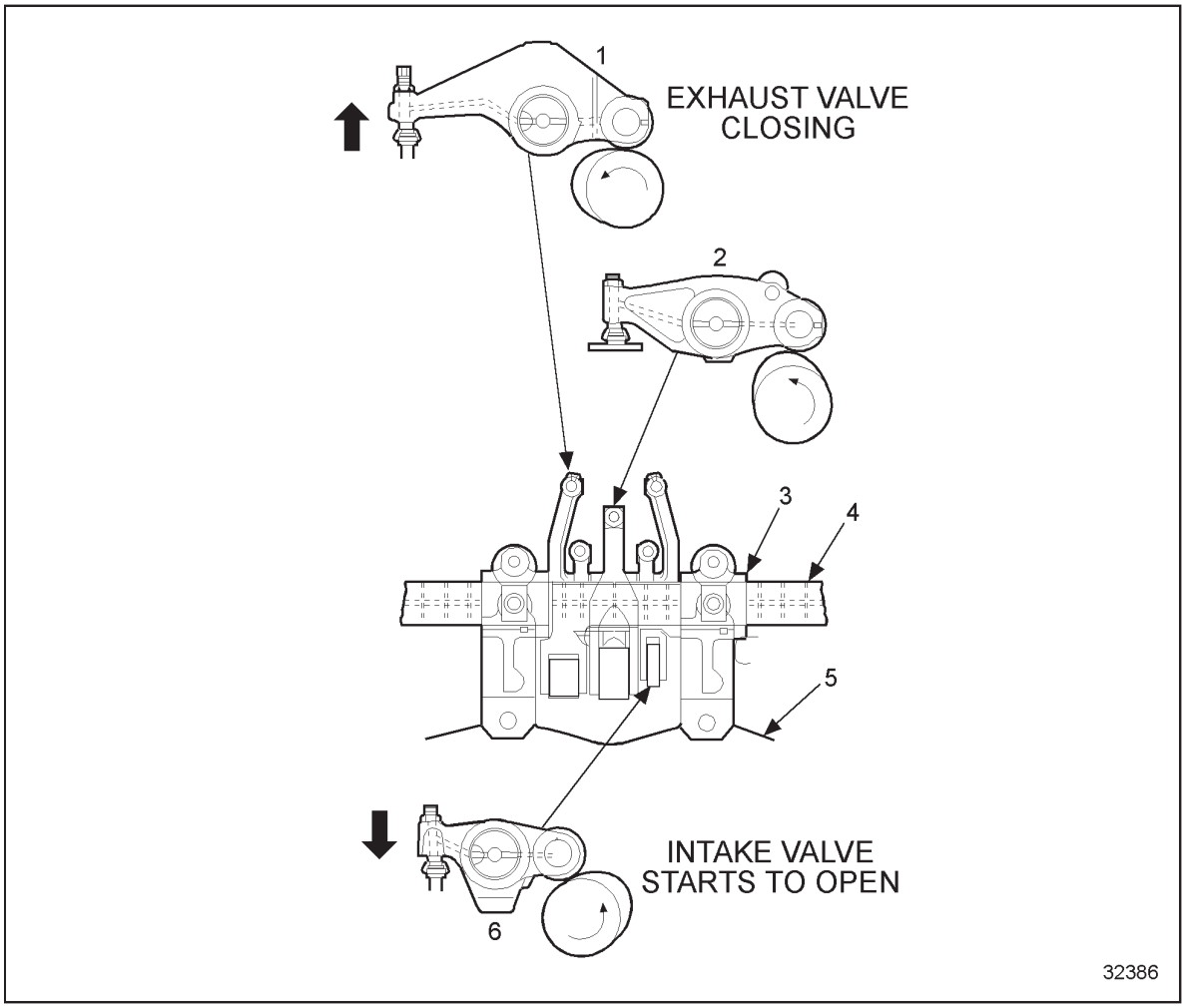
NOTE:
When setting valve lash clearance or injector height, always set them to the dimension listed in Table 12-2.

