



# COLORADO JUNIOR

UNITS UP  
TO 692

**Owner's Manual**

**Parts Catalogue**

**Fitting and Maintenance Instructions**

**C. W. F. HAMILTON MARINE LTD.**

HEAD OFFICE LUNNS ROAD, P.O. Box 709, - CHRISTCHURCH, N.Z.

also at WAIRAU ROAD, TAKAPUNA, AUCKLAND, P.O. Box 30077

## **TURBOCRAFT**

Series.....

No. ....

### **ENGINE**

Type.....

No. ....

### **JET**

Type.....

No. ....

### **NOTE**

THE OWNER MUST FILL IN THE  
DETACHABLE HALF OF THIS PAGE  
AND RETURN TO:—

**C. W. F. HAMILTON MARINE**

**P.O. BOX 709**

**CHRISTCHURCH**

**WITHIN 7 DAYS OF PURCHASE**

**IF NOT,  
ALL WARRANTY  
IS VOID**

## **TURBOCRAFT**

Series.....

No. ....

### **ENGINE**

Type.....

No. ....

### **JET**

Type.....

No. ....

### **DEALER**

.....

.....

.....

### **OWNER**

.....

.....

.....

Date.....

Signature of Owner

.....

PLEASE RETURN THE WHOLE OF THIS SIDE



You will shortly begin boating with your new Jet Boat,  
a remarkable craft with unusual capabilities -

BEFORE CASTING OFF, PLEASE ASK YOURSELF THESE QUESTIONS -

1. Power boats are illegal on some waters. Have I checked this area?
2. Am I attempting to boat where I could disturb wildlife in a National Park Sanctuary, or Refuge ?
3. Is this Wildlife fully protected in this area ?
4. If not, is it open season, or do I need a Licence to take game ?
5. Will I inconvenience, harm, or disturb other users of the water, such as fishermen, property owners, or picnickers ?

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In the back country, remember to ask permission to shoot on surrounding territory, and douse all camp fires.

CHECK LOCAL WILDLIFE REGULATIONS FOR THIS TIME OF YEAR !

## INTRODUCTION.

Hamilton Turbocraft have no propeller - they are purely "reaction propelled" similar to a Jet Aircraft, except that the medium used is water, not air.

High propulsive efficiency, together with other unique advantages is widening the use of the Hamilton Marine Jet propulsion system throughout the world; especially where conditions are difficult for conventional craft.

Complete lack of any underwater appendages beneath the hull, lively performance, and outstanding manoeuvrability have helped bring this about. The Turbocraft has the ability to operate in water only a few inches deep and dirty debris-laden conditions that would spell ruin for the conventional propeller.

With experience, they can be handled safely in confined spaces, turbulent rapids, and cataracts. They are almost impossible to upset in the roughest water conditions because of their unusual safety and stability of speed. Hamilton Turbocraft hulls have been designed to sustain unusual punishment. Intentionally contacting rocks, reefs, floating weeds, sandbars, etc., is obviously not recommended when it can be avoided, but a Turbocraft's extra ruggedness will show its worth if you should strike such an obstacle.

REMEMBER: -

"It takes a lot of experience with any given boat to learn all her whims and traits - to know her strong points and use them wisely to overcome the weak one.

But boats, like individuals, do respond to understanding treatment."

Chapman, Charles F.  
Piloting, Seamanship  
and Small Boat Handling.

## COLORADO JUNIOR JET

## RANGE OF APPLICATION

The Jet unit has been expressly designed for low cost and ease of installation. It is best suited for small-medium planing craft, giving speeds of 30 - 40 M.P.H. (depending on power-weight ratio), very brisk acceleration, excellent power for water ski-ing, and good load-carrying for family or utility use.

It is produced in two versions :-

1. 50 B.H.P.      Hull size      ...    12 - 16 feet  
                         Engine size      ...    60 - 90 cubic inches capacity

Examples: Ford Prefect, Anglia, Consul 315,  
Consul Mark I and II, Hillman,  
Vauxhall Wyvern and Victor, B.M.C.  
four cylinder models, Volkswagen etc.

Max. boat weight    1000 lbs. (before loading)

2. 100 B.H.P.      Hull size      ...    14 - 18 feet  
                         Engine size      ... 100 - 180 cubic inches capacity

Examples: Ford Zephyr Four and Six, Falcon  
Holden, Vauxhall Velox, all B.M.C.  
6 cylinder models.

Max. boat weight    1400 lbs. (before loading)

Heavier and larger boats can be propelled successfully with equal efficiency to a direct driven propeller, but planing may be difficult with average loads, and speeds may be restricted.

As a general guide keep unladen boat weight under 22 lbs/b.h.p. and do not exceeds 33 lbs/b.h.p. fully laden. If these guides are followed, good performance and quick planing will result, and laden cruising speeds approaching 30 m.p.h. will be possible.

### HULLS:

The Colorado Junior Jet may be installed in a wide variety of hulls, both round bilge and hard chine. However, for best performance and handling the following points should be observed:

VEE-ANGLE IN BOTTOM:    Some Vee-angle in the bottom at the transom is desirable for the following reasons :-

- (a) Priming: The jet unit can be mounted lower than in a flat bottom, so that instant priming is assured when the engine is started. The unit should be at least half full of water when the craft is standing idle.
- (b) Choppy water: The Vee-angle assists in keeping the jet unit intake down in "green" water at speed in choppy or rough conditions. Also entrained air entering at the bow is more successfully separated out to the side, thus avoiding engine racing in these conditions.

