

# Walter Direct Mounted V-Drives

## Installation, Operation and Maintenance Manual

### Models **RV-10D**, RV-20D, RV-30D, RV-40D, & RV-48D

- V-Driving is the most advanced method of boat propulsion. America's fastest cruisers are equipped with V-Drives. By placing the engines in the stern more usable space is provided for living quarters on pleasure boats and cargo space on work boats. The engine compartment becomes a very compact unit and can be bulkheaded from the rest of the boat reducing engine noise and increasing safety. It also results in easier installation and greater accessibility of the engines. V-Drives also make it possible to use inboard engines in small cruisers without sacrificing valuable cabin space.

- Only direct drive (1:1 ratio) reverse gears are required. All reduction gearing is incorporated in the V-Drive, eliminating the need for an additional reduction unit on the reverse gear.

- Walter V-Drives are revolutionary. Conventional V-Drives use angle gears and housings to provide the V-angle. Walter V-Drives accomplish this by employing special coupled cardan type constant velocity needle bearing universal joints, fully encased and effectively lubricated by the gear drive lube system. The gears and shafts are parallel and a number of standard gear ratios are available for each size V-Drive.



### Outstanding Advantages of Walter V- Drives

- ① **A wide range of standard ratios!** . . . Special reduction and step-up ratios available at small extra cost.
- ② **Idler gear to change rotation of propeller shaft!** . . . This feature makes it possible to obtain twin screw rotation with same hand engines. Walter V-Drives use a third gear to reverse propeller shaft direction, rather than potentially troublesome chains and sprockets.
- ③ **High capacity water cooling!** . . . A waterjacket in the top of the housing cools the cardan joint V-Drives; except for the model RV-10D, which has a cooling tube in the bottom cover. All V-Drives which are equipped with an oil circulating pump have a cooling coil in the waterjacket, spray nozzle for force feed lubrication to gears and bearings, an oil pressure drop switch and warning light for the instrument panel. The pump is bi-directional. It automatically reverses ports, depending on rotation, keeping the oil flow in the same direction.
- ④ **Clamp-Fit propeller shaft flanges!** . . . These flanges are standard equipment. They grip the entire circumference of the propeller shaft and compensate for small size variations of shafts. They are factory bored and keyed to standard sizes.
- ⑤ **Q-U-I-E-T at ALL speeds!** . . . Walter V-Drives use fully hardened precision helical gears made of the finest alloy steel. The gear teeth are cut and shaved before heat treatment and honed after heat treating for high accuracy, resulting in smooth and quiet operation.
- ⑥ **High propeller thrust capacity!** . . . Special thrust type anti-friction bearings are incorporated in the V-Drives.
- ⑦ **Adjustable mounting brackets!** . . . Brackets are available with two or three way adjustment on all models. They are recommended for ratios over 2:1.

# PARTS LIST

Advise serial number of V-Drive when ordering parts.

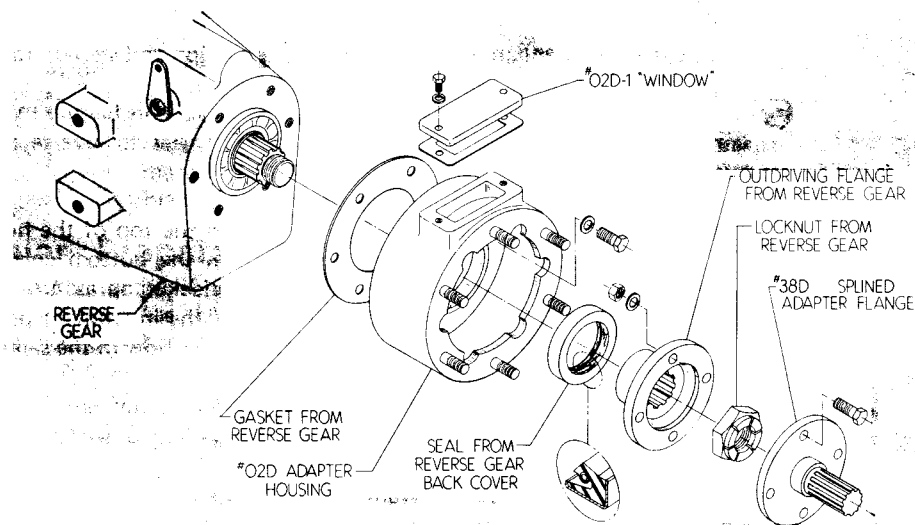
(A dash indicates a part is not used in that model.)

