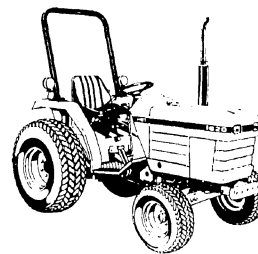


Tractors  
1320  
1520  
1620  
1715  
1720

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**NEW HOLLAND**

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# SERVICE MANUAL

Reprinted

# FOREWORD

This repair manual provides information for the proper servicing and overhaul of Ford 1320-1520 and 1720 Tractor Models and is an essential publication for all service personnel carrying out repairs and maintenance procedures.

The Manual is divided into twelve PARTS, each sub-divided into Chapters. Each Chapter contains information on general operating principles, detailed inspection and overhaul and, where applicable, trouble shooting, special tools and specifications.

The material contained in this Manual was correct at the time of going to print, but Ford New Holland, Inc. policy is one of continuous improvement and the right to change prices, specifications, equipment or design at anytime without notice is reserved. All data in this Manual is subject to production variations, so overall dimensions and weights should be considered as approximate only and the illustrations do not necessarily depict the unit to standard build specification.

# PRODUCTION DATE CODES AND SERIAL NUMBERS

The Tractor Identification Plate is located on the left side of the transmission case on the Ford 1320-1520 and 1720 Tractors and is stamped with the following information:

Production Identification Number — Two letter prefix followed by the Tractor Serial Number.

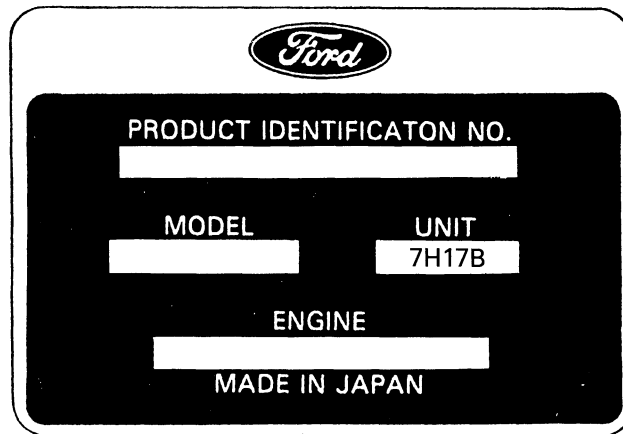
Whenever effecting repair or overhaul the relevant series information should be noted and used when referring to Service Bulletins and/or the Parts Catalog.

Model — Production Model Code

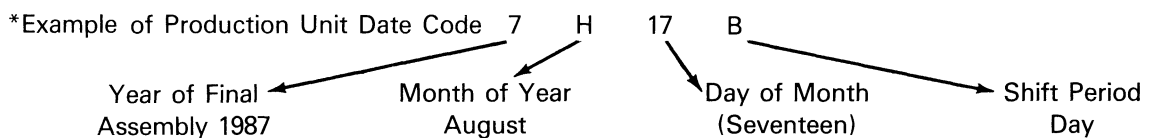
Unit — Production Unit Date Code\*

Engine — Serial Number and Engine Production Date Code

## TRACTOR SERIES IDENTIFICATION PLATE



First Number YEAR	First Letter MONTH	Second Number DAY OF MONTH	Second Letter PRODUCTION SHIFT
4 — 1984	A—Jan.    G—July	01/28/29/30/31	A—Midnight B—Day C—Afternoon
5 — 1985	B—Feb.    H—Aug.		
6 — 1986	C—March   J—Sept.		
7 — 1987	D—April    K—Oct.		
8 — 1988	E—May     L—Nov.		
	F—June    M—Dec.		



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# SAFETY PRECAUTIONS

Practically all service work involves the need to drive the tractor. The Operator's Manual, supplied with each tractor, contains detailed safety precautions relating to driving, operating and servicing that tractor. These precautions are as applicable to the service technician as they are to the operator, and should be read, understood and practiced by all personnel.

Prior to undertaking any maintenance, repair, overhaul, dismantling or re-assembly operations, whether within a workshop facility or out "in the field," consideration should be given to factors that may have an effect upon safety, not only upon the mechanic carrying out the work, but also upon bystanders.

## PERSONAL CONSIDERATIONS

- The wrong clothes or carelessness in dress can cause accidents. Check to see that you are suitably clothed.  
Some jobs require special protective equipment.
- **Eye Protection**  
The smallest eye injury may cause loss of vision. Injury can be avoided by wearing eye protection when engaged in chiselling, grinding, discing, welding, painting, etc.
- **Breathing Protection**  
Fumes, dust and paint spray are unpleasant and harmful. These can be avoided by wearing respiratory protection.
- **Hearing Protection**  
Loud noise may damage your hearing and the greater the exposure the worse the damage. If you feel the noise is excessive, wear ear protection.
- **Hand Protection**  
It is advisable to use a protective cream before work to prevent irritation and skin contamination. After work clean your hands with soap and water. Solvents such as white spirit, paraffin, etc., may harm the skin.
- **Foot Protection**  
Substantial or protective footwear with reinforced toe-caps will protect your feet from falling objects. Additionally, oil-resistant soles will help to avoid slipping.
- **Special Clothing**  
For certain work it may be necessary to wear flame or acid-resistant clothing.
- Avoid injury through incorrect handling of components. Make sure you are capable of lifting the object. If in doubt get help.

## EQUIPMENT CONSIDERATIONS

- **Machine Guards**  
Before using any machine, check to ensure that the machine guards are in position and serviceable. These guards not only prevent parts of the body or clothing from coming in contact with the moving parts of the machine, but also ward off objects that might fly off the machine and cause injury.
- **Lifting Appliances**  
Always ensure that lifting equipment, such as chains, slings, lifting brackets, hooks and eyes are thoroughly checked before use. If in doubt, select stronger equipment than is necessary.  
  
Never stand under a suspended load or a raised implement.
- **Compressed Air**  
The pressure from a compressed air line is often as high as 100 psi (6.9 bar) 7 (kgf/cm<sup>2</sup>). It is perfectly safe if used correctly. Any misuse may cause injury.  
  
Never use compressed air to blow dust, filing, dirt, etc., away from your work area unless the correct type of nozzle is fitted.  
  
Compressed air is not a cleaning agent, it will only move dust, etc., from one place to another. Look around before using an air hose as bystanders may get grit into their eyes, ears or skin.

- **Hand Tools**

Many cuts, abrasions and injuries are caused by defective tools. Never use the wrong tool for the job, as this generally leads either to some injury, or to a poor job.

**Never use**

- A hammer with a loose head or split handle.
- Spanners or wrenches with splayed or worn jaws.
- Spanners or files as hammers; or drills, clevis pins or bolts as punches.

For removing or replacing hardened pins use a copper or brass drift rather than a hammer.

For dismantling, overhaul and assembly of major and sub components, always use the Special Service Tools recommended.

These will reduce the work effort, labor time and the repair cost.

Always keep tools clean and in good working order.

- **Electricity**

Electricity has become so familiar in day to day usage that its potentially dangerous properties are often overlooked. Misuse of electrical equipment can endanger life.

