

CHAPTER 3

PREPARING TROLLING LINES

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CHAPTER 3: PREPARING TROLLING LINES

SECTION A: TOOLS AND UTENSILS

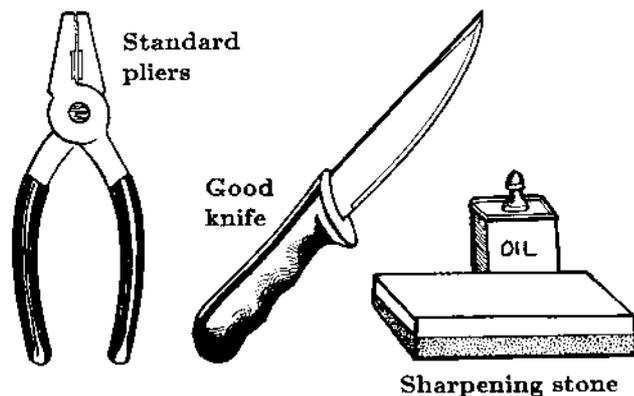
Most of the preparation for trolling is normally done on shore before the fishing trip starts. This makes gear rigging easier and more comfortable, prevents new materials being contaminated with salt water before they are used, and avoids wasting time at sea which could better be used in fishing or carrying out other tasks on the boat. Gear rigging is time consuming, and mastering some of the techniques, particularly when working with wires, requires plenty of patience. However, gear rigging principles are easily learned, and will develop with practice.

The most important thing about gear rigging is to have on hand the right tools and materials for the job. The tools needed will vary depending on the materials being used, but are mostly general purpose items available through hardware or other retail stores.

For working with nylon, only basic tools are needed. These include a pair of standard pliers, a good knife and a sharpening stone (oilstone or whetstone). Sharpen knives regularly.

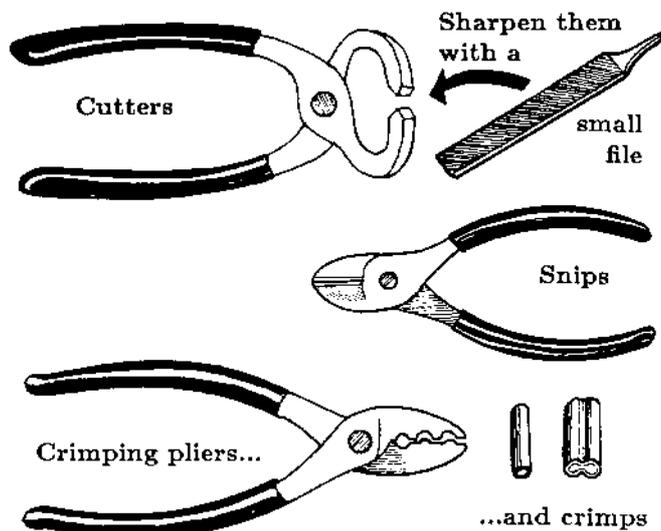
If using wire, you will also need a pair of wire cutters or snips. Cutters are preferred as these can be sharpened using a small file. For cable you may also need crimping pliers and crimps or sleeves of the correct size.

WORKING WITH NYLON MONOFILAMENT



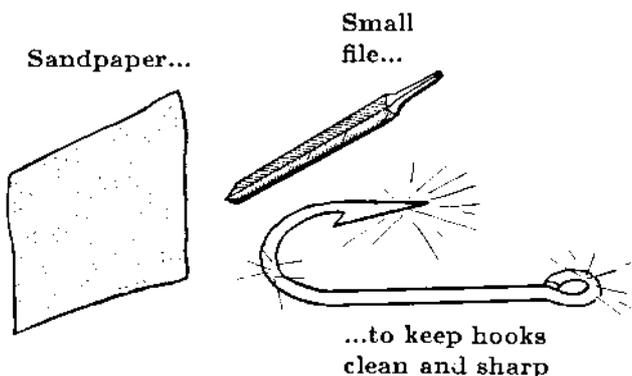
For general work with ropes and lines, it is useful to have on hand adhesive tape, light string or twine, and, if available, waxed dental floss. These are used for whipping rope ends, temporarily attaching or holding line, etc.

WORKING WITH WIRE

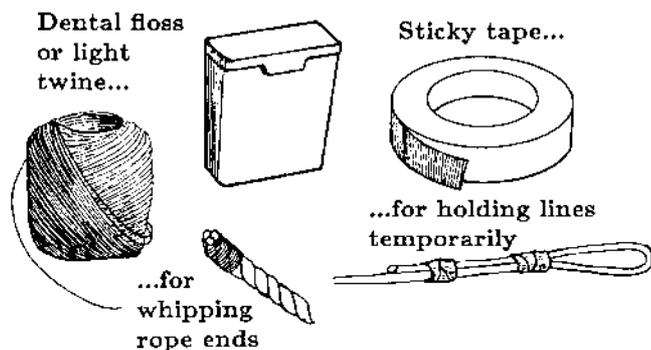


For cleaning and sharpening hooks, emery or glass paper and a small flat or three-cornered file are required. (See Section 3B.)

HOOK MAINTENANCE

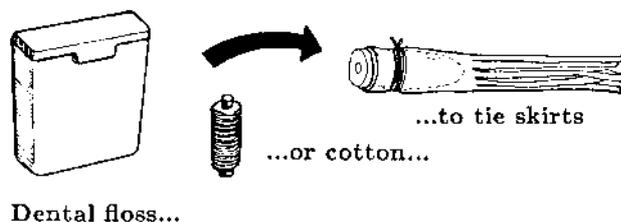


GENERAL ROPE WORK



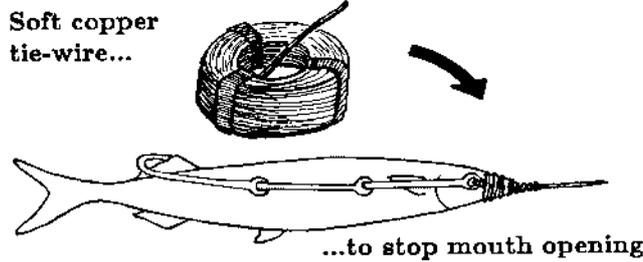
When rigging octopus lures, use waxed dental floss or cotton for tying on lure skirts or other materials. (See Section 4G.)

RIGGING OCTOPUS LURES



For rigging some kinds of natural bait, you may need soft copper or other tie wire to stop the mouth opening, or to tie the head snugly against the line.

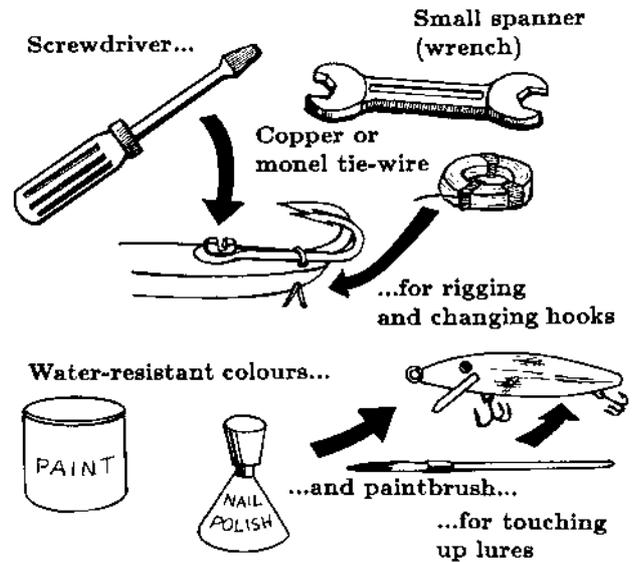
FOR SOME TYPES OF BAIT



For hard lures, changing hooks may require a screwdriver or small spanner (wrench), and soft tie-wire of copper, monel, or other corrosion-resistant metal. Model or auto paint, or nail varnish in bright colours is also useful for touching up damaged lures. Metal polish can be used to restore the shine on reflective metal lures.

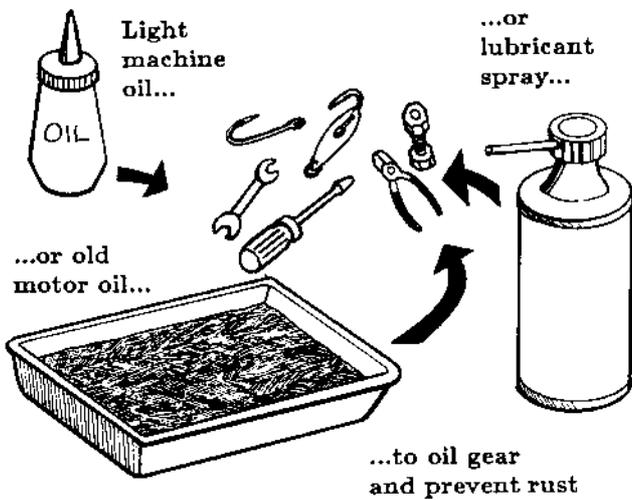
To keep all metallic gear -hooks, cable, hard lures, etc. - and tools in good condition, wipe or wash off any salt water after use and oil well. Use ordinary motor oil or spray-on water repellent lubricant (CRC, WD-40, etc.). Reject oil drained from motor engines is also perfectly okay.

HARD LURES

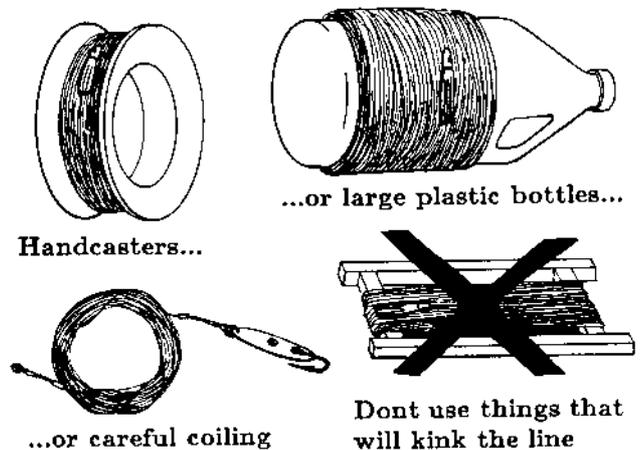


For the storage of completed lines and traces, plastic or wooden handcasters are useful and can be improvised if not readily available. The diameter should be large enough (about 15cm, or 6 inches, at least) to ensure that lines do not kink or bend. Try not to use wooden frame line holders, as these tend to kink the lines, especially when used with wire.

METAL GEAR AND TACKLE

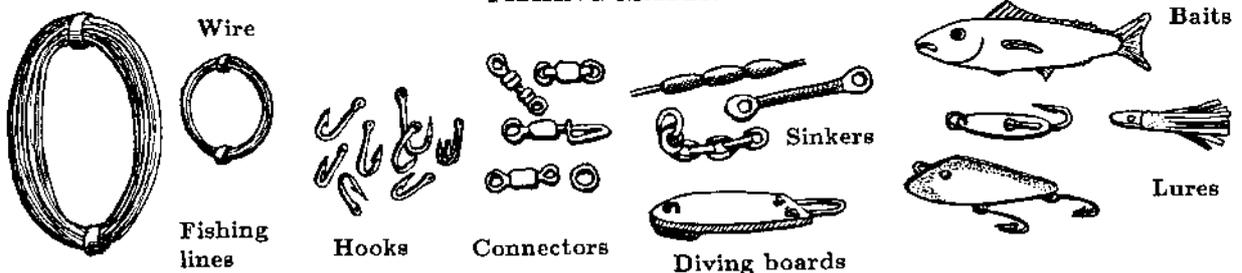


LINE STORAGE



In addition to these tools and utensils, you will need a variety of materials with which to work. These are described in the following sections, and include lines and wire (section 3C), hooks (3B), swivels and rings (3H), sinkers or downriggers (3J and 3K), and baits and lures (4A-H).

FISHING MATERIALS



CHAPTER 3: PREPARING TROLLING LINES

SECTION B: HOOKS

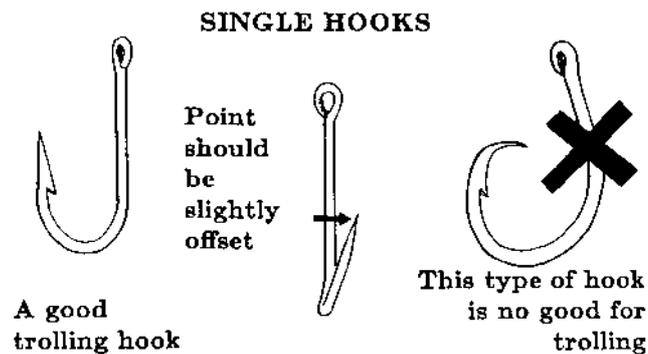
The hook has two functions -to catch the fish, and then to retain it until it is safely on board the boat. To catch the fish, the hook has to be of the right shape so that the point will catch in the fish's mouth, gills or stomach. The point has to be hard enough and sharp enough to penetrate through hard skin and bone. The shank and the bend of the hook have to be solid and strong enough to take the impact of the striking fish, and its struggles to break free, without snapping or straightening.

As well as being strong and sharp, a good trolling hook will be rust-resistant for long life, and smooth, so as not to act as a saw and cut its way out of the fish. Most trolling hooks are barbed to prevent the hooks being thrown by a fighting fish. However for some types of trolling, such as for surface-feeding tunas, barbless hooks can be used and will speed up the fishing operation.

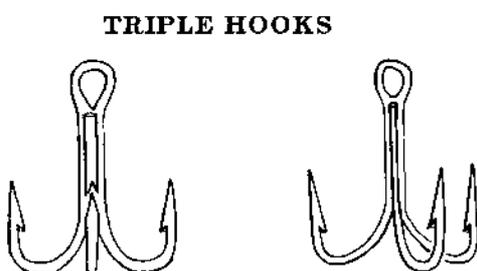
Hook types

The three main styles of hook -single, double and treble -are each available in a wide variety of materials, shapes and sizes:

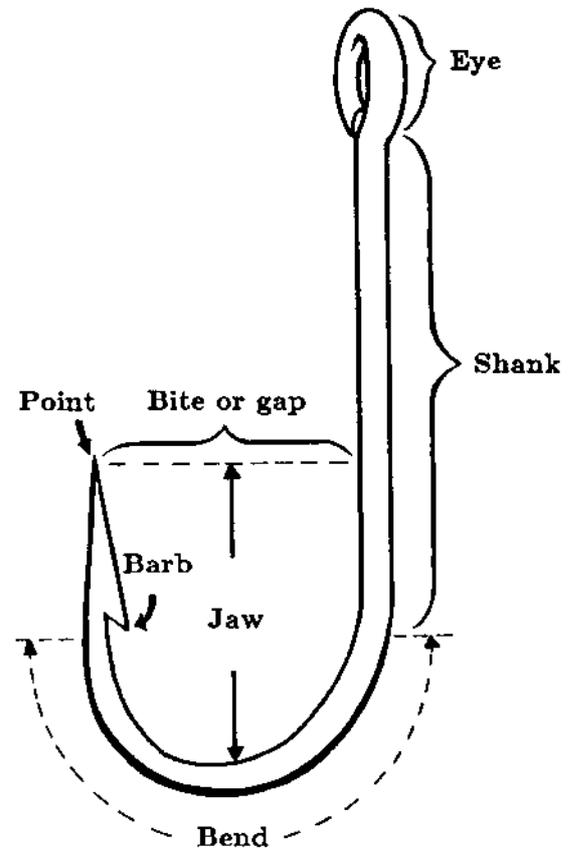
SINGLE HOOKS -Choose heavy gauge hooks with a long straight shank, deep throat, wide jaw and slightly off-set point. Slightly incurved hooks (tarpon hooks) are used by many game fishermen, but strongly incurved hooks, like the tuna circle, are not suitable because the point does not sink itself when the fish strikes. Stick the hook under a table or in a door post and try to bend it open by hand. If you can, it is too weak for use in commercial trolling.



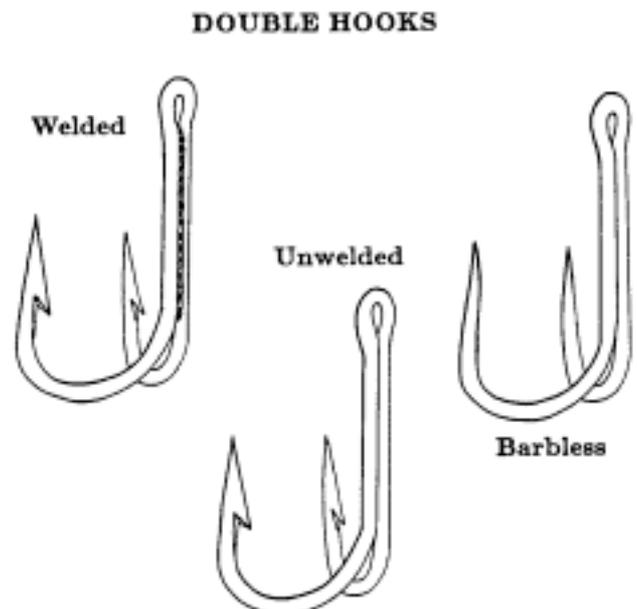
TRIPLE HOOKS -These are always welded and usually available only in smaller sizes. They are very efficient for small fish with a large bite, but are not recommended for commercial use.



PARTS OF A HOOK



DOUBLE HOOKS -Welded hooks are stronger than unwelded ones, but are usually more expensive. Unwelded hooks are more likely to spread, but are also easier to change on some types of lure. Barbless double hooks are preferred by some tuna fishermen as the fish can be quickly unhooked, but barbed hooks are much better for general use.

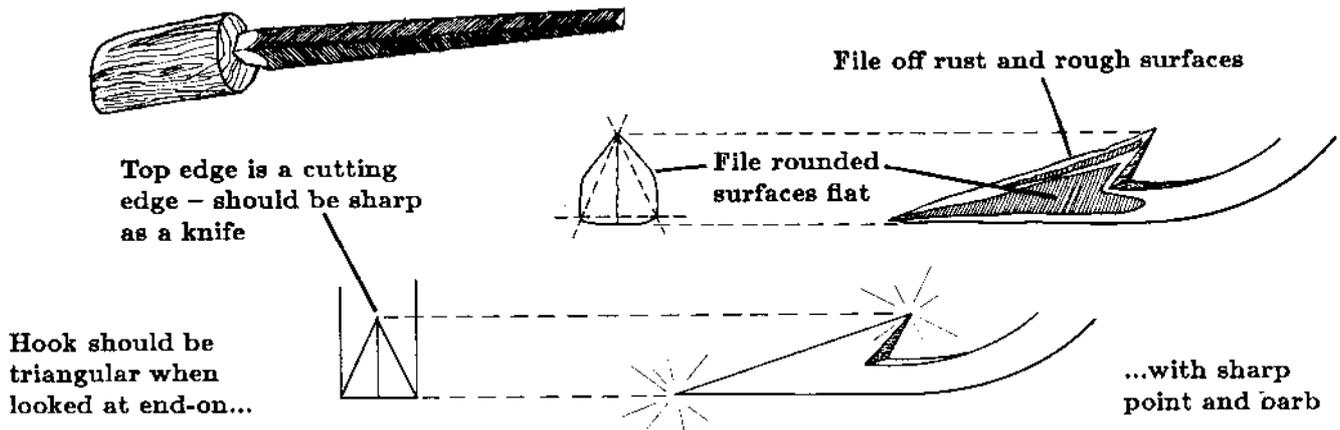


Sharpening Hooks

The sharpness of a hook makes a huge difference to its performance. Always check the points of your hooks before use, to ensure they are sharp and not too rusty. If necessary sharpen them with a small three-cornered file and abrasive paper. A properly sharpened hook should leave a clear, fine scratch when drawn across your thumbnail.

