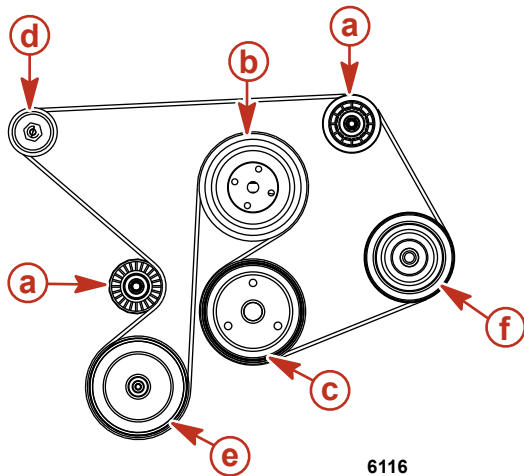


Serpentine Drive Belt

⚠ WARNING

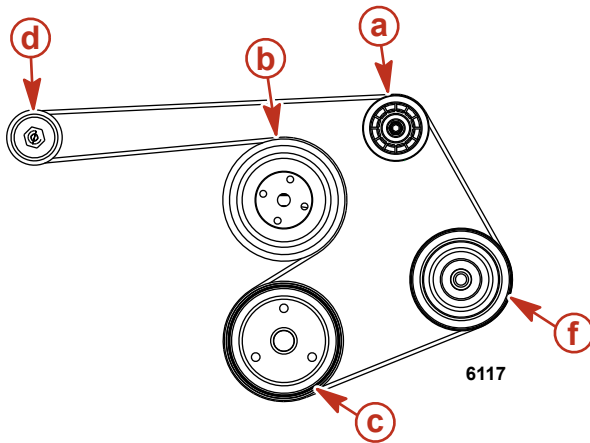
Inspecting the belts with the engine running may cause serious injury or death. Turn off the engine and remove the ignition key before inspecting the belts.



6116

With a seawater pump

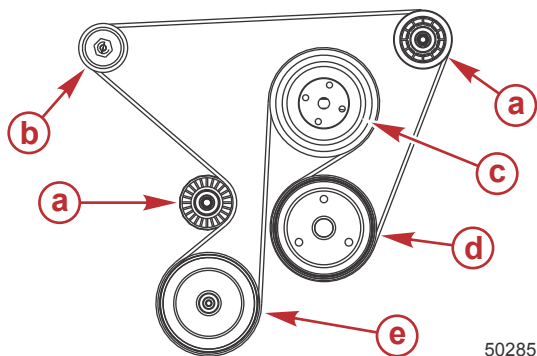
- a - Idler pulley
- b - Water circulating pump pulley
- c - Crankshaft pulley
- d - Alternator pulley
- e - Seawater pump pulley
- f - Power steering pump pulley



6117

Without a seawater pump

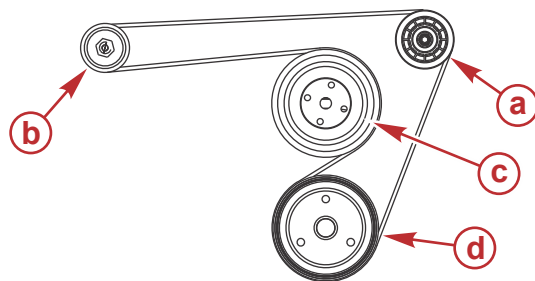
Second Engine on a Dual Engine Installation



50285

With a seawater pump and without a power steering pump

- a - Idler pulley
- b - Alternator pulley
- c - Water circulating pump pulley
- d - Crankshaft pulley
- e - Seawater pump pulley



50286

Without a seawater pump and without a power steering pump

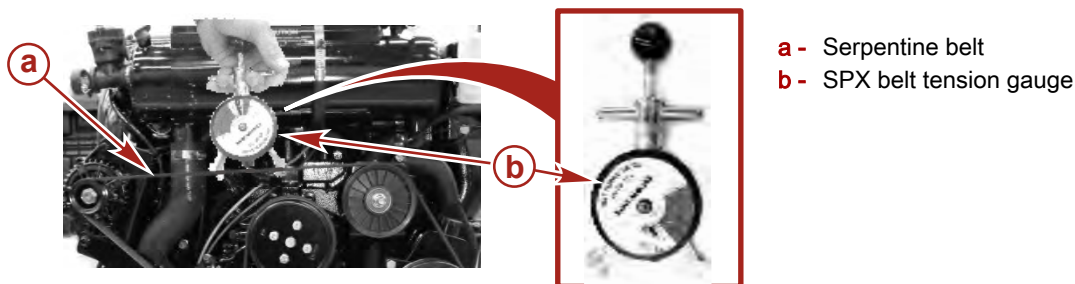
Replacing Belt or Adjusting Tension

IMPORTANT: If a belt is to be reused, it should be installed in the same direction of rotation as before.

