

# **ZF Trouble Shooting Guide**

**JLR 13 38 10\_2E**

## **General Information**

The ZF Trouble Shooting Guide (TSG) is a knowledge-based system. It is designed to aid diagnosis of transmission-related faults which have previously been encountered with ZF products in Land Rover applications.

The guide is intended to cover 6 speed transmission vehicles, which include the following;

L319	Discovery
L320	Range Rover Sport
L322	Range Rover

This file is intended as a supplement to the workshop manuals; specifically to accompany the Description & Operation, and Diagnosis and Testing sections.

It covers problems with both the transmissions themselves, and vehicle-related problems.

It has been compiled using information learned from investigations during assembly, field cases and at dealerships. The guide is a supplement based on 'real time' field issues and as such it will be updated on a regular basis.

If you have comments or questions relating to this publication please use the 'contact us' button on GTR.

November

2007

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# Carry Out Double Flush Action

CARRY OUT DOUBLE FLUSH ACTION

PLEASE OBSERVE ALL SAFETY RECOMMENDATIONS LISTED IN  
LR GTR 44.24.02 & 44.24.06

USING IDS - CONFIRM TRANSMISSION TEMPERATURE IS  
BELOW 30° CELSIUS

DRAIN OIL AND REFILL TRANSMISSION -  
REFER TO GTR 44.24.02

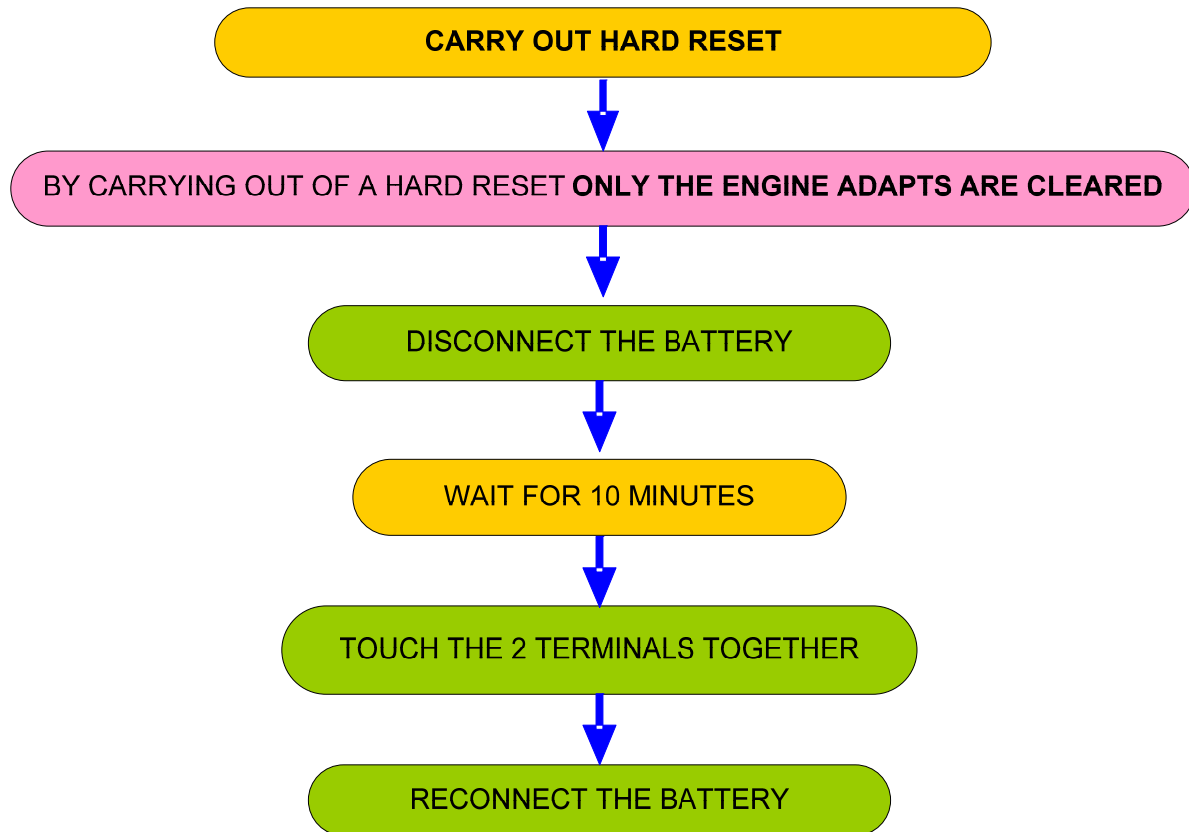
WITH GEAR SELECTOR IN POSITION "PARK" RUN THE ENGINE AT 1750 RPM  
FOR 3 MINUTES AND THEN SWITCH THE ENGINE OFF

USING IDS - ENSURE TRANSMISSION TEMPERATURE IS  
BELOW 40° CELSIUS BEFORE CONTINUING TO THE NEXT STEP

DRAIN OIL AND REFILL TRANSMISSION -  
REFER TO GTR 44.24.02

MAKE THE FINAL OIL LEVEL SETTING -  
REFER TO GTR 44.22.06

# Carry Out Hard Reset (Battery) – Clear Engine Adaptions



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THE TRANSMISSION ADAPPTIONS  
ARE NOT CLEARED BY  
CARRYING OUT A HARD RESET

THE TRANSMISSION ADAPPTIONS  
MUST BE CLEARED BY USING  
THE DEALER SPECIAL TOOL  
(SPECIAL APPLICATION OPTION)

# Clear Transmission Adaption Values (with Dealer Special Tool)

**„THE GOLDEN 6HP26 RULE“:  
BEFORE FLASHING A TRANSMISSION  
THE TRANSMISSION ADAPTIONS MUST BE RESET WITHOUT EXCEPTION**

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**CLEAR THE TRANSMISSION ADAPTIONS**



