

USERGUIDE

Autocolor



WARNING - Reliance on this Manual Could Result in Severe Bodily Injury or Death!

This manual is out-of-date and is provided only for its technical information, data and capacities. Portions of this manual detailing procedures or precautions in the operation, inspection, maintenance and repair of the product forming the subject matter of this manual may be inadequate, inaccurate, and/or incomplete and cannot be used, followed, or relied upon.

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AUTOCOLOR MODULAR BLENDING SYSTEM

The Autocolor's vacuum hopper volumetrically loads itself with a fixed amount of virgin material to which a pre-set, variable amount of colorant, or additive is metered. While regrind can be proportionately fed through Ratio Autocolors, the colorant is still metered only to the amount of natural virgin material.

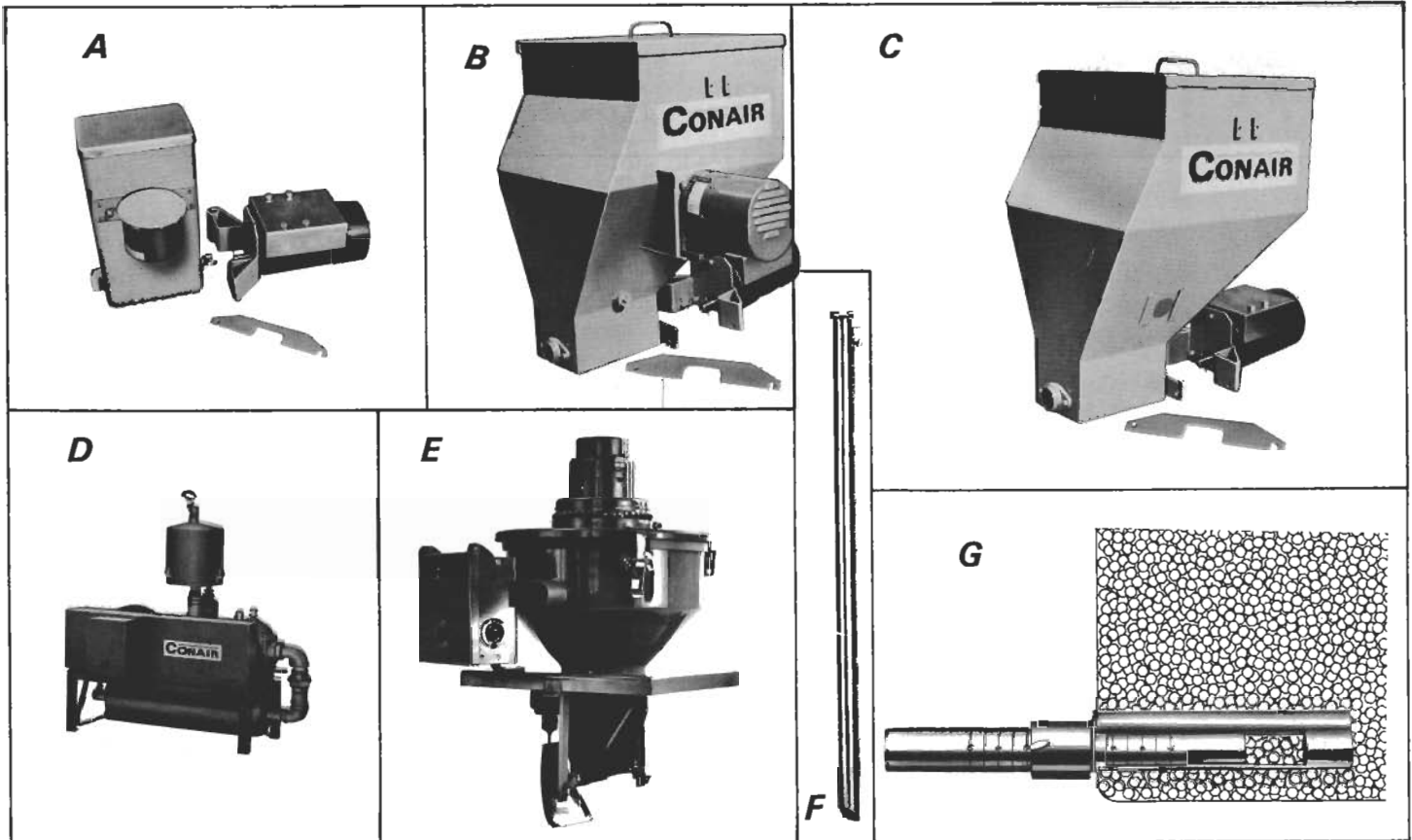
The latest Autocolor Loaders are blending systems in every sense of the word because of the new versatility built into their design.

The Autocolor units include a new solidstate, capacitance-type Level Sensor, which assures a full load of virgin material during each loading cycle to guarantee repeatable color

mixes. As an option in Ratio Autocolors a sensor in the regrind side of the hopper will assure a full charge of regrind each time.

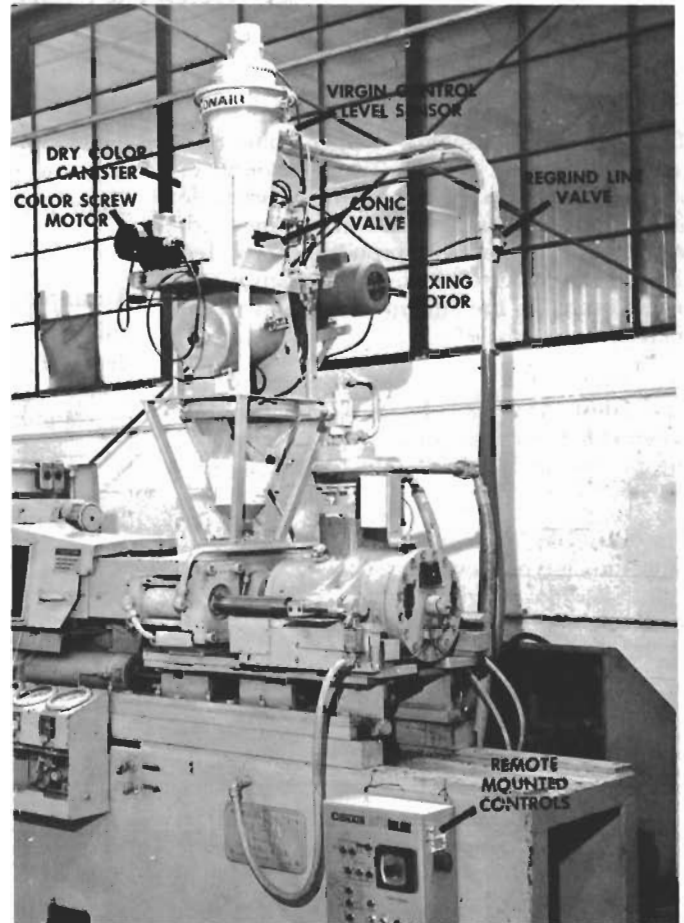
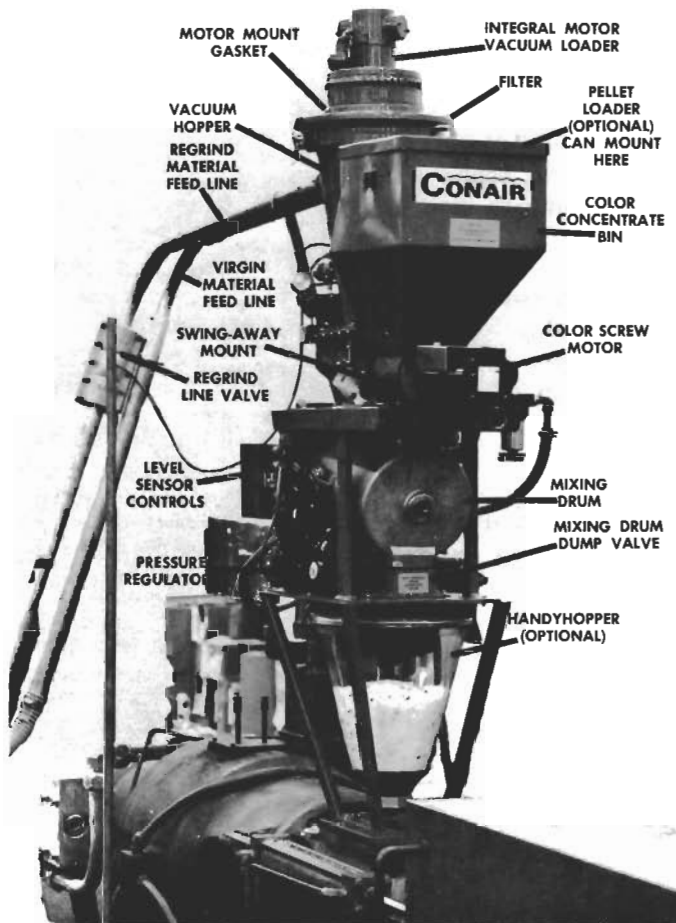
An important feature of the sensor is to provide low colorant level warning. Where a dry color canister is used, the sensor will signal levels through the wall of a plastic canister.

The Adjustable Divider Plate (ADP) in the ratio (two tube) units gives precise regrind/virgin proportioning from 10% to 90% of either material.



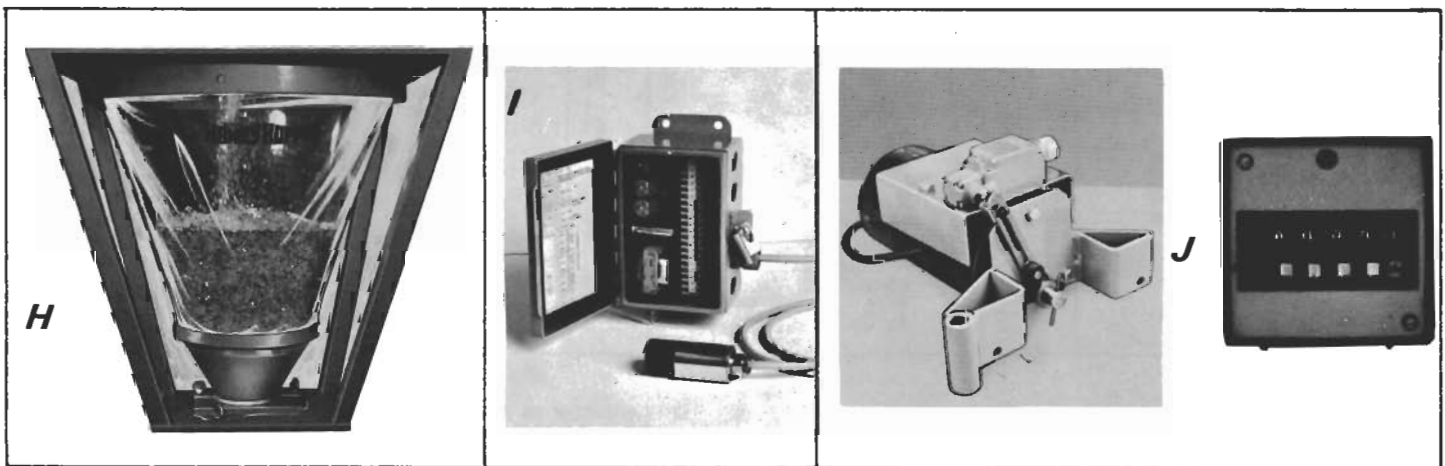
Your Autocolor can also be equipped with a variety of color and additive metering devices and other optional features. Above are identifying photos of the most frequently used options: (A) Powder Metering assembly - for metering dry colors or powdered additives. (B) High-volume powder metering assembly-large capacity for metering powdered additives (C) Pellet metering assembly - for metering color

concentrates or other pelletized additives. (D) Positive displacement vacuum pump - provides loading power for Autocolors not fitted with integral motor loader. (E) Pellet loader automatically keeps pellet metering assembly filled. (F) Vertical material feed tube - for unloading drums, boxes. (G) Horizontal feed tube - for unloading grinder bins, surge bins, etc.