STEMLINE: Avoid a forefoot too fine and deep. This gives too much keeling forward in fast turns causing spinning out. Use a full and convex bow, with a rounded stem rising steadily from well back along the keel.

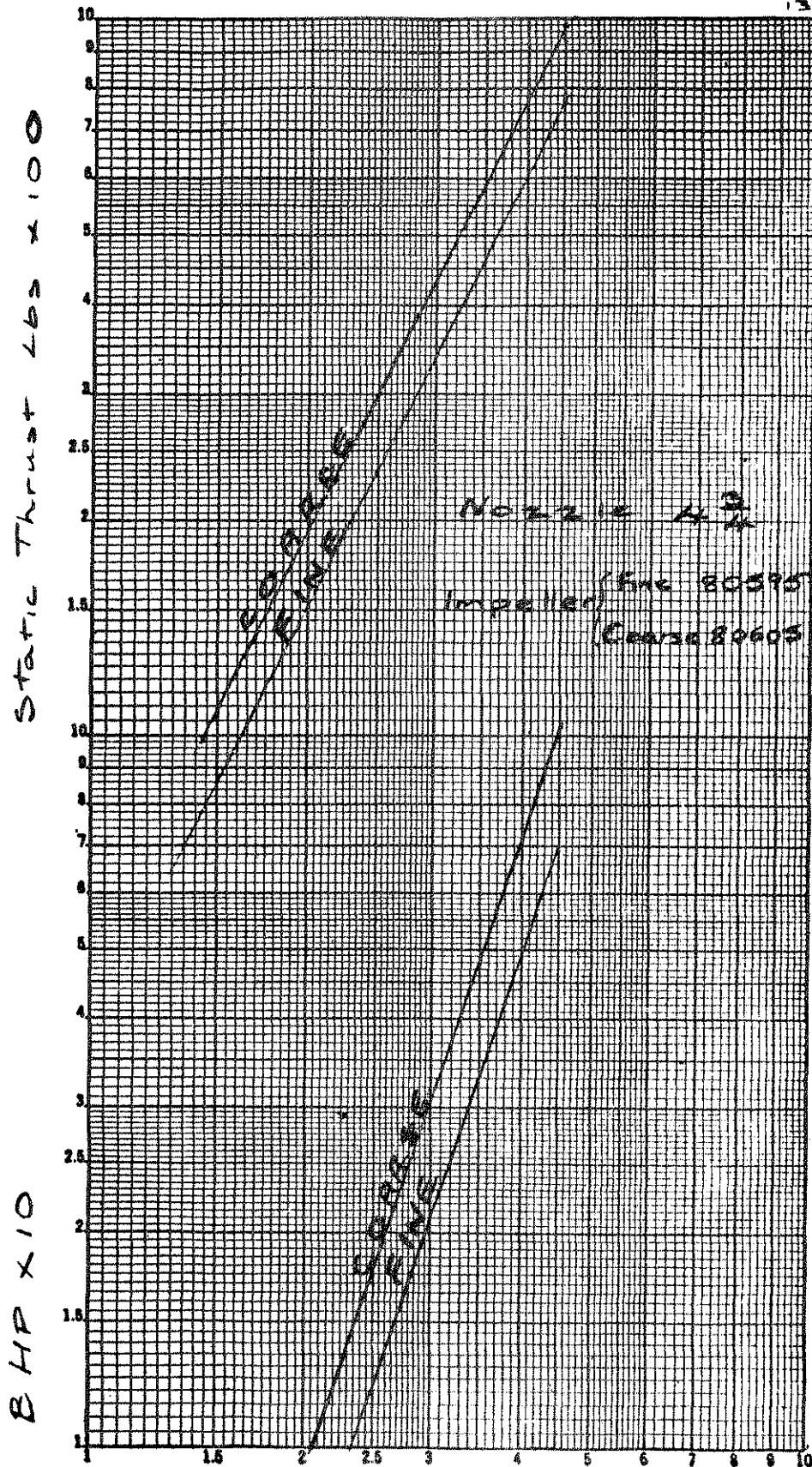
KEELING: Do not use any centre keel or deadwood, (more than 2" or so). If keeling is required aft to control turns, fit a pair of "sister" keels about 2 feet apart at the stern. These should be 2 - 6 feet long, 1" - 3" deep, and faired off to nothing at the front end.

NOTE: The larger the craft, the less the above points apply so generally tend to choose any hull design that is suited to the purpose. Avoid lapstroke hulls or external stringers on the bottom as they can carry entrained air to the jet intake causing engine racing.



# Colorado Junior

13 Feb '63



# COLORADO JUNIOR MARINE JET

## FITTING INSTRUCTIONS

### PREPARATION:

First prepare the keel area near the transom as in diagram JE 107. A flat area 12" wide by 26" long is required built up on the keel line from wood or fibreglass, whichever is preferred. Note that the depth of the block must be such that the sides of the intake hole are 1" deep finally. A flat bottomed hull, therefore, would require a block 1" deep all over, a vee-bottom would be deeper in the centre, but still 1" deep at the hole side. Mark out the rectangular intake hole ( $18\frac{1}{2}$ " long x  $8\frac{7}{8}$ " wide) obtaining distance "x" from the table on Diagram JE 107 which shows the relationship between distance "x" and the transom angle of the hull. Cut this hole out straight through and check that sides are 1" deep. Make sure the top surface is really level and flat. Underneath, flatten off the bottom (9" wide) from the rear edge of the hole, clear back to the transom so that no "step" will remain when the flat intake screen is installed. This will only need to be done on vee-bottoms, as flat bottoms (or near flat) will leave no step in this area. In front of the intake hole, fair off from the flat area smoothly into the bottom on vee-bottom hulls so that the water can flow smoothly up to the intake.

