Ney Tech Dental Surveyor

Directions for Use

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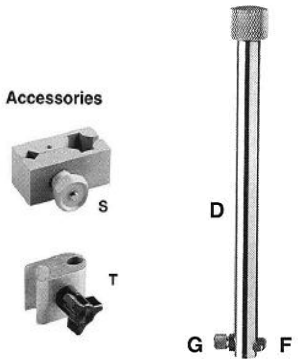
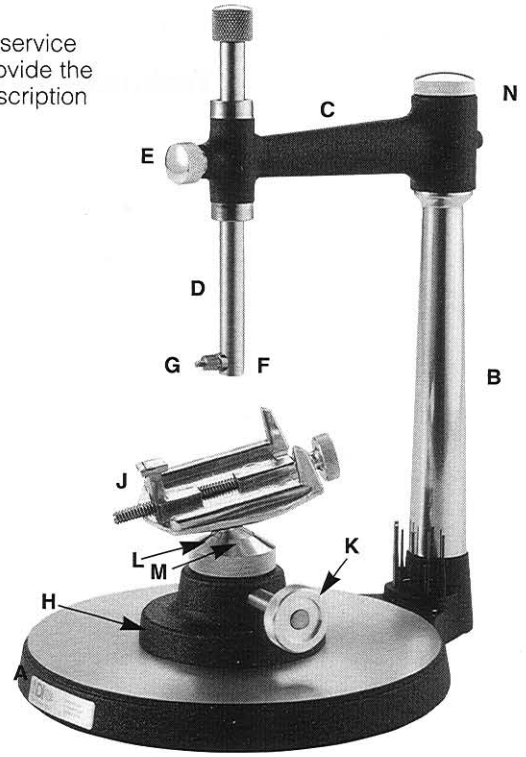
Parts List

To insure prompt and accurate service when ordering parts, please provide the item letter, part number and description of each part.





ITEM	PART NO.	DESCRIPTION
A		Horizontal Survey Base (7" Dia.)*
B		Upright Column*
C		Cross Arm with Spindle Bearing*
D	999-54-21	Vertical Spindle, Lock Nut Style
E	999-54-63	Vertical Spindle Tightening Screw
F	999-54-38	Tool Holder
G	999-54-27	Lock Nut, Tool Holder
H	999-54-08	Survey Table (3" Dia. Complete)
J	999-54-02	Tilt-Top Model Clamp and Adjusting Screw
K	999-54-62	Locking Screw, of Tilt Top Pivot
L	999-54-09	Ball Pivot (Brass)
M	999-54-10	Ball Retaining Ring, Tilt Top
N	999-54-61	Storage Compartment Cap

Accessories

S	999-54-46	Universal Handpiece Holder
T	999-54-47	Ney Handpiece Holder

Ney Tech Surveyor

Parallelometer

For Partial Dentures, Precision and Semi-Precision Restoration Design

The Ney Tech surveyor is an ideal instrument for determining the parallelism of two or more surfaces of teeth or other parts of the cast of a dental arch. It is the professional's choice for designing removable partial dentures, precision and semi-precision fixed restorations.

The Ney Tech surveyor features a horizontal platform, an adjustable spindle for the vertical indicator and a survey table that can be tilted and locked at any angle.

The handpiece holder accessory attachments convert the Ney Tech surveyor into a tool for powered milling operations.

Description of the Ney Tech Surveyor

The original dental surveyor was first introduced to the market in 1923. The present instrument is the result of more than seventy years' continuous experience in this specialized field. The Ney Tech surveyor is designed for lab usage, precision made, durable and is easy to use.

