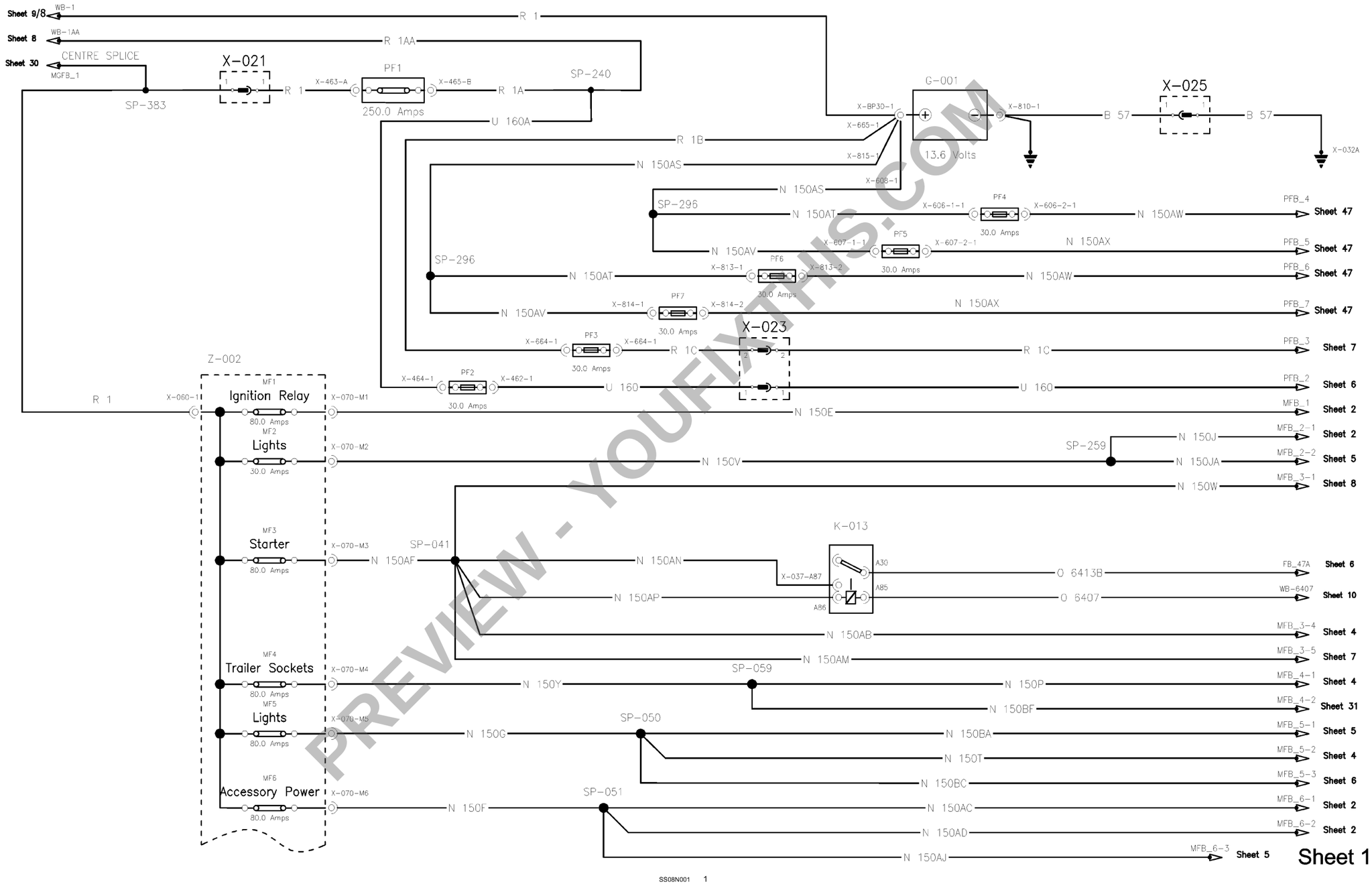
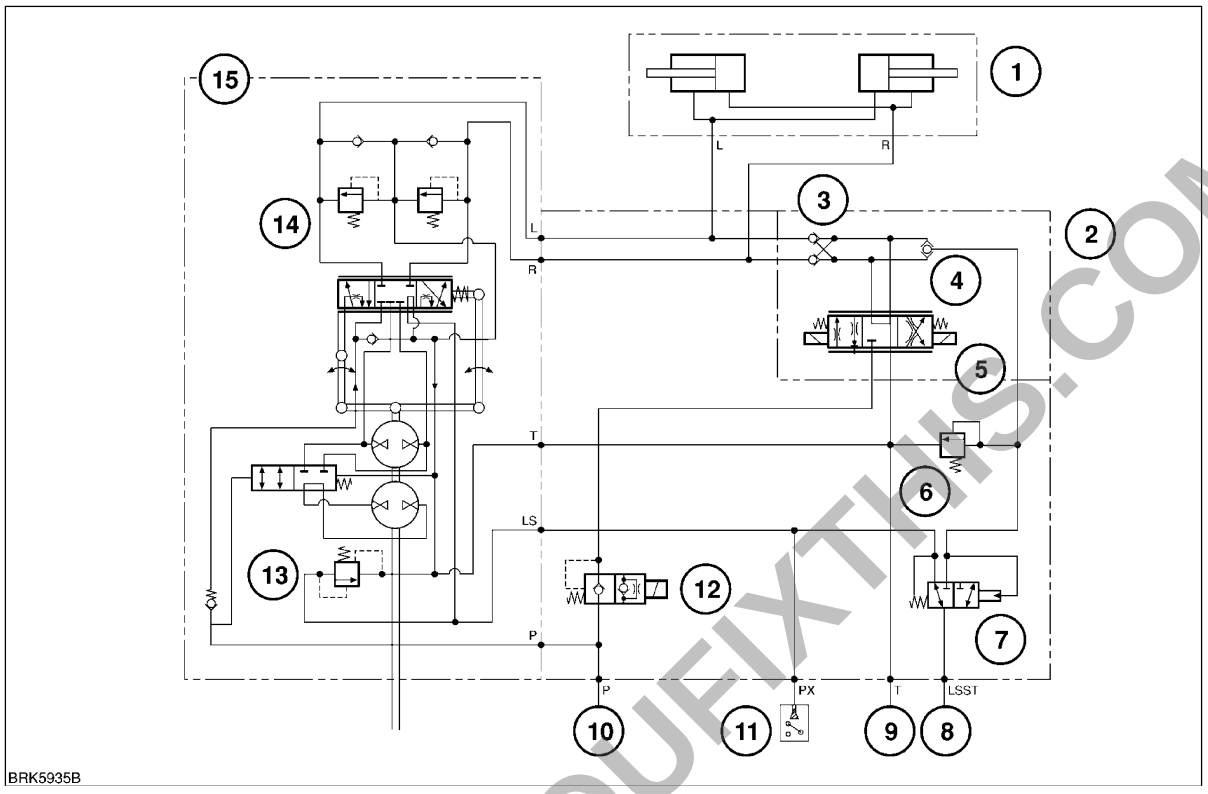



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# STEERING AutoPilot - Hydraulic schema Autoguidance system