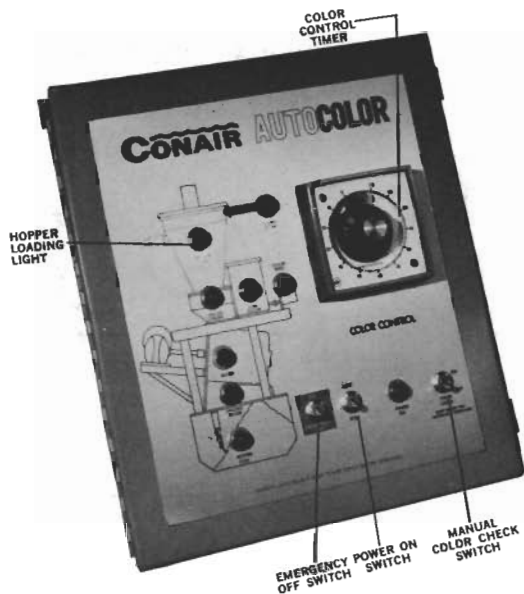
Autocolors are available in two Series. The 300 Series units have capacities to 300 lbs/hr when metering powdered additives, to 400 lbs/hr metering pelletized colors or additives. They can meter one additive to virgin or virgin/regrind materials. The 600 Series units have capacities to 600 lbs/hr metering powdered additives, to 1000 lbs/hr metering pelletized colors or additives and can meter either one, or two additives into virgin or virgin/regrind materials.

Autocolors may either be self-loading, including an integral vacuum motor on the vacuum hopper, or loaded by remote vacuum pumps. They can also be included in Universal Selectronic Systems where one central pump loads, in sequence, up to nine processing stations, any number of which can be filled by an Autocolor.



(H) HandyHopper - replaces standard machine hoppers, lowers installation height, provides quick clean-out. (I) Solid-state Level Sensor Control and Probe - reliable material and function control, up to four can be included.

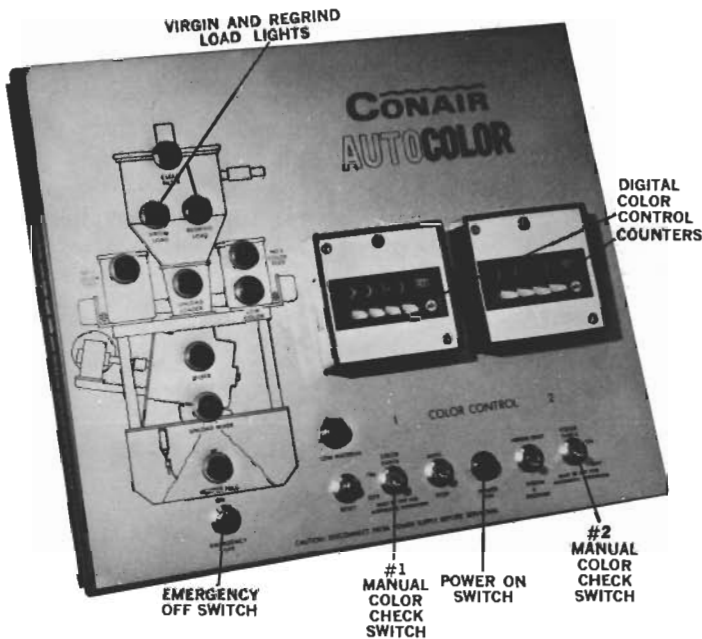
(J) Critical Color Kit - for precision color or additive feeding. Includes brake motor drive and revolution counter in place of Color Timer in control enclosure.



Single Tube Autocolor Control



VIRGIN AND REGRIND LOAD LIGHTS



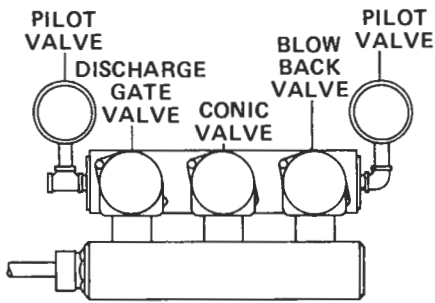
Ratio (Two-Tube) Autocolor Control

Autocolor control enclosures may be remotely mounted at convenient height for operation. They include a graphic face to clearly show unit functions as they occur. Single tube Autocolors, usually loading only virgin pellets, have a single light which signals vacuum hopper filling. Ratio Autocolors have a light for both virgin and regrind filling as they occur. 600 Series Autocolors may include two Color Control Timers or Counters if two additives are being metered. Digital Counters are used for very precise colorant or additive metering. They allow the operator to preset the number of revolutions made by the metering augers, rather than use a timed metering control.

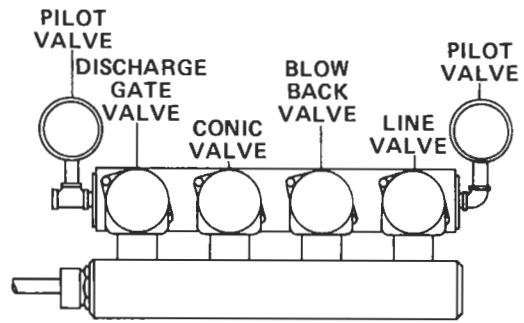
SPECIFICATIONS

AMPERAGE:	120/1/60 Controls* & Autocolor Assembly	240/3/60 P.D. pump only	480/3/60 P.D. pump only
Integral Type Loader Motor — $\frac{3}{4}$ hp	20.5 amps	—	—
Remote 3hp Positive Displacement vacuum pumps	11.0 amps	8.0 amps	4.0 amps
Remote 5hp Positive Displacement vacuum pump	11.0 amps	12.4 amps	6.2 amps
	300 Series	600 Series	
MOUNTING BASE SIZE	12 $\frac{1}{2}$ x 19"	14 $\frac{1}{2}$ x 25"	
HEIGHT ABOVE MACHINE HOPPER (Includes 3" clearance for opening lid)	51"	59"	
O. A. HEIGHT WITH HANDYHOPPER (Includes 3" clearance for opening lid)	with HandyHopper — 77"	with HandyHopper — 85"	
Add for pellet loader on pellet metering assembly	8"	8"	
SHIPPING WEIGHT	335 lbs	475 lbs	
CONVEYING CAPACITIES	to 300 lbs/hr	to 600 lbs/hr	
CONVEYING DISTANCES:	Integral Motor Type Power Positive Displacement Type Power 3hp and 5hp	50'H 12'V up to 200 ft	50'H 12'V up to 200 ft

SINGLE TUBE AUTOCOLOR GANG VALVE ASSEMBLY



TWO-TUBE (RATIO) AUTOCOLOR GANG VALVE ASSEMBLY



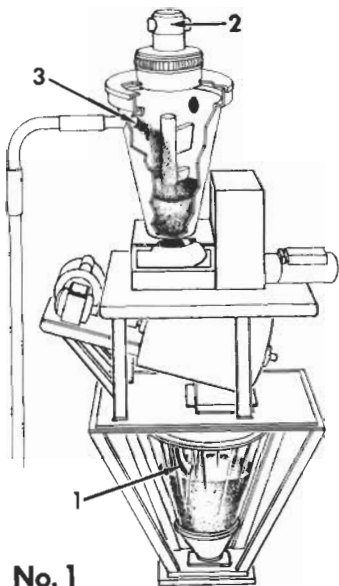
Single Tube Autocolor

Includes a pilot valve and two air valves to perform functions as noted below. They have a common air line connection requiring a 75 psi minimum. Each is factory set for proper operation.

Ratio Autocolor (Two-Tube)

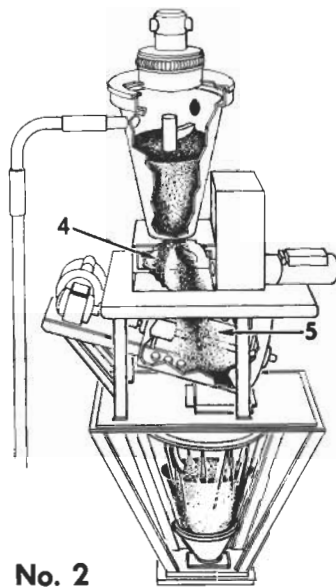
Includes two pilot valves and three air valves to perform functions as noted below. They have a common air line connection requiring 75 psi minimum. Note that air valve controlling the Regrind Line Valve has its own regulator.

SINGLE TUBE AUTOCOLOR OPERATION



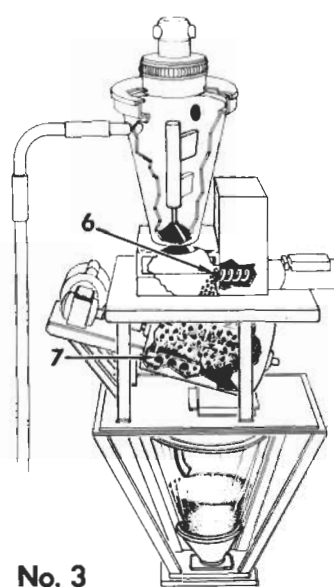
No. 1

1. Material level in HandyHopper falls, level switch (1) starts a pre-set loading cycle by activating the loader vacuum motor (2). Material is drawn into Vacuum Hopper through the Material Inlet (3)*. Virgin Sensor can stop all functions if full charge of virgin is not delivered.