The principal parts of the instrument are as follows: the base (A), an accurately machined horizontal surface on which the survey table moves freely; the vertical upright column (B) carrying a fixed crossarm with spindle bearing (C) at right angles to the base, and spindle tightening screw (E) at the end of the crossarm; the vertical spindle (D) which can be rotated and moved vertically in its bearing, always remaining at right angles to the base; the survey table (H) with its adjustable tilt-top clamp (J) mounted on a ball-and-socket joint (L)

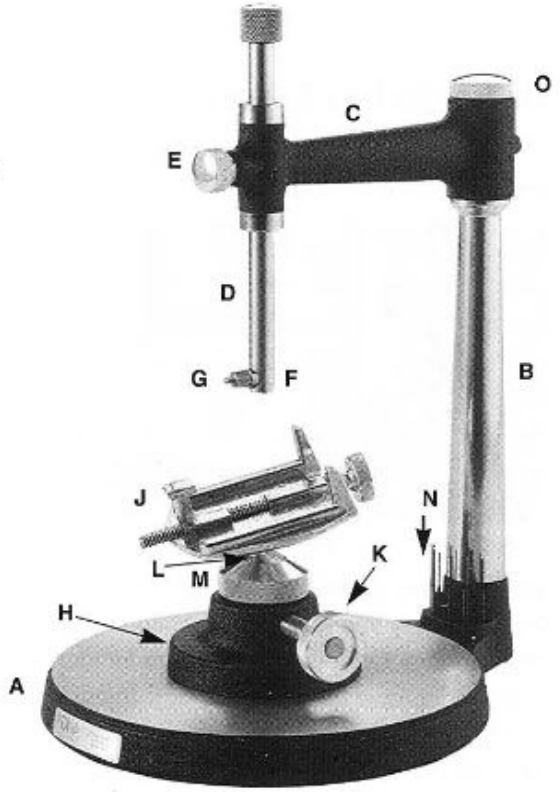
The end of the spindle is designed with a precision V-way and self-adjusting tool holder and locking nut (parts F and G) to hold the analyzing rod, the carbon marker in its reinforcing sheath, the wax trimmer, and the three undercut gauges, all of which are supplied as standard equipment. The tool holder also has adequate capacity to take all standard mandrels.

The analyzing rod is used in the preliminary survey of the cast. It is not a marker and will not draw the survey line on the tooth. This is accomplished by the round carbon marker which is mounted in a metal reinforcing sheath to reduce breakage. The undercut gauges are an important aid in the correct positioning of clasp arm tips in the undercuts on abutment teeth. A primary function of the wax trimmer is to make sure that waxed out undercuts will be trimmed parallel to each other. These small tools have their own storage compartment (O) which is reached by unscrewing the knurled top of the upright column (B). At the foot of the column, a convenient rack (N) has been provided for holding them when the surveyor is being used.

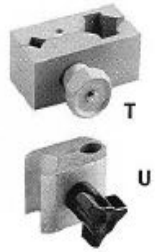
The survey table (H) has a built-in clamp (J) for attaching the cast securely to the tilt-top. The clamp has two fixed lugs and a moveable jaw which moves back and forth on an adjusting screw to grip casts securely at three points. By releasing the locking screw (K), the table top can be tilted to any desired angle and then locked securely in that position by a turn of the screw. A simple device permits resetting the tilt-top to any previously selected position. The ball pivot (L) has two fine lines engraved on it. To reset the top it is only necessary to continue these lines onto the ball retaining ring (M) by marking their continuation with a sharp pencil. When the engraved marks are later realigned with the pencil marks, the tilt-top will be returned to its original position.

Description of Surveyor Parts

The Ney Tech Surveyor comes complete with Surveyor, Round Carbon Markers, Analyzing Rod, Three Undercut Gauges, Wax Trimmer and Carbon Sheath.



Accessories



To Order Surveyor Parts and accessories refer to contents page for list of part numbers and information.

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A	Horizontal Survey Base (7" Dia.)**
B	Upright Column**
C	Cross Arm with Spindle Bearing**
D	Vertical Spindle, Lock Nut Style
E	Vertical Spindle Tightening Screw
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K	Locking Screw, of Tilt Top Pivot
L	Ball Pivot (Brass)
M	Ball Retaining Ring, Tilt Top
N	Built-in Rack for Accessories
O	Storage Compartment Cap
Accessories	
T	Universal Handpiece Holder
U	Ney Handpiece Holder