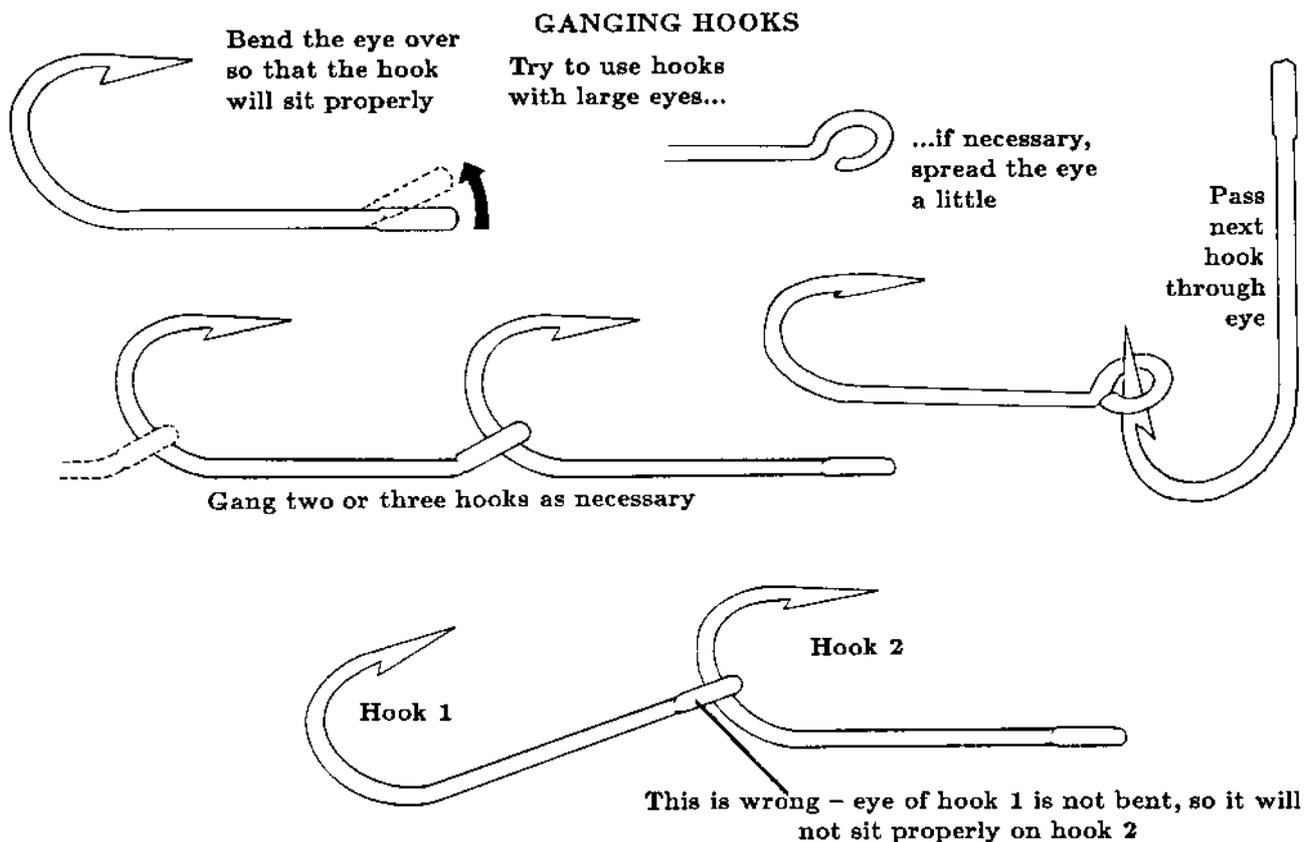
SHARPENING HOOKS

Use a file and fine sandpaper to remove rust and to sharpen the point



Ganging hook:

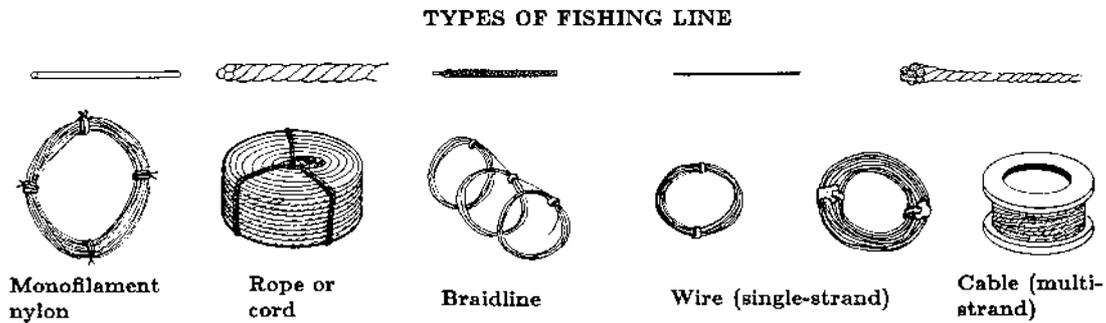
For rigging natural baits (see sections 4B -4F), it may be necessary to 'gang' two or more single hooks, that is to join them in a string so that when a fish strikes the bait there is more chance of it being hooked. (Some manufacturers, sell hooks already ganged). For ganging, try to use hooks with large eyes that can be easily separated if a fish is hooked too well. The chances of the hooks coming apart by accident during trolling are small.



CHAPTER 3: PREPARING TROLLING LINES

SECTION C: TYPES OF FISHING LINE

A very wide variety of monofilament and multifilament lines are available in a variety of materials, including natural fibres, plastics and other synthetic fibres, and metals. The main types of line are defined in Section 1B, and illustrated below.



The characteristics and properties of some of the line types more commonly used for trolling are shown in the table on the facing page.

Handling lines

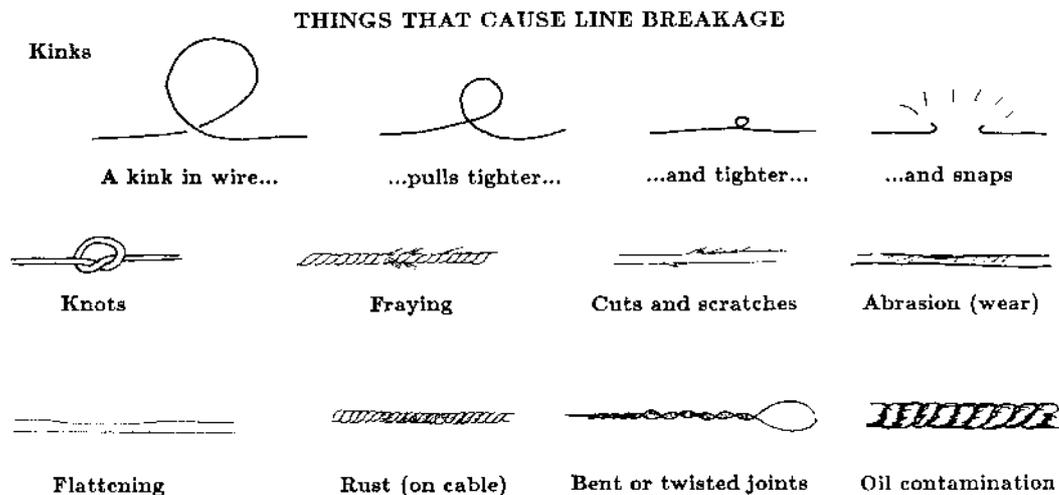
A line is in its natural state when it is laid out straight and under slight tension. At other times, such as when coiled, flaked on deck, etc., careful handling is required to avoid tangles, kinks and knots which will diminish its performance. In particular:

Don't allow wire or cable to get twisted, curled or kinked by bad storage and handling. This can easily result in line breakage.

Don't allow unnecessary knots to develop in lines. Knots can weaken a line to 50 percent or less of its original strength. If a line get knotted, decide whether to throw it away or cut out the knot and re-join the line as shown in Section 3H. Never pull tangled lines tight if you can avoid it.

Don't expose lines unnecessarily to the weather. Sunlight causes deterioration in synthetic lines; water and bacterial growth rot natural fibres; salt water rusts wires and cables. Leave new lines on shore until they are needed.

Do check lines regularly for condition. Look for surface abrasions, cuts, flattening of the line, wear, fraying, rusting, knots, and oil contamination. Decide whether the wear point has been significantly weakened. If so, repair or replace it.



Remember: a weakened line will break at the time when it is under the greatest strain -with a big fish on the end of it.

CHARACTERISTICS OF MAIN TYPES OF TROLLING LINE

Type of line/Main uses		Advantages	Disadvantages
Lines	Monofilament nylon <i>Mainlines and traces</i>	Good strength for diameter. Comes in many sizes. Can easily be tied and knotted. Very elastic, sets hook well. Smooth surface, low drag in water. Usually quite cheap. Widely available. Low visibility in water.	Very easily cut. Very springy and will tangle easily. Can become kinked, making handling and use difficult. Smooth surface is hard to grip, especially when wet. Knots liable to slip.
	Multi-strand (3-ply) monofilament nylon <i>Mainlines</i>	Similar characteristics to ordinary monofilament nylon but:	
		Easier to grip. Less liable to tangle. More elastic.	Creates more drag in water. Takes up much more space on a reel. Not widely available. (Usually used for snoods by longliners.) Difficult to knot.
	Twine, cord or rope <i>Backing cords, mainlines</i>	Often cheaper than monofilament. Can be highly elastic. Lies flat when flaked - less likely to tangle. Easily knotted and tied. Wide range of sizes. Usually widely available. Easy to grip.	Cuts fairly easily under tension. High drag in water. Wears out faster than nylon. Weaker than monofilament of same size. May rot. High visibility in water.
Braidline (e.g. Super-toto) <i>Mainlines</i>	Very strong. Lies flat when flaked. Less liable to tangle. Resistant to abrasion and cutting. Easily knotted and tied. Easy to grip.	Very expensive. Not widely available. High drag in water. High visibility in water.	
Wires	Piano wire <i>Traces</i>	Strong for diameter. Range of sizes available. Inexpensive. Very resistant to cutting. Can be joined without crimps. Low drag in water.	Inelastic. Brittle, breaks easily if kinked. Rusts. Difficult to handle. May not be locally available.
	Single-strand stainless steel wire <i>Traces</i>	Similar characteristics to piano wire, but:	
	Does not rust. Usually widely available.	Moderately expensive. Kinks easily. Springy and very hard to handle.	
Cables	Galvanised Bowden cable <i>Traces</i>	Fairly strong for diameter. Smooth surface, low drag in water. Not prone to kinking. Does not harden with use. Lies flat; easy to handle.	Rusts (Note: Should not be washed in fresh water as this accelerates rust). Requires crimps. May not be locally available.
	Galvanised 9-strand (3x3) steel cable (e.g. Turimoto longline wire) <i>Mainlines, traces</i>	Strong for diameter. Usually inexpensive. Resists twisting and kinking. Can be joined without crimps.	Rusts. Fairly high drag in water. Only available in limited number of sizes. May not be locally available.
	7-strand and 49-strand (7x7) stainless steel cable <i>Mainlines, traces</i>	Strong for diameter. Lies flat and relatively easy to handle. Moderately resistant to twisting or kinking. Many sizes available.	Expensive. May rust or corrode if used with dissimilar metals. Frays with wear, becoming difficult and painful to handle. Breaks if twisted badly.

CHAPTER 3: PREPARING TROLLING LINES

SECTION D: END LOOPS IN LINE AND SINGLE-STRAND WIRE

End loops are needed to join lines to each other and to hooks, swivels, etc. To do their job they must be tied securely so as not to slip, pull tight, or come undone. This and the following sections show ways to make and use end loops in a variety of materials normally used in trolling lines.

Double figure eight knot

This knot is the most useful for making end loops in all types of light line and will hold well even in nylon monofilament.

Using end loops

Hooks, swivels, and other tackle can be simply attached to monofilament line by threading onto the line before making the loop.

Alternatively, they can be attached by passing the completed loop through the hook or swivel eye, and then around the body. This enables tackle to be disconnected and changed easily.

DOUBLE FIGURE-8 KNOT

Double end of line over...



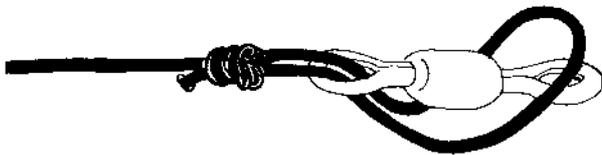
...pass doubled end around standing part of line...



...and back through loop

ATTACHING TACKLE USING END LOOPS

Thread line through eye before making loop...



...pull tight, making sure line falls into right position



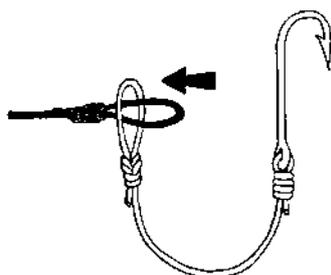
...or, thread loop through eye...



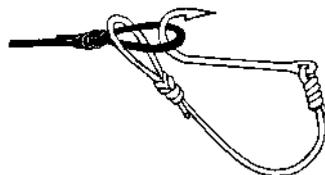
No good. Line may interfere with action of swivel

Lines can also be joined together using end loops (see Section 3H). End loops are made on the ends of each of the two lines to be joined, and one loop passed through the other in the manner shown. This method is most useful for joining lines when one of them is fairly short, for instance in attaching traces to mainlines.

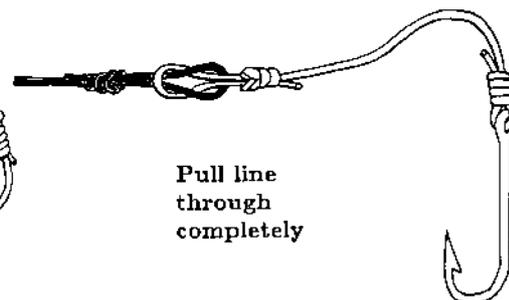
JOINING LINES USING END LOOPS



Pass first loop through second



Pass end of second line back through first loop



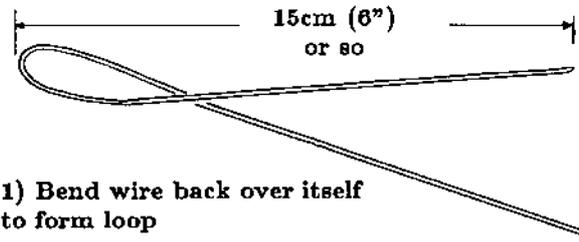
Pull line through completely

End loops in wire

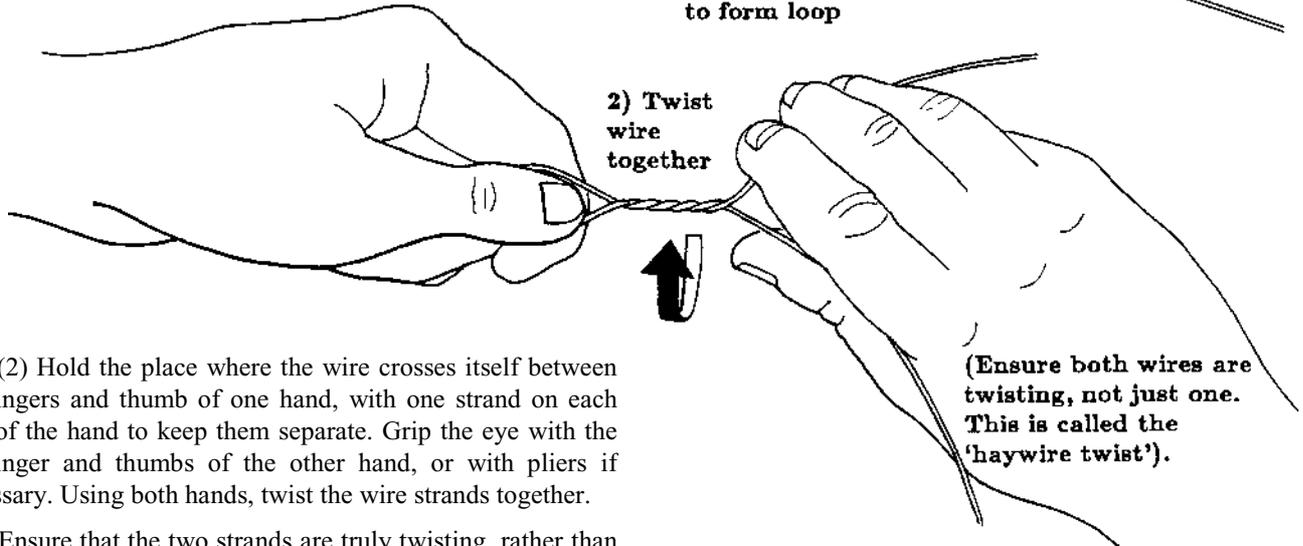
Unlike lines and ropes, most wires and cables cannot be reliably knotted. The most usual way of making end loops in single-strand wire is by making a haywire twist, followed by a barrel twist, as shown below.

(1) Take a bend in the wire to form an eye or loop. Make sure you leave enough of a tag end to work with about 15cm (6 inches) or so.

TWISTED END LOOP FOR WIRE

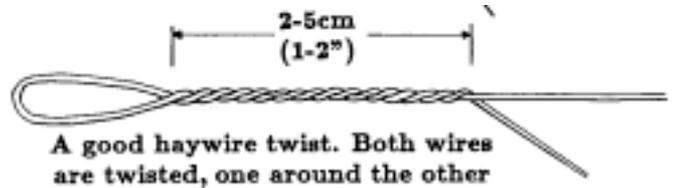


1) Bend wire back over itself to form loop

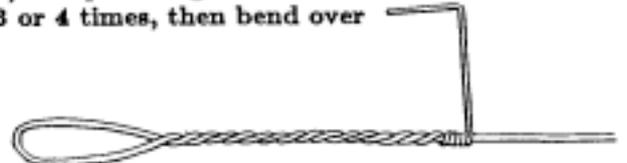


(2) Hold the place where the wire crosses itself between the fingers and thumb of one hand, with one strand on each side of the hand to keep them separate. Grip the eye with the forefinger and thumbs of the other hand, or with pliers if necessary. Using both hands, twist the wire strands together.

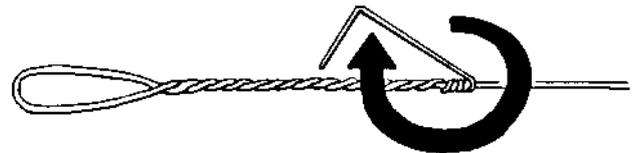
Ensure that the two strands are truly twisting, rather than one staying straight and the other wrapping around it. Continue until the twist is 3-5cm (1-2 inches) long. This is called a haywire twist.



