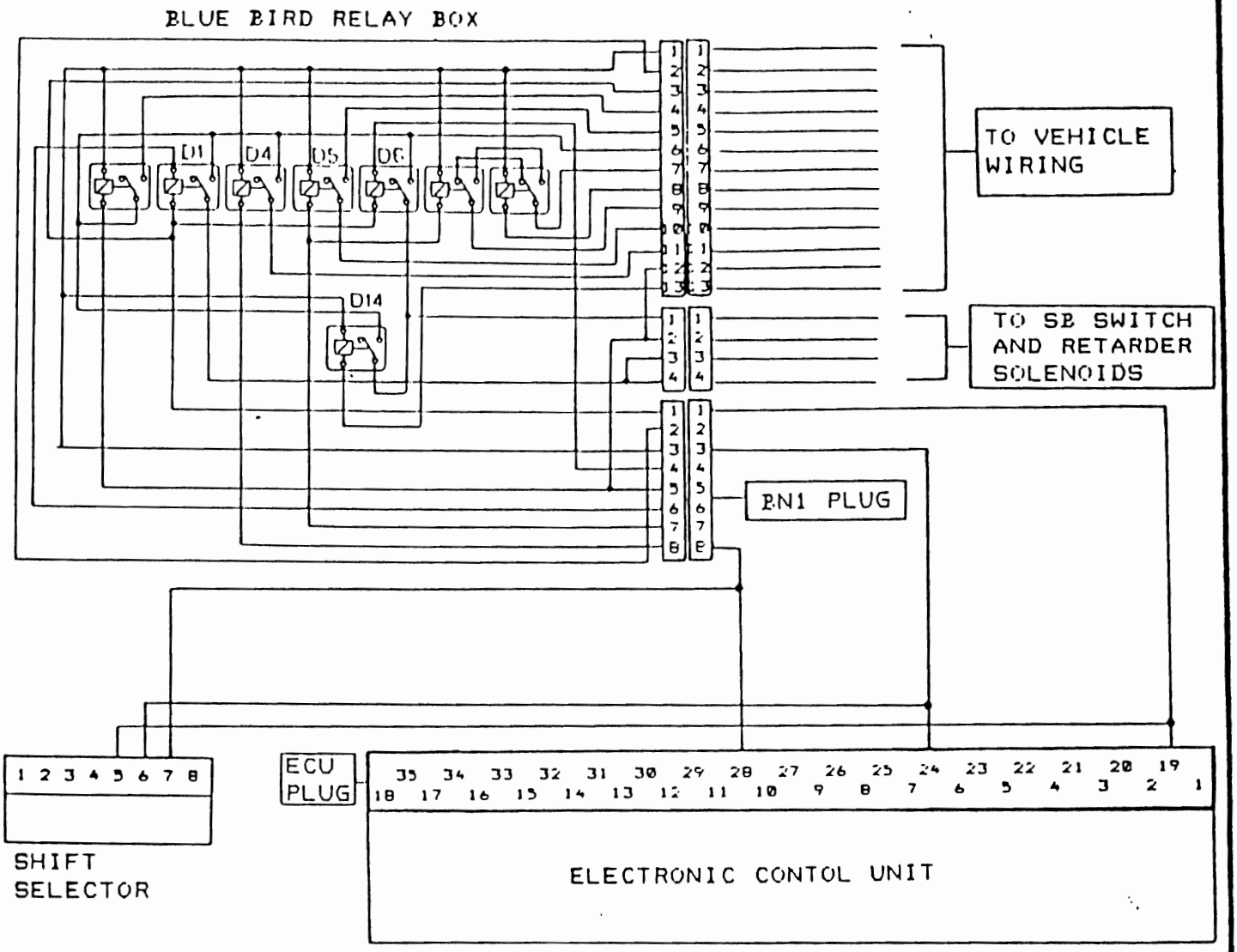
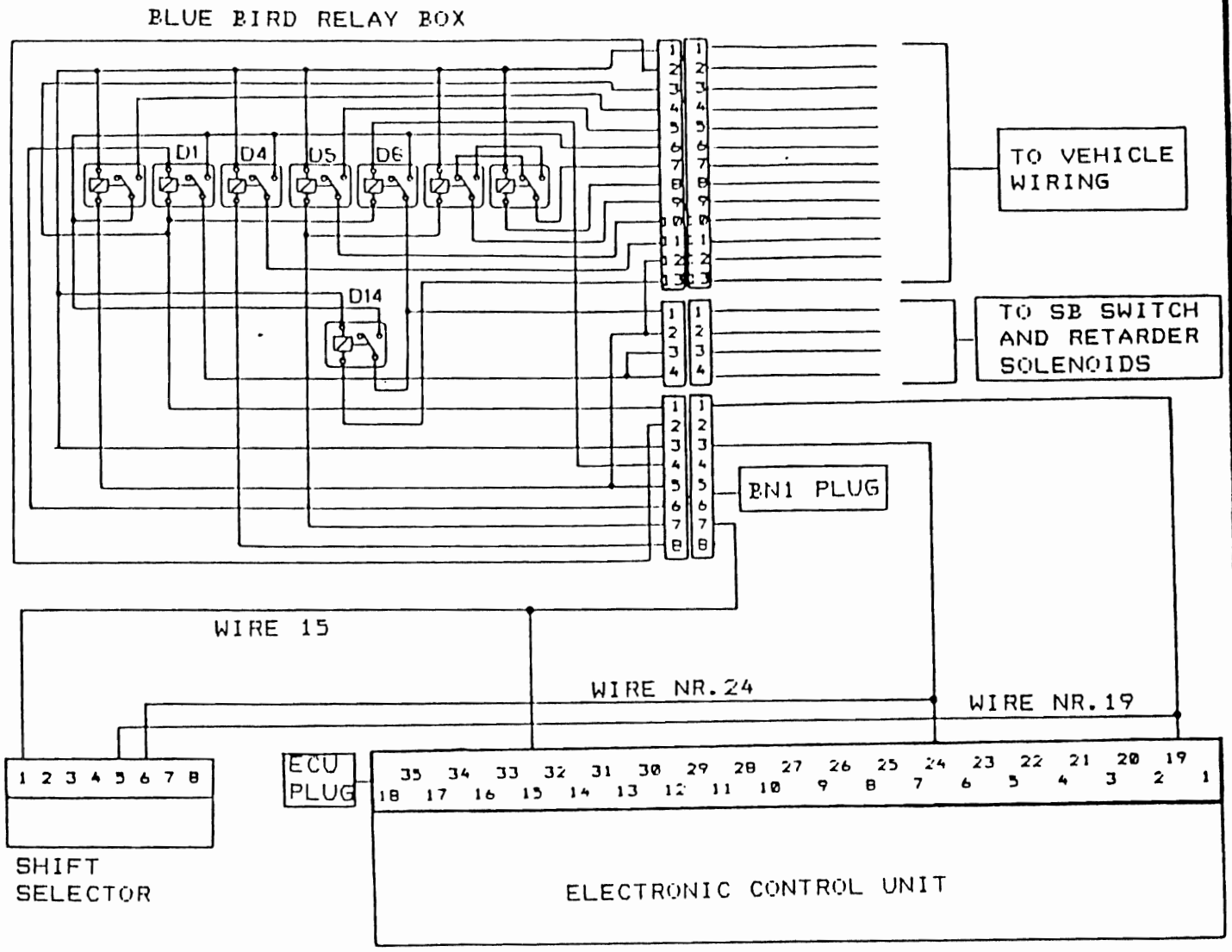
SHIFT RANGE SELECTOR WIRING
TROUBLESHOOTING REVERSE AND BACK UP LIGHTS



TROUBLE SHOOTING PROCEDURE:

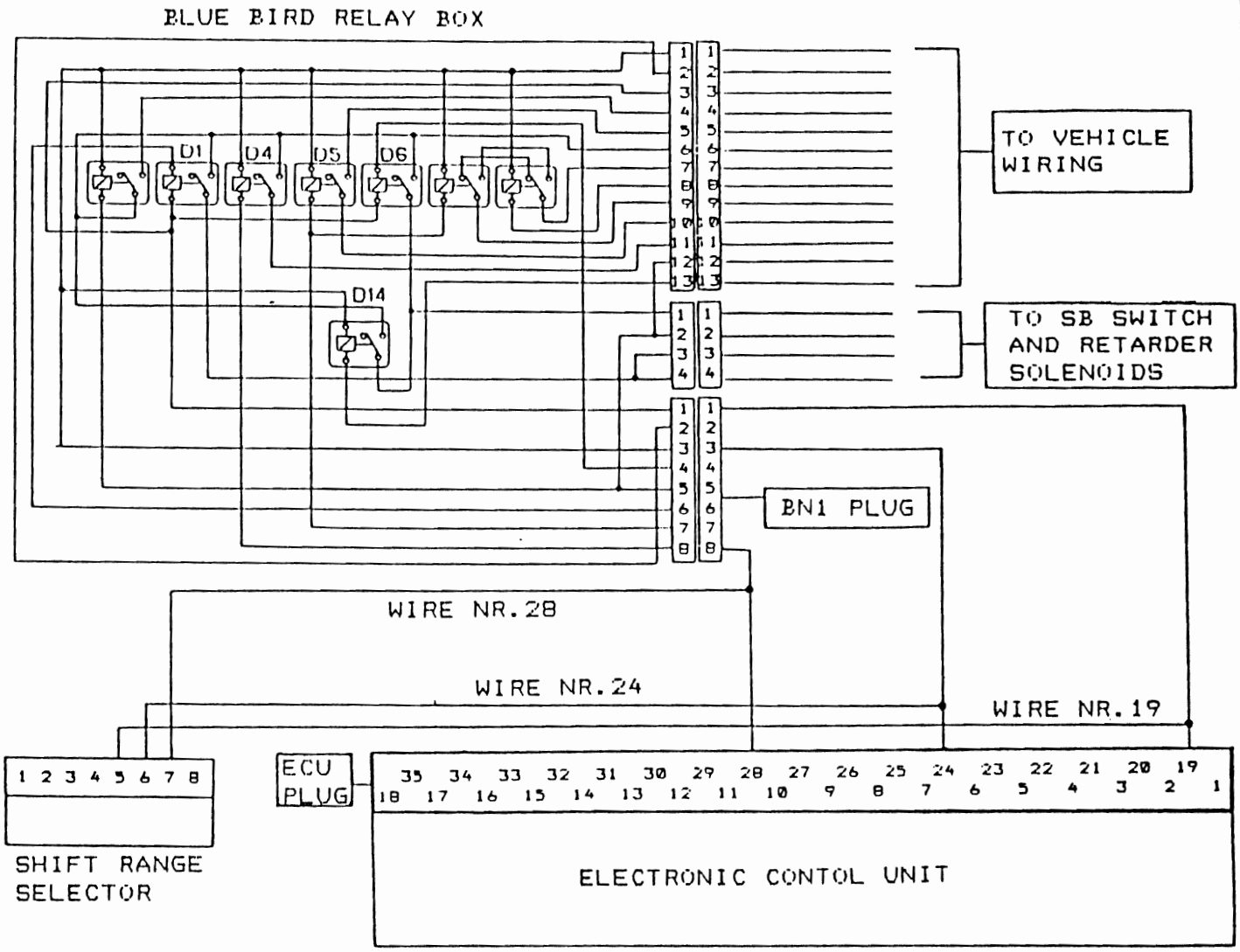
1. SELECT THE 25 VOLT RANGE ON THE VOLT METER.
2. CONNECT THE COMMON LEAD PROBE TO NR.3 PIN OF THE VEHICLE WIRING PLUG.
3. CONNECT THE VOLT LEAD PROBE TO NR.11 PIN OF THE VEHICLE WIRING PLUG.
4. TURN ON THE IGNITION. SELECT R ON THE SHIFT SELECTOR.
5. THE READING ON THE METER SCALE SHOULD READ 12 VOLTS.
6. IF THE READING ON THE VOLT METER IS Ø PROCEED WITH THE TEST.
   IF THE READING IS 12 VOLTS, BUT THE BACK UP LIGHTS DO NOT LIGHT, THE WIRING FROM NR.11 PIN TO THE BACK UP LIGHTS CIRCUIT IS DEFECTIVE.
   CHECK VEHICLE WIRING SCHEMATIC FOR DETAILS.
7. TURN OFF THE IGNITION.
8. MOVE THE VOLT LEAD PROBE TO NR.1 PIN OF THE VEHICLE WIRING PLUG.
9. MOVE THE COMMON LEAD PROBE TO NR.8 PIN OF THE BN1 PLUG.
10. TURN ON THE IGNITION.
11. IF THR READING ON THE METER SCALE IS 12 VOLTS, BUT THE BACK UP LIGHTS DO NOT LIGHT, THE RELAY BOX IS DEFECTIVE.
    IF THE READING IS Ø VOLTS, THEN THE WIRE TO THE SHIFT SELECTOR IS DEFECTIVE.
    NOTE: FOLLOW PROCEDURES FOR CONTINUITY CHECK.

