Authorized Field Change

AFC G-06901

Date: August, 2006

Subject File: ENGINE

Subject: Rocker Arm Replacement Kit for International® VT 365 Engines used in International® 3200, 4200 Models Built Between November 1, 2001 and December 31, 2002

Model: 3200
Start Date: 11/01/2001 End Date: 12/31/2002

Model: 4200
Start Date: 11/01/2001 End Date: 12/31/2002

DESCRIPTION

NOTE – Do a thorough search of the warranty history to make certain this repair has not already been completed.

NOTE – Before ordering parts, make arrangements with the customer to have all applicable International® VT 365 engine AFC's completed during a single visit. Only order parts for vehicles that have been scheduled with the customer.

NOTE – Should a unit involved in this AFC come in for a major engine repair, before proceeding with this AFC, verify that the engine does not require replacement and is viable for this and any other open AFC's.

During AFC repairs perform the "Replace Power Steering Gear Train Gears" first.

Some early production International® VT 365 engines have exhibited unusual valve train fatigue characteristics. This rocker arm replacement kit addresses this issue with upgraded designs of some of the replacement components. Other components are of original design and have been included within this kit as a matter of recommended maintenance and / or relationship with affected parts.

DESCRIPTION (CONT.)

Figure 1 Rocker Arm Replacement Kit

1. Intake Rocker Arm (8)
2. Exhaust Rocker Arm (8)
3. 3/8 Inch Chrome Ball (16)
4. Injector Seal Kit (8)
5. Valve Bridge (16)
6. Injector Hold Down Clamp (8)
7. Rocker Arm Clip (16)

PARTS INFORMATION

Table 1 Parts Information

Part Number	Description	Quantity
1858195C92	Kit Contains the Following:	1
	Instructions	
	Exhaust Rocker Arm Assembly (8)	
	Intake Rocker Arm Assembly (8)	
	3/8 Inch Chrome Ball (16)	
	Rocker Arm Clip (16)	
	Valve Bridge (16)	
	Injector Seal Kit (8)	
	Injector Hold Down Clamp Assembly (8)	

Table 2 Tools required

Tool Description	Tool Number
Quick Release Tool Kit	ZTSE4454
Fuel Injector Hold Down Wrench	ZTSE4524
On Engine Valve Spring Compressor Tool (Figure 2)	ZTSE4697

PARTS INFORMATION (CONT.)

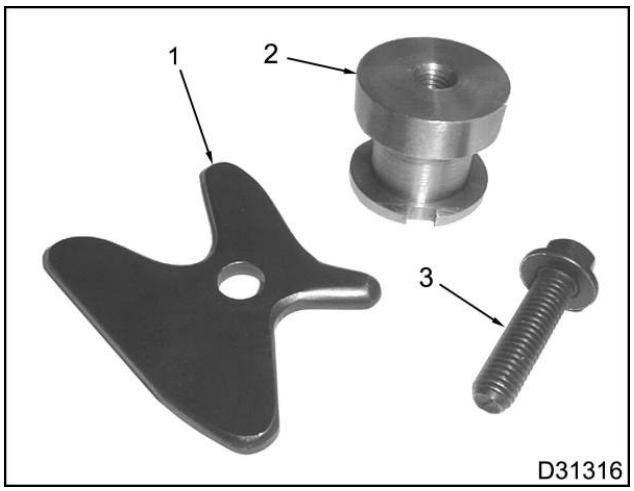


Figure 2 On Engine Valve Spring Compressor Tool

1. Valve Spring Compressor Plate
2. Valve Spring Compressor Base
3. Valve Spring Compressor Bolt

SERVICE PROCEDURE

WARNING – To avoid property damage, personal injury, or death, park the vehicle on a flat level surface, set the parking brake, turn the engine off, and chock the wheels.

WARNING – To avoid personal injury, possible death, or damage to the engine or vehicle, make sure that the engine has cooled down sufficiently before attempting to remove any engine components.

1. Remove the following components as outlined in engine service manual EGES 235-1 or EGES 235-2 (ISIS only) and TSI- 02-12-16:

   - Turbocharger inlet air ducting
   - Valve covers

     When the valve covers are removed, inspect for "X1" rocker arms. If no "X1" rocker arms are found, check the left valve cover for large breather as described in AFC G-06902 and re-install the valve covers. If any "X1" rocker arms are found, proceed with instructions.
   - High-pressure oil rails – requires ZTSE4454 to remove hose
   - Fuel injectors – requires ZTSE4524

SERVICE PROCEDURE (CONT.)

