

lockup-mate®

Mitsubishi Pajero NS, NT, NW, NX (2007+)
Diesel & Petrol



Operating Instructions

Rev L: 16 Jul 2024 (v4.2)

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Thanks for purchasing **lockup-mate®**; a fantastic product to protect the transmission from over-heating, and to improve fuel economy.

PLEASE REFER TO IMPORTANT INFORMATION SECTION FOR A SAFETY WARNING.

LOCKUP-MATE® FEATURES & BENEFITS

Features

Benefit


General Benefits of lockup-mate®

Significantly reduces automatic transmission heat build-up	Prolong the life of the transmission oil and help avoid over-heating related transmission failures
Improved fuel economy	The unit will pay for itself in the long run
Micro-processor controlled	Provides advanced lockup control and features
Fully automatic operation	Easy to use
Doesn't change the factory ECU software	No re-mapping of the transmission ECU required
Simpler installation with comprehensive installation instructions	DIY saves money, or reduces cost if installed by an auto-electrician.
SafeLock® Clutch Protection ★NEW Lockup engagement uses the same low slip criteria as factory ECU	Protect the clutch from excessive wear for long life and reliability
Emergency Brake Unlock ★NEW	Immediately unlock the TCC under heavy
Engine DYNO Tuning Mode ★NEW	Allows tuner to manually lockup of the torque converter when engine tuning on a DYNO

lockup-mate® Operation

Fully automatic lock/unlock control of the Torque Converter lockup clutch	Simple operation for the driver.
Lockup controller uses Speed, RPM, Throttle Pedal position, gear, 4WD mode, and transmission mode (SPORT or DRIVE)	Complex logic to ensure the TCC is locked up whenever possible.

Vehicle status is obtained from the vehicle's internal vehicle digital network (CANBus), via connection to the car's existing OBD2 port.	Precise and reliable information Simpler installation – no cutting of wires to obtain vehicle information. Immunity to electrical noise
Still use your OBD2 devices as it won't interfere with them	Doesn't use OBD2 messages and passively listens to the CANBus, so it's compatible with your existing Scan-gauge, GPS HUD etc
Works when transmission is in either SPORT or DRIVE mode	Optimum heat saving results are obtained in SPORT mode – You shift gears to maximise lockup time. Keeping the blue light on helps keep the transmission cool!
[NT+ Diesel ONLY] SPORT mode uses a hybrid SPORT/DRIVE mode to avoid the 1 st gear quirks	When under 30kph, the transmission is placed into DRIVE to avoid the 1 st gear quirks caused when using any lockup kit. REFER TO SAFETY WARNING in the IMPORTANT INFORMATION section of this manual
Can be enabled or disabled using the switch	Can be switched off if desired
Small custom switch/LED	Discrete and simple installation
LED indication of the lockup status	Driver knows then the TCC is locked
Updates user's settings using existing Instrument Cluster and Cruise Control switches as the user interface.	No need for an extra display or to access the lockup-mate ® controller to adjust the settings.
Automatically adjusts for 4WD low-range use	Simple use
LED is visible in sunlight, and automatically dims (Auto-Dim function) for night use (when headlights are on)	Avoids a glaring LED at night
Auto-dimming of the LED can be overridden by the driver.	LED will be visible during the daytime when driving with the headlights on
Compatible with vehicle modifications (eg, pedal re-mapping devices, re-tuned engines).	lockup-mate ® has adjustable sensitivity to tune it to your own car's setup.