SHIFT SELECTOR WIRING
NEUTRAL START INTERLOCK



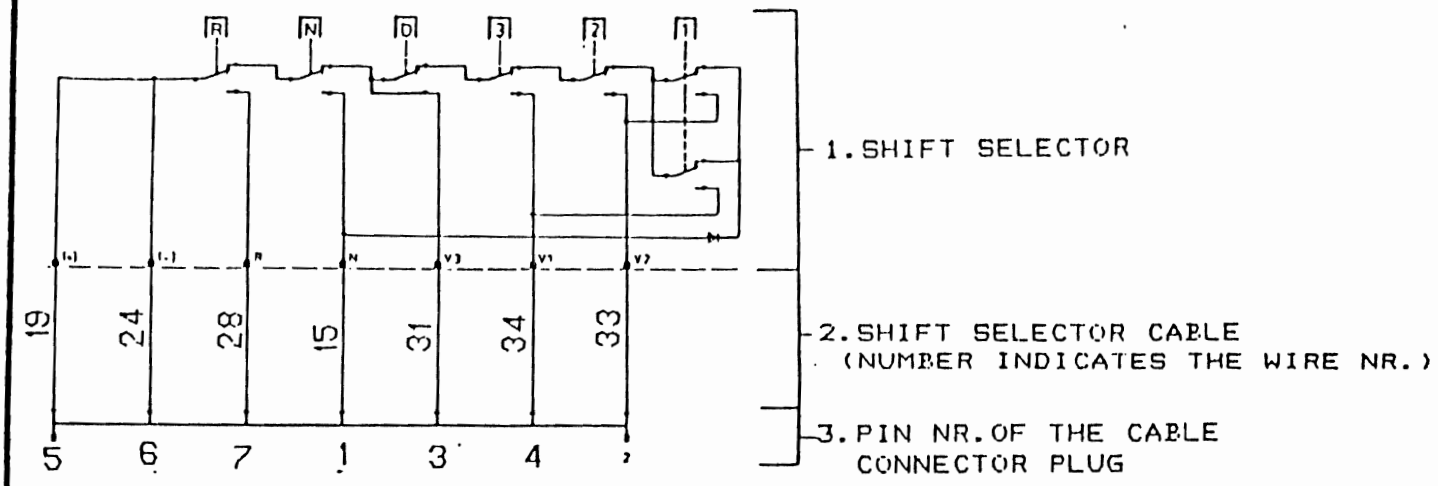
WHEN SELECTING N ON THE SHIFT SELECTOR, A GROUND SIGNAL WILL BE GIVEN AT NR.1 PIN OF THE SHIFT SELECTOR PLUG.
AND WIRE NR.15 TO NR.1 PIN IS PART OF THE MAIN TRANSMISSION WIRING HARNESS AND IS ALSO CONNECTED TO THE ECU AND TO PIN NR.7 OF THE CONNECTOR BN1 OF THE RELAY BOX.
GROUNDING THE NR.7 PIN OF THE RELAY BOX WILL ACTIVATE THE D5 RELAY COIL.
AS THE RELAY CONTACT IS CLOSED NR.5 PIN TO THE VEHICLE WIRING WILL CARRY +12 VOLTS, WHICH ARE USED TO ACTIVATE THE STARTER SOLENOID.
CHECK VEHICLE WIRING SCHEMATIC FOR DETAILS.
GROUNDING NR.15 PIN OF THE ECU WILL SELECT NEUTRAL FUNCTION.
WIRE NR.24 IS THE GROUND FOR THE ECU ON NR.24 PIN AND THE GROUND CONNECTION FOR THE SHIFT SELECTOR ON NR.6 PIN AT THE SHIFT SELECTOR PLUG.

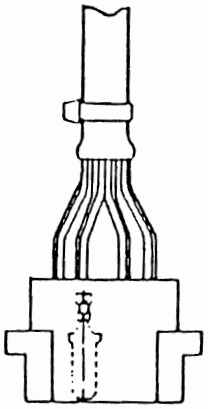
SHIFT RANGE SELECTOR WIRING
REVERSE AND BACK UP LIGHTS



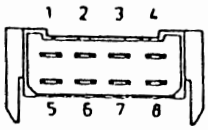
WHEN SELECTING R ON THE SHIFT SELECTOR, A GROUND SIGNAL WILL BE GIVEN AT NR.7 PIN OF THE SHIFT SELECTOR PLUG.
THE WIRE NR.28 AT NR.7 PIN IS PART OF THE MAIN TRANSMISSION WIRING HARNESS AND IS ALSO CONNECTED TO THE ECU AND TO PIN NR.8 OF THE CONNECTOR BN1 OF THE RELAY BOX.
GROUNDING THE NR.8 PIN OF THE RELAY BOX WILL ACTIVATE THE D4 RELAY COIL. AS THE RELAY CONTACT IS CLOSED NR.11 PIN TO THE VEHICLE WIRING WILL CARRY +12 VOLTS, WHICH ARE USED FOR THE BACK UP LIGHTS. CHECK VEHICLE WIRING SCHEMATIC FOR DETAILS.
GROUNDING NR.28 PIN OF THE ECU WILL SELECT REVERSE GEAR.
WIRE NR.24 IS THE GROUND FOR THE ECU ON NR.24 PIN AND THE GROUND CONNECTION FOR THE SHIFT SELECTOR ON NR.6 PIN AT THE SHIFT SELECTOR PLUG.

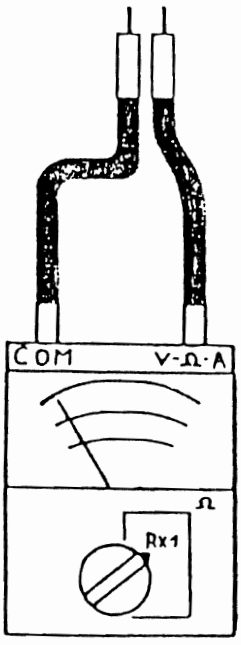
SHIFT SELECTOR TROUBLE SHOOTING





CONNECTOR PLUG



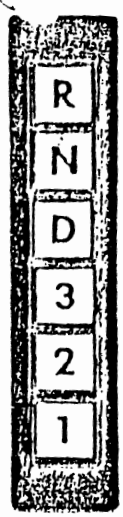


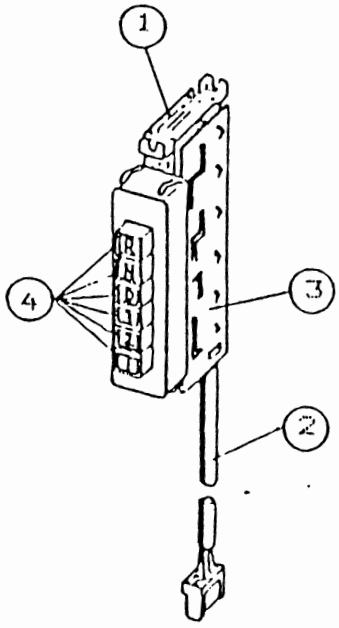
TEST PROCEDURES:

TURN VOLTMETER SELECTOR KNOB TO OHM RX1
THE READING ON THE SCALE SHOULD SHOW ∞ OHMS
TOUCH THE TWO PROBES TOGETHER THE READING
ON THE METER SCALE SHOULD DROP TO Ø OHMS.
THIS MODE IS USED TO CHECK CONTINUITY.

1. CONNECT THE COMMON LEAD PROBE TO NR.6 PIN OF THE CONNECTOR PLUG
2. CONNECT THE OHM LEAD PROBE TO NR.7 PIN AND PUSH THE R BUTTON
   AS THE BUTTON IS PUSHED THE METER READING SHOULD DROP TO Ø, SHOWING THAT THE REVERSE SWITCH IS WORKING PROPERLY.
3. SINCE NR.6 PIN IS THE COMMON WIRE TO ALL SWITCHES, LEAVE THE COMMON LEAD PROBE OF THE METER CONNECTED TO THE PIN NR.6
4. MOVE THE OHM LEAD PROBE FROM NR.7 PIN TO NR.1 PIN PUSH THE N BUTTON, THE READING OF THE METER SHOULD DROP TO Ø, SHOWING THAT THE N SWITCH IS WORKING PROPERLY.
5. MOVE THE OHM LEAD FROM NR.1 PIN TO NR.3 PIN PUSH THE D BUTTON, THE READING OF THE METER SHOULD DROP TO Ø, SHOWING THAT THE D SWITCH IS WORKING PROPERLY.
6. PUSH THE 3 BUTTON AND CHECK WITH THE OHM LEAD PROBE PIN NR.3 AND PIN NR.4. THE METER READING SHOULD BE Ø ON BOTH PINS.
7. PUSH THE 2 BUTTON AND CHECK WITH THE OHM LEAD PROBE PIN NR.3 AND PIN NR.2. THE METER READING SHOULD BE Ø ON BOTH PINS.
8. PUSH NR.1 BUTTON AND CHECK WITH THE OHM LEAD PROBE NR.3, NR.4 AND NR.2 PIN. THE METER READING SHOULD BE Ø ON ALL THREE PINS.