BAIL08CVT094FSA 1

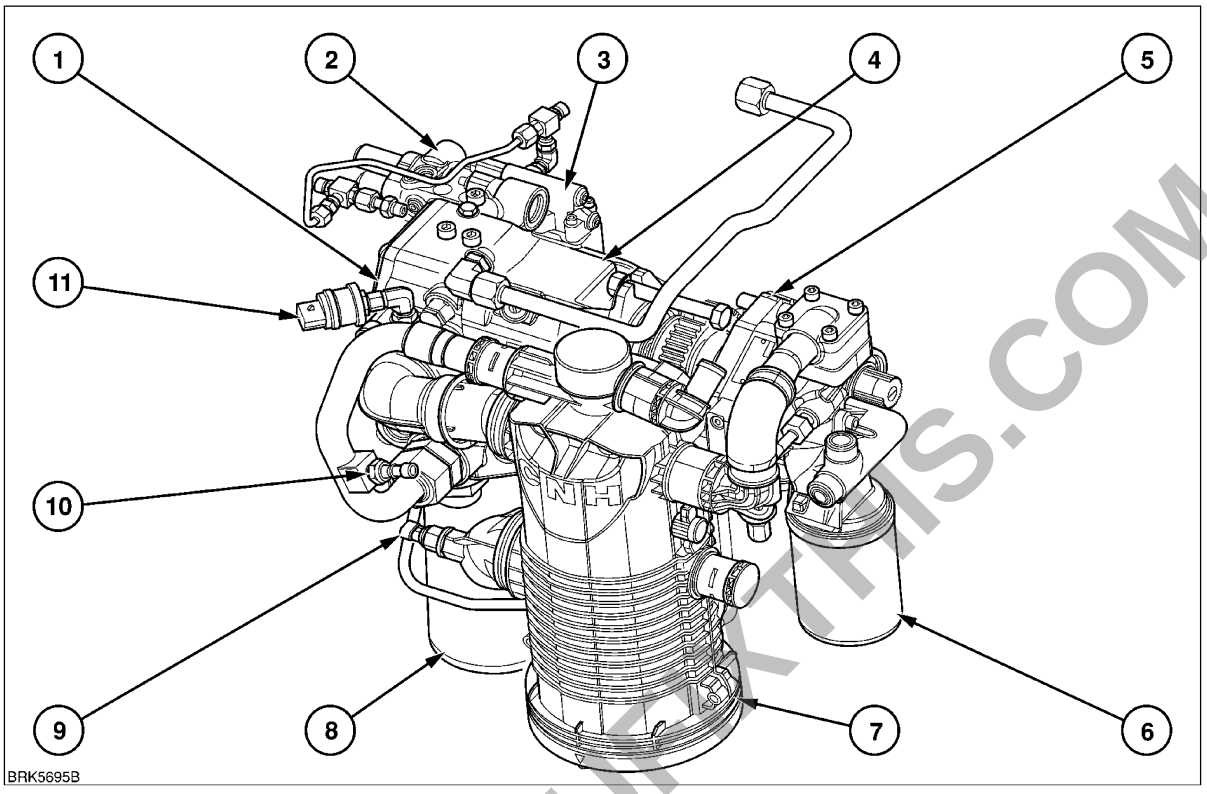
**Auto guidance system schematic**

1. Steering cylinders
2. Autoguidance valve assembly
3. Lock valves
4. Pilot line shuttle valve
5. Directional control valve
6. Relief valve **185 - 190 bar** (**2682.5 - 2755.0 psi**)
7. Load sensing pilot operated shuttle valve
8. Load sensing line
9. Pressure sensor
10. Pressure feed
11. Pressure sensor
12. Isolation valve
13. Relief valve **185 - 190 bar** (**2682.5 - 2755.0 psi**)
14. Shock relief valves **220 - 240 bar** (**3190.0 - 3480.0 psi**)
15. Steering control unit **190 bar** (**2755.0 psi**)

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BAIL08CVT026FSA 1

**Hydraulic pump and related components**

1. Charge pump
2. Priority valve
3. Pressure and flow compensating valve
4. Variable displacement hydraulic pump
5. Vane pump
6. Vane pump filter
7. Suction filter assembly
8. Charge pump filter
9. Low oil temperature switch
10. Low charge pressure switch
11. Filter restriction switch

The location of the principal components in the hydraulic pump assembly are identified above. These items are shown on the hydraulic circuit diagram. (Refer to **PRIMARY HYDRAULIC POWER SYSTEM - Hydraulic schema (A.10.A)**). The principal function of the components are as follows:-

**(1)** Charge Pump

The charge pump ( Refer to **Charge pump - Exploded view (A.10.A)** supplies oil at a charge pressure of **10 bar** (**145.0 psi**) to the variable flow closed centre load sensing pump.

**(2)** Priority valve

The priority valve is located on the top of the variable displacement pump and contains two valves. One ensures priority oil to the trailer brake system and the other controls priority of oil to the steering system. Once these systems are satisfied with the correct amount of oil, the high pressure system oil to the hydraulic power lift and remote control valves are supplied.

**(3)** Flow and Pressure Compensating Valves (Refer to **Compensator - Exploded view (A.10.A)**). These valves monitor the requirements of the hydraulic circuits and signal the pump to increase or decrease flow accordingly.

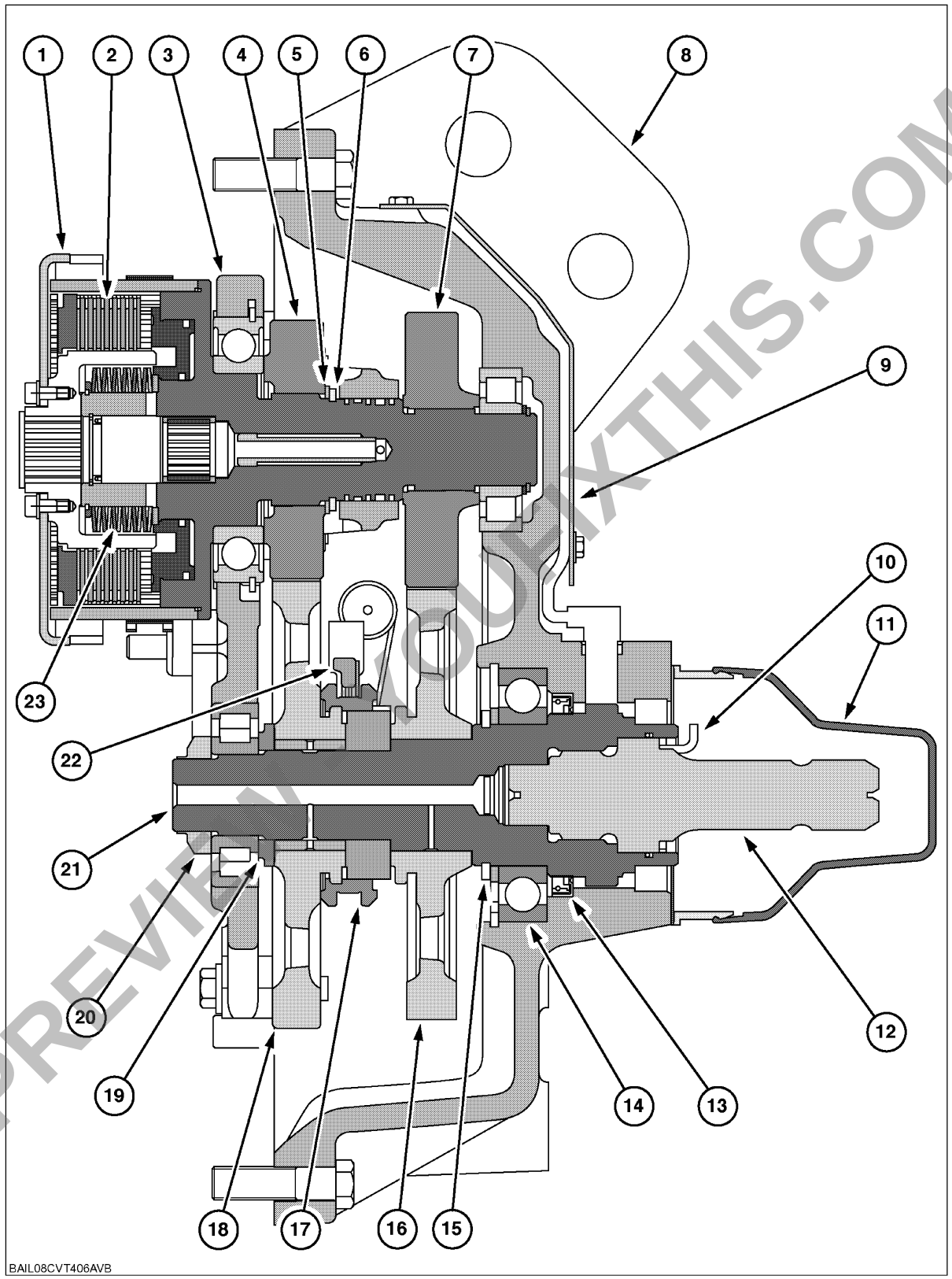
**(4)** Variable Displacement Piston Pump (Refer to **Hydraulic pump Variable displacement pump - Dynamic description (A.10.A)**)
The variable flow piston pump with closed centre load sensing provides oil flow on demand.

