

# QUICKFIX

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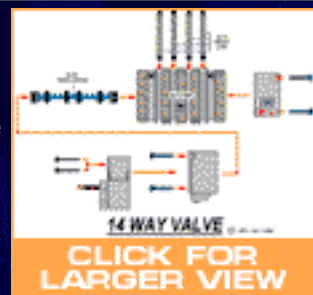


# QUICKFIX

## SECTION 1 - Useful diagrams and schematics

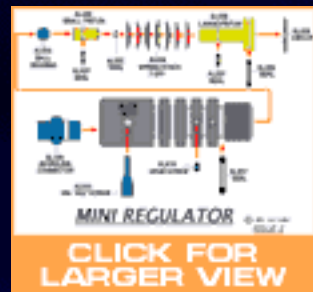
### 14 WAY VALVE SCHEMATIC

The Angel 14 way valve works on the 90psi issued from the LPR (low-pressure regulator) situated inside the Angel. The 14 way is operated by 2 electronic solenoids connected to the trigger, these solenoids act like magnets and shuttle the 14 way backwards and forwards directing the 90psi into the front and rear of the ram, forcing the ram forward to strike the valve and then backwards to re-cock.



### MINIREG SCHEMATIC.

The Angel Minireg converts the 850psi tank pressure to the guns working pressure of 550psi (400-450psi on Low-pressure guns) and acts as a velocity adjuster.



### RAM SCHEMATIC.

The Angels ram includes the brass hammer, which shoots forward to hit the valve. The 14-way valve shuttles 90psi of air alternately into the front and rear of the ram to activate it. The snap ring located at the back of the ram helps to maintain the Angels incredible consistency during play.



### ANGEL WIRING LOOM SCHEMATIC



### ANGEL LPR SCHEMATIC.



## ASSEMBLED RAM PHOTO

The Angels Ram is powered by the 14-way valve at 80-90psi; the snap ring is situated at the back of the ram, and is visible when the Angels back-plate is removed.



## 14-WAY PHOTO

The 14-way valve and Spool are 2 Angel parts that you will very rarely need to replace. Many Angel users still believe that if they experience a leak from the vent holes at the top of the gun, there is a 14 way problem. This is not so, 99 times out of 100 there is simply a chopped O-ring on the Ram, or there has been a petroleum-based lubricant used on the gun which has attacked the Ram seals. Users should always check the Ram seals before anything else.



## THE BATTERY

The Angels rechargeable Nicad battery is good for 400,000 continuous shots off one charge. Always remember to charge the battery for 14 hours upon receipt of the gun, to set the battery's memory cells.



# QUICKFIX

## SECTION 2 - Velocity problems

**PROBLEM** - Velocity is inconsistent.

**CAUSE** - Pressures are not correct.

**FIX** - Check the following:

- 1 - Tank pressure should be 850psi
- 2 - LPR pressure should be 87-90psi (check with Angel tool kit)
- 3 - Valve dwell should be set correctly.

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## SECTION 3 - 1st shot low

**PROBLEM** - First shot is low, sometimes does not leave barrel, after that the gun fires fine. If the gun is left a while without firing the problem re-occurs.

**CAUSE** - Low valve dwell.

**FIX** - Increase dwell time. See Section 7.

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**PROBLEM** - First shot clicks but does not fire, after that the gun fires fine.

**CAUSE** - Ram Snap ring is set too tight

**FIX** - Reset Ram snap ring - See section 8

# QUICKFIX

## SECTION 4 -Accuracy problems

**PROBLEM** - It is a new gun but the paintballs are very innaccurate.

**CAUSE** - Lithium assembly grease is blowing through the bolt, sticking to the paintball causing ball spin.

**FIX** - Clear Lithium grease from breech area using a Q-tip.

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**PROBLEM** - Gun suddenly seems less accurate.