CAUTION – To prevent engine damage, position clean shop towels (refer to TSI- 02-12-16) or rubber hose into each of the oil drain holes prior to fuel injector removal. This practice will ensure that small parts (or broken pieces) will not get into the oil supply should they become dislodged. Potentially damaging components include:

- **⅜" rocker arm pivot balls**
- **Rocker arm pivots and pivot retainers**
- **Injector hold down clamp bolt retainers –"C" type only, see Figure 3 below.**

Be certain to account for all parts (or pieces of) before removing shop towels or rubber hose after rocker arm replacement kit has been installed.

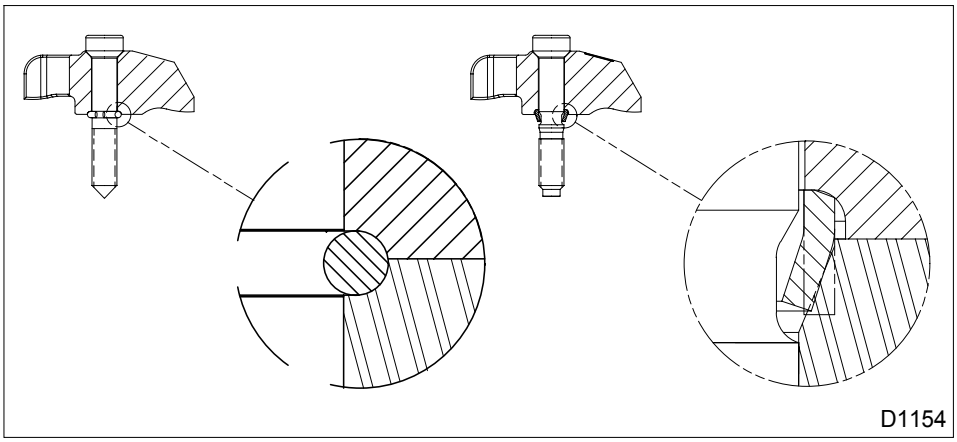


Figure 3 Injector Clamp Designs - Early "C"- Type (left), Current (right)

2. Locate dowel hole in vibration damper (Figure 4). The hole is located between two of the four bolt heads.

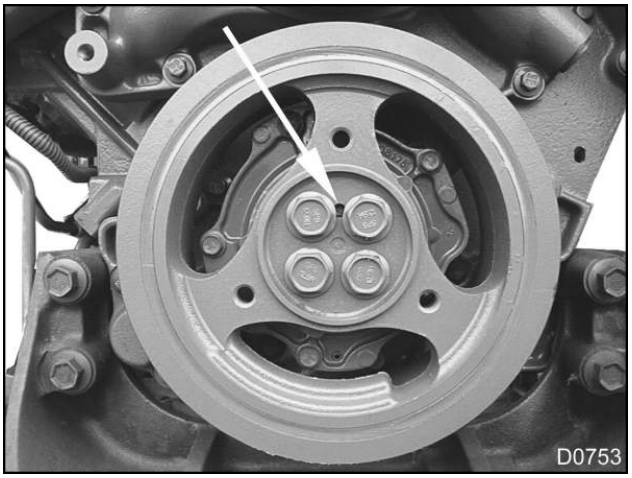


Figure 4 Dowel Hole in Vibration Damper

SERVICE PROCEDURE (CONT.)

3. Rotate crankshaft until the dowel hole is at the 12:00 o'clock position.
   a. Wiggle both rocker arms at the #1 cylinder. Do they **feel free** of any valve train loading? If so, valves are completely closed, allowing rocker arm replacement to be performed at cylinder numbers 1, 2, 7, 8.
   b. If rocker arms **do not feel free** when wiggled, rotate crankshaft one additional revolution (360°). Crankshaft is now in the correct position to service both rocker arms for cylinder numbers 1, 2, 7, 8.

