before the throttle lever is actuated. This device protects the outdrive unit from being shifted at high RPM.

RUNNING IN SHALLOW WATER

When running in shallow water where there is risk of coming into contact with the bottom, the retaining pawl of the drive should be released from the locating pin.

The drive then has an opportunity to tip up should any contact be made with the ground and in this way considerably reduce the risk of damage to the underwater part.

The retaining pawl is released by operating the lift until the drive just begins to rise. This means that with the locating pin in the center hole the lift will be driven 2-3 seconds after which time the warning lamp lights up. When the locating pin is in the forward or rear hole the warning lamp will light up after a briefer or longer interval than the one already mentioned.

NOTE: "Reverse" cannot be engaged when the warning lamp for the lift is lighted up.

TO OBSERVE WHEN REVERSING

Check that the warning lamp for the electro-mechanical lift is not on before going into "Reverse." The outboard drive will "float up" if the warning lamp lights up.

ADJUSTING THE TRIM OF THE BOAT

If the boat is to attain its highest maximum speed, then it is very important to ensure that the outboard drive is correctly trimmed. For this reason the transom shield on the outboard drive has three locating holes. If the transom is at an angle of about 78° to the bottom of the boat, the locating pin should normally be in the center hole since this is the optimum angle for the universal joint. If the transom angle is not 78° or if the weight distribution on board and the design of the hull such that the boat does not come into the right trim for maximum speed, this can be adjusted by moving the locating pin to one of the other holes in the transom shield as follows: If the boat tends to have a "tail down" position while it is under way, this can be remedied by moving the locating pin to the inner hole and if the boat tends to "nose down," move the locating pin instead to the outer hole. Refer to Figure 4.

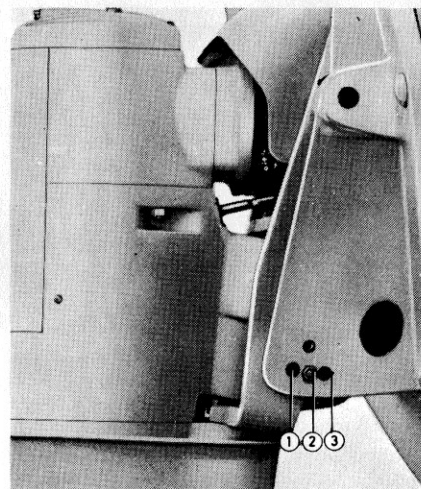


Fig. 4

TRAILER TRANSPORTATION

To prevent the outboard drive from being shaken down from its tipped-up position while being transported on a trailer, the equipment includes a retainer clamp which is fitted as follows: Tip up the outboard drive as far as it will go. Locate the retainer clamp in the retaining pawl. Then press together the lower part of the clamp so that both the pins can be located in the holes just above the locating pin in the transom shield.

MAINTENANCE SCHEME

To be carried out:

OPERATION	Daily before starting for the first time	After 50 hours (1) running	After 100 hours (2) running
1 Check the oil level		•	
2 Change the oil			•
3 Lubrication of drive and steering shaft bearings		•	
4 Check the zinc ring	•		
5 Checking and adjusting the shift linkage			(3)
6 Carry out general inspection			•
7 Prepare unit for winter storage			(3)

- (1) Or twice each season, whichever occurs first.
 (2) Or once each season, whichever occurs first.
 (3) When necessary.

CHECKING THE OIL LEVEL

The oil level should be checked after every 50 hours running or twice each season. The check is carried out with the outboard drive in its lowered position by using the dipstick in the cover above the upper drive housing.

The oil level should be between the marking and the lower end of the dipstick. If necessary, top up with oil of the correct grade and viscosity. This can be done through the dipstick hole.

