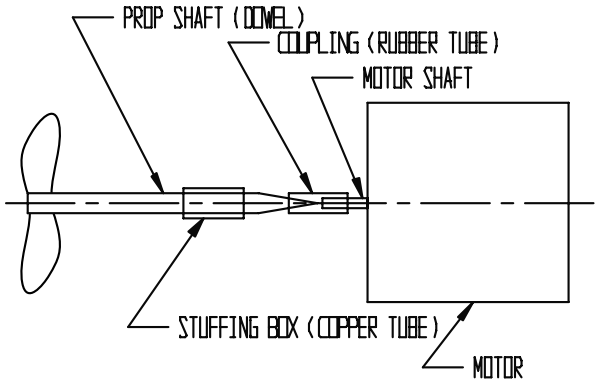
Chapter 17

DRIVE TRAIN FOR BOAT

A. OPEN B FILE.

Step 1. When you start a new drawing away start with the B file. If you started this drawing with the B file go directly to Steps B. If your did not start with the B file complete these Steps: Click **Open** from the File Menu. Click **No** to save current part. Key in **a:b** for the filename and press ENTER.



B. CREATE A RECTANGLE.

Step 1. ESC to Main Menu.

Step 2. F1 CREATE.

Step 3. F1 LINE.

Step 4. F7 RECTANGLE.

Step 5. F2 WIDTH/HEIGHT.

Step 6. Key in **1** for the width and press ENTER.

Step 7. Key in **1** for the height and press ENTER.

Step 8. F9 KEY IN.

Step 9. Key in:
Zero (0) for coordinate X and press ENTER.
.025 for Y and press ENTER.
0 for Z and press ENTER.

Step 10. Use **ALT-A** to center the rectangle on the screen. Hold down ALT and press A.

Step 11. Save the drawing. Click **Save As** from the File Menu. Key **a:drive train** filename and press ENTER. Press ESC for Part Description.

C. CREATE HORIZONTAL CENTER LINE.

Step 1. **Set the Grid and Snap**. Use **CTRL-G**.

Change the **Grid Properties Increment** to:
X = .075 and **Y = .075**

Change the **Snap Properties Increment** to:
X = .025 and **Y = .025** Click OK, **Fig. 1**.

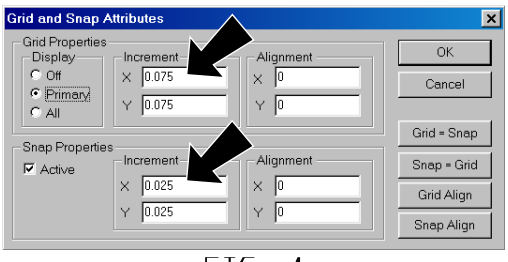


FIG. 1

Fit on Screen ALT-A	Delete CTRL-Q	Redraw CTRL-R	Half Size ALT-H

Step 2. Reduce the drawing down. Use **ALT-S**. Key in **2.7** and **press ENTER two times**.

Step 3. Draw the center line **green**. Change the color to green. Click the color swatch in the side Tool Bar. Click green, number 1.

Step 4. Change the line type to Center Lines. Use **ALT-T**. Hold down ALT and press T. Click the Center Line, line number 3. Click OK.

Step 5. ESC to Main Menu.

Step 6. F1 CREATE.

Step 7. F1 LINE.

Step 8. F5 HORIZONTAL/ VERTICAL.

Step 9. F1 HORIZONTAL.

Step 10. F4 CENTER.

Step 11. Click the vertical line of the rectangle, Line 1, **Fig. 2**.

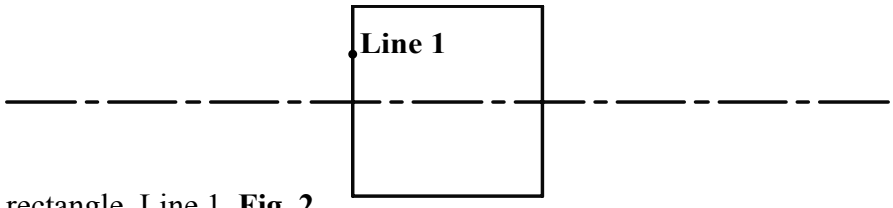


FIG. 2

D. EDIT USING TRIM POSITION.

Step 1. ESC to Main Menu.

Step 2. F2 EDIT.

Step 3. F1 TRIM/EXTEND.

Step 4. F6 POSITION.