<p>Excessive Slip Warning</p> <p>LED flashes if the TCC is unlocked (When in SPORT mode in 3rd gear an above), or when there is currently excessive slip to lockup the clutch</p>	<p>Informs the driver to change to a lower gear to enable lockup to occur, or to reduce engine power (RPM) to lockup the clutch without excessive wear</p>
<p>Engine Light Reset (CEL) ★NEW</p> 	<p>Double tap the LED when in PARK to reset the check engine light (CEL) and reset the codes.</p>

Installation Features

<p>User initiated Self-diagnostic Mode, displaying results on the instrument cluster.</p>	<p>Confirms correct installation and assists with fault finding</p>
<p>Detailed installation instructions</p>	<p>Easy to follow, DIY installation saving you money</p>
<p>Automatic VIN check</p>	<p>Configures automatically based on the vehicle' model year, engine, and transmission</p>
<p>Installed in 1-2 hours</p>	<p>Minimum removal of trim</p>

User Configurable

<p>1. Adjustable sensitivity</p>	<p>Fine tune when the TCC lockup engages</p>
<p>2. Gear at which lockup commences</p>	<p>Select 1st, 2nd, 3rd etc. (default is 2nd)</p>
<p>3. LED brightness</p>	<p>Adjustable to your preference, for both day and night.</p>
<p>4. Minimum speed to activate when in DRIVE ★NEW</p>	<p>Fine tune to suit your vehicle</p>
<p>5. Startup state (on or off)</p>	<p>Remembers the switch setting</p>
<p>6. Night-time override status</p>	<p>Remembers the switch setting</p>
<p>Reset to factory defaults</p>	<p>Restore settings to the original</p>
<p>Stores user settings in micro-processor's non-volatile memory</p>	<p>Remembers all setting when power is removed</p>
<p>Enters user configuration mode only when vehicle engine is off</p>	<p>Safety feature</p>

Updates user's settings using existing Instrument Cluster and Cruise Control switches as the user interface.	
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Other Benefits

Free firmware upgrades	Unit will need to be returned to MM4X4 for an update
Expandable with new MM4X4 products. CANBus connection can be daisy chained off the first the MM 4X4 product that is connected to the OBD2 port to future MM 4X4 products.	Simpler installation and avoids additional bulky OBD2 cables
Adaptable for specialised vehicles - such as with transfer case reduction gears or non-standard diff ratio	Via special order. Contact us for advice.
Electrical control of the TCC clutch is the same as the factory ECU	Mimics the factory control for confidence, and smoother TCC engagement

- ✓ Technical support
- ✓ Made in Australia
- ✓ 12 month warranty

lockup-mate® BASIC OPERATION

WARMUP MODE

lockup-mate® activates once the engine starts and it does not monitor the transmission temperature. Until the transmission oil has reached operating temperature (40°C), the gear changes may be more noticeable when the torque converter is locked. It is recommended to use DRIVE for the first 5-10 minutes to allow the oil to warm up. The LED will pulse steadily during this warmup phase.

KEEPING IT LOCKED

The aim is to keep the **blue** LED on to achieve maximum fuel savings and heat reduction.

THE AIM: Keep the LED Blue, to *“Keep Cool and Save Fuel”*

In the transmission's SPORT mode, **lockup-mate®** will automatically lock the Torque Converter Clutch (TCC) from 2nd gear upward whenever the conditions are suitable (speed, gear, engine load, slip).

In DRIVE mode the transmission ECU chooses the gear, which is often too high for lockup to occur, so it will only lockup when conditions are right for 5th gear, which is ~80kph.

All the driver is required to do is ensure the chosen transmission gear is suitable for lockup to occur, and that the torque converter is not excessively slipping.

The rest is automatic!

When the **lockup-mate®** LED flashes, it is alerting you change to a lower gear because there is excessive torque converter slip and it cannot lockup safely.

This is a reminder to use SPORT mode to manually select a lower gear, and usually this is all that is required to enable lockup.

If after changing down a gear and there is still excessive slip, momentarily back off on the accelerator to reduce the slip, and the torque converter will then lockup.

So, in the simplest terms, to most effectively use **lockup-mate®**:

1. Turn **lockup-mate®** ON – tap the LED/Switch to toggle on and off.
2. Try to keep the **blue** LED ON when driving.
3. If the LED is flashing, use SPORT mode to select a lower gear, and if after that it still flashing it means **lockup-mate®** is protecting the clutch from extra wear. Reduce the slip momentarily by backing off the accelerator to allow lockup.
4. Choose the highest gear that allows the LED to stay **blue** without labouring the engine.