### TRANSOM HOLES:

Mark on the outside of the Transom the hole outline from the full size shape on drawing JE 107. Note the level of the hull bottom on the drawing as a guide to the height. However, check the height of the shaft line  $5\frac{1}{8}$ " above TOP surface of block if in doubt. Cut out this hole straight through the transom parallel to the keel line. If the unit is supplied with reverse, see Drawing to obtain the position of the hole necessary to accomodate the JE 172 Transom Plate. This hole is 3" diameter, 1" to the left of the transom centre line. The height above the shaft line depends on the Transom angle. On some models, a separate part, JE 156, is supplied to provide a reverse seal. In this case, the hole is  $1-15/16$ " diameter, 1" to the left of the transom centre line. The height above the shaft line for various transom angles is as follows :-

0°	4°	8°	12°
8"	7-13/16"	7 $\frac{3}{4}$ "	7-11/16"

### INITIAL JET UNIT FITTING:

Take Jet unit, remove tie bar (41) hinge pins (3) and Deflectors (1 & 2). Remove Steering shaft cotter (10) and Steering shaft (5). Temporarily screw intake screen directly on to the bottom face of the jet unit (say with two screws only).

Slide Jet unit into boat, and drop over intake hole, so that the intake screen automatically locates it in the



correct position. Juggle a little to divide the clearance roughly equally sideways, and fore and aft. Mark through the 11 holes on the base, lift unit out, drill holes through 5/16 dia. and countersink slightly on the underside. Fit screen finally to base of unit, with rubber foot gasket sandwiched in between. Smear both surfaces of the gasket liberally with bac1 Bostick cement, Adfast cement or equivalent. Screw up 4 screws holding screen firmly with sealant smeared on the threads. Refit unit in hull, fit 11 holding down screws (smeared with Sealant around heads) from underside. In hulls with soft wooden bottoms, a metal strip with a row of countersunk holes may be required along each side to prevent the heads of the bolts pulling into the wood. Put fibre washer, flat washer, nut in that order on each, and pull down evenly all round. Make sure the heads of the screws pull in just flush on the underside and do not protrude.

#### TRANSOM SEAL:

Take moulded rubber seal and check that its shape corresponds with the shape of the transom ring. The hole for the projection on the rear face of JE 172 is supposed to be 2 $\frac{1}{4}$ " diameter (i.e. smaller than the projection), to provide a good seal.

Stretch the rubber seal over the tailpipe and slide it up to the transom and with the small steering shaft hole vertical. Fit the Transom ring against the seal. Fit reverse if supplied, and check that the push rod does not foul on the transom ring. Drill screw holes and fasten the ring and seal to the transom with the screws provided. Stretch garter spring around the moulded lip on the seal and hook ends together. Check that sealing lip fits snugly against the tailpipe. Slide steering shaft into place, through small hole in top of rubber seal ring, fix steering shaft inside with cotter pin. Replace deflectors. The top of steering arm inside may be connected directly to the steering cable system with small shackles and cable clamps. A  $\frac{1}{2}$ " hose may be connected to the water offtake nipple to supply the engine with cooling water. Either plug may be used.

#### STEERING ADJUSTMENT:

Later models are fitted with eccentric bushes in the tie bar connecting the deflectors. These allow adjustment to remove slack in steering. To adjust, slacken the  $\frac{3}{8}$ " bolts, and turn the bushes outwards to reduce spacing, inwards to increase spacing. Replace bolts carefully. Eccentric angles should be kept the same both sides. Do not reduce spacing too much or speed may be affected,  $4\frac{3}{8}$ " at the deflector tips being a usual optimum figure.

#### AIR BLEED:

Push one end of the plastic hose over the nipple mounted on the front of the intake, and fix with hose slip. Mount the other end either on the engine or on the transom so that the open end is at least 6" above the water line, preferably higher if possible. Take care to keep the hose clear of the universal and other moving parts.