SERVICING

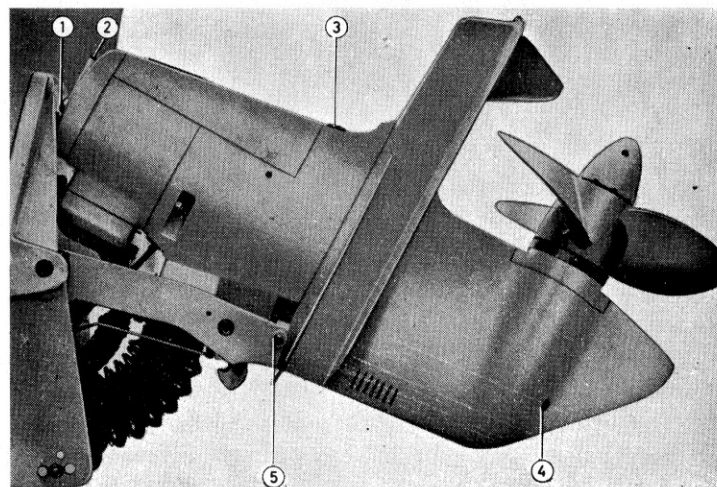


Fig. 5

1. Dipstick
 2. Air hole
 3. Oil filling
 4. Plug for oil drainage
 5. Lubricator for pivot yoke

CHANGING THE OIL

The oil in the outboard drive should be changed after every 100 hours running or at least once every season. The oil is drained off by unscrewing the plug (4, Fig. 5). For easy removal of the oil, unscrew also the plug (2, Fig 5). Oil is added through the oil filling hole (3, Fig. 5). Oil filling must take place with the drive in the tipped-up position and can most suitably be carried out with the help of a pump according to Fig 6. The capacity of the oil system is about 2 quarts.



Fig. 6

Concerning the correct grade and viscosity, see the table. Lower the drive fully, unscrew the dipstick on the top of the drive and wait a moment to allow the oil to rise in the center drive. Wipe the dipstick clean and dip it into the hole as far as it can go without, of course, screwing it down, and then lift it and read off the oil level. Any refilling to be done can be carried out by pouring oil through the hole for the dipstick. Screw on the dipstick and replace the plug in the cover on the upper drive housing.

NOTE: The oil level must never be allowed to exceed the maximum mark on the dipstick.

Never use oil with a higher viscosity than SAE 90

OIL RECOMMENDATIONS

Make	Grade
Bp	EP 90
Caltex	Universal Thuban 90
Castrol	OB or Hypoy 90
Esso	Gear Oil GP 80-90
Gulf	Multi-purpose Gear Lubricant SAE 90
Holman & Moody	7HM-19580-1 Gear Lube
Lubriplate	Marine 90
Mobiloil	Mobilube GX 80-90
Shell	Spirax 90 EP

LUBRICATION OF DRIVE AND STEERING SHAFT BEARINGS

Every 50 hours the drive shaft bearing in the flywheel housing adapter is to be lubricated through the plug in the adapter housing. (Fig. 7). Fill with multi-purpose grease and screw it down tight. After every 50 hours running, the lower bearing on the pivot yoke (5, Fig. 5) should be greased through the lubricator. Use grease of the multi-purpose type and force in so much grease that it starts to creep out at the wear washer which is located between the yoke and the intermediate housing.

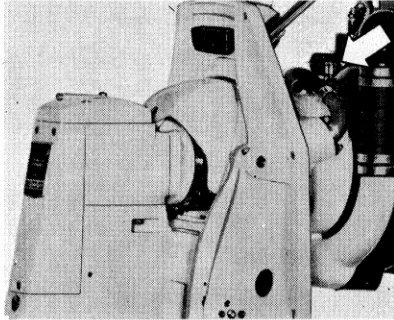


Fig. 7

CHECK THE ZINC RING

A zinc ring is fitted on the drive inside the propeller in order to eliminate galvanic corrosion on the drive. Since this zinc ring is subjected to corrosion, it must be checked at regular intervals.

The interval at which this inspection should be carried out depends on the salt content of the water and also the amount of impurities in the water. We stipulate that the zinc ring must be replaced when it has been corroded down to 50% of its original size. The zinc ring is replaced as follows:

1. Bend up the lock tabs on the lock washer (2, Fig. 8) for the propeller cone (1) and screw off the cone.

2. Pull off the propeller and unscrew the two slotted screws which retain the zinc ring (see Fig. 9) so that the ring can be removed from the propeller housing. Scrape the contact surface against the bearing housing until it is clean.

3. A new zinc ring is fitted in the reverse order to that used when removing. Make sure that there is good metallic contact between the zinc ring and the propeller housing.

NOTE: Do not forget to secure the propeller cone with the lock washer.

