

A New Era In Equine Dentistry

Operator's Manual & Floating Techniques



**Equine Dental
Instrument**

**Plugin and
Cordless Models**

IMPORTANT

Before use, everyone using PowerFloat® must read and understand the instructions in this manual.

WARNING

When using the PowerFloat® the following safety precautions **MUST** be adhered to by the user.



PowerFloat®
PATENTED

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1.0 SAFETY INSTRUCTIONS

READ AND SAVE ALL INSTRUCTIONS FOR FUTURE USE

PowerFloat[®] was designed for a specific application and is only intended to be used in that application. The PowerFloat[®] is NOT to be modified in any manner other than as is specifically set forth in this Operating Manual. Modification of the PowerFloat[®] in a manner contrary to the operating instructions herein will void the warranty contained in this Operating Manual.

PLEASE READ AND UNDERSTAND THE ENCLOSED INSTRUCTION MANUAL

POLARIZED PLUGS: To reduce the risk of electric shock, the PowerFloat[®] has a polarized plug (one blade is wider than the other). This plug will fit in a standard, polarized, 115-volt electrical outlet only one way. If the plug does not fit fully in the outlet, reverse the plug. If it still does not fit, contact a qualified electrician to install the proper outlet. Do not change the plug in any way. In countries with a 220- volt electrical system, a transformer that converts electricity to 115 volts will be necessary to run the motor.

1. **POWERFLOAT[®] IS TO BE USED BY LICENSED VETERINARIANS OR A LICENSED VETERINARY TECHNICIAN UNDER THE SUPERVISION OF A LICENSED VETERINARIAN.**
2. **KNOW YOUR POWERFLOAT[®].** Read this manual carefully to learn your PowerFloat[®]'s applications and limitations as well as potential hazards associated with this type of tool.
3. **USE A GROUND FAULT CIRCUIT INTERRUPTER (GFCI).** Always plug the PowerFloat[®] directly into a GFCI or use an approved extension cord with a GFCI. GFCI's can be purchased at electrical supply retail stores. Do not under any circumstances use the PowerFloat[®] without the PowerFloat[®] being plugged into a system with a ground fault circuit interrupter. Without a GFCI there is no protection against severe electric shock. Do not place the GFCI between the extension cord and the PowerFloat[®]'s plug. GFCIs only afford protection to electrical cords or electrical equipment from the GFCI's output side. Electrical components must be arranged in the following order:
(1) Electrical outlet - (2) GFCI - (3) Extension cord - (4) PowerFloat[®]
4. **KEEP WORK AREA CLEAN.** Cluttered areas invite injuries.
5. **AVOID DANGEROUS ENVIRONMENT.** Do not expose PowerFloat[®] to rain. Do not use PowerFloat[®] in damp or wet locations. Keep area well lit. Avoid chemical or corrosive environments. Do not use PowerFloat[®] in presence of flammable liquids or gases.
6. **GUARD AGAINST ELECTRIC SHOCK.** Prevent body contact with grounded surfaces.
7. **KEEP BYSTANDERS AWAY.** Children and bystanders should be kept at a safe distance from the work area to avoid distracting the operator and contacting the PowerFloat[®] or extension cord.
8. **STORE IDLE POWERFLOAT[®].** When not in use, PowerFloat[®] should be stored in dry, and high or locked-up place — out of reach of children.
9. **DO NOT FORCE POWERFLOAT[®].** It will do the job better, safer, and last longer at the rate for which it was intended.
10. **USE RIGHT TOOL.** Do not use PowerFloat[®] for purpose not intended — do not use PowerFloat[®] for grinding metal or objects other than teeth.
11. **DRESS PROPERLY.** Do not wear loose clothing or jewelry. Loose clothing, drawstrings and jewelry can be caught in moving parts. Rubber gloves and non-skid footwear is recommended when working outdoors. Wear protective hair covering to contain long hair.
12. **USE SAFETY GLASSES. Wear safety goggles or glasses with side shields** complying with current safety standards. **Wear hearing protection** to safeguard against possible hearing loss. **Also wear a face or dust mask** if operation creates dust. All persons in the area where PowerFloat[®] is being operated should also wear safety glasses and face or dust mask.
13. **DO NOT ABUSE CORD.** Never carry PowerFloat[®] by cord or yank it to disconnect from receptacle. Keep cord from heat, oil, and sharp edges. Have damaged or worn power cord and strain reliever replaced immediately. **DO NOT ATTEMPT TO REPAIR POWER CORD.**
14. **SECURE WORK.** Patient should be properly sedated and restrained. Proper restraints are – for example – dental speculum and dental halter. Use proper restraint and sedation in accordance with standard veterinary practices. PowerFloat[®] operator and bystanders safety must be considered when restraining horse.
15. **DO NOT OVERREACH.** Keep proper footing and balance at all times.
16. **MAINTAIN POWERFLOAT[®].** Keep PowerFloat[®] sharp and clean for better and safer performance. Follow instructions for lubricating and changing accessories. Inspect cords periodically and if damaged, have repaired by authorized service facility. Inspect extension cords periodically and replace if damaged. Have all worn, broken or lost parts replaced immediately. Keep handles dry, clean and free from oil and grease.

17. **DISCONNECT POWERFLOAT[®]** when not in use, before servicing, and when changing accessories such as the grinding wheel.
18. **REMOVE ADJUSTING KEYS AND WRENCHES.** Check to see that any keys and adjusting wrenches are removed from the PowerFloat[®] before turning it on.
19. **AVOID UNINTENTIONAL STARTING.** Do not carry a plugged-in PowerFloat[®] with finger on switch. Be sure switch is off when plugging in to an electrical outlet. Keep hands, body and clothing clear of all cutting edges and moving parts when plugging in the PowerFloat[®].
20. **OUTDOOR USE EXTENSION CORDS.** When PowerFloat[®] is used outdoors, use only extension cords marked as suitable for outdoor use and that are polarized. Always attach outdoor extension cords to a ground fault circuit interrupter (GFCI). Keep in mind that extension cords with small gauge conducting wire can cause considerable voltage drop and result in premature wear to the PowerFloat[®]'s motor. Use only extension cords with appropriate length and gauge. Refer to the Extension Cord Selection chart below.
21. **STAY ALERT.** Watch what you are doing. Use common sense. Do not operate PowerFloat[®] when you are tired or while under the influence of medication, alcohol or drugs.
22. **CHECK DAMAGED PARTS.** Before further use of the PowerFloat[®], a guard or other part that is damaged should be carefully checked to determine that it would operate properly and perform its intended function. Check for alignment of moving parts, binding of moving parts, breakage of parts, mounting, and any other conditions that may affect its operation. A guard or other part that is damaged should be properly repaired or replaced by an authorized service center unless otherwise indicated elsewhere in this instruction manual. Have defective switches replaced by an authorized service center. Do not use PowerFloat[®] if switch does not turn it on and off.

MOTOR

Many motors will operate on either DC, or single phase 25 to 60 cycle AC current and voltage within plus or minus 5 percent of that shown on the specification plate on the PowerFloat[®]. Several models, however, are designed for AC current only. Refer to the specification plate on your PowerFloat[®] for proper voltage and current rating.

CAUTION: Do not operate your PowerFloat[®] on a current on which the voltage is not within correct limits. Do not operate a PowerFloat[®] rated AC only on DC current. To do so may seriously damage the PowerFloat[®].

EXTENSION CORD SELECTION

If an extension cord is used, make sure the conductor size is large enough to prevent excessive voltage drop, which will cause loss of power and possible motor damage. A table of recommended extension cord sizes would be found below. This table is based on limiting line voltage drop to 5 volts (10 volts for 230 volts) at 150% of rated amperes.

Length of Cord in Feet (g = gauge of wire in cord)										
Nameplate Amperage Rating of Motor	115V	25 Ft.	50 Ft.	100 Ft.	150 Ft.	200 Ft.	250 Ft.	300 Ft.	400 Ft.	500 Ft.
	230V	50 Ft.	100 Ft.	200 Ft.	300 Ft.	400 Ft.	500 Ft.	600 Ft.	800 Ft.	1000 Ft.
	5-6 amps	18 g	16 g	14 g	12 g	10 g	10 g	8 g	8 g	8 g
	6-8 amps	18 g	16 g	12 g	10 g	10 g	8 g	6 g	6 g	4 g

If an extension cord is to be used outdoors it must be marked with the suffix W-A following the cord type designation. For example SJTW-A to indicate it is acceptable for outdoor use.

2.0 OPERATING INSTRUCTIONS

FOREWORD

Congratulations on your purchase your PowerFloat®. The PowerFloat® is designed to float upper maxillary and lower mandibular equine teeth with its rotating grinding head. Before using PowerFloat® please ensure that you read and follow this Operating Manual carefully.

2.1 TO START AND STOP POWERFLOAT®

CAUTION: MAKE SURE SWITCH IS OFF BEFORE CONNECTING THE POWERFLOAT® PLUG-IN MODEL TO A POWER CIRCUIT

1. Make certain power circuit voltage is the same as that shown on the specification plate of PowerFloat®. Connect the PowerFloat® plug-in model to power circuit which has a ground fault circuit interrupter.
2. PowerFloat® cordless models require DeWalt rechargeable 20 V lithium ion batteries. Fully charged, these batteries attach quickly at the handle's base for unencumbered operation. The larger batteries that come with the 20 V cordless models contain enough power to float approximately 5-6 horses and the smaller batteries that come with the UltraLite model contain enough power for 4-5 horses per battery. Batteries take approximately 1 hour to recharge with the included charger.
3. Squeeze trigger switch (*Fig. 1*) (A) to start motor, as the trigger switch is squeezed, the driver speed increases. To stop motor, release trigger switch.
4. LOCK SLIDE – A lock slide (*Fig. 1*) (B).
5. Continuous operation of the PowerFloat® at maximum RPM's can cause overheating and damage to the right angle gear system. The 20 V cordless models and the plug-in PowerFloat® models can be operated from 0 to 4000 rpm. The UltraLite cordless PowerFloat® model can be operated from 0 to 2850 rpm. For optimal performance, maintain the grinding wheel's speed to approximately 2850-3000 rpm.

2.2 RPM LOCK

Squeeze trigger (*Fig. 1*) (A) to obtain maximum rpm and then slide lock (B) into place for the plug-in and TL drill models. Release trigger while slide lock (B) is in place and motor will continue running. To release the slide lock and stop the motor, squeeze and release the trigger. The slide lock will automatically disengage and the motor will stop.



Fig. 1

2.3 QUICK CONNECT SYSTEM

Fig. 2 The quick connect system allows several floating attachments (B) to become connected to the 20 V motor or the Electric DeWalt Motor by pushing them into the collar (A) (red). Each of the 4 attachments connects to the motor in the same fashion.