**CAUSE** - Poor quality paintballs.

**FIX** - Change paintball brand.

# QUICKFIX

## SECTION 5 - Leaking

**PROBLEM** - There is a slight leak coming out of a hole on the underside of the body of the Angel, where the flash tank is screwed into the gun.

**CAUSE** - High LPR pressure causes air to vent from a dedicated bleed hole.

**FIX** - Check LPR pressure is set between 87 - 90psi. Ensure that LPR pressure is not creeping up above this figure.

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**PROBLEM** - A leak coming from one of the 2 vent holes at the top of the gun.

**CAUSE** - Chopped/worn Ram body o-ring.

**FIX** - Remove Ram and replace all 3 body o-rings, replace Ram taking care not to chop the new o-rings.

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**PROBLEM** - Gun leaks down barrel.

**CAUSE** - Worn Exhaust valve

**FIX** - Change exhaust valve.

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**PROBLEM** - During play, gun vents air down barrel at intervals.

**CAUSE** - Valve is sticking open.

**FIX** - Change exhaust valve and add light lubricant such as 3 in 1 oil.

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## SECTION 6 -Fine Tuning

**QUESTION** - How do I adjust the trigger?

**ANSWER** - To shorten the trigger stroke adjust item 110 in your manual clockwise, to increase tension adjust item 110 counter-clockwise, remember that the screw must be locktited after adjustment. On dual adjustable triggers 2 separate screws can be adjusted for forward and rear travel.

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**QUESTION** - What is the recommended cleaning and lubrication schedule for the Angel?

**ANSWER** - The Angel is designed to be a relatively low maintenance marker, unlike other guns it is neither necessary or advisable to strip and clean the gun after every tournament, this will only cause damage to seals as components are removed. and then re-installed. For general lubrication just disconnect the microline hose, then drop 2-3 drops of auto-lube into the hose and re-connect, when you gas the gun the lube will travel through the system, lubricating all necessary area's. If you have removed any main components, e.g. 14-way valve, ram, or LPR, it is advisable to re-lubricate these with silicone grease before re-installing. Don't oil the bolt, it is supposed to run dry.

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**QUESTION** - How do I set the Ram position?

**ANSWER** - Ram positioning is important to gain maximum gas efficiency and consistency. Remove the Ram and follow the following instructions. Firstly, open the breech and push the Ram back into the chamber, do this carefully so you don't chop the O-rings. Screw the Ram all the way in and close the Breech so that the bolt pin is now fitting into the groove at the end of the hammer. Then start to unscrew the Ram again, after every turn open and close the breech. You are trying to set the Ram so that it opens and closes with a click. This is the ideal position as the bolt pin is sitting on the rearmost point of the hammer.



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## SECTION 7 - Setting the Valve Dwell

### INSTRUCTIONS -

To ensure the Dwell time is set correctly first set the gun at a constant velocity, e.g. 300fps. Then Turn the Dwell pot (the lower one in the grip frame) all the way anti-clockwise. The gun is then at its least efficient setting. Gradually turn the pot clockwise, while firing the gun over a chronograph, you will hear the noise signature of the gun change, when the chrono reading starts to drop turn the pot back anti-clockwise a few degrees and ensure your chrono reading is consistent, the Angel is now at its most efficient setting. If you turn the valve dwell down too much you will starve the valve of gas to propel the ball at the specified velocity. If the Dwell is set too high the gun will sound very loud and inefficient.



# QUICKFIX

## SECTION 8 - Setting the Snap Ring

### INSTRUCTIONS -

To access the snap ring, first remove the back plate, you will see item 071, which is screwed into the Ram body. To set the snap ring you will need the appropriate Allen key, which is included in your spares kit. Make sure the gun is gassed, then turn item 071 anti-clockwise a few turns to loosen it. It is very important that while item 071 is being turned, item 153 does not move. Once you have loosened the snap ring start to tighten it again (turn clockwise) while dry-firing the gun, you will hear the guns noise signature change as the snap ring tightens and eventually the gun will stop firing and you will hear a 'clicking' noise. When you hear this 'clicking' turn the snap ring 1/3 to 1/2 turn anti-clockwise. Your ram snap ring is now in the correct position and your problem will have been deleted. It is far easier to complete this task with a Ram Adjuster Tool.