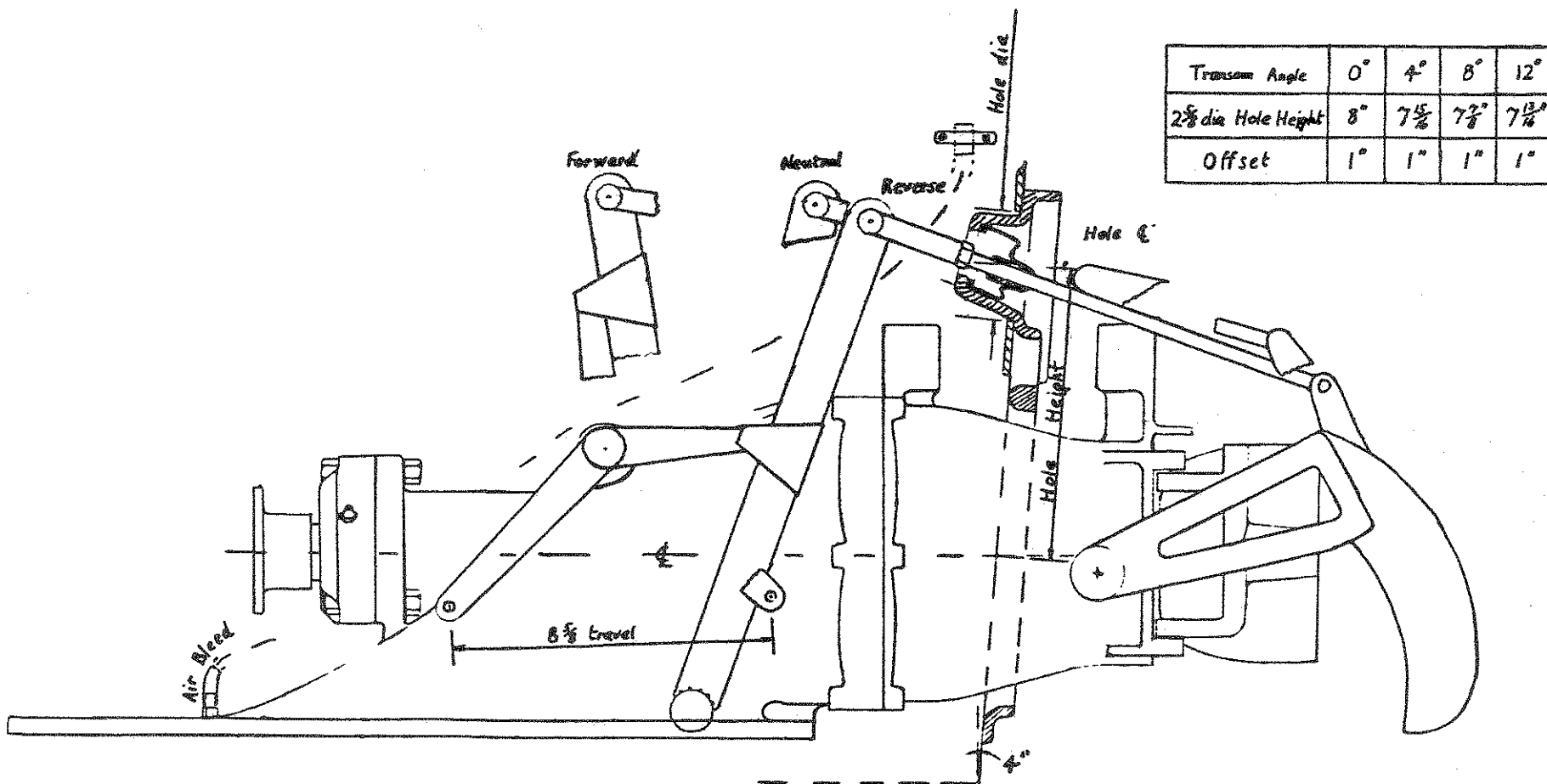
#### REVERSE GEAR:

Refer to the numbered photograph at back of Manual. Fit Reverse Pivot Bushes (69) into holes in bucket side arms (66 and 67). Put  $\frac{5}{8}$ " dia. washers (54) on  $\frac{5}{8}$ " dia. x  $1\frac{1}{2}$  bolts (70) and bolt the bucket onto the threaded Bosses on the tailpipe. Tighten bolts. Put the reverse operating lever (50) on to the lower pivot pin (52) (already fitted) so that the top of the lever is approximately 1" off the unit centre line. Fit on  $\frac{5}{8}$ " dia. washer (54) and  $\frac{1}{8}$ " split pin (55). Put the locking lever (51) on to the other pivot pin so that the short arm rubs on the operating lever and the longer arm clears the outside of the operating lever. Fit the sliding link (53) round the operating lever and bolt to the hole in the short arm of the locking lever with the head of the bolt (56) nearer the intake. Do not tighten the nut as the sliding link must be free to turn. Put on lock nut and tighten.

Put spring (71) through  $\frac{1}{8}$ " dia. hole in operating lever. Attach spring anchor (72) under 2nd from front bolt holding the intake down. Fasten other end of spring to anchor.

Fit the push rod (58) through the transom plate, fasten the bush end between the bucket lugs, fit the lock nut and clevis (61) to the push rod and to the operating lever and check that the push rod does not foul the transom plate.

When the locking lever is engaged in the neutral notch the boat should remain stationary with the engine running. Full steering is still available. With the bucket fully raised ("forward" position), the chrom push rod (58) length should be adjusted in length so that the lowest portion of the bucket is  $\frac{3}{4}$ " above the steering deflectors. When full reverse is selected, the top lip of the bucket should come down to within  $\frac{1}{4}$ " of the steering deflectors. This should be effected by adjusting the draglink inside the boat running forward to the driver's seat. A lock should be provided to hold the control in the reverse position.



THIS DIAGRAM SHOWS 'JUNIOR' UNIT

TABLE OF MEASUREMENTS ALSO SUITABLE FOR 'EXPLORER' JET

## ENGINE INSTALLATION HINTS.

### POSITION.

The engine should be mounted where recommended by the hull designer, or astern of this position if desired. The latter may improve priming when starting, will give more forward cockpit space, and may improve top speed. The closest possible position to the jet will normally be the length of the standard Hamilton drive shaft (available as an extra). This shaft is approximately 18" long.