HOW IT WORKS

By design, the AISIN transmission in the NT+ Diesel does not lock the TCC in 1st gear. [The exception is if the customer has purchased and installed a modified transmission valve body that specifically enables 1st lock-up].

The NS Diesel and NS-NW Petrol models have the JATCO transmission, which allows lockup in 1st gear. Lockup from 2nd gear is the default setting.

lockup-mate® will automatically lockup the torque converter in any speed and gear (2-5) according to the driving conditions. It constantly monitors the vehicle status including speed, current gear, RPM, accelerator pedal, torque converter slip, 2H/4H/4L position, and the SPORT gear choice. This information is used to determine when the TCC should be locked.

In DRIVE mode, it locks up only when above 80 kph because the transmission ECU will select gear which is too high to allow the TCC to be locked. You may need to manually select a lower gear in SPORT mode to enable lockup. Example: In DRIVE the ECU will use 5th gear at 60kph up a slight incline. To achieve lockup, manually select S4.

HIGH RANGE (4H) AND LOW RANGE (4L) OPERATION

lockup-mate® automatically detects if the transfer case is in 2H/4H or 4L, and adjusts its operation accordingly. In 2H/4H, **lockup-mate**® uses a combination of speed, gear, RPM, slip and the accelerator pedal to determine when to lock the TCC.

In 4L, **lockup-mate**® uses only the RPM to determine when to lock the TCC.

★NEW ENGINE TUNING DYNO MODE

lockup-mate® (latest version ONLY) has a special manual lockup mode that can be used when tuning an engine on a DYNO. In DYNO Mode, **lockup-mate**®:

- i. allows the Tuner to manually engage and disengage the torque converter clutch using the LED/SWITCH.
- ii. DOES NOT send any data on the OBD2 interface, so **lockup-mate**® and the tuning dongle can concurrently use the OBD2 port (via Y-splitter cable).

CAUTION: DO NOT use this mode during normal vehicle driving, as in-built driveline protection features of **lockup-mate**® are disabled.

WARNING

When re-flashing the ECU via the OBD2 port during engine tuning, ensure lockup-mate® is either in DYNO Tuning Mode, or disconnected from the OBD2 port.

DO NOT use lockup-mate® in its normal operating mode, as there is a small risk of bricking the ECU if there is a data conflict between the tuning dongle and lockup-mate® during programming.

To Enter DYNO Mode :

1. Hold down the LED/Switch while plugging in the OBD2 connector.
2. Release the LED/Switch after 5 seconds. The LED should now flicker 3 times in bursts every 1 second.
3. To manually activate and deactivate the torque converter lockup clutch, tap the LED/Switch.

Lockup OFF* - LED flickers 3 times every 1 second

Lockup ON* - Solid LED

* **lockup-mate**® is able to passively listen to the vehicle RPM, and will automatically and always disengage the lockup clutch when under 1100RPM. It will not activate the clutch when under 1100RPM if the LED is tapped (eg, when idling).

To Exit DYNO Mode :

Unplug the OBD2 connector, or, hold down the LED/Switch for >5 seconds and release.

NOTE: DYNO mode will automatically exit after 30 minutes of inactivity.

NOTE: **lockup-mate**® will remain in DYNO mode, even if the ignition is switched OFF.

ADVANCED OPERATION

DRIVING IT LIKE A CLUTCH-LESS MANUAL

To lockup during acceleration you can use SPORT mode to drive it like a manual transmission. Accelerate until the LED comes on, then allow the RPM to increase to >2000-2500 before manually changing into S3. The TCC will remain locked, and continue to manually up-shift at a higher RPM until the desired speed is reached and the LED stays ON.

4L MODE

In low range 4WD, **lockup-mate**® only works in SPORT mode.

lockup-mate® automatically determines when low range (4L) has been selected and changes the TCC lockup algorithm. When in 4L, **lockup-mate**® uses the RPM to determine when to lockup the TCC.

