

D35, DX35, D40, DX40, D45, DX45 CONTENTS

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Chapter 1 - General Information

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INTRODUCTION

This repair manual provides the technical information needed to properly service the Case IH D35, DX35, D40, DX40, D45 and DX45 tractors. Use this manual in conjunction with the operator's manual for complete operation, adjustment, and maintenance information.

On Case IH equipment, left and right are determined by standing behind the unit, looking in the direction of travel.

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SAFETY PRECAUTIONS

A careful operator is the best operator. Most accidents can be avoided by observing certain precautions. To help prevent accidents, read and take the following precautions before operating this tractor. Equipment should be operated only by those who are responsible and instructed to do so.

THE TRACTOR

1. Read the Operator's Manual carefully before using the tractor. Lack of operating knowledge can lead to accidents.
2. Use an approved roll bar and seat belt for safe operation. Overturning a tractor without a roll bar can result in death or injury. If your tractor is not equipped with a roll bar and seat belt, see your Case IH Dealer.
3. Always use the seat belt. The only instance when the seat belt should not be used is if the roll bar has been removed from the tractor or folding ROPS is in down position.
4. If a front end loader is to be installed, always use a FOPS (Falling Object Protective Structure) canopy to avoid injury from falling objects.
5. Use the handholds and step plates when getting on and off the tractor to prevent falls. Keep steps and platform cleared of mud and debris.
6. Do not permit anyone but the operator to ride on the tractor. There is no safe place for extra riders.
7. Keep all safety decals clean of dirt and grime, and replace all missing, illegible, or damaged safety decals. See the list of decals in the Decal section of this manual.

SERVICING THE TRACTOR

1. The cooling system operates under pressure which is controlled by the radiator cap. It is dangerous to remove the cap while the system is hot. Always turn the cap slowly to the first stop and allow pressure to escape before removing the cap entirely.
2. Keep any type of open flame away from the tractor and do not smoke while refueling. Wait for the engine to cool before refueling.
3. Keep the tractor and equipment, particularly brakes and steering, maintained in a reliable and

satisfactory condition to ensure your safety and comply with legal requirements.

4. Keep open flame or cold weather starting aids away from the battery to prevent fires or explosions. Use jumper cables according to instructions to prevent sparks which could cause explosion.
5. Stop the engine before performing any service on the tractor.
6. Escaping hydraulic/diesel fluid under pressure can penetrate the skin causing serious injury. If fluid is injected into the skin, obtain medical attention immediately or gangrene may result.
 - DO NOT use your hand to check for leaks. Use a piece of cardboard or paper to search for leaks.
 - Stop the engine and relieve pressure before connecting or disconnecting lines.
 - Tighten all connections before starting the engine or pressurizing lines.
7. Do not modify or permit anyone else to modify or alter this tractor or any of its components or functions without first consulting a Case IH Dealer.
8. The fuel oil in the injection system is under high pressure and can penetrate the skin. Unqualified persons should not remove or attempt to adjust a pump, injector, nozzle, or any other part of the fuel injection system. Failure to follow these instructions can result in serious injury.
9. 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.
10. Some components of your tractor, such as gaskets and friction surfaces (brake linings, clutch linings, etc.) may contain asbestos. Breathing asbestos dust is dangerous to your health. You are advised to have any maintenance or repair on such components carried out by an authorized Case IH Dealer. However, if service operations are to be undertaken on parts that contain asbestos, the essential precautions listed below must be observed:

- Work out of doors or in a well ventilated area.
- Dust found on the tractor or produced during work on the tractor should be removed by extraction, not by blowing.
- Dust waste 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.

OPERATING THE TRACTOR

1. Before starting the tractor, apply the parking brake, place the PTO lever in the "OFF" position, the lift control lever in the down position, the remote control valve levers in the neutral position, and the transmission in neutral.
2. Always sit in the tractor seat when starting the engine or operating controls. Do not start the engine or operate controls while standing beside the tractor.
3. Do not bypass the neutral start switches. Consult your Case IH Dealer if your neutral start controls malfunction. Use jumper cables only in the recommended manner. Improper use can result in tractor runaway.
4. Avoid accidental contact with the gear shift lever while the engine is running, as this can cause unexpected tractor movement.
5. Before getting off the tractor, disengage the PTO, turn the engine off, and apply the parking brake. Never get off the tractor while it is in motion.
6. Do not park the tractor on a steep incline.
7. Do not operate the tractor engine in an enclosed building without adequate ventilation. Exhaust fumes can cause death or illness.
8. If the power steering or engine ceases operating, stop the tractor immediately.
9. Pull only from the drawbar or the lower link drawbar in the down position. Use only a drawbar pin that locks in place. Pulling from the tractor rear axle or any point above the axle may cause the tractor to upset.
10. If the front end of the tractor tends to rise when heavy implements are attached to the three-point hitch, install front end or front wheel weights. Do not operate the tractor with a light front end.

11. Always set the hydraulic selector lever in position control when attaching or transporting equipment. Ensure hydraulic couplers are properly mounted and will disconnect safely in case of accidental detachment of implement.
12. Do not leave equipment in the raised position.
13. Use the flasher/turn signal lights and SMV signs when traveling on public roads both day and night (unless prohibited by law).
14. When operating at night, adjust lights to prevent blinding oncoming drivers.

DRIVING THE TRACTOR

1. Watch where you are going, especially at row ends, on roads, around trees and low hanging obstacles.
2. To avoid upsets, drive the tractor with care and at a safe speed. Use extra caution when operating over rough ground, when crossing ditches or slopes, and when turning corners.
3. To provide two-wheel braking, lock tractor brake pedals together when transporting on roads.
4. Do not coast or free wheel down hills. Use the same gear when going downhill as is used when going uphill.
5. Any towed vehicle with a total weight exceeding that of the towing tractor should be equipped with brakes for safe operation.
6. If the tractor becomes stuck or the tires become frozen to the ground, back up the tractor to prevent upset.
7. Always check overhead clearance, especially when transporting the tractor.
8. When operating at night, adjust lights to prevent blinding oncoming drivers.

OPERATING THE PTO

1. When operating PTO driven equipment, shut off the engine and wait until the PTO stops before getting off the tractor and disconnecting the equipment.
2. Do not wear loose clothing when operating the power take-off or when near rotating equipment.
3. When operating stationary PTO driven equipment, always place all gear shift levers in neutral position.

Apply the tractor parking brake, and block the rear wheels front and back.

4. To avoid injury, do not clean, adjust, unclog, or service PTO driven equipment when the tractor engine is running.
5. Ensure the PTO master shield is installed at all times. Always replace the PTO shield cap when the PTO is not in use.

DIESEL FUEL

1. UNDER NO CIRCUMSTANCES should gasoline, alcohol, or blended fuels be added to diesel fuel. These combinations can create an increased fire or explosive hazard. Such blends are more explosive than pure gasoline in a closed container such as a fuel tank. **DO NOT USE THESE BLENDS.**
2. Never remove the fuel cap or refuel with the engine running or hot.
3. Do not smoke while refueling or when standing near fuel.
4. Maintain control of the fuel filler pipe nozzle when filling the tank.
5. Do not fill the fuel tank to capacity. Allow room for expansion.
6. Wipe up spilled fuel immediately.
7. Always tighten the fuel tank cap securely.
8. If the original fuel tank cap is lost, replace it with a Case IH approved cap. A non-approved, proprietary cap may not be safe.

9. Keep equipment clean and properly maintained.
10. Do not drive equipment near open fires.
11. Never use fuel for cleaning purposes.
12. Arrange fuel purchases so that winter grade fuels are not held over and used in the spring.

SAFETY FRAME (ROPS)

Your Case IH tractor is equipped with a safety frame. It must be maintained in a serviceable condition. Be careful when driving through doorways or working in confined spaces with low headroom.

UNDER NO CIRCUMSTANCES should you:

- modify, drill, or alter the safety frame in any way. Doing so may render you liable to legal prosecution.
- attempt to straighten or weld any part of the main frame or retaining brackets which have suffered damage. Doing so may weaken the structure and endanger your safety.
- secure any parts on the main frame or attach your safety frame with anything other than the special high tensile bolts and nuts specified.
- attach chains or ropes to the main frame for pulling purposes.
- take unnecessary risks even though your safety frame affords you the maximum protection possible.