**(5)** Vane Pump



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# REAR PTO Hydraulic - Sectional view




BAIL08CVT406HVB 1

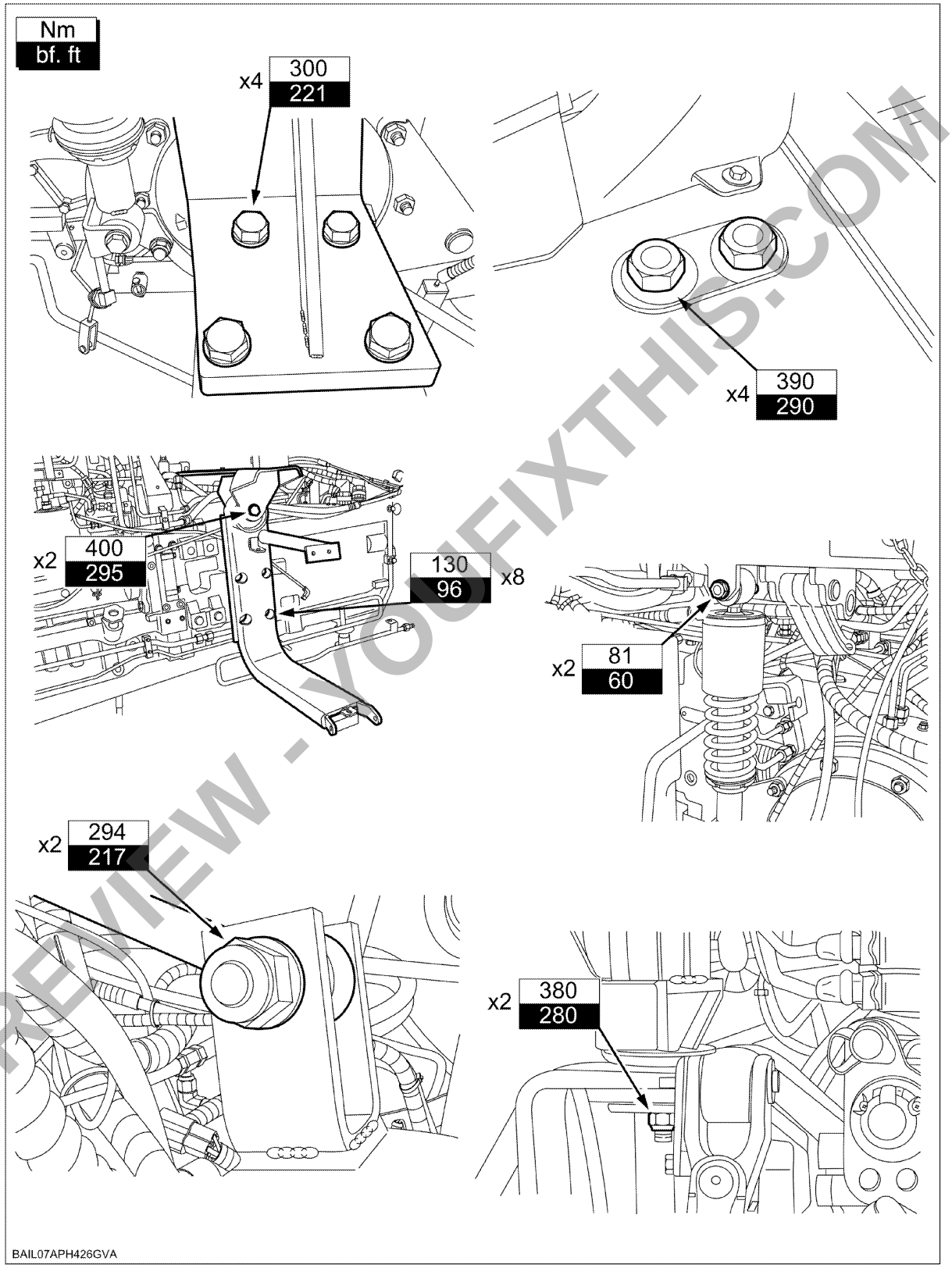
**PTO Sectional View**

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# USER PLATFORM - Torque



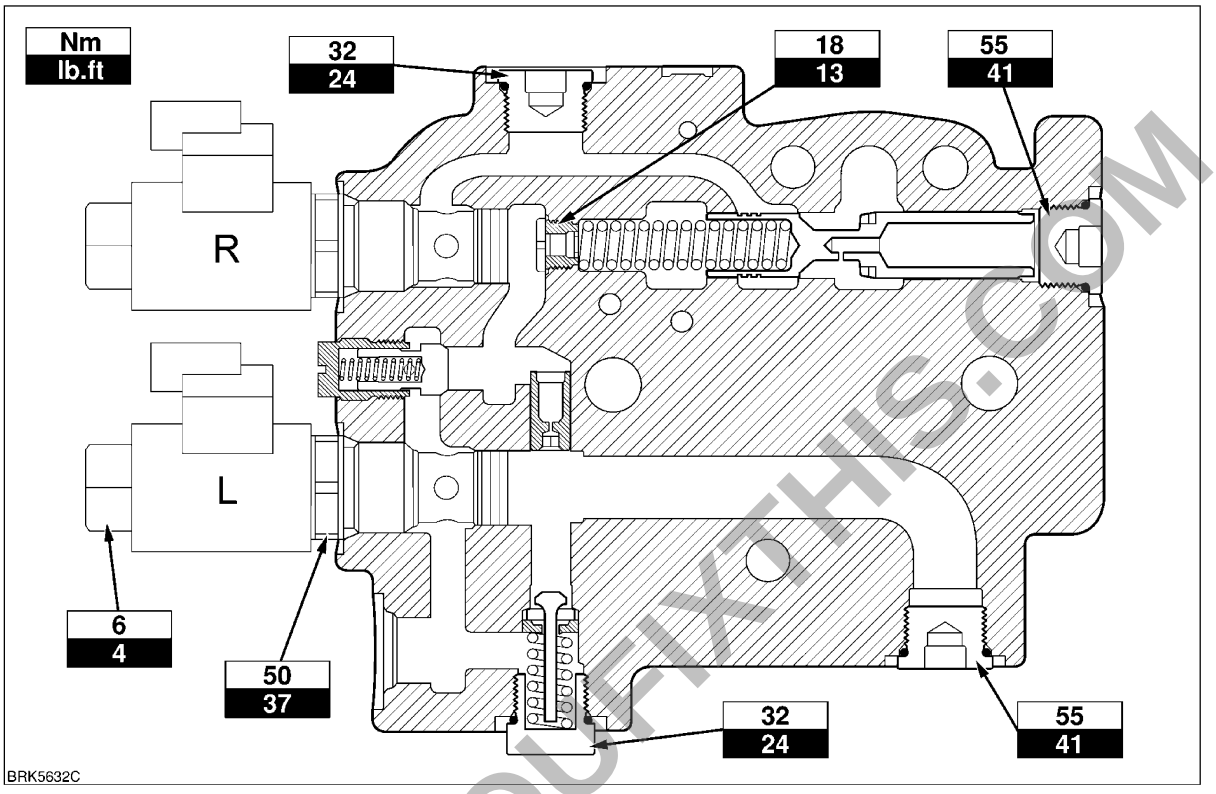

BAIL07APH426GVA 1

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## Control valve - Torque




BAIL08CVT016FSA 1

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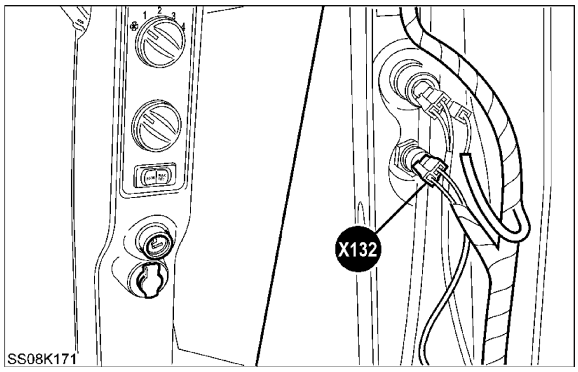


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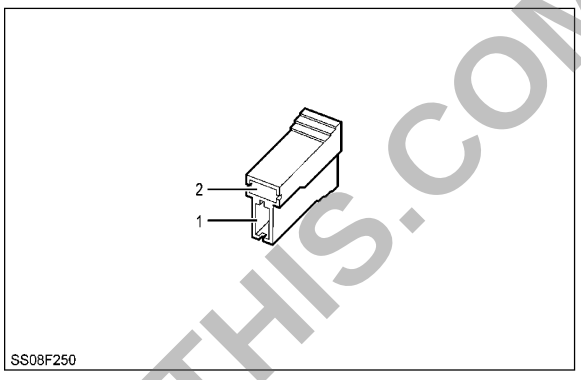
***X132 8 AMPERE SOCKET***

| POS. | WIRE NUMBER | CIRCUIT REFERENCE |
|---|---|---|
| 1 | 9032C (Y) | IGN+ TO POWER SKT. |
| 2 | 57CT (B) | EARTH (ALL) |