Using the Ney Surveyor

The Ney Surveyor-Parallelometer has a variety of uses in fixed bridge construction as well as in clasp design and attachment work. These include the planning of fixed bridges and the cutting of precision rests and key lock seats. In Fig. 1 the Ney Handpiece Holder (A) and the Universal Handpiece Holder (B) are accessories for clamping straight dental handpieces to the vertical spindle of the Surveyor. In effect, the handpiece holder applies a machine shop principle to dental laboratory equipment, namely, that a cylindrical object can be held securely in any desired position in a V-block. The Ney Handpiece Holder (A) and the, Universal Handpiece Holder (B) have two recesses parallel to each other, one for the spindle of the Surveyor and the other for the dental handpiece. The handpiece itself is always parallel to the Surveyor spindle, and, all preparations made with it will necessarily be parallel to each other. The survey table on which the model is mounted is ruggedly made to withstand the pressures necessary in milling and drilling without danger of slipping or changing the angle at which the tilt-top has been set.

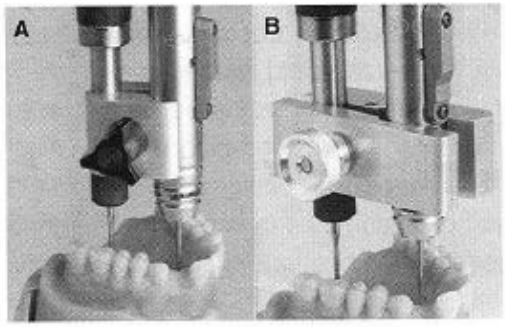


Fig. 1

Below are applications of a Surveyor equipped with a Handpiece Holder:

1. Cutting rests or key locks in one abutment of loose-end fixed bridges parallel to the cavity preparation of the fixed-end abutment.
2. Cutting parallel recesses in the wax pattern for a cast metal abutment to receive the female portion of a Ney attachment.
3. Preparing study models for all fixed bridgework and removable cases. The stone model is mounted on the survey table and tilted to determine the angle which will involve the least possible tooth preparation. Using proper size burs, all cavities are then prepared in the stone teeth with the model locked at the chosen angle so as to provide a common path of insertion. This prepared study model serves as a blueprint for the operator to follow at the chair during the actual work in the mouth and eliminates the possibility of having to change cavity preparations later on due to an unnoticed tilt of one or more of the abutment teeth.

The Surveyed Line


Fig. 2

A surveyed line is a mark drawn by the Carbon of the surveyor on a tooth in such a manner that it outlines the largest dimensions of that tooth in every direction perpendicular to the Spindle of the Surveyor. To obtain this mark the model is mounted on the survey table and, after setting the table to the desired angle, the tooth is brought in contact with the carbon rod and rotated so as to draw the line of contact around the tooth. Without changing the angle at which the Survey Table is set, all of the teeth to be clasped are surveyed and marked in the same manner.

Fig. 2 represents two cones with a common base at the surveyed line on a tooth. The upper cone includes that portion of the tooth above the surveyed line; the lower cone includes that portion of the tooth between the surveyed line and the gingival, the undercut area of the tooth.

In the Surveyor system of partial denture designing, the type of clasp that can be used on each individual tooth is determined by the location of the surveyed line on that tooth.

The Path of Insertion

A round mandrel, secured in the collet (tool holder) of the vertical spindel, is used for analyzing the undercuts of the teeth and tissue to determine the proper path of insertion.

The path of insertion of a removable appliance is the direction in which it seats itself on the teeth. Since the positions of all clasps on the appliance are fixed to each other they must all seat along the same path of insertion. In the Surveyor system of designing partial dentures, each clasp is designed to seat itself in a direction parallel to the Spindle of the Surveyor. Since all of the clasps on the appliance are designed with the model set at the same fixed angle to the Spindle, a common path of insertion is automatically established.

Changing Path of Insertion to Improve Clasping Condition

As stated above, the path of insertion is determined by the angle of the model relative to the vertical Spindle. For this reason, the Table on which the model is mounted for surveying is provided with a ball and socket joint so that the model can be tilted to any directed angle to establish the most favorable path of insertion for each individual case. If the case is surveyed and designed with the occlusal plane at right angles to the spindle, the path of insertion will also be at right angles to the occlusal plane. This is undesirable because it offers little resistance to unseating of the partial by sticky foods. Usually it also results in an undesirable clasping condition. Whenever possible, avoid a path of insertion at right angles to the occlusal plane.