Part No.	DESCRIPTION	RV-10D	RV-20D	RV-30D	RV-40D	RV-48D	Part No.	DESCRIPTION	RV-10D	RV-20D	RV-30D	RV-40D	RV-48D
1	Housing, Main	1	1	1	1	1	15A	Bearing, Gear Shaft, flange end	1	1	1	1	1
2	Adapter Plate	1	—	—	1	1	16	Mounting Bkt. (Opt.)	2	2	2	2	2
02D	Adapter Housing	1	1	1	1	1	18	Stud, Nut & L'Wash	24	26	26	28	28
02D-1	Cover, Adapter	1	1	1	1	1	19A	Screw & L'Wash	—	6	8	8	8
3	Cover, no pump	1	1	1	1	1	19B	Stud, Nut & L'Wash	4	4	8	8	8
3SP	Cover, pump	—	1	1	1	1	21	Oil Level Gage	1	1	1	1	1
4	Cover, Seal	1	1	1	1	1	22	Magnetic Plug	1	2	2	2	2
5	Cover, Blank	1	1	1	1	1	23B	Screw & L'Wash	—	4	4	4	4
6	Cover, Watercooled	1	—	—	—	—	23D	Angle Housing	1	1	1	1	1
6B	Cover, Plain Bottom	—	1	1	1	1	24D	Angle Housing Cover	—	1	1	1	1
6D	Cover, top	—	1	1	1	1	24A-D	Seal, Angle Housing	1	1	1	1	1
6E	Oil Cooling Coil	—	1	1	1	1	25	Prop Flange, complete	1	1	1	1	1
6F	Coil Terminal and O-Rings	—	2	2	2	2	25B	Bolts & L'Wash	3	6	6	6	8
8	Seal, Gear Shaft	1	1	1	1	1	26D	Bearing, Angle Housing	—	1	1	1	1
9A	Pinion Shaft only	1	—	—	1	1	28	Idler Gear	—	1	1	1	1
9AJ	Pinion Shaft and Yoke, 1 piece	—	1	1	—	—	29	Idler Shaft	—	1	1	1	1
9AJ-N	Locknut	—	1	1	1	1	29A	Idler Bushing	—	1	1	1	1
9AJ-W	Lockwasher	—	1	1	1	1	29B	Idler Spacer & Shim	—	1	1	1	1
9B	Pinion Gear	1	1	1	1	1	30	Idler Bearing	—	2	2	2	2
9C	Pinion Shaft Sleeve	—	—	1	1	1	34	Universal Joint Double, complete	1	—	—	1	1
9F	Spacer Ring	—	1	1	—	—	34A	Joint Repair Kit	1	1	1	1	1
9W	Spacer, Flat	—	1	—	—	—	34J	Univ. Joint, less Yoke	—	1	1	—	—
10	Driven Gear	1	1	1	1	1	38B*	Bolt, Nut & L'Wash	4	4	4	4	6
11A	Gear Shaft	1	1	1	1	1	38D	Splined Adap. Flange	1	1	1	1	1
11A-N	Locknut	1	1	1	1	1	42A	Oil pump and Spring	—	1	1	1	1
11A-W	Lockwasher	1	1	1	1	1	42B	Pump End Cap	—	1	1	1	1
12	Breather Cap	1	1	1	1	1	42T	Pump Drive Ring & Pin	—	1	1	1	1
12A	Breather Elbow	1	1	1	1	1	43F	Screen	—	1	1	1	1
13	Gaskets, complete set	1	1	1	1	1	44	Hose & Hose Connections	—	1	1	1	1
14	Bearing, Pinion Shaft, yoke end	1	1	1	1	1	45	Spray Nozzle	—	1	1	1	1
14A	Bearing, Pinion Shaft, closed end	1	1	1	1	1	45C	Nozzle Holder	—	1	1	1	1
15	Bearing, Gear Shaft closed end (P = Pair)	1	1	1 (P)	1 (P)	1 (P)	49	Pressure Drop Switch	—	1	1	1	1
							49A	Warning Light & Plate	—	1	1	1	1