Before using any electrical equipment — particularly portable appliances — make a visual check to make sure that the cable is not worn or frayed and that the plugs, sockets, etc., are intact. Make sure you know where the nearest isolating switch for your equipment is located.

## GENERAL CONSIDERATIONS

- **Solvents**

Use only cleaning fluids and solvents that are known to be safe. Certain types of fluids can cause damage to components such as seals, etc., and can cause skin irritation. Solvents should be checked that they are suitable not only for the cleaning of components and individual parts, but also that they do not affect personal safety of the user.

- **Housekeeping**

Many injuries result from tripping or slipping over, or on, objects or material left lying around by a careless worker. Prevent these accidents from occurring. If you notice a hazard, don't ignore it — remove it.

A clean, hazard-free place of work improves the surroundings and daily environment for everybody.

- **Fire**

Fire has no respect for persons or property. The destruction that a fire can cause is not always fully realized. Everyone must be constantly on guard.

- Extinguish matches/cigars/cigarettes, etc., before throwing them away.
- Work cleanly, disposing of waste material into proper containers.
- Locate the fire extinguishers and find out how to operate them.
- Do not panic — warn those near and raise the alarm.
- Do not allow or use an open flame near the tractor fuel tank, battery or component parts.

- **First Aid**

In the type of work that mechanics are engaged in, dirt, grease, fine dusts, etc., all settle upon the skin and clothing. If a cut, abrasion or burn is disregarded it may be found that a septic condition has formed within a short time. What appears at first to be trivial could become painful and injurious. It only takes a few minutes to have a fresh cut dressed, but it will take longer if you neglect it. Make sure you know where the First Aid box is located.

- **Cleanliness**

Cleanliness of the tractor hydraulic system is essential for optimum performance. When carrying out service and repairs plug all hose ends and component connections to prevent dirt entry.

Clean the exterior of all components before carrying out any form of repair. Dirt and abrasive dust can reduce the efficiency and working life of a component and lead to costly replacement. Use of a high pressure washer or steam cleaner is recommended.

## OPERATIONAL CONSIDERATIONS

- Stop the engine, if at all possible, before performing any service.
- Place a warning sign on tractors which, due to service or overhaul, would be dangerous to start. Disconnect the battery leads if leaving such a unit unattended.
- Do not attempt to start the engine while standing beside the tractor or attempt to by-pass the safety start switch.
- Avoid prolonged running of the engine in a closed building or in an area with inadequate ventilation as exhaust fumes are highly toxic.
- Always turn the radiator cap to the first stop, to allow pressure in the system to dissipate when the coolant is hot.
- Never work beneath a tractor which is on soft ground. Always take the unit to an area which has a hard working surface — concrete for preference.
- If it is found necessary to raise the tractor for ease of servicing or repair, make sure that safe and stable supports are installed beneath axle housings, casings, etc., before commencing work.
- Certain repair or overhaul procedures may necessitate “separating the tractor,” either at the engine/front transmission or front transmission/rear transmission locations. These operations are simplified by the use of the Tractor Splitting Kit/Stands. Should this equipment not be available, then every consideration must be given to stability, balance and weight of the components, especially if a cab is installed.
- Use footsteps or working platforms when servicing those areas of a tractor that are not within easy reach.
- Before loosening any hoses or tubes connecting implements to remote control valves, etc., switch off the engine, remove all pressure in the lines by operating levers several times. This will remove the danger of personal injury by oil pressure.
- Prior to pressure testing, make sure all hoses and connectors not only of the tractor, but also those of the test equipment, are in good condition and tightly sealed. Pressure readings must be taken with the gauges specified. The correct procedure should be rigidly observed to prevent damage to the system or the equipment, and to eliminate the possibility of personal injury.
- When equipment or implements are required to be attached to the hydraulic linkage, either for testing purposes or for transportation, then “position control” should be used.
- Always lower equipment to the ground when leaving the tractor.
- If high lift attachments are installed on a tractor beware of overhead power, electric or telephone cables when traveling. Drop attachment near to ground level to increase stability and minimize risks.
- Do not park or attempt to service a tractor on an incline. If unavoidable, take extra care and block all wheels.
- Observe recommended precautions as indicated in this Repair Manual when dismantling the air conditioning system as escaping refrigerant can cause frostbite.
- Prior to removing wheels and tires from a tractor, check to determine whether additional ballast (liquid or weights) has been added. Seek assistance and use suitable equipment to support the weight of the wheel assembly.
- When inflating tires beware of over inflation — constantly check the pressure. Overinflation can cause tires to burst and result in personal injury.
- Some components on your tractor, such as gaskets and friction surfaces (brake lining, clutch lining, etc.) may contain asbestos. Breathing asbestos dust is dangerous to your health. You are therefore advised to have any maintenance or repair operation on such components carried out by an authorized Ford New Holland Dealer. If, however, service operations are to be undertaken on parts that contain asbestos, the essential precautions are listed below must be observed.
  - Work out of doors or in a well ventilated area.
  - Dust found on tractor or produced during work on the tractor should be dampened, placed in a sealed container and marked to ensure safe disposal.

- If any cutting, drilling, etc., is attempted on materials containing asbestos, the item should be dampened and only hand tools or low speed power tools used.
- Continuous long term contact with used engine oil may cause skin cancer. Avoid prolonged contact with used engine oil. Wash skin promptly with soap and water.

Safety precautions are very seldom the figment of someone's imagination. They are the result of sad experience, where most likely someone has paid dearly through personal injury.

Heed these precautions and you will protect yourself accordingly. Disregard them and you may duplicate the sad experience of others.

## **SERVICE TECHNIQUES**

### **A. SERVICE SAFETY**

Appropriate service methods and proper repair procedures are essential for the safe, reliable operation of all equipment as well as the personal safety of the individual doing the work. This Shop Manual provides general directions for accomplishing service and repair work with tested, effective techniques. Following them will help assure reliability.

There are numerous variations in procedures, techniques, tools, and parts for servicing equipment, as well as in the skill of the individual doing the work. This Manual cannot possibly anticipate all such variations and provide advice or cautions as to each. Accordingly, anyone who departs from the instructions provided in this Manual must first establish that he compromises neither his personal safety nor the equipment integrity by his choice of methods, tools or parts.

### **B. SERVICE TECHNIQUES**

Clean the exterior of all components before carrying out any form of repair. Dirt and abrasive dust can reduce the efficient working life of a component and lead to costly replacement.

Time spent on the preparation and cleanliness of working surfaces will pay dividends in making the job easier and safer and will result in overhauled components being more reliable and efficient in operation.

Use cleaning fluids which are known to be safe. Certain types of fluid can cause damage to 'O' rings and cause skin irritation. Solvents should be checked that they are suitable for the cleaning of components and also that they do not risk the personal safety of the user.

Replace 'O' rings, seals or gaskets whenever they are disturbed. Never mix new and old seals or 'O' rings, regardless of condition. Always lubricate new seals and 'O' rings with hydraulic oil before installation.

When replacing component parts use the correct tool for the job.

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### **HOSES AND TUBES**

Always replace hoses and tubes if the cone end or the end connections are damaged.