[Default engages around 1500-2000 RPM and disengages@1200 RPM]

NOTE : In 4L, if emergency braking is conducted when locked at very low RPM in 1st or 2nd gear, the engine may stall. This is due to the vehicle not providing updates to **lockup-mate**® fast enough for it to respond and unlock the TCC in a timeframe to avoid the stall.

IMPROVED ENGINE BRAKING

lockup-mate® will improve downhill engine braking. Select SPORT mode and an appropriate gear (typically S4 or S3) to increase the RPM to >2500.

It will not lock the TCC unless the RPM is above 1200, so if coasting downhill (800-900 RPM) you will need to increase the RPM to engage the TCC for lockup. This can be achieved by downshifting a gear in SPORT mode, or gently pressing the accelerator. Once the TCC has locked up, the increased RPM will be maintained.

To avoid a harsh TC engagement, the NS Diesel will not initiate lockup if coasting. For improved engine braking, ensure the TC is locked beforehand.

★NEW RESET CHECK ENGINE LIGHT (CEL)

Double-tap the LED/Switch when in PARK to issue the command to reset the CEL. The LED will flash once.

NOTE: This will reset the cause of any CEL. **lockup-mate**® does display the trouble code that caused the CEL.

[NT Diesel ONLY] When entering 4LLc, place the vehicle in PARK and double-tap the LED to reset the 1st gear quirk. The quirk sometimes prevents changing from 1st into 2nd gear until 2800rpm.

OPERATING RECOMMENDATIONS

CAUTION

lockup-mate® should be switched OFF if the driveline may experience high shock loads, such as when charging at obstacles when off-road. An unlocked torque converter helps absorb driveline shock loads.

<i>Driving Conditions</i>	<i>Recommendation</i>
City, country and highway	<p>lockup-mate® ON</p> <p>Reason: Excellent protection from high transmission temperatures and better fuel economy.</p> <p>Use SPORT mode for better downhill engine braking.</p> <p>For country driving in the hills, SPORT mode is recommended with the gear chosen to maintain lockup (keep the blue LED ON to “keep cool and save fuel”).</p>
Rocks and creek-beds	<p>lockup-mate® OFF *</p> <p>* Leave OFF only unless the transmission oil becomes hot (eg, >80°C), then switch lockup-mate® ON when conditions are suitable to reduce the transmission temperature.</p> <p>Reason: The torque converter absorbs driveline shock caused by the highly variable nature of rock driving, eg. lifting/dropping wheels or hitting rock ledges.</p>
Steep Hills (4L ascent)	<p>lockup-mate® ON or OFF, Use SPORT mode</p> <p>Short Hills: Leave OFF unless the transmission oil becomes hot (eg, >80°C), then switch lockup-mate® ON to reduce the transmission temperature.</p> <p>Use SPORT mode and climb in 2nd gear where possible to allow the TCC to lockup.</p> <p>Reason: The torque converter absorbs driveline shock.</p> <p>Long Hills: steep hill climbs will rapidly heat-up the transmission oil, so if conditions are suitable switch lockup-mate® ON and climb in 2nd gear.</p>

<i>Driving Conditions</i>	<i>Recommendation</i>
Steep Hills (descent)	<p>lockup-mate® ON or OFF</p> <p>Typically a 4L steep descent is conducted in 1st gear. [NT+ Diesel ONLY] Since the transmission cannot not lockup in 1st gear the use of lockup-mate® doesn't make a difference.</p> <p>[NS Diesel, NS+ Petrol] Improved engine braking can be achieved in 1st gear if the minimum gear setting is set to 1st.</p> <p>For better 4H engine braking on the asphalt, switch lockup-mate® ON and use SPORT mode.</p>
Sand (beach run at higher speeds >40kph)	<p>lockup-mate® ON</p> <p>Use SPORT mode - ensure the blue LED stays on</p> <p>Reason: Keep the transmission cool and better fuel economy</p>
Sand (dunes and deep sand) Mud	<p>lockup-mate® ON or OFF</p> <p>OFF for short sections. If transmission oil becomes hot (eg, >80°C), then switch lockup-mate® ON to reduce the transmission temperature. Deep sand and mud are a highly variable situations. When a deep section is entered more power is urgently needed to maintain momentum. The torque converter slippage allows the RPM to quickly increase for more turbo boost and power.</p> <p>ON for sustain deep sand driving to avoid high transmission temperatures. Use SPORT mode to choose an appropriate gear and keep the revs high so when it needs the power and the RPM drops, the engine is still at high turbo boost.</p>

