

P U B L I S H E R

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TG electrical and electronic interfaces

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1. Wiring harnesses for wheelbase extensions

1.1 Procedure

Rear-axle control units and sensors are to be moved together with the axle if wheelbase extensions are to be carried out. CAN wiring harnesses must never be cut or extended. MAN therefore offers wiring harness extensions with a corrugated pipe length of 1,500mm. If these extensions prove inadequate, two such wiring harnesses can be plugged together. Only when the method described here is used can the movement of control units and sensors be considered as approved.

1.2 Rear-axle related control units and sensors

Basic equipment on all TG vehicles:

- EBS pressure control module (one module for all rear axles)
- Parking brake warning lamp switch

If the rear axle(s) has air suspension, the following are also fitted:

- Travel sensor (left and right)
- ECAS valve block

Depending on design and equipment, the following cables are also present:

- Plug connection for differential lock

Cable extensions from the EBS pressure control module to sensors on the respective wheel (speed sensor, brake lining wear sensors) are not required if the EBS pressure control module is moved along with the rear axle assembly.

1.3 Performing the work

Some cable extensions require minor rework to the connector on the original wiring harness. A detailed description follows, which includes the required incidental items such as connector housing, catches and adapters with code designations. The corresponding order numbers are itemised in Table 1.

Table 1: Itemised code numbers for incidental items

Code	Designation	MAN item number	Supplier	Supplier No.
AW64	Adapter	81.25433.0184	Schlemmer	7807 029 K
AW65	Adapter	81.25433.0182	Schlemmer	7807 025 K
BA20	Connector housing	81.25432.0337	Grote&Hartmann	18169 000 001
BA21	Connector housing	81.25432.0338	Grote&Hartmann	18170 000 001
BA28	Connector housing	81.25432.0347	Grote&Hartmann	18166 000 001
BA70	Connector housing	81.25432.0434	Grote&Hartmann	18385 000 001
BA71	Connector housing	81.25432.0433	Grote&Hartmann	18286 000 001
BA72	Connector housing	81.25432.0436	Grote&Hartmann	18284 000 001
BB68	Connector housing	81.25432.0435	Grote&Hartmann	18515 000 001
BB69	Connector housing	81.25432.0437	Grote&Hartmann	18516 000 001
BB70	Connector housing	81.25432.0438	Grote&Hartmann	18514 000 001
GV10	Catch slide	81.25435.0994	Grote&Hartmann	14816 660 636
GV12	Catch slide	81.25435.0996	Grote&Hartmann	14818 660 636
SS1	Shrinkdown plastic tube	81.96503.0008	Raychem	RBK 85KT 107 A 0

Table 2: Wiring harness extensions

Range	Moved unit / sensor	Item no. Extension, qty	Description/rework
TGA	EBS pressure control module on rear axle Y264	81.25453.6306 1 x 4-pin	Unplug 4-pin green connector (BA28) on frame wiring harness from EBS pressure control module on rear axle. Remove catch (GV12), eject contacts and push in a new housing (BB69) with identical pin socket collar. Replace catch GV12. Connect corrugated pipe and connector(BB69) using adapter 81.25433.0184 (AW 64). Alternatively: Attach existing housing and wiring harness extension with shrinkdown plastic tube (e.g. SS1) to corrugated pipe.
TGL TGM	EBS pressure control module on rear axle Y264	81.25453.6305 1 x 4-pin	Unplug the standard connector from the pressure control module. Plug the extension into the connecting cable. Plug the extended harness into the pressure module. Note: On the TGL and TGA the same adapter is used for extending wiring harness 81.25453.6305 from: EBS pressure control module, differential lock, travel sensors on left and right and the ECAS valve block.
TGA	Parking brake warning lamp switch B369	81.25453.6305 1 x 4-pin	Unplug 4-pin DIN bayonet connection from Parking brake warning lamp switch and lengthen using extension wiring harness.
TGL TGM	Parking brake warning lamp switch B369	85.25413.6345 1 x 4-pin	

Table 3: Equipment-dependent wiring harness extensions

TGA	Differential lock X637	81.25453.6307 1 x 4-pin	Split at point of separation X637 and insert extension in between.
TGL TGM	Differential lock S185	81.25453.6305 1 x 4-pin	Same wiring harness for extending EBS pressure control module, travel sensors and ECAS valve block.

