



TZX 1002 and Variants Service and Fine Tuning Guide IMPORTANT: Read before Commencing Work

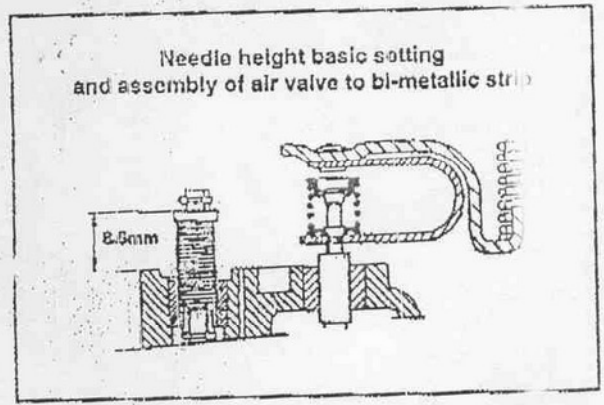
Servicing of the AED unit is limited due to the precise setting operations carried out at the factory. If however adjustments are made to the unit, mark the original settings and then adjust in accordance with these instructions. The operations which can be carried out are:

- a) Ensuring security of external connections
- b) Cleaning (or replacing) Inlet filter
- c) Checking cleanliness of float chamber and fuel inlet valve (or replacing)
- d) Checking and cleaning of the needle diaphragm (or replacing) and associated passages
- e) Resetting or replacing float assembly
- f) Replacing diaphragm spring
- g) Replacing float-chamber lid
- h) Replacing air entry elbow
- i) Replacing main valve diaphragm

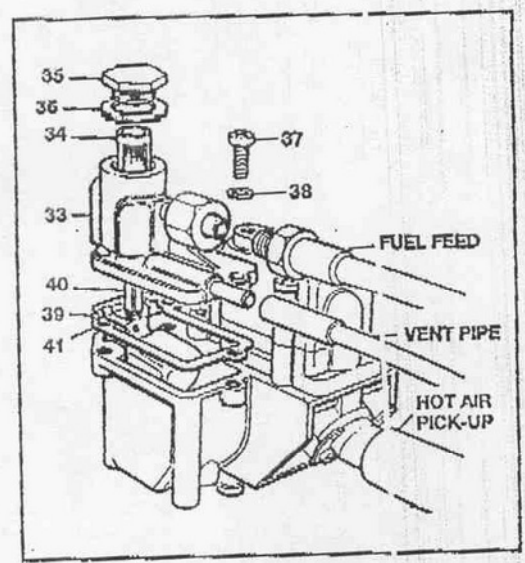
The AED is a precision instrument and should be treated as such. High standards of cleanliness are required when working on the unit. Petrol or paraffin may be used to clean the components. Use nylon cloth, never material that is fluffy or leaves lint, when drying the components.

Dismantling

- 1
 - (a) Remove the polypropylene heat insulation cover. Then, using a thin-bladed screwdriver, prise out the three aluminium blanking plugs (2) in the top cover.
 - (b) Holding the unit upright remove the screws (7,8) retaining the bakelite top cover (3) and remove the cover.

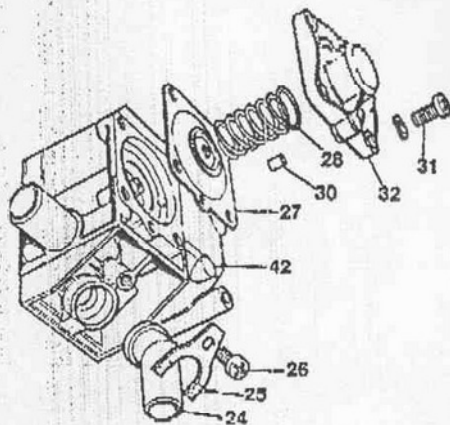


- (c) Disengage the main bi-metal from the air valve stem (see diagram above).
 - (d) Remove the two screws retaining the moulded body (14) and lift off the body.
 - (e) Dismantle the spring clip assembly from the air valve stem and remove the valve, complete with diaphragm, from the body.
 - (f) Remove the jet needle (13) from the valve body, noting the number of turns (flats) required for its removal.
 - (g) Lift the lower body gasket in order to remove the air entry flap valve, together with the spindle and spring.