CONFIGURATION MODE

lockup-mate® allows the driver to adjust the following parameters:

1. **Lockup sensitivity**, ie how much engine load is applied (and also considering speed) before **lockup-mate**® will release the torque converter clutch. If you experience vibration or droning, increase this value.
2. The **minimum gear** that lockup will occur. Default is 2nd gear, ie. it will lockup in 2nd, 3rd, 4th and 5th gears
3. **LED brightness**. The LED brightness is adjustable separately for day and night viewing.
4. **Minimum Speed** in DRIVE before lockup will activate. **★NEW**

ADJUSTING THE SETTINGS – CONFIGURATION MODE

Switch Ignition ON, ENGINE OFF.

Engine must not be running.

To enter Configuration Mode:

1. Switch Ignition ON without starting the engine.
2. Press and hold ON/OFF button for 5 seconds

(Wait until the instrument cluster displays a number on the speedo)

Blue LED illuminates

To **reset to factory defaults**, press and hold COAST/SET instead of ON/OFF button

The first parameter, lockup sensitivity, is displayed on the speedometer.

To move to the next parameter, tap the ON/OFF button again.



1. Lockup Sensitivity

Default is 100.

Allowable range 60-160

Adjust the sensitivity using the cruise control buttons ACC/RES (to increase) or DEC/SET (to reduce).

A lower value of sensitivity causes **lockup-mate**® to hold the TCC locked for longer. A larger value results in the TCC lockup releasing easier.

Tap the ON/OFF button to move to the next parameter



Avoid adjusting sensitivity too low which results in drivetrain vibration (shudder) or droning.

2. Minimum Gear

Default is 2nd

Valid range is 1 to 5 (1st to 5th).

The minimum gear is displayed on the Tacho. Use ACC/RES and COAST/SET to adjust.

[NT+ Diesel] The transmission will not lockup in 1st gear. Do not use 1st unless you have a valve body fitted with the 1st gear lockup modification, as it has no effect.

NOTE: 1st can also cause AT ECU errors (CEL) when changing from 1st to 2nd gear.



3. LED Brightness

The LED brightness is displayed, and the LED intensity is adjusted to the current value.

Use ACC/RES and COAST/SET to adjust.

Use the headlights switch to toggle between night-time brightness and daytime brightness.

Night-time brightness is best adjusted when dark.



4. DRIVE Activation Speed ★NEW

When in DRIVE mode it will only activate lockup above this speed (default is 75 kph).

The allowable range is between 40kph to 120kph.

75 kph is the lowest speed for lockup in 5th gear. Lower values are not recommended as they cause unnecessary lock/unlock cycles, as the transmission ECU usually selects a gear too high to allow lockup.



Tap ON/OFF

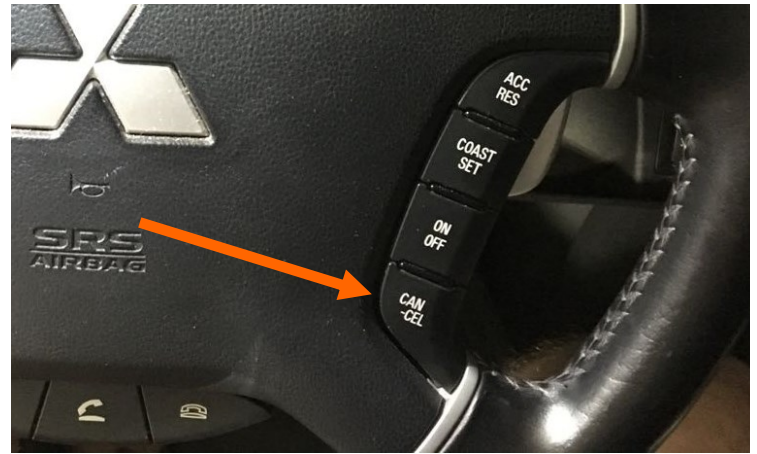
Adjustments are now complete.