4. Remove injector and place into injector cup.

> **CAUTION – To prevent engine damage, place a clean paper towel inside the injector sleeve to prohibit the entrance of any foreign material.**

5. Insert the valve spring compressor base into a new injector hold down clamp. Be sure the **notch in the valve spring compressor base aligns with index feature (Figure 5)** on hold down clamp. Install assembly between the valve bridges as if installing an injector.

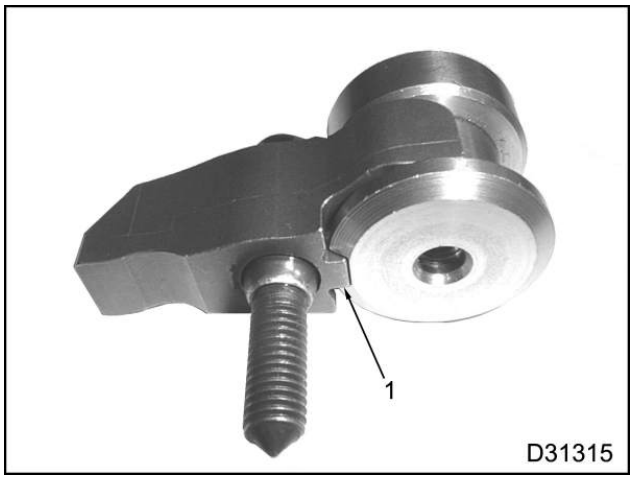


Figure 5 Hold Down Clamp and Valve Spring Compressor Base

1. Locating Notch / Index Feature

NOTE – While centering base between the two valve bridges, lightly tighten hold down bolt, but do not torque.

SERVICE PROCEDURE (CONT.)

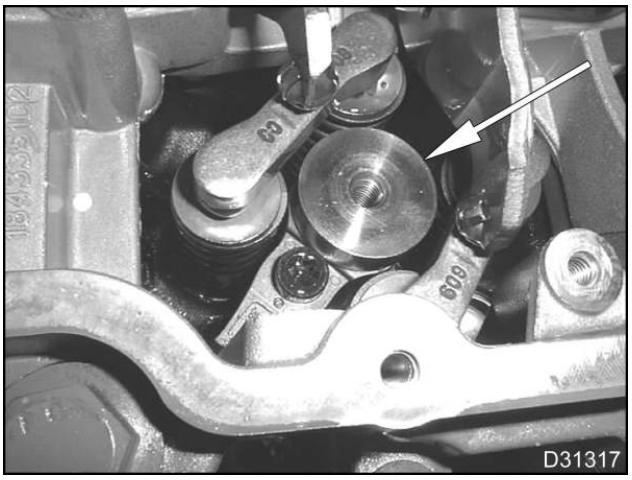


Figure 6 Valve Spring Compressor Base Installed

6. Install valve spring compressor plate onto top of valve bridge, locating small point of plate between the exhaust rocker and valve bridge.

   a. If exhaust rocker is severely worn, insert a small pry bar between the exhaust rocker arm and valve bridge. By compressing the valve bridge down and raising the rocker slightly you should gain enough clearance to rotate the small point of the compressor plate between the two components.

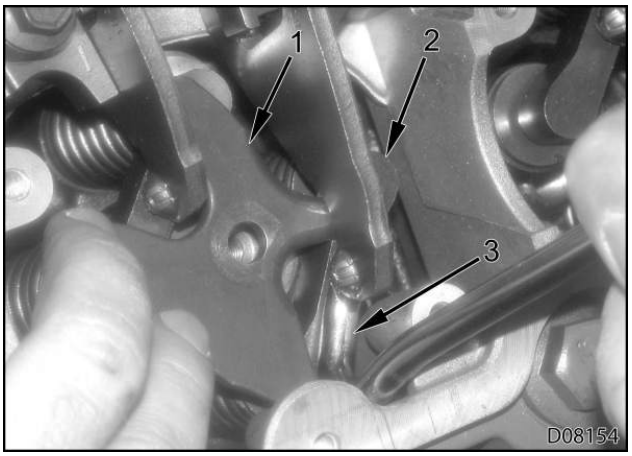


Figure 7 Creating Clearance Between Rocker Arm and Valve Bridge

1. Valve Spring Compressor Plate
2. Valve Bridge
3. Small Pry Bar

   b. Once plate is in position, install valve spring compressor bolt through plate and into valve spring compressor base.

   c. Using a **hand wrench**, tighten bolt to compress valve springs until plate contacts top of valve spring compressor base.