Table 4: Wiring harness extensions for air suspension on rear axles or on all axles

TGA TGL TGM	Travel sensor on rear axle, left B129 right B130	81.25453.6305 2 x 4-pin (One each on L and R) On TGA 4x2 tractor unit only one travel sensor	On the TGL and TGM the same adapter is used for extending wiring harness 81.25453.6305 from: EBS pressure control module and differential lock.
TGA TGL TGM	Valve block ECAS Y132Twin-axle leaf/air	81.25453.6305 1 x 4-pin	
TGA TGL TGM	Valve block ECAS Y132/ 61and Y132/62 Twin axle, air/air	81.25453.6305 2 x 4-pin (per valve block)	
TGA TGL TGM	Valve block ECAS Y161/I and Y161/II > 2 axle, leaf/air and air/air	81.25453.6305 2 x 4-pin (per valve block)	

Each of the speed and brake lining wear sensors itemised in Table 5 below are plugged into the corresponding EBS pressure control module on the rear axles. The associated cabling does not need to be extended when extending the wheelbase because the pressure control module is moved together with the rear axle. For reasons of completeness and for special designs, extension wiring harnesses for speed and brake lining wear sensors are nevertheless available.

Table 5: Wiring harness extensions for special cases

TGA TGL TGM	Speed sensor, drive axle left B121	81.25453.6377 1 x 2-pin	Unplug 2-pin connector (grey BA20 left, black BA21 right) from pressure control module on rear axle. Dismantle catch (GV10), eject contacts and push in a new housing with identical pin socket collar (BA70 left, BA71 right). Replace catch (GV10). Connect corrugated pipe and connector (BA70/BA71) using adapter 81.25433.0184 (AW 64) (e.g. SS1). Alternatively: Attach existing housing and wiring harness extension with shrinkdown plastic tube (e.g. SS1) to corrugated pipe.
	Speed sensor, drive axle right B122	81.25453.6378 1 x 2-pin	
TGA TGL TGM	Brake lining sensor B335, drive axle 2, rear left	81.25453.6387 1 x 4-pin	Unplug 4-pin connector (black BA72 left, orange BB70 right) from EBS pressure control module on rear axle. Connect corrugated pipe and connector with adapter (AW64) and extend brake lining sensor with extension 81.25453.6387 left / 81.25453.6388 right. Insert connector of extension (black left, orange right) into EBS pressure control module on rear axle.
TGA TGL TGM	Brake lining sensor B334, right drive axle Applies to drive axle on 4x2, 6x2/2, 6x2-4, 6x2/4, rear drive axle on 4x4 and rear axle 1 for all other wheel formulae	81.25453.6388 1 x 4-pin	
TGA TGL TGM	Brake lining sensor B335, left drive axle	81.25453.6387 1 x 4-pin	Unplug 4-pin connector (black BA72 left, orange BB70 right) from BVS distributor (brake lining wear sensor, left X2431, right X2432) and insert extension 81.25453.6387 left / 81.25453.6388 right in between.
TGA TGL TGM	Brake lining sensor B334, right drive axle Applies to drive axle 2 rear right on 6x4, 6x6, 8x4, 8x6 and 8x8	81.25453.6388 1 x 4-pin	
TGA (TGL TGM)	Brake lining sensor B530, left rear additional axle	81.25453.6385 1 x 4-pin	Unplug 4-pin connector (green BB69 left, grey BB68 right) from distributor BVS (brake lining wear sensor, left X2431, right X2432) and insert extension 81.25453.6385 left / 81.25453.6386 right in between. As at: 5-2006: Additional axles are in planning for TGL and TGM.
TGA (TGL TGM)	Brake lining sensor B529, right rear additional axle Applies to leading/trailing axle on 6x2/2, 6x2-4, 6x2/4	81.25453.6386 1 x 4-pin	

2. Wiring harness for tail lights, additional tail lights, trailer tow sockets, side marker lights and additional ABS sockets

The possible applications for these cable extensions are:

- Wiring harness extension for tail lights and trailer tow sockets as a result of extending the overhang
- Connection of additional tail lights via T-distributor
- Connection of additional sockets via T-distributor – potential applications: Mounting of 15-pin and type 24N/24S 7-pin sockets or mounting of sockets behind cab on tractor units and trailer tow sockets on the frame end.
- Wiring harness extensions for side marker lights

To extend wiring harnesses or fit additional lights/sockets, only the wiring harnesses described here may be used so as to ensure the correct functioning of the CAN data network.

