PART NO. TONDF-EN-01

HITACHI

Reliable solutions

# Technical Manual

## Operational Principle

ZW

# 140-5B

# 140PL-5B

## Wheel Loader

Service Manual consists of the following separate Part No.

| | |
|---|---|
| Technical Manual (Operational Principle) | : Vol. No.TONDF-EN |
| Technical Manual (Troubleshooting) | : Vol. No.TTNDF-EN |
| Workshop Manual | : Vol. No.WNDF-EN |

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# SECTION 1

# GENERAL

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| | | |
|---|---|---|
| BATTERY | Type | 95D31R |
| | Voltage | 12 V |
| | Capacity | 64 Ah (5-Hour Rate) |
| | Weight | Approx. 20 kg (44 lb) ×2 |



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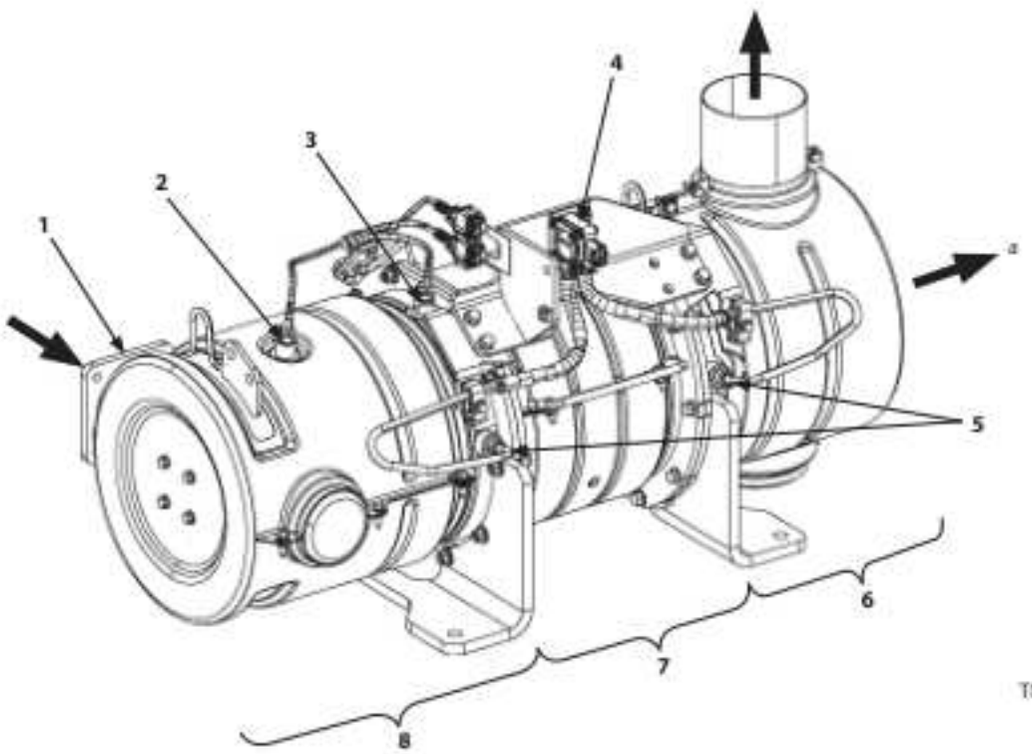
## Muffler Filter

### Outline

Muffler filter (1) is a device which removes particulate matter (PM) including the toxic substance of exhaust gas of the diesel engine.
Muffler filter (1) consists of diesel oxidation catalyst (DOC) (8), filter (CSF) (7), and silencer (6).
Diesel oxidation catalyst (8) oxidizes unburnt fuel and raises exhaust temperature.
Filter (7) traps particulate matter (PM), burns and remove PM by using high-temperature-exhaust gas with diesel oxidation catalyst. Catalyst is applied onto filter (7). This advances PM burning.

In addition, DOC exhaust temperature sensor (2), CSF exhaust temperature sensor (3), and differential pressure sensor (4) are equipped for muffler filter (1).
DOC exhaust temperature sensor (2) and CSF exhaust temperature sensor (3) measure the temperature of before and after diesel oxidation catalyst (8). Then, it is used for control to function catalyst of diesel oxidation catalyst (8) and filter (7) effectively.
Differential pressure sensor (4) measures differential pressure before and after filter (7) and detects PM trapping amount.

