

Mitsubishi Triton: ABS and ASTC Overview

2006 - 2009 ML Triton

2009 - 2014 MN Triton



The Mitsubishi ML Triton made an impact when it was released in 2006 due to its rounded body styling, good handling and performance, at a lower price to its competition. The MN Triton was released in 2009 and shared many common systems, such as the ABS. The MN had the option of stability control which was marketed as ASTC (Active Stability and Traction Control).



The ABS/ASTC warning light is in the right hand side of the instrument cluster

As these models are popular, but are now getting older, the VACC's Technical Department is starting to receive calls from members with faults appearing in the ABS and ASTC. There are no known common faults, and these systems seem reliable. This article will cover system component locations, fault code lists, ECU pinout data and component testing.

Correct System Operation

When the system is operating correctly the ABS / ASTC warning light on the instrument cluster should turn ON for three seconds after the ignition is switched ON and then turn OFF after the system has completed its self-check. If the light does not come ON or stays ON there is a fault in the system. A scan tool is required to check the system for fault codes. (See code list on page 4459).

Wheel Speed Sensors.

The following specifications are the same for ML and MN models with ABS and ASTC systems.

There is a wheel speed sensor on each wheel of a pulse generator type, with a tone wheel with 47 teeth. The gap between the sensor and tone wheel is not adjustable, however, if there are any faulty signals you should check this clearance.

Front: 0.25 – 1.40 mm.

Rear: 0.18 – 0.92 mm.

As the sensor is magnetic, it can pick up foreign material that can affect its ability to correctly sense the wheels rotation. Also, the teeth on the tone wheel can be broken, bent or full of foreign material which can also affect the sensor. Make sure that the sensor and tone wheels are clean and not damaged. ▶

Image: Mitsubishi

Basic Operation of Anti-Lock Braking System and Electronic Stability Control

These systems operate in the same way as similar systems from other manufacturers.

There is an ABS Control unit that is monitoring the four wheel speed sensors. The sensors should produce a constant sine wave signal while the vehicle is in motion (Above 3 to 5 Kmh).

If the brakes are applied and one of the wheels lock up, the signal will be lost. The ABS control unit will then release the brake pressure to that wheel and then pulse the brake pressure via the pump motor to ensure maximum braking performance for the vehicle.

If an electronic stability control system is fitted, it will have a more advanced control unit that will also monitor the frequency of the sine wave signals as well as steering angle, G-forces and yaw rates of the vehicle via dedicated sensors. If the control unit sees an increase in wheel speed sensor signal frequency, this means that the wheel has lost traction and is spinning. So an application of the brakes or reduction of engine output is required. If there is excessive steering angles and G-force and yaw rates, the control unit will apply or release the brakes to try and get the driver out of trouble.

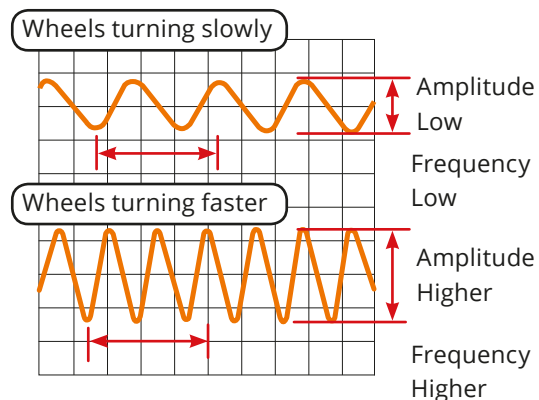
The resistance of the sensors should be between 0.9 – 1.3 k Ω across the terminals.

Check all connectors and wiring in the harness from the ECU to the sensor for damage.

The voltage signal produced by the wheel speed sensors will be a sine wave pattern on an oscilloscope.