Table 6: Extension cable wiring harness, tail lights

Range	Designation	Length in meters	MAN item number
TGA	Extension wiring harness for tail lights (per light)	1	81.25428.6975
TGL TGM	Extension wiring harness for tail lights (per light)	1,5	81.25428.6982

Table 7: Extension wiring harness, trailer tow sockets

Range	Designation	Plug color	Length in meters	MAN item number
TGA	Extension wiring harness for trailer tow socket	black	1	81.25428.6971
TGL TGM	Extension wiring harness for trailer tow socket	black	1,5	81.25428.6972
	Extension wiring harness for trailer tow socket	brown	1	81.25428.6973
	Extension wiring harness for trailer tow socket	brown	1,5	81.25428.6974

Pin assignment depends on the plug colour of the wiring harness:

Table 8: Assignment of socket to plug colour of the cable

Socket	Application	Standard	Plug
Typ 24 N	24 V 7-pin N=normal	DIN ISO 1185	1 x black
Typ 24 S	24 V 7-pin S=supplementary	DIN ISO 3731	1 x brown
15 pin	24 V 15-pin	DIN ISO 12098	1 x black + 1 x brown

Adapter wiring harnesses for tail lights and trailer tow sockets are available for fitting additional lights and sockets (T-distributor). The operating principle is shown in Figure 1.

Table 9: Adapter wiring harness (T-distributor) for additional tail lights

Range	Designation	Length in meters	MAN item number
TGA	Adapter wiring harness for tail lights	1,1	81.25432.6164
TGL TGM	Adapter wiring harness for tail lights	1,6	81.25432.6165

Fig. 1: Operating principle of T-distributor (example: additional lights)

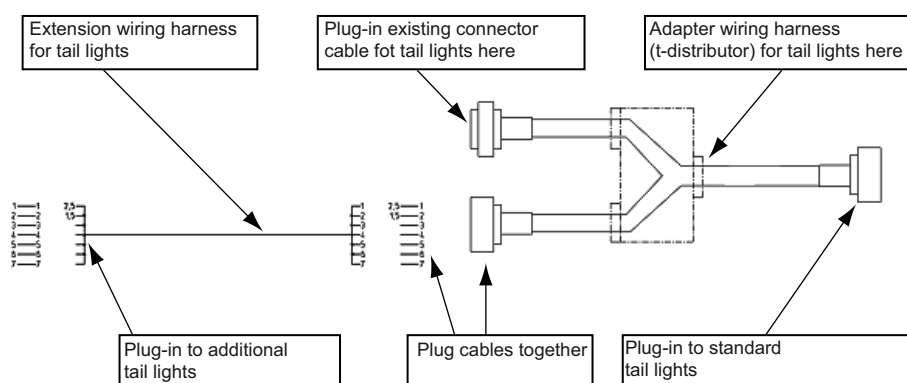


Table 10: Adapter wiring harness (T-distributor) for additional trailer sockets

Adapter wiring harness (T-distributor) for additional trailer tow sockets	Plug colour	Length in meters	MAN item number
Adapter wiring harness, symmetrical T-piece	black	Approx. 0,25	81.25432.6157
Adapter wiring harness, symmetrical T-piece	brown	Approx. 0,25	81.25432.6160
Adapter wiring harness, asymmetrical T-piece	black	Approx. 0,7	81.25432.6173
Adapter wiring harness, asymmetrical T-piece	brown	Approx. 0,7	81.25432.6174