3) Wrap the tag end around 3 or 4 times, then bend over



4) Break tag end by twisting it around in a circle 2 or 3 times



No good. One wire is twisted, the other is still straight

(3) Next, make a tight finishing twist by wrapping the tag end around the main strand three or four times.

(4) Bend the tag end over at right angles about an inch from the final wrap. Twist it around several times, and it will break cleanly leaving a rounded end which will not scratch or cut your hands. As an alternative, the tag end can be snapped off with pliers or wire cutters, but this will leave a sharp point which can cause a surprisingly deep cut in a hand or finger.

5) Finished loop should be neat and tag end should not leave a sharp point



(5) The finished loop should be straight and regular with both strands properly twisted. If one strand is straight with the other wrapped around it, the twist will not hold but will slip and may break when a load is placed on the loop.

CHAPTER 3: PREPARING TROLLING LINES

SECTION E: END LOOPS IN ROPE

Twines and light ropes may be used for parts of the trolling line, particularly the backing and the mainline (see Section 31). Heavier cords and ropes are used for various jobs around the boat, including mooring, anchoring, and tying down loose objects. Knowing how to tie (and untie) proper knots and make simple splices are essential skills for any fisherman.

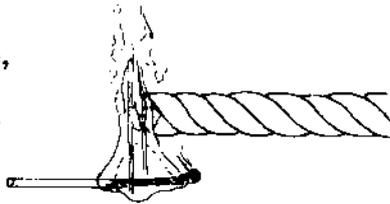
Whipping and sealing rope ends

Tying and untying knots or making splices in ropes can be difficult if the rope ends are frayed or ragged. Since the ends of most ropes will fray very quickly when they are cut, it is usually necessary to whip them before working with them.

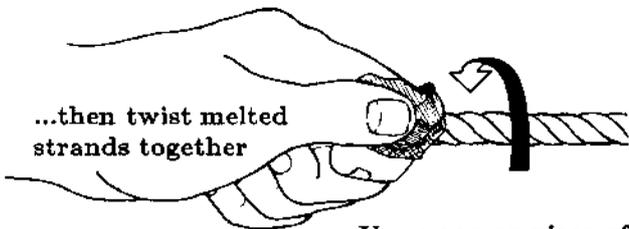
The easiest way is to tightly bind the end of the rope, or the tips of individual rope strands, using adhesive tape or rubber bands. This method is only temporary, since the tape or elastic will soon fall off. However, it is fine for making splices, as the condition of the rope ends is not important once the splice is finished.

For more permanent ends, the rope should be bound tightly as shown, using light twine. The best twines for this purpose are waxed to ensure a good grip.

For synthetic rope, heat end with a match to melt it...



...then twist melted strands together



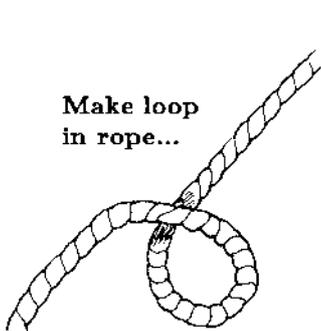
Use a rag or piece of paper to protect your fingers from the heat

Bowline knot

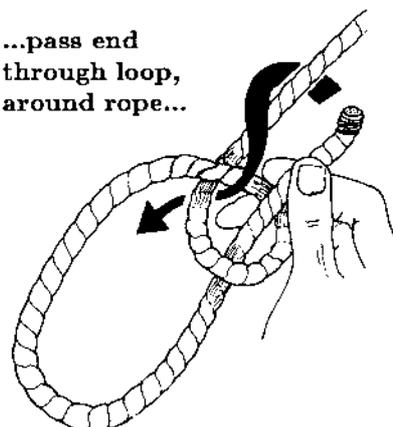
This knot is good for ropes and for heavier lines which grip well. The bowline is strong, will not slip and is fairly easy to undo when necessary. It is not good for slippery lines and will not hold in nylon monofilament.

BOWLINE KNOT

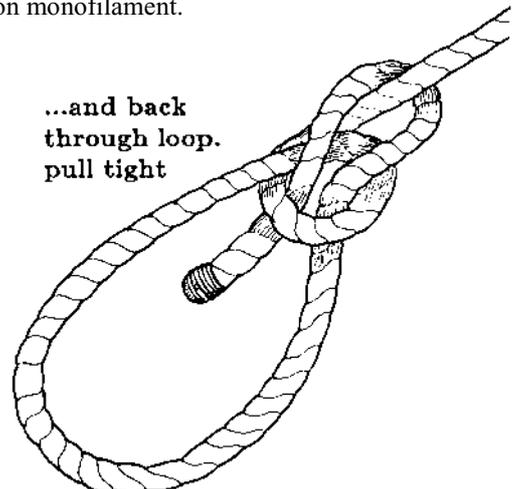
Make loop in rope...



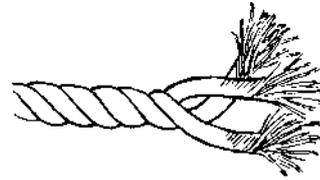
...pass end through loop, around rope...



...and back through loop, pull tight

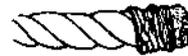


SEALING ROPE ENDS

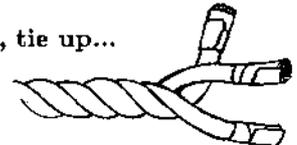


Cut ends of rope will fray if not sealed

For temporary holding, tie up...

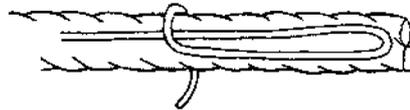


...with cotton, rubber bands...



...or sticky tape

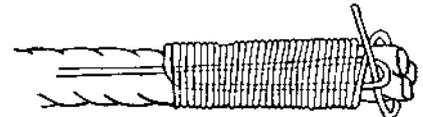
For more permanent holding, whip using light twine or dental floss



Lay loop of twine along rope...

...wrap tightly.

Pass end of twine back through loop...



...use other end to pull loop under wrapping. Cut off both ends

With some synthetic ropes, a short cut is to melt the rope end into a solid plug. To do this, hold the rope end in a match or lighter flame until it becomes sticky, then twist the end tight using a folded piece of greaseproof paper.

Eye splice

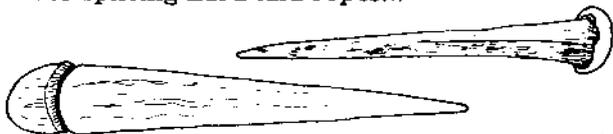
For permanent end loops in ropes, eye splices are much better than knots. They take more time and effort to make, but are far stronger, and will not become snagged or caught up as easily as a knotted line will.

To make an eye splice, first whip the ends of each strand of the rope. It may be helpful to number the ends, or to mark them with different colours.

Unlay the ends until you have enough length to work with – about 20-25 cm (8-10 inches) is enough for 12mm (1/2-inch) diameter rope. With some ropes, it may be necessary to tie or tape the strands together to prevent them unlaying too far.

Double the rope back so that the finished eye will be the size that you want. Form the eye and spread the strands fanwise, placing them against the rope where it is to be entered. Untwist the body of the rope a little and pass the centre end under the centre strand. Then, pass the left end under the next rope strand to the left and the right end under the next strand to the right. If the rope is hard-laid, you may need a spike or fid to help you separate the strands widely enough.

For splicing hard-laid ropes...



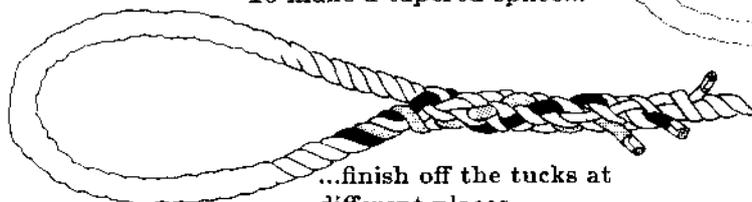
...you may need a spike or 'fid'

If this has been done correctly all three ends should be sticking out at the same level, evenly spaced around the main body of the rope. If they are not like this, pull them out and start again.

Continuing the splice is easier than starting it. Pull the first tucks tight, then take any end and pass it over the next strand and under the one after. Repeat for the other two ends, so that each shows two tucks in the main body of the rope. The ends should still be even and regular.

Repeat this procedure until each strand has 3 or 4 tucks, then cut off the ends close to the body of the rope.

To make a tapered splice...

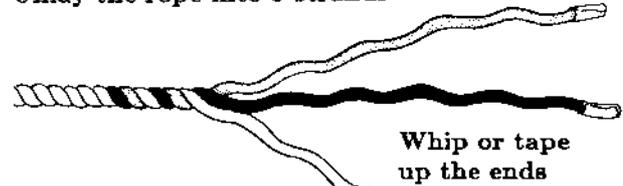


...finish off the tucks at different places

With slippery ropes, or those which fray badly, it is worth whipping the splice to ensure that the ends never slip back through the strands.

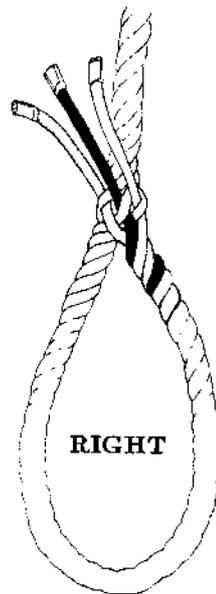
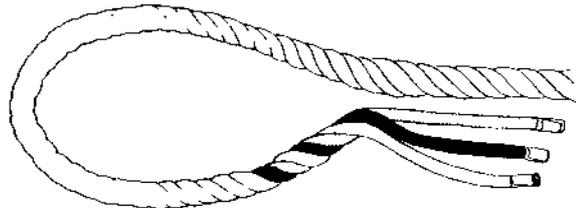
THE EYE SPLICE

Unlay the rope into 3 strands



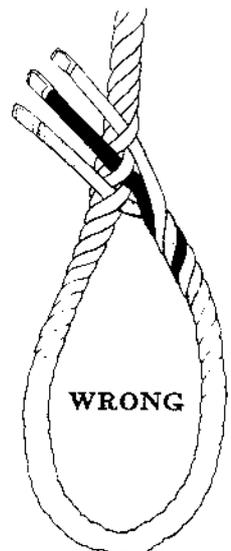
Whip or tape up the ends

Turn the rope to give the size of loop you want



RIGHT

Pass the ends under the lay of the rope

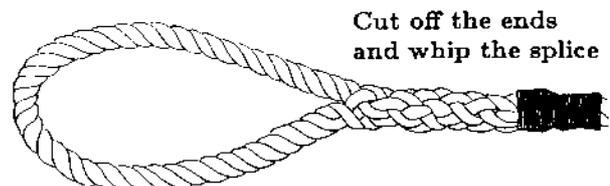


WRONG

Tuck each end over one strand and under the next. Do this three times



To make a tapered splice, make additional tucks with two of the ends so that all three finish at different places, then cut off.



Cut off the ends and whip the splice

CHAPTER 3: PREPARING TROLLING LINES

SECTION F: END LOOPS IN CABLE (MULTI-STRAND WIRE)

Multi-strand wire, or cable, cannot be reliably knotted. Eye splices can be spliced in the same way as for rope (see section 3E) but the procedure is slow and fiddly for small wire, and requires a workbench, vice and various tools for heavier cable. This section shows some easier ways to make end loops in multi-strand wire.

Wrapped end loops

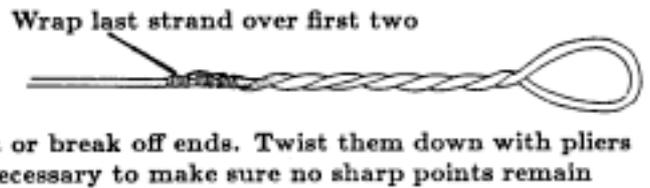
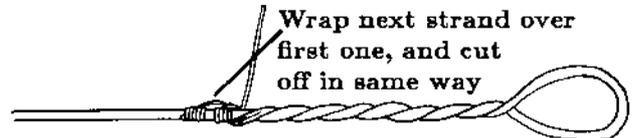
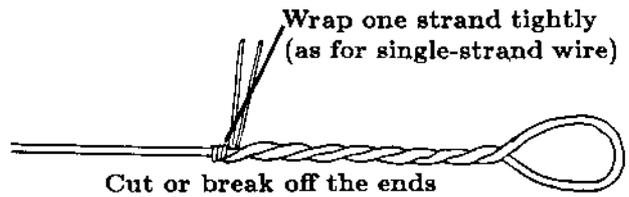
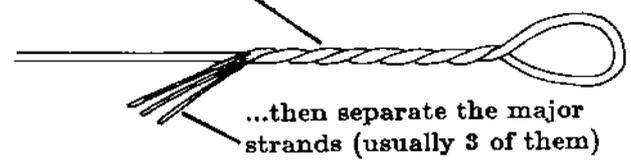
Some multi-strand wires, such as Turimoto galvanized longline wire, can be wrapped in a similar way to single-strand wire (see section 3D). Only the finishing procedure is different.

Make the eye and haywire twist as for the single-strand wire (section 3D). To finish, separate the cable so that the three major strands (which each consists of three minor strands) can be handled individually. Wrap one major strand tightly three or four times around the main strand. Next, separate it into three minor strands, and cut these off flush with the standing part of the wire (or break them off individually as for single-strand wire).

Take the second major strand and repeat the process, wrapping it tightly around the standing part of the wire and covering up the ends of the first wrap. Cut or break off the ends. Finally repeat the procedure with the last major strand, covering up the ends of the second. The finished product should have a regular shape and no sharp ends sticking out. If sharp ends protrude at any point during the wrapping procedure, twist them down with a pair of pliers.

WRAPPED END LOOP FOR GALVANISED STEEL CABLE

First make a haywire twist (see Section 3D)...

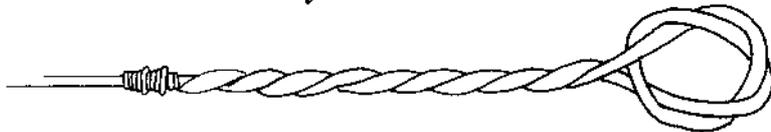


Flemish eye

To strengthen an end loop in cable, and reduce the likelihood of it untwisting, you can make a 'flemish eye'. To do this, tie an ordinary overhand knot in the cable, pulling the knot tight until the eye is about the size you want it. Pass the tag end back through the knot once more and start wrapping as above. The finished product is a stronger and more rigid end loop.

FLEMISH EYE

To make the flemish eye...



...tie a double overhand knot in the cable before completing the end loop

Crimping cable

A simple way to make end loops in multi-strand wire is to crimp them using metal sleeves and crimping pliers. Always use two sleeves and ensure that they are the right size for the wire. Slide the sleeves onto the wire and then tie a flemish eye as shown above. Pass the tag end through the first sleeve, push the sleeve hard against the flemish eye, and crimp it tightly shut using the pliers. Wrap the tag end slightly around the main strand and crimp the other sleeve over the end, making sure the two strands are tight together and the end does not stick out.



Crimps or sleeves the right size for the wire you are using

CRIMPING END LOOPS

Always use two crimps 2-5cm (1-2") apart



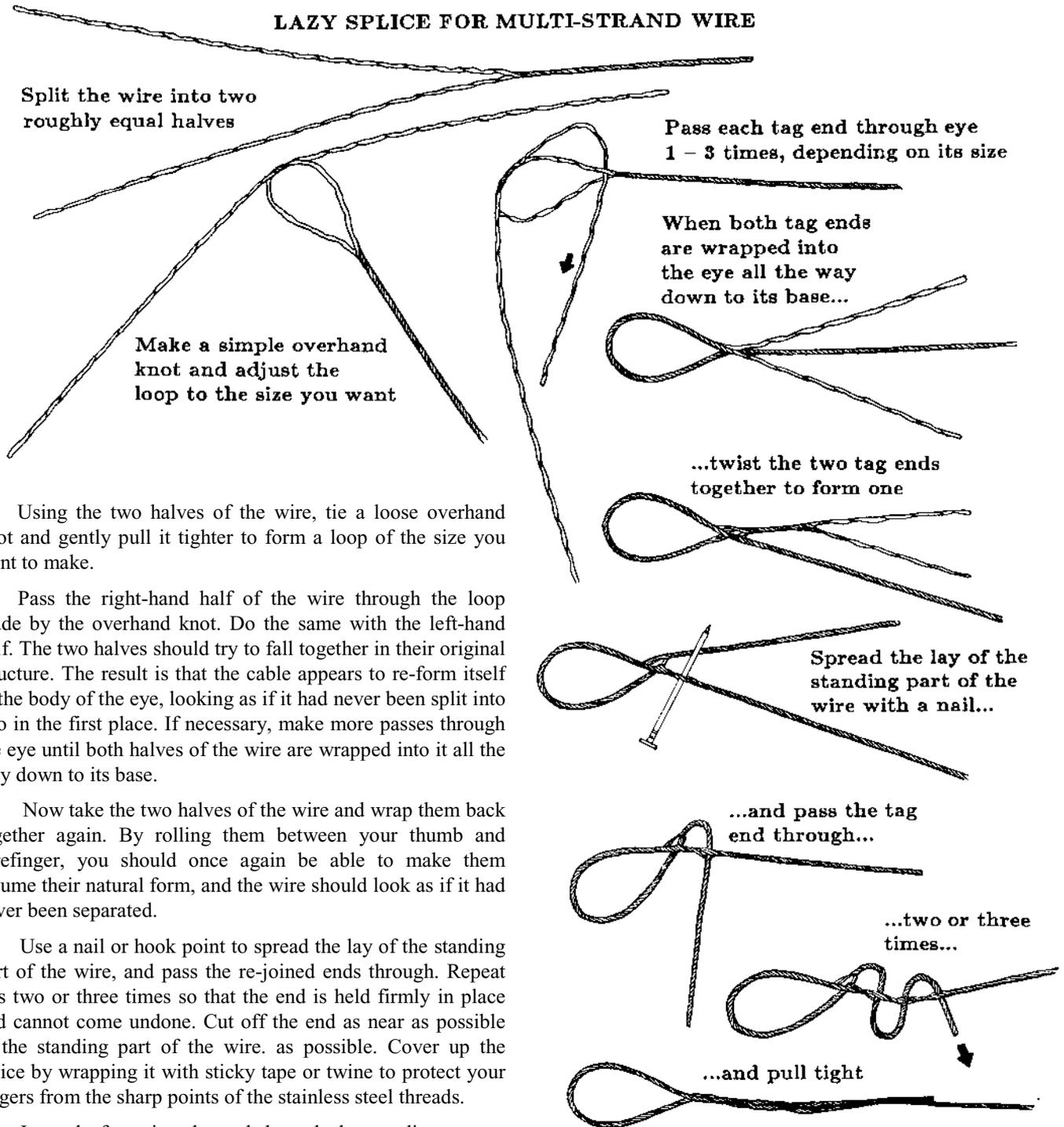
Never leave tag end sticking out

Lazy splice

The lazy splice is an imitation of a true eye splice, but is much quicker and easier to do. It is a good way to make an end loop in 49-strand stainless steel wire if you have no crimps or sleeves available.