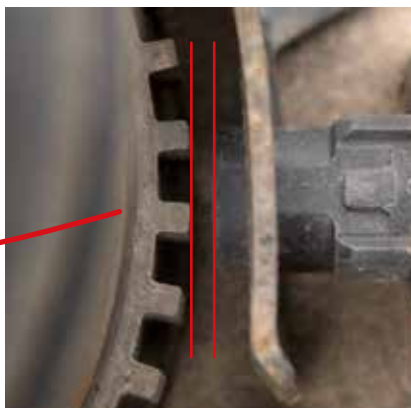
The signal will have a low frequency and amplitude when you turn the wheel by hand. However, if you test drive the vehicle, the frequency and amplitude should increase smoothly with increased road speed.

The voltage when measured with a multimeter, and the wheel rotated at approximately 1 revolution per second, should be 42mV. ▶



Wave form	Possible Cause	Action
No amplitude or very small wave form	<ul style="list-style-type: none"> Faulty sensor 	<ul style="list-style-type: none"> Check sensor
Wave form amplitude has excessive variation	<ul style="list-style-type: none"> Bent axle hub Fault ECU Earth 	<ul style="list-style-type: none"> Check axle Check earths
Noisy or Dirty Waveform	<ul style="list-style-type: none"> Open or Short Circuit Incorrectly mounted sensor Tone wheel missing teeth Tone wheel cracked 	<ul style="list-style-type: none"> Check sensor Check wiring and connectors Check tone wheel Check for nonstandard wiring or components that might cause interference in the sensor wiring.

Front Wheel Speed Sensors



The front wheel speed sensors have the tone wheel fitted onto the front driveshaft for 4WD or the dummy axle for 2WD. It is somewhat exposed which leaves it open to damage and collecting foreign material. It makes it easy to check the gap though.

Rear Wheel Speed Sensors



The rear wheel speed sensors are mounted into the final drive housing, and the tone wheel is mounted inside, with the wheel bearing assembly. The connectors are mounted on top of the final drive assembly.



Interior Locations

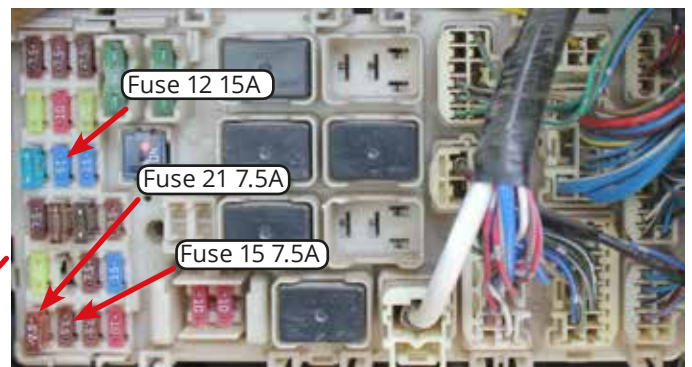
Steering Angle Sensor
(ASTC only, behind steering wheel)



ASC OFF Switch



Junction Box



G Sensor (ABS with 4WD only)



G and Yaw Sensor (ASTC only)



Direction arrow must face toward the RH side of the vehicle.

G Sensor

The G Sensor is mounted under the centre console inside the vehicle.

The following procedure is for the ML-MN ABS systems only, as there is no testing available for the G and Yaw sensor as fitted the ASTC system.

To check the operation of the G Sensor use the following steps.

1. Measure the voltage between terminals 1 and 2 with the ignition

ON. The correct specification 2.4-2.6V

2. Unbolt the sensor. Rotate the sensor so that the arrow mark under the sensor is pointing straight down and measure the voltage between terminals 1 and 2 with the ignition ON. The correct specification 3.55 – 3.95V
3. If the above specifications are not correct, check the voltage

between terminal 1 and 3. The correct specification 4.75 – 5.25V

If the specifications in steps 1 and 2 are not correct, but 3 is OK. Replace the sensor.

If all of the above are out of specification, check the wiring harness and connector.