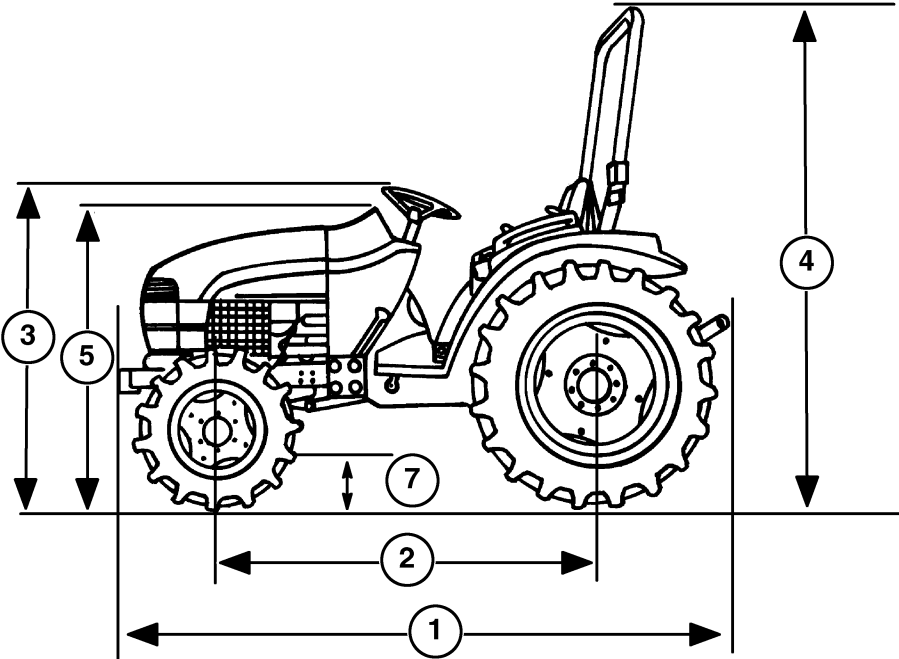
WHEN YOU SEE THIS SYMBOL

IT MEANS:

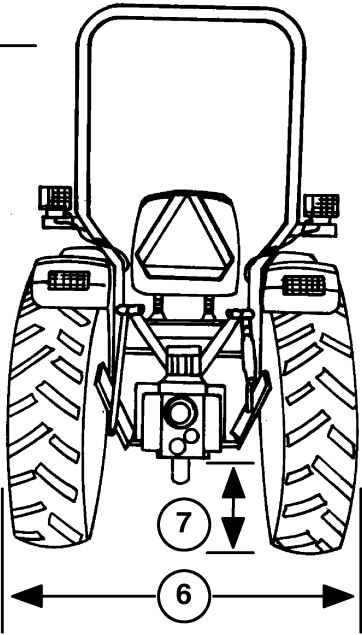
ATTENTION!

BECOME ALERT!

YOUR SAFETY IS INVOLVED!



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SECTION 10 - ENGINE

Chapter 1 - Engine

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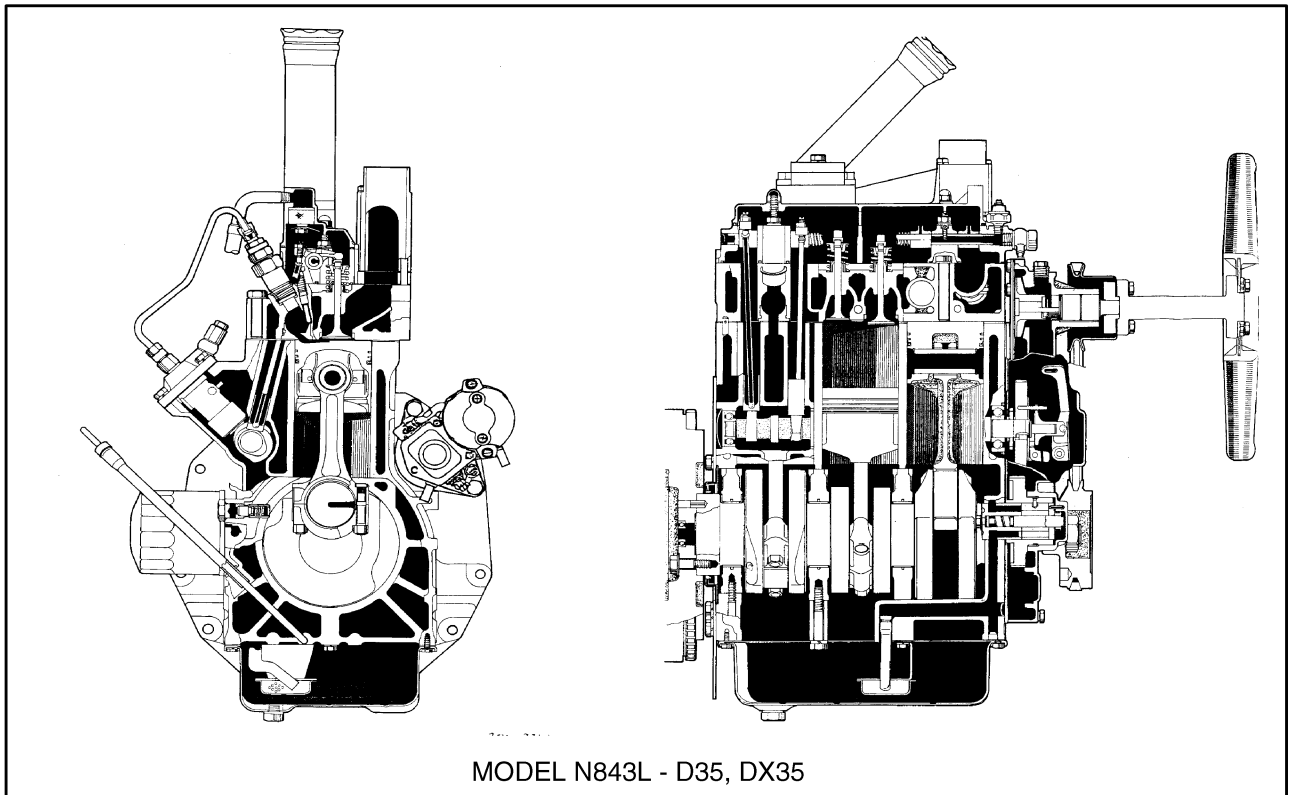
SPECIFICATIONS

GENERAL	D35	D40	D45
Engine Model	N843L	N844	N844L
Number of Cylinders	3	4	4
Bore x Stroke	3.31 x 3.94 in. (84 x 100 mm)	3.31 x 3.54 in. (84 x 90 mm)	3.31 x 3.94 in. (84 x 100 mm)
Displacement	101.4 cu. in. (1622 cc)	121.7 cu. in. (1995 cc)	135.2 cu. in. (2216 cc)
Compression Ratio	22.5:1	22.5:1	22.5:1
Rated Speed (rpm)	2600	2600	2600
Muffler	Horizontal		
Firing Order	1-2-3	1-3-4-2	1-3-4-2
Low Idle Speed	1050 rpm	1050 rpm	1050 rpm
Maximum No-Load Speed	2840 rpm	2840 rpm	2840 rpm
Cylinder Arrangement	In-Line Vertical	In-Line Vertical	In-Line Vertical
Valve Arrangement	Overhead	Overhead	Overhead
Compression Pressure at 200 rpm (cylinder speed)	427 ± 50 psi (29.4 ± 1.8 bar)	427 ± 50 psi (29.4 ± 1.8 bar)	427 ± 50 psi (29.4 ± 1.8 bar)
Variation between cylinders			
CYLINDER BLOCK	N843L	N844	N844L
Bore			
Standard	3.3071-3.3078 in. (84.0 mm)	3.3071-3.3078 in. (84.0 mm)	3.3071-3.3078 in. (84.0 mm)
Maximum	3.3543 in. (85.2 mm)	3.3543 in. (85.2 mm)	3.3543 in. (85.2 mm)
Head Surface Warp			
Standard	.002 in. (.05 mm)	.002 in. (.05 mm)	.002 in. (.05 mm)
Maximum	.005 in. (.12 mm)	.005 in. (.12 mm)	.005 in. (.12 mm)
Re-Bore Size*			
.020 in. oversize (.5 mm)	3.3268-3.3275 in. (84.2 mm)	3.3268-3.3275 in. (84.2 mm)	3.3268-3.3275 in. (84.2 mm)
.040 in. oversize (1.0 mm)	3.3465-3.3472 in. (84.7 mm)	3.3465-3.3472 in. (84.7 mm)	3.3465-3.3472 in. (84.7 mm)