*NOTE: DOC: Diesel Oxidation Catalyst*
*CSF: Catalyzed Soot Filter*




TNED-02-03-001

a- Machine Front Side

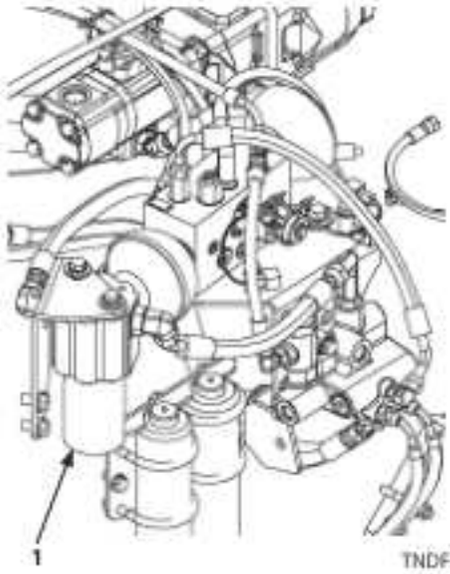
1- Muffler Filter
2- DOC Exhaust Temperature Sensor
3- CSF Exhaust Temperature Sensor
4- Differential Pressure Sensor
5- Differential Pressure Check Port
6- Silencer
7- Filter (CSF)
8- Diesel Oxidation Catalyst (DOC)



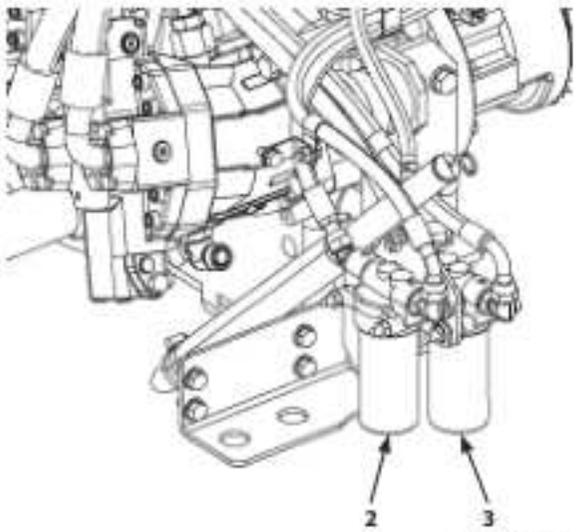
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## Filter

The filter is provided in each circuit of pilot filter (1), HST charge oil filter (2), and transmission oil filter (3).
The relief valve is built in each filter. When abnormal pressure (abnormally high pressure) is generated in delivery pressure oil from each pump, the filter is protected.