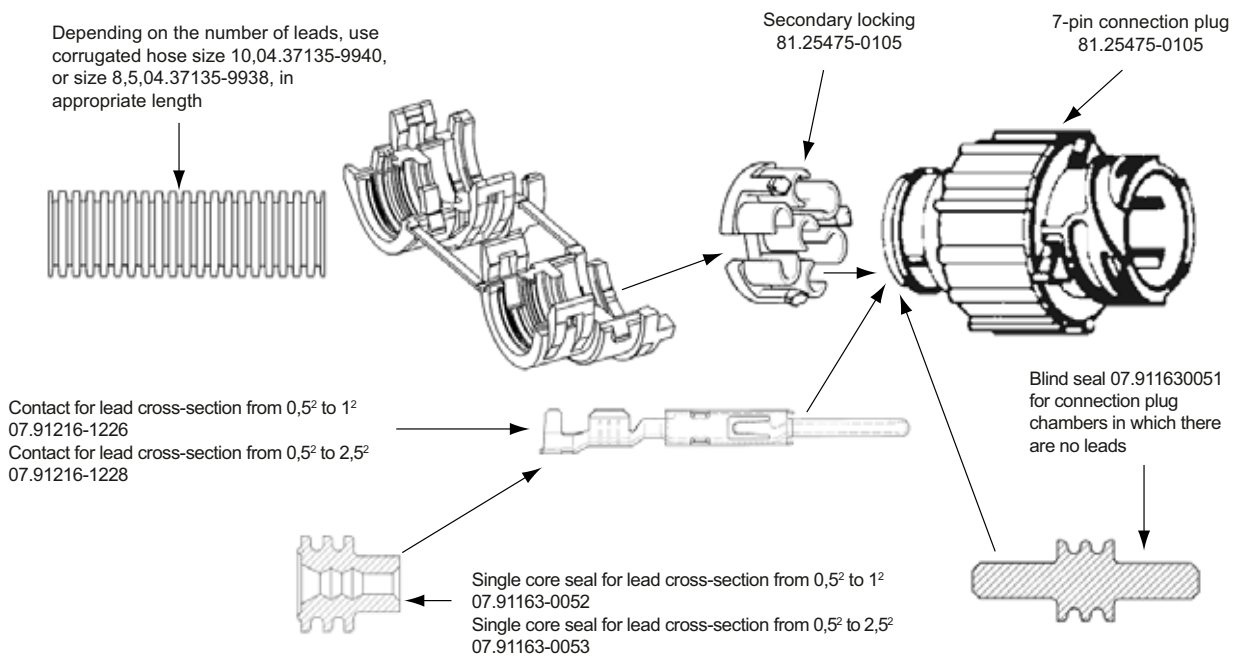
Depending upon the body design it may also be necessary to reposition the side marker lights (the statutory regulations applicable to the lighting system must be observed). If the connection cables are too short, various lengths of wiring harness extension are available. Only original MAN side marker lights using LED technology are permitted. Use of any other lights will result in the partial operating permit for the lighting system to become invalid. Side marker lights with incandescent bulbs will damage the ZBR.

Table 11: Extensions for side marker lights

Range	Designation	Length in meters	MAN item number
TGA TGL TGM	Wiring harness extension	0,5	81.25417.6685
	Wiring harness extension	1,0	81.25417.6686
	Wiring harness extension	2,0	81.25429.6294
	Wiring harness extension	3,0	81.25429.6295