Adjust the valves and set the fuel injector heights as follows:

1. Disconnect starting power for engine.
2. Remove the engine valve rocker cover as outlined. Refer to section 1.6.2 for one-piece, refer to section 1.6.3 for two-piece rocker cover, and refer to section 1.6.5 for three-piece rocker cover.
3. Insert a 3/4 in. drive breaker bar or ratchet into the square hole in the center of the crankshaft pulley.
4. Bar the engine in the direction of rotation and observe the intake and exhaust valve rollers at any cylinder that is close to TDC (top dead center). See Figure 12-4. Choose a cylinder that has the exhaust valves almost completely closed. Just as the exhaust valves are closing, the intake valves will start to open. This is the valve overlap period.



1. Exhaust Valve Rocker Arm Assembly
2. Fuel Injector Rocker Arm Assembly
3. Camshaft
4. Rocker Arm Shaft
5. Cylinder Head
6. Intake Valve Rocker Arm Assembly

Figure 12-4 Valve Overlap Period

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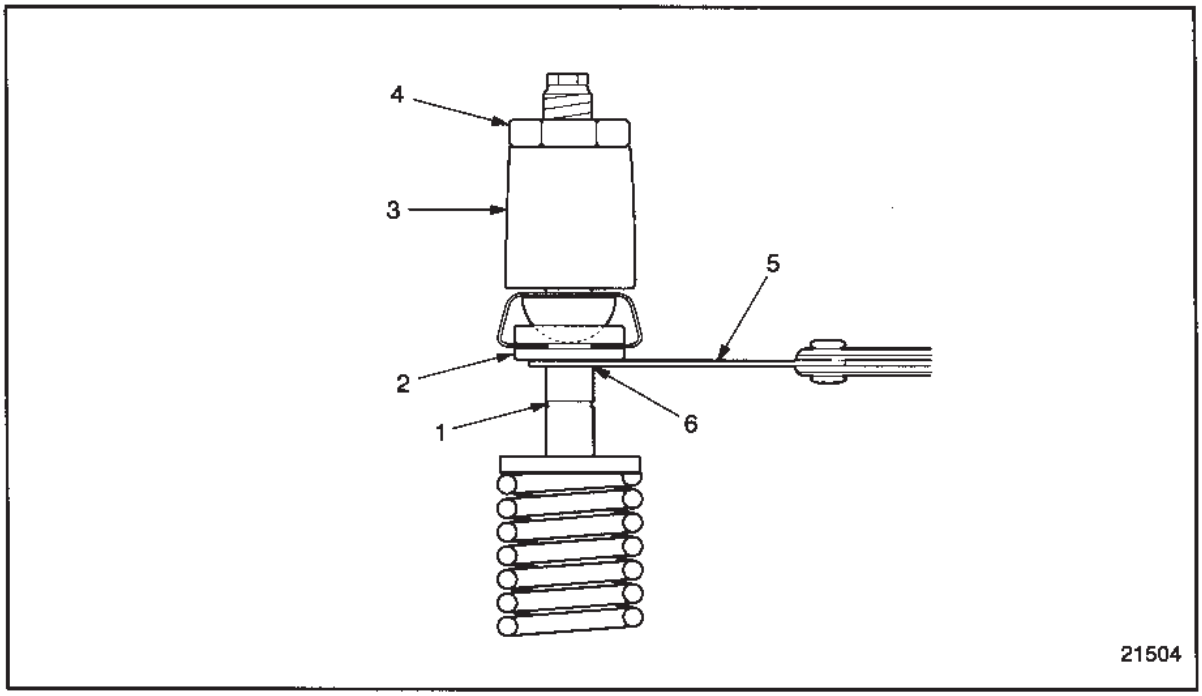
5. Stop engine rotation at the time of valve overlap. Note which cylinder this is, and follow the sequence listed in Table 12-2a to correctly set valves and injector heights. The timing can be started with any cylinder in valve overlap.

Cylinder with Valve Overlap	Set Valves on Cylinder No.	Set Injector Height on Cylinder No.
6	1	5
2	5	3
4	3	6
1	6	2
5	2	4
3	4	1

Table 12-2a Valve Lash and Injector Height Adjustment Sequence

NOTICE:
Never set the valves and injector of the same cylinder at the same time. Doing this will result in engine damage.

6. To adjust the intake valves, insert a 0.203 mm (.008 in.) feeler gage between the tip of the valve stem and the valve button at the end of the rocker arm. See Figure 12-5.