\*Supplied by engine manufacturer

## Assembly to Reverse Gear

• Unbolt the outdriving flange and back cover from the back of the reverse gear. Remove the oil seal from this cover and install it in the #02D adapter housing, preferably with the use of an arbor press. On the RV-48D to the Warner 73 only, the spacer ring and bearing cup must also be removed from the reverse gear cover and installed in the #02D-73 adapter housing. Bolt the #02D adapter housing to the reverse gear (the reverse gear back cover is no longer required). Reinstall the outdriving flange to the reverse gear and fasten with the locknut. Remove the #02D-1 "window" from the adapter housing for wrench clearance and bolt the #38D splined adapter flange to the reverse gear outdriving flange. Reinstall #02D-1. (On some RV-10D models the #38D is not required. The female spline of the #34

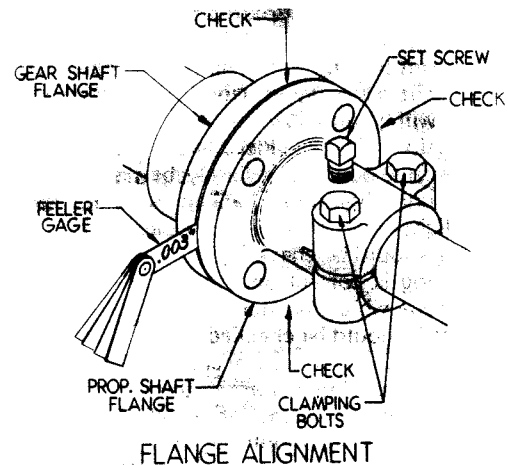


universal joint fits directly over the male spline on the reverse gear tailshaft). Slip the V-Drive on the #38D splined adapter flange and bolt it to the adapter housing.

# Installation

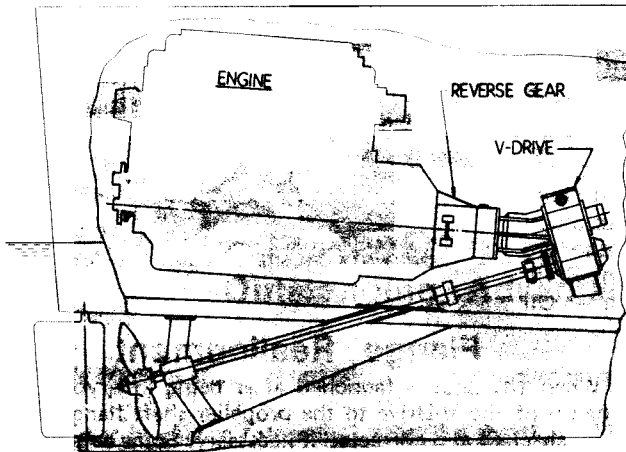
## Flange Alignment

• Install the #25 propeller shaft flange on to the propeller shaft and tighten the two clamping bolts on the split hub (none on RV-10D). A self-locking set screw is provided for the propeller shaft flange. Spot drill the propeller shaft and then securely tighten the set screw. Many good installations are ruined by improper propeller shaft flange alignment. Accurate alignment will ensure a smooth operating drive train and eliminate many problems that arise due to misalignment. Final alignment should not be attempted until the boat has been allowed to "settle" in the water. After the engine has been installed, adjust the mounts per manufacturer's instructions until the pilot diameters of the gear shaft flange and the propeller shaft flange engage freely. Butt the flange faces together. Without rotating either flange, check with a feeler gage in at least four places as shown in the illustration. If the maximum feeler gage that can slip between the flange faces at any point is .003", the unit is properly aligned. If a thicker gage can be inserted at any point, the engine must be readjusted until proper alignment is obtained. Turn the propeller shaft flange 1/4 of a turn without moving the gear shaft flange. Try inserting the .003" feeler gage as described above. The gap will not change if the propeller shaft is straight. If it increases, the shaft or flange is bent and must be removed and straightened. Rotate the propeller shaft flange in two more 1/4 turn increments and repeat the procedure. The pilot diameters



must be rechecked to ensure that they still engage freely. Secure the two flanges together with the heat treated bolts and special high collared lockwashers supplied.