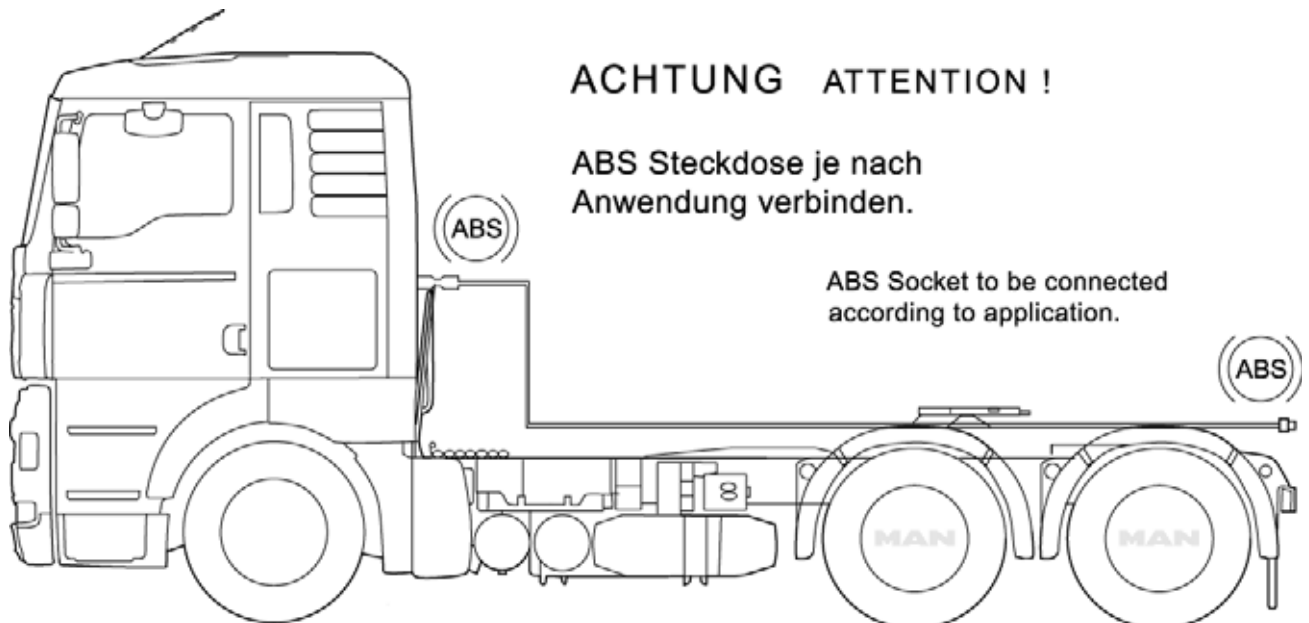
An adapter wiring harness also enables individual cables to be tapped (e.g. to connect an additional license plate light). Individual connector plugs with individual cables are to be made up using Seal connectors, Figure 2 shows how to make up an individual connector plug.

Fig. 2: Making up an individual connector plug



Additional ABS sockets are available for alternating use as a socket behind the cab on tractor units and trailer sockets at the frame end. However, this does not function with T-distributors but with an extension cable, see Figure 3.

Fig. 3: Use of ABS-extension cable



In this way the ABS socket may be mounted either behind the cab (tractor unit) or at the frame end (truck). The cable lengths available conform with the wheelbases of the respective MAN tractor unit (see Table 12).

Table 12: ABS extension cables

Item no.	81.25453.6288	81.25453.6290	81.25453.6291	81.25453.6292
Cable length (total)	4.700mm	5.400mm	6.100mm	6.800mm
Application Wheelbase R	Tractor unit 4x2, 4x4 R <= 3.900	Tractor unit 6x2 R <= 3.200+1.350	Tractor unit 6x4, 6x6 R <=3.600+1.350	Tractor unit 6x4, 6x6 R <= 3.600+1.350

3. Tapping the speed signal

Caution! In order to avoid control unit error messages always switch off the ignition prior to carrying out any work on the tachograph!

It is possible to tap the speed signal from the tachograph. This will ensure that the load on the corresponding pin does not exceed 1mA! This is generally equates to the equivalent of two connected peripheral units. Should this option for tapping the signal be inadequate then the following output multipliers bearing the MAN codes can be connected:

81.25311-0022 (3 • v-pulse output, max. load 1mA for each output) or
88.27120-0003 (5 • v-pulse output, max. load 1mA for each output).

Option for tapping the 'B7 signal' = speed signal:

- 1) At connector B / Pin 7 on the back of the tachograph
- 2) At the 8-pole plug connection X1536 / contact 5. The plug connection is located behind a cover on the driver side A-pillar in the area around the driver's footwell.
- 3) At the factory-fitted interface with customer-specific control module from STEP1 (see Chapter 4.3)

4. Interfaces for intermediate speed control

4.1 Abbreviations and terms used

The text below and the detailed description of the interfaces contains several abbreviations and MAN-specific terms, which Table 13 explains in alphabetical order.

