

INSTALLATION GUIDE

36 DCD DUAL WEBER CONVERSION KIT

**PART NO. 6140-13-2370
(12A ENGINES - '74 ON)**

**PART NO. 6140-13-4560
(13B ENGINES - ALL)**

CONGRATULATIONS! You have purchased the finest induction system available for the rotary engine. Not only will this conversion provide increased horsepower but also improved driveability as well as increased gas mileage during steady state driving.



NOTE

This kit does not comply with federal emission control regulations and is therefore intended for off-road/racing purposes only. It is not legal for street use.

PREFACE

Although it is not necessary to be an automotive mechanic to successfully install this kit, it is presumed that the installer possesses a basic mechanical ability. Properly installed and adjusted, this Weber conversion will give years of trouble-free enjoyment.

This, or any carburetion increase for that matter, will not work on the Mazda rotary engine without the use of a header system to replace the restrictive thermal reactor or catalytic converter. Therefore, this installation guide assumes that headers have been previously installed.

As with any modification, maximum performance can only be achieved when the entire engine is in good working order. For this reason, it is advisable to perform a thorough check of your engine electrical system before installing this kit and perform a tune-up (to stock specifications) if necessary, replacing any worn parts.

Using the linkage kit
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1. Install carburetor
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2. Install PCV

3. Thread 5/16"
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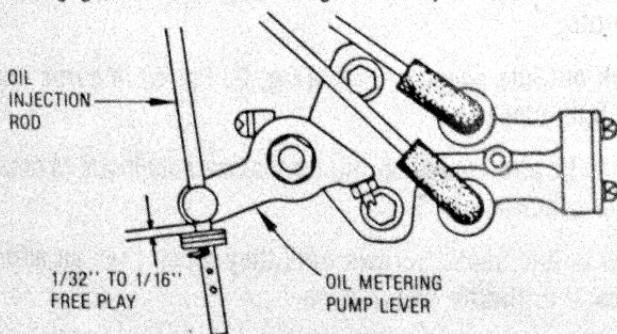
PRELIMINARY SET-UP

Using the linkage kit installation guide as a reference, perform the preliminary set-up on the workbench as follows:

1. Install carbs on manifold (make sure there is a gasket between the carb and phenolic insulator) with float bowls toward the front using nylock nuts and thin 8mm washers provided. *SEE NOTES*
2. Install ~~PGV valve with gasket in manifold.~~ *BRASS BEAKE FITTING*
3. Thread 5/16" nuts onto rod ends leaving 1/4" of threads below nut. Screw one rod end into rear hole of rear manifold boss and the other rod end into the only hole in the front boss. Tighten down lock nuts.
4. Install throttle cable bracket with the two 5/16" bolts and lock washers provided in the remaining holes of the rear boss.
5. Assemble linkage as follows:
 - a. Slide linkage rod into the rod ends with welded lever arm forward of cable arc.
 - b. Slide linkage spacer onto rod behind rear rod end.
 - c. Install lever arm on rod behind spacer as illustrated (do not tighten).
 - d. Install oil injection lever.
 - e. Center rod between oil injection lever and rear lever arm. Be sure the rod turns easily and leave about 1/32" end play.
 - f. Line up the rear lever arm with the welded lever arm and tighten. (Leave oil injection lever loose for adjustment later.)
 - g. Extend the adjustable linkage rods to exactly 4-1/8" center to center.
 - h. Install adjustable rods between lever arms and carbs. Tighten lock nuts.
6. Back out idle speed screws (Fig. 2, Pg. 6) in carbs until throttle plates are fully closed.
7. Install throttle return spring from small hole in arc to small hole in throttle cable bracket.
8. Turn in idle speed screws until they touch then an additional 1/4 turn to crack the throttle plates open.