If the wiring is OK the ABS-ECU could be faulty. ▶

Mitsubishi Triton ML-MN ABS and ASTC Code List

Code	Description
C1200	Right Hand Front Wheel Speed Sensor
C1201	Right Hand Front Wheel Speed Sensor Signal Fault
C1205	Left Hand Front Wheel Speed Sensor
C1206	Left Hand Front Wheel Speed Sensor Signal Fault
C1210	Right Hand Rear Wheel Speed Sensor
C1211	Right Hand Rear Wheel Speed Sensor Signal Fault
C1215	Left Hand Rear Wheel Speed Sensor
C1216	Left Hand Rear Wheel Speed Sensor Signal Fault
C1223	G and Yaw Rate Sensor
C1225	Wheel speed sensor malfunction
C1226	Right Hand Front Control Solenoid Valve Holding System
C1231	Right Hand Front Control Solenoid Valve Reducing System
C1236	Left Hand Front Control Solenoid Valve Holding System
C1241	Left Hand Front Control Solenoid Valve Reducing System
C1246	Right Hand Rear Control Solenoid Valve Holding System
C1251	Right Hand Rear Control Solenoid Valve Reducing System
C1256	Left Hand Rear Control Solenoid Valve Holding System
C1261	Left Hand Rear Control Solenoid Valve Reducing System
C1266	Pump Motor Fault
C1273	Pump Motor Relay Fault (Stuck Off)
C1274	Pump Motor Relay Fault (Stuck On)
C1278	Valve Relay Fault (Stuck Off)
C1279	Valve Relay Fault (Stuck On)
C1280	Pump Motor Fail Safe Relay
C1291	Reverse Signal
C1292	CAN Communication Fault
C1293	Rear Differential Lock Detection Circuit Fault
C1300	Linear Valve (Secondary)

C1310	Linear Valve (Primary)
C1340	Stop Light Switch Fault
C1361	Pressure Sensor Abnormalities
C1362	Pressure Sensor
C1364	Pressure Sensor Fault
C1365	G Sensor Fault
C1371	Yaw Rate Sensor
C1381	G Sensor Fault
C1382	G Sensor Fault
C1383	G Sensor Fault
C1385	Yaw Rate Sensor
C1386	G Sensor
C1388	Yaw Rate Sensor
C1389	G Sensor
C1393	G and Yaw Rate Sensor
C1394	Steering Angle Sensor
C1395	Brake Fluid Charging Incomplete
C1396	Engine ECU Fault
C1505	Steering Angle Sensor
C1506	Steering Angle Sensor
C1620	Engine ECU Communication Fault
C1861	ABS / ACTC ECU Power Supply Fault
U1073	Fault in CAN Bus System
U1100	Engine ECU Timeout
U1101	AT-ECU Timeout
U1104	Steering Angle Timeout
U1105	G and Yaw Rate Sensor Timeout
U1109	ETACS ECU Timeout
U1120	Engine Fault Detected
U1190	ETACS Signal Receiving Fault
U1200	Steering Angle Sensor Communication Fault
U1201	Yaw Rate Sensor Parity Fault
U1202	G Sensor Parity Fault
U1204	Steering Angle Sensor Communication Fault
U1205	G and Yaw Rate Sensor Message Counter Fault