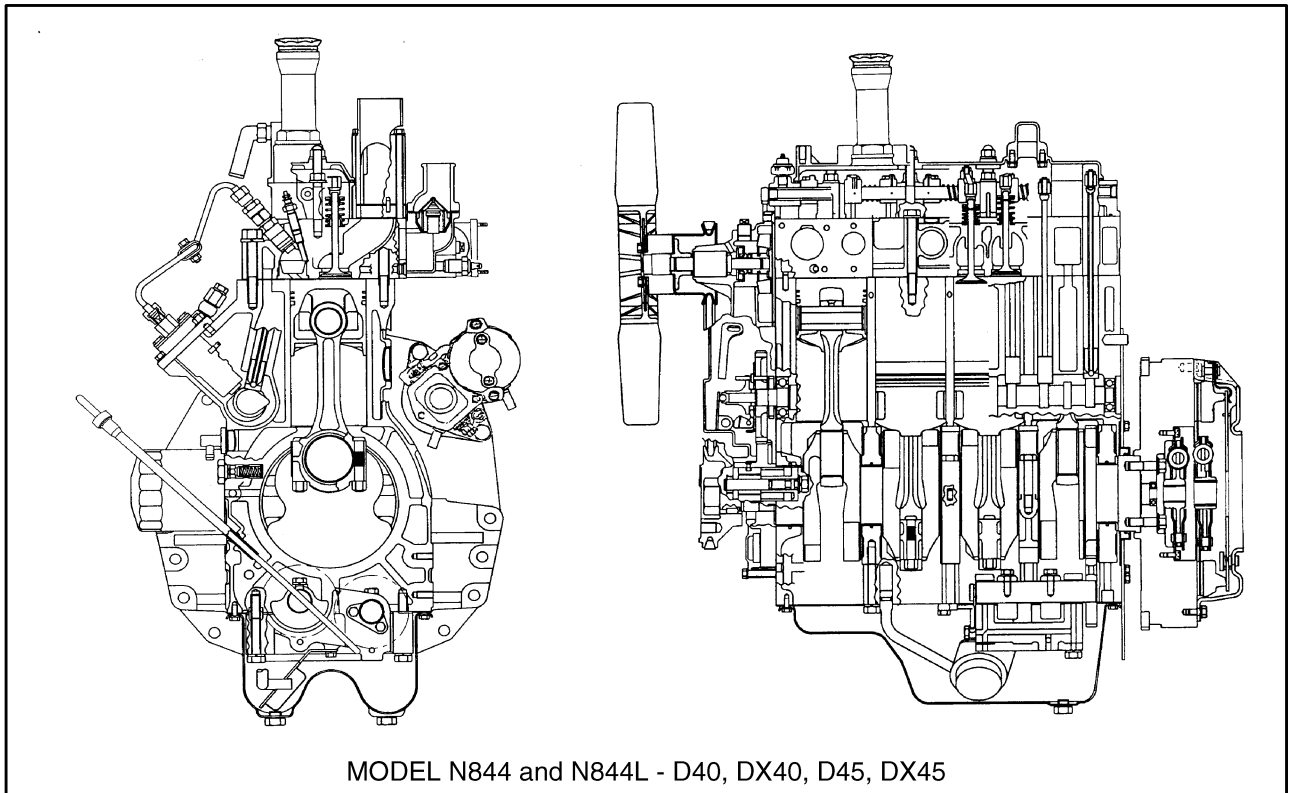
* If bore size exceeds 3.3543 in. (85.2 mm) replace the block.

SECTION 10 - ENGINE - CHAPTER 1

CYLINDER HEAD	N843L	N844	N844L
Head Warp			
Standard	0.002 in. less than (0.05 mm)	0.002 in. (0.05 mm)	0.002 in. (0.05 mm)
Maximum	0.005 in. (0.12 mm)	0.005 in. (0.12 mm)	0.005 in. (0.12 mm)
Valve Seat Width			
Standard	0.067-0.082 in. (1.7-2.1 mm)	0.067-0.082 in. (1.7-2.1 mm)	0.067-0.082 in. (1.7-2.1 mm)
Maximum	0.098 in. (2.5 mm)	0.098 in. (2.5 mm)	0.098 in. (2.5 mm)
Valve Seat Sink			
Standard (Recess)	0.0334-0.0453 in. (0.85-1.15 mm)	0.0334-0.0453 in. (0.85-1.15 mm)	0.0334-0.0453 in. (0.85-1.15 mm)
Maximum	0.071 in. (1.8 mm)	0.071 in. (1.8 mm)	0.071 in. (1.8 mm)
Valve Angle	45°	45°	45°
PISTON	N843L	N844	N844L
Diameter			
Standard	3.30503-3.30562 in. (83.948-83.963 mm)	3.30503-3.30562 in. (83.948-83.963 mm)	3.30503-3.30562 in. (83.948-83.963 mm)
Minimum	3.2953 in. (83.7 mm)	3.2953 in. (83.7 mm)	3.2953 in. (83.7 mm)
Bore Clearance			
Standard	0.0014-0.0028 in. (0.038-0.072 mm)	0.0014-0.0028 in. (0.038-0.072 mm)	0.0014-0.0028 in. (0.038-0.072 mm)
Maximum	0.010 in. (0.25 mm)	0.010 in. (0.25 mm)	0.010 in. (0.25 mm)
Piston Pin Bore			
Standard	1.102-1.1023 in. (27.996-28.000 mm)	1.102-1.1023 in. (27.996-28.000 mm)	1.102-1.1023 in. (27.996-28.000 mm)
Maximum	1.102 in. (27.98 mm)	1.102 in. (27.98 mm)	1.102 in. (27.98 mm)
Piston Pin Clearance			
Standard	-0.000393 +0 .0002 in. (-0.001 + 0.007 mm)	-0.000393 +0 .0002 in. (-0.001 + 0.007 mm)	-0.000393 +0 .0002 in. (-0.001 + 0.007 mm)
Maximum	0.0008 in. (0.02 mm)	0.0008 in. (0.02 mm)	0.0008 in. (0.02 mm)
Available Oversizes	0.020 in. & 0.040 in. (0.5 mm & 1.0 mm)	0.020 in. & 0.040 in. (0.5 mm & 1.0 mm)	0.020 in. & 0.040 in. (0.5 mm & 1.0 mm)



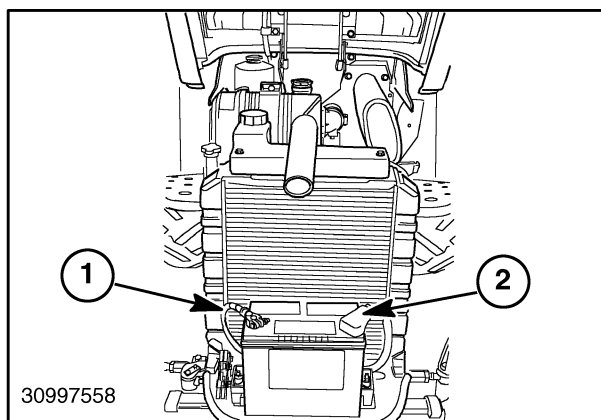
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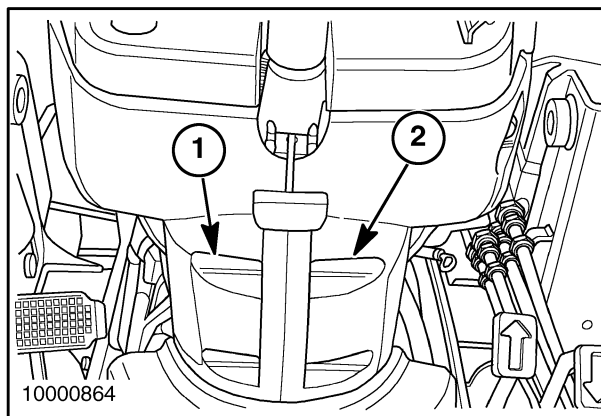
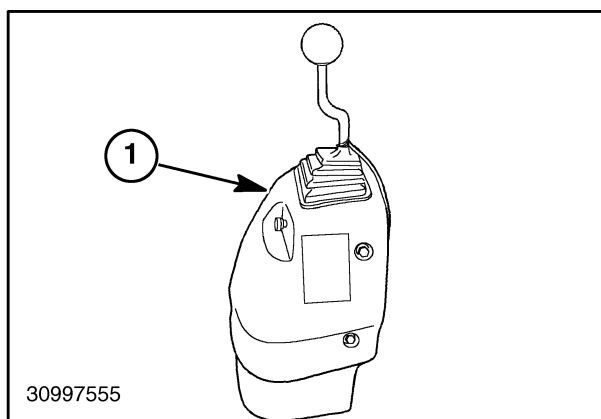
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REMOVAL**Separating at the Clutch Housing/Engine-12x12 Transmission**

6. Remove the negative (-) battery cable, 1, and the positive (+) battery cable, 2, from the battery.
7. Drain all of the hydraulic fluid from the transmission and the differential into a suitable container.
8. Disconnect the headlight wire harness plug and remove the hood from the tractor.
9. Remove the seat, and the seat base assembly from the tractor.
10. Remove the light bars from the fenders and the ROPS.
11. If equipped, remove the remote loader control valve, 1, and the connecting hydraulic tubes from the right fender.
12. Remove the left and right fenders from the tractor.
13. Remove the left, 1, and right, 2, rear hood side panels.
14. Disconnect and remove the throttle cable from the foot throttle control pedal, located on the right deck.
15. Remove the left and the right deck from the tractor.
16. Disconnect the throttle cable from the dash mounted throttle control lever.