SHIFT SELECTOR





DESCRIPTION:

THE SHIFT SELECTOR CONSISTS OF A MAIN FRAME, CIRCUIT BOARD, CONNECTION CABLE WITH CONNECTOR PLUG, SWITCH ASSEMBLY AND THE SHIFT RANGE PUSHBUTTONS.

1. MAIN FRAME
2. CABLE WITH CONNECTOR PLUG
3. CIRCUIT BOARD WITH SWITCH ASSEMBLY
4. SHIFT RANGE PUSH BUTTONS

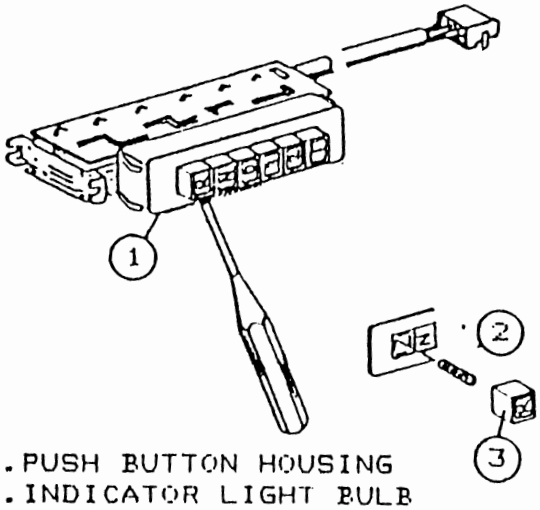
FUNCTION:

IF A SHIFT RANGE IS SELECTED BY PUSHING A SELECTOR BUTTON THE SWITCH ASSEMBLY ON THE CIRCUIT BOARD WILL GIVE A GROUND SIGNAL INTO THE ELECTRONIC CONTROL UNIT
DEPENDING ON WHICH WIRE THE GROUND SIGNAL IS RECEIVED BY THE ELECTRONIC CONTROL UNIT THE CORRESPONDING FUNCTION WILL BE ACTIVATED

THE SHIFT RANGES ARE PROGRAMMED AS FOLLOWS:

POSITION D: 1ST, 2ND, 3RD, 4TH, 5TH GEAR
POSITION 3: 1ST, 2ND, 3RD, 4TH GEAR
POSITION 2: 1ST, 2ND, 3RD GEAR
POSITION 1: 1ST GEAR
POSITION N: NEUTRAL
POSITION R: REVERSE GEAR

CHANGING THE SHIFT RANGE INDICATOR LIGHT BULBS

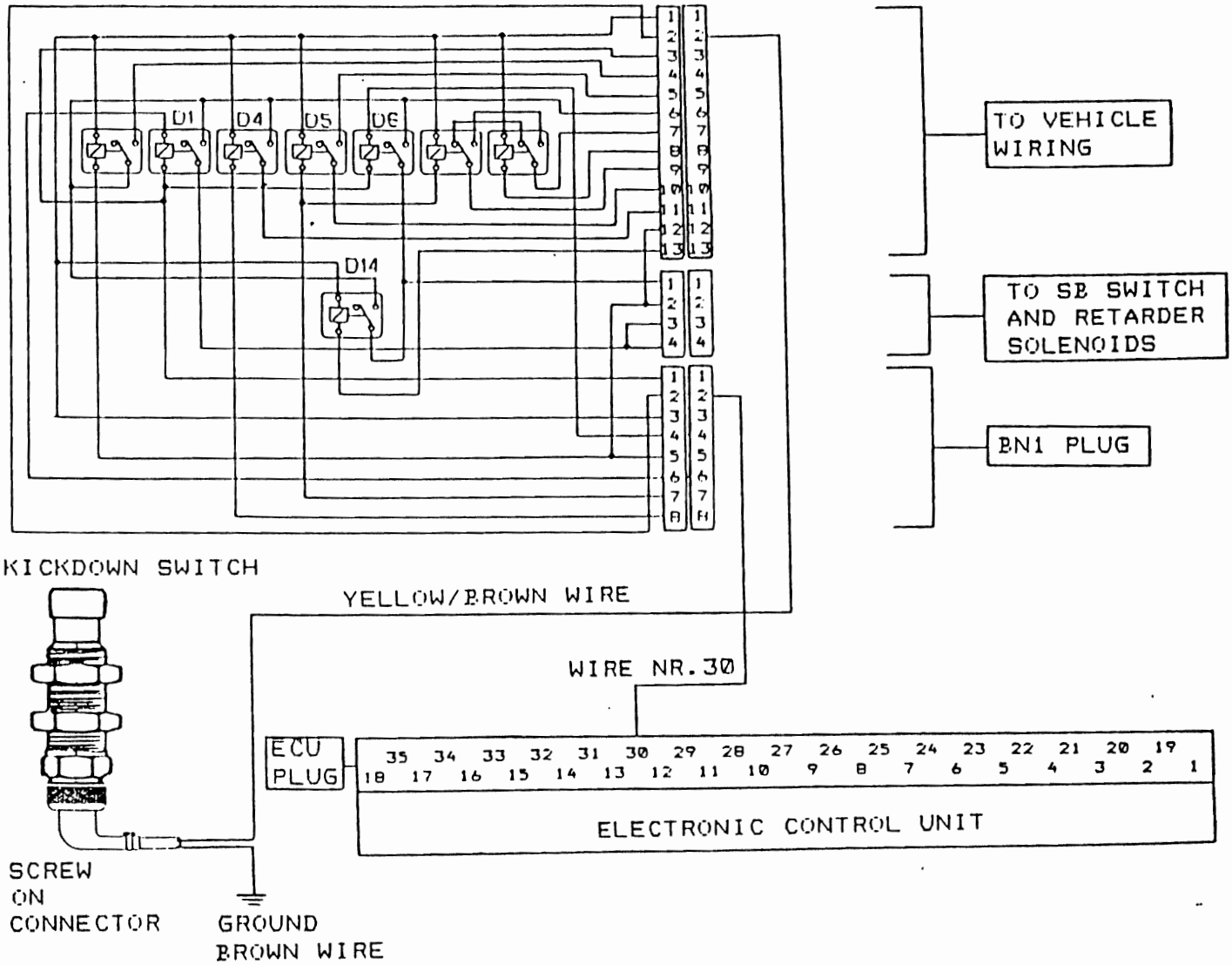


1. PUSH BUTTON HOUSING
2. INDICATOR LIGHT BULB
3. PUSH BUTTON

PROCEDURE:
1. SLIDE A SCREW DRIVER IN BETWEEN THE SHIFT RANGE PUSH BUTTON AND THE PUSH BUTTON HOUSING
2. GENTLY APPLY PRESSURE TO THE PUSH BUTTON AND PRY IT OUT
   NOTE: EXCESSIVE FORCE WILL DAMAGE THE PUSH BUTTON AND/OR THE HOUSING
3. REPLACE DEFECTIVE LIGHT BULB USING TWEEZERS
4. PUSH BUTTON BACK IN PLACE

KICKDOWN SWITCH WIRING
TROUBLE SHOOTING

OPERATION:
THE KICKDOWN SWITCH IS CONNECTED TO NR.2 PIN OF THE RELAY BOX. THE PIN IS ELECTRICALLY CONNECTED TO THE NR.2 PIN OF THE BN1 CONNECTOR. WIRE NR.30 CONNECTS THE NR.2 PIN OF THE BN1 PLUG TO NR.30 PIN OF THE ECU PLUG. SINCE THE KICKDOWN SWITCH IS A NORMALLY CLOSED SWITCH, NR.30 PIN OF THE ECU IS GROUNDED. ACTIVATING THE SWITCH WILL BREAK THE GROUND TO THE ECU, SELECTING THE KICKDOWN OR "PASSING GEAR" FUNCTION.

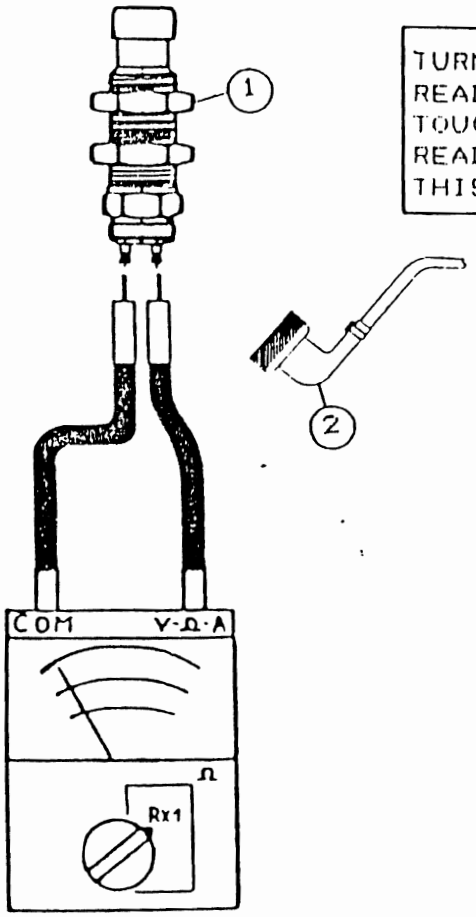


TROUBLE SHOOTING PROCEDURE:

1. SELECT THE 25 VOLT RANGE ON THE VOLT METER.
2. CONNECT THE COMMON LEAD PROBE TO NR.2 PIN OF THE VEHICLE WIRING PLUG.
3. CONNECT THE VOLTAGE LEAD PROBE TO THE NR.1 PIN OF THE VEHICLE WIRING PLUG.
4. TURN ON THE IGNITION. DO NOT START THE ENGINE. THE VOLT METER SHOULD READ 12 VOLTS.
5. IF THE READING ON THE METER SCALE IS 0 VOLTS, CHECK CONTINUITY ON THE KICKDOWN WIRE YELLOW/BROWN TO THE RELAY BOX. CHECK IF THE GROUND WIRE (BROWN WIRE) TO THE KICKDOWN SWITCH PLUG IS PROPERLY GROUNDED.
6. ACTIVATE THE KICKDOWN SWITCH. THE VOLT METER READING SHOULD DROP TO 0 VOL

NOTE: IF CONTINUITY IS CHECKED, FOLLOW PROCEDURES FOR CONTINUITY CHECK.