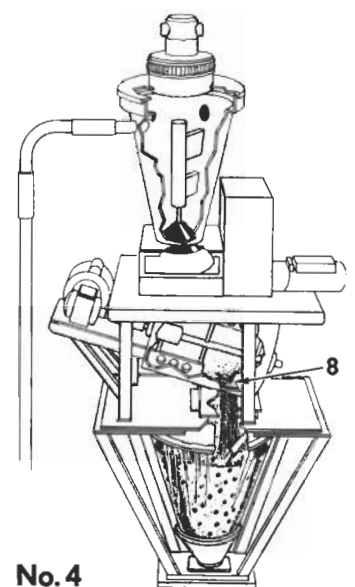
No. 2

2. After vacuum stops, Conic Valve (4) lowers, dropping material into mixing drum (5).



No. 3

3. Timed metering device (6) is activated, feeding pre-determined amount of concentrate or dry colorant to mixing drum. A rotating agitator (7) thoroughly blends the material.

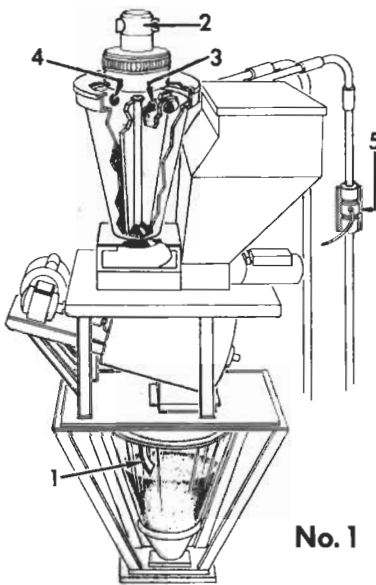


No. 4

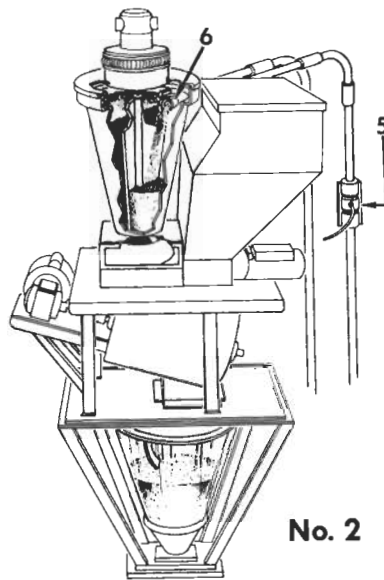
4. After timed mixing cycle is completed, discharge gate (8) opens, allowing blended mix to fall into the HandyHopper or machine hopper.*

*NOTE: Under normal operating procedure, the vacuum hopper would be filling while the mixing drum is emptying. The two operations are simultaneous.

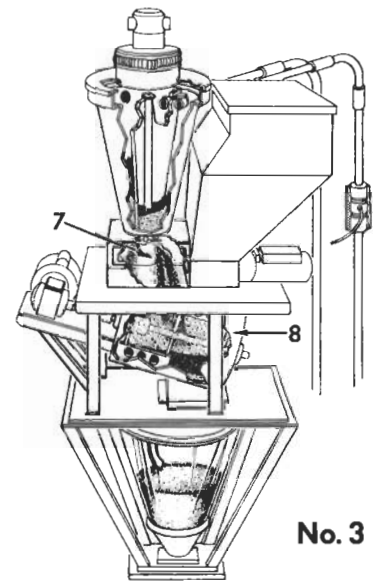
TWO TUBE AUTOCOLOR OPERATION (ADP HOPPER)



No. 1



No. 2



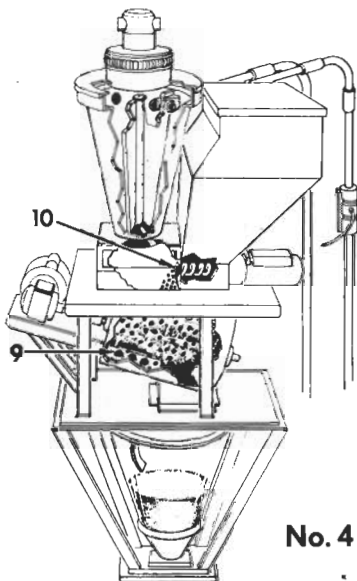
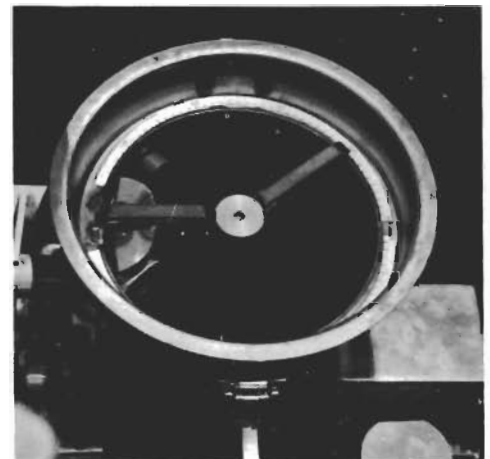
No. 3

1. Material level in HandyHopper falls, level switch (1) starts a pre-set loading cycle by activating the loader vacuum motor (2). Virgin material is then drawn into the virgin section of the ADP (Adjustable Divider Plate) Hopper through the Virgin Material Inlet (3)*. When this section is full, vacuum hopper material sensor (4) opens the Line Valve (5) in the regrind feed line. The vacuum motor continues to run. If sensor is not covered because full charge of virgin is not delivered, all functions stop.

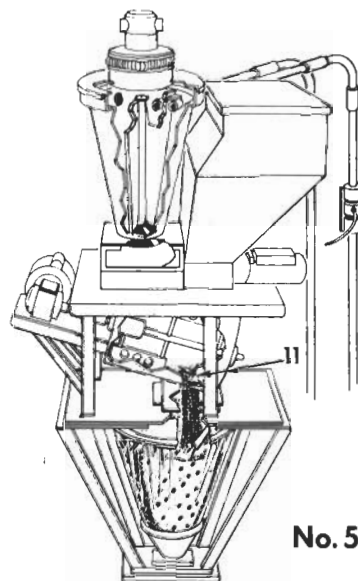
2. With Line Valve (5) open, a pre-determined amount of regrind material now enters regrind section of the ADP hopper through the regrind inlet (6). Divider plate setting determines this ratio.

3. After timed regrind cycle is completed, vacuum motor turns off and the Conic Valve (7) opens, dropping virgin and regrind materials into Mixing Drum (8).

*NOTE: Under normal operating procedure the ADP vacuum hopper would be filling while the mixing drum is emptying. The two operations are simultaneous.



No. 4



No. 5

4. While rotating agitator (9) blends the materials, a timed metering device (10) is activated, feeding pre-determined amount of concentrate or dry colorant into the combined materials. Colorant setting only considers virgin amount added. Presence of regrind helps distribute color evenly.

5. After timed mixing cycle is completed, a discharge gate (11) opens, allowing blended materials to fall into the HandyHopper or machine hopper.*

Ratio Autocolors include a divided vacuum hopper with two material fill tubes. Half of the dividing plate is hinged so that it can be rotated inside the hopper to provide a wide range of ratio adjustments of the regrinds to the virgin materials. See ADP Ratio Adjustment, page 11 for procedure.

A Level Sensor probe can be provided in the virgin side to give positive repeatable volumes of virgin materials during each hopper filling. Another sensor can be used in the regrind side to give precise filling control over that side of the divided hopper, too. See Sensor Control Section, page 14.

NOW YOU OWN THE ONLY PROVEN LOADER THAT BLENDS IN COLOR WHILE IT FILLS YOUR HOPPER.

The Conair Autocolor loads an colors virgin and/or regrind materials on the machine hopper. It eliminates strenuous manual handling, excessive dust in the plant and the waste of materials and colorants.

We build Autocolors carefully and have over 3000 of them in the field. They make your job easier. If you assemble, install, operate and maintain them properly you'll have a reliable loader that you can depend on . . . backed by people who are proud of their equipment and put their best into making it durable and efficient.

Dry colored material cannot be pneumatically conveyed. The Autocolor was developed to convey natural material to the machine hopper then color it and drop the mix by gravity into the machine hopper.

Autocolors may be filled by either integral motor loaders or positive displacement vacuum systems. The choice of vacuum source will not affect the independent operation of the Autocolor unit, but the loading device will have its vacuum "on" time (loading time) controlled by the Autocolor's controls. A solid state timer controls this function and the other unit functions automatically adjust to the setting of this timer. No cam adjustments are necessary.

LEVEL SWITCH SENSORS AND HANDYHOPPER OPTION

If your Autocolor is equipped with a HandyHopper, mount the Autocolor on the HandyHopper frame. Refer to Form 516, attached, to familiarize yourself with the HandyHopper and its use with an Autocolor.

The sensing probe is a versatile option which may be applied in several ways to control Autocolor functions or signal material levels. Your Autocolor is shipped with the necessary wiring for the sensors ordered already completed. Detailed installation and operation instructions for these sensors is found in Sensor Control Section, page 14.

USE THE RIGHT COLORANT

To do its job properly for you the Autocolor must:

- 1) Load a precise charge of uncolored plastic material each cycle.
- 2) Meter a precise amount of colorant into the material.
- 3) Mix colorant and material completely.

Autocolor Hopper Loaders will meter and mix dry color and color concentrates or other free flowing additives.

Sticky or poor flowing dry color formulations cannot be efficiently and economically metered in the Autocolor system. To meter properly in an Autocolor Hopper Loader, a dry colorant must be dry, free flowing, and fully developed.

Your colorant supplier can provide dry color with this characteristic for you. In addition, the colorant must produce the proper color and shade when you process it. If your existing compound does not meet these simple requirements, you may find it necessary to have the physical characteristics of some of your colors adjusted on future

purchases. This is more likely if they were compounded for your drum tumbler.

Powder metering assemblies and color concentrates metering assemblies are interchangeable on the Autocolor, but do not meter dry color with color concentrate assembly, or meter concentrate with a dry color assembly.

USE THE RIGHT PROCEDURE

Some dry colorants may tend to settle and pack in the metering canisters and bins due to molding machine vibration. Conair provides a rotating agitator and vibrator to help flow but there is usually some dry colorant left which is settled and which would not meter properly. Therefore it is necessary to follow this procedure:

- 1) Do not allow color canister or bin level to drop below one-third full (Level of agitator axle). Level sensors are available to signal low color levels.
- 2) Remove the canister or bin and dump settled dry colorant into the colorant stock container when refilling or changing colors. By always emptying the container, you will agitate the settled material adequately for metering. Extra color canisters or bins will speed refilling and color changes and these may be properly filled with fresh material in a central color room so that dust and spillage will be kept from the processing areas.