### LEVEL.

Mount engine preferably on longitudinal bearers so that the crank-shaft line is level with the keel, and with a small clearance of about 1" under the flywheel or oil sump, whichever is closest to the bottom.

### DRIVE SHAFT.

The drive coupling on the jet is made to take the Hardy-Spicer universal joint used on most medium-sized cars (1260 or 1300 series). Use a double universal joint shaft with a sliding spline of an overall length to suit the chosen engine position. Run the universal joint at a slight, but not too great an angle to avoid wear and vibration.  $1^{\circ}$  &  $4^{\circ}$  angle, equal on each is recommended. Make sure that the two centre yokes are in the same plane, the outer yokes in the same plane to avoid torsional vibrations. No special care is required in lining up the engine, the universal will take care of small differences. An absolute maximum universal angle of  $8^{\circ}$  is permitted.

### COOLING SYSTEM.

The following cooling circuit is recommended :-

1. Carry a  $\frac{1}{2}$ " hose from the jet unit offtake through the oil sump cooling coil. (if fitted)
2. Connect through the water-jacketed exhaust manifold. (in such a manner so as to keep the jacket full of water if possible)
3. Pipe through the engine block in at the water pump inlet (or direct into the block if pump not used), and out at the thermostat cover. Retain thermostat in position, but drill  $\frac{1}{8}$ " hole in valve disc.
4. From the thermostat cover, pipe to the exhaust pipe outlet about 6" below the nearest exhaust port, pointing down the pipe. This flow will cool the gases and pipe from there on.
5. If the jet pressure appears excessive, shown by too cool a running temperature, a small adjustable bypass pipe can be arranged from the cylinder block inlet to the exhaust waste pipe to relieve excess pressure when driving hard. Lack of cooling water flow can be noticed first by a louder note from the exhaust, then by the temperature gauge if fitted. Stop immediately, switch off engine and check.

## OPERATION OF JET UNIT

### STEERING:

This is effected by the pair of coupled deflectors arranged either side of the jet nozzle. Turning the steering wheel turns the deflectors, and thus the whole jet stream left or right for powerful and accurate steering.

- Remember:
1. The engine must be running in order to obtain steering.
  2. The wider the throttle the more steering effect is available.
  3. Never stop the engine when approaching a mooring or any other time when steering will be required. You have full steering power even when stationary at the touch of the throttle.

### REVERSE CONTROL:

When fitted this control will enable you to go forward, hold still, or reverse with the movement of the lever. It is possible to brake to a stop by using reverse, or to creep slowly in either direction merely by moving the lever a small amount only the required way. Steering is available the whole time, whether moving forward or back, or even when stationary. Do not use excessive throttle when operating this control.

## C R U I S I N G   T E C H N I Q U E

### 1.   LOADING.

Never carry more weight aboard than absolutely necessary. Remember that a high speed planing hull, like an aeroplane is sensitive to excess weight. The lighter the load the better the performance and the shallower will be the draught. Keep disposable weight about central, or forward of centre for best get-away.

### 2.   CRUISING.

With engine running slowly, manoeuvre into deep enough water to start off, open throttle fully until the craft is planing cleanly, then ease the throttle back slightly to economical cruising revs. About 75% of maximum.

### 3.   BAD PRACTICE.

Avoid using large throttle openings, at slow speeds, in shallow water. The bottom may be sucked up into the intake. Avoid driving the boat in the 10 - 15 m.p.h. range. At these speeds the draught and drag are at a maximum.

### 4.   BLOCKED INTAKE SCREEN.

During operation in debris-laden water the intake screen of the jet unit may become clogged. Floating sticks, weeds and leaves are the worst offenders. The effect is a falling off in thrust and speed, and in extreme cases, by increased noise from the jet unit. Close the throttle momentarily and switch off the engine for a few seconds. In most cases it will be found that most of this material will fall from the screen bars.

If this fails, stop the engine and remove the blockage manually. A rake is provided with all Turbocraft for this purpose. They are also available separately from the manufacturers.

### 5.   STARTING OFF AND STOPPING.

Avoid shallow water except when travelling at a clean planing speed. Pick a deep area for starting off and stopping. Avoid large throttle openings in shallow water at slow speed, as small stones can be sucked from the bottom and block the intake screen.

If this occurs, stop the engine and restart when the intake is in deeper water. Allow boat to move across the bottom before using too much throttle. When running at a reasonable speed, no trouble will be experienced from this source in shallows.



## S E R V I C I N G   I N F O R M A T I O N

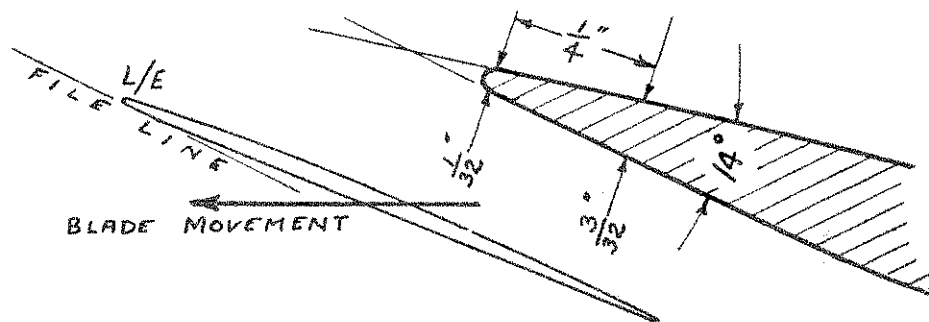
### TO INSPECT THRUST BEARING:

Remove rear end of the drive shaft, undo and remove the Nyloc nut and washer (27 & 29), the four bolts (25). The coupling (26) will then be free to come out with the bearing cap (24) and bearing (23) on it. Do not lose the coupling key (32). The bearing, if it is to be replaced, may now be driven off the coupling. A faulty bearing is normally indicated by a whine or grumble when running at all speeds, even at an idle.