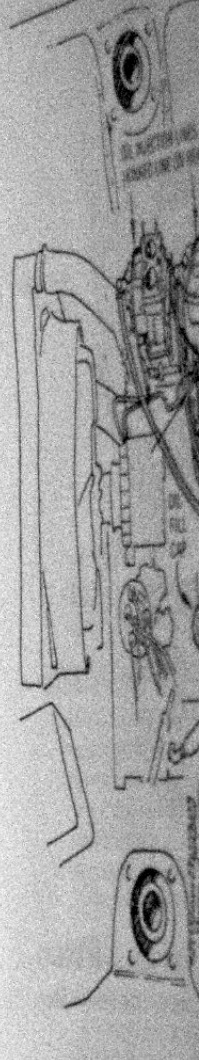
INSTALLATION ON CAR

1. Disconnect negative battery cable.
2. Drain coolant. NOTE: Not all Mazdas have a radiator drain petcock, however, all are equipped with a 14mm drain plug on the left side of the motor at the bottom of the intermediate housing.
3. Remove entire air cleaner assembly.
4. Disconnect brake vacuum hose from intake manifold.
5. Disconnect oil injection tubes and oil injection rod at the carburetor. Disconnect fuel hoses and remove from car. Disconnect choke and throttle cables. (RX-7: also disconnect the 5 vacuum lines that run from the base of the carb. Disconnect hot start cable. Disconnect air conditioning valve vacuum line, if equipped.) Disconnect any other hoses or wires still connected to carb.
6. Using a 12mm socket, remove the six nuts and washers securing intake manifold to engine and remove manifold/carb assembly.
7. Remove all smog valves and piping from top of engine. (RX-7: also remove vacuum valves on firewall [Calif. models only] as well as hot start control motor on rear of left shock tower [ref. Fig. 1].)
8. Remove oil injection rod and put aside for later use.
9. Install Weber carb/manifold assembly with provided gasket using original nuts and washers. NOTE: Due to the possibility of resurfaced side housings the manifold mounting holes are oversize, so while tightening the mounting nuts, pull up on the manifold to ensure proper port alignment.
10. Slip oil injection tubes onto carburetors and into stock tubes as shown in Figure 1 (kinked tube to rear carb, straight tube to front carb). If the fit is loose, a piece of wire twisted around the rubber connection is a good idea to prevent them from slipping off.
11. Hook up stock throttle cable as shown in linkage kit installation guide. If necessary, adjust pedal stop (inside car at pedal) to provide enough cable. Make certain there is a slight amount of slack in the cable so that throttle plates will fully close. Check operation making sure that throttle plates open fully.
12. Install choke cable as shown on reverse of linkage installation guide. Use shorter cable on rear carb. Before tightening cable clamps at carb choke levers, adjust the cables to allow about 1/16" slack when choke is fully in. Check operation.
13. Bend oil injection rod removed earlier, using pattern provided on back of linkage installation guide. Reinstall rod allowing 1/32" to 1/16" free play before lever on oil metering pump becomes engaged as shown below. Tighten oil injection lever on linkage rod.



Check that injection rod does not hinder throttle operation. It may be necessary to further bend rod to obtain both full throttle operation and free play at idle as shown above.