The speedo and tacho will go full deflection and return to zero.

The values are written into non-volatile memory as they are entered.



At any time, CANCEL can be tapped to exit user settings mode.



NOTE: User settings cannot be adjusted when driving.
The engine must be off.

OPERATION WHILST DRIVING

SWITCHING LOCKUP-MATE® ON AND OFF

Turn **lockup-mate**® on and off by using the SWITCH/LED.

The LED can be pushed to activate the momentary switch.

Between engine starts, **lockup-mate**® remembers the previous switch status.

When switched on, you can hear the relay in the **lockup-mate**® control module 'click'.

When tapped during driving, a long flash of the LED indicates it is on. A short flash is off.



ADJUSTING LED BRIGHTNESS (DAY/NIGHT)

When driving with your headlights on in the day-time, you can over-ride the Auto-Dim LED intensity.

Auto-Dim LED intensity operation is linked to the headlights.

To toggle Auto-Dim ON & OFF, press and hold CANCEL for 4 seconds. The LED will momentarily illuminate with the LED intensity.



lockup-mate® stores the headlight override choice in non-volatile memory, so the setting is remembered between engine starts.

★NEW PROTECTION MODE (SAFELOCK®)

Changing modes:

To toggle Protection Mode ON and OFF, press and hold the LED/switch for >10 seconds.

The LED will respond with:

5 flashes – Protection Mode is **ON**

2 flashes – Protection Mode is **OFF**

The unit saves the mode setting in non-volatile memory.

ON (default)

There are two protection features built into **lockup-mate®**.

- 1. Excessive Engine Load** – More torque is needed to accelerate, or the RPM is too low and it will cause driveline shudder. The position of the pedal is used in the algorithm that determines when **lockup-mate®** will activate or release the TCC.

The sensitivity adjustment (see Page 11) can be used to increase or decrease this threshold.

This also improves vehicle drivability. For example, if cruising at 60 KPH (gentle pedal) the engine is only at ~1500 RPM. The vehicle is not able to accelerate quickly at this RPM, as the engine is not able to generate much power/torque. Pushing the pedal harder (eg, to 50%) will release the TCC (momentarily) so the car's RPM increases and will more quickly accelerate. This also prevents driveline shuddering.

NOTE: If the TCC unlocks for a sustained period (eg, climbing a hill) the transmission temperatures will rise. In this circumstance it is better to change down a gear so the TCC locks again.

- 2. Excessive Clutch Slip – SafeLock®** will delay locking the torque converter until the amount of slip is low. It uses the same criteria as the factory computer to engage the clutch. This ensures **lockup-mate®** is not causing additional wear to the clutch plate.

OFF

When Protection Mode is OFF, **lockup-mate**® activates (locks) the TCC when it can, and there-after keeps it locked regardless of the engine load (pedal position). It will only unlock again once the RPM drops below 1200.

It also disables the factory slip limit criteria and will lockup based on the sensitivity setting. The sensitivity adjustment (Page 13) can be used to adjust when the clutch will engage - higher values will engage with less slip.

So, in the above scenario at 60 KPH and locked, as you push harder on the accelerator pedal the TCC will remain locked, and the car will struggle to accelerate and the driveline might shudder. The driver must change down a gear to 3rd to increase RPM so the vehicle has the power to accelerate.

CAUTION

Switching Protection Mode OFF is for the expert driver who specifically wants full control. It relies on the driver making the right gear choices at the right time to not cause excessive engine strain or driveline shudder.

This mode may cause a small amount of extra wear on the torque converter clutch compared to the standard factory engagement limit, as the clutch can engage under high slip conditions, ie, when under medium to high acceleration.

The lockup sensitivity parameter can be adjusted higher to delay lockup when under power to reduce any wear on the clutch.