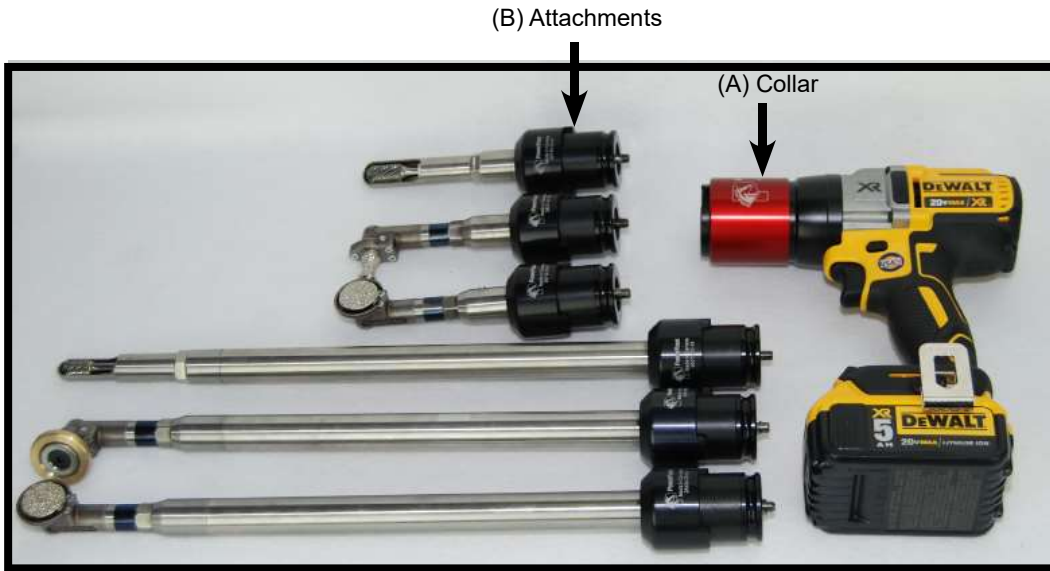


Fig. 2

WARNING:

DO NOT ENGAGE THE MOTOR OF THE DEWALT DRIVER BY DEPRESSING THE TRIGGER BUTTON WHILE CONNECTING OR DISCONNECTING ANY OF THE ATTACHMENTS INTO THE QUICK CONNECT SYSTEM.

Fig. 3 The collar (A) (red) is spring loaded and when the attachment (B) is inserted into the collar system it will automatically self lock. The attachment (B) with projection (C) can be positioned in the up or down position. There is no need to hold or manipulate the collar (A) during the insertion phase of the attachment.

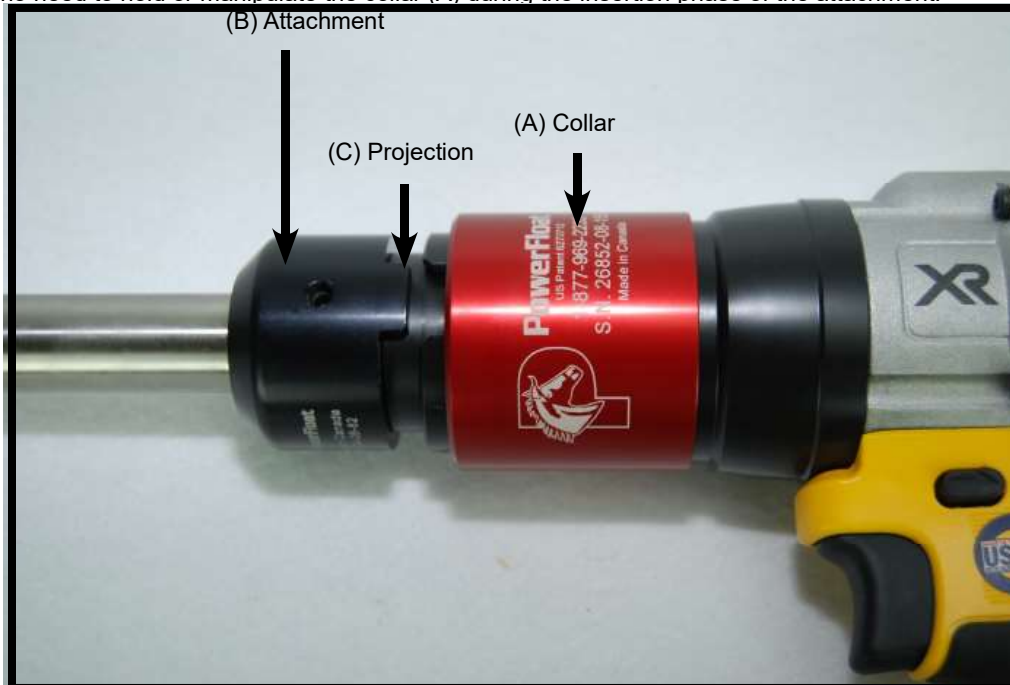


Fig. 3

Fig 4 To insert attachment (B) into the collar (A) push the attachment with slight force into the collar so that the projection (C) is positioned to slide into the slot situated at the front of the collar. This will place the attachment in the up or down position as desired. Push the attachment (B) in the same direction as the arrow into the collar until the collar “clicks” into position to firmly hold the attachment in place inside the collar. The collar has a spring loaded system that will allow the collar (A) to snap into position.



Fig. 4

2.4 REMOVAL OF ATTACHMENT FROM THE COLLAR

To remove the attachment from the collar pull the collar (A) (red) in the direction of the black arrow (*Fig. 4*) as shown and the attachment (B) will be released from the collar. The attachment can then be rotated to the opposite position (up or down) or replaced with another attachment.

3.0 PERSONAL PROTECTIVE EQUIPMENT

Some basic equipment must be purchased before using the PowerFloat®. This instrument is to be sold for use by licensed veterinarians only. It is important that veterinarians take the necessary safety precautions while using the PowerFloat® to protect themselves, their patients and their clients from injury.

1. Eyes: Safety glasses and an anti-fog preparation for eye protection. The anti-fog will prevent the glasses from fogging which occurs with forehead sweating.
2. Ears: Ear plugs or ear phones to protect your hearing.
3. Breathing: Face mask to prevent respiratory injury from tooth dust.
4. Electricity: Replace any old electrical outlets with new ones that accept polarized plugs (one side of the plug end is larger). Obtain a portable ground fault circuit interrupter (GFCI). The GFCI does not sense ground fault changes (5 milliampere current changes) in the input conductors. Therefore, it is recommended that if any extension cords are used, they should be connected between the GFCI's output and the PowerFloat®. The electrical power sequence is wall outlet, then GFCI, then extension cord, then PowerFloat®.
5. Hair Bands: The motor fan of the PowerFloat® is often held close to the side of the veterinarian's head and can suck head hair or loose clothing into the motor fan and cause bodily injury. Adequate measures must be taken to prevent loose hair or objects from entering the side of the motor.
6. Hands: Examination gloves should be worn to protect from potentially harmful bacteria in the horse's mouth.
7. Cleaning Safety: Unplug the PowerFloat® from its electrical supply when cleaning, washing or adjusting the unit.
8. Work Area: Keep the work area clean and dry to protect from electrical injury. Supply any personnel in the immediate working area with safety glasses to prevent eye injury from airborne tooth particles or metal fragments that can originate from the instrument.

4.0 PATIENT PREPARATION

The patient is adequately sedated with the veterinarian's preferred restraint protocol. With visual floating technique the horse should be sedated deeply enough to maintain its head not just resting but loaded on the chin support of the dental halter. It will be difficult for the veterinarian to do precise floating if the head does not stay sufficiently loaded on the chin support. The horse's mouth is irrigated with water and the halter is removed just before placement of the full mouth speculum. The regular halter is removed to prevent external side pressure against the cheeks so that there is more room to work inside the horse's mouth on the buccal side of the cheek teeth.. The speculum is opened to about a 3 3/8" spread between the incisor plates on most speculums. Next, the dental halter is placed on the horse over the speculum and the head of the horse is elevated using the rope and cleat system attached to the nose band of the dental halter. The head is usually elevated enough so that the veterinarian can comfortably see into the mouth and complete the procedure. Height adjustments are made periodically while the upper and lower arcades are floated. The combinations of drugs that are commonly used are:

1. acepromazine, xylazine, and butorphanol
2. detomidine and xylazine
3. detomidine and butorphanol
4. detomidine, xylazine and butorphanol

5.0 MAINTENANCE INSTRUCTIONS

TO ENSURE OPTIMAL PERFORMANCE AND MAINTAIN THE LIFE OF YOUR POWERFLOAT IT IS IMPERATIVE THAT THE UNIT BE LUBRICATED AT THE END OF EACH DAY IT IS USED

- Only non-toxic USDA approved synthetic anti corrosive lubricant should be used.
- During use the PowerFloat should be lubricated after every 4 – 5 horses
- Lubricate both grease ports, and clean and dry the entire unit **AFTER EACH USE BEFORE PLACING IN CASE.**
- Always ensure the grease ports are clean and in working order. Remove any dirt or tooth debris using a fine needle or nylon brush. If you encounter any problems with the grease ports they should be replaced immediately.
- (see LUBRICATION INSTRUCTIONS for detailed instructions)

5.1 CLEANING OF THE QUICK CONNECT COLLAR:

- Apply a generous amount of aerosol brake cleaner to the collar of the Quick Connect. Slide the collar up and down so the brake cleaner completely covers the inside of the collar.
- When the dirt, hair and tooth debris has been loosened use a soft cloth to wipe any remaining dirt and brake cleaner off of the collar.
- Once the initial cleaning has been completed use clipper lubricant to remove any remnants of brake cleaner then apply Jig-A-Loo (or another silicone-based, water-repellent, lubricant) generously to the collar area. This will ensure your Quick Connect collar will slide easily. Jig-A-Loo also contains water-repellent properties, which will provide excellent rust protection for your PowerFloat.

5.2 TO REPLACE GRINDING WHEEL

CAUTION: DISCONNECT FROM POWER CIRCUIT

1. Rotate black/blue metal ring (Fig. 5) (C) to expose the opening in the shaft (A).
2. Insert shaft lock pin, finishing nail or Allen key (Fig. 5) (B), into hole (A) to lock the shaft.
3. Using the grinding wheel removal tool or small sized vise-grip pliers, grip the edges of the grinding wheel (Fig. 6) and rotate counter-clockwise to loosen grinding wheel.
4. Unscrew and remove used grinding wheel.
5. Put the new grinding wheel and washer into place.
6. Using fingers, thread the new grinding wheel into place clockwise until finger-tight.
7. Remove shaft lock pin and replace metal cover (Fig. 5) (C).

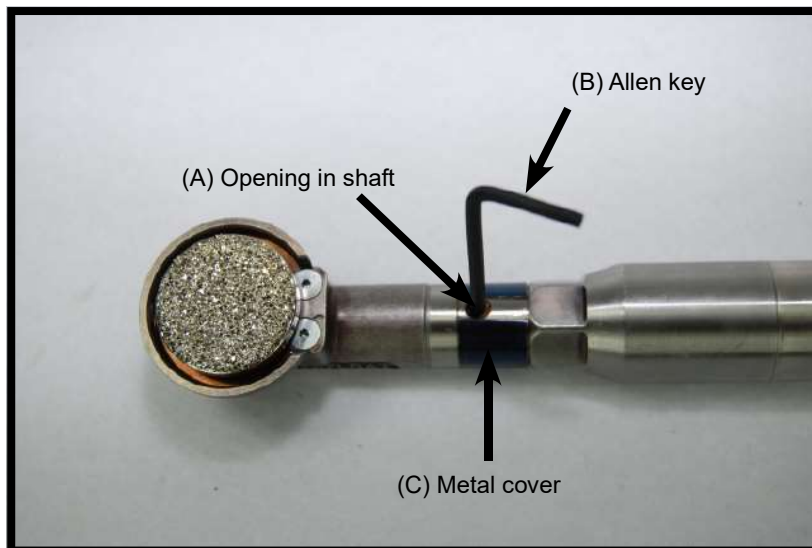


Fig. 5



Grinding wheel removal tool



Small vise-grip pliers

Fig. 6

NOTE: While floating tall teeth, they should always be cooled with syringed water spray at least every 20 seconds, or more often if required, to prevent tooth deterioration from heat build-up due to grinding. Ideally, the PowerFloat® Water Mist System can be utilized to eliminate the heat production from the grinding surface.

