

Ford 5R110W Technical Information

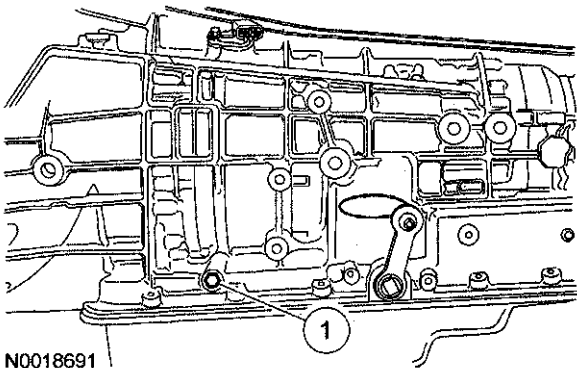
The Ford 5R110W transmission is a 5 speed computer controlled transmission with lock-up torque converter clutch. It was first introduced in 2003 model year Ford F series trucks and then International CF trucks in 2004, and the Ford LFC trucks in 2005.

In “cold mode” (under 5 deg. F.) the unit shifts 1-2-3-4-6. In “hot mode” (over 5 deg. F.) the unit shifts 1-2-3-5-6 with torque converter clutch.

Ratios: 1st gear: 3.09, 2nd: 2.20, 3rd: 1.54, 4th: 1.09, 5th: 1.00 6th: .71 (overdrive)

“Limp mode” certain trouble codes or total loss of power to transmission or TCM will result in reverse and 5th gears only.

Pressure Testing



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1) Pressure tap location, use 300+psi. Gauge (this

transmission is capable of over 300 psi.)

Gear	Line Pressure — kPa (psi)		Commanded (a) — PC-A pressure kPa (psi)	
	Idle	WOT Stall	Idle	WOT Stall
P, N	414 (60)	—	248 (36)	—
R	496 (72)	2,068 (300)	310 (45)	1,407 (204)
(D)	538 (78)	1,793 (260)	338 (49)	1,379 (200)
3	538 (78)	1,793 (260)	338 (49)	1,172 (170)
2	551 (80)	1,379 (200)	338 (49)	952 (138)
1	538 (78)	1,793 (260)	338 (49)	1,213 (176)

(a) = commanded pressure as viewed on diagnostic equipment.

CAUTION: Carry out the Line Pressure Test prior to carrying out the Stall Speed Test. If line pressure is low at stall, do not carry out the Stall Speed Test or additional transmission damage will occur. Do not maintain wide-open throttle (WOT) in any transmission range for more than 5 seconds or transmission damage may occur.

CAUTION: Apply the parking brake and block drive wheels during the line pressure test. Vehicle movement during the test may cause personal injury or damage to the vehicle and equipment.

NOTE: Certain sensor failures may cause high control pressure and failure mode effect management (FMEM) actions. Make sure that on-board diagnostic and electrical repairs have been carried out, or test results may be incorrect.

This test verifies the line pressure is within specifications.

1. Connect the Pressure Gauge to the line pressure tap.
2. Start the engine and check the line pressures at idle speeds with the transmission in each gear range. Refer to the Line Pressure Chart to determine if the line pressure is within specification.

CAUTION: Do not immediately press the throttle to the floor or allow the throttle to immediately close, or internal damage to the engine or transmission will occur.