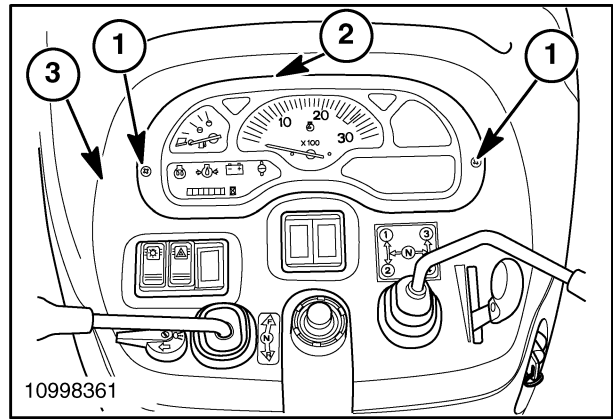


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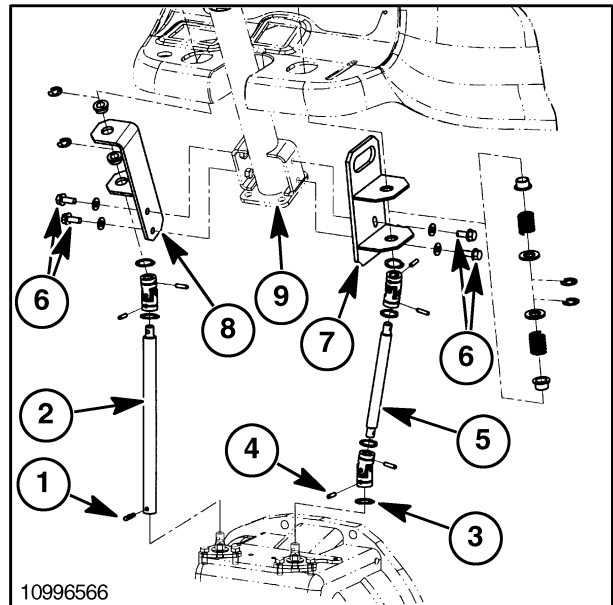
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17. Loosen and remove the two instrument panel retaining screws, 1. Remove the instrument panel, 2, from the dash housing, 3. Disconnect the wiring connector from the instrument panel.



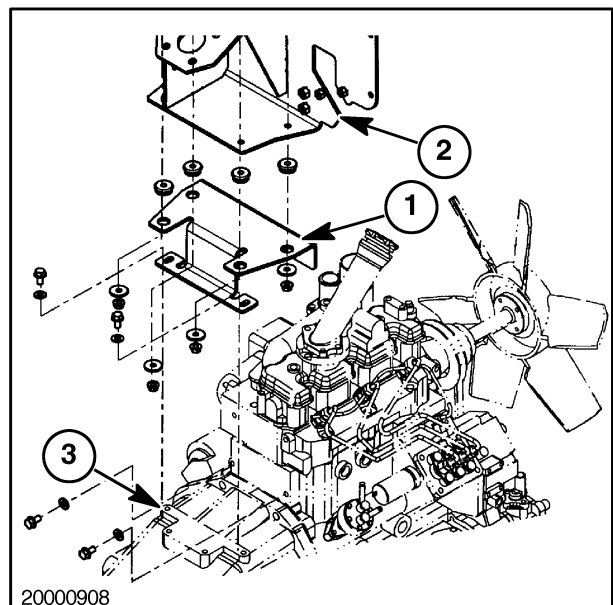
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18. Drive the roll pin, 1, from the lower shuttle shift shaft, 2. Remove the retaining ring, 3, and the roll pin, 4, from the lower main shift shaft, 5. Loosen and remove the retaining bolts, 6, securing the main shift bracket, 7, and the shuttle shift bracket, 8, to the steering column, 9. Remove the shift shaft assemblies by feeding the control levers down through the dash housing.
19. Remove the dash housing from the firewall. Disconnect the wiring connectors from the dash switches.
20. Disconnect the main wiring harness connector.



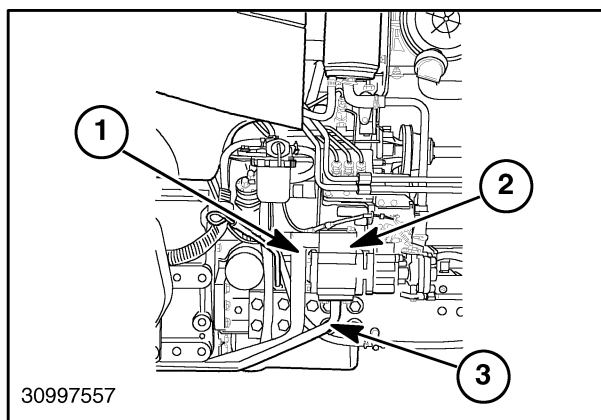
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21. Remove the firewall support bracket, 1, from the firewall, 2, and the clutch housing, 3.



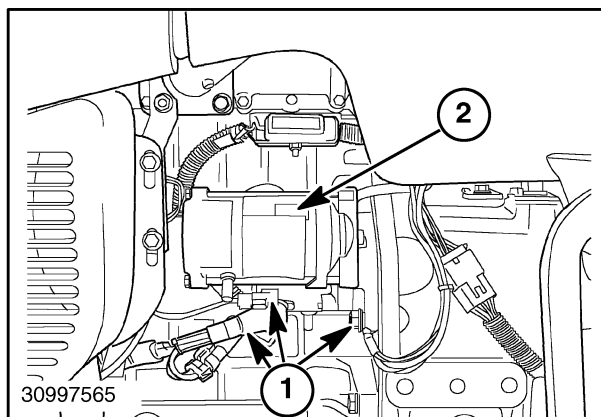
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22. Remove the hydraulic system inlet tube, 1, from the hydraulic pump, 2.
23. Remove the hydraulic system pressure tube, 3, from the hydraulic pump, 2, and the diverter valve.



11

24. Disconnect the wires, 1, on the starter, 2, and remove the starter from the tractor.

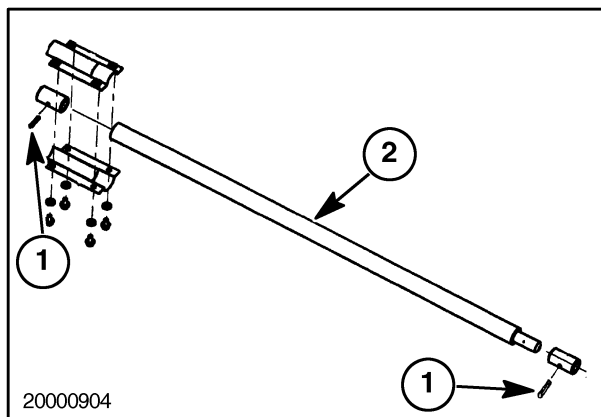


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25. If equipped with FWD, remove the roll pins, 1, from the front and rear of the FWD driveshaft, 2, and remove the driveshaft from the tractor.

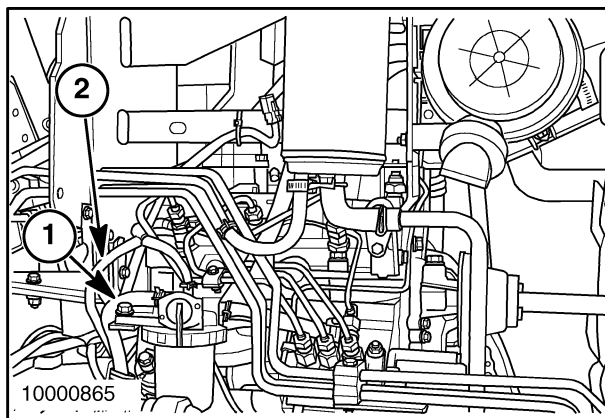
NOTE: Draining the engine oil and removal of the oil filter is necessary on the D35 tractor to gain access to several of the buckle-up bolts.

26. Drain the engine oil into a suitable container and remove the oil filter.



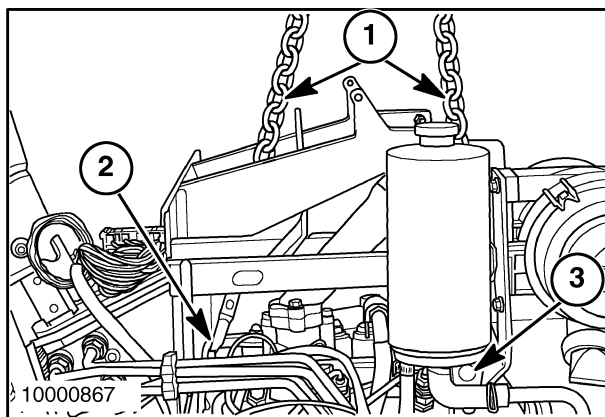
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27. Remove the fuel supply, 1, and return, 2, lines from the fuel filter, 3.
28. Drain the fuel tank into a suitable container.



14

29. Attach a chain sling, 1, to the two hoist eyes, 2 and 3, on the engine.

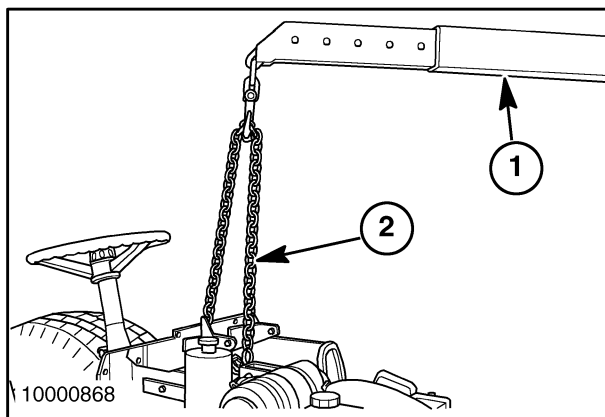


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30. Attach a suitable hoist, 1, to the chain sling, 2.