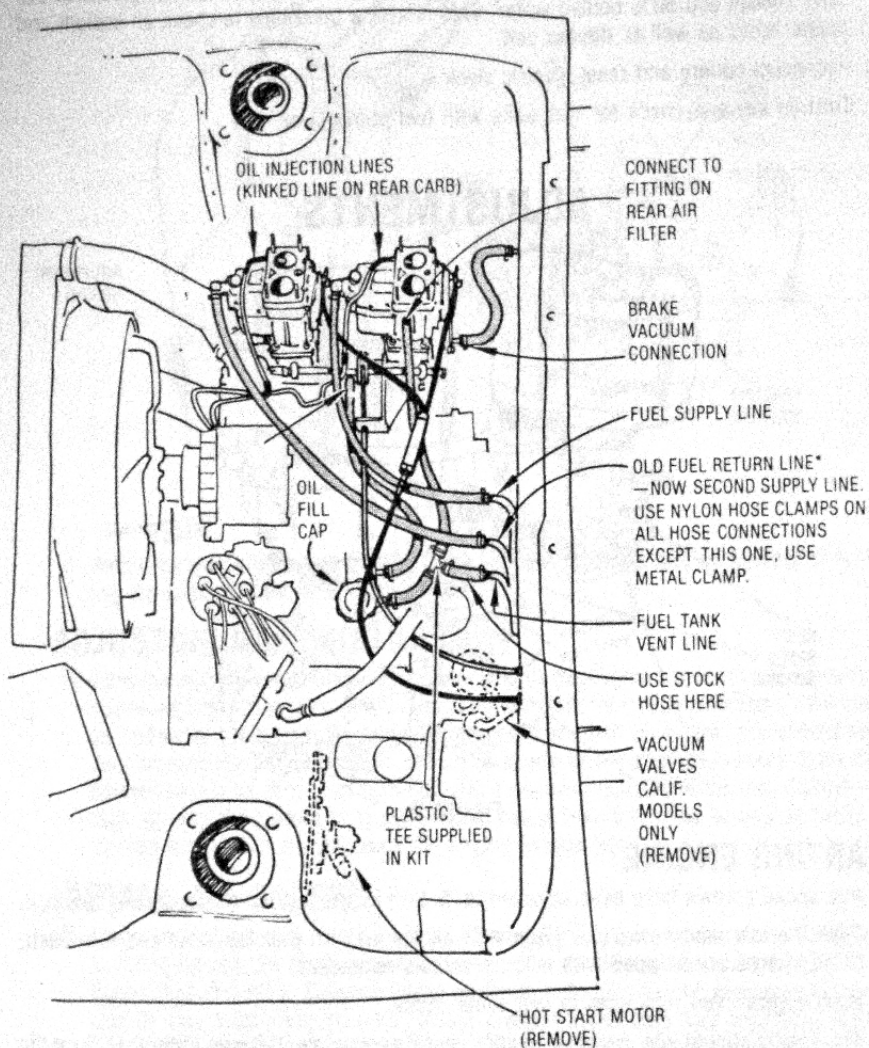
14. The 5/16" fuel pump
Figure 1 below



NOTE: THIS DRAWING IS OF AN ORIGINAL
IS, HOWEVER, TYPICAL OF ALL '74 AND

*The fuel return line (smaller
Webers. This is easiest done on
Mounting Kit (Part No. 6326-13
ea.). On other models, a fuel
both steel lines. Be sure to plug
capability of the Webers require
tioned pumps work fine, however
inlet valves have been installed
pressure, however, 3/8" dia.

14. The 5/16" fuel/PCV hose supplied is now cut as required and installed as shown in Figure 1 below.



NOTE: THIS DRAWING IS OF AN RX-7 ENGINE COMPARTMENT. IT IS, HOWEVER, TYPICAL OF ALL '74 AND LATER MAZDAS.

*The fuel return line (smaller of the two is now used as a second fuel supply line for the Webers. This is easiest done on the RX-7 by installing the Rotary Engineering Dual Fuel Pump Mounting Kit (Part No. 6330-13-6117) and two electronic fuel pumps (Part No. 6330-13-6150 ea.). On other models, a fuel line tee can be installed right after the pump to supply fuel to both steel lines. Be sure to plug the unused return line back to the fuel tank. The high flow capability of the Webers require a higher flow fuel pump than stock. Two of the above mentioned pumps work fine, however, any high flow electric pump will work. Because Grose-Jet inlet valves have been installed in the Webers, they are capable of handling up to 6 psi fuel pressure, however, 3½ psi is ideal for best operation.

FIGURE 1

15. Replace water drain plug, close radiator petcock (if equipped) and refill cooling system.
NOTE: If your coolant is more than a year old, it should be replaced with a new mixture of 50% coolant and 50% bottled water. This is also a good time to check all coolant and heater hoses as well as the fan belt.
16. Reconnect battery and reset electric clock.
17. Turn on key and check for fuel leaks with fuel pump(s) on.