First, using your thumbnail, a nail or a hook point, split the body of the wire into two roughly equal halves. Unwind them back about 10-15cm (4-6 inches) or more depending on the size of the eye you want to make.

LAZY SPLICE FOR MULTI-STRAND WIRE



Using the two halves of the wire, tie a loose overhand knot and gently pull it tighter to form a loop of the size you want to make.

Pass the right-hand half of the wire through the loop made by the overhand knot. Do the same with the left-hand half. The two halves should try to fall together in their original structure. The result is that the cable appears to re-form itself in the body of the eye, looking as if it had never been split into two in the first place. If necessary, make more passes through the eye until both halves of the wire are wrapped into it all the way down to its base.

Now take the two halves of the wire and wrap them back together again. By rolling them between your thumb and forefinger, you should once again be able to make them resume their natural form, and the wire should look as if it had never been separated.

Use a nail or hook point to spread the lay of the standing part of the wire, and pass the re-joined ends through. Repeat this two or three times so that the end is held firmly in place and cannot come undone. Cut off the end as near as possible to the standing part of the wire. as possible. Cover up the splice by wrapping it with sticky tape or twine to protect your fingers from the sharp points of the stainless steel threads.

Instead of passing the end through the standing part to secure it, you can use a crimp or sleeve. However, because it takes longer to make than a crimped eye, the lazy splice is usually only used when sleeves are not available. Alternatively, it can be whipped down using twine or strong thread.

Or, whip or crimp the tag end down



CHAPTER 3: PREPARING TROLLING LINES

SECTION G: KNOTS FOR HOOKS AND TACKLE

Nylon monofilament fishing line is slippery and does not grip well when tied. Many knots will come undone under tension, even if they appear secure when tied. Some knots which will hold, and which can be used for attaching tackle to monofilament lines, are shown below.

Palomar knot

The Palomar knot is popular among Hawaiian fishermen, who claim it is easier to tie and less liable to slip than other knots.

To tie the Palomar knot, double the end of the line over in a loop. Pass the loop through the eye of the hook, and tie it loosely in an ordinary overhand knot. Pass the eye of the loop over the body of the hook. Pull gently on the standing part of the line and the tag end together to close the knot. Tighten it up by pulling hard on the mainline.

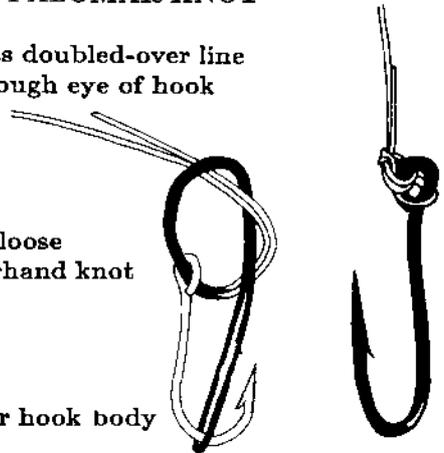
PALOMAR KNOT

Pass doubled-over line through eye of hook

Tie loose overhand knot

Pass loop over hook body

Pull tight



Slip knot

This knot can also be used for braided lines like super-toto, dacron, etc., whose rough surface prevents slipping and makes the clinch knot (above) hard to pull tight.

SLIP KNOT

About 25cm (1 foot)

Thread hook onto line. Leave long enough tag end to work with

Run line over end of finger and hold in place with thumb

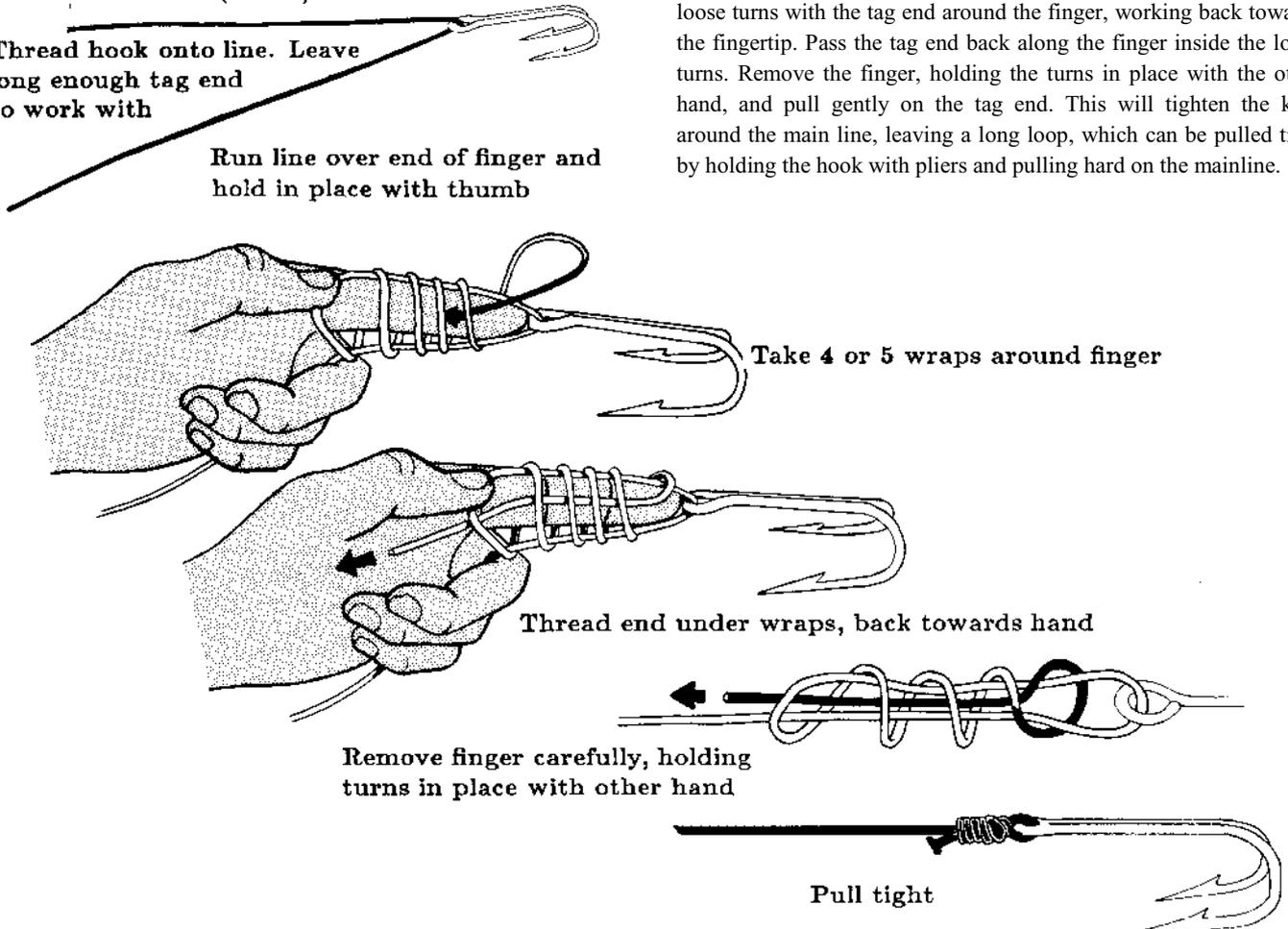
Thread the line through the eye of the hook or swivel, leaving about a foot of line to work with. Run the line down the inside of your forefinger, around your fingertip, and up the back of the finger, leaving the hook eye pulled against the fingertip. Take four or five loose turns with the tag end around the finger, working back towards the fingertip. Pass the tag end back along the finger inside the loose turns. Remove the finger, holding the turns in place with the other hand, and pull gently on the tag end. This will tighten the knot around the main line, leaving a long loop, which can be pulled tight by holding the hook with pliers and pulling hard on the mainline.

Take 4 or 5 wraps around finger

Thread end under wraps, back towards hand

Remove finger carefully, holding turns in place with other hand

Pull tight

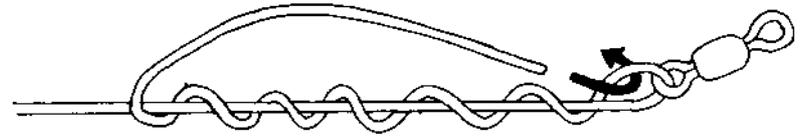


Clinch knot

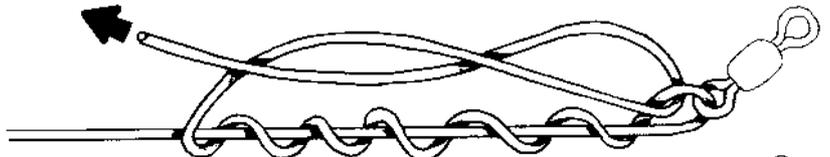
Pass the end of the line through the eye of the hook and double it back. Rotate the hook four or five times, twisting the lines around each other. Lubricate the lines with saliva to make it slip more easily. Pass the tag end back through the loop at the end of the twist and pull gently so that the knot starts to close up. Pass the tag end back under itself. Hold the hook with pliers and pull hard on the mainline so that the knot pulls tight. Pull the tag end tight and cut off close to the knot, then flatten it with pliers or your teeth so that it cannot slip or be pushed back through.

CLINCH KNOT

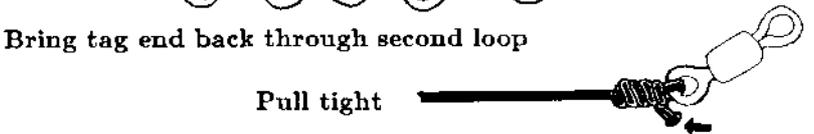
Thread tag end through eye of swivel or hook.



Wrap around line 4 or 5 times, then pass back through loop



Bring tag end back through second loop



Pull tight

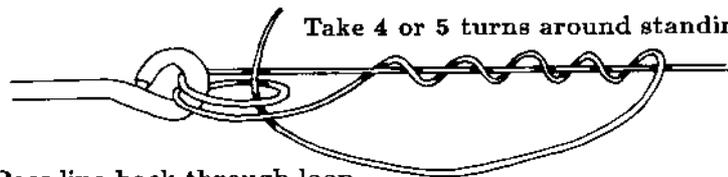
'TRILENE' KNOT

Similar to clinch knot (above), but...

'Trilene' knot

The 'Trilene' knot is recommended by the manufacturers of a proprietary brand of nylon monofilament. It resembles the clinch knot (see above) in some ways, but to start it, the line is passed through the eye of the hook twice instead of just once. The hook is then twisted around 4 or 5 times as with the clinch knot, and the tag end passed through the double loop of line where the hook is attached prior to pulling tight.

...start with double pass through eye of hook



Take 4 or 5 turns around standing part

Pass line back through loop



Pull tight

Tying a hook rigid on wire

For some types of trolling, especially when using natural baits (see sections 4B-4F) and ganged hooks rigged on wire traces, it is useful to tie the first hook rigid on the end of the line, so that it cannot hang free or swing around too much.

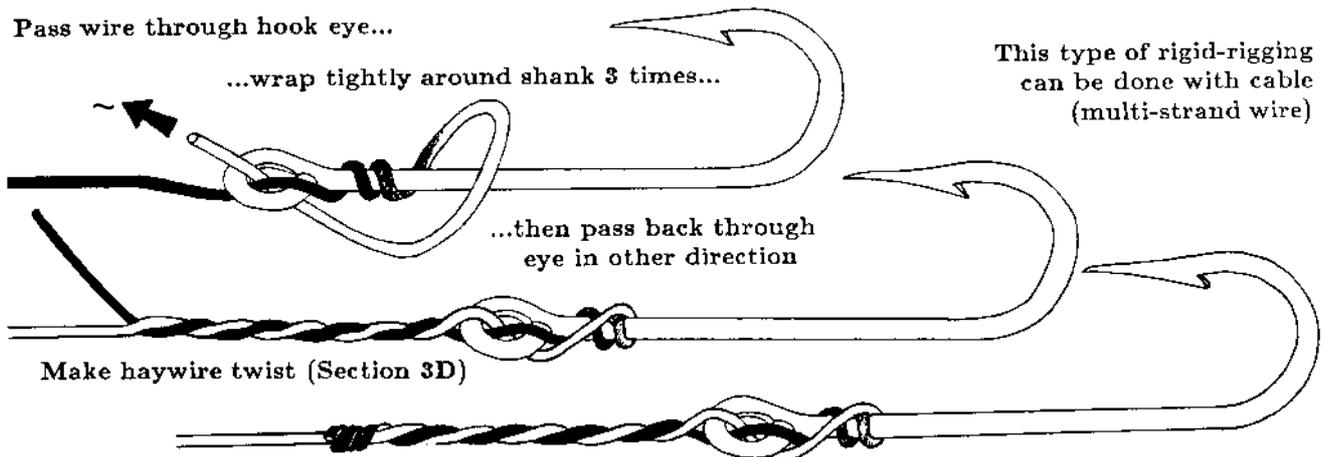
Pass the wire through the hook eye, wrap it tightly two or three times around the hook shaft then pass it back through the hook eye from the opposite direction. The haywire twist and final wrap are then made as for a normal end loop (see Section 3D).

TYING A HOOK RIGID ON WIRE

Pass wire through hook eye...

...wrap tightly around shank 3 times...

This type of rigid-rigging can be done with cable (multi-strand wire)



...then pass back through eye in other direction

Make haywire twist (Section 3D)

Finish by wrapping as normal (Section 3D)

CHAPTER 3: PREPARING TROLLING LINES

SECTION H: JOINING LINES TOGETHER

Most trolling lines are a composite of several lengths of different materials, joined together in various ways along their length. Lines can be joined directly to each other when they are of the same or similar materials. If they are of very different materials, such as nylon and wire, they should be joined indirectly, using a ring or a swivel in between. This prevents one line damaging or cutting the other.

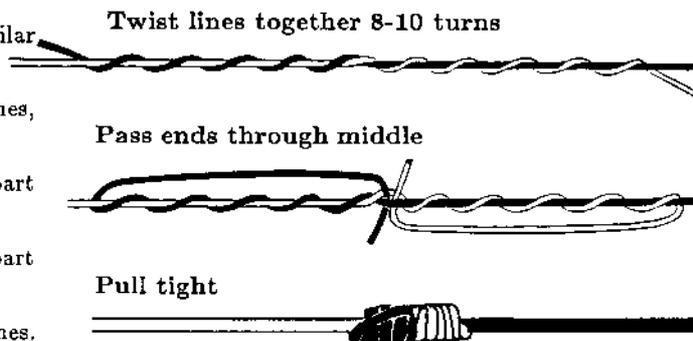
The knots below are recommended for making permanent connections in lines (not wire), repairing breaks or damage, etc.

Blood knot (also called Barrel knot)

This is suitable for joining monofilament and similar lines.

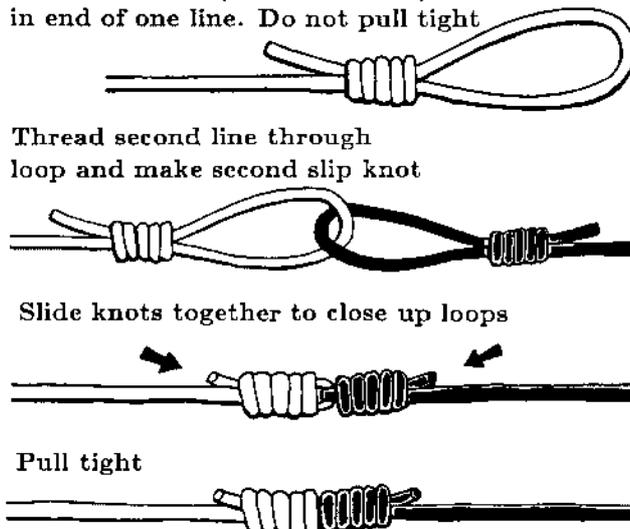
1. Twist the line ends around each other 8-10 times, leaving enough of a tag end to work with.
2. Using a finger, toe, or fixed object, spread apart the lines at the centre of the twist.
3. Pass the two tag ends between the spread-apart lines from opposite sides.
4. Tighten the knot by pulling on the main lines. Moisten the knot with saliva to help it slip.
5. Cut off the tag ends and flatten them with pliers or your teeth to prevent them slipping back through.

BLOOD KNOT (BARREL KNOT)



DOUBLE SLIP KNOT

Make slip knot (see Section 3G) in end of one line. Do not pull tight



Double slip knot

Suitable for heavier lines or those which have a rough surface and do not slip easily.

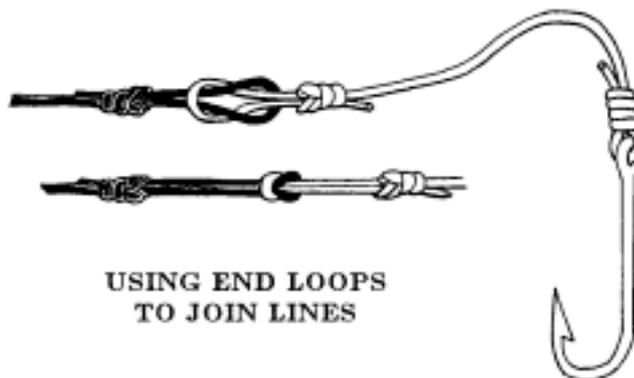
1. Make a slip knot in one of the lines as shown in Section 3G. Pull the turns tight by gently drawing on the tag end while holding onto the loop. Leave the loop large enough to work with and do not pull it tight.
2. Pass the second line through the loop and make a second slip knot exactly the same as the first.
3. Tighten up the knot by pulling hard on both main lines. When tight, cut off the tag ends.

Looking at the above drawings, you can see that in the blood knot, each line wraps around the other, while with a double slip knot each line wraps around itself. This characteristic gives a lot more strength to the blood knot, especially when using thin lines which tend to cut through each other. The blood knot is recommended for use whenever possible, and always with nylon monofilament.

Using end loops

Joining lines using end loops (see Sections 3D-3F) is simple and allows easy disconnection of traces, etc. An end loop is made on each line to be joined. One line is passed through the end loop on the other as shown, and the two lines pulled up tight.

Don't use end loops (or knots) to join hard materials (such as wire) to soft ones (such as monofilament). Use a swivel or connector as shown opposite.

