CHALWYN
by AMOT

# D-Series Engine Automatic Overspeed Shut Down Valves

## (Spindle Types with Air Pressure and Manual Shut Down Options)

## Selection, Application and Maintenance

| Valve Numbers |
| --- |
| D92-AP D102-AP D121-AP D136-AP |
| D92-AMP D102-AMP D121-AMP D136-AMP |

CE238 (9) 0516 D

# FITTING

## SAFETY

WARNING

- Care should be taken when unpacking to prevent injury.
- Exhaust gases may cause permanent respiratory problems, suffocation or death. Any exhaust systems should be piped out of enclosed areas.
- Ensure that a hot engine has sufficiently cooled before commencing any work.
- Ensure that the engine is prevented from being started before commencing work.
- Isolate any air or oil supply being connected to the valve before commencing work.
- The D Valve should be located in a safe and easily accessible position to prevent injury to the operator due to moving parts or contact with hot surfaces while setting the valve.
- Parts of the machinery on which workers are likely to move about or stand to set the Valve, should be designed and constructed in such a way as to prevent workers from slipping, tripping or falling on or off these parts.
- A risk assessment should be conducted before commencing work, to ensure that all hazards such as exhaust fumes, risks due to moving parts, noise and hot surfaces have been eliminated or minimised.

NOTES

- No special handling requirements apply to the D Valve.
- Carefully read and fully understand the installation instructions before commencing work.
- Only competent personnel should install the D valve.
- Wear appropriate Personal Protective Equipment including safety footwear, safety glasses, thermal and oil resistant gloves and ear plugs.
- Any spilt oil should be collected in an appropriate container and disposed of in accordance with COSHH and local regulations.

**1.** These valves are supplied with the shut down air cylinder assembled to the valve with all adjustments completed. Type “AMP” valves are also supplied with the manual shut down cable and lever fitted. It is recommended that these assemblies are not separated during fitting.

**2.** The Chalwyn valve is designed for fitting as close to the engine air intake manifold as possible. Where an engine air intake flametrap is also fitted, the Chalwyn valve must always be positioned on the upstream (air cleaner) side of the flametrap. These same requirements are generally applicable to both naturally aspirated and turbocharged engines but in the case of a turbocharged engine the following may be applicable.

a) Insufficient space to fit between the turbocharger and engine. In this case the valve may be fitted upstream of the turbocharger.

b) The turbocharger air outlet temperature is exceptionally high (150º C plus). In this case fit the valve downstream of the intercooler or upstream of the turbocharger.

**Note**: Where the valve is fitted immediately upstream of the turbocharger, ensure that the valve spindle does not project into the turbocharger when the valve closes.

**3.** Where more than one Chalwyn valve is fitted to an engine as in the case of an engine with multiple intake pipes, a balance pipe arrangement must be installed to connect the various intake pipes together downstream (engine side) of the shut down valves. Typically balance pipe diameters should be about 30% of the diameter of the intake pipes.

**4.** When fitting ensure the direction of air flow is in compliance with direction shown on the body. The valve may be installed either horizontally or vertically. Ensure that the mechanical cables are installed without tight bends and are positioned to avoid mechanical damage or damage from hot surfaces.

**5.** The flexible cuffs at the inlet and outlet of the valve should be of a re-inforced type, provide adequate support for the valve and prevent excessive vibration. If necessary, additional support brackets mounted from the engine should be considered.

**6.** Particular care must be taken to ensure the integrity of the intake pipework between the Chalwyn valve and intake manifold. Ideally metal pipework should be used and any gaps kept as short as possible (taking into account any relative movement) and closed by reinforced hose. The possibility of a hose collapse on closure of the shut down valve should be avoided.