# QUICKFIX

## SECTION 9 - Miscellaneous

**PROBLEM** - Gun is not firing at all, the light comes on at the back, but when the trigger is pressed nothing happens.

**CAUSE** - Debris in the 14-way.

**FIX** - Firstly, remove the backplate while the gun is gassed, the view you now have should be similar to the image. The orange button is an electronic override button. The button isolates all the electronics in the gun, so when it is pressed the user can tell if the problem is electrical or pneumatic. If you press the button and the gun fires, you know the problem is electrical, if it does not fire it will be pneumatic.



If the gun continues to make a clicking noise when the orange button is pressed, this indicates that the 14 way spool is jammed, probably by a piece of debris or a chopped ram o-ring. The fix to this is to degas the gun, remove the rear solenoids by unscrewing the 4 small screws at the back of the 14way body. Then remove the 14-way shuttle from the 14-way body, you will need a small pin or thin hook for this. With the spool removed, re-gas the gun, the 90psi used to operate the 14way is very low pressure so there is no danger involved here. The 90psi of pressure will blow out any debris that may have been blocking the spool. Degas the gun again and swab out the inside of the 14-way body with a Q-tip, then replace the 14-way spool and solenoid. The gun should now work without a problem. If there were any fragments of o-ring found in the 14-way body they will have come from the ram, you should now replace the ram o-rings.

**PROBLEM** - Angel is very loud and air is blowing up the feed tube.

**CAUSE** - Valve dwell is set too high.

**FIX** - Decrease valve dwell ([see section 7](#))

**PROBLEM** - Delrin ball in ball detent has come out and been shot out of the gun.

**CAUSE** - Ball detent has been over-tightened.

**FIX** - Replace ball detent and screw in finger tight only.

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**PROBLEM** - Gun does not fire, green light on back-plate is blinking

**CAUSE** - Low battery.

**FIX** - Charge battery.

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**QUESTION** - I'm thinking about buying an Angel but if it broke is there a warranty and could I send it back to get fixed at any time?

**ANSWER** - If you were to have a problem with your Angel, the first step would be to return it to the place of purchase. If this is an authorized service center they will carry out the warranty work straight away. If not, they will contact us and we will arrange for the gun to be fixed and returned to the user without delay. It is not necessary for guns to make journeys across the Atlantic. See our service section for a list of service agents.