***NOTE:*** *For the wiring color code refer to,* ***Wiring harness - Overview (A.30.A)****.*




SS08K171 5




SS08F250 6

REAR LEFT HAND C-PILLAR

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# Contents

## INTRODUCTION

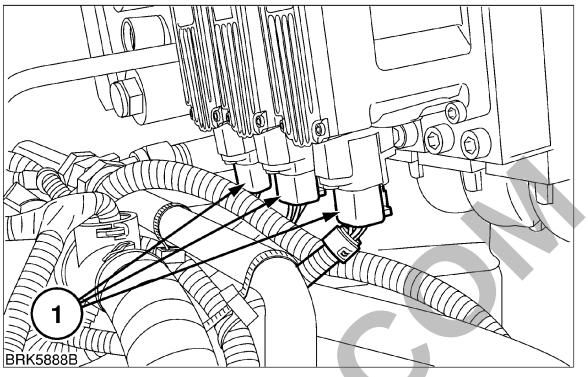
Foreword ..... 3
Safety rules ..... 9
Torque ..... 21
Torque Hydraulic connectors ..... 25

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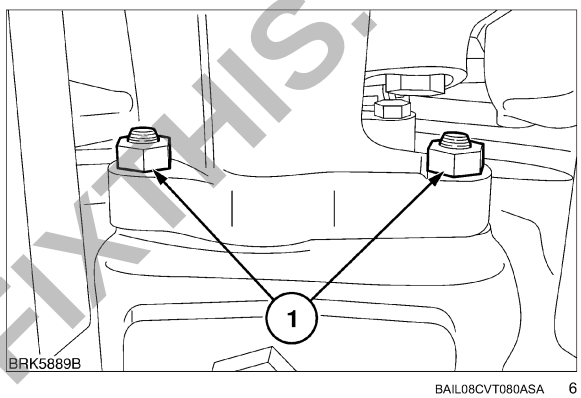
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5. Disconnect the electrical connectors **(1)** from the remote valve solenoids.



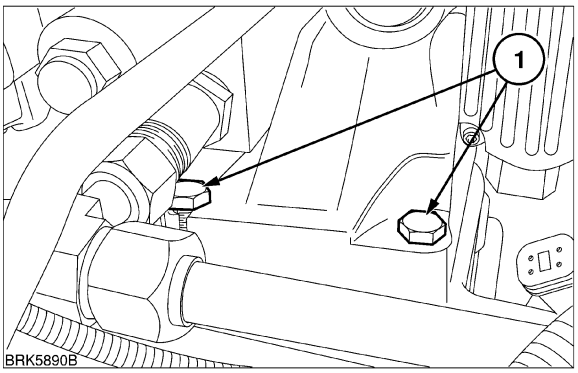

BAIL08CVT079ASA 5

6. Undo and remove the rear retaining nuts **(1)** at the base of the remote valve manifold.



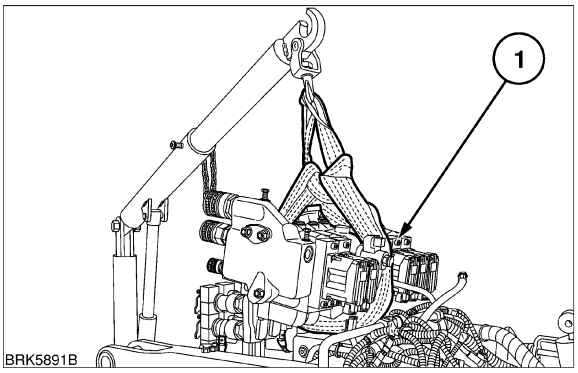

BAIL08CVT080ASA 6

7. Undo and remove the retaining bolts **(1)** at the front of the manifold. There is a slot where the right hand bolt is mounted to allow easier removal of the bolt due to the proximity of the EDC valve pipe.




BAIL08CVT081ASA 7

8. Using a suitable hoist and supports, lift the remote valve stack **(1)** clear of the rear axle housing. Place on a suitable support.




BAIL08CVT082ASA 8

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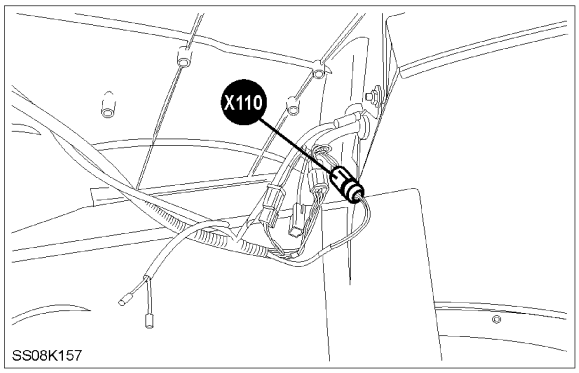
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# Connector - Component diagram 11

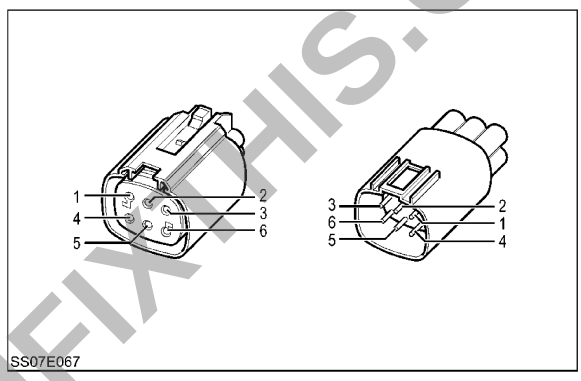
***X110 RIGHT HAND FENDER CONNECTOR 2 HPL RAISE/LOWER SWITCH***

| POS. | WIRE NUMBER | CIRCUIT REFERENCE |
|---|---|---|
| 1 | 5100B (K) / 5100 (K) | EDC EXTERNAL SWITCH UP |
| 2 | 5200B (N) / 5200 (N) | EDC VALVE SUPPLY |
| 3 | 5095A (K) / 5095 (K) | EDC VALVE DOWN EDC EXTERNAL SWITCH DOWN |
| 4 | 2059 (W) | FENDER PTO SWITCH INPUT |
| 5 | 2050E (G) / 2050 (G) | PTO SUPPLY / DOG SUPPLY |
| 6 | 2056A (W) / 2056 (W) | PTO FENDER PTO SWITCH ON |

***NOTE:*** *For the wiring color code refer to,* ***Wiring harness - Overview (A.30.A)****.*




SS08K157 1



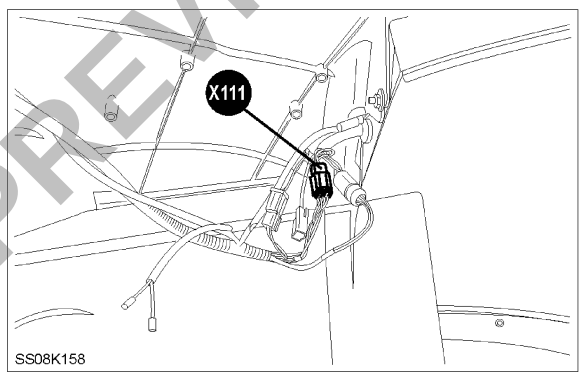

SS07E067 2

RIGHT HAND REAR FENDER

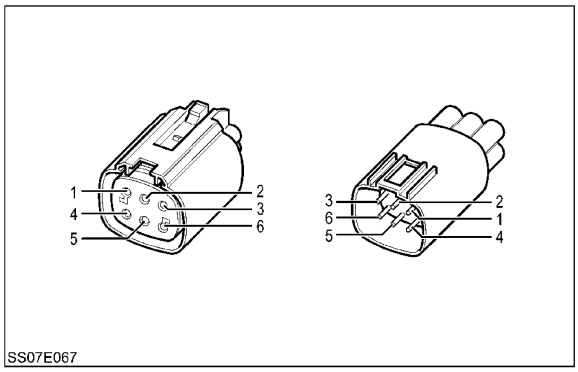
***X111 RIGHT HAND FENDER CONNECTOR 1 TAIL LAMP***

| POS. | WIRE NUMBER | CIRCUIT REFERENCE |
|---|---|---|
| 1 | 1013C (R) / 1013 (R) | RIGHT HAND LAMPS |
| 2 | 810C (G) / 810 (G) | STOPLAMPS |
| 3 | 3004B (G) / 3004 (G) | RIGHT HAND TURN SIGNAL WARNING LAMP |
| 4 | 57AV (B) | EARTH (ALL) |
| 5 | 998B (G) / 998 (G) | WORK LAMP-REAR FEED (INNER) |
| 6 | 57AP (B) | EARTH (ALL) |