SERVICE PROCEDURE (CONT.)

> **CAUTION – To prevent engine damage, do not use any type of power tools.**

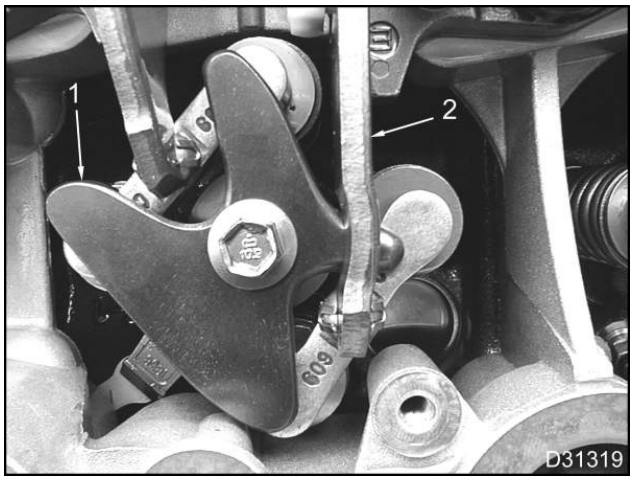


Figure 8 Valve Spring Compressor Plate Installed

1. Plate Properly Positioned on Top of Valve Bridges
2. Exhaust Rocker Arm

7. Disengage rocker arm from push rod while rotating rocker arm and compressing rocker arm clip simultaneously. Remove rocker arm and retaining clip (see Figure 9) (early design). Repeat procedure for adjacent rocker arm.

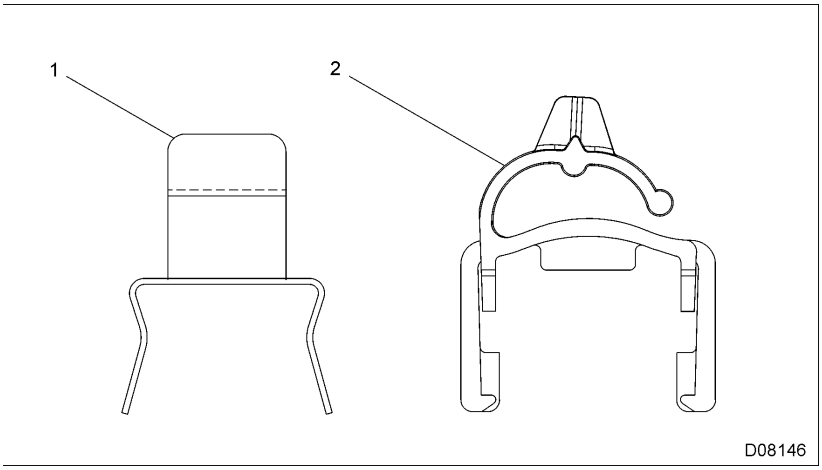


Figure 9 Rocker Arm Retaining Clip Designs

1. Early Design
2. Current Design

SERVICE PROCEDURE (CONT.)

CAUTION – To prevent engine damage, make sure you can account for the two ⅜" rocker arm pivot balls. If balls fall onto cylinder head, use a magnet to retrieve them.

CAUTION – To prevent engine damage, you must account for each rocker arm pivot and pivot retainer. Failure to account for broken pieces would require the removal of the oil pan to retrieve, if shop towels or hoses were not placed within the oil drain holes. Refer to Figure 10.

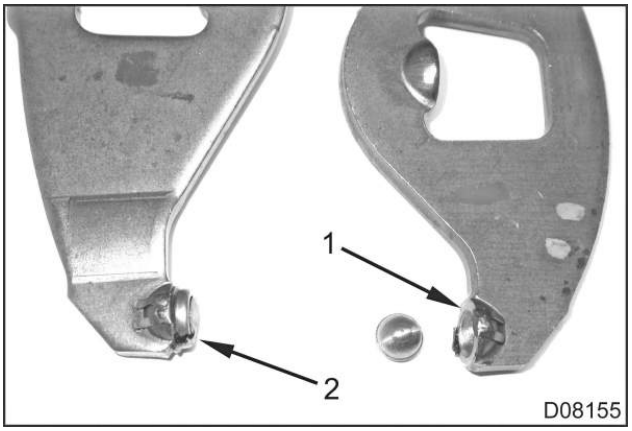


Figure 10 Damaged Rocker Arm Pivot and Retainer

1. Retainer Partially Missing (unaccounted for)
2. Retainer Cracked (intact and accounted for)

8. With rocker arms removed, back out valve spring compressor bolt and remove valve spring compressor plate to gain access to valve bridges.