THE TRANSMISSION ADAPTIONS ARE NOT CLEARED BY CARRYING OUT A HARD RESET

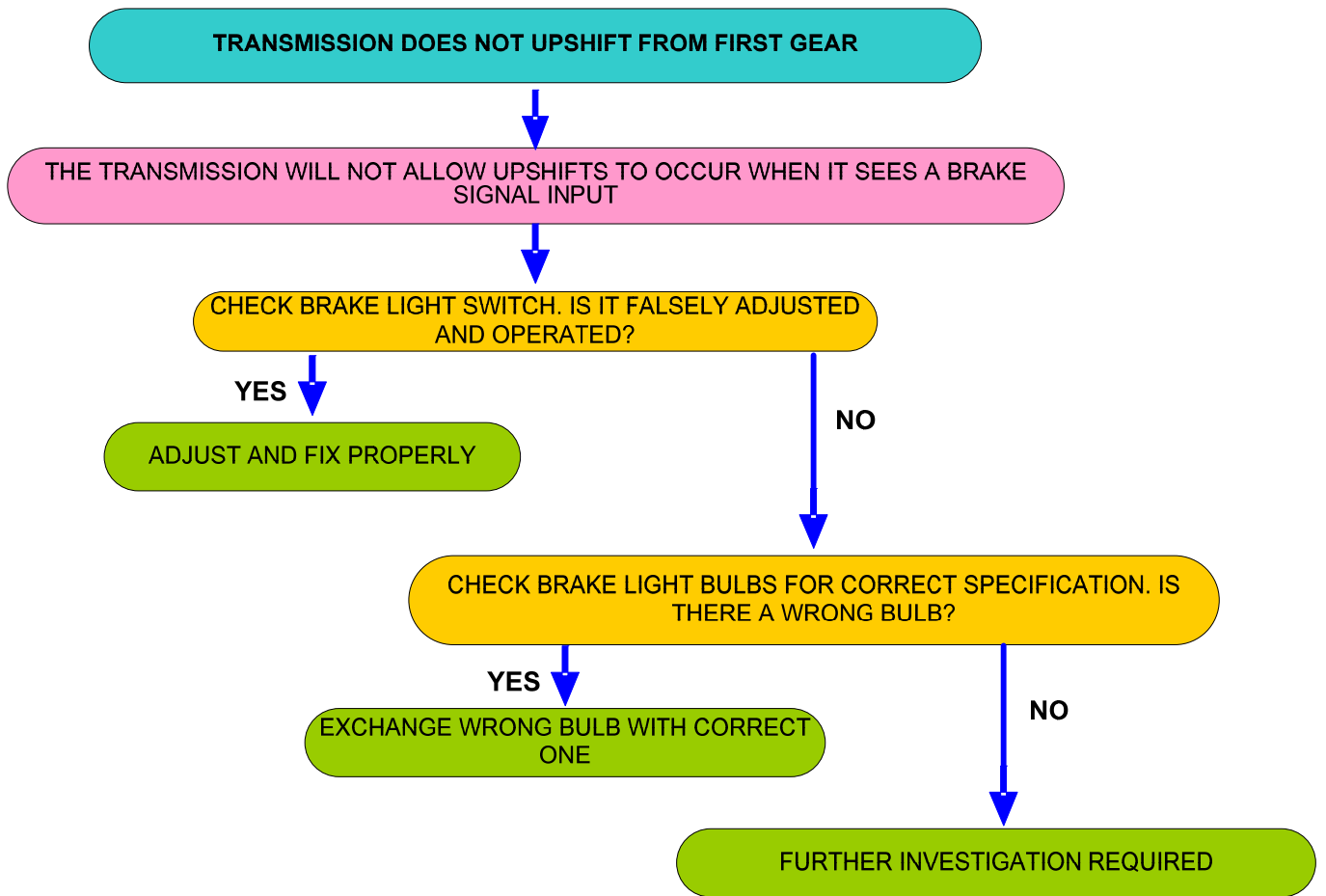


THE TRANSMISSION ADAPTIONS MUST BE CLEARED MANUALLY



USE THE DEALER SPECIAL TOOL  
(SPECIAL APPLICATION OPTION)

# Does Not Upshift From First Gear



# Grinding Noise At Constant Speed

CYCLICAL GRINDING NOISE WHEN PULL UP A GRADIENT AT ABOUT 40 MPH OR/AND POSSIBLE THUMP FROM TRANSMISSION AFTER COMING TO A COMPLETE STOP

THESE COMPLAINTS CAN BE CAUSED BY OIL COOLER FLUID / GLYCOL / WATER IN THE TRANSMISSION OIL

CHECK CONDITION OF OIL BY DRAINING OIL INTO A CLEAN CONTAINER. DOES THE ATF LOOK LIKE COFFEE OR HONEY?

YES

CONTACT DTS HOTLINE

NO

CHECK THE ATF SAMPLE WITH AN OIL TEST (SUCH AS HANA TEST). CAN YOU CONFIRM OIL COOLER FLUID / GLYCOL?

YES

CONTACT DTS HOTLINE

NO

CARRY OUT OIL COOLER/RADIATOR PRESSURE TEST. ANY LEAKAGE?