5.3 GRINDING CHEEK TEETH

1. Rotate grinding head to downward (*Fig. 7*) or upward (*Fig. 8*) position.
2. Position the PowerFloat® in the patient's mouth.
3. Start PowerFloat®. CAUTION: DO NOT EXERT PRESSURE ON TOOTH WHILE DOING THIS.
4. Begin grinding.
5. Prolonged grinding at high rpm (revolutions per minute) may cause excessive heat buildup underneath the grinding wheel in the right angle housing of the PowerFloat®. Excessive heat in this area could cause thermal injury (burns) to the cheek and tongue during contact. The operator must monitor the right angle housing temperature to prevent buccal mucosa or lingual thermal injury. If excessive heat is detected, the operator **MUST** cool the housing. **First unplug the PowerFloat® from its electrical outlet.** Then cool the unit by :
 - Apply a cool damp towel to the housing metal until it is cool again
 - Spray cold water on the housing with syringe until it is cool again while holding the housing in the (inverted) upside down position so that the water will run off during application. (Housing on top and grinding wheel underneath)

After the housing has been cooled and dried off with a towel, plug the PowerFloat® back into the electrical outlet and resume grinding teeth.



Fig. 7



Fig. 8

5.4 GRINDING INCISORS

1. Rotate grinding head to downward (*Fig. 9*), or upward (*Fig. 10*) position.
2. Start PowerFloat[®] and lock trigger at appropriate speed with trigger vise (see page 5) or engage the trigger lock on the TL model.
3. Position PowerFloat[®] on shoulder (*Fig. 11*).
4. Position the PowerFloat[®] near the patient's incisors.
5. Begin grinding incisors.



Fig. 9



Fig. 10



Fig. 11

5.5 UTILIZING DIASTEMA BURRS

To install a diastema burr, remove the grinding wheel from the PowerFloat[®]. Thread in the smallest needed burr (to begin to open the diastema) until the burr is finger tight (*Fig. 12*). Throughout the diastema procedure, sequentially remove and install wider burrs as it becomes necessary to further widen the diastema.



Fig. 12

CAUTION: To prevent thermal injury to the teeth, do not burr longer than 10 seconds at a time without water-cooling the site.

CAUTION: Do not widen a diastema excessively. In some horses the pulp chamber or its horns may be located in close proximity to the interdental edge of the teeth. Do not invade pulp chambers or pulp horns

during the widening procedure.

6.0 MAINTENANCE

Keep motor clean and dry. Clean and towel dry hands during dental procedures to keep motor housing clean. Periodically blow out all air passages with dry, compressed air. All plastic parts should be cleaned with soft damp cloth. DO NOT use solvents, soaps or other chemicals to clean plastic parts of the PowerFloat[®] as they may damage such parts. The PowerFloat[®] can be kept dry during storage by towel drying and wrapping it in a towel during storage.

CAUTION: Wear safety glasses while performing this operation.

Keep grinding head clean. Dry brushing of the grinding wheel can be accomplished by placing a wet nylon brush on the wheel and spinning the wheel at 500 - 1000 rpms. After cleaning the grinding head and right angle, remove excess tooth material from the area with a dry towel.

CAUTION: Wear safety glasses while performing this operation.

DO NOT IMMERGE THE RIGHT ANGLE GRINDING HEAD IN WATER

Unplug the PowerFloat[®] from its electrical outlet before cleaning with a wet brush or applying a disinfecting solution. Always wear safety glasses while performing any cleaning operation. The grinding wheel, the space between the grinding wheel and guard, the right angle housing, and the shaft can be cleaned with a nylon brush which has been immersed in water. Excess tooth debris, which accumulates in the guard surrounding the wheel may be removed with a small nail or by continuous wet brushing of the area. The grinding wheel, guard, and right angle can be spray cleaned with WD-40™. Water may also be sprayed on the right angle while it is held in an inverted position.

After cleaning is finished, the right angle area and shaft can be disinfected with a chlorhexidene solution. After spray disinfection, use a clean towel to dry the PowerFloat[®]. After drying, plug the PowerFloat[®] back into the electrical outlet and continue floating procedures.

6.1 FAILURE TO START

Should your PowerFloat[®] fail to start, check to make sure the prongs on the cord plug are making good contact in the outlet. Also, check for blown fuses or open circuit breakers in the line.

6.2 IN-LINE CLUTCH DETERIORATION

If the grinding wheel begins to stall when little pressure is applied the clutch will need to be replaced. This is a non-maintainable part. Have unit serviced by PowerFloat[®].

6.3 GRINDING HEAD LUBRICATION

With prolonged use the threads on the shaft of the grinding wheel can become stuck in position, making it difficult to unscrew the grinding wheel for replacement. To prevent this occurrence, change and clean the underside of the grinding wheel monthly. Before replacing the grinding wheel, apply a small amount of grease to its threads to protect the shaft from corrosion.

6.4 LUBRICATION

6.4.1 Keep Grinding Head Lubricated

ONLY NON-TOXIC (FOOD GRADE) SYNTHETIC GREASE SHOULD BE USED. Ideally utilize a high performance food grade grease with anti-corrosion and water resistance properties. The PowerFloat[®] has two grease fill ports, one located on the end of the grinding head (Fig. 13) (A), and the other located further along the shaft and situated beside the collar (Fig. 14) (D). Synthetic grease is required for smooth operation. Grease should be applied after every 2 hours of operation. To grease, rotate the shaft locking cover (Fig. 14) (C), until the shaft hole is uncovered (Fig. 13) (B). The grease gun performs similar to a plunger. Insert the tip into the grease port and push down on the grease gun to force grease into the grease port (Fig. 15). Apply grease until a small amount of new grease (clean) is seen coming out of the shaft locking hole (Fig. 15) (E). Two to four full pumps of grease into Grease Port (A) (Fig. 13) should be sufficient. The rule is to pump grease into Grease Port (A) (Fig. 13) until clean grease circulates through and exits from the shaft opening (B) (Fig. 13). Grease Port (D) (Fig. 14) only requires two pumps from the grease plunger.

CAUTION: Do not apply grease into grease port unless the port opening is clean enough to see the silver check valve ball.

Before applying the grease to the grease port, clean any debris from the opening. Do not insert a larger and stronger object into the opening. Beneath the opening lies a small spring-loaded ball. Excessive pressure with any instrument may damage the mechanism. After physical removal of tooth debris from the port area, more cleaning may be done with the wire brush and spraying with WD-40™. Always lubricate grinding head before storing after procedures are completed.

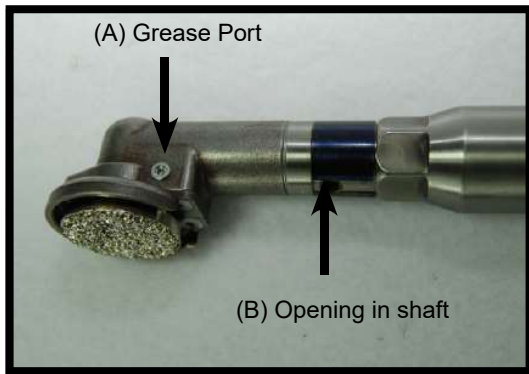


Fig. 13

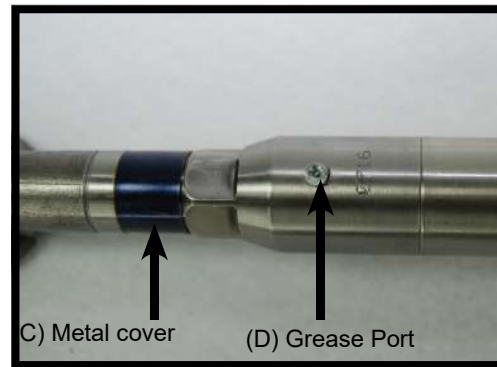


Fig. 14



Fig. 15

6.4.2 Lubrication Procedure

Both grease ports (A) (Fig. 13) and (D) (Fig. 14) should be greased after every 5 dental procedures, or before storing the PowerFloat®. Clean grease in the shaft protects the gear mechanism during storage and operation.

1. Clean the grease ports (A) and (D) with a soft nylon brush to remove all debris in the ports. When properly cleaned, you will observe a silver colored ball (check valve) in the depression of the grease ports.
2. Rotate the black steel shaft cover to expose the shaft opening (B) (Fig. 13).
3. Place the tip of the grease plunger onto grease port (A) and slowly push down on the grease gun to depress the plunger and pump grease into the port. Continue pumping until fresh grease begins to exit from the shaft opening (B). The grease port contains a silver colored spring-loaded ball (check valve) which is designed to accept grease slowly. If the grease inside the grease gun is warm, the grease will flow more easily. Repeat this procedure with grease port (D).
4. Rotate the black steel shaft ring to cover the shaft opening (B).
5. Grease procedure is completed. Plug the PowerFloat® into an electrical outlet and resume floating procedure.

CAUTION: Lubricate and clean before storage. Always lubricate the right angle gears before storing the PowerFloat® in a carrying case. Lubricate the grease ports, and clean and dry the entire instrument before replacing it in its case. Keep a dry towel in the carrying case to absorb residual moisture or store the PowerFloat® contents with the case open so that no extra moisture remains in the closed case.

6.4.3 Grease Gun Replacement

To fill the grease gun with grease:

1. Obtain a grease cartridge and insert it into a lever pump grease gun.
2. Remove cap (A) (Fig. 16) from the PowerFloat[®] grease gun.
3. Remove plastic piston (B) (Fig. 17) from inside the grease gun by pulling on the chain attached to the plastic piston.
4. Pump grease into the grease gun chamber until it is 85% full (Fig. 18).
5. Replace the plastic piston (B) (Fig. 17) and push inward to expel trapped air between piston and grease.
6. Replace cap (A) (Fig. 16).
7. Grease gun is now filled and ready for use.



Fig. 16



Fig. 17

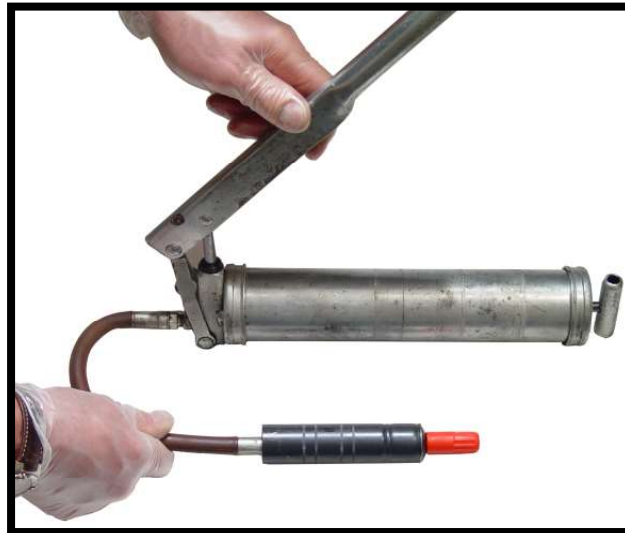


Fig. 18

6.5 REPLACEMENT PARTS

When servicing, use only replacement parts from PowerFloat Inc. or an approved supplier.

6.6 BRUSH INSPECTION AND LUBRICATION

For your continued safety and electrical protection, brush inspection and replacement on PowerFloat[®] should ONLY be performed by PowerFloat Inc. On an as needed basis take or send your PowerFloat[®] to our PowerFloat Inc. repair facility to be thoroughly cleaned and inspected; worn parts replaced, when necessary; re-lubricated with fresh lubricant, if required; reassembled with new brushes; and performance tested. Any loss of power before the above maintenance check may indicate the need for immediate servicing of your PowerFloat[®]. DO NOT CONTINUE TO OPERATE POWERFLOAT[®] UNDER THIS CONDITION. If proper operating voltage is present, return your PowerFloat[®] unit to PowerFloat Inc. for immediate service.

6.7 SERVICE AND REPAIRS

PowerFloat[®] will eventually require servicing or replacement of parts due to wear from normal use. These operations, including brush inspection and replacement, should ONLY be performed by PowerFloat Inc. We cannot guarantee repairs made or attempted by anyone other than a qualified PowerFloat repair facility.