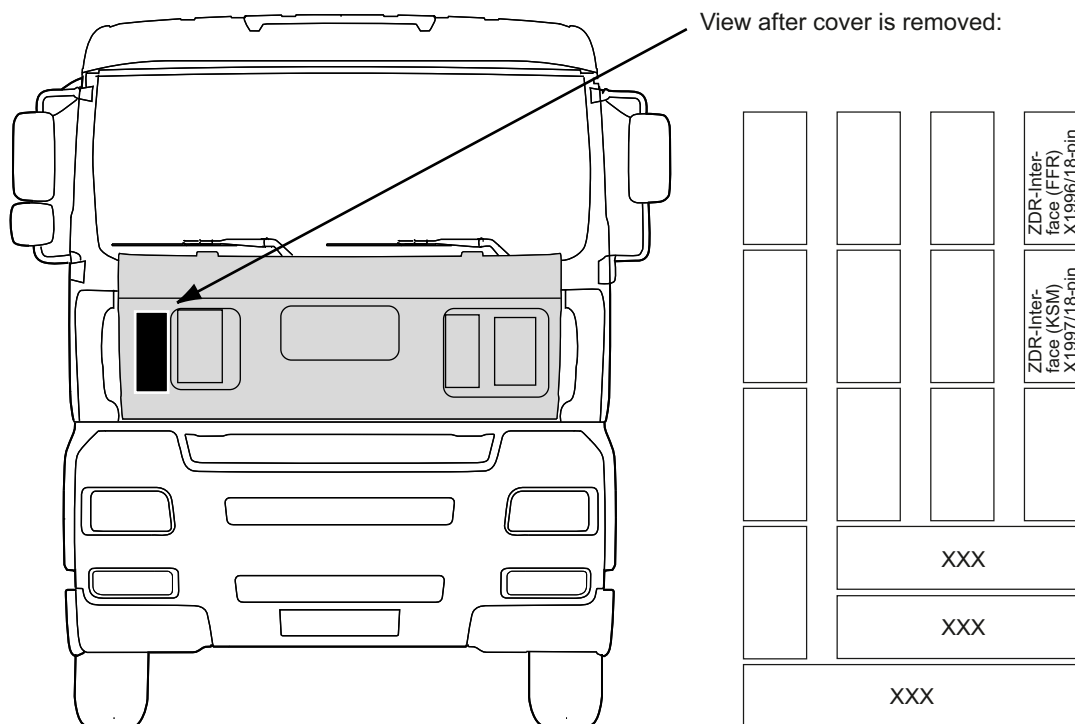
Table 13: Abbreviations used and MAN-specific terms

Term/abbreviation	Explanation
A-CAN	Set-up-CAN (CAN = Controller Area Network)
AUS	Switch-off of FGR/FGB/ZDR functions
CAN	Controller Area Network (= databus, digital network)
DBG	Engine speed limiter
DE	Digital input
EMV	Electromagnetic compatibility
FIN	Vehicle identification number
FFR	Vehicle management computer
FGR/FGB/ZDR	Vehicle speed control/vehicle speed limiter/intermediate speed control
FMS	Fleet Management System
GETRIEBE-N	Neutral position of gearbox
GMT	Greenwich Mean Time
HGB	Maximum speed limiter
High-side-Schalter	Output switching downstream of Terminal 30 (+U _{BAT})
HP	ZF automatic gearbox HP...
KS	Short circuit
KSM	Customer-specific control module
LED	Light emitting diode
Low-side-Schalter	Output switching downstream of Terminal 31 (-U _{BAT})
M3135	MAN works number (M+Number 3 - 4 digit)
MAN-CATS II	Computer diagnostic system used in MAN workshops (CATS = computer aided testing system)
MBG	Torque limiter
MDB	Torque/speed limiter
MEMORY	Stored function/value
NA	Power take-off
NMV	Power take-off prefitted depending on engine
PIN	Plug contact
PTO	Power take off
PWM	Pulse width modulation
R-Gang	Reverse gear
SET+	Increase and set speed and/or accelerate
SET-	Reduce and set speed and/or decelerate
SG	Control unit
T-CAN	Power train-CAN (CAN = Controller Area Network)
+U _{BAT}	Pulse voltage of batteries
-U _{BAT}	Minus voltage of batteries
UTC	Universal Time Code
VIN	Vehicle Identification Number
ZBR	Central on-board computer
ZDR	Interim speed control/regulator

4.2 Interface mounting location

The ZDR interfaces are located behind the front panel and can be accessed from outside after unlocking the front panel and removing the housing cover (see Figure 4).