When installing a new hose loosely connect each end and make sure the hose takes up the designed position before tightening the connection. Clamps should be tightened sufficiently to hold the hose without crushing and to prevent chafing.

The hoses are the arteries of the unit, be sure they are in good condition when carrying out repairs or maintenance, otherwise the machine's output and productivity will be affected.

After replacing a hose on a moving component make sure the hose does not foul by moving the component through its complete range of travel.

Be sure any hose which has been installed is not kinked or twisted.

Hose connections which are damaged, dented, crushed or leaking restrict oil flow and the productivity of the components being served. Connectors which show signs of movement from the original swaged position have failed, and will ultimately separate completely.

A hose with a chafed outer cover will allow water entry. Concealed corrosion of the wire reinforcement will subsequently occur along the hose length with resultant hose failure.

Ballooning of the hose indicates an internal leakage due to structural failure. This condition rapidly deteriorates and total hose failure soon occurs.

Kinked, crushed, stretched or deformed hoses generally suffer internal structural damage which can result in oil restriction, a reduction in the speed of operation and ultimate hose failure.

Free-moving, unsupported hoses must never be allowed to touch each other or related working surfaces. This causes chafing which reduces hose life.

# **PART 1**

## **ENGINE SYSTEMS**

### **MODELS 1320-1520-1720**

#### **Chapter 1**

##### **ENGINE AND LUBRICATION SYSTEM**

<b>Section</b>		<b>Page</b>
A.	DESCRIPTION AND OPERATION .....	1
B.	ENGINE OVERHAUL .....	2

#### **Chapter 2**

##### **COOLING SYSTEM**

<b>Section</b>		<b>Page</b>
A.	DESCRIPTION AND OPERATION .....	33
B.	OVERHAUL .....	34

#### **Chapter 3**

##### **TROUBLE SHOOTING, SPECIFICATIONS AND SPECIAL TOOLS**

<b>Section</b>		<b>Page</b>
A.	TROUBLE SHOOTING .....	41
B.	SPECIFICATIONS .....	45
C.	SPECIAL TOOLS .....	52
D.	COMPRESSION TEST AND TOOLS .....	53

# PART 1

## ENGINE SYSTEMS

### MODELS 1320-1520-1720

## Chapter 1

### ENGINE AND LUBRICATION SYSTEM

Section	Page
A. DESCRIPTION AND OPERATION .....	1
B. ENGINE OVERHAUL .....	2

#### A. DESCRIPTION AND OPERATION

This chapter describes the engine overhaul and repair procedures of the Models 1320-1520 and 1720 tractors. Repair procedures are essentially the same for all models except as noted in the repair procedures.

The tractors are equipped with three-cylinder in-line engines. They are all four cycle, overhead valve, liquid cooled engines. The engines are identified by a code number cast into the side of the cylinder block.

Engine Identification	Tractor Model	Horsepower
J823	1320	19.0
J843	1520	22.0
N843	1720	26.5

#### CYLINDER HEAD AND VALVE TRAIN COMPONENTS

The cylinder head incorporates the valve assemblies, rocker arms, rocker shaft, push rods, and lifters.

A swirl chamber located between the injector assembly and the main combustion chamber of the cylinders provides improved starting and greater fuel efficiency. Initial combustion starts in the pre-combustion chamber and as the air-fuel expansion occurs a strong swirl pattern is created in the main combustion chamber for more complete combustion of the air-fuel mixture.

The air intake manifold is separated from the cast aluminum valve cover on all of these engines. The exhaust manifold is bolted to the left hand side of the cylinder head on each of the models.

Cylinder heads have integral valve guides. Standard size valves only are used.

#### CYLINDER BLOCK ASSEMBLY

The cylinder block assembly contains the pistons, connecting rods, crankshaft, timing gears and engine oil pump.

The crankshaft is supported on four main bearings. The front bearing is positioned in a bore in the front of the block.

The 2nd, 3rd and 4th bearings are split liners located in holders bolted to the block.

The camshaft is supported on two ball bearings located on each end of the block.

#### PISTON AND CONNECTING RODS

All models utilize a straight connecting rod and a three ring piston.

#### LUBRICATION SYSTEM

##### Models — All

The oil pump assembly is located within the injection pump drive gear at the front of the block and below and to the left of the crankshaft as viewed from the front. The oil pump is driven by the crankshaft gear.

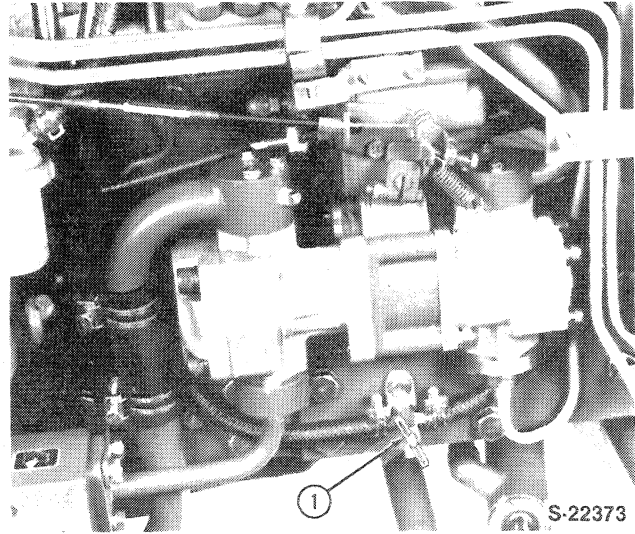
Oil is picked up from the sump by the intake tube and drawn into the lower side drilling in the block to the oil pump. Oil from the pump flows through passages in the block, past the relief valve, through the oil filter and

returns to the main oil gallery in the area of the drilled bolt located on the side of the block. Oil flow in the main oil gallery extends to the four main bearings. Oil flow to the main bearings passes through drilled passages in the crankshaft to the three connecting rod bearings. The remaining portion of the oil flow is directed through the external tube to the rocker arm assembly. Oil flows from the external tube into a passage in the rocker arm bracket to the rocker shaft.

Oil leakage from clearance between the rocker arms and the shaft overflows in the valve cover and lubricates the valve stems, push rods and tappets.

The relief valve is mounted in the side of the block and intersects the main oil passage. When the oil pressure exceeds the rated pressure, oil is by-passed through the relief valve directly to sump.

The cylinder walls, pistons and piston pins are splash lubricated by the crankshaft.