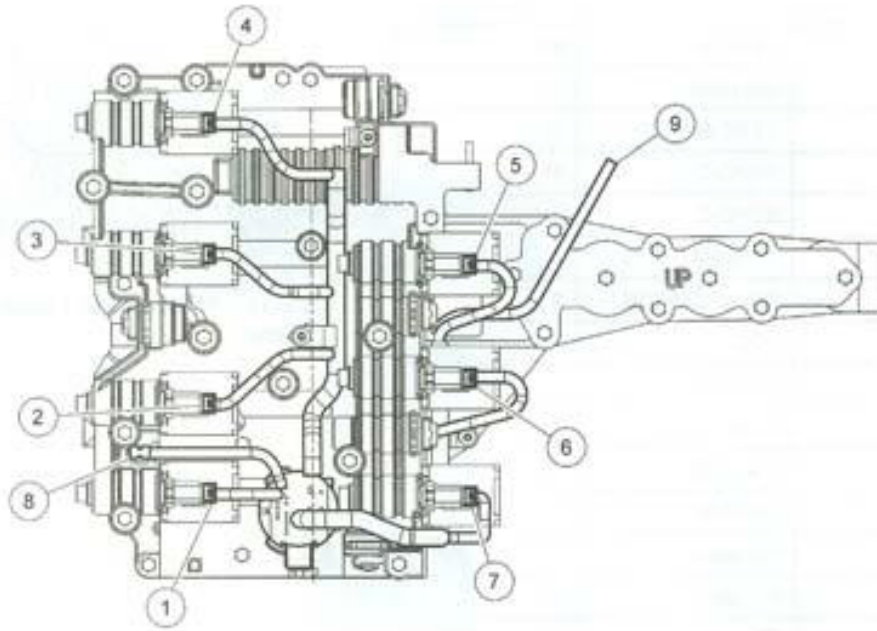
3. Check line pressure at wide open throttle (WOT) stall speed with the range selector lever in all gear ranges. Slowly press the throttle to WOT record the pressure reading. After recording the pressure reading slowly release the throttle until closed throttle is obtained (idle). Refer to the Line Pressure Chart to determine if the line pressure is within specification.

Test Results	Possible Source
High line pressure at idle — all ranges	<ul style="list-style-type: none"> • Wiring harness (external or internal). • PC-A solenoid. • Main regulator valve in pump stuck.
Low line pressure at idle — all ranges	<ul style="list-style-type: none"> • PC-A solenoid concerns. • Low fluid level. • Blown out solenoid gasket filter (7H200). • Line pressure blow off valve stuck open (on solenoid body assembly). • Cross leaks due to loose bolts on the solenoid body. • Line pressure skill valve in pump stuck open. • Restricted or damage sump filter. • Sticking pump regulator valve.
Low coast clutch pressure	<ul style="list-style-type: none"> • Wiring harness (external or internal). • SSPC-A solenoid. • Coast clutch assembly.
Low overdrive clutch pressure	<ul style="list-style-type: none"> • Wiring harness (external or internal). • SSPC-B solenoid. • Overdrive clutch assembly.
Low intermediate clutch pressure	<ul style="list-style-type: none"> • Wiring harness (external or internal). • SSPC-C solenoid. • Intermediate clutch assembly.
Low direct clutch pressure	<ul style="list-style-type: none"> • Wiring harness (external or internal). • SSPC-D solenoid. • Direct clutch assembly.
Low low/reverse clutch pressure	<ul style="list-style-type: none"> • Wiring harness (external or internal). • SSPC-E solenoid. • Low/reverse clutch assembly.

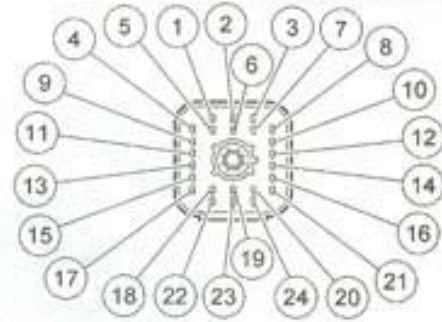
Without software you cannot test individual clutches, you need to select gears while sitting still to achieve this, you can however drive the truck and monitor pressures as shifts. Please have helper monitor gauge. Warning: **Do not** drive truck and watch pressures at same time alone!