9. Following valve bridge replacement, compress valves again to enable installation of new rocker arms.

10. Place a dab of wheel bearing grease onto new rocker arm socket (to hold new ⅜" ball in place while installing rocker arm).

11. Position ⅜" ball and rocker arm underneath fulcrum and rotate rocker arm into place making sure push rod is seated within rocker arm.

    Install new plastic rocker arm retaining clip (See Figure 11) (current design) by positioning top of clip to top of rocker arm opening and rotating clip snapping into position around fulcrum plate. Refer to illustration below for correctly installed clip (See Figure 12). Repeat procedure with adjacent rocker arm.

SERVICE PROCEDURE (CONT.)

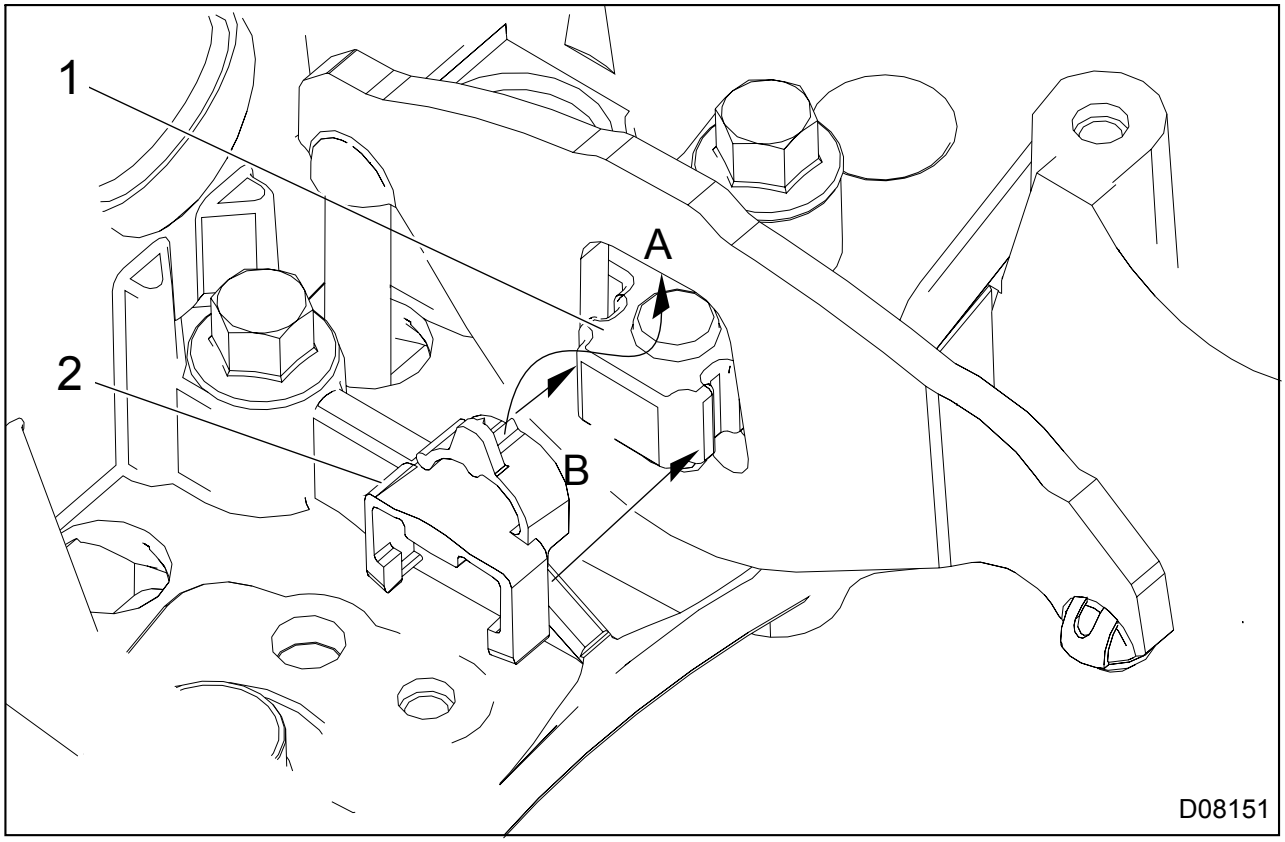


Figure 11 Position "A" in First then Slide "B" Around Fulcrum Plate

1. Fulcrum Plate
2. Rocker Arm Retaining Clip

SERVICE PROCEDURE (CONT.)

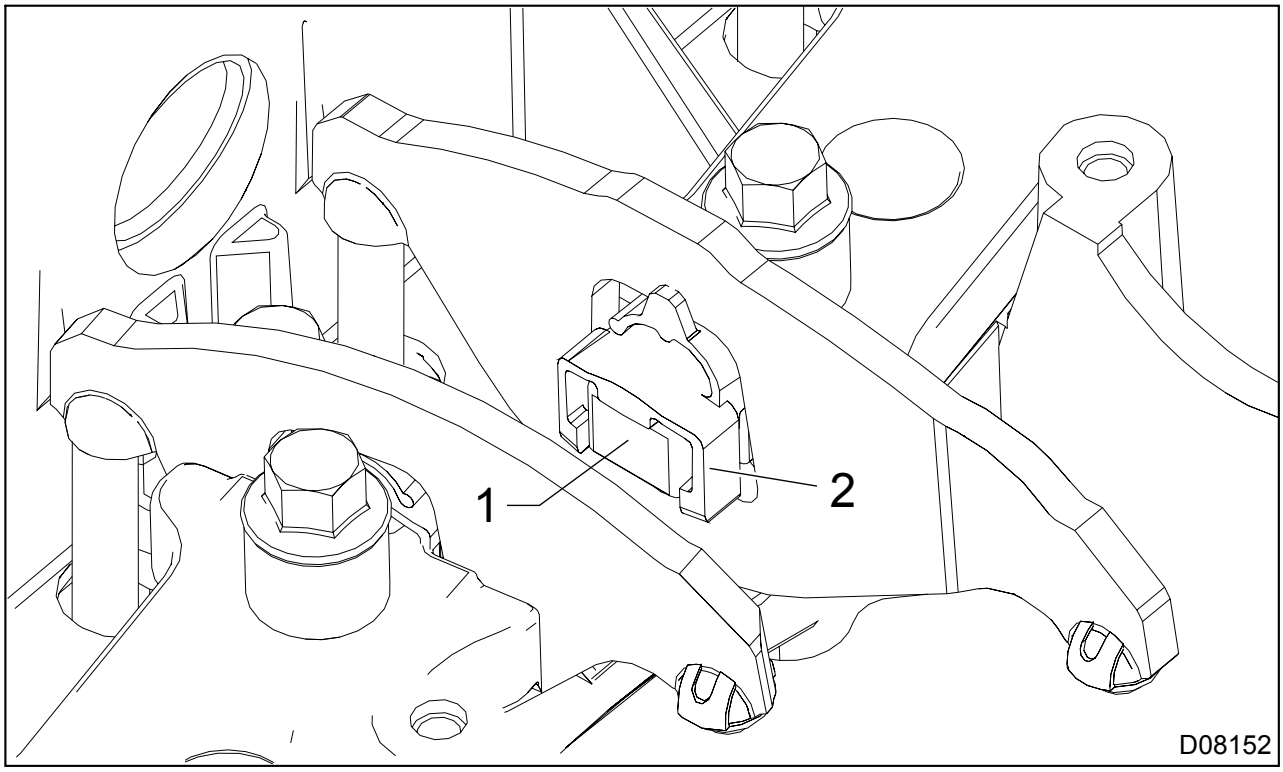


Figure 12 Retaining Clip in Correct Position

1. Fulcrum Plate
2. Rocker Arm Retaining Clip

SERVICE PROCEDURE (CONT.)

12. Remove valve spring compressor bolt. Make sure rocker arm remains in place and ⅜" ball has not fallen out. Repeat procedure on remaining cylinders for this crankshaft position session.