YES

CONTACT DTS HOTLINE

NO

FURTHER INVESTIGATION REQUIRED



# Harsh Roll Out Shifts 2-1 (MY05 and MY06)

HARSH ROLL OUT SHIFTS 2-1

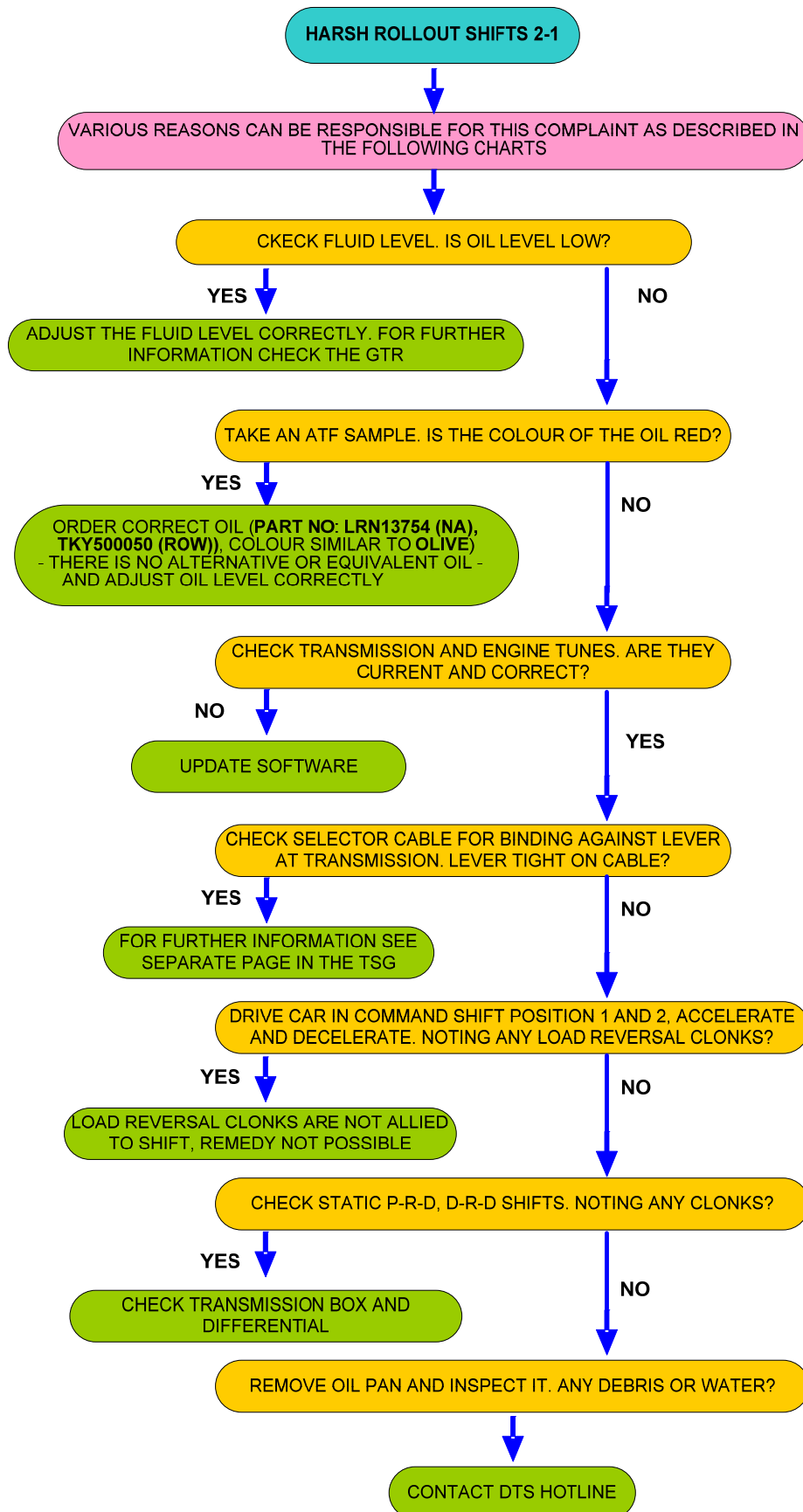
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graph TD; A[HARSH ROLL OUT SHIFTS 2-1] --> B[COMPLAINT MAY BE CAUSED AS A RESULT OF WATER CONTAMINATION IN THE TRANSMISSION FROM MANUFACTURING AT LAND ROVER]; B --> C[SEE LAND ROVER TECHNICAL BULLETIN NO. LM307-001NAS (NA) RESP. LM307-005 (ROW)];
```

COMPLAINT MAY BE CAUSED AS A RESULT OF WATER CONTAMINATION IN THE TRANSMISSION FROM MANUFACTURING AT LAND ROVER

SEE LAND ROVER TECHNICAL BULLETIN NO. **LM307-001NAS** (NA)  
RESP. **LM307-005** (ROW)



# Harsh Roll Out Shifts 2-1



# Holds 1st Gear After Cold Start (MY07)

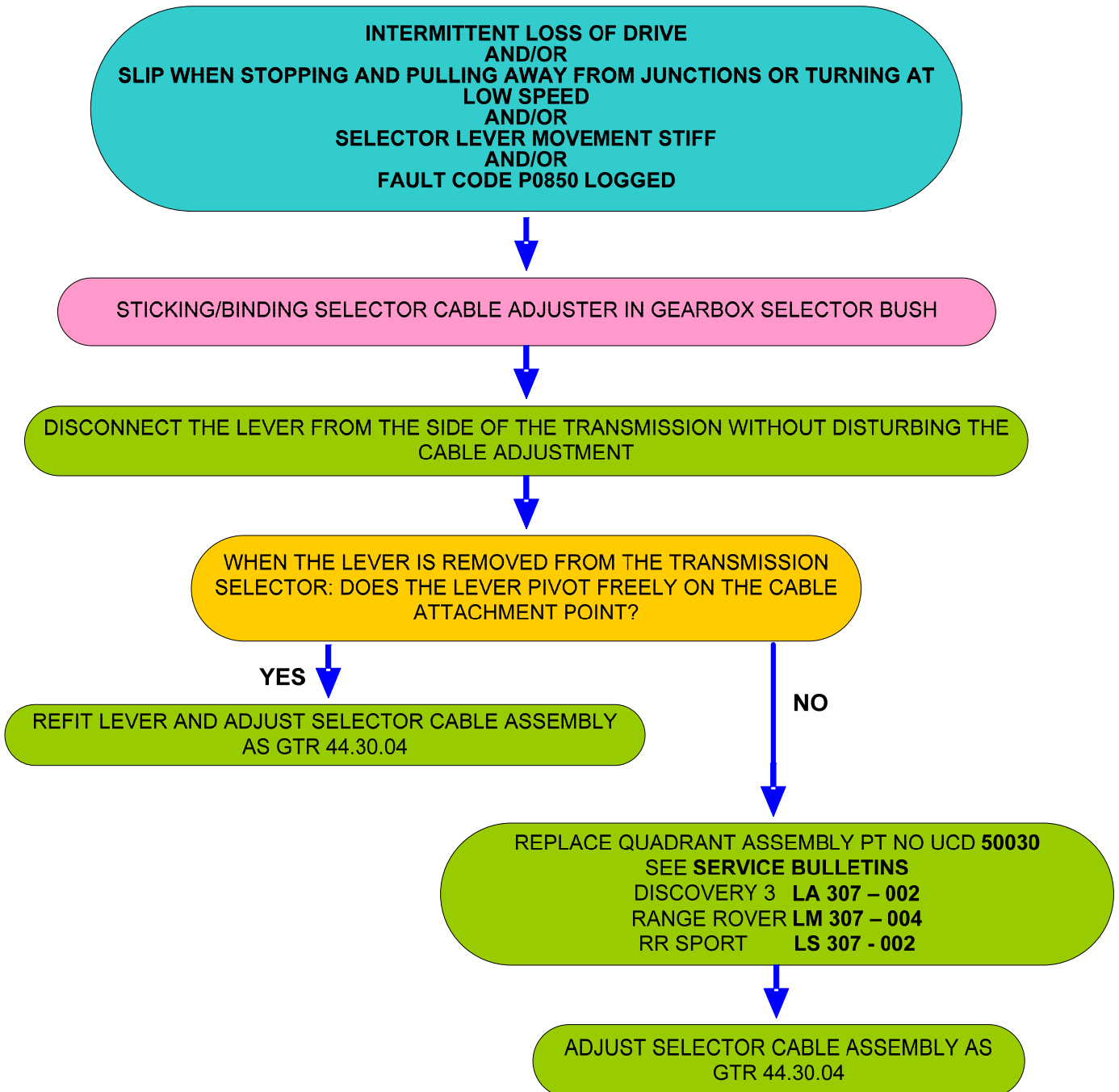
TRANSMISSION HOLDS FIRST GEAR AFTER COLD START

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graph TD; A[TRANSMISSION HOLDS FIRST GEAR AFTER COLD START] --> B[IF THE VEHICLE IS DRIVEN UPHILL WITH COLD ENGINE, THE TRANSMISSION WILL NOT UPSHIFT UNTIL HIGH ENGINE REVS DUE TO THE TRANSMISSION GRADIENT MODE STRATEGY IN MY 2007]; B --> C[NO CHANGE POSSIBLE. IN MY 2008 THIS STRATEGY HAS CHANGED IN ORDER TO ADDRESS THIS COMPLAINT];
```