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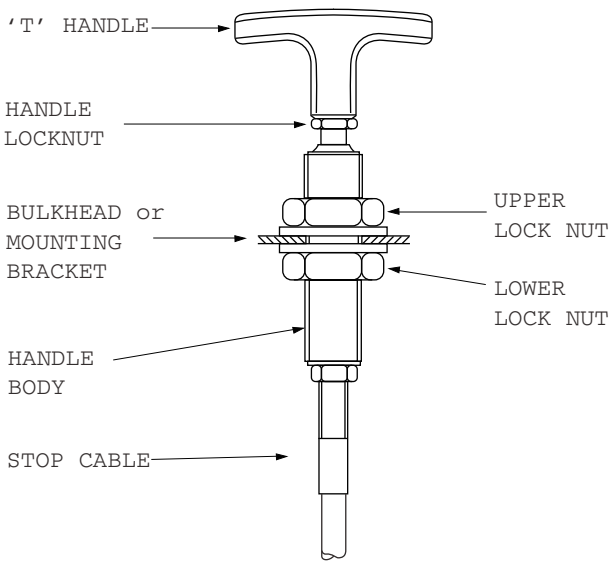
# FITTING cont.

7. Any engine crankcase breather connections into the intake system between the Chalwyn valve and engine, or any internal crankcase breather arrangement venting directly into the engine intake ports, must be sealed and replaced by an external breather system venting either to atmosphere or to the intake system upstream of the shut down valve. External breather system kits for various engine types are available from Chalwyn.

8. Securely locate the air cylinder assembly using the four mounting holes provided.

9. Connect the CLEAN, DRY shut down air supply to the inlet port of the shut down valve cylinder. the air exhaust port should also be piped back to clean, dry air to avoid moisture or dust being drawn back into the air cylinder. **Note:** A shut down air supply pressure of 2.5 bar (36 psi) to 8 bar (116 psi) is required to operate the shut down. See note reference “Adjustment of Air Cylinder - page 6.

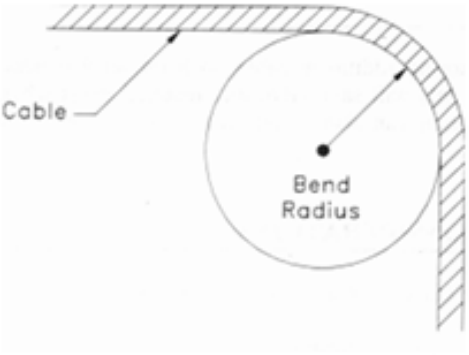
10. In the case of -AMP valves fit the "T" handle assembly RTD-100 through a suitable ø20mm (3/4” diameter) hole in a bulkhead or mounting bracket as follows. Release the handle locknut. Remove the handle, handle locknut and upper locknut and washer. thread handle body through the bulkhead/ bracket. Refit upper locknut and washer. Adjust lower and upper locknut to position handle and tighten. Refit handle locknut and handle. Tighten locknut.




**Important Notes**

For some of the largest size valves, handle assembly RLD-100 is supplied in place of RTD-100. In this case a suitable bracket will need to be made up to mount the handle assembly.

It takes a significant force to move the valve to the fully closed position using the RLD-100 (or RTD-100) handle when the engine is not running. This is a design feature and adjustment is not necessary. When the engine is running, manual shut down will be achieved satisfactorily using considerably less force to operate the shut down lever.




Min bend radius = 150mm (6”)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# ADJUSTMENT

## SAFETY

WARNING

- When adjusting the D Valve, take care to ensure that contact with hot surfaces or entanglement in adjacent equipment is avoided

NOTE

- If a manual shut down cable assembly is fitted, ensure that excessive effort is not required to operate the manual override.

Once the Chalwyn valve is installed, adjustment of the overspeed trip setting is carried out using the inlet adjuster and locknut (refer to diagram). Basically rotating the inlet adjuster clockwise will increase the engine speed at which automatic shut down occurs.

As supplied, the valve will be adjusted such that shut down will generally occur well below the engine high idle speed. To increase the shut down speed to the required setting proceed as follows:-

**Note.** Prior to carrying out the following adjustments check that the air pressure shut down control and , where fitted, the manual shut down control, are in the “run” position.