KICKDOWN SWITCH TROUBLESHOOTING



TURN VOLTMETER KNOB TO RX1 THE READING ON THE METER SCALE SHOULD SHOW ∞OHMS. TOUCH THE TWO TEST PROBES TOGETHER THE READING ON THE SCALE SHOULD DROP TO Ø OHMS. THIS MODE IS USED TO CHECK CONTINUITY.

TO VEHICLE WIRING PLUG

1. KICKDOWN SWITCH
2. SCREW ON TYPE CONNECTOR PLUG

TEST PROCEDURE:

IMPORTANT: ENGINE SHOULD NOT BE RUNNING DURING THIS TEST.

1. REMOVE SCREW ON CONNECTOR.
2. TURN VOLT METER SELECTOR KNOB TO OHM RX1 POSITION.
3. CONNECT THE COMMON LEAD PROBE TO ONE OF THE SWITCH TERMINALS.
4. CONNECT THE OHM LEAD PROBE TO THE OTHER TERMINAL.
5. THE READING ON THE METER SCALE SHOULD BE Ø OHMS.
6. ACTIVATE THE KICKDOWN SWITCH BY PRESSING THE ACCELERATOR DOWN ("PEDAL TO THE METAL")
7. AS THE SWITCH IS ACTIVATED THE READING ON THE METER SCALE SHOULD GO TO OHMS.

KICKDOWN SWITCH

DESCRIPTION:

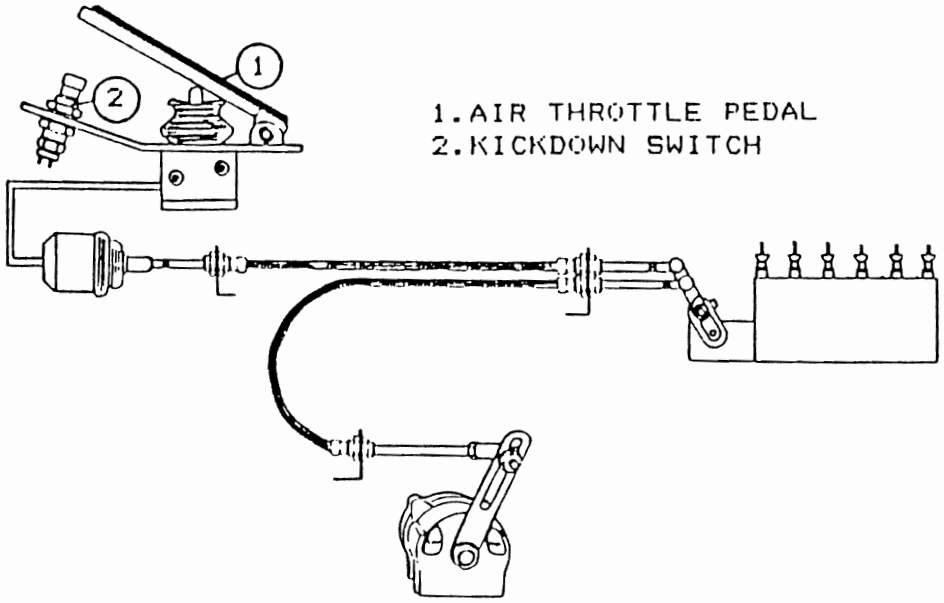
THE KICKDOWN SWITCH CONSISTS OF A THREADED BRASS BUSHING, TWO INSTALLATION NUTS, ELECTRICAL SWITCH AND THE ACTIVATION MECANISM.

FUNCTION:

PUSHING ONTO THE SPRING LOADED ACTIVATION MECANISM WILL CAUSE THE NORMALLY CLOSED ELECTRICAL SWITCH TO INTERRUPT THE GROUND SIGNAL TO THE ELECTRONIC CONTROL UNIT, SELECTING THE KICKDOWN OR PASSING GEAR" FUNCTION.

INSTALLATION:

THE KICKDOWN SWITCH IS LOCATED UNDER THE AIR THROTTLE PEDAL

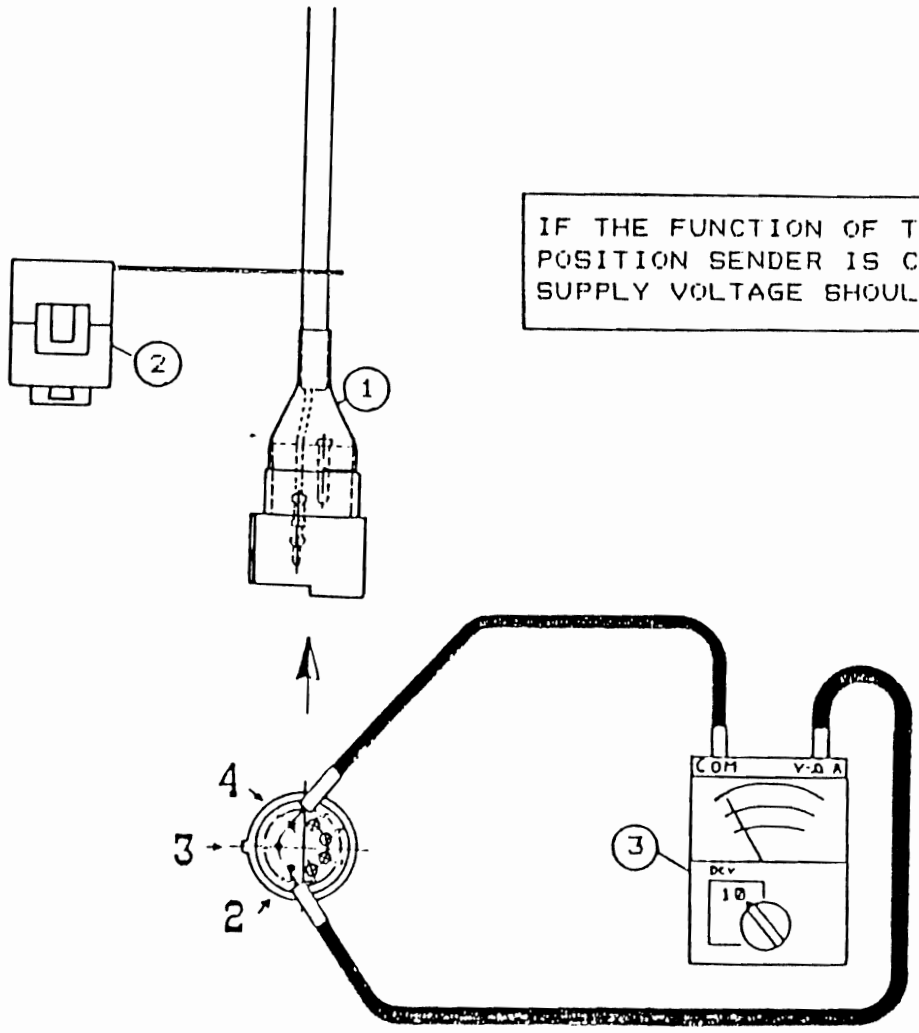


1. AIR THROTTLE PEDAL
2. KICKDOWN SWITCH

ADJUSTMENT PROCEDURE:
IMPORTANT: ENGINE SHOULD NOT BE RUNNING DURING THIS ADJUSTMENT.

1. BEFORE ADJUSTING THE KICKDOWN SWITCH, THE THROTTLE PEDAL CABLE AND THE THROTTLE POSITION SENDER HAVE TO BE ADJUSTED PROPERLY.
   NOTE: ADJUST AS DESCRIBED UNDER "THROTTLE POSITION SENDER ADJUSTMENT"
2. STEP ON THE THROTTLE PEDAL AND HOLD FULL THROTTLE.
3. LOOSEN THE KICKDOWN SWITCH INSTALLATION NUTS AND MOVE THE SWITCH TOWARDS THE THROTTLE PEDAL.
4. RIGHT AFTER THE SWITCH CIRCUIT OPENS, SECURE THE POSITION BY LOCKING THE KICKDOWN INSTALLATION NUTS.
   NOTE: IT SHOULD ONLY BE POSSIBLE TO ACTIVATE THE KICKDOWN FUNCTION WHEN THE INJECTION PUMP IS AT FULL THROTTLE AND THE THROTTLE POSITION SENDER IS AT THE HIGH STOP.

THROTTLE POSITION SENDER TROUBLE SHOOTING



IF THE FUNCTION OF THE THROTTLE POSITION SENDER IS CORRECT, THE SUPPLY VOLTAGE SHOULD BE CHECKED.

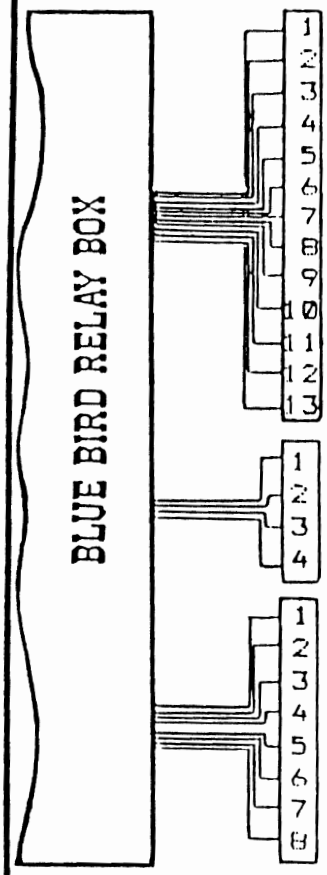
1. CABLE AND WIRE FROM MAIN TRANSMISSION WIRING HARNESS
2. SECURING CAP FOR PLUG CONNECTION
3. VOLT METER

IMPORTANT: THE ENGINE SHOULD NOT BE RUNNING DURING THIS TEST.

TEST PROCEDURES:

1. DISCONNECT THROTTLE POSITION SENDER FROM THE MAIN HARNESS.
2. SELECT THE 10 VOLT RANGE ON THE VOLT METER.
3. CONNECT THE COMMON LEAD PROBE OF THE VOLT METER TO NR.4 PIN OF THE WIRING HARNESS PLUG
4. CONNECT THE VOLTAGE LEAD PROBE OF THE VOLT METER TO NR.2 PIN OF THE WIRING HARNESS PLUG.
5. TURN ON THE IGNITION OF THE VEHICLE AND CHECK THE VOLTAGE READING ON THE VOLT METER SCALE. IMPORTANT: DO NOT START THE ENGINE THE READING SHOULD BE 4,5 VOLTS.