Before re-assembly make sure all parts are clean and in good condition. Place the coupling flange down on a firm surface. Put the bearing cap over it, with the machined surface uppermost. Wrap the insulating strip (21) round the coupling and hold it in place by sliding the insulating washer (22) over it. Now put the bearing on over the insulation, pressing only on the inner ring. Press the bearing and insulating washer right down to the shoulder making sure that the insulating strip does not get damaged or misplaced. Put a heavy coating of Lithium based water repellent grease over the bearing seal to fully pack the space behind the bearing. Fit the key in the keyway in the shaft, first making sure that the rubber "O" ring is in place in the gland sleeve recess (19) and that the insulating washer (20) is against the face of the gland sleeve. Now slide the coupling over the shaft and key and enter the bearing into the intake. Tighten the bolts (25). Fit the washer (29) and tighten the Nyloc nut to 70 lb. ft. torque. Refit the drive shaft and check that the shaft turns freely. Re-oil the gland seals.

### TO CHECK IMPELLER:

From the aft end, remove the reverse bucket (65), pushrod (58), tiebar (41), and deflectors (1 & 2). Inside, remove the water leads and unions, cotter pin (10), and withdraw steering shaft (5). Undo the ring of screws, and remove transom plate and seal off the tail pipe. Next remove the ring of six nuts and bolts holding the unit together, and withdraw tailpipe out through the hole in the transom. Watch for large "O" ring in its recess. Undo bronze shaft nut, slide off bearing sleeve and impeller. Watch for key in the shaft. Keep the impeller edges reasonably sharp and take care to sharpen only as shown in the sketch. Blunt leading edges can reduce performance considerably.



## M A I N T E N A N C E

NOTE: This unit has been designed to require the absolute minimum of maintenance. The main moving parts which may require occasional attention are described below to enable the owner to better understand the design.

### THRUST BEARING:

This is a deep-groove heavy duty ball race with its lubricant sealed in for life. No maintenance or attention is required during the life of the bearing.

### REAR BEARING:

This is a water-lubricated cutless rubber bearing. It requires no attention. DO NOT RUN THE UNIT WITH A DRY BEARING as this will damage the bearing. Application of a garden hose to the small hole in the fairing inside the nozzle will wet the bearing sufficiently to allow the unit to be run for a short time, but REMEMBER, the engine still has no water circulation and prolonged running will cause damage.

### GLAND SEAL:

This is a double row synthetic rubber lip seal. The space between the two seals should be checked every 10 hours and kept full of 140 grade oil, either by removing the grease nipple and pouring it in, or by using the oil in a grease gun and applying it to the nipple. Excess oil will escape through into the water passage of the unit. Oil or water escaping into the boat through the drain hole indicates a leaky seal which may require attention. If 140 grade oil is unobtainable, use a very light Lithium based water repellant grease.

### DRIVE SHAFT UNIVERSALS:

Every 30 hours sparingly grease the universal joints and sliding splines. Do not overgrease.

### TRANSOM SEAL:

Occasionally inspect the rubber and check that it is sealing effectively.

### SALT-WATER OPERATION:

The unit is designed for fresh or salt water use, however, it is not recommended that they are moored out in the sea for long periods unused. It is advisable to flush out the unit with a fresh water hose, or run the craft in fresh water before storage for any length of time. A rub over the outside with an oily rag is helpful.

When re-assembling make sure all parts are clean, and grease all meeting surfaces. Fit key in keyway in shaft, and slide impeller over shaft and key. Slide on bearing sleeve and when tightening the nut, ensure that the washer is central, as otherwise it can prevent the tailpipe from fitting on. Tightening torque for the nut is 70 lb. ft. Before sliding the tailpipe back on, clean all traces of grease from the bearing sleeve. - (Important). It is often helpful to dust the sleeve with talc or French chalk to act as a lubricant for the rubber bearing. The rest of the assembly is straightforward.

#### TO RENEW GLAND SEAL:

Worn seals are usually indicated by water leakage from the small drain hole in the intake casing. Remove coupling and bearing from unit as above. Withdraw gland sleeve (19), watch for "O" ring just behind insulation washer (20).

Renew the gland sleeve if it has appreciable grooves worn in it. If the seals have lips with a flat wider than 1/16 inch then these need replacing also. In this case remove the tailpipe as above and withdraw shaft and impeller as a unit. The seals may now be driven out. Carefully scrape the seal bore and clean out any old adhesive and pieces of seal. When refitting the seals lightly smear the bore and the outside diameter of the seals with a rubber-based adhesive such as Pliobond and press the seals in to the following dimensions measured from the outside front face. (All lips should face aft, away from the thrust bearing.)

No. 1 :- 3-1/16 in. No. 2 :- 2 $\frac{1}{2}$  in. No. 3 :- 1-9/16 in.  
Allow to dry and re-assemble using procedure already described.