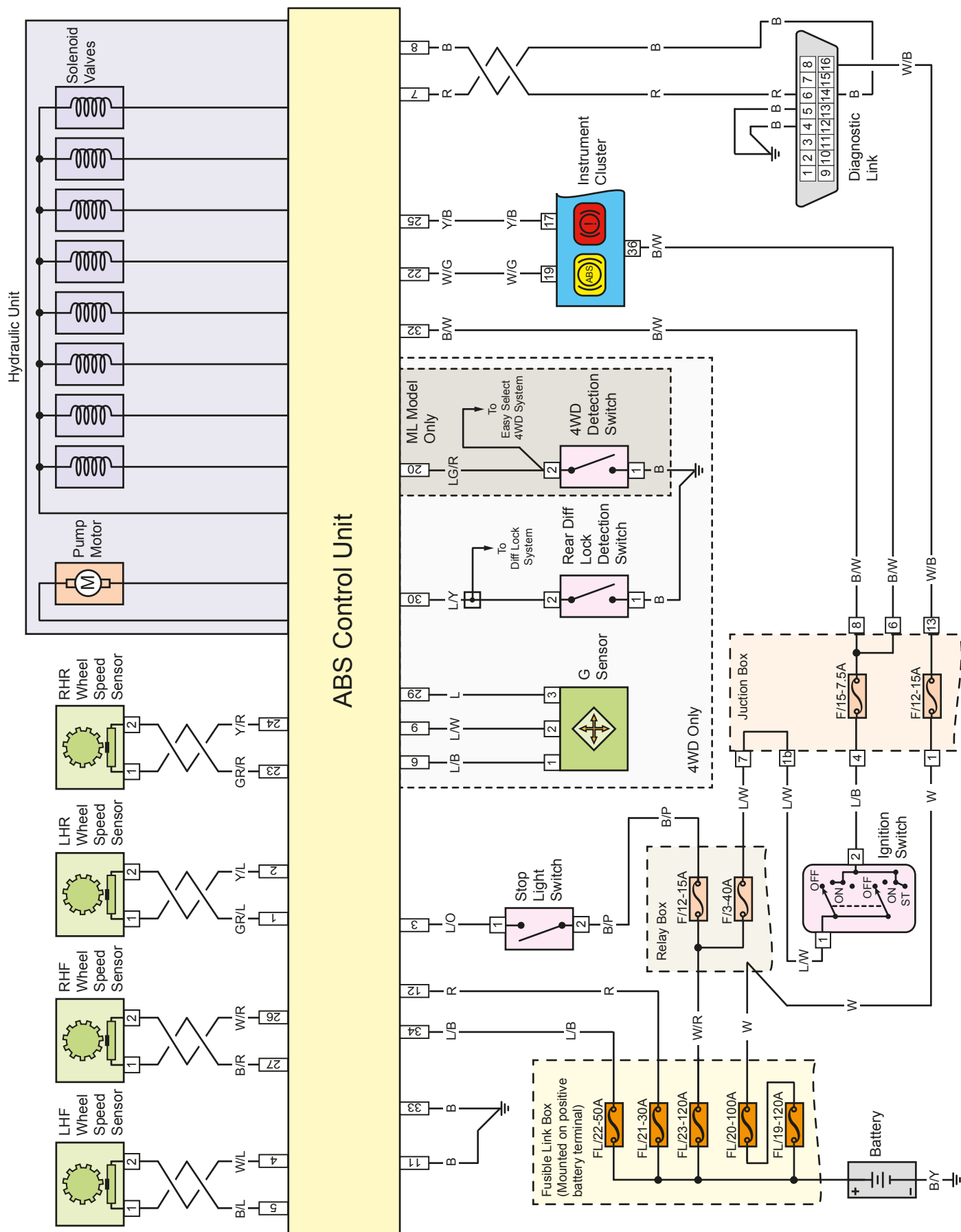


We would like to thank the team at Get Wrecked 4x4 for allowing us access to their vehicles for the photos in this article.