***NOTE:*** *For the wiring color code refer to,* ***Wiring harness - Overview (A.30.A)****.*




SS08K158 3




SS07E067 4

RIGHT HAND REAR FENDER

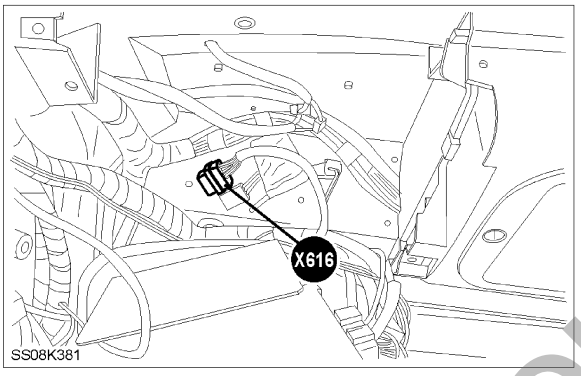


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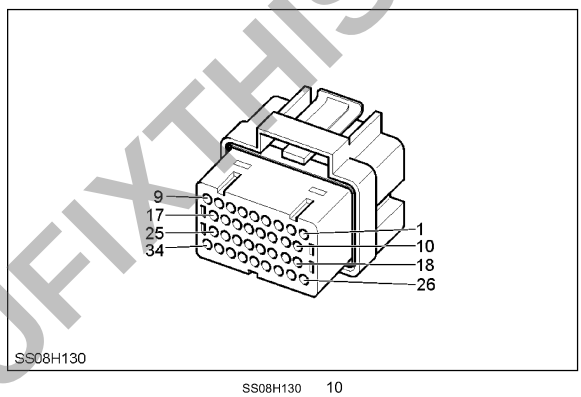
***X616 TECU UNIT CN1***

| POS. | WIRE NUMBER | CIRCUIT REFERENCE |
|---|---|---|
| 1 | 5900D (Y) | ISO BUS CAN SIGNAL LOW |
| 2 | 5910D (G) | ISO BUS CAN SIGNAL HIGH |
| 4 | 5400P (Y) | CAN H |
| 5 | 5420P (G) | CAN L |
| 10 | 5000C (L) | EDC MEMORY POWER |
| 11 | 57TA (B) | EARTH (ALL) |
| 14 | 5980D (U) | ISO BUS IMPLEMENT SIGNAL |
| 15 | 5970 (O) | ISO BUS ECU SIGNAL |
| 16 | 7000AR (U) | TRANS CONTROL SUPPLY |
| 21 | 61T (B/O) | CASE GROUND |

***NOTE:*** *For the wiring color code refer to,* ***Wiring harness - Overview (A.30.A)****.*




SS08K381 9

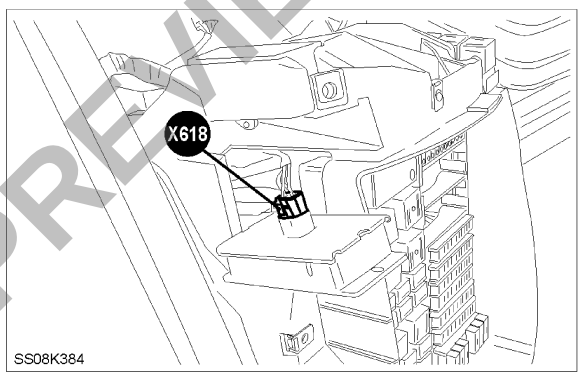



SS08H130 10

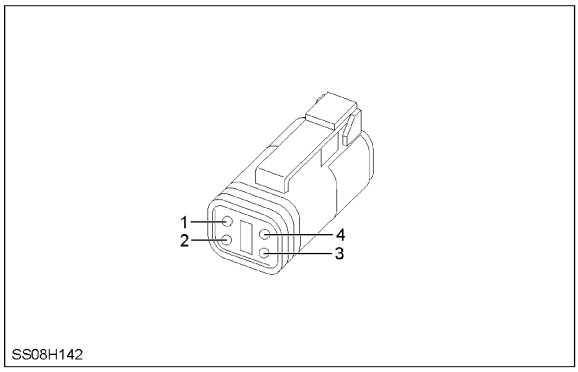
IN CAB RIGHT HAND BEHIND OPERATOR'S SEAT

***X618 ISO BUS CAN TERMINATOR***

| POS. | WIRE NUMBER | CIRCUIT REFERENCE |
|---|---|---|
| 1 | 5920E (R | ISO BUS CAN SUPPLY POSITIVE |
| 2 | 5900E (Y) | ISO BUS CAN SIGNAL LOW |
| 3 | 5915E (B) | ISO BUS CAN SUPPLY GROUND |
| 4 | 5910E (G) | ISO BUS CAN SIGNAL HIGH |




SS08K384 11

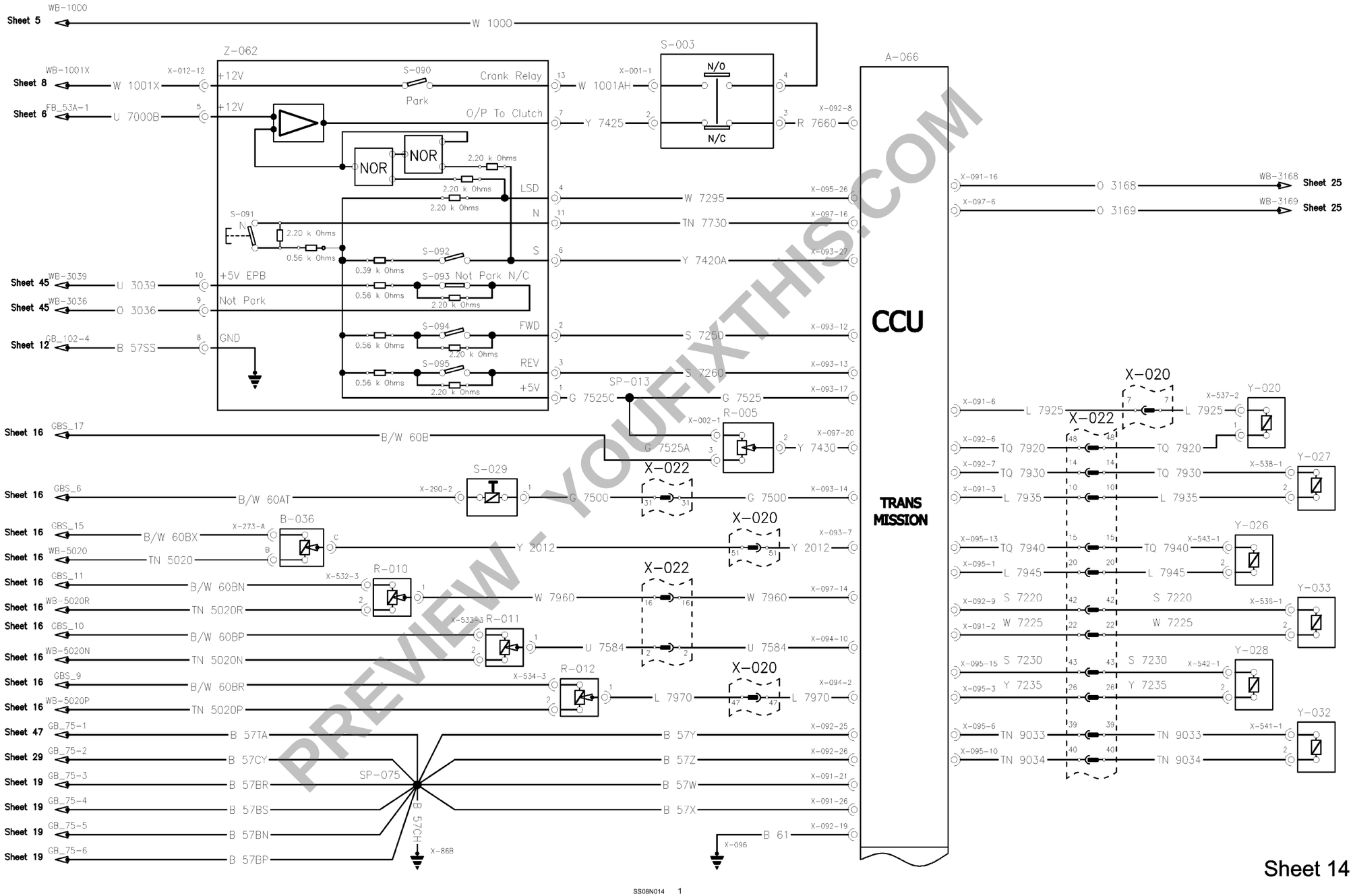



SS08H142 12

BEHIND RIGHT HAND TRIM TOP THE FUSEBOX



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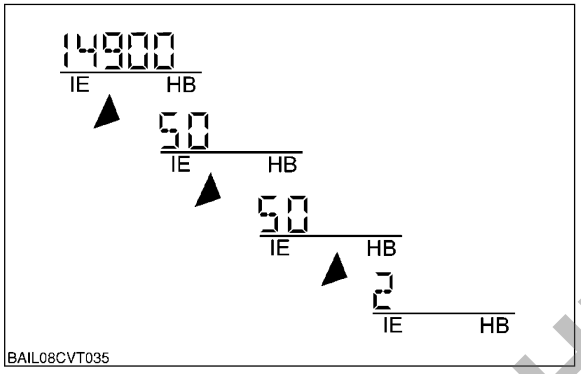



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The top section of the display will cycle through the fault code, if a fault code is stored.
The following is an example fault code:
14900 Fault code
50 Hour of first occurrence
50 Hour of last occurrence
2 Number of occurrences of the fault




BAIL08CVT035 30

Depress the navigation “up" or “down" key to change to the next fault code in the list.
The top section of the display will display “_ _ _" at the end of the list.
Depress the “menu" key to continue navigating through the “HH" menus.