NOTE: Belt deflection is to be measured on the belt at the location that has the longest distance between two pulleys.

1. Loosen the 16 mm (5/8 in.) locking nut on the adjustment stud.
2. Turn the adjustment stud and loosen the belt.
3. If a new serpentine drive belt is required, remove the old belt, and install a new belt onto the pulleys.

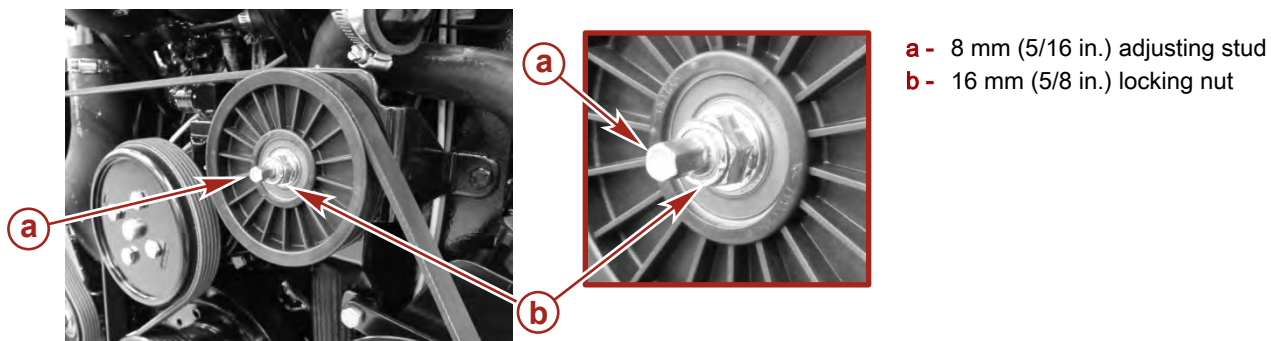
4. Put a wrench on the adjustment stud 16 mm (5/8 in.) locking nut.
5. Use an 8 mm (5/16 in.) socket and tighten the adjusting stud to adjust the belt deflection.
6. Using one of the two methods following, check for correct deflection.
 - a. Push down with moderate thumb pressure on the longest stretch of belt. Proper deflection is 13 mm (½ in.).
 - b. Attach the belt tension gauge to the belt. The gauge has different ranges for new and used belts.



49019

Belt Tension Gauge	SPX BT-33-73-F
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7. While holding the adjustment stud at the correct belt tension, tighten the 16 mm (5/8 in.) locking nut to the specified torque.



49020

Description	Nm	lb-in.	lb-ft
Locking nut	29	–	21

8. Operate the engine for a short period of time and recheck the belt adjustment.

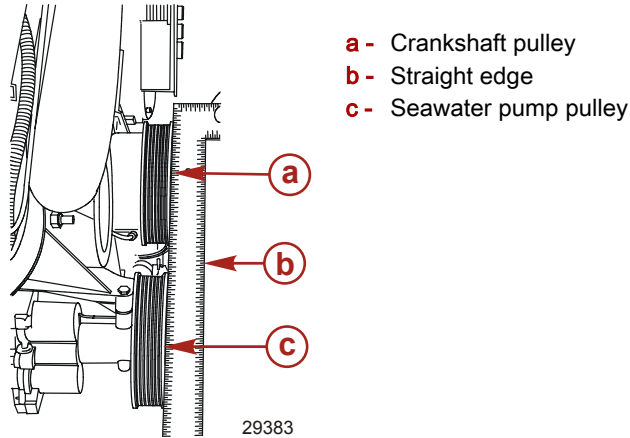
Pulley Alignment

Premature belt failure is an indication of pulley misalignment or pulley damage. Care must be taken when removing or installing an engine to prevent damage to engine components, brackets, or pulleys. Pulleys that are misaligned due to bent or damaged brackets can cause belt shredding and premature failure. Stepping on pulleys and belt driven components that are mounted on brackets can cause pulley misalignment and subsequent belt failure.