**Figure 1**  
**Radiator Drain Cock**

1. Coolant Drain Cock

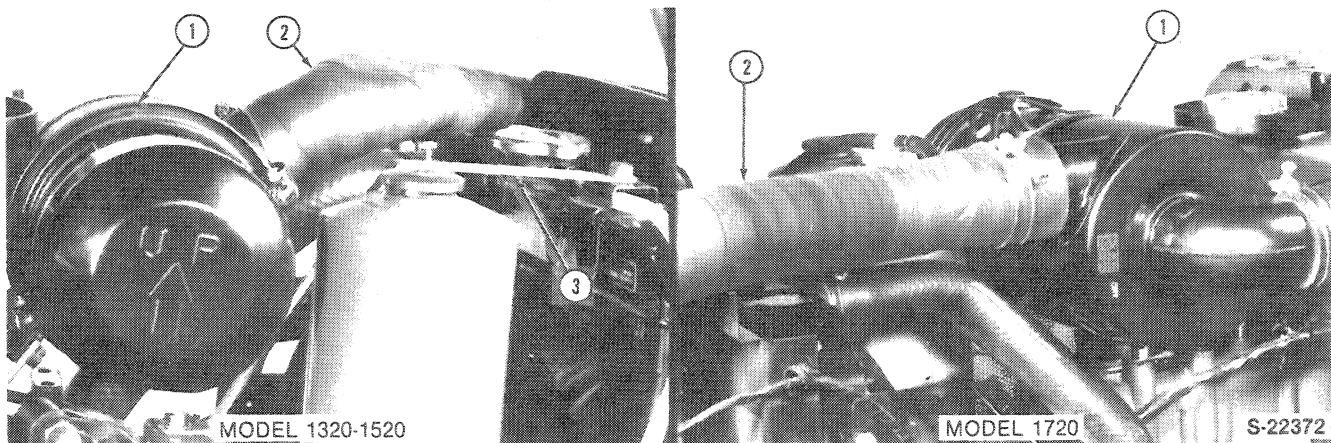
## B. ENGINE OVERHAUL

### CYLINDER HEAD AND RELATED COMPONENTS

#### REMOVAL

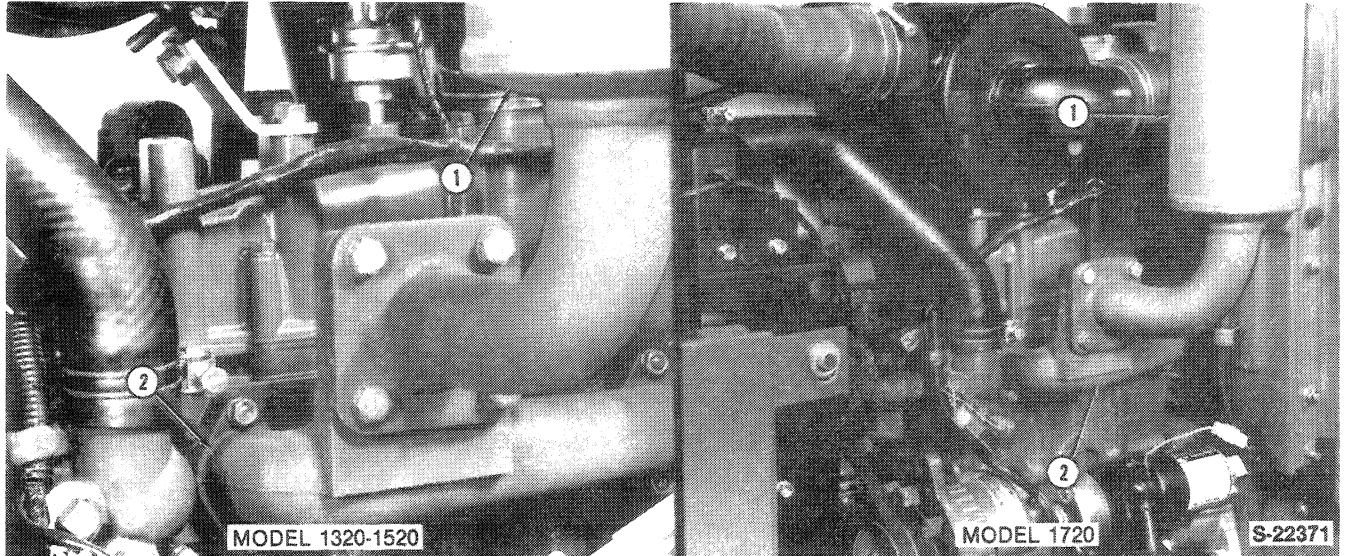
1. Drain the radiator assembly, Figure 1.

2. Remove the air cleaner assembly along with the air cleaner hoses, Figure 2.
3. Remove the upper radiator hose from the cylinder head, Figure 2.
4. Remove the exhaust muffler and manifold assembly, Figure 3.



**Figure 2**  
**Air Cleaner Removal**

- |                         |   |
|-------------------------|---|
| 1. Air Cleaner Assembly | 3. Radiator Support Brace (Model 1320/1520) |
| 2. Air Intake Tube      |   |



**Figure 3**

**Exhaust Manifold Removal**

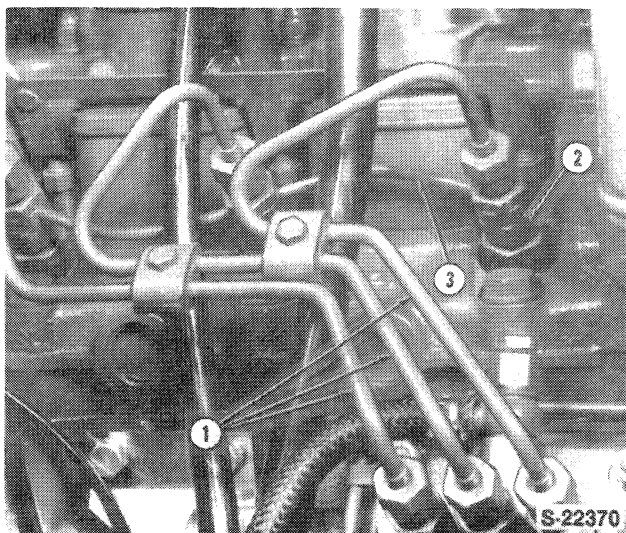
- 1. Muffler Assembly
- 2. Exhaust Manifold

**Model 1320-1520**

Remove the radiator support brace from the cylinder head, Figure 2.

- 5. Remove the injection lines and cap all openings, Figure 4.
- 6. Remove the injector leak-off line (3), Figure 4.
- 7. Remove the injector assemblies, Figure 4.

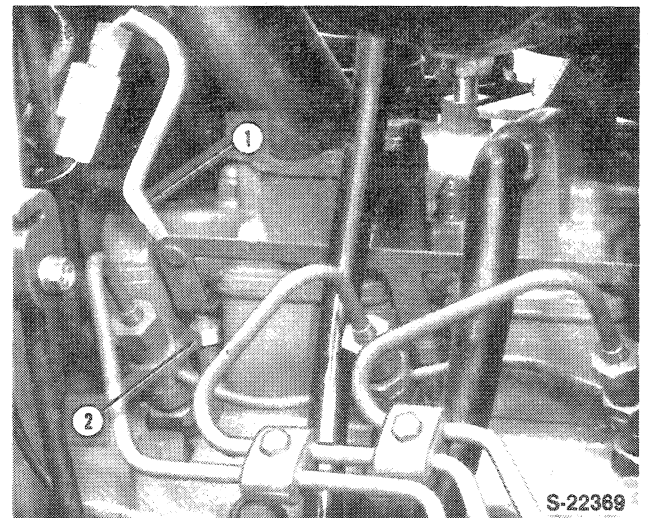
- 8. Remove the glow plug wire connectors and remove the glow plugs, Figure 5.