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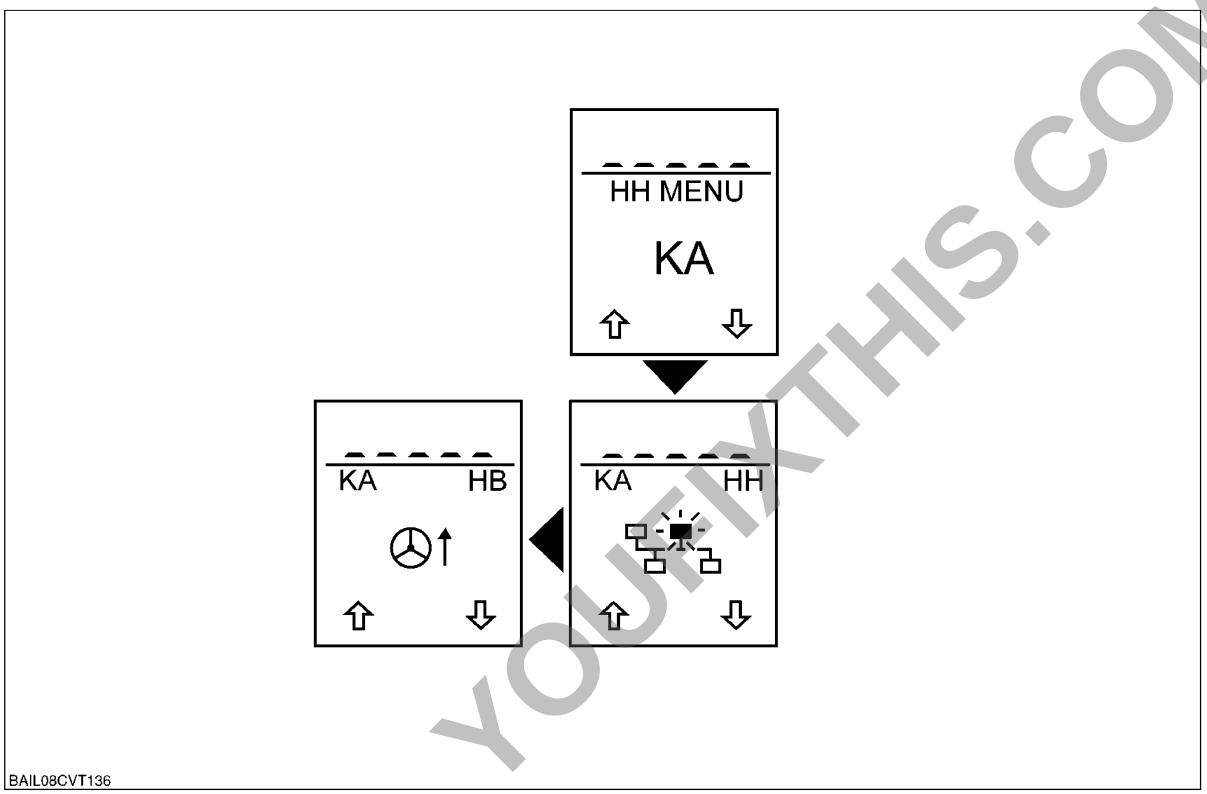


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## HB - DISPLAY STORED FAULT CODES

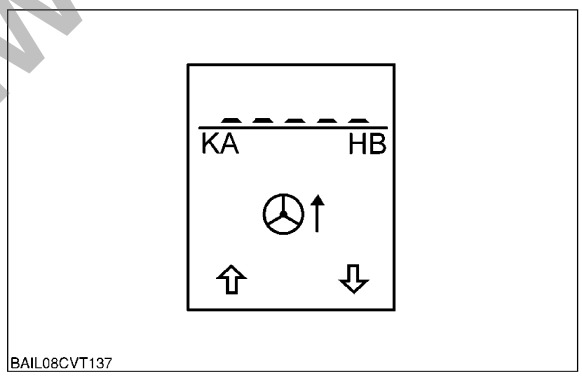
This menu is used to display fault codes which are stored in the EEPROM of the controller.
A maximum of ten fault codes for each sub-system can be stored.
Common to all sub-systems.

HB Menu Screen Select Diagram




BAIL08CVT136 18

Select the steering sub-system by depressing the "menu" key, as the example shown.




BAIL08CVT137 19

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# DISTRIBUTION SYSTEMS - A

## PNEUMATIC SYSTEM - 20.A

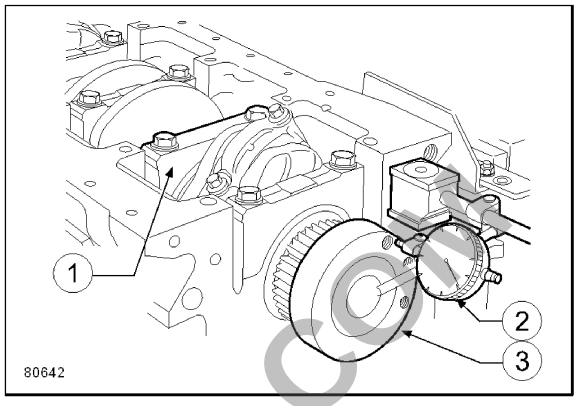
**Puma 165 CVT**
**Puma 180 CVT**
**Puma 195 CVT**
**Puma 210 CVT**
**Puma 225 CVT**

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25. The thrust ring clearance is checked by setting a dial gauge **(2)** with a magnetic base on the crankshaft **(3)** as shown. The normal assembly clearance is **0.068 - 0.41 mm** (**0.003 - 0.016 in**) . If the clearance is found to be greater change the main half bearings of the second from last rear thrust bearing support **(1)** and check the clearance again between the crankshaft journals and main half bearings.

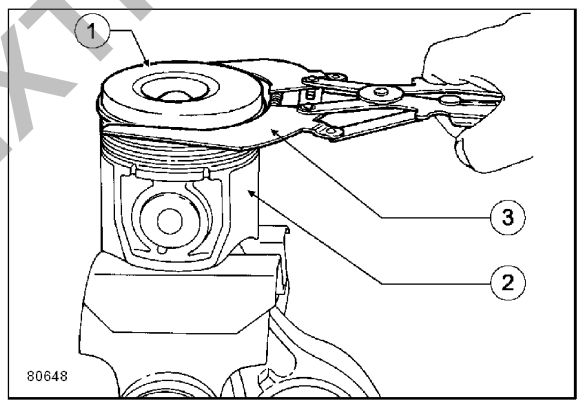



80642_163 21

26. Piston assembly - Refer to **Connecting rod and piston - Exploded view (B.10.A)**

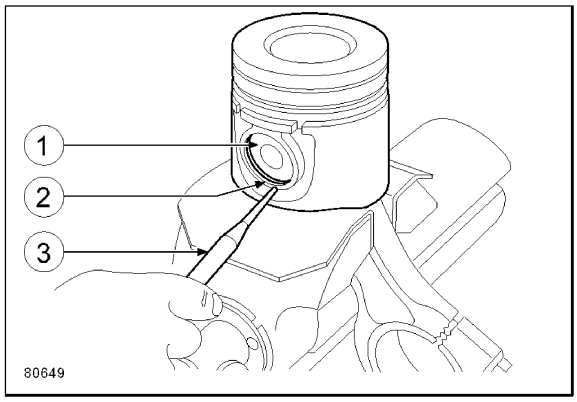
***NOTE:*** *The pistons are supplied as spares with the following sizes: Standard and* ***0.4 mm***

27. Clean all parts carefully before proceeding with the operations described below.
Check that the pistons show no signs of seizure, scoring, cracking or excessive wear; change them if they do.
Removing the rings **(1)** from the piston **(2)** with suitable piston ring pliers **(3)**.