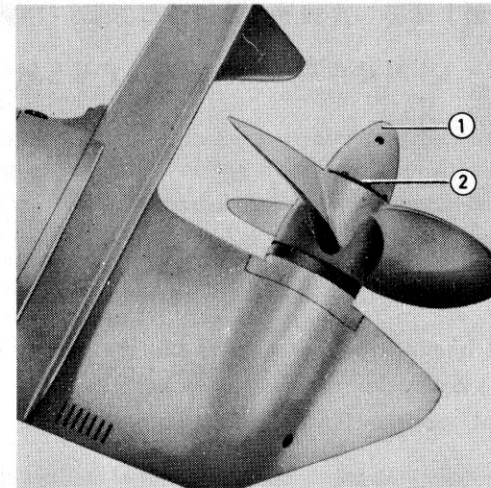


Fig. 8

1. Propeller cone
2. Lock washer

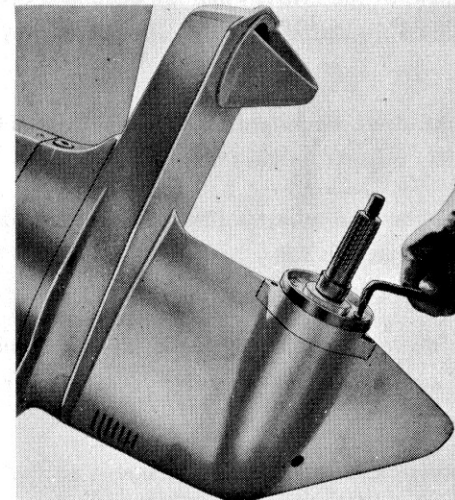


Fig. 9

CHECKING AND ADJUSTING THE SHIFT LINKAGE AND PUSH ROD

Check and adjust the shift linkage as follows:

1. Remove the protecting cover (7, Fig. 10) over the shift mechanism. Put the control lever in neutral position.
2. The bearings of the shift (9) and the control cable (6) must not be pinched in the lever arms in "forward," "reverse" and "neutral" position.
3. The lever has to be adjusted so that it does not come into contact with the housing in the "forward position." Adjustments can be made at (8) and (10).

The function of the push rod (3) is to release the retaining pawl by the help of the lift (1) when the outboard drive is being tipped up. Checking and adjustment of the push rod are as follows:

1. Pull the drive backwards so that the retaining pawl (5) is firmly gripped in the locating pin (4).
2. Check that the adjuster sleeve (2) in the upper part of the rod sticks up 3.5-4.0 mm (0.138-0.16") = "A" above the lift lever.
3. Press down the adjuster sleeve (2) evenly with the lift lever and check that the drive is released from the locating pin (4).
4. If necessary, turn the adjuster sleeve so that sufficient impact is obtained.

CARRY OUT GENERAL INSPECTION

General inspection of the outboard drive must be carried out after every 100 hours running or at least once each season. Clean the drive externally and touch up any damaged paintwork. Be particularly thorough with the points concerning oil filling and drainage.

NOTE: Do not paint the zinc ring

At the same time check for oil leakage, ensure that the rubber bellows are in good condition and that there is no abnormal wear on the links for the control mechanism and also make sure that the retaining pawl is not chafing on its pins.

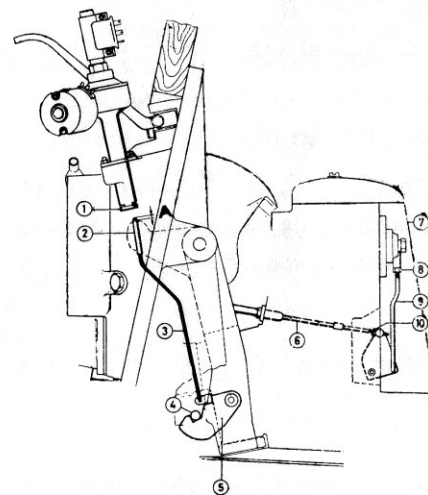


Fig. 10

PREPARE FOR SEASONAL STORAGE

Even insignificant corrosion on precision-machined parts can result in a serious deterioration in the conditions of these parts.

If the outboard drive is to remain idle for a longer period than one month, we recommend that it should be given protective treatment as described below.

PROTECTIVE TREATMENT

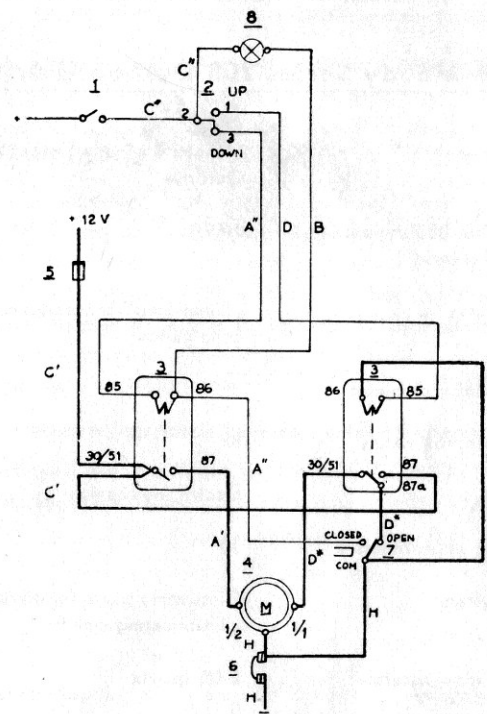
Drain off the oil from the drive and fill up with preservative oil (for example Shell Ensis Oil 20 or similar). First clean the drive externally with fresh water and then with kerosene or similar solvent. Remove all marine growths and deposits. Then touch up any of the paintwork that may be damaged. NOTE: Do not paint the zinc ring. Protect the outboard drive externally by applying anti-rust oil.