NOTE: The hoist is used for supporting the engine and axle assembly, not for lifting.

31. Roll a floor jack under the tractor from the rear of the tractor, and place under the clutch housing. Raise the jack enough to support the drive train.

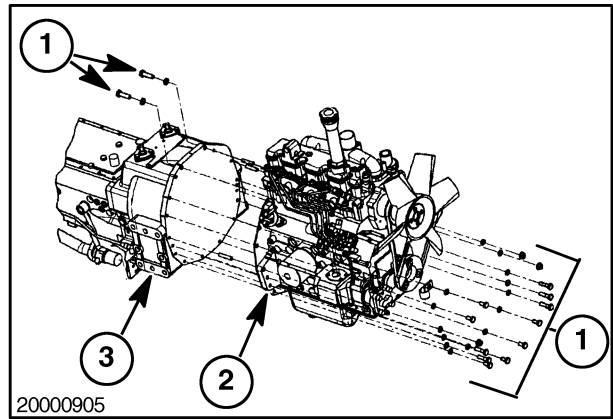


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32. Remove the buckle-up bolts, 1, that secure the engine, 2, to the clutch housing, 3.

NOTE: The hoist and/or the floor jack may need to be raised or lowered to allow the separation of the engine from the clutch housing.

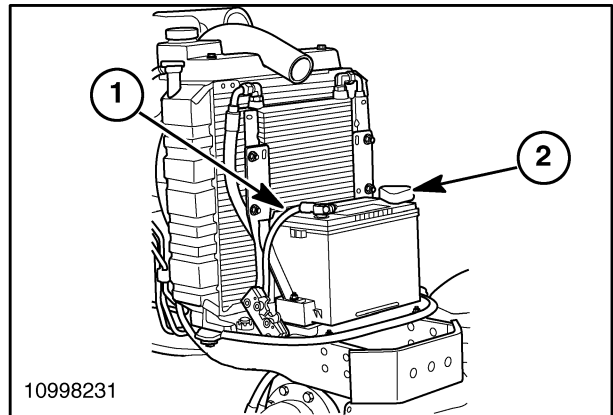
33. Carefully roll the drive train away from the engine, using the floor jack for support.



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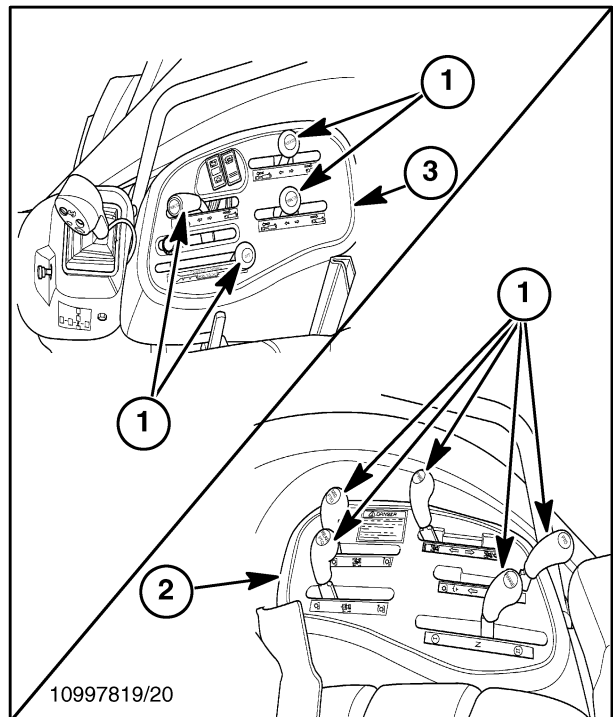
Separating at the HST Housing/Engine-HST Transmission

1. Remove the negative (-) battery cable, 1, and the positive (+) battery cable, 2, from the battery.
2. Drain all of the hydraulic fluid from the transmission, differential, and the oil cooler into a suitable container.
3. Disconnect the headlight wire harness plug and remove the hood from the tractor.
4. Remove the seat, and the seat track assembly from the tractor deck.



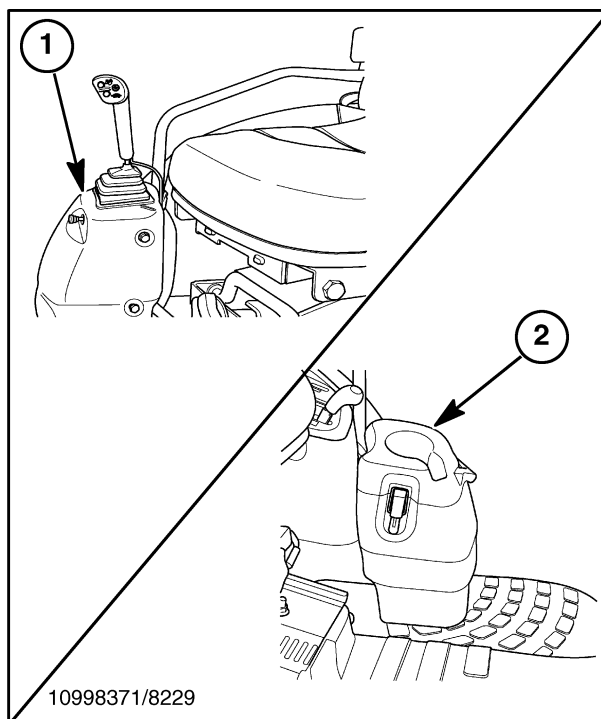
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5. Remove the control lever grips, 1, from the control levers on both sides of the tractor.
6. Remove the left, 2, and the right, 3, control pods from the fenders.
7. Remove the light bars from the fenders and the ROPS.
8. Disconnect and remove the control levers from the tractor deck and the connecting linkage.



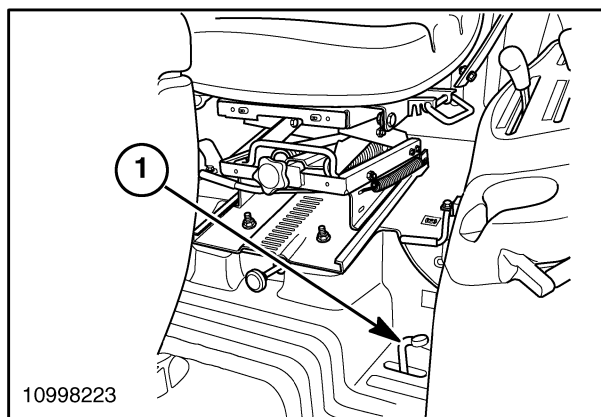
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9. If equipped, remove the remote, loader control valve, 1, from the right fender, and the cup holder/ tool box, 2, from the left fender.
10. Remove the left and right fenders from the tractor.



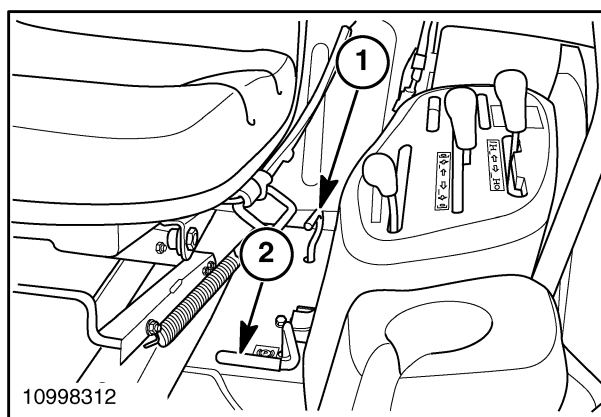
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11. Disconnect and remove the differential lock pedal, 1.



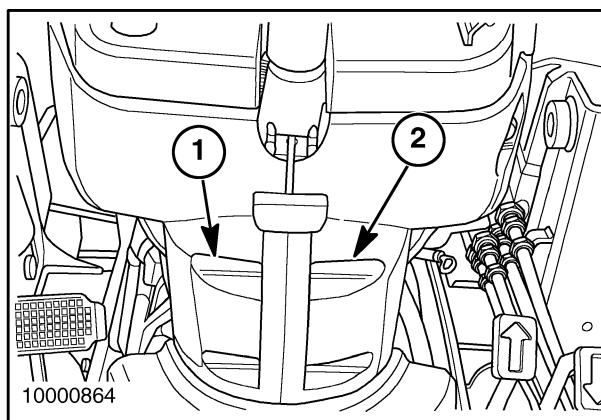
21

12. If equipped, disconnect and remove the fulltime 2WD lever, 1.
13. Disconnect and remove the parking brake handle, 2.



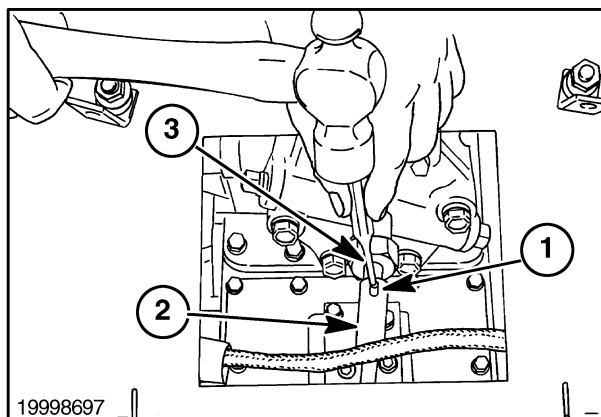
22

14. Remove the left, 1, and right, 2, rear hood side panels.
15. Remove the floor mat from the tractor deck.



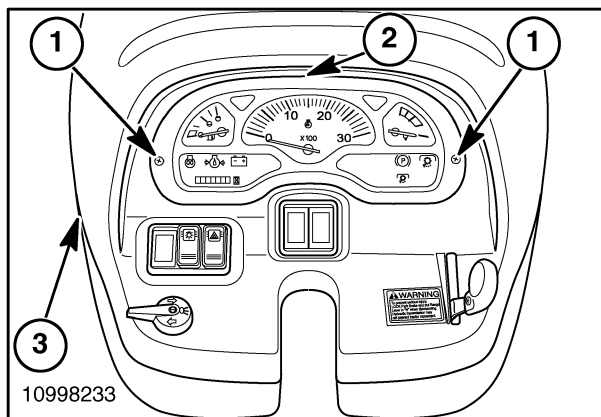
23

16. Drive the roll pin, 1, from the HPL speed control shaft, 2, and remove the control shaft from the HPL shaft, 3.
17. Remove the deck from the tractor.