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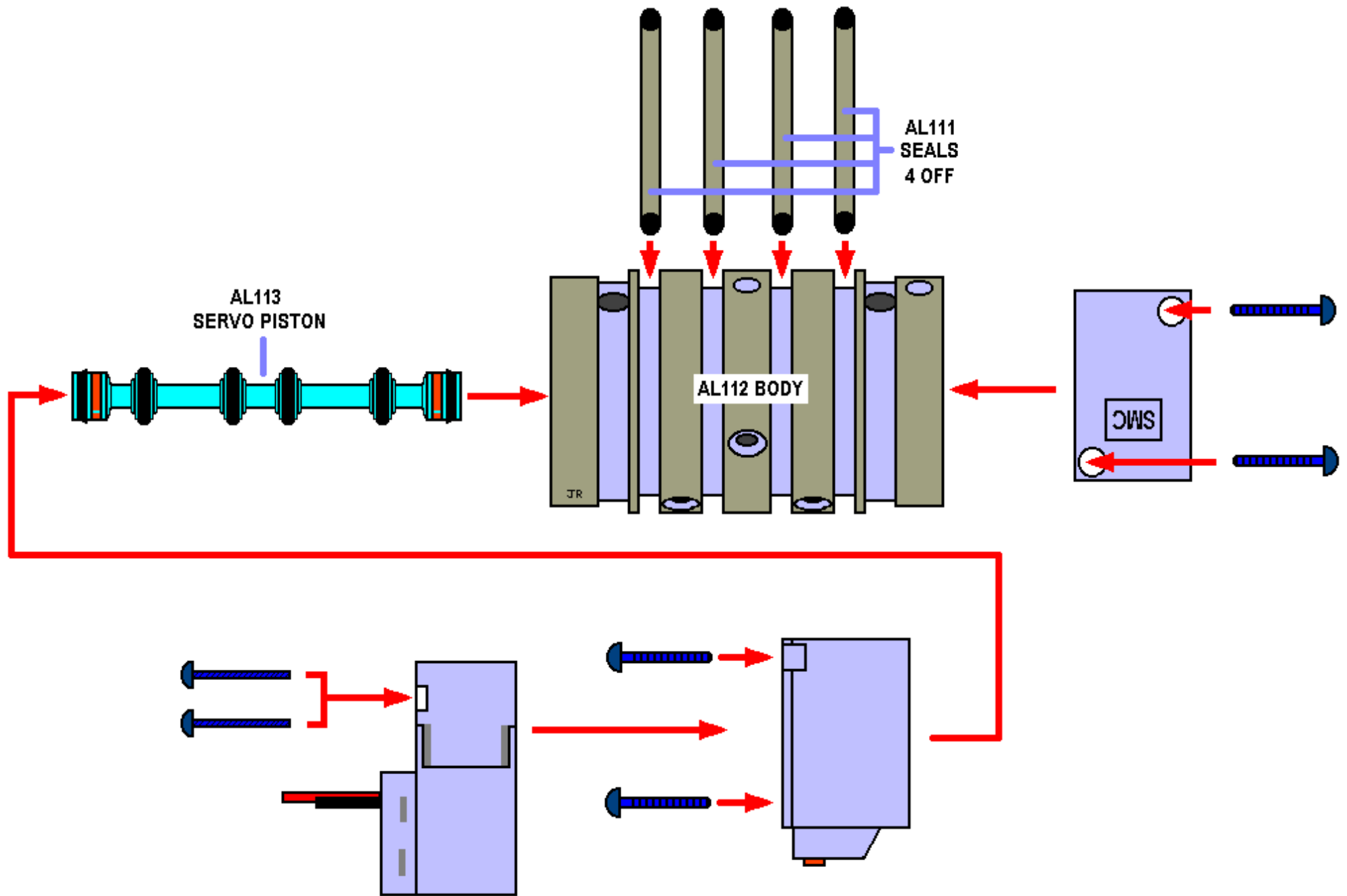
**QUESTION** - I have heard that the Angel doesn't work so well in cold weather. Is this true?

**ANSWER** - The Angel uses Compressed air or Nitro, and unlike Co2 there is no evidence to suggest that cold temperatures will effect the stability of the gas. I can think of no other variables that would be affected by temperature so I can only conclude that there is no reason for the Angels performance to be influenced by hot or cold weather.