**Figure 4**

**Injector Removal**

- 1. Injection Lines
- 2. Injector Assembly
- 3. Injector Leak-off Line

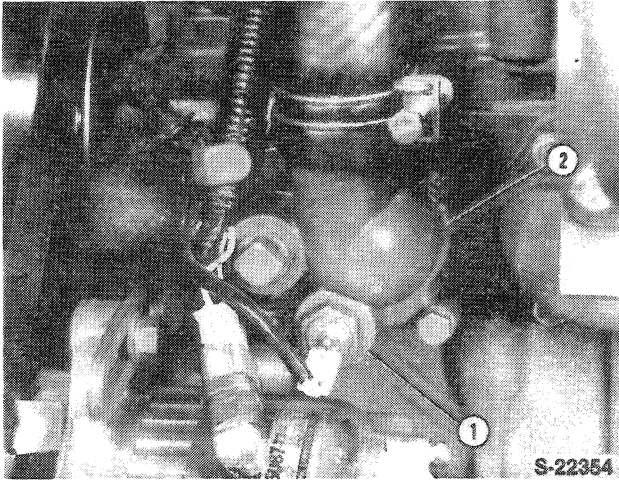


**Figure 5**

**Glow Plug Removal**

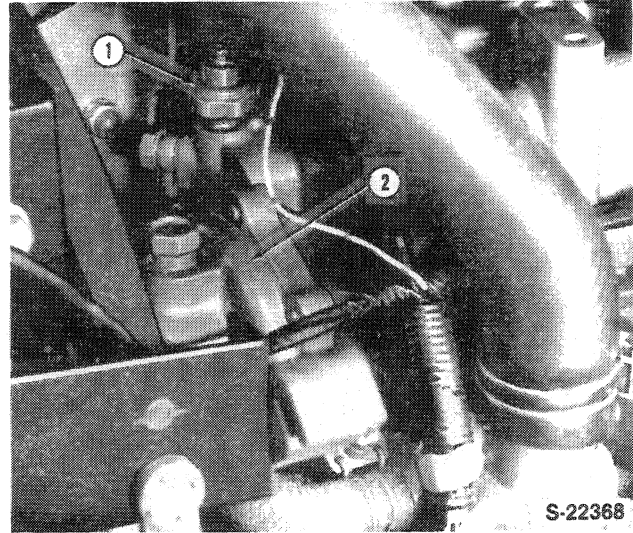
- 1. Glow Plug Wire
- 2. Glow Plug Assembly Connector

- 9. Remove the temperature sender switch, Figure 6.



**Figure 6**  
**Temperature Sender**

- 1. Sender
- 2. Coolant Outlet Connector



**Figure 7**  
**Oil Pressure Switch**

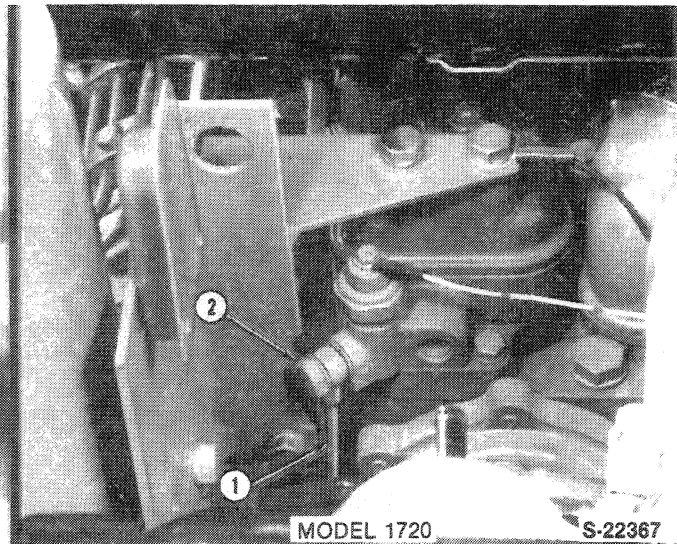
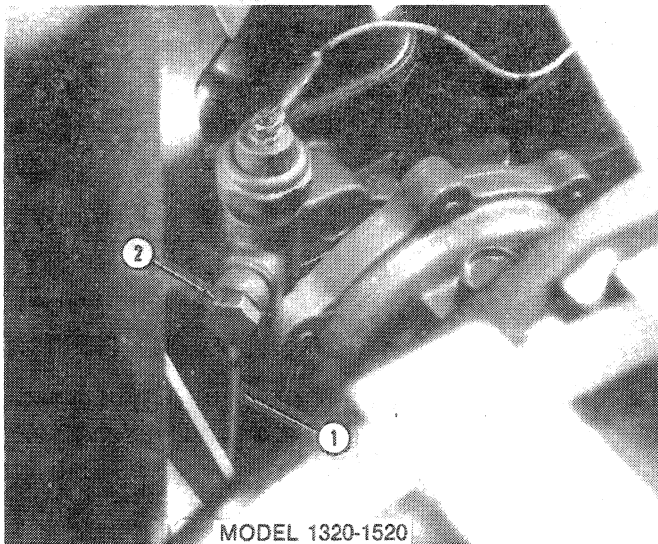
- 1. Switch
- 2. Water Pump Assembly

- 10. Remove the oil sender switch from the front of the cylinder head, Figure 7.
- 11. Remove the water pump assembly, Figure 7.
- 12. Remove the external oil transfer tube bolt from the front of the cylinder head, Figure 8.
- 13. Remove the air inlet manifold assembly, Figure 9.
- 14. Remove the valve cover assembly, Figure 10.

- 15. Remove the valve rocker arm shaft and support as an assembly, Figure 11.

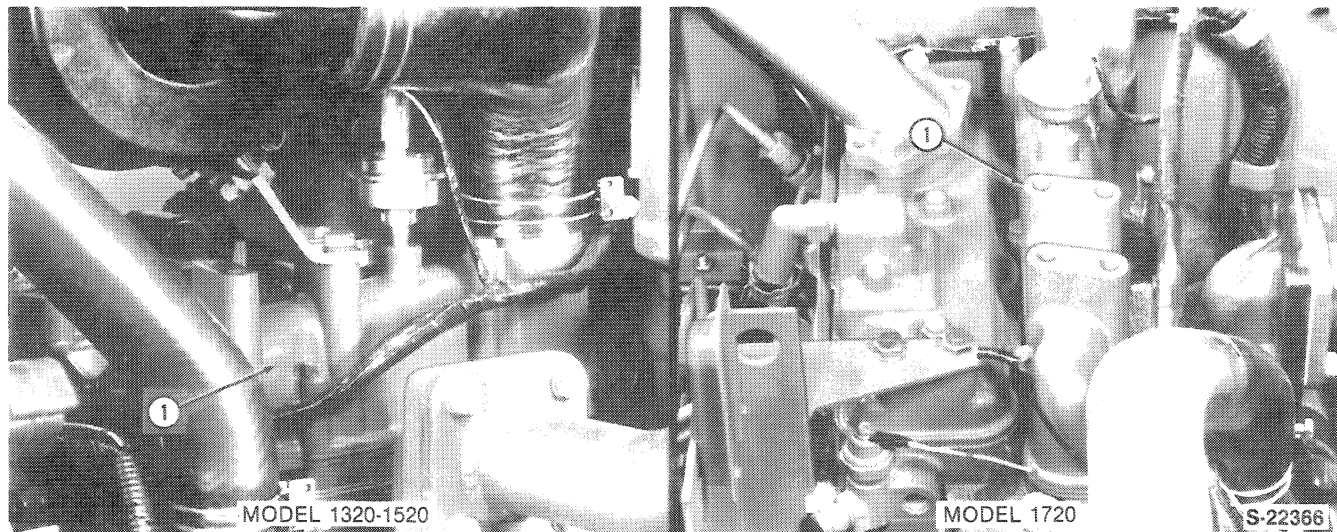
**NOTE:** Alternately loosen the rocker support bolts a turn at a time to prevent distorting the rocker shaft support.