TNDF-04-05-001



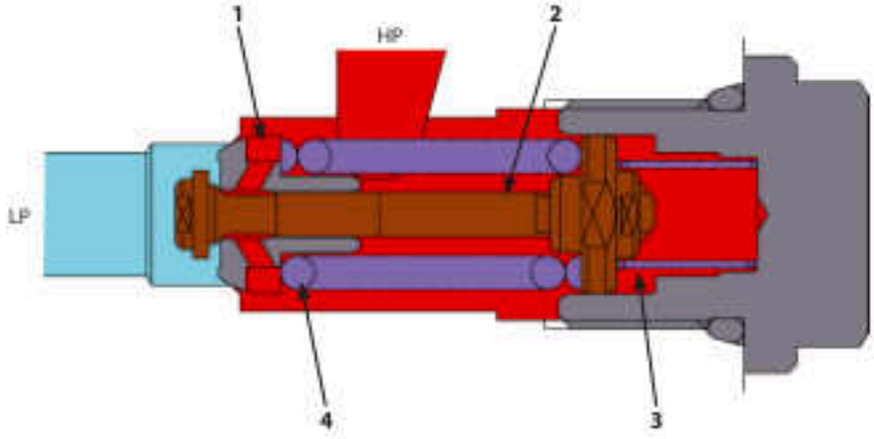
TNDF-04-05-002

1- Pilot Filter
2- HST Charge Oil Filter
3- Transmission Oil Filter



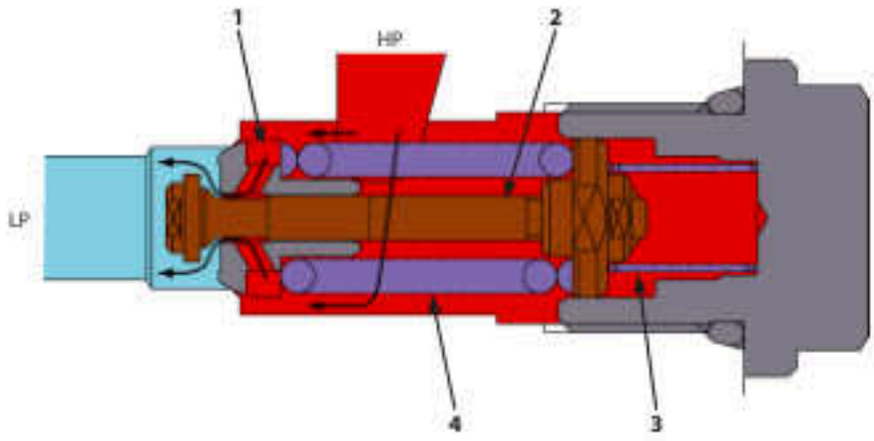
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Normal Operation:



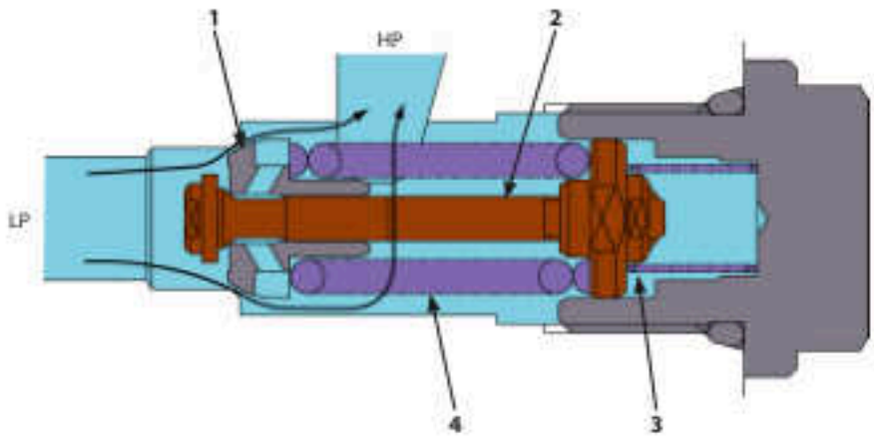

T4GB-03-02-027

During Relief Operation:




T4GB-03-02-028

During Make-Up Operation:




T4GB-03-02-029

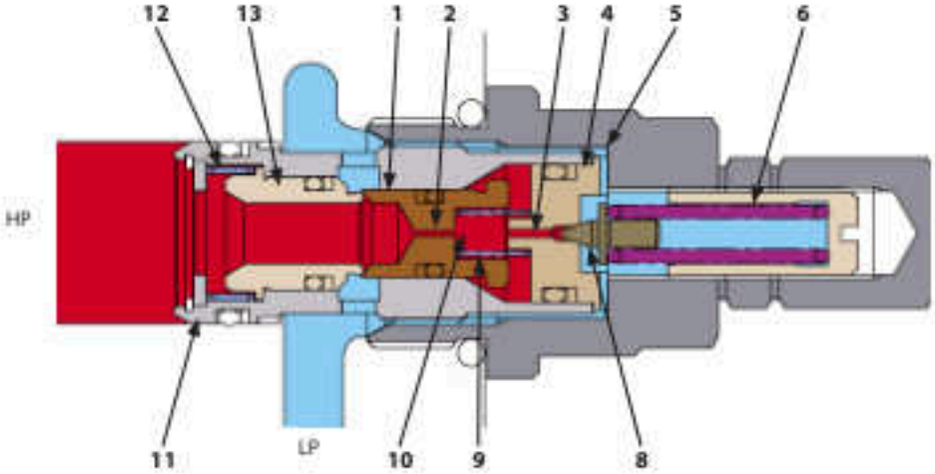
HP- Actuator Circuit; LP- Hydraulic Oil Tank