BLUE BIRD RELAY BOX
FUNCTION:

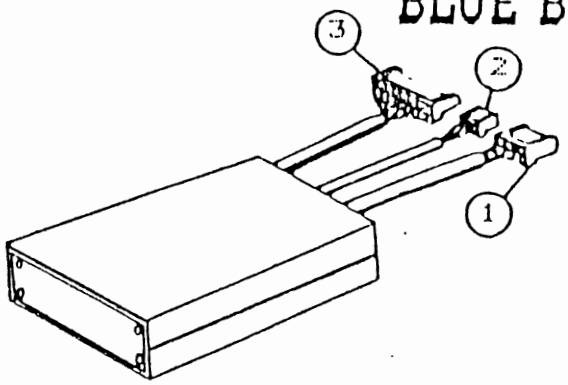


=TO 8 AMP CIRCUIT BREAKER
=INPUT KICKDOWN SWITCH
=GROUND FOR RELAY BOX AND TRANSMISSION
=OUTPUT TO STOPLIGHT RELAY
=OUTPUT TO STARTER RELAY
=TO 20 AMP CIRCUIT BREAKER
=TO ALLENAIR VALVE (HI IDLE)
=TO LOW AIR PRESSURE SWITCH (AT PARKING BRAKE)
=TO PURPLE WIRE IN BENDIX HARNESS (CRUISE CONTROL)
=INPUT FROM IGNITION SWITCH
=OUTPUT FOR BACK UP LIGHTS
=OUTPUT TO RETARDER INDICATOR LIGHT
=INPUT FROM TRANSMISSION OIL GAUGE

=OUTPUT FOR RETARDER REDUCTION SOLENOID
=INPUT FOR RETARDER FUNCTION (SWITCH SB)
=OUTPUT TO MV1 RETARDER SOLENOID
=OUTPUT TO MV2 RETARDER SOLENOID

=GROUND FOR TRANSMISSION SYSTEM
=OUTPUT FOR KICKDOWN FUNCTION
=(+)12 VOLTS TO TRANSMISSION SYSTEM
=INPUT FOR RETARDER REDUCTION RELAY (D6)
=OUTPUT FOR RETARDER FUNCTION REQUESTED
=INPUT FOR RETARDER FUNCTION RELAY (D1)
=INPUT FOR NEUTRAL START INTERLOCK RELAY (D5)
=INPUT FOR BACK UP LIGHT RELAY (D4)

BLUE BIRD RELAY BOX

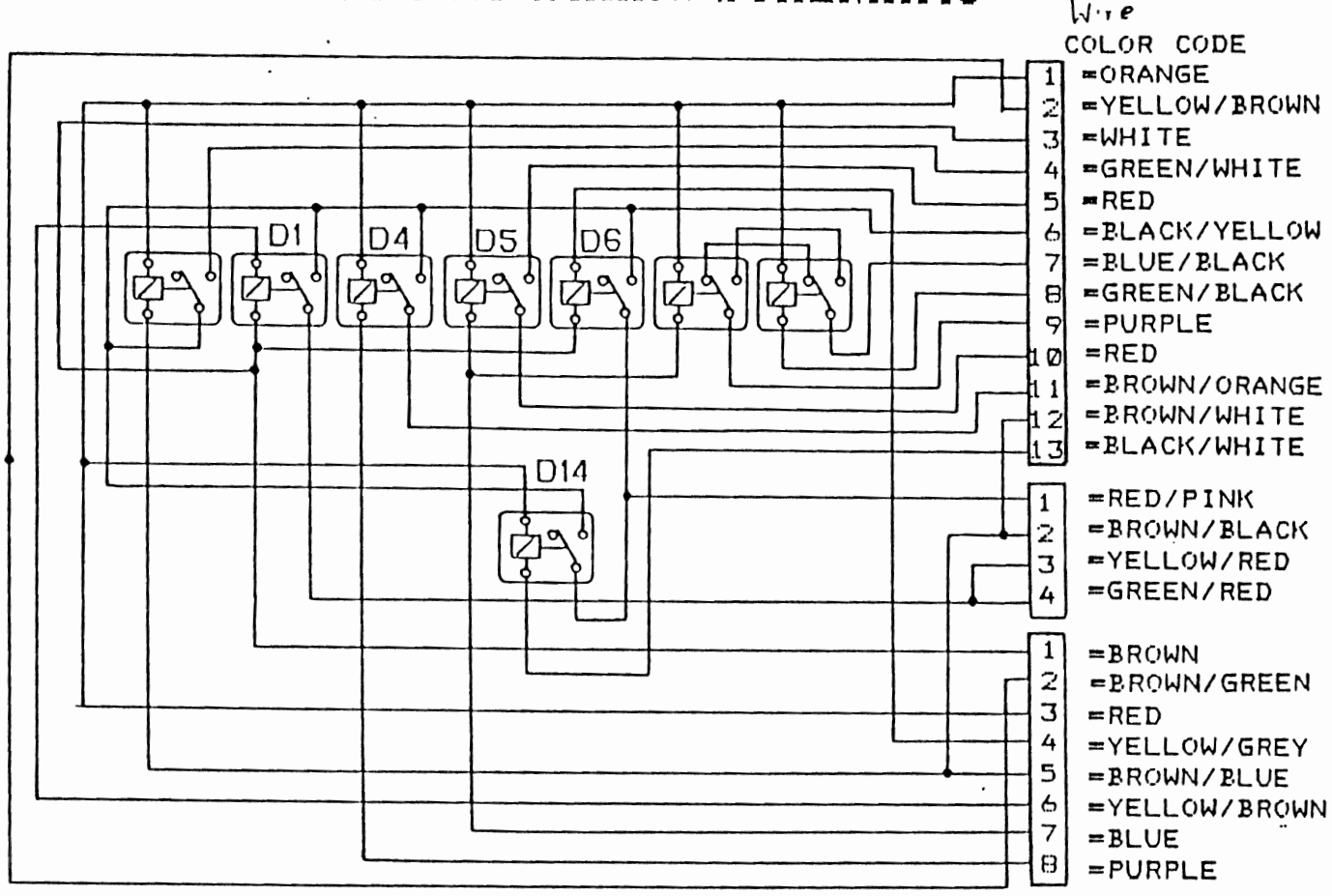


1. CONNECTOR PLUG EN1
2. RETARDER PLUG
3. VEHICLE WIRING PLUG

DESCRIPTION:

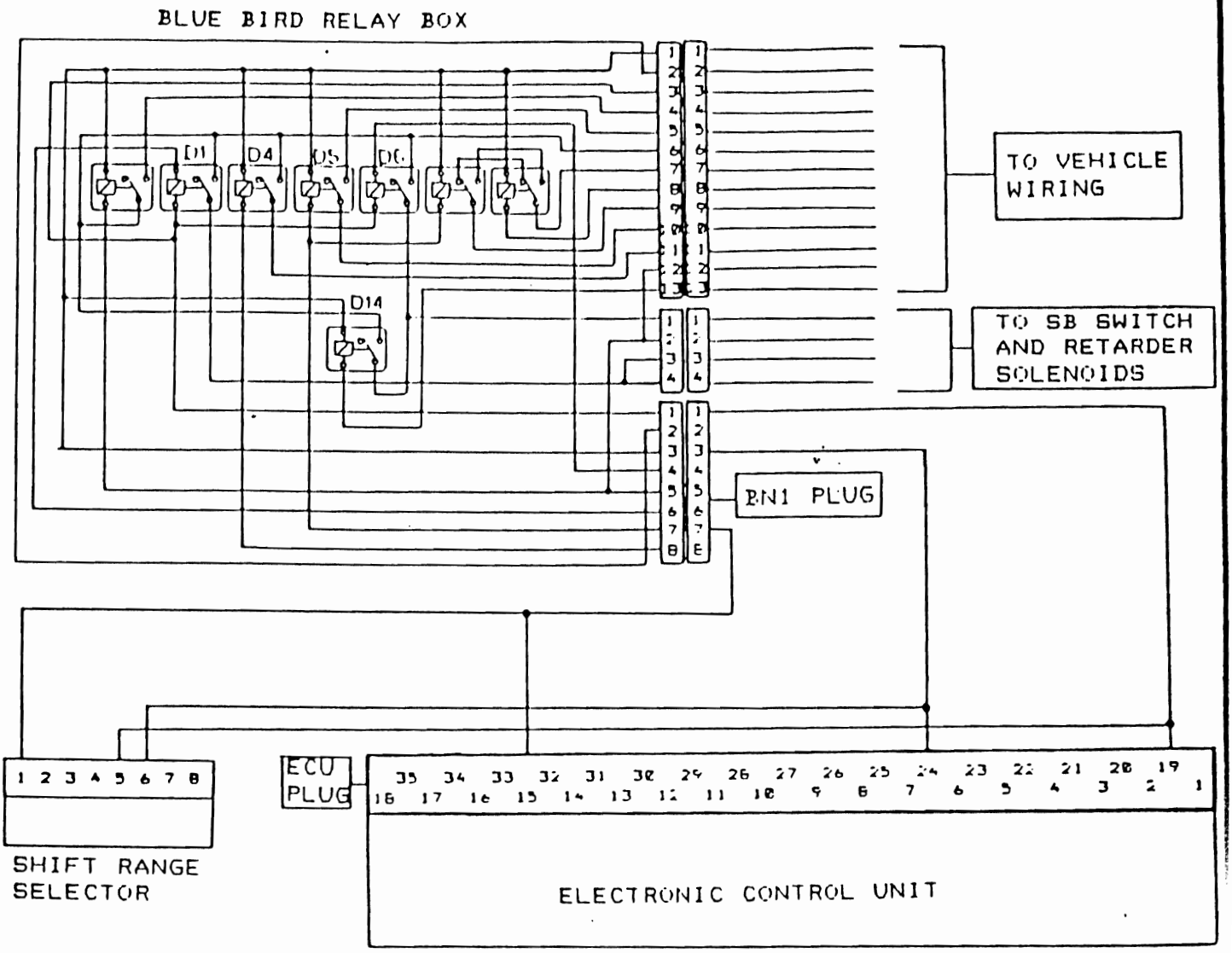
THE RELAY BOX CONSISTS OF AN ALUMINUM HOUSING AND THREE CONNECTION PLUGS. THROUGH PLUG "EN1" THE TRANSMISSION ECU RECEIVES ALL THE INPUT SIGNALS WHICH ARE NECESSARY FOR PROPER TRANSMISSION FUNCTION.
THE MV1, MV2 AND THE RETARDER REDUCTION SOLENOIDS RECEIVE THEIR SIGNALS THROUGH THE "RETARDER PLUG".
THE "VEHICLE WIRING PLUG" CONNECTS THE TRANSMISSION WIRING TO THE VEHICLE WIRING.