- 16. Remove the valve stem caps and push rods, Figure 11.



**Figure 8**  
**External Oil Transfer Tube**

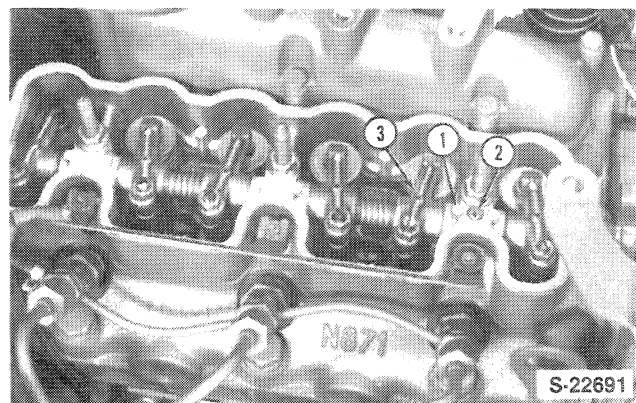
- 1. External Tube
- 2. Banjo Bolt



**Figure 9**  
**Inlet Manifold**

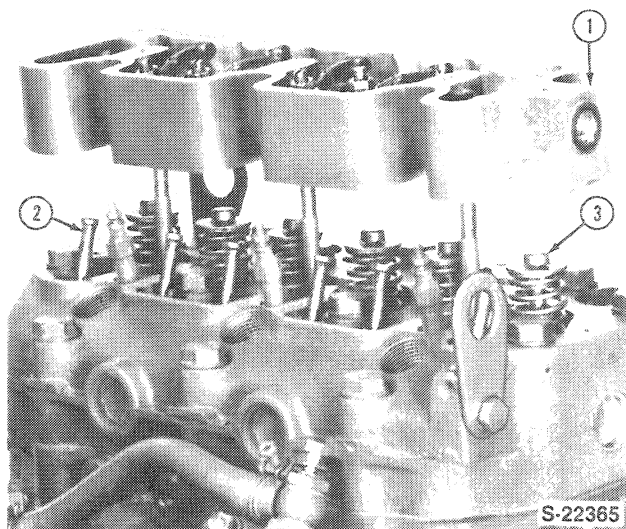
1. Manifold

**NOTE:** *Keep all valve components in separately marked containers for re-assembly in their original location.*



**Figure 10**  
**Valve Cover Removal**

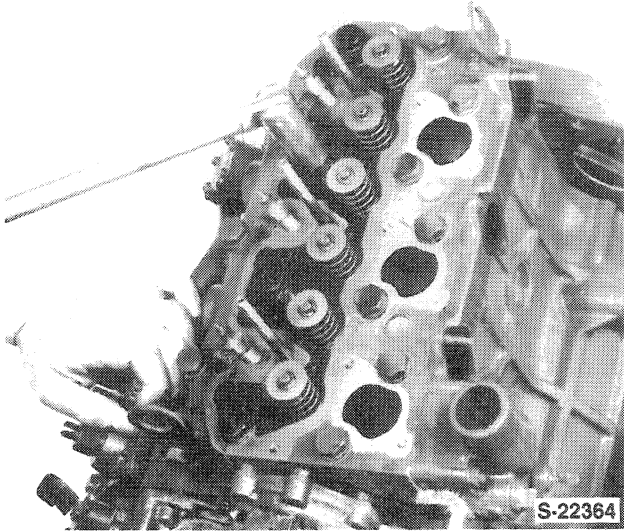
- |                                    |                              |
|------------------------------------|------------------------------|
| 1. Rocker Shaft<br>Support Bracket | 2. Rocker Shaft Set<br>Screw |
| 3. Rocker Arms                     |                              |



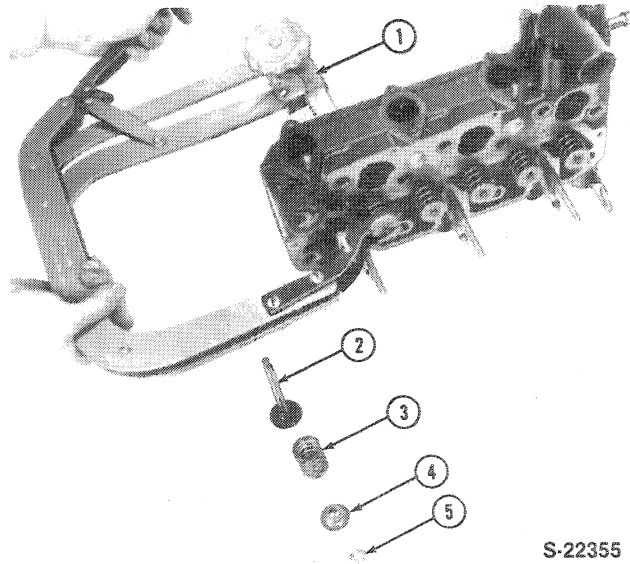
**Figure 11**  
**Rocker Arm Assembly — Removal**

1. Rocker Arm Support Bracket	2. Push Rod
3. Valve Stem Cap	

- Remove the cylinder head bolts by alternately loosening a half turn at a time to prevent warping the head, Figure 12.



**Figure 12**  
Cylinder Head Removal



**Figure 13**  
Cylinder Head Valve Removal

1. Valve Spring Compressor	3. Spring
2. Valve	4. Retainer
	5. Keepers

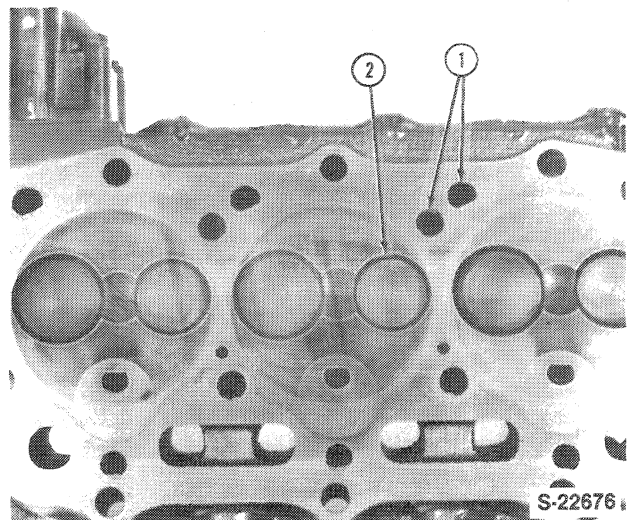
## DISASSEMBLY

- Clean the cylinder head and remove any carbon deposits from around the valve heads.
- Use a valve spring compressor and remove the valve spring retainer locks, spring and spring retainer from the valves, Figure 13.
- Remove the valves and place the valve components together in separately marked containers for reassembly in their original location.