1. Intake Valve
2. Valve Button
3. Intake Valve Rocker Arm Assembly
4. Locknut
5. Feeler Gage
6. Tip of Intake Valve

Figure 12-5 Intake Valve Adjustment

7. Loosen the locknut, and turn the adjusting set screw until the feeler gage produces an even smooth pull between the valve stem and valve button.
8. Tighten the locknut to 41 - 47 N m (30 - 35 lb ft) and remove the feeler gage. Reinsert the feeler gage to ensure that the adjustment did not change when the locknut was tightened. Readjust as necessary.
9. The exhaust valves are adjusted the same way as the intake valves, except use a 0.660 mm (.026 in.) feeler gage (1991 and later models only). Early models (pre-1991 models) use 0.508 mm (.020 in.) feeler gage as listed in Table 12-2. See Figure 12-6.

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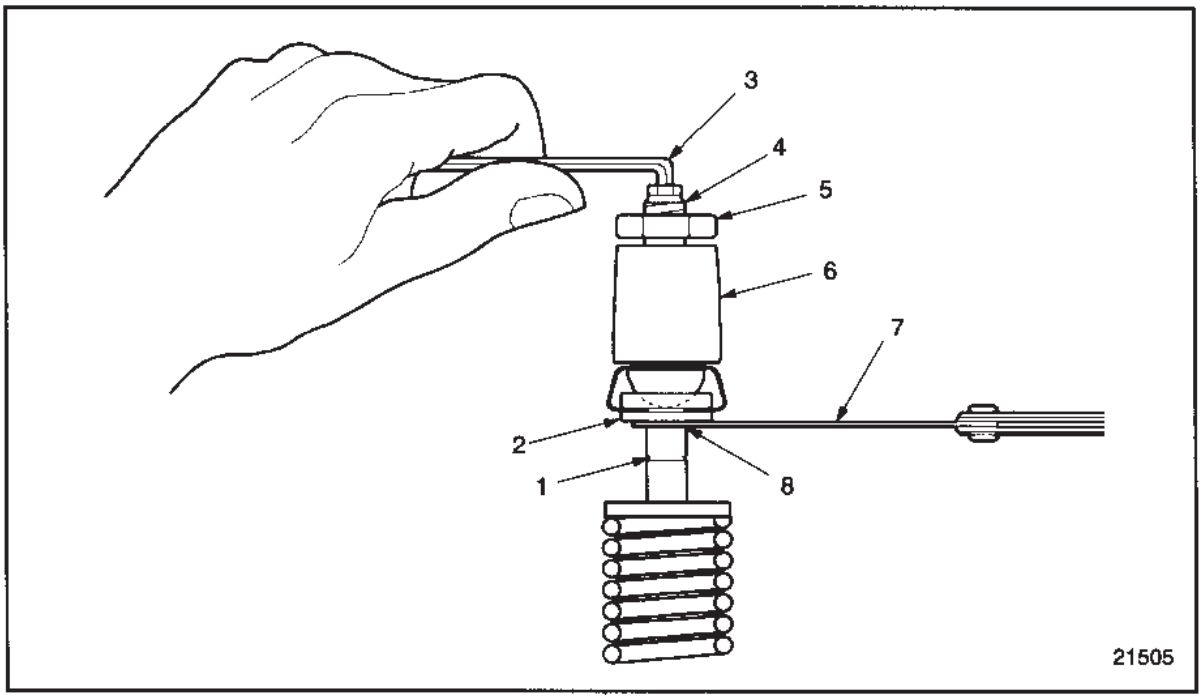