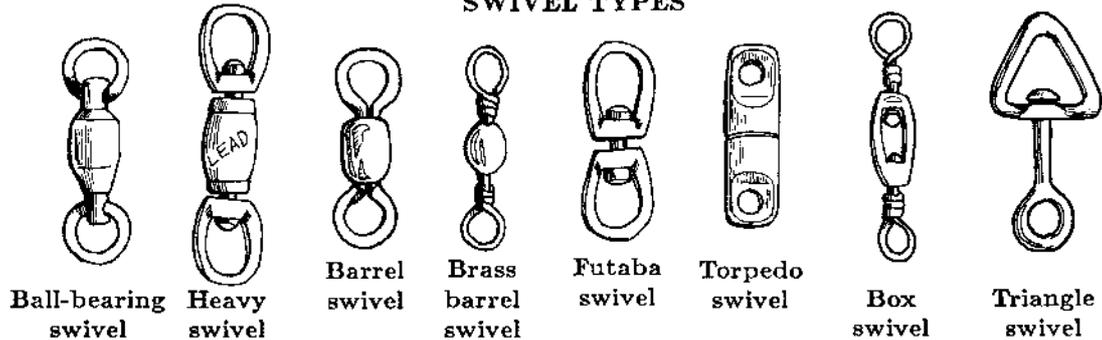


Connector rings and swivels

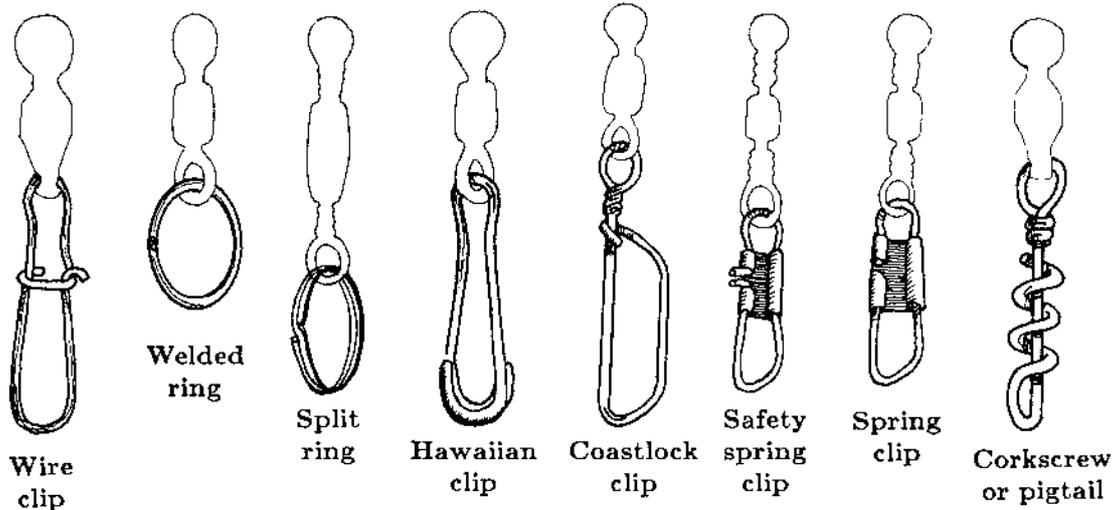
These are used when the lines to be joined are of different types and there is a danger that one will cut or wear through the other one. Rings are very simple and can be improvised from heavy galvanized fence wire or similar materials. Swivels must be shop-bought but are much better than rings as they prevent the action of a spinning lure or bait from twisting up the entire length of the line.

Some swivels have snaps, clips or other 'easy fix' devices which allow rapid changing of lures and traces, attachment of sinkers, etc., while fishing. However, beware of lightweight snaps and clips which are often much weaker than the rest of the swivel, and will break or open at the impact of a striking fish.

SWIVEL TYPES



SWIVELS WITH CLIPS AND RINGS



RINGS AND CONNECTORS



Swivels can be easily attached using end loops, or the knots shown in Section 3G. It is better to make permanent connections using knots, etc., whenever possible. Only use end loops or snap swivels when it will often be necessary to disconnect and re-connect lines (e.g., changing traces, etc.).

Use swivels whenever possible when joining lines



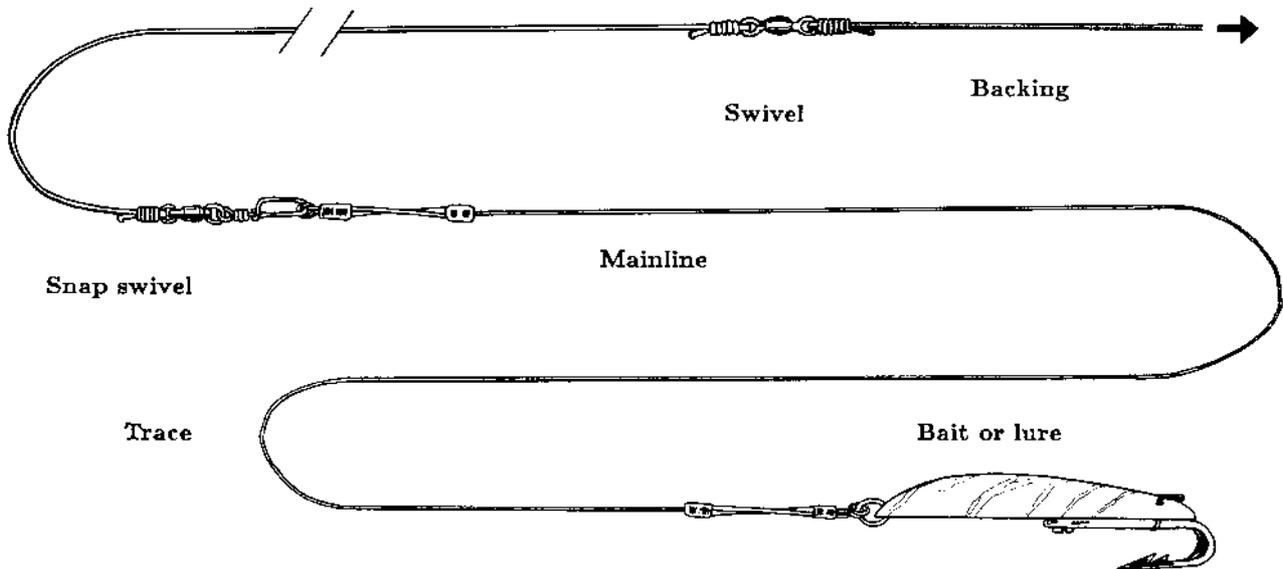
Use clips or fasteners if the lines will be often taken apart

CHAPTER 3: PREPARING TROLLING LINES

SECTION I: THE ASSEMBLED TROLLING LINE

The completed trolling line is a composite line normally made up of three distinct parts -the trace, to which the bait is attached; the mainline, used to distance the bait and trace from the boat; and the backing, which performs different functions depending on the trolling arrangement.

THE ASSEMBLED TROLLING LINE



The mainline

This makes up most of the length of the line. It should be strong but light, and durable enough not to need replacing too frequently. Nylon monofilament of 100 kg to 300 kg breaking strain is normally used, but other types of line such as braid line or, for subsurface trolling, cable can also be used. Line length depends on the type of trolling being carried out -30-50m would be typical, but see Section 3B for more detailed comments on line types.

The trace

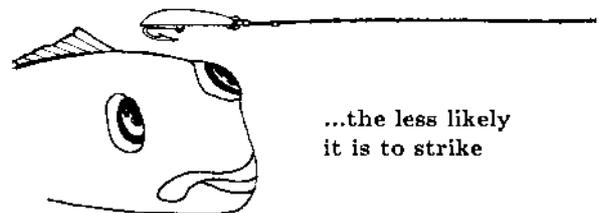
The main function of the trace is to take any damage caused by striking fish and so protect the mainline at its own expense. Therefore, the trace is usually of lower breaking strain than the mainline. The trace must also resist the fish when it attacks the lure, and in its subsequent fight to escape. As many of the tropical species caught by trolling have razor-sharp teeth, it is usual to use wire or cable for traces. The exception is when trolling for oceanic tunas, whose small teeth permit them to be taken on monofilament traces.

A desirable property of a trace is invisibility. The more easily the fish can see the trace, the less likely it is to attack the bait. This is particularly true of tunas, which have excellent eyesight and which will often only strike lures rigged on nylon monofilament.

A trace is thus a compromise between strength, resistance to cutting, and visibility. The material chosen must resist the teeth and the impact of the fish being caught, and should be as invisible as possible. If used on a fixed line (see Section 31) it should have a lower breaking strain than the mainline, but this is not necessary if used on a reel equipped with a drag (see Sections 3M and 3N).

TRACE MATERIALS

The easier a fish can see the line...



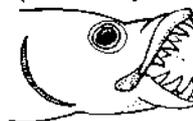
...the less likely it is to strike

For soft-mouthed fish (like tuna)...



...use monofilament

For sharp-toothed fish (like many reef species)...



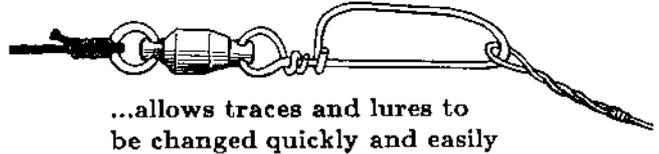
...use wire or cable

Changing traces

It is usual to attach traces to the mainline in a way that enables them to be disconnected and rapidly replaced when damaged or when baits are being changed. When possible use a good-quality snap swivel at this point to prevent any twists caused by the spinning of the bait being passed up the mainline.

CHANGING TRACES

Using a strong snap swivel on the end of the mainline...



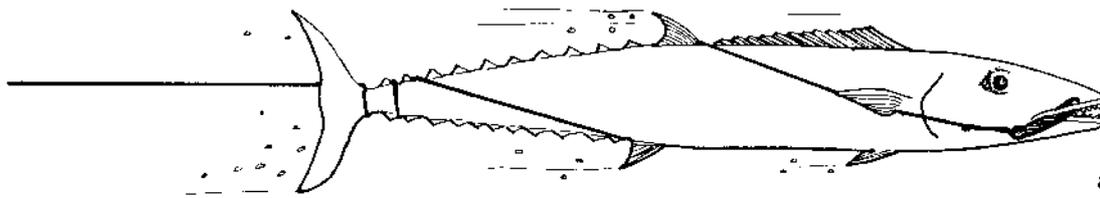
Trace length

Trace length depends on the material and its ease of handling and storage. The trace should be long enough to ensure that no part of the fish will come into contact with the mainline, even when it is swimming directly away from you.

If the trace is less visible than the mainline, it should be long. If it is of some highly visible material (cable) it should be as short as possible. Much depends on personal preference, but as a rough rule, allow 1-2m (3-7 feet) for cable, 2-5m (7-17 feet) for wire, and up to 10m (33 feet) for nylon.

TRACE LENGTH

Trace should be long enough...



...to prevent fish from damaging mainline under any circumstances

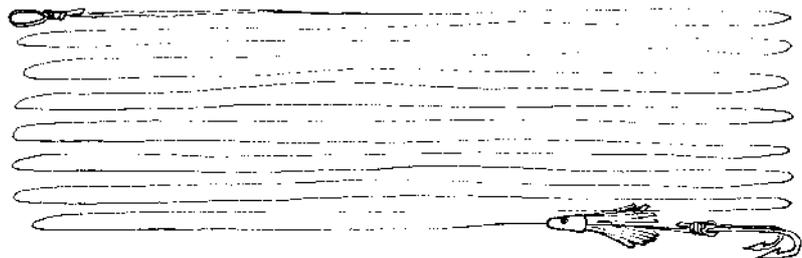
If using heavy cable, keep traces fairly short



For light cable or wire, traces can be longer



For light wire or monofilament, use longest traces to take advantage of low visibility



The backing

This is usually a heavier, and often cheaper, material than the mainline and does not normally go in the water. Its function varies: on a fixed line (Section 31) it incorporates a shock absorber; and on a handreel (Section 3M) it can serve to protect the mainline and act as an emergency backup line when the fish is too strong to control. More information on backing can be found under these two sections.

CHAPTER 3: PREPARING TROLLING LINES

SECTION J: SINKERS

Most of the materials normally used to make up a trolling line -nylon monofilament, wire, cable, hooks, and the bait itself - are denser than water and would normally sink. However, when trolling, the pressure of water against the line forces it to the surface, particularly when trolling at high speed. Most baits and many types of lures normally 'swim' at or just below the sea surface, and may even leap or skip out of the water if trolled too fast.

Nevertheless, it is often desirable that the bait should be presented deeper in the water to be attractive to some types of fish (see Section 51). There are various ways of forcing the bait or lure to swim deeper.

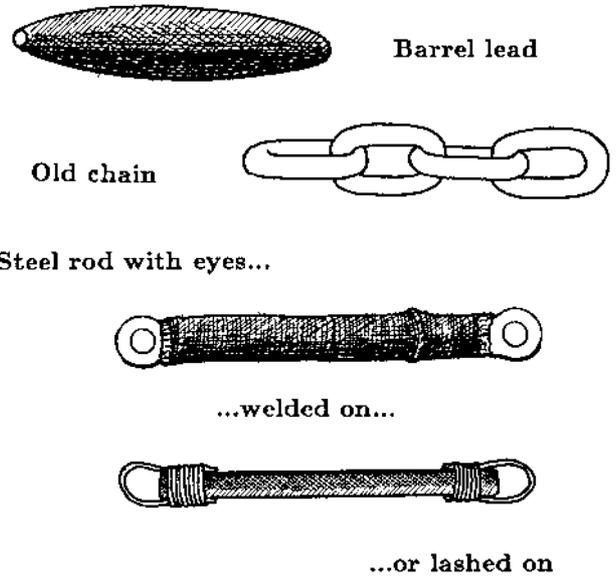
Heavier line materials

Using wire instead of nylon monofilament for the mainline will lower the bait by an amount which depends on the line length and speed. However, cable is usually a costly material for a mainline, may rust or corrode and need frequent replacing, and may be difficult to handle or prone to kinking.

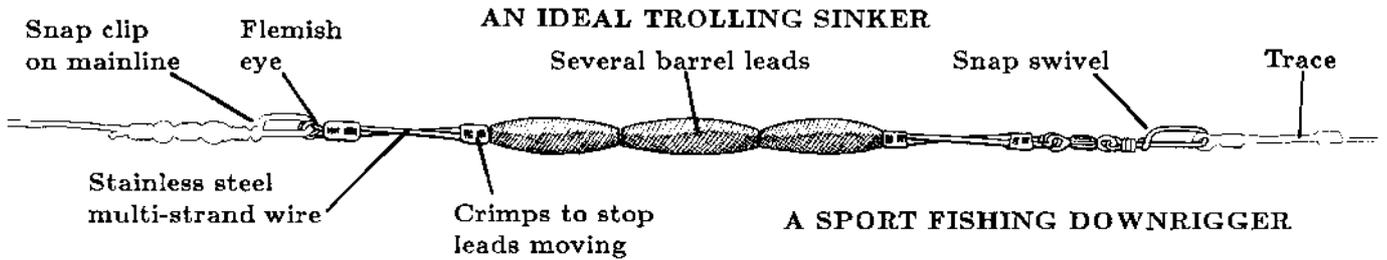
Sinkers

A variety of heavy materials can be used as sinkers. As well as lead weights manufactured for the purpose, lengths of iron bar, chain, etc. can also be used. If using steel bar, weld or lash eyes firmly onto each end, or tie onto a short length of cable.

SINKER TYPES



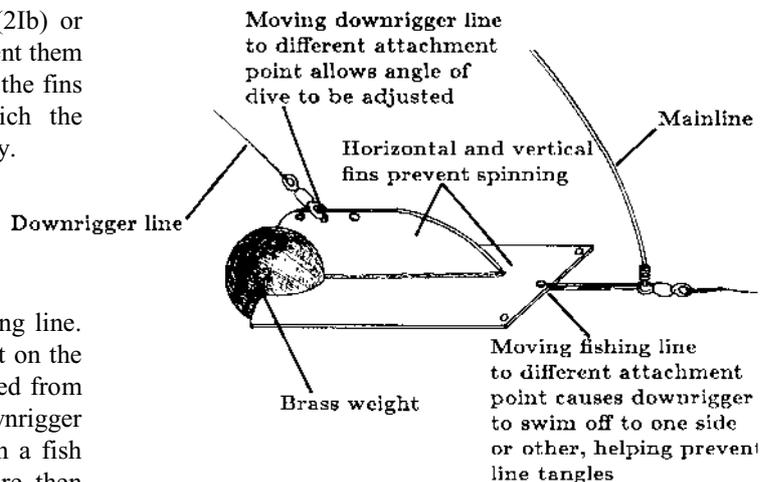
An ideal trolling sinker consists of a series of cast lead barrel weights threaded onto a short length of heavy cable. An eye should be made at both ends, with a snap swivel attached to one of the eyes, so that the sinker can be attached to the trolling line between the mainline and the trace, and easily removed when necessary. Heavy grade cable, preferably stainless steel, should always be used as the lead weights will accelerate its corrosion.



Downriggers

Downriggers are heavy weights, normally 1kg (2lb) or more, and usually equipped with fins or vanes to prevent them from spinning. Several different attachment points on the fins also allow some adjustment of the angle at which the downrigger will 'swim', both horizontally and vertically.

A downrigger is not fixed directly into the trolling line. Instead, it is towed from a separate line tied to a point on the back of the boat (or, for very heavy weights, suspended from a deck winch). The fishing line is attached to the downrigger by a weak link, or 'breakaway', which will part when a fish strikes, freeing the line. The fish and the weight are then hauled in separately.



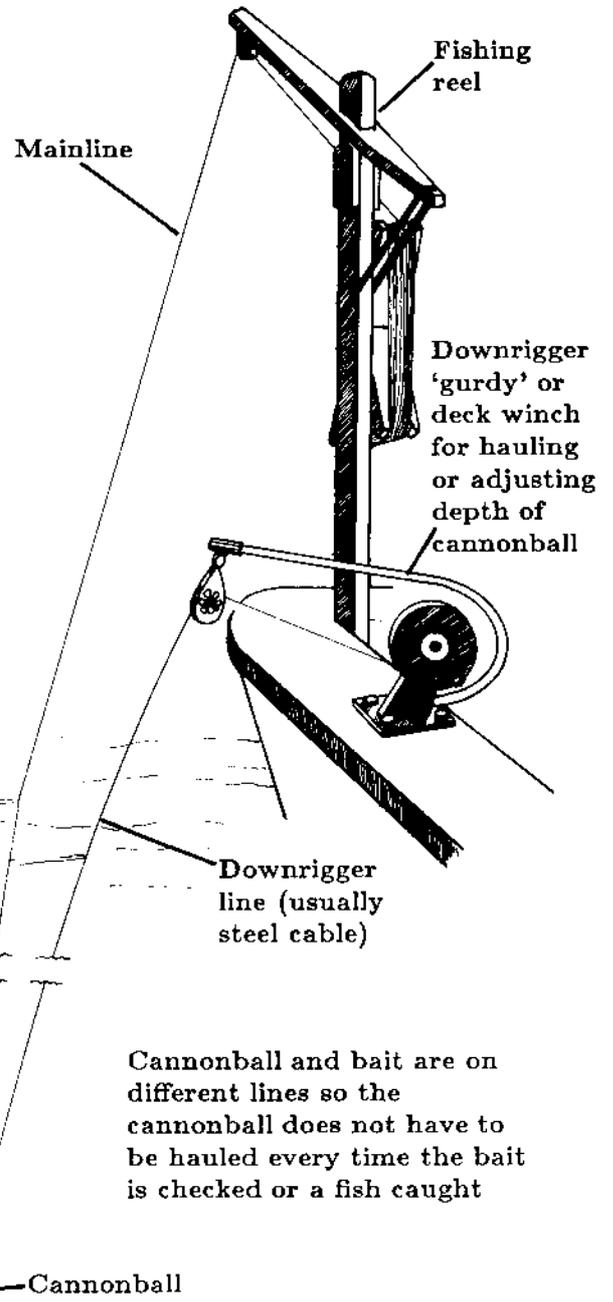
Downriggers are mainly used in sport fishing but have also found favour with some commercial fishermen.