The above difficulties are overcome by using an anterior or posterior tilt (Fig. 3). When an anterior part of the model mounted on the Survey Table is down, it is an anterior tilt. When the posterior part of the model is down, this is a posterior tilt. It is also often possible to obtain better clasping conditions by tilting the model slightly to the right or left to obtain a better balance of undercuts, particularly in bilateral cases. For more on tilting see pages 7, 9, and 11.

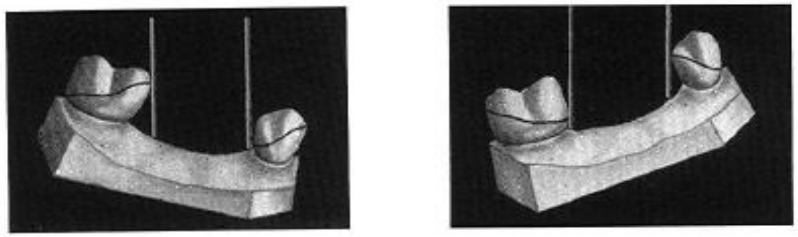


Fig. 3

General Rules For Tilting

A. On an all-tooth-bearing case supplying no anteriors, either a posterior or anterior tilt may be used, the choice being governed by the undercut conditions.

B. On partials with a free-end saddle on one or both sides, supplying posteriors only, a posterior tilt should be used. This provides an undercut on the side of the clasped tooth adjacent to the free-end saddle, and an undercut in this location is necessary to hold the free end of the saddle against the ridge.

C. When all the teeth supplied by a partial are anterior to the clasped teeth, an anterior tilt should be used. This is similar to the free-end saddle condition described in Rule B except that it is in the anterior region. For this reason, it is necessary to use an anterior tilt to provide undercuts on the anterior sides of the clasped teeth in order to hold the saddle against the ridge.

D. Whenever a free-end saddle condition exists either in the posterior or anterior region, the tilt should be toward that region. When free-end saddles exist in both the posterior and anterior regions, the choice of tilt is governed by the undercut conditions.

E. When no free-end saddle condition exists in either the posterior or anterior regions and the partial supplies both posterior and anterior teeth, a posterior tilt should be used. This makes it possible to seat the anteriors without excessive interproximal spaces.

Clasp Analysis

In the construction of a removable partial denture, clasps are utilized for the purposes of providing retention, bracing and support. "Retention" is that action of a clasp which holds the appliance in place or prevents it from becoming unseated. "Bracing" is that action of a clasp which braces the appliance against the sides of the teeth to avoid lateral movement. "Support" is that action of the clasp which supports the appliance on the occlusal surfaces of the teeth to avoid movement tissue-ward under occlusal forces.

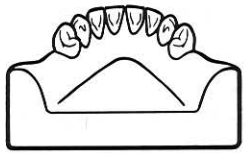
The quality of retention is secured by the *flexibility* of a clasp.

Bracing and support are obtained from the *rigidity* of a clasp. Both flexibility and rigidity are positively provided in a surveyed restoration through the proper selection and location of clasps.

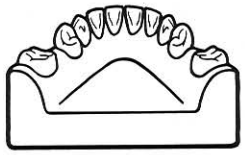
The Ney Tech Surveyor System

There are three basic partial denture conditions that can exist in partially edentulous mouths. They are the

Unilateral



Bilateral Free-End



Bilateral All-Tooth Supported

There are also three variations. One is the unilateral replacement that carries a bar with clasp to the opposite side of the arch.  This type of case is automatically treated as a bilateral all-tooth-supported situation.

A second variation is the bilateral free-end condition where the missing teeth are in the anterior segment of the arch. The same rule applies to the anterior free-end saddle  as to the posterior free-end,  and the clasp treatment is the same. The basic problem in each case is to hold the saddle in contact with the ridge.

The third variation is the bilateral condition that is free-end on one side and all-tooth-supported  on the other. This is automatically taken care of correctly if the recommended design procedure for a free-end  case is followed.