COLOR DRIVE MOTORS, HIGH VOLUME COLOR BINS

Standard speed color drive motors for dry colorants or other powdered additives are 60 rpm. Optional speeds available for special conditions are: 120 and 200 rpm. The 60 rpm motor will be suitable for most colors; however, for colors requiring high or low letdown the other motors can be used. Conair will help pick the right one.

When extremely high letdown requirements exist, a high volume bin may be provided with a larger metering screw. On Series 600 Autocolors two (2) bins may be utilized if required.

A critical Coloring Kit is available for extremely precise metering control over pelletized or powdered additives. The Kit includes a revolution counter instead of a Color Timer and a Brake motor instead of the standard drive assembly.

INITIAL SET UP

- 1) Lift the Autocolor from its packing carton and set it, with shipping board still attached, at a convenient height for calibration. Be careful not to damage the paddle level switch assembly, if your unit is equipped with this, as it protrudes below the base frame. An open drum is usually a good temporary platform for the unit for calibration prior to machine mounting unless your Autocolor is shipped with its own HandyHopper in which case you can mount the unit on the machine initially. Follow mounting instructions on Form 516; Instructions for HandyHoppers, attached, then return to step 2.

2) Connect a 75-to-100 psi compressed air supply to the air line filter on the Autocolor. (Adequate pressure must be available to unit to insure operation). Use a $\frac{5}{8}$ inch I.D. air hose clamped to the $\frac{5}{8}$ inch O.D. nipple on the air line filter. It is desirable not to use a quick disconnect since the smaller orifice restricts air flow. Make sure the air hose is long enough to allow mounting of the Autocolor on the machine hopper later (if calibration is done off the machine).

WARNING

An air pressure supply exceeding 100 psi can damage the loader filter. Air supply must be free of oil and water. The use of dirty, oily, or wet air, or the use of excessive air pressure can cause filter failure allowing plastic particles to enter the vacuum source and cause damage.

RATIO (TWO-TUBE) AUTOCOLORS

3) Ratio Autocolors will include a Conair Line Valve which is fitted into the regrind feed tube (right hand tube, facing hopper) in a vertical portion of that line. This position prevents the flexible liner from closing on material in the tube. This Line Valve should be in place prior to calibration to prevent vacuum loss during its portion of the cycle.

The Line Valve is closed during virgin loading so that 100% of the vacuum is available for virgin material loading. Five to seven seconds after the virgin side fills, the regrind valve opens. The full vacuum is then transmitted through the open regrind line. If the regrind source is empty, the valve assures a load of virgin by preventing a venting of the vacuum through the regrind line. Always leave a minimum setting of 5 - seconds on the regrind timer, even when no regrind is being conveyed. This assures complete cycle operation.

There's an important flexible vacuum tubing connection between the Line Valve and a fitting on the special regrind material line coupler which must be in place to assure proper Line Valve operation. This connection provides a slight vacuum to the exterior of the collapsible liner in the valve to assure fast, complete opening whenever the virgin side of the hopper is filled.

The Adjustable Divider Plate (ADP) is fully gasketed to provide a complete seal between the two segments of the hopper so that powders can't migrate between segments during vacuum loading. Maintaining this seal is important in powder applications, so strict attention to adjustment techniques is required. (See page 12.)

Normally the hopper will be filled with virgin material first, then the second part of the loading cycle will fill the regrind side of the hopper. It is recommended that the left hand material tube (facing the tubes from the outside of the hopper) be used for the material loaded first. This will support the ADP during the high vacuum created in the second stage of the loading cycle and help keep the ADP from moving should it not be securely fastened.

ALL AUTOCOLORS

The length of time to be set for virgin loading depends primarily on the density, particle size and shape, and the conveying distance of the material being conveyed. Since completely filling of the loading chamber volumetrically weighs the material, assuring the same load weight from cycle to cycle, it is very important that the amount of vacuum on time is sufficient.

4) Connect the plug on the long, multi-wire cable into the jack on the remote control box. The control box can be located at any convenient location within reach of this cable.

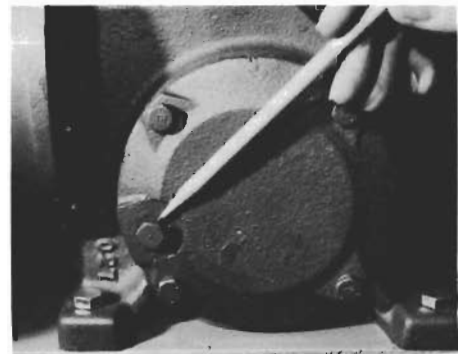
5) Plug the control box power cord into a 120/1/60 receptacle. Do not use voltages below 100/1/60; damage to electric motors may result.

SAFETY PRECAUTION

USE A GROUNDED ELECTRICAL SOURCE

6) Replace solid shipping plug on top of mixer motor housing, with vented plug. See that lubricant in the mixer motor is at the correct level. Remove the lubricant-level plug on the mixer motor transmission housing. On Reliance motors the lubricant-level plug is either painted red or is brass. On U.S. motors, there are four Allen key bolts. Either of the two bolts at mid-height serves as the lubricant-level plug. If necessary, remove the plug on the top of the housing and fill housing with gear-lube up to the lubricant-level plug hole. DO NOT OVERFILL.

Use SAE 140 gear lube for operation at ambient temperatures from 15 degrees F. to 110 degrees F. See tag on motor for recommended lubricants and related information. Make sure there is an air pocket below the fill hole to prevent lubricant from welling out due to heat expansion. Replace all plugs.



Fill transmission with SAE 140 to level plug

7) Temporarily connect the flexible material feed tubing, supplied with the hopper loader, to the material inlet of the vacuum hopper. The other end of the flexible tubing should be clamped to the vented feed tube and placed in a supply of the virgin material.

8) When the main "power on" switch is placed in the Auto position, the vacuum motor is turned on (note that main switch will not actuate if the manual color check switch is left in an "on" position). Inside the control panel a plug-in timer with dial type adjustment controls the length of time the vacuum motor remains on (except for Sensor controlled units). This timer is labeled "virgin loading". See Timer and Cam Functions. (Page 13).

(If your Autocolor includes solid state level sensor(s) in the vacuum hopper, refer to Sensor Control Section, page 14 and note the operating set-up instructions for this type unit. Then return to this section and continue following these instructions at paragraph 9).

When loading with an integral motor loader, you can determine that the hopper is completely filled by opening the hopper cover after the unit turns off and before the Conic Valve opens (about 10 second delay). A distinct, audible speed-up of the loader motor also indicates a full hopper.

If the Autocolor is filled by a positive displacement vacuum loader, a high vacuum reading on the power unit gauge indicates a full vacuum hopper.

To set the "vacuum on" timer simply determine with a wrist watch or stop watch the exact number of seconds required to completely fill the chamber. To the actual loading time add a five second safety factor and set this time on the adjustable timer. Example: actual loading time 16 seconds plus 5 second safety factor = 21 seconds. Set timer for 21 seconds.

9) At the control box, turn the power switch to "AUTO" and push the Color Check Switch down (OFF). Determine that the Autocolor functions occur in the sequence described on Pages 5 or 6. The loading time interval is preset at the factory for normal beside-the-press conveying distances. After confirming correct sequence on the graphic control face, turn power switch to "STOP". Plug in the color motor and vibrator (if included).

10) Set the COLOR CONTROL dial, which determines how long colorant is metered into the mixing drum each cycle. There are two ways to set this dial: The simplified method and the precise method.

SIMPLIFIED METHOD FOR AVERAGE COLORING

The easiest way to set the color metering time is to simply leave the COLOR CONTROL timer dial setting at 15 seconds, and make trial-and-error corrections after the Autocolor is started. Normally, a hopper load of material would be used before the effect of a dial change could be seen. To avoid this, turn the power switch off after the vacuum chamber is loaded, and allow only that load to dump into the hopper. (Note that the control has an automatic provision causing it to complete one full cycle even if the switch is turned off in the middle of the cycle). Once the minimum colorant requirement is established by examining the parts, the COLOR CONTROL timer will repeatably control colorant metering.

PRECISE METHOD FOR CRITICAL COLORING

To precalibrate the color metering time, the following procedure can be used for either dry color or color concentrate:

A. Remove the mixing drum agitator assembly. Loosen the clamps on either side and grasp the agitator extension.

CAUTION

LIFT THE RED HANDLE WHEN REMOVING DRUM

(See Figure 9A)

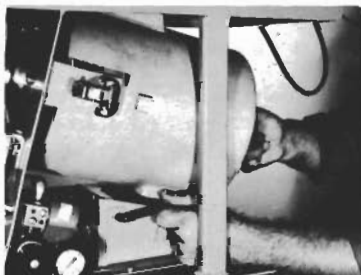


Fig. 9-A Lift red handle and slide mixing drum assembly back. Hold to agitator shaft to steady drum.

Slide the drum straight back from the plate by pulling on the end of the agitator shaft to disengage it at the hex coupling (Fig. 9B)

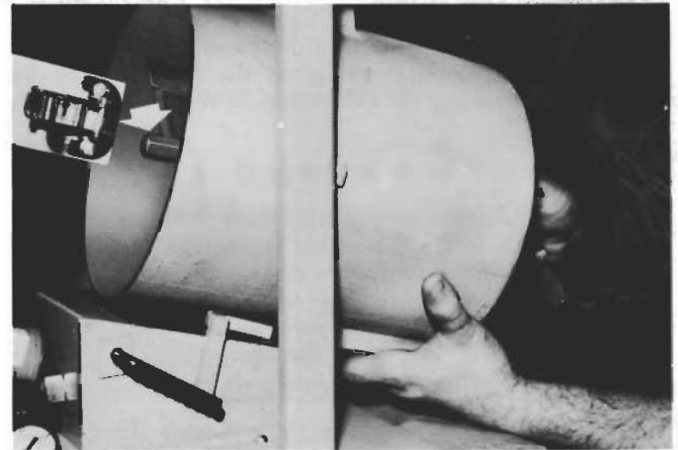


Fig. 9-B Hold drum valve closed with hand to prevent spilling material.

B. Compressed air and electrical power should be connected. Check.

C. Determine, by weight, the amount of virgin loaded in the vacuum hopper during one loading cycle. Make sure a full load of virgin is measured for accurate color calibration. This is automatically assured by the level sensor located in the vacuum hopper (see Sensor Control Section page 14) Follow procedures 7) and 8), page 8.

NOTE:

While it is not necessary to consider regrinds in the initial coloring settings of Ratio Autocolors, it is important to have the desired regrind/virgin ratio setting in the vacuum receiver so that an accurate amount of virgin will be tested against the amount of colorant to be added. Therefore move the adjustable plate to the setting selected for ratio with virgin prior to calibration tests.