- 2
 - (a) Unscrew the large screwed plug (35) and remove the filter.
 - (b) Unscrew the three screws (37) retaining the float chamber lid (33) and carefully remove the lid. If it is stuck to the main body, separate by tapping the side of the lid with the handle of a screwdriver.
 - (c) Remove the float needle (40) and float assembly (39) complete with the hinge pin. The float needle may now be detached from the float by unhooking the wire spring.
 - (d) Remove the float lid gasket (41).
 - (e) Drain any residual fuel by inverting the unit.

RECONDITIONED A.E.D.



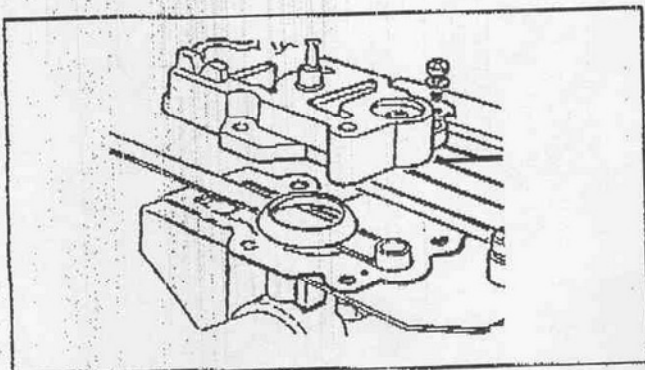
- 3
- With the unit inverted, unscrew the four screws (31) retaining the needle diaphragm cap (29) and hold the cap against the load of the spring (28) inside it whilst withdrawing the screws. If the cap is stuck to the diaphragm, hold the unit firmly then separate by tapping at the side with the handle of a screwdriver.
 - Remove the cap, spring, diaphragm (27) and hollow locating dowel (30) from the main body (42).
 - Unscrew the screw (26) retaining the air entry pipe clamp (25) and remove the clamp and the pipe (24).

Inspection

- 1
- Wash all components thoroughly, using clean petrol or paraffin only.
 - Examine all parts carefully for damage, in particular those parts not being replaced.
 - Ensure that all accessible drilled holes are free from obstruction.
- 2
- Check that the filter (34) is clean as a check on the vehicle's fuel supply system.
 - Examine the float needle tip (40) for wear or damage and also its seat in the float chamber lid.
 - Ensure that the float assembly, when in position, pivots freely in the float chamber with clearance all around. Also ensure that there is sideplay for the float spindle in the body recesses.
 - Check that the air inlet flap (21) moves freely and closes off under the action of its return spring (23). This can be done by gently operating the flap using a small screwdriver or other slim implement through the air inlet orifice.

Reassembly

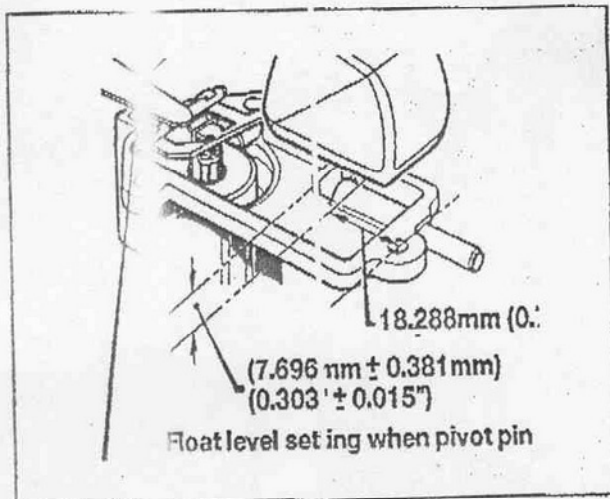
- 1
- Fit the new main valve diaphragm with the concave side of the diaphragm toward the valve head.
 - Insert the main valve assembly into the valve body and refit spring and clips to the main valve stem (see diagram on page 218 for detail of the correct order of assembly of clips).
 - Refit the air entry flap valve with spring and spindle, ensuring that the legs of the spring are correctly located.
 - Fit new valve body gasket, ensuring that it does not foul the air entry flap valve.



- 2
- Place a steel rule along the main body to cover the valve nozzle. Position the diaphragm clamp ring directly over the main valve seat or the steel rule.
 - Align the valve body carefully over the main body so that the clamp ring engages in the diaphragm recess and fit the two short screws with spring washers.
 - Lightly tighten the screws and remove the steel rule. It is important to check that the jet needle threaded insert in the valve body is aligned with the jet tube bore before fully tightening the securing screws.
 - Check the operation of the air entry flap valve ensuring that it is lightly sprung onto its seat.
 - Check the operation of the air entry flap valve ensuring that it is lightly sprung onto its seat.