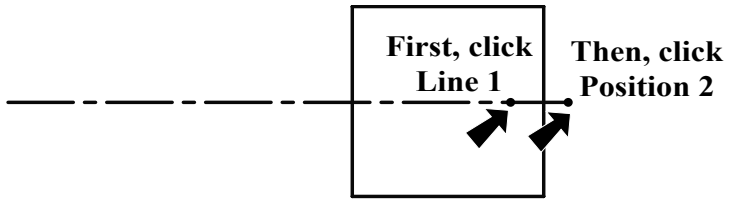


FIG. 3

Step 5. Trim the green line that extends to the right beyond the motor (blue). To trim part of a line, click the line you are to keep, Line 1, **Fig. 3**. Move cursor to the position you want to trim, Position 2 and click.

E. DRAW MOTOR SHAFT.

Step 1. Use **ALT-A** to center the rectangle on the screen. Hold down ALT and press A.

Step 2. Draw the lines **gray**. Change the color to gray. Click the color swatch in the side Tool Bar. Click gray, number 14.

Step 3. Change the line type back to Object Lines. Use **ALT-T**. Hold down ALT and press T. Click the Object line, Line number 1. Click OK.

Step 4. ESC to Main Menu.

Step 5. F1 CREATE.

Step 6. F1 LINE.

Step 7. F1 ENDPOINTS.

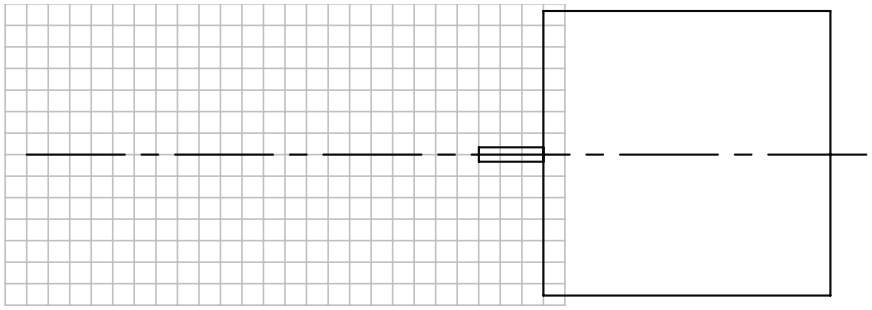


FIG. 4

Step 8. Draw the lines in **Fig. 4**. Use the grid to detemine the location of the lines.

F. DRAW THE COUPLING.

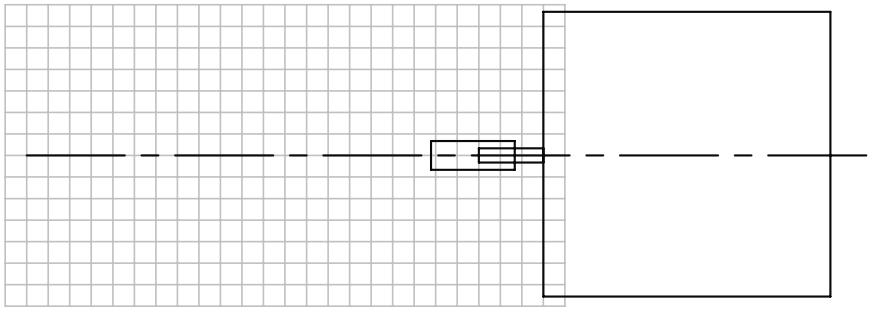
Step 1. Draw the lines **purple**. Change the color to purple. Click the color swatch in the side Tool Bar. Click purple, number 13.

Step 2. ESC to Main Menu.

Step 3. F1 CREATE.

Step 4. F1 LINE.

Step 5. F1 ENDPOINTS.



Step 6. Draw the lines in **Fig. 5**. Use the grid to detemine the location of the lines.

FIG. 5

G. DRAW THE PROPELLOR SHAFT.

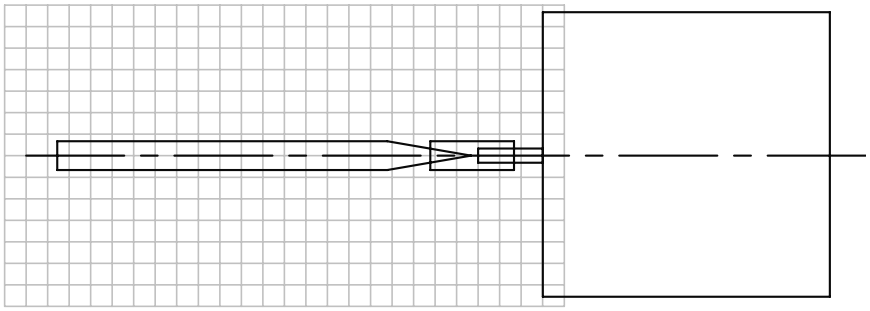
Step 1. Draw the lines **peach**. Change the color to peach. Click the color swatch in the side Tool Bar. Click peach, number 12.