Cannonballs

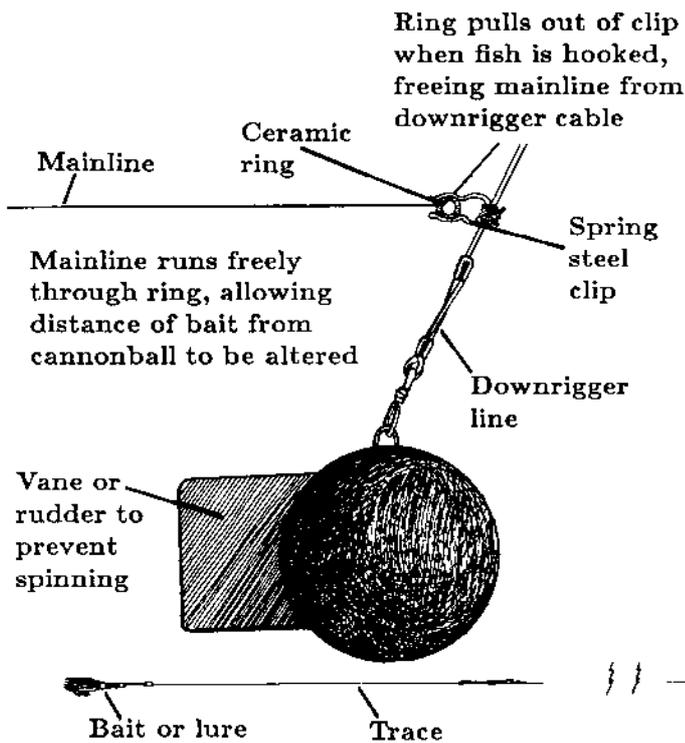
'Cannonball' or large downrigger trolling is a technique used by commercial salmon fishermen in the northern hemisphere, and by some game fishermen in the Pacific. This method uses a heavy weight of between 1 and 25kg (2 to 55lbs) trolled at slow speeds (less than 2 knots) to get one or more lures down very deep. Home-made 'cannonballs' of various designs can also be improvised.

This technique is of possible application in commercial trolling for deep-swimming tunas, especially around FADs, and is currently under trial in SPC experimental fishing programmes. However, its suitability for smallscale commercial fishermen in the Pacific Islands region has not so far been fully demonstrated and the technique is not discussed further in this book, as it requires specialised heavy-duty trolling tackle and deck gear.

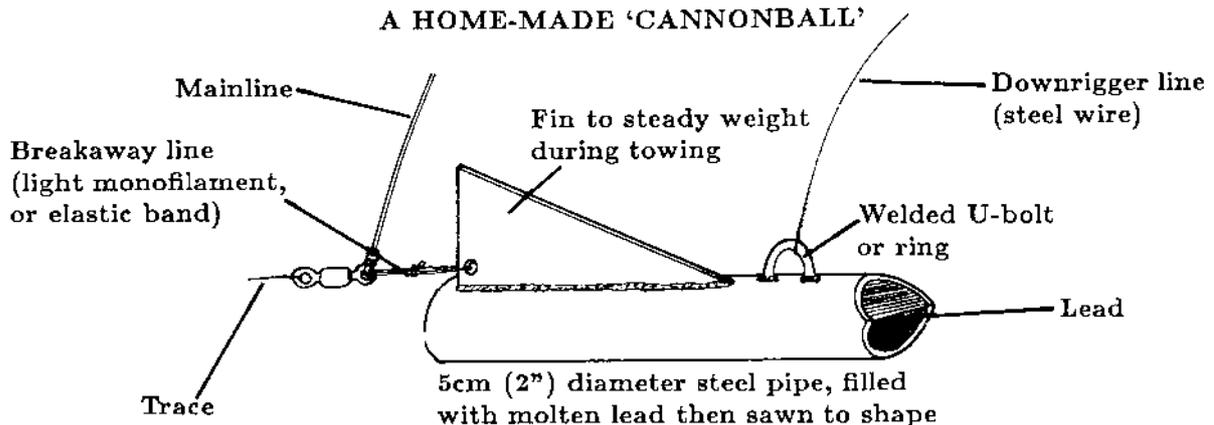
A CANNONBALL TROLLING RIG



CANNONBALL DETAIL



A HOME-MADE 'CANNONBALL'



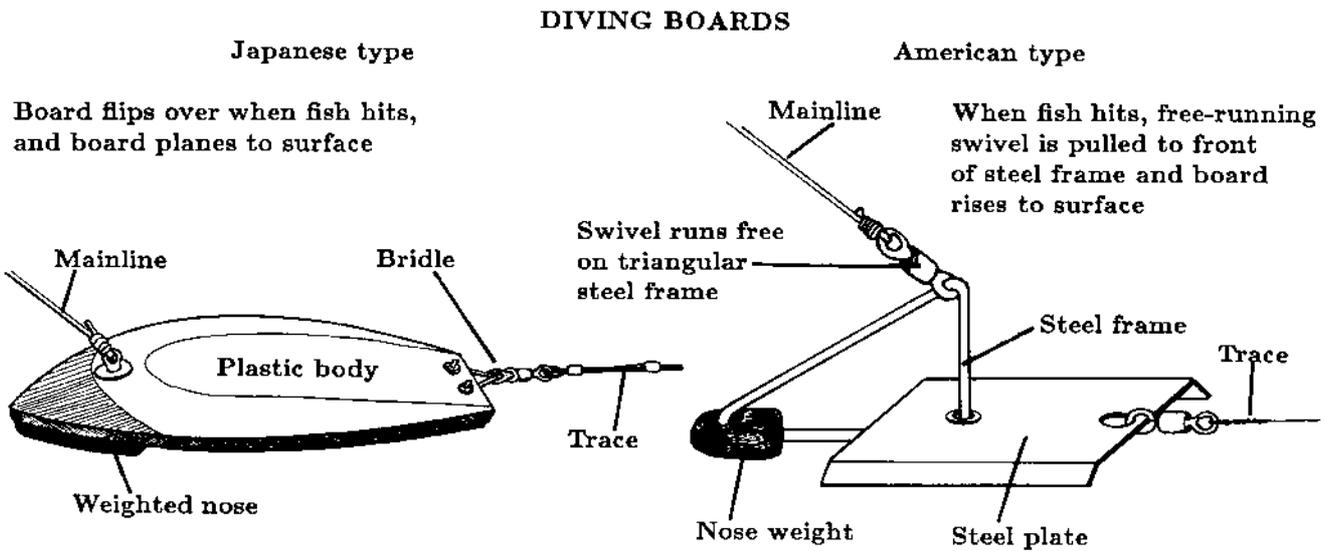
CHAPTER 3: PREPARING TROLLING LINES

SECTION K: DIVING DEVICES

Diving boards and similar devices are used as an alternative to sinkers to get the line down deeper. A diving device planes like an underwater kite, diving deeper and carrying the lure along with it.

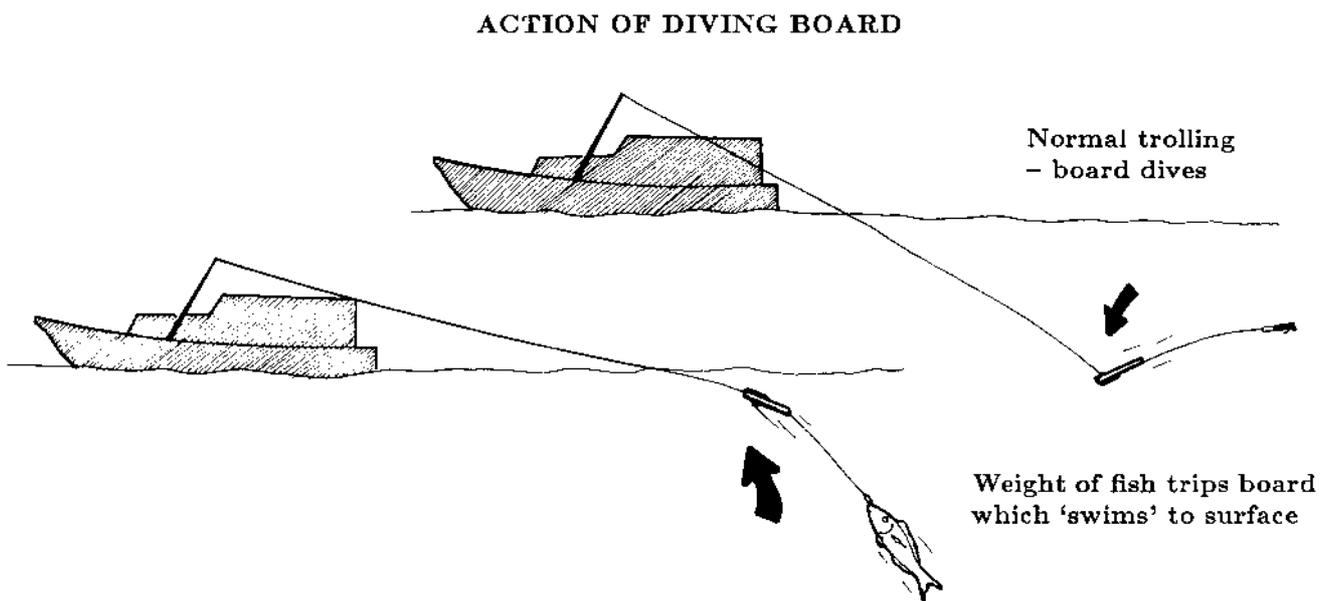
Diving boards

These are small wooden, plastic or metal boards or plates, often with a weighted nose, which are attached between the mainline and the trace. Under normal trolling conditions they will dive down, taking the bait behind them.



Tripping

The trolling depth of the board depends on the amount of line you payout. Once the board reaches its maximum depth, it will (usually) stay there and remain steady provided that it is properly balanced. When a fish hooks up on the lure, the added weight on the line alters the board's angle and causes it to rise to the surface, dragging the fish along with it.

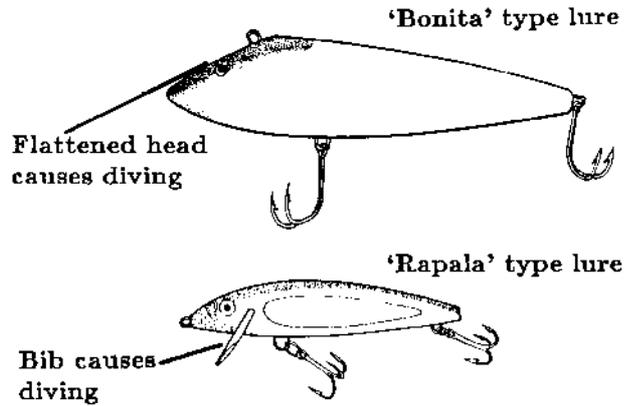


Although the most effective way to get a bait or lure down deep, a line with a diving board will often lose more fish than a weighted line, because it tends to go slack when the fish strikes and the board becomes unstable. A badly balanced board will swim from side to side and may spin when surfacing, causing line tangles.

Diving lures

Some artificial lures are themselves designed to dive. These usually incorporate a 'mini-diving board' or bib at the front of the lure, or have an angled nose or head section which forces them down. Lures of this type will usually dart from side to side very actively when being trolled. See Section 4A for more information on lure types.

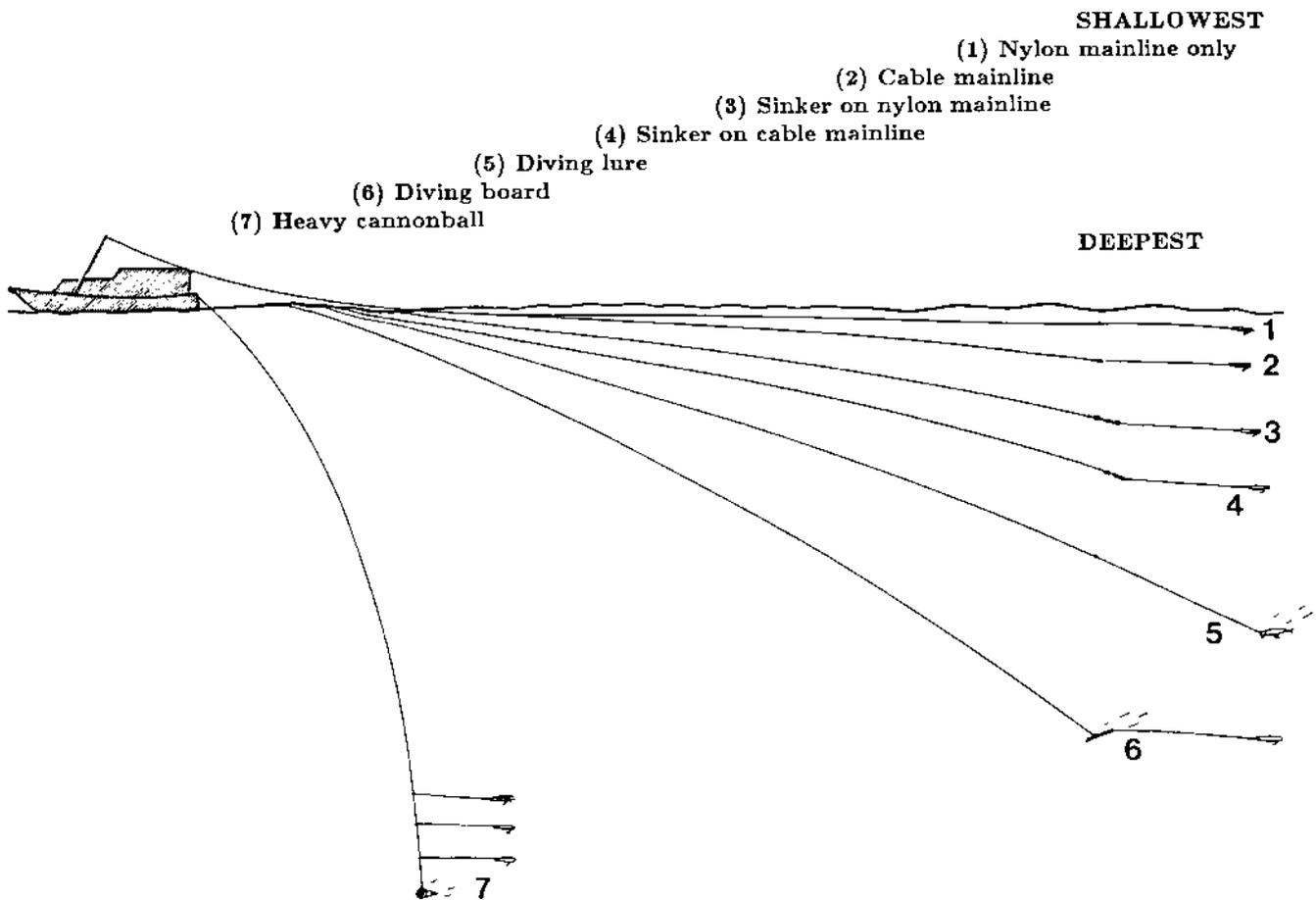
DIVING LURES



Trolling depth

At the same trolling speed, the sinker and diving board types described in this section and in Section 3J would achieve the relative depths shown in the drawing below.

HOW DEEP WILL THEY GO?



This is a guide only, and will vary depending on line length, sinker weight, lure type, etc

CHAPTER 3: PREPARING TROLLING LINES

SECTION L: RIGGING FIXED LINES

A fixed trolling line is attached by the backing cord to some point on the boat, such as the transom or trolling boom. The mainline is tied or clipped to the end of the backing cord, preferably with a swivel in between. When a fish is hooked, it is hauled in hand over hand.

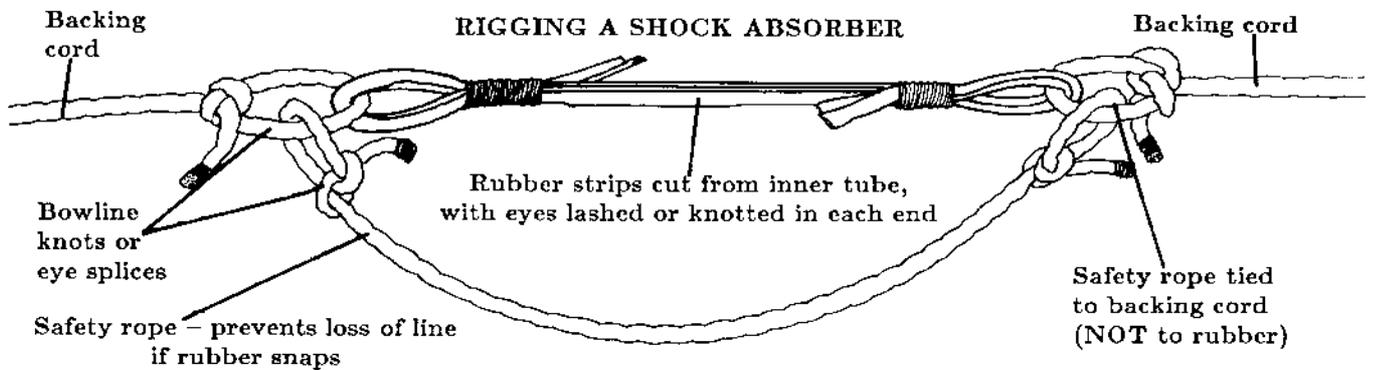
Making shock absorbers

When rigging a fixed trolling line it is very important to incorporate a rubber shock absorber into the backing cord. This takes the impact of the initial strike of the fish, reducing the chances of line breakage. It also sets the hook in the fish's mouth. Without the shock absorber, the hook can be snatched or torn out of the fish's mouth when it strikes, so more fish will be lost.

The best shock absorbers are those which are manufactured for the purpose, but home-made versions can be almost as good. Old bicycle inner tubes doubled over, loops or strips cut from car inner tubes and lashed together, or lengths of light rubber tubing are all commonly used. Length depends on the strength and stretchiness of the rubber -25-75cm (20-30 inches) is normal.