1- Seat; 2- Shaft; 3- Spring B; 4- Spring A



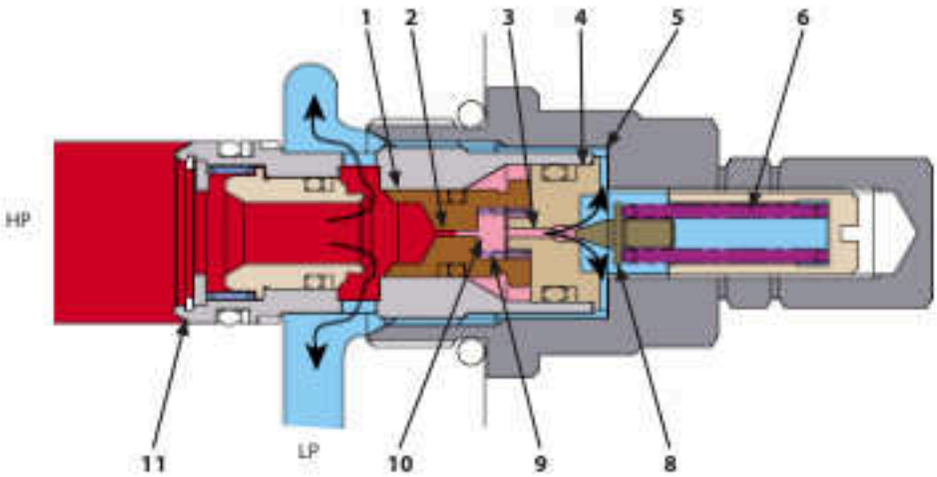
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Normal Operation:




T176-03-03-012

Relief Operation:




T176-03-03-013

HP- Actuator Circuit
LP- Hydraulic Oil Tank

1- Main Poppet
2- Orifice A
3- Orifice B
4- Seat
5- Passage A
6- Spring B
8- Pilot Poppet
9- Spring A
10- Spring Chamber
11- Sleeve
12- Spring C
13- Make-Up Valve