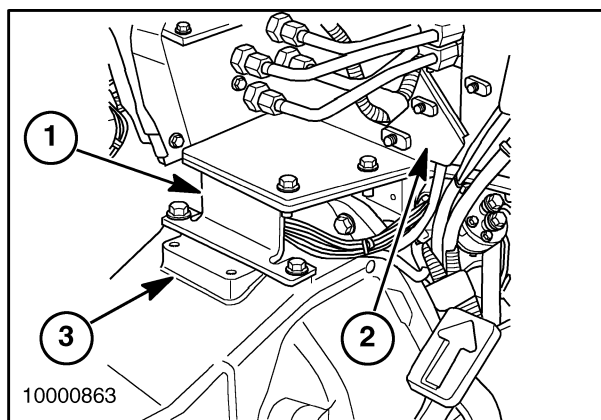
24

18. Loosen and remove the two instrument panel retaining screws, 1. Remove the instrument panel, 2, from the dash housing, 3. Disconnect the wiring connector from the instrument panel.
19. Disconnect the throttle cable from the throttle control lever.
20. Remove the dash housing from the firewall. Disconnect the wiring connectors from the dash switches.
21. Disconnect the two main wiring harness connectors.



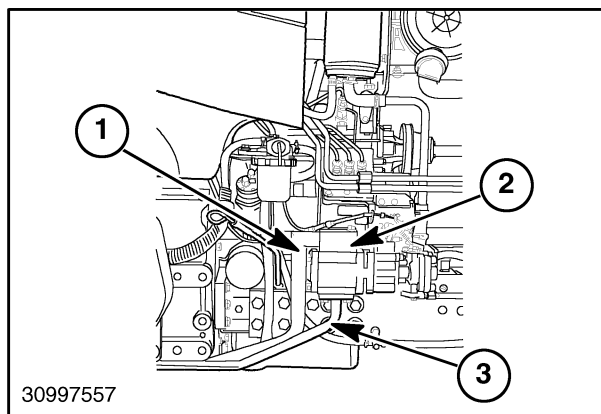
25

22. Remove the firewall support bracket, 1, from the firewall, 2, and the HST housing, 3.



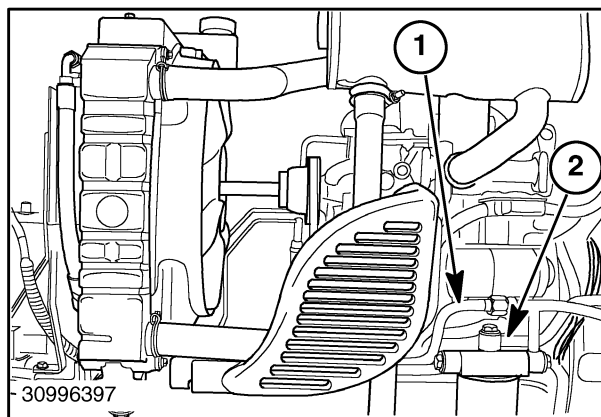
26

23. Remove the hydraulic system inlet tube, 1, from the hydraulic pump, 2.
24. Remove the hydraulic system pressure tube, 3, from the hydraulic pump, 2, and the diverter valve.



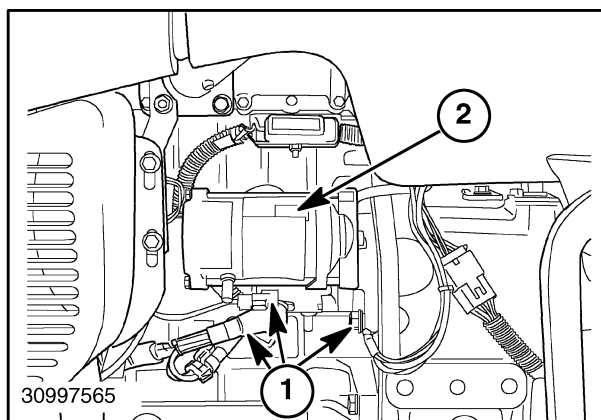
27

25. Remove the HST oil cooler tube, 1, and the HST pressure tube, 2, from the tractor.



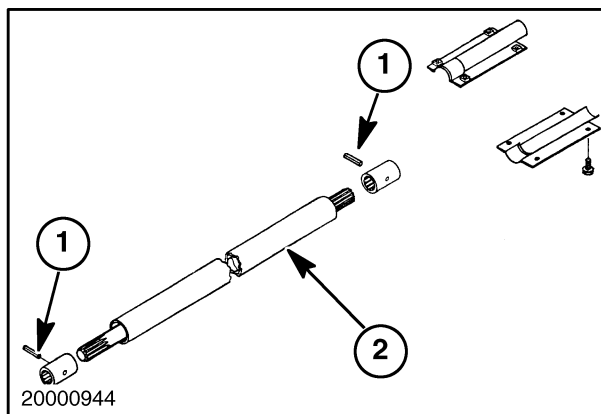
28

26. Disconnect the wires, 1, on the starter, 2, and remove the starter from the tractor.



29

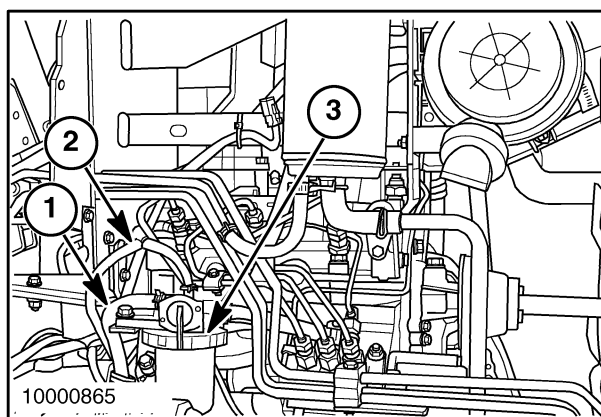
27. If equipped with FWD, remove the roll pins, 1, from the front and rear of the FWD driveshaft, 2.
28. Remove the driveshaft, 2, from the tractor.



30

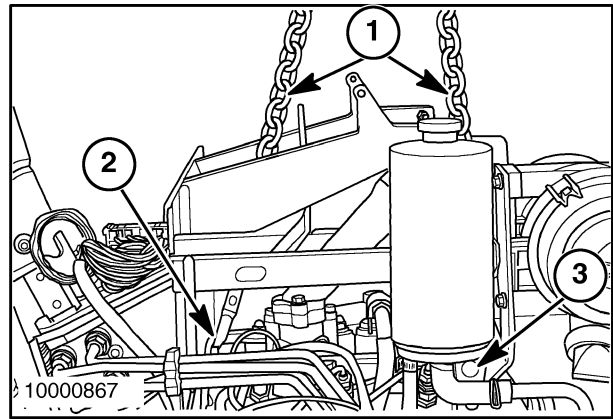
NOTE: Draining the engine oil and removal of the oil filter is necessary on the DX35 tractor to gain access to several of the buckle-up bolts.

29. Drain the engine oil into a suitable container and remove the oil filter.
30. Remove the fuel supply, 1, and return, 2, lines from the fuel filter, 3.
31. Drain the fuel tank into a suitable container.



31

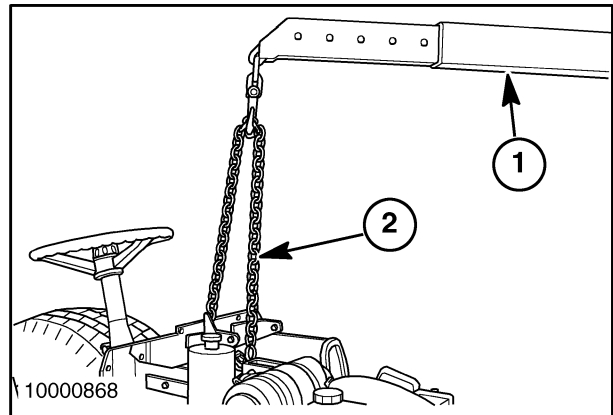
32. Attach a chain sling, 1, to the two hoist eyes, 2 and 3, on the engine.