Rigging shock absorbers

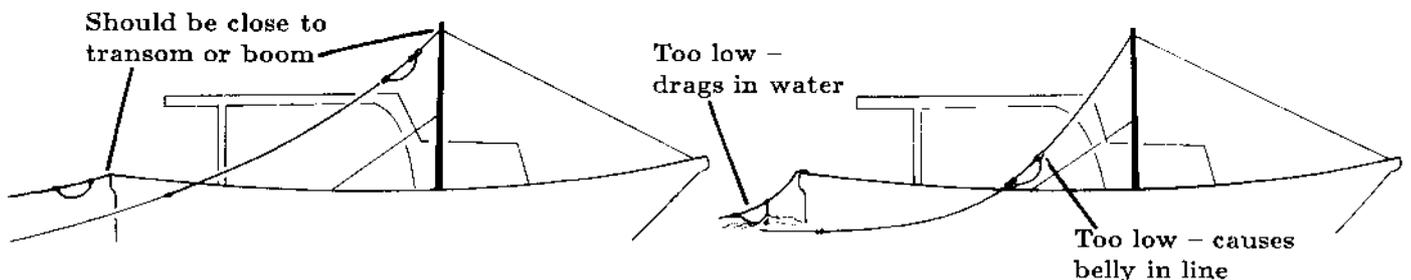
The shock absorber should be tied into the backing cord as shown below, using bowline knots or eye splices (see Section 3E) to make the end loops. Since rubber is much weaker than rope, it is essential to incorporate a safety rope to prevent the loss of the entire line if the rubber breaks. Tie the safety rope to the loops in the backing cord (not to the shock absorber) and make sure it is long enough to allow the rubber to stretch fully.



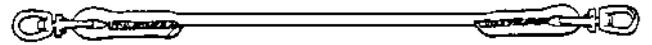
Position

The shock absorber should be very close to the point where the backing cord is attached to the boat. This will prevent it hanging down and forming a belly in the line. If it does this, the slack line will increase the chances of fish not being properly hooked on the strike.

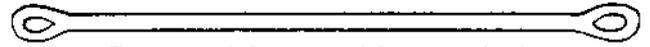
POSITION OF SHOCK ABSORBER



SHOCK ABSORBER MATERIALS



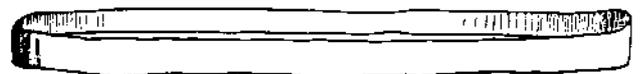
Commercial type with swivels



Commercial type without swivels



Old bicycle inner tube



Strips or loops cut from large inner tubes



Surgical rubber tubing or speargun rubber

Backing cord and lazy line

The backing cord is usually left permanently attached to the boat or trolling boom. Its purpose is to carry the shock absorber, and to act as a 'lazy line', or attachment point, for the mainline, which is tied or clipped onto it. This is very important on a trolling boom, as otherwise it would be necessary to bring the booms inboard every time a line had to be attached or disconnected.

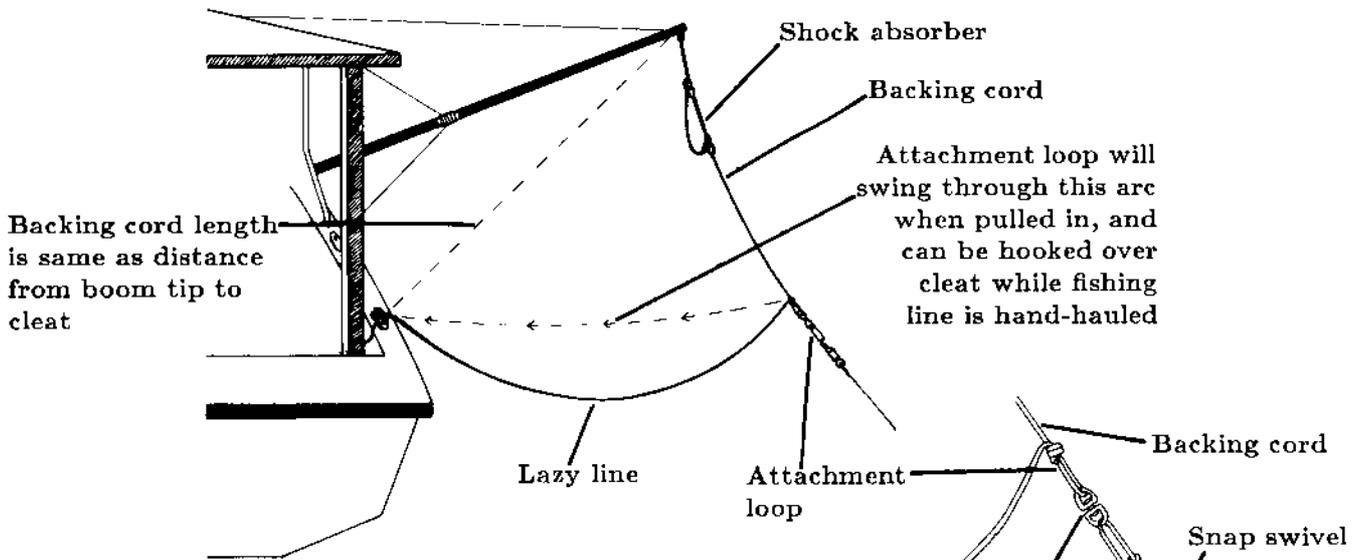
A good system is to make the backing cord and lazy line from the same continuous length of rope. A figure-of-eight knot (see Section 3D) is tied partway along the rope, and serves as the attachment point for the mainline. The part of the line between the boom and the loop is called the backing cord: the part between the loop and the boat is the lazy line.

The position of the attachment loop (the figure-of-eight knot) should be worked out carefully before tying. The lazy line should be long enough to hang loosely between the boat and the trolling line during normal fishing, preferably without dangling in the water. The end should be tied to a fixed point on the boat when fishing starts and not disconnected until fishing is over. When the lazy line is pulled in, the attachment loop should swing into the boat at exactly the spot from where the mainline would normally be hauled. In this way, the start of the mainline is delivered straight into the fisherman's hands, and hauling is rapid and efficient.

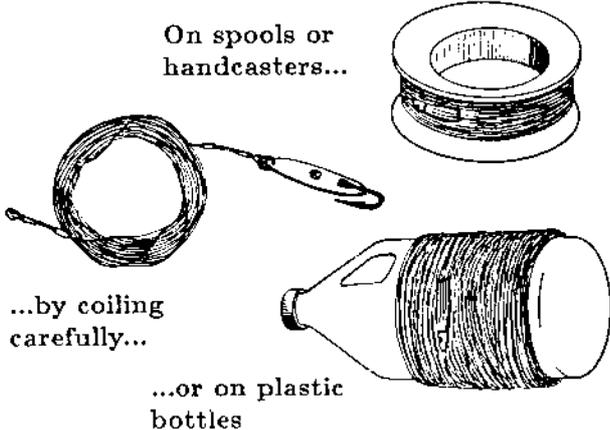
If available, a heavy duty swivel should be placed in the attachment loop before it is tied. The mainline can then be clipped onto the swivel instead of directly to the attachment loop, and is less likely to twist.

The backing cord should be kept as short as possible, while still allowing it to do its job. For a line attached to the stern of the boat, it can be as short as one metre (3 -4 feet). For a line attached to a trolling boom, it may be several metres long, depending on the size of the boat and the length of the boom.

BACKING CORD / LAZY LINE



STORING FIXED LINES



Line storage

Fixed lines can be stored on a plastic handcaster, an old bottle, or similar item. At the end of fishing, haul the line as normal, wrapping it onto the handcaster as you go. Do not detach the mainline from the backing cord until it is all on board the boat. Leave the backing cord attached to the trolling booms or store it separately.

More information on fishing with fixed lines is given in Section 6D.

CHAPTER 3: PREPARING TROLLING LINES

SECTION M: RIGGING LINES ON HANDREELS

When trolling, wooden handreels, (see Section 2F) have a number of advantages over fixed lines. They allow easy adjustment of line length, help avoid the snagging and tangling which occurs when lines are piled on deck, speed up line recovery, and allow big fish to be played. Perhaps most important, they also enable the line to be used for other fishing methods, such as deep-bottom fishing. Nevertheless, many people still prefer fixed lines to handreels.

Sections 2F and 2G describe the types of reels available and their mounting on the boat. This and the following sections show proper rigging of the reels for trolling.

Loading the reel

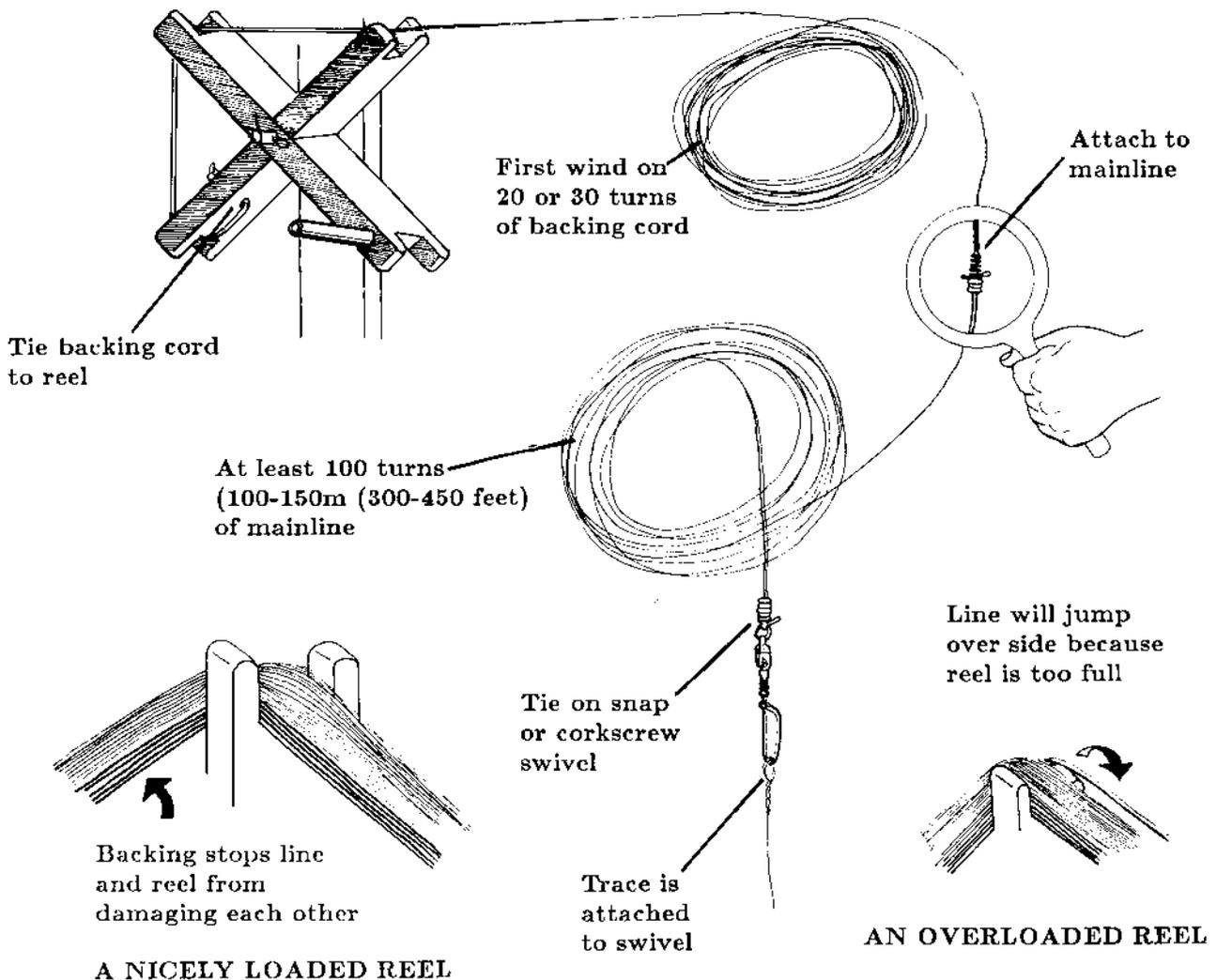
This is normally done by two people, one slowly winding the reel handle while the other holds the coil of line and ensures that it unravels freely.

Some fishermen start with 20 or 30 turns (one turn is about 1m (3 feet 4 inches)) of a light rope or cord backing, which acts to protect the mainline from damage by sharp edges on the reel, or wrap the reel once or twice with strips of inner tube rubber, for the same reason. Others see no need for any backing, and wind the mainline straight onto the reel.

For trolling, the mainline length should be at least 100 metres (330 feet), and preferably longer, (this is essential if the reel is also to be used for deep-bottom fishing).

Once winding the mainline is complete, a strong snap swivel is tied on (see Section 3H), and this serves as the attachment point for the trace during fishing.

LOADING LINE ONTO A WOODEN HANDREEL



CHAPTER 3: PREPARING TROLLING LINES

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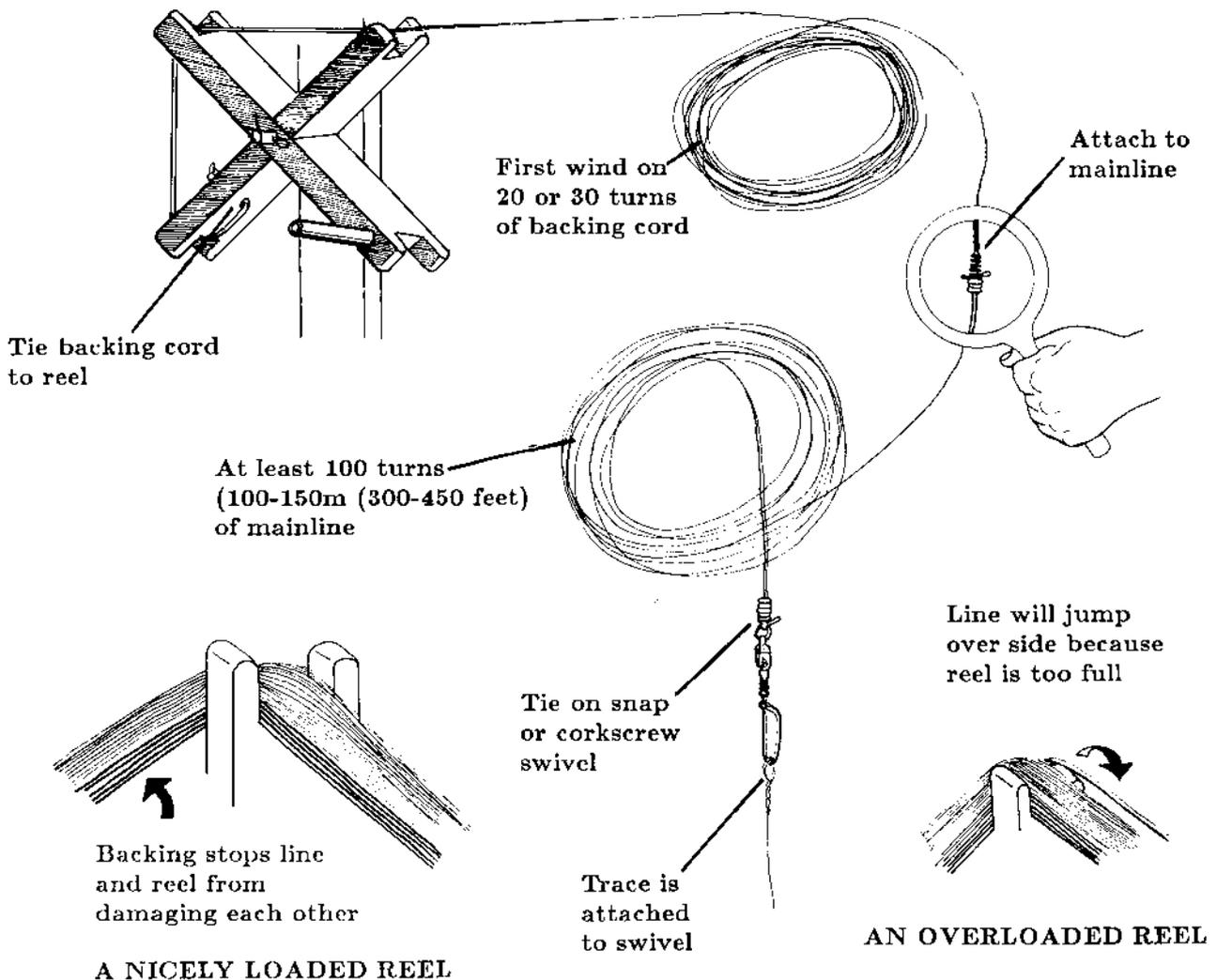
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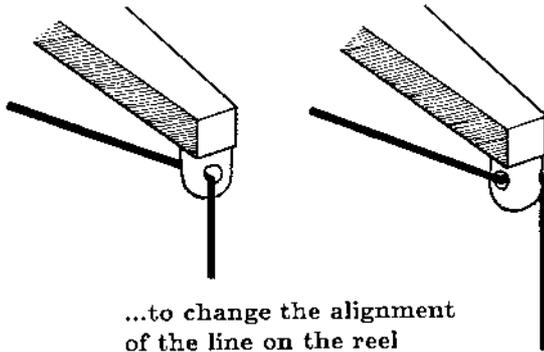


Overloading

When loading the reel, take care not to overfill it, as this can cause line to spillover the sides. Ensure that the line is evenly wound and not all on one side.

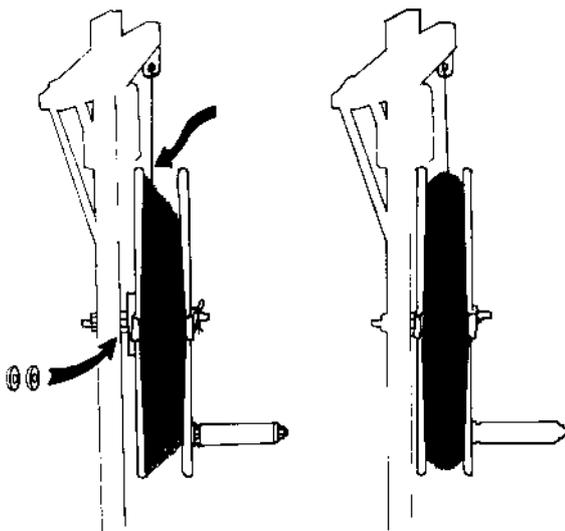
ADJUSTING THE REEL

Try turning the insulator...



...to change the alignment of the line on the reel

Winding can be adjusted...

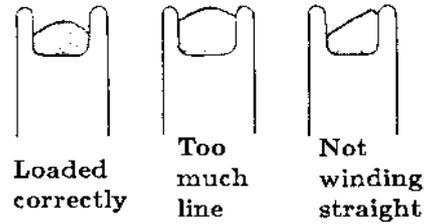


...by adding or removing spacing washers on the reel shaft

Using wire

The standard electrical insulator at the end of the reel arm is fine for use with nylon monofilament and most types of line. However, no wire of any kind should ever be wound through an insulator or other similar fitting, as the wire will immediately kink or curl and become useless. If using wire mainlines or traces which you want to wind onto the handreel, you must replace the insulator with a pulley or block, preferably 7 cm (3 inches) or more in diameter.