ADJUSTMENTS

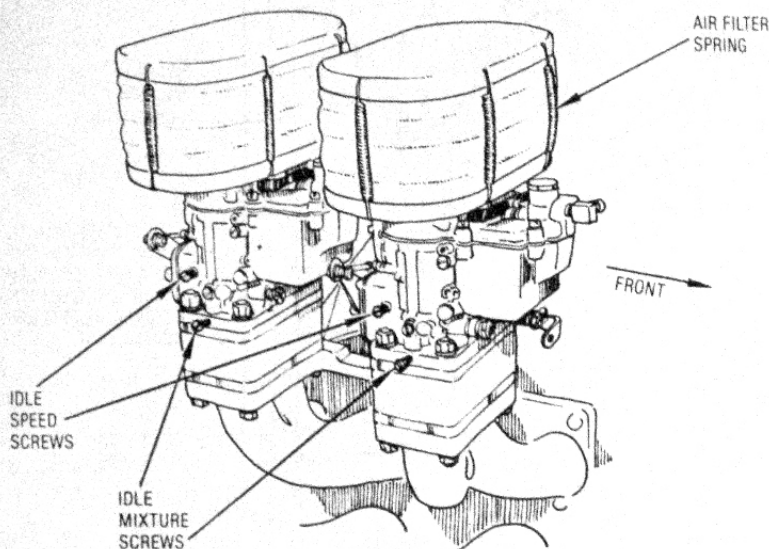


FIGURE 2

STARTING ENGINE

1. Idle speed screws have been adjusted to $\frac{1}{4}$ turn in and ignition timing should be stock.
2. Turn the idle mixture screws (Figure 2) all the way in, then back out one turn each.
NOTE: Carbs are shipped with mixture screws removed.
3. Start engine. You may need to use some choke.
4. The engine should idle, possibly roughly, but it should idle. If it won't idle at all, turn the idle speed screws in another $\frac{1}{4}$ turn each and let the engine warm to operating temperature.

SYNCHRONIZING CARBS

5. After engine is warm slow the idle down to standard idling speed (700-900 RPM). Hook up a timing light and advance the trailing ignition by 5 degrees. The trailing timing should now be 15° ATDC with the leading at TDC (0°). Rev the engine a couple of times to clean the plugs before proceeding.
6. Loosen rear lever arm on linkage rod so both carbs work independently.
7. Using a uni-syn synchronizing tool (available at most import car parts stores), measure the air flow through the primary venturi of each carb and adjust the idle so that at *idle speed* the carbs are flowing equally. If a uni-syn is not available, you can listen to each carb using an 18" length of tubing as shown in Figure 3. The carbs are synchronized when the hissing is equal.

8. Retighten lever arm and check for the same amount.

ADJUSTING IDLE MIXTURE

9. Turn the mixture screw of one carb (the speed unstable) then very slowly turn it an additional $\frac{1}{8}$ turn. By doing this you get a very smooth idle and both carburetors should be about one turn out. Turning the screws in or out more than $\frac{1}{4}$ turn should be avoided.

INSTALL AIR FILTER

10. Place air filter bases on carburetors and fit on rear air filter housing. Tighten flange nuts provided. Secure with springs provided. Never operate a rotary engine with the air filter removed or damaged. Do not damage the housings.

IGNITION TIMING

- The vacuum advance system is built-in centrifugal advance. Ignition timing should be set with the engine idling.
11. With the engine idling, adjust the timing so that the motor idles smoothly, retard the timing to 0° (leading). For best performance, set the timing to what you want. However, for good performance, set the timing (which at idle is approximately 15° ATDC).
12. Have fun with your Porsche.