Step 2. ESC to Main Menu.

Step 3. F1 CREATE.

Step 4. F1 LINE.

Step 5. F1 ENDPOINTS.



Step 6. Draw the lines in **Fig. 6**.

FIG. 6

H. DRAW THE STUFFING BOX.

Step 1. Draw the lines **yellow**. Change the color to yellow. Click the color swatch in the side Tool Bar. Click yellow, number 4.

Step 2. ESC to Main Menu.

Step 3. F1 CREATE.

Step 4. F1 LINE.

Step 5. F1 ENDPOINTS.

Step 6. Draw the lines in **Fig. 7**.

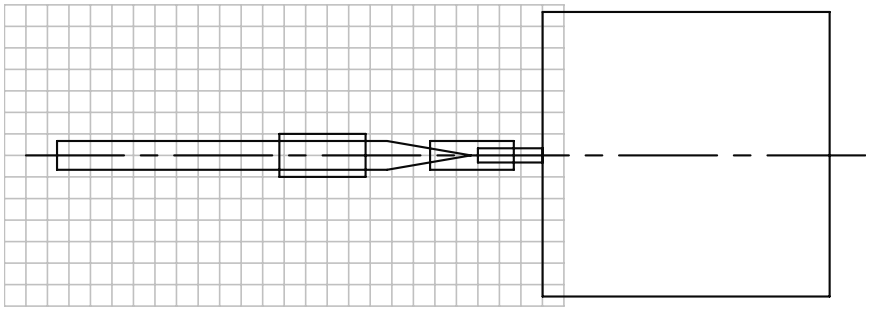


FIG. 7

I. DRAW PROPELLER BLADE.

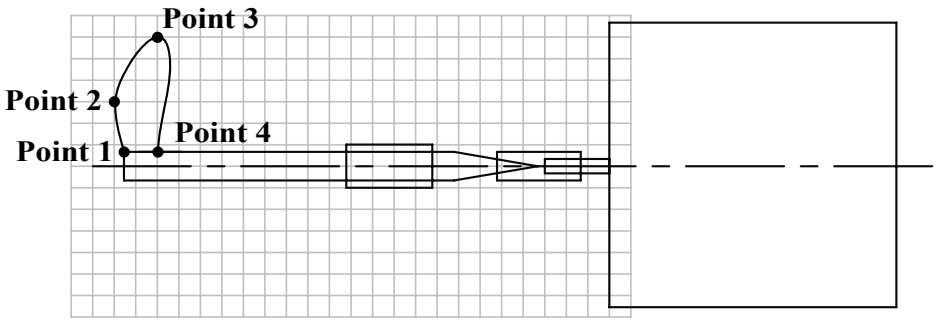
Step 1. Draw the propeller **green**. Change the color to green. Click the color swatch in the side Tool Bar. Click greem, number 10.

Step 2. ESC to Main Menu.

Step 3. F1 CREATE.

Step 4. F9 SPLINE.

Step 5. F2 3D CUBI.



Step 6. Click each Point in **Fig. 8**, then press **ENTER three times**.

FIG. 8

Step 7. Use CTRL-R to clear temporary markers. Hold down CTRL and press R.

Step 8. Save the drawing. Use **CTRL-S** to save.

J. MIRROR COPY THE PROPELLER BLADE.

Step 1. ESC to Main Menu.

Step 2. F4 X-FORM.

Step 3. F5 MIRROR.

Step 4. F2 COPY.

Step 5. F1 SINGLE.

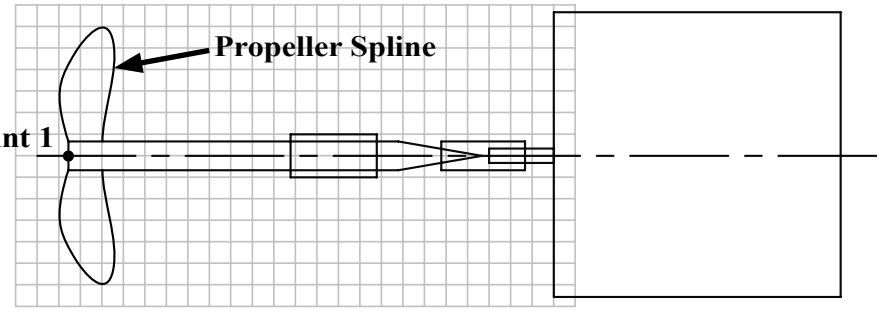


FIG. 9

Step 6. Select the propeller spline, **Fig. 9,** with a click and press ENTER.