It's possible incorrect use in this mode may cause the engine trouble codes at lower RPM.

IMPORTANT INFORMATION - NT+ DIESEL ONLY

The following section is not applicable for the NS Diesel, and NS+ Petrol models.

lockup-mate® will avoid the quirk with the Pajero's AISIN transmission when a lockup kit is used, but there are some things you need to know about this feature.

UNDERSTANDING THE QUIRK IN THE NT+ DIESELS

In SPORT mode, the Pajero NT+ Diesel has an annoying quirk that sometimes:

- prevents the transmission selecting 2nd gear until above ~3000RPM (30 kph); and
- downshifts into 1st gear too early (30 kph).

The quirk is only generated when in high range, and is like a 'mode' that the transmission enters. No error codes are generated. The work-around is to simply shift the transmission into DRIVE when below 30 kph, and back to SPORT mode when above 30 kph.

lockup-mate® does this for you. SPORT mode is now like a hybrid SPORT/DRIVE to avoid the quirk.

Refer to Safety Feature for Engine Braking.

SAFETY FEATURE – Engine Braking

lockup-mate® does not shift into DRIVE at 30 kph when you are in 1st or 2nd gear (SPORT mode) and are decelerating using engine braking (foot off accelerator pedal). Shifting into DRIVE releases engine braking and has the potential to cause an accident if unexpected.

At 30 kph and below, the transmission may either stay in 2nd gear, or switch to 1st gear (ie. quirk is not avoided). Although the quirk is not avoided, unexpected switching into 1st gear has the effect of increased engine braking and is safer compared to the alternative of releasing engine braking by switching to DRIVE.

Alternatively, for predictable gear control and to avoid the 1st gear quirk, switch off **lockup-mate**® using the LED/switch. Down-hill descents that require engine braking will not over-heat the transmission.

HOW TO CLEAR THE QUIRK MODE

Starting and stopping the vehicle using the ignition key does NOT clear it.

To determine if the quirk mode is active:

Vehicle stationary - ignition or engine on - low or high range 4WD:

1. Turn off **lockup-mate**®
2. Put the transmission into SPORT
3. Try to change up to 2nd gear (shift lever +).

If the mode is active, it will not let you go into 2nd gear.

There are two ways to 'clear' the quirk mode:

1. Put the transmission into PARK, and double tap the LED/Switch to issue the command to reset engine codes (CEL). Alternatively, use your OBD2 reader (ScanGauge, UltraGauge, Torque Pro, etc) It MUST be in PARK. Even though there may be no engine trouble codes, this works.
2. In high range (2H,4H,4HLC) turn **lockup-mate**® OFF and drive normally to above 30 kph, such that the torque converter slips.

DRIVING IN SPORT MODE (2H, 4H, 4HLC)

If the feature is activated to avoid the quirk (default is ON), when the car is below 30 kph, the transmission is actually in DRIVE, and the green D is illuminated on the instrument cluster.

As the car accelerates above 30 kph, **lockup-mate**® switches back to SPORT, and the gear number is displayed (1st, 2nd or 3rd). You're now back in the normal SPORT mode.

As you accelerate from stop, you don't need to manually shift gears until you're above 30 kph.

Shifting + and – when below 30 kph (ie. in DRIVE) has no effect.

In concept, it's like a hybrid DRIVE/SPORT mode

lockup-mate® will only lock the torque converter clutch (TCC) when you're above 30 kph and in 'normal' SPORT mode.


It does not lockup the TCC when you're below 30 kph.

USING 4LLC (LOW RANGE 4WD)

This quirk is not caused when the 4LLc is used, however, you should clear it before using 4LLc.

When in 4LLc, if you've cleared the quirk mode, SPORT operates as you'd normally expect and TCC locks when in 2nd gear or above.