D. Catch the initial load of virgin material in a bag or pre-weight box held under the Conic Valve discharge as shown (Fig. 9C). Weigh and record. This figure can be used for all color calibrations with this same kind of virgin material. If the amount of virgin to regrind is changed in a Ratio Autocolor hopper, the unit's color settings must be recalibrated to the new volume of virgin being colored.



Fig. 9-C Catch one load of virgin in bag or pre-weighted box.

E. Unplug vibrator lead and remove vibrator from canister. (if powder bin or pellet bin are used, ignore this step) Loosen swing-away mount knob, lift mounting bracket clip and swing color metering motor out of the way. If low-color level sensor is included, loosen clamp screw and move back out of the way. If concentrates are used they can be filled while metering bin is on the Autocolor.

When using powdered additives, fill the color canister, or bin, in remote area, rather than on the unit. This will eliminate unnecessary dust from filling or spillage. See Page 7 "Use the Right Procedure".

Install the color canister or bin (remove discharge spout cap). Plug in agitator motor and vibrator (if included).

F. Set COLOR CONTROL timer at 15 seconds. Leave the Power Switch at "STOP".

G. Hold pre-weighed cup under the color discharge opening as shown (Fig.10A) and turn on the Color Check switch (push up). A 15-second charge of colorant will fall into the cup.

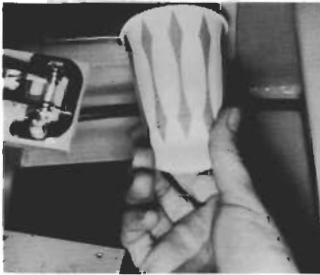


Fig. 10-A Catch metered colorant in pre-weighed cup.

H. Weigh the dry color and cup on a small scale and determine the weight of colorant. For better accuracy, you can meter five charges of color and take the average value. A gram scale is the most convenient since most color manufacturers specify requirements in grams of dry color per 100 pounds of plastic. The weight of dry color required is easily calculated. For example, if your particular Autocolor loads 9.0 lbs. per cycle (Step D) and the manufacturer recommends 150 grams per hundred pounds, simply multiply 150 by 9/100 to get 13.5 grams required.

I. Adjust the color timer in proportion to the color charge desired. For example, if 15 seconds on the color timer gives you 18 grams of color, and you require 13.5 grams of color, simply multiply the color metering time (15 seconds) by ratio of color required over color metered (13.5/18.0). $15 \text{ sec.} \times 13.5 \text{ gram}/18.0 \text{ gram} = 11.2 \text{ sec.}$

J. Catch and weigh another charge of dry color. Adjust color timer as necessary. Usually preciseness of metering is not critical. An Autocolor oriented colorant might meter with a repeatability of + or - 1/2%.

In many applications the amount of colorant will not affect the actual color of the part, but only the opaqueness of the part. How critical the metering is depends entirely on the end product. (If inconsistent color metering is encountered, request an Autocolor-oriented colorant from your supplier).

K. Record the correct color metering time for future use. The metering time for color from different manufacturers will usually be different.

Once the proper COLOR CONTROL Calibration setting is determined and recorded, shut down the unit, remove color canister or bin using cap to prevent spillage (Fig. 10B),

empty and clean the color canister or bin, disconnect air and electrical connections and disassemble conveying tube to vacuum hopper. Replace mixing drum assembly making sure motor drive shaft engages the agitator paddle in the drum. (Fig. 9B) It is not necessary to lift the red handle when replacing the drum. Make sure drum is securely latched into place.

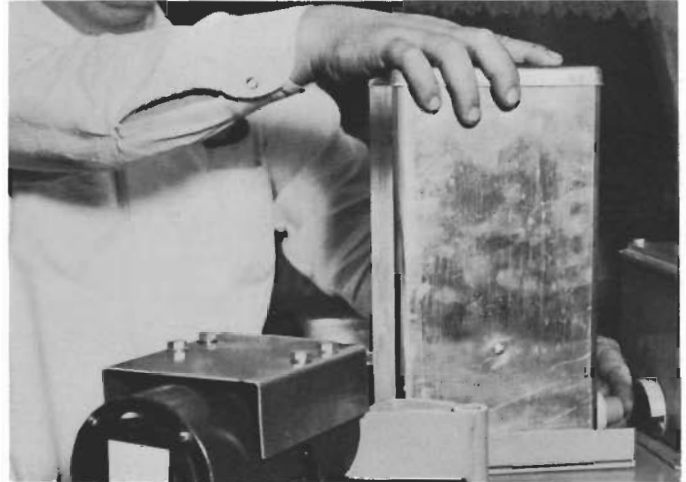


Fig. 10-B Always cover canister and put cap on spout when removing or carrying.

NOTE: IF YOUR AUTOCOLOR IS EQUIPPED WITH A HANDYHOPPER. REFER TO INSTALLATION SECTION OF FORM 516A. ATTACHED INSTEAD OF THE FOLLOWING MACHINE MOUNTING INSTRUCTIONS.

MACHINE MOUNTING THE AUTOCOLOR

The machine hopper must be large enough to accept a full load from the vacuum hopper after the level switch trips. This is necessary because after a load of material trips the switch, the unit will complete one more cycle and the Conic Valve must be able to close for this cycle.

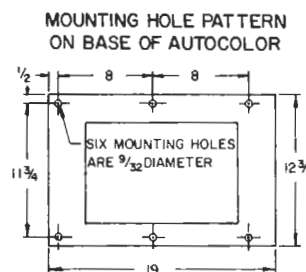


Fig. 10-C 300 Series

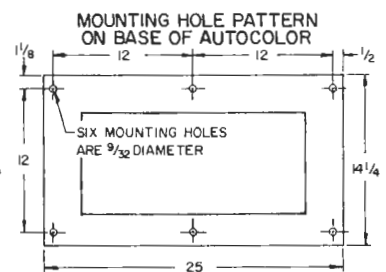


Fig. 10-D 600 Series

1. For a permanent, dust-tight installation, the Autocolor should be mounted directly on the machine hopper cover. If the present cover is not satisfactory to support the unit solidly, it should be braced or special arrangements should be made to provide a solid, sealed installation. Figures 10C and 10D show mounting hole patterns for the 300 Series and 600 Series bases. Provisions for lifting the Autocolor clear for complete machine hopper cleaning should be made unless HandyHopper is used. Conair can provide a lifting yoke which fits the frame for this purpose.

2. The hopper level switch should be lowered as far as possible for ultimate sensitivity. Be sure inside curve of the paddle faces the material (Fig. 11A). Make sure set screws on level sensor shaft are tight and check that its position is not too low for the machine hopper. It should have four (4) inches of space from the hopper wall to swing back through when plastic piles against the inside curve of the blade. See Figure 11A for minimum machine hopper dimensions for satisfactory operation.

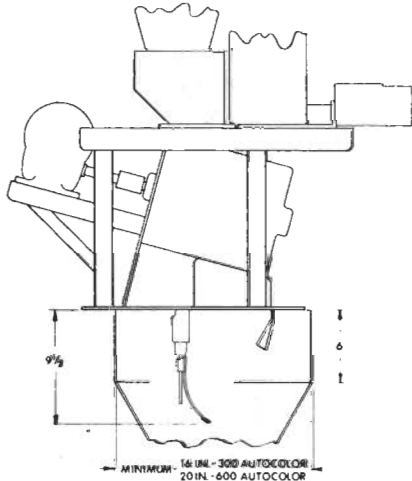


Fig. 11-A Minimum machine hopper dimensions for Auto-color mounting.

NOTE: FOR UNITS EQUIPPED WITH SOLID-STATE LEVEL SENSORS SEE SENSOR CONTROL SECTION, PAGE 14.

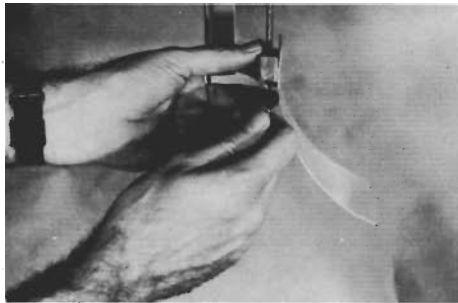


Fig. 11-B Loosen set screws to lower blade for level sensing. Inside curve of blade faces material.

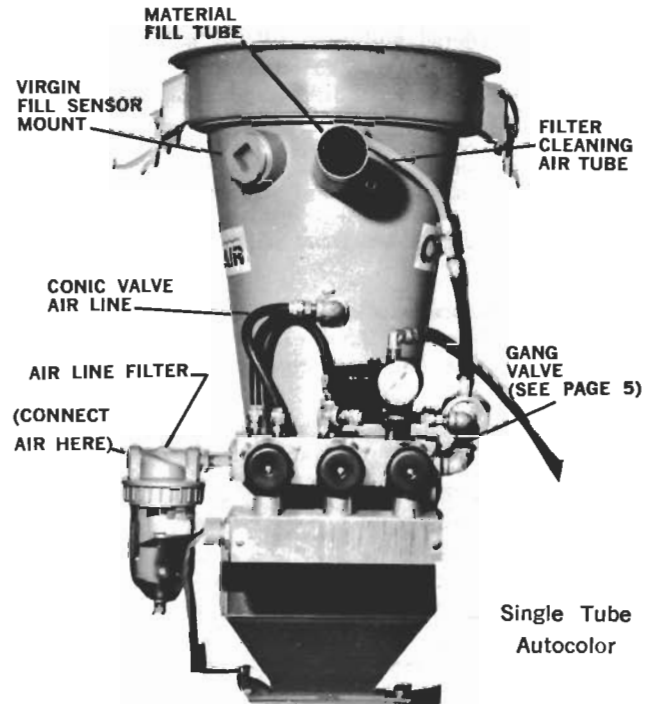
CAUTION

If the sensing blade is not properly positioned and oriented, the material-loading motor will run during every operating cycle. As the motor runs, the material will back up into the drum and the vacuum chamber and damage to Conic Valve and mixer motor is possible.

3. Before mounting the unit on the prepared cover, be sure it is properly oriented for material feeding to material sources and the color canisters or bins are accessible. Mount the unit on the cover, fastening with self lagging screws or bolts and locknuts. Be especially careful not to damage the level switch when lowering the assembled Autocolor and cover onto the machine hopper.

4. Mount the graphic control panel on a convenient, protected surface within the span of the control cable lead from the Autocolor.

5. Cut a conveying tube and connect, with coupler, to the material inlet tube on the vacuum hopper. Additional E.M.T. can be purchased locally, but we recommend using Conair vacuum tight couplers. It's important to make sure tubing is butted between the two 'O' ring seals. Do not overtighten coupler screws.



6. If Ratio Autocolor is being installed, mount the Conair Line Valve in a vertical section of the regrind feed line. Refer back to description and installation guide for these Valves on Page 8, paragraph 3) under Initial Set Up.