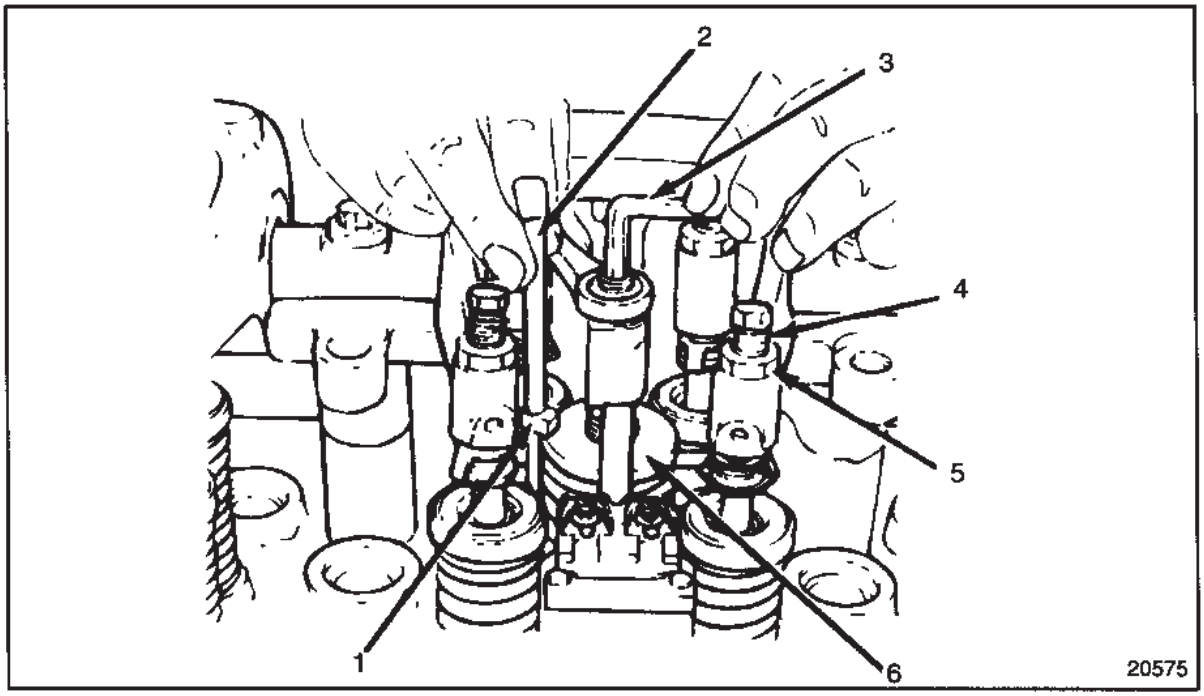
1. Location of Identification Groove
2. Valve Button
3. Allen Wrench
4. Adjusting Screw
5. Locknut
6. Exhaust Rocker Arm Assembly
7. Feeler Gage
8. Tip of Exhaust Valve

Figure 12-6 Exhaust Valve Adjustment

NOTE:
Effective with all 1991 model year engines, a change was made to the exhaust valve material which requires a different exhaust valve lash setting. Refer to section 1.4 for exhaust valve identification.

10. After each set of intake and exhaust valves is adjusted, adjust the corresponding injector listed in Table 12-2a. Injector height settings and tools are listed in Table 12-2.
11. For natural gas applications the valves are adjusted the same way as on the diesel engine, except that a .032 in. (0.813 mm) feeler gage is used for exhaust valves and a .011 in. (0.279 mm) feeler gage is used for intake valves.
12. Adjust the fuel injector height for the engine models in parentheses by placing the small end of the height gage in the hole provided in the fuel injector body, with the flat of the gage toward the fuel injector plunger. See Figure 12-3. The injector height settings for Series 60 engines are listed in Table 12-2.

13. Loosen the fuel injector rocker arm locknut and turn the adjusting set screw until the extended part (flag) of the gage will just pass over the top of the injector follower. An accurate "feel" will be developed. The objective is to adjust all six injectors to the same feel. See Figure 12-7.
14. Tighten the locknut to 41 - 47 N m (30 - 35 lb ft). Check the adjustment with the height gage and, if necessary, readjust the set screw. Remove the height gage.



1. Height Gage Flag
2. Height Gage
3. Allen Wrench (3/16")
4. Set Screw
5. Locknut
6. Fuel Injector Follower

Figure 12-7 Fuel Injector Height Adjustment

15. Refer to the adjusting sequence listed in Table 12-2a and proceed to the next cylinder in the adjustment sequence.
16. Bar the engine over in the direction of normal rotation until the next cylinder in the adjustment sequence is in its valve overlap period.
17. Repeat the valve adjustment and fuel injector height adjustments procedures until all the valves and fuel injectors have been adjusted.
18. Replace the engine rocker cover.
19. Reconnect starting power to the engine.

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