The Unilateral Case

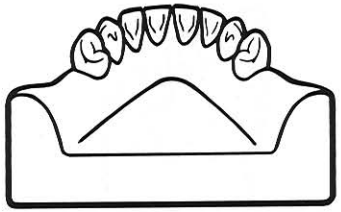
Use only the #1,  the #2,  and the #1-#2  combination on a unilateral  case. These clasps provide double-bracing and double-retention and are the only cast clasps that will give satisfactory results without extending a bar and clasp to the opposite side of the arch for bracing and stability.

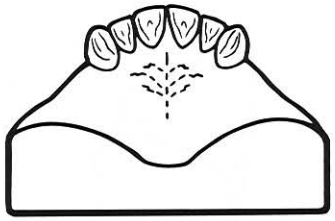
Unilateral models can generally be tilted laterally  as well as anterior-posteriorly so as to re-locate the undercuts for using these double-bracing,   double-retaining clasps. Under proper conditions so developed, small unilateral replacements will give reasonable satisfaction. If, however, suitable clasping conditions cannot be found by tilting, the case will fail as a removable and a fixed bridge or attachment case is indicated.

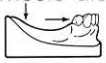
The tilt that results in a good #1 clasp  indication on one abutment very rarely produces that same indication on the abutment at the opposite end of the edentulous space. Normally the undercut conditions will require a #1 clasp for one end and a #2 or #1-#2 combination for the other.

Never use a Back-action  or Ring clasp  on a unilateral replacement  because they brace from one side  only and retain from the opposite side  and will work successfully only on bilateral  cases.

The Free-end Saddle





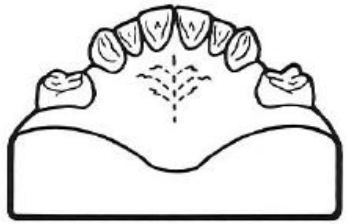
A free-end saddle  should be held securely against the ridge  for proper function and patient comfort. The best mechanical method of doing this is to engage the tooth mesio-distally with retention at the distal  holding the saddle down. 

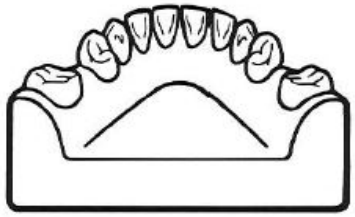
The clasps that offer the most in distal retention are the Back-action  or the reverse Back-action  because they completely embrace the distal retentive area on a tooth. This distal grip is supplemented by the flexible mesial tip  of the Back-action clasp, also in an undercut.

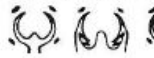
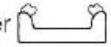
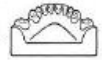
When a Back-action  cannot be used, the next choice is the #2 clasp  because of its ability to use at least a portion of the distal undercut area  for retention. It cannot embrace the entire distal area because part must be relieved to accommodate the occlusal rest  truss arm.

The #1 clasp  is never indicated for free-end  saddle cases since it gets its retention bucco-lingually  instead of mesio-distally. If the rigid portion of a #1 clasp  is placed below the survey line in an attempt to get distal retention, it will not seat unless it is ground away. If forced to place, it would be bent out of shape.

The Bilateral All-Tooth-Supported Case





A bilateral all-tooth-supported case might be regarded as two unilaterals joined together  across the arch with either a lingual or palatal bar. However, a single unilateral  can be tilted laterally  to find undercut conditions that will accept the double-bracing, double-retaining  #1, the #2 and the #1-#2 combination clasps. A similar result can rarely be obtained on a bilateral  case, as teeth normally lean lingually toward each other  on lowers and flare buccally away from each other  on uppers. It becomes necessary, therefore, to use the single-bracing, Back-action  and Ring clasps  on bilateral case abutments that lean toward or away from each other. The bracing and retention for a successful case is obtained *across* the arch, both on uppers  and lowers. 

All cases must be planned and designed as a unit with all of the clasp parts functioning together as a single unit when the partial is inserted or removed from the mouth.

If a bilateral case is all-tooth-supported on one side and free-end on the other,  it is properly treated as a *free-end* problem.