IF THE VEHICLE IS DRIVEN UPHILL WITH COLD ENGINE, THE TRANSMISSION WILL NOT UPSHIFT UNTIL HIGH ENGINE REVS DUE TO THE TRANSMISSION GRADIENT MODE STRATEGY IN MY 2007

NO CHANGE POSSIBLE. IN MY 2008 THIS STRATEGY HAS CHANGED IN ORDER TO ADDRESS THIS COMPLAINT

# Intermittent Slip – Transmission Switches To N - Bump - Jerky - Selector Lever



# No Upshift After Acceleration

NO UPSHIFT AFTER DOWNSHIFT TO ACCELERATE

THE TRANSMISSION HAS A CORNER RECOGNITION MODE THAT USES FRONT WHEEL SPEEDS TO DETERMINE IF THE CAR IS IN A CORNER

CHECK TYRES: ARE THE TYRES OF THE CORRECT SIZE, AIR PRESSURE AND EQUAL TREAD?

NO

FIT CORRECT TYRES

YES

CHECK TYRES: IS THE SPARE TYRE USED?

YES

NO

USE DEALER DIAGNOSTIC TOOL TO CHECK THE FRONT WHEEL SPEEDS

DEALER DIAGNOSTIC TOOL:  
DRIVING STRAIGHT THE FRONT  
WHEEL SPEEDS SHOULD BE  
EXACTLY THE SAME

DEALER DIAGNOSTIC TOOL: USE **kph** OPTION

A VARIANCE OF **1 kph** CAN CAUSE CORNER RECOGNITION TO ENGAGE

ANY DIFFERENCE IN FRONT WHEEL SPEED?

YES

FIT CORRECT TYRES

NO

TRY MORE TO LOCATE THE FAILURE  
(ANY FAULT CODES LOGGED?)