Fig. 4: Mounting location of ZDR-interfaces



4.3 Description

The retrofit KSM interface is available in 2 versions to-date and these are both upwards compatible (fitting new version in a used vehicle) and downwards compatible (fitting new version in used vehicle and older version can be fitted into new vehicle). The fleet management interface can only be fitted together with the KSM interface STEP05 or later (fitted ex-works since March 2002).

Table14: Interface descriptions

Intermediate speed control with interface on vehicle management computer (ZDR on FFR)	
download PDF-File: zdr-ffr_gb.pdf	This document describes the interface for intermediate speed control on the vehicle management computer (FFR), the interface is fitted on all TG chassis and tractor units. It is however, only enabled if either intermediate speeds, a power take-off with intermediate speeds or a power take-off preparation has been ordered ex-works. Retrospective enabling or disabling of the interface is possible in authorised workshops. The general and industry-specific factory settings for the interface have been circulated to all MAN workshops via a service bulletin.
Intermediate speed control with customer-specific control module (ZDR with KSM) STEP0 (fitted ex-works to March 2002)	
download PDF-File: zdr-ksm_gb.pdf	This document describes the interface on the customer-specific control module, the interface is available as a special equipment item for all TG. It is possible to retrofit the interface and modify its functions in authorised workshops. This version of the interface does not support the manufacturer-independent Fleet Management Standard (FMS). For the FMS interface, a KSM of generation STEP05 or later is required (= Item no. 81.25806.7004).

Table14: Interface descriptions

Intermediate speed control with customer-specific control module (ZDR with KSM) STEP05 (fitted ex-works since March 2002 = 81.25816.7004)	
download PDF-File: (zdr-ksmstep05-fms_gb.pdf)	This document describes the interface for the customer-specific control module of Generation Step 05, recognisable by Item No. 81.25816.7004 affixed to the housing. This interface is available as a special equipment item for all TG vehicles. It is possible to retrofit the interface and modify its functions in authorised workshops.
Fleet management standard interface with customer-specific control module (FMS with KSM) STEP05 (fitted ex-works since March 2002 = 81.25816.7004)	
download PDF-File: (zdr-ksmstep05-fms_gb.pdf)	This document describes the implementation of the manufacturer-independent Fleet Management Standard Interface (FMS) for all TG vehicles. Additional information is available at www.fms-standard.com . The FMS interface is integrated into customer-specific control modules (= KSM) Step05 and later (= item number 81.25816.7004) and this is the reason why this special equipment item is a pre-requisite for connection to the FMS interface. It is possible to retrofit the interface and modify its functions in authorised workshops.
Intermediate speed control with customer-specific control module (ZDR with KSM) STEP 1 (fitted ex-works since August 2003 = 81.25816.7005)	
download PDF-File: zdr-ksmstep1-fms_gb.pdf	This document describes the interface for the customer-specific control module of Generation Step 1, recognisable by Item No. 81.25816.7005 affixed to the housing. This interface is available as a special item for all TG vehicles. It is possible to retrofit the interface and modify its functions in authorised workshops.* * Requires a central on-board computer with code ZBR 81.25806.7033 or higher item number and vehicle management computer FFR 81.25805.7015.
Fleet management standard interface with customer-specific control module (FMS with KMS) STEP 1 (fitted ex-works since August 2003 = 81.25816.7005)	
download PDF-File: zdr-ksmstep1-fms_gb.pdf	This document describes the implementation of the manufacturer-independent Fleet Management Standard Interface (FMS) for all TG vehicles. Additional information is available at www.fms-standard.com . The FMS-interface is integrated into the customer-specific control module (= KSM) STEP05 and later (= item number 81.25816.7005), which is why this special equipment item is a pre-requisite for connection to the FMS interface. It is possible to retrofit the interface and modify its functions in authorised workshops.* * Requires a central on-board computer with code ZBR 81.25806.7033 or higher item number and vehicle management computer FFR 81.25805.7015.