RELAY BOX WIRING SCHEMATIC



RELAY FUNCTION:
D1=ACTIVATES MV1 AND MV2 RETARDER SOLENOIDS ON THE TRANSMISSION.
D4=ACTIVATES THE BACK UP LIGHTS.
D5=NEUTRAL START INTERLOCK (ENGINE CAN ONLY BE STARTED IN NEUTRAL POSITION ON THE SHIFT SELECTOR).
D6=ACTIVATES RETARDER REDUCTION IN 1st AND 2nd GEAR.
D14=ACTIVATES RETARDER REDUCTION IF THE TRANSMISSION OIL TEMPERATURE GOES TO HIGH.

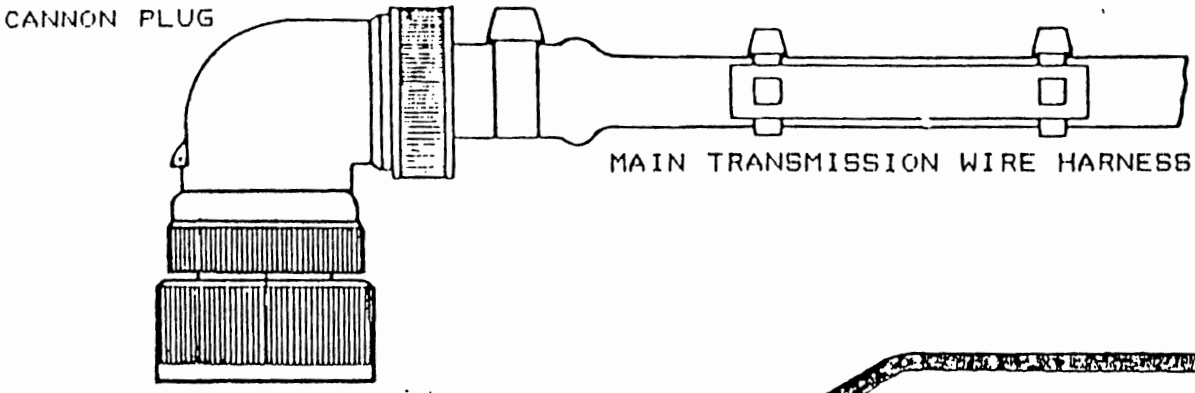
SHIFT SELECTOR WIRING
TROUBLESHOOTING NEUTRAL START INTERLOCK

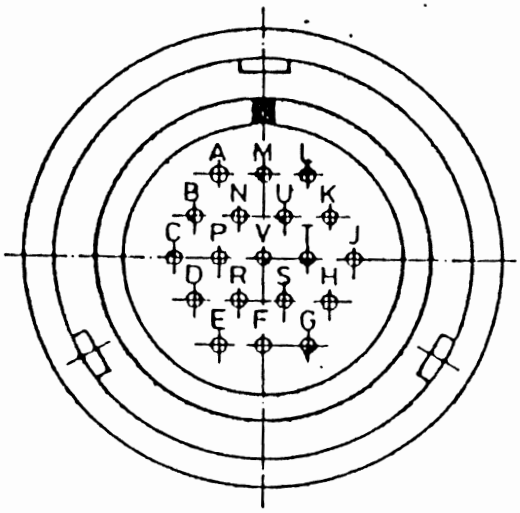


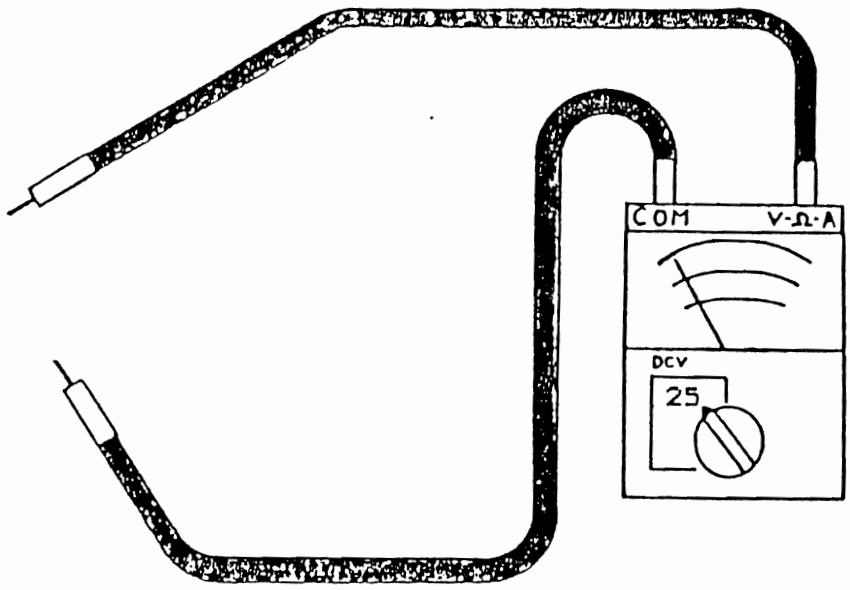
TROUBLE SHOOTING PROCEDURE

1. SELECT THE 25 VOLT RANGE ON THE VOLT METER.
2. CONNECT THE COMMON LEAD PROBE TO NR.3 PIN OF THE VEHICLE WIRING PLUG.
3. CONNECT THE VOLTAGE LEAD PROBE TO NR.5 PIN OF THE VEHICLE WIRING PLUG.
4. TURN ON THE IGNITION, SELECT N ON THE SHIFT SELECTOR.
5. THE READING ON THE METER SCALE SHOULD READ 12 VOLTS.
6. IF THE READING ON THE VOLT METER IS Ø PROCEED WITH THE TEST.
   IF THE READING IS 12 VOLTS, BUT THE STARTER WILL NOT ENGAGE, THE WIRING FROM NR.5 PIN TO THE STARTER CIRCUIT IS DEFECTIVE.
   CHECK VEHICLE WIRING SCHEMATIC FOR DETAILS.
7. TURN OFF THE IGNITION.
8. MOVE THE VOLTAGE LEAD PROBE TO NR.1 PIN OF THE VEHICLE WIRING PLUG.
9. MOVE THE COMMON LEAD PROBE TO NR.7 PIN OF THE BN1 PLUG.
10. TURN ON THE IGNITION,
11. IF THE READING ON THE METER SCALE IS 12 VOLTS BUT THE STARTER WILL NOT ENGAGE, THE RELAY BOX IS DEFECTIVE. IF THE READING IS Ø VOLT THEN THE WIRE TO THE SHIFT SELECTOR IS DEFECTIVE.
    NOTE: FOLLOW PROCEDURES FOR CONTINUITY CHECK.

SHIFT SOLENOID ACTIVATION TROUBLESHOOTING FORWARD GEAR



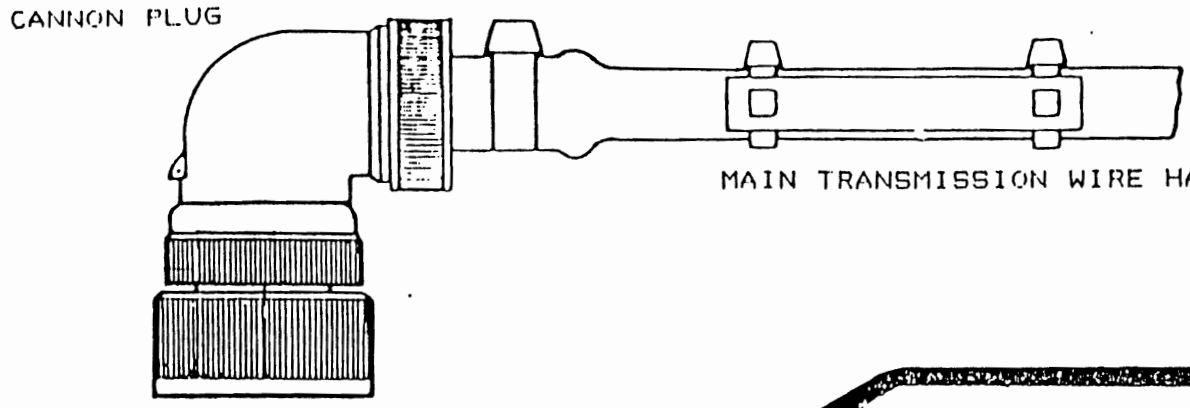


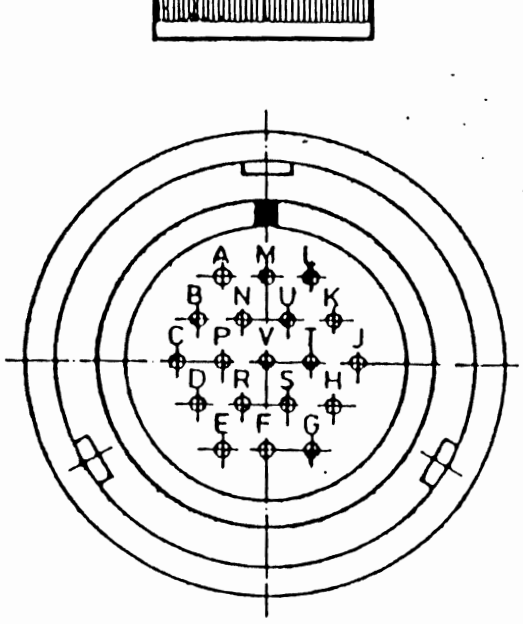


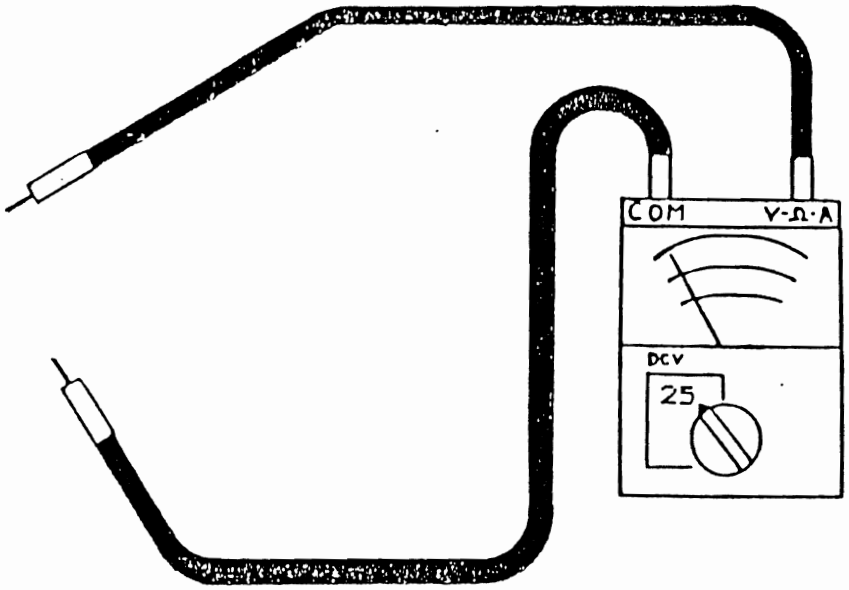
TEST PROCEDURE:

1. DISCONNECT THE CANNON PLUG ON THE TRANSMISSION.
2. SELECT THE 25 VOLT RANGE ON THE VOLT METER.
3. CONNECT THE COMMON LEAD PROBE TO THE"N"PIN OF THE CANNON PLUG.
4. CONNECT THE VOLTAGE LEAD PROBE TO THE "A" PIN OF THE CANNON PLUG.
5. TURN ON THE IGNITION AND SELECT D ON THE SHIFT SELECTOR.
6. AS THE ECU IS SELECTING FIST GEAR PIN "A" AS PART OF THE FIRST GEAR CLUTCH COMBINATION WILL CARRY 12 VOLTS.
   NOTE:IF VOLTAGE IS Ø VOLT, CONTINUITY OF WIRE NR.18 TO PIN "A" HAS TO BE CHECKED.FOLLOW CONTINUITY TEST PROCEDURES.
   IF THE READING OF THE VOLT METER SCALE IS 12 VOLTS PROCEED WITH TEST
7. TURN OFF THE IGNITION,SELECT N ON THE SHIFT SELECTOR.
8. MOVE V LEAD PROBE FROM PIN "A" TO PIN "F" OF THE CANNON PLUG.
9. TURN ON THE IGNITION AND SELECT D ON THE SHIFT SELECTOR.
10. AS THE ECU IS SELECTING FIRST GEAR PIN "F" AS PART OF THE FIRST GEAR CLUTCH COMBINATION WILL CARRY 12 VOLTS,
    NOTE:IF VOLTAGE IS O VOLTS,CONTINUITY OF WIRE NR.5 TO PIN "F" HAS TO BE CHECKED.FOLLOW CONTINUITY TEST PROCEDURES.
    IF THE READING ON THE VOLT METER SCALE IS 12 VOLTS BOTH SHIFT SOLENOIDS RECEIVE PROPER VOLTAGE FOR THEIR OPERATION.
    PROBLEM IS LOCATED IN THE TRANSMISSION ITSELF.

SHIFT SOLENOID ACTIVATION TROUBLESHOOTING REVERSE GEAR



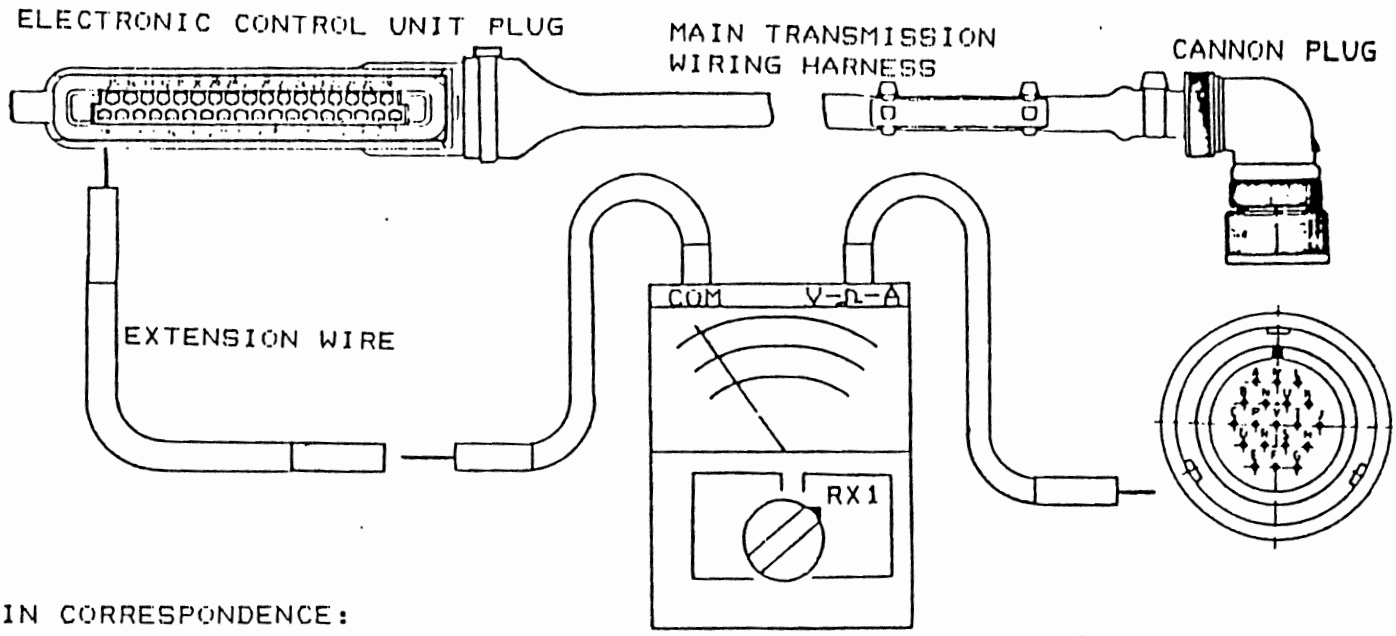




TEST PROCEDURE:

1. DISCONNECT THE CANNON PLUG ON THE TRANSMISSION.
2. SELECT THE 25 VOLT RANGE ON THE VOLT METER.
3. CONNECT THE COMMON LEAD PROBE TO THE"N"PIN OF THE CANNON PLUG.
4. CONNECT THE VOLTAGE LEAD PROBE TO THE "C" PIN OF THE CANNON PLUG.
5. TURN ON THE IGNITION AND SELECT R ON THE SHIFT SELECTOR.
6. AS THE ECU IS SELECTING REVERSE GEAR PIN "C" AS PART OF THE REVERSE CLUTCH COMBINATION WILL CARRY 12 VOLTS.
   NOTE: IF VOLTAGE IS Ø VOLT CONTINUITY OF WIRE NR.14 TO PIN C HAS TO BE CHECKED. FOLLOW CONTINUITY TEST PROCEDURES.
   IF THE READING OF THE VOLT METER SCALE IS 12 VOLTS, PROCEED WITH THE TEST
7. TURN OFF THE IGNITION, SELECT N ON THE SHIFT SELECTOR.
8. MOVE V LEAD PROBE FROM PIN "C" TO PIN "F" OF THE CANNON PLUG.
9. TURN ON THE IGNITION, AND SELECT R ON THE SHIFT SELECTOR.
10. AS THE ECU IS SELECTING REVERSE GEAR, PIN "F" AS PART OF THE REVERSE CLUTCH COMBINATION WILL CARRY 12 VOLT.
    NOTE: IF VOLTAGE IS Ø VOLT, CONTINUITY OF WIRE NR.5 TO PIN F HAS TO BE CHECKED. FOLLOW CONTINUITY TEST PROCEDURES.
    IF THE READING ON THE VOLT METER SCALE IS 12 VOLTS, BOTH SHIFT SOLENOIDS RECEIVE PROPER VOLTAGE FOR THEIR OPERATION.
    PROBLEM IS LOCATED IN THE TRANSMISSION ITSELF.

CONTINUITY TEST
SHIFT SOLENOIDS&SPEED SENSORS



PIN CORRESPONDENCE:

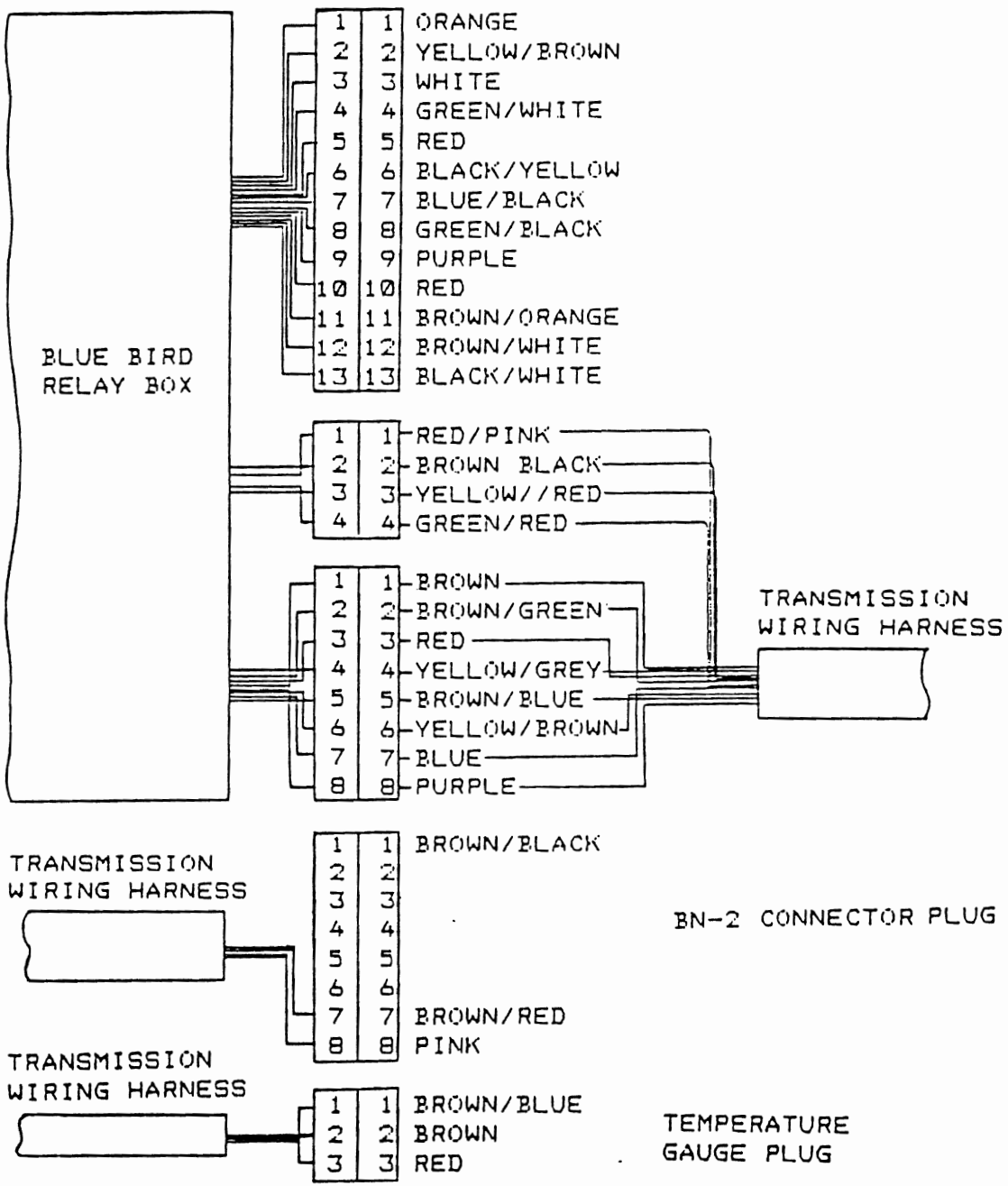
PINS AT ECU PLUG		PINS AT CANNON PLUG
PIN NR. 18	=	PIN A(A CLUTCH SOLENOID)
PIN NR. 17	=	PIN B(B CLUTCH SOLENOID)
PIN NR. 14	=	PIN C(C CLUTCH SOLENOID)
PIN NR. 11	=	PIN D(D CLUTCH SOLENOID)
PIN NR. 8	=	PIN E(E CLUTCH SOLENOID)
PIN NR. 5	=	PIN F(F CLUTCH SOLENOID)
PIN NR. 12	=	PIN U(MODULATOR VALVE SOLENOID)
PIN NR. 25	=	PIN T(TURBINE SPEED SENSOR)
PIN NR. 7	=	PIN V(ROAD SPEED SENSOR)
PIN NR. 6	=	PIN M(SPEED SENSOR GROUND)
PIN NR. 24	=	PIN N(SHIFT SOLENOID GROUND)
PIN NR. 2	=	PIN H(LOCK UP CLUTCH SOLENOID)
		PIN S,K,L,J,P,R ARE NOT USED