#### GENERAL:

If you dismantle part of the unit, it is generally worth while examining the seals and the impeller at the same time. A complete checkover just before the start of the season usually pays dividends in the form of assured reliability and peak performance.

# COLORADO JUNIOR JET

## GENERAL PARTS LIST

ITEM	PART NO.	DESCRIPTION	NO. REQD.
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The basic unit should contain the following :-

1	JE 103	L.H. Steering Deflector	1
2	JE 102	R.H. Steering Deflector	1
3	JE 168	Hinge Pin	2
4	JE 134	Steering shaft bush	2
5	JE 111Y	Steering fork W.A.	1
9	JE 142	Steering arm	1
10	$\frac{3}{8}$ x $1\frac{5}{8}$	Cotter pin, w/nut & washer	1
11	JE 120	Mainshaft	1
12	$7\frac{3}{4}$ x 8 x $\frac{1}{8}$	O ring W.S.	1
13	JE 147	Wear ring insulator	1
14	JE 144	Wear ring	1
15	63097	Name plate	1
16	63135	Name plate	1
17	$\frac{1}{8}$ BSP	Grease nipple straight	1
18	GACO MIS 18	Seals	3
19	JE 123	Gland sleeve with 1 x $1\frac{1}{4}$ x $\frac{1}{8}$ O-ring seal	1
20	JE 145	Insulating washer	1
21	JE 146	Insulating sleeve	1
22	JE 148	Insulating washer	1
23	6308 GG	Ball bearing	1
24	JE 131	Bearing cap	1
25	$5/16$ x $\frac{3}{4}$	UNC hex hd bolt	4
26	JE 124	Coupling	1
27	NP/D246/11/2	Self-locking nut	1
28	JE 127	Hex. nut	1
29	$\frac{3}{4}$ x $1\frac{1}{2}$ x 150WC	Brass washer	2
30	JE 122	Bearing sleeve	1
31	JC 49	Rubber bearing	1
32	JE 121	Key	2
33	JE 105	Tailpipe	1
34	$5/16$ x $2\frac{1}{2}$	Hex. hd. bolt, washer & nut	6
35	$5/16$ x 2	Csk. hd. M/C screw	4
36	JE 118 SY	Intake Screen (or JE 155 SY)	1
37	JE 101	Intake casting	1
38	JE 132	Intake gasket	1
39	$5/16$ BSW x $2\frac{1}{4}$	Csk. hd. M/C screws, 2 washers & nut	11
41	JE 106	Tie bar	1
42	$\frac{3}{8}$ UNC x $1\frac{1}{4}$	Hex. hd. bolt & washer	2
43	$\frac{3}{4}$ BSP	Plug	1
44	JE 163	Conical spring	1
45	JE 164	Water intake	1
46	JE 162	Eccentric tie bar bush	1
47	MOO	Hose clip	1
48	J 634	Plastic hose $\frac{3}{8}$ " x 2'6"	1
77	JE 167	Air bleed nipple	1
78	JE 178	Seal spring	1