- 3
- Drop the jet needle into the jet tube and screw the square-head jet adjuster screw into the valve body until the dimension in drawing A is achieved or to where the jet needle was prior to dismantling. Check the location of the needle in the jet before fitting the needle diaphragm.
 - Position the top cover gasket.
 - Refit the main bi-metal with the bi-metal slotted on the main valve stem under the lower clip (see drawing A) and resting on its "V" pivot slots.
 - Fit the top cover noting that there are, in some top covers, internally moulded serrations which hold the jet needle in position and that the spring in the cover locates on the main bi-metal.
 - Refit the air entry pipe.

- 4
- With the unit inverted, fit the new needle diaphragm assembly as follows: Ensure that the hollow dowel (30) is free from obstruction and fit it to the main body.
 - Place the diaphragm (27) over the dowel, with the float rivet head downwards, and align it with the screw holes.
 - Position the spring (28) in the locating place of the diaphragm.
 - Place the cap (29) over the spring and press down towards the body. Take care to engage with the hollow dowel and to keep screw holes aligned.
 - Whilst holding the cap down against the pressure of the spring, check that the diaphragm has not puckered around the edges of the screw holes.
 - Fit the four screws with their spring washers and tighten down evenly.



- 5
- The following procedure must be adhered to when replacing the float chamber lid assembly: Fit a new float chamber lid gasket to the body of the unit.
 - Using the new components supplied, invert the float chamber lid and drop the float needle into its seating.
 - Fit the float assembly ensuring that the needle is correctly located on the float by means of its wire stirrup.
 - Holding the float assembly to the face of the lid with the tip of a steel rule or feeler gauge (as shown in diagram) position the lid over the float chamber close enough to allow the float hinge pin to drop into position, when the feeler gauge is removed, without the needle falling from the seating bore or the stirrup becoming disengaged.

- (e) Align the screw holes, and fit the three screws and spring washers including the specification tag.
- (f) Tighten the screws evenly.
- (g) Test that the float is free to move in the chamber by rotating the whole unit around the float pin axis and listening for movement of the float.

6

- (a) Refit the filter (34) and plug (35) using a new washer (36).
- (b) On completion of tuning adjustments fit the aluminium blanking plugs and heat insulation cover.
- (c) Refit the unit to the vehicle in accordance with the manufacturer's instructions ensuring that all connections are secure and that all pipework is leak free.

Priming The AED With Fuel

On early vehicles the AED can be primed with fuel by merely switching on the ignition, which immediately activates the fuel pump. Later vehicles are fitted with an engine oil pressure sensitive inhibitor switch in the electrical circuit of the fuel pump. The engine therefore has to be cranked for several seconds in order to activate the fuel pump and allow it to prime the AED. In either case, wait approximately 20 seconds before attempting to start the engine, to allow the fuel well in the AED to fill.

Checking The Mixture Strength

Start the engine. Initially it should run slightly rich as the fuel well is used up, but after approximately 10 seconds should settle down to more even running. An erratic beat and visible exhaust flames indicates too rich a mixture. Surging, or the inability to run for more than a few seconds culminating in a rapid stall out indicates too weak a mixture.

Mixture Adjustment

- (a) Remove the push-on plastic insulating cover (1).
- (b) Unscrew and remove the two screws retaining the top cover (7, 8).
- (c) Disengage cover from gasket and remove carefully (9).
- (d) The mixture is regulated by the square headed brass screw which carries the metering needle (13). Move in increments of not more than 1/8 of a turn (half flat), clockwise to weaken, anti-clockwise to richen.
- (e) Carefully replace the top cover ensuring that the gasket is correctly positioned and the C-shaped spigot, moulded on the underside of the top cover, engages with circular recess around the needle adjuster. Press the cover down against the spring load and screw in the two retaining screws. Do not overtighten.
- (f) Restart the engine and, if necessary, repeat the procedure using finer increments.

Fast Idle Speed Adjustment

- (a) Having established the correct mixture strength the fast idle speed will require minimal adjustment. Ideally this should be approx. 1000 rpm at an ambient temperature of 10°C.
- (b) Remove the centre brass plug in the top cover which exposes the adjust screw (5). Using a narrow blade screwdriver, turn clockwise to reduce rpm and anti-clockwise to increase rpm.