7. Clamp the flexible feed tube and the vertical feed tube to the rigid tubing entering the loader. The feed tube should just touch the bottom of the material container. If horizontal tube is used, cut a hole near the bottom of the bin to accommodate the feed and air tube (see Fig. 11C). Clamp flexible feed tube between adjustable feed tube and rigid conveying line to allow flow adjustment.

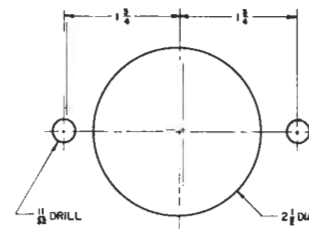


Fig. 11-C Horizontal feed tube mounting dimensions for 1 1/2" EMT.

Vertical and horizontal feed tubes are adjustable for the air-to-material ratio best for your conveying distance and material. Keep the air vent unobstructed. If surging occurs during loading you need more air in the tube. Turn the adjustment screw to open or close the vent. When using the horizontal feed, sliding adjustable tube in or out changes the air-to-material ratio. Air is introduced through the top vent tube.

RATIO AUTOCOLORS

8. Refer to Figures 12-A, 12-B, and 12-C for ADP Ratio Autocolor hopper adjustment procedure. Set Adjustable Divider Plate for approximate virgin/regrind ratio.

Remember that the first material to be loaded will enter the left tube (as you face the side by side tubes from outside the hopper). This is usually the virgin material tube and therefore the right tube will be loading the selected ratio of regrind. The plate should be relocated to a setting which approximates the desired proportion. The calibration chart on the rim of the vacuum hopper is accurate for the percent of hopper volume that the segment will hold. If 10% regrind is desired during each load, set the divider plate at "10/90". The right hand tube will fill the smaller segment with regrind.

9. Complete compressed air connection to air filter on the Autocolor and plug connection between the Autocolor and its remote, graphic control enclosure. Plug into power source. Check all other plug connections (color feed screw motor, vibrator on dry color units, etc.). The unit is now ready to run.

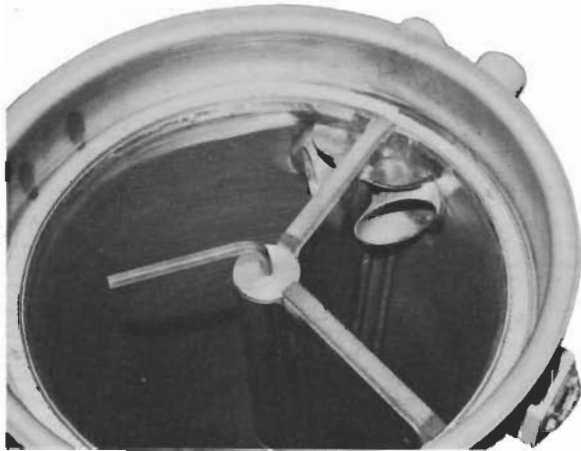


Fig. 12-A Always loosen and remove the hold down screw before moving the adjustable divider plate. A $\frac{3}{8}$ " Allen wrench is used. Be sure to tighten this screw when plate is set at desired position. Replace filter prior to closing hopper cover.

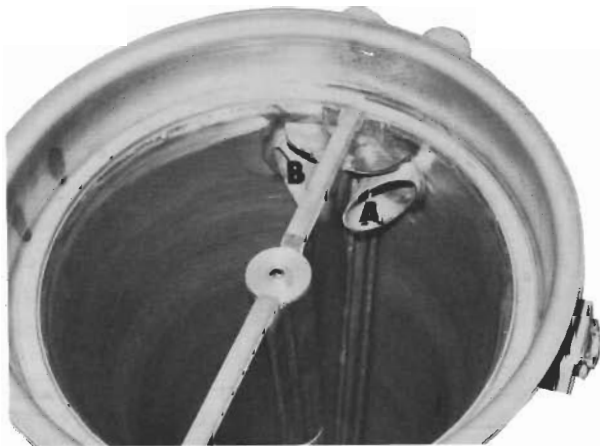
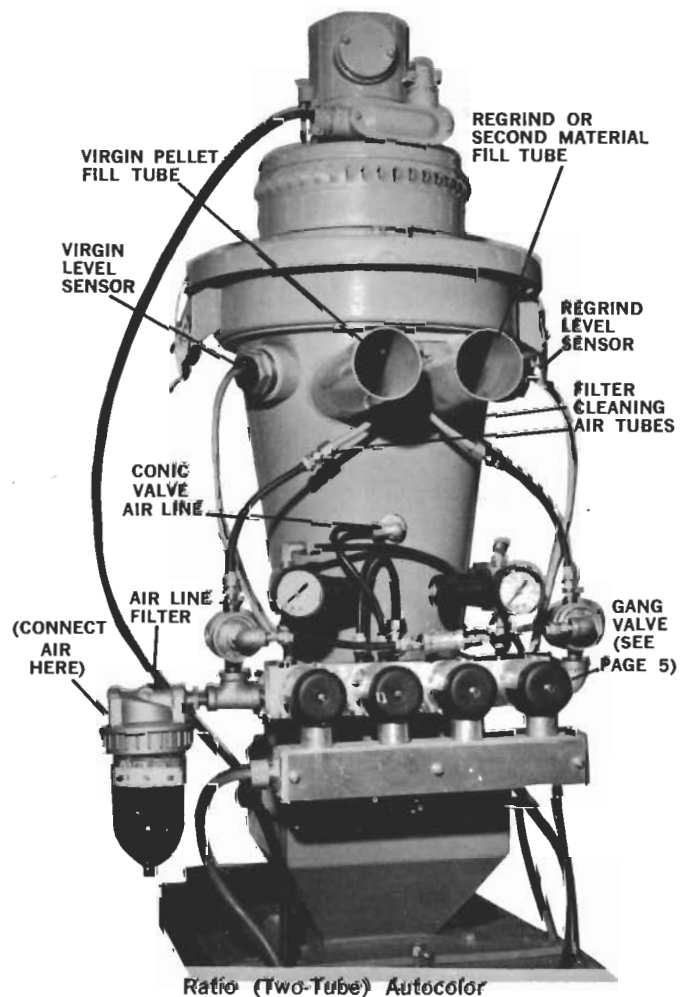


Fig. 12-B In this position equal volumetric amounts of virgin and regrind will be loaded. The ratio calibration is on the rim of the hopper. Tube A would fill first (usually the virgin material) and Tube B would fill next (usually regrind).



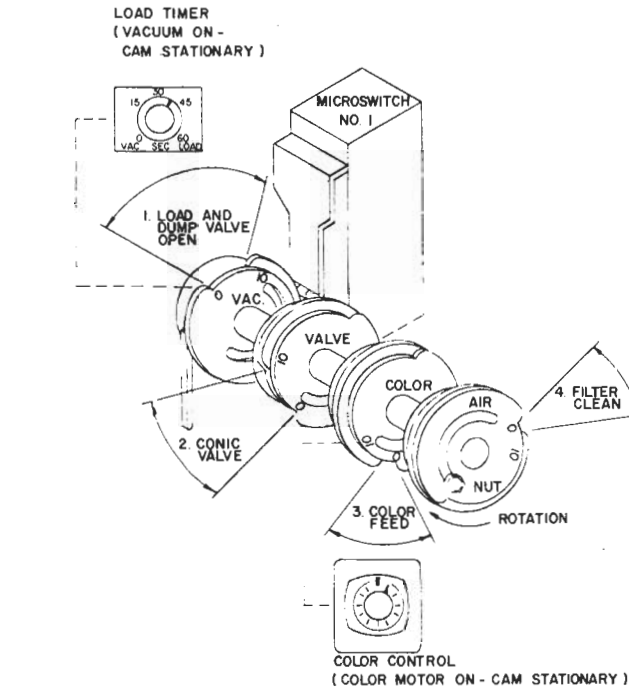
Fig. 12-C The hopper filter has two distinct sides, one made of a sateen cloth, one of a urethane foam. The urethane side fits against the expanded metal support in the hopper cover. Properly installed, the filter's urethane foam side is up.



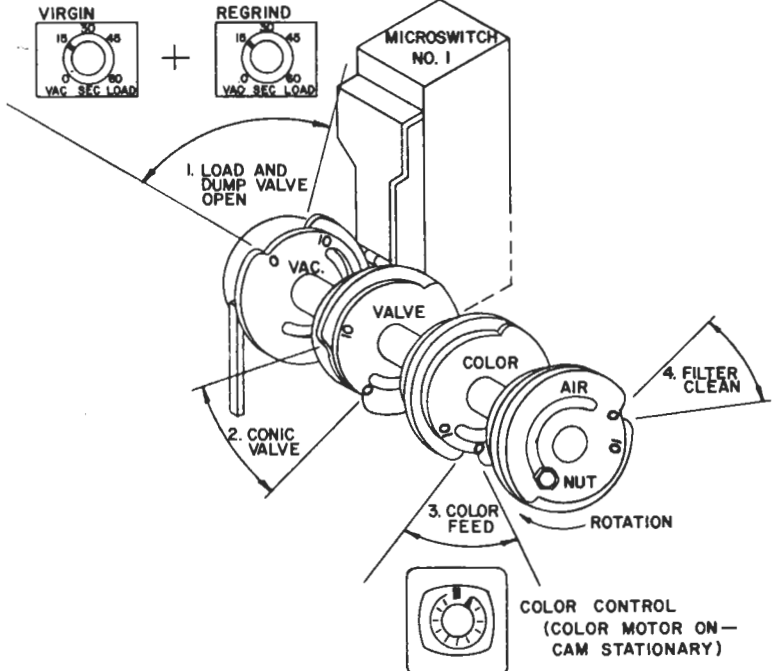
Ratio (Two-Tube) Autocolor

NOTE: IF YOUR AUTOCOLOR INCLUDES SOLID-STATE LEVEL SENSORS, SEE SENSOR CONTROL SECTION, PAGE 14, FOR VACUUM LOAD CONTROL AND ADJUSTMENTS.

**LOAD TIMERS
(VACUUM ON - CAM STATIONARY)**



FACTORY SETTING		ADJUSTABLE WITH SEPARATE TIMER					
CAM	PERCENT	0	25	50	75	100	
	SECONDS	0	10	20	30	40	50
1	VAC LOAD	10-60 SEC.					
	DUMP VALVE OPEN	8 SEC.					
2	CONIC VALVE OPEN	8 SEC.					
3	COLOR FEED	0-2 MIN.					
4	FILTER CLEANING	2 SEC.					