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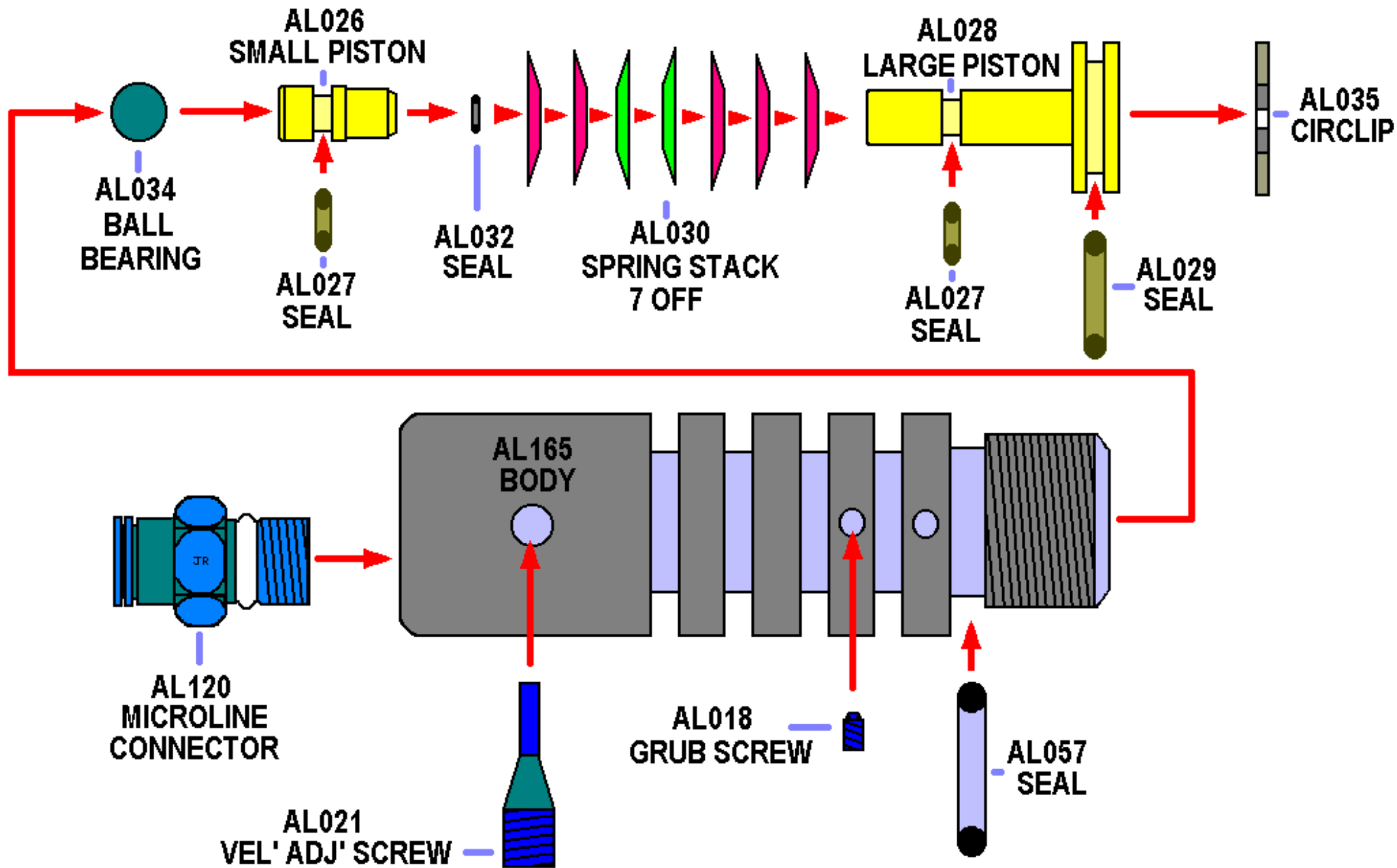
**QUESTION** - Dear J.R., I keep hearing about the VL Revolution upgrade kit. How does it work and can it be used with other guns (apart from the Angel)?

**ANSWER** - The VI Revolution Upgrade is developed by WDP specifically for the Angel. The loader works off the Angels batteries, and so needs no power source of it's own. A power lead links the hopper with a plug on the backplate of the gun. The Intellifeed system spins the hopper paddle when the user reaches a fire rate of 2 shots per second, the hopper will continue to agitate until 2 seconds after the gun has ceased firing, ensuring a fresh stack of balls is ready to fire.