Needle Lift Adjustment

This is set to .045" at 20°C (measured when static) and should not need to be touched, except perhaps in the case of an engine having low manifold depression, where it may be desirable to reduce this figure to overcome part warm starting problems. Needle lift is temperature sensitive and ideally should reduce to zero at, or just prior to, the moment of closure of the main valve. The adjust screw (4) for this setting is found under the brass plug at the narrow end of the top cover. There is a hole through the centre of it to allow a 1/16" diameter probe to be inserted when measuring the needle lift. Screw clockwise to reduce needle lift, anti-clockwise to increase lift.

Part Warm Starting Problems

The inability of an engine to restart in the part warm condition is almost invariably caused by over-richness. This can be caused by:

- (a) Too much main valve opening, due to either incorrect initial setting or air leaks into the hot air system preventing temperature rise within the unit.
- (b) Too much needle lift giving excessive cranking enrichment.
- (c) Inability of the engine to generate sufficient manifold depression to pull down the needle diaphragm, due to being excessively worn mechanically or retarded ignition setting.

Fault Diagnosis

Engine fails to fire when cold

Possible Cause:

Inadequate or no fuel supply to the AED

Remedy:

Slacken the filter plug on the AED. Crank the engine; fuel should leak from the plug. If no fuel, check the system leading to the AED. If fuel is present, tighten the plug. Then carry out the following check:

Note: This check is not applicable when AED temperature is above 35°C (95°F).

Crank the engine for several seconds. Remove the pipe at the inlet manifold. If fuel is present, it indicates that the AED is satisfactory and the cause for failure to start must be traced to some other source. If no fuel is present this indicates a faulty AED.

Proceed as follows: Remove the float-chamber lid and check that the needle valve and float are free to move. If there is no fuel in the float chamber, check that the fuel filter is clean and that ample fuel is being delivered to the unit. If adequate fuel is being delivered to the float chamber this indicates a malfunction elsewhere in the unit (provided the temperature is within the unit operating range) and the unit should be replaced.

Engine fires but fails to keep running when cold

Possible Cause (1):

Sticking or faulty needle valve or float

Remedy:

Check the following:
Remove the vent pipe from the float chamber and check that fuel is not discharged when cranking the engine.

If fuel is discharged, check the operation of the needle valve and float as detailed in the fuel supply check above.

Possible Cause (2):

Faulty air flap valve

Remedy:

Remove the air inlet elbow on the AED and check that the flap valve is free to move and return under spring load.

Possible Cause (3):

Inadequate fuel supply

Remedy:

Check for lack of fuel as detailed above.

Possible Cause (4):

Faulty jet needle diaphragm

Remedy:

Remove the AED complete and service as shown in the servicing instructions. If the diaphragm is satisfactory, a replacement unit should be fitted.

Possible Cause (1):

Incorrect starting procedure

Remedy:

Crank the engine and open the throttle slightly. If the unit is badly over-choked open the throttle fully. Do not over-rev. If the engine starts but fails to keep running, carry out check for sticking or faulty needle valve below.

Possible Cause (2):

Leaks from pipe layout

Remedy:

Ensure that all pipes are correctly fitted, particularly the pipe between the hot air pick-up and the AED. Rectify as necessary, ensuring air-tight joints.

Note: Air leaks at the hot air entry will result in excessive fuel consumption and the possibility of stalling at certain engine temperatures.

Before carrying out further checks ensure that the AED is not the cause of failure to start. Remove the pipe from the AED to inlet manifold. Blank off the aperture in the manifold. If the engine starts this indicates that the AED is at fault, and further checks must be made. However, if the engine is flooded, it may be necessary to crank for several seconds with a slightly open throttle before the engine will fire.

Possible Cause (3):

Sticking or faulty needle valve or float

Remedy:

Check the following:

Remove the vent pipe from the float chamber and check that fuel is not discharged when cranking the engine.