32

33. Attach a suitable hoist, 1, to the chain sling, 2.

NOTE: The hoist is used for supporting the engine and axle assembly, not for lifting.

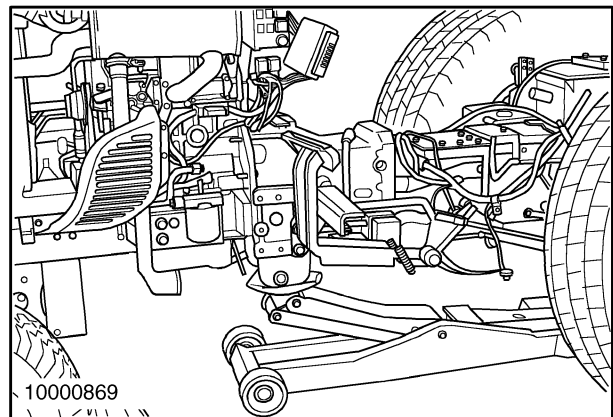


33

34. Roll a floor jack under the tractor from the rear of the tractor, and place under the HST housing. Raise the jack enough to support the drive train.

35. Remove the buckle-up bolts that secure the engine to the HST housing.

NOTE: The hoist and/or the floor jack may need to be raised or lowered to allow the separation of the engine from the HST housing.



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36. Carefully roll the drive train away from the engine, using the floor jack for support.

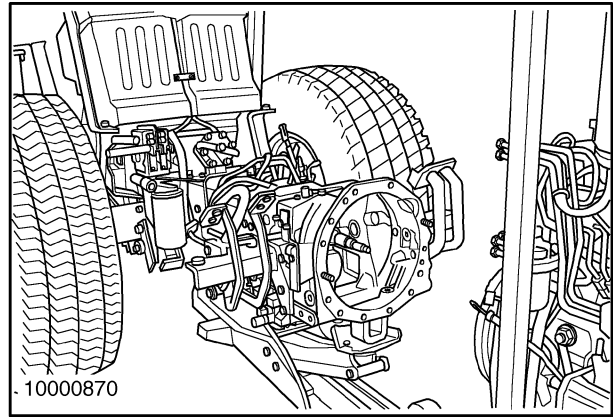
Separating at the Engine/Frame

1. Use jack stands under the frame rails to support the front frame/engine assembly.



Make sure the front frame/engine assembly is securely supported before removing the chain sling from the engine.

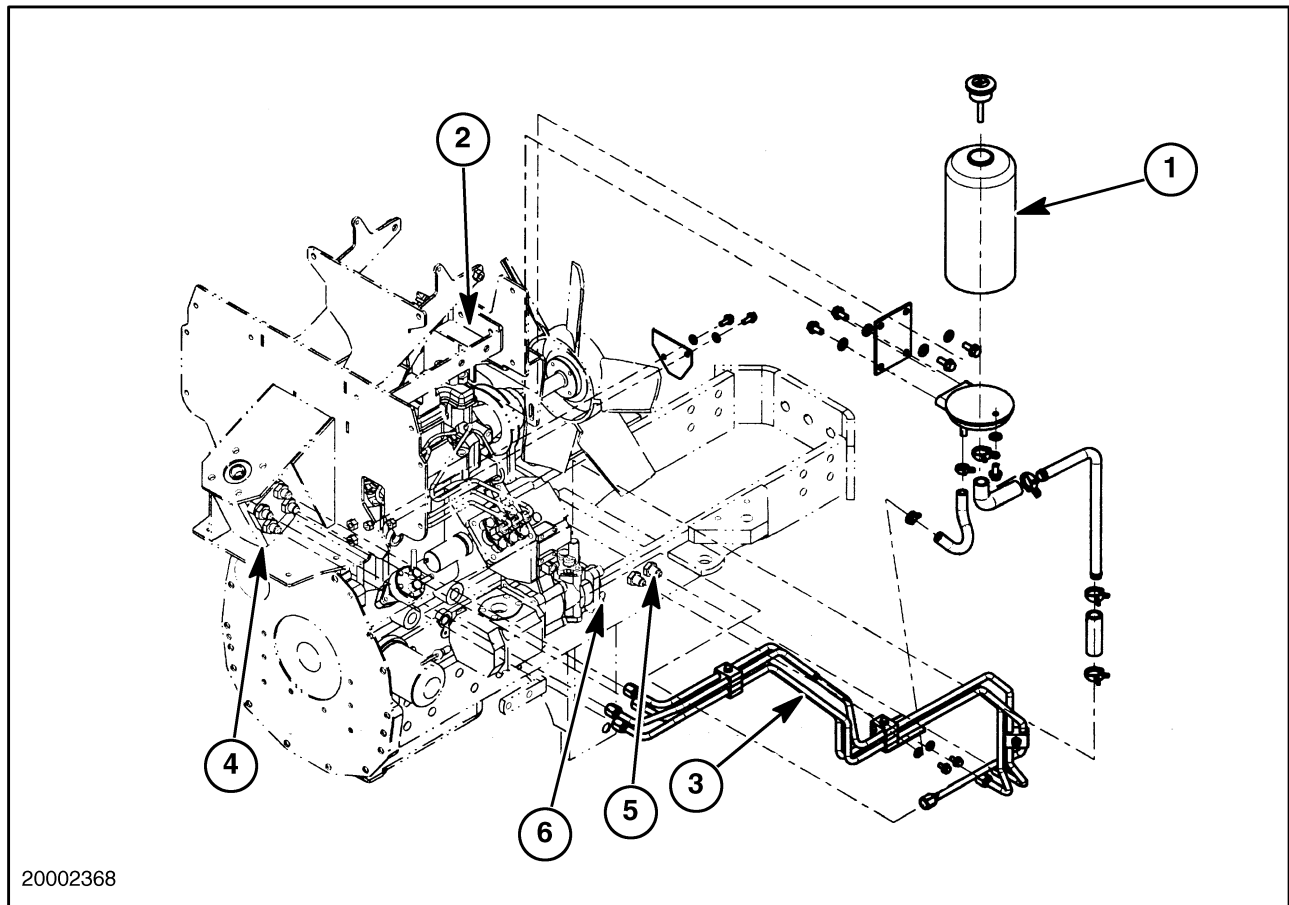
2. Remove the chain sling from the two hoist eyes on the engine.



35

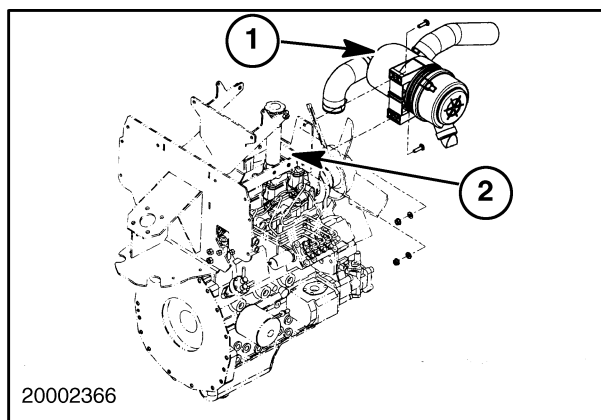
3. Drain the hydraulic fluid from the power steering reservoir, 1, into a suitable container. Remove the reservoir, 1, from the firewall, 2.

4. Remove the power steering lines, 3, from the power steering control motor, 4, the frame, 5, and the power steering pump, 6.