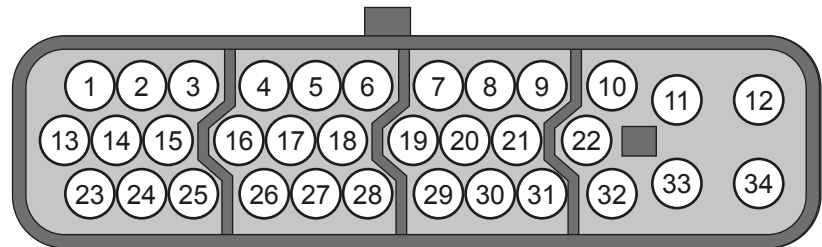
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Mitsubishi Triton ML-MN ABS Wiring Diagram



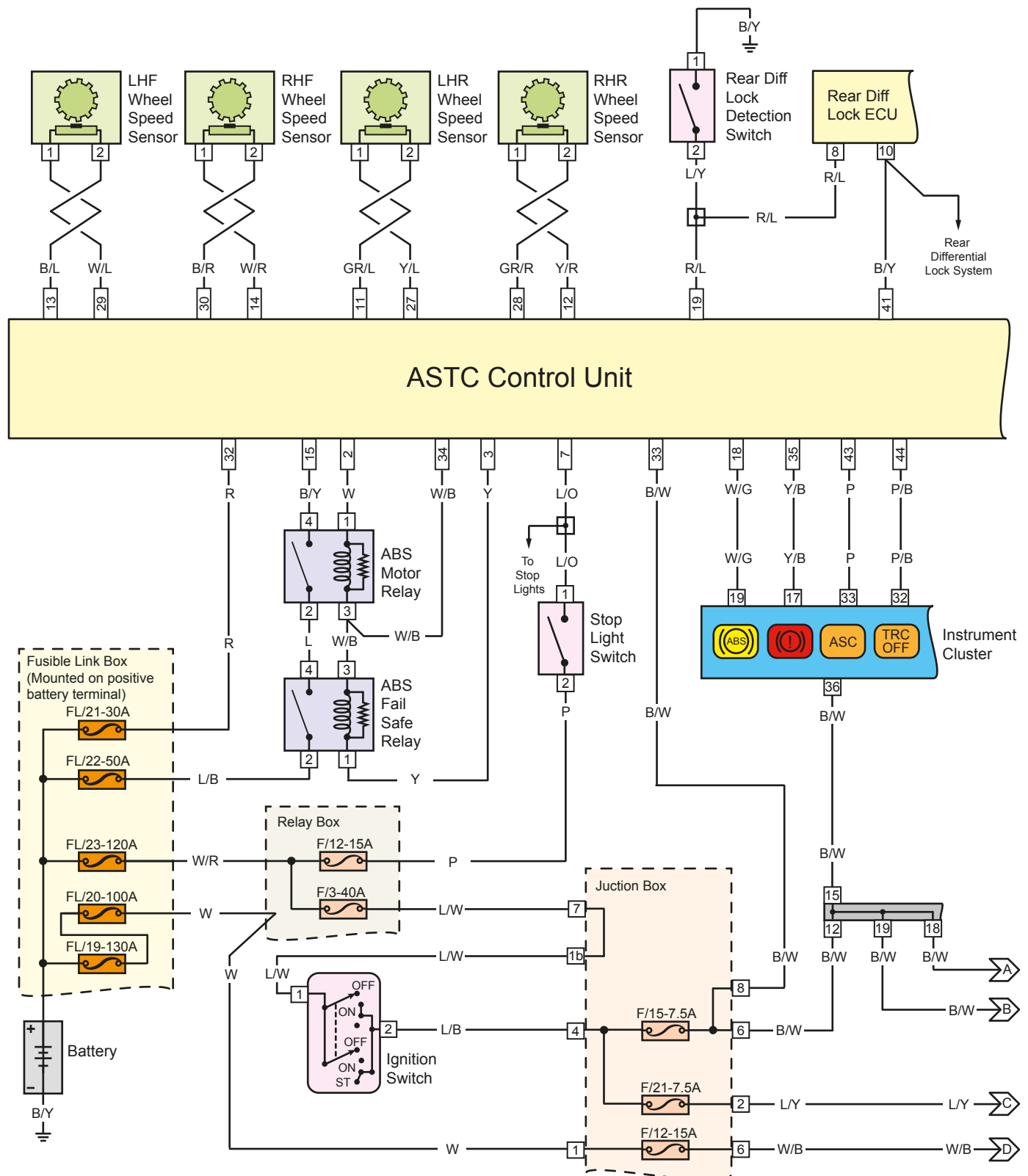
Mitsubishi Triton ML-MN ABS ECU Connector and Pin Out Data