If the outboard drive is dismantled from the boat, a cover has to be mounted in the rubber bellows and on the stub shaft in the flywheel housing adapter.

PREPARING FOR USE AGAIN

Drain off the preservative oil from the outboard drive. Fill up with SAE 90 hypoid oil (see Servicing).

Electrical Wiring Diagram for Lift Unit



COMPONENTS

1. Key switch
2. Switch
3. Relay
4. Electric motor
5. Fuse
6. Motor cut-out
7. Breaker
8. Warning lamp

CABLE MARKINGS

Design	Colour	sq. mm ²	AWG
A'	Ivory	3.5	13
A''	Ivory	1.5	15
B	Black	1.5	15
C'	Red (+)	2.5	13
C''	Red (+)	1.5	15
D*	Green	2.5	13
D	Green	1.5	15
H	Blue	2.5	13

TECHNICAL DATA

Holman & Moody Series 200 Outboard Drive

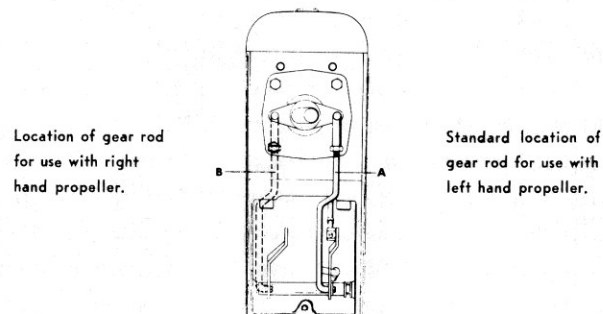
Type designation	Holman & Moody Series 200 Outdrive
Reduction ratio, 200 B type, overall ("forward and reverse")	1.59:1
Shift Mechanism	"Silent-Shift" self-adjusting cone clutch
Maximum propeller diameter	15"
Tip-up angle, approximately	65°
Lift Unit, type	Electric/mechanical
Steering angle, approximately	30°
Lubricating system	Circulating pump for oil supply to all lubricating points
Oil capacity, approximately	2 US quarts
Oil viscosity	SAE 90
Oil grade	Hypoid oil

ADJUSTMENT FOR CHANGE FROM L. H. TO R. H. PROPELLER

The gears in the outboard drive are designed to operate under load in either direction of rotation, for use with either left hand or right hand propeller, however the standard unit is assembled to use left hand propeller.

In the standard unit, for use with left hand propeller, the lower clutch-and-gear functions as the forward drive gear. If it is desired to use a right hand propeller, as required for the starboard unit of a pair, the linkage of the shifting mechanism may be reversed by a simple change in the assemble, whereupon the upper gear will become the forward drive gear. The procedure is as follows:

1. Remove the cover from the gear mechanism.
2. Move the gear control rod from location "A" as shown in Fig. to location "B"



By reference to Fig., it will be observed that in both positions of the gear rod (A and B, Fig.) the cable from the shift control lever has a "push" motion for engaging the forward gear.

WARRANTY

Holman and Moody Marine outdrive units are guaranteed against defective materials and workmanship for a period of six months or 400 hours, whichever occurs first, from the date of delivery to the first owner. The owner registration card must be completed and returned to Holman and Moody Marine Corporation, c/o Municipal Airport, Charlotte, North Carolina, to assure coverage under this policy. Holman and Moody reserves the right to make changes in its product, without obligating themselves to incorporate these changes in units of prior manufacture. The obligation of Holman and Moody Marine Corporation is limited to the replacement or repair of such drive assembly or parts that should be found upon inspection at the Charlotte factory to have been defective in material or workmanship. Transportation of merchandise to and from the factory will be paid by the owner. The warranty does not cover parts which have become damaged through abnormal wear, or parts damaged during installation or transportation, nor any parts which are not genuine Holman and Moody Marine or Ford Motor Company parts. If damage occurs to the unit because of parts which Holman and Moody Marine Corporation has not assembled on it, the damage will not be Holman and Moody Marine's expense. No contingent liability is accepted through the failure of any outdrive or drive unit parts. All repairs and replacement of parts must be authorized in writing by Holman and Moody Marine before we will accept responsibility for the claim. The owners manual must be followed in detail for the warranty to be valid. Outdrive units which have been raced or are built specifically for racing do not carry a warranty.