TEST PROCEDURES:

NOTE: TURN VOLT METER SELECTOR KNOB TO OHM RX1 POSITION. THE READING ON THE METER SCALE SHOULD SHOW OHMS. TOUCH THE TWO TEST PROBES TOGETHER. THE READING ON THE SCALE SHOULD DROP TO Ø OHMS. A Ø READING IS THE INDICATION FOR CONTINUITY. THE INDICATES AN OPEN CIRCUIT.

1. DISCONNECT THE ECU PLUG AND THE CANNON PLUG AT THE TRANSMISSION.
2. CONNECT THE OHM LEAD PROBE AT THE CANNON PLUG TO THE WIRE TO BE TESTED
   NOTE: CHECK PIN CORRESPONDENCE CHART FOR REFERENCE.
3. CONNECT THE COMMON WIRE TO THE CORRESPONDING PIN ON THE ECU PLUG.
   AN EXTENSION WIRE IS NEEDED TO COVER THE DISTANCE.
4. IF THE READING ON THE METER SCALE IS Ø, THE WIRE IS NOT DEFECTIVE.
   IF THE READING IS ∞, THE WIRE HAS TO BE REPLACED, USING ONE OF THE TWO SPARE WIRES WHICH ARE INCLUDED IN THE MAIN TRANSMISSION WIRING HARNESS.

COLOR CODE
EXTERNAL TRANSMISSION WIRING



LEGEND
EXTERNAL TRANSMISSION WIRING

(1) =VEHICLE WIRING PLUG

(2) =SB AND RETARDER PLUG

(3) =CONNECTOR PLUG BN1

(4) =CONNECTOR PLUG BN2

(5) =CONNECTOR PLUG TEMPERATURE GAUGE

(6) =KICKDOWN SWITCH

(7) =PART OF THE MAIN TRANSMISSION WIRING HARNESS

(8) =RETARDER ON/OFF SWITCH

(9) =SHIFT PROGRAM SWITCH (POWER/ECONOMY)

(10) =TEMPERATURE GAUGE

(11) =RETARDER INDICATOR LIGHT

(12) =HOT TRANSMISSION OIL INDICATOR LIGHT

(13) =20 AMPERE CIRCUIT BREAKER

(14) =8 AMPERE CIRCUIT BREAKER

(15) =AIR PRESSURE SWITCH (IN BRAKE AIR LINE)

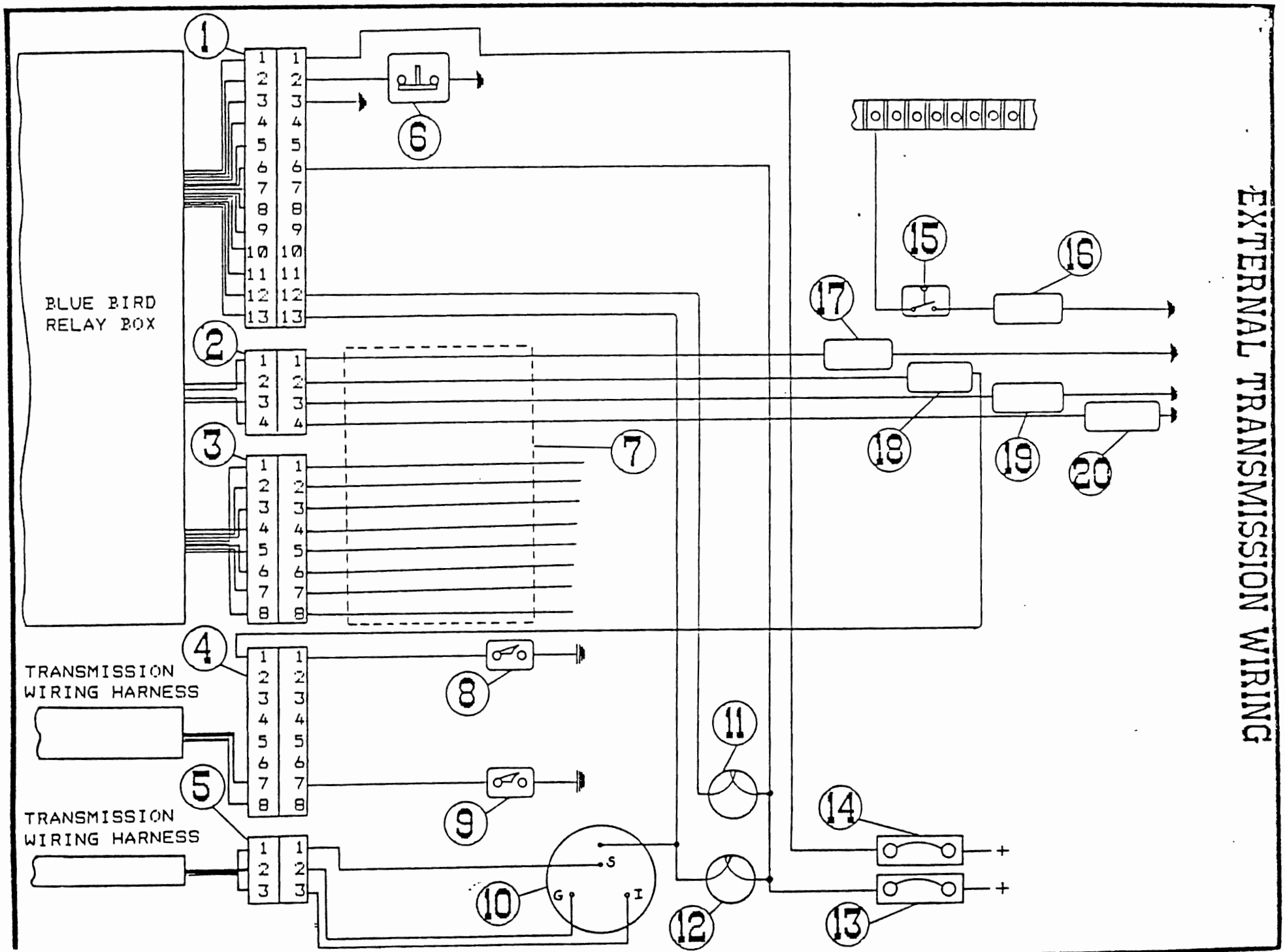
(16) =MVFK AIR SOLENOID VALVE

(17) =MV4 AIR SOLENOID VALVE

(18) =AIR PRESSURE SWITCH(RETARDER SIGNAL)

(19) =MV1 AIR SOLENOID

(20) =MV2 AIR SOLENOID


EXTERNAL TRANSMISSION WIRING
BLUE BIRD
RELAY BOX
TRANSMISSION
WIRING HARNESS
TRANSMISSION
WIRING HARNESS
1
2
3
4
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G
I
+
+

TROUBLESHOOTING

	Fault	Potential Cause	Check Note	Remedy
)	Retarder not functioning	- Oil level too low	Check oil level	Correct oil level
		- Retarder switched off	———	Switch on retarder
		- No voltage in retarder solenoid valve	Test electrical system with PR-61 tester	Correct electrical fault
		- Loose electrical connections	———	Check and tighten plugs
		- Brake pressure switch defective	Test with PR-61 tester or voltmeter	Renew switch
		- No air at retarder solenoid valve	Check air pressure at solenoid valve *	Check compressed air supply
		- Retarder solenoid valve defective	Unscrew solenoid valve, check air passage	Renew retarder solenoid valve
		- Retarder control valve not operating	Check pressure R3 at measuring point 5	Consult ZF
		- Control box defective	Test with PR-61 tester	Renew control box
		- Transmission damaged	———	Renew transmission

* WARNING - accident risk!

List of lubricants TE-ML 14 (State 01/92)

Synthetic ATF for ZF-Ecomat-Transmission

Manufacture	Marking
Amsoil, --/USA	Amsoil ATF D-21455/M-881101
Castrol Ltd., Swindon/GB	Castrol Transmax S D-21923/E-25115
DEA Mineralöl AG, Hamburg/D	Deafluid S
Deutsche BP AG, Hamburg/D	BP Autran LTF
ELF LUB, Paris/F	Elfmatic G2 SYN D-22517
Esso AG, Hamburg/D	Esso ATF LDS
Fina Europe S.A., Brüssel/B	Finamatic S 6726
Henkel Corp. Emery Group, Cincinnati/USA	2802 Emgard DII/M Synthetic ATF; D-21879/M-880702
Kuwait Petrol Research & Techn. B.V., Rotterdam/NL	Q8 Auto 14 Synthetic
Neste OY, Espoo/SF	Neste ATF-S
Noviol B.V., Nijmegen/NL	Kennoco Synthetic ATF DII
Nynäs Industri Ab, Nynäshamn/NL	Syntomatic
Pakelo Motor Oil Srl, S. Bonifacio/I	Pakelo Auxon II E
Red Line Synthetic Oil Corp., Martinez/USA	Red Line Synthetic ATF D-21870/M-890212
Veedol Intern. Ltd., Swindon/GB	Veedol ATF Unitrans S D-22674/E-25122
Wintershall AG, Düsseldorf/D	Wintershall ATF Dexron S

Complementary approvals to the list of lubricants TE-ML 14 (State 03/93):

Aral AG	Aral ATF E-S DIIE
Castrol Ltd.	Castrol Transmax Z
Mobil Oil AG	Mobil SHC ATF E-25300/M-921202
Shell Rotterdam/NL	Shell ATF PAD 5650
Texaco Research	Texamatic S
Total Group	Total ATF E-25226

Altogether there are 22 synthetic ATF-Oils approved for the ZF-Ecomat.