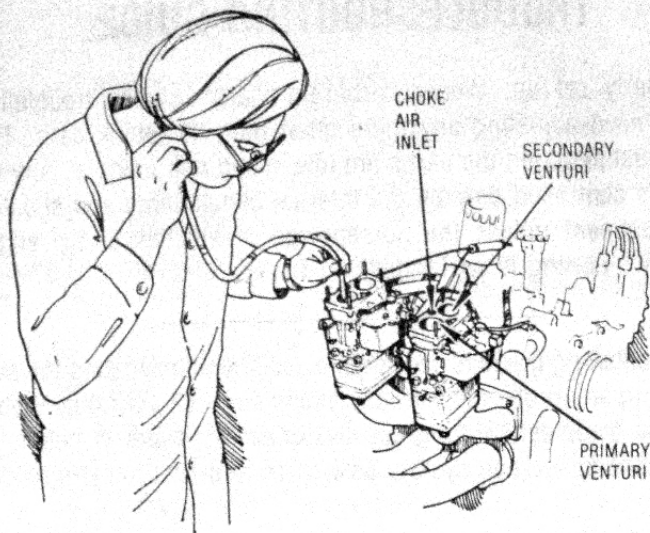


FIGURE 3

8. Retighten lever arm and check that both carbs open together and each pump jet is squirting the same amount.

ADJUSTING IDLE MIXTURE

9. Turn the mixture screw of one carburetor in until the engine starts to hunt severely (idle speed unstable) then very slowly back it out until that rotor runs smoothly. Then back out an additional 1/8th turn. By doing this several times with each carb, you should obtain a very smooth idle and both carbs should be nearly identical in adjustment. Both mixture screws should be about one turn out. (On a sound engine when the idle mixture is correct, turning the screws in 1/2 turn should cause severe hunting or engine stalling and turning out 1/2 turn should cause the engine to lope badly.)

INSTALL AIR FILTERS

10. Place air filter bases on carb tops (base with hose fitting goes on rear carb). Fit PCV hose to fitting on rear air filter. Install air horns over air filter bases and secure with 5mm flange nuts provided. Saturate filtron elements with oil provided (squeeze out excess) and fit over supporting screens. Install element assemblies and filter tops to carbs. Secure with springs provided as shown in Figure 2. NOTE: Except while adjusting carbs, *never* operate a rotary engine without air filters. Even a small particle of dirt can severely damage the housings.

IGNITION TIMING

The vacuum advance system of the distributor is not used with the Weber set-up. Only the built-in centrifugal advance system is used. For optimum performance the ignition timing should be set with a timing light and a good ear.

11. With the engine idling, advance the timing 5 degrees (both leading and trailing). If the motor idles poorly, retard the ignition until it smooths out but never more retarded than 0° (leading). For best performance a total advance of 22°-24° (above 4000 RPM) is what you want. However, for good idling and around town driving a total advance of 16°-18° (which at idle is approximately 0°-3°) is best.
12. Have fun with your Porsche killer.

TROUBLESHOOTING GUIDE

When properly set up, Weber carburetors are virtually troublefree and should not need adjusting any more often than the stock carb. The only external adjustments on the carbs are idle speed and mixture. Any running above idle is controlled only by the internal components and should never require adjustment unless the horsepower capabilities of the engine are changed (i.e., porting is performed).

This troubleshooting guide is provided to assist you in locating the source of and correcting any problems you may encounter with your dual Weber conversion. This troubleshooting guide assumes that there is nothing wrong with the engine or ignition system as we are referring to carburetion problems only.

CONDITION	POSSIBLE CAUSE	ACTION
RICH IDLE Engine lopes badly. Black smoke. Turning mixture screw in has no effect.	1. Choke is partially engaged	1. Put finger over choke air inlet (Fig. 3). If idle speed does not change, proceed to 2. If idle changes considerably, choke is not closed. Proceed as follows: <ol style="list-style-type: none"> Check operation of cable and make sure lever arm touches the stop. If closing off choke air inlet still affects idle remove choke cable and make sure that choke levers have about 1/8" free play before lifting piston. If there is no free play, remove choke cover assembly and bend tab that engages choke piston to gain about 1/8" free play. Also check that piston is seating fully.
	2. Float level is too high	2. Remove carb top and check float level (Fig. 4).
	3. Fuel pressure is too high	3. Check fuel pressure. 3½ psi is recommended. 6 psi is <i>maximum</i> . Check operation of inlet valve.
LEAN IDLE Engine hunts or won't come down to idle. Turning mixture screw out has no effect.	1. Vacuum leak	1. Check for vacuum leaks at manifold, engine flange or in brake servo plumbing. Check for faulty PCV valve.
	2. Float level is too low	2. Remove carb top and check float level (Fig. 4).