# P0500 Vehicle Speed Sensor – Intermittant Loss Of Drive

INTERMITTENT LOSS OF DRIVE, FAULT CODE P0500 VEHICLE SPEED SENSOR LOGGED



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graph TD; A[INTERMITTENT LOSS OF DRIVE, FAULT CODE P0500 VEHICLE SPEED SENSOR LOGGED] --> B[WHEN ONE OF THE FOUR DRIVESHAFTS BECOME DISENGAGED THE VEHICLE WILL LOOSE DRIVE INTERMITTENTLY WHEN THE SPLINES BECOME DISENGAGED FROM THE DIFFERENTIAL. CAUSE IS THE SECURING CLIP ON THE END OF THE DRIVESHAFT NOT ENGAGED CORRECTLY]; B --> C[CAREFULLY EXAMINE ALL DRIVESHAFTS FOR SECURE FITMENT INTO THE DIFFERENTIAL];
```

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CAREFULLY EXAMINE ALL DRIVESHAFTS FOR SECURE FITMENT INTO THE DIFFERENTIAL

# **P0601 Internal Mechatronic Unit Fault (07MY)**

**FAULT CODE P0601 LOGGED**

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graph TD; A[FAULT CODE P0601 LOGGED] --> B[INTERNAL MECHATRONIC UNIT FAULT]; B --> C[CONTACT DTS HOTLINE];
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**INTERNAL MECHATRONIC UNIT FAULT**



**CONTACT DTS HOTLINE**

# P0659 Unable To Get Transmission Out Of Park

UNABLE TO GET TRANSMISSION OUT OF PARK,  