INSTALLATION DRAWING

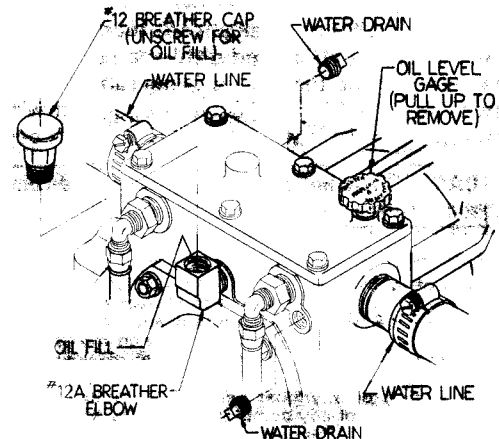


## Water and Switch Connections

• Hook up the water lines to the two pipe connections on the V-Drive (intake and exhaust lines are interchangeable). Generally one line from the seacock to the V-Drive and another from the V-Drive to the intake of the engine water circulating pump are utilized. In some cases, scuppers through the hull are connected to and from the V-Drive to provide independent water-cooling and are actuated by the movement of the boat through the water. With closed cooling systems, the V-Drive should be incorporated into the system between the cooler and the suction side of the water pump. Proper operating temperatures are from 140° to 180°F, although safe operating temperatures may be as high as 210°F. On the models equipped with an oil circulating pump, the #49 oil pressure drop switch and the 12 volt #49A warning light should be hooked up per the wiring diagram (see page 4). The switch may be grounded to any part of the V-Drive or engine (either terminal may be used for the ground).

## Oil Fill

• Pull out the #21 oil level gage. Unscrew the #12 breather cap and fill the V-Drive with SAE #30 motor oil through the #12A breather elbow. On the RV-10D only, the oil may be added by removing the plug in the top of the main housing. See table below for approximate oil capacities. The amount varies with the angle of installation. The oil level should be checked with the oil level gage fully inserted in the unit. The proper level is between the "H" and "L" marks on the gage. Add a 2 ounce tube of Molykote (molybdenum disulfide), which is supplied with each V-Drive for extra lubrication and break-in. It provides protection against scoring or galling of gears, bearings and other moving parts. Additional Molykote after break-in is not required. Reinstall the breather cap. The oil level should be rechecked after the unit has been run and allowed to sit for about a minute. Add oil if necessary.

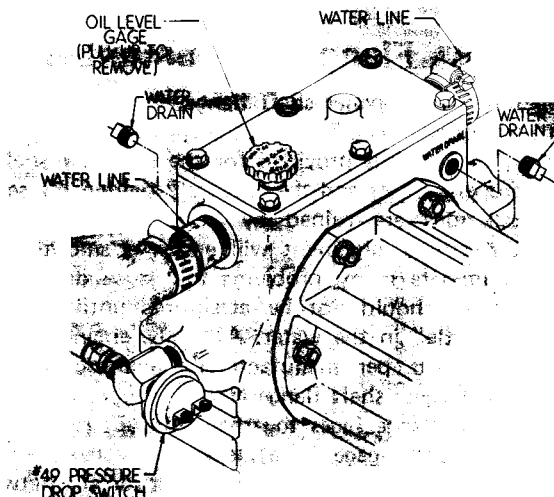


	RV-10D	RV-20D	RV-30D	RV-40D	RV-48D
Oil Capacity (Approx.)	1 pint	2 pints	3 pints	4 pints	4 pints