CONDITION

WON'T ACCELERATE
Stumbles off idle (lean)

Backfires on deceleration (rich)

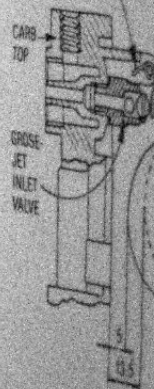
Bad gas mileage

Engine misses at high RPM

Engine "burbles" at high RPM

If none of the above helps please give our technical department a call to solve your problem.

FLOAT DROP ADJUSTMENT



TROUBLESHOOTING (Cont.)

CONDITION	POSSIBLE CAUSE	ACTION
WON'T ACCELERATE Stumbles off idle (lean)	3. Fuel pressure is too low	3. Check fuel pressure. Should be 3½ psi. Do <i>not</i> exceed 6 psi.
	4. Throttle plates fully closed	4. Adjust idle speed screws.
	1. Fuel delivery insufficient	1. Check operation of fuel pump(s) and output. (Should be at least 35 gallons per hour.)
	2. Float level is too low	2. Remove carb top and check float level (Fig. 4).
Backfires on deceleration (rich)	3. Accelerator pump not working	3. Check operation of accelerator pump
	4. Dirty fuel filter	4. Change fuel filter
Bad gas mileage	1. Float level is too high	1. Remove carb top and check float level (Fig. 4).
	2. Choke is partially engaged	2. Refer to RICH IDLE
Engine misses at high RPM	1. Too rich	1. Refer to RICH IDLE
	1. Too lean	1. Refer to WON'T ACCELERATE
Engine "burbles" at high RPM	2. Carbs out of synchronization	2. Check synchronization
	1. Too rich	1. Refer to RICH IDLE
	2. Dirty air filter	2. Clean and re-oil air filter elements

If none of the above helps your problem and your engine and electrical system is sound, please give our technical department a call at (805) 963-8702 and we will do our best to help solve your problem.