The Bilateral All-Tooth-Supported Case (Cont'd)

If there are two posterior abutments and one or both are lost later on, the case then becomes a free-end problem. Therefore, the ideal method of designing an all-tooth-supported case with posterior abutments is to regard it as if it were already a free-end problem and first determine the proper clasps to use for the anterior abutments. The result will be normally either Back-action or #2 clasps.

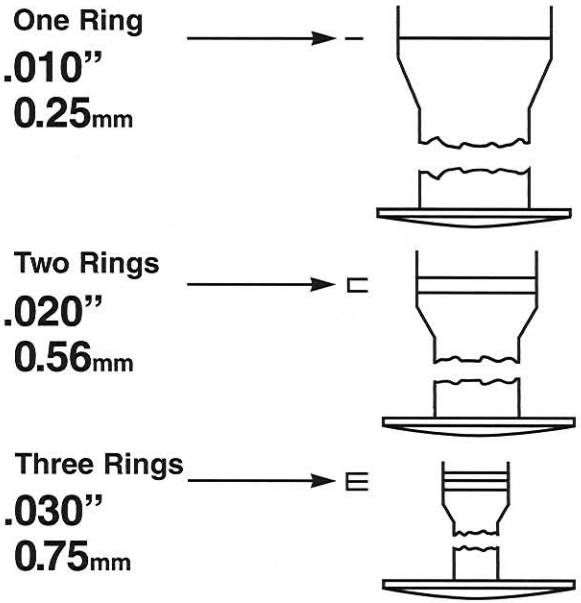
Using the tilt established by the anterior abutments, the posterior abutments are surveyed and the clasps selected.

If the posterior teeth are lowers and lean toward each other, use Ring clasps. If, as on an upper, the posteriors lean away from each other, Ring clasps are also used. If the posterior abutment teeth stand straight enough in the arch so that they individually present adequate undercut areas both buccally and lingually in relation to each other, use either the #1, the #2 or the #1-#2 combination double-bracing, double-retaining clasps, depending upon the mesial undercut conditions. If there is enough non-undercut area to accommodate #1 clasps, they are preferable because of their superior bracing; if not, #2 clasps should be used.

Ney Tech Undercut Gauges

There are three gauges supplied with the Surveyor providing three exact amounts of horizontal undercut – .010" (0.25mm), .020" (0.56mm), and .030" (0.75mm). This measurement is the distance from the shank of the gauge to the rim of the gauge head, as illustrated. Each size is applicable to one or more of the clasps in the Ney Tech system indicating the correct amount of undercut that should be utilized in the design of the clasp of average length and thickness. Longer, thinner clasps can safely be used in greater undercuts, whereas clasps that are shorter and thicker than average will secure the same retention with somewhat less undercut.

Gauge Size can be determined by the quantity of incised rings on gauge shank.



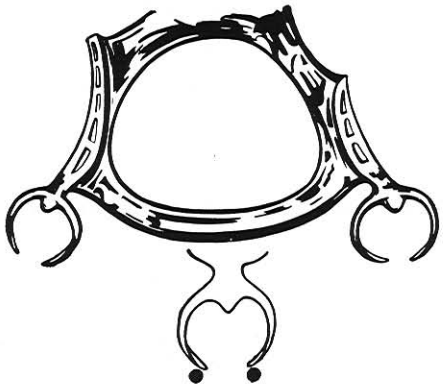
Ney Tech Undercut Gauges measure horizontally.

Consequently, with the general clasp design plan of the case in mind, it is possible to check accurately whether a certain experimental tilt will provide the right amount of undercut in the right location to accommodate the clasp that is being planned for that tooth.

The .010" (0.25mm) gauge is used only with Back-action clasps, and the .030" (0.75mm) exclusively with Ring clasps. The .020" (0.56mm) gauge is used with # 1 clasps, # 2 clasps, the #1- #2 combination, and in certain cases, with Ring clasps and Back-actions.