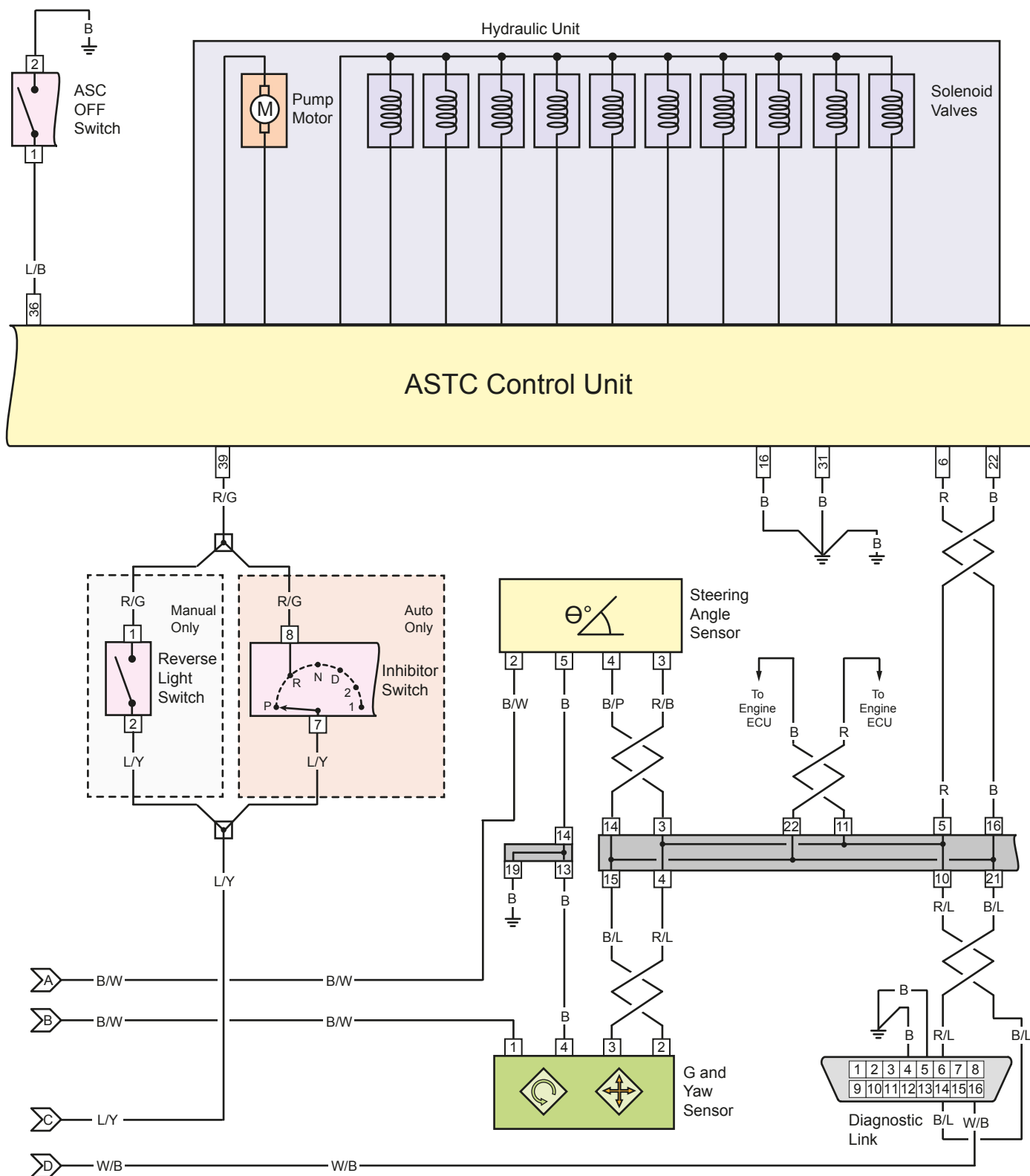
Back Probing View

Terminal	Wire Colour	Component	Condition	Voltage
1	GR/L	LHR Wheel Speed Sensor	While wheel is spinning	Wave form
2	Y/L	LHR Wheel Speed Sensor	While wheel is spinning	Wave form
3	L/O	Stop Lamp Switch	Switch Depressed	Battery Voltage
			Switch Released	0V
4	W/L	LHF Wheel Speed Sensor	While wheel is spinning	Wave form
5	B/L	LHF Wheel Speed Sensor	While wheel is spinning	Wave form
6	L/B	G Sensor Earth	Always	0V
7	R	CAN Bus	Ignition ON	Signal
8	B	CAN Bus	Ignition ON	Signal
9	L/W	G Sensor Signal	Ignition ON	5V
11	B	Earth	Always	0V
12	R	Solenoid Valve Power Supply (FL 21 30A)	Always	Battery Voltage
20	LG/R	4WD Detection Switch (ML Only)	-	-
22	W/G	ABS Warning Light	Ignition ON, with ABS Light ON	2V or less