## Operation

- A pressure drop warning light is mounted on the instrument panel on V-Drives equipped with an oil circulating pump. The warning light will stay lit until the boat gets under way and the engine speed increases to sufficient RPM for the pump to maintain pressure. This normally occurs at approximately 1200 RPM, but the actual speed may vary by as much as 400 RPM. Extended cruising at low RPM, such as when trolling, is not harmful to the V-Drive, even though the warning light may stay lit. Normal operation is between 6 to 12 PSI. The light will go on when the oil pressure drops below 2 PSI. Loss of oil and/or insufficient oil level are the major causes of pressure drop. The oil level should immediately be restored, and while running the boat, the unit should be checked for leaks. If the oil level is normal and the light stays lit when the boat reaches normal cruising speed, the wiring should be checked for loose and/or corroded connections. If the wiring is correct and the light remains lit, the #49 pressure drop switch, which is mounted on the side of the V-Drive (see illustration), should be checked for proper operation. The switch can easily be removed and an accurate oil pressure gage installed in its place. If the pressure is normal, the switch should be replaced. If the pressure is below normal, the oil lines should be checked for blockage. The pump should be inspected and replaced if necessary. The pump is standard on the RV-48D and an optional feature on other models (not available on the RV-10D).

The oil level should be checked several times during the season, especially on V-Drives without pumps (see "Installation — Oil Fill").

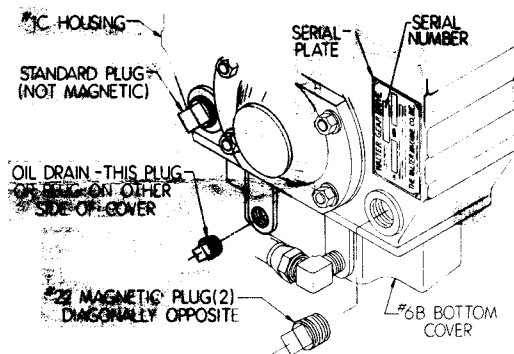


A clatter or rattle in the V-Drive at low RPM is due to the over-riding of the propeller during the compression stroke of the engine. Although annoying, it is not harmful. It may be reduced by adjusting the idle speed and/or tuning up the engine for smoother operation.

## Maintenance

### Oil Change

- After the first 100 hours of operation and every season and/or 500 hours thereafter, the oil should be changed. Run the boat to warm up the V-Drive to operating temperature. With the engine turned off, remove any one of the plugs in the #6B bottom cover to drain the oil. The removal of only one plug is necessary. Reinstall the plug after draining. Unscrew the two #22 magnetic plugs that are located on diagonally opposite corners of the #1C main housing (only one on RV-10D). The plugs can be checked to see if they are magnetic only after removal. Touch the inside face with a metallic object, such as a screwdriver. Clean them and reinstall. Usually, there are four plugs in the bottom part of the main housing. Only two of these are magnetic. The other two need not be removed (see illustration). Refill with SAE 30 motor oil to the proper level (see "Installation — Oil Fill").



### Water Drain

- For protection from freezing during winter lay-up, remove the small pipe plugs (located diagonally opposite) on the front and back of the housing marked "Water Drain" (see illustration). On the RV-10D only, one of the water lines going into the #6 water-cooled bottom cover must be disconnected to drain the water.

### Flange Realignment

- When the boat is launched after being in drydock, the line-up of the V-Drive to the propeller shaft flange should be rechecked and corrected if necessary. Some engines with rubber mounts may sag and must be raised with adjustments or shims for proper alignment (see "Installation — Flange Alignment").