OVERLOADING AND MISALIGNMENT



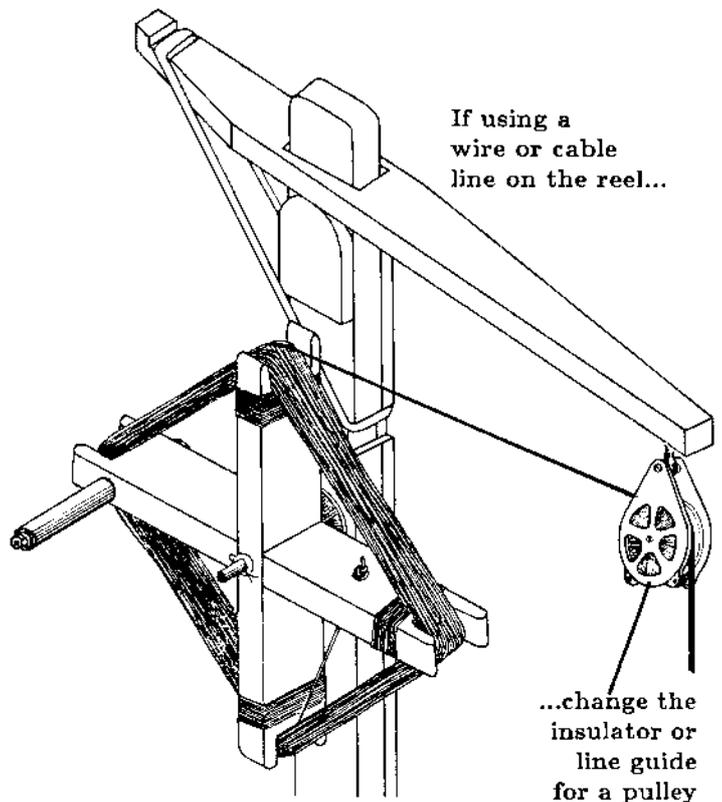
Adjustments

If the reel is not winding evenly, it may be possible to adjust this by twisting the insulator on the end of the reel arm. When winding in a heavy fish, it may also be necessary to lean on the end of the reel arm to keep the line in alignment with the reel.

Further adjustment is possible by removing the reel from the shaft and adding or removing spacing washers to alter the distance between the reel and the stanchion post.

Neither of these adjustments will make very much difference if the reel is badly made in the first place. It is very important that the reel be square and sits straight on the shaft.

USING CABLE MAINLINES



Section 3N shows how to rig the handreel for trolling. Section 6E gives information on trolling practices using the handreel.

CHAPTER 3: PREPARING TROLLING LINES

SECTION N: RIGGING HAND REELS FOR TROLLING

As with fixed lines, handreels can be used with trolling booms to increase the spread of the lines and the number that can be trolled from the boat.

Rigging through a trolling boom

Trolling booms that are to be used for handreels must have a line guide (insulator, shackle or similar) at the tip, as shown in section 2D. This should be smooth and rounded so as not to cause too much wear on the line. If a wire mainline is to be used, the boom tip must be fitted with a pulley (see section 2D).

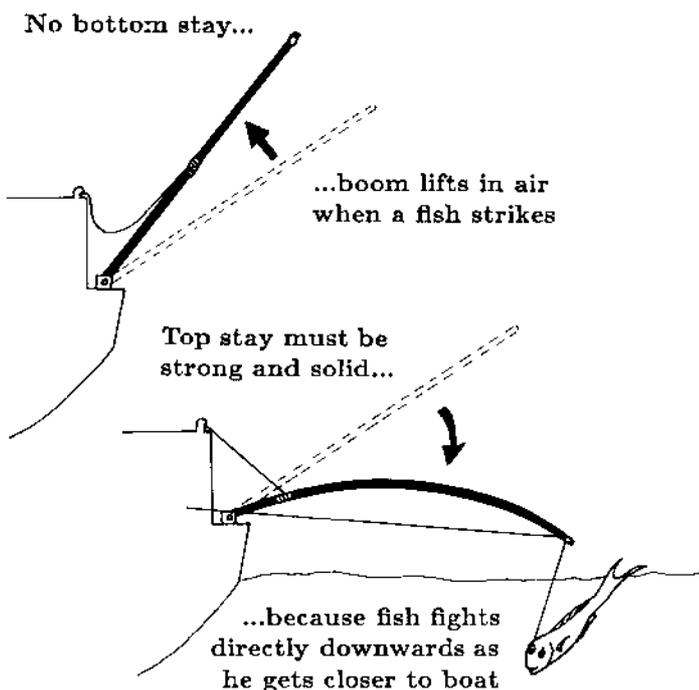
Rabbit line

Before putting out the trolling boom, take a piece of light line or string a little more than twice the length of the boom. Pass this through the boom eye, then tie off both ends at the base of the boom. Once the boom is in a fishing position, the inside end of this string is tied to the swivel on the end of the mainline. Pulling the outer end of the string pulls the mainline out through the boom eye and back to the boat, where it can be rigged for fishing. Once fishing is over, the procedure is reversed, so that when the mainline is taken out of the boom eye, the string is led back in, and can be tied off, ready for next time.

Boom stays

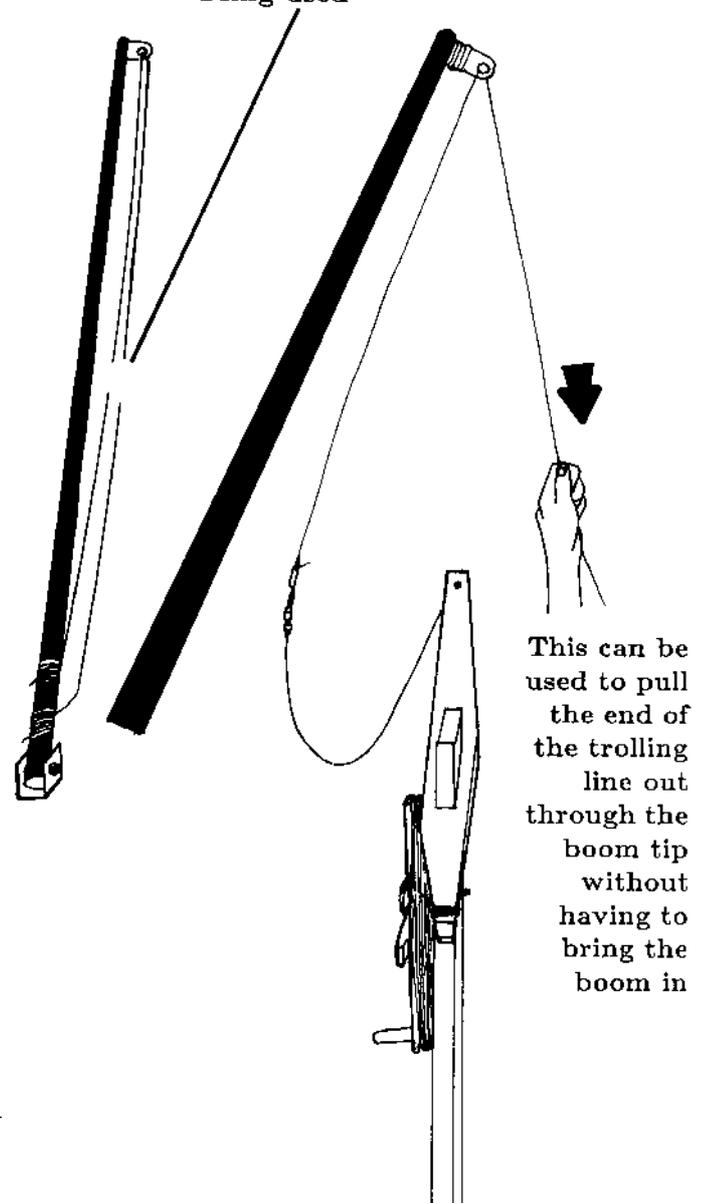
Booms for use with handreels must have good top and bottom stays (see Section 2E). If there is no bottom stay, the boom will lift when a fish strikes, or each time you try to wind the line in quickly. Without a topstay, the boom will bend and may break when a fish is wound in close to the boat and is fighting downwards against the boom.

STAYS FOR HANDREEL BOOMS



RABBIT LINE

Tie a length of light line through the boom and leave it in place when the boom is not being used



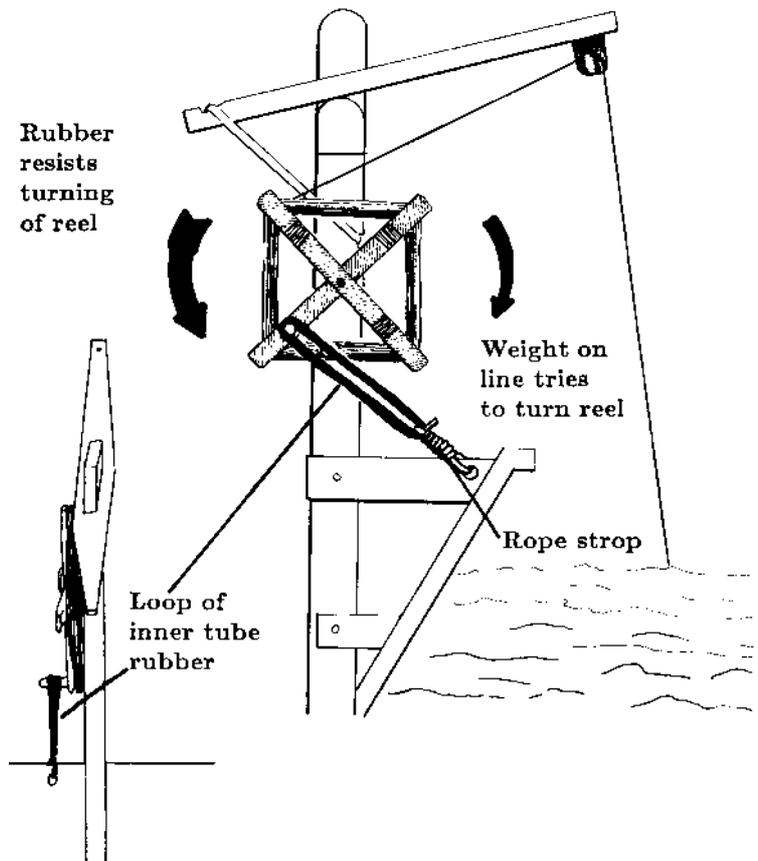
Braking System (Drag)

Unlike a fixed line, there is no shock absorber incorporated into the trolling line itself. This is replaced by the braking system, which also acts as a drag to prevent line over-run due to the reel spinning too fast when a fish strikes.

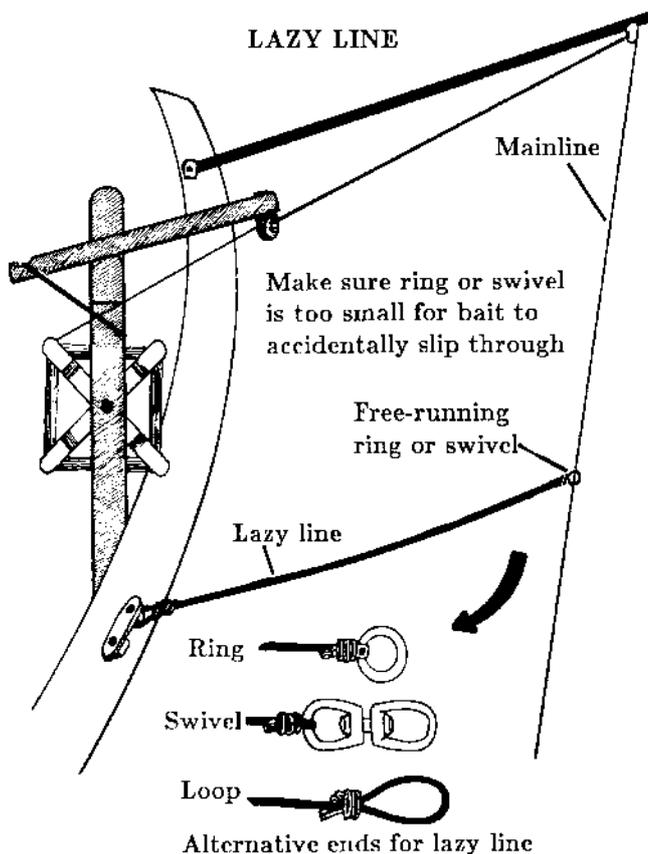
Most commercially made handreels are fitted with a brake of some type, usually a friction adjustment, which is undoubtedly the best. For the Samoan handreel, a simple but very effective brake can be improvised. This consists of a simple loop of inner tube rubber, attached by means of a rope stop to a fixed point on the boat. This is looped over the reel handle during normal trolling, and lifted off when winding in the line.

The brake loop should be reasonably tight, so that it is difficult to turn the reel manually with one hand. Depending on its strength, adjust the length of the rubber loop so that the handle can move fairly easily through about a quarter of a turn in each direction. If the brake is too loose, the reel will spin too freely on a strike, perhaps causing a tangle, not hooking the fish properly, and paying out a lot of line, which must then be wound back in again. If it is too tight the reel may not turn when a fish strikes, resulting in broken gear or fish breaking off the line.

BRAKE FOR WOODEN HANDREEL

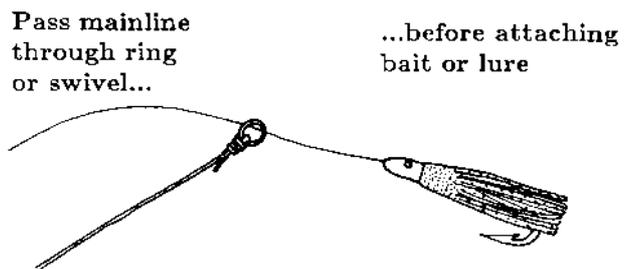


LAZY LINE

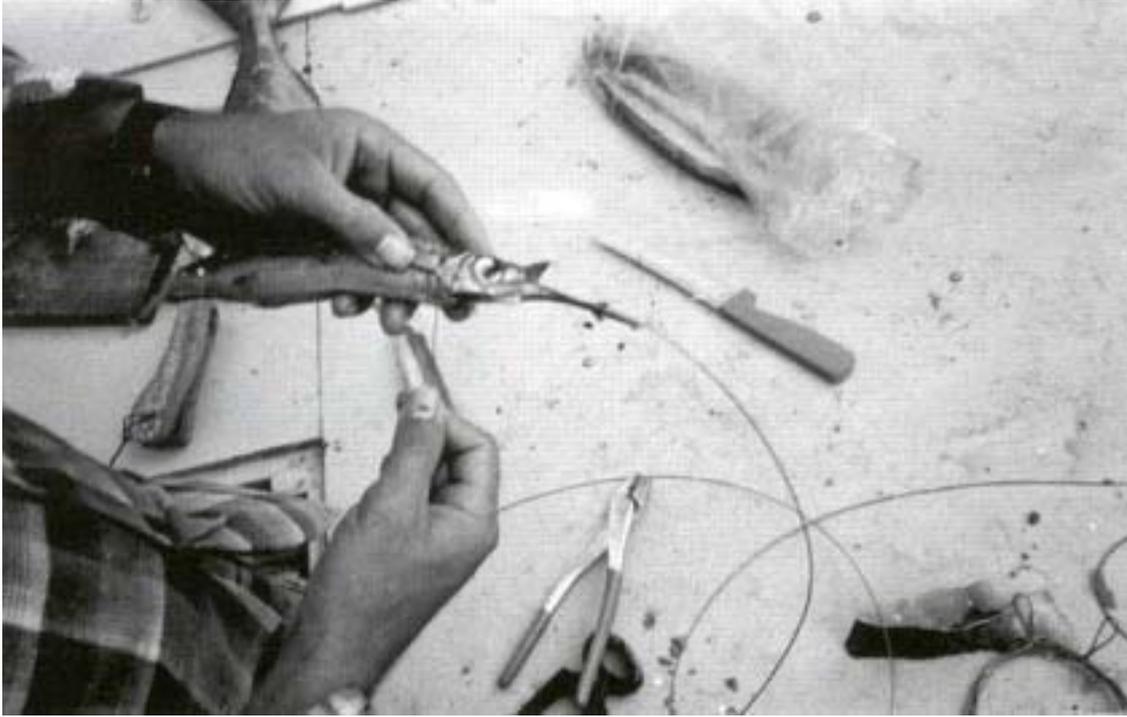


Lazy line

As with a fixed line (Section 31), a lazy line is needed so that the mainline can be pulled inboard when boating a fish. The lazy line cannot be attached to the mainline, but must be free to slide along it. Usually, a steel ring, a large-eyed swivel, or a simple loop is tied onto the end of the lazy line. The mainline should be threaded through this ring OJ: loop before attaching the trace and bait or lure. The ring should be too small for the bait or lure to pass through, so that there is no chance of the lazy line ever slipping off over the end of the trace.



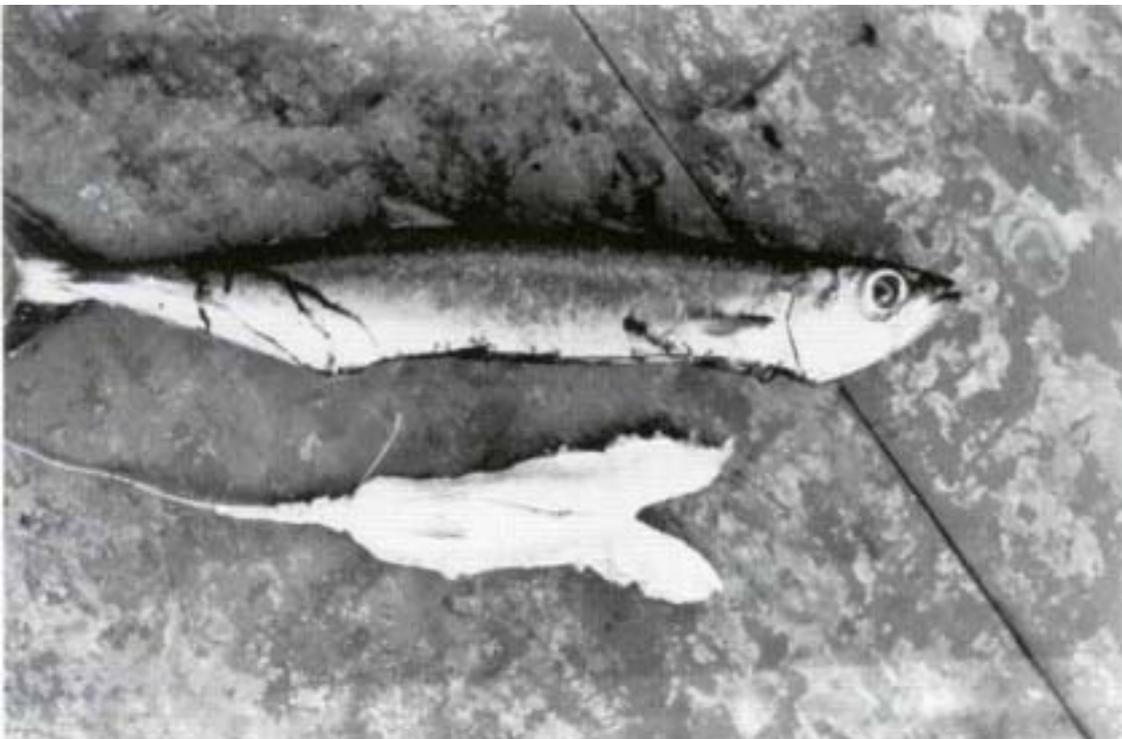
See Section 6E for information on trolling practices using the handreel.



Location: Noumea, New Caledonia

Photo: G.L. Preston

Rigging garfish as trolling bait



Location: Funafuti, Tiovalu

Photo: L.B. Chapman

Rigged belly flap cut from a small scad