FAULT CODE P0659 LOGGED

DEALER DIAGNOSTIC TOOL SUGGESTS THAT THE FAULT RELATES TO AN INTERNAL  
TRANSMISSION ACTUATOR/SOLENOID. THIS INFORMATION IS MISLEADING, THE FAULT  
RELATES TO THE SHIFT LOCK SOLENOID AT THE SELECTOR MECHANISM IN THE CAR

CHECK PINS C2658-9 AND C2658-10 (SELECTOR MODULE  
CONNECTOR). FOR CORROSION

YES

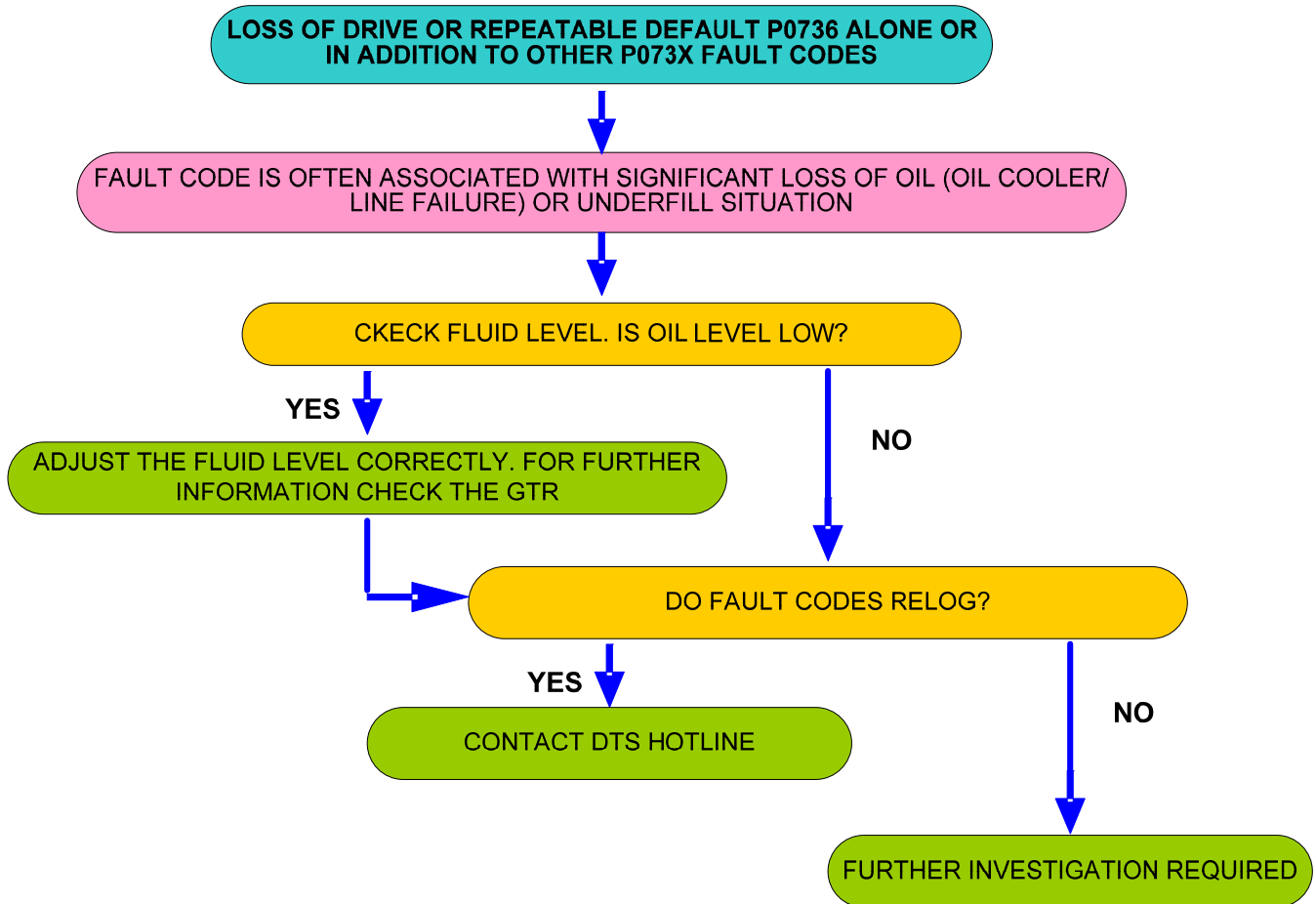
REPAIR/REPLACE DEFECTIVE PINS

NO

FURTHER INVESTIGATION REQUIRED

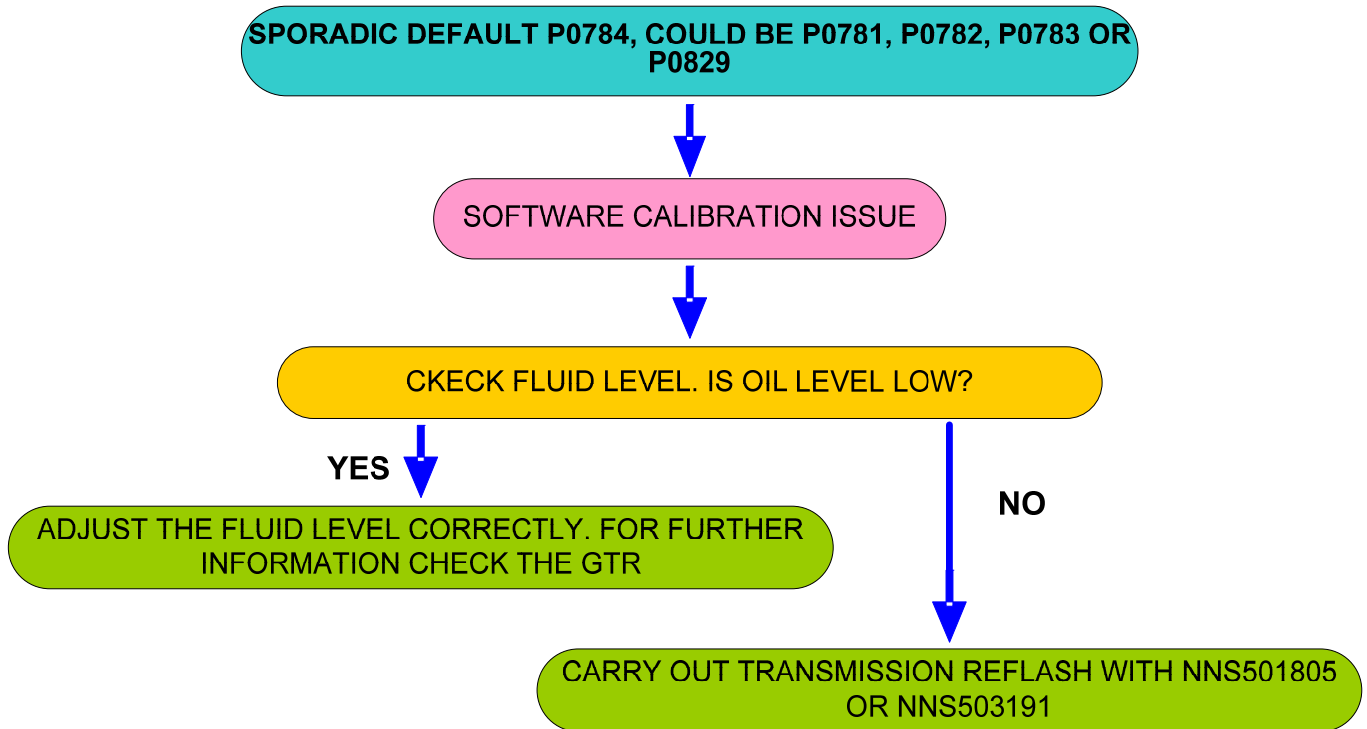
# P0736, P073X

## Intermittent Loss Of Drive

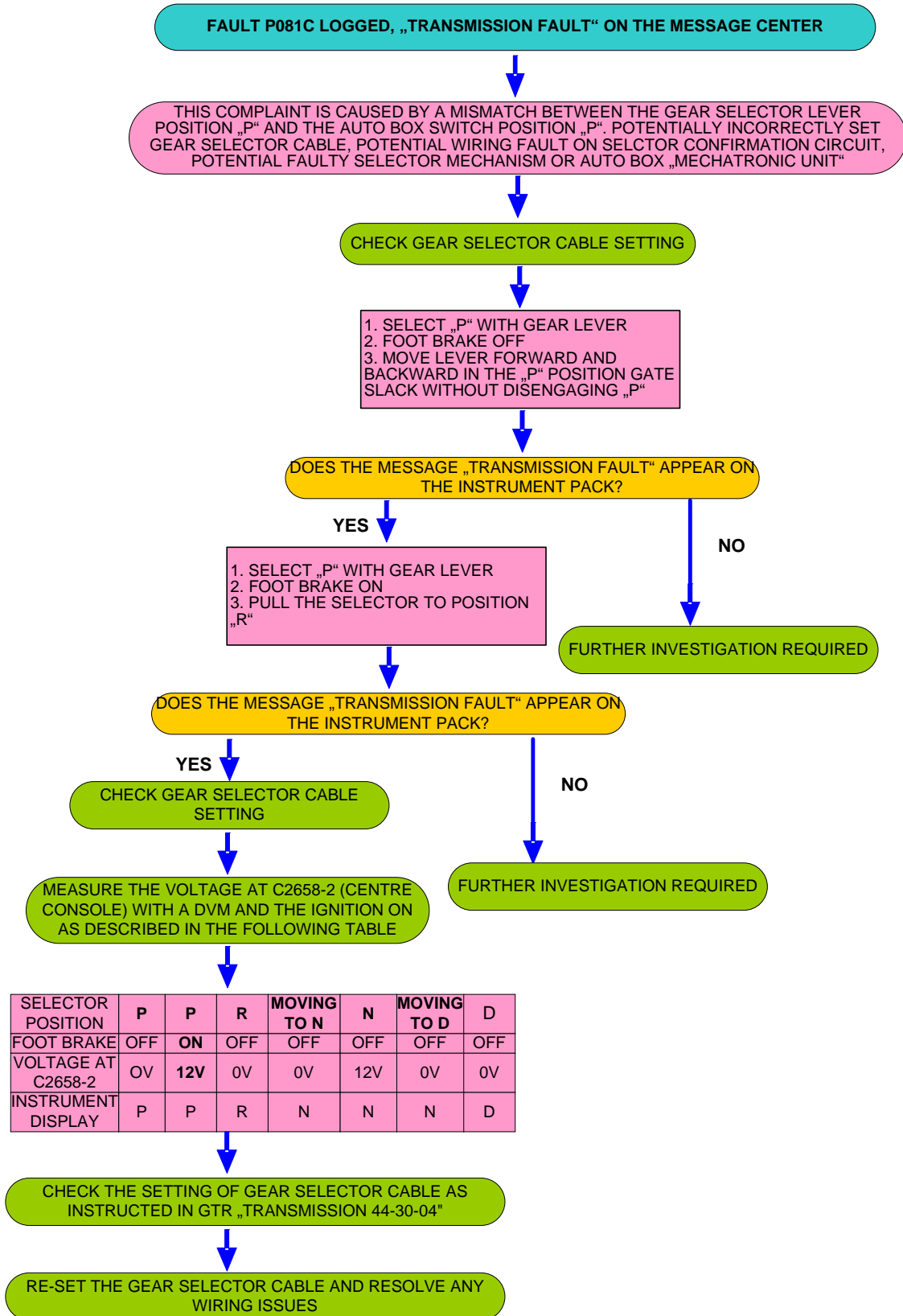




# P0784, P078X, P0829 Sporadic Fault (MY05 and MY06)



# P081C Transmission Fault On Message Centre – Selector Cable



# P2743 Rear Differential – Not Transmission Temperature Sensor

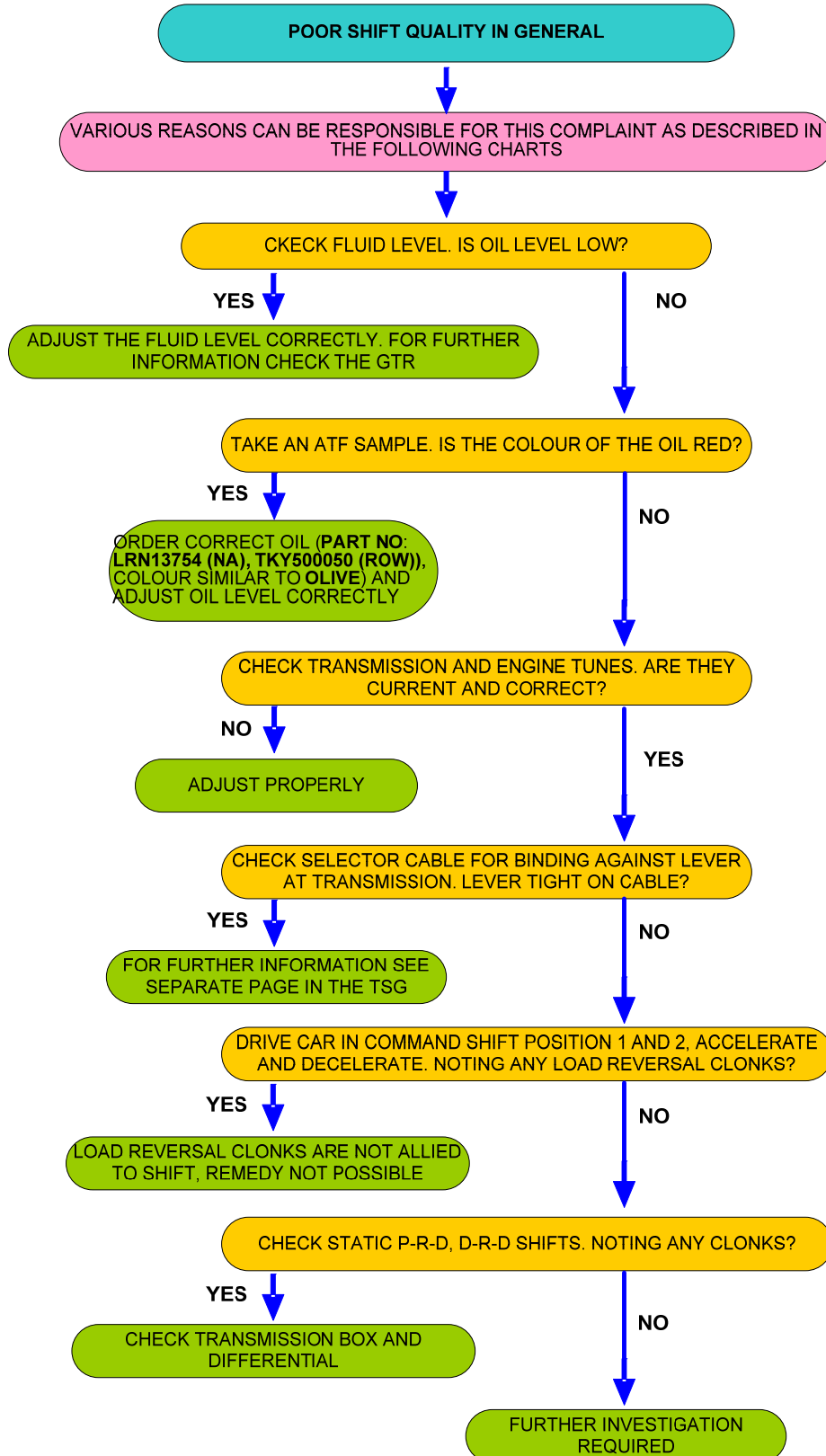
FAULT CODE P2743 LOGGED

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graph TD; A[FAULT CODE P2743 LOGGED] --> B[DEALER DIAGNOSTIC TOOL SUGGESTS THAT THE FAULT RELATES TO AN INTERNAL TRANSMISSION TEMPERATURE SENSOR. THIS INFORMATION IS MISLEADING, THE FAULT RELATES TO THE REAR DIFFERENTIAL AND IS NOT RELATED TO THE AUTO TRANSMISSION FUNCTION]; B --> C[SEE LAND ROVER DIAGNOSTICS FOR REAR DIFFERENTIAL];