13. After all eight rocker arms and valve bridges have been replaced for cylinders 1, 2, 7 and 8, the crankshaft can be rotated one complete revolution to service cylinders 3, 4, 5 and 6.

14. Install new O-ring seal kit onto each of the fuel injectors and install as outlined in engine service manual EGES 235-1 or EGES 235-2 (ISIS).

15. Remove paper towels from injector bores and install injectors using the furnished injector hold down clamps as outlined in engine service manual EGES 235-1 or EGES 235-2 (ISIS).

16. Take one last look (using a magnet) for small broken particles before removing shop towels or rubber hose from oil drain holes.

17. Continue to install the following components as outlined in engine service manual EGES 235-1 or EGES 235-2 (ISIS):

    - High-pressure oil rail and hose
    - Valve covers

      NOTE: Check left valve cover for larger breather as described in AFC G-06902 and install new valve cover if needed. Also complete AFC Claim for valve cover inspection or charge parts out if new valve cover is used.

    - Turbocharger inlet air ducting

Operation number must appear on all claims.

Table 3 Labor Information

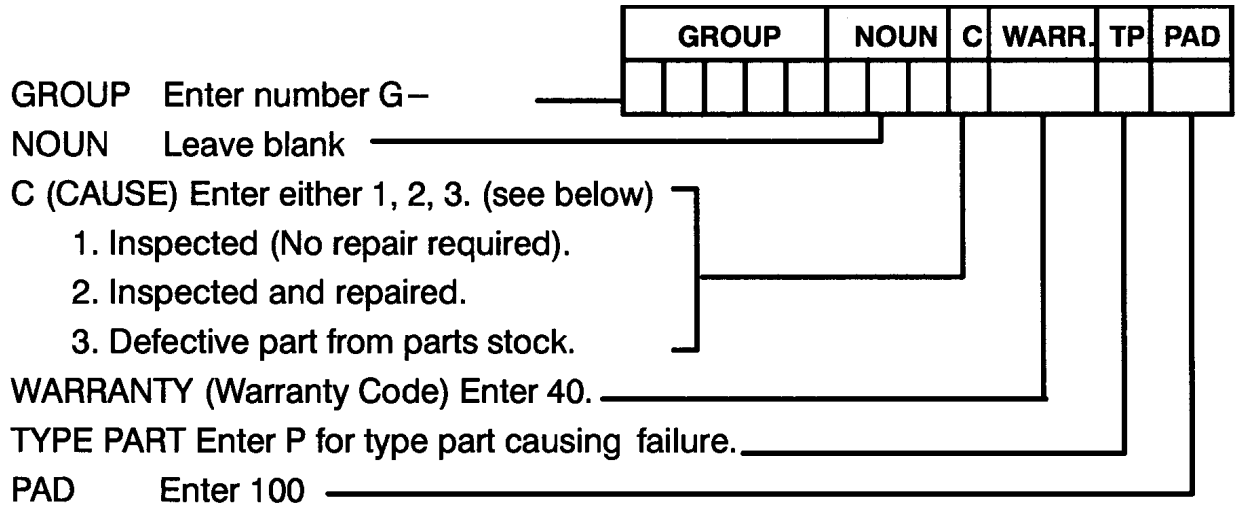
Operation No.	Description	Time
A40–06901–1	Inspection Only	0.2 Hr.
A40–06901–2	Install Rocker Arm Kit	9.6 Hrs.
A40–06901–3	Add on for Install Rocker Arm Kit for Vehicle with Air Conditioner	0.5 Hr.
A40–06901–4	Add on for R&R Valve Covers (Non 1000 Models)	2.6 Hrs.
A40–06901–5	Add on for R&R Valve Covers (1000 Models Only)	4.0 Hrs.

ADMINISTRATIVE PROCEDURE

Expense is to be charged to Warranty. Claims are to be submitted in the normal manner, making reference to Authorized Field Change Number G-06901

It is important that the coding be completed properly to assist in processing the warranty claim. Complete instructions will be found in the Warranty Manual, Section 7–1. Special attention should be given to Items 39 through 44.

To assure this important improvement is made in a timely manner, all claims for G-06901 activity must be submitted by August 31, 2007 or within the normal warranty period for the vehicle, if after August 31, 2007.



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