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# FRONT CONSOLE HARNESS

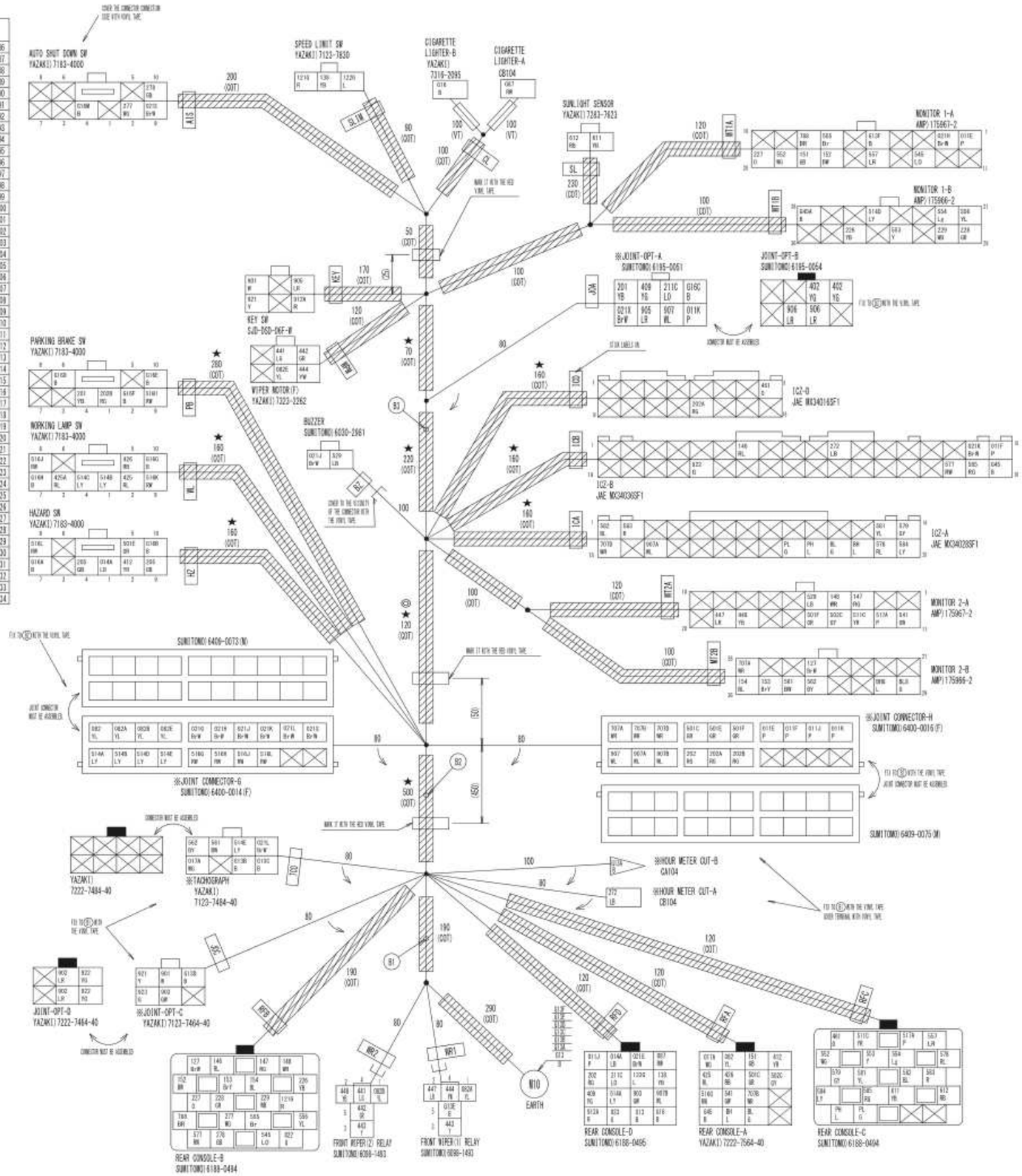
Appliicable Machine

| Attach to vol. No. | Model |
|---|---|
| TTNDF-EN-01 | ZW140-5B/ZW140PL-5B |
| TTNDF90-EN-00 | ZW140-5B/ZW140PL-5B |
| TTNDG-EN-01 | ZW150-5B/ZW150PL-5B |
| TTNDG90-EN-00 | ZW150-5B/ZW150PL-5B |

CAUTION: Parts numbers on the drawing are provided only for reference purpose. To order parts on the drawing, be sure to consult the Parts Catalog.