Solenoid ID and connector pin-out chart

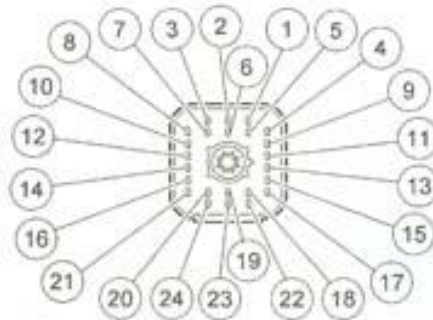
- 1) PC-A
- 2) TCC
- 3) SSPC-B
- 4) SSPC-A
- 5) SSPC-E
- 6) SSPC-D
- 7) SSPC-C
- 8) TFT
- 9) TRS Position



Pin Number	Description	TCM Connector
1	SSPC-E	90
2	Not used	—
3	SSPC-B	70
4	SSPC-D	48
5	SSPC-C	91
6	Not used	—
7	Solenoid VPWR	6
8	TCC	49
9	Not used	—
10	PC-A	89
11	Not used	—
12	SSPC-A	92
13	Not used	—
14	Not used	—
15	TR-P Signal	37
16	Not used	—
17	TR-P Ground	36
18	TFT Signal	14
19	Not used	—
20	Solenoid VPWR	6
21	VPWR for TR-P Sensor only	30
22	SGNRTN	14
23	Not used	—
24	Solenoid VPWR	73

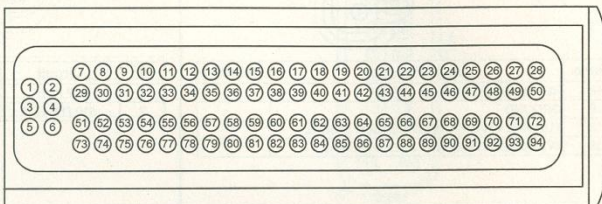


Transmission Internal Harness Connector



Transmission Vehicle Harness Connector

TCM Terminal pin-outs



Pin	Circuit	Gauge	Circuit Function	Qualifier
1	462 (VT)	18	VOLTAGE SUPPLIED IN START AND RUN (OVERLOAD PROTECTED)	
2	-	-	Not Used	
3	57 (BK)	18	GROUND	
4	-	-	Not Used	
5	-	-	Not Used	
6	1876 (YE-WH)	18	SOLENOID - VPWR	
7	-	-	Not Used	
8	1852 (PK-LG)	18	MSCAN -	
9	1851 (WH-LG)	18	MSCAN +	
10	-	-	Not Used	
11	1861 (RD)	18	VOLTAGE SUPPLIED AT ALL TIMES (OVERLOAD PROTECTED)	
12	199 (LB-YE)	18	TRANSMISSION RANGE SENSOR SIGNAL	
13	-	-	Not Used	
14	1875 (OR-WH)	18	TRANSMISSION FLUID TEMPERATURE SENSOR SIGNAL RETURN	
15	-	-	Not Used	
16	-	-	Not Used	
17	-	-	Not Used	
18	-	-	Not Used	
19	-	-	Not Used	
20	-	-	Not Used	

Pin	Circuit	Gauge	Circuit Function	Qualifier
21	-	-	Not Used	
22	-	-	Not Used	
23	-	-	Not Used	
24	-	-	Not Used	
25	-	-	Not Used	
26	-	-	Not Used	
27	-	-	Not Used	
28	2334 (BN-YE)	18	PTO ENABLE	
29	-	-	Not Used	
30	1876 (YE-WH)	18	SOLENOID - VPWR	
31	-	-	Not Used	
32	-	-	Not Used	
33	57 (BK)	18	GROUND	
34	-	-	Not Used	
35	-	-	Not Used	
36	570 (BK-WH)	18	GROUND	
37	199 (LB-YE)	18	TRANSMISSION RANGE SENSOR SIGNAL	
38	923 (OG-BK)	18	TRANSMISSION FLUID TEMPERATURE SENSOR FEED	
39	-	-	Not Used	
40	-	-	Not Used	
41	-	-	Not Used	
42	-	-	Not Used	
43	-	-	Not Used	
44	-	-	Not Used	