FACTORY SETTING		ADJUSTABLE WITH SEPARATE TIMER					
CAM	PERCENT	0	25	50	75	100	
	SECONDS	0	10	20	30	40	50
1	VAC LOAD	10-60 SEC.					
	VIRGIN	10-60 SEC.					
	REGRIND	5-50 SEC.					
	DUMP VALVE OPEN	8 SEC.					
2	CONIC VALVE OPEN	8 SEC.					
3	COLOR FEED	0-2 MIN.					
4	FILTER CLEANING	2 SEC.					

**TIMER AND CAM FUNCTIONS
SINGLE TUBE UNITS**

1. Adjustable timer for virgin loading controls #1 cam which holds position until timer times out. With #1 cam in this position, the mixing chamber dump valve is held open, allowing mixed materials to dump to processing.

All Vacuum Load Time changes are made on the Adjustable Timer; no cam adjustments are necessary.

2. #2 cam controls opening and closing of Conic Valve on vacuum hopper throat. Sufficient delay between #1 and #2 is needed to allow vacuum motor to stop completely before opening Conic Valve.

3. #3 cam actuates the external COLOR CONTROL timer. Sequence holds here until COLOR CONTROL timer times out.

4. #4 cam actuates the burst of compressed air for automatic filter cleaning in the hopper loader cover.

**TIMER AND CAM FUNCTIONS
RATIO (TWO TUBE) UNITS**

1. Adjustable timer for virgin loading controls the line valve mounted in the regrind tube. When the virgin load timer times out, the line valve opens and the adjustable timer for regrind loading controls the regrind loading time.

The #1 cam holds position until both the virgin and regrind load timers time out. With the cam in this position, the mixing chamber dump valve is held open, allowing mixed materials to dump to processing.

All virgin and regrind load time changes are made on the adjustable timers; no cam adjustments are necessary.

2. #2 cam controls opening and closing of Conic Valve on vacuum hopper throat. Sufficient delay between #1 and #2 is needed to allow vacuum motor to stop completely before opening Conic Valve.

3. #3 cam actuates the external COLOR CONTROL timer Sequence holds here until COLOR CONTROL timer times out.

4. #4 cam actuates the burst of compressed air for automatic filter cleaning in the hopper loader cover.

OPERATION

1. Check that compressed air is turned on and is delivering between 75-100 psig. Set both pressure regulators on the Autocolor for 40 psig operation.

2. Always make sure a filter is in place in the hopper cover before operating the unit. Without it the integral motor will be damaged or the positive displacement pump can be loaded with powder. Note the proper installation. The foam urethane side of the filter should be up, away from the material tube inlets. The compressed air blow-back lines will blow across the cloth face of the filter following each loading cycle.

3. **COLOR CHECK** switch should be OFF (down). Turn power switch to AUTO (don't operate the Autocolor if voltage supply is below 100 v.a.c.; damage to electrical motors may result). The Autocolor will begin to operate.

4. If virgin or regrind material flow is not smooth for the installed conveying distance, adjust the feed devices as described. Check the virgin source periodically so that the Autocolor is not starved for virgin material. If your unit includes a sensor in the vacuum hopper, the unit will stop automatically if you run out of virgin - See Sensor Control Section.

5. Check and refill the colorant supply at regular intervals. Do not refill dry colorants on the machine. See Page 7, "Use The Right Procedure". This prevents spillage in the molding room and assures consistent coloring. Low color level sensors may be included with your unit to signal low level.

RATIO AUTOCOLORS

1. The most important operating instruction is the method used to adjust the ADP in the vacuum hopper. By using care, the gasketing which seals the segments of the hopper will last indefinitely.

The hold-down screw and cap which can be loosened with a $\frac{3}{8}$ " Allen wrench (center of plate, over Conic Valve) must be fully removed to relocate the plate to a new setting! If the screw is merely loosened and the plate pushed against the walls of the hopper the gasketing can be torn loose or displaced and leaks will occur between hopper segments.

IMPORTANT: The virgin side of the Autocolor Loader must fill before opening the regrind line valve. Filling the virgin side completely closes off the virgin line so there is no loss of vacuum through that line when the regrind line valve opens. It is important that the full vacuum be transmitted through the regrind line since regrinds are more difficult than virgin to convey.

2. Be sure to adjust the regrind load timer so that the load time slightly exceeds the time it takes for this side of the hopper to fill. This will ensure a full load each time and maintain maximum operating efficiency. (If Sensors are included in the regrind side of the hopper, see following section). Always install the Conair Line Valve in the regrind line on a vertical section of the regrind line.

SENSOR CONTROL SECTION

(For Autocolors with Solid-State Level Sensors)

SINGLE TUBE MODELS

A material sensor is located in the virgin material chamber to ensure a full load of material each cycle, a critical requirement for repeatable accuracy for coloring. The

sensor provides protection against a partial virgin load due to depletion of the material source, clogged loader filter, a break in the material line, etc. If a full load isn't received, the Autocolor will automatically shut down and signal the operator. This prevents an improperly mixed batch being fed into your machine.

The length of time the vacuum motor (or pump) operates is controlled by the sensor instead of the adjustable timers in the control enclosure (vacuum timers) see paragraph 8, pg. 8. Conveying distance and flow characteristics of the materials are compensated for because the loader will keep running until the sensor head is covered.

An "alarm" timer (3 TM) is provided inside the control box (this is the dialtype timer used for vacuum-on control). The correct setting on this timer is the time required to load a full load of virgin material plus a 25% safety factor.

During initial startup set this timer to its maximum setting. Time the number of seconds needed to completely fill the loader, then turn the timer back to the actual fill time plus 25%. (When the chamber is full the sensor will turn off the "load" light.) (Example 15 seconds actual load time plus 4 seconds = 19 second timer setting.)

If for any reason the hopper does not fill in the set time, the Autocolor will shut down and the "low material" light on the face of the control box will flash. (The same signal can be used to actuate an audible alarm if desired.) After correction of the reason for the incomplete load, push the "reset" button (on face of control) to restart the Autocolor. It will start again in the "loading" mode of the cycle.

RATIO MODELS (two material tubes -- ADP-Adjustable Divider Plate-Vacuum Hopper)

Sensors In Virgin Material Side Only:

Use the same procedure as described for single tube models. In normal operation the virgin side will load first with the regrind valve in a closed position. When the virgin material level covers the sensor, the regrind valve will open and the vacuum pump will continue to run and convey regrind for the length of time set on the "regrind" timer. (The regrind timer is located just to the right of the "alarm" timer in the control enclosure.)

Sensors In Both Sides Of ADP Vacuum Hoppers:

Autocolor units including Sensors for positive volume control of both materials, have a two position toggle switch on the control panel for selection of "virgin and regrind" or "virgin only". This switch must be placed in the "virgin only" position if no regrind is available. If the switch is in the "virgin and regrind" position the Autocolor will load both virgin and regrind materials then continue with the remaining cycle only after both sensors are covered. If for any reason either sensor is not covered, the Autocolor will stop and the "low material" light will light on the control panel.

These Autocolors include only one alarm timer. The time setting on this alarm timer must include the time necessary to fill the virgin side of the hopper, plus the regrind side, plus 25% safety factor. Special timers are available for unusual installations.

ADJUSTING SENSITIVITY - ALL SENSOR CONTROLLED MODELS

If the Autocolor doesn't get a full load yet continues through the cycle, the sensor(s) may have too sensitive a setting. Turn the screw on back of the sensing head counter-clockwise (half turn increments), while cycling the Autocolor, until a full load is achieved.

If the loading chamber(s) is filled completely, but the low material alarm shuts down the Autocolor, increase sensitivity by turning the screw clock-wise (half turn increments) while pressing the "reset" button until the Autocolor completes a normal cycle.

LOW COLOR LEVEL SENSORS:

Autocolors may be fitted with sensors that signal low colorant levels. These sense through the plastic canisters or storage bin sight glasses. Adjust sensing head to the desired level by loosening the screw on the mounting post. They should not be positioned below the agitator shaft on dry color canisters. When the color canister or bin is installed the sensor should just touch the side of the canister or the sight glass.

When the colorant falls below the sensor level, the amber light marked "low color" on the control box will flash. Sensitivity for proper signalling is adjusted as described above.

COLOR CHANGING AND CLEANING - ALL MODELS

1. Turn power switch to STOP. The Autocolor will complete its cycle as can be seen on the graphic control face. The POWER ON light will remain lit until unit completes the cycle.
2. Remove the mixing drum. See Figures 9A and 9B. Hold the discharge flap on the drum bottom closed with one hand to prevent spilling residue which may be in the drum.
3. Unplug and remove the color canister. See Page 7, "Use The Right Procedure". Use the plastic cap for the color discharge spout on dry color canisters and bins to prevent spilling residue colorants.
4. Clean. Clean the mixing drum and color concentrate canister(s) or bin(s). Use rags wet with detergent and water, or a suitable solvent for the colorant. Dry all parts. If desired, drum, agitators and canisters may be completely submerged in water or solvent. A long handled brush is helpful.

The use of spare canisters, bins, drums and drum agitators is recommended if frequent color changes are made. Spares make color change fast and easy, reduce labor requirements for cleaning. Spare color canisters are inexpensive. Having one for each colorant completely eliminates cleaning of the canisters.

5. After cleaning the machine hopper and all other areas which might contaminate new colors, replace the mixing drum assembly. Fill color canister or bin with new colorant and reinstall on the Autocolor.

6. Reconnect all electrical plugs which may have been removed during cleaning, check air and power supplies and restart as described.

COLOR CONCENTRATE MODELS

Operation is virtually the same as models equipped for use with dry color, but color concentrate Autocolors are different in several important respects.

Because of their large size, color concentrate pellets require an increased storage volume. A color pellet metering bin is used instead of a dry color canister. Larger color feed screws and outlet openings are provided with pellet metering bins. Since concentrates are free feeding (no packing and bridging), no inside paddle wheel and no vibrator are needed. A 1/10 hp color feed motor (120 r.p.m.) is standard on all color concentrate Autocolors.

Color feed canisters and pellet metering bins are interchangeable on Autocolor Hopper Loaders. However, the dry color canister should never be used to feed concentrate, and the concentrate bin should never be used to feed dry colorant. Erratic metering or stoppage will result.

CHANGING FROM CANISTER TO BIN

When changing from a dry colorant canister to a pellet metering bin, remove the color-feed-opening bushing in the loader mount casting (Figure 15A) to accommodate the larger outlet on the concentrate hopper.

The timer setting is determined in the same manner as with dry colorant.

On color concentrate Autocolors, the standard color motor is geared to turn the color feed screw at higher speeds; 120 rpm is typical. Faster speed is necessary (than on dry color Autocolors) because of the large volume of concentrate to be metered during each cycle. Optional 60 and 200 rpm motors are available for unusually low or high letdown requirements.