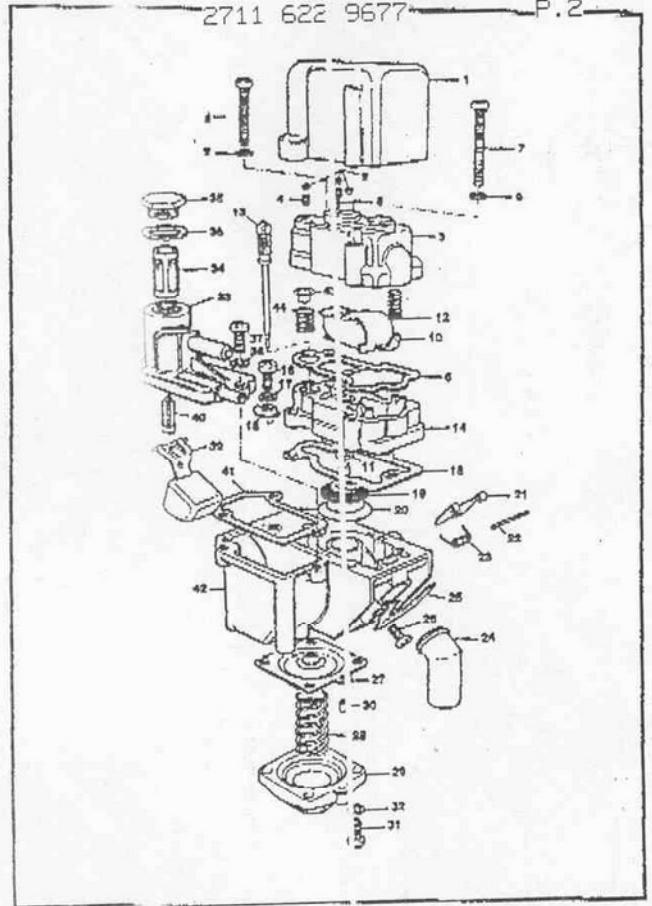
If fuel is discharged, check the operation of the needle valve and float. Remove the float chamber lid. Check that needle valve and float are free to move. If there is no fuel in the float chamber, check that the fuel filter is clean and that ample fuel is being delivered to the unit. See the servicing instructions.

Possible Cause (4):

Faulty needle diaphragm

Remedy:

Remove the AED complete and service as shown in the servicing instructions. If the diaphragm is



- 1 Heat Insulation Cover
- 2 Aluminium Blanking Plugs
- 3 Top Cover Complete
- 4 Hollow Cap Screw - Adjusting Needle
- 5 Grub Screw - Adjusting Valve
- 6 Gasket - Top Cover
- 7 Screw - Long
- 8 Screw - Short
- 9 Spring Washer
- 10 Main Bimetal Complete
- 11 Locating Washer - Main Bimetal
- 12 Loading Spring - Main Bimetal
- 13 Jet Needle Complete
- 14 Valve Body
- 15 Valve Body Gasket
- 16 Screw
- 17 Spring Washer
- 18 Special Plain Washer
- 19 Main Valve and Diaphragm Complete
- 20 Clamp Ring - Diaphragm
- 21 Air Entry Flap
- 22 Flap Spring
- 23 Return Spring For Flap
- 24 Air Entry Elbow
- 25 Retaining Clamp For Air Entry Elbow
- 26 Screw - Fixing Air Entry Pipe
- 27 Needle Diaphragm
- 28 Diaphragm Spring
- 29 Cap - Needle Diaphragm
- 30 Hollow Locating Bowl - Cap and Needle Diaphragm
- 31 Screw
- 32 Spring Washer
- 33 Float Chamber Lid
- 34 Nylon Filter
- 35 Filter Plug
- 36 Filter Plug Washer
- 37 Screw
- 38 Spring Washer
- 39 Float Complete
- 40 Float Needle
- 41 Float Chamber Gasket
- 42 Main Body Casting
- 43 Spring Seat
- 44 Spring
- 45 Upper Bimetal Spring

New or reconditioned units are pre-set to a factory specification which should allow the engine to start. However, like the main carburetters, the AED will require trimming of the mixture and idle speed settings to accommodate the individual fuelling requirements of your engine. This operation must be completed within the first 3 minutes (approx) of running time, i.e. before any substantial amount of heat reaches the AED to cause significant movement of the bimetals. It will therefore probably take more than one cold start to achieve the desired results.

When fitting the new AED it is essential that the hot air pipe, which runs around the back of the engine to the rear exhaust manifold, is correctly installed, and that the insulation which clads the pipe is complete and undamaged. Ensure that the connection to the hot-spot on the rear exhaust manifold is secure and there are no gaps which might admit cool air. The supply of hot air is essential in order to expand the bi-metallic elements and thus close down the AED when the engine is hot. Failure of the main bi-metallic element to close the air valve will result in an over-rich mixture during normal engine running.

pipe clamp (25) and remove the clamp and the pipe