| No. | SIZE | COLOR | TYPE | FROM | TO | |
|---|---|---|---|---|---|---|
| 011E | 0.5 | P | AVSS | JOINT CONNECTOR-H | MONITOR 1-A(1) | 1 |
| 011F | 0.5 | P | AVSS | JOINT CONNECTOR-H | 1C2-B(18) | 2 |
| 011J | 0.75 | P | AVSS | REAR CONSOLE-D | JOINT CONNECTOR-H | 3 |
| 011K | 0.5 | P | AVSS | JOINT CONNECTOR-H | JOINT-OPT-A | 4 |
| 014A | 0.5 | L-B | AVSS | REAR CONSOLE-B | HAZARD SW | 5 |
| 017A | 0.5 | W-G | AVSS | REAR CONSOLE-A | TACHOGRAPH | 6 |
| 021G | 0.5 | Br-W | AVSS | REAR CONSOLE-D | JOINT CONNECTOR-G | 7 |
| 021H | 0.5 | Br-W | AVSS | JOINT CONNECTOR-G | MONITOR 1-A(2) | 8 |
| 021J | 0.5 | Br-W | AVSS | JOINT CONNECTOR-G | BUZZER(+) | 9 |
| 021K | 0.5 | Br-W | AVSS | JOINT CONNECTOR-G | 1C2-B(17) | 10 |
| 021L | 0.5 | Br-W | AVSS | JOINT CONNECTOR-G | TACHOGRAPH | 11 |
| 021S | 0.5 | Br-W | AVSS | JOINT CONNECTOR-G | AUTO SHUT DOWN SW | 12 |
| 021X | 0.5 | Br-W | AVSS | 021S | JOINT-OPT-A | 13 |
| 082 | 0.75 | Y-L | AVSS | REAR CONSOLE-A | JOINT CONNECTOR-G | 14 |
| 082A | 0.5 | Y-L | AVSS | JOINT CONNECTOR-G | FRNT WPR(1) RELAY | 15 |
| 082B | 0.5 | Y-L | AVSS | JOINT CONNECTOR-G | FRNT WPR(2) RELAY | 16 |
| 082E | 0.75 | Y-L | AVSS | JOINT CONNECTOR-G | WIPER MOTOR(F) | 17 |
| 087 | 1.25 | R-W | AVSS | REAR CONSOLE-B | CIGARETTE LIGHTER-A | 18 |
| 121G | 0.5 | R | AVSS | REAR CONSOLE-B | SPEED LIMIT SW | 19 |
| 122G | 0.5 | L | AVSS | SPEED LIMIT SW | REAR CONSOLE-D | 20 |
| 127 | 0.5 | Br-W | AVSS | REAR CONSOLE-B | MONITOR 2-B(25) | 21 |
| 138 | 0.5 | Y-B | AVSS | SPEED LIMIT SW | REAR CONSOLE-D | 22 |
| 146 | 0.5 | R-L | AVSS | 1C2-B(1) | REAR CONSOLE-B | 23 |
| 147 | 0.5 | R-G | AVSS | MONITOR 2-A(3) | REAR CONSOLE-B | 24 |
| 148 | 0.5 | W-R | AVSS | REAR CONSOLE-B | MONITOR 1-A(4) | 25 |
| 151 | 0.3 | G-B | AVSS | MONITOR 1-A(18) | REAR CONSOLE-A | 26 |
| 152 | 0.3 | B-W | AVSS | MONITOR 1-A(17) | REAR CONSOLE-B | 27 |
| 153 | 0.5 | Br-Y | AVSS | MONITOR 2-B(25) | REAR CONSOLE-B | 28 |
| 154 | 0.5 | B-L | AVSS | REAR CONSOLE-B | MONITOR 2-B(36) | 29 |
| 201 | 0.5 | Y-B | AVSS | JOINT-OPT-A | PARKING BRAKE SW | 30 |
| 202 | 0.5 | R-G | AVSS | REAR CONSOLE-D | JOINT CONNECTOR-H | 31 |
| 202A | 0.5 | R-G | AVSS | JOINT CONNECTOR-H | 1C2-B(13) | 32 |
| 202B | 0.5 | R-G | AVSS | JOINT CONNECTOR-H | PARKING BRAKE SW | 33 |
| 205 | 0.3 | G-B | AVSS | HAZARD SW | HAZARD SW | 34 |
| 211G | 0.5 | L-O | AVSS | REAR CONSOLE-B | JOINT-OPT-H | 35 |
| 226 | 0.5 | Y-B | AVSS | MONITOR 1-B(34) | REAR CONSOLE-B | 36 |
| 227 | 0.3 | O | AVSS | MONITOR 1-A(20) | REAR CONSOLE-B | 37 |
| 228 | 0.3 | G-R | AVSS | MONITOR 1-B(29) | REAR CONSOLE-B | 38 |
| 229 | 0.3 | W-B | AVSS | MONITOR 1-B(30) | REAR CONSOLE-B | 39 |
| 272 | 0.5 | L-B | AVSS | 1C2-B(11) | HOUR METER CUT-A | 40 |
| 277 | 0.5 | W-G | AVSS | REAR CONSOLE-B | AUTO SHUT DOWN SW | 41 |
| 278 | 0.5 | G-B | AVSS | AUTO SHUT DOWN SW | REAR CONSOLE-B | 42 |