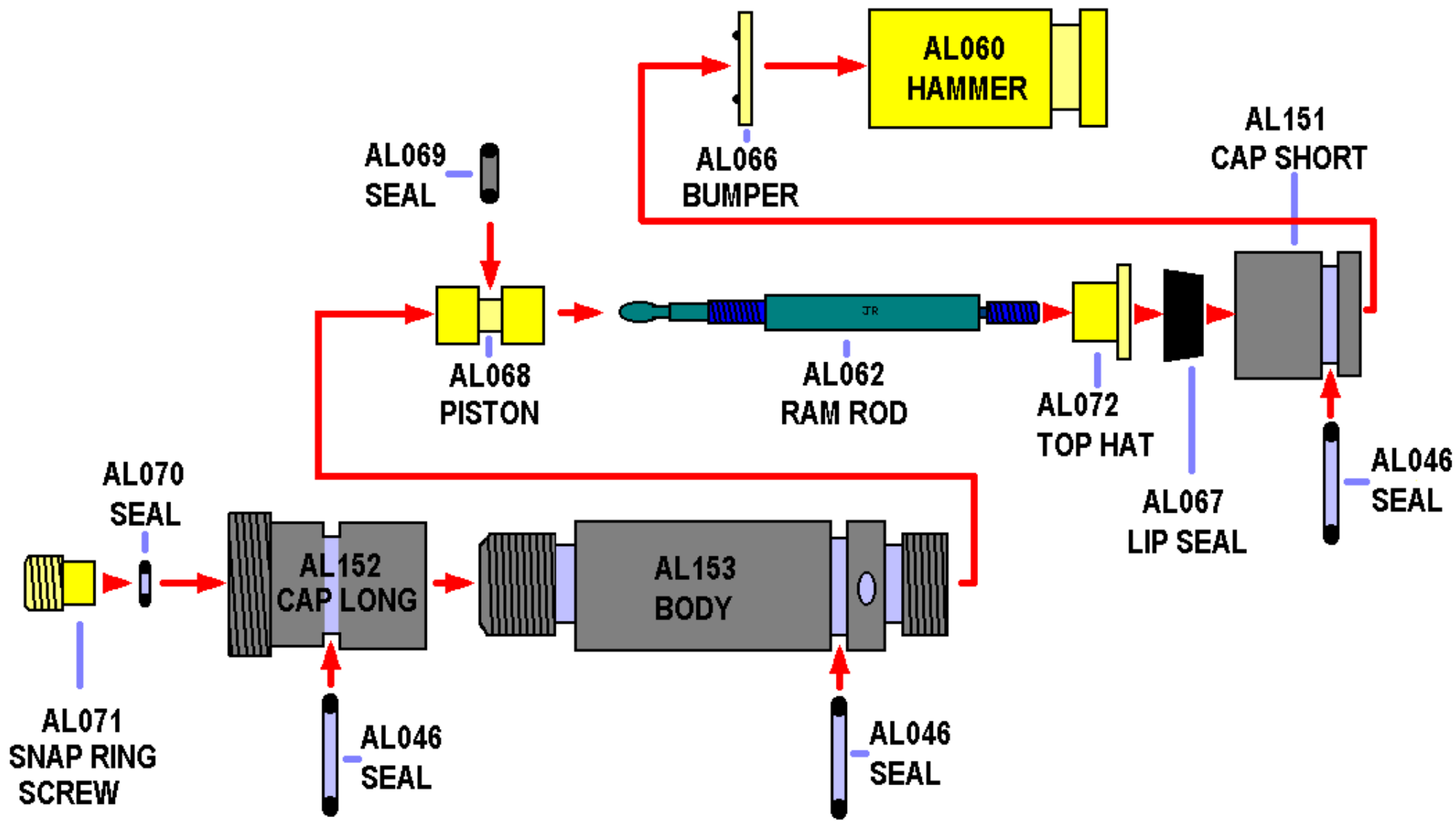
# 14 WAY VALVE

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