7.0 GENERAL TROUBLESHOOTING

7.1 GRINDING WHEEL IS NOT TURNING

Most likely, the mesh of the gears under the grinding wheel have jammed. The clutch prevents the shaft from turning the gears when you start the unit. Simply apply pliers to the top of the grinding wheel and forcibly turn the wheel clockwise or counter clockwise to un-jam the gears. Then press the trigger on the motor to begin operation.

7.2 SEIZED COLLAR ROTATIONAL SYSTEM

If the instrument head cannot be rotated to an up or down position, Over time, tooth debris can become cemented in the gap created when the shaft is extended (pull out position) to rotate the shaft. This gap should be oiled bi-monthly to prevent build-up of debris. To loosen, spray inside of the gap with WD-40, then lubricate with 3 in 1 oil. Forcibly loosen and resume using in both upper and lower position.

7.3 ANGLE HEAD HEATS UP EXCESSIVELY

The right angle housing contains gears and bearings that generate heat at high RPM's. Continuous use of the PowerFloat[®] at maximum RPM's is not recommended. To prevent overheating and injury to the horses soft tissue, the operator can periodically cool the housing by unplugging the electrical cord and inverting the grinding head and pouring cold water on it with an injection syringe or a dose syringe. Resume use after cooling. Cool only by pouring or dripping water on inverted right angle. A wet towel application to the right angle may also be used.

DO NOT IMMERSE RIGHT ANGLE INTO WATER. ALWAYS UNPLUG POWERFLOAT[®] BEFORE COOLING THE RIGHT ANGLE HOUSING

7.4 UNABLE TO GREASE ANGLE HEAD

Inability to grease probably means the grease fitting ball (grease port) has seized. Contact PowerFloat Inc. to obtain a new fitting (grease port) with instructions for replacement.

DO NOT ATTEMPT TO DISLodge GREASE NIPPLE

7.5 UNABLE TO REMOVE GRINDING WHEEL

If left over an extended period of time, the threads on the grinding wheel shaft that thread into the right angle may become cemented with tooth debris, thus making removal difficult. Obtain graphite (Liquid Wrench) from local hardware store and lubricate under the wheel sufficiently so it will penetrate the threads. Let sit for 10 minutes and then re-attempt to loosen wheel by turning in a counter clockwise direction using a pair of vise-grip pliers. Repeat procedure until successful. Apply grease to the threads on the new grinding wheel before replacement.

7.6 MOTOR LOSING POWER

Take the unit intact to an authorized drill motor repair shop for evaluation of the motor brushes. OR/ Return the unit intact to PowerFloat Inc. for repair. Any repairs performed by anyone other than PowerFloat Inc. will not be warrantied.

7.7 GRINDING WHEEL LOOSENS AND UNWINDS DURING OPERATION

If this occurs, the forward/reverse button on the DeWalt cordless has disengaged and is in the reverse position. The button on the right hand side of the gun should be pushed in flush to the housing and secured for normal operation. (The reverse switch on the plug-in model has been permanently removed)

The grinding wheel of the PowerFloat[®] is driven by a gear and spline system made of a metal alloy. The gears should be protected with adequate lubrication. Water and saliva can have a negative effect when it gains entry into the gear mechanism. Lubricate the PowerFloat[®] often to protect your instrument.

8.0 FLOATING TECHNIQUES

8.1 HANDGRIPS

Handgrip refers to the various positions used to hold the chrome shaft and to operate the motor of the PowerFloat® during procedures. The veterinarian needs to learn the different grips and be able to associate them with the proper floating technique. Grips are not hand-specific. They can be executed with either the left or the right hand.

8.1.1 Multi-Technique Handgrips

Overhand Grip

To execute an Overhand Grip, wrap the chrome section of the shaft inside the thumb and fingers of the hand, with the knuckles facing upwards (*Fig. 19*). If the knuckles shift out of position, it may cause the wrist to block the veterinarian's line-of-sight into the horse's mouth. (*This handgrip is used in Lower Arcade Technique, all Contouring Techniques and Incisor Bite Alignment Technique*)

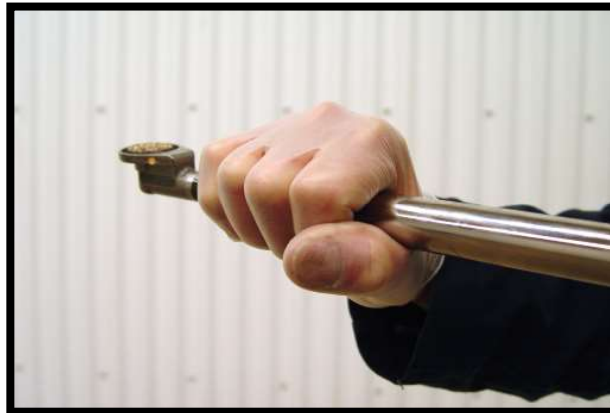


Fig. 19

8.1.2 Arcade Technique Handgrips

Pool-Cue Grip

To execute a Pool-Cue Grip, use the last three fingers of the hand to grasp the speculum where the side arms attach to the incisor plates (*Fig. 20*). Then spread the thumb and forefinger to form a cradle for the PowerFloat®'s shaft to slide and pivot on. Keep the wrist positioned down below the veterinarian's line-of-sight. Insert the grinding wheel and shaft through the cradle formed by the thumb and forefinger then rest the chrome shaft on top of the cradle (*Fig. 21*). This handgrip will resemble standard pool-cue grips used in billiards and pool.



Fig. 20



Fig. 21

Modified Pool-Cue Grip

A Modified Pool-Cue Grip is a version of the Pool-Cue Grip that has been adapted specifically for contouring front teeth. To execute a Modified Pool-Cue Grip, spread the thumb, index and middle fingers to form a cradle in the shape of a “W” (*Fig. 22*). Place the chrome shaft of the PowerFloat® inside the cradle so that the thumb and the last three fingers are positioned underneath the shaft and the index finger is wrapped overtop (*Fig. 23*). To support the shaft, use mainly the thumb and the forefinger. The middle finger is then free to reach inside the inter-dental space and abduct the corner of the horse’s cheek for improved exposure of the tooth.



Fig. 22



Fig. 23

8.1.3 Contouring Technique Handgrips

Thumb and Forefinger Grip

To execute a Thumb and Forefinger Grip, first hold the shaft near the grinding wheel in a comfortable hand position. Insert the grinding wheel into the horse’s mouth. Once the grinding wheel has been positioned inside the mouth, release the hand from the shaft and then introduce the thumb and first finger at the buccal side of the inter-dental space. Grip the right-angle portion of the grinding head between the thumb and forefinger for support and for precise manipulation of the grinding surface (*Fig. 24*). The last three fingers of the hand remain outside the inter-dental space to provide an unobstructed view of the mouth (*Fig. 25*). In addition, the dorsal area of the first finger and first knuckle can be used to abduct the corner of the mouth for further exposure of the tooth. The thumb can extend past the edge of the stainless steel guard to push down on the mucosal fold situated in front of the first lower cheek tooth.



Fig. 24



Fig. 25

8.1.4 Incisor Bite Alignment Technique Handgrips

Side-Arm C-Clamp Grip

To execute a Sidearm C-Clamp Grip, hold one hand in the shape of a “C” with the thumb at the bottom and the fingers forming the top (*Fig. 26*). Place the grinding wheel inside the “C” so that the shaft moves through the middle of the shape and becomes surrounded by the hand. In this position, the hand will act much like a C-Clamp. One end will be used to apply pressure to the right-angle portion, and the other end will stabilize against the horse’s jaw. When floating the upper incisors, use the thumb to apply pressure to the right-angle portion and the fingers to stabilize the grip (*Fig. 27*). When floating the lower incisors, use the fingers to apply pressure to the right-angle portion and the thumb to stabilize the grip (*Fig. 28*).

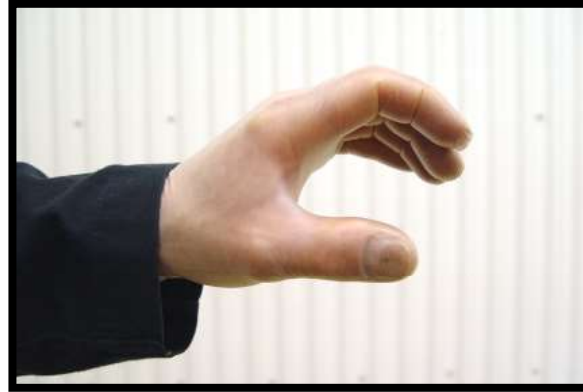


Fig. 26



Fig. 27



Fig. 28

The PowerFloat®'s motor can be operated in two ways: Hands-Free or Variable Speed. Both methods offer unique advantages under certain circumstances. For Variable Speed control, remove the QuickGrip clamp and then grip the PowerFloat®'s motor while using the fingers to operate the trigger (*Fig. 29*). For Hands-Free operation, apply a QuickGrip clamp to the trigger or utilize the trigger lock on the TL model and then grasp the shaft with an underhand grip (*Fig. 30*).



Fig. 29



Fig. 30

8.2 ARCADE TECHNIQUES

8.2.1 Upper Arcade Technique

Rotate the chrome shaft into the UP position with the right angle portion below the wheel guard.

8.2.1.1 RIGHT UPPER ARCADE TECHNIQUE TRIADAN SYSTEM TOOTH 106 to 111 (This technique is a mirror image of Left Upper Arcade Technique)

Right Upper Arcade Technique incorporates the Right Pool-Cue Grip.

Take position in front of and diagonally on the horse's left side. Visualization of the right arcade will occur from across the horse's mouth. Execute a Right Pool-Cue Grip while inserting the PowerFloat® into the left side of the horse's mouth, then move the grinding surface diagonally over the tongue and across the mouth to reach the right upper arcade (Fig. 31). Tilt the right-angle portion of the shaft (located under the grinding wheel guard) toward the horse's cheek in order to displace the cheek away from the teeth (Fig. 32). This position enables the grinding surface to float the sharp points on the buccal aspect of the upper arcade. Rotate the grinding wheel in the middle of the arcade for a few seconds to allow the horse to get accustomed and then move the grinding surface to the back of the mouth and begin by floating the rear teeth first.

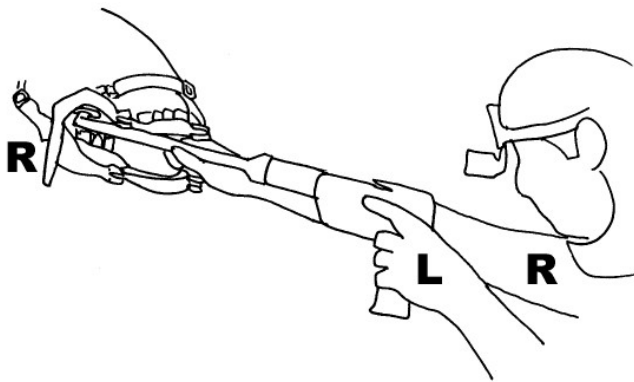


Fig. 31

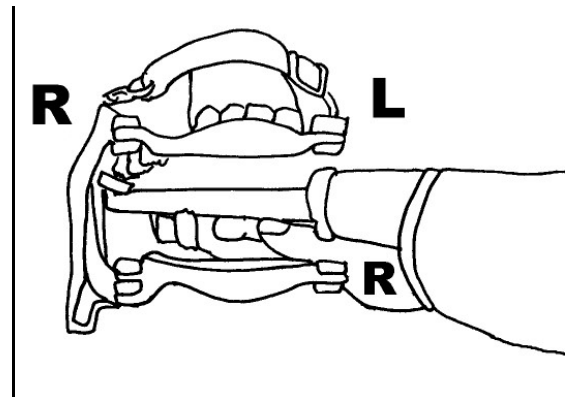


Fig. 32

The sharp point on the caudal aspect of the third upper molar can be removed by pushing the grinding wheel as far back as possible and slightly rotating the grinding surface on the back of the tooth. The guard will protect the soft tissue caudal to the last tooth.