Step 7. F1 1 POINT HORIZONTAL.

Step 8. To indicate position on the plane, click the end of the prop shaft, Point 1, **Fig. 9**.

Step 9. Save the drawing. Use **CTRL-S** to save.

Fit on Screen ALT-A	Delete CTRL-Q	Redraw CTRL-R	Half Size ALT-H

K. MIRROR MOVE THE PROPELLER BLADE.

Step 1. ESC to Main Menu.

Step 2. F4 X-FORM.

Step 3. F5 MIRROR.

Step 4. F1 MOVE.

Step 5. F1 SINGLE.

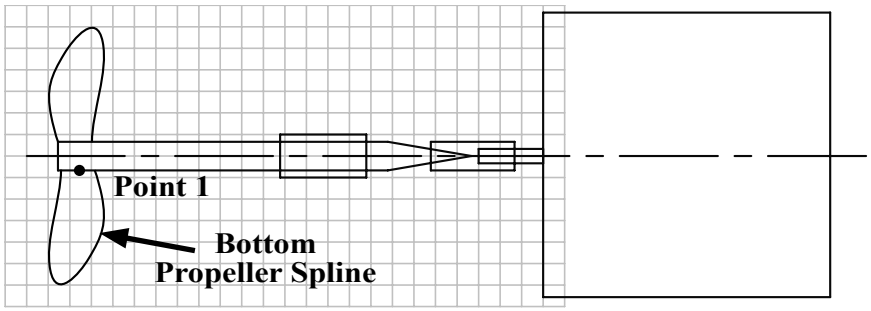


FIG. 10

Step 6. Select the bottom propeller spline, **Fig. 10,** with a click and press ENTER.

Step 7. F2 1 POINT VERTICAL.

Step 8. To indicate position on the plane, click Point 1, **Fig. 10**.

L. SET TEXT HEIGHT.

Step 1. ESC to Main Menu.

Step 2. F3 DETAIL.

Step 3. F9 SET.

Step 5. In the Set Details Attributes set the **Note Character Height to .1**, **Fig. 11** and click OK.

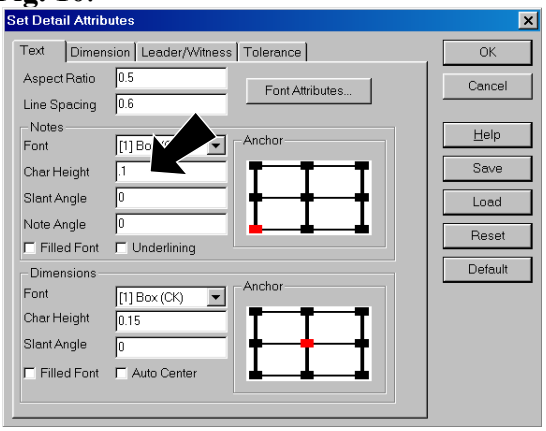


FIG. 11

M. LABEL PARTS.

Step 1. ESC to Main Menu.

Step 2. F3 DETAIL.

Step 3. F3 LABEL.

Step 4. Key in **1** for the numbers of arrowheads.

Step 5. Lock the Caps, key in: **MOTOR SHAFT** and click OK.

Step 6. Click Point 1 for the text position, **Fig. 12**.

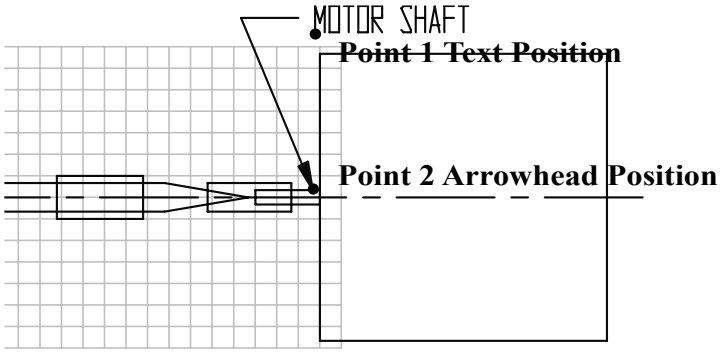


FIG. 12

Step 7. Click on the left of the text to indicate leader side.