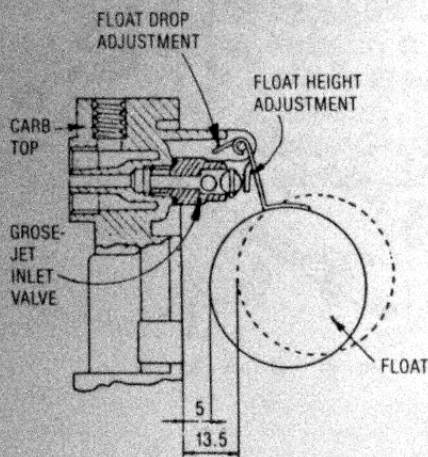


FIGURE 4

FLOAT LEVEL ADJUSTMENT

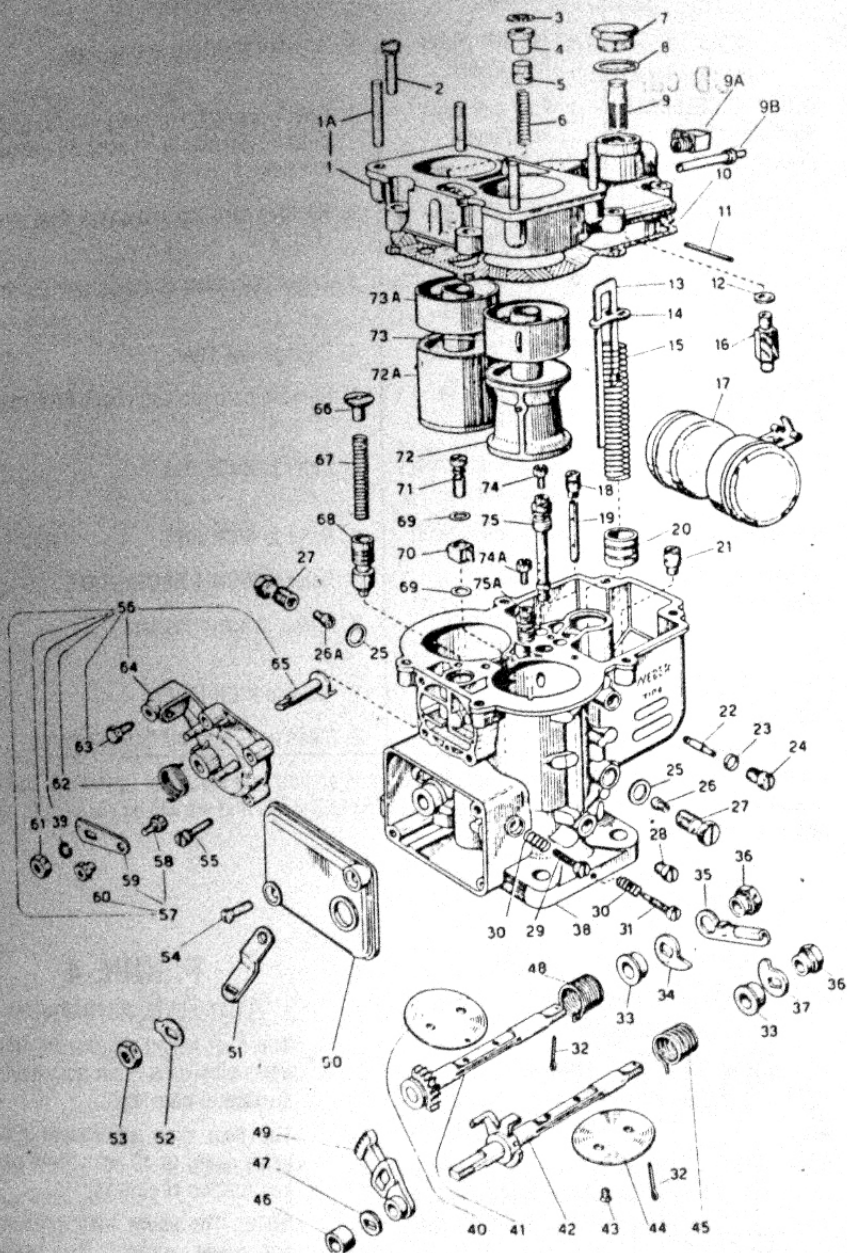
The float height adjustment (inlet valve closed) is 5mm from gasket surface of carb top.

The float drop adjustment (inlet valve open) is 13.5mm from gasket surface of carb top.

NOTE: The above measurements are made *without* the gasket installed and do not take into account the float seam.

THE ROTARY ENGINEERING 36 DCD WEBER CARBURETOR

This exploded view is not provided for parts not provided for. Itemized by part number available at (part number 3930) on Weber DCD carburetor.



- 1.
- 9.
- 9A.
- 9B.
- 13.
- 16.
- 17.
- 2.
- 2.
- 2.
- 2.
- 2.
- 3.
- 3.
- 4.
- 4.
- 5.
- 5.
- 6.
- 7.
- 7.

This exploded view of the Rotary Engineering 36 DCD carb is not provided as an incentive to tear your carburetor apart. It is provided for reference use only. The major components are itemized below. If you wish to overhaul your carbs we have available a very good Haynes Manual (Part No. 6430-77-3930) on Weber carburetors which includes a section on the DCD carb.

1. Carb top
9. Fuel inlet screen
- 9A. Fuel inlet fitting
- 9B. Oil injection fitting
- 13/14/15/20. Accelerator pump assembly
16. Grose-Jet inlet valve
17. Float
21. Acc. pump intake valve
22. Idle jet
26. Primary main jet
- 26A. Secondary main jet
29. Idle speed screw
31. Mixture adjusting screw
38. Carb body
41. Secondary throttle shaft
42. Primary throttle shaft
51. Throttle control lever
56. Choke cover assembly
68. Choke piston
70. Pump jet
72. Primary venturi (choke)
- 72A. Secondary venturi (choke)
73. Primary auxiliary venturi
- 73A. Secondary auxiliary venturi
74. Primary air corrector jet
- 74A. Secondary air corrector jet
75. Primary emulsion tube
- 75A. Secondary emulsion tube