8.2.1.2 LEFT UPPER ARCADE TECHNIQUE TRIADAN SYSTEM TOOTH 206 to 211 (This technique is a mirror image of Right Upper Arcade Technique)

Left Upper Arcade Technique incorporates the Left Pool-Cue Grip.

Take position in front of and diagonally on the horse's right side. Visualization of the left arcade will occur from across the horse's mouth. Execute a Left Pool-Cue Grip while inserting the PowerFloat® into the left side of the horse's mouth, then move the grinding surface diagonally over the tongue and across the mouth to reach the right upper arcade (Fig. 33). Tilt the right-angle portion of the shaft (located under the grinding wheel guard) toward the horse's cheek in order to displace the cheek away from the teeth (Fig. 34). This position enables the grinding surface to float the sharp points on the buccal aspect of the upper arcade. Rotate the grinding wheel in the middle of the arcade for a few seconds to allow the horse to get accustomed and then move the grinding surface to the back of the mouth and begin by floating the rear teeth first.

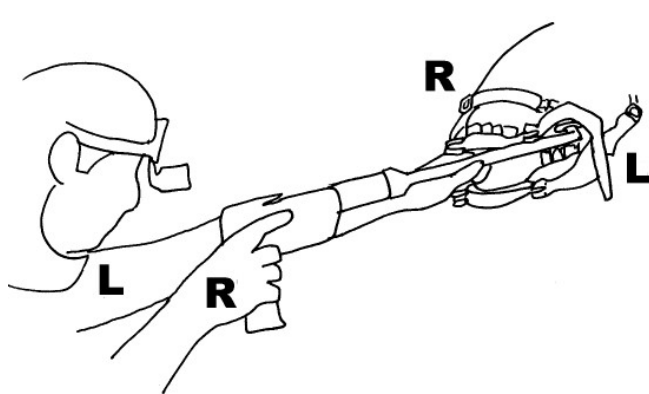


Fig. 33

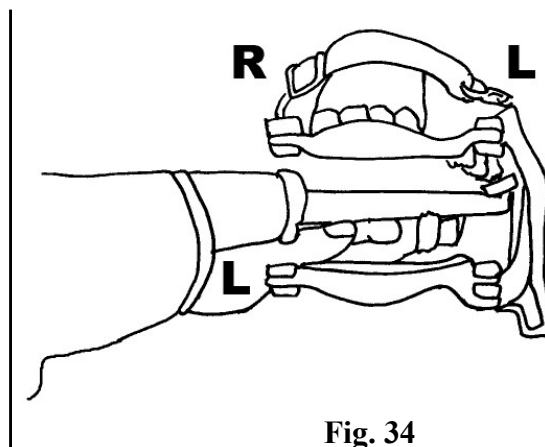


Fig. 34

The sharp point on the caudal aspect of the third upper molar can be removed by pushing the grinding wheel as far back as possible and slightly rotating the grinding surface on the back of the tooth. The stainless steel guard will protect the soft tissue caudal all the way to the last tooth.

8.2.2 Upper Contouring Technique

(Rotate the chrome shaft into the UP position with the right angle portion below the wheel guard.)

The term 'contouring' is preferable to 'shaping' or 'rounding'. The horseman term 'bit-seat' is a descriptive term for clients but not an accurate term for what is accomplished. When contouring is completed the rostral margins of Triadan System Tooth 106 and Tooth 206 should be smooth and the same shape as the end of a human thumb.

8.2.2.1 RIGHT UPPER TOOTH CONTOURING TECHNIQUE TRIADAN SYSTEM TOOTH 106

(This technique is a mirror image of Left Upper Tooth Contouring Technique)

Right Upper Tooth Contouring Technique incorporates three handgrips. The Left Overhand Grip, the Right Modified Pool-Cue Grip and the Left Thumb and Forefinger Grip.

To contour the rostral and the rostro-buccal side of Tooth 106, take position at the left corner of the horse's mouth with the PowerFloat® parallel to the shoulders and execute a Left Overhand Grip while operating the trigger with the right thumb. Insert the grinding wheel in the corner of the mouth and slide the wheel across the tongue to a point below the tooth. Then reposition the hand grip so that the fist stabilizes against the arms of the speculum adjacent to the left corner of the horse's mouth and steadies the grip on the shaft (Fig. 35). Precise floating and shaping are controlled by the stabilization of the overhand against speculum. Now, the veterinarian can easily float and view the rostral and rostro-buccal edges without placing either hand inside the mouth.

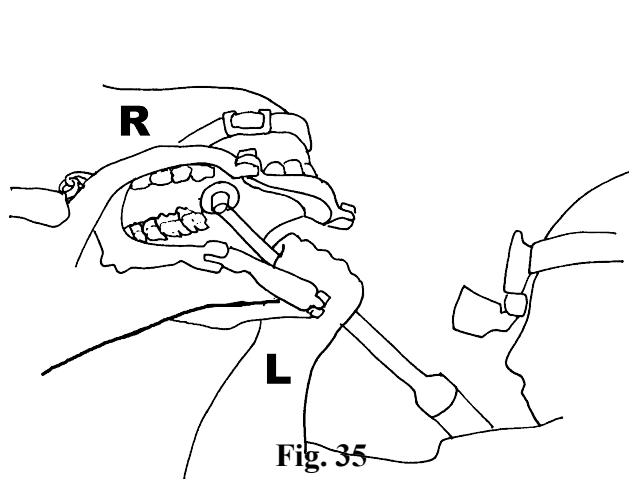


Fig. 35

If the buccal edge is too close to the mucosa, float the edge of the teeth using the Thumb and Forefinger Grip. First, take position on the horse's left side, then insert the grinding wheel into the mouth and execute a Left Thumb and Forefinger Grip (Fig. 36). Use the middle finger to push the buccal-mucosa laterally and out of the way of the grinding wheel to prevent abrasion on the mucosa fold.

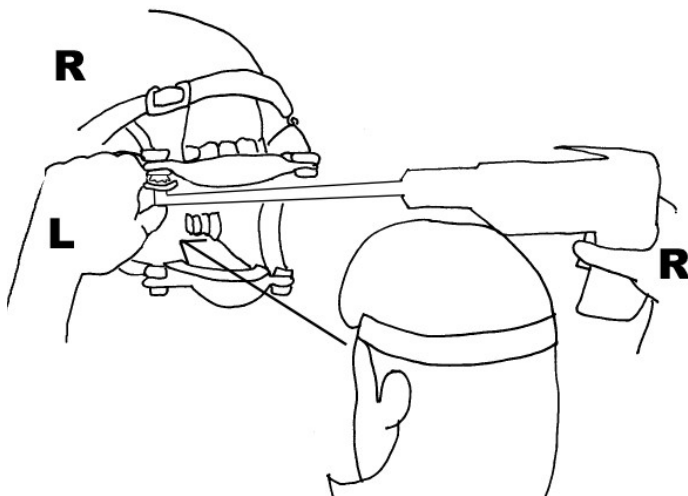


Fig. 36

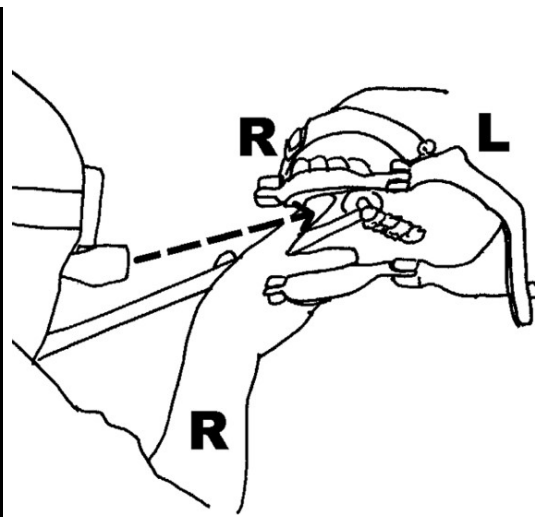


Fig. 37

To round the rostral and rostro-palatal edge of the tooth, take position diagonally on the horse's right side and execute a Right Modified Pool-Cue Grip. Place the grinding wheel inside the corner of the mouth while using the middle finger to abduct the cheek to improve visualization and begin contouring the palatal edge (*Fig. 37*). Little manipulation is needed to successfully contour the front and inside edge of tooth 106 to complete rounding on the front of the tooth.

8.2.2.2 LEFT UPPER TOOTH CONTOURING TECHNIQUE TRIADAN SYSTEM TOOTH 206
(This technique is the mirror image of the Right Upper Tooth Contouring Technique)

Left Upper Tooth Contouring Technique incorporates three handgrips. The Right Overhand Grip, the Left Modified Pool-Cue Grip and the Right Thumb and Forefinger Grip.

To contour the rostral and the rostro-buccal side of Tooth 206, take position at the right corner of the horse's mouth with the PowerFloat® parallel to the shoulders and execute a Right Overhand Grip while operating the trigger with the left thumb. Insert the grinding wheel in the corner of the mouth and slide the wheel across the tongue to a point below the tooth. Then reposition the hand grip so that the fist stabilizes against the arms of the speculum adjacent to the right corner of the horse's mouth and steadies the grip on the shaft (*Fig. 38*). Precise floating and shaping are controlled by the stabilization of the overhand against speculum. Now, the veterinarian can easily float and view the rostral and rostro-buccal edges without placing either hand inside the mouth.

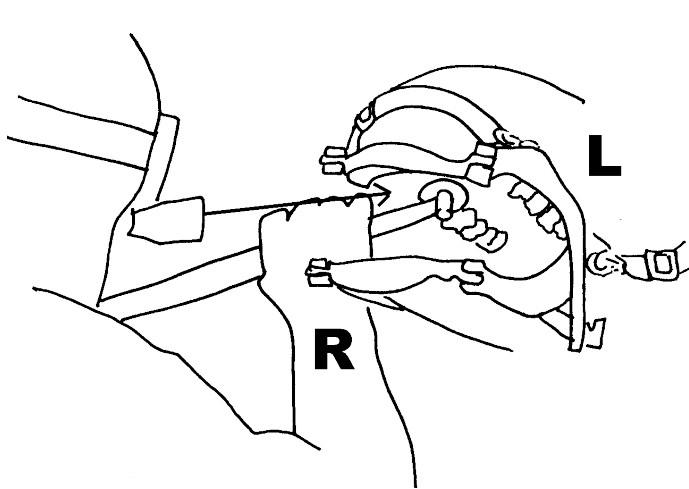


Fig. 38

If the buccal edge is too close to the mucosa, float the edge of the teeth using the Thumb and Forefinger Grip. First, take position on the horse's right side, then insert the grinding wheel into the mouth and execute a Right Thumb and Forefinger Grip (Fig. 39). Use the middle finger to push the buccal-mucosa laterally and out of the way of the grinding wheel to prevent abrasion on the mucosa fold.