80648 22

28. The piston pin **(1)** and retaining rings **(2)** should be removed using a marking tool **(3)**.




80649_167 23

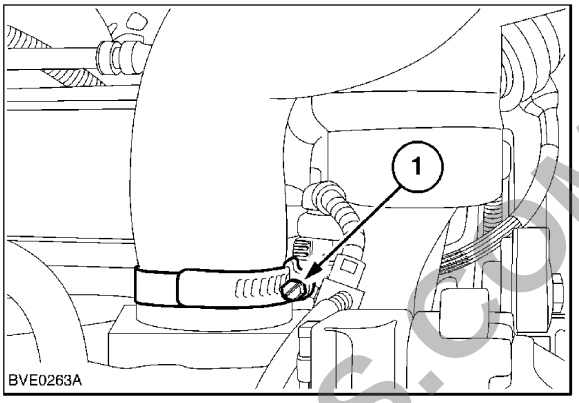
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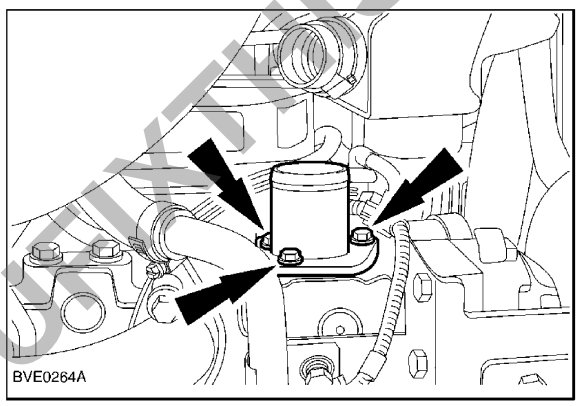
# Thermostat - Remove

1. Loosen the hose clamp **(1)** and disconnect the coolant hose from the thermostat housing.



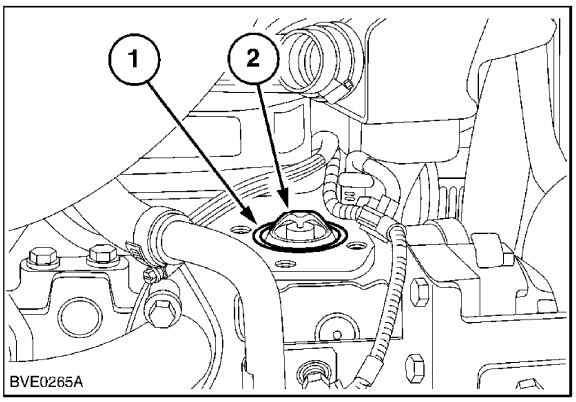

BVE0263A 1

2. Remove the thermostat housing from the cylinder block.




BVE0264A 2

3. Remove the thermostat seal **(1)** and the thermostat **(2)**.




BVE0265A 3

**Next operation:**
**Thermostat - Install (B.50.A)**

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| | | | |
|---|---|---|---|
| 467 | Tube | 468 | Test port |
| 469 | Seal ring | 470 | Screw-in piece |
| 471 | Seal ring | 472 | Pressure sensor, clutch "A" |
| 473 | Pressure sensor, clutch "B" | | |
| 481 | Screw | 482 | Mount bracket |
| 483 | Solenoid valve F2 | 484 | Solenoid valve F1 |
| 485 | Solenoid valve R2 | 486 | Solenoid valve F4 |
| 487 | Screw | 488 | Mount bracket |
| 489 | System pressure sensor P1 | 490 | Temperature sensor, transmission oil |
| 491 | Seal ring | 492 | Accumulator |
| 493 | Seal ring | 494 | Screw |
| 495 | Test port | 496 | Seal ring |
| 497 | Valve block | 498 | Seal rings |
| 499 | Connecting piece | 500 | O-rings |
| 501 | Safety valve | 502 | Solenoid valve, clutch “A” |
| 503 | Solenoid valve, clutch “B” | 504 | Solenoid valve R1 |
| 505 | Solenoid valve F3 | 506 | Seal ring |

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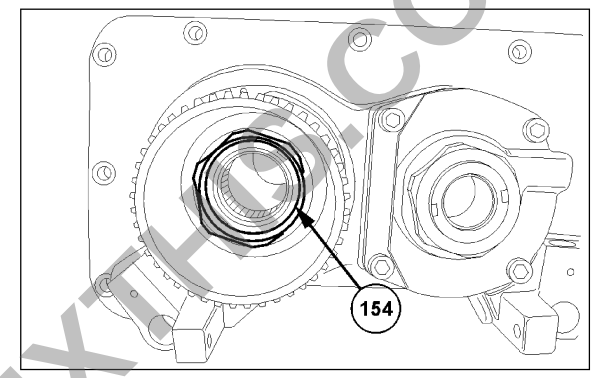
# Gear - Disassemble (F2/R1)

Puma 165 CVT 40 km/h gearbox, Puma 165 CVT 35 km/h gearbox, Puma 180 CVT 40 km/h gearbox, Puma 180 CVT 35 km/h gearbox, Puma 195 CVT 40 km/h gearbox, Puma 195 CVT 35 km/h gearbox, Puma 210 CVT 40 km/h gearbox, Puma 210 CVT 35 km/h gearbox, Puma 225 CVT 40 km/h gearbox, Puma 225 CVT 35 km/h gearbox

**TRANSMISSION Continuously Variable Transmission (CVT) - Exploded view (Transmission input) (C.20.G)**
**TRANSMISSION Continuously Variable Transmission (CVT) - Exploded view (Transmission output) (C.20.G)**

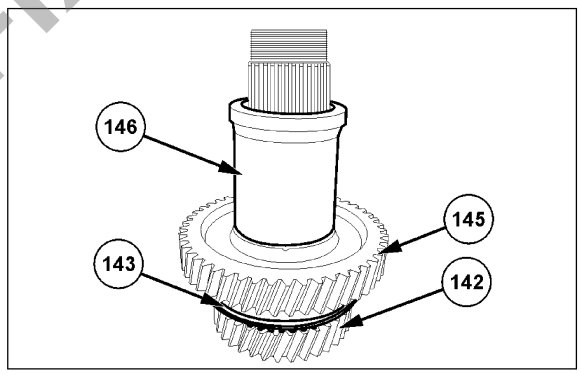
**Prior operation:**
**Gear - Remove (F2/R1) (C.20.G)**

1. Remove the nut **(154)** pull out the output sleeve shaft **(136)**.



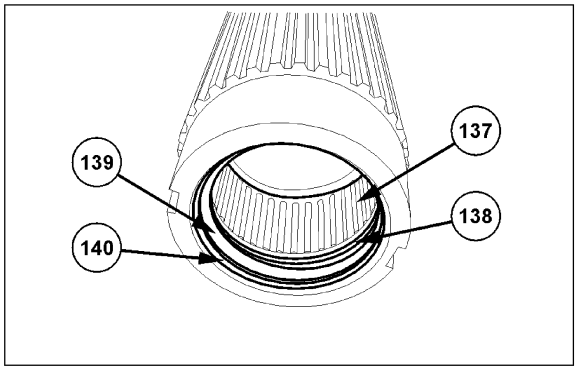

SS08G372 1

2. Remove the spacer sleeve **(146)** from the output sleeve shaft **(136)**. Remove the gear wheels **(142)** and **(145)** together with the synchroniser unit **(143)**, needle bearing **(141)** and bearing bush **(144)**.




SS08K476 2

3. Remove the snap rings **(138)** and **(140)**, the seal ring **(139)** and the needle bearing **(137)** from the output sleeve shaft **(136)**.



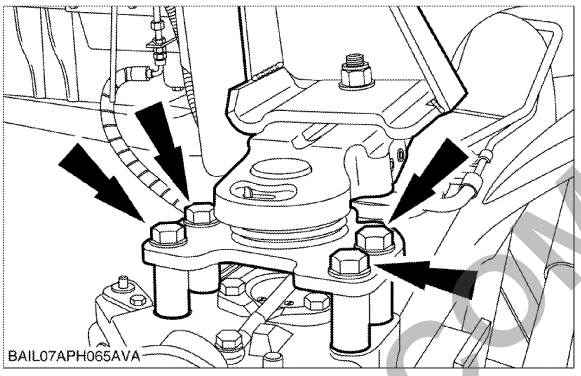

SS08H032 3

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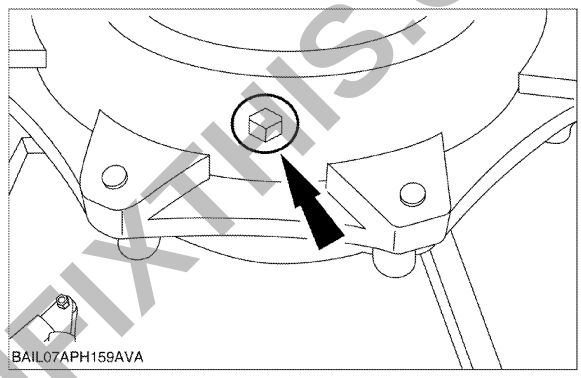
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4. Remove the dynamic front fender (if equipped).