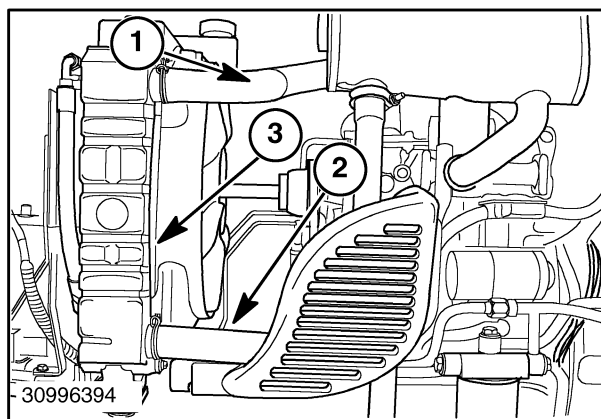


36

5. Remove the air cleaner assembly, 1, from the firewall, 2.

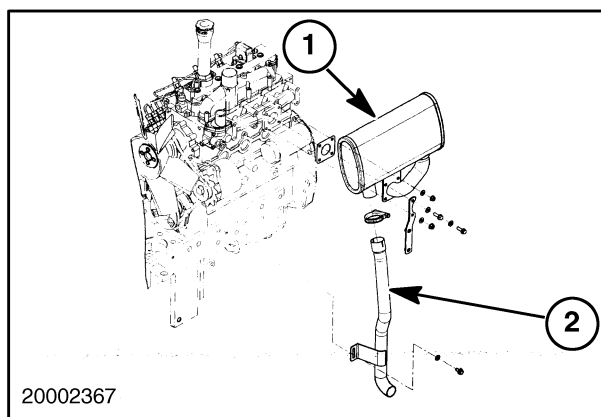


6. Remove the muffler guard, 1, from the tractor.



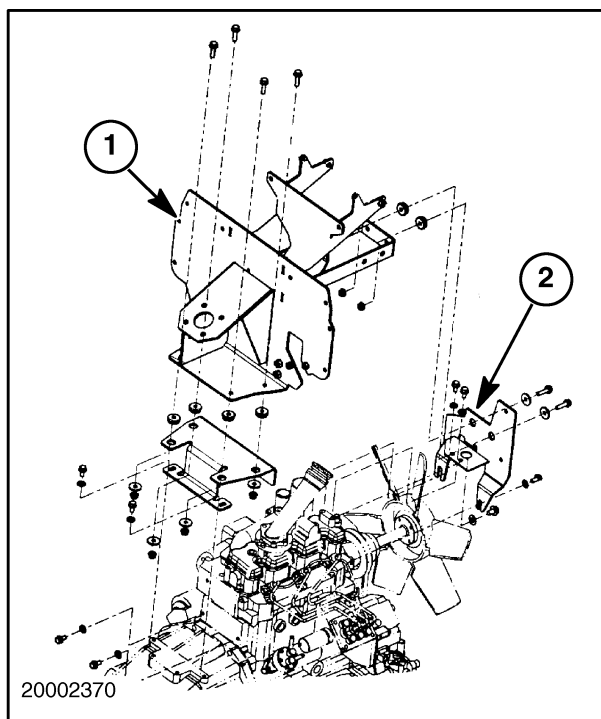
37

7. Remove the muffler, 1, and the exhaust pipe, 2, from the tractor.
8. Drain the coolant from the radiator into a suitable container.
9. Remove the top and the bottom radiator hoses.
10. Remove the radiator and the oil cooler (if equipped) from the tractor.



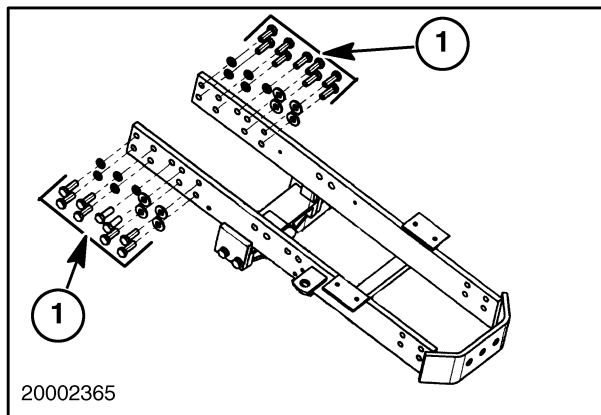
38

11. Remove the firewall, 1, and the air cleaner mounting bracket, 2, from the engine.
12. Attach a chain sling to the two hoist eyes on the engine.
13. Attach a suitable hoist to the chain sling, and raise the hoist enough to support the engine.



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14. Loosen and remove the engine mounting bolts, 1, on both sides of the frame.
15. Carefully lift the engine from the frame.
16. Attach the engine to a suitable engine stand.
17. With the engine securely attached to the engine stand, remove the chain sling from the two engine hoist eyes.

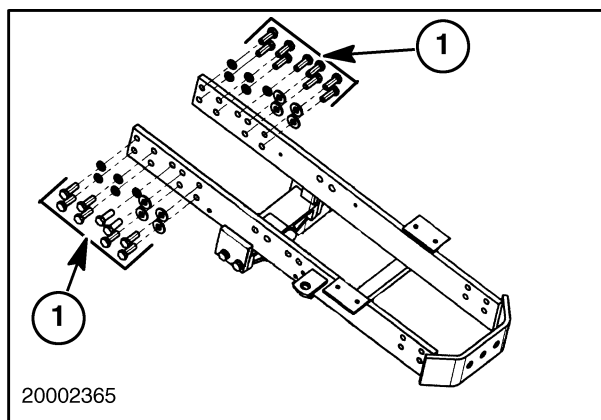


40

INSTALLATION

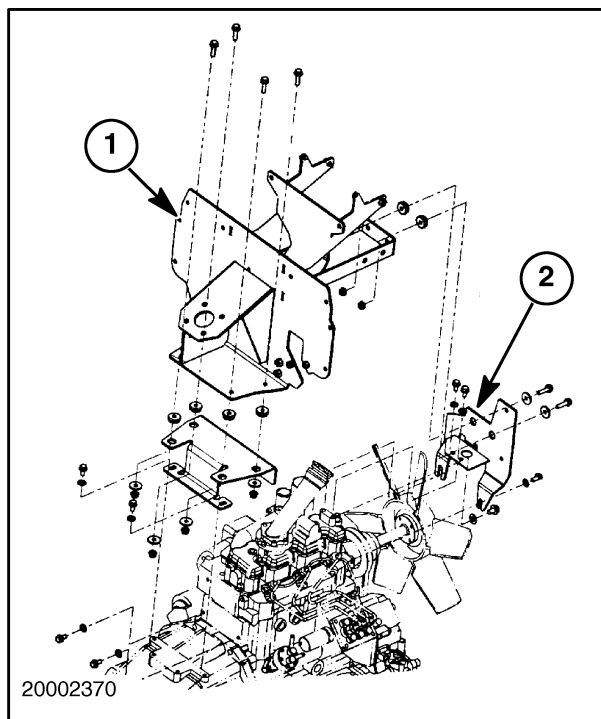
1. Attach a chain sling to the two hoist eyes on the engine.
2. Attach a suitable hoist to the chain sling and raise the hoist enough to support the engine.
3. Remove the engine from the engine stand.
4. Using the hoist, position the engine in the frame, aligning the mounting holes in the frame with the mounting holes in the engine.

5. Install the engine mounting bolts, 1, on both sides of the frame. Tighten the mounting bolts to 102 - 129 ft. lbs. (139-175 N·m).
6. With the engine securely installed into the frame, remove the chain sling from the two engine hoist eyes.



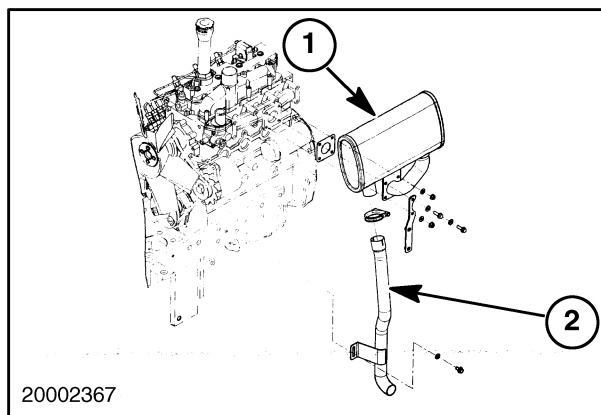
41

7. Install the firewall, 1, and the air cleaner mounting bracket, 2, onto the engine.
8. Install the radiator and the oil cooler (if equipped) onto the tractor frame.
9. Install the top and bottom radiator hoses.
10. Fill the radiator with new coolant to the proper level.



42

11. Install the muffler, 1, onto the exhaust manifold, and attach the exhaust pipe, 2, onto the muffler.



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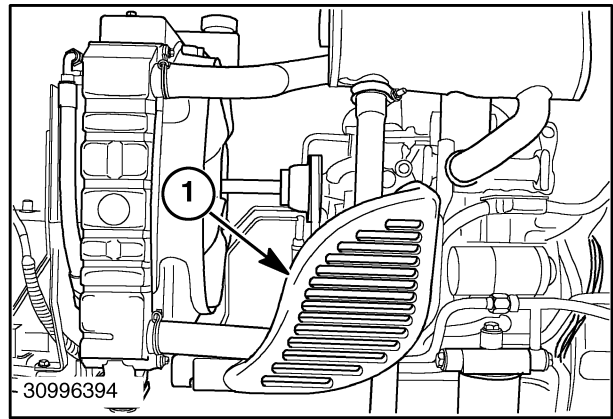
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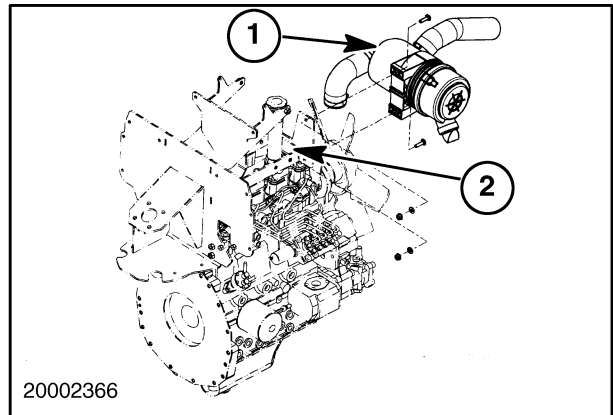
Thank you so much for reading

12. Install the muffler guard, 1, on the tractor.



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13. Install the air cleaner assembly, 1, on the firewall, 2, and connect the air inlet hose to the air inlet manifold pipe.



45

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