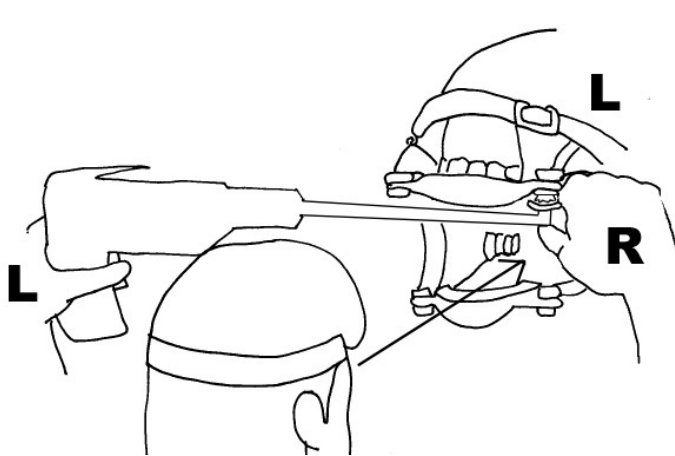


Fig. 39

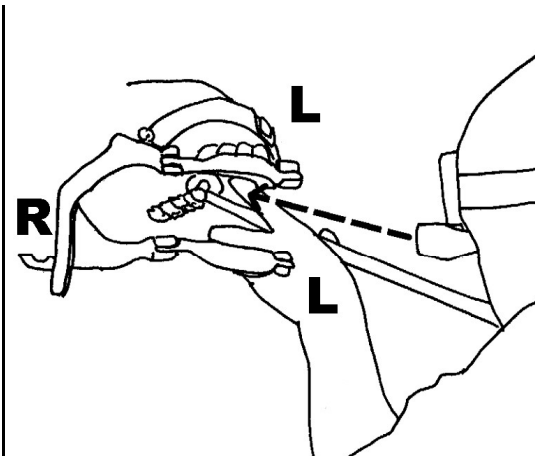


Fig. 40

To round the rostral and rostro-palatal edge of the tooth, take position diagonally on the horse's left side and execute a Left Modified Pool-Cue Grip. Place the grinding wheel inside the corner of the mouth while using the middle finger to abduct the cheek to improve visualization and begin contouring the palatal edge (Fig. 40). Little manipulation is needed to successfully contour the front and inside edge of tooth 206 to complete rounding on the front of the tooth.

8.2.3 Lower Arcade Technique

Rotate the chrome shaft into the DOWN position with the right angle portion above the wheel guard.

8.2.3.1 RIGHT LOWER ARCADE TECHNIQUE TRIADAN SYSTEM TOOTH 406 to 411

(This technique is the mirror image of Left Lower Arcade Technique)

Right Lower Arcade Technique incorporates the Right Overhand Grip.

Take position directly in front of the horse and in close enough so that the head lamp shines straight down the dental arcade. Execute a Right Overhand Grip and then move the grinding wheel diagonally into the right corner of the mouth (Fig. 41). Keep the wrist of the right hand held down out of the line of sight to easily visualize the placement of the grinding wheel on top of the lower arcade. Once the grinding wheel has reached the arcade, tilt the right angle portion lingually to displace the tongue and then use the diagonal position of shaft to pull the corner of the cheek laterally. In addition, remember to keep the head in close and the wrist out of the line of sight to achieve maximum exposure of the arcade. Better visualization is achieved with the veterinarian's head close to the horse's mouth opening than if the head is positioned further back.

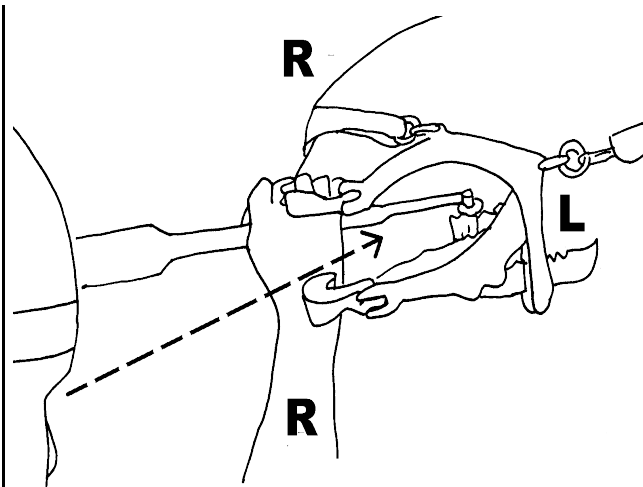
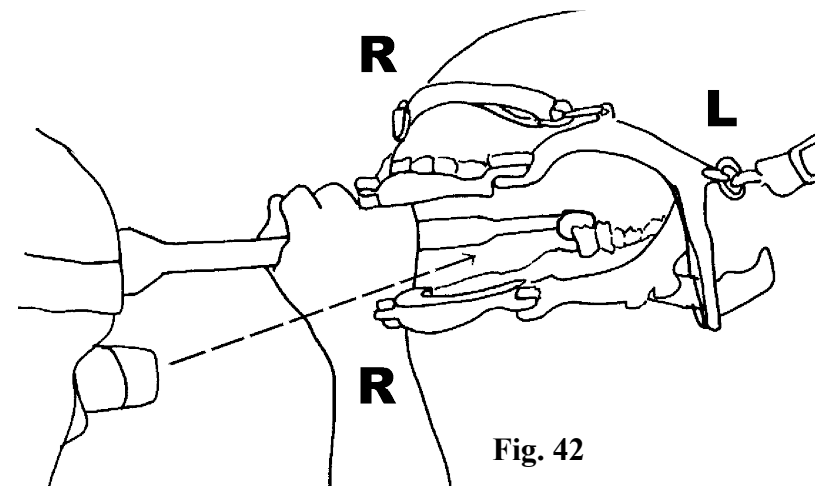


Fig. 41



Side View

Saggital View

After the sharp enamel points on the lingual side of the teeth are floated, the right angle can be tilted to a more vertical position or slanted towards the buccal side of the teeth to remove dominant projections such as tall teeth or exaggerated transverse ridges (Fig. 42). To remove very tall caudal hooks on Triadan System Tooth 411 (last cheek tooth), the narrow width design of the right angle allows it to be tilted lingually or buccally so that it can slide past the edge of the last upper tooth and be placed in the narrow space between the last upper and lower teeth.

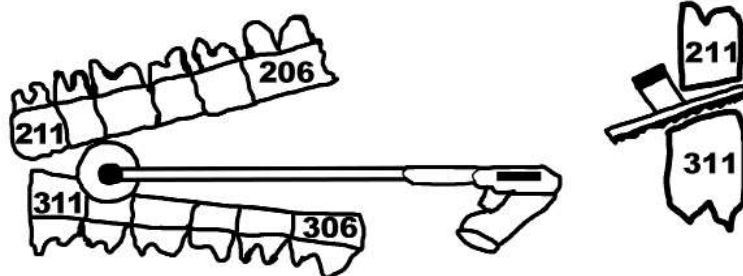


Fig. 43

In rare situations, extremely tall hooks can be encountered. These can be floated directly sideways at a 90 degree angle to the tooth on the lingual side (Fig. 43). Side floating is done until enough tooth has been reduced to execute angle floating. Eventually the full right angle and grinding wheel can move completely over the top of the lower tooth. This technique will only take some extra minutes and is safer and preferable to cutting (*fracturing*) the tooth to remove the hook.

(Right angle tilts to the palatal side of Tooth 211 to slip the wheel into the space between the ramp on 311 and 211.)

8.2.3.2 LEFT LOWER ARCADE TECHNIQUE TRIADAN SYSTEM TOOTH 306 to 311
(This technique is the mirror image of Right Lower Arcade Technique)

Left Lower Arcade Technique incorporates the Left Overhand Grip.

Take position directly in front of the horse and in close enough so that the head lamp shines straight down the dental arcade. Execute a Left Overhand Grip and then move the grinding wheel diagonally into the left corner of the mouth. Keep the wrist on the left hand held down out of the line of sight to easily visualize the placement of the grinding wheel on top of the lower arcade (Fig. 44). Once the grinding wheel has reached the arcade, tilt the right-angle portion lingually to displace the tongue and then use the diagonal position of shaft to pull the corner of the cheek laterally. In addition, remember to keep the head in close and the wrist out of the line of sight to achieve maximum exposure of the arcade. Better visualization is achieved with the veterinarian's head close to the mouth opening of the horse than if the head is positioned further back.

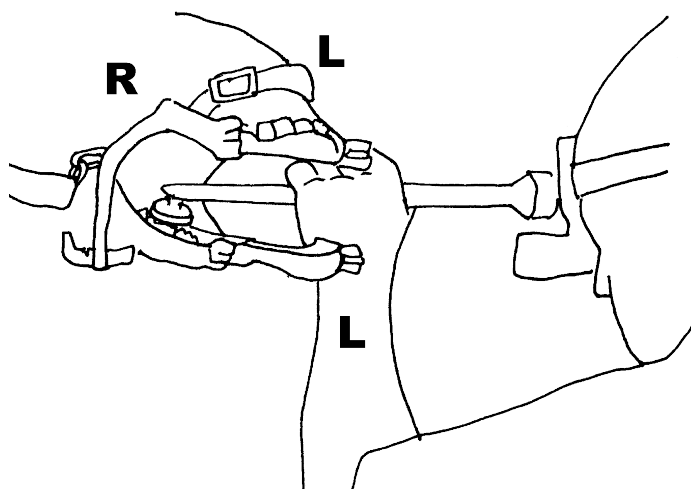


Fig. 44

After the sharp enamel points on the lingual side of the teeth are floated, the right-angle portion can be tilted to a more vertical position or slanted towards the buccal side of the teeth (Fig. 45) to remove dominant projections such as tall teeth or exaggerated transverse ridges. To remove very tall caudal hooks on Triadan System Tooth 311, the narrow width design of the right angle allows it to be tilted lingually or buccally so that it can slide past the edge of the last upper tooth and be placed in the narrow space between the last upper and lower teeth.

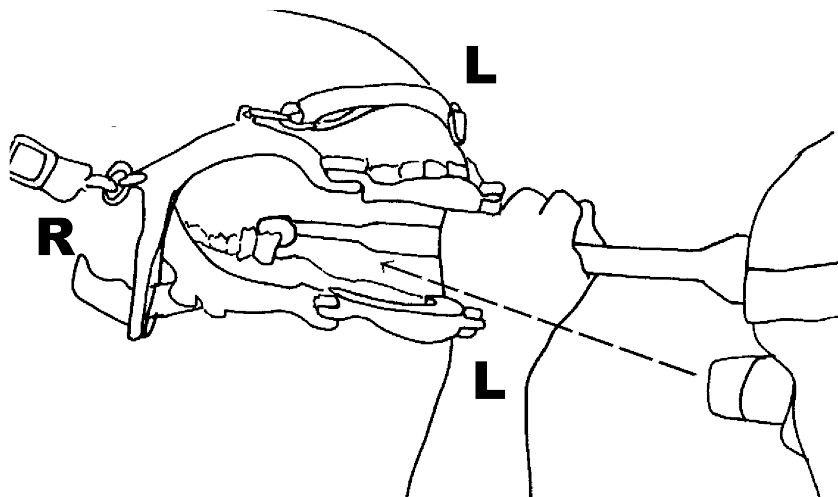


Fig. 45

In rare situations, extremely tall hooks can be encountered. These can be floated directly sideways at a 90 degree angle to the tooth on the lingual side (see Fig. 43). Side floating is done until enough tooth has been reduced to execute angle floating. Eventually the full right angle and grinding wheel can move completely over the top of the lower tooth. This technique will only take some extra minutes and is safer and preferable to cutting (*fracturing*) the tooth to remove the hook.

8.2.4 Lower Contouring Technique

Rotate the chrome shaft into the DOWN position with the right angle of the shaft above the wheel guard.

8.2.4.1 LEFT LOWER TOOTH CONTOURING TECHNIQUE TRIADAN SYSTEM TOOTH 306

(This technique is the mirror image of the Right Lower Tooth Contouring Technique)

Left Lower Tooth Contouring Technique incorporates two handgrips. The Left Modified Pool-Cue Grip and the Right Thumb and Forefinger Grip.