ITEM	PART NO.	DESCRIPTION	NO. REQD.
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IMPELLER OPTION

49	JE 104	Impeller 40 - 60 b.h.p.	OR	1
	80603	Impeller 60 - 100 b.h.p.		1

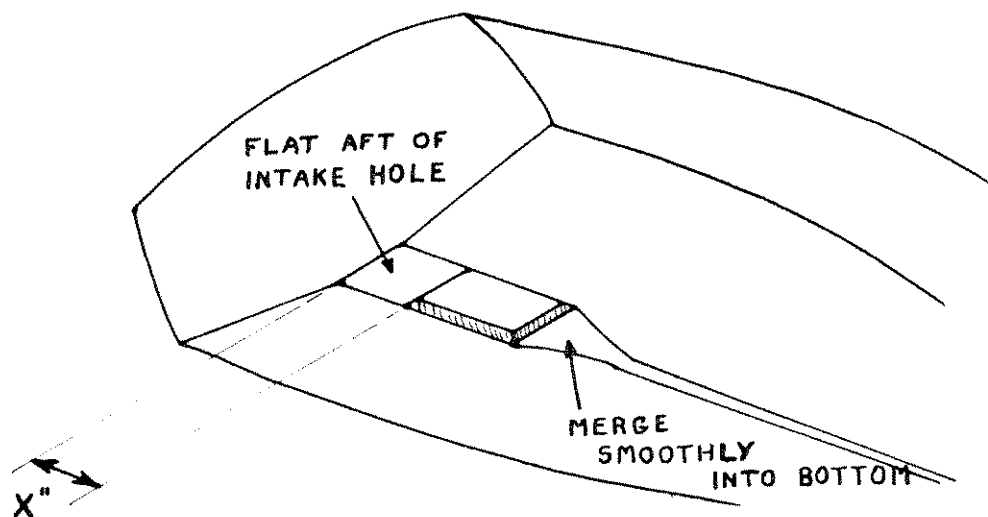
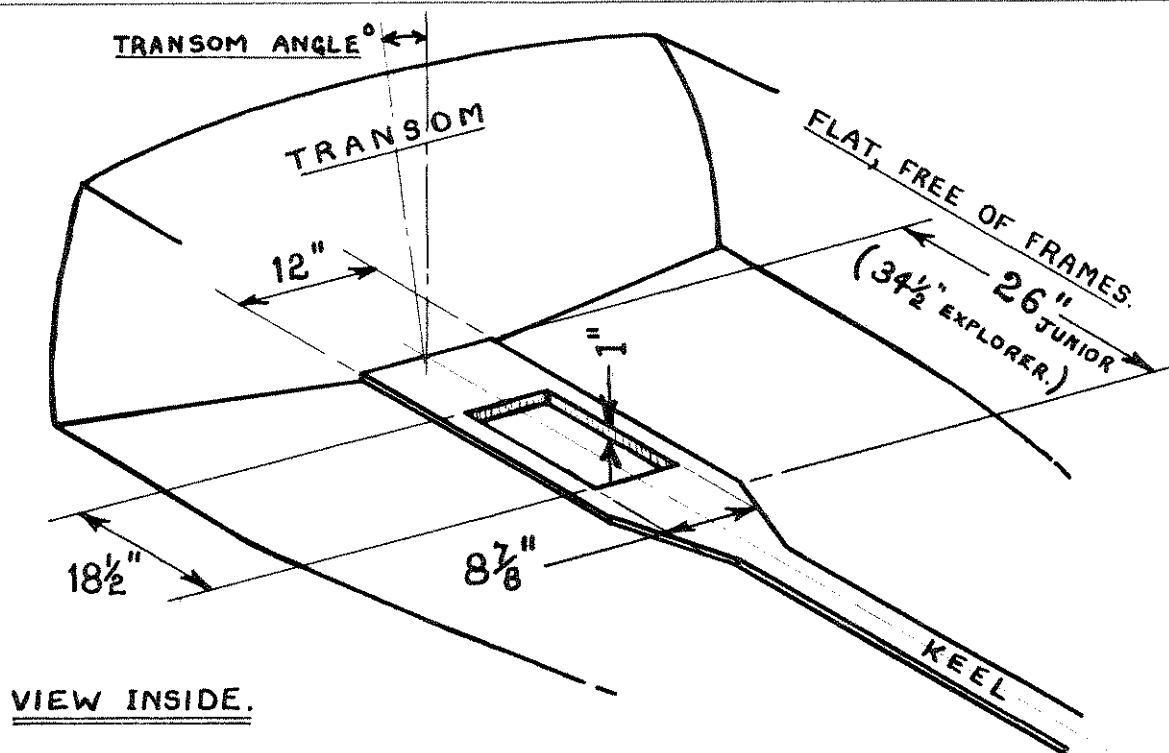
ADDITIONAL PARTS FOR NO REVERSE OPTION

6	JE 108	Transom plate		1
7	JE 177	Moulded Transom seal		1
8	3/16 BSW	Cd. pl. csk. hd. M/C screw, w/nut, plain & fibre washer		12
40	$\frac{5}{8}$ UNC x $\frac{3}{4}$	Skt. hd. setscrews		4

or ADDITIONAL PARTS FOR REVERSE OPTION

74	JE 172	Transom plate Mk III		1
75	JE 176	Transom plate seal Mk III		1
76	JE 154-1	Splash guard		1
50	JE 149Y	Reverse lever		1
51	JE 150Y	Locking lever (or JE 183)		1
52	JE 151	Lever pivot		2
53	JE 152	Sliding link		1
54	$\frac{5}{8}$ dia	Washers		4
55	$\frac{1}{8}$ x 1	Split pin		2
56	$\frac{1}{4}$ x $1\frac{1}{4}$	UNC bolt, nut & L/nut		1
58	JE 157Y	Push rod		1
59	JE 159	Transom seal bush		1
60	63091	Rubber cover		1
61	$\frac{3}{8}$ dia	Clevis & UNF lock nut		1
62	$\frac{3}{8}$ x $1\frac{1}{2}$ UNC	Bolt, nut & lock nut		1
63	$\frac{1}{4}$ x $1\frac{1}{2}$ UNC	Bolt, nut & lock nut		1
64	3/16 x $\frac{5}{4}$	BSW screw, nut & washer		3
65	JE 153	Reverse bucket		1
66	JE 166	Side arm L.H.		1
67	JE 165	Side arm R.H.		1
68	$\frac{1}{4}$ BSW	Gutter bolt, nut & L/washer		4
69	JE 161	Pivot bush		2
70	$\frac{5}{8}$ x $1\frac{1}{2}$	UNC hex. hd. bolt		2
71	JE 169	Spring		1
72	JE 170	Spring anchor		1

# MOUNTING BASE DETAILS OF COLORADO SERIES JET UNITS



	FORWARD SLOPING TRANSOM NOT RECOMMENDED				RECOMMENDED RANGE							NOT RECOMMENDED REVERSE FITTING NOT POSSIBLE		
TRANSOM ANGLE°	-8°	-6°	-4°	-2°	0°	2°	4°	6°	8°	10°	12°	14°	16°	18°
COL. JUNIOR X"	7 1/2"	7 1/4"	7"	6 3/4"	6 1/2"	6 1/4"	6 1/8"	5 7/8"	5 5/8"	5 1/2"	5 1/4"	4 7/8"	4 5/8"	4 3/16"
COL. EXPLORER X"	16"	15 3/4"	15 1/2"	15 1/4"	15"	14 3/4"	14 5/8"	14 3/8"	14 1/8"	14"	13 3/4"	13 3/8"	13 1/8"	12 1/16"