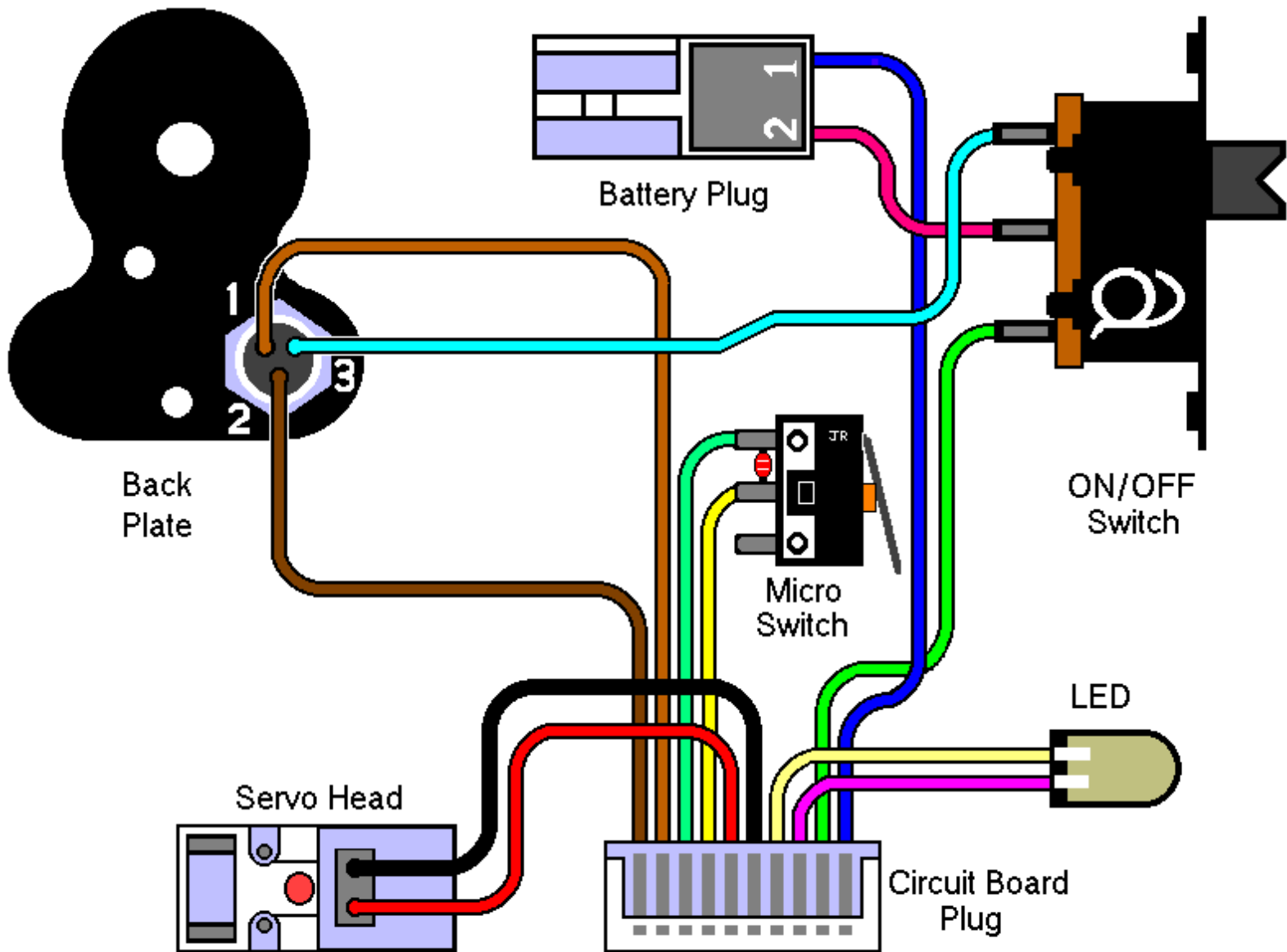
# MINI REGULATOR