			Ignition ON, with ABS Light OFF	Battery Voltage
23	GR/R	RHR Wheel Speed Sensor	While wheel is spinning	Wave form
24	Y/R	RHR Wheel Speed Sensor	While wheel is spinning	Wave form
25	Y/B	Brake Warning Light	Ignition ON, with Brake Warning ON	2V or less
			Ignition ON, with Brake Warning OFF	Battery Voltage
26	W/R	RHF Wheel Speed Sensor	While wheel is spinning	Wave form
27	B/R	RHF Wheel Speed Sensor	While wheel is spinning	Wave form
29	L	G Sensor Output	Ignition ON and Vehicle on a level surface	2.4 – 2.6 V
30	L/Y	Rear Differential Lock Detection Switch	-	-
32	B/W	ABS-ECU Power Supply (F15 7.5A)	Ignition ON	Battery Voltage
			Ignition START	0V
33	B	Earth	Always	0V
34	L/B	Motor Power Supply	Ignition ON	Battery Voltage

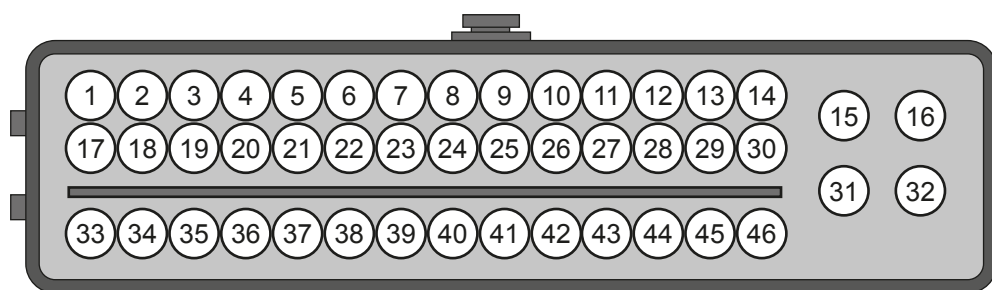
Mitsubishi Triton MN ASTC Wiring Diagram Part 1