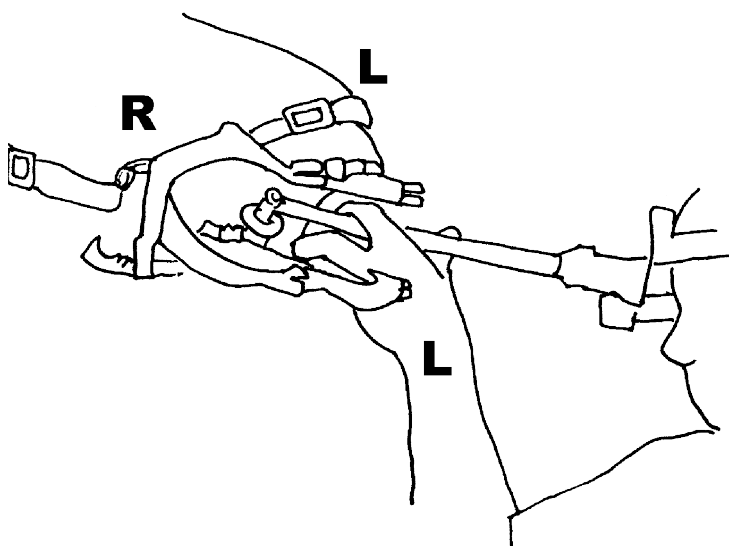


Fig. 46

To round the rostral and rostro-lingual edge of Tooth 306, take position diagonally on the horse's left side and execute a Left Modified Pool-Cue Grip. Insert the grinding wheel into the left corner of the mouth and then use the middle finger to place traction on the corner of the left cheek (Fig. 46). This traction puts tension on the fold of mucosa that loosely doubles up against the rostral area of the tooth. The fold must be pulled out of the way of the edge of the grinding wheel to prevent the wheel from causing damage during contouring. With some horses, the mucosal fold near the front tooth extends so high towards the occlusal edge of the tooth that it is not possible to use the Modified Pool-Cue Grip. In these circumstances, opt instead to use the Thumb and Forefinger Technique, as follows:

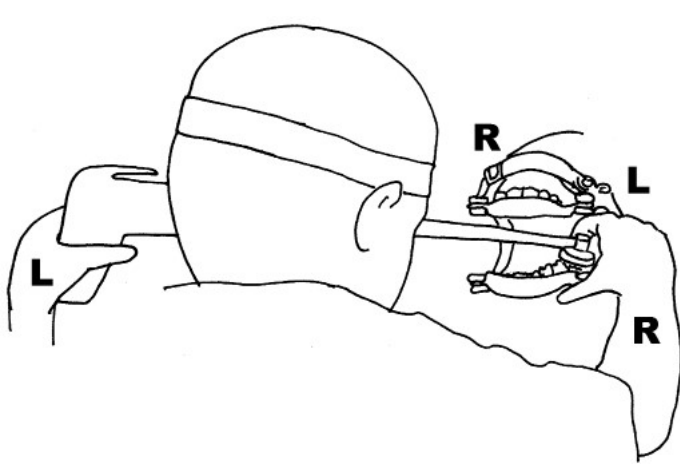


Fig. 47

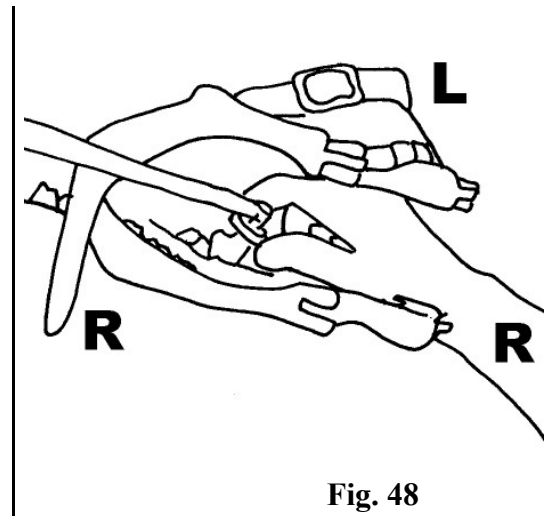


Fig. 48

To round the rostral and rostro-buccal edge of Tooth 306, take position on the horse's left side. Insert the grinding wheel into the corner of the mouth and then execute a Right Thumb and Forefinger Grip (*Fig. 47*). Keep the last free fingers outside the inter-dental space and use the dorsal area of the forefinger to abduct the upper corner of the cheek for better exposure of the tooth. The thumb can be extended below the edge of the guard to push down on the mucosal fold to keep it away from the grinding wheel (*Fig. 48*). Another alternative of the guard to push down on the mucosal fold to keep it away from the grinding wheel is to use the thumb or middle finger to abduct the mucosal fold and cheek away from the front of the tooth.

8.2.4.2 RIGHT LOWER TOOTH CONTOURING TECHNIQUE TRIADAN SYSTEM TOOTH 406 (This technique is the mirror image of Left Lower Tooth Contouring Technique)

Right Lower Tooth Contouring Technique incorporates two handgrips. The Right Modified Pool-Cue Grip and the Left Thumb and Forefinger Grip.

To round the rostral and rostro-lingual edge of Tooth 406, take position diagonally on the horse's right side and execute a Right Modified Pool-Cue Grip. Insert the grinding wheel into the right corner of the mouth and then use the middle finger to place traction on the corner of the right cheek (*Fig. 49*). This traction puts tension on the fold of mucosa that loosely doubles up against the rostral area of the tooth. The fold must be pulled out of the way of the edge of the grinding wheel to prevent the wheel from causing damage during contouring. With some horses, the mucosal fold near the front tooth extends so high towards the occlusal edge of the tooth that it is not possible to use the Modified Pool-Cue Grip. In these instances, opt instead to use the Thumb and Forefinger Technique, as follows:

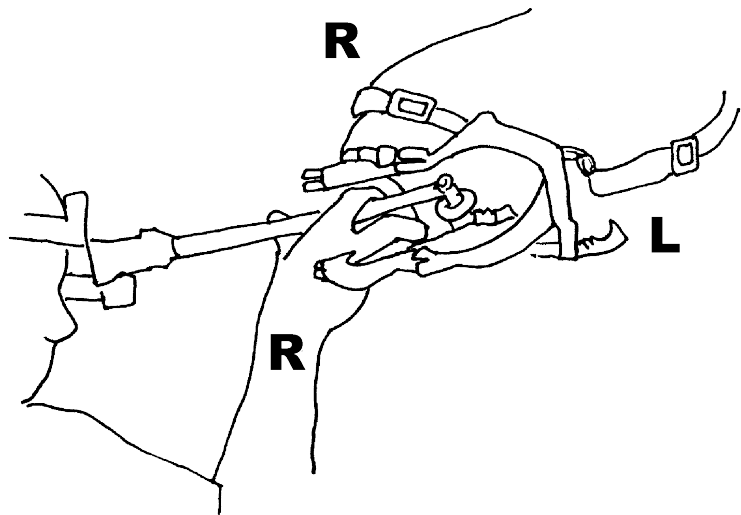


Fig. 49

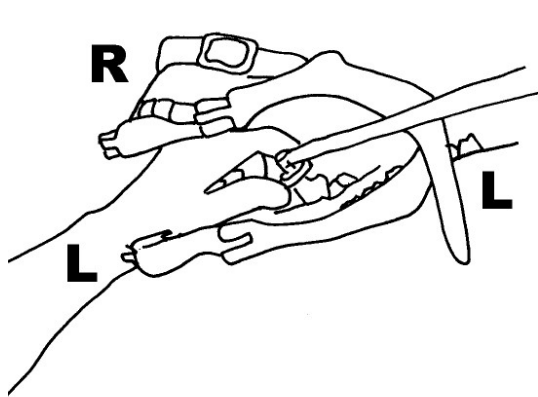


Fig. 50

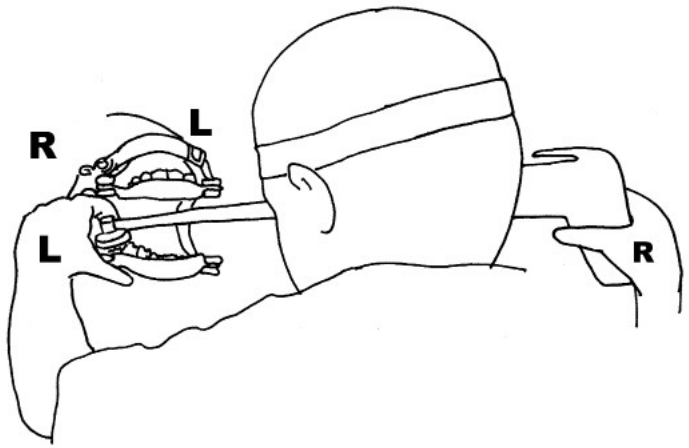


Fig. 51

To round the rostral and rostro-buccal edge of Tooth 406, take position on the horse's right side. Insert the grinding wheel into the corner of the mouth and then execute a Left Thumb and Forefinger Grip (Fig. 50). Keep the last free fingers outside the inter-dental space and use the dorsal area of the forefinger to abduct the upper corner of the cheek for better exposure of the tooth. The thumb can be extended below the edge of the guard to push down on the mucosal fold to keep it away from the grinding wheel (Fig. 51). Another alternative is to use the thumb or middle finger to abduct the mucosal fold and cheek away from the front of the tooth.

8.3 INCISOR BITE ALIGNMENT TECHNIQUE

Incisor Bite Alignment Technique incorporates two handgrips. The Overhand Grip and the Sidearm C-Clamp Grip.

In preparation for incisor bite alignment, remove both the speculum and the dental halter from the horse's head. To keep the horse's mouth open during incisor procedures, position a plastic gag inside the mouth as you would place a bit from a bridle and, with elastic cord, secure the gag around the poll of the horse so that the horse cannot remove the gag from its mouth. Re-secure the dental halter on the horse's head and then adjust the halter to an appropriate height that allows the horse to comfortably rest its head on the chin support (Fig. 52).

If the veterinarian decides to execute procedures hands-free, attach a Quick-Grip clamp (Fig. 52) to the PowerFloat®'s trigger and adjust the clamp until the desired speed is reached. For optimal performance, maintain the grinding wheel's operating speed to 3000 rpm.

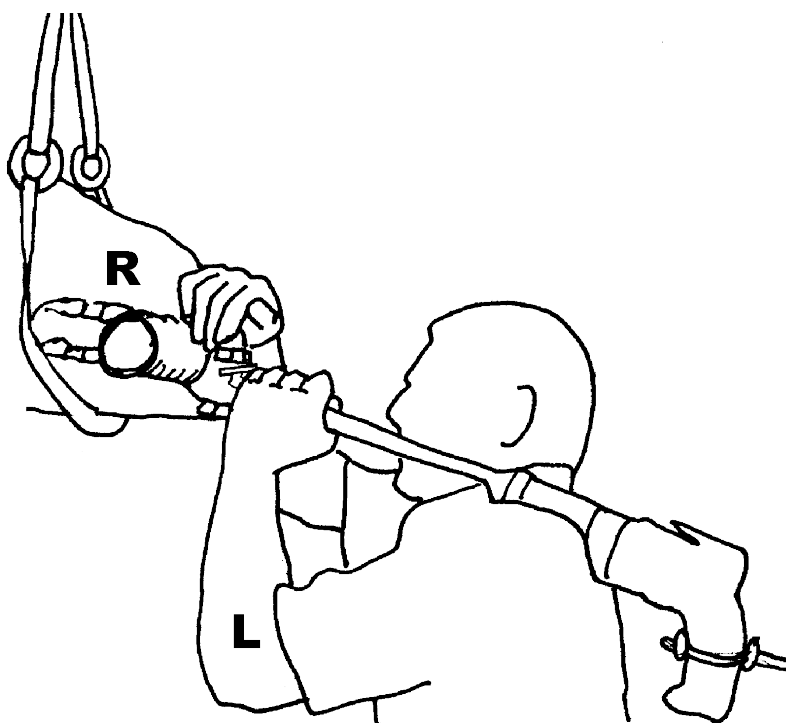


Fig. 52

8.3.1 Overhand Grip

The Overhand Grip has the advantage of placing the least amount of stress on the hands, in addition to freeing the trigger hand to stabilize and to keep the horse's head in a comfortable working position.