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ISSUE 2



# RAM ASSEMBLY

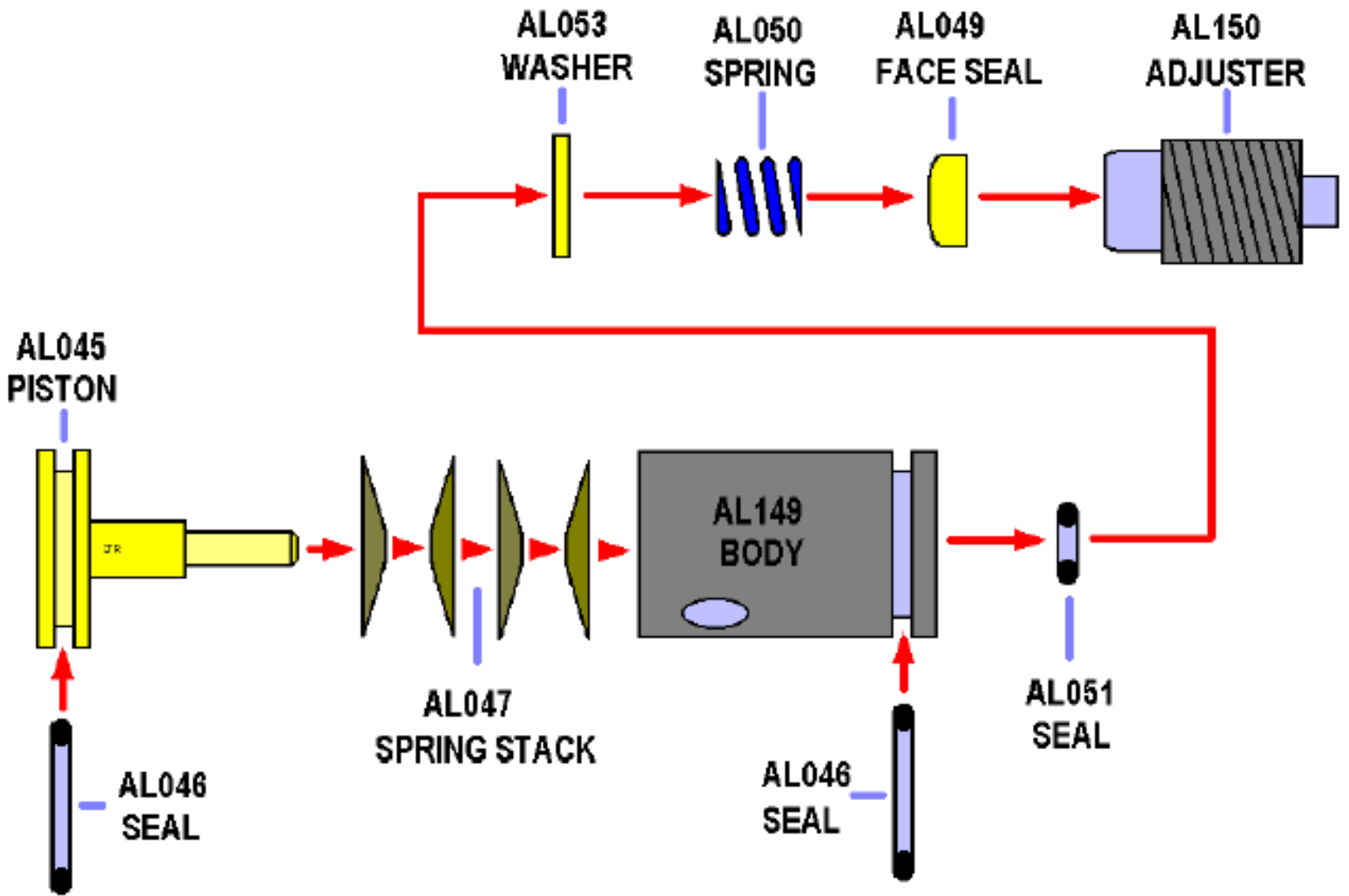
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# WIRING DIAGRAM

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# LPR ASSEMBLY

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