| 402 | 0.5 | Y-G | AVSS | JOINT-OPT-B | JOINT-OPT-D | 43 |
| 409 | 0.5 | Y-G | AVSS | REAR CONSOLE-D | JOINT-OPT-A | 44 |
| 412 | 0.5 | Y-R | AVSS | HAZARD SW | REAR CONSOLE-A | 45 |
| 425 | 0.5 | R-L | AVSS | WORKING LAMP SW | REAR CONSOLE-A | 46 |
| 425A | 0.5 | R-L | AVSS | WORKING LAMP SW | 425 | 47 |
| 426 | 0.5 | R-B | AVSS | WORKING LAMP SW | REAR CONSOLE-A | 48 |
| 441 | 0.75 | L-G | AVSS | WIPER MOTOR(F)/Lo | FRNT WPR(2) RELAY | 49 |
| 442 | 0.75 | G-R | AVSS | WIPER MOTOR(F)/Hi | FRNT WPR(2) RELAY | 50 |
| 443 | 0.75 | Y | AVSS | FRNT WPR(2) RELAY | FRNT WPR(1) RELAY | 51 |
| 444 | 0.75 | Y-W | AVSS | FRNT WPR(1) RELAY | WIPER MOTOR(F) | 52 |
| 447 | 0.5 | L-R | AVSS | FRNT WPR(1) RELAY | MONITOR 2-A(19) | 53 |
| 448 | 0.5 | Y-B | AVSS | FRNT WPR(2) RELAY | MONITOR 2-A(18) | 54 |
| 461 | 0.5 | O | AVSS | REAR CONSOLE-C | 1C2-B(8) | 55 |
| 501C | 0.3 | G-R | AVSS | REAR CONSOLE-A | JOINT CONNECTOR-H | 56 |
| 501E | 0.3 | G-R | AVSS | JOINT CONNECTOR-H | HAZARD SW | 57 |
| 501F | 0.3 | G-R | AVSS | JOINT CONNECTOR-H | MONITOR 2-A(15) | 58 |
| 502D | 0.3 | G-Y | AVSS | REAR CONSOLE-A | MONITOR 2-A(14) | 59 |
| 511C | 0.3 | Y-R | AVSS | REAR CONSOLE-C | MONITOR 2-A(12) | 60 |
| 514A | 0.5 | L-Y | AVSS | REAR CONSOLE-D | JOINT CONNECTOR-G | 61 |
| 514B | 0.5 | L-Y | AVSS | JOINT CONNECTOR-G | #WORKING LAMP SW | 62 |
| 514C | 0.5 | L-Y | AVSS | 514B | #WORKING LAMP SW | 63 |
| 514D | 0.3 | L-Y | AVSS | JOINT CONNECTOR-G | MONITOR 1-B(25) | 64 |
| 514E | 0.5 | L-Y | AVSS | JOINT CONNECTOR-G | TACHOGRAPH | 65 |
| 516G | 0.5 | R-W | AVSS | REAR CONSOLE-A | JOINT CONNECTOR-G | 66 |
| 516H | 0.3 | R-W | AVSS | JOINT CONNECTOR-G | PARKING BRAKE SW | 67 |
| 516J | 0.3 | R-W | AVSS | JOINT CONNECTOR-G | #WORKING LAMP SW | 68 |
| 516K | 0.3 | R-W | AVSS | 516J | #WORKING LAMP SW | 69 |
| 516L | 0.3 | R-W | AVSS | JOINT CONNECTOR-G | HAZARD SW | 70 |
| 517A | 0.3 | P | AVSS | REAR CONSOLE-C | MONITOR 2-A(12) | 71 |
| 529 | 0.5 | L-B | AVSS | BUZZER(-) | MONITOR 2-A(5) | 72 |
| 541 | 0.3 | G-W | AVSS | MONITOR 2-A(11) | REAR CONSOLE-A | 73 |
| 545 | 0.5 | L-O | AVSS | REAR CONSOLE-B | MONITOR 1-A(13) | 74 |
| 552 | 0.5 | W-G | AVSS | MONITOR 1-A(19) | REAR CONSOLE-C | 75 |
| 553 | 0.3 | Y | AVSS | MONITOR 1-B(32) | REAR CONSOLE-C | 76 |
| 554 | 0.5 | Lg | AVSS | MONITOR 1-B(22) | REAR CONSOLE-C | 77 |
| 555 | 0.3 | Br | AVSS | MONITOR 1-A(7) | REAR CONSOLE-B | 78 |
| 556 | 0.3 | Y-L | AVSS | MONITOR 1-B(21) | REAR CONSOLE-B | 79 |
| 557 | 0.3 | L-R | AVSS | MONITOR 1-A(15) | REAR CONSOLE-C | 80 |
| 561 | 0.5 | B-W | AVSS | MONITOR 2-B(34) | TACHOGRAPH | 81 |
| 562 | 0.5 | B-Y | AVSS | MONITOR 2-B(33) | TACHOGRAPH | 82 |
| 577 | 0.5 | R-W | AVSS | 1C2-B(34) | REAR CONSOLE-B | 83 |
| 578 | 0.5 | R-L | AVSS | 1C2-A(27) | REAR CONSOLE-C | 84 |
| 579 | 0.5 | G-Y | AVSS | 1C2-A(14) | REAR CONSOLE-C | 85 |