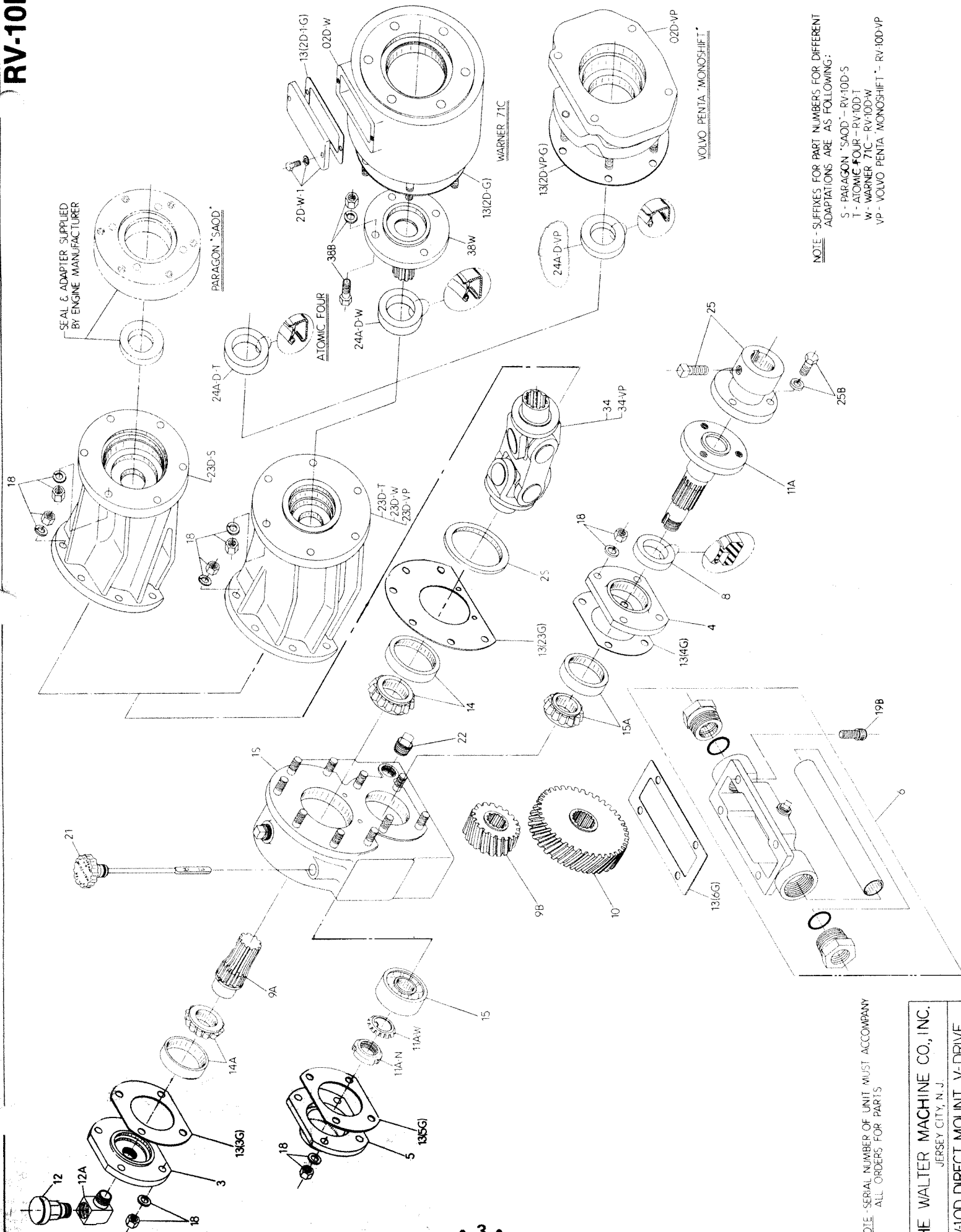
## Dealer Preparation

- The propeller shaft alignment must be checked and corrected, if necessary, before the boat is delivered. Final alignment should not be attempted until the boat is allowed to "settle" in the water. The oil level must be checked and oil added if required. While the boat is being run, the water connections should be checked for leaks. The oil pressure drop switch and warning light (if the V-Drive is equipped with an oil circulating pump) should be checked for proper operation. Do not transport the boat with the propeller shaft coupling connected. Damage to the shaft, shaft log and V-Drive can result.

**DANGER:** Do not touch V-Drive or related components until all shafts and exposed parts are stopped and the ignition is off. All repair and maintenance must be done by a person who is fully qualified.

**LIMITED ONE YEAR WARRANTY** — All assembled V-Drives and parts are warranted against defective material or workmanship for a period of twelve months or 400 hours of operation, whichever occurs first, from date of delivery. The Walter Machine Co., Inc. obligation under this warranty is limited to replacement or repair of any defective material when returned prepaid to our factory in Jersey City, and shall be subject to our inspection and verification of claim. Each V-Drive has a serial number on a nameplate on the side of the main housing, which must be submitted when making warranty claim. This warranty will not apply to any failure which results from accident, neglect, fire, sinking, abuse, abnormal service, lack of maintenance or improper installation or service. This warranty will not apply to haul-out, launch, towing or storage charges, mechanic travel time, inconvenience, loss of time or income, removal and replacement and/or modification of any boat parts to facilitate repairs. The Walter Machine Co., Inc. will not accept responsibility for contingent liability through failure of any complete unit or part.