## INSPECTION AND REPAIR

### CYLINDER HEAD

- Clean all carbon deposits from the combustion chamber and valve ports using a wire brush and scraper.
- Clean all dirt and residue from the gasket surface using care not to scratch or nick the machined surface.
- Clean the cylinder head in solvent and air dry.
- Check the head for cracks or damage, Figure 14, in the following areas:
  - Valve ports
  - Valve seats
  - Combustion chamber
  - External cracks in the water jackets



**Figure 14**  
Cylinder Head Inspection

1. Cylinder Head Ports	2. Valve Seat
------------------------	---------------

5. Inspect the gasket surfaces for scratches or nicks which could cause leakage.
6. Examine the core hole plugs for rust or signs of leakage. If a plug shows signs of damaging rust or leakage, replace all the plugs in the head.
7. Use a straight edge and feeler gauge and check the cylinder head for warp length wise, cross wise and diagonally, Figure 15.

Resurface or replace the head if warpage is greater than 0.005 in. (0.12 mm).

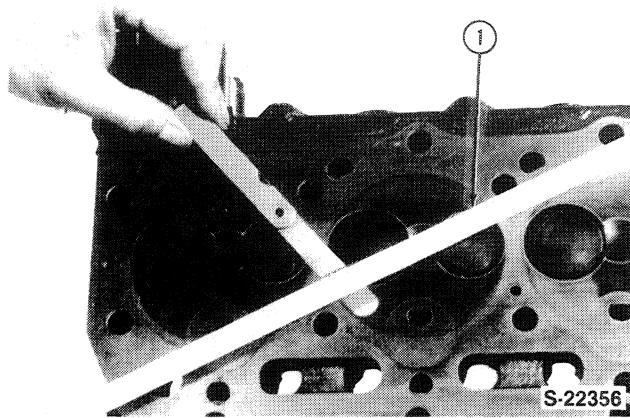


Figure 15

**Cylinder Head Flatness Check**

1. Straight Edge

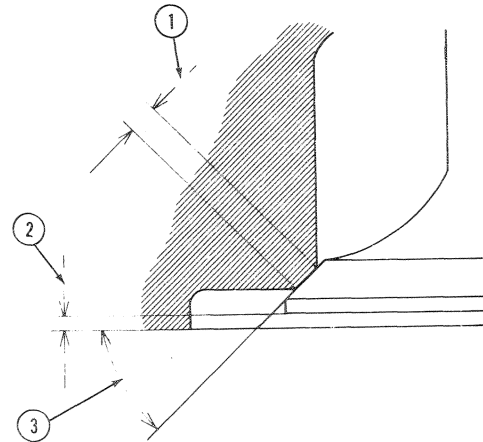
**VALVE SEATS**

Examine the valve seats and reface the seat if damaged.

Valve seat grinding requires that the seat be ground to the correct width and properly positioned as shown in Figure 16.

A valve that extends too deep into the combustion area will result in valve burning and if the valve is recessed too deep into the head it will cause a rapid build-up of carbon deposits.

1. Check the seat for surface defects. Use a 45° stone if necessary to reface. Grind away only enough material to provide a smooth even seat.
2. Check the seat width, Figure 17, if necessary, use a 15° stone to lower the seat contact point and use a 75° stone to raise the seat contact point.

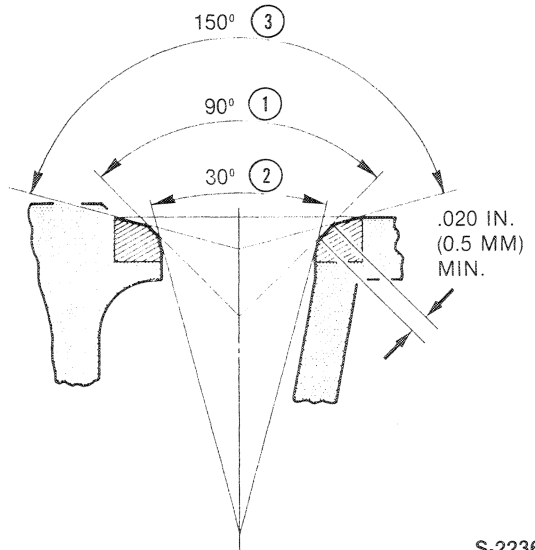


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Figure 16

**Valve Grinding Checks**

- |  |                         |
|--|-------------------------|
| 1. Correct Valve Seat Width and Location | 3. 45° Valve Seat Angle |
| 2. Correct Valve Head Margin             |                         |



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Figure 17

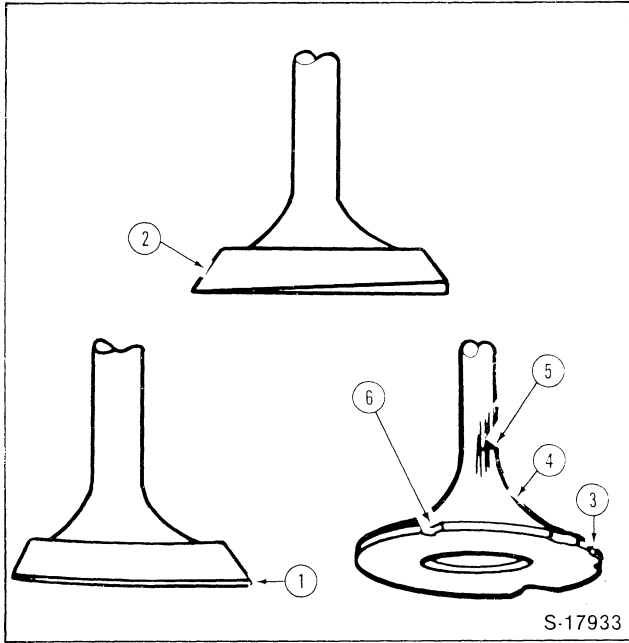
**Valve Seat Grinding**

- |                                    |                                    |
|------------------------------------|------------------------------------|
| 1. Seat Angle — 45° Stone          | 3. Raise Seat Location — 75° Stone |
| 2. Lower Seat Location — 15° Stone |                                    |

**NOTE:** Refacing the seat should always be coordinated with refacing of the valve to assure a compression tight fit.

**VALVES**

1. Clean all deposits from the valves using a soft wire brush. Inspect the condition of the valve and discard any that are badly burned, cracked or bent, Figure 18.



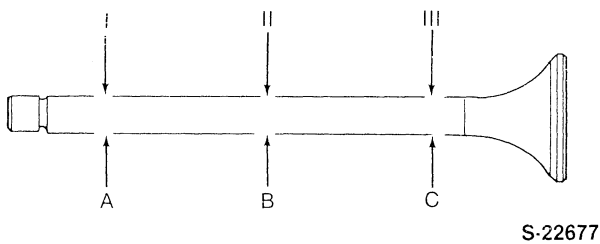
**Figure 18**

**Valve Defect Inspection**

- |   |                    |
|---|--------------------|
| 1. Margin Too Thin<br>Min. .002 in. (.5 mm) | 3. Pitting         |
| 2. Bent Valve                               | 4. Indented        |
|   | 5. Wear or Necking |
|   | 6. Burned          |
2. Using a micrometer, measure the valve stem at points "A", "B" and "C", Figure 19.