Pin	Circuit	Gauge	Circuit Function	Qualifier
45	-	-	Not Used	
46	-	-	Not Used	
47	-	-	Not Used	
48	236 (BK-LG)	18	SHIFT SOLENOID D	
49	924 (BN-OG)	18	TRANSMISSION COAST CLUTCH SOLENOID	
50	-	-	Not Used	
51	-	-	Not Used	
52	-	-	Not Used	
53	-	-	Not Used	
54	-	-	Not Used	
55	-	-	Not Used	
56	-	-	Not Used	
57	-	-	Not Used	
58	-	-	Not Used	
59	-	-	Not Used	
60	-	-	Not Used	
61	134 (GY-OG)	18	INTERMEDIATE SHAFT SPEED SENSOR SIGNAL	
62	57 (BK)	18	GROUND	
63	970 (DG-WH)	18	TURBINE SHAFT SPEED SENSOR SIGNAL	
64	-	-	Not Used	
65	57 (BK)	18	GROUND	
66	-	-	Not Used	
67	1789 (VT-WH)	18	REVERSING LAMPS RELAY CONTROL	
68	-	-	Not Used	
69	-	-	Not Used	
70	315 (VT-OG)	18	TRANSMISSION SHIFT SOLENOID B	
71	-	-	Not Used	
72	22 (LB-BK)	18	PARK INTERLOCK	
73	1876 (YE-WH)	18	SOLENOID - VPWR	
74	2335 (PK-LG)	18	PTO REQUEST	
75	-	-	Not Used	
76	-	-	Not Used	
77	2336 (RD-OG)	18	PTO ENGAGED	
78	224 (TN-WH)	18	TRANSMISSION OVERDRIVE CANCEL SWITCH	
79	-	-	Not Used	
80	-	-	Not Used	
81	-	-	Not Used	
82	-	-	Not Used	
83	57 (BK)	18	GROUND	
84	57 (BK)	18	GROUND	
85	57 (BK)	18	GROUND	
86	-	-	Not Used	
87	136 (DB-YE)	18	OUTPUT SHAFT SPEED SENSOR SIGNAL	

Pin	Circuit	Gauge	Circuit Function	Qualifier
88	-	-	Not Used	
89	480 (VT-YE)	18	PRESSURE CONTROL SOLENOID	
90	125 (DB-WH)	18	TRANSMISSION SHIFT SOLENOID E	
91	971 (PK-BK)	18	TRANSMISSION SHIFT SOLENOID C	
92	237 (OG-YE)	18	TRANSMISSION SHIFT SOLENOID A	
93	-	-	Not Used	
94	-	-	Not Used	

Temperature sensor resistance chart

- Measure the resistance between pins 1 and 2 at the TFT sensor.

Transmission Fluid Temperature

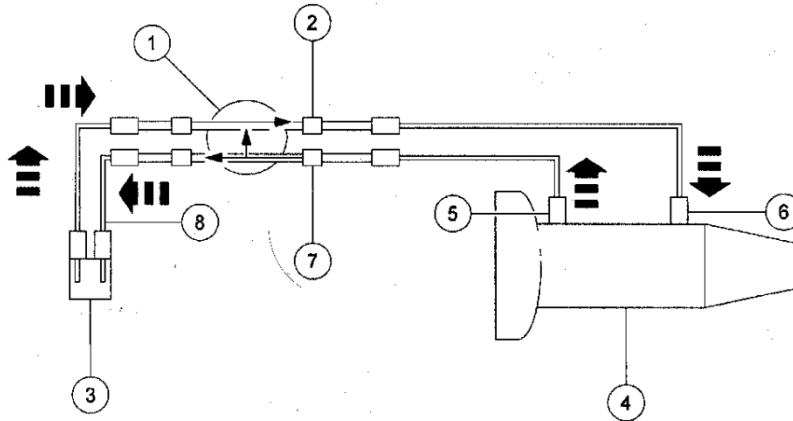
°C	°F	Resistance (Ohms)
-40 to -20	-40 to -4	967K - 284K
-19 to -1	-3 to 31	284K - 100K
0 to 20	32 to 68	100K - 37K
21 to 40	69 to 104	37K - 16K
41 to 70	105 to 158	16K - 5K
71 to 90	159 to 194	5K - 2.7K
91 to 110	195 to 230	2.7K - 1.5K
111 to 130	231 to 266	1.5K - 0.8K
131 to 150	267 to 302	0.8K - 0.54K

The only type fluid that should be used in this transmission is Mercon SP. The use of any other types of fluid can cause transmission failure.