Attach a Quick-Grip clamp to the trigger and then support the shaft on top of either shoulder with the motor suspended behind the back. Using either hand, the area of the chrome shaft proximal to the right-angle portion is wrapped inside an Overhand Grip with the knuckles facing upwards (Fig. 53). Place the free hand onto the bridge of the horse's nose to stabilize the horse's head and begin floating (Fig. 54). All personnel in the working area should wear safety glasses.



Fig. 53



Fig. 54

8.3.2 Sidearm C-Clamp Grip

The Sidearm C-Clamp Grip has the advantage of allowing greater flexibility and range of motion for shaping incisor teeth. It also gives the veterinarian the option of floating using variable speed or hands-free operation of the trigger.

Hands-Free

Attach a Quick-Grip clamp to the trigger and, using either hand, grip the shaft from above using an underhand grip with the knuckles facing downwards. Hold the PowerFloat® up at approximately shoulder-level. In this position, the grinding wheel can be controlled through adjustments in the wrist and the elbow (*Fig. 55*). With the other hand, execute a Side-Arm C-Clamp Grip and position the grinding wheel inside the handgrip and begin floating the incisor teeth.



Fig. 55

8.3.3 Variable Speed

For variable speed control of the grinding wheel, grip the PowerFloat®'s motor with either hand, using the fingers to operate the trigger. Hold the PowerFloat® up at approximately shoulder-level (*Fig. 56*). In this position, the grinding wheel can be finely manipulated through rotations and twists in the wrist, or to a larger extent through movements of the wrist and arm. With the other hand, execute a Side-Arm C-Clamp Grip and position the grinding wheel inside the handgrip and begin floating the incisor teeth.



Fig. 56

8.4 ALTERNATIVE TECHNIQUES

8.4.1 Upper Rear Molar

Some horses may have large masseter muscles where the space between the caudal part of the rear upper cheek teeth and the buccal mucosa is tight. In these situations, remove the speculum and secure a plastic gag behind the incisor teeth. Insert the grinding wheel under the gag (Fig. 57) and position it to reach the outside caudal edge of Tooth 111 or Tooth 211 (Fig. 58). This technique allows a steeper angle of attack to round the caudal edge of the tooth.

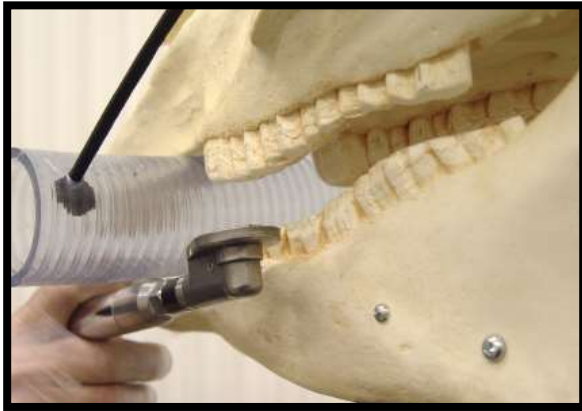


Fig. 57



Fig. 58

8.4.2 Tooth Cooling

Do not float on a single tooth or group of teeth for longer than 20 seconds without cooling the tooth (teeth) with cold water. Repeat floating and cooling procedure as needed until procedure is completed.

8.4.3 Rear Cheek Tension

With horses who have very tight cheeks there is less room to maneuver so that access to the rear edges of the teeth is more difficult. The veterinarian can lessen the cheek tension by:

1. Collapsing the front of the speculum by 1 or more ratchets. In most speculums, this will decrease the width between the incisor plates from 3 ½ - 2 ¾ inches or 8 ¾ - 6 ¾ centimeters. This has the effect of reducing the rear cheek tension against the teeth so there is more room for the grinding head to maneuver.
2. Slightly lower the dental halter supporting the horse's chin. This can be accomplished quickly by adjusting the rope of the dental halter to lower the halter down. Lower head positions have less tension against the teeth in the rear cheeks.
3. Bend the head and neck slightly so that the floating is executed on the inside (concave) of the bend. This head position also reduces rear cheek tension.

8.5 SEQUENTIAL FLOW TECHNIQUE

Sequential Flow Technique is a combination of all arcade and contouring techniques into one ordered and comprehensive procedure. With practice, this technique can increase floating efficiency with no loss in performance or results.

SEQUENTIAL FLOW TECHNIQUE

Sequential Flow Technique starts with the PowerFloat®'s shaft in the UP position.

Begin by floating the left arcade (*Triadan System Tooth 206 - 211*) using Upper Arcade Technique with a Left Pool-Cue Grip. Once Tooth 206 is reached, the PowerFloat® rotates around into the position for Upper Tooth Contouring Technique using a Right Overhand Grip and then contours **only the buccal side** of Tooth 206. Then the grinding wheel slides across to Tooth 106 while the handgrip changes to a Right Modified Pool-Cue Grip and contours **only the lingual side** of Tooth 106.

Next, position the PowerFloat® around to float the right arcade (*Triadan System Tooth 106 - 111*) using Upper Arcade Technique with a Right Pool-Cue Grip. Once Tooth 106 is reached, rotate the PowerFloat® around into Upper Tooth Contouring Technique using a Left Thumb and Forefinger Grip (or a Left Overhand Grip) and finish Tooth 106 by contouring **only the buccal side**. Then the grinding wheel slides across to Tooth 206 while the handgrip changes to a Left Modified Pool-Cue Grip and contours **only the lingual side** of Tooth 206 to complete the upper arcades.

Rotate the shaft into the DOWN position and, if necessary, re-adjust the dental halter to the veterinarian's preferred position for lower teeth.

Resume Sequential Flow Technique by floating the left lower arcade (*Triadan System Tooth 306 - 311*) using Lower Arcade Technique with a Left Overhand Grip. Once the grinding wheel reaches Tooth 306, alter the hand position into a Left Modified Pool-Cue Grip. Use this position to contour **only the lingual side** of Tooth 306. Next, the grinding wheel slides across the horse's mouth while the handgrip changes into a Left Thumb and Forefinger Grip and contours **only the buccal side** of Tooth 406.

Switch positions back around to float the left arcade (*Triadan System Tooth 406 - 411*) using Lower Arcade Technique with a Right Overhand Grip. Once Tooth 406 is reached, alter hand positions into a Right Modified Pool-Cue Grip to contour **only the lingual side** of Tooth 406. Next, the grinding wheel slides across the mouth while the handgrip changes to a Right Thumb and Forefinger Grip and then contours **only the buccal side** of Tooth 306. Once contouring on Tooth 306 is finished, Sequential Flow Technique is complete.

FLOATING TECHNIQUE ORDER

Upper Teeth

1. Left Upper Arcade Technique	w/ Left Pool-Cue Grip	(Tooth 206 - 211)
2. Left Upper Contouring Technique	w/ Right Overhand Grip	(Tooth 206, buccal)
3. Right Upper Contouring Technique	w/ Right Modified Pool-Cue Grip	(Tooth 106, lingual)
4. Right Upper Arcade Technique	w/ Right Pool-Cue Grip	(Tooth 106 - 111)
5. Right Upper Contouring Technique	w/ Left Overhand Grip	(Tooth 106, buccal)
6. Left Upper Contouring Technique	w/ Left Modified Pool-Cue Grip	(Tooth 206, lingual)

Lower Teeth

7. Left Lower Arcade Technique	w/ Left Overhand Grip	(Tooth 306 - 311)
8. Left Lower Contouring Technique	w/ Left Modified Pool-Cue Grip	(Tooth 306, lingual)
9. Right Lower Contouring Technique	w/ Left Thumb & Forefinger Grip	(Tooth 406, buccal)
10. Right Lower Arcade Technique	w/ Right Overhand Grip	(Tooth 406 - 411)
11. Right Lower Contouring Technique	w/ Right Modified Pool-Cue Grip	(Tooth 406, lingual)
12. Left Lower Contouring Technique	w/ Right Thumb & Forefinger Grip	(Tooth 306, buccal)

8.6 NON-VISUAL FLOATING TECHNIQUE

(My Approach to Motorized Equine Dentistry Using the PowerFloat®)

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The addition of the PowerFloat® (1-877-969-2233) to the veterinarian's armamentarium of equine dental tools has simplified dental procedures by enabling one tool to accomplish many operations. The high torque, low rpm (4,000rpm max) enables rapid, safe tooth removal with low heat production. An in-line clutch stops the disc when excessive pressure is applied to the grinding disc. The PowerFloat® uses a rotating disc grinder on a rigid direct driveshaft attached to a clutch assembly, which is attached to a Porter Cable/DeWalt variable speed drill. The rotating disc, the size of a quarter, and the slender driveshaft make access easy to teeth by the visual or non-visual method.

The manufacturer recommends the visual method using the PowerFloat®, requiring a head support for the horse's head and watching the grinding disc for control. When floating the left side of the mouth the drill is held in the right hand and the left hand grips the lower incisor plate of the speculum. The shaft of the float is stabilized with the left hand similar to holding a pool cue. The operator wears a head light and is looking into the mouth while using the float. The light is pointed toward the area being floated. This is a very effective method, but can be tiring for taller persons or when working on shorter horses.

Using a head support for most horses puts the mouth at the level of my chin. In this position, looking into the mouth while floating requires me to duck my head and tilt my head backward or crouch down. Either of these positions requires the operator to elevate the arms and elbows to shoulder level. Ergonomically, these positions are difficult to maintain when working on many horses. Neck and shoulder fatigue is sequelae of using these positions.

I use a non-visual method requiring less sedation and usually no head support. The non-visual method requires less bending over for the operator when floating short horses. Also, I am able to keep my elbows down, closer to my body for most of the procedure creating less shoulder and arm fatigue. Switching which hand controls the drill can obviate hand fatigue. Eye and ear protection should be used regardless of the method of application.

Method

The halter is removed and a full speculum is applied. I start on the upper left arcade, cupping the shaft of the PowerFloat® with my left hand, near the disc, and gently apply the disc to the tooth at about 1/3 speed. Some horses will react with some head motion when the disc touches the tooth. When the horse accepts the noise and vibration, I increase the speed to ¾ maximum to maximum and press the disc more firmly on the tooth. The disc is initially positioned at a 45° angle to the buccal side of the tooth, then rotated counter-clockwise until about 20° to the buccal side. (See *Figure 1*)

The right hand is controlling the rotation, by rotating the drill. The left hand holds the disc on the tooth. This action is repeated until the tooth is adequately floated, usually just 2 to 3 rotations. I then move the disc caudally about 1 cm and repeat the rotation until the entire arcade is floated.

The upper right arcade is done in a similar fashion, switching hands so the right hand holds the disc end and the left hand controls the drill.

The lower arcades are done after rotating the shaft of the PowerFloat® 180 degrees. Rotating the shaft turns the disc down, allowing the drill to be held in the same position. I control the float by keeping one hand close to the disc while working on the premolars. When working on the lower molars my hand will be about mid-shaft, with my first and second fingers parallel to the shaft. The same disc rotation used on the upper arcades is used the round the lower arcade edges.