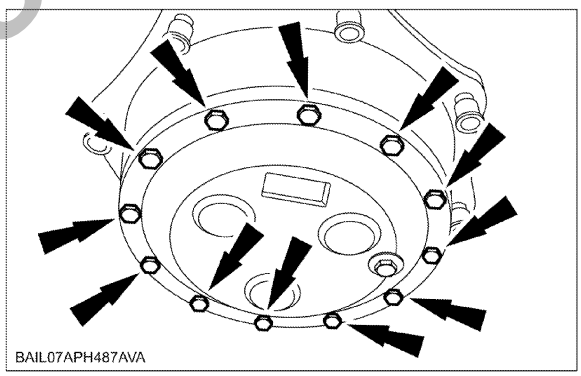

BAIL07APH065AVA 4

5. Rotate the hub until the drain plug is at the lowest point. Remove the axle hub drain plug and drain the hub oil into a suitable container.
Reinstall the drain plug and tighten to **75 Nm** (**55 lb ft**).



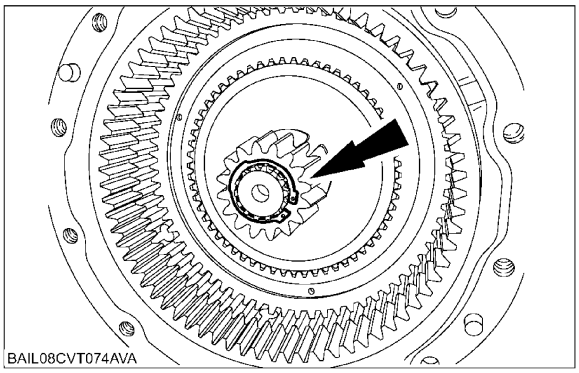

BAIL07APH159AVA 5

6. Remove the hub end plate and the planetary gears assembly.




BAIL07APH487AVA 6

7. Remove the planetary drive gear retaining circlip.



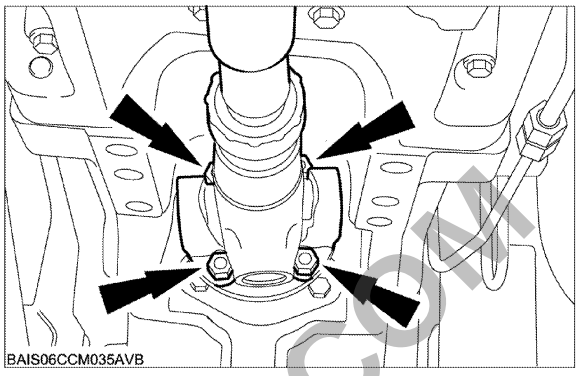

BAIL08CVT074AVA 7

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4. Remove the drive shaft rear retaining nuts.
Remove the drive shaft.




BAIS06CCM035AVB 4

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# Control valve - Remove

**⚠ WARNING ⚠**

**Handle all parts carefully. Do not put your hands or fingers between parts. Wear suitable safety clothing - safety goggles, gloves and shoes.**

B026

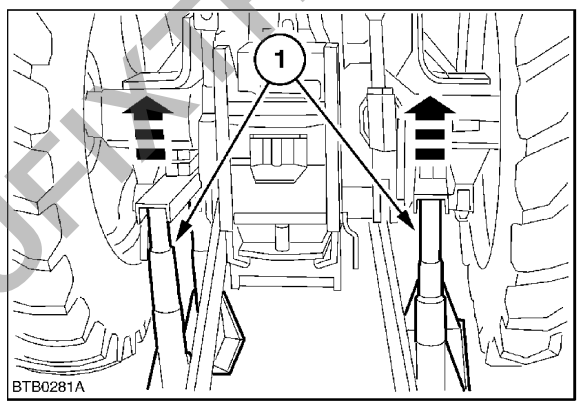
**⚠ DANGER ⚠**

**Lift and handle all heavy components using lifting equipment of appropriate lifting capacity. Make sure that units or parts are supported by suitable slings or hooks. Make sure that no-one is in the vicinity of the load to be lifted. Failure to comply could result in serious injury or death.**

B012

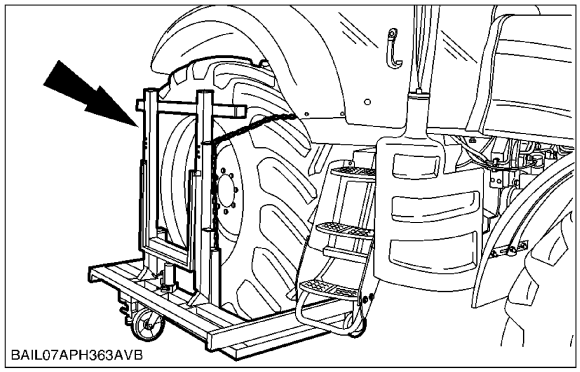
1. Make sure that the vehicle is parked on a level surface.
2. Chock the front wheels using suitable wheels stops.
3. Raise the rear of the vehicle and place two suitable axle stands **(1)** under the final drive cases.

***NOTE:*** *If required, detach the lift rods from the lower links.*




BTB0281A 1

4. Remove the right-hand rear wheel.




BAIL07APH363AVB 2

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## BODY AND STRUCTURE - E

### FRAME Primary frame - 10.B


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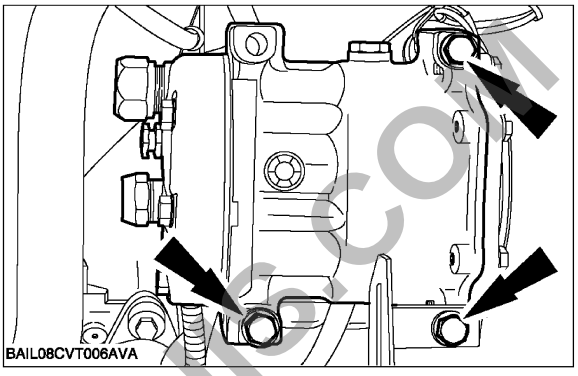


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# Compressor - Install

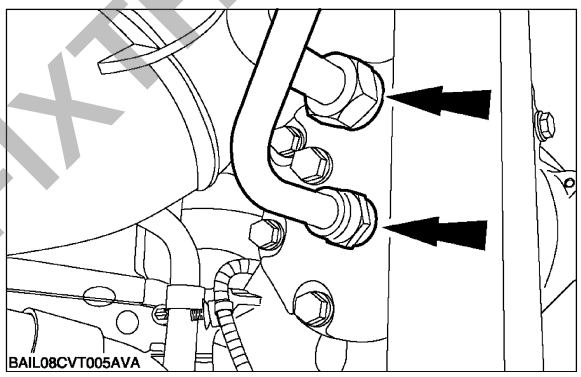
**Prior operation:**
Refill the compressor with new oil, for further information refer to **Compressor - Filling (E.40.D)**

1. Install the compressor.
   Tighten to **40 - 51 Nm** ( **29 - 38 lbf.ft**).



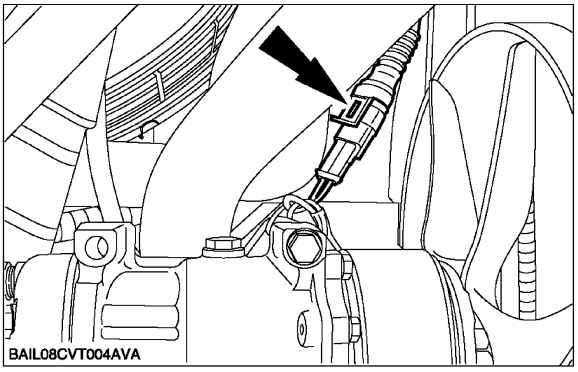

BAIL08CVT006AVA 1

2. Connect the compressor supply and return pipes.




BAIL08CVT005AVA 2

3. Connect the compressor electrical connector.




BAIL08CVT004AVA 3

4. Install the air conditioning drive belt, for further information refer to **Fan and drive Belt - Install (B.50.A)**.
5. Evacuate and recharge the air conditioning system, for further information refer to **ENVIRONMENT CONTROL Heating, ventilation and air-conditioning - Evacuate (E.40.D) ENVIRONMENT CONTROL Heating, ventilation and air-conditioning - Charging (E.40.D)**

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