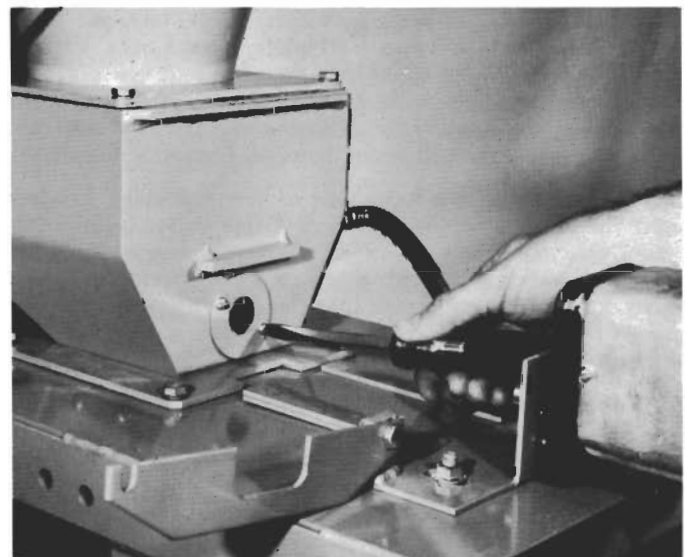


Fig. 15-A

If a very large amount of concentrate is required, or the concentrate bin is too high for safe access, the level of color concentrate in the bin can be automatically maintained with a Conair Pellet Loader (Model 100-073) mounted on top of the bin. Using the loader, concentrate is loaded from large containers located beside the processing machine. (Pellet Loaders cannot be used on dry color in powder form).

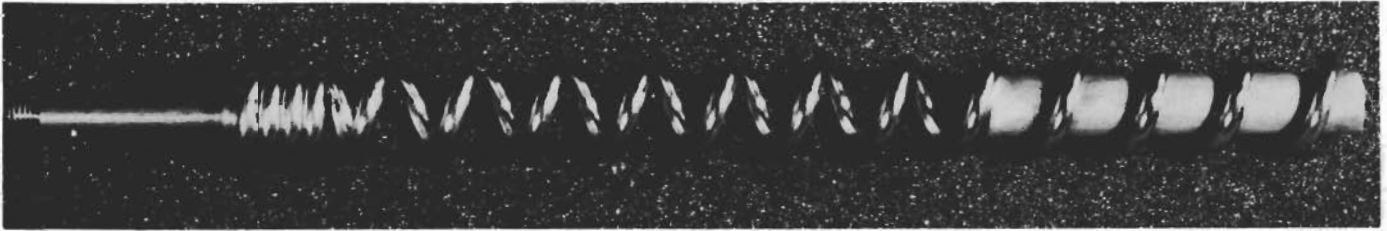


Fig. 16A Use dowel in color feed screw to accurately meter small amounts of color.

SPECIAL APPLICATIONS

To meter small amounts of color more accurately, an aluminum dowel can be inserted into the discharge end of the standard dry color feed screw. See Figure 16A. These dowels have a $\frac{3}{8}$ inch O.D. and are 2 inches long. Using a dowel reduces the amount of color fed, during a given time and at a given rpm, to approximately $\frac{1}{3}$ the normal amount. Using the dowel and setting the color timer to make the color-feed time three times as long, will cause the Autocolor to meter in about the same amount of material. The advantage is that since the time period is approximately three times as long, and control time variations are relatively constant, the accuracy will be greatly improved. Dowels and feed screws with the dowels inserted are available from Conair.

NON COLORING USES

Additives — Autocolor Hopper Loaders are used to meter and blend in blowing agents, zinc stearate, boric acid powder, and other additives and lubricants.

Autocolors with two metering assemblies are available. For Autocolors having only one canister or bin, an additive can be blended in rather than color.

Mixing — Ratio Autocolor Hopper Loaders can be used to mix two plastic materials which do not require coloring. In this case the loading time can be greatly increased. To avoid unnecessary use of the color drive motor, set the color timer to zero.

MAINTENANCE

Autocolor — Check compressed air filter bowl for indications of oil or water at least once each week. Turn screw in bottom of filter clockwise to drain. If heavily loaded, check loader filter and replace if clogged. A clogged filter can rupture and motor damage could result. Install air line cleaner or supplementary filter if air is overloaded with water and/or oil.

Check gear lube level in mixing drum motor transmission each month. Fill as described on Page 8. Change after 750 hours or more often if motor is in dusty area. See Page 8 and tags for instructions on filling transmission.

TROUBLE SHOOTING GUIDE FOR AUTOCOLORS INCLUDING SOLID-STATE LEVEL SENSORS

DIFFICULTY	ITEM	PROBABLE CAUSE	CORRECTION
Virgin or regrind load portion of Autocolor cycle is bypassed	1	Sensor in virgin chamber is out of adjustment	See Sensor Adjustment Page 15
Virgin or regrind chamber is not filled, but Autocolor continues through cycle	2	See Item 1	
Virgin or regrind chamber fills but low material alarm comes on	3	See Item 1	
Color canister runs out of color, but low color light does not come on	4	Color level sensor out of adjustment	See Sensor Adjustment Page 15
Color canister is full but color light still blinks	5	See Item 6	

ALL AUTOCOLORS

DIFFICULTY	ITEM NO.	PROBABLE CAUSE	CORRECTION
Controls, loader will not operate.	1. 2.	Level switch malfunction. Fuse blown	Check, replace. Replace. Check for short.
Loader motor won't turn on.	3.	Motor burn-out.	Repair or replace.
Loader motor runs, little or no material conveyed. (Ratio Autocolors only)	4. 5. 6. 7. 8. 9.	Feed tube or conveying line blocked. Vacuum leak. Too much "dead" time in loading cycle. Loader motor brushes worn. Loader filter clogged. Regrind Line Valve not closing.	Clear obstruction. Check tube connections and hopper cover. Check Conic Valve for seal. Needs minimum 1/2" air line. Lengthen "on" time by adjusting "Virgin Loading" time. Replace. Clean or replace. Line Valve should be in vertical or slanted position. Check air supply and Ratio Loading Timer. (Ratio Autocolor Controls only)
Surging during loading.	10. 11.	Improper conveying air-to-material ratio. Feed or conveying tubes blocked.	Adjust vented feed tube, see instructions. See Item 4.
Conic Valve held open due to level of material in machine hopper.	12.	Autocolor too low in machine hopper or hopper too small.	Re-position. See instructions, Pg. 11. Install larger machine hopper to allow one full hopper load of material.
Level switch not stopping loader when process hopper is full.	13.	Blade improperly positioned.	Material must discharge against inside curve. Lower blade for sensitivity.
Filter cleaning cycle doesn't operate.	14.	Solenoid inoperative. Cleaning cycle micro-switch malfunction.	Clean or replace. Replace.
Loader filter continuously clogs.	15. 16. 17. 18.	Improper air line size. Quick-coupler used. Line pressure too low. See Item 21. Filter wet from oil and/or water in air supply.	Use 1/2" line. DO NOT USE QUICK COUPLERS OR RESTRICT AIR FLOW. Provide min. 75 psig. — — — — Install air line dryer or additional line filter.
Loader filter ruptures.	19.	See Item 18.	— — — —
Dust coming from motor vents or motor damage due to material intake.	20. 21.	Filter ruptured, missing or misaligned. Material passing through filter.	STOP UNIT! Check for motor damage, repair. Replace filter, center in cover. Material size too fine for filter. Colorant being drawn into vacuum hopper. Conic Valve not sealing, See Item 12.
Color Drive motor not running.	22. 23.	Not plugged in. COLOR CHECK switch 'on'.	Make connection. Push COLOR CHECK switch down (off).
Color Feed rate not consistent.	24. 25. 26.	Color supply too low. Canister or bin not securely mounted. Colorant not free flowing.	Remove canister or bin and fill. Keep level above axle of agitator. See instructions. Check and correct. Check with supplier and obtain new type.

Conair has made the largest investment in customer support in the plastics industry. Our service experts are available to help with any problem you might have installing and operating your equipment. Your Conair sales representative also can help analyze the nature of your problem, assuring that it did not result from misapplication or improper use.

WE'RE HERE TO HELP

To contact Customer Service personnel, call:



HOW TO CONTACT CUSTOMER SERVICE

From outside the United States, call: 814-437-6861

You can commission Conair service personnel to provide on-site service by contacting the Customer Service Department. Standard rates include an on-site hourly rate, with a one-day minimum plus expenses.

If you do have a problem, please complete the following checklist before calling Conair:

- Make sure you have all model, serial and parts list numbers for your particular equipment. Service personnel will need this information to assist you.
- Make sure power is supplied to the equipment.
- Make sure that all connectors and wires within and between loading control and related components have been installed correctly.
- Check the troubleshooting guide of this manual for a solution.
- Thoroughly examine the instruction manual(s) for associated equipment, especially controls. Each manual may have its own troubleshooting guide to help you.
- Check that the equipment has been operated as described in this manual.
- Check accompanying schematic drawings for information on special considerations.

BEFORE YOU CALL ...

Additional manuals and prints for your Conair equipment may be ordered through the Customer Service or Parts Departments for a nominal fee.

EQUIPMENT GUARANTEE

Conair guarantees the machinery and equipment on this order, for a period as defined in the quotation from date of shipment, against defects in material and workmanship under the normal use and service for which it was recommended (except for parts that are typically replaced after normal usage, such as filters, liner plates, etc.). Conair's guarantee is limited to replacing, at our option, the part or parts determined by us to be defective after examination. The customer assumes the cost of transportation of the part or parts to and from the factory.

PERFORMANCE WARRANTY

Conair warrants that this equipment will perform at or above the ratings stated in specific quotations covering the equipment or as detailed in engineering specifications, provided the equipment is applied, installed, operated and maintained in the recommended manner as outlined in our quotation or specifications.

Should performance not meet warranted levels, Conair at its discretion will exercise one of the following options:

- Inspect the equipment and perform alterations or adjustments to satisfy performance claims. (Charges for such inspections and corrections will be waived unless failure to meet warranty is due to misapplication, improper installation, poor maintenance practices or improper operation.)
- Replace the original equipment with other Conair equipment that will meet original performance claims at no extra cost to the customer.
- Refund the invoiced cost to the customer. Credit is subject to prior notice by the customer at which time a Return Goods Authorization Number (RGA) will be issued by Conair's Service Department. Returned equipment must be well crated and in proper operating condition, including all parts. Returns must be prepaid.

Purchaser must notify Conair in writing of any claim and provide a customer receipt and other evidence that a claim is being made.

WARRANTY LIMITATIONS

Except for the Equipment Guarantee and Performance Warranty stated above, Conair disclaims all other warranties with respect to the equipment, express or implied, arising by operation of law, course of dealing, usage of trade or otherwise, including but not limited to the implied warranties of merchantability and fitness for a particular purpose.