| No. | SIZE | COLOR | TYPE | FROM | TO | |
|---|---|---|---|---|---|---|
| 581 | 0.5 | Y-L | AVSS | 1C2-A(13) | REAR CONSOLE-C | 86 |
| 582 | 0.5 | B-L | AVSS | REAR CONSOLE-C | 1C2-A(1) | 87 |
| 583 | 0.5 | R | AVSS | 1C2-A(2) | REAR CONSOLE-C | 88 |
| 584 | 0.5 | L-Y | AVSS | 1C2-A(29) | REAR CONSOLE-C | 89 |
| 585 | 0.5 | R-G | AVSS | 1C2-B(35) | REAR CONSOLE-C | 90 |
| 611 | 0.3 | Y-B | AVSS | REAR CONSOLE-C | SUNLIGHT SENSOR | 91 |
| 612 | 0.3 | R-B | AVSS | SUNLIGHT SENSOR | REAR CONSOLE-C | 92 |
| 701A | 0.5 | W-R | AVSS | JOINT CONNECTOR-H | MONITOR 2-B(35) | 93 |
| 701B | 0.5 | W-R | AVSS | REAR CONSOLE-A | JOINT CONNECTOR-H | 94 |
| 701D | 0.5 | W-R | AVSS | JOINT CONNECTOR-H | 1C2-A(15) | 95 |
| 768 | 0.3 | B-R | AVSS | MONITOR 1-A(6) | REAR CONSOLE-B | 96 |
| 822 | 0.5 | G | AVSS | 1C2-B(23) | REAR CONSOLE-B | 97 |
| 901 | 0.5 | W | AVSS | KEY SW(ACC) | JOINT-OPT-C | 98 |
| 902 | 0.5 | L-R | AVSS | JOINT-OPT-D | JOINT-OPT-B | 99 |
| 903 | 0.5 | G-W | AVSS | JOINT-OPT-C | REAR CONSOLE-D | 100 |
| 905 | 0.75 | L-R | AVSS | KEY SW(START) | JOINT-OPT-A | 101 |
| 906 | 0.75 | L-R | AVSS | JOINT-OPT-B | JOINT-OPT-B | 102 |
| 907 | 0.75 | W-L | AVSS | JOINT-OPT-A | JOINT CONNECTOR-H | 103 |
| 907A | 0.5 | W-L | AVSS | JOINT CONNECTOR-H | 1C2-A(17) | 104 |
| 907B | 0.75 | W-L | AVSS | JOINT CONNECTOR-H | REAR CONSOLE-B | 105 |
| 912A | 1.25 | R | AVSS | REAR CONSOLE-D | KEY SW(B) | 106 |
| 921 | 1.25 | Y | AVSS | KEY SW(ON) | JOINT-OPT-C | 107 |
| 922 | 1.25 | Y-G | AVSS | JOINT-OPT-D | JOINT-OPT-D | 108 |
| 923 | 1.25 | G | AVSS | JOINT-OPT-C | REAR CONSOLE-D | 109 |
| G13 | 2 | B | AVSS | EARTH | REAR CONSOLE-D | 110 |
| G13A | 0.5 | B | AVSS | HOUR METER CUT-B | EARTH | 111 |
| G13B | 0.5 | B | AVSS | TACHOGRAPH | EARTH | 112 |
| G13C | 0.5 | B | AVSS | TACHOGRAPH | EARTH | 113 |
| G13D | 0.5 | B | AVSS | JOINT-OPT-C | EARTH | 114 |
| G13E | 0.75 | B | AVSS | FRNT WPR(2) RELAY | EARTH | 115 |
| G13F | 0.3 | B | AVSS | MONITOR 1-A(5) | EARTH | 116 |
| G16 | 1.25 | B | AVSS | CIGARETTE LIGHTER-B | REAR CONSOLE-D | 117 |
| G16A | 0.5 | B | AVSS | HAZARD SW | G16 | 118 |
| G16B | 0.5 | B | AVSS | HAZERD SW | G16 | 119 |
| G16C | 0.5 | B | AVSS | JOINT-OPT-A | G16 | 120 |
| G16D | 0.5 | B | AVSS | PARKING BRAKE SW | G16 | 121 |
| G16E | 0.5 | B | AVSS | PARKING BRAKE SW | G16 | 122 |
| G16F | 0.5 | B | AVSS | PARKING BRAKE SW | G16 | 123 |
| G16G | 0.5 | B | AVSS | WORKING LAMP SW | G16 | 124 |
| G16H | 0.5 | B | AVSS | WORKING LAMP SW | G16 | 125 |
| G16B | 0.5 | B | AVSS | AUTO SHUT DOWN SW | G16 | 126 |
| G45 | 0.75 | B | AVSS | 1C2-B(36) | REAR CONSOLE-A | 127 |
| G45A | 0.5 | B | AVSS | MONITOR 1-B(28) | G45 | 128 |
| PH | 0.5 | L | AVSSGS | 1C2-A(24) | REAR CONSOLE-C | 129 |
| PL | 0.5 | G | AVSSGS | 1C2-A(23) | REAR CONSOLE-C | 130 |
| RH | 0.5 | L | AVSSGS | 1C2-A(28) | REAR CONSOLE-A | 131 |
| RL | 0.5 | G | AVSSGS | 1C2-A(25) | REAR CONSOLE-A | 132 |
| RHB | 0.5 | L | AVSSGS | RH | MONITOR 2-B(33) | 133 |
| RLB | 0.5 | G | AVSSGS | RL | MONITOR 2-B(26) | 134 |






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