Replace valve if the stem wear diameter is less than the following dimensions:

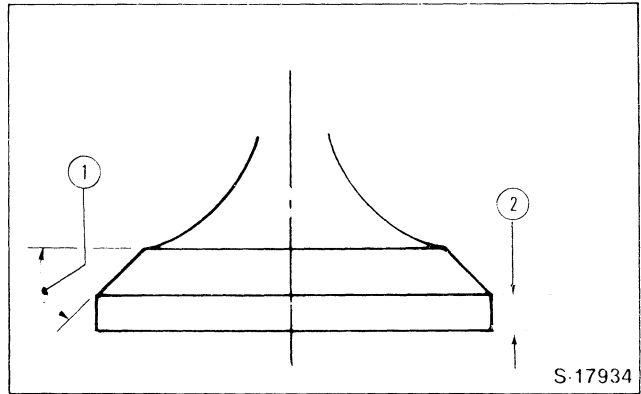
	<b>Intake</b>	<b>Exhaust</b>
Ford Model:	.271 in.	.269 in.
All	(6.89 mm)	(6.84 mm)



**Figure 19**

**Valve Stem Wear Points**

3. If inspection indicates that the valve may be re-used, the valve should be ground as shown, Figure 20.



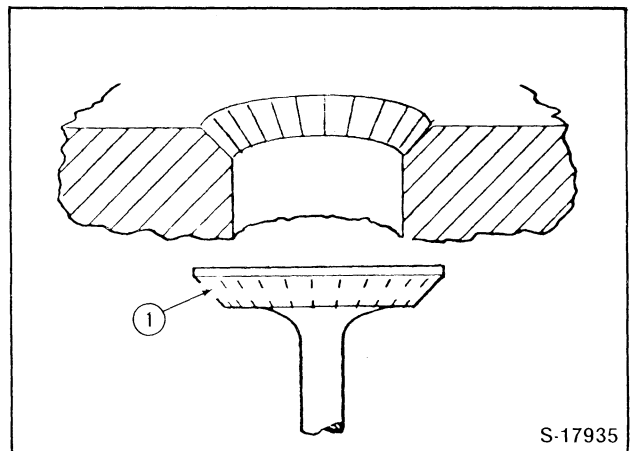
**Figure 20**

**Valve Correctly Ground**

1. 45° Angle Seat
2. Minimum Valve Margin

**IMPORTANT:** After grinding the valve and seat, check to assure that the seat contacts the center of the valve face. Using Prussian Blue, lightly coat the valve seat, place the valve in position and rotate the valve slightly while holding a light pressure against the valve. If the blue is transferred to the center of the valve face, the contact is correct.

If Prussian Blue is not available, mark the valve face or seat with a soft lead pencil as shown, Figure 21. Rotate the valve slightly in the seat. The penciled lines will be broken at the seat contact area.



**Figure 21**

**Valve Seat Contact Location**

1. Seat



**Suggest:**

**If the above button click is invalid.**

**Please download this document**

**first, and then click the above link**

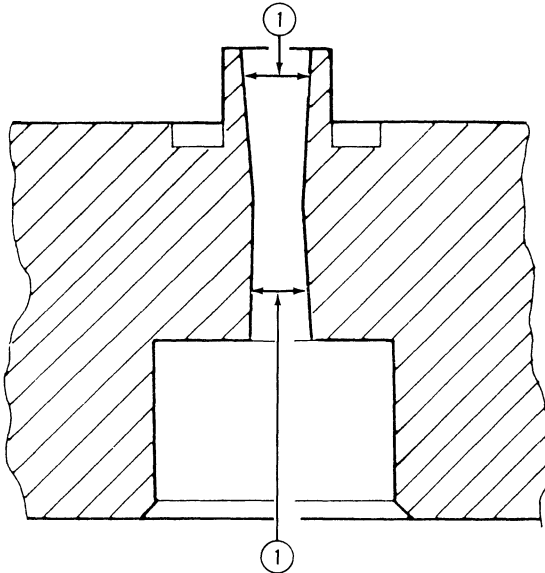
**to download the complete manual.**

**Thank you so much for reading**

**VALVE GUIDES**

Thoroughly clean the valve guides before attempting to check internal wear.

1. Using a small hole gauge, measure the valve guide bore at the top and bottom wear points, Figure 22.



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**Figure 22**  
**Valve Guide Wear Check**

1. Wear Point

2. Determine the stem to guide clearance by subtracting the stem diameter from the valve guide diameter, Figure 23.

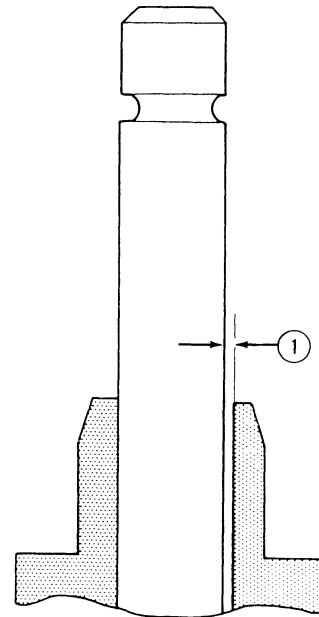
Replace valves if the clearance is more than .0078 in. (0.2 mm).

3. Replace the cylinder head if excessive clearance is determined. See "Specifications," Chapter 3, for wear limits.

**VALVE SPRINGS**

1. Place the valve springs on a flat surface. Measure the free-length of the spring and squareness, Figure 24.

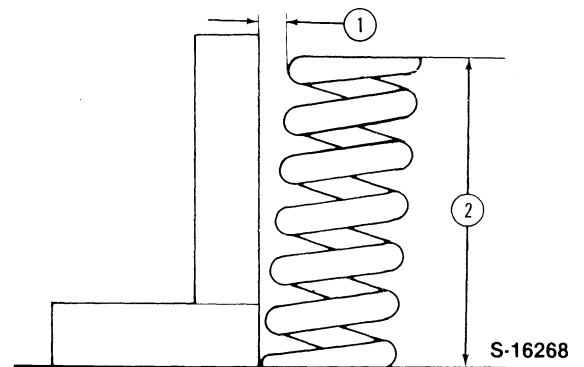
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**Figure 23**  
**Valve Stem to Guide Clearance Check**

1. Clearance



S-16268

**Figure 24**  
**Valve Spring Length and Squareness Check**

1. Squareness
2. Free Length

Replace springs that do not meet the following specifications:

	<b>Max. Out of Square</b>	<b>Min. Free Length</b>
Model: All	.079 in. (2.0 mm)	1.319 in. (33.5 mm)

2. Place the springs in a suitable spring load tester and measure the spring load rating. Replace the springs that do not meet the following load specifications.

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