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SEE LAND ROVER DIAGNOSTICS FOR REAR DIFFERENTIAL

# Poor Shift Quality (General)



# Software Calibration Identification

**„THE GOLDEN 6HP26 RULE“:  
BEFORE FLASHING A TRANSMISSION  
THE TRANSMISSION ADAPPTIONS MUST BE RESET WITHOUT EXCEPTION**

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**IDENTIFY SOFTWARE LEVEL WITH DEALER DIAGNOSTIC TOOL  
(IDS/WDS) BY USING THE S93 REPORT FUNCTION**

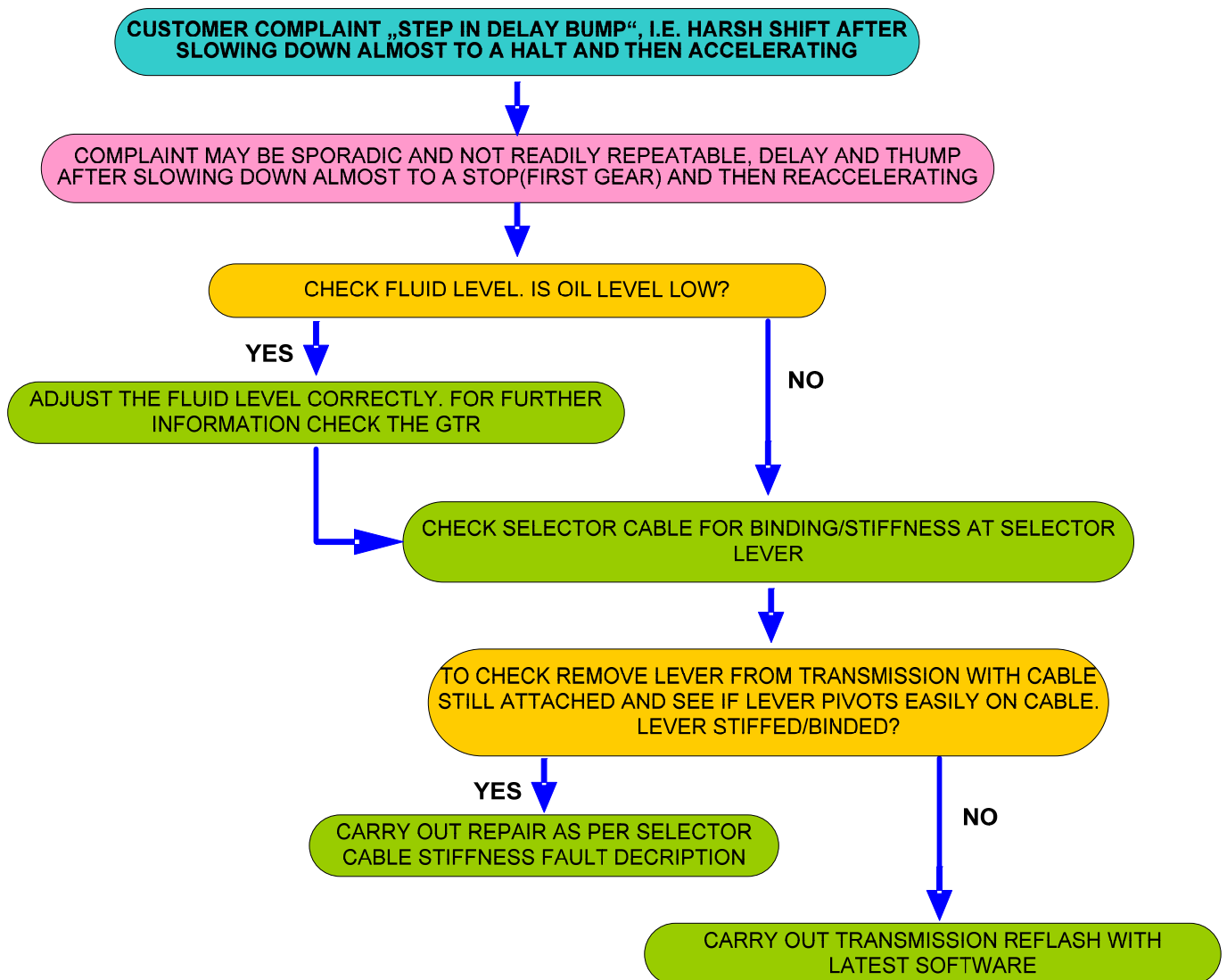


**SOFTWARE CALIBRATION IDENTIFIER WILL NOT BE SHOWN IF MODULE INTEGRITY  
TEST IS PERFORMED**



**TYPICALLY CALIBRATION IDENTIFIER IS AN **NNSXXXXX**  
NUMBER AND **NOT** AN **NNVXXXXX****

# Step In Delay - Bump (MY05 and MY06)



# Surge – On Acceleration Under Light Load

**SURGE ON ACCELERATION UNDER LIGHT LOAD**

VEHICLE CAN BE FELT TO SURGE AND TACHOMETER NEEDLE FLUCTUATES

CARRY OUT DOUBLE FLUSH ACTION

PLEASE OBSERVE ALL SAFETY RECOMMENDATIONS LISTED IN LR GTR 44.24.02 & 44.24.06

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DRAIN OIL AND REFILL TRANSMISSION - REFER TO GTR 44.24.02

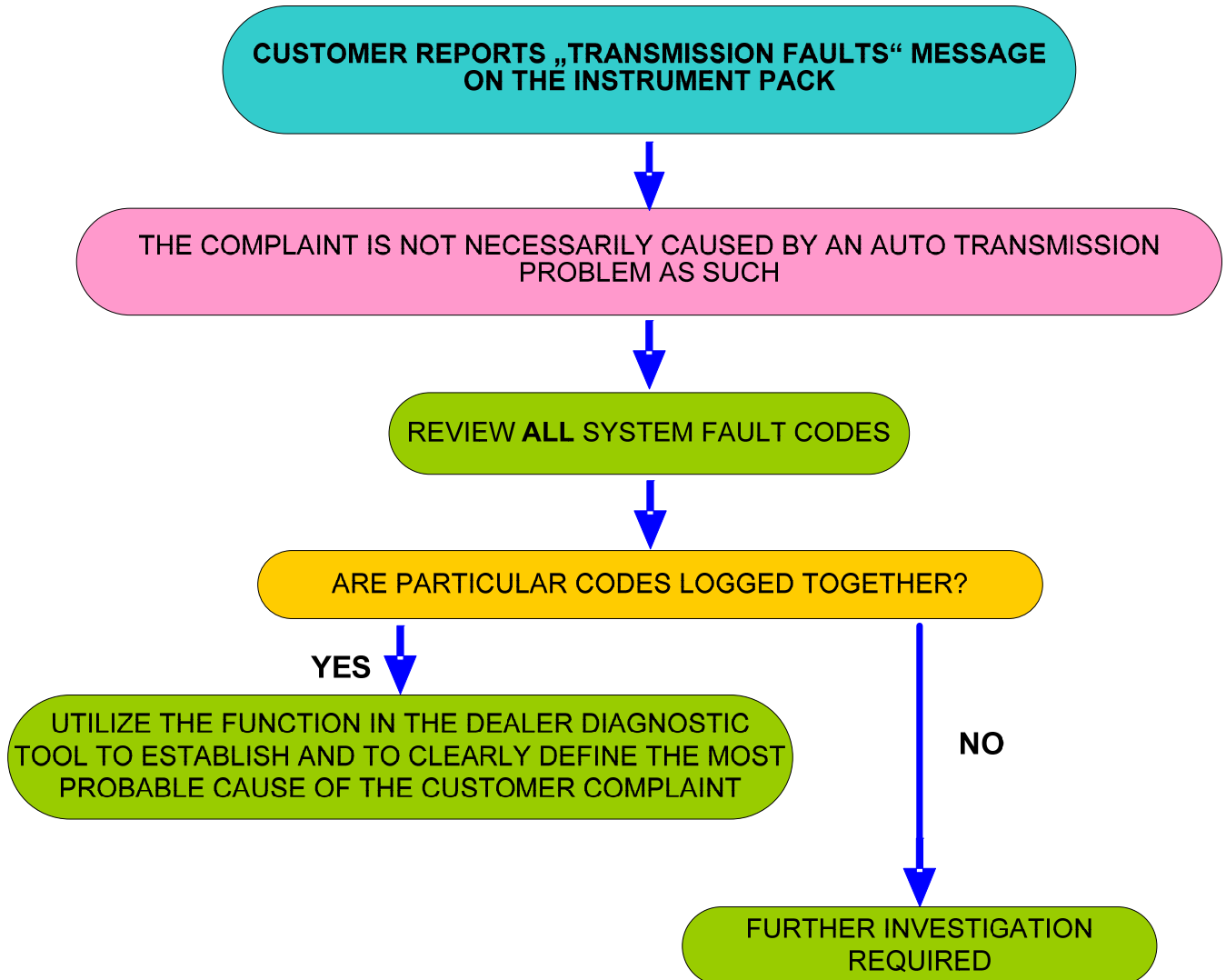