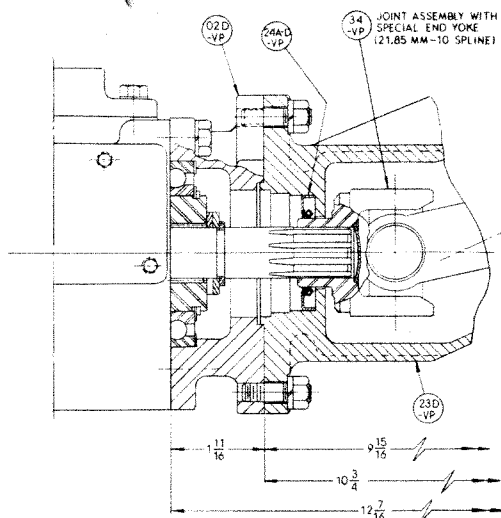
Manufactured by: THE WALTER MACHINE CO., INC. • 84-98 CAMBRIDGE AVENUE • JERSEY CITY, N.J. 07307  
TELEPHONE: (201) 656-5654



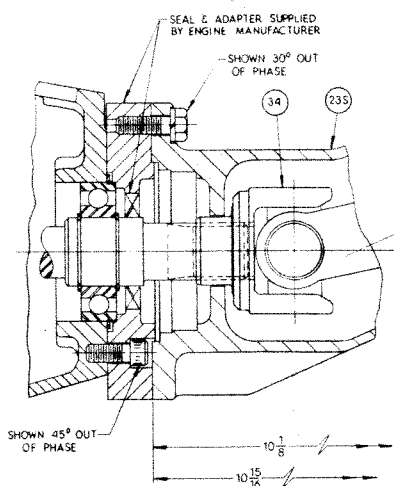
NOTE - SUFFIXES FOR PART NUMBERS FOR DIFFERENT ADAPTATIONS ARE AS FOLLOWING:  
 S - PARAGON 'SAOD' - RV-10D-S  
 T - ATOMIC FOUR - RV-10D-T  
 W - WARNER 71C - RV-10D-W  
 VP - VOLVO PENTA 'MONOSHIFT' - RV-10D-VP

NOTE - SERIAL NUMBER OF UNIT MUST ACCOMPANY ALL ORDERS FOR PARTS

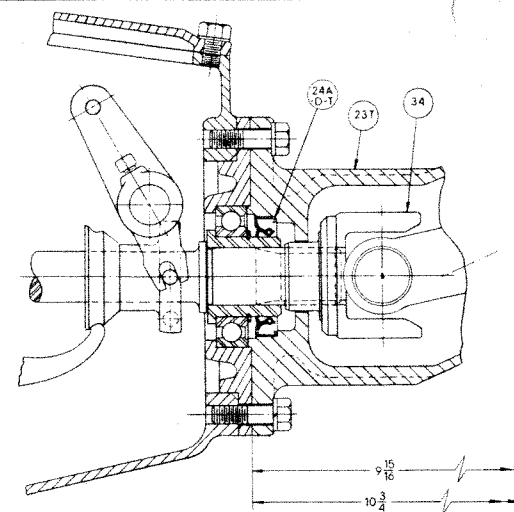
THE WALTER MACHINE CO., INC.  
 JERSEY CITY, N. J.  
 RV-10D DIRECT MOUNT V-DRIVE