Mitsubishi Triton MN ASTC Wiring Diagram Part 2



Mitsubishi Triton MN ASTC ECU Pin Out Data



Back Probing View

Terminal	Wire Colour	Component	Condition	Voltage
2	W	ABS Motor Relay Coil	-	-
3	Y	ABS Fail Safe Relay	-	-
6	R	CAN Bus	-	-
7	L/O	Stop Light Switch	Ignition ON, Stop Light Switch ON	Battery Voltage
			Ignition ON, Stop Light Switch OFF	1V or less
11	GR/L	LHR Wheel Speed Sensor	While wheel is spinning	Wave form
12	Y/R	RHR Wheel Speed Sensor	While wheel is spinning	Wave form
13	B/L	LHF Wheel Speed Sensor	While wheel is spinning	Wave form
14	W/R	RHF Wheel Speed Sensor	While wheel is spinning	Wave form
15	B/Y	ABS Motor Relay Coil	Always	Battery Voltage
16	B	Earth	-	-
18	W/G	Instrument Cluster	-	-
19	B/Y	Rear Differential Lock	Rear Differential Lock Detection Switch OFF	Battery Voltage
			Rear Differential Lock Detection Switch ON	1V or less
22	B	CAN Bus	-	-
27	Y/L	LHR Wheel Speed Sensor	While wheel is spinning	Wave form
28	GR/R	RHR Wheel Speed Sensor	While wheel is spinning	Wave form
29	W/L	LHF Wheel Speed Sensor	While wheel is spinning	Wave form
30	B/R	RHF Wheel Speed Sensor	While wheel is spinning	Wave form
31	B	Earth	-	-
32	R	Solenoid Valve Power Supply	Always	Battery Voltage
33	B/W	ASTC ECU Power Supply	Ignition ON, ASC Switch OFF	Battery Voltage
			Ignition ON, ASC Switch ON	1V or less
34	W/B	ABS Motor Relay	-	-
35	Y/B	Instrument Cluster	-	-
36	L/B	ASC OFF Switch	-	-
39	R/G	Reverse Light Switch	Ignition ON, In any position other than reverse	Battery Voltage
			Ignition ON, In reverse	1V or less
39	R/G	Inhibitor Switch	Ignition ON, In any position other than reverse	Battery Voltage
			Ignition ON, In reverse	1V or less
41	B/Y	Rear Differential Lock ECU	-	-
43	P	Instrument Cluster	-	-
44	P/B	Instrument Cluster	-	-

Warning

If the battery has gone flat and you have jump-started the vehicle and started to drive without letting the battery recharge, there is a chance that the engine will misfire or stop. This is due to the ABS / ASTC system consuming a significant amount of current while it is going through its initial self-tests. There is not enough capacity while the battery is flat for this to occur and the engine to run at the same time. Once the battery is fully charged this problem should not reoccur.

Under Bonnet Locations

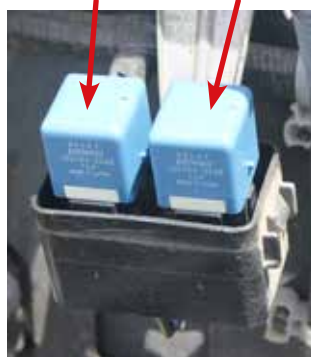


WARNING:

To remove the ASTC control unit connector make sure that you pull the white (or grey) tab all the way up before trying to pull the connector from the control unit.

Relays

ABS Motor Relay ABS Fail Safe Relay



NOTE: These relays are only fitted on the models with ASTC. The workshop manual shows their location to be near the ASTC control unit. However, the vehicle shown in this article has them mounted on the firewall.

ABS / ASTC Control Unit



Relay Box



Fuse 12 15A

Fusible Link 3 40A

Front Wheel Speed Sensor Connectors

Mounted on chassis rail.



This article should have given you a good overview of these systems, and be of assistance in diagnosing and repairing any faults. For more information on the history of ABS development and operation, see the March 1993 issue of Tech Talk.

For more information on Mitsubishi Tritons, log on to Tech Online or call the Technical Advisory service. [Tech Online](#)