Step 8. Click on the line of the Motor Shaft, Point 2 to indicate the arrow tip position, **Fig. 12**

Fit on Screen ALT-A	Delete CTRL-Q	Redraw CTRL-R	Half Size ALT-H

Step 9. F10 BACKUP.

Step 10. Key in: **COUPLING (RUBBER TUBE)** and click OK.

Step 11. Click Point 1 for the text position, **Fig. 13**.

Step 12. Click at the left of the text to indicate leader side.

Step 13. Click on the line of the Coupling to indicate the arrow tip position, **Fig. 13**

Step 14. F10 BACKUP.

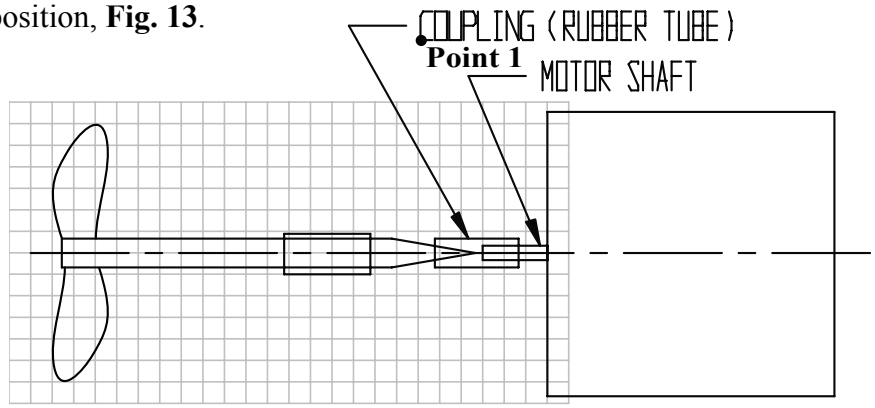


FIG. 13

Step 15. Repeat Labeling steps and label: **PROP SHAFT (DOWEL)**
MOTOR
STUFFING BOX (COPPER TUBE) **, Fig. 14**

N. CREATE PATTERN FILE.

Step 1. F5 FILES.

Step 2. F2 PATTERN.

Step 3. F1 CREATE.

Step 4. F7 ALL DISPLAYED.

Step 5. F3 EXCEPT TYPE.

Step 6. Click the Labels and Note check boxes and click OK.

Step 7. Click on the bottom left corner of the motor, Point 1, **Fig. 14** to indicate base position.

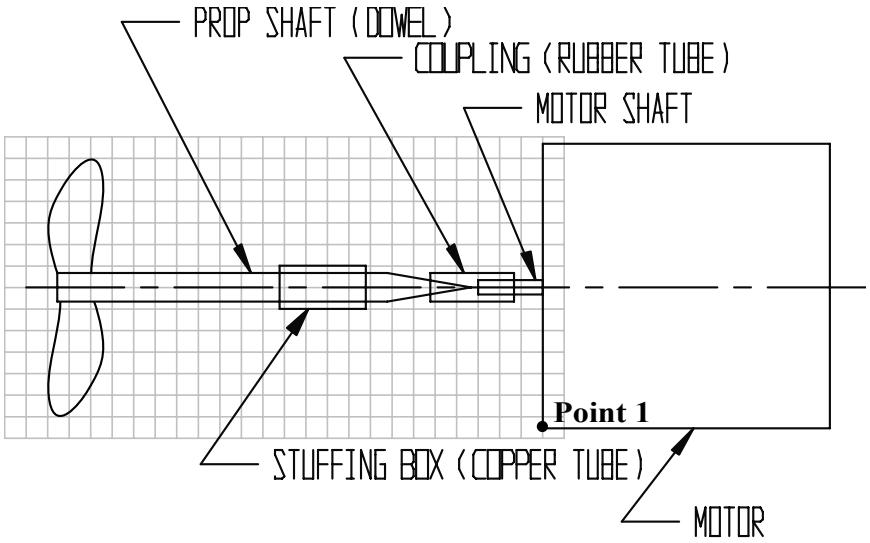


FIG. 14

Step 8. Key in: **a:drive train** for a file name and click Save.

O. ADD YOUR NAME AND THE PERIOD.

Step 1. Use: **Detail, Note, Key-In** commands to add text. Save the drawing. Use **CTRL-S**.

Step 2. Save the drawing. Use **CTRL-S**.

Fit on Screen ALT-A	Delete CTRL-Q	Redraw CTRL-R	Half Size ALT-H