OPERATION OVERVIEW

ON/OFF	Tap LED to toggle ON or OFF. The kit will respond with a short flash ON, long flash OFF.
Check Engine Light 	To reset, double-tap LED in PARK. LED will flash once.
Dyno Mode	Press and hold LED for 5 seconds while plugging in the OBD2 connector.
LED Auto-Dim	To toggle ON & OFF, press and hold CANCEL for 4 seconds.
Protection Mode (SafeLock®)	Press and hold LED for >10 seconds. 5 flashes = ON, 2 flashes = OFF
Quirk – To Reset 1st Gear Quirk (NT+ Diesel only)	Double-tap LED in PARK. LED will flash once.
Configuration Mode	Ignition ON, Engine OFF. Press and hold CRUISE ON/OFF button for 5 seconds. P1 = Lockup Sensitivity P2 = Minimum Gear P3 = Night Mode/LED brightness P4 = Minimum Speed/DRIVE Activation Speed
Reset to factory defaults	Ignition ON, Engine OFF. Press and hold COAST/SET button for 5 seconds. It will then enter Configuration Mode with the factory defaults loaded.

LED BEHAVIOURS

Flashing whilst driving	Slip Alert Warning – change gears in SPORT Mode or back off acceleration to lockup
Flickering whilst stationary (in 3 second bursts)	Dyno Mode, hold down the LED for 5 seconds to exit.
Pulsing	Transmission is warming up.
Illuminated constantly whilst driving	TCC is locked.
No LED during driving	TCC is unlocked.
LED constantly illuminated	Configuration Mode, exit by tapping CRUISE ON/OFF button.
LED very dim	Headlights on and Auto-Dim active OR LED may be in Night Mode OR not facing driver.

WARRANTY POLICY

MM 4X4 is committed to providing quality products to you and this policy outlines our warranty against defective products manufactured by MM 4X4.

MM 4X4 warrants our manufactured products against defects in workmanship or materials for the Warranty Period. The warranty does not cover damage due to normal wear and tear (for example marks and scratches). This warranty is not applicable to products re-sold by MM 4X4. Warranties for these products are defined by the manufacturer.

MM 4X4 accepts no liability for damage to the vehicle as a result of product installation or use.

Warranty Period

MM 4X4 warrants MM 4X4 manufactured products for a period of 12 months commencing from the date of purchase.

Warranty Entitlement

To be entitled to claim a warranty claim, the customer must:

1. Fit the product according to the provided installations instructions;
2. Provide evidence of purchase;
3. Return the faulty product to MM 4X4 for assessment against the Warranty Entitlement Exclusions; and
4. Make a claim within the Warranty Period.

Warranty Entitlement Exclusions

The Customer is not entitled to a warranty claim if:

1. The defect is the result of misuse, inappropriate use, incorrect installation, or installation into a vehicle not supported by the product; or
2. The product has been modified; or
3. The product housing has been opened; or
4. The product has been damaged.

Making a Warranty Claim

To make a warranty claim:

1. Contact MM 4X4 (enquiries@mm4x4.com.au) to discuss the claim;
2. If directed by MM 4X4, return the product to the address provided by MM 4X4 (at the customer's expense) and ensure the product is accompanied with the following information:
 - a. A copy of the proof of purchase;
 - b. The return merchandise authorisation (RMA) number provided by MM 4X4;
 - c. The customer's name and contact details;
 - d. A return shipping address.

Upon receipt of the faulty product, MM 4X4 will assess the claim against the Warranty Entitlement and Exclusions.

For valid warranty claims, MM 4X4 will repair or replace the goods and ship them (free of charge) to the provided shipping address.

For warranty claims that are assessed as invalid, MM 4X4 will contact the customer to seek further direction, which may include:

- a. Reasons for denying the warranty claim;
- b. A quote to repair the fault product;
- c. Returning the faulty or repaired product to the provided shipping address (at the customer's expense);
- d. Agreement to dispose of the faulty product; or
- e. A quote to supply a replacement product.

Warranty Complaints and Enquiries

Our goods come with guarantees that cannot be excluded under the Australian Consumer Law. You are entitled to a replacement or refund for a major failure and compensation for any other reasonably foreseeable loss or damage. You are also entitled to have the goods repaired or replaced if the goods fail to be of acceptable quality and the failure does not amount to a major failure.



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