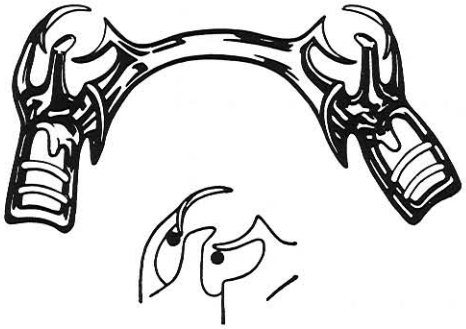
The Ney Tech Clasp and Undercut Gauge Chart

These Clasps Supply Double Bracing and Double Retention



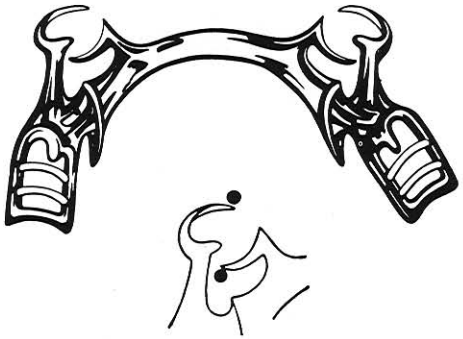
#1 CLASP
• USE .020" (0.5MM) GAUGE

#1 Clasp is used in unilateral cases; and in bilateral cases where abutments stand straight in the arch in relation to each other. #1 Clasp retention is usually on side of tooth away from saddle. Use .020" (0.5mm) Undercut Gauge to measure retention.



#2 CLASP
• USE .020" (0.5MM) GAUGE

#2 Clasp can be used in unilateral cases and also in bilateral cases when abutments stand straight in the arch in relation to each other. #2 Clasp retention is always on side tooth *next* to saddle. Use .020" (0.5mm) Gauge at clasp tips to measure retention.



#1-#2 COMBINATION
• USE .020" (0.5MM) GAUGE

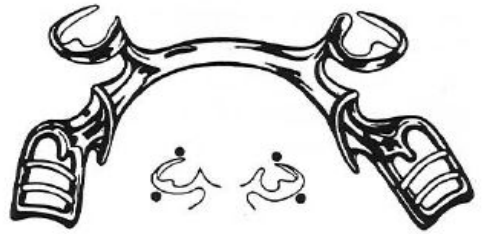
#1-#2 Combination Clasp is for unilaterals and also for bilaterals where titled or rotated abutments present characteristic #1-#2 survey lines. Retention areas are *next* to the saddle on one side of the tooth, and *away* from the saddle on the opposite side. Use .020" (0.5mm) Gauge.

The Ney Tech Clasp and Undercut Gauge Chart

These Clasps Supply Single Bracing Only

BACK-ACTION CLASP
• USE .010" (0.25MM) GAUGE

For bilateral cases only. Retention is normally found at the distal and mesio-buccal, with the .010" (0.25mm) Gauge used at both areas. If there is no undercut at mesio-buccal, retilt the case and use .020" (0.5mm) Undercut Gauge at the distal.

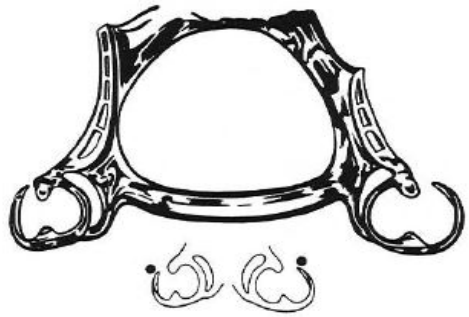


REVERSE BACK-ACTION
• USE .010" (0.25MM) GAUGE

For bilateral cases only when bicuspid abutments have extreme lingual tilt, placing retention area on the distal and lingual. The .010" (0.25mm) Undercut Gauge is used at the distal and mesio-lingual.

UPPER RINGS
• USE .020" (0.5MM) GAUGE

For bilateral cases only. When there are molars on both sides of the arch tilted bucally away from each other, use the .020" (0.5mm) Gauge on each abutment. If one side is free-end, the opposing Ring Clasp uses the .030" (0.75mm) Gauge. Maximum retention is at the mesio-buccal.



LOWER RINGS
• USE .020" (0.5MM) GAUGE

For bilateral cases only. When there are molars on both sides of the arch leaning lingually toward each other, use the .020" (0.5mm) Gauge on each abutment. If one side is free-end and the other is Ring Clasp, use the .030" (0.75mm) Gauge. Maximum retention is at the mesio-lingual.