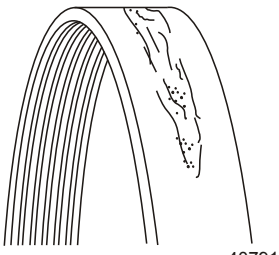
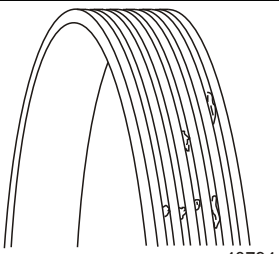
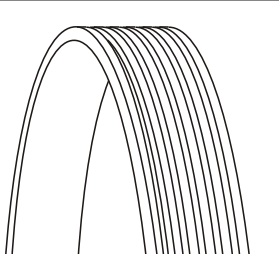
Verifying Pulley Alignment

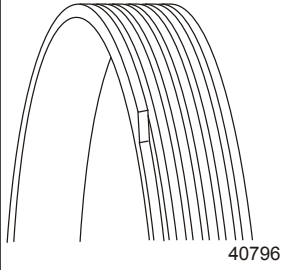
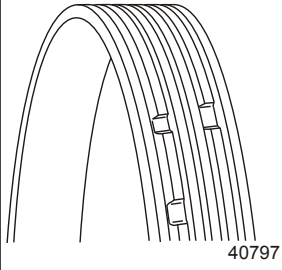
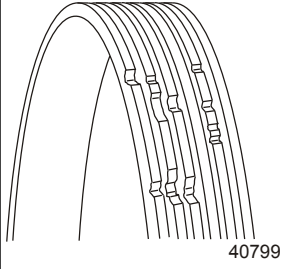
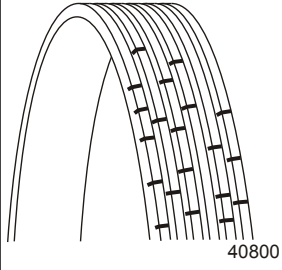
1. Place the straight edge across the seawater pump, alternator, or power steering pump pulley and the crankshaft pulley.

2. Compare the angle of the outer face of each pulley to the straight edge. It should be parallel. The outer face of the seawater pump pulley may be slightly in front of or behind the straight edge.



Serpentine Belt Failure Identification

Appearance	Description	Cause	Solution
 <p>40791</p>	Abrasion Each side of the belt appears shiny or glazed. Severe condition: Fabric is exposed.	Belt is in contact with an object. Can be caused by improper belt tension or tensioner failure.	Replace the belt and inspect for contact with an object. Verify the belt tensioner is functioning.
 <p>40794</p>	Pilling Belt material is sheared off from the ribs and builds up in the belt grooves.	There are a number of causes including lack of tension, misalignment, worn pulleys, or a combination of these factors.	When pilling leads to belt noise or excess vibration, the belt should be replaced.
 <p>40795</p>	Improper install The belt ribs begin separating from the joined strands. If left unattended, the cover will often separate, causing the belt to unravel.	Improper belt installation is a common cause of premature failure. One of the outermost belt ribs is placed outside the pulley groove, causing a belt rib to run without a supporting or aligning pulley groove.	The belt life has been severely limited and should be replaced immediately. Ensure all ribs of the replacement belt fit into the pulley grooves. Run the engine. Then, with the engine off and battery disconnected, inspect the belt for proper installation.

Appearance	Description	Cause	Solution
 40796	Misalignment Sidewalls of the belt may appear glazed or the edge-cord may become frayed and the ribs are removed. A noticeable noise may result. In severe cases, the belt can jump off the pulley.	Pulley misalignment. Misalignment forces the belt to kink or twist while running, causing premature wear.	Replace the belt and verify the alignment of the pulley.
 40797	Chunk-out Pieces or chunks of rubber material have broken off the belt. When chunk-out has occurred, a belt can fail at any moment.	Chunk-out can happen when several cracks in one area move parallel to the cord line. Heat, age, and stress are the primary contributors.	Replace the belt immediately.
 40799	Uneven rib wear Belt shows damage to the side with the possibility of breaks in the tensile cord or jagged edged ribs.	A foreign object in the pulley can cause uneven wear and cut into the belt.	Replace the belt and inspect all pulleys for foreign objects or damage.
 40800	Cracking Small visible cracks along the length of a rib or ribs.	Continuous exposure to high temperatures, the stress of bending around the pulley leads to cracking. Cracks begin on the ribs and grow into the cord line. If three or more cracks appear in a three-inch section of a belt, eighty percent of the life is gone.	Replace the belt immediately.

NOTE: Minor, transverse cracks (across the belt width) may be acceptable. Longitudinal cracks (in the direction of belt length) that join transverse cracks are NOT acceptable.

Closed Cooling

Description

Closed cooling is a standard feature on some models and is available as an accessory or a factory installed option on others. When closed cooling is used, a mixture of antifreeze and water is circulated through the water jackets in the engine block, cylinder heads, and—on some applications—the exhaust manifolds to dissipate the heat. Refer to Water Flow Diagrams. This coolant is then passed through a heat exchanger. Here the coolant rejects heat to seawater (water in which the boat is being operated), which is simultaneously being passed through the exchanger. The heat is then carried away by the seawater and discharged overboard via the exhaust elbows. The design of the heat exchanger allows for the transfer of heat, while ensuring that the two coolants are separated. In this manner, the expensive engine components are never exposed to seawater, which can be corrosive in salty, polluted, or mineral laden water areas.