Cooler flow and flushing

General Procedures

Transmission Fluid Cooler — Backflushing and Cleaning



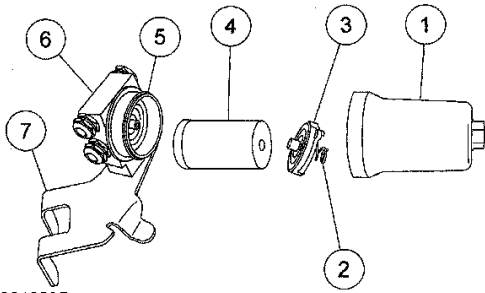
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Figure 23 Typical Cooler Line and Remote Filter Fluid Flow

- | | | |
|--|--|--|
| 1. Remote filter adapter assembly | 4. Transmission | 7. Transmission fluid cooler fitting (fluid flowing into remote filter) |
| 2. Transmission fluid cooler fitting (fluid flowing from remote filter back into transmission) | 5. Transmission fluid cooler fitting (fluid flowing out) | 8. Transmission fluid cooler tube (fluid flowing into radiator in-tank cooler) |
| 3. Radiator in-tank cooler | 6. Transmission fluid cooler fitting (fluid flowing in) | |

Do not alter the filter arrangement or the cooler line set up. It's very easy to change the flow rate on this unit which can result in cooler by-pass which will result in overheated transmission. Do not remove the factory style filter and replace with an aftermarket unit, or do-away with filter element, change external cooler with aftermarket ect.

There is also a temperature controlled flow valve in the unit that allows cooler flow warm and not cold. If checking cooler flow make sure transmission is at operating temperatures.



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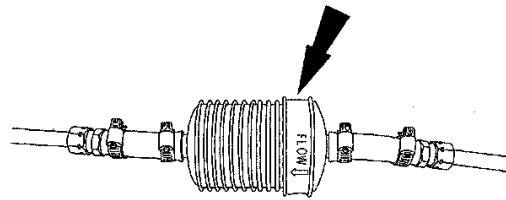
Figure 24 Remote Fluid Filter

1. Housing
2. Spring
3. Pressure plate/ magnet
4. Filter element
5. O-ring
6. Manifold
7. Bracket

CAUTION: Whenever the transmission has been serviced or a remanufactured transmission has been installed, the transmission fluid cooler tubes and the remote filter manifold must be cleaned and backflushed to remove any contaminants or transmission failure will occur.

NOTE: This transmission is equipped with a remote transmission fluid filter which is located on the driver side rear of the transmission. When carrying out an overhaul or installing a remanufactured transmission a new filter element must be installed.

1. Using a suitable torque converter/fluid cooler cleaner, flush the transmission fluid cooler and tubes.
2. If equipped, remove and discard the transmission fluid in-line filter.



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3. Remove the remote filter element.

CAUTION: The transmission cooler tubes must be disconnected prior to flushing out the cooler tubes.

4. Disconnect the 4 transmission fluid cooler tubes at the remote filter housing. For additional information, refer to Transaxle/ Transmission Cooling(Transaxle / Transmission Cooling, page 299).
5. Leave the transmission fluid cooler tubes disconnected from the transmission case.
6. Disconnect both transmission fluid cooler tubes from the radiator in-tank cooler.
7. Flush each transmission fluid cooler tube independently.
8. Connect the cleaner pressure and return lines correctly.
 - a. Connect the pressure line-to-fluid cooler inlet tube.
 - b. Connect the return line-to-fluid cooler outlet tube.
 - c. Place the outlet end of the return line in the fluid tank reservoir.