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DRAIN OIL AND REFILL TRANSMISSION - REFER TO GTR 44.24.02

MAKE THE FINAL OIL LEVEL SETTING - REFER TO GTR 44.24.06

# Transmission Fault Message On Instrument Pack





# Transmission Overheat - Message

„TRANSMISSION OVERHEAT“ MESSAGE ON INSTRUMENT PACK

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graph TD; A[„TRANSMISSION OVERHEAT“ MESSAGE ON INSTRUMENT PACK] --> B[DEALERS ARE NOT ABLE TO CLEAR OVERHEAT MESSAGE FROM INSTRUMENT PACK, NO FAULT CODES FOR OVERHEATING]; B --> C[CARRY OUT HARD RESET ON VEHICLE TO RESOLVE COMPLAINT];
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DEALERS ARE NOT ABLE TO CLEAR OVERHEAT MESSAGE FROM INSTRUMENT PACK, NO FAULT CODES FOR OVERHEATING

CARRY OUT HARD RESET ON VEHICLE TO RESOLVE COMPLAINT

# Vibration At 70mph – 95kph

CYCLICAL VIBRATION FELT WHEN THROTTLE DEPRESSED AT 70 MPH (115 KPH) 2000 RPM (ENGINE SPEED) IN 6TH GEAR, FEELS LIKE A TORQUE CONVERTER VIBRATION, CAN ALSO BE REPRODUCED IN 5<sup>TH</sup> GEAR AND 4<sup>TH</sup> GEAR AT 2000 RPM (ENGINE SPEED)



PROBLEM IS CAUSED BY ENGINE TUNE RELATED PROBLEM (MISSFIRE)



COMPLAINT CAN BE SOLVED BY FLASHING THE LATEST ENGINE TUNE