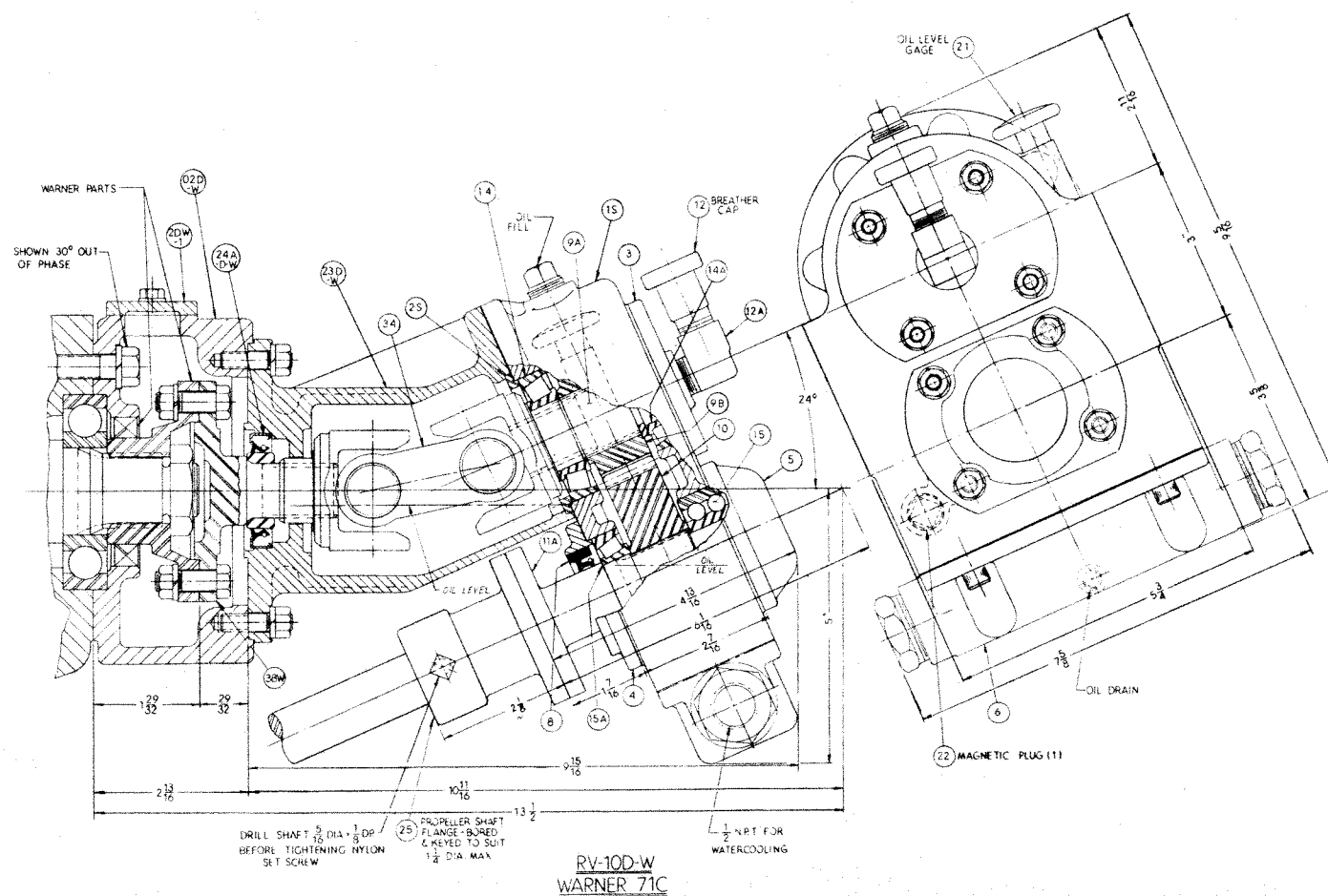
RV-10D-VP  
VOLVO PENTA "MONOSHIFT"



RV-10D-S  
PARAGON "SAOD"



RV-10D-T  
ATOMIC FOUR



RV-10D-W  
WARNER 71C

NOTE: ALL DIMENSIONS AND PART NUMBERS  
OMITTED BY PARTIAL SECTION VIEWS  
SHOULD BE TAKEN FROM MAIN DRAWING

STANDARD RATIOS (REDUCTION)	HP/100 RPM (GASOLINE)	THE WALTER MACHINE CO., INC. JERSEY CITY, N.J.	
1.00-1	2.7	RV-10D DIRECT MOUNT V-DRIVE	
1.29-1	2.5		
1.67-1	2.2		
2.00-1	2.0		
		4/21/78	LPD