1. Start engine. Slowly accelerate. Note speed at which shut down occurs.
2. Remove hose at **air inlet** to Chalwyn valve to expose the adjuster and locknut (see diagram).
3. Release locknut. Turn adjuster clockwise one turn. Tighten locknut.
4. Refit inlet hose to Chalwyn valve.
5. Start engine. Slowly accelerate. Note speed at which shut down occurs.
6. Repeat the above steps ‘**2**’ to ‘**5**’ until the first setting at which the engine does not shut down at high idle speed (i.e. maximum throttle, no load). Then either:

*a) Use the results of shut down speed versus adjuster setting as a calibration check to make a final adjustment to give the required setting (typically 10% to 15% over high idle).*

**or**

*b) If a very precise setting is not required, turn the adjuster a further one turn clockwise to take the shut down above high idle speed by a suitable margin. When using this setting procedure it may be found that the engine occasionally shuts down during its normal operation. If so, turn the adjuster clockwise by a further one half turn.*

7. Ensure the adjuster locknut is fully tightened. (Use a thread lock adhesive on the locknut threads).
8. After completing the valve adjustment, check the functioning of the air pressure shut down and, if applicable, the manual shut down, by operating each in turn with the engine running at medium speed. The engine should stop within a few seconds in each case.

### Important Notes:

**Adjustment of Air Cylinder.**

The air pressure shut down arrangement is adjusted such that when operated with the engine not running, it makes the valve close to within about 1mm of the valve seat. This will give satisfactory operation of the valve when the engine is running DO NOT adjust the system such that the air cylinder pulls the valve into contact with the valve seat as this may result in early cable failure..

**Insufficient Overspeed Adjustment.**

Should there be insufficient adjustment available to set the required overspeed trip point, the outlet locknut should be released and the outlet adjuster rotated anticlockwise by four turns. The outlet locknut should then be treated with a thread lock adhesive and securely tightened. Further adjustment to the inlet adjuster as per above instructions is then continued.

**Turbocharged Engines.**

When setting up a valve on a turbocharged engine using the preceding method, it may be found that at high power outputs, the engine will shut down at a lower speed than required. If this occurs, further small adjustments in steps of one half turn clockwise should be made until the problem is eliminated.



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# MAINTENANCE

## SAFETY

WARNING

- When externally cleaning the valve ensure the engine is sufficiently cooled before commencing work, if cleaning a hot valve take extra care to avoid touching hot surfaces and to avoid entanglement in adjacent equipment.
- Take care not to trap fingers when making adjustments to the valve setting.
- When maintaining the valve, isolate pressure sources and ensure that there is no trapped pressure before dismantling.
- Equipment contains springs, during dismantling ensure that spring forces are safely removed.
- When internally cleaning components with chemical agents avoid contact with skin, inhalation and ingestion of the cleaning agents and dirt / debris removed. Appropriate PPE should be worn.

NOTES

- No special handling requirements apply to the D Valve.
- Carefully read and fully understand the maintenance instructions before commencing work.
- Only competent personnel should maintain the D valve.
- Wear appropriate Personal Protective Equipment including safety footwear, safety glasses, thermal and oil resistant gloves and ear plugs.
- Any spilt oil should be collected in an appropriate container and disposed of in accordance with COSHH and local regulations.

Routine maintenance should be undertaken as below:

**Daily:** Run engine in the mid speed range. Apply the air pressure shut signal and check that the engine stops within a few seconds.

## Three Monthly:

1. Disconnect intake pipework and release the valve from any support brackets etc. to allow it to be removed.

2. Inspect the valve internally for cleanliness. If necessary, clean in paraffin or white spirit taking normal precautions. Dry the valve thoroughly.

3. Check there is no excessive wear and that the valve moves smoothly over its complete operating stroke. **DO NOT LUBRICATE.**

4. Refit valve. Check valve setting based on the “Adjustment” instructions given herein.

5. Operate the air pressure shut down system whilst the engine is running at medium speed. The engine should stop within a few seconds.

6. Where applicable operate the manual shut down control with the engine running at medium speed. The engine should stop within a few seconds.

**Note:** If the valve fails to function correctly, or if there is any doubt about the operation of the valve, it should be withdrawn from service until corrective action has been completed.

**Important Notes:**
The three monthly routine maintenance period requirement is dependent on the operating conditions to which the equipment is exposed and, by experience, may need to be varied.

Any maintenance problems not covered by the routine maintenance schedule should be discussed with your Chalwyn Distributor before any repair work is undertaken


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