

# ENGINE ADJUSTMENTS

**NOTE:** *UNIVERSAL recommends that the following engine adjustments be performed by a competent engine mechanic. The information below is provided to assist the mechanic.*

4. Close the raw water seacock (thru-hull).
5. Crank the engine and allow the gauge to reach a maximum reading. Record the reading.
6. Repeat this process for each cylinder. Look for cylinders with dramatically (at least 20%) lower compression than the average of the others.

#### Compression pressure at cranking speed:

**Standard value:** 412 – 469 psi (29 – 33 kgf/cm<sup>2</sup>)  
(2.84 – 3.24 MPa)

**Limit:** 327 psi (23 kgf/cm<sup>2</sup>) (2.26 MPa)

**Maximum difference between cylinders:**  
10% or less.

**NOTE:** *If the readings are below the limit, the engine needs an overhaul.*

7. Re-install the glow plugs (use anti-seize compound on the threads) and reset the fuel shut-off to the run position.
8. *Open the raw water seacock (thru-hull).*

If a weak cylinder is flanked by healthy cylinders, the problem is either valve- or piston- related. Check the valve clearances for the weak cylinder, adjust as needed, and test again. If the cylinder is still low, apply a small amount of oil into the cylinder to seal the rings, and repeat the test. If the compression comes up, the rings are faulty.

Abnormally high readings on all cylinders indicate heavy carbon accumulation, a condition that might be accompanied by high pressures and noise.

**NOTE:** *In case of severe vibrations and detonation noise, have the injectors checked and overhauled by an authorized fuel injection service center. Poor fuel quality, contaminants and loss of positive fuel pressure to the injection pump will result in injector faults.*

When low compression is found, determine the cause by applying a small amount of oil in the cylinder through the glow plug hole. Allow the oil to settle.

Install the pressure gauge and repeat the above test. If the compression reading rises dramatically, the fault is with the rings. If the compression value does not rise, the problem is with the valves.

A slight rise in compression would indicate a problem with both the rings and the valves.

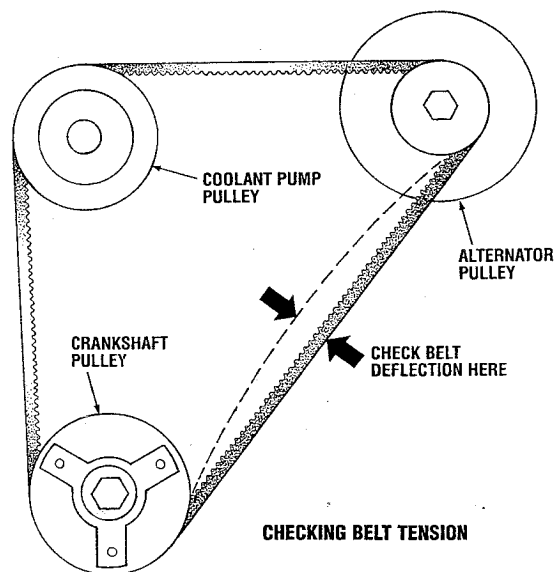
## DRIVE BELT ADJUSTMENT

The drive belt must be properly tensioned. A loose drive belt will not provide proper alternator charging and will eventually damage the alternator. A drive belt that is too tight will pull the alternator out of alignment and/or cause the alternator to wear out prematurely. Excessive drive belt tension can also cause rapid wear of the belt and reduce the service life of the coolant pump's bearing. A slack belt or the presence of oil on the belt can cause belt slipping, resulting in high operating temperatures and tachometer variations.

**⚠ WARNING:** *Never attempt to check or adjust the drive belt's tension while the engine is in operation.*

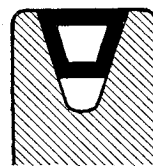
## Checking Belt Tension

1. To check the belt tension, press the belt at the midpoint between the alternator pulley and the crankshaft pulley with a force of 22 lbs. (10 kfg) (98 N). The belt deflection should be 3/8 in. – 1/2 in. (10 – 12 mm) deep.



## Adjusting Belt Tension

1. To adjust the belt tension, loosen the alternator adjusting strap bolt and the base mounting bolt.
2. With the belt loose, inspect the belt for damage, wear, cracks and frayed edges. If the belt is damaged, replace it. If it is nearly worn out and deeply sunk in the pulley groove, replace it.



GOOD  
BELT



BAD  
BELT

3. Pivot the alternator on the base mounting bolt to the left or right as required, to loosen or tighten.
4. Tighten the base mounting bolt and the adjusting strap bolt securely.
5. Run the engine for about 5 minutes, then shut down and recheck the belt tension.